Indiana Department of Transportation

County Clark Route Heavy Haul Transportation Corridor / New Alignment Des. No. 1382612

FHWA-Indiana Environmental Document

CATEGORICAL EXCLUSION / ENVIRONMENTAL ASSESSMENT FORM

General Project Information

Road No./County:	Heavy Haul Transportation Corridor / Clark County
Designation Number:	1382612
Project Description/Termini:	Construction of approximately 1.48 miles of heavy haul-designated roadway from North Access Road (St. 10+00) to SR 265/Old Salem Road interchange (St. 88+32.65).

After completing this form, I conclude that this project qualifies for the following type of Categorical Exclusion (FHWA must review/approve if Level 4 CE):

	Categorical Exclusion, Level 2 – The proposed action meets the criteria for Categorical Exclusion Manual Level 2 - table 1, CE Level Thresholds. Required Signatories: ESM (Environmental Scoping Manager)
	Categorical Exclusion, Level 3 – The proposed action meets the criteria for Categorical Exclusion Manual Level 3 - table 1, CE Level Thresholds. Required Signatories: ESM, ES (Environmental Services Division)
	Categorical Exclusion, Level 4 – The proposed action meets the criteria for Categorical Exclusion Manual Level 4 - table 1, CE Level Thresholds. Required Signatories: ESM, ES, FHWA
X	**Environmental Assessment (EA)** – EAs require a separate FONSI. Additional research and documentation is necessary to determine the effects on the environment. Required Signatories: ES, FHWA

Note: For documents prepared by or for Environmental Services Division, it is not necessary for the ESM of the district in which the project is located to release for public involvement or sign for approval.

Release for Public Involvement

2-5-18

ES Signature Date

MICHELLE B ALLEN

Digitally signed by MICHELLE B ALLEN
DN: c=US, o=U.S. Government, ou=FHWA FHWAIndianapolisIN, ou=DOT FHWAIndianapolisIN, cn=MICHELLE B ALLEN
Date: 2018.02.05 15:22:33 -05'00'

FHWA Signature Date

Certification of Public Involvement _____ _____

Office of Public Involvement Date

Note: Do not approve until after Section 106 public involvement and all other environmental requirements have been satisfied.

INDOT ES/District Env. Reviewer Signature: _____ Date: 2-5-18

Name and Organization of CE/EA Preparer: Leah S. Boits and Briana M. Hope, American Structurepoint, Inc.

Part I - PUBLIC INVOLVEMENT

Every Federal action requires some level of public involvement, providing for early and continuous opportunities throughout the project development process. **The level of public involvement should be commensurate with the proposed action.**

	Yes	No
Does the project have a historic bridge processed under the Historic Bridges PA*?		X
If No, then:		
Opportunity for a Public Hearing Required?	X	

**A public hearing is required for all historic bridges processed under the Historic Bridges Programmatic Agreement between INDOT, FHWA, SHPO, and the ACHP.*

Discuss what public involvement activities (legal notices, letters to affected property owners and residents (i.e. notice of entry), meetings, special purpose meetings, newspaper articles, etc.) have occurred for this project.

Remarks:

Notice of Entry for Survey
A Notice of Survey was sent to adjoining property owners on February 4, 2014, indicating survey and environmental work was being initiated for the proposed project. Additional Notice of Survey letters were mailed on May 27, 2014 and July 17, 2015 for supplemental areas. On February 22, 2017, Notice of Entry letters were then sent to individual property owners where additional archaeological work needed to be conducted. For reference to the letters, see Appendix F, F-1 to F-6.

Public Information Meetings
Two Public Information meetings were held on January 28, 2015 and April 5, 2017 at the Utica Elementary School. A Public Notice was published on the Indiana Department of Transportation (INDOT) news release website on January 15, 2015. A reminder of the meeting was published on the INDOT news release site on January 25, 2015. The intent of the January 28, 2015 meeting was to introduce preliminary information about the proposed new roadway. The public was invited to share comments and questions with project team members during the informal open house before and after a presentation. The public was also invited to nominate an individual for inclusion as a member of the Community Advisory Committee (CAC) being organized to participate in the development of the environmental and engineering evaluations. Public comments were accepted through February 11, 2015. Two (2) comments were received within the designated comment period; one comment requested more communication with regard to the project. The other comment focused on the concern of the project's effect on a property owner's land. In addition, four (4) CAC nomination forms for two (2) individuals were received (details below). Information pertaining to the January 28, 2015 Public Information Meeting, including public notices, sign-in sheets, project information handouts, presentation, and comment sheets can be found in Appendix F (F-7 to F-28).

The intent of the April 5, 2017 meeting was to discuss potential route alternatives being considered for the Heavy Haul Transportation Corridor. A Public Notice for the April meeting was mailed to adjoining property owners and local government officials on March 28, 2017; the Public Notice was also published on the INDOT news release website on March 28, 2017. A reminder of the meeting was published on the INDOT news release site on April 3, 2017. The public was invited to share comments and questions with members of the project team during the informal open house before and after the presentation. The public was also invited to nominate additional individuals to serve on the CAC. Public comments were accepted through April 29, 2017. No additional comments were received. Information pertaining to the April 5, 2017 Public Information Meeting, including public notices, sign-in sheets, project information handouts, and presentation can be found in Appendix F (F-29 to F-44).

CAC Meeting
A CAC is a group of individuals serving as representatives of their local community and neighborhood groups to act as a liaison for the exchange of information between the community and transportation officials. CAC members are given the opportunity to participate in the development of project evaluations, potentially continuing its direct involvement with the project through the preparation of final design plans for the proposed project. The INDOT, in partnership with Federal Highway Administration (FHWA), maintain final authority and responsibility concerning decision-making regarding the Heavy Haul Transportation Corridor.

The CAC was selected from area residents, businesses, and officials having direct interest in the project. Requests for nominations for inclusion as a member of the CAC were made at the January 28, 2015 and April 5, 2017 Public

Information meetings; two (2) neighborhood representatives were nominated and included as CAC members. Committee members were selected as representatives of larger groups and were responsible for coordinating and facilitating communications between INDOT and project team members as the project developed.

An invitation to participate in a CAC meeting was sent to CAC members on October 6, 2017. The CAC meeting was held on October 26, 2017 at the INDOT Project Office in Jeffersonville Indiana. The intent of the CAC meeting was to discuss the project development, including the project timeline and overview of the current design, and to provide comments and feedback. The primary concerns discussed at the meeting included the following:

- Upgrading the existing Port Road to meet heavy haul standards in order to avoid impacting individual property owners along the proposed corridor
- Concern about project's impact on individual properties
- Access to the Heavy Haul Transportation Corridor

INDOT and the project-design team engaged in open discussions with regard to questions and concerns during the open forum portion of the meeting. Information pertaining to the October 26, 2017 CAC meeting, including the meeting agenda, handout sheets, sign-in sheets, and a summary of meeting minutes, can be found in Appendix F (F-45 to F-54).

Public Hearing
The proposed project is being processed as an Environmental Assessment (EA). Per the current *Indiana Department of Transportation (INDOT) Public Involvement Manual 2012*, a public hearing will be provided to the public. Upon approval and release of the EA for public involvement, a legal advertisement will be placed in a local publication notifying the public of the EA's availability for review and comment for a period of 30 days.

The legal notice will appear in a local publication of general circulation, contingent upon the approval and release of this document for public involvement, announcing the availability of the environmental documentation, and the date and venue of the public hearing at least 15 days and again at least seven days in advance of the event. The hearing will allow the public to formally provide comments on the preferred alternative and potential effects to the social and natural environment. Comments will be accepted for a period of 15 days following the hearing.

Subsequent to the satisfactory completion of the public involvement process, and if determined appropriate, a request for preparation of a Finding of No Significant Impact (FONSI) will be submitted to the FHWA through INDOT. All comments received during this period will be listed and individually addressed in the disposition of comments attachment included in the FONSI request packet. If any comments cause a re-examination or require a change to the EA, an Additional Information (AI) document may be prepared and approved by the FHWA prior to the submission of the FONSI request to the FHWA. The preparation of the FONSI by the FHWA will indicate that the NEPA process for this project has been completed. Individuals included on the mailing list for the project will be notified by U.S. mail of the FONSI issuance by the FHWA. In addition, a public notice announcing the availability of the FONSI will be advertised in a local publication of general circulation.

Section 106
To meet the public involvement requirements of Section 106 of the National Historic preservation Act, the INDOT, on behalf of the FHWA issued a finding of "No Historic Properties Affected" on December 1, 2017, which was advertised in the December 27, 2017 edition of the *News and Tribune* (Appendix C, C-85). No comments regarding the Section 106 finding were received from the public within the designated comment period, which closed on January 22, 2018.

Public Controversy on Environmental Grounds

	Yes	No
Will the project involve substantial controversy concerning community and/or natural resource impacts?		X

Remarks:

To date, there are no known substantial controversies concerning this project with respect to community and/or natural resource impact. Two Public Information meetings were held on January 28, 2015 and April 5, 2017. Some property owners and members of the public objected to the proposed project corridor. A recurring concern involved upgrading existing infrastructure (Port Road) to meet heavy haul standards instead of constructing new alignment. The use of Port Road as a heavy haul corridor was reiterated during the October 26, 2017 CAC meeting. Upgrading Port Road to meet heavy haul standards was evaluated as an alternative for this project. However, this alternative does not meet the system connection south of SR 265/Old Salem Road interchange criteria of the purpose and need (Appendix F, F-45 to F-54).

These issues do not merit substantial controversy on environmental grounds. Impacts to historic resources have been minimized to the extent practical through project design. Impacts to the community and individual properties will be addressed as the project advances through the right-of-way phase. Comments received in the public hearing process will be addressed and presented in the request for FONSI.

Part II - General Project Identification, Description, and Design Information

Sponsor of the Project: INDOT, Indiana Economic Development Corporation, Ports of Indiana, Clark County, City of Jeffersonville, and River Ridge Development Authority INDOT District: Seymour

Local Name of the Facility: Heavy Haul Transportation Corridor

Funding Source (*mark all that apply*): Federal [X] State [X] Local [X] Other* [ ]

*If other is selected, please identify the funding source: _____

PURPOSE AND NEED:

Describe the transportation problem that the project will address. The solution to the traffic problem should NOT be discussed in this section. (Refer to the CE Manual, Section IV.B.2. Purpose and Need)

The need for the proposed project is due to the current and predicted rapid industrial and commercial development in the area that would result in a significant increase in volume of heavy haul vehicles mixing with local traffic. This growth, combined with the lack of connectivity and suitable roadways for heavy haul vehicles in the area, indicates a need for the proposed project. The purpose of the proposed project is to provide a route built specifically for heavy haul vehicles that provides a continuous connection between the River Ridge Commerce Center (RRCC) and the Ports of Indiana-Jeffersonville (Port) via the new State Road (SR) 265/Old Salem Road interchange.

Sponsorship and Location

The INDOT, in partnership with the FHWA, the Indiana Economic Development Corporation, the Ports of Indiana, the Board of Commissioners of Clark County, the City of Jeffersonville Redevelopment Commission, and the River Ridge Development Authority (RRDA), is developing a federal-aid road project to improve connectivity for the Ports of Indiana-Jeffersonville (Port) with other regional transportation assets.

The area is located on the Jeffersonville and Charlestown USGS 7.5 Minute Quadrangle Maps in Tracts 6-7, 14-17, 24-27, 38-40, and 52-53 and is within the Louisville Metropolitan Planning Area (LMPA), which consists of nine counties in Kentucky (Jefferson, Oldham, Trimble, Henry, Shelby, Spencer, Nelson, Bullit and Meade) and four Indiana counties (Washington, Harrison, Floyd and Clark). Preliminary corridor studies identified an approximately 1.3-mile wide corridor between the Port of Indiana, Jeffersonville and SR 265 to establish roadway alignment alternatives for the project.

The project area has several major generators of traffic that consist primarily of heavy trucks or heavy haul vehicles. However, the road network in the area is primarily made of up of local facilities not designed to handle such vehicle loading. Heavy haul vehicles (often referred to as Michigan truck trains) are generally 60 feet or more in length with a gross vehicle weight of 134,000 pounds, as compared to Indiana legal load limits of 80,000 pounds gross vehicle weight. Heavy haul vehicles require the design of facilities to take into account the maximum weight of the heavy haul vehicles and the anticipated number of heavy haul vehicles utilizing the facility on a daily basis. The resulting difference between a facility designed to carry heavy haul vehicles and standard load trucks is often a significant difference in pavement thickness. Based on current and predicted rapid industrial and commercial development associated with the major traffic generators in the project area it is anticipated that truck traffic will increase by 129 percent over the next 20 years.

Existing Conditions

Major Traffic Generators

The Port of Indiana-Jeffersonville

Located 1.5 miles south of the SR 265/Old Salem Road interchange and along the riverfront of the Ohio River, the Port is the fastest growing of the Inland Waterway System, accepting 200,000 trucks, 17,000 rail cars, and 1,300 barges annually. The Port occupies approximately 1,057 acres of land with an estimated 316 acres of commercial parcels remaining undeveloped. Currently the Port has 28 existing manufacturing and industrial companies employing 1,500 individuals. The Port is roughly bordered to the northwest by Middle/New Middle Road, to the southwest by The Fields of Lancassange Subdivision and Lancassange Creek, to the southeast by the Ohio River and to the northeast by Brown-Forman Road. The Port boasts a strategic location of being within one day's drive to more than two-thirds of the U.S. population and connects to three interstate facilities, I-71, I-64 and I-65, via SR 265. Additionally, rail service throughout the Port is provided by MG Rail operated by Consolidated Grain and Barge.

Recently, the Ports of Indiana received a $10 million Transportation Investment Generating Economic Recovery (TIGER) grant for a $17 million project intended to further develop rail and road connections within the Port property. According to the press release issued by the Ports of Indiana on October 30, 2015, "The project will enhance and overhaul the railroad infrastructure and intermodal capabilities throughout the entire port. The project scope includes construction of a siding to accommodate unit train delivery to and from the Port, reconfiguration of the waterfront railroad infrastructure including two new rail loops that will dramatically increase operational efficiency, construction of a waterfront intermodal facility that will more than double the capacity of bulk commodities transferred from rail cars to barges, construction of a rail yard that will allow cargo to be transferred between trucks and rail cars, and construction of more than a mile of the railroad extension towards RRCC." Growth in and around the Port is expected to continue as a result of these improvements and due to the development of the RRCC, the largest industrial/commercial park in the region, and the completion of the Louisville-Southern Indiana Ohio River Bridges Project East End Crossing (EEC).

River Ridge Commerce Center(RRCC)
The RRCC is a 6,000-acre tract of repurposed U.S. government property located approximately 0.5 mile north of the SR 265/Old Salem Road interchange and 2.0 miles northeast of the existing SR 265/SR 62/Port Road interchange. With only 2,000 acres of the property currently developed, the RRCC is the largest and fastest growing industrial/commercial park in the region. According to the 2014 RRDA Gateway Master Plan document, the RRCC has generated over $1.16 billion in economic output and supports over 5,900 direct jobs, which accounts for 12% of Clark County's workforce. The RRCC property includes a 1,500-acre site, with Mega-Site certification. A Mega-Site is a large, contiguous tract of land that is marketed for major manufacturing or industrial developments, and the certification ensures potential buyers that due diligence items have already been completed. This makes the land more attractive to developers. The expansion of the RRCC facilities, including the Mega-Site, is expected to significantly increase transportation demands between the Port and the RRCC, including a significant increase in heavy haul vehicle traffic.

City of Jeffersonville and Utica Area
The Jeffersonville-Utica area is in the midst of extensive infrastructure and industrial/commercial expansion projects. This is, in part, spurred by the recent completion of the EEC. The EEC completes an interstate level highway around the north side of the LMPA, connecting I-265 in Indiana and Kentucky via Indiana SR 265 and KY 841 (Gene Snyder Freeway), and provides a major regional circumferential interstate level route. Expansion of existing and new development of industrial and business parks in the area of New Middle Road and Port Road are already under way. Many of the industries expanding into the area use heavy haul vehicles for distribution and receiving operations.

Existing Infrastructure

Port Road
Port Road is generally a northwest-southeast route that extends from Utica Pike to SR 265, providing direct access between the Port and the SR 62/SR 265 interchange. It is functionally classified as a major collector between SR 265 and Utica Pike. Port Road serves as the primary access to the Port for commercial/heavy vehicle traffic and is the only current connection from SR 265 to the Port that trucks can safely navigate, although not designed to effectively handle heavy haul vehicles. Port Road is a two lane roadway with a current traffic volume of 8,405 vehicles per day (2015) with 29 percent trucks and a projected traffic volume of 19,295 vehicles per day (2035) with 29 percent trucks. Port Road also serves a number of established business parks to the west of Middle Road/New Middle Road. The typical section of Port Road consists of two 12-foot wide lanes (one in each direction) bordered by 10-foot wide paved shoulders. The posted speed limit along Port Road is 30 miles per hour. The vertical alignment of the facility is generally rolling terrain, while the horizontal alignment has various tangent to curvilinear sections.

Old Salem Road
Old Salem Road was recently upgraded from a narrow two lane facility accommodating two 8-foot wide travel lanes with no shoulders to an improved roadway with two 11-foot wide travel lanes in each direction and shoulders no more than 4-feet wide along each travel lane. With the completion of the roadway improvements, Old Salem Road functions as a minor arterial for the collection and distribution of local traffic south of the SR 265 interchange. Old Salem road previously functioned as a low-volume local road (less than 500 vehicles per day) and generally served as an access drive to residential properties north of Utica. However, the facility retained two significantly steep grade sections (greater than 10%), that required posting of steep grade advanced warning signage. Other issues with Old Salem Road as the southern link between the RRCC, SR 265 and the Port are discussed below. Old Salem Road is not designed to effectively handle heavy haul vehicles and improvements did not include a pavement structure to accommodate heavy haul vehicles.

International Drive / Logistics Avenue
The RRDA is part of a local partnership has recently constructed a north-south roadway through the RRCC property. The Kentuckiana Regional Planning & Development Agency (KIPDA) identified the roadway as a Heavy Haul Road in their Horizon 2035 Metropolitan Transportation Plan. The new roadway connects the SR 265 interchange with SR 62 on the north side of the RRCC property. The portion of the roadway running north from the SR 265/Old Salem Road interchange is signed as International Drive and

the portion continuing west to SR 62 will be signed as Logistics Avenue. The roadway collects and distributes traffic north of the SR 265 interchange. The typical section of International Drive/Logistics Avenue consists of two 12-foot wide travel lanes, one in each direction, separated by a 14-foot wide two-way left turn lane. The roadway was constructed to effectively handle heavy haul vehicle loads.

Middle Road / New Middle Road
The Middle Road/New Middle Road corridor is an important local route that generally extends from the southwest to the northeast servicing commercial development on the east side of the City of Jeffersonville. The two lane road is functionally classified as a minor arterial roadway and currently terminates approximately 1.0 mile northeast of its intersection with Port Road. The typical section of Middle Road consists of two 12-foot wide lanes (one in each direction) bordered by 10-foot wide paved shoulders. The extension of Middle Road east of Port Road, New Middle Road, consists of two 12-foot wide lanes (one in each direction) bordered by 2-foot wide paved shoulders. The posted speed limit along Middle Road is 45 miles per hour. The vertical alignment of the facility is generally level, while the horizontal alignment has various tangent to curvilinear sections. Middle Road/New Middle Road is not constructed to effectively handle heavy haul vehicles.

Utica Pike/Upper River Road
Utica Pike/Upper River Road is a southwest to northeast minor arterial route connecting downtown Jeffersonville to the town of Utica. As Utica Pike enters the downtown area of Jeffersonville it is known at Market Street, while in Utica it is referred to as 4th Street. In the project area, the typical section generally consists of two 11-foot wide travel lanes with narrow to no shoulders. Both the vertical and horizontal alignment of the facility are generally level, while the horizontal alignment has various tangent to curvilinear sections. Utica Pike is not constructed to effectively handle heavy haul vehicles.

SR 62
SR 62 is a west-east route beginning west of Mt. Vernon in southwest Indiana and ending at US 50 southwest of Lawrenceburg in southeast Indiana. Through the project area, SR 62 is generally on a southwest-northeast alignment. It is functionally classified as a principal arterial from Utica-Sellersburg Road south to SR 265 where the roadway then continues south as 10th Street into the City of Jeffersonville, and as a minor arterial from Utica-Sellersburg Road north into Charlestown. The typical section of SR 62 consists of four 12-foot wide lanes (two in each direction) with 4-foot wide outside and 2-wide inside paved shoulders. A 22-foot wide grass median separates the eastbound and westbound lanes. The posted speed limit along SR 62 is 55 miles per hour east of Utica-Sellersburg Road and 45 miles per hour west of Utica-Sellersburg Road continuing along 10th Street and into Jeffersonville. The vertical alignment of the facility is generally level and the horizontal alignment is typically tangent. Neither SR 62 nor 10th Street is constructed to effectively handle heavy haul vehicles.

SR 265 (SR 62/Port Road to the Ohio River)
The Louisville-Southern Indiana Ohio River Bridges Project EEC completed the interstate-level highway around the north side of the LMPA, connecting I-265 in Indiana and Kentucky via Indiana SR 265 and Kentucky (KY) 841. The completion of the EEC provides a significant regional connection in the northern portion of the LMPA via a new bridge spanning the Ohio River. Prior to the completion of this regional route, traffic generated from the Port area with intended destinations in the eastern reaches of the LMPA, or beyond, had to travel westward and navigate through the congested downtown Jeffersonville area and Spaghetti Junction (the convergence of three interstates, I-71, I-65 and I-64) before backtracking to the east. This new route provides a direct access to the eastern reaches of the LMPA and other interstate facilities, such as I-71 and I-64, without having to traverse through the downtown areas of Jeffersonville and Louisville.

SR 265 is a four lane dived highway consisting of two 12-foot wide eastbound travel lanes and two 12-foot wide westbound travel lanes. The eastbound and westbound lanes are separated by a depressed median varying in width. Aside from the interchange with SR 62/Port Road, the only other direct access point to the local road network eastward to the Ohio River is at the new interchange with Old Salem Road. While designed to effectively handle the standard maximum load on Indiana highways of 80,000 pounds gross weight, SR 265 is not specifically designed to handle heavy haul vehicles.

Primary Need Criteria
Deficient System Linkage

Deficient Connectivity Between Existing Infrastructure and Major Traffic Generators
An examination of the local street network in the eastern limits of the City of Jeffersonville reveals an overall lack of connectivity providing direct local access to key commerce areas. Currently, there are only four roads that provide local access between the areas north of SR 265 and south of it, Port Road/ SR 62, Utica-Sellersburg Road, Old Salem Road/International Drive/Logistics Avenue and Utica Pike/Upper River Road. While Port Road/SR 62 is functionally classified as a principal arterial, neither is designed for heavy haul vehicles. Utica-Sellersburg Road is functionally classified as a major collector, it has substandard horizontal curvature making it an undesirable facility to be used for direct local vehicular access across SR 265 and it is not designed to handle heavy haul

vehicles. The International Drive/Logistics Avenue connection north of SR 265 will provide a connection between the RRCC and the highway. However, issues remain with the south leg, Old Salem Road, which are discussed in the following section. The Utica Pike/Upper River Road system is located in the floodplain of the Ohio River, subjecting it to flooding on a 5 year return frequency. This issue makes it an unreliable local access route, especially in times of emergencies. Of these four routes, only two, Old Salem Road/International Drive/Logistics Avenue and Port Road/SR 62 also have direct access to SR 265.

Inadequate System Connection South of the SR 265 / Old Salem Road Interchange
The 2003 Final Environmental Impact Statement (FEIS) and the 2012 Supplemental Final Environmental Impact Statement (SFEIS) for the Louisville-Southern Indiana Ohio River Bridges Project references the need for a connection between the new SR 265/Old Salem Road interchange, the Port, and the RRCC. More specifically, it recognized the need to improve existing roadway connections to the RRCC and for the consideration of additional connections between the Port and SR 265. Though the extension of SR 265 between SR 62/Port Road and the Ohio River includes the addition of a new interchange at Old Salem Road, along with a northern spur now connecting to International Drive/Logistics Avenue and a southern spur connecting to Old Salem Road, it does not fully address the recognized need to the evaluated additional connections between the Port and SR 265. Such an action would have independent utility from the EEC given a connection to the local road system north and south of the interchange is provided.

The intersecting roads at this interchange consist of two local roads, Old Salem Road to the south and International Drive/Logistics Avenue to the north. International Drive/Logistics Avenue provides a three lane connector road between the Old Salem Road interchange and the RRCC at SR 62 and Logistics Avenue. Both the International Drive/Logistics Avenue and the roadway connecting Old Salem Road and International Drive/Logistics Avenue through the SR 265/Old Salem Road interchange are designed to effectively handle heavy haul vehicle traffic. Evidenced by the continued growth of the Port area and the development of the RRCC (refer to Section 2.1), there is a demonstrated need for a continuous route southward to the Port.

Currently, the only connecting route to the Port from the SR 265/Old Salem Road interchange is a non-continuous one provided via Old Salem Road, which continues into the historic town of Utica as Mulberry Street, and Utica Pike (4th Street within the town of Utica). As discussed in Section 2.2, the Old Salem Road section of this south link to the Port is unable to handle added traffic volumes and heavy haul vehicles expected from the interchange.

Based on the Louisville Southern Indiana Ohio River Bridges, Traffic Forecast Report, February 22, 2012 and Section 6 Roadway the projected traffic volumes for Old Salem Road indicate 7,200 vehicles per day (2030) with six percent trucks. Even after the aforementioned upgrades to Old Salem Road are complete, using this south link to the Port for heavy haul vehicle traffic is undesirable. The added traffic to this facility will be routed into the Utica town center connecting to Utica Pike (4th Street). In so doing, additional upgrades to the town's infrastructure will likely be required. Such upgrades are likely to adversely affect the Utica Historic District, which was determined eligible for inclusion in the National Register of Historic Places (NRHP) as part of the Louisville-Southern Indiana Ohio River Bridges Project, and have impairing effects on the community cohesion of the town.

<u>Lack of Infrastructure Designed to Effectively Handle Heavy Haul Vehicles</u>

Presently, the only state-classified extra heavy duty highways across Indiana are in northwest and northeast sections of the state. Such facilities are constructed to handle heavy haul vehicles. The continued development of the RRCC and the Port with manufacturing and industrial facilities is expected to significantly increase transportation demands, specifically heavy haul vehicles, between the two traffic generators. Predicted volumes of traffic between RRCC and the Port by 2035 are 14,742 vehicles per day with 30 percent trucks. Neither route currently connecting the RRCC and the Port, Port Road and SR 62 and Old Salem Road/Utica Pike, SR 265/Old Salem Road interchange and International Drive/Logistics Avenue, are designed for heavy haul vehicles. The roadway connecting Old Salem Road and International Drive/Logistics Avenue over SR 265 was designed to handle Michigan train truck loads. However, all other roadways were not. Aside from the potential damages to the town of Utica discussed in the previous section, the lack of a continuous heavy haul vehicle routes between the Port and SR 265 will likely result in heavy haul vehicles continued usage of Port Road for access to SR 265. The continued passage of these types of vehicles over a facility not properly designed to handle such loads will result in accelerated deterioration of the pavement and subgrade, requiring more frequent maintenance and replacement.

PROJECT DESCRIPTION (PREFERRED ALTERNATIVE):

County: Clark Municipality: City of Jeffersonville

Limits of Proposed Work: North Access Road (St. 10+00) to SR 265/Old Salem Road interchange (St. 88+32.65)

Total Work Length: 1.48 Mile(s) Total Work Area: 21.5 Acre(s)

	Yes[1]	No
Is an Interchange Modification Study / Interchange Justification Study (IMS/IJS) required?		X
If yes, when did the FHWA grant a conditional approval for this project?	Date: N/A	

[1]*If an IMS or IJS is required; a copy of the approved CE/EA document must be submitted to the FHWA with a request for final approval of the IMS/IJS.*

In the remarks box below, describe existing conditions, provide in detail the scope of work for the project, including the preferred alternative. Include a discussion of logical termini. Discuss any major issues for the project and how the project will improve safety or roadway deficiencies if these are issues.

Project Location:
The proposed project area is located in Utica Township, Clark County, Indiana. More specifically, the project is located on the Jeffersonville USGS 7.5 Minute Quadrangle Map in tracts 7, 15, and 16. The project corridor is located just west of the Town of Utica, north of the Ohio River and south of SR 265.

The proposed project extends 1.48 miles from its southern terminus at North Access Road, located approximately 0.5 mile north of the Brown Forman Road and Utica Pike intersection, to its northern terminus of the SR 265/Old Salem Road interchange. The proposed project has independent utility and would function independent of other projects and improvements taking place in the vicinity of the project. The southern terminus will tie into the existing North Access Road and the northern terminus will tie into the existing SR 265/Old Salem Road interchange, providing continuous connection between the RRCC and the Port.

Proposed Improvements (Preferred Alternative – Alternative DE):
The proposed corridor begins approximately 0.5 mile north of the Brown Forman Road and Utica Pike intersection, extends generally north 1.48 miles, and ends at the SR 265/Old Salem Road interchange. The preferred Heavy Haul Transportation Corridor (HHTC) roadway will be constructed as a two-lane urban minor arterial road designed to "heavy haul" specifications. Heavy haul specifications consist of a more robust pavement section to withstand a maximum vehicle weight of 134,000 pounds. To account for the heavy haul vehicles, the proposed roadway will be constructed as 14.5-foot thick pavement with lime subgrade. The proposed roadway will have a design speed of 35 miles per hour with two 13-foot wide travel lanes and 11-foot wide outside shoulders. The 11-foot wide shoulders will be included as part of a 16-foot wide clear zone on both sides of the roadway. Guardrail will be set within the clear zone, approximately 3.5 feet from the edge of the shoulder, where needed. Several small structures will be placed along the project corridor to convey roadside drainage and streams beneath the proposed roadway (See **Design Criteria for Bridges** below for specific details). In addition, two-foot wide rock cut ditches will be constructed outside of the clear zone to convey roadside drainage (Appendix A, A-11 to A-49).

In order to provide direct connection to commercial development on the east side of the City of Jeffersonville and maintain access to local residents, the HHTC roadway will tie in to New Middle Road and Utica-Sellersburg Road, respectively. Proposed improvements to New Middle Road include connecting the current termination point to the newly constructed HHTC roadway. The typical section will be consistent with the current Middle Road typical section, with two 12-foot wide travel lanes (one in each direction) and two 10-foot wide paved shoulders. The posted speed limit will be 45 miles per hour.

As Utica-Sellersburg Road approaches New Middle Road from the south, Utica Sellersburg Road will be reconstructed to turn west and connect with the new HHTC roadway. The typical section for Utica-Sellersburg Road will be two 12-foot wide travel lanes (one in each direction) with 8-foot wide shoulders. In order to maintain access to nearby residences, a new connector road that terminates south of the HHTC roadway, Utica Connector Road, will be constructed. In addition, to maintain residential access north of the HHTC roadway and keep local traffic from mixing with heavy haul traffic, Utica Sellersburg Road approaching the HHTC roadway from the north will also terminate north of the new roadway.

The preferred alternative also includes the construction of a new bridge over Lentzier Creek. The proposed bridge will be a 0.11-mile long, three-span continuous composite steel plate girder bridge; the spans will be 172.5 feet, 208 feet, and 172.5 feet long. The bridge will have a 54-foot, 4-inch wide out-to-out coping with a 51-foot, 4-inch wide clear roadway width. The typical section of the bridge consists of two 13-foot wide travel lanes and 12-foot, 8-inch wide outside shoulders. A 1.5-foot wide concrete bridge railing will be installed outside of the shoulders. The bridge over Lentzier Creek will be about 60-80 feet above the stream bottom (Appendix A, A-50 to A-57).

The preferred alternative requires approximately 26 acres of permanent right-of-way acquisition. Of the total right-of way-acquisition, 4.9 acres of right-of-way will be required from residential parcels. Three (3) residential relocations will likely be required for the construction of the roadway. No temporary right-of-way is anticipated.

Maintenance of Traffic (MOT):
Because the proposed HHTC roadway will be constructed primarily on new terrain, MOT will not be required for the newly built roadway section. However, during the entire duration of construction, barricades would be placed at the end of New Middle Road, which currently terminates approximately 0.1 mile northeast of its intersection with Port Road, and at the connection point to Old Salem Road near the I-265/Old Salem Road interchange.

A three-mile detour route for Utica-Sellersburg Road will be utilized while the new HHTC roadway and Utica-Sellersburg Road intersection is being constructed. The detour will direct traffic along Brown Forman Road, to Utica Pike, to Port Road, to New Middle Road, to Utica-Sellersburg Road. The detour will be in place for approximately 90 days.

Programming and Summary of Impacts:
The project is listed in the *2018-2021 INDOT State Transportation Improvement Program* (STIP) and in the Kentuckiana Regional Planning and Development Agency's (KIPDA) *2018 –2021 Transportation Improvement Program* (TIP). The total estimated cost listed in the STIP is $15,002,571, which includes $1,232,000 in engineering costs (2018-2019), $10,558,152 in construction costs (2018-2019), and $3,212,419.01 in right-of-way costs. The total cost listed in the TIP is $47,041,709; however, this cost includes the construction of a three-lane road from the SR 265/Old Salem Road interchange north through RRCC to Indiana Highway 62, which is a 100% locally sponsored project (Appendix G, G-1 to G-7).

This project will result in a roadway and bridge with the capacity to handle heavy haul vehicles. The roadway will provide heavy haul vehicles an additional continuous and direct local access connection between major traffic generators while also separating the heavy haul traffic from local traffic. Therefore, it is a net benefit for the surrounding community and transient users of SR 265 and other local facilities. Impacts to the social environment include three potential relocations, which will be conducted in accordance with 49 CRF 24 and the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 as amended. Because the project is primarily new alignment on new terrain, temporary inconveniences due to MOT measures may occur at areas associated with tying the new roadway in to existing infrastructure.

OTHER ALTERNATIVES CONSIDERED:

Describe all discarded alternatives, including the Do-Nothing Alternative and an explanation of why each discarded alternative was not selected.

As part of the project development, a range of alternatives was considered. Due to the steep terrain of the area and because the area is rich in cultural resources, 12 alternatives (including the preferred alternative) were considered potentially feasible. Through coordination with resource agencies, three (3) of the 12 alternatives were determined to fully satisfy the purpose and need with minimal impacts to resources. A description of the 11 discarded alternatives, including two that met the purpose and need, and the reasons they were discarded from further consideration are discussed below.

No Build (Do Nothing)
This alternative leaves the existing roadways as they currently exist. This alternative would utilize the current local street system with no expenditure of capital funds for the addition of a heavy haul-designated roadway or for upgrading existing infrastructure to meet heavy haul standards. The No Build alternative would not provide direct and continuous connectivity between existing infrastructure and major traffic generators, address inadequate system connection south of the SR 265/Old Salem Road interchange, or design infrastructure to effectively hand heavy haul vehicles. While this alternative eliminates cost, the potential relocation of residents, and any environmental impacts, it would not have met the objectives of the purpose and need. Therefore, this alternative was discarded from further consideration.

Port Road (Existing Infrastructure)
The Port Road Alternative would be an approximate 4.0-mile long corridor, none of which would be constructed on new terrain. Travel

time along this route from the Port to RRCC is estimated to be approximately 11.5 minutes, which is approximately 8.5 minutes longer than it is anticipated to travel along the preferred alternative. This alternative would utilize approximately 2.0 miles of Port Road and the Port Road/SR 265 interchange and 2.0 miles of SR 265. This alternative would require the widening and reconstruction of approximately 2.0 miles of Port Road, including portions of the SR62/SR265 interchange, to meet heavy haul standards. The Port Road Alternative would also require upgrades to existing intersections to provide safe interaction with heavy load vehicles. Currently Port Road provides direct access to SR 265 from the Port. However, the reconstruction of Port Road would not provide direct and continuous connection to the RRCC. To complete the RRCC connection, vehicles would need to utilize SR 265 to access the Old Salem Road interchange and gain access to the RRCC.

Because the pavement on SR 265 was not designed for heavy haul standards, the expected life of the pavement and bridge structures would likely be shortened by regular use of the expected heavy load vehicles. In addition, the westbound entrance ramp to SR 265 from the Old Salem Road interchange would need to be extended to provide an adequate acceleration lane for heavy vehicles. This impact requires the widening of the existing pavement and the bridge structure over a tributary to Lentzier Creek. The eastbound ramp to the SR 265/Old Salem Road interchange would also need to be re-evaluated to determine if the existing ramp length is sufficient to accommodate trucks waiting to turn north to gain access to the RRCC as the traffic moving north/south across the bridge over SR 265 would be free flow. In addition, the pavement in the roundabout interchange at SR 265 and SR 62 would also require a structural upgrade to accommodate the heavy load vehicles.

Utilizing Port Road as a designated heavy haul roadway would increase the amount of local commuter traffic mixing with not only heavy haul traffic but other large commercial traffic vehicles. Considering the projected increase in traffic along Port Road [8,405 vehicles per day (2015) \ 19,295 vehicles per day (2035)], the forced mixing of commercial traffic and local commuter traffic is likely to result in an increased risk of potential conflicts between not only larger commercial trucks and local commuter traffic but also between the large trucks. It is likely that the forced mixing of traffic would also result in overall slower travel times.

It is estimated that the Port Road Alternative would take approximately 24 months to construct, which is four (4) months longer than is anticipated to construct Alternative DE (preferred alternative); because the construction would occur on existing alignment, it is anticipated that normal traffic patterns would be interrupted for approximately 18 months (with lane restrictions). Since the preferred alternative is on new alignment, interruptions to existing traffic would be minimal. The Port Road Alternative would include five (5) intersecting roadways, three (3) controlled stops, two (2) yields, six (6) merges, one (1) railroad crossing, and 14 commercial access points. In comparison, the preferred alternative will have two (2) intersecting roadways, one commercial access point, and no stops, yields, merges, or railroad crossings.

Port Road is currently functionally classified as a major collector between SR 265 and Utica Pike. A collector street system is intended to provide both access and traffic circulation within residential neighborhoods and commercial/industrial areas by collecting and distributing traffic from local streets through the area to-and-from arterials and their ultimate destinations. Collector systems typically accommodate a shorter trip, and due to property access being a primary function of the roadway, there is not an emphasis on mobility or high operation speed. Arterial systems are intended to provide a higher degree of mobility between destinations typically through higher operating speeds and some degree of access control along the designated roadway, which is one of the goals of the HHTC roadway. Utilizing Port Road as the HHTC roadway introduces an increase in mixed-traffic utilizing the roadway with the primary intent of traveling between the Port and RRCC. This would likely result in the continued loss of mobility along Port Road due to the current number of existing access points and likely continued lack of access control along the corridor. The preferred alternative (DE) is being designed as a designated heavy haul route, functionally classified as urban minor arterial. Therefore, encouraging traffic (primarily trucks) with the intent of traveling between the Port and the RRCC to utilize the roadway. This will ultimately allow Port Road to continue to function as a collector system as intended and warranted by the apparent functions of the roadway, which are property access and collection and distribution of traffic from local streets to-and-from arterials (SR 265, Middle Road/New Middle Road, and Utica Pike).

While not a consideration of the purpose and need, the Port Road Alternative would also have the most impact on the major traffic generators and local businesses as a result of construction. The Port Road Alternative (existing infrastructure) currently serves as the primary access to the Port for commercial/heavy vehicle traffic and is the only current connection from SR 265 to the Port that trucks can safely navigate. While access to the Port would be maintained and impacts would be temporary, access to and from the Port would be impacted as a result of construction activities required for the Port Road improvements. As described above, the overall construction of the roadway improvements that would be required to utilize Port Road as the designated heavy haul route would take a minimum of 24 months to complete the facility, with lane restrictions likely being in place for 18 months. As compared to other alternatives the Port Road alternative would have the longest temporary impacts to the surrounding community.

The Port Road Alternative would eliminate potential relocation of residents, reduce required right-of-way, and reduce some environmental impacts. However, it would not fully satisfy the purpose and need. The Port Road Alternative would result in infrastructure being designed to effectively handle heavy haul vehicles. While not providing direct and continuous connectivity between

existing infrastructure and the major traffic generators, the alternative does provides connectivity between the Port, RRCC, and Jeffersonville via Middle Road/New Middle Road, Port Road, and SR 265. However, as compared to the other alternatives the Port Road alternative does not adequately address system connection. The Port Road alternative functionally operates as a collector system, has the longest travel times, and the most access points, number of stops, yields, and merges. Therefore, this alternative was discarded from further consideration.

Wetland Avoidance
This alternative would include the same proposed improvements as the preferred alternative (DE). However, it would involve lengthening the bridge over Lentzier Creek and skewing the angle of the crossing over the creek to span and avoid the wetlands; this alternative would also involve placing new piers outside of the wetland boundaries. While this alternative would avoid impacting wetlands, it would increase the impact to streams. In addition, in order to construct a bridge long enough to span the wetlands, construction costs would increase significantly. Therefore, this alternative was discarded from further consideration.

Alternative A1
Alternative A1 would be a 2.22-mile long corridor, of which, 0.77 mile would be constructed on new terrain. Travel time along this route from the Port to RRCC is estimated to be approximately 4.5 minutes, which is approximately 1.5 minutes longer than the preferred alternative. This alternative would utilize Utica Pike, some new terrain, and a portion of Old Salem Road to connect the Port to the SR 265/Old Salem Road interchange. While this alternative would utilize some existing infrastructure and reduce the amount of new terrain developed, it does not fully satisfy the purposes and need as it does provide direct and continuous connectivity between major traffic generators. In addition, Utica Pike is located in the floodplain of the Ohio River, and is subject to flooding on a 5-year return frequency, making it an unreliable local access route, especially in times of emergencies. A1 would also result in more residential relocations than any other alternative analyzed. The construction of Alternative A1 as the HHTC roadway would take approximately 24 months to complete, which is approximately four (4) months longer than Alternative DE (preferred). This alternative would include four (4) intersecting roadways, nine (9) access points (five commercial and four residential), and one controlled stop along the route. In comparison, the preferred alternative will have two (2) intersecting roadways, one commercial access point (no residential), and no controlled stops along the route. Therefore, this alternative was discarded from further consideration.

Alternative A2
Alternative A2 would be an approximate 2.26-mile long corridor, of which, 0.96 mile would be constructed on new terrain. Travel time along this route from the Port to RRCC is estimated to be approximately 4.5 minutes, which is approximately 1.5 minutes longer than it is anticipated to travel along the preferred alternative. This alternative would utilize Utica Pike, some new terrain, and a portion of Old Salem Road to connect the Port to the SR 265/Old Salem Road interchange. The new alignment terrain portion of the roadway would be shifted west from the A1. While this alternative would utilize some existing infrastructure and reduce the amount of new terrain developed, it does not fully satisfy the purpose and need as it does not provide direct and continuous connectivity between major traffic generators. In addition, Utica Pike is located in the floodplain of the Ohio River, and is subject to flooding on a 5-year return frequency, making it an unreliable local access route, especially in times of emergencies. A2 would likely result in the greatest amount of impacts to wetlands as compared to any other alternative under consideration, and would likely require more residential relocations than the preferred alternative. The construction of Alternative A2 as the HHTC roadway would take approximately 24 months to complete (12 months with lane restrictions), which is approximately four (4) months longer than Alternative DE (preferred). This alternative would include four (4) intersecting roadways, nine (9) access points (five commercial and four residential), and one controlled stop along the route. In comparison, the preferred alternative will have two (2) intersecting roadways, one commercial access point (no residential), and no controlled stops along the route. Therefore, this alternative was discarded from further consideration.

Alternative B
Alternative B would be an approximate 1.64-mile long corridor, of which, 1.49 miles would be constructed on new terrain. This alternative would utilize the same logical termini as the preferred alternative (North Access Road and SR 265/Old Salem Road interchange). Travel time along this alternative from the Port to RRCC is approximately 3 minutes, which is the same amount of time to travel along the preferred alternative. Alternative B would be constructed west of Brown Forman Road, turning northeast approximately 0.5 mile from the southern terminus. This alternative would be constructed mostly through agricultural fields, which would reduce the number of relocations to one. Alternative B was not proposed to continue north and become a frontage road along SR 265 because of the likelihood of significant archaeological sites in the area. Moving this alternative farther north before tying back in also would have resulted in additional stream crossings; in addition, the terrain north of Alternative B is steep with gulleys throughout, which would require additional fill and potentially more structures. Alternative B would fully satisfy the purposes and need; however, it would likely impact archaeological sites that require preservation in place. The construction of Alternative B as the HHTC roadway would take approximately 20 months to complete; the same amount of time estimated to construct Alternative DE. This alternative would have the same number of intersecting roadways (2), commercial access points (1), and controlled stops (0) as the preferred alternative. Therefore, this alternative was discarded from further consideration.

Alternative C
Alternative C would be an approximate 1.64-mile long corridor, of which, 1.49 miles would be constructed on new terrain. This alternative would utilize the same logical termini as the preferred alternative (North Access Road and SR 265/Old Salem Road interchange). Travel time along this alternative from the Port to RRCC is approximately 3 minutes, which is the same amount of time to travel along the preferred alternative. Alternative C would be constructed to turn east across Brown Forman Road, south of New Middle Road. Alternative C would fully satisfy the purposes and need and reduce the number of relocations to two. However, Alternative C would impact a known archaeological site determined eligible for listing on the National Register of Historic Places. The construction of Alternative C as the HHTC roadway would take approximately 20 months to complete; the same amount of time estimated to construct Alternative DE. This alternative would have the same number of intersecting roadways (2), commercial access points (1), and controlled stops (0) as the preferred alternative. Therefore, this alternative was discarded from further consideration.

Alternative D
Alternative D would be an approximate 1.59-mile long corridor, of which, 1.43 miles would be constructed on new terrain. This alternative would utilize the same logical termini as the preferred alternative (North Access Road and SR 265/Old Salem Road interchange). Travel time along this alternative from the Port to RRCC is approximately 3 minutes, which is the same amount of time to travel along the preferred alternative. Alternative D would be constructed along a similar alignment as Alternative C, but would turn north to cross Lentzier Creek perpendicularly. Alternative D would fully satisfy the purposes and need and reduce the amount of impact to Lentzier, but would result in more stream crossings than other alternatives. In addition, Alternative D would impact a known archaeological site eligible for listing on the National Register of Historic Places. The construction of Alternative D as the HHTC roadway would take approximately 20 months to complete; the same amount of time estimated to construct Alternative DE. This alternative would have the same number of intersecting roadways (2), commercial access points (1), and controlled stops (0) as the preferred alternative. Therefore, this alternative was discarded from further consideration.

Alternative E
Alternative E would be an approximate 1.70-mile long corridor, of which, 1.55 miles would be constructed on new terrain. This alternative would utilize the same logical termini as the preferred alternative (North Access Road and SR 265/Old Salem Road interchange). Travel time along this alternative from the Port to RRCC is approximately 3 minutes, which is the same amount of time to travel along the preferred alternative. Alternative E would be constructed to turn east across Brown Forman Road, north of New Middle Road. Alternative E would fully satisfy the purposes and need, would likely avoid impacts to archaeological sites, and have one less relocation than the preferred alternative. However, Alternative E would have a greater amount of impacts to forests and streams than the preferred alternative; it would also require more right-of way than the preferred alternative. Alternative E would also potentially impact the most karst features out of any of the alternatives analyzed. The construction of Alternative E as the HHTC roadway would take approximately 20 months to complete; the same amount of time estimated to construct Alternative DE. This alternative would have the same number of intersecting roadways (2), commercial access points (1), and controlled stops (0) as the preferred alternative. Therefore, this alternative was discarded from further consideration.

Alternative F
Alternative F would be an approximate 1.62-mile long corridor, of which, 1.46 miles would be constructed on new terrain. This alternative would utilize the same logical termini as the preferred alternative (North Access Road and SR 265/Old Salem Road interchange). Travel time along this alternative from the Port to RRCC is approximately 3 minutes, which is the same amount of time to travel along the preferred alternative. Alternative F would be constructed along a similar alignment as Alternative E. However, Alternative F would turn north earlier than Alternative E to cross Lentzier Creek. Alternative F has similar forest, stream, and wetland impacts to the preferred alternative (DE), and is anticipated to have the same number of relocations. The construction of Alternative F as the HHTC roadway would take approximately 20 months to complete; the same amount of time estimated to construct Alternative DE. This alternative would have the same number of intersecting roadways (2), commercial access points (1), and controlled stops (0) as the preferred alternative. Alternatives DE (preferred), F, and HH were all determined to satisfy the purpose and need and also minimize the amount of overall impacts to forest, stream, and wetland. Because forest, stream, and wetland impacts are estimated to be similar between the three alternatives (DE, F, HH) coordination with resource agencies determined that any of the three alternatives (DE, F, or HH) would likely be acceptable. All alternatives considered, including Alternative F, are located within an archaeological rich area. Since DE (preferred) was investigated for the presence of archaeological resources and is therefore known to likely avoid impacts to such resources, the entirety of Alternative F was not fully examined for the presence of archaeological resources and would require further investigation to be completed in order to further consider this alternative. Through coordination with resource agencies, it was determined that while Alternative F fully satisfied the purpose and need, because the overall impacts to resources were comparable to the preferred alternative, additional archaeological work did not need to be completed and Alternative F could be discarded from further consideration.

Alternative G
Alternative G would be an approximate 1.77-mile long corridor, of which, 1.62 miles would be constructed on new terrain. This alternative would utilize the same logical termini as the preferred alternative (North Access Road and SR 265/Old Salem Road

interchange). Travel time along this alternative from the Port to RRCC is approximately 3 minutes, which is the same amount of time to travel along the preferred alternative. Alternative G would be constructed along a similar alignment as Alternative E. However, Alternative G would continue east to connect with Old Salem Road. While this alternative would fully satisfy the purpose and need, it would result in more relocations and impacts to karst resources than the preferred alternative, and it would have the greatest impact to forests and streams out of all of the alternatives analyzed. The construction of Alternative G as the HHTC roadway would take approximately 20 months to complete; the same amount of time estimated to construct Alternative DE (preferred). This alternative would include the same number of intersecting roadways (2), commercial access points (1), and controlled stops (0) as the preferred alternative. However, Alternative G would have four (4) residential access points, whereas DE would have none. Therefore, this alternative was discarded from further consideration.

Alternative HH

Alternative HH would be an approximate 1.47-mile long corridor, of which, 1.31 miles would be constructed on new terrain. This alternative would utilize the same logical termini as the preferred alternative (North Access Road and SR 265/Old Salem Road interchange). Travel time along this alternative from the Port to RRCC is approximately 3 minutes, which is the same amount of time to travel along the preferred alternative. Alternative HH would be constructed along a similar alignment as Alternative E. However, Alternative HH would turn north earlier than Alternative E and after Alternative F to cross Lentzier Creek. Alternative HH has similar forest, stream, and wetland impacts to the preferred alternative (DE), and is anticipated to have the same number of relocations. The construction of Alternative HH as the HHTC roadway would take approximately 20 months to complete; the same amount of time estimated to construct Alternative DE. This alternative would have the same number of intersecting roadways (2), commercial access points (1), and controlled stops (0) as the preferred alternative. Alternatives DE (preferred), F, and HH were all determined to satisfy the purpose and need and also minimize the amount of overall impacts to forest, stream, and wetland. Because forest, stream, and wetland impacts are estimated to be similar between the three alternatives (DE, F, HH) coordination with resource agencies determined that any of the three alternatives (DE, F, or HH) would likely be acceptable. All alternatives considered, including Alternative HH, are located within an archaeological rich area. Since DE (preferred) was investigated for the presence of archaeological resources and is therefore known to likely avoid impacts to such resources, the entirety of Alternative HH was not fully examined for the presence of archaeological resources and would require further investigation to be completed in order to further consider this alternative. Through coordination with resource agencies, it was determined that while Alternative HH fully satisfied the purpose and need, because the overall impacts to resources were comparable to the preferred alternative, additional archaeological work did not need to be completed and Alternative HH could be discarded from further consideration.

The following Alternative Screening Matrix details the estimated impacts associated with Alternatives DE, F, and HH as they were determined to meet the purpose and need and minimize the amount of overall impacts to resources. The overall Alternative Screening Matrix detailing the estimated impacts to all alternatives considered as presented at the public meetings can be found in Appendix A, A-4 to A-5. As development of the proposed project design continued and SR 265 was opened, the Alternative Screening Matrix was re-evaluated and updated to reflect the refinement of the overall design and the consideration of potential improvements and impacts to SR 265. The revised Alternative Screening Matrix can be found in Appendix A, A-6 to A-7.

Alternatives Screening			
Criteria	**Alternatives**		
	DE	**F**	**HH**
PURPOSE AND NEED CONSIDERATIONS			
Does alternative provide connectivity between existing infrastructure major traffic generators?	YES	YES	YES
Does the alternative address inadequate system connection south of the SR 265/Old Salem Road Interchange?	YES	YES	YES
Will the infrastructure be designed to effectively handle Heavy Haul Vehicles?	YES	YES	YES
ENVIRONMENTAL CONSIDERATIONS			
Adverse Effect on Historic Properties	0	0	0
Business Relocations	0	0	0
Environmental Justice Issues	ND	ND	ND
Farmland Impacted (total acres)	3.4	3.49	2.51
Prime & Unique Farmland (total acres)	ND	ND	ND
Forest Impacts (net loss in acres)	11.8	11.8	11.7
Homes/Apartment Unit Relocations	3	3	3
Karst Features Impacted	4	2	3
Noise Impacted Receivers	ND	ND	ND
Potential Archaeological Sites Impacted	0	ND	ND
Potential Hazardous Material Sites	2	2	2
Right-of-Way (total acres)	28.6	29.2	25.5
Section 4(f) Property Use	Not Likely	Not Likely	Not Likely
Stream Crossings	8	7	7
Stream Channel length within Construction Limits (total linear feet)	1078	1326	1137
Upstream Drainage Area (mi^2)	5.54	5.54	5.54
Surface Water Impoundments Impacted	0	1	1
Wetland Impacts (total acres)	0.05	0.03	0.02
USACE Jurisdictional Wetlands (acres)	0.05	0.03	0.02
USACE Non- Jurisdictional Wetlands (acres)	N/A	N/A	N/A
ENGINEERING CONSIDERATIONS			
Constructability (High, Medium or Low)	Medium	Medium	Medium
Estimated Total Cost (Million $)	$12.20	$11.80	$10.70
Length (total miles)	1.48	1.62	1.47
New Construction (total miles)	1.32	1.46	1.31
Structure Length (total feet)	375	220	220

ND = Not Determined; N/A = Not Applicable

County Clark Route Heavy Haul Transportation Corridor / New Alignment Des. No. 1382612

The Do Nothing Alternative is not feasible, prudent or practicable because (*Mark all that apply*):

It would not correct existing capacity deficiencies;	
It would not correct existing safety hazards;	
It would not correct the existing roadway geometric deficiencies;	
It would not correct existing deteriorated conditions and maintenance problems; or	
It would result in serious impacts to the motoring public and general welfare of the economy.	
Other (Describe) *Heavy haul-standard infrastructure will not be available for heavy haul vehicles, increasing the volume of heavy haul vehicles mixing with local traffic, and failing to provide direct and continuous connectivity for heavy haul vehicles from the between major traffic generators.*	X

ROADWAY CHARACTER: Heavy Haul Transportation Corridor Road

Functional Classification: Urban (Suburban) Minor Arterial
Current ADT: 8,800 VPD (2020) Design Year ADT: 16,700 VPD (2040)
Design Hour Volume (DHV): N/A Truck Percentage (%) 50
Designed Speed (mph): 35 Legal Speed (mph): N/A

	Existing		Proposed	
Number of Lanes:	N/A		2	
Type of Lanes:	N/A		Travel	
Pavement Width:	N/A	ft.	26	ft.
Shoulder Width:	N/A	ft.	11	ft.
Median Width:	N/A	ft.	N/A	ft.
Sidewalk Width:	N/A	ft.	N/A	ft.

Setting:		Urban	X	Suburban		Rural
Topography:		Level	X	Rolling		Hilly

If the proposed action has multiple roadways, this section should be filled out for each roadway.

ROADWAY CHARACTER: Middle Road/New Middle Road

Functional Classification: Minor Arterial
Current ADT: N/A VPD (2020) Design Year ADT: N/A VPD (2040)
Design Hour Volume (DHV): N/A Truck Percentage (%) N/A
Designed Speed (mph): 45 Legal Speed (mph): 45

	Existing		Proposed	
Number of Lanes:	2		2	
Type of Lanes:	Travel		Travel	
Pavement Width:	24	ft.	24	ft.
Shoulder Width:	2	ft.	10	ft.
Median Width:	N/A	ft.	N/A	ft.
Sidewalk Width:	N/A	ft.	N/A	ft.

Setting:		Urban	X	Suburban		Rural
Topography:		Level	X	Rolling		Hilly

ROADWAY CHARACTER: Utica-Sellersburg Road

Functional Classification: Major Collector
Current ADT: 400 VPD (2013) Design Year ADT: 750 VPD (2030)
Design Hour Volume (DHV): N/A Truck Percentage (%) N/A
Designed Speed (mph): 45 Legal Speed (mph): 45

	Existing		Proposed	
Number of Lanes:	2		2	
Type of Lanes:	Travel		Travel	
Pavement Width:	18	ft.	24	ft.
Shoulder Width:	0	ft.	8	ft.
Median Width:	N/A	ft.	N/A	ft.
Sidewalk Width:	N/A	ft.	N/A	ft.

Setting:		Urban	X	Suburban		Rural
Topography:		Level	X	Rolling		Hilly

DESIGN CRITERIA FOR BRIDGES:

Structure/NBI Number(s): N/A Sufficiency Rating: N/A
(Rating, Source of Information)

	Existing		Proposed	
Bridge Type:	N/A		Continuous Composite Steel Plate Girder	
Number of Spans:	N/A		3	
Weight Restrictions:	N/A	ton	None	ton
Height Restrictions:	N/A	ft.	N/A	ft.
Curb to Curb Width:	N/A	ft.	51’ 4”	ft.
Outside to Outside Width:	N/A	ft.	54’ 4”	ft.
Shoulder Width:	N/A	ft.	12’ 8”	ft.
Length of Channel Work:			0	ft.

Describe bridges and structures; provide specific location information for small structures.

Remarks:

Bridges
One bridge is proposed along the HHTC route that will carry the roadway over Lentzier Creek. The newly constructed bridge will be 0.11-mile long, three-span continuous composite steel plate girder bridge; the spans will be 172.5 feet, 208 feet, and 172.5 feet long. The bridge will have a 54-foot, 4-inch wide out-to-out coping with a 51-foot, 4-inch wide clear roadway width. The typical section of the bridge consists of two 13-foot wide travel lanes and 12-foot, 8-inch wide outside shoulders. A 1.5-foot wide concrete bridge railing will be installed outside of the shoulders. The bridge will be designed to meet heavy haul standards. The proposed bridge will span Lentzier Creek. Therefore, no channel work is anticipated.

Formal application for a Construction in a Floodway (CIF) Permit from the Indiana Department of Natural Resources (IDNR) will likely be required due to the encroachment upon the Lentzier Creek floodway. An Indiana Department of Environmental Management (IDEM) Section 401 Permit will be required for this project in conjunction with the U.S. Army Corps of Engineers (USACE) Section 404 Permit due to impacts to Lentzier Creek. Mitigation may be needed as a result of this project.

Small Structures and Culverts
Structure 1 is a culvert that will be installed near the southern terminus of the project corridor, south of Maritime Road. The culvert will be 74 feet long and 36 inches in diameter. The structure will convey unnamed tributary (UNT) 2 east beneath the new heavy haul roadway.

Structure 12 is a culvert that will be installed north of Maritime Road, near the southern terminus of the project corridor. The culvert is a 137-inch by 87-inch pipe arch, and will be 150 feet long. The structure will convey UNT 3 beneath the roadway.

Structure 4 is a 4-foot by 9-foot box culvert that will be installed at the New Middle Road and heavy haul road intersection. The culvert is 59 feet long and will convey UNT 3 beneath Utica-Sellersburg Road.

Structure 11 is a culvert that will be installed near the northern terminus, north of the three-span bridge. The culvert will be 266 feet long and 72 inches in diameter. The structure will convey UNT 8 beneath the new heavy haul roadway.

	Yes	No	N/A
Will the structure be rehabilitated or replaced as part of the project?		X	

If the proposed action has multiple bridges or small structures, this section should be filled out for each structure.

MAINTENANCE OF TRAFFIC (MOT) DURING CONSTRUCTION:

	Yes	No
Is a temporary bridge proposed?		X
Is a temporary roadway proposed?		X
Will the project involve the use of a detour or require a ramp closure? (describe in remarks)		X
Provisions will be made for access by local traffic and so posted.		
Provisions will be made for through-traffic dependent businesses.		
Provisions will be made to accommodate any local special events or festivals.		
Will the proposed MOT substantially change the environmental consequences of the action?		X
Is there substantial controversy associated with the proposed method for MOT?		X

Remarks:

Because the proposed HHTC roadway will be constructed primarily on new terrain, MOT would not be required for the newly built roadway section. However, during the entire duration of construction, barricades would be placed at the end of New Middle Road, which currently terminates approximately 0.1 mile northeast of its intersection with Port Road, and at the connection point to Old Salem Road near the I-265/Old Salem Road interchange.

A three-mile detour route for Utica-Sellersburg Road will be utilized while the new HHTC and Utica-Sellersburg Road intersection is being constructed. The detour will direct traffic along Brown Foreman Road, to Utica Pike, to Port Road, to New Middle Road, to Utica-Sellersburg Road. The detour will be in place for approximately 90 days.

During development of this project, early coordination letters dated April 29, 2016 were sent to Clark county Emergency Management Agency, Clark County Sheriff's Office, Utica Elementary School, Greater Clark County Schools, and Jeffersonville Police Department. This coordination was undertaken as a way to provide the representative emergency service agencies and school corporations the opportunity to comment on the potential effects of the project on their service routes. None of the agencies contacted returned comments on the project. It is anticipated that emergency routes will be temporarily affected by the detour at New Middle Road and Utica-Sellersburg Road during the construction of the connector. Emergency service providers and school corporations will be given at least two weeks notification of any restrictions resulting from construction.

Indiana Department of Transportation

County Clark Route Heavy Haul Transportation Corridor / New Alignment Des. No. 1382612

ESTIMATED PROJECT COST AND SCHEDULE:

Engineering: $ 1,232,000 (2018-2019) Right-of-Way: $ 3,212,419.01 (2019) Construction: $ 10,558,152 (2018-2019)

Anticipated Start Date of Construction: Spring 2020

Date project incorporated into STIP July 3, 2017 (Appendix G, G-1 to G-3)

	Yes	No
Is the project in an MPO Area?	X	

If yes,

Name of MPO Kentuckiana Regional Planning and Development Agency (KIPDA)

Location of Project in TIP Pages 41 and 270 (Appendix G-4 to G-7)

Date of incorporation by reference into the STIP July 3, 2017

RIGHT OF WAY:

	Amount (acres)	
Land Use Impacts	Permanent	Temporary
Residential	4.9	0
Commercial	1.9	0
Agricultural	1.5	0
Forest	9.1	0
Wetlands	0.029	0
Other: Scrub/Pasture	8.56	0
TOTAL	**25.99**	**0**

Describe both Permanent and Temporary right-of-way and describe their current use. Typical and Maximum right-of-way widths (existing and proposed) should also be discussed. Any advance acquisition or reacquisition, either known or suspected, and there impacts on the environmental analysis should be discussed.

Remarks:

The proposed project will require a total of approximately 26 acres of additional permanent right-of-way acquisition. Of the total right-of-way acquisition, approximately 4.9 acres of right-of-way will be required from residential parcels. Approximately 1.5 acres of agricultural, 9.1 acres of forest, 0.029 acre of wetlands, 1.9 acres of commercial, and 8.56 acres of scrub/pasture property will also be required for the construction of the HHTC roadway. Three residential relocations will likely be required for the construction of the HHTC roadway.

All right-of-way will be acquired an accordance with applicable federal and state procedures. Those procedures include specific requirements for appraisals, review appraisals, negotiations, and relocation benefits. Compliance with these procedures will assure the fair and equitable treatment of affected residents and businesses. The acquisition and relocation program will be conducted in accordance with 49 CFR 24 and the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 as amended.

Part III – Identification and Evaluation of Impacts of the Proposed Action

SECTION A – ECOLOGICAL RESOURCES

	Presence	Impacts Yes	Impacts No
Streams, Rivers, Watercourses & Jurisdictional Ditches	X	X	
Federal Wild and Scenic Rivers			
State Natural, Scenic or Recreational Rivers			
Nationwide Rivers Inventory (NRI) listed			
Outstanding Rivers List for Indiana			
Navigable Waterways			

Remarks:

The Federal Wild and Scenic Rivers listing, State Natural Scenic and Recreational Rivers listing, and the Outstanding Rivers List for Indiana were researched by American Structurepoint, Inc. personnel to determine possible presence of protected waterways in the project area. No listed waterways were identified within or adjacent to the project area.

Additionally, 2005 and 2016 aerial photography, United States Geological Survey (USGS) topographic mapping, and the National Wetland Inventory (NWI) map were reviewed to determine whether any perennial or intermittent streams occurred within the project area. These maps can be referenced in Appendix A, A-2 and Appendix E, E-126 to E-142. The results of this review identified Lentzier Creek as a perennial stream flowing through the northern half of the area, as well as two UNTs to Lentzier Creek depicted as intermittent streams; one of the intermittent streams is mapped in the northern half of the investigated area and the other is mapped in the southern half of the investigated area.

American Structurepoint, Inc. personnel visited the site on May 6 and 7, 2014 and July 21, 2015 to conduct a wetland delineation to determine the presence/absence of jurisdictional waters. Lentzier Creek and the two UNTs were confirmed during the field visits. In addition to the three confirmed streams, six (6) additional intermittent streams were delineated during the field visits. All of the delineated streams appear to drain to the Ohio River, a Traditional Navigable Waterway (TNW), via Lentzier Creek. Therefore, it is anticipated that all nine (9) streams will be considered jurisdictional "waters of the U.S." A Wetland Delineation and Waters Report, dated June 9, 2016, was prepared for this project, and was approved by the INDOT Ecology and Waterway Permits Office (EWPO) on October 13, 2017 (Appendix E, E-2 to E-209). Specific details pertaining to each of these resources, and project impacts, are provided below.

Lentzier Creek is a perennial stream that generally flows south through the project area. Lentzier Creek was delineated for a total of 2,081 linear feet within the investigated area. The ordinary high water mark (OHWM) was approximately 3 feet deep and 18 feet wide. Lentzier Creek is located within a FEMA-designated 100-year floodplain. The creek appears to drain south to the Ohio River, a TNW. Therefore, it is anticipated Lentzier Creek would be considered a jurisdictional "waters of the U.S." by the U.S. Army Corps of Engineers (USACE). Lentzier Creek will be spanned by the 0.11-mile long, three-span continuous steel plate girder bridge. No impacts below the OHWM of Lentzier Creek are anticipated.

UNT 1 is an intermittent stream that generally flows east through the investigated area approximately 700 feet north of North Access Drive. UNT 1 was delineated for approximately 195 linear feet within the investigated area. The OHWM was approximately one foot deep by three feet wide. The stream is located within the FEMA-designated 100-year floodplain associated with UNT 3 (described below) and has a drainage area of approximately 0.04 square mile. UNT 1 flows to UNT 3, which drains to Lentzier Creek. Lentzier Creek drains south to the Ohio River, a TNW. Since the stream has a hydrologic connection to a TNW, it is anticipated that UNT 1 will be considered a jurisdictional "waters of the U.S." The proposed project will not impact UNT 1.

UNT 2 is an intermittent stream that generally flows east through the investigated area adjacent to Maritime Road. UNT 2 was delineated for approximately 1,489 linear feet within the investigated area. The OHWM was approximately 1.5 feet deep and two feet wide. The stream is not located within a FEMA-designated floodplain. UNT 2 has a drainage area of approximately 0.06 square mile. Approximately 94 linear feet of UNT 2 will be impacted as a result of the placement of a 74-foot long 36-inch diameter pipe and the placement of riprap at the pipe ends for erosion control purposes.

UNT 3 is an intermittent stream that generally flows south through the investigated area, approximately 235 feet west of

the intersection of Utica-Sellersburg Road and Brown Forman Road. UNT 3 was delineated for approximately 2,452 linear feet within the investigated area. The OHWM was approximately two feet deep and five feet wide. The southernmost 250 feet of the stream are located within a FEMA-designated 100-year floodplain. UNT 3 has a drainage area of approximately 0.23 square mile. UNT 3 drains to Lentzier Creek, which drains south to the Ohio River, a TNW. Since the stream has a hydrologic connection to a TNW, it is anticipated that UNT 3 will be considered a jurisdictional "waters of the U.S." The proposed project will impact approximately 354 linear feet of UNT 3 as a result of the placement of a 59-foot long 4-foot by 9-foot box culvert, a 150-foot long 137 inch by 87 inch pipe arch, and relocation of 105 stream into the constructed roadside ditch . Additionally, 40 linear feet of UNT 3 will be impacted by the placement of riprap at the ends of the box culvert and pipe arch for erosion control purposes.

UNT 4 is an intermittent stream that generally flows east through a wooded area near the center of the investigated area. UNT 4 was delineated for approximately 404 linear feet within the investigated area. The OHWM was six inches deep and three feet wide. The stream is not located within a FEMA-designated floodplain within the investigated area, but appears to be located within the FEMA-designated 100-year floodplain of Lentzier Creek immediately east of the investigated area. UNT 4 has a drainage area of less than 0.10 square mile. UNT 4 appears to drain east out of the area to a pond located within the FEMA-designated 100-year floodplain of Lentzier Creek, which drains south to the Ohio River, a TNW. Since the stream has a hydrologic connection to a TNW, it is anticipated that UNT 4 will be considered a jurisdictional "waters of the U.S." The proposed project will not impact UNT 4.

UNT 5 is an intermittent stream that generally flows northeast through the heavily wooded area near the center of the investigated area. UNT 5 was delineated for approximately 413 linear feet within the investigated area. The OHWM was six inches deep and three feet wide. Approximately 328 linear feet of UNT 5 are located within the FEMA-designated 100-floodplain of Lentzier Creek. UNT 5 has a drainage area of approximately 0.04 square mile. UNT 5 flows north to Lentzier Creek, which drains south to the Ohio River, a TNW. Since the stream has a hydrologic connection to a TNW, it is anticipated that UNT 5 will be considered a jurisdictional "waters of the U.S." The proposed project will not impact UNT 5.

UNT 6 is an intermittent stream that generally flows north through the heavily wooded area near the center of the investigated area. UNT 6 was delineated for approximately 406 linear feet within the investigated area. The OHWM was two inches deep and one foot wide. Approximately 161 linear feet of UNT 6 are located within the FEMA-designated floodplain of Lentzier Creek, and the stream has a drainage area of less than 0.10 square mile. East of the investigated area, UNT 6 appears to flow north and drain into another unnamed stream. The unnamed stream appears to drain to Lentzier Creek, which drains south to the Ohio River, a TNW. Since the stream has a hydrologic connection to a TNW, it is anticipated that UNT 6 will be considered a jurisdictional "waters of the U.S." Approximately 150 linear feet of the headwaters of UNT 6 will be filled as a result of the construction of the HHTC roadway.

UNT 7 is an intermittent stream that generally flows southeast through the investigated area, approximately 0.4 mile west of Old Salem Road. UNT 7 was delineated for approximately 123 feet within the investigated area. The OHWM was approximately 2.5 feet deep and 13 feet wide. UNT 7 is located within the FEMA-designated 100-year floodplain associated with Lentzier Creek and has a drainage area of approximately 0.61 square mile. The unnamed stream drains to Lentzier Creek, which drains south to the Ohio River, a TNW. Since the stream has a hydrologic connection to a TNW, it is anticipated that UNT 7 will be considered a jurisdictional "waters of the U.S." The proposed project will not impact UNT 7.

UNT 8 is an intermittent stream that generally flows south through the northern portion of the investigated area, approximately 683 feet west of Old Salem Road. UNT 8 was delineated for approximately 1,012 linear feet within the investigated area. The OHWM was approximately one foot deep and six feet wide. UNT 8 is not located within a FEMA-designated floodplain within the investigated area, but appears to be located in one associated with Lentzier Creek just south of the investigated area. The stream has a drainage area of approximately 0.14 square mile. UNT 8 appears to drain out of the investigated area to the south to an unnamed stream. The unnamed stream drains to Lentzier Creek, which drains south to the Ohio River, a TNW. Since the stream has a hydrologic connection to a TNW, it is anticipated that UNT 8 will be considered a jurisdictional "waters of the U.S." The proposed project will impact approximately 286 linear feet of UNT 8 as a result of the placement of a 72-inch diameter culvert and of riprap at the culvert ends for erosion control purposes.

A total of 884 linear feet of stream will be permanently impacted by the proposed project. Total cumulative impacts are greater than 300 linear feet to delineated streams. Therefore, impacts are above the threshold requiring stream mitigation. A formal jurisdictional determination of the waterways has not yet been made by the USACE, but is required during the permitting phase.

An early coordination letter was sent to resource agencies, including Indiana Department of Natural Resources (IDNR), Indiana Department of Environmental Management (IDEM), USACE, and U.S. Fish and Wildlife (USFWS) on April 29, 2016 outlining the project scope and requesting comments from agencies. On May 26, 2016, a resource agency meeting was held at American Structurepoint to discuss the impacts of the proposed project on natural resources and address agency concerns prior to the end of the 30-day review period. In a response letter dated June 3, 2016, the IDNR requested that an alternative that minimizes impacts to streams is needed, including alignments that reduce the number of stream crossings. In addition, IDNR provided standard recommendations to reduce impacts to fish, wildlife, and botanical resources (Appendix B, B-38 to B-41). Applicable recommendations from the IDNR are detailed in **Section J - Environmental Commitments** of this document.

In a response letter dated June 2, 2016, USFWS suggested stream impacts be avoided as much as possible and provided standard recommendations to reduce impacts on fish and wildlife resources. These recommendations include restricting channel work and vegetation clearing to the minimum necessary for installation of any structures and roadway (Appendix B, B-34 to B-37).

The IDEM automated response to early coordination on January 19, 2018 provided recommendations, which include the appropriate structures and techniques to be used both during and after construction, waste, air quality, and erosion control measures, and measures to reduce disturbance to streams and riparian vegetation (Appendix B, B-43 to B-53). Applicable recommendations from the IDEM are detailed **in Section J - Environmental Commitments** of this document.

While no formal response was received from the USACE, informal coordination with IDEM and USACE continued after the May 26, 2016 agency meeting to identify an alignment that reduced stream impacts.

In an effort to reduce stream and forest impacts, Alternatives DE, F, G, and HH were established and evaluated. Alternatives F, G, and HH would be constructed on new terrain and would utilize the same logical termini as the preferred Alternative DE (North Access Road and SR 265/Old Salem Road interchange). Alternative G would be constructed along a similar alignment as Alternative E. However, Alternative G would continue east to connect with Old Salem Road. While this alternative would satisfy the purpose and need, it would result in more relocations and impacts to karst resources than the preferred alternative, and it would have the greatest impact to forests and streams out of all of the alternatives analyzed. Therefore, G was discarded from further consideration. Alternatives F and HH had similar forest, stream, and wetland impacts as compared to the preferred alternative (DE), and are anticipated to have the same number of relocations. All alternatives, including Alternatives F and HH, are located within an archaeological rich area. The entirety of Alternatives F and HH were not fully examined for impacts to archaeological resources and would require further investigation to be completed in order further consider these routes. Through coordination with resource agencies, it was determined that while Alternatives F and HH satisfy the purpose and need, the overall impacts to resources are comparable to the fully evaluated preferred alternative (DE). Therefore, Alternatives F and HH could be discarded from further consideration (Appendix A-4 to A-9).

On October 13, 2017 an additional coordination letter was sent to resource agencies indicating that a preferred alternative had been selected (Appendix B, B-54 to B-55). Agencies were asked to reply within 30 days of the receipt of the letter; no additional responses were received. On November 13, 2017, an agency site visit was scheduled to allow agency personnel to see the resources along the preferred alternative. Individuals from IDNR, IDEM, USFWS, and USACE were in attendance. No objections to proceeding with the preferred alternative were received.

	Presence	Impacts	
Other Surface Waters		**Yes**	**No**
Reservoirs			
Lakes			
Farm Ponds			
Detention Basins	X	X	
Storm Water Management Facilities			
Other:			

Remarks:

Aerial photography from 2005 and 2016, USGS topographic mapping, and the NWI map were reviewed to determine whether any other surface waters occurred within the project area. The results of this review identified an open water feature near the southern terminus of the project, approximately 750 feet west of Brown Forman Road. American Structurepoint personnel visited the site on May 6 and 7, 2014 and July 21, 2015 to conduct a wetland delineation to determine the presence/absence of jurisdictional waters. The open water feature was field verified as Pond 1 during the July 21, 2015 field investigation. A Wetland Delineation and Waters Report, dated June 9, 2016, was prepared for this project, and was approved by the INDOT EWPO on October 13, 2017 (Appendix E, E-2 to E-209).

The investigated area was larger than the proposed construction limits to ensure incidental construction limits were captured. Pond 1 is located outside of the construction limits; therefore, no impacts are anticipated. No other surface waters were identified within the project area.

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	Presence	Impacts Yes	Impacts No
Wetlands	X	X	

Total wetland area: 4.42 acre(s) Total wetland area impacted: 0.029 acre(s)

(If a determination has not been made for non-isolated/isolated wetlands, fill in the total wetland area impacted above.)

Wetland No.	Classification	Total Size (Acres)	Impacted Acres	Comments
A	PEMC	1.47	0	Wetland A is an emergent wetland located approximately 560 feet north of Loop Road, and appears to be associated with an unmaintained detention basin. Wetland A appears to drain north to Pond 1, which eventually drains to the Ohio River, a TNW via Lentzier Creek. Therefore, Wetland A will likely be considered a "waters of the U.S."
B	PEMC	0.04	0	Wetland B is an emergent wetland located approximately 800 feet north of Brown Forman Road, east of Pond 1. Wetland B appears to drain west to UNT 1, which eventually drains to the Ohio River, a TNW via Lentzier Creek. Therefore, Wetland B will likely be considered a "waters of the U.S."
C	PEME	0.12	0	Wetland C is an emergent wetland located in the northwest quadrant of the Utica-Sellersburg Road and Maritime intersection. Wetland C appears to drain south to UNT 3, which eventually drains to the Ohio River, a TNW via Lentzier Creek. Therefore, Wetland C will likely be considered a "waters of the U.S."
D	PSS1C	0.59	0	Wetland D is a scrub-shrub wetland located approximately 340 feet south of New Middle Road. Wetland D appears to drain to UNT 3, which eventually drains to the Ohio River, a TNW via Lentzier Creek. Therefore, Wetland D will likely be considered a "waters of the U.S."
E	PEME	0.01	0	Wetland E is an emergent wetland located approximately 0.27 mile north of Fox Den. Wetland E appears to drain south to Lentzier Creek, which drains to the Ohio River, a TNW. Therefore, Wetland E will likely be considered a "waters of the U.S."
F	PEME	0.01	0	Wetland F is an emergent wetland located approximately 38 feet north of Wetland E. Wetland F appears to drain east to Lentzier Creek, which drains to the Ohio River, a TNW. Therefore, Wetland F will likely be considered a "waters of the U.S."
G	PFO1C	0.02	0.022	Wetland G is a forested wetland located approximately 0.4 mile northwest of Fox Den. Wetland G appears to drain east to UNT 6, which eventually drains to the Ohio River, a TNW, via Lentzier Creek. Therefore, Wetland G will likely be considered a "waters of the U.S."
H	PFO1C	1.00	0	Wetland H is a forested wetland located approximately 160 feet northeast of Wetland G. Wetland H appears to drain east to UNT 6, which eventually drains to the Ohio River, a TNW, via Lentzier Creek. Therefore, Wetland H will likely be considered a "waters of the U.S."
I	PEMC/PFO1C	1.06 0.47 PEMC; 0.59 PFO1C	0.007	Wetland I is a forested and emergent wetland located approximately 0.3 mile west of Old Salem Road. Wetland I appears to drain south to Lentzier Creek, which drains to the Ohio River, a TNW. Therefore, Wetland I will likely be considered a "waters of the U.S."
J	PFO1C	0.10	0	Wetland J is a forested wetland located approximately 0.14 mile west of Old Salem Road. Wetland J appears to eventually drain south to Lentzier Creek via UNT 8, which drains to the Ohio River, a TNW. Therefore, Wetland J will likely be considered a "waters of the U.S."

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Wetlands (*Mark all that apply*)	**Documentation**	**ES Approval Dates**
Wetland Determination	X	**October 13, 2017**
Wetland Delineation	X	**October 13, 2017**
USACE Isolated Waters Determination		
Mitigation Plan		

Improvements that will not result in any wetland impacts are not practicable because such avoidance would result in (Mark all that apply and explain):

Substantial adverse impacts to adjacent homes, business or other improved properties;	
Substantially increased project costs;	X
Unique engineering, traffic, maintenance, or safety problems;	X
Substantial adverse social, economic, or environmental impacts, or	X
The project not meeting the identified needs.	

Measures to avoid, minimize, and mitigate wetland impacts need to be discussed in the remarks box.

Remarks:

American Structurepoint completed a desktop review that included referencing 2005 and 2016 aerial photography, USGS topographic mapping, and NWI mapping (Appendix A, A-2 and Appendix E, E-126 to E-142). The desktop review depicted five NWI wetlands. Three were mapped within the forested portion near the center of the investigated area; one was mapped near the southern terminus and was associated with an open water feature; and one was associated with an open water feature located near the northern terminus.

American Structurepoint personnel visited the site on May 6 and 7, 2014 and July 21, 2015 to conduct a wetland delineation to determine the presence/absence of jurisdictional waters. Several wetlands were delineated within the forested area where the three forested wetlands were mapped. The southernmost NWI mapped wetland was field verified as an open water feature (Pond 1) during the 2015 field visit. The final mapped wetland associated with an open water feature near the northern terminus was field verified as land that had been cleared and filled during the 2014 and 2015 field investigations for the construction of SR 265. A Wetland Delineation and Waters Report, dated June 9, 2016, was prepared for this project, and was approved by the INDOT EWPO on October 13, 2017 (Appendix E, E-2 to E-209).

As a result of this investigation three (3) forested wetlands, five (5) emergent wetlands, one (1) scrub-shrub wetland, and one (1) forested/emergent wetland were delineated. The total acreage of wetland delineated within the investigated area was 4.42 acres. Approximately 0.029 acre of forested wetland is anticipated to be impacted by the construction of the proposed project. All wetland impacts are associated with the construction of the proposed 0.11 mile long, three-span continuous steel plate girder bridge over Lentzier Creek.

The Wetland Avoidance Alternative would involve lengthening the bridge over Lentzier Creek and skewing the angle of the crossing over the creek to span and avoid the wetlands; this alternative would also involve placing new piers outside of the wetland boundaries. While this alternative would avoid impacting wetlands, it would increase the impact to streams. In addition, in order to construct a bridge long enough to span the wetlands, construction costs would increase significantly. Therefore, this alternative was discarded from further consideration.

In an early coordination response letter dated June 2, 2016, USFWS indicated that wetland impacts should be avoided as much as possible, and any unavoidable impacts should be compensated for in accordance with the USACE mitigation guidelines (Appendix B, B-34 to B-37).

In an early coordination response letter dated June 3, 2016, IDNR indicated that an alternative to minimize impacts to wetlands was needed. In addition, IDNR provided standard recommendations to minimize impacts to fish, wildlife, and botanical resources (Appendix B, B-38 to B-41). These recommendations have been added as commitments in **Section J – Environmental Commitments** of this document.

In an effort to reduce wetland impacts, Alternatives DE, F, G, and HH were established and evaluated. Alternative F, G and HH would be constructed on new terrain and would utilize the same logical termini as the preferred Alternative DE (Access Road and SR 265/Old Salem Road interchange). Alternative G would be constructed along a similar alignment as Alternative E. However, Alternative G would continue east to connect with Old Salem Road. While this alternative would satisfy the purpose and need, it would result in more relocations and impacts to karst resources than the preferred

alternative, and it would have the greatest impact to forests and streams out of all of the alternatives analyzed. Therefore, G was discarded from further consideration. Alternatives F and HH had similar forest, stream, and wetland impacts as compared to the preferred alternative (DE), and are anticipated to have the same number of relocations. All alternatives, including Alternatives F and HH, are located within an archaeological rich area. The entirety of Alternatives F and HH were not fully examined for impacts to archaeological resources and would require further investigation to be completed in order further consider these routes. Through coordination with resource agencies, it was determined that while Alternatives F and HH satisfy the purpose and need, the overall impacts to resources are comparable to the fully evaluated preferred alternative (DE). Therefore, Alternatives F and HH could be discarded from further consideration.

The IDEM automated response to early coordination on January 19, 2018 provided recommendations, which include the appropriate structures and techniques to be used both during and after construction, and the appropriate permits to be completed if impacts to wetlands are to occur (Appendix B, B-43 to B-53). Applicable recommendations from the IDEM are detailed in **Section J - Environmental Commitments** of this document.

The USACE did not formally respond to early coordination efforts. However, it is anticipated the USACE will provide any concerns regarding water resources as part of the permitting process, as well as any conditions to minimize impacts.

The proposed project will likely require a Section 401 Water Quality Certification (WQC) from IDEM and a Section 404 Indiana Regional General Permit (RGP) from USACE for potential impacts to wetlands. Because impacts to wetlands are anticipated to be less than 0.10 acre, wetland mitigation is not anticipated. Actual impacts to wetlands and final permit determinations will be made during final design. INDOT, or its authorized agents, will be responsible for obtaining the necessary permits prior to construction, including all mitigation required as conditions of the approved permits. Wetland areas to be avoided must be clearly marked in the field and on the final plans.

	Presence	Impacts	
		Yes	No
Terrestrial Habitat	X	X	
Unique or High Quality Habitat			

Use the remarks box to identify each type of habitat and the acres impacted (i.e. forested, grassland, farmland, lawn, etc).

Remarks:

American Structurepoint staff visited the site on May 6 and 7, 2014 and July 21, 2015. The surrounding area was observed to be rolling landscape with commercial development near the southern terminus of the investigated area with a combination of undeveloped and residential land making up the remaining southern half of the investigated area. The center and northern half of the investigated area was largely forested with steep terrain and several streams flowing throughout the corridor. The northern terminus of the investigated area was cleared due to the recent construction of SR 265 and the terrain was steep with several streams flowing through the area.

Tree clearing is anticipated to occur along the preferred alternative alignment. Approximately 9.1 acres of forested habitat is anticipated to be cleared. In addition, approximately 4.9 acres of maintained lawns/residential areas, 1.5 acres of agricultural land, and 8.56 acres of pastures/scrubby vegetation are anticipated to be permanently impacted. However, these areas do not serve as unique or high-quality habitat. Through continued coordination with INDOT and USFWS (Appendix I, I-1 to I-26), it was determined that formal Section 7 would be required for impacts to foraging habitat for the gray bat. On January 18, 2018, a Biological Assessment (BA) was submitted to INDOT and FHWA. The BA concluded that the proposed project *may affect, and is likely to adversely affect* the gray bat foraging habitat. As such, a list of AMMs were provided; these AMMs have been included as “firm” commitments in **Section J** of this document. In addition, it was determined that the project team should consult with the USFWS’s Bloomington Field Office regarding implementation of project-specific mitigation measures for the permanent loss of 9.1 acres of forested habitat. Mitigation will be provided at a ratio of 1:1 if forest restoration is used to compensate for forest impacts. If forest preservation is proposed, a ratio of 2:1 will be required (Appendix I, I-55). Therefore, loss of terrestrial habitat, specifically forested area, will be mitigated for to offset impacts to wildlife habitat. In addition, implementation of standard INDOT specifications for re-vegetation of disturbed areas will promote re-establishment of similar ground cover in the areas temporarily impacted by construction equipment access, as well as within the areas where sod strips are placed.

In an early coordination response letter dated June 2, 2016, USFWS indicated that the proposed project has potential for impacts to the foraging habitat of the gray bat. In the response it was indicated that depending on the alignment selected, a bat survey may be necessary to determine impacts the threatened and endangered species (Appendix B, B-34 to B-37). A mist net survey was conducted in 2016 to determine the presence/likely absence of federally endangered bat species

within the proposed project corridor. Results of that sampling are discussed in more detail in the **Threatened and Endangered Species** section below.

In an early coordination response letter dated June 3, 2016, IDNR indicated that an alternative to minimize impacts to forested areas was needed. In addition, IDNR noted that habitat fragmentation may negatively impact wildlife; therefore, the preferred alternative should minimize fragmentation of these habitats. IDNR provided recommendations to minimize and mitigate for impacts to fish, wildlife, and botanical resources. These recommendations have been added as commitments **in Section J – Environmental Commitments** of this document. In addition, appropriate mitigation ratios resulting from impacts to non-wetland/riparian forest and wetlands in the floodway/floodplain will be applied in compliance with the DNR's Floodway Habitat Mitigation guidelines for impacts required as part of a formal application for a CIF Permit from the IDNR due to the encroachment upon the Lentzier Creek floodway.

The IDEM automated response to early coordination on January 19, 2018 provided recommendations, which include the appropriate structures and techniques to be used both during and after construction, waste, air quality, and erosion control measures, and measures to reduce disturbance to riparian vegetation (Appendix B, B-43 to B-53). Applicable recommendations from the IDEM are detailed in **Section J - Environmental Commitments** of this document.

In an effort to reduce stream, forest, and overall ecological impacts including forest fragmentation, Alternatives DE, F, G, and HH were established and evaluated. Alternative F, G, and HH would be constructed on new terrain and would utilize the same logical termini as the preferred Alternative DE (North Access Road and SR 265/Old Salem Road interchange). Alternative G would be constructed along a similar alignment as Alternative E. However, Alternative G would continue east to connect with Old Salem Road. While this alternative would satisfy the purpose and need, it would result in more relocations and impacts to karst resources than the preferred alternative, and it would have the greatest impact to forests and streams out of all of the alternatives analyzed. Therefore, Alterative G was discarded from further consideration. Alternatives F and HH had similar forest, stream, and wetland impacts as compared to the preferred alternative (DE). All alternatives, including Alternatives F and HH, are located within an archaeological rich area. The entirety of Alternatives F and HH were not fully examined for impacts to archaeological resources and would require further investigation to be completed in order further consider these routes. Through coordination with resource agencies, it was determined that while Alternatives F and HH satisfy the purpose and need, the overall impacts to ecological resources are comparable to the fully evaluated preferred alternative (DE). Therefore, Alternatives F and HH could be discarded from further consideration. The preferred alternative (DE) includes the construction of a new bridge 0.11-mile long, three-span continuous composite steel plate girder bridge; the spans will be 172.5 feet, 208 feet, and 172.5 feet long over the Lentzier Creek stream valley. The new bridge will be about 60-80 feet above the stream bottom helping maintain a continuous wildlife corridor passage along the Lentzier Creek stream valley, and also resulting in minimized tree clearing and overall reduced impacts to the riparian corridor, fish, wildlife, and botanical resources.

On October 13, 2017 an additional coordination letter was sent to resource agencies describing the additional alternatives that had been developed based on the early coordination response comments received from the agencies and the feedback from the May 26, 2016 resource agency meeting held at American Structurepoint. The October 13, 2017 letter also indicated that a preferred alternative had been selected (Appendix B, B-54 to B-55). Agencies were asked to reply within 30 days of the receipt of the letter; no additional responses were received commenting on the preferred alternative (DE). On November 13, 2017, an agency site visit was scheduled to allow agency personnel to see the resources along the preferred alternative. Individuals from IDNR, IDEM, USFWS, and USACE were in attendance. No objections to proceeding or additional responses concerning the preferred alternative were received.

If there are high incidences of animal movements observed in the project area, or if bridges and other areas appear to be the sole corridor for animal movement, consideration of utilizing wildlife crossings should be taken.

Karst	**Yes**	**No**
Is the proposed project located within or adjacent to the potential Karst Area of Indiana?	X	
Are karst features located within or adjacent to the footprint of the proposed project?	X	
If yes, will the project impact any of these karst features?	X	

Use the remarks box to identify any karst features within the project area. (Karst investigation must comply with the Karst MOU, dated October 13, 1993)

Remarks:

The project is located outside of the designated karst area of the state as identified in the October 13, 1993, Memorandum of Understanding (MOU) between INDOT, IDNR, IDEM, and USFWS. A Red Flag Investigation (RFI) was conducted as part of the preliminary environmental evaluation of the project corridor (Appendix B, B-30). This analysis determined the project is located near known sinkhole areas and several mapped sinkhole locations are within the project study area. Noting the potential location of the project within a karst region of Indiana, as defined by the mapped presence of karst features in the study area, an investigation of karst features, as outlined by the Karst MOU was performed to identify and characterize karst features in the study area and to evaluate potential impacts due to the proposed project.

American Structurepoint staff conducted a field investigation on April 22-23 and May 6, 2014, on December 19, 2016, and on April 11, 2017. A total of three (3) karst features were located within the proposed construction limits of the preferred alternative: springs SP-2, SP-3, and SP-11.

- SP-2 is an ephemeral spring seep along bedrock bedding planes within the investigated corridor.
- SP-3 is an ephemeral spring in an incised ravine within the investigated corridor.
- SP-11 is a point emergence spring located west of Old Salem Road within the investigated corridor.

In addition to the three springs, a portion of the drainage areas/watershed areas for four additional features (SI-1, SI-8, SW-1, and SW-2) are included within the construction limits of Alternative DE. No caves were identified within the study area.

The associated drainage areas of sinkholes SI-1 and SI-8 and swallets SW-1 and SW-2 are anticipated to be affected by proposed Alternate DE. Approximately 2.19 acres of the drainage area of feature SI-1, and 1.61 acres of drainage area for features SI-8, SW-1 and SW-2 will be impacted by Alternate DE. These impacts can be mitigated with installation of appropriately sized drainage structures under the roadway to facilitate drainage to the features. Three small springs (SP-2, SP-3 and SP-11) will be affected by Alternative DE; however, these impacts can be mitigated by placement of spring boxes to allow continuation of flow emerging from the springs.

The final Karst Report was submitted to INDOT Environmental Services (ES) on January 2, 2018. INDOT ES approved the Karst Report on January 3, 2018 (Appendix E, E-210 to E-272). Per the Karst MOU, the approved Karst Report will be distributed to IDEM, USFWS, and IDNR for review and concurrence. This has been added a firm commitment to **Section J – Environmental Commitments** of this document.

In the June 2, 2016 response, USFWS indicated that the project area is located in an area of karst geologic features. USFWS recommended a karst survey be performed, which, as stated above, was completed by American Structurepoint staff from 2014-2017. USFWS also noted that while the area is not within the designated karst area of the state, INDOT was encouraged to follow the protocols and procedures outlined in the 1993 MOU for construction of transportation projects in karst areas if any karst features are identified (Appendix B, B-34 to B-37). These recommendations as well as general recommendations to minimize the impacts to karst features have been included in **Section J** of this document.

Threatened or Endangered Species	**Presence**	**Impacts**	
		Yes	**No**
Within the known range of any federal species	X	X	
Any critical habitat identified within project area			
Federal species found in project area (based upon informal consultation)	X	X	
State species found in project area (based upon consultation with IDNR)			

	Yes	**No**
Is Section 7 formal consultation required for this action?	X	

Remarks:

Review of the USFWS listing of threatened and endangered species by county as published by USFWS Region 3 website (https://www.fws.gov/midwest/endangered/lists/indiana-cty.html) indicates the federally endangered Indiana bat (*Myotis sodalis*) and gray bat (*M. grisescens*), as well as the federally threatened northern long-eared bat (*M. septentrionalis*) are noted within Clark County.

An inquiry using the USFWS Information for Planning and Consulting (IPaC) website (https://ecos.fws.gov/ipac/) did not indicate the presence of the federally endangered species, the Rusty Patched Bumblebee, in or within 0.5 mile of the project area.

In the early coordination response letter dated June 2, 2016, USFWS indicated that the proposed project is within the range of the Indiana bat, gray bat, and northern long-eared bat. USFWS indicated that the project has the potential for impacts to the foraging habitat of the gray bat, and that depending on the alignment selected, a bat survey may be necessary to determine impacts to threated and endangered species. USFWS also included standard recommendations in their response, including implementation of temporary erosion and siltation control devices (Appendix B, B-34 to B-37).

Based on these recommendations, on June 28 through July 1, 2016, a mist net survey was conducted by Eco-Tech Consultants. Eleven (11) bats of three species were captured, including five gray bats. No Indiana or northern long-eared bats were captured. Therefore, the Scoping Sheet for the Indiana Bat and Northern Long-Eared Bat Range-Wide Programmatic Information Consultation was prepared and submitted to INDOT ES on December 1, 2016 (Appendix I, I-8 to I-26). Based on the mist net results, a determination of *may affect, not likely to adversely affect without avoidance and minimization measures* (AMMS) was reached for the Indiana bat and northern long-eared bat. No further consultation with USFWS is required regarding the northern long-eared bat and Indiana bat.

Through continued coordination with INDOT and USFWS (Appendix I, I-1 to I-25), it was determined that formal Section 7 would be required for impacts to foraging habitat for the gray bat. On January 18, 2018, a Biological Assessment (BA) was submitted to INDOT and FHWA. The BA concluded that the proposed project *may affect, and is likely to adversely affect* the gray bat foraging habitat. As such, a list of AMMs were provided; these AMMs have been included as "firm" commitments in Section J of this document. In addition, it was determined that the project team should consult with the USFWS's Bloomington Field Office regarding implementation of project-specific mitigation measures for the permanent loss of 9.1 acres of forested habitat. Mitigation will be provided at a ratio of 1:1 if forest restoration is used to compensate for forest impacts. If forest preservation is proposed, a ratio of 2:1 will be required (Appendix I, I-27 to I-131).

On January 19, 2018, INDOT and FHWA approved the final BA; the BA was then forwarded to USFWS by FHWA on January 22, 2018. FHWA requested that USFWS concur with the findings of the BA. They also requested that Formal Consultation be initiated and that USFWS prepare a Biological Opinion (BO) for the project. The BO for the Heavy Haul Transportation Corridor project is anticipated to be issued by June 6, 2018 (135 days). Mitigation measures are anticipated, and as described above, are included as "firm" commitments in Section J of this document. Any changes will be updated in the FONSI request.

The IDNR early coordination response dated June 3, 2016 stated that the Natural Heritage Program's data have been checked, and indicated that the state endangered osprey (*Pandion haliaetus*) has been documented within the project area. Also, the Charlestown Military Reservation, a U.S. Department of Defense property, is within ½ mile north of the project area (Appendix B, B-38 to B-41). As indicated the response letter, the active osprey nest is located with Area #2 of the proposed project area. However, the proposed project improvements associated with the preferred Alternative (DE) are located in Areas #1 and #3 as indicated in the maps associated with the early coordination mailing (Appendix B, B-9). In addition, the proposed project will not impact the Charlestown Military Reservation. Recommendations pertaining specifically to threatened and endangered species include tree cutting time restrictions. Applicable recommendations from the IDNR are detailed in **Section J - Environmental Commitments** of this document.

SECTION B – OTHER RESOURCES

Drinking Water Resources	**Presence**	**Impacts Yes**	**Impacts No**
Wellhead Protection Area			
Public Water System(s)			
Residential Well(s)			
Source Water Protection Area(s)			
Sole Source Aquifer (SSA)			

If a SSA is present, answer the following:

	Yes	**No**
Is the Project in the St. Joseph Aquifer System?		
Is the FHWA/EPA SSA MOU Applicable?		
Initial Groundwater Assessment Required?		
Detailed Groundwater Assessment Required?		

Remarks:

Wellhead Protection Area:
The IDEM Wellhead Proximity Determinator website (http://www.in.gov/idem/cleanwater/pages/wellhead/) was accessed on April 20, 2016 by American Structurepoint personnel. The required project location data was provided and it was determined that this project is not located within a Wellhead Protection Area.

Public Water Systems:
Drinking water in the project area is provided by Indiana American Water and Watson Water Company. No permanent impacts to drinking water resources are anticipated. Temporary impacts to drinking water resources may occur from service disruptions. As part of normal utility coordination process, the City of Jeffersonville, the Town of Utica, Indiana American Water, and Watson Water Company will be coordinated with during advancement of design of the project and during construction to ensure interruptions in service are minimized.

Residential Wells:
The IDNR Water Well Record Database (https://www.in.gov/dnr/water/3595.htm) was accessed on April 20, 2016 by American Structurepoint personnel. Based on this search, there appears to be no wells located within the project area. Therefore, impacts to residential wells are not anticipated.

Sole Source Aquifer:
The proposed project is located in Clark county; therefore, the project is not located within the area of the St. Joseph Aquifer System, the only legally designated sole source aquifer in the state. Therefore, the FHWA/U.S. Environmental protection Agency (EPA) Sole Source Aquifer Memorandum of Agreement (MOA) is not applicable to this project, and a groundwater assessment is not required.

Flood Plains	**Presence**	**Impacts Yes**	**Impacts No**
Longitudinal Encroachment			
Transverse Encroachment	X	X	
Project located within a regulated floodplain	X	X	
Homes located in floodplain within 1000' up/downstream from project			

Discuss impacts according to classification system described in the "Procedural Manual for Preparing Environmental Studies".

Remarks:

The Flood Insurance Rate Maps (FIRM), which are administered by the Federal Emergency Management Agency (FEMA), were reviewed by staff of American Structurepoint to determine if a 100-year floodplain is present within the project area. As defined by the FIRM for Panel 18019C0283E, the proposed HHTC route crosses one floodplain designated as Zone A, the 100-year floodplain associated with Lentzier Creek (Appendix E, Page E-1). Zone A is defined as special flood hazard areas subject to inundation by the 1 percent annual chance flood (100-year flood), or base

flood, and is the flood that has a 1 percent chance of being equaled or exceeded in any given year.

This encroachment is classified as a Category 5 impact as defined in the INDOT CE Manual:

There will be no substantial impacts on natural and beneficial floodplain values; there will be no substantial change in flood risks; and there will be no substantial increase in potential for interruption or termination of emergency service or emergency evaluation routes; therefore it has been determined that this encroachment is not substantial. A hydraulic design study that addresses various structure size alternates was completed during the preliminary design phase. A summary of this study was be included with the Field Check Plans.

A hydraulic design study was completed on July 27, 2017; the study concluded that the encroachment is not substantial. INDOT approved the hydraulic design study on August 25, 2017. A copy of the hydraulic design study and INDOT concurrence memo can be found in Appendix J, J-11 to J-122.

In the early coordination response letter dated June 3, 2016, IDNR indicated that the proposed project may require the formal approval of the agency for construction in a floodway pursuant to the Flood Control Act (IC 14-28-1). For reference to the IDNR early coordination response, see Appendix B, B-38 to B-41.

	Presence	Impacts	
Farmland		**Yes**	**No**
Agricultural Lands			
Prime Farmland (per NRCS)			

Total Points (from Section VII of CPA-106/AD-1006* **N/A**

**If 160 or greater, see CE Manual for guidance.*

See CE Manual for guidance to determine which NRCS form is appropriate for your project.

Remarks:

The Natural Resources Conservation Service (NRCS) was sent an early coordination letter on April 29, 2016. In a May 13, 2016 response, NRCS indicated that a determination could not be reached due to the size of the investigated area, and the request should be resubmitted once routes were available. Therefore, on January 19, 2018, the October 16, 2017 recoordination letter and exhibits were sent to NRCS staff. As of February 5, 2018, no response had been received from NRCS. As is required by the Farmland Protection Policy Act (FPPA), NRCS will continue to be coordinated with and, as appropriate, Form NRCS-AD-1006/NRCS-CPA-106 will be completed. Since this project is anticipated to receive a total point value less than 160 points, it is anticipated that this site will receive no further consideration for farmland protection. No other alternatives other than the preferred alternative (DE) discussed in this document will be considered without a re-evaluation of the project's impacts upon farmland. This project is not anticipated to have a significant impact to farmland. However, if this project results in an AD-1006/CPA-106 score of 160 points or greater, additional coordination with the NRCS will be initiated to resolve the impacts. Additional coordination or changes in anticipated impacts, as well as any mitigation commitments will be addressed in the FONSI.

SECTION C – CULTURAL RESOURCES

	Category	Type	INDOT Approval Dates	N/A
Minor Projects PA Clearance				X

Results of Research

	Eligible and/or Listed Resource Present
Archaeology	
NRHP Buildings/Site(s)	
NRHP District(s)	
NRHP Bridge(s)	

Project Effect

No Historic Properties Affected [X] No Adverse Effect [ ] Adverse Effect [ ]

Documentation (mark all that apply)	Documentation Prepared	ES/FHWA Approval Date(s)	SHPO Approval Date(s)
Historic Properties Short Report			
Historic Property Report	X	February 2, 2017	April 24, 2017
Archaeological Records Check/ Review	X	March 20, 2017	April 24, 2017
Archaeological Phase Ia Survey Report	X	March 20, 2017	April 24, 2017
Archaeological Phase Ic Survey Report			
Archaeological Phase II Investigation Report	X	March 20, 2017	April 24, 2017
Archaeological Phase III Data Recovery			
APE, Eligibility and Effect Determination	X	December 1, 2017	January 22, 2018
800.11 Documentation	X	December 1, 2017	January 22, 2018

		MOA Signature Dates (List all signatories)
Memorandum of Agreement (MOA)		

Describe all efforts to document cultural resources, including a detailed summary of the Section 106 process, using the categories outlined in the remarks box. The completion of the Section 106 process requires that a Legal Notice be published in local newspapers. Please indicate the publication date, name of paper(s) and the comment period deadline. Likewise include any further Section 106 work which must be completed at a later date, such as mitigation or deep trenching.

Remarks:

Area of Potential Effect (APE):
Pursuant to 35 CFR Section 800.16(d), the Area of Potential Effects (APE) was drawn to encompass potential impacts from the undertaking; it initially included properties within one mile of the undertaking and then was narrowed based on topography and intervening structures. The APE for archaeology was the project footprint (Appendix C, C-4).

Coordination with Consulting Parties:
In a letter dated April 18, 2016, the following individuals or organizations were invited to join Section 106 consultation. On February 22, 2017, Gary Gilmore, a property owner, contacted W&A and requested to be added to the consulting party list for this project (Appendix D). In addition, INDOT sent a letter dated April 18, 2016, to the following federally-recognized Tribes and invited them to join in consultation. Note that subsequent to this email, the Pokagon Band of Potawatomi Indians requested to be consulted on all counties in Indiana and were invited to join consultation (Appendix

C, C-47 to C-51 and C-77 to C-84). If no response was received to the consulting party invitation after 30 days, it was assumed the invited parties did not wish to act as consulting parties for the undertaking. The FHWA, INDOT Cultural Resources Office (CRO), and the State Historic Preservation Officer (SHPO) are considered automatic consulting parties for all undertakings.

Agency/Organization	Response
Indiana Landmarks—Southern Regional Office	Will Participate – April 22, 2016
Indiana Landmarks—Central Office	No Response
Borden Institute Historical Society	No Response
Clark's Grant Historical Society	No Response
Howard Steamboat Museum/Clark County Historical Society	No Response
Jeff-Clark Preservation, Inc.	No Response
Jeffersonville Main Street	No Response
Jeffersonville Historic Board of Review	No Response
Clark County Historian	Will Participate – May 1, 2016
Mayor of the City of Jeffersonville	No Response
Utica Town Board	Will Participate – May 4, 2016
Kentuckiana Regional Planning and Development Agency	No Response
City of Jeffersonville Engineer	Will Participate – April 22, 2106
Jeffersonville Department of Economic Development and Department of Redevelopment	No Response
Clark County Board of Commissioners	Will Not Participate – April 28, 2016
Gary Gilmore	Will Participate – February 22, 2017
Clark County Council	No Response
Miami Tribe of Oklahoma	Will Participate – May 4, 2016
Eastern Shawnee Tribe of Oklahoma	No Response
Peoria Tribe of Indians of Oklahoma	No Response
United Keetoowah Band of Cherokee Indians	No Response
Pokagon Band of Potawatomi Indians	Will Participate

Archaeology:
Pursuant to 36 CFR § 800.4(b), staff from W&A conducted a Phase Ia records check beginning on February 17, 2014, using the site files in the Indiana Cemetery & Burial Registry, SHAARD, and other data on file at the Indiana Department of Natural Resources, Division of Historic Preservation and Archaeology (IDNR, DHPA). Staff then returned for additional materials on file at IDNR, DHPA on May 21, 2014. Archaeologists consulted with staff of Indiana University Purdue University—Fort Wayne (IPFW) about previous investigations in, or near, the project location. As a result, one alternative (Alternative B) was eliminated from further consideration due to sites identified within the Alternative B corridor warranting preservation in place.

W&A archaeologists conducted a Phase Ia archaeological field reconnaissance in May 5-13, July 8-10, and August 5, 2014. During the Phase Ia investigations completed in May, July, and August 2014, archaeologists identified two previously-recorded sites (12CL0533 and 12CL0129) with the potential to yield information important to the regional prehistoric record within a "survey area" provided by the client.

An agency coordination meeting was held September 8, 2014, with FHWA, INDOT, INDOT's consultants, and SHPO to discuss the archaeological investigation for the project. At the meeting, the group decided to conduct a Phase II investigation for the area between sites 12CL0533 and 12CL0129 to see if they were connected; SHPO and INDOT agreed to a multi-stage investigation that would include remote sensing followed by feature investigation, contingent on SHPO approval. The meeting was summarized in a letter sent to the INDOT project manager on September 12, 2014.

To further evaluate eligibility, W&A prepared a work plan (Goldbach 2015) for Phase II investigation of Sites 12CL0533 and 12CL0129. The work plan was completed on March 27, 2015; W&A submitted the work plan to the SHPO on March 27, 2015. The SHPO accepted to the Phase II work plan in a letter dated April 1, 2015.

Phase II remote sensing was performed on April 27-29, 2015. Utilizing the results from the remote sensing, W&A archaeologists performed investigatory excavations on May 11-14, 18, and 21, 2015. W&A conveyed a management summary to the SHPO on June 3, 2015, for these Phase II investigations. Based on the Phase II sampling of site 12CL0129/0533, the archaeologist recommended that portion of the site as not eligible for inclusion in the NRHP or

IRHSS

In a letter dated June 12, 2015, the SHPO concurred with the recommendation of the Phase II Management Summary that the portion of archaeological site 12CL0129/0533 "located within the project corridor is not eligible for inclusion in the State or National Registers of Historic Places." SHPO also requested the Phase II report be delivered in full by May 21, 2016.

Phase Ia archaeological investigations resumed from September 28, 2015 to October 7, 2015. At the conclusion of these Phase Ia investigations, archaeologists had recorded twenty-six sites, six of which had been previously recorded.

INDOT-CRO sent an email to the Tribal consultation partners informing them that the Phase II (Goldbach 2017a), and Phase Ia (Goldbach 2017b) reports were available for review on INSCOPE on March 27, 2017. The Phase Ia report recommended the project proceed as planned. The Phase II report recommended the portion of Site 12CL0129/0533 within the project corridor as not eligible for inclusion in the IRHSS or NRHP. The HPR, Phase Ia, and Phase II reports were all approved by INDOT-CRO prior to their transmittal to consulting parties and Tribal consulting partners.

On April 11, 2017, at the request of INDOT and FHWA, archaeologists for W&A conducted a survey in an alternative "study area." The survey area totaled approximately 3.0 acres. The survey identified one site, 12CL1052, for further work.

In a letter dated April 24, 2017, the SHPO responded to the Phase Ia Archaeological Field Reconnaissance Report and the Phase II Archaeological Investigations. SHPO stated, "[w]e also agree with the Phase Ia (Goldbach; February 24, 2017) and Phase II (Goldbach, Arnold and Hughes; February 24, 2017) archaeology reports addressing the archaeological aspects of this project." Specifically, SHPO concurred that Sites 12CL1004 to 12Cl1016 and Sites 12CL1051 to 12CL1057 lack sufficient integrity to be considered potentially eligible and no additional work is needed at the sites. SHPO acknowledged that the Phase Ia documented Sites 12Cl0129/943 and 12CL0533 as one large artifact scatter and that the Phase II report recommended the site not eligible for nomination to the State or National Registers of Historic Places, concluding "[t]he portion of sites 12-Cl-129/544 located within the project area will not require additional archaeological assessment."

Finally, in the letter dated April 24, 2017, the SHPO stated that "[i]f any archaeological artifacts or human remains are uncovered during construction, demolition, or earthmoving activities, state law (Indiana Code 14-21-1-27 and -29) requires that the discovery be reported to the Department of Natural Resources within two (2) business days.

In October 2017, archaeologists for W&A prepared a Phase Ia Archaeological Field Reconnaissance—Addendum No. 1 (Addendum No. 1 Report/ Goldbach 2017c) which documented efforts to identify and evaluate archaeological resources within a "survey area" that is outside the preferred alternative. It was decided after the Phase Ia reconnaissance not to pursue the alternative "survey area," and the archaeological APE remains the same as that described in Phase Ia report (Goldbach 2017b). The Addendum No. 1 Report (Goldbach 2017c) identified one site for further work: site 12CL1052, which could not be fully assessed because of landowner constraints. However, since the alternative "survey area" will not be moving forward as part of the preferred alternative, the site will not be impacted by construction of the proposed project. If the portion of site 12CL1052 within the "survey area" of the Addendum No. 1 Report (Goldbach 2017c) cannot be avoided and becomes part of the preferred alternative, then additional investigation is recommended. It was further recommended that the project area previously examined and cleared in the Phase Ia report (Goldbach 2017b) be allowed to proceed without additional work.

INDOT sent an email providing Tribal Representatives access to the Addendum No. 1 Report on IN SCOPE. Structurepoint sent a paper copy of this 800.11 documentation and Addendum No. 1 Report to the Indiana SHPO. No further efforts, including consultation, to identify historic archaeological resources took place.

Historic Properties:
Historians conducted an aboveground site survey in April, May, and July of 2014. Historians identified the James A. Smith Farmstead ruins that had been previously determined to be NRHP-eligible under Criteria A, C, and D. The property is located outside of the archaeological APE.

On December 9, 2015, W&A historians reviewed the aboveground APE drawn in 2014 and expanded it based on additional alternatives under investigation. At the same time, historians drove the APE to confirm that no significant changes had taken place that would alter the results of previous survey. No changes were noted.

On March 27, 2017, American Structurepoint informed consulting parties via email of the availability of the Historic Property Report (HPR, Fivecoat and Molloy 2016) on INSCOPE. The HPR identified the James A. Smith Farmstead as having been previously determined eligible under Criterion D. Historians recommended no other properties as eligible for listing in the NRHP. (Note: This email was distributed to consulting party Gary Gilmore on April 5, 2017. It was later discovered that Indiana Landmarks had been inadvertently omitted from the distribution list; an email informing of them of the availability of the HPR was sent on August 9, 2017.)

In a letter dated April 24, 2017, the SHPO responded to the HPR. SHPO concurred that the James A. Smith Farmstead is eligible for the NRHP under Criterion D and that "it is the only above-ground property identified in the HPR that is eligible for the NRHP." No further efforts, including consultation, to identify historic aboveground resources took place.

Although the James A. Smith Farmstead was identified in the aboveground APE as eligible under Criterion D (archaeological), it is located outside of the archaeological APE (which is the project footprint). Since this resource is located outside the archaeological APE, the project will have no impact on historic properties.

Documentation, Findings:
INDOT-CRO, acting on behalf of FHWA, issued a finding of "No Historic Properties Affected" for this undertaking on December 1, 2017. Documentation of this finding is included in Appendix C, C-1 to C-9. Correspondence received on January 22, 2018 from the SHPO concurred with the "No Historic Properties Affected" finding (Appendix C, C-86 to C-87). No other consulting parties provided comments on the "No Historic Properties Affected" finding or supporting documentation.

Public Involvement:
In accordance with 36 CFR 800.2(d), 800.3€, and 800.6(a)(4), the views of the public were sought regarding the "No Historic Properties Affected" finding. A public notice was placed in the December 23, 2017 edition of the *News and Tribune* describing the proposed project. Further, the notice stated that the documentation supporting the "No Historic Properties Affected" was available for review at the office of American Structurepoint, Inc. and electronically on INDOT's Section 106 document posting website, IN SCOPE. Public comments regarding the finding were accepted for a period of thirty (30) days, ending on January 22, 2018. No comments were received within the allotted timeframe. A copy of this legal public notice and publisher's affidavit is included in Appendix C-85. The Section 106 process was completed and the responsibilities of INDOT, acting on behalf of FHWA under Section 106 are fulfilled.

SECTION D – SECTION 4(f) RESOURCES/ SECTION 6(f) RESOURCES

Section 4(f) Involvement (mark all that apply)

	Presence	Use Yes	Use No
Parks & Other Recreational Land			
Publicly owned park			
Publicly owned recreation area			
Other (school, state/national forest, bikeway, etc.)			

	Evaluations Prepared	FHWA Approval date
Programmatic Section 4(f)*		
"De minimis" Impact*		
Individual Section 4(f)		

	Presence	Use Yes	Use No
Wildlife & Waterfowl Refuges			
National Wildlife Refuge			
National Natural Landmark			
State Wildlife Area			
State Nature Preserve			

	Evaluations Prepared	FHWA Approval date
Programmatic Section 4(f)*		
"De minimis" Impact*		
Individual Section 4(f)		

	Presence	Use Yes	Use No
Historic Properties			
Sites eligible and/or listed on the NRHP			

	Evaluations Prepared	FHWA Approval date
Programmatic Section 4(f)*		
"De minimis" Impact*		
Individual Section 4(f)		

**FHWA approval of the environmental document also serves as approval of any Section 4f Programmatic and/or De minimis evaluation(s) discussed below.*

Discuss Programmatic Section 4(f) and "de minimis" Section 4(f) impacts in the remarks box below. Individual Section 4(f) documentation must be separate Draft and Final documents. For further discussions on Programmatic, "de minimis" and Individual Section 4(f) evaluations please refer to the "Procedural Manual for the Preparation of Environmental Studies". Discuss proposed alternatives that satisfy the requirements of Section 4(f).

Remarks:

The U.S. Department of Transportation Act of 1966 prohibits the use of certain public and historic lands for federally funded transportation facilities unless there is no feasible and prudent alternative. The law applies to publicly owned parks, recreation areas, and wildlife/waterfowl refuges, and National Register eligible or listed historic properties. These properties are called Section 4(f) resources. No 4(f) resources associated with publicly owned parks, recreation areas or wildlife/waterfowl refuges were identified within the project area.

A RFI was prepared for the project area (Appendix D, D-11); no potential 4(f) resources were identified within the

project area. In addition, an early coordination letter was mailed to the City of Jeffersonville Parks Department on April 29, 2016. No response was received. There is no anticipated 4(f) use associated with the proposed project.

Section 6(f) Involvement	**Presence**	**Use**	
		Yes	**No**
Section 6(f) Property			

Discuss proposed alternatives that satisfy the requirements of Section 6(f). Discuss any Section 6(f) involvement.

Remarks:

Section 6(f) resources are lands that were purchased with or improved using funds from the Land and Water Conservation Fund (LWCF) to preserve, develop, and assure accessibility to outdoor recreation resources, and to strengthen the health and vitality of the public. Section 6(f) of the LWCF prohibits conversion of LWCF lands unless the National Park Service approves substitution property of reasonable equivalent usefulness and location.

A RFI was prepared for the project area (Appendix D, D-11); no potential 6(f) resources were identified within the project area. An early coordination letter was sent to the IDNR Division of Outdoor Recreation on April 29, 2016. No response was received. No Section 6(f) resources will be affected as a result of this project.

SECTION E – Air Quality

Air Quality

Conformity Status of the Project	**Yes**	**No**
Is the project in an air quality non-attainment or maintenance area?		X
If YES, then:		
Is the project in the most current MPO TIP?		
Is the project exempt from conformity?		
If the project is NOT exempt from conformity, then:		
Is the project in the Transportation Plan (TP)?		
Is a hot spot analysis required (CO/PM)?		

Level of MSAT Analysis required?

Level 1a [ ] Level 1b [X] Level 2 [ ] Level 3 [ ] Level 4 [ ] Level 5 [ ]

Remarks:

Clark County is designated as an attainment area for all regulated air pollutants. It should be noted that Clark County was previously designated a maintenance area for 8-hour ozone, 24-hour TSP, and Annual PM2.5. However, the 8-hour ozone was revoked in the Federal Register (FR), effective April 6, 2015; TSP designations removed from the Code of Federal Regulations on June 16, 1997; and The 1997 annual fine particles standard was revoked in the FR, effective October 24, 2016. Therefore, an updated maintenance plan is no longer required (Appendix G, G-8 to G-9).

The project is listed in the *2018-2021 KIPDA* TIP, which was approved by the FHWA on August 28, 2017 (Appendix G, G-4 to G-7). The project is also listed in the *2018-2021 INDOT* (STIP), which was approved by FHWA on July 3, 2017 (Appendix G, G-1 to G-3). With FHWA's approval of the STIP and TIP, concurrence with the air conformity demonstration for all applicable pollutants is also granted.

Mobile Source Air Toxics (MSAT):
The purpose of this project is to provide a route built specifically for heavy haul vehicles that provides a continuous connection between the RRCC and Port via the SR 265/Old Salem Road interchange. Although traffic projections indicate truck traffic will nearly double between the existing year (2020) and the design year (2040), 2,552 trucks per day and 4,843 trucks per day, respectively, the quantities are still well below the 10,000 trucks per day FHWA

typically considers to be required before there is a meaningful impact on traffic volumes. As such, this project has been determined to generate minimal air quality impacts for CAAA criteria pollutants and has not been linked with any special MSAT concerns. As such, this project will not result in changes in traffic volumes, vehicle mix, basic project location, or any other factor that would cause an increase in MSAT impacts of the project from that of the no-build alternative.

Moreover, EPA regulations for vehicle engines and fuels will cause overall MSAT emissions to decline significantly over the next several decades. Based on regulations now in effect, an analysis of national trends with EPA's Motor Vehicle Emission Simulator (MOVES) 2014 model forecasts a combined reduction of over 90 percent in the total annual emission rate for the priority MSAT from 2010 to 2050 while vehicle-miles of travel are projected to increase by over 45 percent (Updated Interim Guidance on Mobile Source Air Toxic Analysis in NEPA Documents, Federal Highway Administration, October 12, 2016). This will both reduce the background level of MSAT as well as the possibility of even minor MSAT emissions from this project.

SECTION F - NOISE

Noise	**Yes**	**No**
Is a noise analysis required in accordance with FHWA regulations and INDOT's traffic noise policy?	X	

	No	**Yes/ Date**
ES Review of Noise Analysis		**January 24, 2018**

Remarks:

Due to the construction of new terrain roadways, the proposed project improvements are categorized as a Type I project from criteria set forth by the FHWA and INDOT. Therefore, in accordance with 23 CFR 772-*Procedures for Abatement of Highway Noise* and the INDOT Traffic Noise Policy approved by FHWA (effective July 1, 2017), a noise impact analysis was required as part of project development. The required analysis was completed using FHWA's accepted model for forecasting changes in noise levels associated with highway projects, Traffic Noise Model, Version 2.5 (TNM 2.5). The TNM models and noise analysis report were approved by INDOT ES on January 24, 2018**.** For reference to this determination and analysis, see the excerpts from the Noise Analysis Report which is included in Appendix H (H-1 to H-19).

Noise abatement measures incorporated into Type I projects must be both feasible and reasonable. There are two components to a feasible determination; acoustic feasibility and engineering feasibility. To satisfy the acoustic feasibility benchmarks, INDOT requires proposed noise barriers provide at least a 5.0 decibels [dB(A)] reduction in future traffic noise levels for a majority of the impacted receptors. To meet engineering feasibility criteria, the physical location and geometry of noise barriers including offsets, heights, and lengths are considered for optimum noise absorption performance.

The reasonableness of noise abatement measures is firstly based on cost effectiveness of construction. INDOT considers proposed noise abatement measures reasonable if the construction year cost of the proposed noise barriers is no more than $30,000 per benefited receptor for new terrain construction. In addition, INDOT's Design Goal for noise abatement is to provide at least a 7.0 dB(A) reduction for benefited first row receptors in the design year. However, conflicts with adjacent lands may make it impossible to achieve substantial noise reduction at all benefited first row receptors. Therefore, the noise reduction design goal to determine the reasonableness for any proposed noise barriers for Indiana is 7 dB(A) for a majority (greater than 50%) of the benefited first row receptors. Finally, results from opinion surveys of benefited receptors (residents and property owners) can also factor into the final determination of reasonableness for any proposed noise barriers.

All receptors of noise (dwelling, office, commercial building, undeveloped lands, etc.) within 500 feet of the proposed construction of the HHTC were identified and classified according to land uses and applicable noise abatement criteria (NAC). Identified receptors were incorporated into the project's TNM-2.5 model. Existing noise levels were applied based on ambient sound measurements taken from representative receptor locations. Future noise levels were generated from projected traffic volumes (2040) and proposed edges of pavement for the

developed HHTC alignment.

The project's traffic noise model identified 27 receptors within 500 feet of the proposed HHTC alignment. Of the total identified study area receptors, three (3) are planned for relocations as part of the project construction. Of the 24 remaining receptors, two residential receptors were predicted to experience future traffic noise impacts. These receptors are projected to experience a future traffic noise level equal to or above 66.0 decibels (dB(A)). These future noise levels are within 1.0 dB(A) of the NAC defined value of 67.0 dB(A).

With only two impacted receptors remaining after construction is complete, the issue of feasibility was examined with potential noise barrier wall geometry at each impacted receptor. Providing uninterrupted lengths of noise barrier at both impacted receptor locations can result in noise reductions that satisfy the feasibility goal. However, the noise barrier heights and lengths required to meet feasibility criteria at each location has a corresponding construction cost that exceeds the cost-effectiveness criteria established for reasonability. The proposed noise barriers analyzed ranged from $173,444 to $341,977 per benefited receptor which exceeds the reasonable cost threshold of $30,000 per benefited receptor. Therefore, noise abatement measures in the form of two separate noise barriers for the potential benefit of two impacted receptors are feasible, but the cost of noise abatement is not reasonable.

Based on the results of the studies thus far accomplished, the State of Indiana has not identified any locations where noise abatement is likely. A re-evaluation of the noise analysis will occur during final design. If during final design it has been determined that conditions have changed such that noise abatement is feasible and reasonable, then abatement measures might be provided. The final decision on the installation of any abatement measure(s) will be made upon the completion of the project's final design and the public involvement process.

SECTION G – COMMUNITY IMPACTS

Regional, Community & Neighborhood Factors	**Yes**	**No**
Will the proposed action comply with the local/regional development patterns for the area?	X	
Will the proposed action result in substantial impacts to community cohesion?		X
Will the proposed action result in substantial impacts to local tax base or property values?		X
Will construction activities impact community events (festivals, fairs, etc.)?		X
Does the community have an approved transition plan?	X	
If No, are steps being made to advance the community's transition plan?		
Does the project comply with the transition plan? (explain in the remarks box)	X	

Remarks:

Negative impacts the proposed project will have on the community include temporary inconveniences commonly associated with construction such as noise, fugitive dust, increased travel delay, and utility disruptions. However, these impacts are temporary and will cease upon completion of the project. These temporary inconveniences do not outweigh the benefits the project will bring to public facilities following the completion of the project.

Inconveniences to residents in the project area that are typically associated with a new road, including increased noise levels are to be expected, but will not be significant. The proposed route will not sever the cohesion of any established neighborhoods. The project will bring a net benefit to the community by removing heavy haul vehicles from local roads, which will reduce travel time and increase safety. Removing heavy haul traffic from local roadways that are not constructed to meet heavy haul standards will also increase the service life of local roadways.

In an early coordination response letter dated May 18, 2-16, the INDOT Office of Aviation stated that the Clark County Municipal Airport is located 11,000 feet west of the proposed project area. If any permanent structures or equipment utilized for the project penetrates the 100:1 slope from the airport then FAA Form 7460 (Notice of Proposed construction or alteration) must be filed. This recommendation has been added to **Section J – Environmental Commitments** of this document.

Transition Plan:
KIPDA has an approved Americans with Disabilities Act (ADA) Transition Plan, approved in 2014

(http://www.kipda.org/files/PDF/Transportation_Division/Information/Coordinated_Plan_Complete_-_FINAL.pdf). However, as proposed, the project does not include the addition of pedestrian facilities. Therefore, the ADA Transition Plan does not apply to the project as designed.

Indirect and Cumulative Impacts

	Yes	No
Will the proposed action result in substantial indirect or cumulative impacts?		X

Remarks:

Indirect effects are effects that are caused by an action and are later in time or farther removed in distance, but are still reasonably foreseeable. Cumulative impacts are impacts to the environment which result from the incremental impact of an action when added to other past, present, and reasonable foreseeable future actions, regardless of who undertake those other action.

The proposed project will construct a new roadway in a suburban area east of the City limits of Jeffersonville, Indiana. Approximately half of the project corridor is located within a suburban/urban landscape with commercial properties located near the southern terminus and residential properties located in the southern half of the project area. The other half of the project corridor is located within an undeveloped, forested landscape. Because the heavy haul corridor is currently being designed without cross roads (except New Middle), the potential for residential and/or commercial growth induced by the construction of the roadway is diminished. The likelihood of development along the roadway in the middle and northern portions of the project corridor, with or without the construction on the heavy haul roadway, is also unlikely due to the steep topography in these areas.

The preferred alternative is anticipated to directly impact approximately 9.1 acres of forest for the construction of the roadway. According to the 2018 BA, the federally endangered gray bats are present within the project corridor. Gray bats use the riparian forest habitat for foraging and/or flyway corridors. While the removal of forest results in a *may affect, and likely to adversely affect* determination, the removal of 9.1 acres of total forest is anticipated to be minimal for maintaining gray bat riparian forest flyway and foraging habitat.

Indirect effects on gray bats include runoff of sediment during construction into streams utilized for foraging. These effects will be minimized with the implementation of construction and post-construction best management practices (BMPs) for water quality treatment of stormwater runoff to protect aquatic resources that support important macroinvertebrate food sources for gray bats. Temporary erosion control measures will also be included within the preliminary construction plans. Permanent erosion control features include riprap installation over geotextile at the outflow of all culverts and paved side ditches. Permanent grass seeding will be applied to all permanent slopes and exposed surfaces prior to project completion.

In addition, there are several transportation projects in Clark County that are in various stages of completion. Each of the projects is generally located in the vicinity of the SR 265 corridor east of SR 62 and north of the City of Jeffersonville, and each has independent utility. These projects include the Louisville-Southern Indiana Ohio Bridges Project – East End Crossing, Old Salem Road Improvement, Project A (Heavy Haul Transportation Corridor), Project B (RRCC connection to SR 265 vial SR265/Old Salem Road interchange), and Project C (new direct, grade separated rail connection between the Port and RRCC). In a letter to FHWA dated March 22, 2016, INDOT discusses each project and demonstrates how each has independent utility (Appendix J, J-1 to J-5). Therefore, the proposed project would be usable and would be a reasonable expenditure even if no additional transportation improvements in the area were made.

Public Facilities & Services

	Yes	No
Will the proposed action result in substantial impacts on health and educational facilities, public and private utilities, emergency services, religious institutions, airports, public transportation or pedestrian and bicycle facilities? *Discuss how the maintenance of traffic will affect public facilities and services.*		X

Remarks:

During development of this project, early coordination letters dated April 29, 2016 were sent to Clark county Emergency Management Agency, Clark County Sheriff's Office, Utica Elementary School, Greater Clark County Schools, and Jeffersonville Police Department. This coordination was undertaken as a way to provide the representative emergency service agencies and school corporations the opportunity to comment on the potential effects of the project on their service routes. None of the agencies contacted returned comments on the project. It is anticipated that emergency routes will be temporarily affected by the detour at New Middle Road and Utica-Sellersburg Road during the construction of the connector. Emergency service providers and school corporations will be given at least two weeks notification of any restrictions resulting from construction.

Environmental Justice (EJ) (Presidential EO 12898)	**Yes**	**No**
During the development of the project were EJ issues identified?		X
Does the project require an EJ analysis?	X	
If YES, then:		
Are any EJ populations located within the project area?		X
Will the project result in adversely high or disproportionate impacts to EJ populations?		X

Remarks:

According to the INDOT CE manual, the project requires an Environmental Justice (EJ) analysis if the project is being processed as an Environmental Assessment. For the EJ analysis, the community encompassing the project limits is called the affected community (AC). The reference community is typically the larger county, city, or town that encompasses the AC. This reference community is called the community of comparison (COC). It is possible to have more than one COC if a project crosses through multiple municipalities. The purpose of the EJ analysis is to identify affected communities that have elevated low-income and/or minority populations. If an elevated EJ population is present, further assessment is completed to determine if the project has a disproportionately high and adverse effect when compared to other populations within the area.

Methodology:
An elevated EJ population (either low-income or minority) is considered to be present if the analysis reveals one of two conditions. First, the AC is found to be more than 50 percent minority or low-income. Secondly, if the low-income population or the minority population of the AC are found to be 25 percent higher than the same populations in the COC. A low-income population is a population with a median income that is below the federal poverty guidelines. A minority population consists of individuals who belong to one or more federally recognized minority groups. The analysis completed for this project used the most current census data regarding low-income and minority demographics, which is the 2016 American Community Survey Five Year Estimates (2012-2016) prepared by the U.S. Census Bureau (Appendix J, J-6 to J-10). The following summarizes the results of this data analysis.

Analysis:
The project area is comprised on one census tract, 507.01 (AC), as determined by a review of the 2016 U.S. Census Data (Appendix J, J-6). For this analysis, Clark County was analyzed as the COC. Within Clark County, 9.9 percent of the population was considered low-income and 5.1 percent of the population was considered minority. An EJ population would exist if the AC exceeded 12.4 percent for low-income or 6.4 percent minority.

According to the 2016 U.S. Census, 4.2 percent of the AC was considered low-income and 3.7 percent was considered minority. As such, a potential EJ population does not exist within the AC as compared to Clark County. For reference, see the table below and Appendix J. As a result of this study, there are no disproportionately high and adverse impacts to any population of EJ concerns.

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	COC Clark County, Indiana	AC Census Tract 507.01
LOW-INCOME POPULATION		
Total Population for Whom Poverty Status is Determined	112,188	5,483
Total Population Below Poverty Level	11,153	230
Percent Low-Income	9.9	4.2
125 Percent of COC	12.4	
AC Percent Low-Income Greater Than 125 Percent of COC?		No
AC Percent Low-Income Greater Than 50 Percent?		No
Population of EJ Concern?		No
MINORITY POPULATION		
Total Population	113,993	5,521
Minority Population	108,160	5,314
Percent Minority	5.1	3.7
125 Percent of COC	6.4	
AC Percent Minority Greater Than 125 Percent of COC?		No
AC Percent Minority Greater Than 50 Percent?		No
Population of EJ Concern?		No

Relocation of People, Businesses or Farms

	Yes	No
Will the proposed action result in the relocation of people, businesses or farms?	X	
Is a Business Information Survey (BIS) required?		X
Is a Conceptual Stage Relocation Study (CSRS) required?		X
Has utility relocation coordination been initiated for this project?	X	

Number of relocations: Residences: 3 Businesses: 0 Farms: 0 Other: 0

If a BIS or CSRS is required, discuss the results in the remarks box.

Remarks:

The proposed project will require the relocation of three residences. The acquisition and relocation program will be conducted in accordance with 49 CFR 24 and the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 as amended. Relocation resources are available to all residential and business relocates without discrimination. No person displaced by this project will be required to move from a displaced dwelling unless comparable replacement housing is available to that person.

Currently, two electric companies, one natural gas company, two water companies, two sewer companies, one cable company, and one communications company have services to residents and businesses in or near the project area. Coordination with these utility companies has begun to identify potential conflicts and relocation of the appropriate facilities. This coordination will continue through the duration of the engineering phase of the work.

SECTION H – HAZARDOUS MATERIALS & REGULATED SUBSTANCES

Hazardous Materials & Regulated Substances (Mark all that apply)	**Documentation**
Red Flag Investigation	X
Phase I Environmental Site Assessment (Phase I ESA)	
Phase II Environmental Site Assessment (Phase II ESA)	
Design/Specifications for Remediation required?	

	No	**Yes/ Date**
ES Review of Investigations		**October 18, 2017**

Include a summary of findings for each investigation.

Remarks:

A RFI was prepared by American Structurepoint, Inc., on October 17, 2017 and approved by INDOT ES on October 18, 2017 (Appendix D, D-1 to D-18). The RFI consisted of a review of readily available Geographic Information System (GIS) data layers provided by IndianaMap, the Indiana Geological Survey, and additional data sources, including the county Interim Reports and the Indiana Natural Heritage Database.

Two hazardous material concern records were identified within the investigated area. A solid waste landfill located within one-half mile of the project area at 5217 Utica Pike, and a tire waste site located at 5100 Utica Pike. Because the landfill is mapped adjacent to the project area and may be associated with a historical tire waste site, a Phase II investigation was recommended in order to fully assess and characterize any contamination that has resulted from the past use of this site.

The investigated area in the RFI was drawn larger than the actual construction limits to ensure incidental construction was captured in the review. However, since the approval of the document, project design has developed and it has been determined that construction will not extend to Utica Pike; the previously identified hazardous material sites are now approximately 0.5 mile south of the project limits. Therefore, no impacts are anticipated. No further investigation is required.

If a spill occurs or contaminated soils or water are encountered during construction, appropriate personal protective equipment (PPE) should be used. Contaminated materials will need to be properly handled by trained personnel and disposed in accordance with current regulations. IDEM should be notified through the spill line at (888) 233-7745 within 24 hours of discovery of a release from a UST system and within 2 (two) hours of discovery of a spill.

SECTION I – PERMITS CHECKLIST

Permits (mark all that apply)	**Likely Required**
Army Corps of Engineers (404/Section10 Permit)	
Individual Permit (IP)	
Nationwide Permit (NWP)	
Regional General Permit (RGP)	X
Pre-Construction Notification (PCN)	
Other	
Wetland Mitigation required	
Stream Mitigation required	
IDEM	
Section 401 WQC	X
Isolated Wetlands determination	
Rule 5	X
Other	
Wetland Mitigation required	
Stream Mitigation required	X

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IDNR

Construction in a Floodway	X
Navigable Waterway Permit	
Lake Preservation Permit	
Other	
Mitigation Required	X
US Coast Guard Section 9 Bridge Permit	
Others (Please discuss in the remarks box below)	

Remarks:

The following summarizes the status of all known permits associated with the proposed project. INDOT, or its authorized agent, is responsible for obtaining the necessary permits prior to construction, including all mitigation required as conditions of the approved permits.

The proposed project will require a Rule 5 Construction Sediment and Erosion Control Permit from IDEM as more than one acre of land will be disturbed. A Section 401 Individual Permit from IDEM and a Section 404 Regional General Permit (RGP) from the USACE will be required for impacts to wetlands and streams. Because wetland impact is less than 0.1 acre (0.029 acre), wetland mitigation is not anticipated. Due to the amount of stream impacts anticipated (894 linear feet), wetland and stream mitigation will likely be required.

Formal application for a Construction in a Floodway Permit from IDNR may be required due to the encroachment upon the FEMA-designated floodplain of Lentzier Creek.

SECTION J- ENVIRONMENTAL COMMITMENTS

The following information should be provided below: List all commitments, name of agency/organization requesting the commitment(s), and indicating which are firm and which are for further consideration. The commitments should be numbered.

Remarks:

Firm:

1. Local school districts and emergency services will be notified of any potential traffic delays at least two weeks prior to the start of construction. (INDOT)
2. If additional permanent or temporary right-of-way is determined to be required, INDOT Environmental Services will be contacted immediately. (INDOT)
3. If the scope of the project changes from that which is described within this document, INDOT Environmental Services will be notified immediately. (INDOT)
4. If a spill occurs or contaminated soils or water are encountered during construction, appropriate personal protective equipment (PPE) should be used. Contaminated materials will need to be properly handled by trained personnel and disposed in accordance with current regulations. IDEM should be notified through the spill line at (888) 233-7745 within 24 hours of discovery of a release from a UST system and within 2 (two) hours of discovery of a spill. (INDOT Hazardous Materials Unit)
5. All conditions of required regulatory permits (i.e., Section 401 WQC, Section 404 RGP, Rule 5, and Construction in a Floodway Permit) must be observed unless exempt through coordination with the permitting agency. (INDOT)
6. Any unavoidable impacts should be compensated for in accordance with the Corps of Engineers mitigation guidelines. (USFWS)
7. Implement temporary erosion and siltation control devices such as placement of riprap check dams in drainage ways and ditches, installation of silt fences, covering exposed areas with erosion control materials, and grading slopes to retain runoff in basins. (USFWS)
8. Post DO NOT DISTURB signs at the construction zone boundaries and do not clear trees or understory vegetation outside the boundaries. (USFWS)
9. The project shall not remove trees or forested habitat outside of the proposed construction limits. (USFWS)
10. Low-water in-stream work will be limited to installation of culverts, piers, pilings and/or footings, shaping of spill slopes adjacent to bridge abutments, and placement of riprap. (USFWS)
11. Culverts will span the active stream channel and shall either be embedded or a 3-sided/open-arch culvert, and be installed where practicable on an essentially flat slope. When applicable, culverts placed in streams with high quality substrate such as gravel, cobbles and boulders, shall not disturb the native substrate within the stream bed in order to provide natural habitat for the aquatic community. (USFWS)
12. In-stream channel work and vegetation clearing shall be restricted to the minimum necessary for installation of the stream crossing structure. (USFWS)
13. Construction shall minimize the extent of hard armor (riprap) in bank stabilization by using bioengineering techniques whenever possible. If rip rap is utilized for bank stabilization, extend it below low-water elevation to provide aquatic habitat. (USFWS)
14. Temporary erosion and sediment control BMPs will be utilized within areas of disturbed soil. All disturbed soil areas upon project completion will be vegetated following INDOT's standard specifications. (USFWS)
15. Work within the inundated part of the stream channel (in perennial streams and larger intermittent streams) will be restricted to outside of the the fish spawning season (April 1 through June 30), except for work within sealed structures such as caissons or cofferdams that were installed prior to the spawning season. (USFWS)
16. No equipment shall be operated below the Ordinary High Water Mark during this time unless the machinery is within the caissons or on the cofferdams. (USFWS)
17. The project proposes temporary construction and permanent post-construction BMPs for water quality treatment of stormwater runoff from impervious areas within the Proposed Alternative limits and INDOT ROW. Temporary construction BMPs will include sediment traps, check dams, silt fences, ditch inlet protections, temporary construction entrance stabilization, and temporary sediment basin within the preliminary construction plans to protect aquatic habitats. Permanent erosion control features include riprap installation over geotextile at the outflow of all culverts and paved side ditches in areas of 3 percent or steeper grades. Structural BMPs may also be employed to reduce stormwater pollution through filtration, biological uptake, and microbial activity. Post-construction BMPs are effective in treating for total suspended solids, nutrients, and metals as well as reducing impervious area stormwater runoff, thereby protecting aquatic resources that support important macroinvertebrate food sources for gray bats. (USFWS)
18. The project proposes any explosive blasting will be conducted in daylight hours and will utilize blasting mats to

prevent flyrock from escaping the project's construction limits. (USFWS)

19. If necessary, the project proposes downward facing permanent lighting to reduce disturbance to nearby suitable bat foraging habitat. No temporary lighting to facilitate nighttime construction will be used. (USFWS)
20. If appropriate, the proposed project will evaluate wildlife crossings under bridges and culverts. Suitable crossings include flat areas below bridge abutments with suitable ground cover, high water shelves in culverts, amphibian tunnels and diversion fencing. (USFWS)
21. The project team should consult with the USFWS' Bloomington Field Office regarding implementation of project-specific mitigation measures for the permanent loss of 9.1 acres of forested habitat associated with the Proposed Alternative. Mitigation will be provided at a ratio of 1:1 if forest restoration is used to compensate for forest impacts. If forest preservation is proposed, a ratio of 2:1 will be required. (USFWS)
22. If any archaeological artifacts or human remains are uncovered during construction, demolition, or earthmoving activities, state law (Indiana Code 14-21-1-27 and -29) requires that the discovery be reported to the Department of Natural Resources within two (2) business days (IDNR)
23. Do not work in the waterway from April 1 through June 30 without the prior written approval of the Division of fish and Wildlife. (IDNR)
24. Do not cut any trees suitable for Indiana bat or northern long-eared bat roosting (greater than 3 inches dbh, living or dead, with loose hanging bark, or with cracks, crevices, or cavities) from April 1 through September 30. (IDNR)
25. Post "Do Not Mow or Spray" signs along the right-of-way. (IDNR)
26. The physical disturbance of the stream and riparian vegetation, especially large trees overhanging any affected water bodies should be limited to only that which is absolutely necessary to complete the project. The shade provided by the large overhanging trees helps maintain proper stream temperatures and dissolved oxygen for aquatic life. (IDEM)
27. Reasonable precautions must be taken to minimize fugitive dust emissions from construction and demolition activities. For example, wetting the area with water, constructing wind barriers, or treating dusty areas with chemical stabilizers (such as calcium chloride or several other commercial products). Dirt tracked onto paved roads from unpaved areas should be minimized. (IDEM)
28. Ensure that asphalt paving plants are permitted and operate properly. The use of cutback asphalt, or asphalt emulsion containing more than seven percent (7%) oil distillate, is prohibited during the months of April through October. (IDEM)
29. All solid wastes generated by the project, or removed from the project site, need to be taken to a properly permitted solid waste processing or disposal facility. (IDEM)
30. Use erosion and sediment control measures, including temporary earthen berms to control sediment from construction zones entering sinkholes (INDOT ES)
31. Bare and disturbed areas within sinkhole drainage areas should be re-vegetated as soon as practical following construction with a mixture of grasses (excluding all varieties of tall fescue), legumes, and native shrubs and hardwood tress species (INDOT ES)
32. Where possible, the existing vegetation surrounding features should be maintained throughout construction, including a minimum 10-foot buffer measured from the rim, or highest closed contour, surrounding the depression (INDOT ES)
33. All sinkholes and surrounding buffer areas should be fenced for the duration of construction (INDOT ES)
34. Closure or repair of sinkholes within the project limits (INDOT ES)
35. If the proposed drainage design is modified to use existing karst features, a full-scale pollutant loading calculation should be performed to estimate the potential loads anticipated for the specific karst feature and dye-tracing should be performed to determine flow paths from these features (INDOT ES)
36. A low salt and no spray strategy should be implemented, including the use of road signs that indicate the no spray zone (INDOT ES)
37. An Emergency Response Plan, including a site-specific Spill Response Plan, will be developed prior to the start of project construction to identify response protocols if a spill occurs during construction (INDOT ES)
38. Material storage and staging areas, as well as equipment storage, maintenance and re-fueling areas should not be located within the drainage are of any karst features (INDOT ES)
39. Use of structural BMPs (e.g., water quality filters and hydrodynamic devices) should be considered at the stormwater outfalls to surface streams in the area to minimize pollutant loading and contain releases from spills. (INDOT ES)
40. Per the Karst MOU, the Karst Report will be submitted to participating agencies (IDEM, IDNR, USFWS) for review prior to construction. (INDOT ES)
41. If any permanent structures or equipment utilized for the project penetrates the 100:1 slope for the airport, FAA Form 7460 must be filed with INDOT, Office of Aviation (317-232-1477). (INDOT)

For Further Consideration:

1. Although the area is not within the designated karst area of the state, INDOT is encouraged to follow the protocols and procedures outlined in the 1993 Memorandum of Understanding for construction of transportation projects in karst areas. (USFWS)
2. Wetland and stream impacts should be avoided as much as possible. (USFWS)
3. Depending on the size and flow of the various waterways, avoid channel work during the fish spawning season (April 1 through June 30). (USFWS)
4. Restrict channel work and vegetation clearing to the minimum necessary for installation of any structures and roadway. (USFWS)
5. If riprap is utilized for bank stabilization, extend it below low-water elevation to provide aquatic habitat. (USFWS)
6. Re-vegetate all disturbed soil areas immediately upon project completion, using native trees and shrubs in riparian zone. (USFWS)
7. Minimize the extent of artificial bank stabilization and use bioengineering methods wherever feasible. (USFWS)
8. Culverts should span the active stream channel, should be either embedded or a 3-sided or open-arch culvert, and be installed where practicable on an essentially flat slope. When an open-bottomed culvert or arch is used in a stream, which has a good natural bottom substrate, such as gravel, cobbles, and boulders, the existing substrate should be left undisturbed beneath the culvert to provide natural habitat for the aquatic community. (USFWS)
9. Minimize impacts to and fragmentation of wetland, non-wetland forest in and outside of the floodway, streams, and floodway habitat with an alignment that minimizes the construction footprint through forested habitat, the number of forested areas impacted, and the number of stream crossings. (IDNR)
10. A multiple-span bridge/elevated roadway design could be combined with MSE walls to reduce right-of-way impacts when crossing forested valleys. If a multiple-span elevated roadway is not feasible, then the road's footprint should be minimized through the use of MSE walls throughout the valley rather than cut/fill. (IDNR)
11. Further habitat studies are recommended to determine areas to avoid. A floristic quality assessment and fauna surveys such as amphibian/herpetological surveys of the potentially affected area are recommended. (IDNR)
12. Impacts to non-wetland/riparian forest in the floodway/floodplain will require mitigation. 1:1 ratio for less than 1 acre of impact to non-wetland forest; and 2:1 ratio for impacts to non-wetland forest over 1 acre. (IDNR)
13. Impacts to streams including intermittent and ephemeral streams should be addressed in any mitigation proposal. Unavoidable stream enclosure should be done with a 3-sided culvert designed with the inclusion of grates every 100 feet to allow the enclosed stream area to approximate normal lighting conditions. (IDNR)
14. A single-span or multiple-span elevated road/bridge design is needed to avoid the unreasonably large impact to the stream resulting from the amount of fill needed for the road berm. (IDNR)
15. Creek crossings should be constructed using a bridge or 3-sided culvert instead of 4-sided (box) culverts. If box or pipe culverts are used, the bottoms should be buried a minimum of 6 inches below the stream bed elevation. Crossing should span the entire channel width and should maintain the natural stream substrate within the structure. Crossing structures should have a minimum openness ratio of 0.25 (height x width / length). Stream depth and water velocities in the crossing structure during low-flow conditions should approximate those in the natural stream channel. (IDNR)
16. Revegetate all bare and disturbed areas with a mixture of native grasses, sedges, wildflowers, and native shrub and hardwood tree species as soon as possible upon completion. Do not use any varieties of Tall Fescue or other non-native plants (e.g., crown-vetch). (IDNR)
17. Minimize and contain within the project limits in-channel disturbance and the clearing of trees and brush. (IDNR)
18. Use minimum average 6 inch graded riprap tone extended below the normal water level to provide habitat for aquatic organisms in the voids. (IDNR)
19. Plant native hardwood trees along the top of bank and right-of-way to replace the vegetation destroyed during construction. (IDNR)
20. Do not construct any temporary runarounds, causeways, cofferdams, pump around or stream diversion systems. (IDNR)
21. Seed and protect all disturbed slopes that are 3:1 or steeper with biodegradable heavy-duty erosion control blankets (follow manufacturer's recommendations for selection and installation); seed and apply mulch on all other disturbed areas. (IDNR)

SECTION K- EARLY COORDINATION

Please list the date coordination was sent and all agencies that were contacted as a part of the development of this Environmental Study. Also, include the date of their response or indicate that no response was received. INDOT and FHWA are automatically considered early coordination participants and should only be listed if a response is received.

Remarks:

Early coordination letters were sent out April 29, 2016. Re-coordination was sent out to select agencies on October 16, 2017. NRCS received re-coordination materials January 19, 2018. The table below identifies the recipients of those letters and the date their response, if any, was received.

Agency	Response	Location of Response
U.S. Fish and Wildlife Service	June 2, 2016	Appendix B, B-34 to B-37
U.S. Natural Resources Conservation Service	May 13, 2016	Appendix B, B-31
Indiana Geological Survey	May 13, 2016	Appendix B, B-30
INDOT Office of Aviation	May 18, 2016	Appendix B, B33
National Park Service, Midwest Regional Office	No Response	N/A
Indiana Department of Natural Resources, Division of Fish and Wildlife	June 3, 2016	Appendix B, B-38 to B-41
U.S. Department of Housing and Urban Development	No Response	N/A
Indiana Department of Environmental Management	No Response	Appendix B, B-43 to B-53
INDOT Office of Public Involvement	No Response	N/A
INDOT, Seymour District	No Response	N/A
U.S. Forest Service – Hoosier National Forest	No Response	N/A
USACE Louisville District	No Response	N/A
U.S. Coast Guard	May 13, 2016	Appendix B, B-32
City of Jeffersonville, Engineer	No Response	N/A
KIPDA	No Response	N/A
Clark County Highway Engineer	No Response	N/A
City of Jeffersonville Mayor	No Response	N/A
Utica Town Board	No Response	N/A
Jeffersonville Department of Economic Development and Department of Redevelopment	No Response	N/A
Jeffersonville Department of Planning and Zoning	No Response	N/A
Jeffersonville Police Department	No Response	N/A
Jeffersonville Storm Water Department	No Response	N/A
One Southern Indiana	No Response	N/A
RRCC	No Response	N/A
Greater Clark County Schools	No Response	N/A
Utica Elementary School	No Response	N/A
Clark county Sheriff's Office	No Response	N/A
Clark County Surveyor's Office	March 13, 2017	Appendix B, B-42
Clark county Drainage Board	No Response	N/A
Port of Indiana – Jeffersonville	No Response	N/A
Indiana Economic Development Corporation	No Response	N/A
Clark County Emergency Management Agency	No Response	N/A
DNR Outdoor Recreation	No Response	N/A
Clark County Board of Commissioners	No Response	N/A
Clark County Council	No Response	N/A
City of Jeffersonville Parks Department	No Response	N/A

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Appendix A: Graphics

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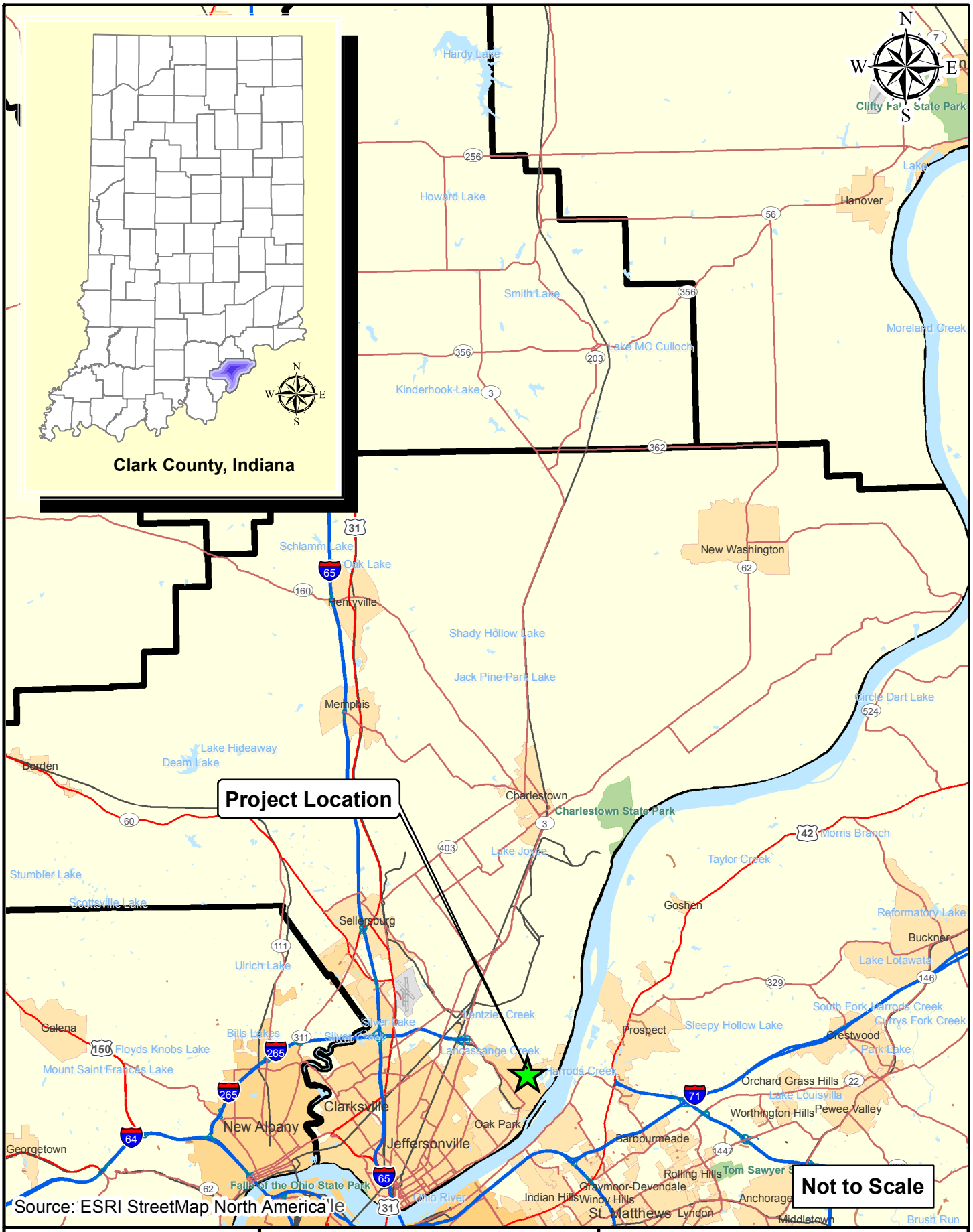

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Figure 1. Project Location Map

Indiana Department of Transportation
Central Office
100 North Senate Avenue
Indianapolis, Indiana 46204

Heavy Haul Transportation Corridor
Des. No. 1382612

Location: Jeffersonville
Township: Utica
County: Clark
State: Indiana

Date: 09/25/2015

Appendix A
Page A-1

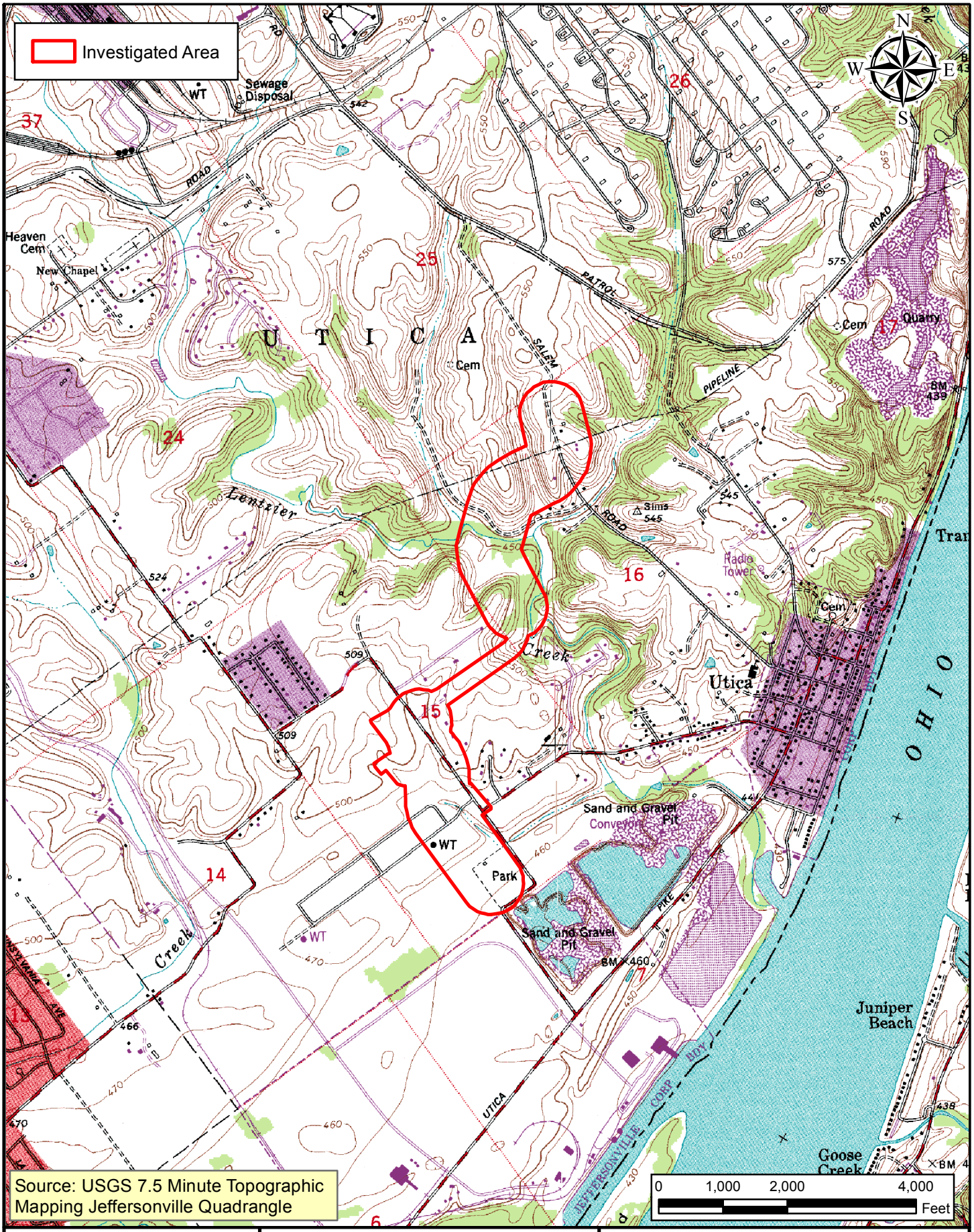

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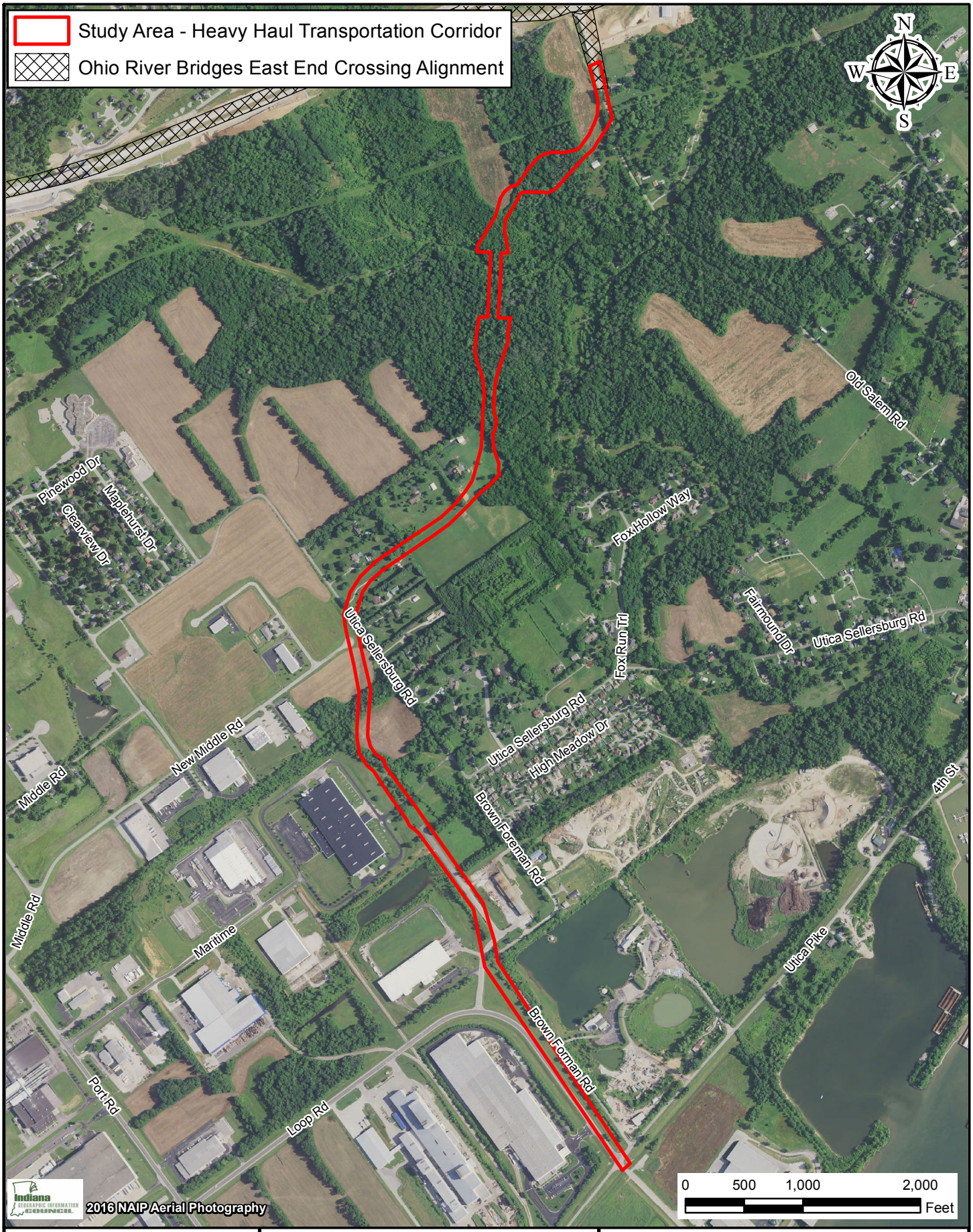
Figure 2. USGS Topographic Mapping

Indiana Department of Transportation
Central Office
100 North Senate Avenue
Indianapolis, Indiana 46204

Heavy Haul Transportation Corridor
Des. No. 1382612

Location: Jeffersonville
Township: Utica
County: Clark
State: Indiana

Date: 02/01/2017



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2016 Aerial Photography

Indiana Department of Transportation
Central Office
100 North Senate Avenue
Indianapolis, Indiana 46204

Heavy Haul Transportation Corridor
Des. No. 1382612

Location: Jeffersonville
Township: Utica
County: Clark
State: Indiana

Date: xx/xx/20xx

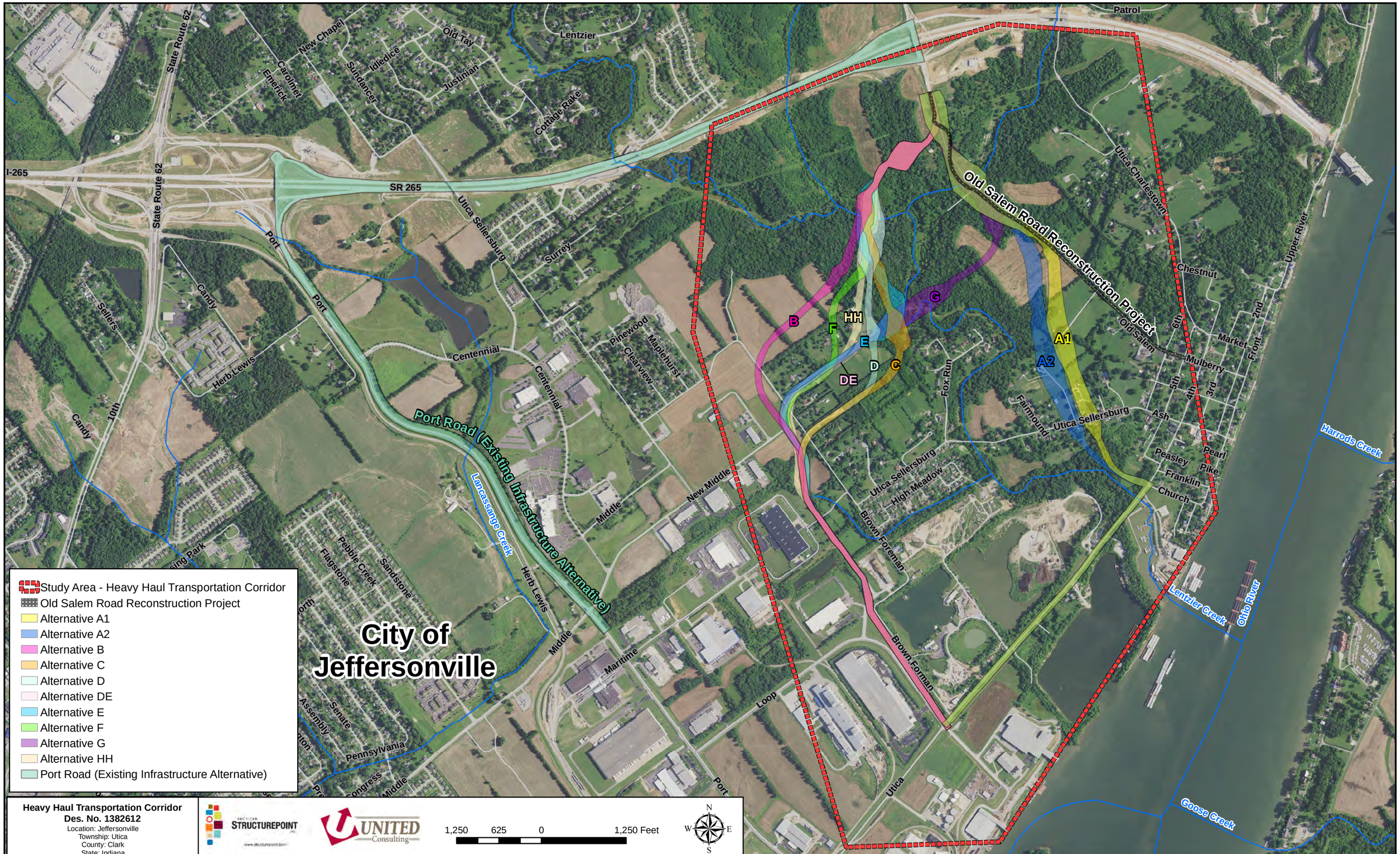
Heavy Haul Transportation Corridor - Des. No. 1382612

Original Alternatives Screening

Criteria	Alternatives											
	No-Build	A1	A2	B	C	D	DE	E	F	G	HH	Port Road (Existing Infrastructure)
PURPOSE AND NEED CONSIDERATIONS												
Does alternative provide connectivity between existing infrastructure major traffic generators?	NO	NO	NO	YES	YES	YES	YES	YES	YES	YES	YES	YES
Does the alternative address inadequate system connection south of the SR 265/Old Salem Road Interchange?	NO	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	NO
Will the infrastructure be designed to effectively handle Heavy Haul Vehicles?	NO	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
ENVIRONMENTAL CONSIDERATIONS												
Adverse Effect on Historic Properties	N/A	0	0	0	0	0	0	0	0	0	0	0
Business Relocations	N/A	0	0	0	0	0	0	0	0	0	0	0
Environmental Justice Issues	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Farmland Impacted (total acres)	N/A	3.49	5.23	6.29	1.28	2.06	3.4	3.4	3.49	3.32	2.51	0
Prime & Unique Farmland (total acres)	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Forest Impacts (net loss in acres)	N/A	15.61	19.47	12.39	18.81	17.85	15.74	18.29	10.63	20.19	11.87	0.16
Homes/Apartment Unit Relocations	N/A	10	7	1	2	3	3	2	3	6	3	0
Karst Features Impacted	N/A	3	5	3	4	8	4	10	2	9	3	ND
Noise Impacted Receivers	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Potential Archaeological Sites Impacted	N/A	0	0	2	2	3	0	0	ND	0	ND	ND
Potential Hazardous Material Sites	N/A	5	5	2	2	2	2	2	2	2	2	0
Right-of-Way (total acres)	0	54.2	60.7	25.4	34.6	28.6	28.6	30	29.2	34.9	25.5	0.85
Section 4(f) Property Use	N/A	Likely	Not Likely	Likely	Likely	Likely	Not Likely	Not Likely	Not Likely	Not Likely	Not Likely	Not Likely
Stream Crossings	N/A	4	4	7	9	9	8	8	7	11	7	2
Stream Channel length within Construction Limits (total linear feet)	N/A	1258	1929	1177	1689	1741	1718	1784	1181	2902	1588	239
Upstream Drainage Area (mi^2)	N/A	8.49	8.49	5.54	5.54	5.54	5.54	5.54	5.54	7.18	5.54	1.12
Surface Water Impoundments Impacted	0	0	0	0	1	0	0	0	0	0	0	0
Wetland Impacts (total acres)	N/A	1.44	1.98	0.23	0.36	0.59	0.66	0.25	0.08	1.54	0.23	0.48
USACE Jurisdictional Wetlands (acres)	N/A	1.44	1.98	0.23	0.36	0.59	0.66	0.25	0.08	1.54	0.23	0.48
USACE Non- Jurisdictional Wetlands (acres)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
ENGINEERING CONSIDERATIONS												
Constructability (High, Medium or Low)	N/A	Low	Low	Medium	Medium	Medium	Medium	Medium	Medium	Medium	Medium	Low
Estimated Total Cost (Million $)	$0	$17.50	$17.70	$11.90	$11.90	$11.60	$12.20	$12.30	$11.80	$14.80	$10.70	$10.59
Length (total miles)	N/A	2.22	2.26	1.64	1.64	1.59	1.48	1.7	1.62	1.77	1.47	1.31
New Construction (total miles)	N/A	0.77	0.96	1.49	1.49	1.43	1.32	1.55	1.46	1.62	1.31	0
Structure Length (total feet)	N/A	440	440	220	220	220	375	220	220	440	220	635

ND = Not Determined
N/A = Not Applicable

*Original Alternatives Analysis Map



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For Planning Purposes Only

Heavy Haul Transportation Corridor - Des. No. 1382612

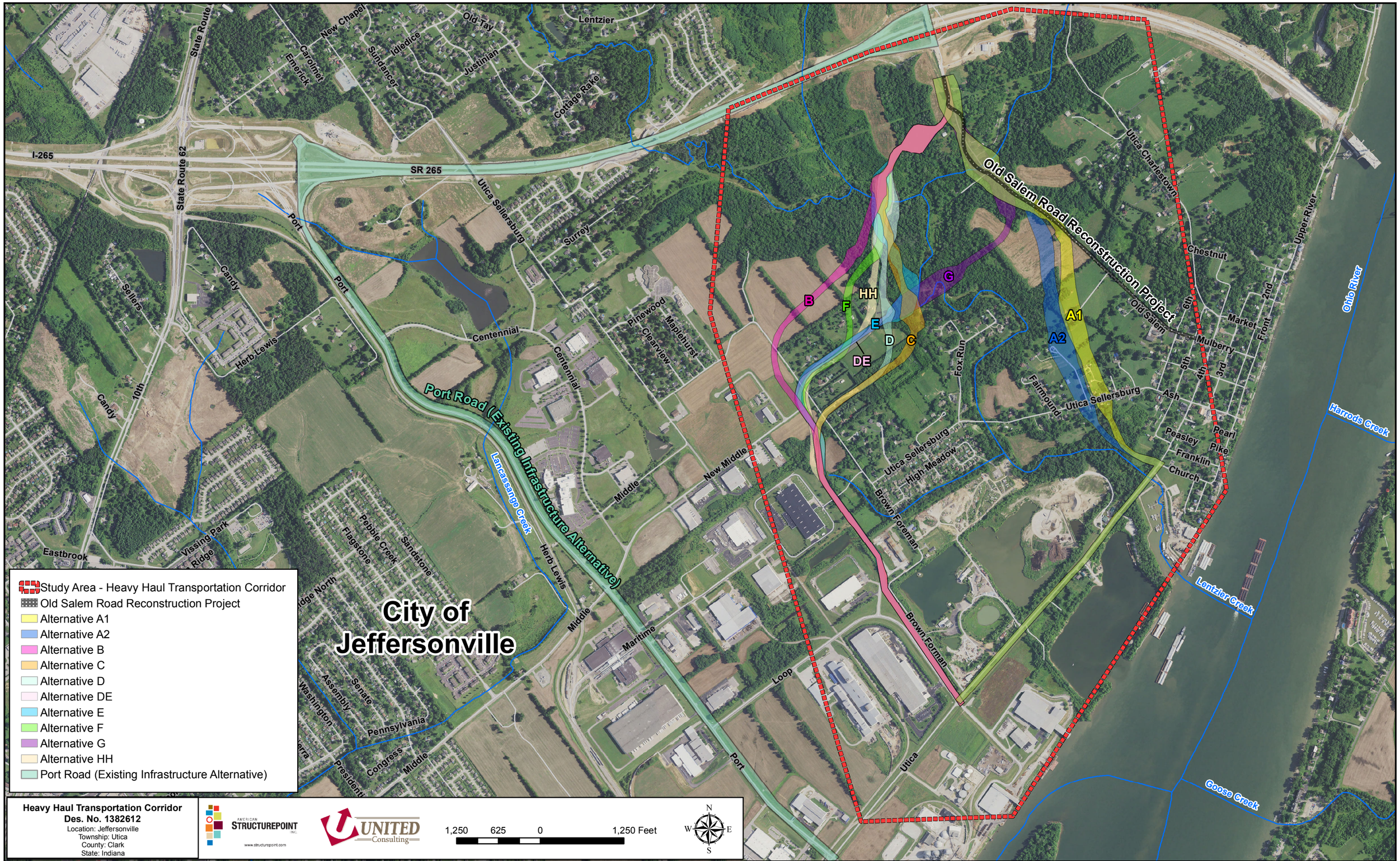
Updated Alternatives Screening

Criteria	Alternatives											
	No-Build	A1	A2	B	C	D	DE	E	F	G	HH	Port Road (Existing Infrastructure)
PURPOSE AND NEED CONSIDERATIONS												
Does alternative provide connectivity between existing infrastructure major traffic generators?	NO	NO	NO	YES	YES	YES	YES	YES	YES	YES	YES	YES
Does the alternative address inadequate system connection south of the SR 265/Old Salem Road Interchange?	NO	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	NO
Will the infrastructure be designed to effectively handle Heavy Haul Vehicles?	NO	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
ENVIRONMENTAL CONSIDERATIONS												
Adverse Effect on Historic Properties	N/A	0	0	0	0	0	0	0	0	0	0	0
Business Relocations	N/A	0	0	0	0	0	0	0	0	0	0	0
Environmental Justice Issues	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Farmland Impacted (total acres)	N/A	3.49	5.23	6.29	1.28	2.06	3.4	3.4	3.49	3.32	2.51	0
Prime & Unique Farmland (total acres)	N/A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Forest Impacts (net loss in acres)	N/A	15.61	19.47	12.39	18.81	17.85	15.74	18.29	10.63	20.19	11.87	0.16
Homes/Apartment Unit Relocations	N/A	10	7	1	2	3	3	2	3	6	3	0
Karst Features Impacted	N/A	3	5	3	4	8	4	10	2	9	3	ND
Noise Impacted Receivers	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Potential Archaeological Sites Impacted	N/A	0	0	2	2	3	0	0	ND	0	ND	ND
Potential Hazardous Material Sites	N/A	5	5	2	2	2	2	2	2	2	2	0
Right-of-Way (total acres)	0	54.2	60.7	25.4	34.6	28.6	28.6	30	29.2	34.9	25.5	0.85
Section 4(f) Property Use	N/A	Likely	Not Likely	Likely	Likely	Likely	Not Likely	Not Likely	Not Likely	Not Likely	Not Likely	Not Likely
Stream Crossings	N/A	4	4	7	9	9	8	8	7	11	7	4*
Stream Channel length within Construction Limits (total linear feet)	N/A	1258	1929	1177	1689	1741	1718	1784	1181	2902	1588	2959*
Upstream Drainage Area (mi^2)	N/A	8.49	8.49	5.54	5.54	5.54	5.54	5.54	5.54	7.18	5.54	4.31*
Surface Water Impoundments Impacted	0	0	0	0	1	0	0	0	0	0	0	0
Wetland Impacts (total acres)	N/A	1.44	1.98	0.23	0.36	0.59	0.66	0.25	0.08	1.54	0.23	0.48
USACE Jurisdictional Wetlands (acres)	N/A	1.44	1.98	0.23	0.36	0.59	0.66	0.25	0.08	1.54	0.23	0.48
USACE Non- Jurisdictional Wetlands (acres)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
ENGINEERING CONSIDERATIONS												
Constructability (High, Medium or Low)	N/A	Low	Low	Medium	Medium	Medium	Medium	Medium	Medium	Medium	Medium	Medium*
Estimated Total Cost (Million $)	$0	$17.50	$17.70	$11.90	$11.90	$11.60	$12.20	$12.30	$11.80	$14.80	$10.70	$21.50 *
Length (total miles)	N/A	2.22	2.26	1.64	1.64	1.59	1.48	1.7	1.62	1.77	1.47	4.0*
New Construction (total miles)	N/A	0.77	0.96	1.49	1.49	1.43	1.32	1.55	1.46	1.62	1.31	0
Structure Length (total feet)	N/A	440	440	220	220	220	375	220	220	440	220	635

ND = Not Determined
N/A = Not Applicable

As development of the proposed project design continued and SR 265 was opened, the Alternative Screening Matrix was re-evaluated and updated to reflect the refinement of the overall design and the consideration of potential improvements and impacts to SR 265.

*Updated Alternatives Analysis Map



Heavy Haul Transportation Corridor
Des. No. 1382612
Location: Jeffersonville
Township: Utica
County: Clark
State: Indiana

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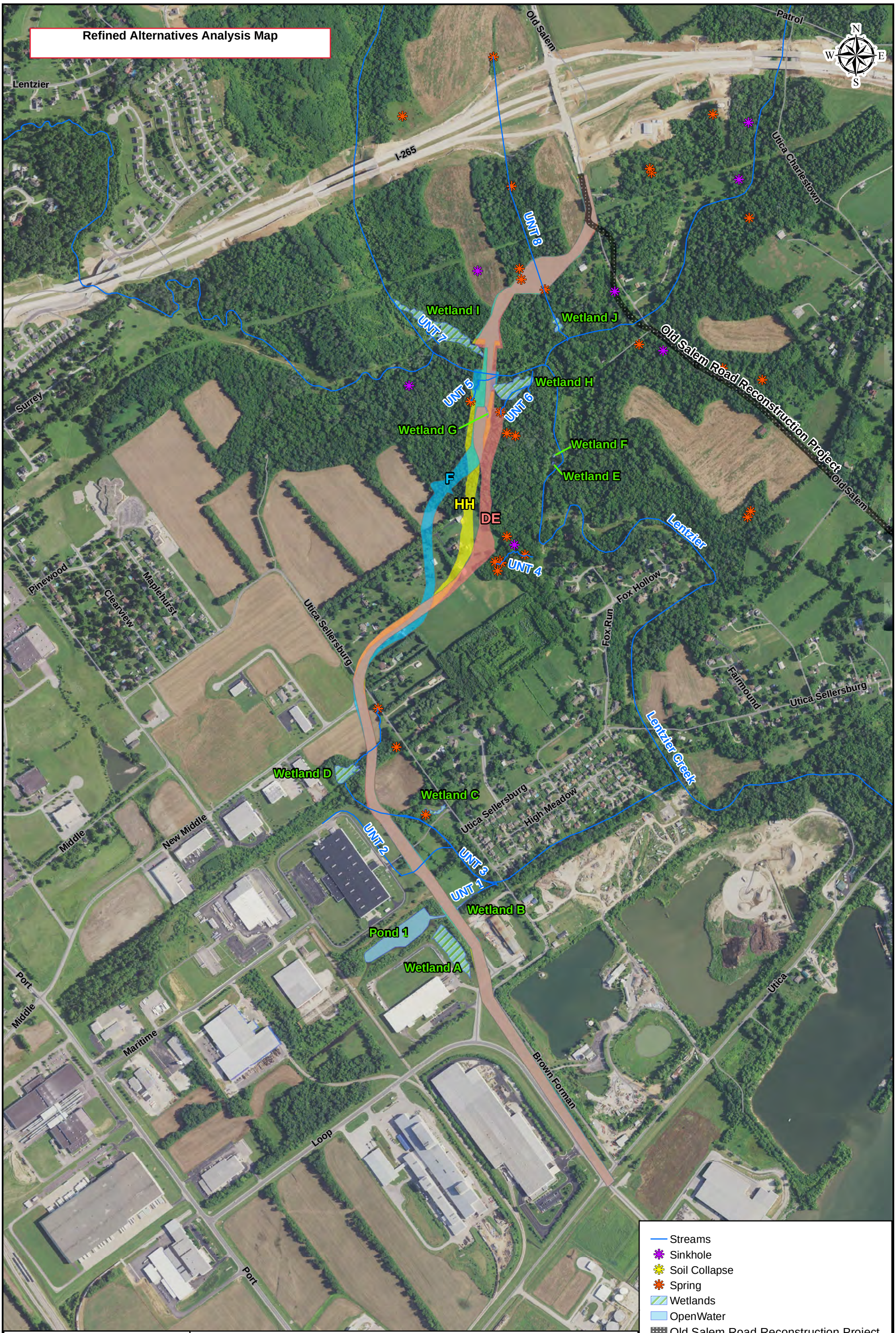
Heavy Haul Transportation Corridor - Des. No. 1382612

Refined Alternatives Screening

Criteria	Alternatives		
	DE	F	HH
PURPOSE AND NEED CONSIDERATIONS			
Does alternative provide connectivity between existing infrastructure major traffic generators?	YES	YES	YES
Does the alternative address inadequate system connection south of the SR 265/Old Salem Road Interchange?	YES	YES	YES
Will the infrastructure be designed to effectively handle Heavy Haul Vehicles?	YES	YES	YES
ENVIRONMENTAL CONSIDERATIONS			
Adverse Effect on Historic Properties	0	0	0
Business Relocations	0	0	0
Environmental Justice Issues	ND	ND	ND
Farmland Impacted (total acres)	3.4	3.49	2.51
Prime & Unique Farmland (total acres)	ND	ND	ND
Forest Impacts (net loss in acres)	11.8	11.8	11.7
Homes/Apartment Unit Relocations	3	3	3
Karst Features Impacted	4	2	3
Noise Impacted Receivers	ND	ND	ND
Potential Archaeological Sites Impacted	0	ND	ND
Potential Hazardous Material Sites	2	2	2
Right-of-Way (total acres)	28.6	29.2	25.5
Section 4(f) Property Use	Not Likely	Not Likely	Not Likely
Stream Crossings	8	7	7
Stream Channel length within Construction Limits (total linear feet)	1078	1326	1137
Upstream Drainage Area (mi^2)	5.54	5.54	5.54
Surface Water Impoundments Impacted	0	1	1
Wetland Impacts (total acres)	0.05	0.03	0.02
USACE Jurisdictional Wetlands (acres)	0.05	0.03	0.02
USACE Non- Jurisdictional Wetlands (acres)	N/A	N/A	N/A
ENGINEERING CONSIDERATIONS			
Constructability (High, Medium or Low)	Medium	Medium	Medium
Estimated Total Cost (Million $)	$12.20	$11.80	$10.70
Length (total miles)	1.48	1.62	1.47
New Construction (total miles)	1.32	1.46	1.31
Structure Length (total feet)	375	220	220

ND = Not Determined
N/A = Not Applicable



Heavy Haul Transportation Corridor
Des. No. 1382612

Location: Jeffersonville
Township: Utica
County: Clark
State: Indiana

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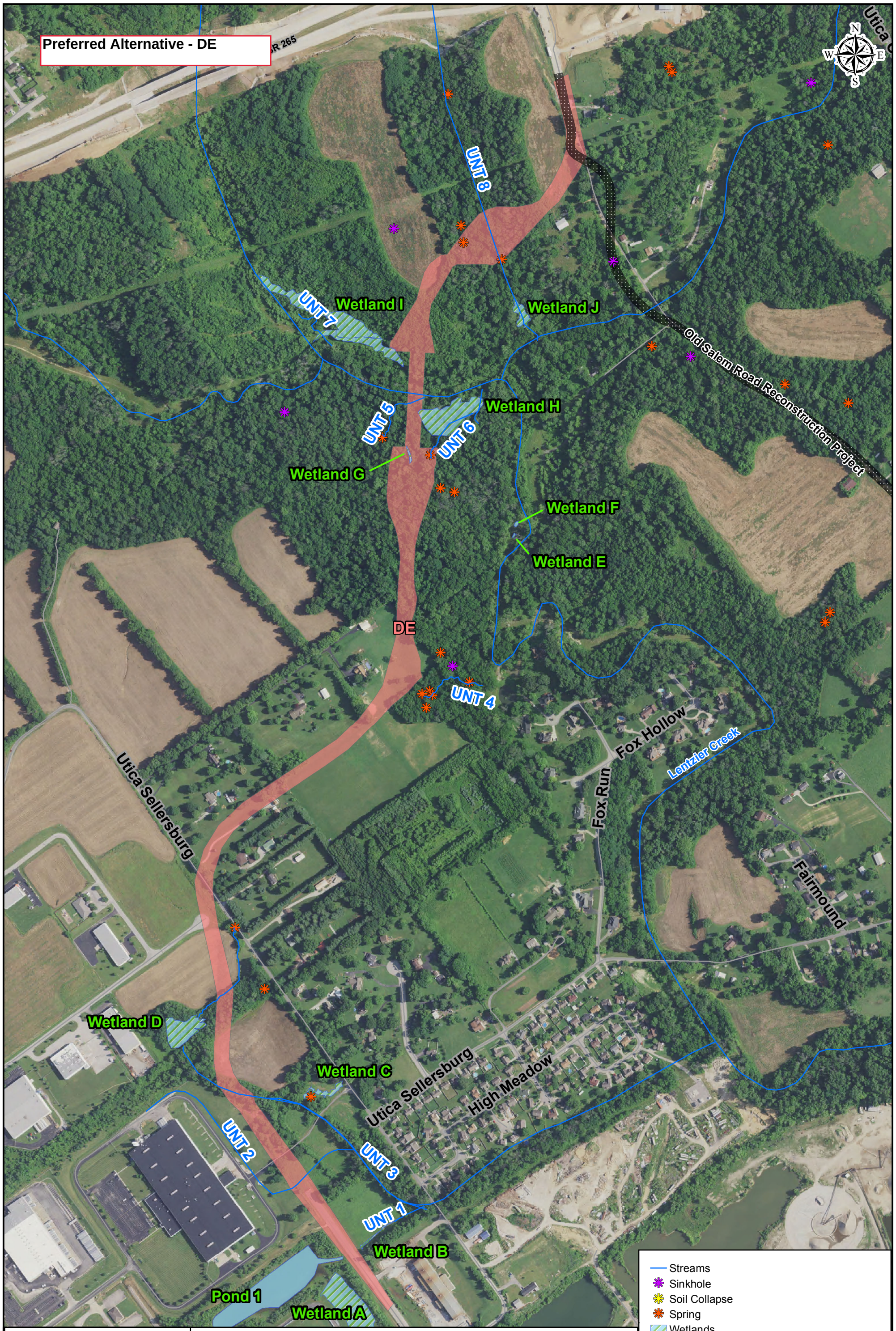

Heavy Haul Transportation Corridor
Des. No. 1382612

Location: Jeffersonville
Township: Utica
County: Clark
State: Indiana

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PROJECT	DESIGNATION
1382612	1382612
CONTRACT	BRIDGE FILE
R-36260	

INDIANA DEPARTMENT
OF TRANSPORTATION

TRAFFIC DATA	TRANSPORTATION CORRIDOR
A.D.T. (2020)	8,800 V.P.D.
A.D.T. (2040)	16,700 V.P.D.
DIRECTIONAL DISTRIBUTION	50%
TRUCKS A.D.T.T. (2020)	2,552 V.P.D.
A.D.T.T. (2040)	4,843 V.P.D.
DESIGN DATA	
DESIGN SPEED	35 M.P.H.
PROJECT DESIGN CRITERIA	NEW CONSTRUCTION (NON-FREEWAY)
FUNCTIONAL CLASSIFICATION	MINOR ARTERIAL
RURAL/URBAN	URBAN (SUBURBAN)
TERRAIN	ROLLING
ACCESS CONTROL	NONE

ROAD PLANS

THE HEAVY HAUL TRANSPORTATION CORRIDOR
DES. NO. 1382612

New road construction to support development of the River Ridge Commerce Center and the Port of Indiana located in Survey 15 & 16 of the Illinois Grant, Utica Township, Clark County, Indiana.

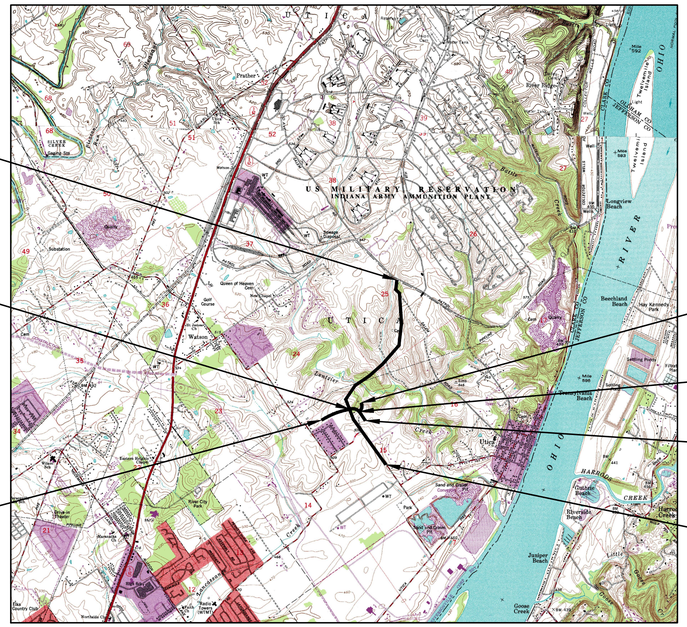
Gross Length:	1.48 MI.
Net Length:	1.42 MI.
Maximum Grade:	5.0 %

LATITUDE: 38°20'17"N LONGITUDE: 85°40'12"W

END PROJECT
HEAVY HAUL CORRIDOR
88+32.65 LINE "PR-DE"

END CONSTRUCTION
407+92.65 LINE "PR-NM" =
505+56.87 LINE "PR-US"

BEGIN CONSTRUCTION
400+00.00 LINE "PR-NM"



SCALE: 1"=4000'

END CONSTRUCTION
903+96.81 LINE "PR-UC"

BEGIN CONSTRUCTION
900+00.00 LINE "PR-UC"

BEGIN CONSTRUCTION
500+00.00 LINE "PR-US"

BEGIN PROJECT
HEAVY HAUL CORRIDOR
10+00.00 LINE "PR-DE"

[INDIANA DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS DATED 2018 TO BE USED WITH THESE PLANS]

UNITED Consulting
1625 N. Post Road
Indianapolis, Indiana 46219
Phone: 317-895-2585
Fax: 317-895-2596 Web: www.ucindy.com

PLANS PREPARED BY: UNITED CONSULTING (317) 895-2585
PHONE NUMBER
CERTIFIED BY: DATE
APPROVED FOR LETTING: INDIANA DEPARTMENT OF TRANSPORTATION DATE

BRIDGE FILE	
DESIGNATION	
1382612	
SURVEY BOOK	SHEETS
	---- of .
CONTRACT	PROJECT
R-36260	1382612

File Name: P:\C3D\14-402\Road\Dwg\Plans\Line DE\Title Sheet Line DE.dwg Plot Date: 10/12/2017 Plotted By: Andrews, Jeff

UTILITIES

CABLE TV
Insight Communications
3408 Industrial Parkway
Jeffersonville, IN 47130
502-357-4400

COMMUNICATIONS
AT&T
866 Rock Creek Road
Plano, IL 60545
630-552-9785

ELECTRIC
Clark County REMC
7810 State Road 60
Sellersburg, IN 47172
812-246-3316

Duke Energy
1619 West Defenbaugh Street
Kokomo, IN 46902
812-375-5828

GAS
Vectren
1 North Main Street
Evansville, IN 47711
812-491-4765

Sewers
Jeffersonville Storm Water Dept.
1420 Bates-Bowyer Avenue
Jeffersonville, IN 47130
(812) 285-6476

Jeffersonville Wastewater Dept.
River Ridge Commerce Center
423 Lewman Way
Jeffersonville, IN 47130
(812) 285-6451

WATER
Indiana American Water
555 E. County Line Road, Suite 201
Greenwood, IN 46143
317-885-2444

Watson Water Company
4106 Utica Sellersburg Road
Jeffersonville, IN 47130
812-246-5416

REVISIONS

GENERAL NOTES

SHEET NO.	DESCRIPTION

INDEX

SHEET NO.	DESCRIPTION
1	Title Sheet
2	Index Sheet
3-5	Typical Sections
6-13	Plan and Profiles
14-19	Superelevation Diagrams
1-51	Cross Sections

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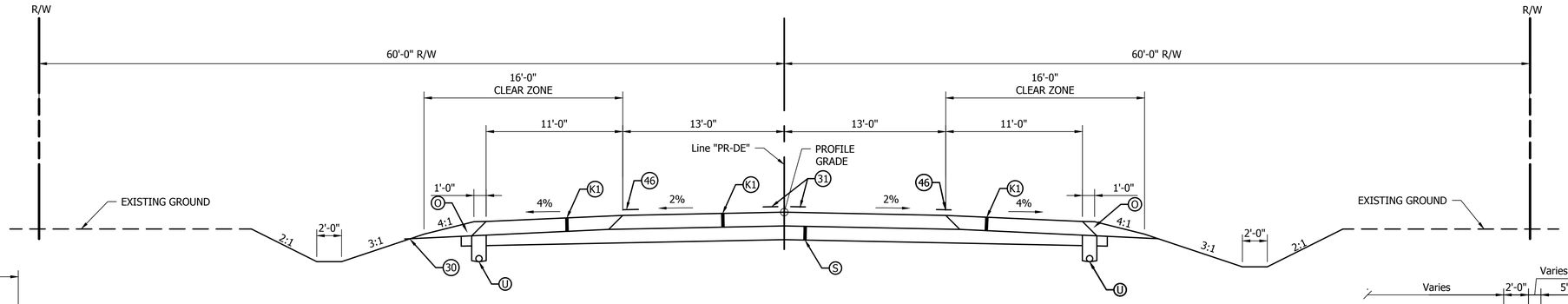
RECOMMENDED FOR APPROVAL
DESIGN ENGINEER DATE

DESIGNED: JRA
DRAWN: EAM
CHECKED: MAT
CHECKED: JRA

INDIANA
DEPARTMENT OF TRANSPORTATION

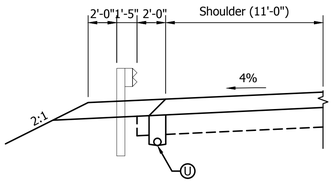
INDEX

HORIZONTAL SCALE	BRIDGE FILE
1" = 50'	-
VERTICAL SCALE	DESIGNATION
Change in Sheet	1382612
SURVEY BOOK	SHEETS
-	2 of XX
CONTRACT	PROJECT
R-36260	

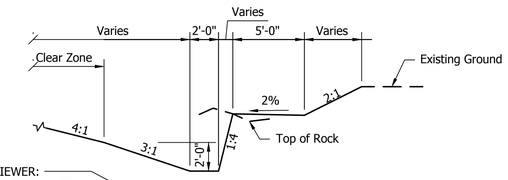


TYPICAL SECTION

Sta. 10+00.00 to Sta. 23+85.00 "PR-DE"
Sta. 44+60.00 to Sta. 48+25.00 "PR-DE"
Sta. 58+75.00 to Sta. 66+24.00 "PR-DE"
Sta. 85+05.00 to Sta. 88+44.11 "PR-DE"

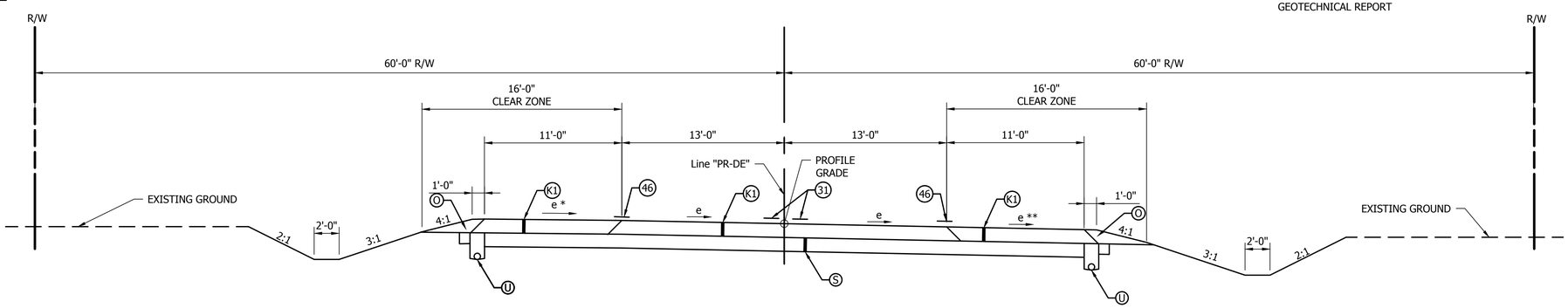


TYPICAL GUARDRAIL SECTION



NOTE TO REVIEWER:
LIMITS TO BE DETERMINED
AFTER WE RECEIVE THE
GEOTECHNICAL REPORT

TYPICAL ROCK CUT DITCH



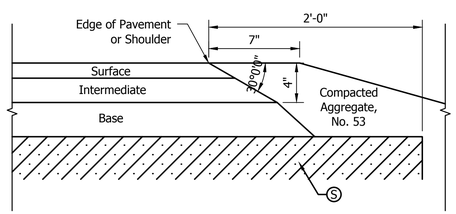
SUPERELEVATION SECTION

Sta. 23+85.00 to Sta. 44+60.00 "PR-DE"
Sta. 48+25.00 to Sta. 58+75.00 "PR-DE"
Sta. 66+24.00 to Sta. 85+05.00 "PR-DE"

* High Side Shoulder - If e is 4% or less, grade shoulder at 4% down.
If e is greater than 4% and less than or equal to 6%, grade shoulder at 2% down.
If e greater than 6%, grade shoulder at 1% up.

** Low Side Shoulder - If e is 4% or less, grade shoulder at 4% down.
If e is greater than 4%, grade shoulder in plane with the mainline pavement.

Curve to the right shown, curves to the left reversed.



SAFETY EDGE DETAIL (NOT TO SCALE)

LEGEND

- (K1) Full Depth Pavement
  165#/syd QC/QA-HMA, 4, 76, Surface, 9.5mm
  275#/syd QC/QA-HMA, 4, 76, Intermediate, 19.0mm
  440#/syd QC/QA-HMA, 4, 64, Base, 25.0mm
  250#/syd QC/QA-HMA, 5, 76, Intermediate, OG 19.0mm
  440#/syd QC/QA-HMA, 4, 64, Base, 25.0mm
- (S) Subgrade Treatment, Type IB (Lime)
- (U) Underdrains
- (30) Seeding, U
- (31) Line, Thermoplastic, Solid, Yellow, 4"
- (46) Line, Thermoplastic, Solid, White, 4"
- (O) Compacted Aggregate, No. 53

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www.ucindy.com

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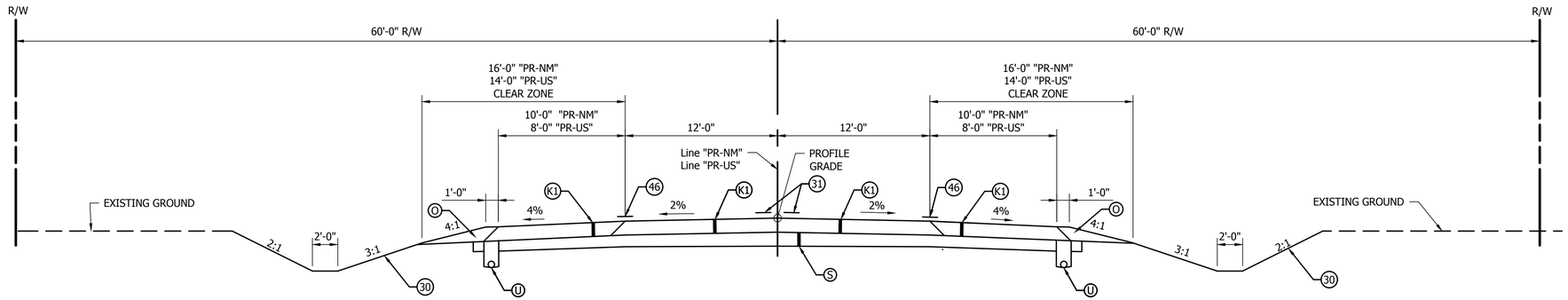
DESIGNED: JRA	DRAWN: EAM
CHECKED: MAT	CHECKED: MAT

INDIANA
DEPARTMENT OF TRANSPORTATION

TYPICAL CROSS SECTIONS
TRANSPORTATION CORRIDOR

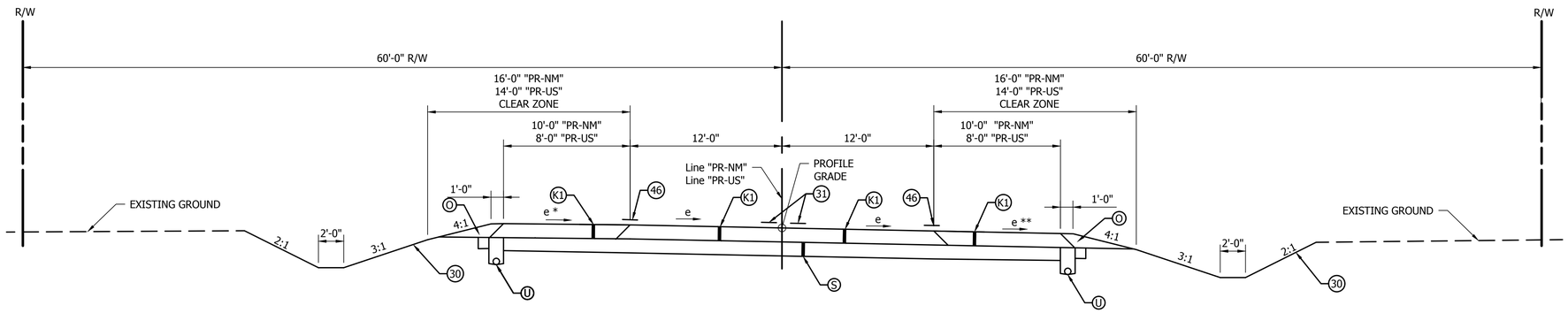
HORIZONTAL SCALE	BRIDGE FILE
1" = 5'	XX
VERTICAL SCALE	DESIGNATION
1"=5'	1382612
SURVEY BOOK	SHEETS
	3 of XX
CONTRACT	PROJECT
R-36260	1382612

File Name: P:\C3D\14-402\Road\Dwg\Plans\Line DE\Typical Line DE.dwg Plot Date: 10/12/2017 Plotted By: Andrews, Jeff



TYPICAL SECTION

Sta. 400+00.00 to Sta. 400+60.00 "PR-NM"
Sta. 405+35.00 to Sta. 406+80.43 "PR-NM"
Sta. 500+00.00 to Sta. 501+00.00 "PR-US"



SUPERELEVATION SECTION
LINE "PR-NM", PR-US

Sta. 400+60.00 to Sta. 405+35.00 "PR-NM"
Sta. 406+80.43 to Sta. 407+79.65 "PR-NM"
Sta. 501+00.00 to Sta. 505+43.81 "PR-US"

* High Side Shoulder - If e is 4% or less, grade shoulder at 4% down.
If e is greater than 4% and less than or equal to 6%, grade shoulder at 2% down.
If e greater than 6%, grade shoulder at 1% up.

** Low Side Shoulder - If e is 4% or less, grade shoulder at 4% down.
If e is greater than 4%, grade shoulder in plane with the mainline pavement.

Curve to the right shown, curves to the left reversed.

LEGEND

- (K1) Full Depth Pavement
  165#/syd QC/QA-HMA, 4, 76, Surface, 9.5mm
  275#/syd QC/QA-HMA, 4, 76, Intermediate, 19.0mm
  440#/syd QC/QA-HMA, 4, 64, Base, 25.0mm
  250#/syd QC/QA-HMA, 5, 76, Intermediate, OG 19.0mm
  440#/syd QC/QA-HMA, 4, 64, Base, 25.0mm
- (S) Subgrade Treatment, Type IB (Lime)
- (U) Underdrains
- (30) Seeding, U
- (31) Line, Thermoplastic, Solid, Yellow, 4"
- (46) Line, Thermoplastic, Solid, White, 4"
- (O) Compacted Aggregate, No. 53

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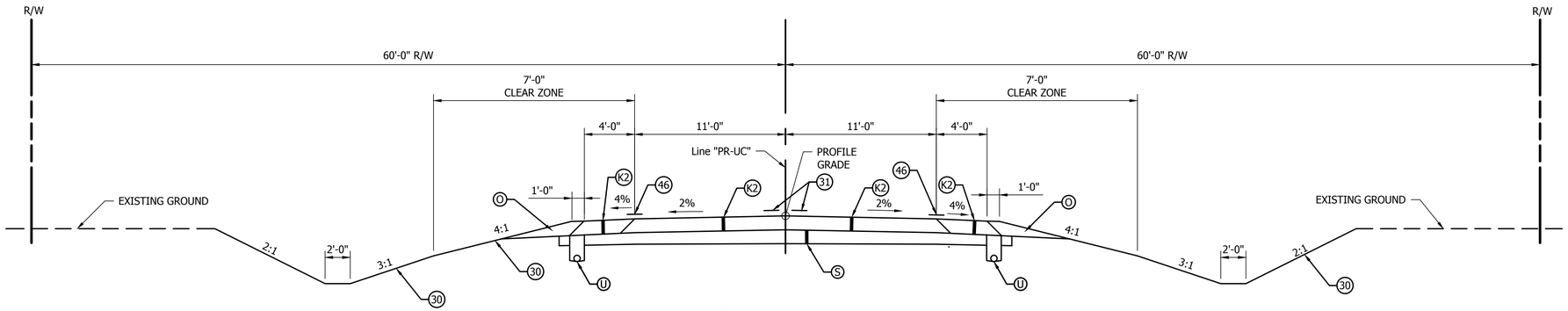
CHECKED: MAT | CHECKED: MAT

INDIANA
DEPARTMENT OF TRANSPORTATION

TYPICAL CROSS SECTIONS
TRANSPORTATION CORRIDOR

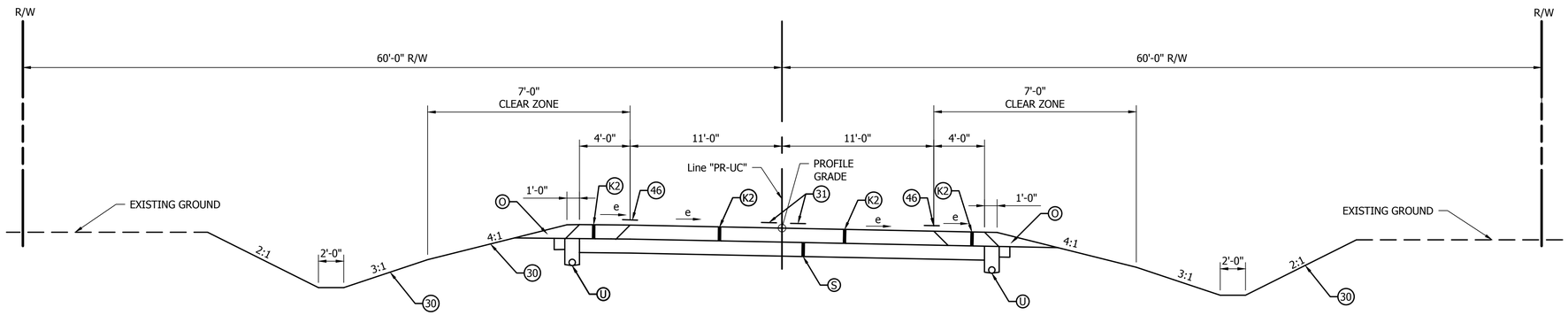
HORIZONTAL SCALE	BRIDGE FILE
1" = 5'	
VERTICAL SCALE	DESIGNATION
1"=5'	1382612
SURVEY BOOK	SHEETS
	4 of XX
CONTRACT	PROJECT
R-36260	1382612

File Name: P:\C3D\14-402\Road\Dwg\Plans\Line DE\Typical Line DE.dwg Plot Date: 10/12/2017 Plotted By: Andrews, Jeff



TYPICAL SECTION
LINE "PR-UC"

Sta. 902+65.00 to Sta. 903+96.81 "PR-UC"



SUPERELEVATION SECTION
LINE "PR-UC"

Sta. 900+12.05 to Sta. 902+65.00 "PR-UC"

Curve to the right shown, curves to the left reversed.

LEGEND

- (K2) Full Depth Pavement
  165#/syd QC/QA-HMA, 4, 76, Surface, 9.5mm
  275#/syd QC/QA-HMA, 4, 76, Intermediate, 19.0mm
  6" Compacted Aggregate, Base, No. 53
- (S) Subgrade Treatment, Type IB (Lime)
- (U) Underdrains
- (30) Seeding, U
- (31) Line, Thermoplastic, Solid, Yellow, 4"
- (46) Line, Thermoplastic, Solid, White, 4"
- (O) Compacted Aggregate, No. 53

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DEPARTMENT OF TRANSPORTATION

TYPICAL CROSS SECTIONS
TRANSPORTATION CORRIDOR

HORIZONTAL SCALE	BRIDGE FILE
1" = 5'	
VERTICAL SCALE	DESIGNATION
1"=5'	1382612
SURVEY BOOK	SHEETS
	5 of XX
CONTRACT	PROJECT
R-36260	1382612

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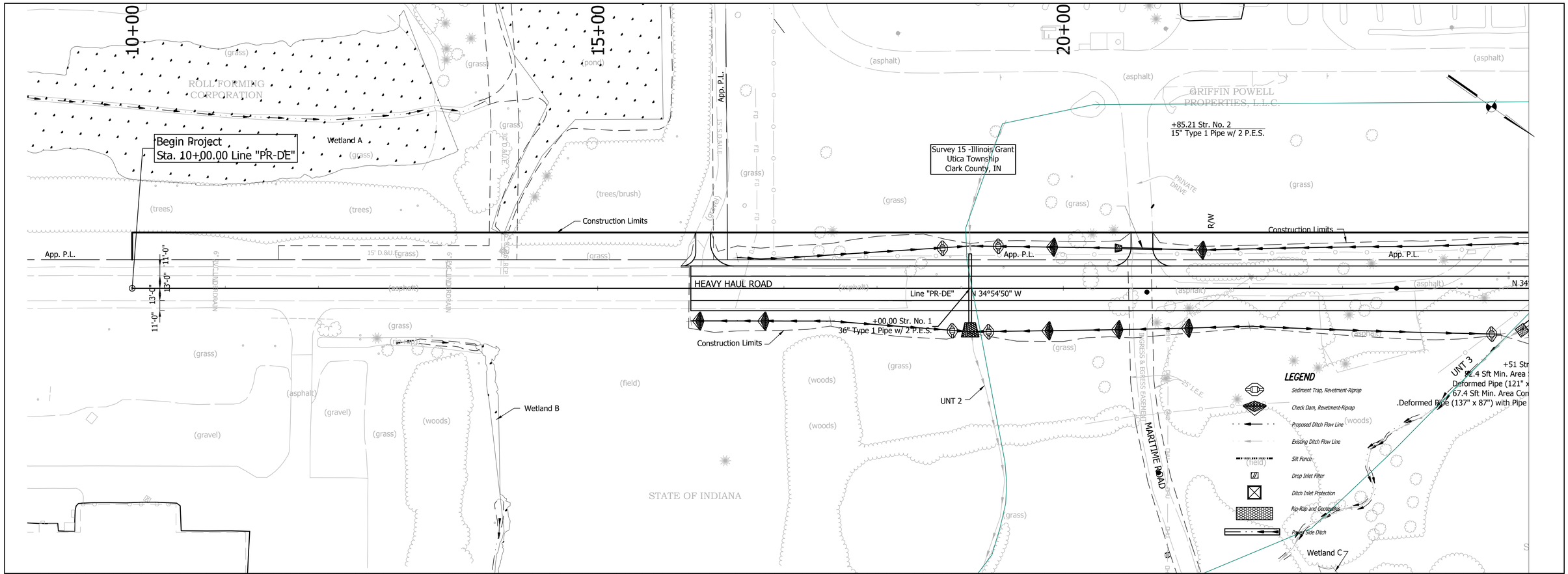

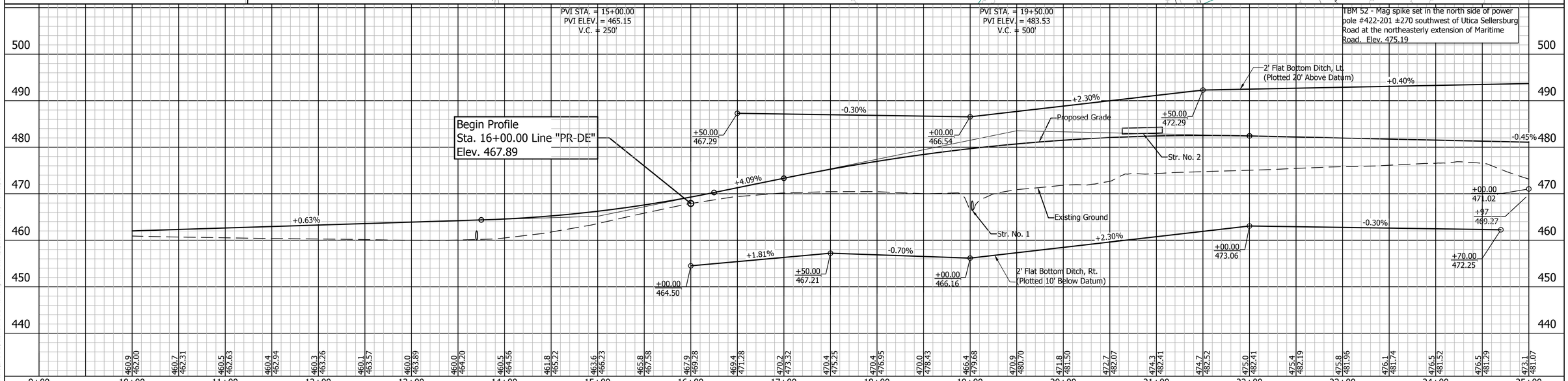

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DESIGN ENGINEER DATE

DESIGNED: JRA DRAWN: EAM
CHECKED: MAT CHECKED: JRA

INDIANA
DEPARTMENT OF TRANSPORTATION

PLAN & PROFILES
LINE "PR-DE"

HORIZONTAL SCALE	BRIDGE FILE
1" = 50'	-
VERTICAL SCALE	DESIGNATION
1" = 10'	1382612
SURVEY BOOK	SHEETS
-	---- of XX
CONTRACT	PROJECT
R-36260	----

File Name: P:\FC30\14-402\Road\Dwg\Plans\Line DE\Alternative DE - Revising Plot Date: 2/1/2018 Plotted By: Hamed, Eric

Utica Township
Clark County, IN

P.I. Sta. 27+02.03 "PR-DE"
Delta = 40°30'51" XX.

P.C. Sta. 30+62.78 Line "PR-DE"

P.I. Sta. 31+44.61 "PR-DE"
Delta = 17°53'11" Lt.

33+29.86, "PR-DE"
Public Road Approach, Type B

+30.00 "NM" Str. No. 3
15" Type 1 Pipe w/ 2 P.E.S.

Construction Limits

"PR-DE"
N 11°53'16" W

The Heavy Haul Road

N 1°17'17" E

N 5°42'10" W

P.T. Sta. 32+25.11 Line "PR-DE"

32+79.57, "PR-DE"
Public Road Approach, Type B

P.T. Sta. 28+27.45 Line "PR-DE"

P.C. Sta. 25+65.11 Line "PR-DE"

+51 Str. No. 12
52.4 Sft Min. Area Smooth,
Deformed Pipe (121" x 77") or
67.4 Sft Min. Area Corrugated,
.Deformed Pipe (137" x 87") with Pipe Anchors

P.O.T. 33+84.56 Line "PR-DE"=
P.I. 407+92.65 Line "PR-NM"
P.I. 505+56.87 Line "PR-US"

CURVE DATA
P.I. Sta 31+44.61 Line "PR-DE"
Delta = 17°53'11" XX
R = 520.00'
T = 81.83'
L = 162.33'
E = 6.40'
SE = X.XX%

+30.86 "US" Str. No. 4
4' X 9' Type 1 Box w/ 2 P.E.S.

CURVE DATA
P.I. Sta 27+02.03 Line "PR-DE"
Delta = 40°30'51" XX
R = 371.00'
T = 136.92'
L = 262.34'
E = 24.46'
SE = X.XX%

STATE OF INDIANA

Wetland D

NEW MIDDLE ROAD

RK PROPERTY HOLDINGS, L.L.C.

App. P.L. & Exist. R/W

T. R/W

Line "PR-DE"

89°56'28"

UTICA CONNECTOR ROAD

+45.00 "UC" Str. No. 5
15" Type 1 Pipe w/ 2 P.E.S.

+78.00 "UC" Str. No. 6
Inlet E-7 & 105' of 12" Type 2 Pipe
& 1 P.E.S.

UTICA SELLERSBURG ROAD

+70.00 "US" Str. No. 7
Inlet E-7 & 119' of 12" Type 2 Pipe

+94.38 "PR-US"
Public Road Approach, Type B

KELLER, DANIEL R., ET UX

CURVE DATA
P.I. Sta 40+11.59 Line "PR-DE"
Delta = 68°36'04" XX
R = 560.00'
T = 382.01'
L = 670.50'
E = 117.89'
SE = X.XX%

P.I. Sta. 40+11.59 "PR-DE"
Delta = 68°36'04" XX.

+00.00 Str. No. 9
4' X 6' Type 1 Box w/ 2 P.E.S.

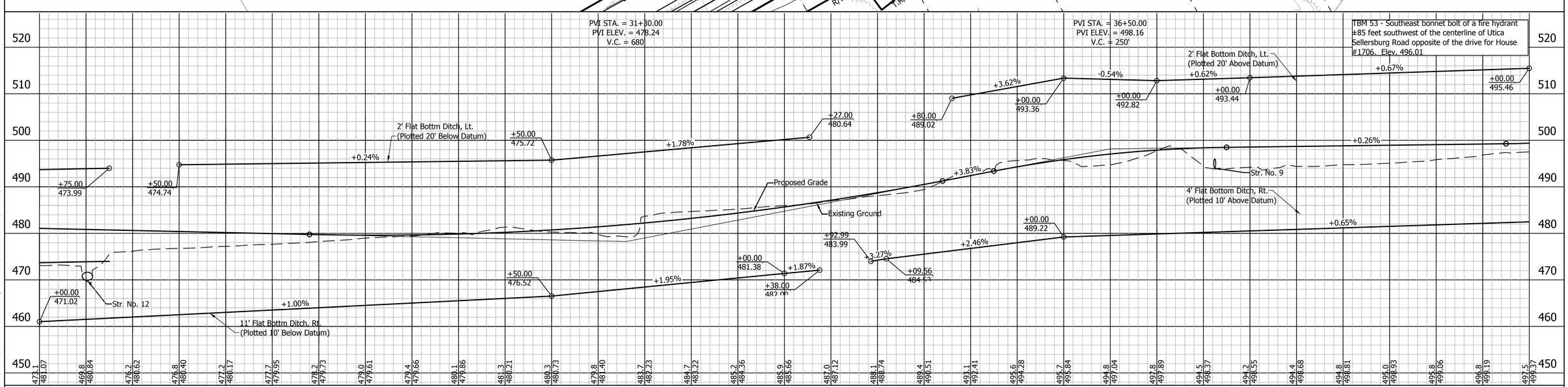
P.C. Sta. 36+29.58 Line "PR-DE"

Construction Limits

The Heavy Haul Road

N 89°18'55" E

25+00 30+00 35+00 40+00



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DESIGN ENGINEER DATE

DESIGNED: JRA
DRAWN: EAM
CHECKED: MAT
CHECKED: JRA

INDIANA
DEPARTMENT OF TRANSPORTATION

PLAN & PROFILES
LINE "PR-DE"

HORIZONTAL SCALE	BRIDGE FILE
1" = 50'	-
VERTICAL SCALE	DESIGNATION
1" = 10'	1382612
SURVEY BOOK	SHEETS
-	---- of XX
CONTRACT	PROJECT
R-36260	1382612

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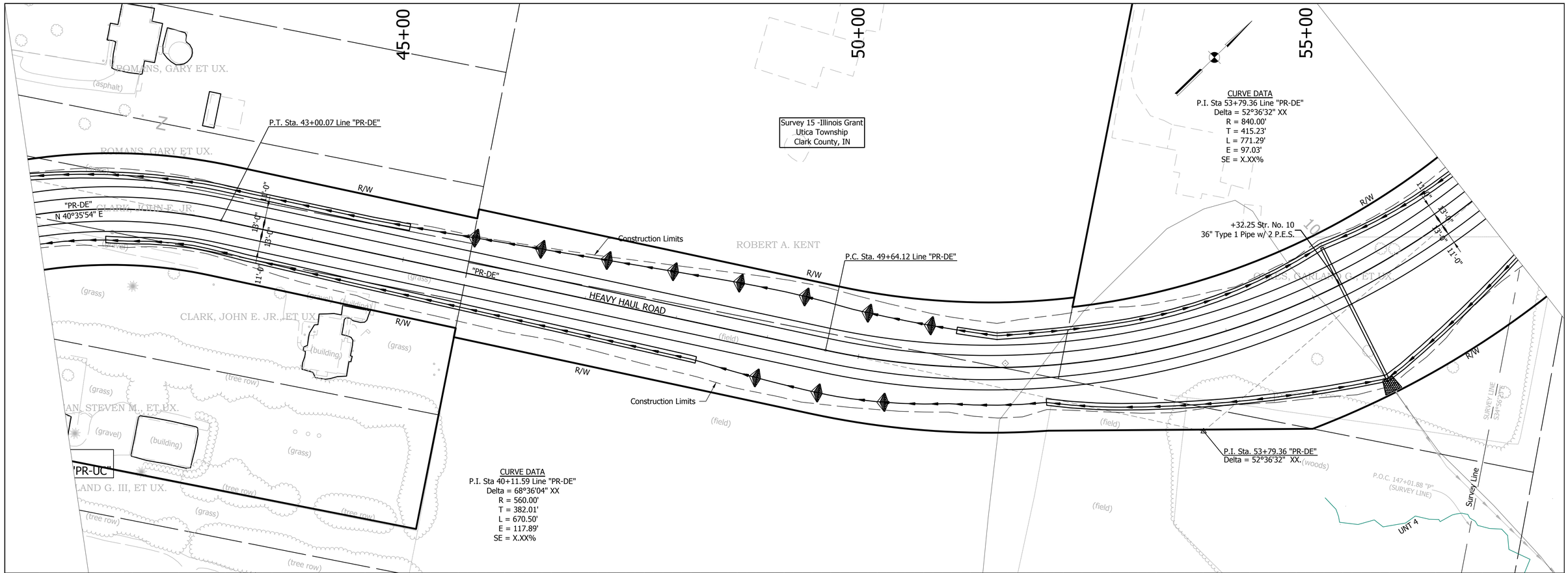

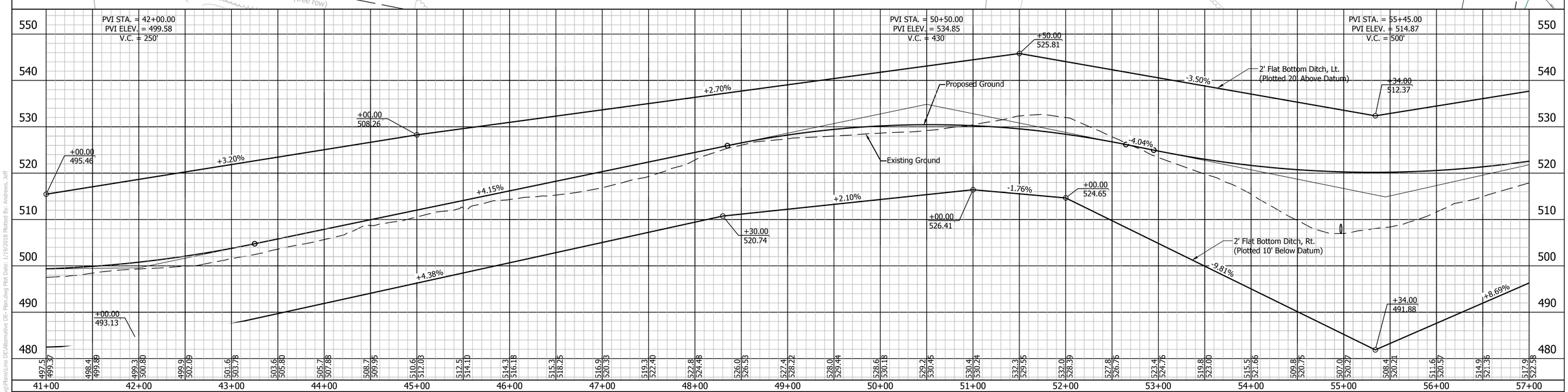

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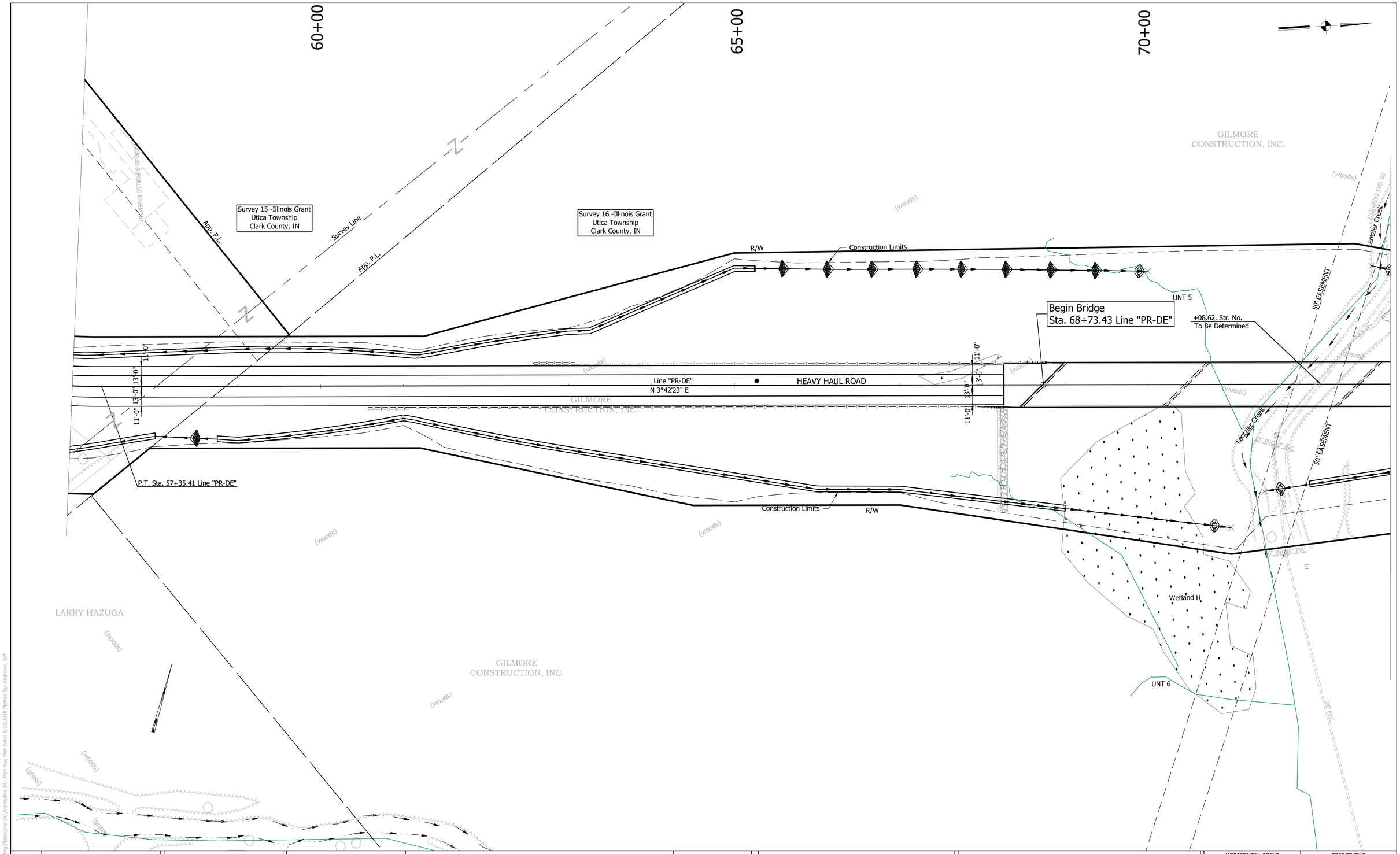
INDIANA
DEPARTMENT OF TRANSPORTATION

PLAN & PROFILES
LINE "PR-DE"

HORIZONTAL SCALE	BRIDGE FILE
1" = 50'	-
VERTICAL SCALE	DESIGNATION
1" = 10'	1382612
SURVEY BOOK	SHEETS
-	---- of XX
CONTRACT	PROJECT
R-36260	1382612

File Name: P:\CSD\14-402\Road\Dwg\Plans\Line DE\Alternative DE-Plan.dwg Plot Date: 1/19/2018 Plotted By: Andrews, Jeff



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DEPARTMENT OF TRANSPORTATION

Plan and Profile
LINE "PR-DE"

HORIZONTAL SCALE	BRIDGE FILE
1" = 50'	-
VERTICAL SCALE	DESIGNATION
1" = 10'	1382612
SURVEY BOOK	SHEETS
-	---- of XX
CONTRACT	PROJECT
R-36260	1382612

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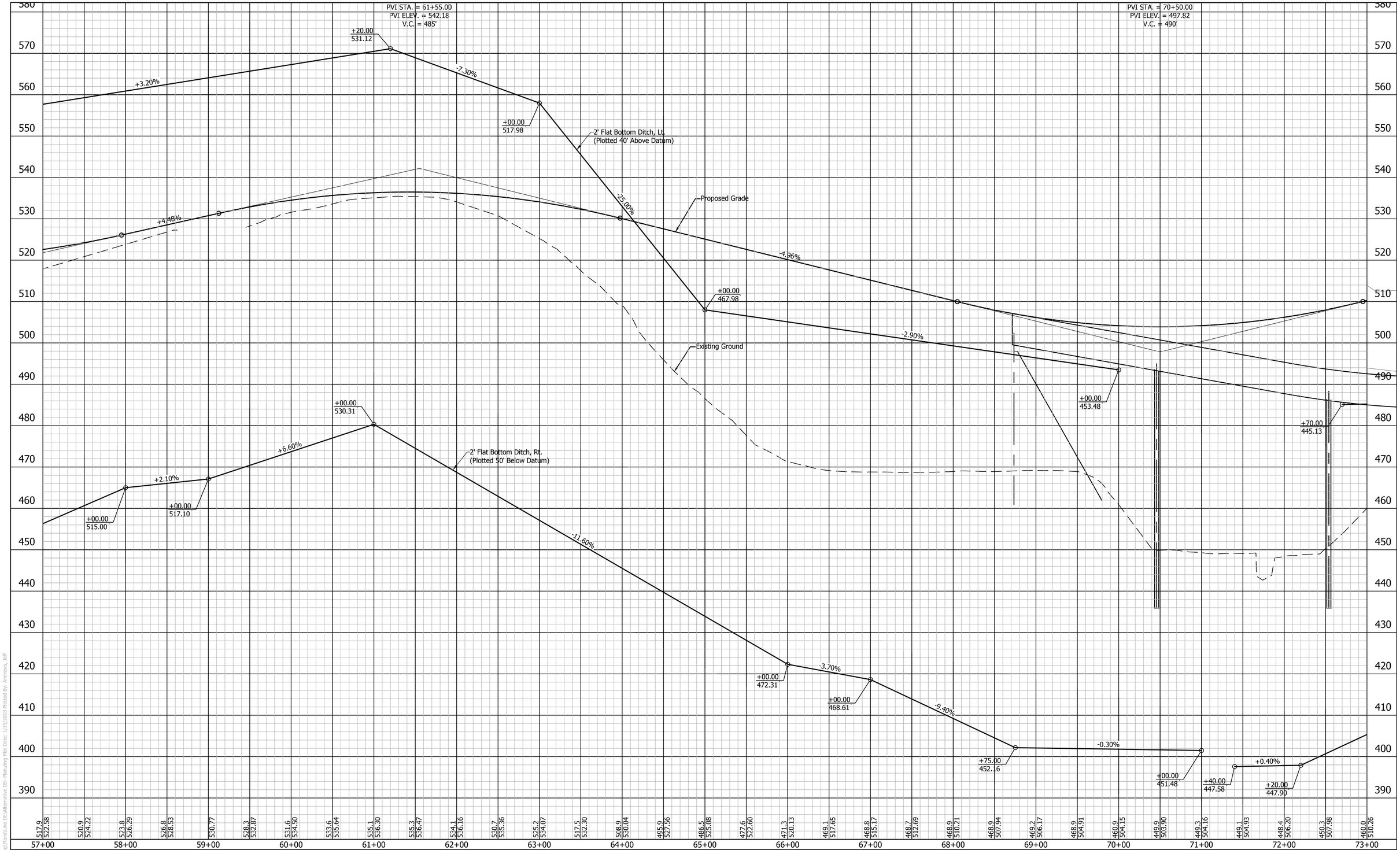

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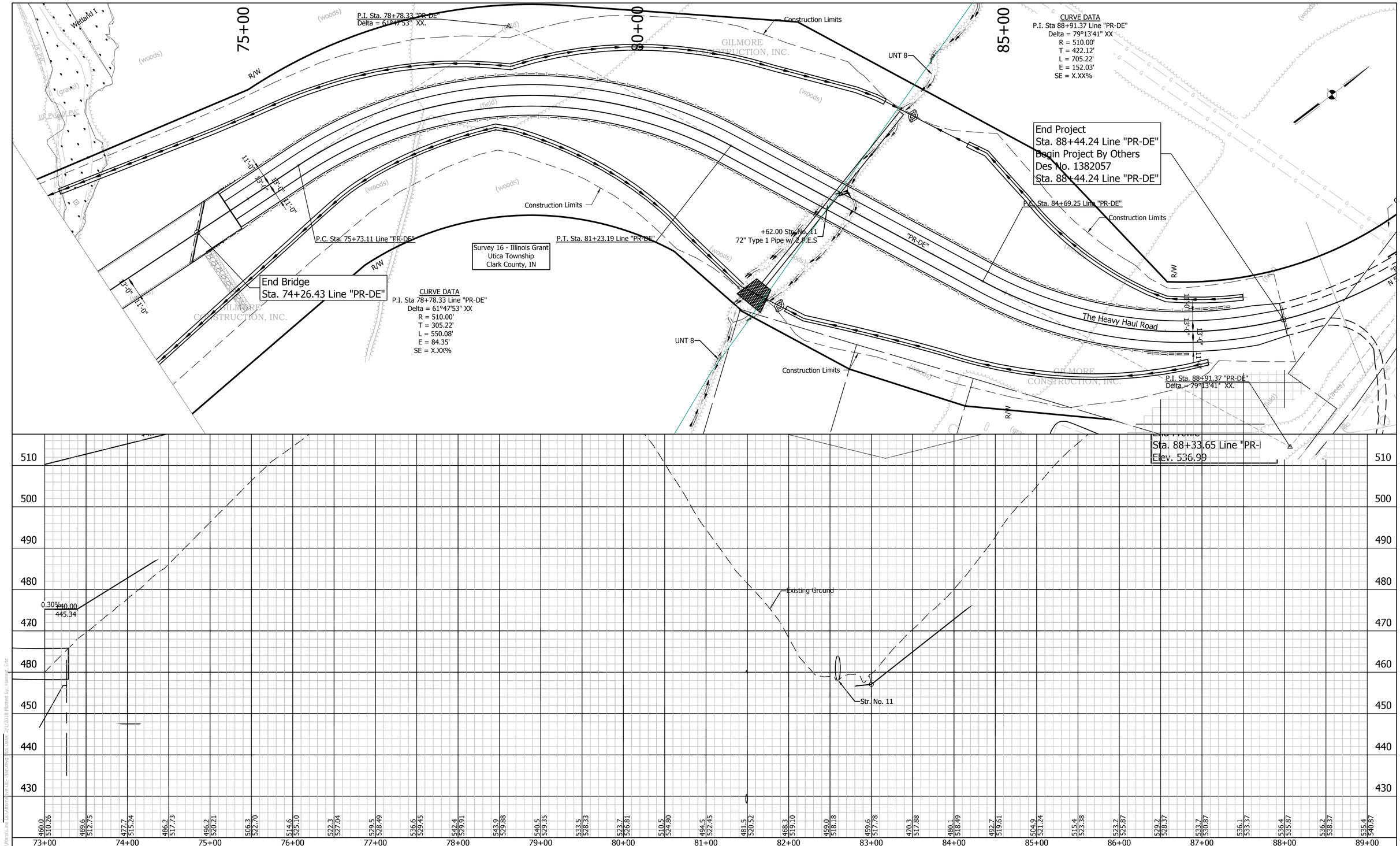
Plan and Profile
LINE "PR-DE"

HORIZONTAL SCALE	BRIDGE FILE
1" = 50'	-
VERTICAL SCALE	DESIGNATION
1" = 10'	1382612

SURVEY BOOK	SHEETS		
-	----	of	XX
CONTRACT	PROJECT		
R-36260	1382612		

File Name: P:\CD\14-402\Road\Dwg\Plans\Line DE\Alternative DE-Plan.dwg Plot Date: 1/19/2018 Plotted By: Andrews, Jeff



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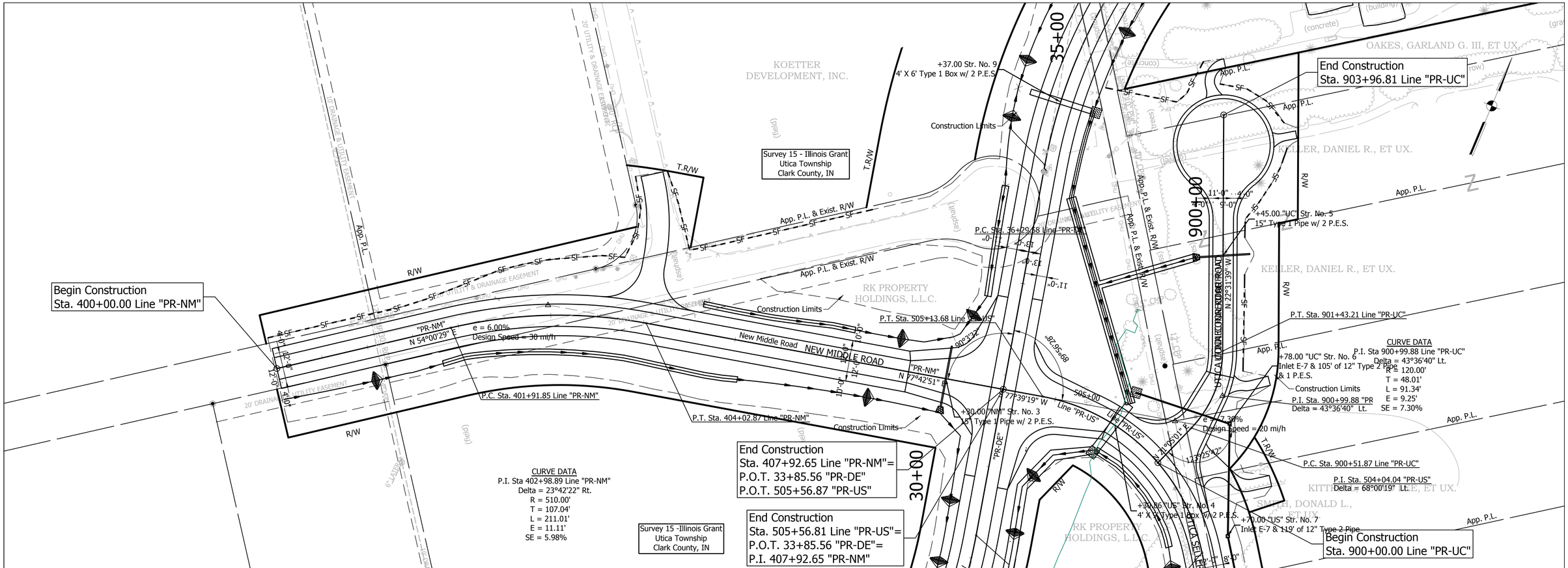
DESIGN ENGINEER DATE

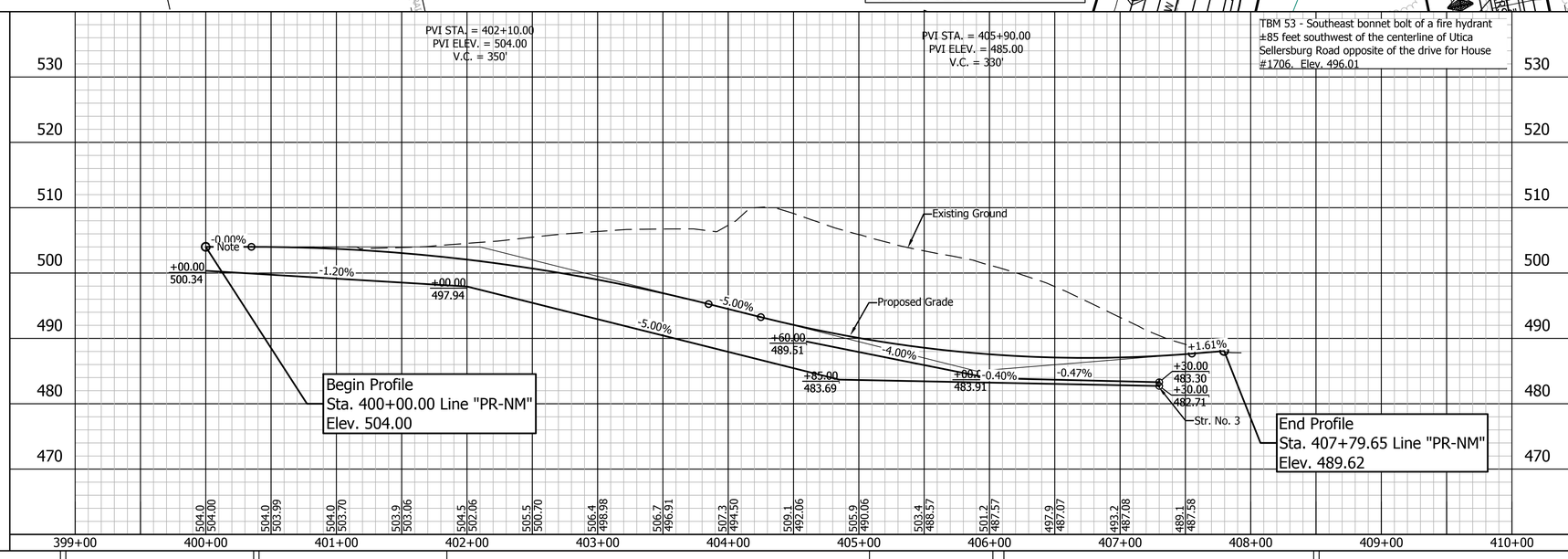
DESIGNED: JRA
DRAWN: EAM
CHECKED: MAT
CHECKED: JRA

INDIANA
DEPARTMENT OF TRANSPORTATION

Plan and Profile
LINE "PR-DE"

HORIZONTAL SCALE	BRIDGE FILE
1" = 50'	-
VERTICAL SCALE	DESIGNATION
1" = 10'	1382612
SURVEY BOOK	SHEETS
-	---- of XX
CONTRACT	PROJECT
R-36260	1382612





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CHECKED: MAT CHECKED: JRA

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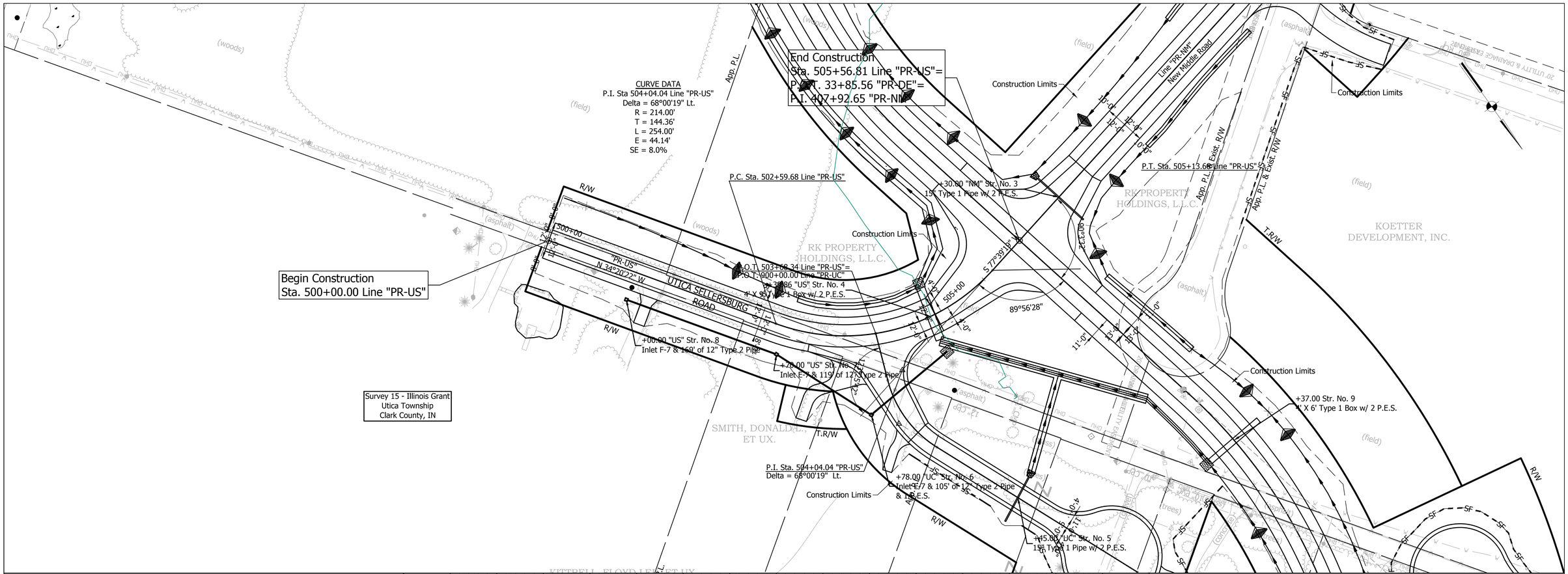
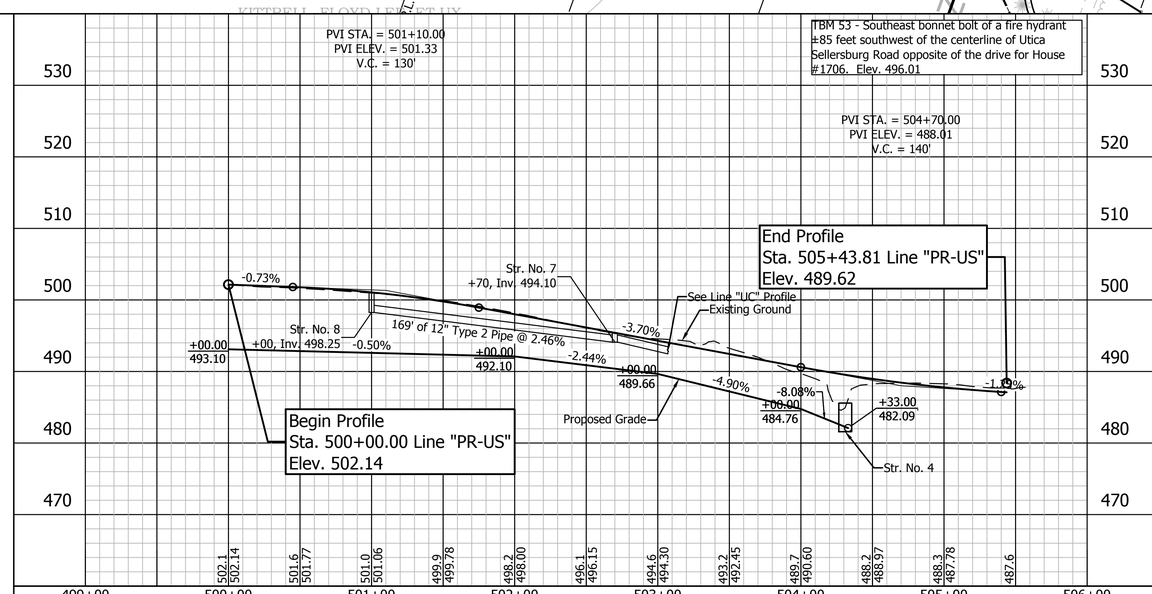
DEPARTMENT OF TRANSPORTATION

Plan and Profile
LINE "PR-NM"

HORIZONTAL SCALE	BRIDGE FILE
1" = 50'	-
VERTICAL SCALE	DESIGNATION
1" = 10'	1382612
SURVEY BOOK	SHEETS
-	---- of XX
CONTRACT	PROJECT
R-36260	1382612





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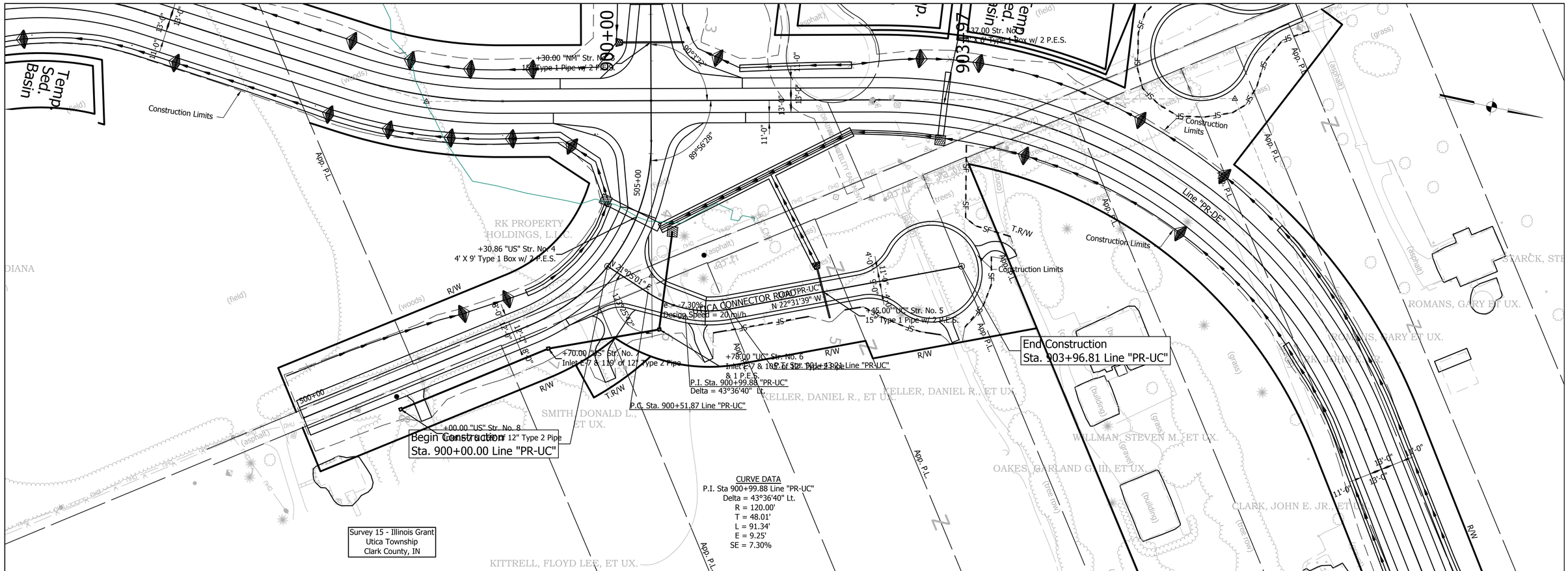
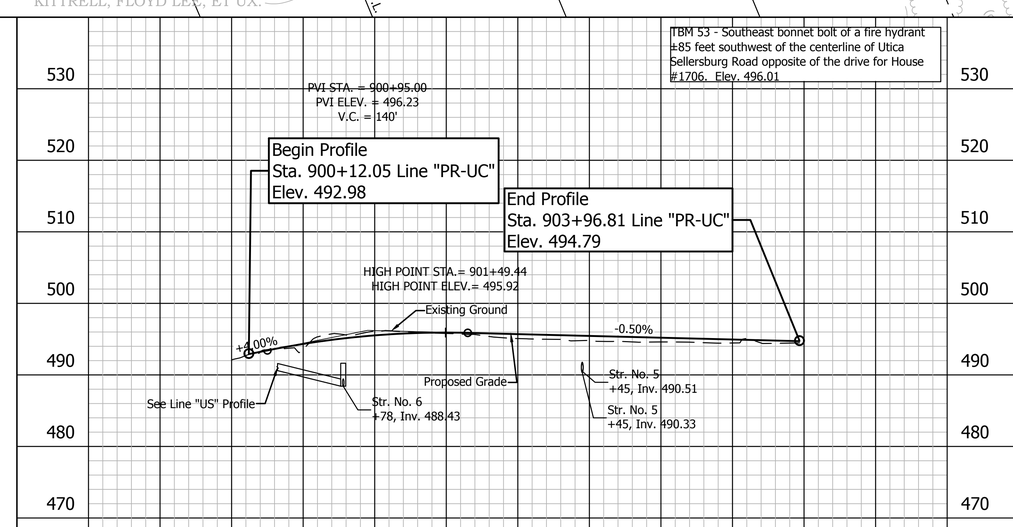
Plan and Profile
Line "PR-US"

HORIZONTAL SCALE	BRIDGE FILE
1" = 50'	-
VERTICAL SCALE	DESIGNATION
1" = 10'	1382612
SURVEY BOOK	SHEETS
-	---- of XX
CONTRACT	PROJECT
R-36260	1382612



CURVE DATA
P.I. Sta 900+99.88 Line "PR-UC"
Delta = 43°36'40" Lt.
R = 120.00'
T = 48.01'
L = 91.34'
E = 9.25'
SE = 7.30%



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DESIGNED: JRA DRAWN: EAM
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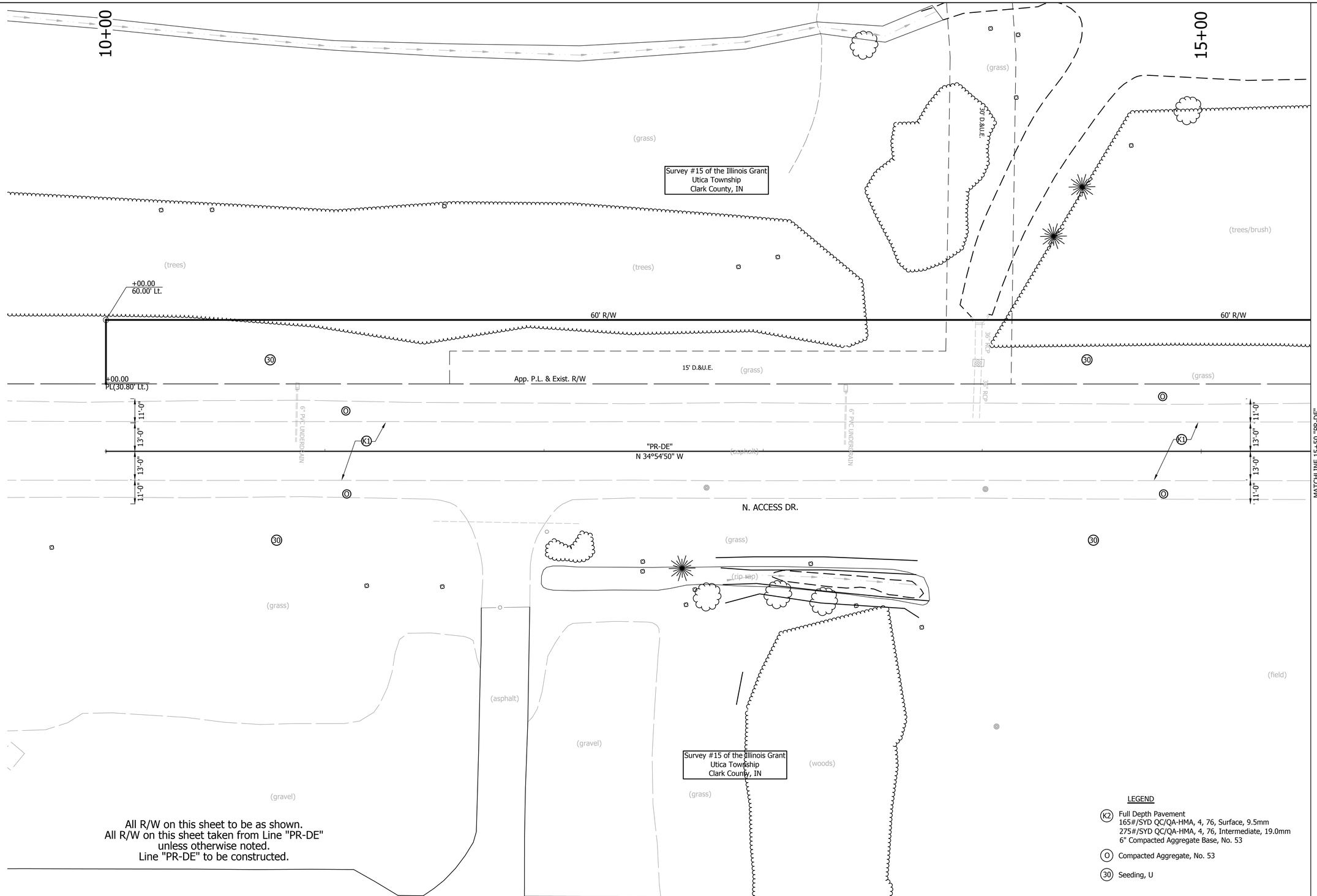
SUPER ELEVATIONS
Line "PR-DE"

HORIZONTAL SCALE	BRIDGE FILE
1" = 50'	-
VERTICAL SCALE	DESIGNATION
1" = 10'	1382612
SURVEY BOOK	SHEETS
-	---- of XX
CONTRACT	PROJECT
R-36260	1382612

File Name: P:\CSD\14-402\Road\Dwg\Plans\Line DE\Alternative DE- Plan.dwg Plot Date: 1/19/2018 Plotted By: Andrews, Jeff



All R/W on this sheet to be as shown.
All R/W on this sheet taken from Line "PR-DE"
unless otherwise noted.
Line "PR-DE" to be constructed.

LEGEND

K2 Full Depth Pavement
165#/SYD QC/QA-HMA, 4, 76, Surface, 9.5mm
275#/SYD QC/QA-HMA, 4, 76, Intermediate, 19.0mm
6" Compacted Aggregate Base, No. 53

O Compacted Aggregate, No. 53

30 Seeding, U

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CHECKED: MAT CHECKED: JRA

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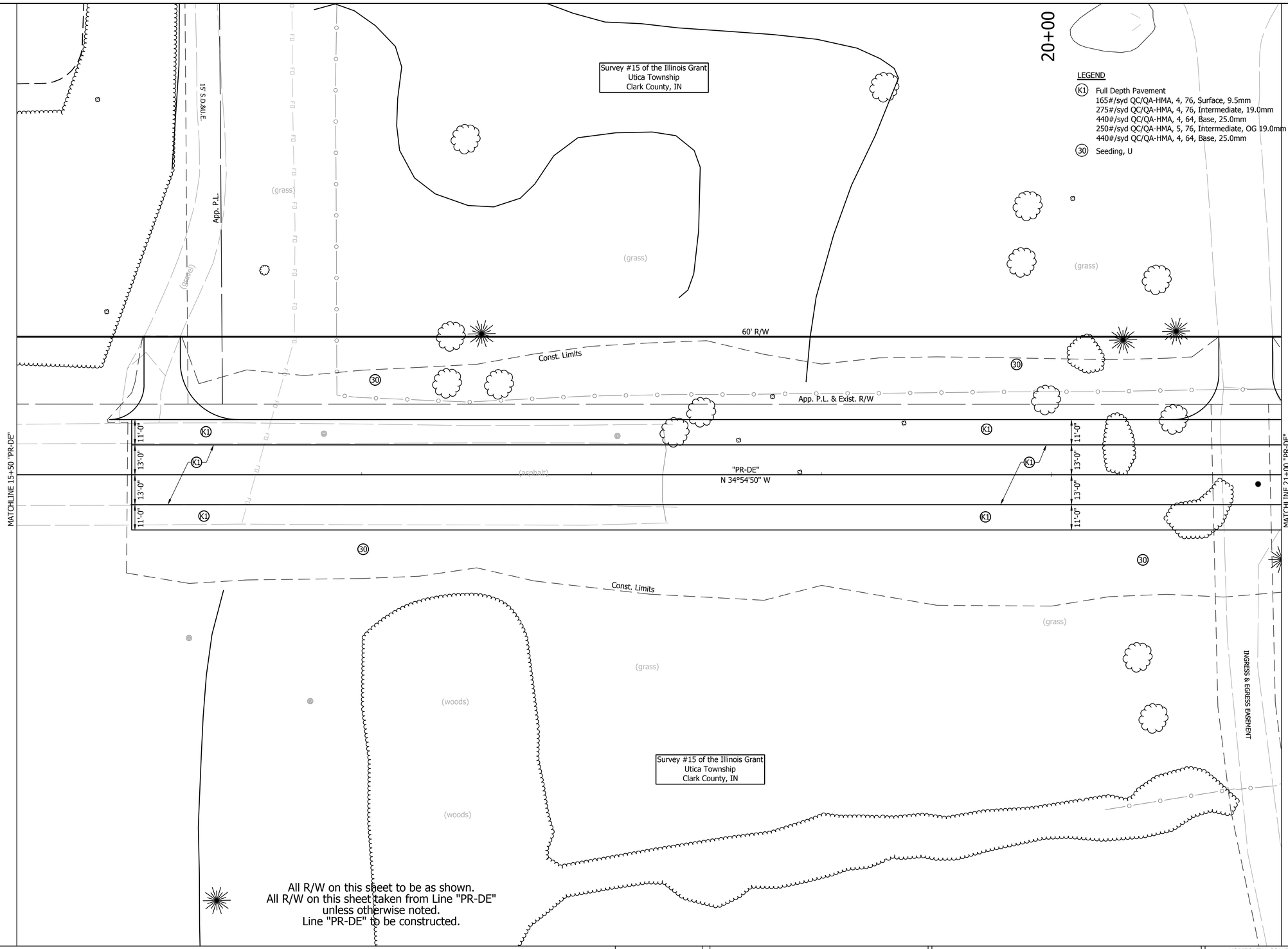
DEPARTMENT OF TRANSPORTATION

CONSTRUCTION DETAILS
Line "PR-DE"

HORIZONTAL SCALE	BRIDGE FILE
1" = 20'	-
VERTICAL SCALE	DESIGNATION
N/A	1382612
SURVEY BOOK	SHEETS
-	---- of XX
CONTRACT	PROJECT
R-36260	1382612

File Name: P:\C3D\14-402\Road\Dwg\Plans\Line DE\CONDET DE.dwg Plot Date: 10/12/2017 Plotted By: Andrews, Jeff



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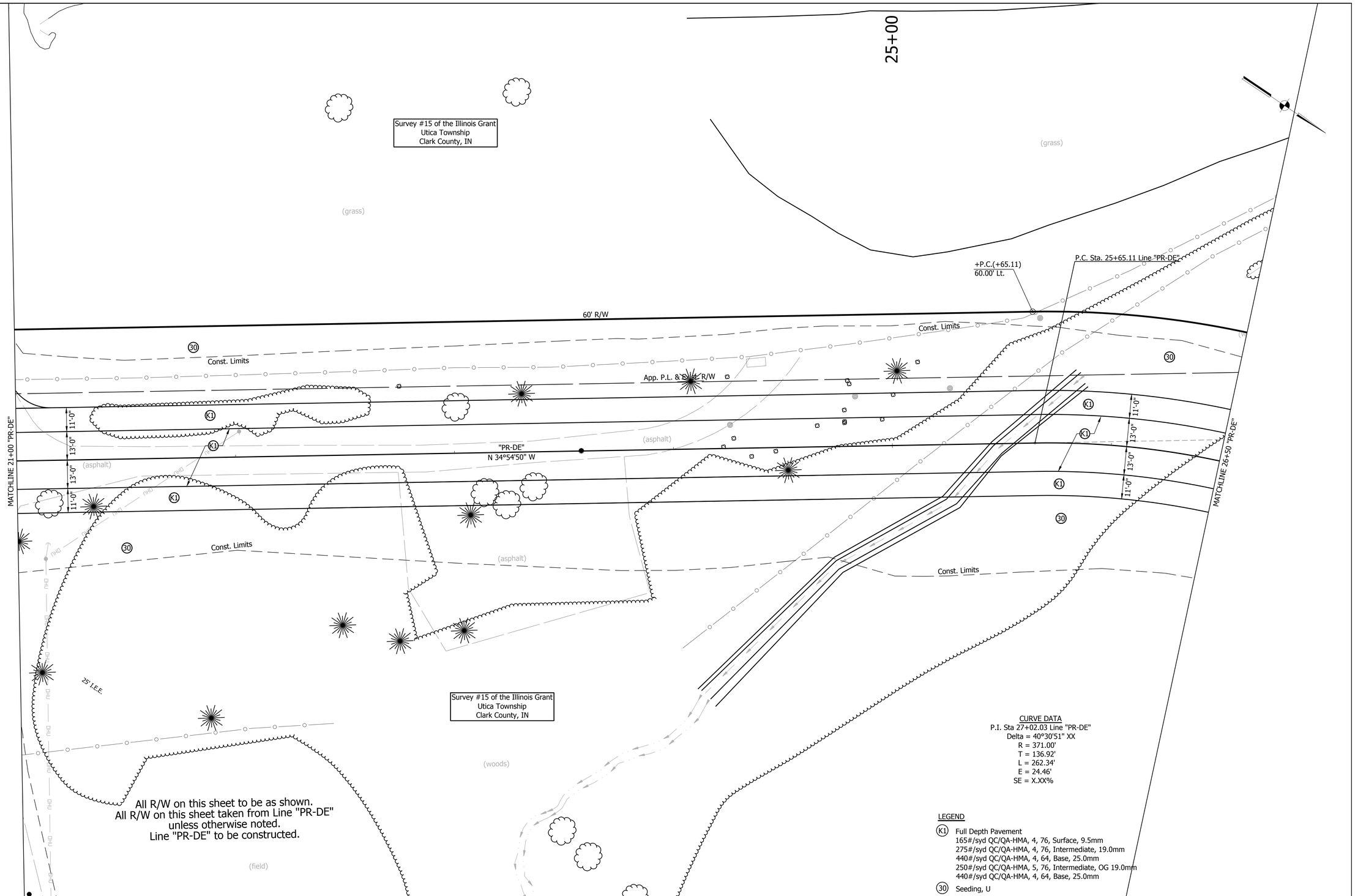
CHECKED: MAT CHECKED: JRA

INDIANA
DEPARTMENT OF TRANSPORTATION

CONSTRUCTION DETAILS
Line "PR-DE"

HORIZONTAL SCALE	BRIDGE FILE
1" = 20'	-
VERTICAL SCALE	DESIGNATION
N/A	1382612
SURVEY BOOK	SHEETS
-	---- of XX
CONTRACT	PROJECT
R-36260	1382612

File Name: P:\C3D\14-402\Road\Dwg\Plans\Line DE\CONDET DE.dwg Plot Date: 10/12/2017 Plotted By: Andrews, Jeff



CURVE DATA
P.I. Sta 27+02.03 Line "PR-DE"
Delta = 40°30'51" XX
R = 371.00'
T = 136.92'
L = 262.34'
E = 24.46'
SE = X.XX%

LEGEND

K1 Full Depth Pavement
165#/syd QC/QA-HMA, 4, 76, Surface, 9.5mm
275#/syd QC/QA-HMA, 4, 76, Intermediate, 19.0mm
440#/syd QC/QA-HMA, 4, 64, Base, 25.0mm
250#/syd QC/QA-HMA, 5, 76, Intermediate, OG 19.0mm
440#/syd QC/QA-HMA, 4, 64, Base, 25.0mm

30 Seeding, U

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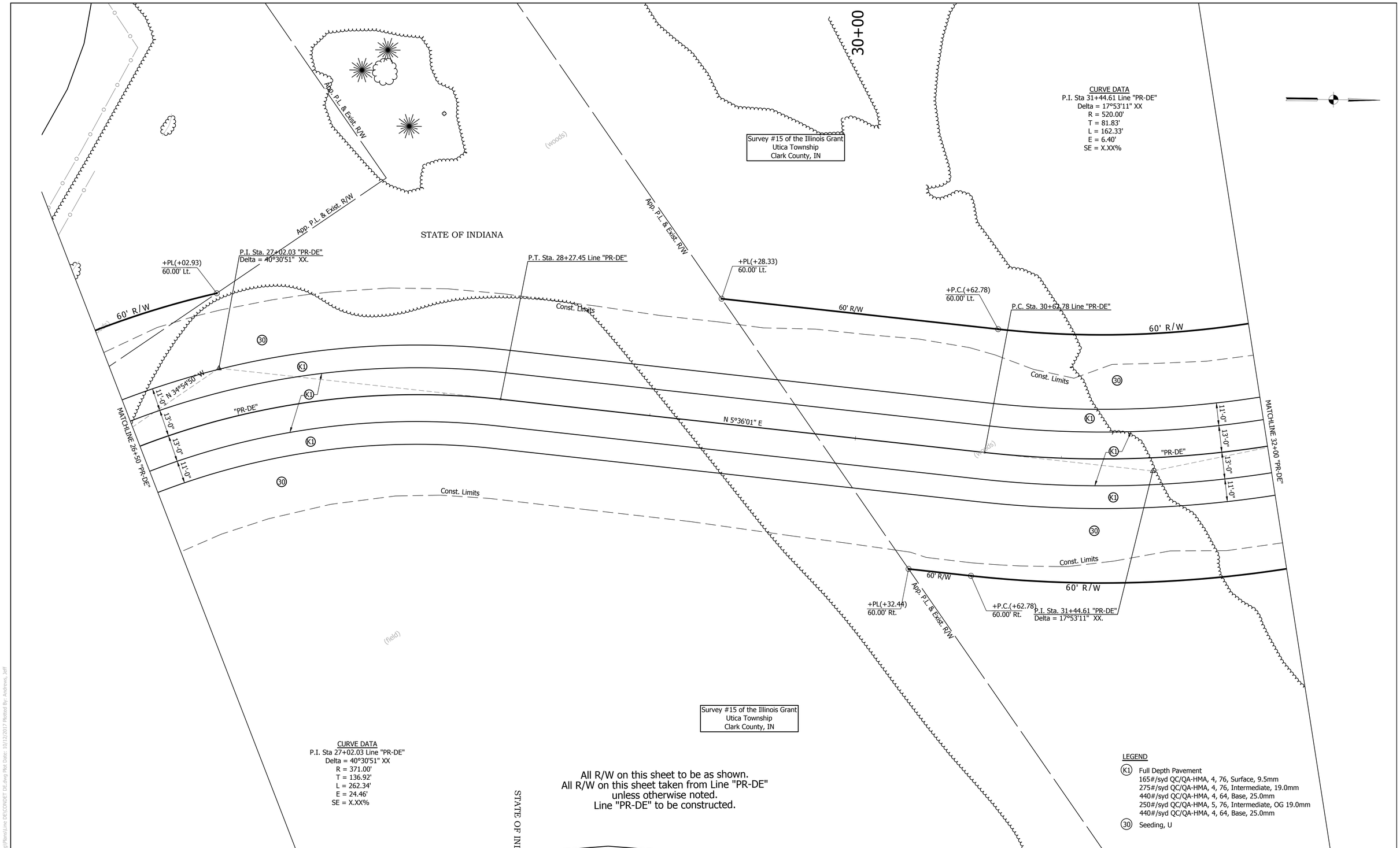
CHECKED: MAT CHECKED: JRA

INDIANA
DEPARTMENT OF TRANSPORTATION

CONSTRUCTION DETAILS
Line "PR-DE"

HORIZONTAL SCALE	BRIDGE FILE
1" = 20'	-
VERTICAL SCALE	DESIGNATION
N/A	1382612
SURVEY BOOK	SHEETS
-	---- of XX
CONTRACT	PROJECT
R-36260	1382612

File Name: P:\C3D\14-402\Road\Dwg\Plans\Line DE\CONDET DE.dwg Plot Date: 10/12/2017 Plotted By: Andrews, Jeff



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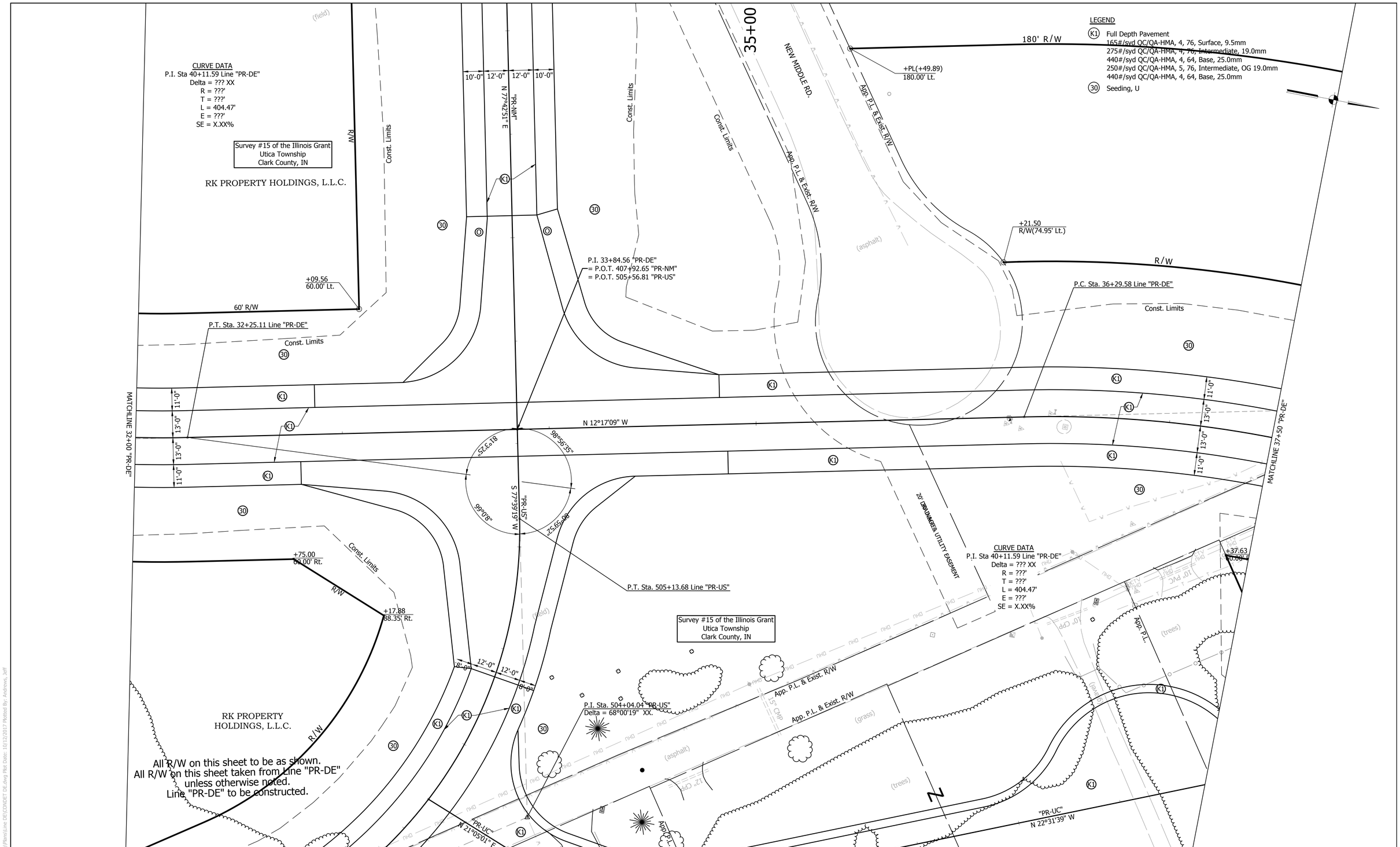
CONSTRUCTION DETAILS
Line "PR-DE"

HORIZONTAL SCALE	BRIDGE FILE
1" = 20'	-
VERTICAL SCALE	DESIGNATION
N/A	1382612
SURVEY BOOK	SHEETS
-	---- of XX
CONTRACT	PROJECT
R-36260	1382612

File Name: P:\CID\14-402\Road\Dwg\Plans\Line DE\CONDET DE.dwg Plot Date: 10/12/2017 Plotted By: Andrews, Jeff



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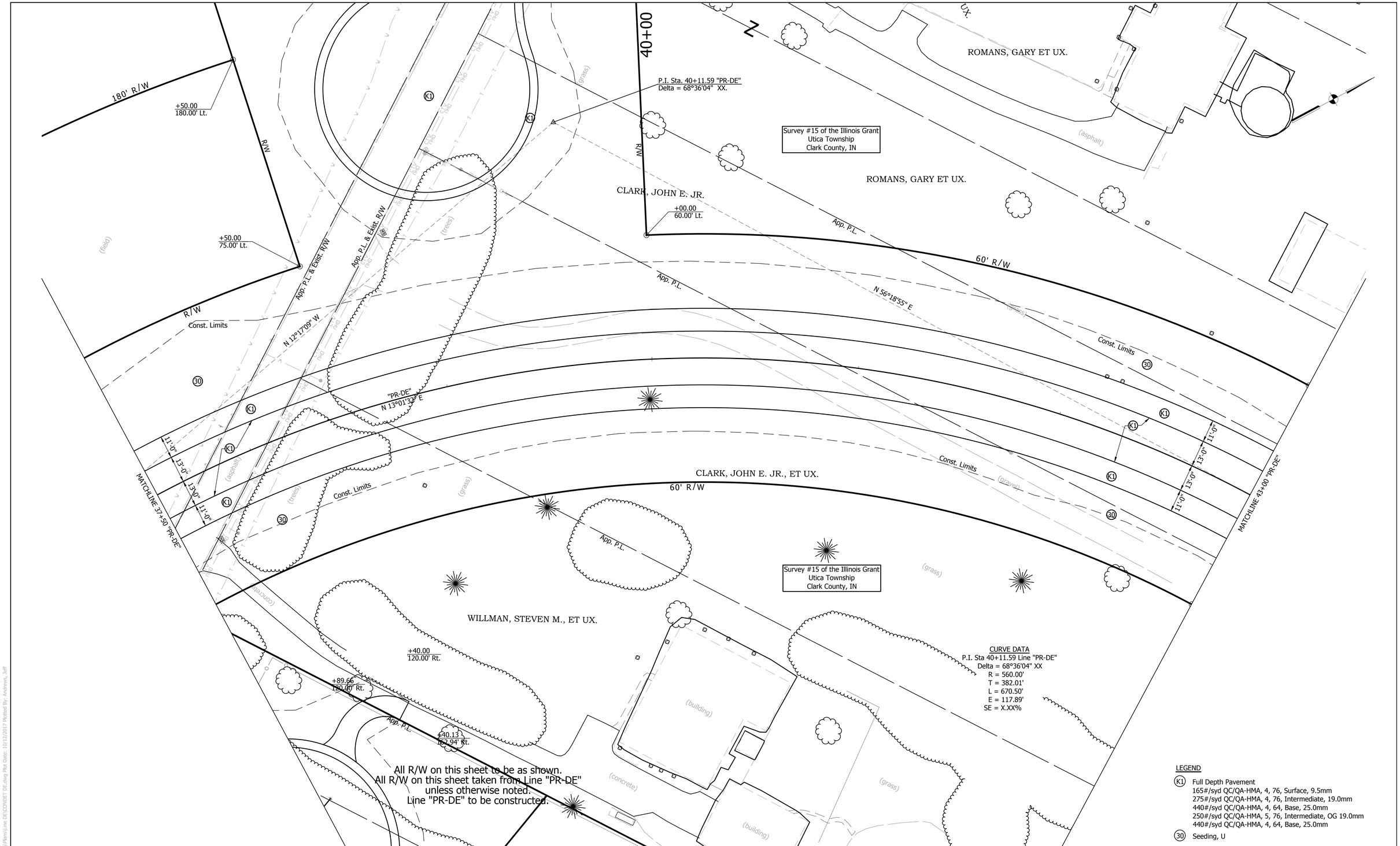
DEPARTMENT OF TRANSPORTATION

CONSTRUCTION DETAILS
Line "PR-DE"

HORIZONTAL SCALE	BRIDGE FILE
1" = 20'	-
VERTICAL SCALE	DESIGNATION
N/A	1382612
SURVEY BOOK	SHEETS
-	---- of XX
CONTRACT	PROJECT
R-36260	1382612

File Name: P:\CSD\14-402\Road\Dwg\Plans\Line DE\CONDET DE.dwg Plot Date: 10/12/2017 Plotted By: Andrews, Jeff



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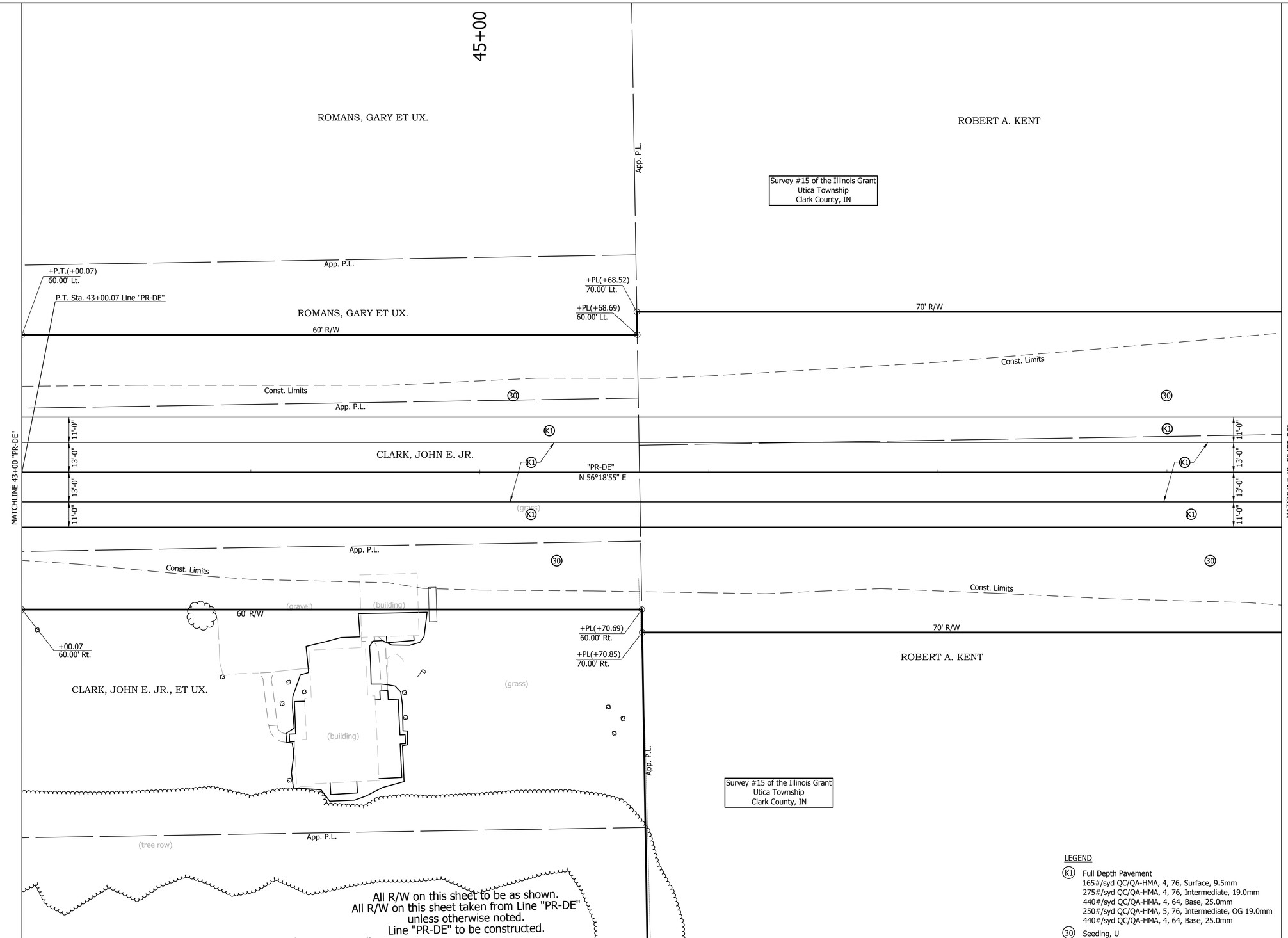
DEPARTMENT OF TRANSPORTATION

CONSTRUCTION DETAILS
Line "PR-DE"

HORIZONTAL SCALE	BRIDGE FILE
1" = 20'	-
VERTICAL SCALE	DESIGNATION
N/A	1382612
SURVEY BOOK	SHEETS
-	---- of XX
CONTRACT	PROJECT
R-36260	1382612

File Name: P:\CSD\14-602\Road\Dwg\Plans\Line DE\CONDET DE.dwg Plot Date: 10/12/2017 Plotted By: Andrews, Jeff



LEGEND

K1 Full Depth Pavement
165#/syd QC/QA-HMA, 4, 76, Surface, 9.5mm
275#/syd QC/QA-HMA, 4, 76, Intermediate, 19.0mm
440#/syd QC/QA-HMA, 4, 64, Base, 25.0mm
250#/syd QC/QA-HMA, 5, 76, Intermediate, OG 19.0mm
440#/syd QC/QA-HMA, 4, 64, Base, 25.0mm

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DESIGNED: JRA DRAWN: EAM
CHECKED: MAT CHECKED: JRA

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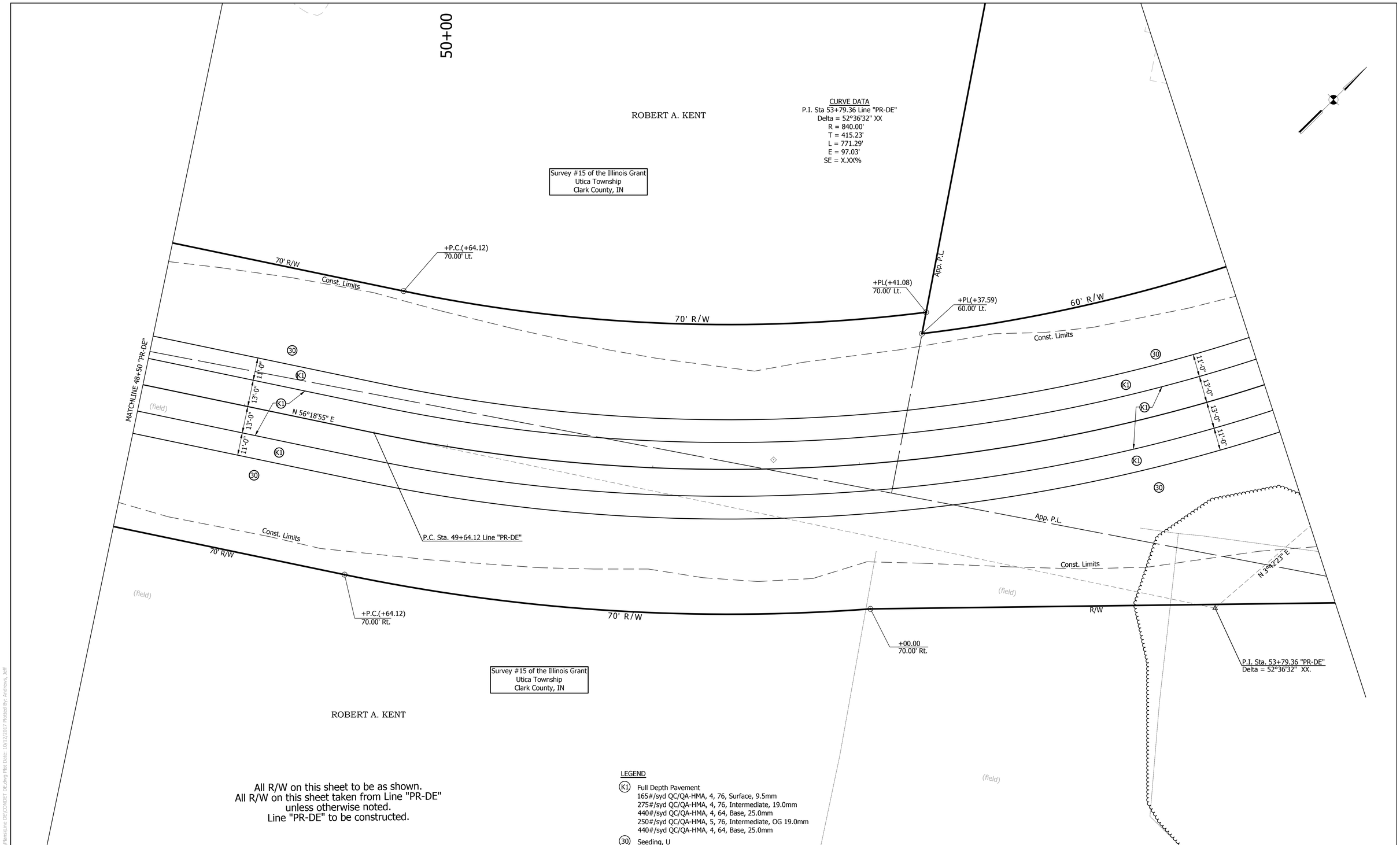
DEPARTMENT OF TRANSPORTATION

CONSTRUCTION DETAILS
Line "PR-DE"

HORIZONTAL SCALE	BRIDGE FILE
1" = 20'	-
VERTICAL SCALE	DESIGNATION
N/A	1382612
SURVEY BOOK	SHEETS
-	---- of XX
CONTRACT	PROJECT
R-36260	1382612

File Name: P:\C3D\14-402\Road\Dwg\Plans\Line DE\CONDET DE.dwg Plot Date: 10/12/2017 Plotted By: Andrews, Jeff



All R/W on this sheet to be as shown.
All R/W on this sheet taken from Line "PR-DE"
unless otherwise noted.
Line "PR-DE" to be constructed.

LEGEND

K1 Full Depth Pavement
165#/syd QC/QA-HMA, 4, 76, Surface, 9.5mm
275#/syd QC/QA-HMA, 4, 76, Intermediate, 19.0mm
440#/syd QC/QA-HMA, 4, 64, Base, 25.0mm
250#/syd QC/QA-HMA, 5, 76, Intermediate, OG 19.0mm
440#/syd QC/QA-HMA, 4, 64, Base, 25.0mm

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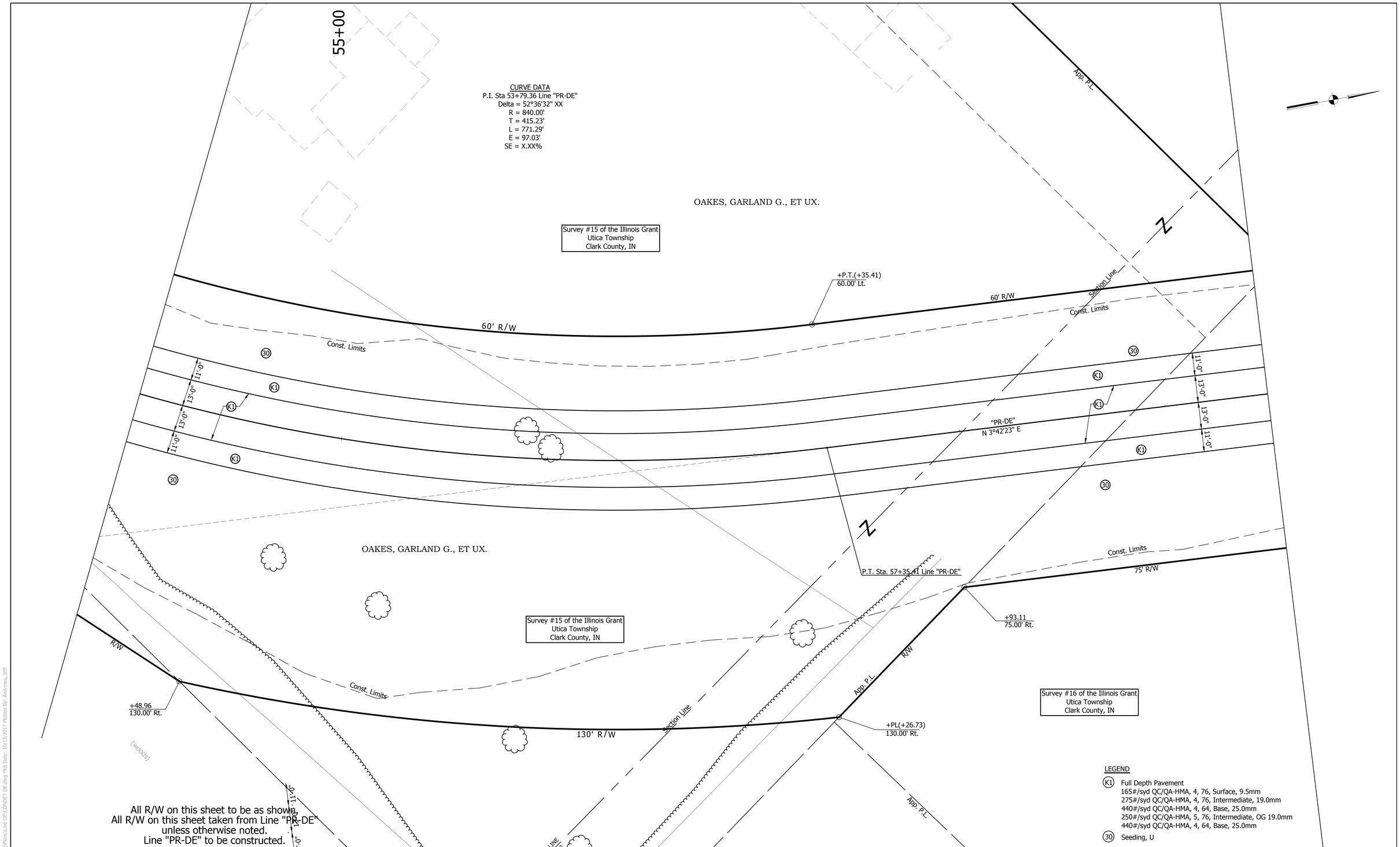
INDIANA
DEPARTMENT OF TRANSPORTATION

CONSTRUCTION DETAILS
Line "PR-DE"

HORIZONTAL SCALE	BRIDGE FILE
1" = 20'	-
VERTICAL SCALE	DESIGNATION
N/A	1382612
SURVEY BOOK	SHEETS
-	---- of XX
CONTRACT	PROJECT
R-36260	1382612

File Name: P:\CSD\14-402\Road\Dwg\Plans\Line DE\CONDET DE.dwg Plot Date: 10/12/2017 Plotted By: Andrews, Jeff



File Name: P:\CSD\14-402\Road\Dwg\Plans\Line DE\CONSET DE.dwg Plot Date: 10/12/2017 Plotted By: Andrews, Jeff

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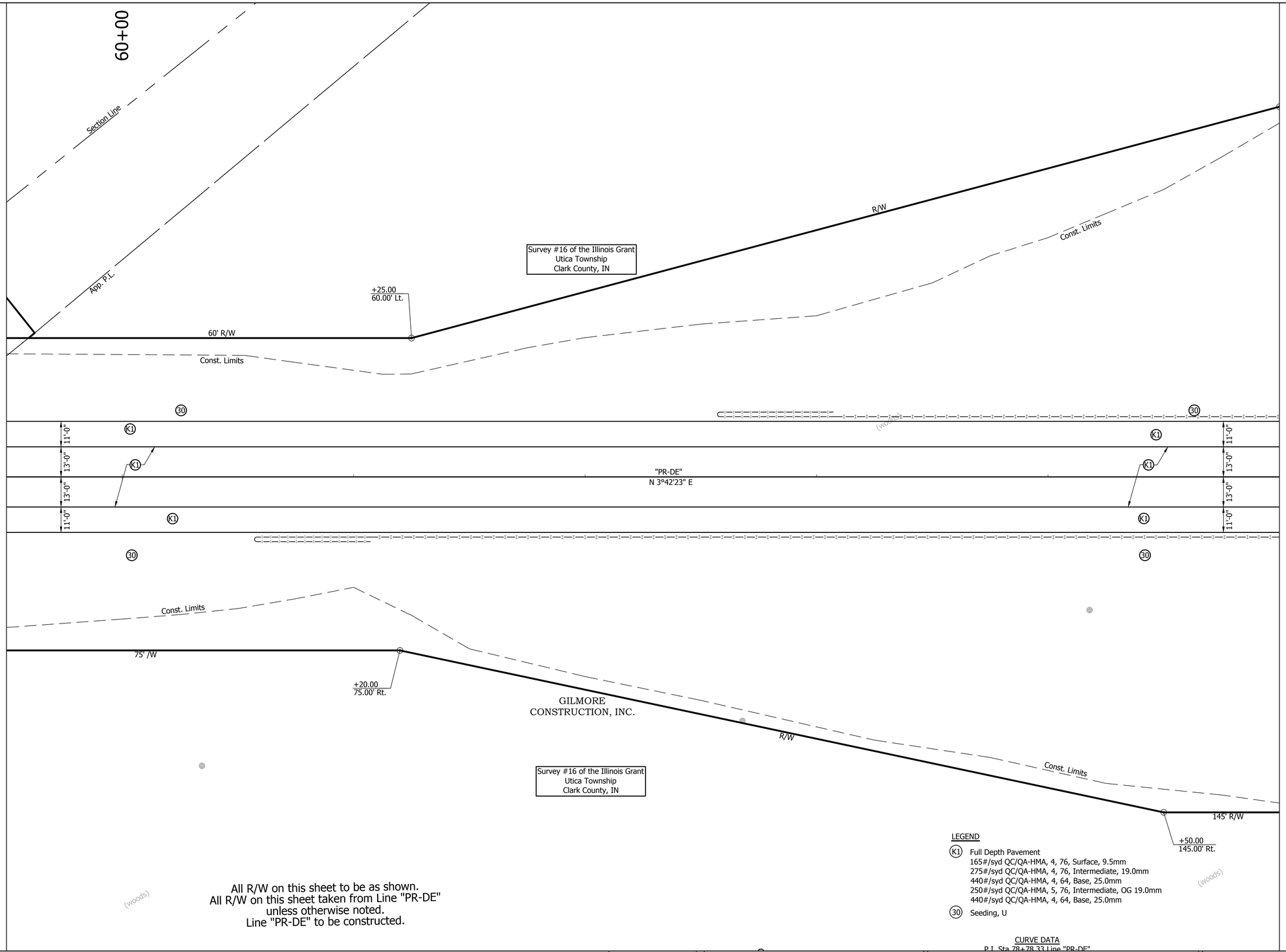
DEPARTMENT OF TRANSPORTATION

CONSTRUCTION DETAILS
Line "PR-DE"

HORIZONTAL SCALE	BRIDGE FILE
1" = 20'	-
VERTICAL SCALE	DESIGNATION
N/A	1382612
SURVEY BOOK	SHEETS
-	---- of XX
CONTRACT	PROJECT
R-36260	1382612



All R/W on this sheet to be as shown.
All R/W on this sheet taken from Line "PR-DE"
unless otherwise noted.
Line "PR-DE" to be constructed.

LEGEND

K1 Full Depth Pavement
165#/syd QC/QA-HMA, 4, 76, Surface, 9.5mm
275#/syd QC/QA-HMA, 4, 76, Intermediate, 19.0mm
440#/syd QC/QA-HMA, 4, 64, Base, 25.0mm
250#/syd QC/QA-HMA, 5, 76, Intermediate, OG 19.0mm
440#/syd QC/QA-HMA, 4, 64, Base, 25.0mm

30 Seeding, U

CURVE DATA
P.I. Sta 78+78.33 Line "PR-DE"

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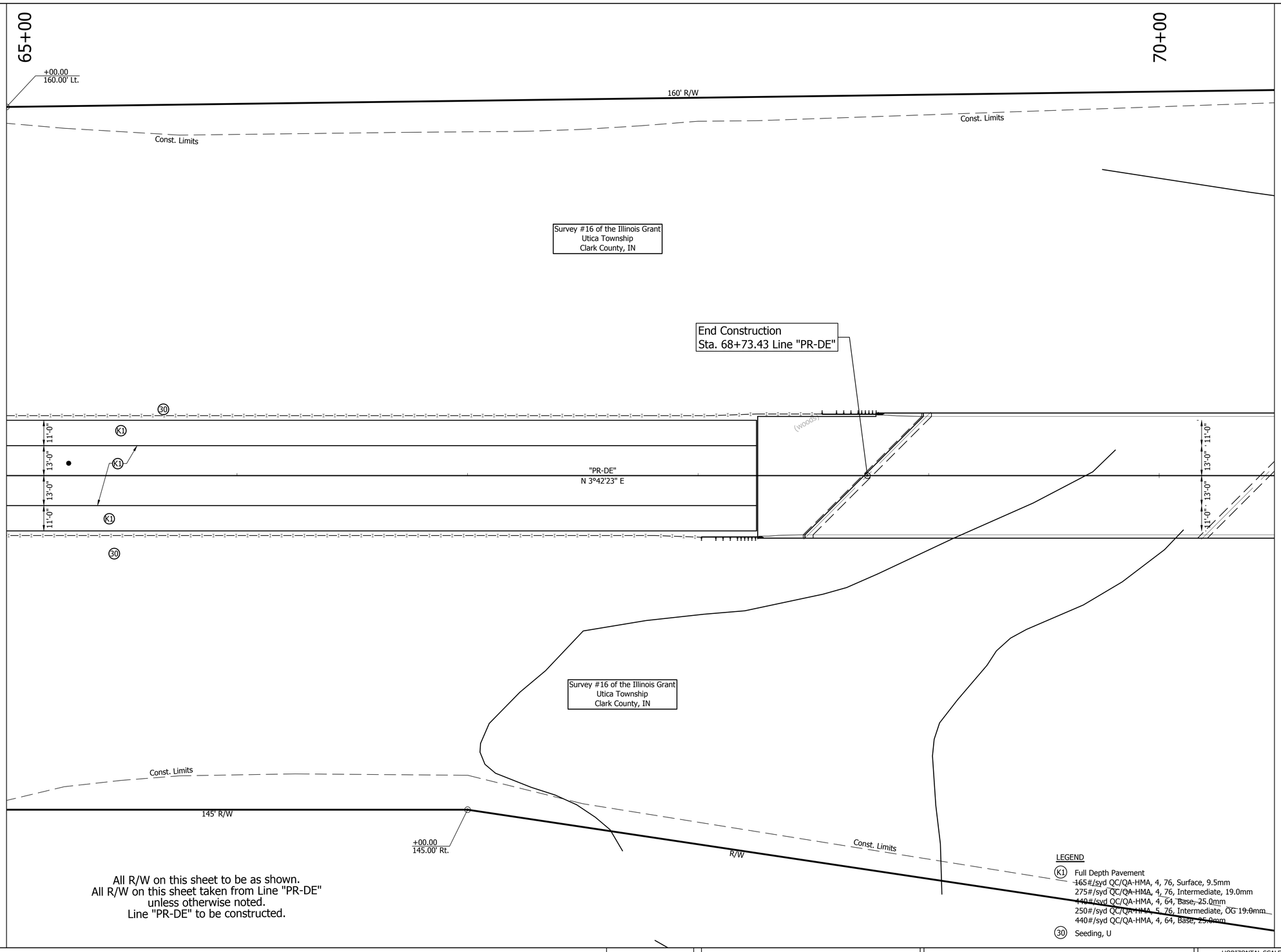
CONSTRUCTION DETAILS
Line "PR-DE"

HORIZONTAL SCALE	BRIDGE FILE
1" = 20'	-
VERTICAL SCALE	DESIGNATION
N/A	1382612
SURVEY BOOK	SHEETS
-	---- of XX
CONTRACT	PROJECT
R-36260	1382612

File Name: P:\C3D\14-402\Road\Dwg\Plans\Line DE\CONDET DE.dwg Plot Date: 10/12/2017 Plotted By: Andrews, Jeff



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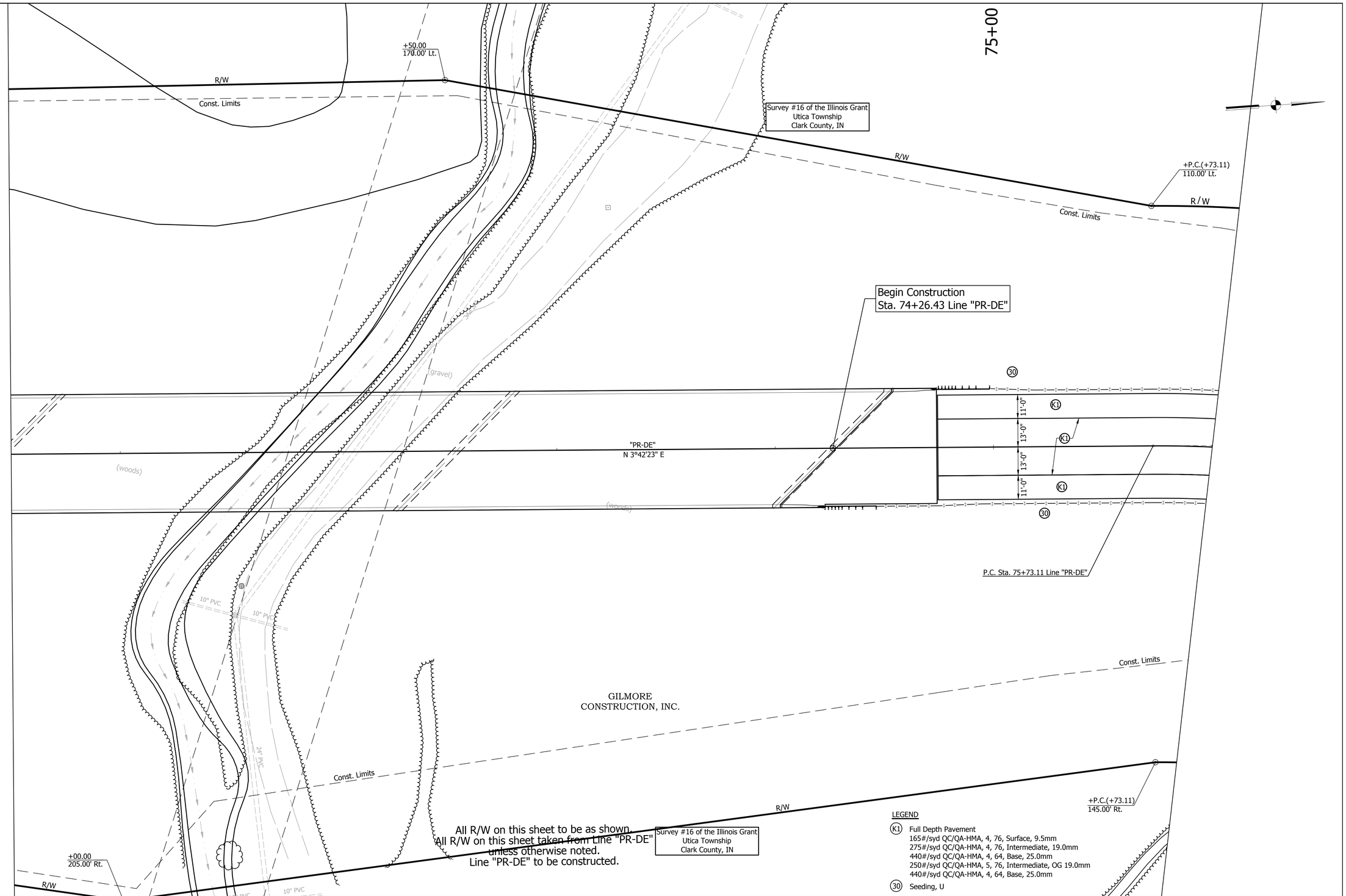
DEPARTMENT OF TRANSPORTATION

CONSTRUCTION DETAILS
Line "PR-DE"

HORIZONTAL SCALE	BRIDGE FILE
1" = 20'	-
VERTICAL SCALE	DESIGNATION
N/A	1382612
SURVEY BOOK	SHEETS
-	---- of XX
CONTRACT	PROJECT
R-36260	1382612

File Name: P:\CSD\14-402\Road\Dwg\Plans\Line DE\CONDET DE.dwg Plot Date: 10/12/2017 Plotted By: Andrews, Jeff



LEGEND

K1 Full Depth Pavement
165#/syd QC/QA-HMA, 4, 76, Surface, 9.5mm
275#/syd QC/QA-HMA, 4, 76, Intermediate, 19.0mm
440#/syd QC/QA-HMA, 4, 64, Base, 25.0mm
250#/syd QC/QA-HMA, 5, 76, Intermediate, OG 19.0mm
440#/syd QC/QA-HMA, 4, 64, Base, 25.0mm

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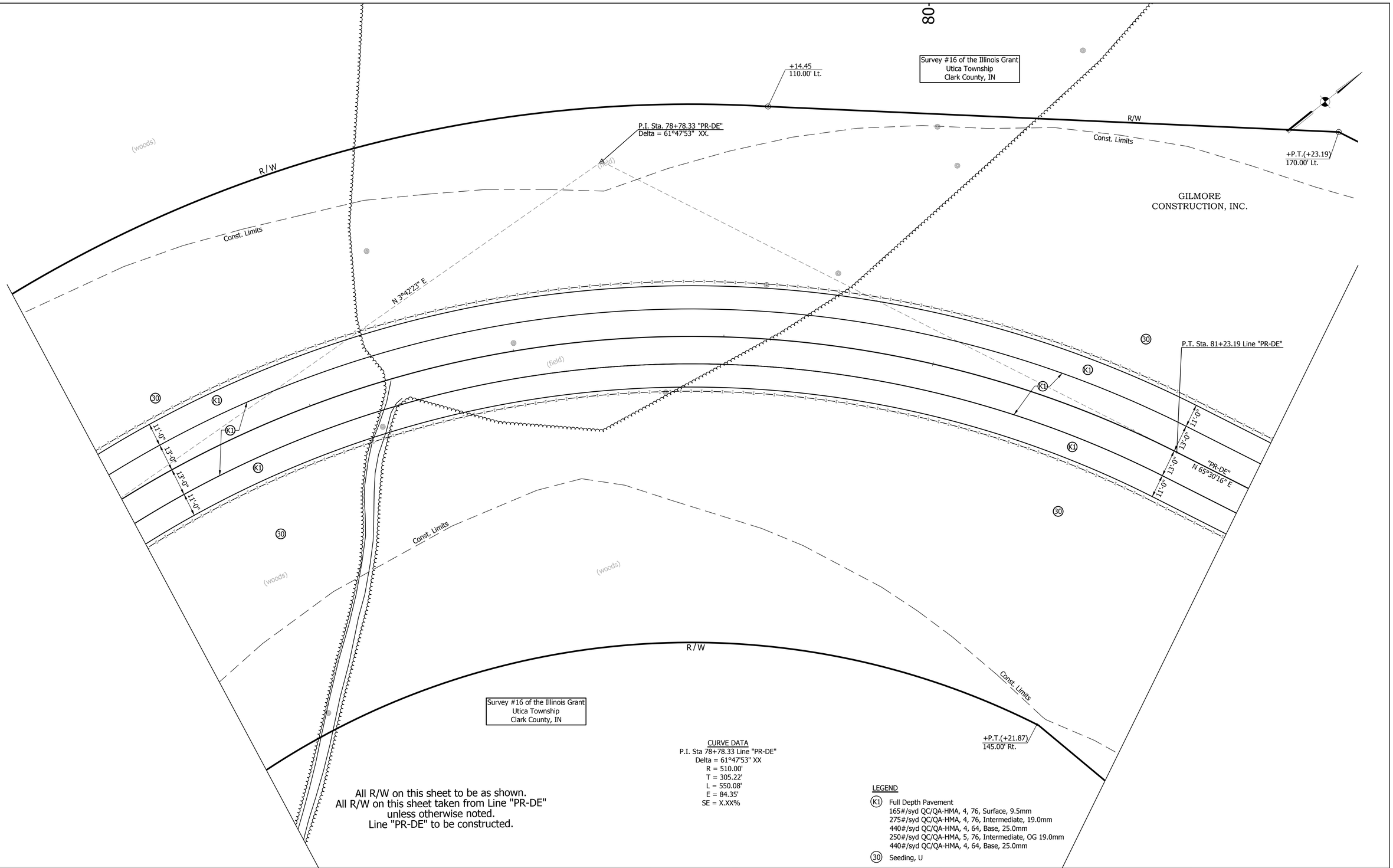
CONSTRUCTION DETAILS
Line "PR-DE"

HORIZONTAL SCALE	BRIDGE FILE
1" = 20'	-
VERTICAL SCALE	DESIGNATION
N/A	1382612
SURVEY BOOK	SHEETS
-	---- of XX
CONTRACT	PROJECT
R-36260	1382612

File Name: P:\CD\14-402\Road\Dwg\Plans\Line DE\CONDET DE.dwg Plot Date: 10/12/2017 Plotted By: Andrews, Jeff



All R/W on this sheet to be as shown.
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unless otherwise noted.
Line "PR-DE" to be constructed.

CURVE DATA
P.I. Sta 78+78.33 Line "PR-DE"
Delta = 61°47'53" XX
R = 510.00'
T = 305.22'
L = 550.08'
E = 84.35'
SE = X.XX%

LEGEND

K1 Full Depth Pavement
165#/syd QC/QA-HMA, 4, 76, Surface, 9.5mm
275#/syd QC/QA-HMA, 4, 76, Intermediate, 19.0mm
440#/syd QC/QA-HMA, 4, 64, Base, 25.0mm
250#/syd QC/QA-HMA, 5, 76, Intermediate, OG 19.0mm
440#/syd QC/QA-HMA, 4, 64, Base, 25.0mm

30 Seeding, U

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RECOMMENDED FOR APPROVAL
DESIGN ENGINEER DATE

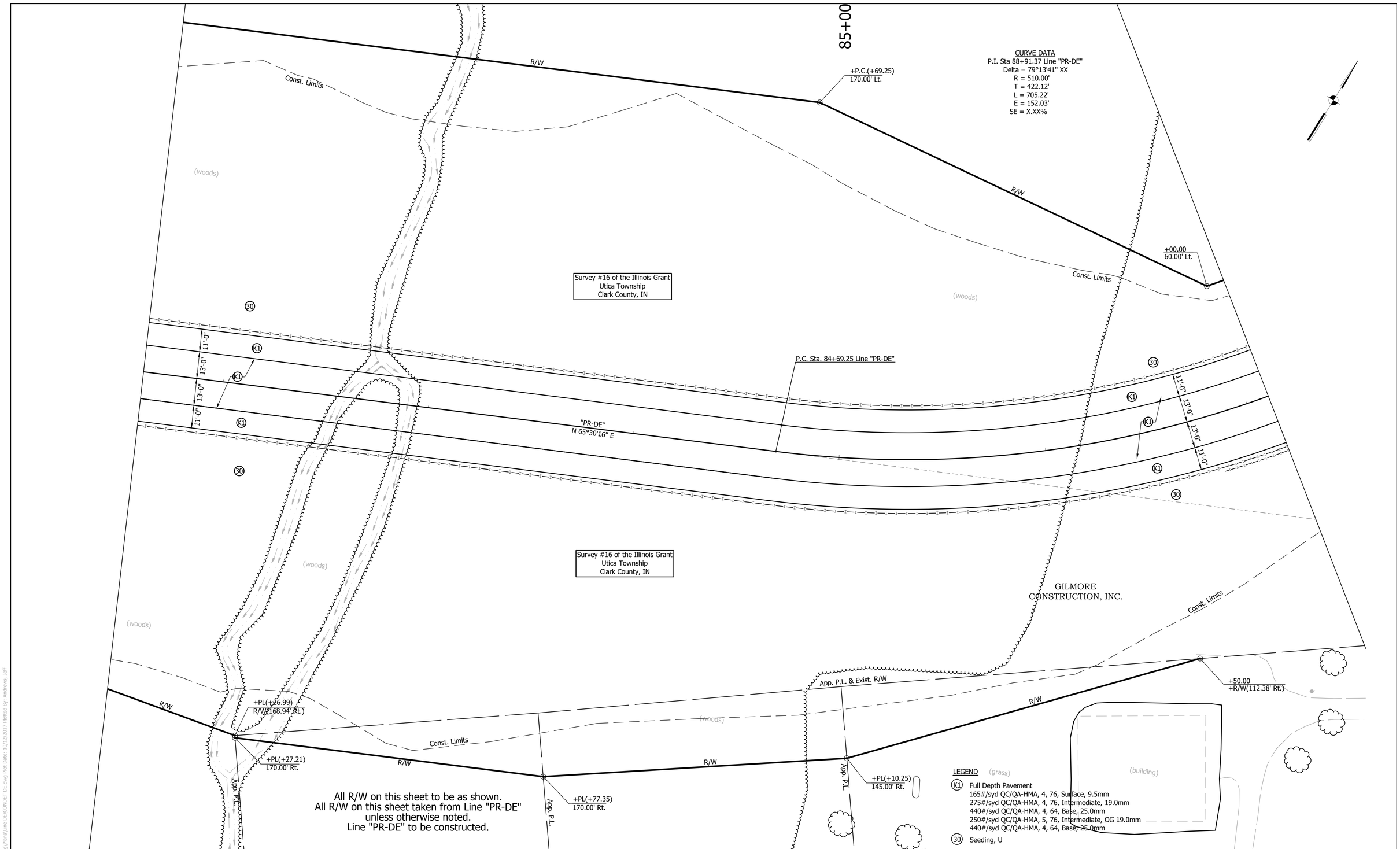
DESIGNED: JRA DRAWN: EAM
CHECKED: MAT CHECKED: JRA

INDIANA
DEPARTMENT OF TRANSPORTATION

CONSTRUCTION DETAILS
Line "PR-DE"

HORIZONTAL SCALE	BRIDGE FILE
1" = 20'	-
VERTICAL SCALE	DESIGNATION
N/A	1382612
SURVEY BOOK	SHEETS
-	---- of XX
CONTRACT	PROJECT
R-36260	1382612

File Name: P:\C3D\14-002\Road\Dwg\Plans\Line DE\CONSET DE.dwg Plot Date: 10/12/2017 Plotted By: Andrews, Jeff



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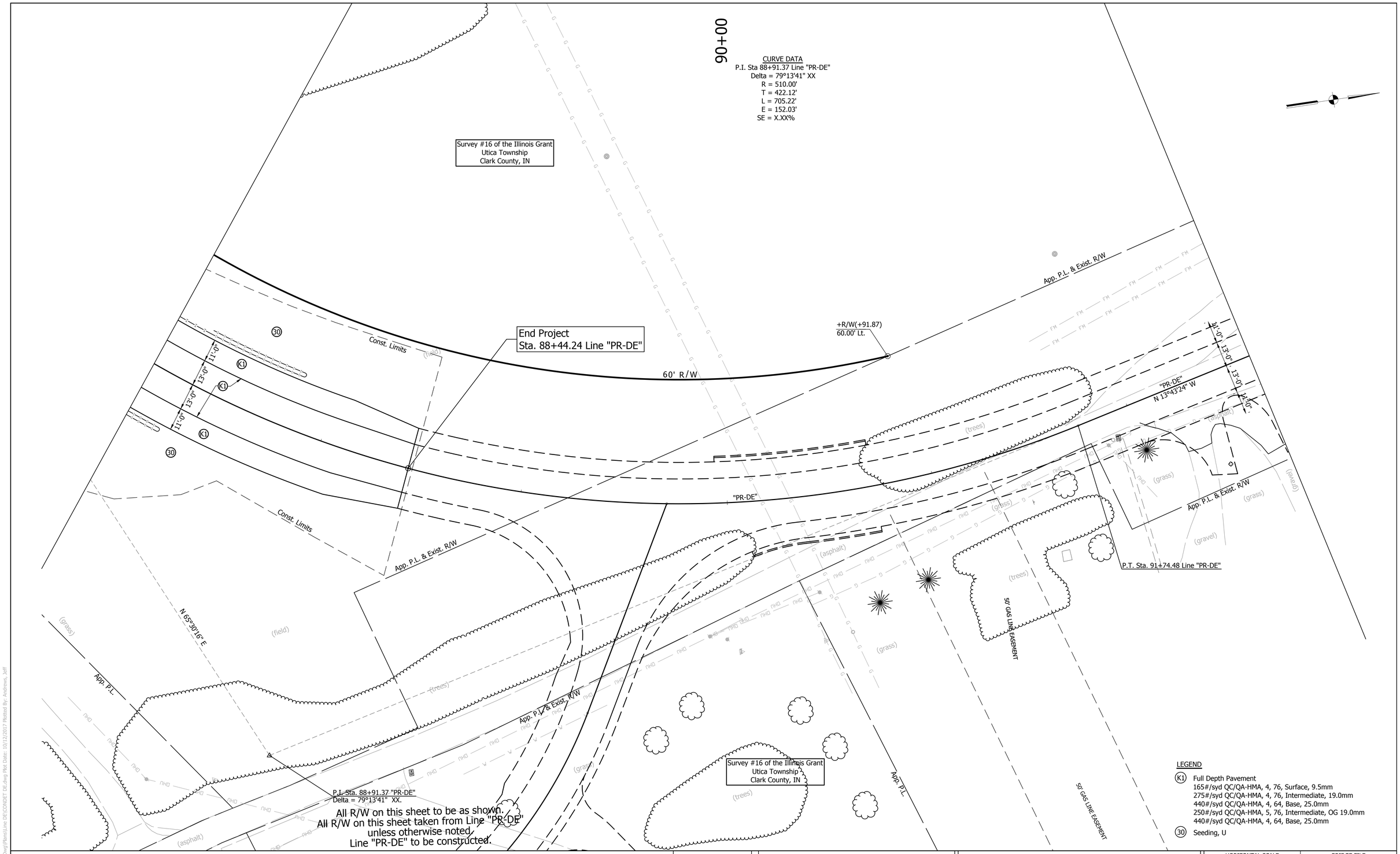
INDIANA
DEPARTMENT OF TRANSPORTATION

CONSTRUCTION DETAILS
Line "PR-DE"

HORIZONTAL SCALE	BRIDGE FILE
1" = 20'	-
VERTICAL SCALE	DESIGNATION
N/A	1382612
SURVEY BOOK	SHEETS
-	---- of XX
CONTRACT	PROJECT
R-36260	1382612

File Name: P:\C3D\14-002\Road\Dwg\Plans\Line DE\CONDET DE.dwg Plot Date: 10/12/2017 Plotted By: Andrews, Jeff



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INDIANA
DEPARTMENT OF TRANSPORTATION

CONSTRUCTION DETAILS
Line "PR-DE"

HORIZONTAL SCALE	BRIDGE FILE
1" = 20'	-
VERTICAL SCALE	DESIGNATION
N/A	1382612

SURVEY BOOK	SHEETS		
-	----	of	XX
CONTRACT	PROJECT		
R-36260	1382612		

File Name: P:\CD\14-402\Road\Dwg\Plans\Line DE\CONDET DE.dwg Plot Date: 10/12/2017 Plotted By: Andrews, Jeff

GILMORE
CONSTRUCTION,
INC.

(field)

(field)

Survey #16 of the Illinois Grant
Utica Township
Clark County, IN

App. P.L. & Exist. R/W

App. P.L. & Exist. R/W

(gravel)

(gravel)

(gravel)

(concrete)

"PR-DE"
N 13°43'24" W

(asphalt)

(gravel)

(grass)

App. P.L. & Exist. R/W

App. P.L. & Exist. R/W

4 - 6" PVC
UNDERDRAINS

(field)

Survey #16 of the Illinois Grant
Utica Township
Clark County, IN

App. P.L.

App. P.L. & Exist. R/W

All R/W on this sheet to be as shown.
All R/W on this sheet taken from Line "PR-DE"
unless otherwise noted.
Line "PR-DE" to be constructed.

JAMES

LEGEND

(K2) Full Depth Pavement
165#/SYD QC/QA-HMA, 4, 76, Surface, 9.5mm
275#/SYD QC/QA-HMA, 4, 76, Intermediate, 19.0mm
6" Compacted Aggregate Base, No. 53

(O) Compacted Aggregate, No. 53

(30) Seeding, U

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DESIGN ENGINEER DATE

DESIGNED: JRA DRAWN: EAM
CHECKED: MAT CHECKED: JRA

INDIANA
DEPARTMENT OF TRANSPORTATION

CONSTRUCTION DETAILS
Line "PR-DE"

HORIZONTAL SCALE	BRIDGE FILE
1" = 20'	-
VERTICAL SCALE	DESIGNATION
N/A	1382612

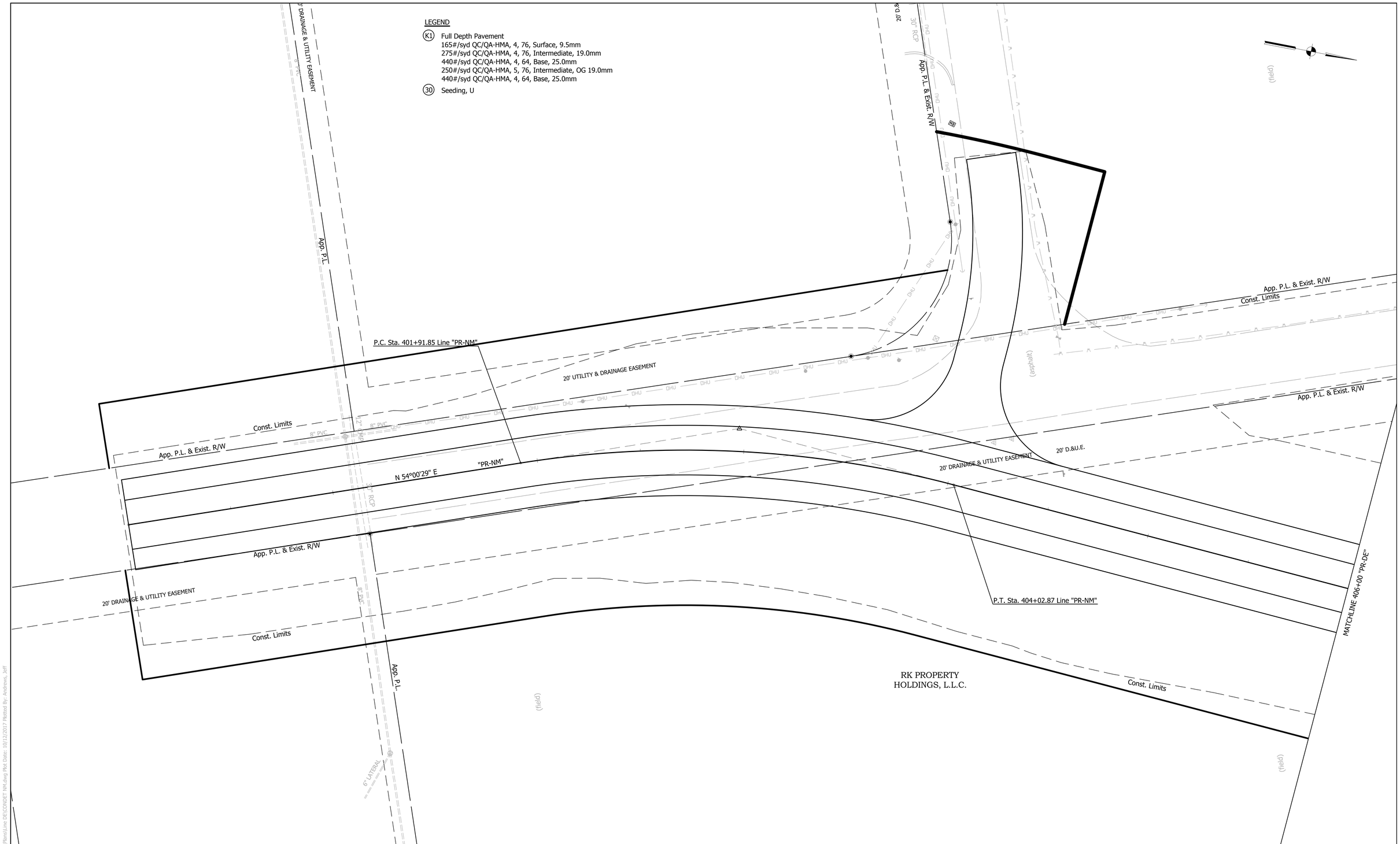
SURVEY BOOK	SHEETS		
-	----	of	XX
CONTRACT	PROJECT		
R-36260	1382612		

File Name: P:\CSD\14-402\Road\Dwg\Plans\Line DE\CONDET_DE.dwg Plot Date: 10/12/2017 Plotted By: Andrews, Jeff

LEGEND

(K1) Full Depth Pavement
165#/syd QC/QA-HMA, 4, 76, Surface, 9.5mm
275#/syd QC/QA-HMA, 4, 76, Intermediate, 19.0mm
440#/syd QC/QA-HMA, 4, 64, Base, 25.0mm
250#/syd QC/QA-HMA, 5, 76, Intermediate, OG 19.0mm
440#/syd QC/QA-HMA, 4, 64, Base, 25.0mm

(30) Seeding, U



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RECOMMENDED FOR APPROVAL _____ DESIGN ENGINEER DATE

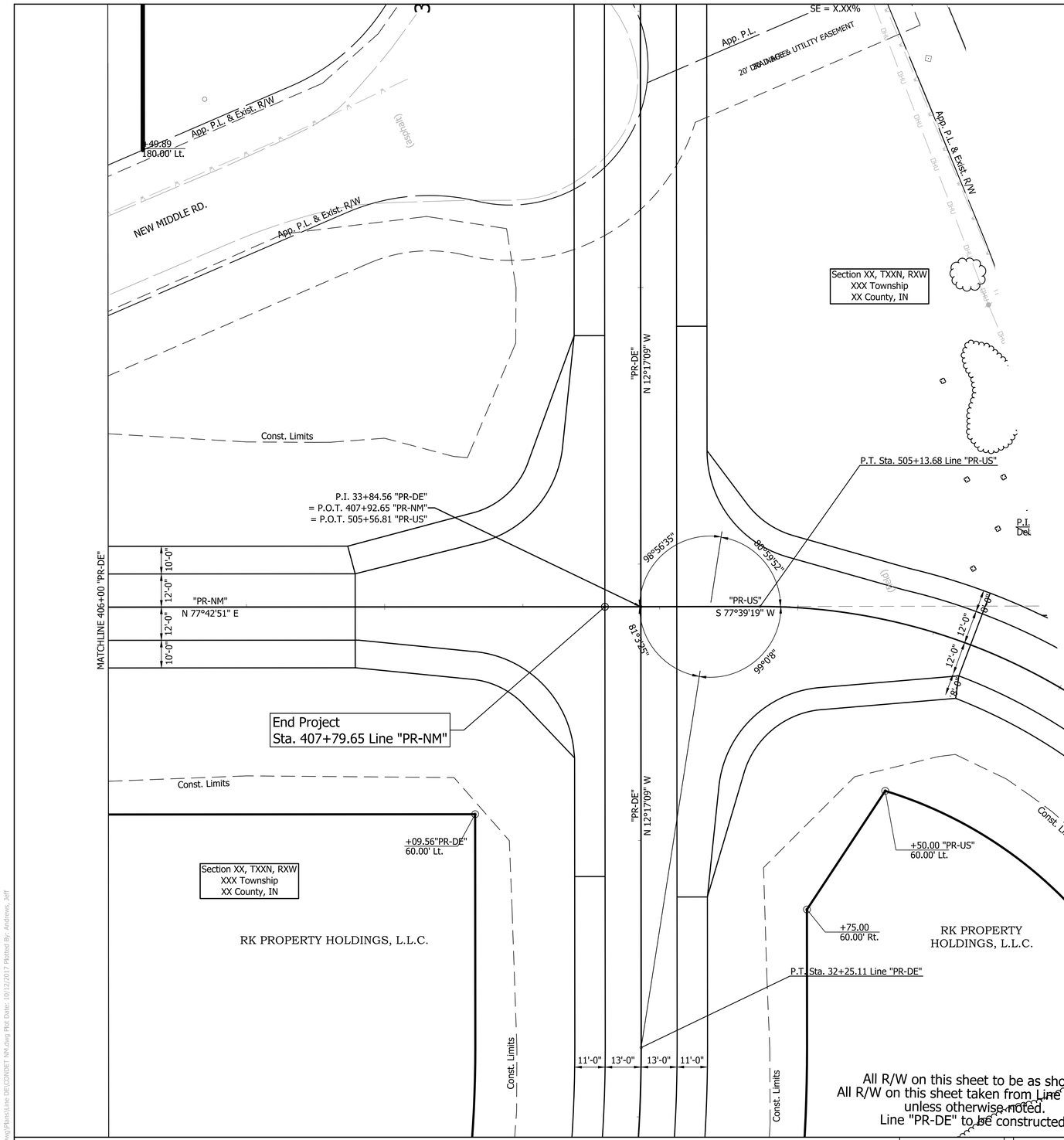
DESIGNED: JRA DRAWN: EAM
CHECKED: MAT CHECKED: JRA

INDIANA
DEPARTMENT OF TRANSPORTATION

CONSTRUCTION DETAILS
Line "PR-NM"

HORIZONTAL SCALE	BRIDGE FILE
1" = 20'	-
VERTICAL SCALE	DESIGNATION
N/A	1382612
SURVEY BOOK	SHEETS
-	---- of XX
CONTRACT	PROJECT
R-36260	1382612

File Name: P:\C3D\14-402\Road\Dwg\Plans\Line DE\CONDET NM.dwg Plot Date: 10/12/2017 Plotted By: Andrews, Jeff



LEGEND

(K1) Full Depth Pavement
165#/syd QC/QA-HMA, 4, 76, Surface, 9.5mm
275#/syd QC/QA-HMA, 4, 76, Intermediate, 19.0mm
440#/syd QC/QA-HMA, 4, 64, Base, 25.0mm
250#/syd QC/QA-HMA, 5, 76, Intermediate, OG 19.0mm
440#/syd QC/QA-HMA, 4, 64, Base, 25.0mm

(30) Seeding, U

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RECOMMENDED FOR APPROVAL
DESIGN ENGINEER DATE

DESIGNED: JRA DRAWN: EAM
CHECKED: MAT CHECKED: JRA

INDIANA
DEPARTMENT OF TRANSPORTATION

CONSTRUCTION DETAILS
Line "PR-NM"

HORIZONTAL SCALE	BRIDGE FILE
1" = 20'	-
VERTICAL SCALE	DESIGNATION
N/A	1382612
SURVEY BOOK	SHEETS
-	---- of XX
CONTRACT	PROJECT
R-36260	1382612

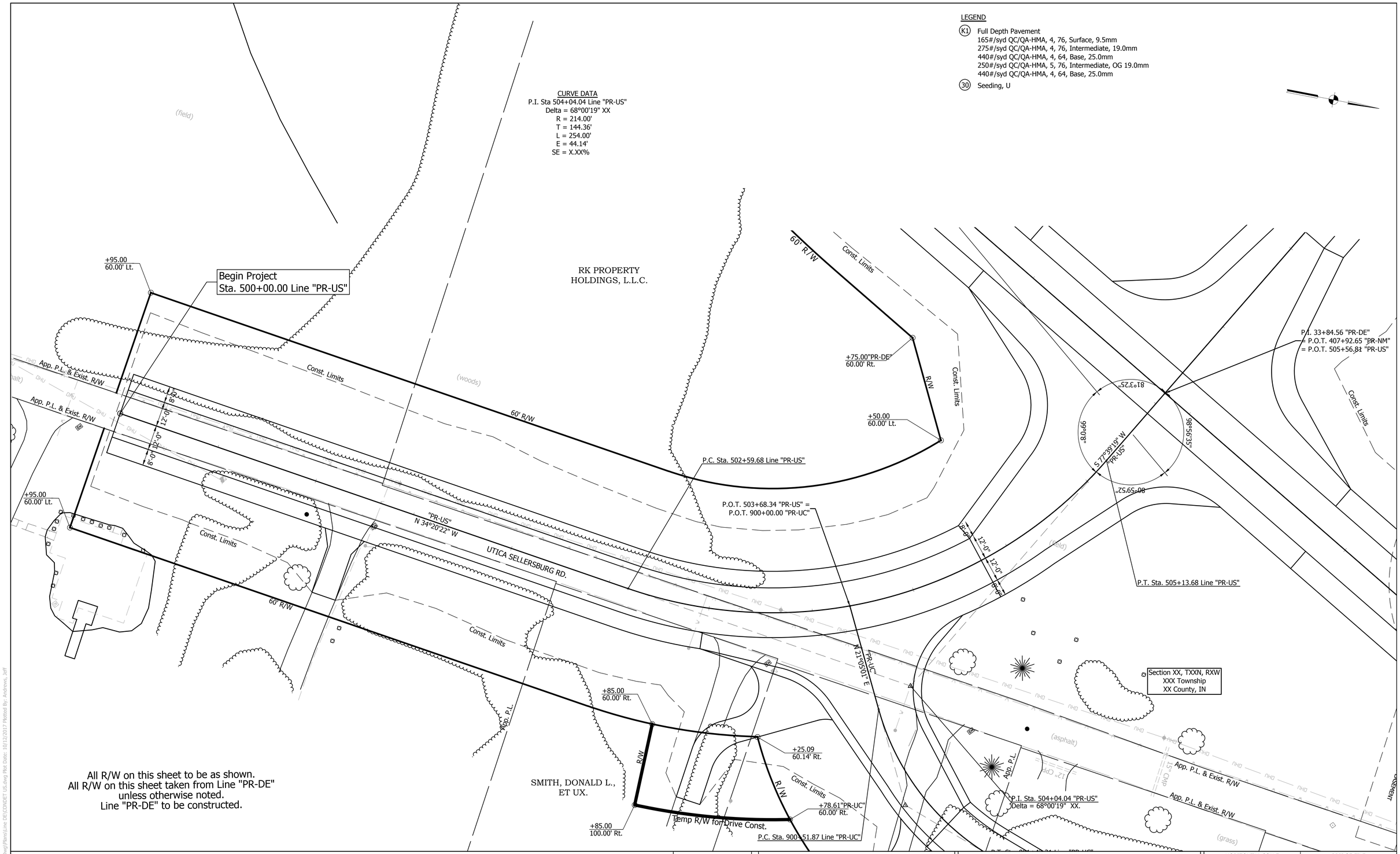
File Name: P:\CSD\14-402\Road\Dwg\Plans\Line DE\CONDET NM.dwg Plot Date: 10/12/2017 Plotted By: Andrews, Jeff

LEGEND

(K1) Full Depth Pavement
165#/syd QC/QA-HMA, 4, 76, Surface, 9.5mm
275#/syd QC/QA-HMA, 4, 76, Intermediate, 19.0mm
440#/syd QC/QA-HMA, 4, 64, Base, 25.0mm
250#/syd QC/QA-HMA, 5, 76, Intermediate, OG 19.0mm
440#/syd QC/QA-HMA, 4, 64, Base, 25.0mm

(30) Seeding, U

CURVE DATA
P.I. Sta 504+04.04 Line "PR-US"
Delta = 68°00'19" XX
R = 214.00'
T = 144.36'
L = 254.00'
E = 44.14'
SE = X.XX%



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RECOMMENDED FOR APPROVAL
DESIGN ENGINEER DATE

DESIGNED: JRA DRAWN: EAM
CHECKED: MAT CHECKED: JRA

INDIANA
DEPARTMENT OF TRANSPORTATION

CONSTRUCTION DETAILS
Line "PR-US"

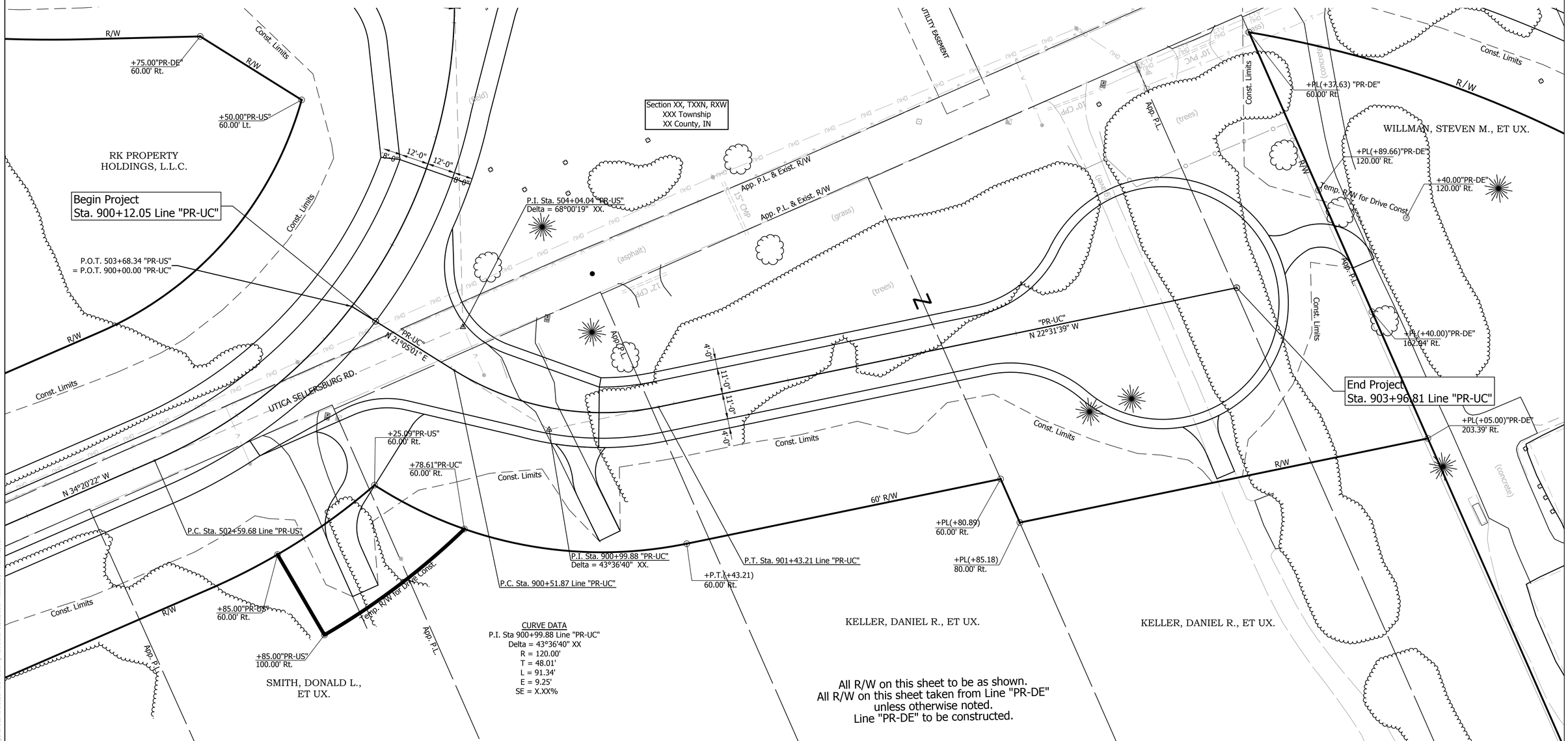
HORIZONTAL SCALE	BRIDGE FILE
1" = 20'	-
VERTICAL SCALE	DESIGNATION
N/A	1382612
SURVEY BOOK	SHEETS
-	---- of XX
CONTRACT	PROJECT
R-36260	1382612

File Name: P:\CID\14-402\Road\Dwg\Plans\Line DE\CONDET_US.dwg Plot Date: 10/12/2017 Plotted By: Andrews, Jeff

LEGEND

(K1) Full Depth Pavement
165#/syd QC/QA-HMA, 4, 76, Surface, 9.5mm
275#/syd QC/QA-HMA, 4, 76, Intermediate, 19.0mm
440#/syd QC/QA-HMA, 4, 64, Base, 25.0mm
250#/syd QC/QA-HMA, 5, 76, Intermediate, OG 19.0mm
440#/syd QC/QA-HMA, 4, 64, Base, 25.0mm

(30) Seeding, U



CURVE DATA
P.I. Sta 900+99.88 Line "PR-UC"
Delta = 43°36'40" XX
R = 120.00'
T = 48.01'
L = 91.34'
E = 9.25'
SE = X.XX%

All R/W on this sheet to be as shown.
All R/W on this sheet taken from Line "PR-DE"
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Line "PR-DE" to be constructed.

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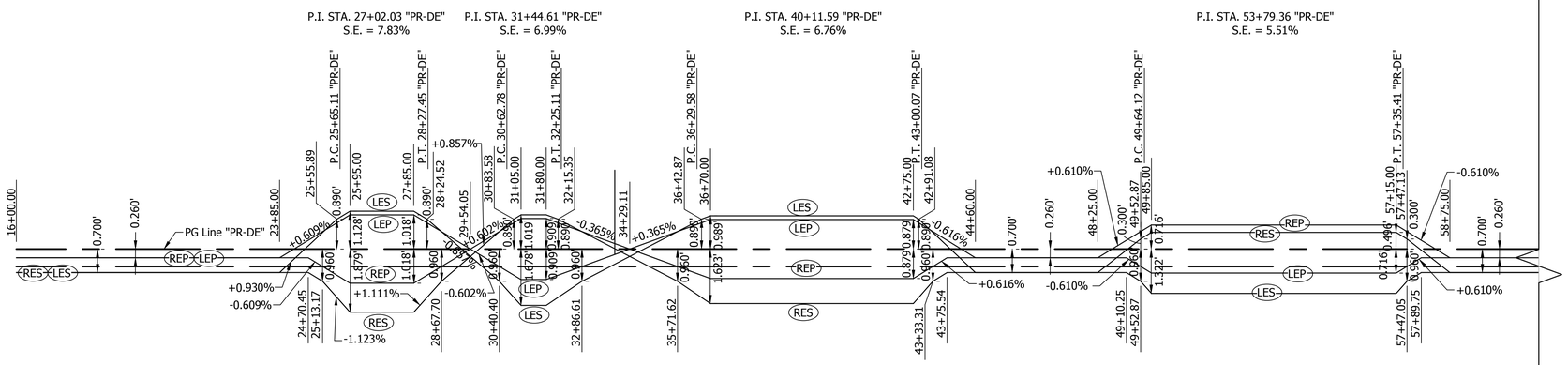
DESIGNED: JRA	DRAWN: EAM		
CHECKED: MAT	CHECKED: JRA		

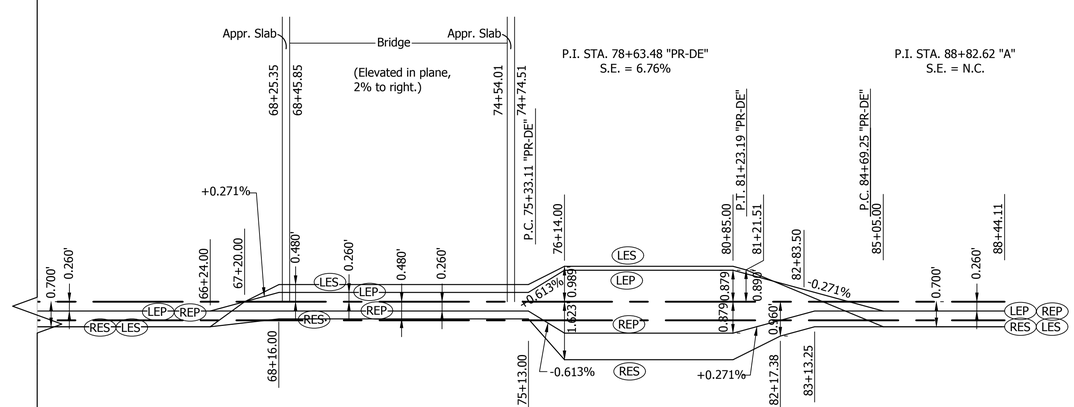
INDIANA
DEPARTMENT OF TRANSPORTATION

CONSTRUCTION DETAILS
Line "PR-UC"

HORIZONTAL SCALE	BRIDGE FILE
1" = 20'	-
VERTICAL SCALE	DESIGNATION
N/A	1382612
SURVEY BOOK	SHEETS
-	---- of XX
CONTRACT	PROJECT
R-36260	1382612

File Name: P:\C3D\14-402\Road\Dwg\Plans\Line DR\CONDET LIC.dwg Plot Date: 10/12/2017 Plotted By: Andrews, Jeff





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DESIGN ENGINEER DATE

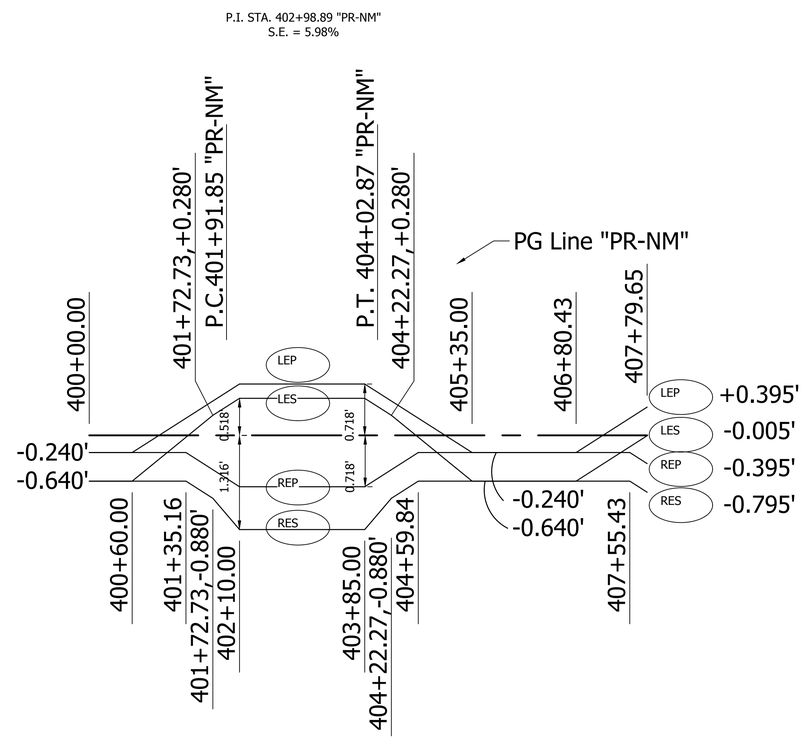
DESIGNED: JRA DRAWN: EAM
CHECKED: MAT CHECKED: JRA

INDIANA
DEPARTMENT OF TRANSPORTATION

SUPER ELEVATIONS
Line "PR-DE"

HORIZONTAL SCALE	BRIDGE FILE
1" = 200'	-
VERTICAL SCALE	DESIGNATION
1"=200'	1382612
SURVEY BOOK	SHEETS
-	---- of XX
CONTRACT	PROJECT
R-36260	1382612

File Name: P:\C3D\14-402\Road\Dwg\Plans\Line DE\Super PR-DE.dwg Plot Date: 10/12/2017 Plotted By: Andrews, Jeff



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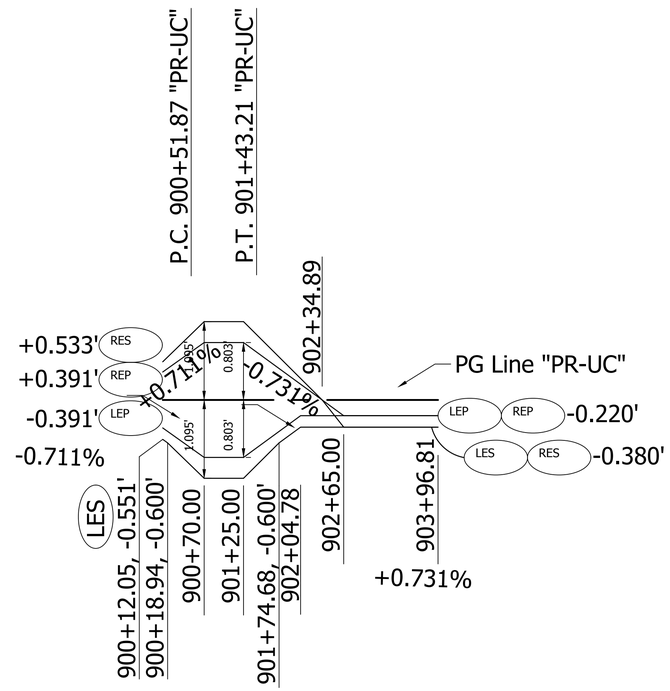
RECOMMENDED FOR APPROVAL ____ DESIGN ENGINEER DATE	INDIANA DEPARTMENT OF TRANSPORTATION	HORIZONTAL SCALE 1" = 200'	BRIDGE FILE -
		VERTICAL SCALE 1"=200'	DESIGNATION 1382612
DESIGNED: JRA / DRAWN: EAM	SUPER ELEVATIONS Line "PR-NM"	SURVEY BOOK -	SHEETS ---- of XX
CHECKED: MAT / CHECKED: JRA		CONTRACT R-36260	PROJECT 1382612

File Name: P:\C3D\14-402\Road\Dwg\Plans\Line DE\Super PR-NM.dwg Plot Date: 10/12/2017 Plotted By: Andrews, Jeff



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RECOMMENDED FOR APPROVAL	DESIGN ENGINEER DATE
DESIGNED: JRA	DRAWN: EAM
CHECKED: MAT	CHECKED: JRA

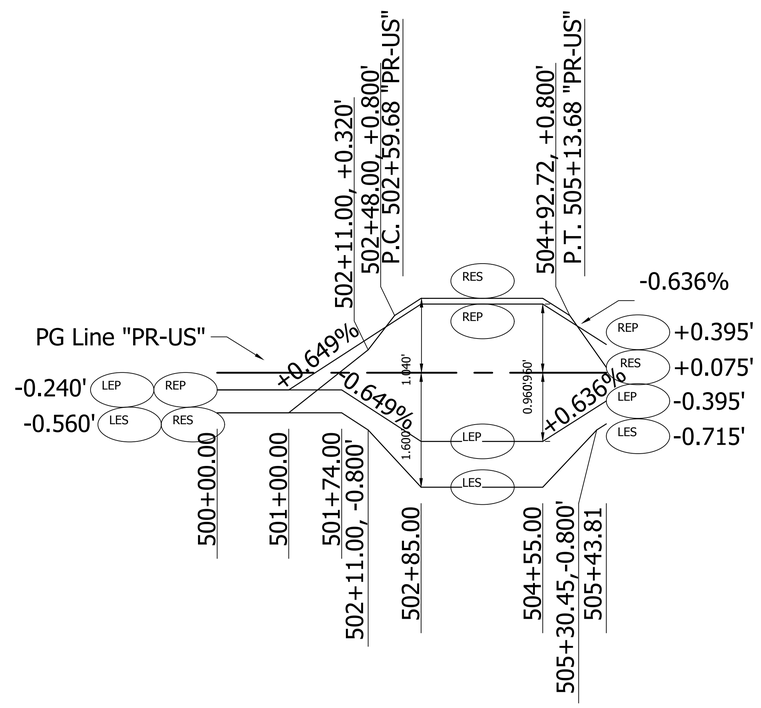
INDIANA
DEPARTMENT OF TRANSPORTATION

SUPER ELEVATIONS
Line "PR-UC"

HORIZONTAL SCALE	BRIDGE FILE
1" = 100'	-
VERTICAL SCALE	DESIGNATION
1"=100'	1382612
SURVEY BOOK	SHEETS
-	---- of XX
CONTRACT	PROJECT
R-36260	1382612

File Name: P:\C3D\14-402\Road\Dwg\Plans\Line DE\Super PR-UC.dwg Plot Date: 10/12/2017 Plotted By: Andrews, Jeff

P.I. STA. 504+04.04 "PR-US"
S.E. = 8.00%



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INDIANA
DEPARTMENT OF TRANSPORTATION

SUPER ELEVATIONS
Line "PR-US"

HORIZONTAL SCALE	BRIDGE FILE
1" = 100'	-
VERTICAL SCALE	DESIGNATION
1"=100'	1382612
SURVEY BOOK	SHEETS
-	---- of XX
CONTRACT	PROJECT
R-36260	1382612

File Name: P:\C3D\14-402\Road\Dwg\Plans\Line DE\Super PR-US.dwg Plot Date: 10/12/2017 Plotted By: Andrews, Jeff

STRUCTURE DATA

STRUCTURE NUMBER	LOCATION						SIZE	DESCRIPTION		LENGTH	VIDEO INSPECTION LENGTH	SKEW	FLOW LINE			SERVICE LIFE	SITE DESIGNATION	pH	BACKFILL METHOD	STRUCTURE BACKFILL	TYPE	FLOWABLE BACKFILL	TYPE	TOP OF CASTING	REVETMENT RIPRAP	SCOUR PROTECTION				SLOTTED DRAINS	PIPE END SECTION	GRATED BOX END SECTION			SAFETY METAL END SECTION			CONNECT TO STR. NO.	REMARKS
	STATION	LEFT	RIGHT	MEDIAN	CROSS	OFFSET		PIPE TYPE	MANHOLE, INLET, CATCH BASIN, OR SPECIALTY STRUCTURE				COVER	UP STREAM	DOWN STREAM											SUMP DEPTH	GEOTEXTILES	RIPRAP				TYPE	SLOPE	EA.	TYPE	SLOPE	EA.		
						FT	IN			LFT	LFT		LFT	ELEV.	ELEV.	YR.				CYS		CYS			TON	IN	SYS	TYPE	TON	LFT	EA.									
1	19+00 "DE"				X		36"	1	CULVERT	74	74		1.8	466.26	465.95	75	A	7.0	1	57.3	2						24	REV	12		2									
2	20+85 "DE"	X				42.4	15"	1	CULVERT	43	43		1.0	461.07	460.82	75	A	7.0	1	8.7	2						6	REV	2		2									
3	407+30 "NM"				X		15"	1	CULVERT	66	66		1.3	483.03	482.46	75	A	7.0	1	19.2	2						6	REV	2		2									
4	504+31 "US"				X		4' X 9'	1	BOX CULVERT	59	59		0.5	484.06	481.59	75	A	7.0	1	94.4	2						43	1	28		2									
5	902+45 "UC"				X		15"	1	CULVERT	54	54		2.0	490.51	490.33	75	A	7.0	1	15.3	2						6	REV	2		2									
6	900+78 "UC"		X			29.9	12"	2	INLET E-7	105	105		2.0	488.43	485.65	75	NA	7.0	1	17.7	2			491.63			4	REV	1		1									
7	502+70 "US"		X			31.0	12"	2	INLET E-7	119	119		1.9	494.10	488.43	75	NA	7.0	1	12.5	2			497.18														6	
8	501+00 "US"		X			31.0	12"	2	INLET F-7	169	169		1.8	498.25	494.10	75	NA	7.0	1	11.0	2			501.25														7	
9	37+00 "DE"				X		4' X 6'	1	BOX CULVERT	68	68		0.7	492.01	489.87	75	A	7.0	1	73.2	2						48	2	36		2									
10	55+32 "DE"				X		36"	1	CULVERT	157	157		14.5	512.92	511.72	75	A	7.0	1	279.0	2						24	REV	12		2									
11	82+62 "DE"				X		72"	1	CULVERT	266	266		47.0	459.31	455.80	75	A	7.0	1	1875.0	2						86	1	64		2									
12	25+51 "DE"				X		Varies (See Plans)	1	CULVERT	150	150		47.0	459.31	455.80	75	A	7.0	1	1875.0	2						116	1	82		2									

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RECOMMENDED FOR APPROVAL _____ DESIGN ENGINEER DATE

DESIGNED: ESH DRAWN: ESH
CHECKED: JRA CHECKED: JRA

INDIANA
DEPARTMENT OF TRANSPORTATION

STRUCTURE DATA TABLE
HEAVY HAUL ROAD

HORIZONTAL SCALE	BRIDGE FILE
NA	-
VERTICAL SCALE	DESIGNATION
NA	1382612
SURVEY BOOK	SHEETS
-	of
CONTRACT	PROJECT
R-36260	1382612

File Name: P:\C3D\14-402\Road\Dwg\Plans\Line DE\Structure Data.dwg Plot Date: 2/1/2018 Plotted By: Harned, Eric

PROJECT	DESIGNATION
1382612	1702513
CONTRACT	BRIDGE FILE
R-36260	-

STRUCTURE INFORMATION				
STRUCTURE	TYPE	SPAN AND SKEW	OVER	STATION
-	CONTINUOUS COMPOSITE STEEL PLATE GIRDER	THREE SPANS: 172'-6", 208'-0", 172'-6" SKEW 45°00'00" RIGHT	LENTZIER CREEK	933+37.38 "PR-DE"

INDIANA DEPARTMENT OF TRANSPORTATION

BRIDGE PLANS

FOR SPANS OVER 20 FEET
HEAVY HAUL TRANSPORTATION CORRIDOR
OVER
LENTZIER CREEK

PROJECT NO. 1382612 P.E.
1382612 R/W
1382612 CONST.

RP XX+XX

New bridge construction to support development of the River Ridge Commerce Center and the Port of Indiana located in Survey 15 & 16 of the Illinois Grant, Utica Township, Clark County, Indiana.

TRAFFIC DATA	TRANSPORTATION CORRIDOR
A.D.T. (2020)	8,800 V.P.D.
A.D.T. (2040)	16,700 V.P.D.
DIRECTIONAL DISTRIBUTION	50%
TRUCKS A.D.T.T. (2020)	2,552 V.P.D.
A.D.T.T. (2040)	4,843 V.P.D.
DESIGN DATA	
DESIGN SPEED	35 M.P.H.
PROJECT DESIGN CRITERIA	NEW CONSTRUCTION (NON-FREEWAY)
FUNCTIONAL CLASSIFICATION	MINOR ARTERIAL
RURAL/URBAN	URBAN (SUBURBAN)
TERRAIN	ROLLING
ACCESS CONTROL	NONE

LATITUDE: 38°20'17"N LONGITUDE: 85°40'12"W

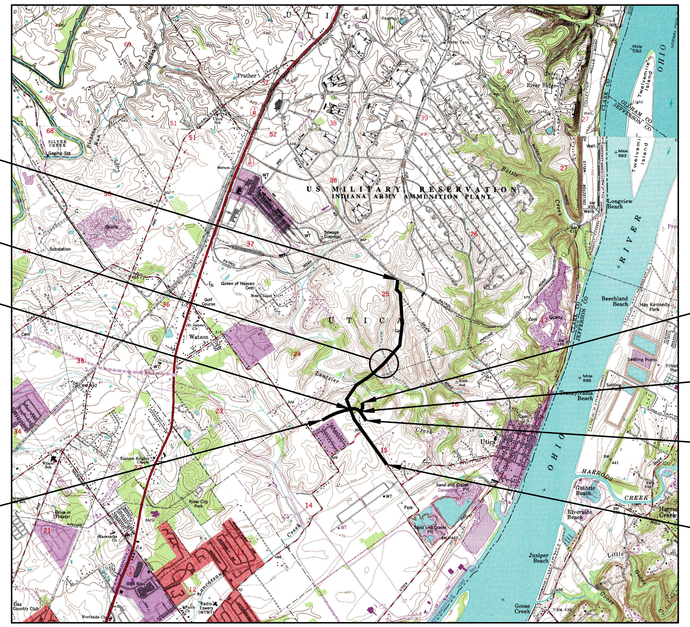
BRIDGE LENGTH :	0.11 MI.
ROADWAY LENGTH :	1.37 MI.
TOTAL LENGTH :	1.48 MI.
MAX GRADE :	5.0%

END PROJECT
HEAVY HAUL CORRIDOR
88+32.65 LINE "PR-DE"

BRIDGE OVER LENTZIER CREEK
71+49.93 LINE "PR-DE"

END CONSTRUCTION
407+92.65 LINE "PR-NM" =
505+56.87 LINE "PR-US"

BEGIN CONSTRUCTION
400+00.00 LINE "PR-NM"



SCALE: 1"=4000'

END CONSTRUCTION
903+96.81 LINE "PR-UC"

BEGIN CONSTRUCTION
900+00.00 LINE "PR-UC"

BEGIN CONSTRUCTION
500+00.00 LINE "PR-US"

BEGIN PROJECT
HEAVY HAUL CORRIDOR
10+00.00 LINE "PR-DE"

[INDIANA DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS DATED 2018 TO BE USED WITH THESE PLANS]

UNITED Consulting
1625 N. Post Road
Indianapolis, Indiana 46219
Phone: 317-895-2585
Fax: 317-895-2596 Web: www.ucindy.com

PLANS PREPARED BY: UNITED CONSULTING (317) 895-2585
PHONE NUMBER
CERTIFIED BY: DATE
APPROVED FOR LETTING: INDIANA DEPARTMENT OF TRANSPORTATION DATE

BRIDGE FILE	
-	
DESIGNATION	
1702513	
SURVEY BOOK	SHEETS
	1 of 8
CONTRACT	PROJECT
R-36260	1382612

File Name: P:\C3D\14-402\Bridge\Bridge over Lentzier Creek\Dwg\Plans\Title Sheet Line DE.dwg Plot Date: 10/24/2017 Plotted By: Kocher, Nick

UTILITIES

CABLE TV
Insight Communications
3408 Industrial Parkway
Jeffersonville, IN 47130
502-357-4400

COMMUNICATIONS
AT&T
866 Rock Creek Road
Plano, IL 60545
630-552-9785

ELECTRIC
Clark County REMC
7810 State Road 60
Sellersburg, IN 47172
812-246-3316

Duke Energy
1619 West Defenbaugh Street
Kokomo, IN 46902
812-375-5828

GAS
Vectren
1 North Main Street
Evansville, IN 47711
812-491-4765

Sewers
Jeffersonville Storm Water Dept.
1420 Bates-Bowyer Avenue
Jeffersonville, IN 47130
(812) 285-6476

Jeffersonville Wastewater Dept.
River Ridge Commerce Center
423 Lewman Way
Jeffersonville, IN 47130
(812) 285-6451

WATER
Indiana American Water
555 E. County Line Road, Suite 201
Greenwood, IN 46143
317-885-2444

Watson Water Company
4106 Utica Sellersburg Road
Jeffersonville, IN 47130
812-246-5416

REVISIONS

GENERAL NOTES

SHEET NO.	DESCRIPTION

INDEX

SHEET NO.	DESCRIPTION
1	Title Sheet
2	Index Sheet
3	Typical Sections
4	Layout
5-7	General Plan
8	Bridge Summary

Indiana 811
Know what's below. Call before you dig.
CALL TWO WORKING DAYS BEFORE YOU DIG
Call 811 or 800-382-5544

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Indianapolis, IN 46219
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Fax 317-895-2596
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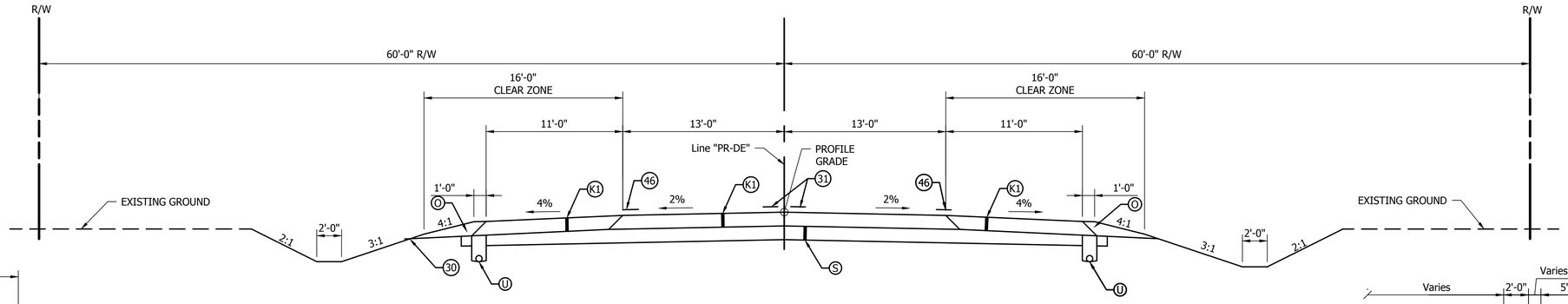
DESIGNED: CJA DRAWN: AJM
CHECKED: SGM CHECKED: CJA

INDIANA
DEPARTMENT OF TRANSPORTATION

INDEX
HEAVY HAUL CORRIDOR OVER LENTZIER CREEK

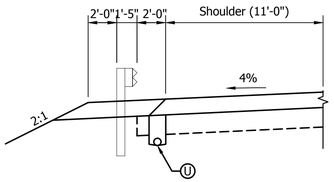
HORIZONTAL SCALE	BRIDGE FILE
AS NOTED	-
VERTICAL SCALE	DESIGNATION
AS NOTED	1702513
SURVEY BOOK	SHEETS
-	2 of 8
CONTRACT	PROJECT
R-36260	1382612

File Name: P:\C3D\14-402\Bridge\Bridge over Lentzier Creek\Dwg\Plans\INDEX-DE.dwg Plot Date: 10/24/2017 Plotted By: Kocher, Nick

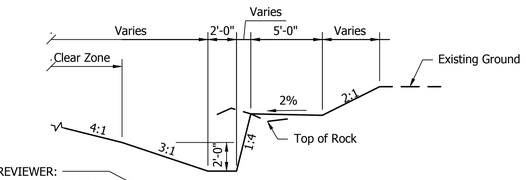


TYPICAL SECTION

Sta. 10+00.00 to Sta. 23+85.00 "PR-DE"
Sta. 44+60.00 to Sta. 48+25.00 "PR-DE"
Sta. 58+75.00 to Sta. 66+24.00 "PR-DE"
Sta. 85+05.00 to Sta. 88+44.11 "PR-DE"

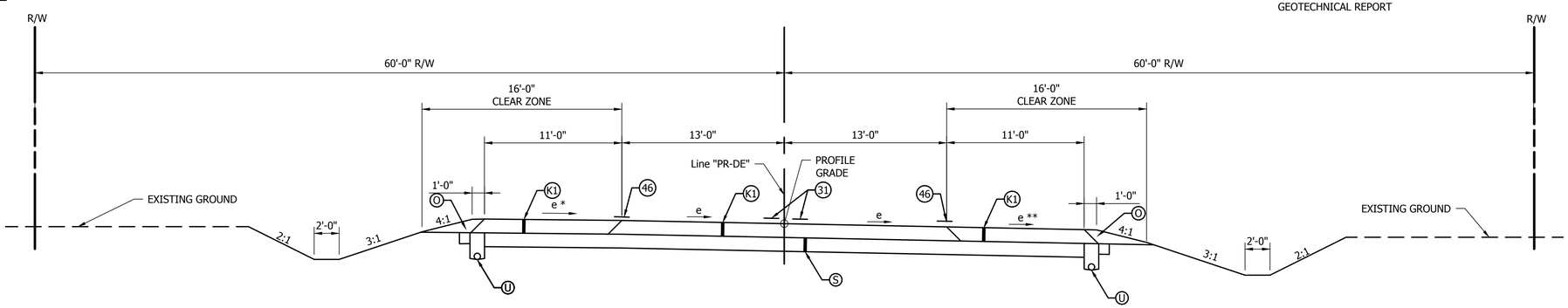


TYPICAL GUARDRAIL SECTION



NOTE TO REVIEWER:
LIMITS TO BE DETERMINED
AFTER WE RECEIVE THE
GEOTECHNICAL REPORT

TYPICAL ROCK CUT DITCH



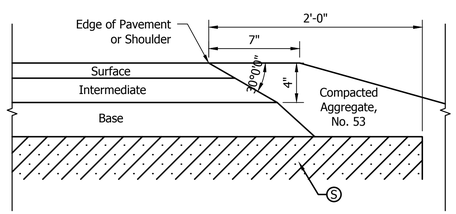
* High Side Shoulder - If e is 4% or less, grade shoulder at 4% down.
If e is greater than 4% and less than or equal to 6%, grade shoulder at 2% down.
If e greater than 6%, grade shoulder at 1% up.

** Low Side Shoulder - If e is 4% or less, grade shoulder at 4% down.
If e is greater than 4%, grade shoulder in plane with the mainline pavement.

SUPERELEVATION SECTION

Sta. 23+85.00 to Sta. 44+60.00 "PR-DE"
Sta. 48+25.00 to Sta. 58+75.00 "PR-DE"
Sta. 66+24.00 to Sta. 85+05.00 "PR-DE"

Curve to the right shown, curves to the left reversed.



SAFETY EDGE DETAIL (NOT TO SCALE)

LEGEND

- (K1) Full Depth Pavement
  165#/syd QC/QA-HMA, 4, 76, Surface, 9.5mm
  275#/syd QC/QA-HMA, 4, 76, Intermediate, 19.0mm
  440#/syd QC/QA-HMA, 4, 64, Base, 25.0mm
  250#/syd QC/QA-HMA, 5, 76, Intermediate, OG 19.0mm
  440#/syd QC/QA-HMA, 4, 64, Base, 25.0mm
- (S) Subgrade Treatment, Type IB (Lime)
- (U) Underdrains
- (30) Seeding, U
- (31) Line, Thermoplastic, Solid, Yellow, 4"
- (46) Line, Thermoplastic, Solid, White, 4"
- (O) Compacted Aggregate, No. 53

FOR INFORMATION ONLY
(SEE ROAD PLANS)

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DESIGNED: JRA | DRAWN: EAM
CHECKED: MAT | CHECKED: MAT

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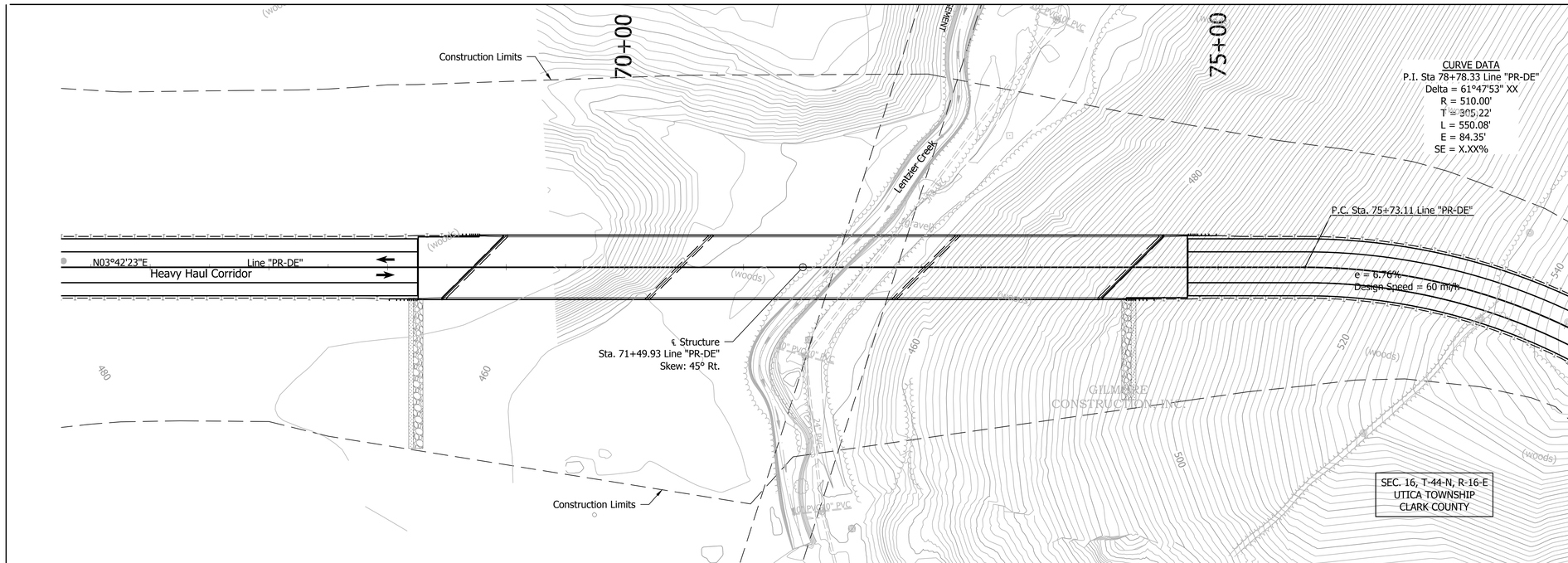
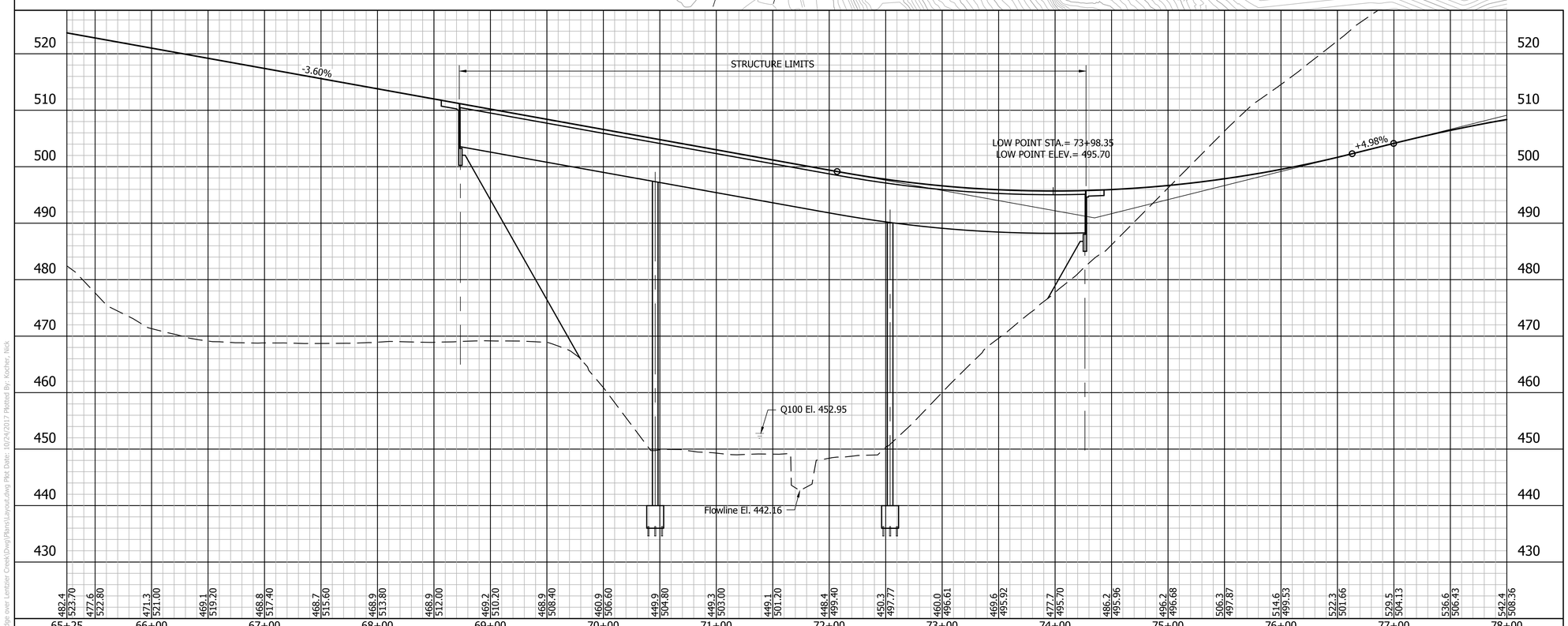
DEPARTMENT OF TRANSPORTATION

TYPICAL CROSS SECTIONS
TRANSPORTATION CORRIDOR

HORIZONTAL SCALE	BRIDGE FILE
1" = 5'	XX
VERTICAL SCALE	DESIGNATION
1"=5'	1382612
SURVEY BOOK	SHEETS
	3 of 8
CONTRACT	PROJECT
R-36260	1382612

File Name: P:\C3D\14-402\Road\Dwg\Plans\Line DE\Typical Line DE.dwg Plot Date: 10/12/2017 Plotted By: Andrews, Jeff





EXISTING STRUCTURE

NONE

HYDRAULIC DATA

Drainage Area:	5.3 sq. mi.
1% Annual EP Elevation:	452.95 (NAVD)
1% Annual EP Flow:	1,700 cfs
0.2% Annual EP Elevation:	454.15 (NAVD)
0.2% Annual EP Flow:	2,380 cfs

PROPOSED STRUCTURE HYDRAULIC SUMMARY

Miniumum Low Structure Elevation:	488.5 (NAVD)
Gross Waterway Area Opening Below	
1% Annual EP:	762 sft
1% Annual EP Road Overflow Area:	0 sft
1% Annual EP Average Velocity:	2.58 fps
1% Annual EP Backwater:	0.12 ft
0.2% Annual EP Average Velocity:	2.78 fps
0.2% Annual EP Backwater:	0.14 ft

PROPOSED STRUCTURE SCOUR SUMMARY

Flow Line Elevation:	442.16 (NAVD)
1% Annual EP Contraction Scour:	0.0 ft
1% Annual EP Total Scour:	8.0 ft
1% Annual EP Low Scour Elevation:	434.16 (NAVD)
1% Annual EP Maxiumum Velocity:	6.07 fps
0.2% Annual EP Contraction Scour:	0.0 ft
0.2% Annual EP Total Scour:	8.0 ft
0.2% Annual EP Low Scour Elevation:	434.16 (NAVD)
0.2% Annual EP Maximum Velocity:	6.43 fps

NOTES:
For guardrail limits and side ditch grades, see Road Plan and Profile Sheet.
For alignment references, benchmarks, and topo references, see Road Plans.

HEAVY HAUL CORRIDOR OVER
LENTZIER CREEK
CONTINUOUS COMPOSITE STEEL
PLATE GIRDER BRIDGE
3 SPANS: 172'-6", 208'-0", 172'-6"
SKEW: 45°00'00" RT
51'-4" CLEAR ROADWAY
CLARK COUNTY

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1625 N. Post Road
Indianapolis, IN 46219
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Fax 317-895-2596
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CHECKED: SGM CHECKED: CJA

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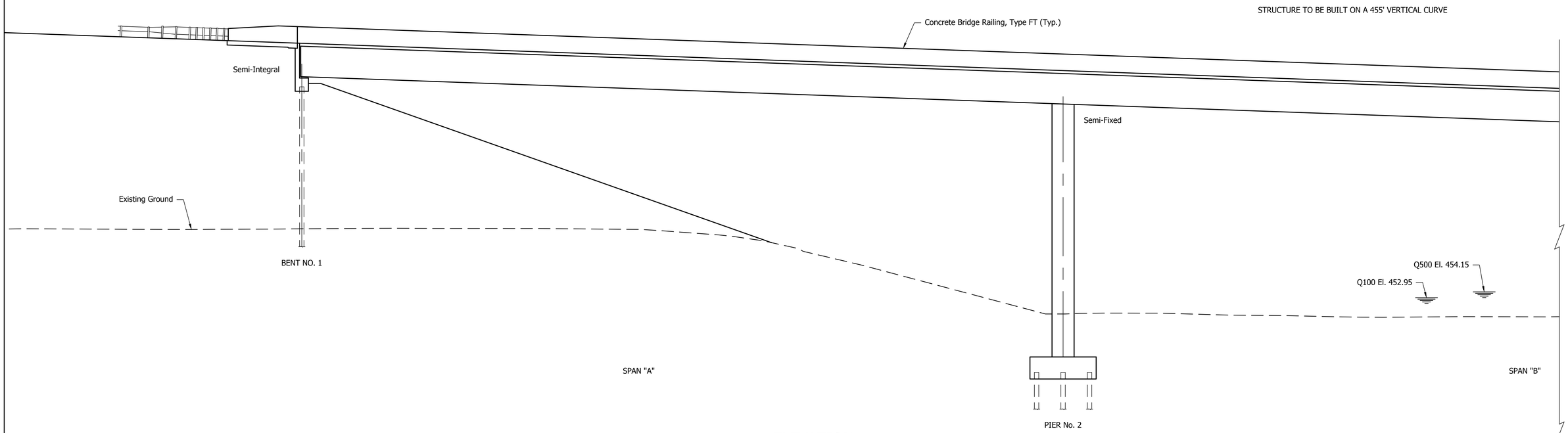
DEPARTMENT OF TRANSPORTATION

LAYOUT
HEAVY HAUL ROAD OVER LENTZIER CREEK

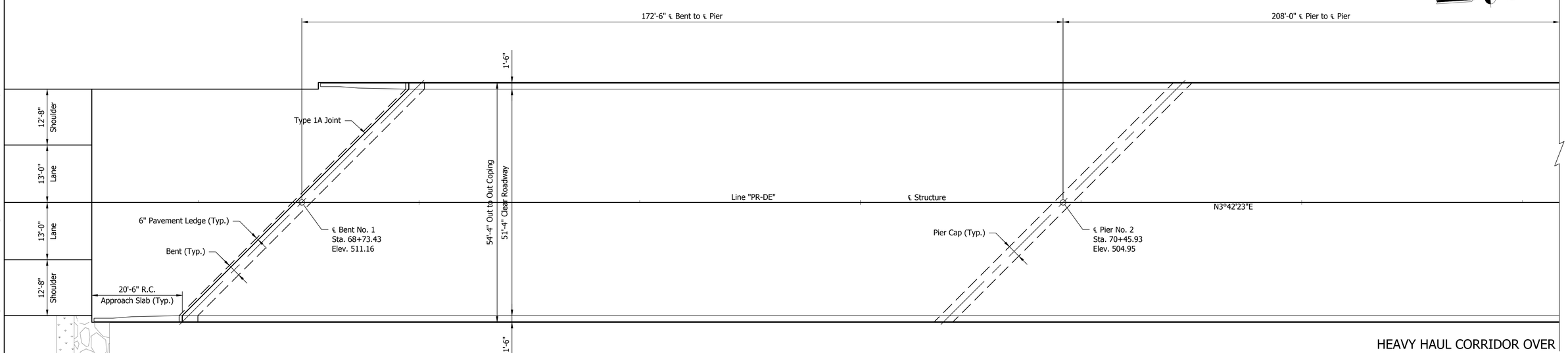
HORIZONTAL SCALE	BRIDGE FILE
1" = 50'	-
VERTICAL SCALE	DESIGNATION
1" = 10'	1702513
SURVEY BOOK	SHEETS
-	4 of 8
CONTRACT	PROJECT
R-36260	1382612

File Name: P:\CD\14-402\Bridge\Bridge over Lentzier Creek\Dwg\Plans\Layout.dwg Plot Date: 10/24/2017 Plotted By: Kocher, Nick



ELEVATION

Scale: 3/32" = 1'-0"



PLAN

Scale: 3/32" = 1'-0"

HEAVY HAUL CORRIDOR OVER
LENTZIER CREEK
CONTINUOUS COMPOSITE STEEL
PLATE GIRDER BRIDGE
3 SPANS: 172'-6", 208'-0", 172'-6"
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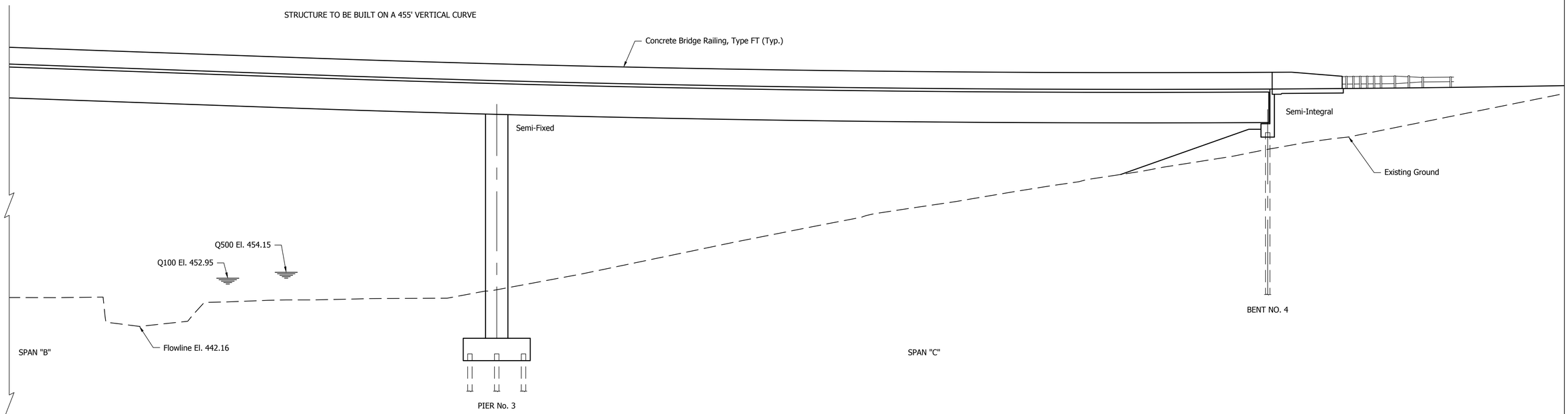
DEPARTMENT OF TRANSPORTATION

GENERAL PLAN
HEAVY HAUL CORRIDOR OVER LENTZIER CREEK

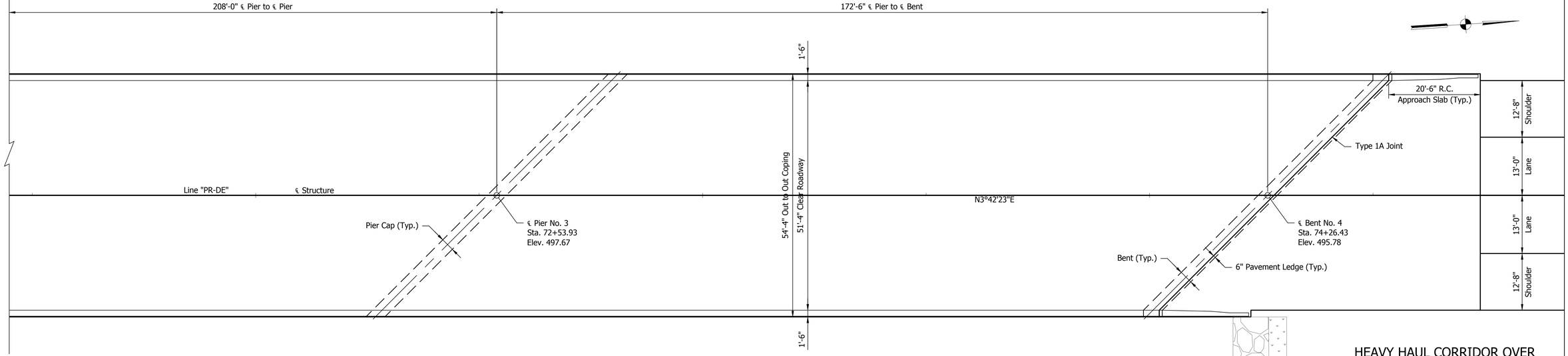
HORIZONTAL SCALE	BRIDGE FILE
AS NOTED	-
VERTICAL SCALE	DESIGNATION
AS NOTED	1702513
SURVEY BOOK	SHEETS
-	5 of 8
CONTRACT	PROJECT
R-36260	1382612

File Name: P:\C3D\14-402\Bridge\Bridge over Lentzier Creek\Dwg\Plans\General Plan.dwg Plot Date: 10/24/2017 Plotted By: Kocher, Nick



ELEVATION

Scale: 3/32" = 1'-0"



PLAN

Scale: 3/32" = 1'-0"

HEAVY HAUL CORRIDOR OVER
LENTZIER CREEK
CONTINUOUS COMPOSITE STEEL
PLATE GIRDER BRIDGE
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GENERAL PLAN
HEAVY HAUL CORRIDOR OVER LENTZIER CREEK

HORIZONTAL SCALE	BRIDGE FILE
AS NOTED	-
VERTICAL SCALE	DESIGNATION
AS NOTED	1702513
SURVEY BOOK	SHEETS
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CONTRACT	PROJECT
R-36260	1382612

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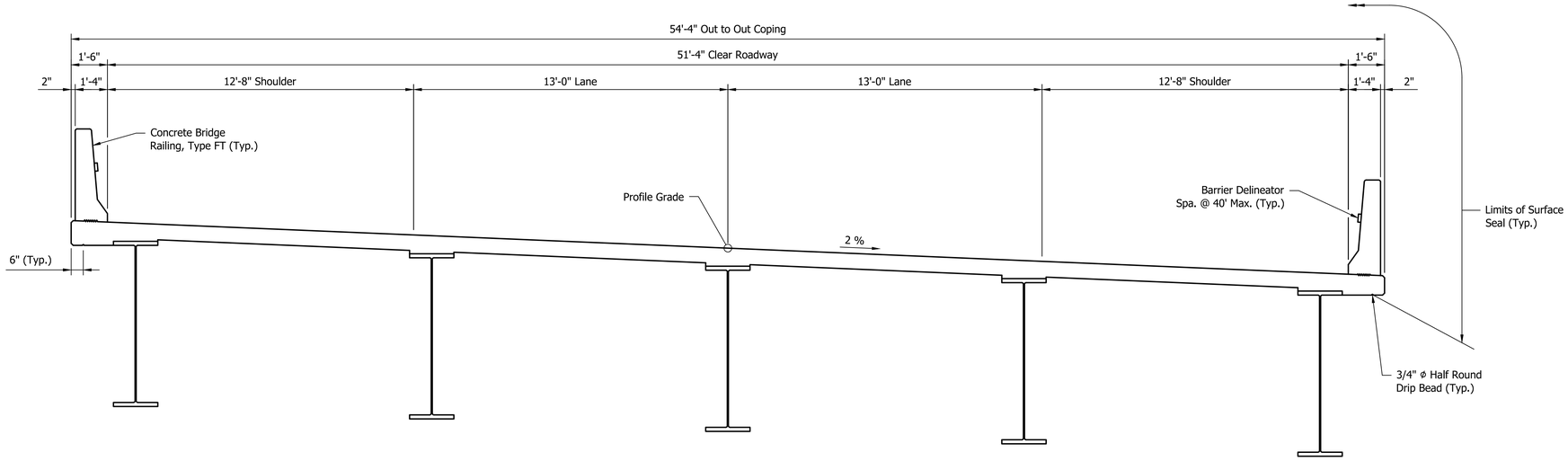

TYPICAL SECTION

Scale: 3/8" = 1'-0"

GENERAL NOTES

Reinforcing steel covering to be 2 1/2" in the top and 1" minimum in the bottom of floor slabs, 3" in footings except bottom steel which shall be 4", and 2" in all other parts, unless noted.

Surface seal all exposed new concrete surfaces of bents, top of bridge deck, face of deck coping, all exposed surfaces of concrete railings and railing transitions, and underside of deck to the face of exterior beam. (Est. Quantity = 15,861 sft. Per Bridge)

DESIGN DATA

Superstructure and substructure designed for HL-93 Loading, in accordance with the AASHTO LRFD Bridge Design Specifications, 6th Edition, 2012, and its subsequent interims and designed for Michigan Truck Train Live Load in accordance with INDOT Design Manual Section 403-3.0. Designed for actual dead load plus 15 psf for S.I.P. forms and 35 psf for future wearing surface. Slab designed with 1/2" sacrificial wearing surface.

SEISMIC DESIGN DATA

Seismic Performance Zone 1
Acceleration Coefficient = 0.126
Seismic Site Class D

ULTIMATE DESIGN STRESSES

Class "C" Concrete	f'c = 4,000 psi
Reinforcing Steel (Grade 60)	fy = 60,000 psi

CONSTRUCTION LOADING

The exterior girder has been checked for strength, deflection, and overturning using the construction loads shown below. Cantilever overhang brackets were assumed for support of the deck overhang past the edge of the exterior girder. The finishing machine was assumed to be supported 6" outside the vertical coping form. The top overhang brackets were assumed to be located 6" past the edge of the vertical coping form. The bottom overhang brackets were assumed to be braced against the intersection of the girder bottom flange and web.

Deck Falsework Loads:	Designed for 15 lb/sft for permanent metal stay-in-place deck forms, removable deck forms, 2' exterior walkway.
Construction Live Load:	Designed for 20 lb/sft extending 2' past the edge of coping and 75 lb/ft vertical force applied at a distance of 6" outside the face of coping over a 30' length of the deck centered with the finishing machine.
Finishing Machine Load:	4,500 lb distributed over 10' along the coping.
Wind Load:	Structure designed for 70 mph horizontal wind loading in accordance with LRFD 3.8.1.

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DEPARTMENT OF TRANSPORTATION

GENERAL PLAN
HEAVY HAUL CORRIDOR OVER LENTZIER CREEK

HORIZONTAL SCALE	BRIDGE FILE
AS NOTED	-
VERTICAL SCALE	DESIGNATION
AS NOTED	1702513
SURVEY BOOK	SHEETS
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R-36260	1382612

File Name: P:\C3D\14-402\Bridge\Bridge over Lentzier Creek\Dwg\Plans\General Plan.dwg Plot Date: 2/1/2018 Plotted By: Kocher, Nick

SUMMARY OF BRIDGE QUANTITIES

ITEM	CONCRETE CLASS C SUPERSTR	CONCRETE CLASS A SUBSTR	CONCRETE CLASS C SUBSTR	CONCRETE CLASS B IN FTG.	CONCRETE CLASS C RAILING	REINF. BARS	EPOXY COATED REINF. BARS	STRUCT. STEEL	DRILLED HOLE 1"Φ	BRIDGE DECK OVERLAY	BRIDGE DECK OVERLAY ADDITIONAL*	BRIDGE PATCHING, FULL DEPTH*	BRIDGE DECK PATCHING, PARTIAL DEPTH	HYDRO - DEMOLITION	SURFACE MILLING	AGGREGATE FOR END BENT BACKFILL	FIELD DRILLED HOLES IN CONCRETE	STEEL RAILING PF-1	CONCRETE RAILING PF-1	CONCRETE BRIDGE RAILING TRANSITION TPF-1	I BEAM TYPE III	SHEAR STUD CONNECTORS	SURFACE SEAL **	EPOXY COATED THREADED BAR ASSEMBLIES	R.C. BRIDGE APPROACH 12 Inch	DENSE GRADED SUBBASE 6 Inch
	cys.	cys.	cys.	cys.	lft.	lbs.	lbs.	lbs.	each	sys.	cys.	sft.	sft.	sys.	sys.	cys.	each	lft.	cys.	each	lft.	each	sft.	each	sys.	cys.
BENT NO. 1																										
PIER NO. 2																										
PIER NO. 3																										
BENT NO. 4																										
SUPERSTRUCTURE																										
NORTH APPROACH																										
SOUTH APPROACH																										
WEST BRIDGE RAIL																										
EAST BRIDGE RAIL																										
Totals																										

** ESTIMATED QUANTITY
* UNDISTRIBUTED QUANTITIES

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DEPARTMENT OF TRANSPORTATION

BRIDGE SUMMARY
HEAVY HAUL CORRIDOR OVER LENTZIER CREEK

HORIZONTAL SCALE	BRIDGE FILE
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VERTICAL SCALE	DESIGNATION
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CONTRACT	PROJECT
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File Name: P:\C3D\14-402\Bridge\Bridge over Lentzier Creek\Dwg\Plans\Bridge_Summary.dwg Plot Date: 10/24/2017 Plotted By: Kocher, Nick

Appendix B: Early Coordination

- Early Coordination Request Letter and Mailing List – April 29, 2016
- Early Coordination Responses
- Re-Coordination Letter – October 16, 2017

April 29, 2016

Example Early Coordination Letter

Re: Des. No. 1382612
Heavy Haul Transportation Corridor
Port of Indiana – Jeffersonville to SR 265
Utica Township, Clark County, Indiana
Project No. 2013.01857

Dear Ms. Hardisty:

The Indiana Department of Transportation (INDOT), in partnership with the Federal Highway Administration (FHWA), the Indiana Economic Development Corporation, the Ports of Indiana, the Board of Commissioners of Clark County, the City of Jeffersonville Redevelopment Commission, and the River Ridge Development Authority (RRDA), is developing a federal-aid road project to improve connectivity for the Ports of Indiana-Jeffersonville (Port) with other regional transportation assets. The proposed project is located in Utica Township, Clark County, Indiana.

The area is located on the Jeffersonville and Charlestown USGS 7.5 Minute Quadrangle Maps in Tracts 6-7, 14-17, 24-27, 38-40, and 52-53 and is within the Louisville Metropolitan Planning Area (LMPA), which consists of nine counties in Kentucky (Jefferson, Oldham, Trimble, Henry, Shelby, Spencer, Nelson, Bullit and Meade) and four Indiana counties (Washington, Harrison, Floyd and Clark). Preliminary corridor studies have identified an approximately 1.3-mile wide corridor between the Port of Indiana, Jeffersonville and State Road (SR) 265 to establish roadway alignment alternatives for the project. The alternatives are currently being developed and evaluated within the project corridor based upon environmental studies and coordination. Various maps and aerial photographs are enclosed showing the area being investigated.

The project area has several major generators of traffic that consist primarily of heavy trucks or heavy haul vehicles. However, the road network in the area is primarily made of up of local facilities not designed to handle such vehicle loading. Heavy haul vehicles (often referred to as Michigan truck trains) are generally 60 feet or more in length with a gross vehicle weight of 134,000 pounds, as compared to Indiana legal load limits of 80,000 pounds gross vehicle weight. Heavy haul vehicles require the design of facilities to take into account the maximum weight of the heavy haul vehicles and the anticipated number of heavy haul vehicles utilizing the facility on a daily basis. The resulting difference between a facility designed to carry heavy haul vehicles and standard load trucks is often a significant difference in pavement thickness. Based on current and predicted rapid industrial and commercial development associated with the major traffic generators in the project area it is anticipated that truck traffic will increase by 129 percent over the next 20 years.

The need for the proposed project is due to the current and predicted rapid industrial and commercial development in the area that would result in a significant increase in volume of heavy haul vehicles mixing with local traffic. This growth, combined with the lack of connectivity and suitable roadways for heavy haul vehicles in the area, indicates a need for the proposed project. The purpose of the proposed project is to provide a route built specifically for heavy haul vehicles that provides continuous connection between the RRCC and the Port via the new SR 265/Old Salem Road interchange.

The proposed project corridor generally extends north from the Port to the SR 265/Old Salem Road interchange. The area is a combination of forest, open grass, industrial, and farmed areas. The forested areas are generally on steep slopes. Few existing roads are located within this area. The proposed project corridor is bounded by the SR 265 corridor at the northern project limits. Lentzier Creek and several tributaries are located within the project corridor.

The proposed project consists of the construction of a 3-lane road designed to "heavy haul" specifications. The proposed road would have a design speed of 35 miles per hour with two 12-foot travel lanes and one 11- to 12-foot auxiliary lane. The road would likely be constructed on new alignment at a total length of approximately 1.75 miles. While only three lanes would be constructed, right-of-way would be wide enough to allow for future expansion to five lanes if required by traffic demand.

A Red Flag Investigation has been conducted to identify potential infrastructure, water, mining, hazardous materials, cultural resources, and ecological resources that may impact or be impacted by the proposed project. Potential concerns and recommendations are listed below:

- Noting the potential location of the project within the karst region of Indiana, as defined by the Karst Memorandum of Understanding (Karst MOU), an investigation of karst features in the project corridor and determination of potential impacts will be conducted.

- Multiple water resources including National Wetland Inventory (NWI) wetlands and streams were mapped with the project corridor. A wetland delineation and waters investigation will be completed to identify resources within the project corridor.

- Coordination will be conducted with the Indiana Department of Natural Resources and the US Fish and Wildlife Service regarding the potential for threatened and endangered species in the proposed project area. The Gray Bat (*Myotis grisescens*), the Indiana Bat (*Myotis sodalis*), and the Northern Long-Eared Bat (*Myotis septentrionalis*) have all been identified as potentially occurring in or near the proposed project corridor.

- Two potential trails, Ohio River Greenway to Charlestown State Park and Porter Road Corridor, run through the proposed project area. Both are managed by the City of Jeffersonville. Appropriate coordination should occur with the City of Jeffersonville if work is proposed along either of these corridors.

- One natural gas pipeline, owned by Indiana Gas Co. Inc., crosses the proposed project area. Appropriate coordination should occur with the INDOT utilities coordinator if excavation is to occur in the area.

- Several potential hazardous materials sites were identified. Environmental Site Assessments will be conducted to further investigate several of these areas.

- Based on preliminary review of the State Historic Architectural and Archaeological Research Database (SHAARD) and the Clark County Interim Report, several historical sites and structures are located within or near the project corridor. A Historic Property Report and an Archaeology Report will be prepared for

the project. The Section 106 process will further investigate potential impacts to historic sites and structures.

This letter is part of the early coordination phase of the environmental review process. You are asked to review this information and provide any comments you may have relative to anticipated impacts of the project on areas in which you have jurisdiction or special expertise. We will incorporate your comments into a study of the project's environmental impacts. To facilitate the development of this project, you are asked to reply within 30 days of receipt of this letter. If no response is received by that date, it will be assumed you have no comments at the present time.

Your timely cooperation in the development of this project is appreciated. For general inquiries please contact myself at (317) 234-4916 or by e-mail at rbales@indot.in.gov or Michelle Allen of FHWA at (317) 226-7344 or by e-mail at michelle.allen@dot.gov. However, please contact our consultant, Leah Boits of American Structurepoint at (317) 547-5580 or by e-mail at lboits@structurepoint.com for coordination purposes, questions, or if additional information is needed.

Respectfully,

Ron Bales
Environmental Policy Manager
Indiana Department of Transportation

Enclosures

- State Location Map
- USGS Topographic Mapping
- 2014 Aerial Photography
- Red Flag Investigation Infrastructure Map
- Red Flag Investigation Water Resources Map
- Red Flag Investigation Mining/Mineral Exploration Map
- Red Flag Investigation Hazardous Material Concerns Map
- Early Coordination Distribution List

State Location map found in Appendix B

Early Coordination Mailing List

Project Name:	Transportation Corridor
Route/Street:	New Alignment
DES No:	1382612
Location:	Utica Township, Clark County, Indiana
ASI Project No:	2013.01857

Salu	Name	Title	Attn:	Agency/Company	Address 1	Address 2	City	State	Zip	Delivery Method
Mr. Pruitt	Mr. Scott Pruitt	Field Supervisor		US Fish and Wildlife Service	Bloomington Field Office	620 South Walker Street	Bloomington	Indiana	47403-2121	Email
Ms. Hardisty	Ms. Jane Hardisty	State Conservationist		US Natural Resources Conservation Service	6103 Lakeside Boulevard		Indianapolis	Indiana	46278	Mail
Ms. Hasenmueller	Ms. Nancy Hasenmueller	Head		Indiana Geological Survey	Environmental Geology Section					Email
Mr. Kinder	Mr. James Kinder	Chief Airport Inspector		Indiana Department of Transportation	Office of Aviation					Email
Sir or Madam			Regional Environmental Coordinator	Midwest Regional Office	National Park Service	601 Riverfront Drive	Omaha	Nebraska	68102	Mail
Mr. Marquis	Mr. Rich Marquis	Division Administrator	Michelle Allen	Federal Highway Administration	Federal Office Building Room 254	575 North Pennsylvania Street	Indianapolis	Indiana	46204	Email
Mr. Clark	Mr. Cameron F. Clark	Director	Christie Stanifer, Environmental Review Coordinator	Indiana Dept. of Natural Resources, Division of Fish and Wildlife	273 Government Center West	402 West Washington Street	Indianapolis	Indiana	46204	Email
Sir or Madam		Field Environmental Officer		Chicago Regional Office, US Department of Housing and Urban Development	Metcalfe Federal Building	77 West Jackson Boulevard, Room 2401	Chicago	Illinois	60604	Mail
				Indiana Department of Environmental Management						Online Form
				Indiana Department of Environmental Management						Online Locator
Mr. Sullivan	Mr. Jim Sullivan	Chief, Groundwater Section		Indiana Department of Environmental Management		100 North Senate Avenue	Indianapolis	Indiana	46204	Mail
Mr. Bales	Mr. Ron Bales	Environmental Policy Manager		INDOT Environmental Services	642 Government Center North	100 North Senate Avenue	Indianapolis	Indiana	46204	Email
Mr. Clark	Mr. Rickie Clark	Manager, Public Hearings		Indiana Department of Transportation	100 North Senate Avenue, Room 642		Indianapolis	Indiana	46204	Email

Early Coordination Mailing List

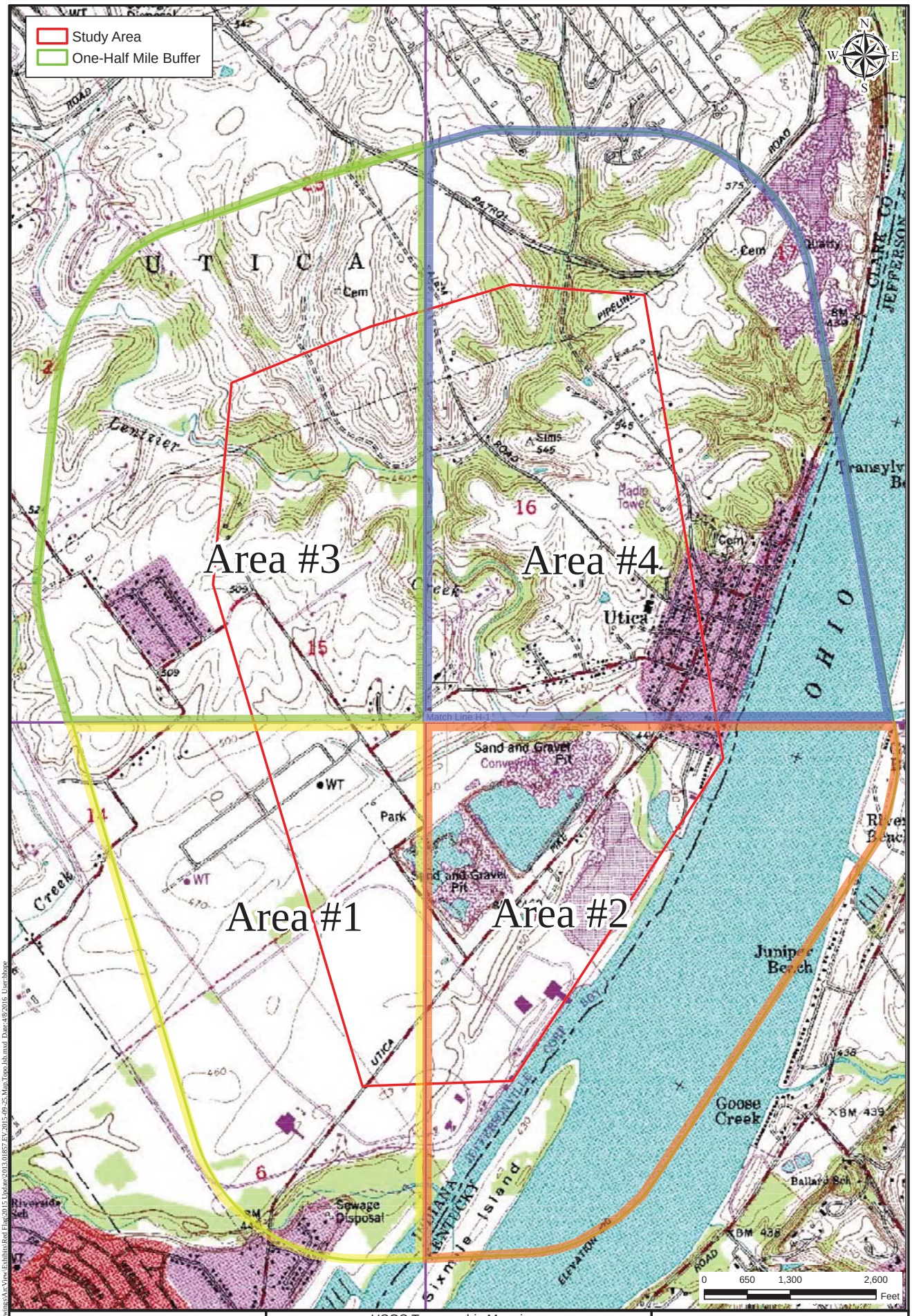
Project Name:	Transportation Corridor
Route/Street:	New Alignment
DES No:	1382612
Location:	Utica Township, Clark County, Indiana
ASI Project No:	2013.01857

Salu	Name	Title	Attn:	Agency/Company	Address 1	Address 2	City	State	Zip	Delivery Method
Mr. Dye	Mr. David Dye	Environmental Scoping Manager		INDOT Seymour District Office		185 Agrico Lane	Seymour	Indiana	47274	Email
Ms. Glossa	Ms. Melany Glossa	Forest Supervisor		Hoosier National Forest	US Forest Service	811 Constitution Avenue	Bedford	Indiana	47421	Mail
Sir or Madam		Chief, Environmental Resources	CEPMP-P-E	Department of the Army	Louisville District, Corps of Engineers	P.O. Box 59	Louisville	Kentucky	40201-0059	Mail
Sir or Madam		Chief, Bridge Program Section		Eighth Coast Guard District		1222 Spruce Street	St. Louis	Missouri	63103-2832	Mail
Mr. Crouch	Mr. Andy Crouch	City Engineer		City of Jeffersonville	500 Quartermaster Court		Jeffersonville	Indiana	47130	Mail
Ms. Wahle	Ms. Jennifer Wahle			Kentuckiana Regional Planning and Development Agency	11520 Commonwealth Drive		Louisville	Kentucky	40299	Mail
Mr. Dixon	Mr. Brian Dixon	Highway Engineer		Clark County Highway Department	Clark County Government Building	501 East Court Avenue, Room 404	Jeffersonville	Indiana	47130	Mail
Mr. Moore	Mr. Mike Moore	Mayor		City of Jeffersonville	City Hall, Suite 250	500 Quartermaster Court	Jeffersonville	Indiana	47130	Mail
Mr. Dorman	Mr. Hank Dorman	President		Utica Town Board	726 Utica Charlestown Road		Utica	Indiana	47130	Mail
Mr. Waiz	Mr. Rob Waiz	Director		Jeffersonville Department of Economic Development and Department of Redevelopment	City Hall, Suite 257	500 Quartermaster Court	Jeffersonville	Indiana	47130	Mail
Mr. Corbin	Mr. Shane Corbin	Director		Jeffersonville Department of Planning and Zoning	City Hall, Suite 200	500 Quartermaster Court	Jeffersonville	Indiana	47130	Mail
Mr. Kavanaugh	Mr. Kenny Kavanaugh	Chief of Police		Jeffersonville Police Department	2218 East 10th Street		Jeffersonville	Indiana	47130	Mail

Early Coordination Mailing List

Project Name:	Transportation Corridor
Route/Street:	New Alignment
DES No:	1382612
Location:	Utica Township, Clark County, Indiana
ASI Project No:	2013.01857

Salu	Name	Title	Attn:	Agency/Company	Address 1	Address 2	City	State	Zip	Delivery Method
Sir or Madam				Jeffersonville Storm Water Department	500 Quartermaster Court		Jeffersonville	Indiana	47130	Mail
Ms. Dant Chesser	Ms. Wendy Dant Chesser	President and CEO		One Southern Indiana	4100 Charlestown Road		New Albany	Indiana	47150	Mail
Mr. Acy	Mr. Jerry Acy	Executive Director		River Ridge Commerce Center	6200 East Highway 62	Suite 600	Jeffersonville	Indiana	47130	Mail
Dr. Melin	Dr. Andrew Melin	Superintendent		Greater Clark County Schools	2112 Utica-Sellersburg Road		Jeffersonville	Indiana	47130	Mail
Ms. Gilland	Ms. Kathy Gilland	Principal		Utica Elementary School	210 Maplehurst Drive		Jeffersonville	Indiana	47130	Mail
Mr. Noel	Mr. Jamey Noel	Sheriff		Clark County Sheriff's Office	501 East Court Avenue		Jeffersonville	Indiana	47130	Mail
Mr. Blankenbeker	Mr. David Blankenbeker	Surveyor		Clark County Surveyor's Office	Clark County Government Building	501 East Court Avenue, Room 421	Jeffersonville	Indiana	47130	Mail
Mr. Killen	Mr. Mike Killen	President		Clark County Drainage Board	Clark County Government Building	501 East Court Avenue, Room 421	Jeffersonville	Indiana	47130	Mail
Mr. Stewart	Mr. Scott Stewart	Port Director		Port of Indiana - Jeffersonville	1402 Port Road		Jeffersonville	Indiana	47130	Mail
Ms. Fisher	Ms. Pamela Fisher	Director, Regulatory Affairs		Indiana Economic Development Corporation	One North Capitol, Suite 700		Indianapolis	Indiana	46204	Mail
Mr. Kavanaugh	Mr. Les Kavanaugh	Director		Clark County Emergency Management Agency	110 North Indiana Avenue		Sellersburg	Indiana	47172	Mail
Ms. Ostby	Ms. Susan Ostby			DNR Outdoor Recreation	402 West Washington Street	Room 271W	Indianapolis	Indiana	46204	Mail
Mr. Coffman	Mr. Jack Coffman	President		Clark County Board of Commissioners	501 East Court Avenue		Jeffersonville	Indiana	47130	Mail
Ms. Hollis	Ms. Barbara Hollis	Council President		Clark County Council	501 East Court Avenue		Jeffersonville	Indiana	47130	Mail
Mr. Northam	Mr. Paul Northam	Director		City of Jeffersonville Parks Department	500 Quartermaster Court		Jeffersonville	Indiana	47130	Mail



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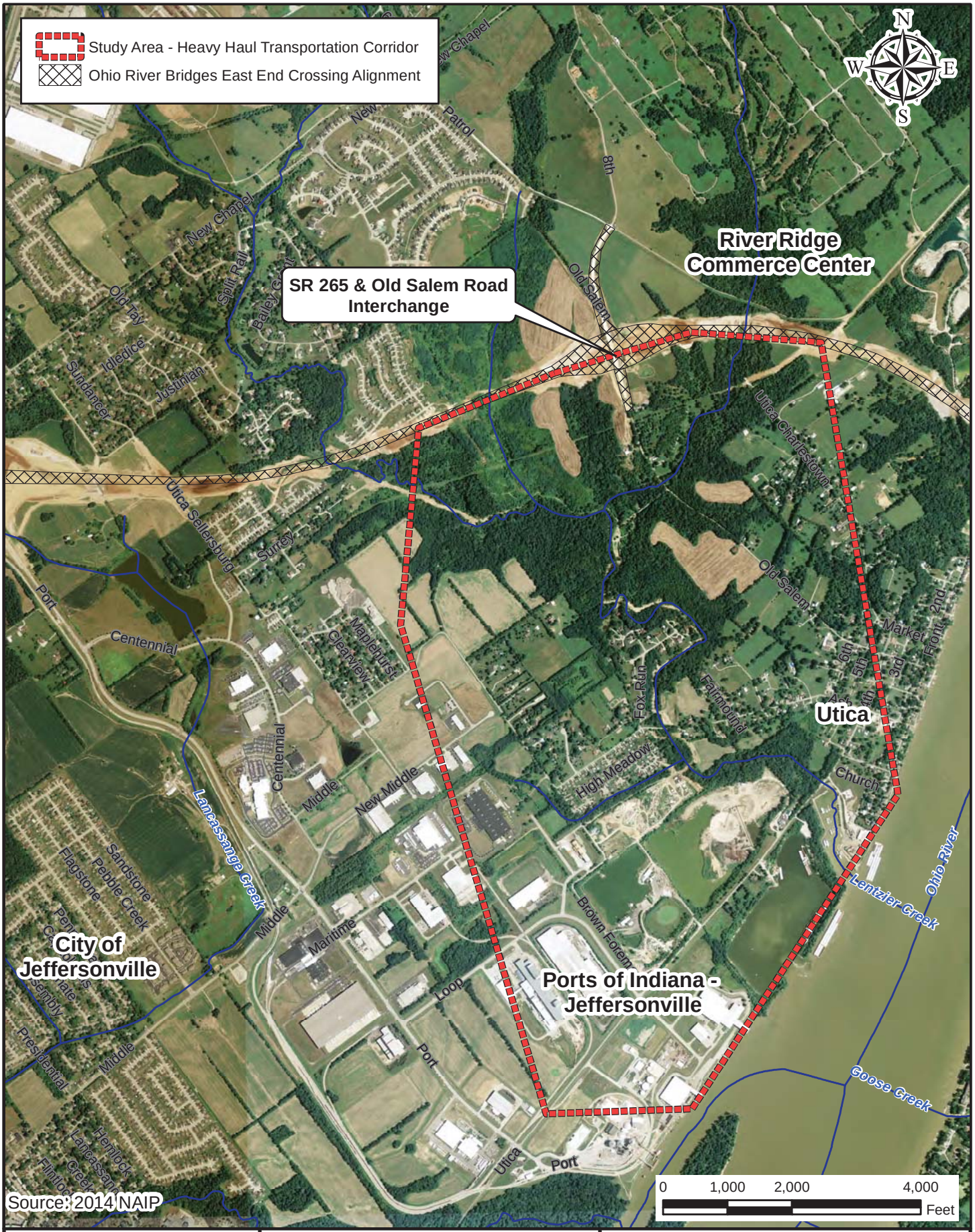
USGS Topographic Mapping
Jeffersonville and Charlestown Quadrangles

Indiana Department of Transportation
Central Office
100 North Senate Avenue
Indianapolis, Indiana 46204

Des. No. 1382612
Transportation Corridor
Location: Jefferson and Utica
Township: Utica
County: Clark
State: Indiana

Date: 04/08/2016



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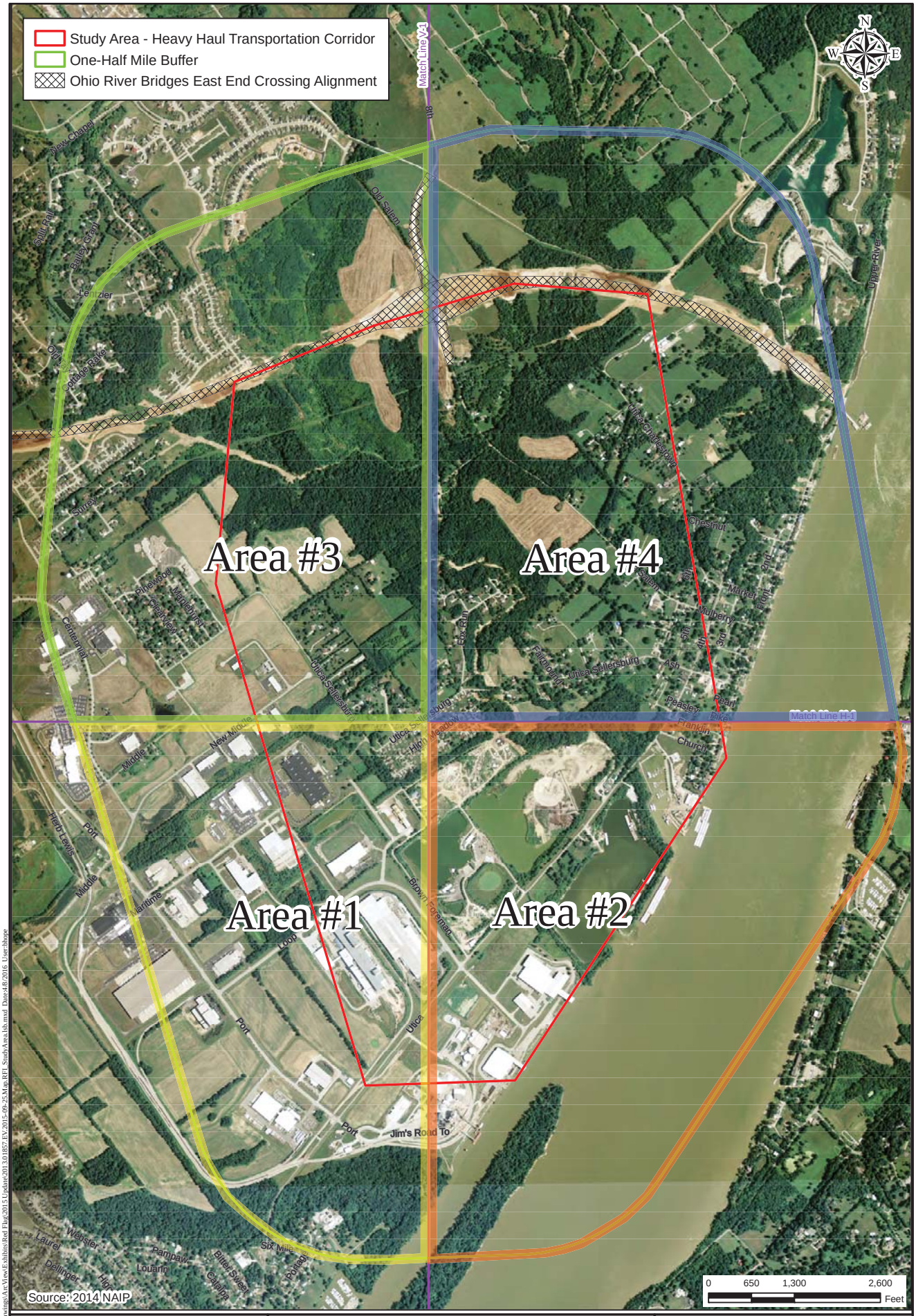
2014 Aerial Photography

Indiana Department of Transportation
Central Office
100 North Senate Avenue
Indianapolis, Indiana 46204

Des. No. 1382612
Transporatation Corridor
Location: Jeffersonville
Township: Utica
County: Clark
State: Indiana

Date: 04/08/2016



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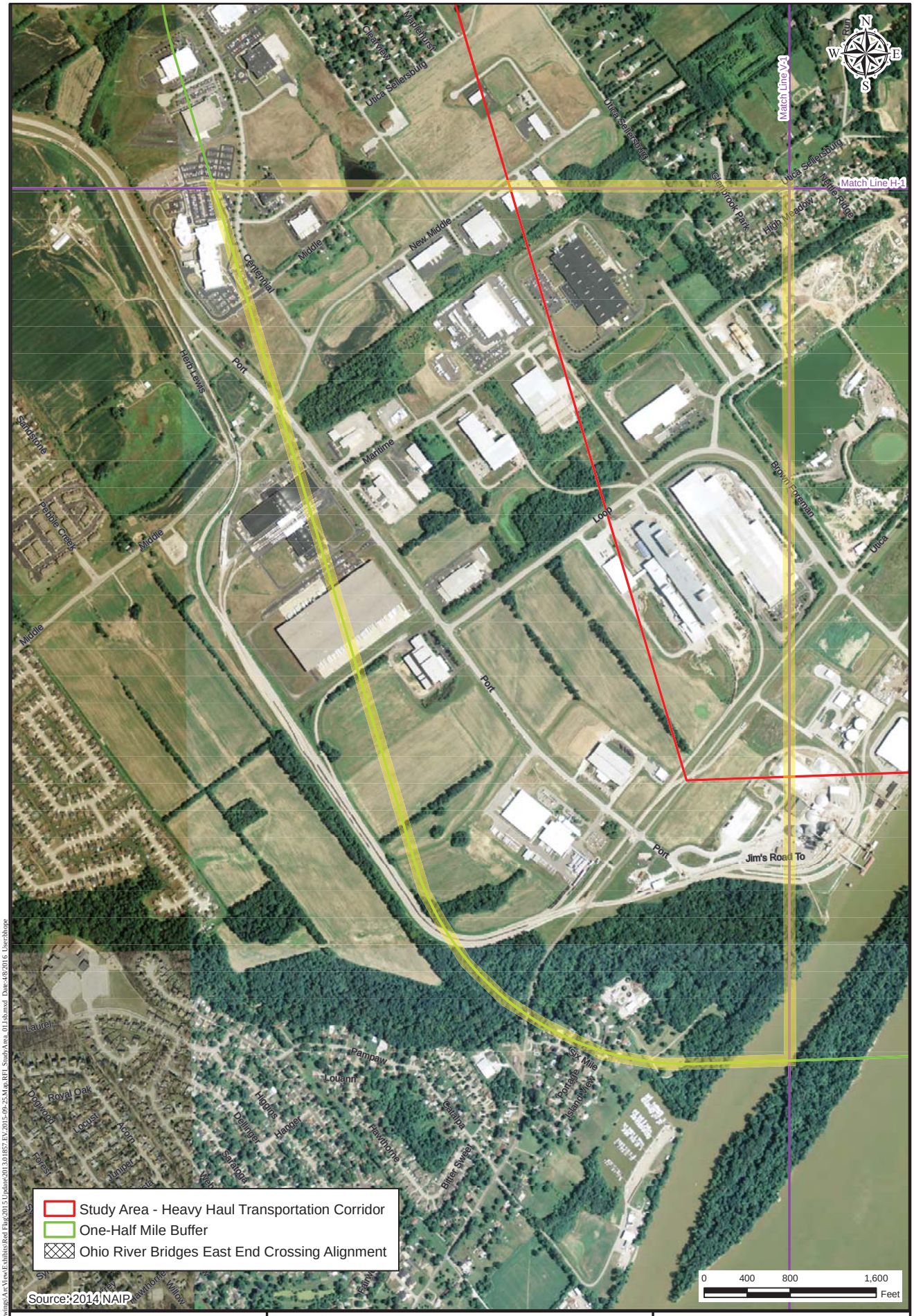
Red Flag Study Area

Indiana Department of Transportation
Central Office
100 North Senate Avenue
Indianapolis, Indiana 46204

Des. No. 1382612
Transportation Corridor
Location: Jefferson and Utica
Township: Utica
County: Clark
State: Indiana

Date: 04/08/2016



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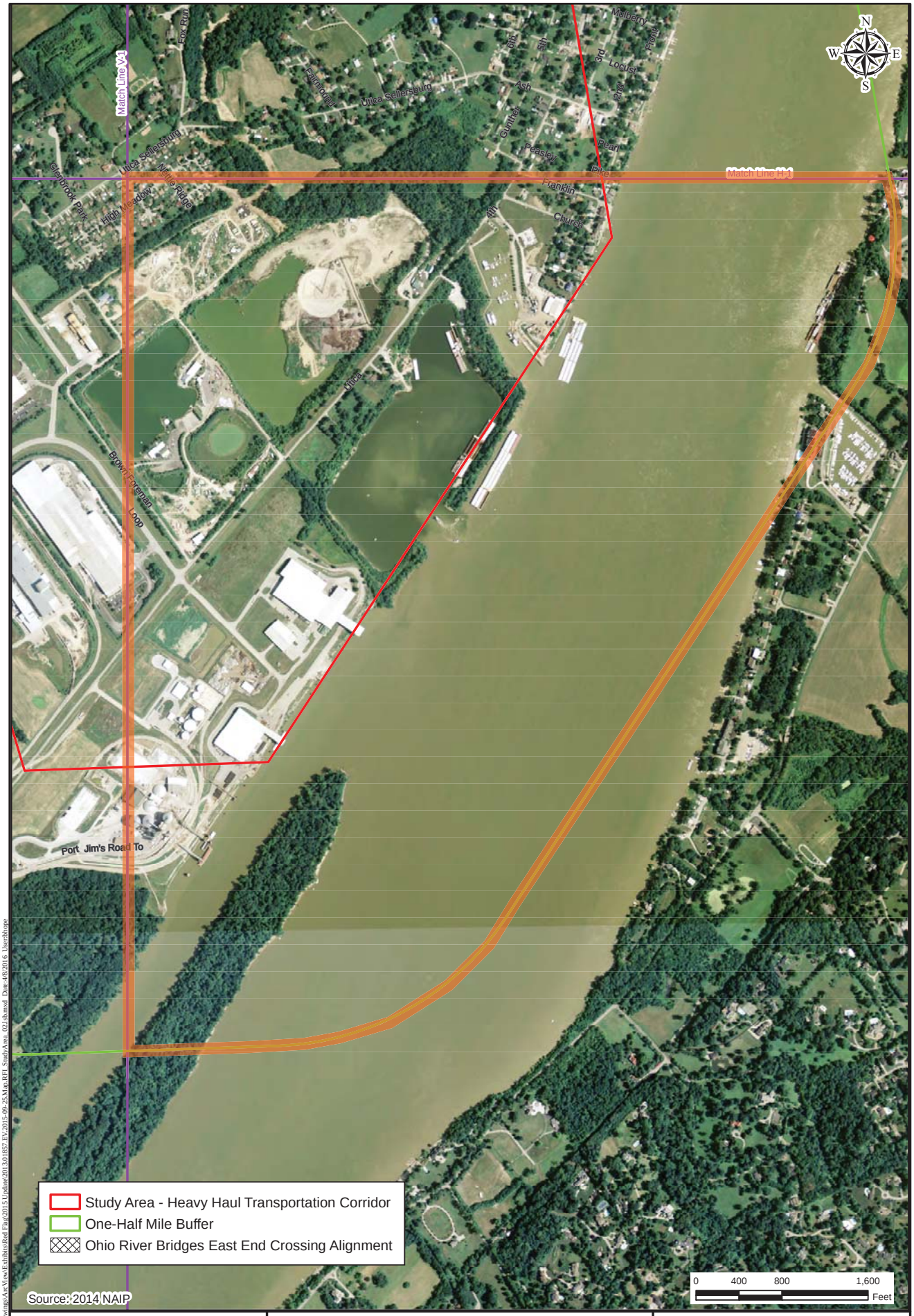
Red Flag Study Area - Area 1 of 4

Indiana Department of Transportation
Central Office
100 North Senate Avenue
Indianapolis, Indiana 46204

Des. No. 1382612
Transportation Corridor
Location: Jefferson and Utica
Township: Utica
County: Clark
State: Indiana

Date: 04/08/2016

Appendix B
Page B-10



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Red Flag Study Area - Area 2 of 4

Indiana Department of Transportation
Central Office
100 North Senate Avenue
Indianapolis, Indiana 46204

Des. No. 1382612
Transportation Corridor
Location: Jefferson and Utica
Township: Utica
County: Clark
State: Indiana

Date: 04/08/2016

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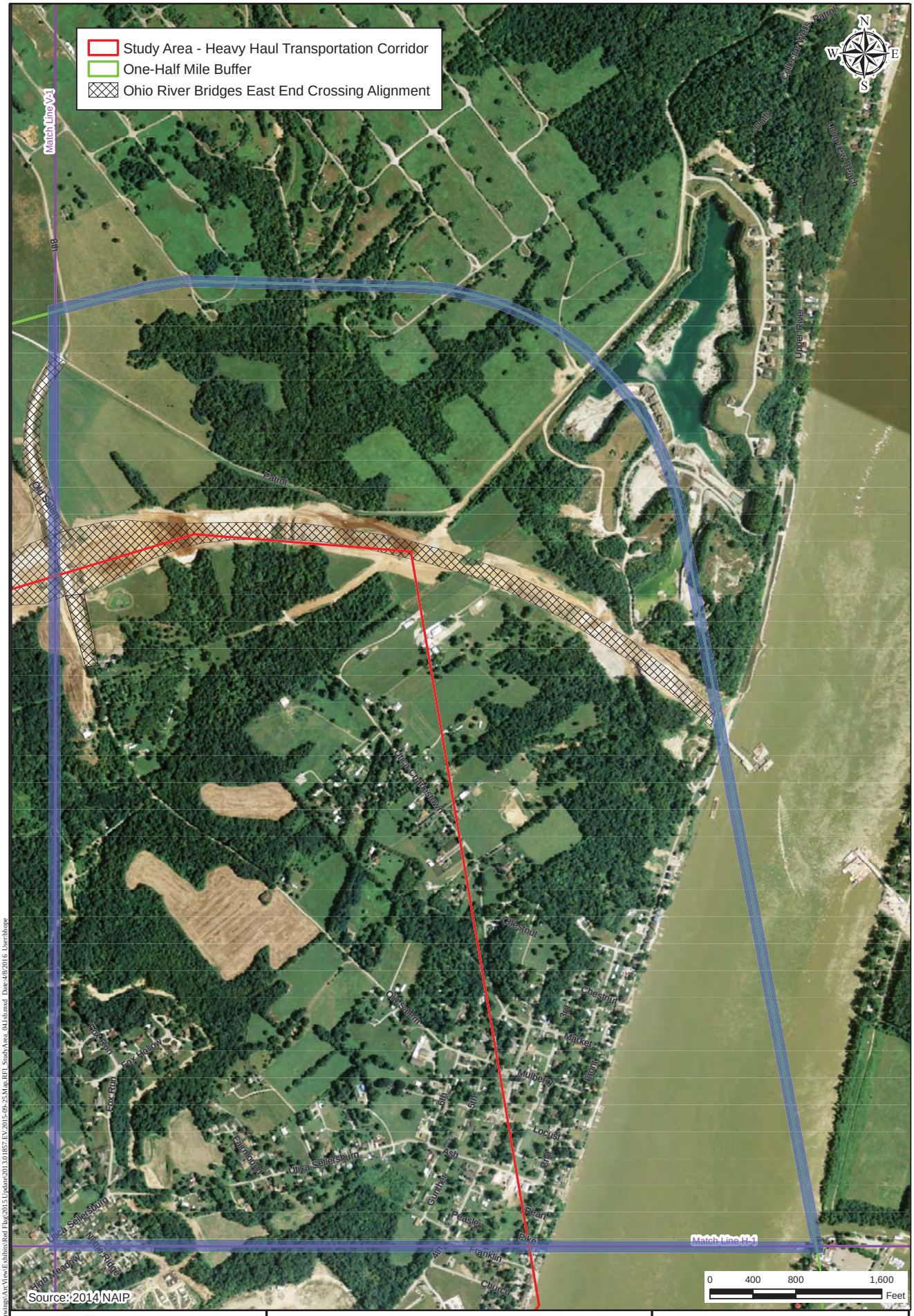
Red Flag Study Area - Area 3 of 4

Indiana Department of Transportation
Central Office
100 North Senate Avenue
Indianapolis, Indiana 46204

Des. No. 1382612
Transportation Corridor
Location: Jefferson and Utica
Township: Utica
County: Clark
State: Indiana

Date: 04/08/2016



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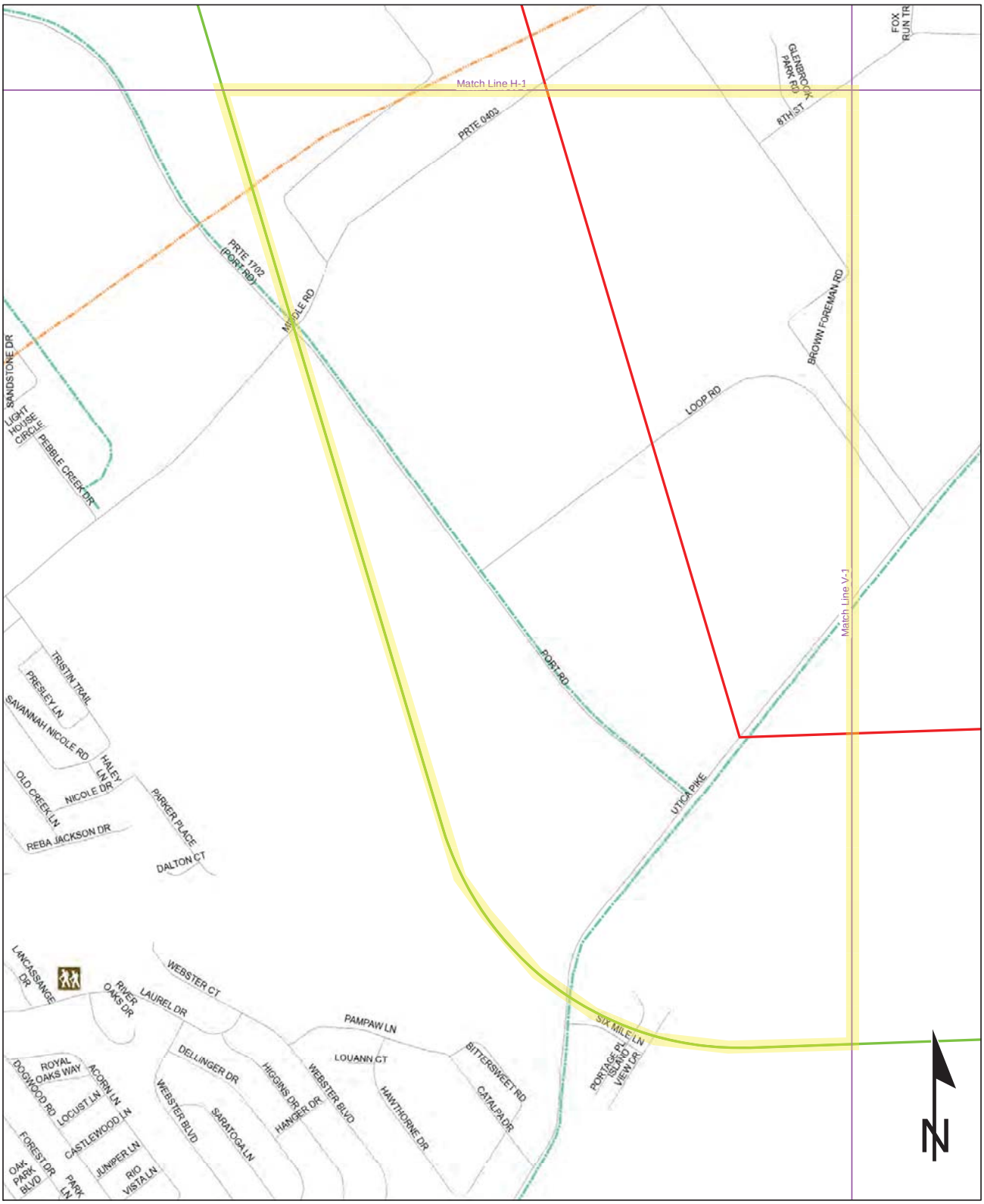
Red Flag Study Area - Area 4 of 4

Indiana Department of Transportation
Central Office
100 North Senate Avenue
Indianapolis, Indiana 46204

Des. No. 1382612
Transportation Corridor
Location: Jefferson and Utica
Township: Utica
County: Clark
State: Indiana

Date: 04/08/2016

Red Flag Investigation - Infrastructure
Des. 1382612 Heavy Haul Transportation Corridor
Clark County, Indiana
Area 1 of 4



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Sources:
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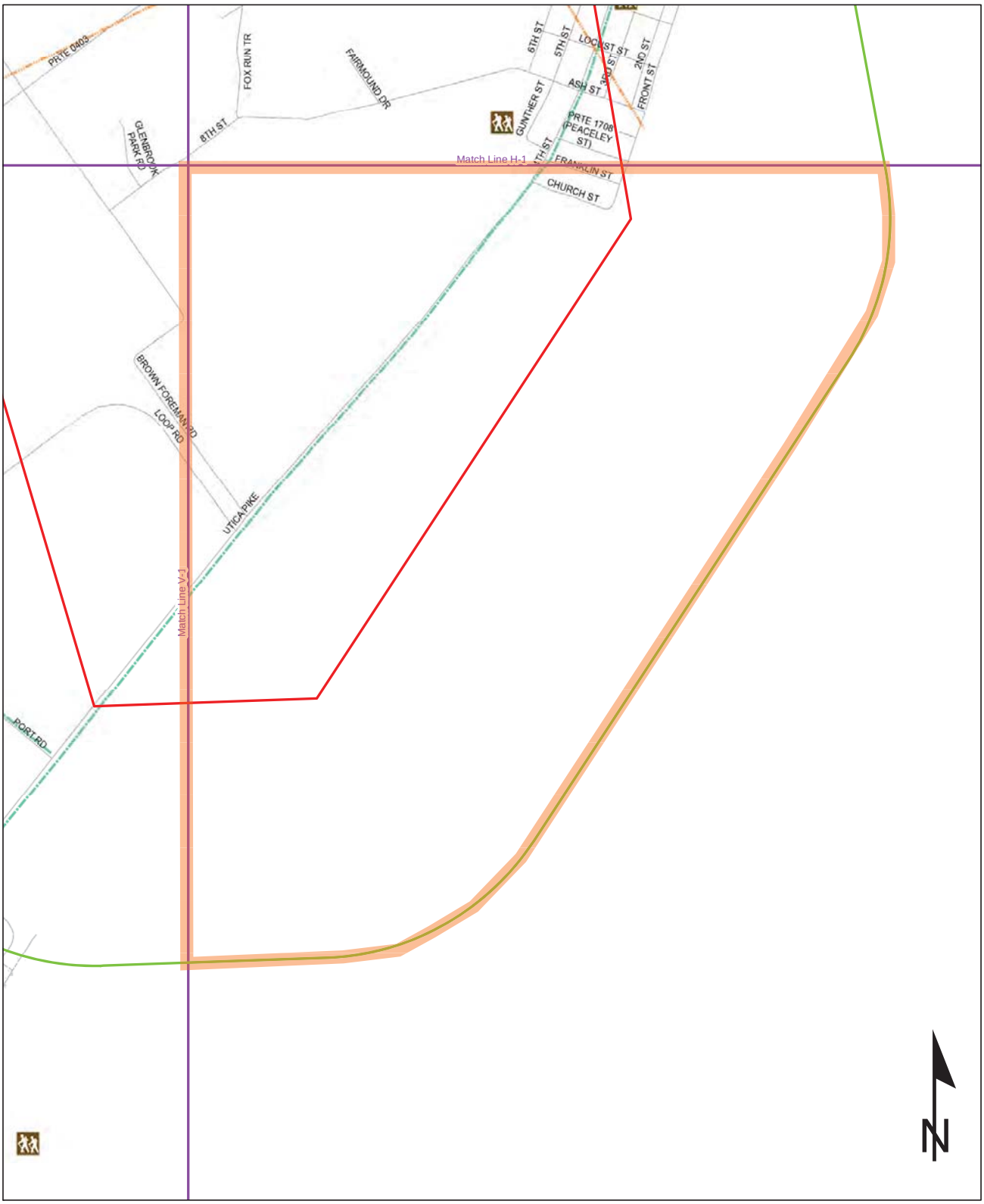
Orthophotography - Obtained from Indiana Map Framework Data (www.indianamap.org)
Map Projection: UTM Zone 16 N **Map Datum:** NAD83

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

Religious Facility	Recreation Facility	Study Area
Religious Facility Indiana Map	Pipeline	Half Mile Radius
Airport	Railroad	Interstate
Cemeteries	Trails	State Route
Hospital	Managed Lands	US Route
School	County Boundary	Local Road

Red Flag Investigation - Infrastructure
Des. 1382612 Heavy Haul Transportation Corridor
Clark County, Indiana
Area 2 of 4



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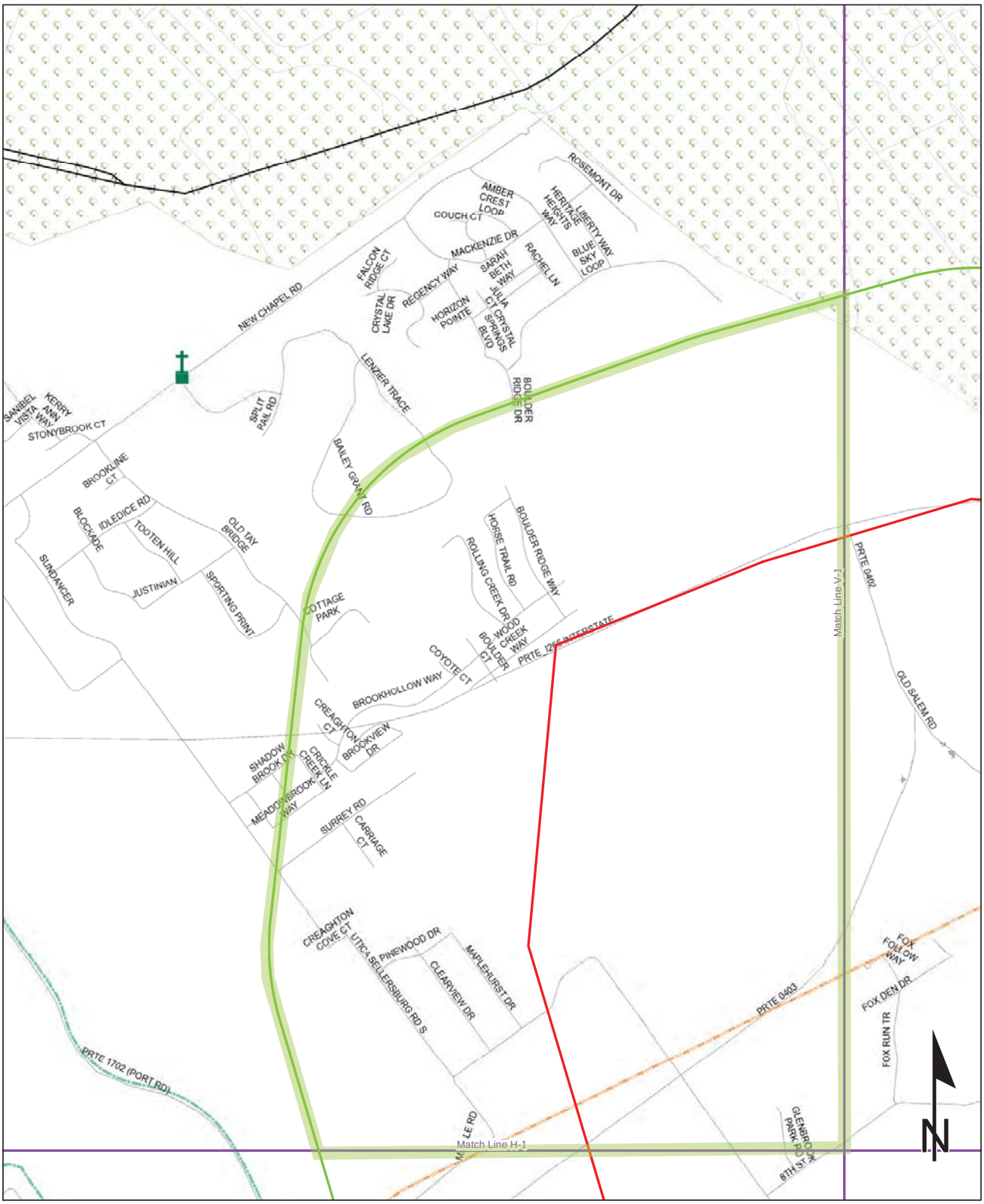
Religious Facility	Recreation Facility	Study Area
Religious Facility Indiana Map	Pipeline	Half Mile Radius
Airport	Railroad	Interstate
Cemeteries	Trails	State Route
Hospital	Managed Lands	US Route
School	County Boundary	Local Road

Red Flag Investigation - Infrastructure
Des. 1382612 Heavy Haul Transportation Corridor
Clark County, Indiana
Area 3 of 4



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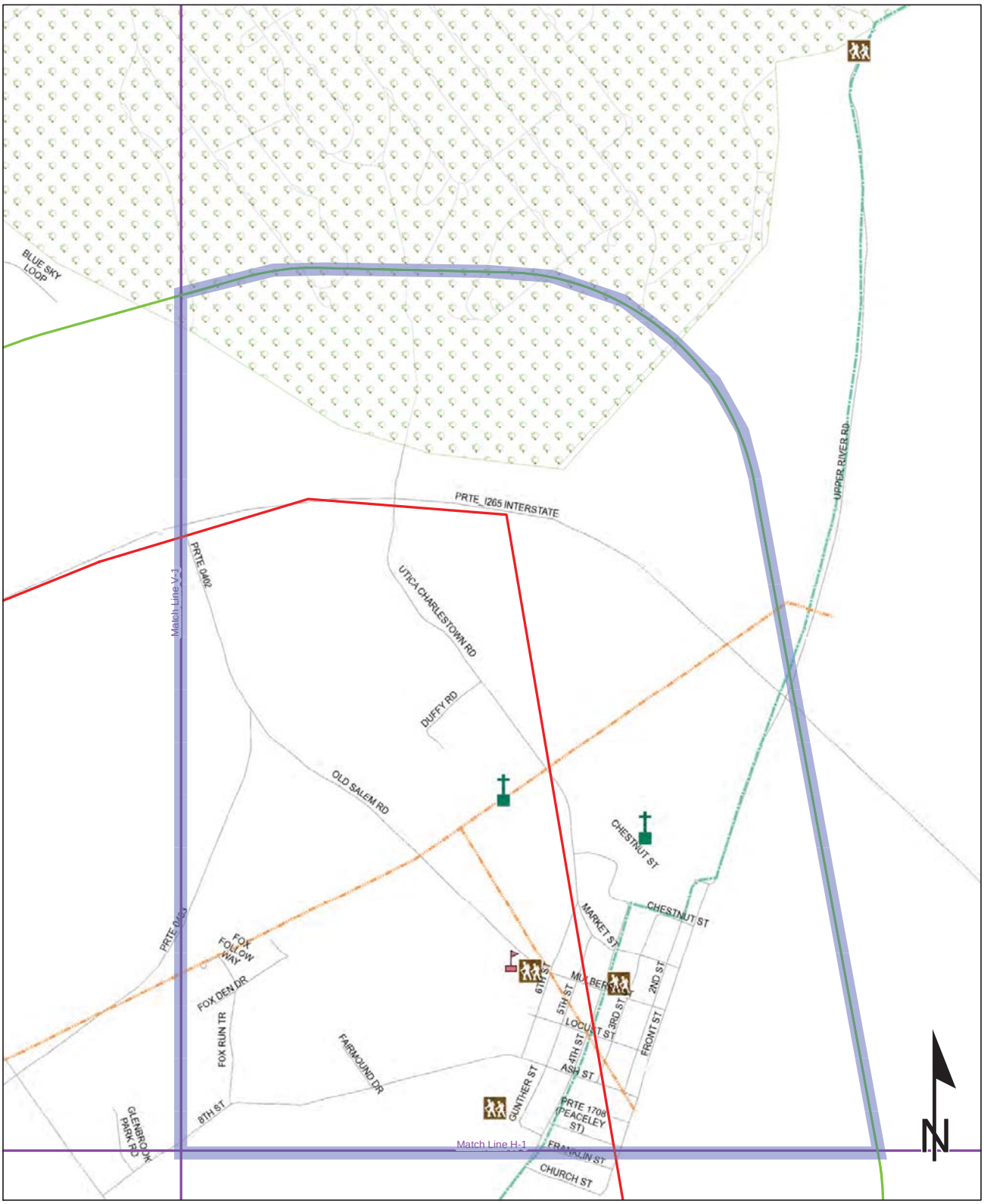
Hospital	Managed Lands	US Route
School	County Boundary	Local Road

Red Flag Investigation - Infrastructure
Des. 1382612 Heavy Haul Transportation Corridor
Clark County, Indiana
Area 4 of 4



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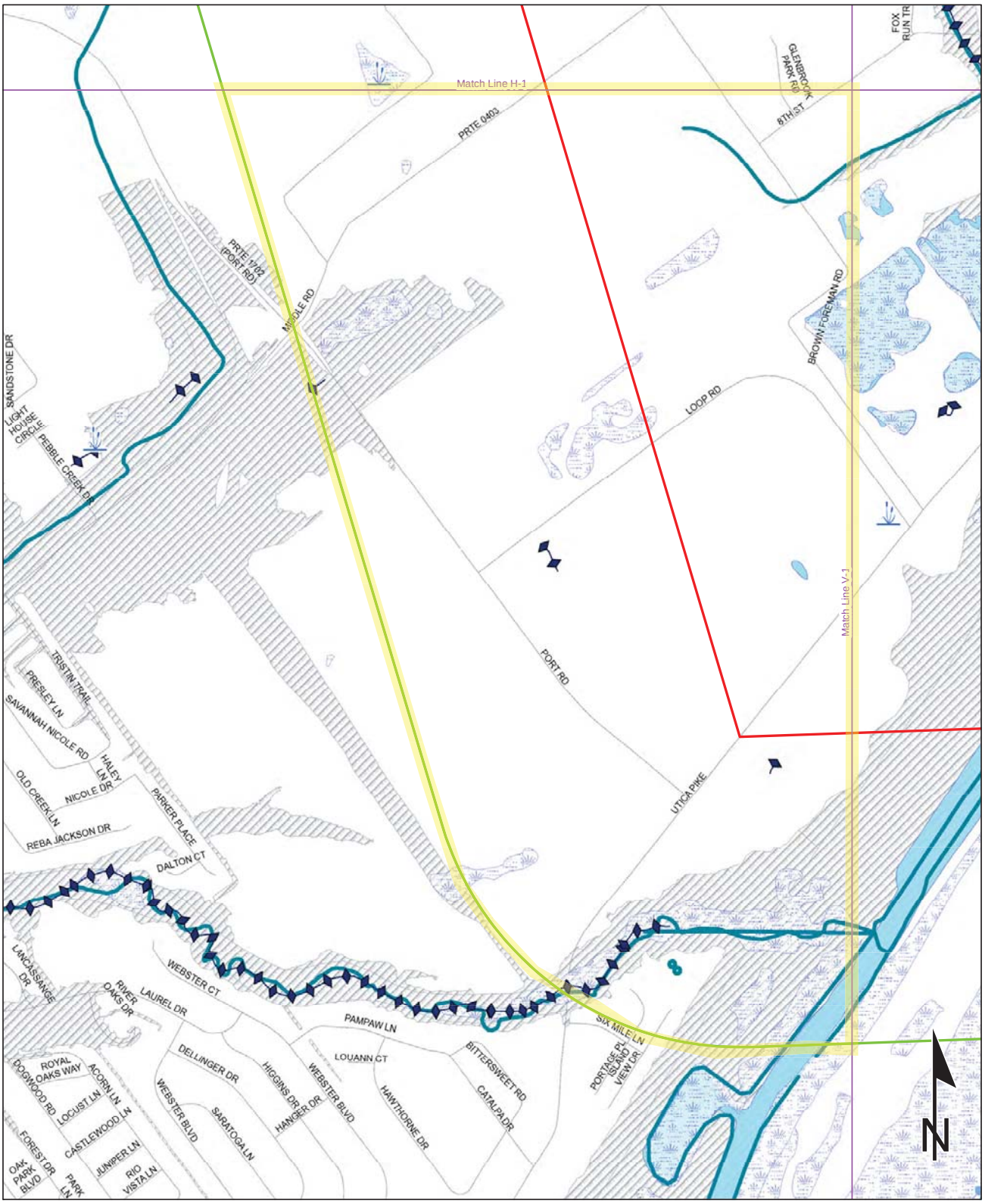
Hospital	Managed Lands	US Route
School	County Boundary	Local Road

Red Flag Investigation - Water Resources
Des. 1382612 Heavy Haul Transportation Corridor
Clark County, Indiana
Area 1 of 4



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Sources:
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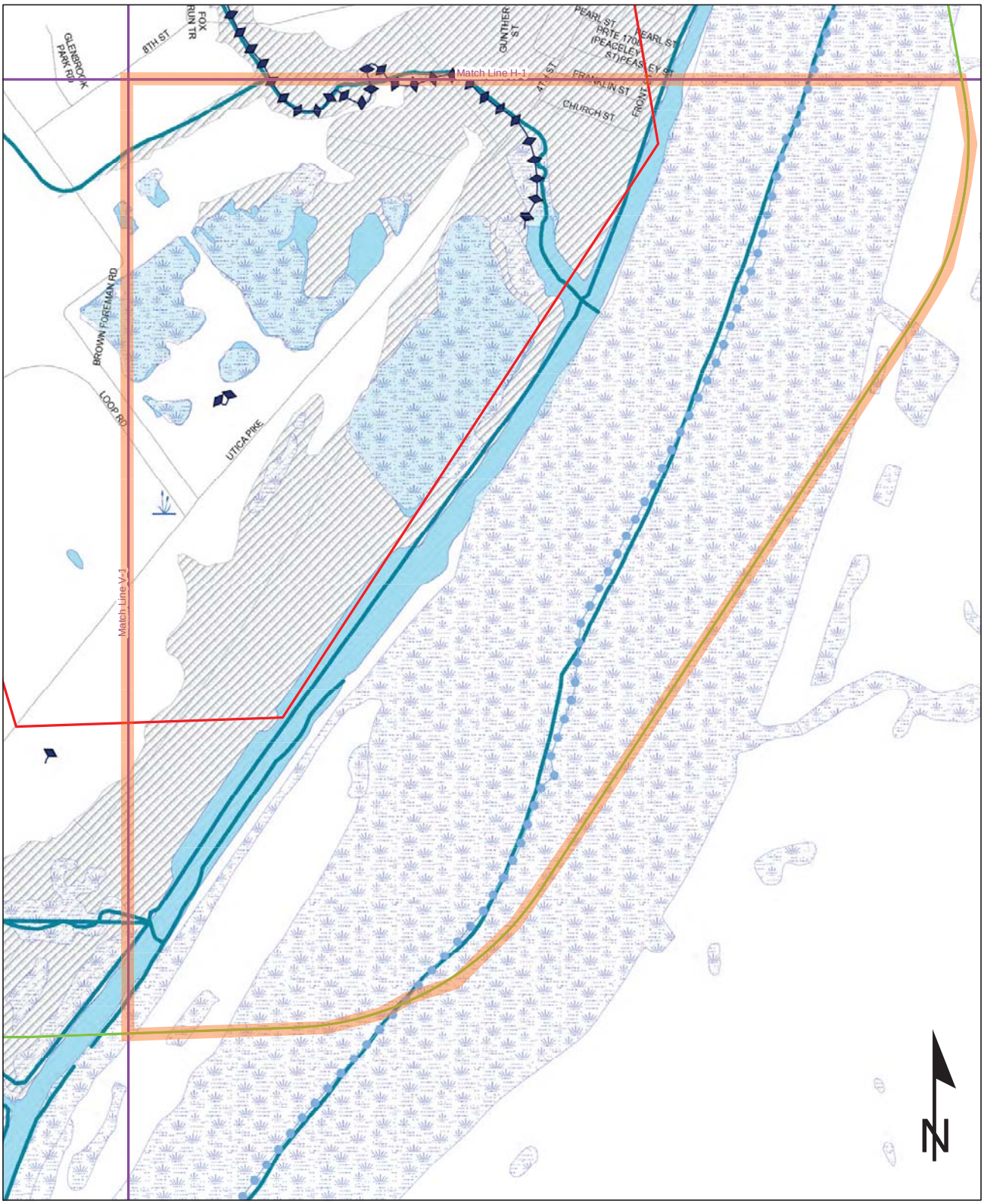
Orthophotography - Obtained from Indiana Map Framework Data (www.indianamap.org)
Map Projection: UTM Zone 16 N **Map Datum:** NAD83

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

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

Red Flag Investigation - Water Resources
Des. 1382612 Heavy Haul Transportation Corridor
Clark County, Indiana
Area 2 of 4



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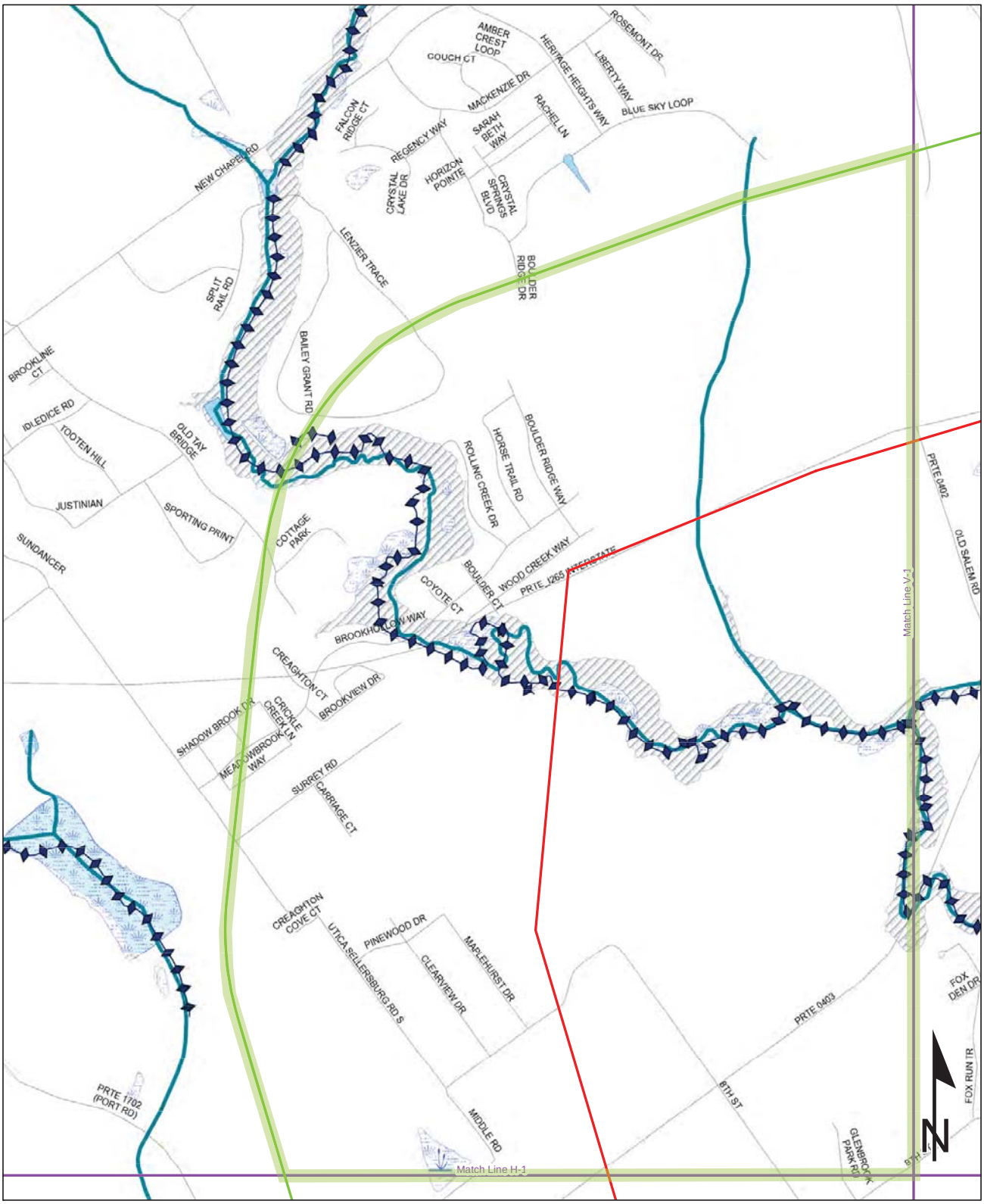
NPS NRI listed	Sinkhole Area	Local Road
River	Sinking-Stream Basin	
Canal Route - Historic	County Boundary	

Red Flag Investigation - Water Resources
Des. 1382612 Heavy Haul Transportation Corridor
Clark County, Indiana
Area 3 of 4



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Orthophotography - Obtained from Indiana Map Framework Data (www.indianamap.org)
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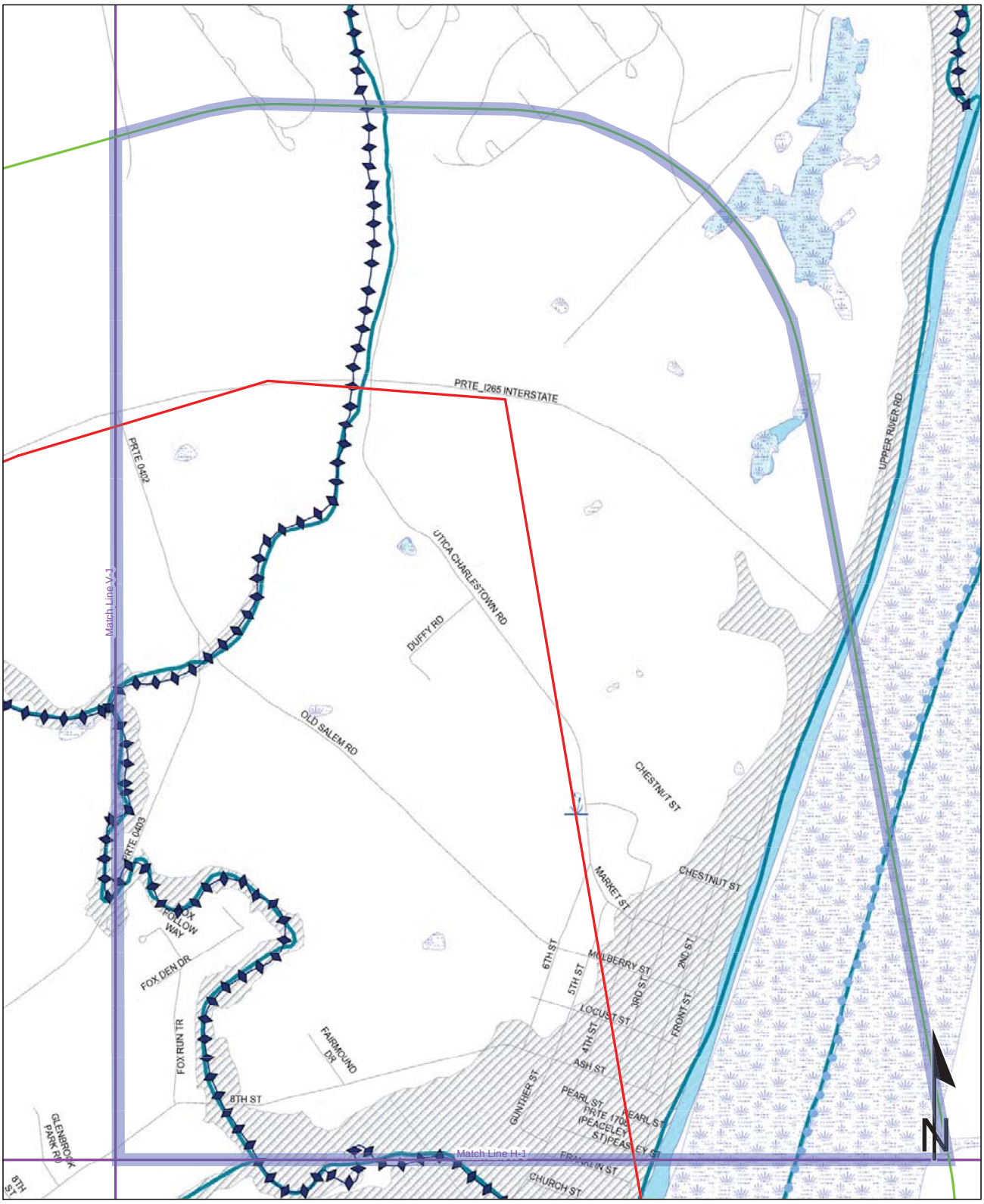
Canal Structure - Historic	Lake	Interstate
NWI- Line	Floodplain - DFIRM	State Route
Stream - Impaired	Cave Entrance Density	US Route
NPS NRI listed	Sinkhole Area	Local Road
River	Sinking-Stream Basin	
Canal Route - Historic	County Boundary	

Red Flag Investigation - Water Resources
Des. 1382612 Heavy Haul Transportation Corridor
Clark County, Indiana
Area 4 of 4



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Sources:
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Orthophotography - Obtained from Indiana Map Framework Data (www.indianamap.org)
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NWI- Line	Floodplain - DFIRM	State Route
Stream - Impaired	Cave Entrance Density	US Route
NPS NRI listed	Sinkhole Area	Local Road
River	Sinking-Stream Basin	
Canal Route - Historic	County Boundary	

Red Flag Investigation - Mining/Mineral Exploration
Des. 1382612 Transportation Corridor
Clark County, Indiana
Area 1 of 4

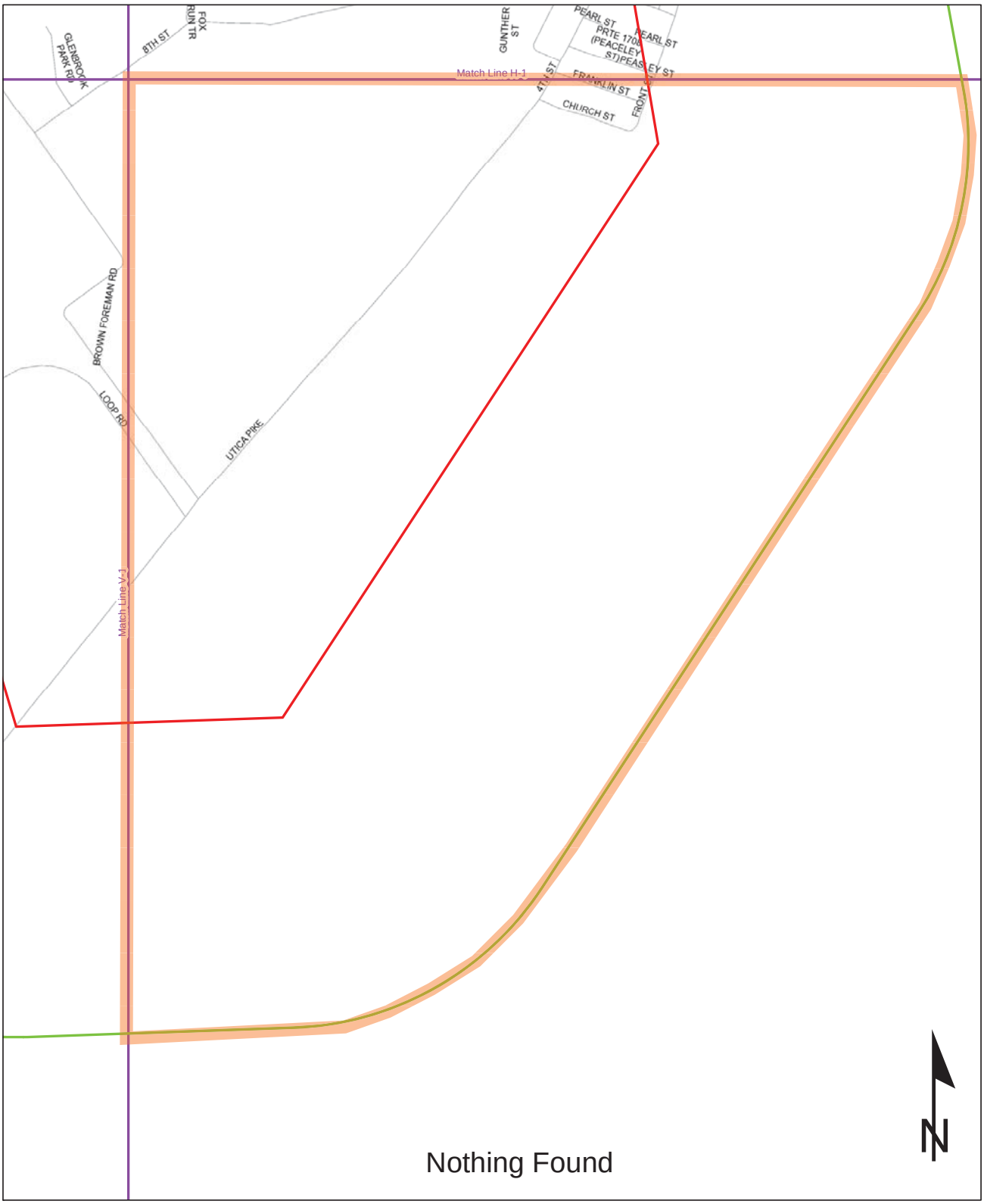
0.2 0.1 0 0.2 Miles

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

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

- Petroleum Well
- Mine - Surface
- Mine - Underground
- Petroleum Field
- County Boundary
- Project Area
- Half Mile Radius
- Interstate
- State Route
- US Route
- Local Road

Red Flag Investigation - Mining/Mineral Exploration
Des. 1382612 Transportation Corridor
Clark County, Indiana
Area 2 of 4



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Sources:
Non Orthophotography Data - Obtained from the State of Indiana Geographical Information Office Library
Orthophotography - Obtained from Indiana Map Framework Data (www.indianamap.org)
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- Petroleum Field
- County Boundary
- Project Area
- Half Mile Radius
- Interstate
- State Route
- US Route
- Local Road

Red Flag Investigation - Mining/Mineral Exploration
Des. 1382612 Transportation Corridor
Clark County, Indiana
Area 3 of 4

0.2 0.1 0 0.2 Miles

Sources:
Non Orthophotography
Data - Obtained from the State of Indiana Geographical Information Office Library
Orthophotography - Obtained from Indiana Map Framework Data (www.indianamap.org)
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- Petroleum Well
- Mine - Surface
- Mine - Underground
- Petroleum Field
- County Boundary
- Project Area
- Half Mile Radius
- Interstate
- State Route
- US Route
- Local Road

Red Flag Investigation - Mining/Mineral Exploration
Des. 1382612 Transportation Corridor
Clark County, Indiana
Area 4 of 4

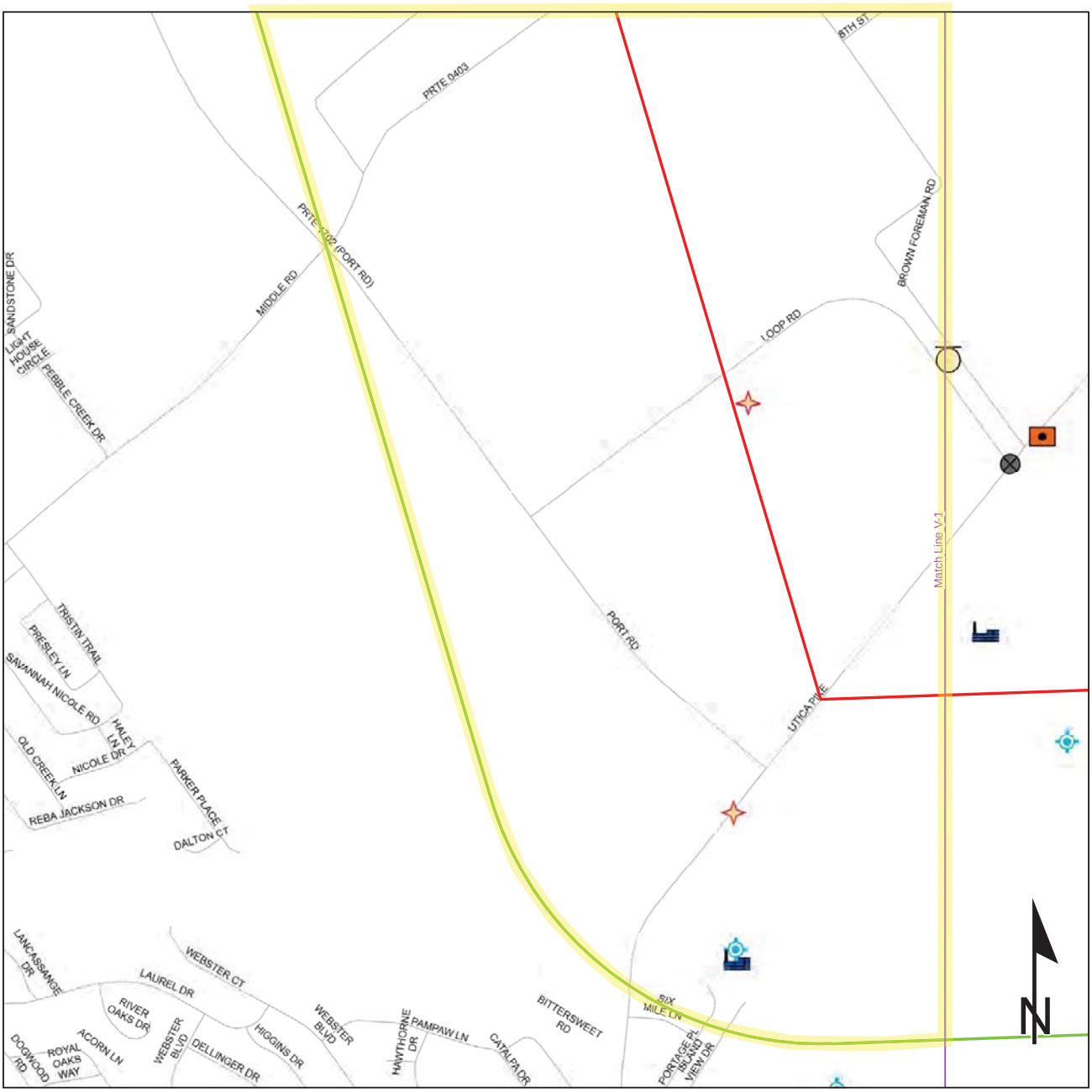
0.2 0.1 0 0.2 Miles

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

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

- Petroleum Well
- Mine - Surface
- Mine - Underground
- Petroleum Field
- County Boundary
- Project Area
- Half Mile Radius
- Interstate
- State Route
- US Route
- Local Road

Red Flag Investigation - Hazardous Material Concerns
Des. 1382612 Heavy Haul Transportation Corridor
Clark County, Indiana
Area 1 of 4



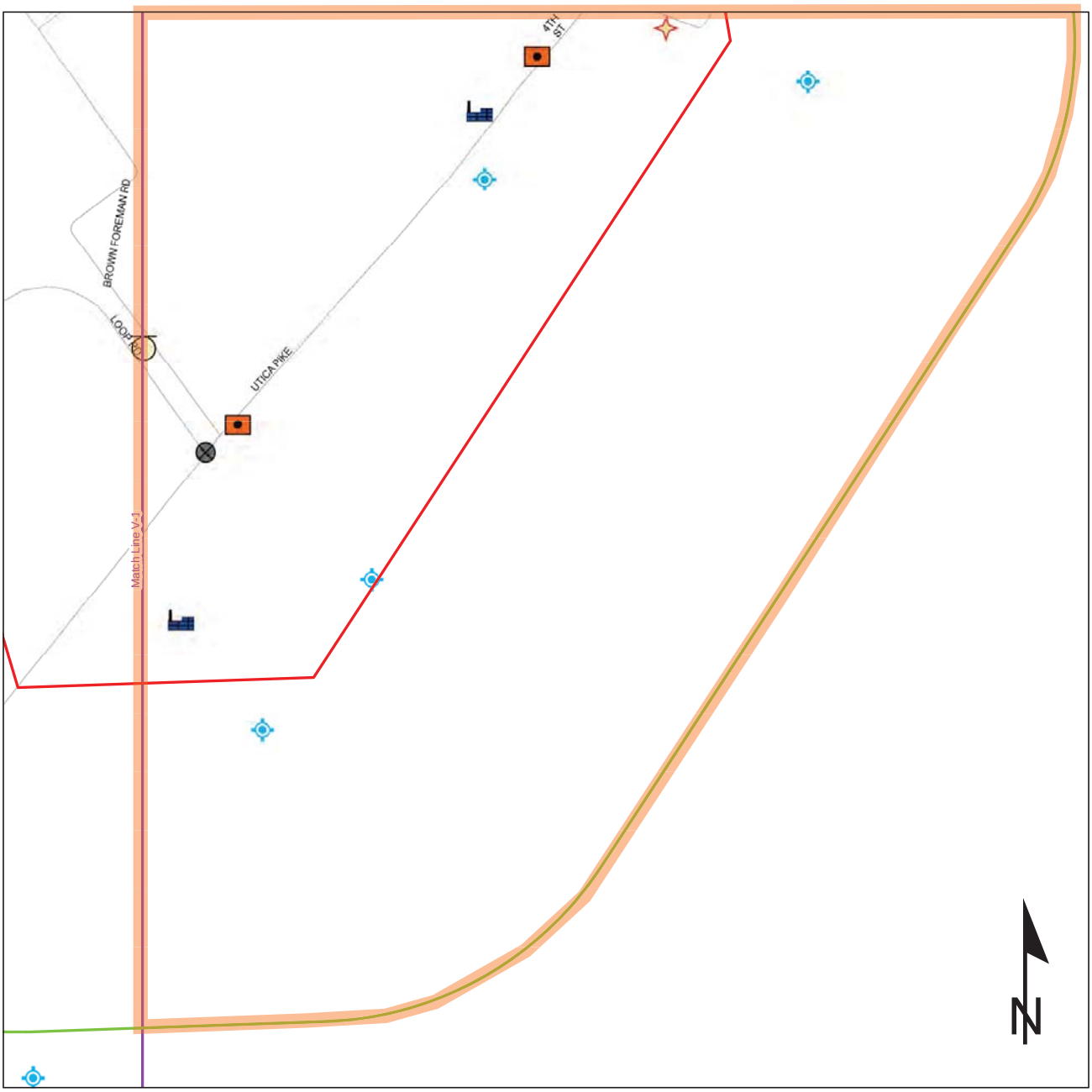
Brownfield	RCRA Generator/TSD	Institutional Controls
RCRA Corrective Action Sites	Restricted Waste Site	County Boundary
Confined Feeding Operation	Septage Waste Site	Study Area
Construction/Demolition Site	Solid Waste Landfill	Half Mile Radius
Infectious/Medical Waste Site	State Cleanup Site	Interstate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

0.2 0.1 0 0.2 Miles

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

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

Red Flag Investigation - Hazardous Material Concerns
Des. 1382612 Heavy Haul Transportation Corridor
Clark County, Indiana
Area 2 of 4



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

0.2 0.1 0 0.2 Miles

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

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

Red Flag Investigation - Hazardous Material Concerns
Des. 1382612 Heavy Haul Transportation Corridor
Clark County, Indiana
Area 3 of 4

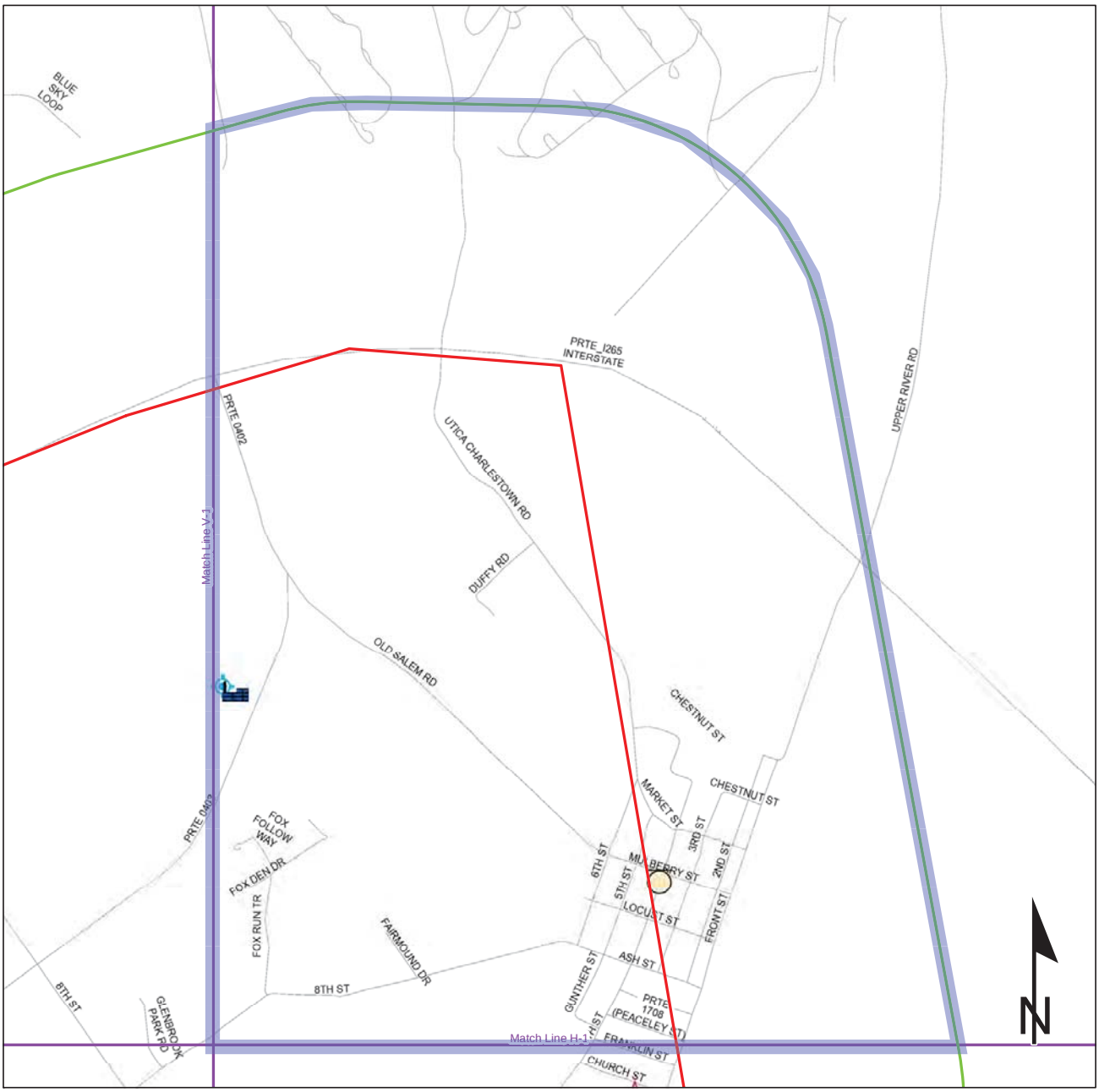
Brownfield	RCRA Generator/TSD	Institutional Controls
RCRA Corrective Action Sites	Restricted Waste Site	County Boundary
Confined Feeding Operation	Septage Waste Site	Study Area
Construction/Demolition Site	Solid Waste Landfill	Half Mile Radius
Infectious/Medical Waste Site	State Cleanup Site	Interstate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

0.25 0.125 0 0.25 Miles

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

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

Red Flag Investigation - Hazardous Material Concerns
Des. 1382612 Heavy Haul Transportation Corridor
Clark County, Indiana
Area 4 of 4



Brownfield	RCRA Generator/TSD	Institutional Controls
RCRA Corrective Action Sites	Restricted Waste Site	County Boundary
Confined Feeding Operation	Septage Waste Site	Study Area
Construction/Demolition Site	Solid Waste Landfill	Half Mile Radius
Infectious/Medical Waste Site	State Cleanup Site	Interstate
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Open Dump Waste Site	Waste Transfer Station	

0.25 0.125 0 0.25 Miles

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

Project No. 2013.01857 Des. No. 1382612
Project Description: Heavy Haul Transportation Corridor

Name of Organization requesting early coordination:

American Structurepoint, Inc.

QUESTIONNAIRE FOR THE INDIANA GEOLOGICAL SURVEY

1) Do unusual and/or problem ( ) geographic, (X) geological, ( ) geophysical, or ( ) topographic features exist within the project limits? Describe:
This is a potential problem. The letter describing this project notes that karst is a potential problem. Karst sink holes have been mapped within the project area (see "Karst Sinkhole Inventory" layer on the Indiana Map at http://maps.indiana.edu/).

2) Have existing or potential mineral resources been identified in this area? Describe:
This is a potential problem. All of the project area is underlain by Silurian carbonate rocks and about one third of the area (higher elevations in northern part of project area) is underlain by Devonian carbonate rocks. These rocks have been mined elsewhere as a source of crushed-stone and are a potential mineral resource within the project area.

3) Are there any active or abandoned mineral resources extraction sites located nearby? Describe: This is probably not a problem. An abandoned quarry pit extends into the northeast corner of Area 4. Two other small, abandoned quarries are located in Area 4. A flooded, abandoned sand and gravel pit is located in the northwest corner of Area 2.

This information was furnished by:

Name: Walter A. Hasenmueller, LPG IN816 Title: Geologist
Address: 611 North Walnut Grove, Bloomington, IN 47405
Phone: 812-855-7428 Date: May 5, 2016

United States Department of Agriculture

Natural Resources Conservation Service
Indiana State Office
6013 Lakeside Boulevard
Indianapolis, IN 46278
317-290-3200

May 13, 2016

Ronald E. Bales
Manager, Environmental Policy Office
Environmental Services Division
Indiana Department of Transportation
100 North Senate Avenue, Room N642
Indianapolis, Indiana 46278

Dear Mr. Bales:

A determination for the proposed Heavy Haul Transportation Corridor project from Port of Indiana – Jeffersonville to State Road 265 in the Utica Township, Clark County, Indiana, as referred to in your letter received April 29, 2016 cannot be made at this time. Please resubmit when routes are available.

If you need additional information, please contact Rick Neilson at 317-295-5875.

Sincerely,

Jane E. Hardisty

JANE E. HARDISTY
State Conservationist

Enclosures

Helping People Help the Land.

USDA is an equal opportunity provider and employer.

U.S. Department of Homeland Security
United States Coast Guard

Commander
Eighth Coast Guard District

1222 Spruce Street, Room 2.102D
St. Louis, MO 63103-2832
Staff Symbol: dwb
Phone: (314) 269-2434
Fax: (314) 269-2379
Email: allan.o.monterroza@uscg.mil
www.uscg.mil/d8/westernriversbridges

16591.6
May 13, 2016

Mr. Ron Bales
Environmental Policy Manager
Indiana Department of Transportation
100 North Senate Avenue, Room N642
Indianapolis, IN 46204

Subj: DES. NO. 1382612, HEAVY HAUL TRANSPORTATION CORRIDOR, PORT OF INDIANA – JEFFERSONVILLE TO SR 265, UTICA TOWNSHIP, CLARK COUNTY, INDIANA, PROJECT NO. 2013.01857

Dear Mr. Bales:

We have reviewed the information in your letter dated April 29, 2016 and determined that this project does not include a bridge crossing over water. Therefore the Coast Guard has no interest in the project.

If there are any questions, please contact Mr. Allan Monterroza at the above listed number. We appreciate the opportunity to comment on the project.

Sincerely,

ERIC A. WASHBURN
Bridge Administrator, Western Rivers
By direction of the District Commander

Questionnaire for the Indiana Department of Transportation,
Office of Aviation

Job No. _____ **Des/Bridge No:** 1382612

Project Description:

Heavy Haul Transportation Corridor Port Of Indiana,

Jeffersonville to Utica Township, Clark County, Indiana

Requested By:
STRUCTUREPOINT

Are there any existing or proposed airports within or near the project limits? *YES*

If yes, describe any potential conflicts with air traffic during or after the construction of the project.

The Clark County Municipal Airport *is located 11,000'West of the project. If any permanent structures or equipment utilized for the project penetrates the 100:1 slope from the airport FAA Form 7460 (Notice of Proposed contstruction or alteration) must be filed. For assistance contact Adam French, INDOT Office of Aviation, 317-232-1477.*

This information was furnished by:

Name: *James W. Kinder*

Title: *Chief Airport Inspector – INDOT Office of Aviation*

Date: *May 18, 2016*

United States Department of the Interior
Fish and Wildlife Service

Bloomington Field Office (ES)
620 South Walker Street
Bloomington, IN 47403-2121
Phone: (812) 334-4261 Fax: (812) 334-4273

June 2, 2016

Mr. Ron Bales
Indiana Department of Transportation
100 North Senate Avenue
Room N642
Indianapolis, Indiana 46204

Des. No. 1382612
Heavy Haul Transportation Corridor
Port of Indiana – Jeffersonville to SR 265 (Crossing Lentzier Creek)
Utica Township, Clark County, Indiana
Project No. 2013.01857

Dear Mr. Bales:

This responds to your letter dated April 29, 2016 requesting U.S. Fish and Wildlife Service (FWS) comments on the aforementioned project. The FWS also attended an agency meeting on May 26, 2016 to further discuss the project.

These comments have been prepared under the authority of the Fish and Wildlife Coordination Act (16 U.S.C. 661 et. seq.) and are consistent with the intent of the National Environmental Policy Act of 1969, the Endangered Species Act of 1973, as amended, and the U. S. Fish and Wildlife Service's Mitigation Policy.

The proposed project consists of the construction of a 3-lane road designed to "heavy haul" specifications. The proposed road would have a design speed of 35 miles per hour with two 12-foot travel lanes and one 11- to 12- foot auxiliary lane. The road would likely be constructed on new alignment at a total length of approximately 1.75 miles. While only three lanes would be constructed, right-of-way would be wide enough to allow for future expansion to five lanes if required by traffic demand. Recent discussions have indicated that the road corridor could be up to 500 feet wide and potentially remove 40-50 acres of forest, depending on the alignment chosen. Various alternatives are currently being developed along with a matrix to compare and evaluate the different alternatives and their impacts. This information will be necessary for us to fully evaluate each alternative.

The surrounding land use is a combination of forest, open grass, industrial, and farmed areas. The forested areas are generally on steep slopes. The proposed project corridor is bounded by the new SR 265 corridor to the north and the Ohio River to the south. Lentzier Creek and several tributaries are located within the project corridor. Depending on which alternative is selected, the project could significantly impact local fish and wildlife resources.

KARST RESOURCES

The proposed project is in an area of karst geologic features, which often support unique subterranean ecosystems. Previous studies have found unique cave fauna in some of the caves in the Jeffersonville area, and a gray bat colony had been shown to use karst resources on the former Indiana Army Ammunition Plant. We recommend that a survey for karst features in the surrounding terrain be performed. Although this area is not within the designated karst area of the state, we encourage INDOT to follow the protocols and procedures outlined in the 1993 Memorandum of Understanding for construction of transportation projects in karst areas if any karst features are identified.

ENDANGERED SPECIES

The proposed project is within the range of the federally endangered Indiana bat (*Myotis sodalis*) and gray bat (*Myotis grisescens*), and the federally threatened northern long-eared bat (*Myotis septentrionalis*) (NLEB).

Indiana bats hibernate in caves then disperse to reproduce and forage in relatively undisturbed forested areas associated with water resources during spring and summer. Recent research has shown that they will inhabit fragmented landscapes with adequate forest for roosting and foraging. Young are raised in nursery colony roosts in trees, typically near drainageways in undeveloped areas. Like all other bat species in Indiana, the Indiana bat diet consists exclusively of insects. There are records of the Indiana bat in Clark County and there is suitable summer habitat for this species present throughout the area surrounding the project site.

Gray bats inhabit caves year-around and migrate between winter hibernation caves and summer cave roosts for reproduction and foraging. Preferred foraging habitat is along wooded stream corridors and the forage base often includes a high proportion of aquatic insects. There is one significant summer maternity colony known in Indiana, in southern Clark County. Previous studies have shown that its main foraging habitat is along Silver Creek and Muddy Fork, but it has also been documented foraging on Lancassange Creek and on streams in the former INAAP property. There are also records just across the Ohio River in Kentucky.

Based on the information provided, there is the potential for impacts to the foraging habitat of the gray bat.

The northern long-eared bat was recently listed as threatened under the Endangered Species Act (ESA) (87 Stat. 884, as amended; 16 U.S.C. 1531 *et seq.*). At this time, no critical habitat has been proposed for the NLEB. The entire state of Indiana is within the known range of the NLEB.

During the summer, NLEBs typically roost singly or in colonies in cavities, underneath bark, crevices, or hollows of both live and dead trees and/or snags (typically ≥3 inches dbh). Males and non-reproductive females may also roost in cooler places, like caves and mines. This bat seems opportunistic in selecting roosts, using tree species based on presence of cavities or crevices or presence of peeling bark. It has also been occasionally found roosting in structures like barns and sheds (particularly when suitable tree roosts are unavailable). They forage for insects in upland and lowland woodlots and tree lined corridors. During the winter, NLEBs predominately hibernate in caves and abandoned mine portals. Additional habitat types may be identified as new information is obtained. The northern long-eared bat is considered extant in Clark County.

This endangered species information is provided for technical assistance only, and does not fulfill the requirements of Section 7 of the Endangered Species Act. Depending on the alignment selected, a bat survey may be necessary to determine impacts to threatened and endangered species. Specific avoidance and minimization measures for T&E species would be developed based on survey results.

ADDITIONAL RECOMMENDATIONS

Land use in the project area consists of forest areas, agricultural, industrial, and some scattered residential areas. Lentzier Creek and a couple of its tributaries will likely be crossed by the project. The NWI data indicate the presence of wetlands within the project area, near the midway point; these are generally associated with the Lentzier Creek drainage. Wetland and stream impacts should be avoided as much as possible, and any unavoidable impacts should be compensated for in accordance with the Corps of Engineers mitigation guidelines.

Based on a review of the plans you provided, we recommend the following general mitigation measures be included in the final project plans in order to minimize adverse impacts on fish and wildlife resources:

1. Depending on the size and flow of the various waterways, avoid channel work during the fish spawning season (April 1 through June 30).

2. **Restrict channel work and vegetation clearing to the minimum necessary for installation of any structures and roadway.**

3. If riprap is utilized for bank stabilization, extend it below low-water elevation to provide aquatic habitat.

4. Implement temporary erosion and siltation control devices such as placement of riprap check dams in drainage ways and ditches, installation of silt fences, covering exposed areas with erosion control materials, and grading slopes to retain runoff in basins.

5. Re-vegetate all disturbed soil areas immediately upon project completion, using native trees and shrubs in the riparian zone.

6. Minimize the extent of artificial bank stabilization and use bioengineering methods wherever feasible.

7. Culverts should span the active stream channel, should be either embedded or a 3-sided or open-arch culvert, and be installed where practicable on an essentially flat slope. When an open-bottomed culvert or arch is used in a stream, which has a good natural bottom substrate, such as gravel, cobbles and boulders, the existing substrate should be left undisturbed beneath the culvert to provide natural habitat for the aquatic community.

8. Post DO NOT DISTURB signs at the construction zone boundaries and do not clear trees or understory vegetation outside the boundaries.

OTHER CONSIDERATIONS

As was discussed in the agency meeting, we recommend that a Port Road upgrade/reconstruction be considered as a potential alternative during the screening process. An upgrade of an existing road could be more cost effective and would be less damaging to the surrounding natural and human environment.

If a permit under Section 404 of the Clean Water Act is needed for the proposed project, our recommendations to the U.S. Army Corps of engineers for permit conditions would be consistent with our comments here.

We appreciate the opportunity to comment at this early stage of project planning. If you have any questions about our recommendations, please call Robin McWilliams Munson at (812) 334-4261 (Ext. 1207).

Sincerely,

Scott E. Pruitt
Field Supervisor

cc: Michelle Allen, Federal Highway Administration, Indianapolis, IN
Leah Boits, American Structure Point, 7260 Shadeland Ave, Indianapolis, IN 46256

THIS IS NOT A PERMIT

State of Indiana
DEPARTMENT OF NATURAL RESOURCES
Division of Fish and Wildlife
Early Coordination/Environmental Assessment

DNR #: ER-19026 **Request Received:** April 29, 2016

Requestor: American Structurepoint Inc
Leah Boits
7260 Shadeland Station
Indianapolis, IN 46256

Project: Heavy Haul Transportation Corridor, Port of Indiana, Jeffersonville to SR 265; Des #1382612; Project #2013.01857

County/Site info: Clark

The Indiana Department of Natural Resources has reviewed the above referenced project per your request. Our agency offers the following comments for your information and in accordance with the National Environmental Policy Act of 1969.

If our agency has regulatory jurisdiction over the project, the recommendations contained in this letter may become requirements of any permit issued. If we do not have permitting authority, all recommendations are voluntary.

Regulatory Assessment: This proposal may require the formal approval of our agency pursuant to the Flood Control Act (IC 14-28-1) for any proposal to construct, excavate, or fill in or on the floodway of a stream or other flowing waterbody which has a drainage area greater than one square mile

Natural Heritage Database: The Natural Heritage Program's data have been checked.
The state endangered osprey (Pandion haliaetus) has been documented within the project area. Also, the Charlestown Military Reservation, a US Department of Defense property, is within 1/2 mile north of the project area.

Fish & Wildlife Comments: There is an active osprey nest located within Area #2 of the proposed project area. The nest has been active the last three years. As an endangered and migratory bird species, osprey and their nests are protected and it is strongly recommended that construction activities do not occur during their nesting period, which is from March 23 through August 1.

1) Alternatives

Parts of the new-terrain road's alignment(s) will impact large areas of closed-canopy forest on steep to very steep hillsides. Stream impacts will be mainly to Lentzier Creek but headwater and unnamed tributaries to Lentzier Creek will be impacted by some of the alignment alternatives.

An alternative is needed that minimizes impacts to:
-wetlands (forested, scrub-shrub and emergent);
-non-wetland forest in the floodway and outside the floodway (also referred to as upland woods);
-streams and floodway habitat

Minimization must also include minimizing fragmentation of these habitats. Alignments that minimize the construction footprint through forested habitat, the number of forested areas impacted, and the number of stream crossings are generally environmentally preferred.

Alternatives A1 and A2 will have wide right-of-way footprints in the UNT Lentzier Creek

valley, where they are proposed on the Old Salem Road alignment. The alignments also cross Lentzier Creek itself in a forested part of the creek valley closer to the Ohio River. A1 and A2 will require significant cut-and-fill impacts in ascending to the ridge north of Utica-Sellersburg Road. These alignments are not environmentally-preferred and should not be carried forward.

Alternatives B and F have significant impacts to forested habitat due to the roadway ascending the valley along the north or south slope of a tributary to Lentzier Creek. Alternative B is more environmentally-acceptable than F, particulaly if MSE walls and wide conspan arches to cross creeks are included in the design. Alternative F is not environmentally-preferred and should not be carried forward in its current form, though modifications that reduce impacts could make this a potential alternative.

Alternative C has a wide right-of-way footprint for a longer distance than most other alignments as well as impacting a forested headwater tributary valley south of the Lentzier Creek valley. This alternative should not be carried forward.

Alternative D crosses three separate forested valleys and appears to have the widest footprint over the Lentzier valley. The right-of-way footprint appears to impact two springs in the Lentzier Creek valley. Alternative D could be carried forward but only with mitigation measures such as:
-MSE walls to reduce the footprint, rather cut and fill/berm methods; and
-wide conspan crossings to minimize impacts to the creek and allow ample room for wildlife movement.
If carried forward, Alternative D should turn so it more closely aligns with Alternatives E or F at the south side of the valley in order to avoid crossing another forested headwater tributary valley.

Alternative E makes several wide turns throughout the valleys and will require more cut and fill (i.e. wider right-of-way impacts to forested habitat) than the other alignments. It also impacts one of the springs in the Lentzier Creek valley. Alternative E should not be carried forward unless impacts to forested habitat can be reduced.

Alternative G appears to have the most impacts as it crosses Lentzier Creek's channel two or three times, and crosses the valley along a forested tributary valley resulting in significant amounts of impacts to forested habitat. Alternative G follows Old Salem Road where it has a wide right-of-way footprint through the forested valley of UNT Lentzier Creek. Alternative G should not be carried forward.

All alternatives except A1-A2 impact a sinkhole near a tributary to Lentzier Creek west of Utica-Sellersburg Rd (south of New Middle Road) and several springs in the UNT Lentzier Creek valley west of Old Salem Road. The alignments should be modified to avoid such features. Due to the presence of sinkholes and springs along the alignments a karst assessment conducted by a qualified geologist with knowledge and experience in karst geology is recommended.

A multiple-span bridge/elevated roadway design could be combined with MSE walls to reduce right-of-way impacts when crossing forested valleys. If a multiple-span elevated roadway is not feasible then the road's footprint should be minimized through the use of MSE walls throughout the valley rather than cut/fill.

2) Botanical Resource Impacts and Mitigation

In addition to the project's direct impacts to closed-canopy forested habitat, the project will also result in substantial indirect impacts such as habitat fragmentation. Habitat loss and fragmentation are the main causes of the decline of wildlife. Habitat

fragmentation creates smaller, more isolated habitat areas of lower habitat value for wildlife as compared to large, contiguous habitats. Fragmentation allows non-native species and predators access to the forest interior which is vital habitat for many neotropical migratory songbird species and can negatively affect the long-term viability of wildlife populations with limited mobility.

Further habitat assessment studies are recommended to determine areas to avoid. A floristic quality assessment and fauna surveys such as amphibian/herpetological surveys of the potentially affected area were recommended in our previous review of the project however no such studies or assessments have been forwarded to us for review. As a result the fish, wildlife, and botanical resources that will be impacted are largely unknown and therefore whether the proposed mitigation will adequately offset the impacts to fish, wildlife and botanical resources remains also largely unknown. An Indiana Bat study may be needed to rule out the presence of this species in the area of potential impacts during the bat's reproductive season.

Impacts to non-wetland/riparian forest in the floodway/floodplain will require mitigation at the following ratios:
Impacts to non-wetland forest under 1 acre should be mitigated at a 1:1 ratio.
Impacts to non-wetland forest over 1 acre should be mitigated at a minimum 2:1 ratio. This ratio may be increased if impacts to undisturbed high quality forest are likely as determined by flora and fauna surveys.
Impacts to wetlands should be mitigated at the appropriate ratio. The DNR's Floodway Habitat Mitigation guidelines (and plant lists) can be found online at: http://www.in.gov/legislative/iac/20140806-IR-312140295NRA.xml.pdf .

3) Stream Impacts

Headwater streams provide valuable aquatic and riparian habitat for small fish, wildlife such as amphibians, reptiles and invertebrates and contribute significantly to the health of downstream river segments. The Ohio EPA maintains a website containing extensive information on the characteristics of headwater streams, the issues affecting headwater streams and their ecological and economic importance. (http://www.epa.ohio.gov/dsw/wqs/headwaters/index.aspx)
Impacts to streams including intermittent and ephemeral streams should be addressed in any mitigation proposal. Stream-piping, burial or enclosure is detrimental to wildlife resources and if 150' or more is enclosed, mitigation to offset the in-stream and riparian habitat impacts should be proposed. Unavoidable stream enclosure should be done with a three-sided culvert designed with the inclusion of grates every 100ft to allow the enclosed stream area to approximate normal lighting conditions.

A single-span or multiple-span elevated road/bridge design is needed to avoid the unreasonably large impact to the stream resulting from the amount of fill needed for the road berm.

Creek crossings should be constructed using a bridge or a three-sided culvert structure instead of 4-sided (box) culverts. If box or pipe culverts are used, the bottoms should be buried a minimum of 6" (or 20% of the culvert height/pipe diameter, whichever is greater up to a maximum of 2') below the stream bed elevation. Crossings should span the entire channel width (a minimum of 1.2 times the bankfull width) and should maintain the natural stream substrate within the structure. Crossing structures should have a minimum openness ratio of 0.25. The openness ratio is defined as height x width / length. Stream depth and water velocities in the crossing structure during low-flow conditions should approximate those in the natural stream channel.

THIS IS NOT A PERMIT

State of Indiana
DEPARTMENT OF NATURAL RESOURCES
Division of Fish and Wildlife

Early Coordination/Environmental Assessment

The additional measures listed below should be implemented to avoid, minimize, or compensate for impacts to fish, wildlife, and botanical resources:

1) Revegetate all bare and disturbed areas with a mixture of native grasses, sedges, wildflowers, and native shrub and hardwood tree species as soon as possible upon completion. Do not use any varieties of Tall Fescue or other non-native plants (e.g. crown-vetch).
2) Minimize and contain within the project limits inchannel disturbance and the clearing of trees and brush.
3) Do not work in the waterway from April 1 through June 30 without the prior written approval of the Division of Fish and Wildlife.
4) Do not cut any trees suitable for Indiana bat or Northern Long-eared bat roosting (greater than 3 inches dbh, living or dead, with loose hanging bark, or with cracks, crevices, or cavities) from April 1 through September 30.
5) Use minimum average 6 inch graded riprap stone extended below the normal water level to provide habitat for aquatic organisms in the voids.
6) Plant native hardwood trees along the top of the bank and right-of-way to replace the vegetation destroyed during construction.
7) Post "Do Not Mow or Spray" signs along the right-of-way.
8) Appropriately designed measures for controlling erosion and sediment must be implemented to prevent sediment from entering the stream or leaving the construction site; maintain these measures until construction is complete and all disturbed areas are stabilized.
9) Do not construct any temporary runarounds, causeways, cofferdams, pump around or stream diversion systems.
10) Seed and protect all disturbed slopes that are 3:1 or steeper with biodegradable heavy-duty erosion control blankets (follow manufacturer's recommendations for selection and installation; seed and apply mulch on all other disturbed areas.

Contact Staff: Christie L. Stanifer, Environ. Coordinator, Fish & Wildlife
Our agency appreciates this opportunity to be of service. Please contact the above staff member at (317) 232-4080 if we can be of further assistance.

Date: June 3, 2016

for Christie L. Stanifer
Environ. Coordinator
Division of Fish and Wildlife

From: Talaina Taff
To: Boits, Leah
Subject: Re: Des. 1382612
Date: Monday, March 13, 2017 11:23:58 AM

David Blankenbeker, Clark County surveyor, says there are no legal drains in Clark County.

On Mon, Mar 13, 2017 at 10:39 AM, Boits, Leah <lboits@structurepoint.com> wrote:

> Ms. Taff,
>
> We are preparing a Waters Report for a potential road construction project in Clark County, Indiana. Please let me know if there are any legal drains within the vicinity of the proposed project. I have attached maps and aerial photography for your reference.
>
> Thank you,
>
> Leah
>
> ---
>
> Leah Boits
> Environmental Specialist, Environmental Services Group
>
> ENHANCING COMMUNITIES SINCE 1966
>
> AMERICAN STRUCTUREPOINT INC.
>
> 7260 Shadeland Station, Indianapolis, IN 46256
>
> t 317.547.5580 c 574.850.7137
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> e lboits@structurepoint.com w www.structurepoint.com
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Gov. Eric J. Holcomb

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IDEM (http://www.in.gov/idem/index.htm) > Proposed Roadway Letter

Indiana Department of Environmental Management

We Protect Hoosiers and Our Environment.

100 North Senate Avenue - Indianapolis, IN 46204
(800) 451-6027 - (317) 232-8603 - www.idem.IN.gov

INDOT
Ron Heustis

, IN

American Structurepoint
Leah S. Botis

, IN

Date

Dear Grant Administrator or Other Finance Approval Authority:

RE: The Indiana Department of Transportation (INDOT), in partnership with the Federal Highway Administration (FHWA), the Indiana Economic Development Corporation, the Ports of Indiana, the Board of Commissioners of Clark County, the City of Jeffersonville Redevelopment Commission, and the River Ridge Development Authority (RRDA), is developing a federal-aid road project to improve connectivity for the Ports of Indiana-Jeffersonville (Port) with other regional transportation assets. The proposed project is located in Utica Township, Clark County, Indiana. The area is located on the Jeffersonville and Charlestown USGS 7.5 Minute Quadrangle Maps in Tracts 6-7, 14-17, 24-27, 38-40, and 52-53 and is within the Louisville Metropolitan Planning Area (LMPA), which consists of nine counties in Kentucky (Jefferson, Oldham, Trimble, Henry, Shelby, Spencer, Nelson, Bullit and Meade) and four Indiana counties (Washington, Harrison, Floyd and Clark). Preliminary corridor studies have identified an approximately 1.3-mile wide corridor between the Port of Indiana, Jeffersonville and State Road (SR) 265 to establish roadway alignment alternatives for the project. The alternatives are currently being developed and evaluated within the project corridor based upon environmental studies and coordination. Various maps and aerial photographs are enclosed showing the area being investigated. The project area has several major generators of traffic that consist primarily of heavy trucks or heavy haul vehicles. However, the road network in the area is primarily made of up of local facilities not designed to handle such vehicle loading. Heavy haul vehicles (often referred to as Michigan truck trains) are generally 60 feet or more in length with a gross vehicle weight of 134,000 pounds, as compared to Indiana legal load limits of 80,000 pounds gross vehicle weight. Heavy haul vehicles require the design of facilities to take into account the maximum weight of the heavy haul vehicles and the anticipated number of heavy haul vehicles utilizing the facility on a daily basis. The resulting difference between a facility designed to carry heavy haul vehicles and standard load trucks is often a significant difference in pavement thickness. Based on current and predicted rapid industrial and commercial development associated with the major traffic generators in the project area it is anticipated that truck traffic will increase by 129 percent over the next 20 years. The need for the proposed project is due to the current and predicted rapid industrial and commercial development in the area that would result in a significant increase in volume of heavy haul vehicles mixing with local traffic. This growth, combined with the lack of connectivity and suitable roadways for heavy haul vehicles in the area, indicates a need for the proposed project. The purpose of the proposed project is to provide a route built specifically for heavy haul vehicles that provides continuous connection between the RRCC and the Port via the new SR 265/Old Salem Road interchange. The proposed project corridor generally extends north from the Port to the SR 265/Old Salem Road interchange. The area is a combination of forest, open grass, industrial, and farmed areas. The forested areas are generally on steep slopes. Few existing roads are located within this area. The proposed project corridor is bounded by the SR 265 corridor at the northern project limits. Lentzier Creek and several tributaries are located within the project corridor. The proposed project consists of the construction of a 3-lane road designed to “heavy haul” specifications. The proposed road would have a design speed of 35 miles per hour with two 12-foot travel lanes and one 11- to 12-foot auxiliary lane. The road would likely be constructed on new alignment at a total length of approximately 1.75 miles. While only three lanes would be constructed, right-of-way would be wide enough to allow for future expansion to five lanes if required by traffic demand.

The Indiana Department of Environmental Management (IDEM) is aware that many local government or not-for-profit entities are seeking grant monies, a bond issuance, or another public funding mechanism to cover some portion of the cost of a public works, infrastructure, or community development project. IDEM also is aware that in order to be eligible for such funding assistance, applicants are required to first evaluate the potential impacts that their particular project may have on the environment. In order to assist applicants seeking such financial assistance and to ensure that such projects do not have an adverse impact on the environment, IDEM has prepared the following list of environmental issues that each applicant must consider in order to minimize environmental impacts in compliance with all relevant state laws.

IDEM recommends that each applicant consider the following issues when moving forward with their project. IDEM also requests that, in addition to submitting the information requested above, each applicant also sign the attached certification, attesting to the fact that they have read the letter in its entirety, agree to abide by the recommendations of the letter, and to apply for any permits required from IDEM for the completion of their project.

IDEM recommends that any person(s) intending to complete a public works, infrastructure, or community development project using any public funding consider each of the following applicable recommendations and requirements:

WATER AND BIOTIC QUALITY

1. Section 404 of the Clean Water Act requires that you obtain a permit from the U.S. Army Corps of Engineers (USACE) before discharging dredged or fill materials into any wetlands or other waters, such as rivers, lakes, streams, and ditches. Other activities regulated include the relocation, channelization, widening, or other such alteration of a stream, and the mechanical clearing (use of heavy construction equipment) of wetlands. Thus, as a project owner or sponsor, it is your responsibility to ensure that no wetlands are disturbed without the proper permit. Although you may initially refer to the U.S. Fish and Wildlife Service National Wetland Inventory maps as a means of identifying potential areas of concern, please be mindful that those maps do not depict jurisdictional wetlands regulated by the USACE or the Department of Environmental Management. A valid jurisdictional wetlands determination can only be made by the USACE, using the 1987 Wetland Delineation Manual.

   USACE recommends that you have a consultant check to determine whether your project will abut, or lie within, a wetland area. To view a list of consultants that have requested to be included on a list posted by the USACE on their Web site, see USACE Permits and Public Notices (http://www.lrl.usace.army.mil/orf/default.asp) (http://www.lrl.usace.army.mil/orf /default.asp (http://www.lrl.usace.army.mil/orf/default.asp)) and then click on "Information" from the menu on the right-hand side of that page. Their "Consultant List" is the fourth entry down on the "Information" page. Please note that the USACE posts all consultants that request to appear on the list, and that inclusion of any particular consultant on the list does not represent an endorsement of that consultant by the USACE, or by IDEM.

   Much of northern Indiana (Newton, Lake, Porter, LaPorte, St. Joseph, Elkhart, LaGrange, Steuben, and Dekalb counties; large portions of Jasper, Starke, Marshall, Noble, Allen, and

Adams counties; and lesser portions of Benton, White, Pulaski, Kosciusko, and Wells counties) is served by the USACE District Office in Detroit (313-226-6812). The central and southern portions of the state (large portions of Benton, White, Pulaski, Kosciosko, and Wells counties; smaller portions of Jasper, Starke, Marshall , Noble, Allen, and Adams counties; and all other Indiana counties located in north-central, central, and southern Indiana) are served by the USACE Louisville District Office (502-315-6733).

Additional information on contacting these U.S. Army Corps of Engineers (USACE) District Offices, government agencies with jurisdiction over wetlands, and other water quality issues, can be found at http://www.in.gov/idem/4396.htm (http://www.in.gov/idem/4396.htm). IDEM recommends that impacts to wetlands and other water resources be avoided to the fullest extent.

2. In the event a Section 404 wetlands permit is required from the USACE, you also must obtain a Section 401 Water Quality Certification from the IDEM Office of Water Quality. To learn more about the water quality certification program, visit: http://www.in.gov/idem/4384.htm (http://www.in.gov/idem/4384.htm).

3. If the USACE determines that a wetland or other body of water is isolated and not subject to Clean Water Act regulation, it is still regulated by the state of Indiana . A state isolated wetland permit from IDEM's Office of Water Quality is required for any activity that results in the discharge of dredged or fill materials into isolated wetlands. To learn more about isolated wetlands, contact the Office of Water Quality at 317-233-8488.

4. If your project will impact more than 0.5 acres of wetland, stream relocation, or other large-scale alterations to bodies of water such as the creation of a dam or a water diversion, you should seek additional input from the Office of Water Quality, Wetlands staff at 317-233-8488.

5. Work within the one-hundred year floodway of a given body of water is regulated by the Department of Natural Resources, Division of Water. Contact this agency at 317-232-4160 for further information.

6. The physical disturbance of the stream and riparian vegetation, especially large trees overhanging any affected water bodies should be limited to only that which is absolutely necessary to complete the project. The shade provided by the large overhanging trees helps maintain proper stream temperatures and dissolved oxygen for aquatic life.

7. For projects involving construction activity (which includes clearing, grading, excavation and other land disturbing activities) that result in the disturbance of one (1), or more, acres of total land area, contact the Office of Water Quality – Watershed Planning Branch (317/233-1864) regarding the need for of a Rule 5 Storm Water Runoff Permit. Visit the following Web page
    - http://www.in.gov/idem/4902.htm (http://www.in.gov/idem/4902.htm)

   To obtain, and operate under, a Rule 5 permit you will first need to develop a Construction Plan (http://www.in.gov/idem/4917.htm#constreq

(http://www.in.gov/idem/4917.htm#constreq)), and as described in 327 IAC 15-5-6.5 (http://www.in.gov/legislative/iac/T03270/A00150 [PDF] (http://www.in.gov/legislative/iac/T03270/A00150.PDF), pages 16 through 19). Before you may apply for a Rule 5 Permit, or begin construction, you must submit your Construction Plan to your county Soil and Water Conservation District (SWCD) (http://www.in.gov/isda/soil/contacts/map.html (http://www.in.gov/isda/soil/contacts/map.html)).

Upon receipt of the construction plan, personnel of the SWCD or the Indiana Department of Environmental Management will review the plan to determine if it meets the requirements of 327 IAC 15-5. Plans that are deemed deficient will require re-submittal. If the plan is sufficient you will be notified and instructed to submit the verification to IDEM as part of the Rule 5 Notice of Intent (NOI) submittal. Once construction begins, staff of the SWCD or Indiana Department of Environmental Management will perform inspections of activities at the site for compliance with the regulation.

Please be mindful that approximately 149 Municipal Separate Storm Sewer System (MS4) areas are now being established by various local governmental entities throughout the state as part of the implementation of Phase II federal storm water requirements. All of these MS4 areas will eventually take responsibility for Construction Plan review, inspection, and enforcement. As these MS4 areas obtain program approval from IDEM, they will be added to a list of MS4 areas posted on the IDEM Website at: http://www.in.gov/idem/4900.htm (http://www.in.gov/idem/4900.htm).

If your project is located in an IDEM-approved MS4 area, please contact the local MS4 program about meeting their storm water requirements. Once the MS4 approves the plan, the NOI can be submitted to IDEM.

Regardless of the size of your project, or which agency you work with to meet storm water requirements, IDEM recommends that appropriate structures and techniques be utilized both during the construction phase, and after completion of the project, to minimize the impacts associated with storm water runoff. The use of appropriate planning and site development and appropriate storm water quality measures are recommended to prevent soil from leaving the construction site during active land disturbance and for post construction water quality concerns. Information and assistance regarding storm water related to construction activities are available from the Soil and Water Conservation District (SWCD) offices in each county or from IDEM.

8. For projects involving impacts to fish and botanical resources, contact the Department of Natural Resources - Division of Fish and Wildlife (317-232-4080) for additional project input.

9. For projects involving water main construction, water main extensions, and new public water supplies, contact the Office of Water Quality - Drinking Water Branch (317-308-3299) regarding the need for permits.

10. For projects involving effluent discharges to waters of the State of Indiana , contact the Office of Water Quality - Permits Branch (317-233-0468) regarding the need for a National Pollutant Discharge Elimination System (NPDES) permit.

11. For projects involving the construction of wastewater facilities and sewer lines, contact the Office of Water Quality - Permits Branch (317-232-8675) regarding the need for permits.

AIR QUALITY

The above-noted project (see page 1) should be designed to minimize any impact on ambient air quality in, or near, the project area. The project must comply with all federal and state air pollution regulations. Consideration should be given to the following:

1. Regarding open burning, and disposing of organic debris generated by land clearing activities; some types of open burning are allowed under specific conditions (http://www.in.gov/idem/4148.htm (http://www.in.gov/idem/4148.htm)). You also can seek an open burning variance from IDEM.

   IDEM generally recommends that you take vegetative wastes to a registered yard waste composting facility or that the waste be chipped or shredded with composting on-site. You must register with IDEM if more than 2,000 pounds is to be composted; contact 317-232-0066). The finished compost can then be used as a mulch or soil amendment. You also may bury any vegetative wastes (such as leaves, twigs, branches, limbs, tree trunks and stumps) on-site, although burying large quantities of such material can lead to subsidence problems.

2. Reasonable precautions must be taken to minimize fugitive dust emissions from construction and demolition activities. For example, wetting the area with water, constructing wind barriers, or treating dusty areas with chemical stabilizers (such as calcium chloride or several other commercial products). Dirt tracked onto paved roads from unpaved areas should be minimized.

   If construction or demolition is conducted in a wooded area where blackbirds have roosted or abandoned buildings or building sections in which pigeons or bats have roosted for three to five years, precautionary measures should be taken to avoid an outbreak of histoplasmosis. This disease is caused by the fungus Histoplasma capsulatum, which stems from bird or bat droppings that have accumulated in one area for three to five years. The spores from this fungus become airborne when the area is disturbed and can cause infections over an entire community downwind of the site. The area should be wetted down prior to cleanup or demolition of the project site. For more detailed information on histoplasmosis prevention and control, please contact the Acute Disease Control Division of the Indiana State Department of Health at 317-233-7272.

3. The U.S. EPA and the U.S. Surgeon General recommend that people not have long-term exposure to radon at levels above 4 pCi/L. For a county-by-county map of predicted radon levels in Indiana , visit http://www.in.gov/idem/4267.htm (http://www.in.gov/idem/4267.htm).

The U.S. EPA further recommends that all homes and apartments (within three stories of ground level) be tested for radon. If in-home radon levels are determined to be 4 pCi/L or higher, then U.S. EPA recommends a follow-up test. If the second test confirms that radon levels are 4 pCi/L or higher, then U.S. EPA recommends the installation of radon-reduction measures. For a list of qualified radon testers and radon mitigation (or reduction) specialists, visit http://www. in.gov/isdh/regsvcs/radhealth/pdfs/radon_testers_mitigators_list.pdf (http://www.in.gov/isdh/regsvcs/radhealth/pdfs/radon_testers_mitigators_list.pdf). Also, is recommended that radon reduction measures be built into all new homes, particularly in areas like Indiana that have moderate to high predicted radon levels.

To learn more about radon, radon risks, and ways to reduce exposure, visit http://www.in.gov/isdh/regsvcs/radhealth/radon.htm (http://www.in.gov/isdh/regsvcs/radhealth/radon.htm), http://www.in.gov/idem/4145.htm (http://www.in.gov/idem/4145.htm), or http://www.epa.gov/radon/index.html (http://www.epa.gov/radon/index.html).

4. With respect to asbestos removal, all facilities slated for renovation or demolition (except residential buildings that have four (4) or fewer dwelling units and which will not be used for commercial purposes) must be inspected by an Indiana-licensed asbestos inspector prior to the commencement of any renovation or demolition activities. If regulated asbestos-containing material (RACM) that may become airborne is found, any subsequent demolition, renovation, or asbestos removal activities must be performed in accordance with the proper notification and emission control requirements.

   If no asbestos is found where a renovation activity will occur, or if the renovation involves removal of less than 260 linear feet of RACM off of pipes, less than 160 square feet of RACM off of other facility components, or less than 35 cubic feet of RACM off of all facility components, the owner or operator of the project does not need to notify IDEM before beginning the renovation activity.

   For questions on asbestos demolition and renovation activities, you can also call IDEM's Lead/Asbestos section at 1-888-574-8150.

   In all cases where a demolition activity will occur (even if no asbestos is found), the owner or operator must still notify IDEM 10 working days prior to the demolition, using the form found at www.in.gov/icpr/webfile/formsdiv/44593.pdf.

   Anyone submitting a renovation/demolition notification form will be billed a notification fee based upon the amount of friable asbestos containing material to be removed or demolished. Projects that involve the removal of more than 2,600 linear feet of friable asbestos containing materials on pipes, or 1,600 square feet or 400 cubic feet of friable asbestos containing material on other facility components, will be billed a fee of $150 per project; projects below these amounts will be billed a fee of $50 per project. Billings will occur on a quarterly basis.

For more information about IDEM policy regarding asbestos removal and disposal, visit: http://www.in.gov/idem/4983.htm (http://www.in.gov/idem/4983.htm).

5. With respect to lead-based paint removal, IDEM encourages all efforts to minimize human exposure to lead-based paint chips and dust. IDEM is particularly concerned that young children exposed to lead can suffer from learning disabilities. Although lead-based paint abatement efforts are not mandatory, any abatement that is conducted within housing built before January 1, 1978 , or a child-occupied facility is required to comply with all lead-based paint work practice standards, licensing and notification requirements. For more information about lead-based paint removal, visit http://www.in.gov/idem/permits/guide/waste/leadabatement.html (http://www.in.gov/idem/permits/guide/waste/leadabatement.html).

6. Ensure that asphalt paving plants are permitted and operate properly. The use of cutback asphalt, or asphalt emulsion containing more than seven percent (7%) oil distillate, is prohibited during the months of April through October. See 326 IAC 8-5-2 , Asphalt Paving Rule (http://www.ai.org/legislative/iac/T03260/A00080.PDF (http://www.ai.org/legislative/iac/T03260/A00080.PDF)).

7. If your project involves the construction of a new source of air emissions or the modification of an existing source of air emissions or air pollution control equipment, it will need to be reviewed by the IDEM Office of Air Quality (OAQ). A registration or permit may be required under 326 IAC 2 (www.ai.org/legislative/iac/t03260/a00020.pdf (http://www.ai.org/legislative/iac/t03260/a00020.pdf).). New sources that use or emit hazardous air pollutants may be subject to Section 112 of the Clean Air Act and corresponding state air regulations governing hazardous air pollutants.

8. For more information on air permits, visit http://www.in.gov/idem/4223.htm (http://www.in.gov/idem/4223.htm), or to initiate the IDEM air permitting process, please contact the Office of Air Quality Permit Reviewer of the Day at (317) 233-0178 or oamprod at idem.in.gov.

LAND QUALITY

In order to maintain compliance with all applicable laws regarding contamination and/or proper waste disposal, IDEM recommends that:

1. If the site is found to contain any areas used to dispose of solid or hazardous waste, you need to contact the Office of Land Quality (OLQ) at 317-308-3103.

2. All solid wastes generated by the project, or removed from the project site, need to be taken to a properly permitted solid waste processing or disposal facility. For more information, visit http://www.in.gov/idem/4998.htm (http://www.in.gov/idem/4998.htm).

3. If any contaminated soils are discovered during this project, they may be subject to disposal as hazardous waste. Please contact the OLQ at 317-308-3103 to obtain information on proper disposal procedures.

4. If Polychlorinated Biphenyls (PCBs) are found at this site, please contact the Industrial Waste Section of OLQ at 317-308-3103 for information regarding management of any PCB wastes from this site.

5. If there are any asbestos disposal issues related to this site, please contact the Industrial Waste Section of OLQ at 317-308-3103 for information regarding the management of asbestos wastes. (Asbestos removal is addressed above, under Air Quality.)

6. If the project involves the installation or removal of an underground storage tank, or involves contamination from an underground storage tank, you must contact the IDEM Underground Storage Tank program at 317-308-3039(http://www.in.gov/idem/4999.htm (http://www.in.gov/idem/4999.htm)).

FINAL REMARKS

Should the applicant need to obtain any environmental permits in association with this proposed project, please be mindful that IC 13-15-8 requires that they notify all adjoining property owners and/or occupants within ten days of your submittal of each permit application. Applicants seeking multiple permits, may still meet the notification requirement with a single notice if all required permit applications are submitted with the same ten day period.

Please note that this letter does not constitutes a permit, license, endorsement, or any other form of approval on the part of either the Indiana Department of Environmental Management or any other Indiana state agency.

Should you have any questions relating to the content or recommendations of this letter, or if you have additional questions about whether a more complete environmental review of your project should be conducted, please feel free to contact Steve Howell at (317) 232-8587, snhowell@idem.in.gov.

Signature(s) of the Applicant

I acknowledge that I am seeking grant monies, a bond issuance, or other public funding mechanism to cover some portion of the cost of the public works, infrastructure, or community development project as described herein, which I am working (possibly with others) to complete.

Project Description

The Indiana Department of Transportation (INDOT), in partnership with the Federal Highway Administration (FHWA), the Indiana Economic Development Corporation, the Ports of Indiana, the Board of Commissioners of Clark County, the City of Jeffersonville Redevelopment Commission, and the River Ridge Development Authority (RRDA), is developing a federal-aid road project to improve connectivity for the Ports of Indiana-Jeffersonville (Port) with other regional transportation assets. The proposed project is located in Utica Township, Clark County, Indiana. The area is located on the Jeffersonville and Charlestown USGS 7.5 Minute Quadrangle Maps in

Tracts 6-7, 14-17, 24-27, 38-40, and 52-53 and is within the Louisville Metropolitan Planning Area (LMPA), which consists of nine counties in Kentucky (Jefferson, Oldham, Trimble, Henry, Shelby, Spencer, Nelson, Bullit and Meade) and four Indiana counties (Washington, Harrison, Floyd and Clark). Preliminary corridor studies have identified an approximately 1.3-mile wide corridor between the Port of Indiana, Jeffersonville and State Road (SR) 265 to establish roadway alignment alternatives for the project. The alternatives are currently being developed and evaluated within the project corridor based upon environmental studies and coordination. Various maps and aerial photographs are enclosed showing the area being investigated. The project area has several major generators of traffic that consist primarily of heavy trucks or heavy haul vehicles. However, the road network in the area is primarily made of up of local facilities not designed to handle such vehicle loading. Heavy haul vehicles (often referred to as Michigan truck trains) are generally 60 feet or more in length with a gross vehicle weight of 134,000 pounds, as compared to Indiana legal load limits of 80,000 pounds gross vehicle weight. Heavy haul vehicles require the design of facilities to take into account the maximum weight of the heavy haul vehicles and the anticipated number of heavy haul vehicles utilizing the facility on a daily basis. The resulting difference between a facility designed to carry heavy haul vehicles and standard load trucks is often a significant difference in pavement thickness. Based on current and predicted rapid industrial and commercial development associated with the major traffic generators in the project area it is anticipated that truck traffic will increase by 129 percent over the next 20 years. The need for the proposed project is due to the current and predicted rapid industrial and commercial development in the area that would result in a significant increase in volume of heavy haul vehicles mixing with local traffic. This growth, combined with the lack of connectivity and suitable roadways for heavy haul vehicles in the area, indicates a need for the proposed project. The purpose of the proposed project is to provide a route built specifically for heavy haul vehicles that provides continuous connection between the RRCC and the Port via the new SR 265/Old Salem Road interchange. The proposed project corridor generally extends north from the Port to the SR 265/Old Salem Road interchange. The area is a combination of forest, open grass, industrial, and farmed areas. The forested areas are generally on steep slopes. Few existing roads are located within this area. The proposed project corridor is bounded by the SR 265 corridor at the northern project limits. Lentzier Creek and several tributaries are located within the project corridor. The proposed project consists of the construction of a 3-lane road designed to “heavy haul” specifications. The proposed road would have a design speed of 35 miles per hour with two 12-foot travel lanes and one 11- to 12-foot auxiliary lane. The road would likely be constructed on new alignment at a total length of approximately 1.75 miles. While only three lanes would be constructed, right-of-way would be wide enough to allow for future expansion to five lanes if required by traffic demand.

With my signature, I do hereby affirm that I have read the letter from the Indiana Department of Environmental Management that appears directly above. In addition, I understand that in order to complete the project in which I am interested, with a minimum impact to the environment, I must consider all the issues addressed in the aforementioned letter, and further, that I must obtain any required permits.

Dated Signature of the Public Owner Contact/Responsible Elected Official Ronald Heustis, P.E. Digitally signed by Ronald Heustis, P.E. DN: cn=Ronald Heustis, P.E., o=INDOT, ou, email=rheustis@indot.in.gov, c=US Date: 2018.01.19 17:24:54 -05'00'

Ron Heustis

Dated Signature of the Project Planner/Consultant Contact Person Leah S. Botis 2018-01-19

Leah S. Botis

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INDIANA DEPARTMENT OF TRANSPORTATION

100 North Senate Avenue
Room N642
Indianapolis, Indiana 46204

PHONE: (317) 233-6795
FAX: (317) 233-4929

Eric Holcomb, Governor
Joe McGuinness, Commissioner

October 16, 2017

Re: Alternatives Analysis
Des. No. 1382612
Heavy Haul Transportation Corridor
Utica Township, Clark County, Indiana

Dear Regulatory Agency Members,

On April 29, 2016 early coordination letters were mailed out providing details for a federally funded road project proposed by the Indiana Department of Transportation (INDOT), in partnership with the Federal Highway Administration (FHWA), the Indiana Economic Development Corporation, the Ports of Indiana, the Board of Commissioners of Clark County, the City of Jeffersonville Redevelopment Commission, and the River Ridge Development Authority (RRDA). A copy of the early coordination is attached for your reference. This letter is written as a touchpoint to describe the development of the project since the initial early coordination was initiated and to seek your comments regarding those resources under your jurisdiction. Your cooperation in this endeavor is appreciated.

On May 26, 2016 representatives from American Structurepoint, United Consulting, INDOT, and FHWA, met with resource agencies at the American Structurepoint office to discuss the purpose and need of the project as well as several preliminary alternatives currently being assessed. Agencies brought up concerns with alternatives A1, A2, and alternative G; these alternatives appeared to have the greatest amount of stream and wetland impacts, as well as the largest construction limitations due to elevation change. In an effort to reduce potential impacts, it was suggested that Alternatives D and E be combined and evaluated as an additional alternative. Because of the potential magnitude of stream, forest, and endangered species impacts, touch base meetings and ongoing coordination with INDOT, FHWA, USFWS, USACE, and IDEM has continued since the resource agency meeting.

Since the May 26, 2016 agency meeting, an alternatives matrix was developed and refined. This matrix originally compared the impacts of nine alternatives (No-Build, A1, A2, and B-G). As coordination continued, Alternatives DE and HH were added. Through the continued coordination with USFWS, USACE, IDEM, INDOT, and FHWA, Alternatives DE, F, and HH were determined to meet the purpose and need and minimize the amount of overall impacts to resources. Because forest, stream, and wetland impacts are estimated to be similar between the three alternatives, IDEM, USACE, and USFWS agreed that any of the three alternatives would likely be acceptable. Since Alternative DE is known to likely avoid impacts to archaeological resources and the overall project corridor is known to be rich with significant archaeological resources, the USACE, IDEM, USFWS, and FHWA agreed that it would be acceptable if Alternative DE was moved forward through the environmental review process. For reference, see the enclosed original and revised alternatives matrix screenings and mapping.

You are asked to review this information and provide any comments you may have relative to anticipated impacts of the project on areas in which you have jurisdiction or special expertise. We will incorporate your comments into the selection and final design of a preferred alternative. To facilitate the development of this

INDIANA DEPARTMENT OF TRANSPORTATION

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Eric Holcomb, Governor
Joe McGuinness, Commissioner

project, **you are asked to reply within 30 days of receipt of this letter**. If no response is received by that date, it will be assumed you have no comments at the present time.

Your timely cooperation in the development of this project is appreciated. For general inquiries please contact myself at (317) 234-4916 or by e-mail at rbales@indot.in.gov. However, please contact our consultant, Leah Boits of American Structurepoint at (317) 547-5580 or by e-mail at lboits@structurepoint.com for coordination purposes, questions, or if additional information is needed.

Respectfully,

Ron Bales
Environmental Policy Manager
Indiana Department of Transportation

Enclosures

Sample Early Coordination Letter
Original Alternatives Matrix
Original Alternatives Map
Revised Viable Alternatives Matrix
Revised Viable Alternatives Map

Sample Early Coordination Letter on page B-1; enclosures found in Appendix A

Appendix C: Section 106 Documentation

- "No Historic Properties Affected" Finding – December 21, 2017
- Public Notice of Effect Finding – December 23, 2017
- SHPO Concurrence with Effect Finding – January 22, 2018

December 21, 2017

Re: Section 106 Effect Finding
Des. No. 1382612
DHPA No. 17495
Heavy Haul Transportation Corridor
Utica Township, Clark County, Indiana

Dear Consulting Party:

The Indiana Department of Transportation (INDOT); in partnership with the Indiana Economic Development Corporation, Jeffersonville Port of Indiana, Clark County Commissioners, City of Jeffersonville Redevelopment Authority, and River Ridge Development Authority; is developing a road project to provide a direct connection between the Jeffersonville Port of Indiana, the River Ridge Commerce Center (RRCC), and State Road 62. The project corridor generally extends north approximately 1.75 miles from the Port of Indiana to the SR 265/Old Salem Road interchange. The project is funded, in part, by the Federal Highway Administration (FHWA).

Section 106 of the National Historic Preservation Act requires federal agencies to take into account the effects of their undertakings on historic properties. In accordance with 36 CFR 800.2(c), you were invited to be a consulting party to participate in the Section 106 process. In response to this invitation, we have recorded that you wish to participate as a consulting party to provide recommendations regarding the potential impact of this project on historic properties present within the Area of Potential Effect (APE).

On December 1, 2017, the INDOT, acting on behalf of FHWA, signed the Section 106 Finding and Determinations: Area of Potential Effects, Eligibility Determinations, and Effect Findings of "No Historic Properties Affected" for this undertaking. This documentation describes the undertaking, the efforts taken to identify historic properties, the effects of the undertaking on the identified historic properties and summarizes consulting parties and public views.

In accordance with 36 C.F.R. § 800.6(a)(3), a copy of the signed "No Historic Properties Affected" finding and the supporting 800.11(d) documentation is now available on IN SCOPE for your review. To access the documentation, follow the IN SCOPE link (http://erms.indot.in.gov/Section106Documents/) and enter the project's Des. No. Should you require a hard copy of this documentation, please contact this office and the information will be mailed to you.

The participating consulting parties are being asked to review the "No Historic Properties Affected" finding and supporting documentation. All comments are to be received within 30-days of receipt of this letter. Your comments regarding the "No Historic Properties Affected" finding and supporting 800.11(d) documentation should be provided to American Structurepoint, Inc. at the following address:

Ms. Leah Boits
American Structurepoint, Inc.
7260 Shadeland Station
Indianapolis, Indiana 46256
lboits@structurepoint.com.

Tribal contacts may contact Shaun Miller at smiller@indot.in.gov or 317- 233-6795 or Michelle Allen at FHWA at michelle.allen@dot.gov or 317-226-7344.

Thank you for your time, consideration and feedback.

Sincerely,

Anuradha V. Kumar, Manager
Cultural Resources Office
Environmental Services

emc: Ms. Mary Kennedy, INDOT-CRO
Mr. Shaun Miller, INDOT-CRO
Ms. Leah Boits, American Structurepoint, Inc.
Dr. Linda Weintraut, Weintraut & Associates, Inc.

Distribution List:
Indiana Department of Natural Resources, Division of Historic Preservation & Archaeology
Miami Tribe of Oklahoma
Indiana Landmarks
Clark County Historian
Utica Town Board
City of Jeffersonville
Mr. Gary Gilmore

Public Notice
Des. No. 1382612

The Indiana Department of Transportation (INDOT); in partnership with the Indiana Economic Development Corporation, Jeffersonville Port of Indiana, Clark County Commissioners, City of Jeffersonville Redevelopment Authority, and River Ridge Development Authority; is planning to undertake a road project funded in part by the Federal Highway Administration (FHWA). The project is located in Utica Township, Clark County, Indiana.

Under the preferred alternative, the proposed project would involve the construction of a two-lane road designed to "heavy haul" specifications. The proposed road would have a design speed of 35 miles per hour with two 13-foot travel lanes and 11-foot shoulders. The road would likely be constructed on new alignment at a total length of approximately 1.75 miles. The proposed corridor generally extends north from the Port to the SR 265/Old Salem Road interchange. The area is a combination of forest, open grass, industrial, and farmed areas. Few existing roads are located within this area. The proposed project corridor is bounded by the SR 265 corridor at the northern project limits. Lentzier Creek and several tributaries are located within the project corridor.

Properties listed in or eligible for the National Register of Historic Places (NRHP) located within the Area of Potential Effects (APE) include the Smith-Sutton Site and the James A. Smith Farmstead. The INDOT, on behalf of the FHWA, has issued a "No Historic Properties Affected" finding for the project due to the fact that the NRHP listed and eligible properties within the APE will not be impacted by the undertaking. In accordance with the National Historic Preservation Act, the views of the public are being sought regarding the effect of the proposed project on the historic elements as per 36 CFR 800.2(d), 800.3(e) and 800.6(a)(4). Pursuant to 36 CFR 800.4(d)(1), the documentation specified in 36 CFR 800. 11(d) is available for inspection in American Structurepoint's office. Additionally, this documentation can be viewed electronically by accessing INDOT's Section 106 document posting website IN SCOPE at http://erms.indot.in.gov/Section106Documents. This documentation serves as the basis for the "No Historic Properties Affected" finding. The views of the public on this effect finding are being sought. Please reply with any comments to Leah Boits, American Structurepoint, 7260 Shadeland Station, Ph: 317-547-5580, Fax: 317-543-0270, lboits@structureoint.com no later than January 22, 2017.

In accordance with the "Americans with Disabilities Act", if you have a disability for which INDOT needs to provide accessibility to the document(s) such as interpreters or readers, please contact Rickie Clark at 317-232-6601 or rclark@indot.in.gov.

FEDERAL HIGHWAY ADMINISTRATION'S
SECTION 4(F) COMPLIANCE REQUIREMENTS (for historic properties) AND
SECTION 106 FINDINGS AND DETERMINATIONS
AREA OF POTENTIAL EFFECT
ELIGIBILITY DETERMINATIONS
EFFECT FINDING
HEAVY HAUL TRANSPORTATION CORRIDOR
UTICA and JEFFERSONVILLE TOWNSHIPS, CLARK COUNTY, INDIANA
DES NO.: 1382612

AREA OF POTENTIAL EFFECT
(Pursuant to 36 CFR Section 800.4(a)(1))
Pursuant to 36 CFR 800.16(d), the Area of Potential Effects (APE) was drawn to encompass potential impacts from the undertaking; it initially included properties within one mile of the undertaking and then was narrowed based on topography and intervening structures. The APE for archaeology was the project footprint. (See Appendix A: Maps.)

ELIGIBILITY DETERMINATIONS
(Pursuant to 36 CFR 800.4(c)(2))
No resources listed in, or eligible for listing in, the National Register of Historic Places (NRHP) are located within the APE for this project.

James A. Smith Farmstead - The Ohio River Bridges (ORB) project determined the property to be eligible for the NRHP under Criterion A, C, and D in 2004. The structure suffered a fire which damaged its integrity leaving it no longer eligible under Criterion A and C. The property (although a ruin) continues to be illustrative of the history of a nineteenth-century residence under Criterion D as an archaeological site. The James A. Smith Farmstead, however, is not within the archaeological APE.

EFFECT FINDING
The Indiana Department of Transportation (INDOT), acting on the Federal Highway Administration's (FHWA) behalf, has determined a finding of "No Historic Properties Affected" is appropriate for this undertaking. The James A. Smith Farmstead was identified in the aboveground APE as eligible under Criterion D, but is located outside of the archaeological APE (which is the project footprint). Since this resource is located outside the archaeological APE, the project will have no impact on historic properties. INDOT respectfully requests the Indiana State Historic Preservation Officer provide written concurrence with the Section 106 determination of "No Historic Properties Affected" for the Heavy Haul Transportation Corridor.

SECTION 4(F) COMPLIANCE REQUIREMENTS (for historic properties)
This undertaking will not convert property from any Section 4(f) historic resource to a transportation use. INDOT, acting on behalf of FHWA, has determined the appropriate Section 106 finding is "No Historic Properties Affected"; therefore, no Section 4(f) evaluation is required.

Anuradha V. Kumar Digitally signed by Anuradha V. Kumar
Date: 2017.12.01 12:46:15 -05'00'

Anuradha Kumar, for FHWA
Manager
INDOT Cultural Resources

12/1/2017

Approved Date

FEDERAL HIGHWAY ADMINISTRATION/INDIANA DEPARTMENT OF TRANSPORTATION
DOCUMENTATION OF SECTION 106 FINDING OF
NO HISTORIC PROPERTIES AFFECTED
SUBMITTED TO THE STATE HISTORIC PRESERVATION OFFICER
PURSUANT TO 36 CFR SECTION 800.4(d)(1)
HEAVY HAUL TRANSPORTATION CORRIDOR
UTICA AND JEFFERSONVILLE TOWNSHIPS, CLARK COUNTY, INDIANA
DES NO.: 1382612

1. DESCRIPTION OF THE UNDERTAKING

The Indiana Department of Transportation (INDOT) in partnership with the Federal Highway Administration (FHWA), the Indiana Economic Development Corporation, the Ports of Indiana, the Board of Commissioners of Clark County, the City of Jeffersonville Redevelopment Commission, and the River Ridge Development Authority, is developing a federal-aid road project to improve connectivity for the Ports of Indiana-Jeffersonville (Port) with other regional transportation assets. Section 106 of the National Historic Preservation Act requires Federal agencies to take into account the effects of their undertakings on historic properties. The federal involvement in the project is funding received from the FHWA.

The proposed project is located in Utica Township, Clark County, Indiana. More specifically, the area is located on the Jeffersonville and Charlestown USGS 7.5-Minute Quadrangle Maps in Tracts 6-7, 14-17, 24-27, 38-40, and 52-53 and is within the Louisville Metropolitan Planning Area (LMPA), which consists of nine counties in Kentucky (Jefferson, Oldham, Trimble, Henry, Shelby, Spencer, Nelson, Bullit, and Meade) and four Indiana counties (Washington, Harrison, Floyd, and Clark).

The need for the proposed project is due to the current and predicted rapid industrial and commercial development in the area that would result in a significant increase in volume of heavy haul vehicles mixing with local traffic. This growth, combined with the lack of connectivity and suitable roadways for heavy haul vehicles in the area, indicates a need for the proposed project. The purpose of the proposed project is to provide a route built specifically for heavy haul vehicles that provides continuous connection between the River Ridge Commerce Center (RRCC) and the Port via the new State Road (SR) 265/Old Salem Road interchange.

The proposed project corridor generally extends north from the Port to the SR 265/Old Salem Road interchange. The area is a combination of forest, open grass, industrial, and farmed areas. The forested areas are generally on steep slopes. Few existing roads are located within this area. The proposed project corridor is bounded by the SR 265 corridor at the northern project limits. Lentzier Creek and several tributaries are located within the project corridor.

The preferred project corridor, consists of the construction of a two-lane road designed to “heavy haul” specifications. The proposed road would have a design speed of 35 miles per hour with two 13-foot travel lanes and 11-foot shoulders. The road would likely be constructed on new alignment at a total length of approximately 1.75 miles.

36 CFR § 800.16(d) defines the Area of Potential Effects (APE) as the “geographic area or areas within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties, if any such properties exist. The area of potential effects is influenced by the scale and nature of an undertaking and may be different for different kinds of effects caused by the undertaking.”

The Area of Potential Effects (APE) was drawn approximately one mile from the proposed project area’s centerline but it was narrowed based upon existing topography and the limited view-shed due to existing structures and wooded terrain; it was expanded as additional alternatives were considered. The aboveground APE as illustrated takes into account the impacts from all alternatives. The APE for archaeological resources was defined as the project footprint. (See Appendix A: Maps.)

2. EFFORTS TO IDENTIFY HISTORIC PROPERTIES

Pursuant to 36 CFR § 800.4(b), United Consulting, the project consultant for INDOT, charged Weintraut & Associates (W&A) with identifying and evaluating historic properties. Historians for W&A reviewed the National Register of Historic Places (NRHP), Indiana Register of Historic Sites and Structures (IRHSS), Indiana Historic Sites and Structures Inventory (IHSSI), the State Historical Architectural and Archaeological Research Database (SHAARD), the Indiana Historic Bridge Inventory, and the *Clark County Interim Report*, for previously identified properties. Historians also reviewed prior Section 106 studies. In conducting research, historians examined primary and secondary resources. Documentary research for the project included a review of county histories, aerial photographs, and online resources. Historians also consulted with representatives of the River Ridge Development Authority for information about resources within or near the APE. W&A found that the Ohio River Bridges (ORB) project had determined the James A. Smith Farmstead to be eligible for the NRHP under Criteria A, C, and D in 2004.

Pursuant to 36 CFR § 800.4(b), staff from W&A conducted a Phase Ia records check beginning on February 17, 2014, using the site files in the Indiana Cemetery & Burial Registry, SHAARD, and other data on file at the Indiana Department of Natural Resources, Division of Historic Preservation and Archaeology (IDNR, DHPA). Staff then returned for additional materials on file at IDNR, DHPA on May 21, 2014. Archaeologists consulted with staff of Indiana University Purdue University—Fort Wayne (IPFW) about previous investigations in, or near, the project location.

Historians conducted an aboveground site survey in April, May, and July of 2014. While in the field, they photographed and inventoried properties that were constructed more than fifty years before the anticipated date of the project's completion. They scrutinized the area carefully looking for architectural or historic thematic continuity of properties to evaluate the area for a historic district. Further, they evaluated individual properties using the National Register guidance for applying the criteria for evaluation and the criteria considerations. Finally, they used the guidance provided by the staff of the IDNR, DHPA regarding recent past resources. W&A prepared a context by which they evaluated properties meeting the age requirement for NRHP consideration for this project. Historians identified the James A. Smith Farmstead ruins (WA1) that had been previously determined to be NRHP-eligible under Criteria A, C, and D. The structure suffered a fire which damaged its integrity leaving it no longer eligible under Criterion A and C. The property (although a ruin) continues to be illustrative of the history of a nineteenth-century residence under Criterion D. It is located outside of the archaeological APE (which is the project footprint). (See Appendix B: Photographs, for images from the aboveground structural survey.)

W&A archaeologists conducted a Phase Ia archaeological field reconnaissance in May 5-13, July 8-10, and August 5, 2014. During the Phase Ia investigations completed in May, July, and August 2014, archaeologists identified two previously-recorded sites (12CL0533 and 12CL0129) with the potential to yield information important to the regional prehistoric record within a "survey area" provided by the client. (Note that the survey area for this project was larger than the final project area.)

An agency coordination meeting was held September 8, 2014, with FHWA, INDOT, INDOT's consultants, and SHPO to discuss the archaeological investigation for the project. At the meeting, the group decided to conduct a Phase II investigation for the area between sites 12CL0533 and 12CL0129 to see if they were connected; SHPO and INDOT agreed to a multi-stage investigation that would include remote sensing followed by feature investigation, contingent on SHPO approval. The meeting was summarized in a letter sent to the INDOT project manager on September 12, 2014. (See Appendix C: Correspondence.)

To further evaluate eligibility, W&A prepared a work plan (Goldbach 2015) for Phase II investigation of Sites 12CL0533 and 12CL0129. The work plan was completed on March 27, 2015; W&A submitted the work plan to the State Historic Preservation Officer (SHPO) on March 27, 2015. (See Appendix C: Correspondence and Appendix D: Report Summaries.)

The SHPO responded to the Phase II work plan in a letter dated April 1, 2015. The SHPO accepted the work plan with four conditions, specifically:

> "1. All archaeological investigation must be directly supervised in the field and laboratory by an archaeologist meeting the professional qualification standards for archaeology in 312 IAC 12-3-4;

2. If any human remains dating on or before December 31, 1939 are encountered, the discovery must be reported to the Indiana Department of Natural Resources within two (2) business days. The discovery must be treated in accordance with IC 14-21-1 and 312 IAC 22 [. . .];
3. A report detailing the methods, techniques, analysis, and results of the project must be submitted to the DHPA for review and comment within one year of the end of fieldwork.
4. If major revisions to the archaeological plan are implemented, please coordinate with DHPA and INDOT-[CRO]."

(See Appendix C: Correspondence, for the letter from SHPO.)

Phase II remote sensing was performed on April 27-29, 2015. Utilizing the results from the remote sensing, W&A archaeologists performed investigatory excavations on May 11-14, 18, and 21, 2015. The archaeological testing found an absence of earthworks, mounds, middens, burials, or significant subsurface deposits. The low density of features and artifacts led the principal investigator to conclude that the tested portion of site 12CL0129/0533 has limited potential to yield information important to the knowledge of the prehistory of the region. W&A conveyed a management summary to the Indiana SHPO on June 3, 2015, for these Phase II investigations. Based on the Phase II sampling of site 12CL0129/0533, the archaeologist recommended that portion of the site as not eligible for inclusion in the NRHP or IRHSS. (See Appendix C: Correspondence.)

In a letter dated June 12, 2015, the SHPO concurred with the recommendation of the Phase II Management Summary that the portion of archaeological site 12CL0129/0533 "located within the project corridor is not eligible for inclusion in the State or National Registers of Historic Places." SHPO also requested the Phase II report be delivered in full by May 21, 2016. (See Appendix C: Correspondence.)

Phase Ia archaeological investigations resumed from September 28, 2015 to October 7, 2015. At the conclusion of these Phase Ia investigations, archaeologists had recorded twenty-six sites, six of which had been previously recorded.

On December 9, 2015, W&A historians reviewed the aboveground APE drawn in 2014 and expanded it based on additional alternatives under investigation. At the same time, historians drove the APE to confirm that no significant changes had taken place that would alter the results of previous survey. No changes were noted.

In a letter dated April 18, 2016, the following individuals or organizations were invited to join Section 106 consultation: Indiana State Historic Preservation Officer (SHPO); Indiana Landmarks—Southern Regional Office; Indiana Landmarks—Central Office; Borden Institute Historical Society; Clark's Grant Historical Society; Howard Steamboat Museum/Clark County Historical Society; Jeff-Clark Preservation, Inc.; Jeffersonville Main Street; Jeffersonville Historic Board of Review; Clark County Historian; Mayor of the City of Jeffersonville; Utica Town Board; Kentuckiana Regional Planning and Development Agency; City of Jeffersonville Engineer; Jeffersonville Department of Economic Development and Department of Redevelopment; Clark County Board of Commissioners; and Clark County Council. Indiana Landmarks—Southern Regional Office; City of Jeffersonville Engineer; Clark County Historian, SHPO, and Utica Town Board sent affirmative post card responses to the invitation to join consultation. The Clark County Board of Commissioners declined the invitation to participate. (See Appendix C: Correspondence and Appendix E: Consulting Parties.)

INDOT sent a letter dated April 18, 2016, to the following federally-recognized Tribes and invited them to join in consultation: Miami Tribe of Oklahoma, Eastern Shawnee Tribe of Oklahoma, Peoria Tribe of Indians of Oklahoma, and United Keetoowah Band of Cherokee Indians. The Miami Tribe of Oklahoma accepted the invitation to participate. Note that subsequent to this email, the Pokagon Band of Potawatomi Indians requested to be consulted on all counties in Indiana and were invited to join consultation. (Appendix C: Correspondence and Appendix E: Consulting Parties.)

On February 22, 2017, Gary Gilmore, a property owner, contacted W&A and requested to be added to the consulting party list for this project. (Appendix E: See Consulting Parties.)

On March 27, 2017, American Structurepoint (Structurepoint), the environmental consultant on this project, informed consulting parties via email of the availability of the Historic Property Report (HPR, Fivecoat and Molloy 2016) on INSCOPE. The HPR identified the James A. Smith Farmstead (WA1) as having been previously determined eligible under Criterion D. Historians recommended no other properties as eligible for listing in the NRHP. (Note: This email was distributed to consulting party Gary Gilmore on April 5, 2017. It was later discovered that Indiana Landmarks had been inadvertently omitted from the distribution list; an email informing of them of the availability of the HPR was sent on August 9, 2017. See Appendix C: Correspondence for copies of these emails.)

INDOT-Cultural Resources Office (CRO) sent an email to the Tribal consultation partners informing them that the HPR, Phase II (Goldbach 2017a), and Phase Ia (Goldbach 2017b) reports were available for review on INSCOPE on March 27, 2017. The Phase Ia report recommended the project proceed as planned. The Phase II report recommended the portion of Site 12CL0129/0533 within the project corridor as not eligible for inclusion in the IRHSS or NRHP. The HPR, Phase Ia, and Phase II reports were all approved by INDOT-CRO prior to their transmittal to consulting parties and Tribal consulting partners. (See Appendix C: Correspondence and Appendix D: Report Summaries.)

On April 11, 2017, at the request of INDOT and FHWA, archaeologists for W&A conducted a survey in an alternative “study area.” The survey area totaled approximately 1.22 hectares (ha) (3.0 acres [ac]). The survey identified one site, 12CL1052, for further work. (See Appendix D: Report Summaries.)

In a letter dated April 24, 2017, the SHPO responded to the HPR, Phase Ia Archaeological Field Reconnaissance Report, and the Phase II Archaeological Investigations. SHPO concurred that the James A. Smith Farmstead (WA1) is eligible for the NRHP under Criterion D and that “it is the only above-ground property identified in the HPR that is eligible for the NRHP.” (See Appendix C: Correspondence.)

Further, SHPO stated, “[w]e also agree with the Phase Ia (Goldbach; February 24, 2017) and Phase II (Goldbach, Arnold and Hughes; February 24, 2017) archaeology reports addressing the archaeological aspects of this project.” Specifically, SHPO concurred that Sites 12CL1004 to 12Cl1016 and Sites 12CL1051 to 12CL1057 lack sufficient integrity to be considered potentially eligible and no additional work is needed at the sites. SHPO acknowledged that the Phase Ia documented Sites 12Cl0129/943 and 12CL0533 as one large artifact scatter and that the Phase II report recommended the site not eligible for nomination to the State or National Registers of Historic Places, concluding “[t]he portion of sites 12-Cl-129/544 located within the project area will not require additional archaeological assessment.” (See Appendix C: Correspondence.)

Finally, in the letter dated April 24, 2017, the SHPO stated that “[i]f any archaeological artifacts or human remains are uncovered during construction, demolition, or earthmoving activities, state law (Indiana Code 14-21-1-27 and -29) requires that the discovery be reported to the Department of Natural Resources within two (2) business days. (See Appendix C: Correspondence.)

In October 2017, archaeologists for W&A prepared a Phase Ia Archaeological Field Reconnaissance—Addendum No. 1 (Addendum No. 1 Report/ Goldbach 2017c) which documented efforts to identify and evaluate archaeological resources within a “survey area” that is outside the preferred alternative. It was decided after the Phase Ia reconnaissance not to pursue the alternative “survey area,” and the archaeological APE remains the same as that described in Phase Ia report (Goldbach 2017b). The Addendum No. 1 Report (Goldbach 2017c) identified one site for further work: site 12CL1052, which could not be fully assessed because of landowner constraints. However, since the alternative “survey area” will not be moving forward as part of the preferred alternative, the site will not be impacted by construction of the proposed project. If the portion of site 12CL1052 within the “survey area” of the Addendum No. 1 Report (Goldbach 2017c) cannot be avoided and becomes part of the preferred alternative, then additional investigation is recommended. It was further recommended that the project area previously examined and cleared in the Phase Ia report (Goldbach 2017b) be allowed to proceed without additional work. (See Appendix D: Report Summaries.)

INDOT sent an email providing Tribal Representatives access to the Addendum No. 1 Report on INSCOPE. Structurepoint sent a paper copy of this 800.11 documentation and Addendum No. 1 Report to the Indiana SHPO.

No further efforts, including consultation, to identify historic archaeological and aboveground resources took place.

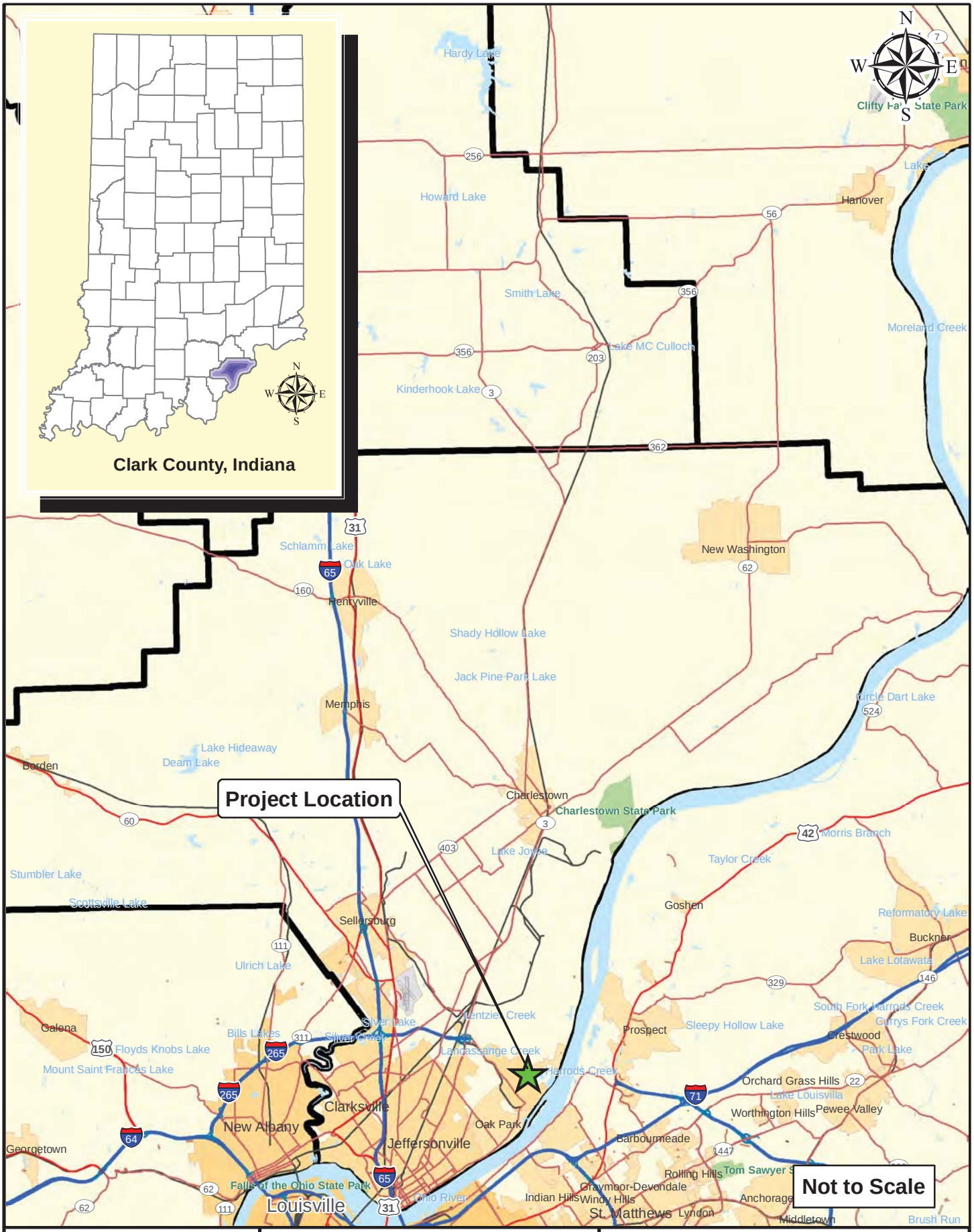
3. BASIS FOR FINDING

One aboveground resource was identified as eligible under Criterion D: the remains of the James A. Smith Farmstead (WA1). This resource was identified in the aboveground APE, but is located outside of the archaeological APE (which is the project footprint). Since this archaeological resource is located outside the archaeological APE, the project will have no impact on historic properties. Therefore, the finding of “No Historic Properties Affected” is appropriate for this undertaking as no historic properties are present within the APE.

APPENDIX

Appendix A: Maps
Appendix B: Photographs
Appendix C: Correspondence
Appendix D: Report Summaries
Appendix E: Consulting Parties

APPENDIX A. Maps



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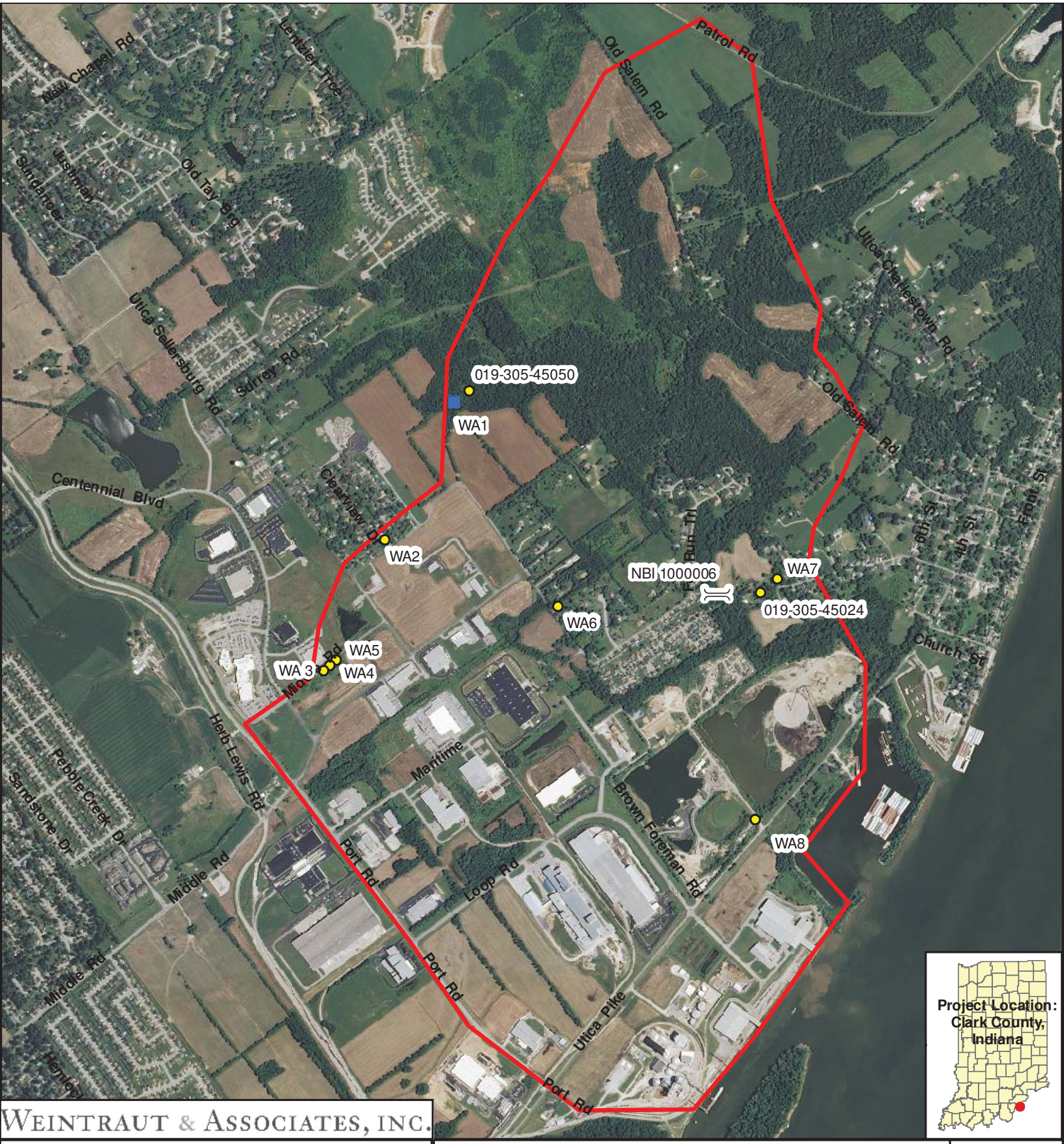
AMERICAN STRUCTUREPOINT INC
www.structurepoint.com

Project Location Map

Indiana Department of Transportation
Central Office
100 North Senate Avenue
Indianapolis, Indiana 46204

Des. No. 1382612
Transportation Corridor
Location: Jeffersonville
Township: Utica
County: Clark
State: Indiana

Date: 09/25/2015



WEINTRAUT & ASSOCIATES, INC.

600 300 0 600 Meters

2,000 1,000 0 2,000 Feet

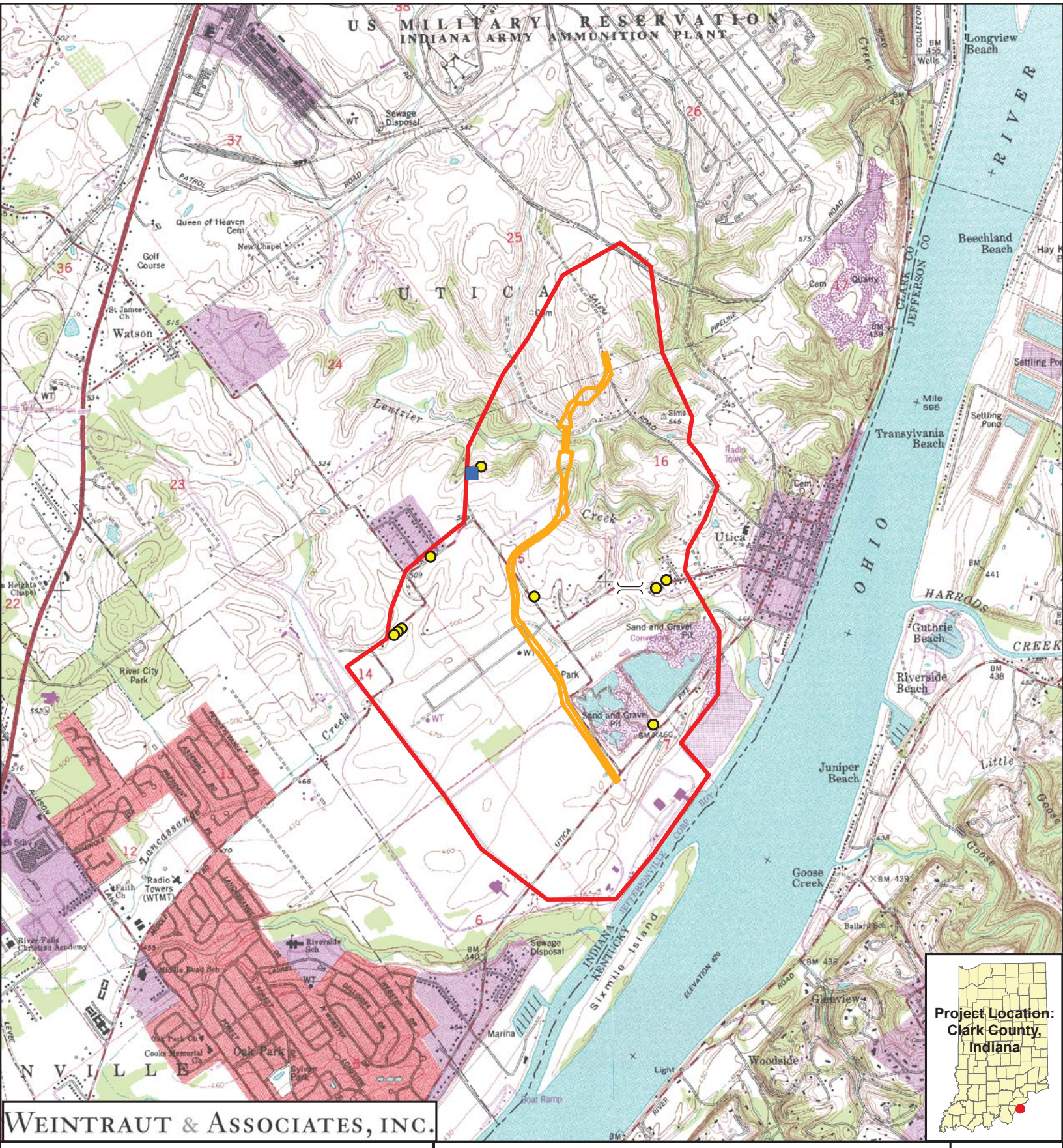
APE

Contributing Resource

Previously Determined Eligible

Bridge

N



WEINTRAUT & ASSOCIATES, INC.

1,000 500 0 1,000 Meters

3,000 1,500 0 3,000 Feet

APE

Alternative DE

bridge

Previously Determined Eligible

Contributing Resource

N

APPENDIX B. Photographs

A view along New Middle Road looking northwest from 4712 New Middle Road.

A view along New Middle Road looking southeast from 4712 New Middle Road.

A view looking east from Port Road and Loop Road.

A view looking east-northeast from Utica Pike and Brown Forman Road.

A view looking northeast from Utica Pike and Brown Forman Road.

A view looking northwest from Utica Pike and Brown Forman Road.

A view looking northwest up Utica Sellersburg Road from Fairmound Drive.

A view looking southwest from Utica Pike and Brown Forman Road.

A view of a modern subdivision located along Glenbrook Park Road looking southwest.

A view of Loop Road looking north-northeast from 5134 Loop Road.

A view of modern subdivisions looking southwest along Utica Sellersburg Road.

A view of the east elevation of 2120 Utica-Sellersburg Road (WA2).

A view of the home at 1508 Old Salem Road looking southeast.

A view of the north elevation of the home at 4514 Middle Road (WA3).

A view of the northwest elevation of the James Smith House (WA1).

A view of Utica Pike looking northeast from 5217 Utica Pike.

A view of Utica Sellersburg Road looking northeast from Fairmound Drive.

A view southwest from west of the terminus of New Middle Road.

Chicken houses behind the home at 2120 Utica-Sellersburg Road (WA2).

Looking at the north elevation and deck of the Utica Sellersburg bridge over Lentzier Creek (NBI_1000006).

Looking east-northeast along Loop Road near 5134 Loop Road.

Looking north toward 702 Port Road from the Utica Pike intersection.

Looking northeast from near the weigh scale building at 5217 Utica Pike (WA8).

Looking northwest along Old Salem Road from the tributary to Lentzier Creek.

Looking northwest along Port Road from Maritime Road.

Looking south to the barns located at 1117 Utica Sellersburg Road (45024).

Looking southeast from Port Road and Utica Pike.

Looking southeast from the tributary of Lentzier Creek along Old Salem Road.

Mary Smith's gravestone in the Smith Cemetery (45050).

South and west elevations of the home at 1610 Utica Sellersburg Road (WA6).

The north and east elevations of the home at 4516 Middle Road (WA4).

The north and east elevations of the home at 4520 Middle Road (WA5).

The north elevation of the home located at 1117 Utica Sellersburg Road

The northwest elevation of the James Smith House (WA1).

The Smith Cemetery sign and entrance (45050).

The south and east elevations of the weigh scale building at 5217 Utica Pike (WA8).

The south elevation of the home at 916 Utica Sellersburg Road (WA7).

The view east down Utica Sellerburg Road from Fairmound Drive.

The west elevation of the home at 1316 Old Salem Road.

APPENDIX C. Correspondence

Meeting Minutes

1625 N. Post Road, Indianapolis, IN 46219 (317) 895-2585 www.ucindy.com

UNITED Consulting

September 12, 2014

Mr. Tim Muench, P.E.
Project Manager
Indiana Department of Transportation
100 North Senate Avenue
Indianapolis, IN 46204

RE: Archaeological Resource Discussion
Transportation Corridor (Des. No. 1382612)

Dear Mr. Muench:

A coordination meeting was held on September 8, 2014 at Indiana Department of Transportation (INDOT). The following people were in attendance:

- Patrick Carpenter — INDOT- Office of Environmental Services (OES)
- Shaun Miller — OES
- Mitch Zoll — INDR – Division of Historic Preservation and Archaeology (DHPA)
- Michelle Allen — Federal Highway Administration (FHWA)
- Mohammad Hajeer — FHWA
- Chris Pope — United Consulting (UNITED)
- Matt Taylor — UNITED
- Briana Hope — American Structurepoint Inc. (ASI)
- Amy Marlatt — ASI
- Nicholas Murphy — ASI
- Linda Weintraut — Weintraut & Associates (W&A)
- Jason Goldbach — W&A

The objective of the meeting was to discuss the status of the archaeological investigation between the Port of Indiana and the proposed SR 265 and Utica-Sellersburg Road interchange, and also to determine the next steps in the investigation. During the meeting, the following information was discussed:

1. UNITED gave a project status update focusing on the August Stakeholder Meeting and upcoming Steering Committee meeting that will be held in October. The Committee will be required to address project delays due to the unanticipated cultural resources and other budget related issues.

2. UNITED and W&A have developed and studied additional western alignments for the corridor. The original alignment, Alternative "B" was discarded due to impacts to a site that is on the National Register of Historic Places. Alternative "C", had the next fewest relocations, but impacts a mound structure and was discarded. Alternative "E", the current proposal runs between Alternates "B" and "C" and is anticipated to miss the known extent of the mound structure, but passes through an area of reported "contributing resources". W&A recommends a Phase II be performed to further define the extents and character of the resources encountered along Alternate "E". The W&A approach is to first perform an above ground remote sensing at this location to identify subsurface resources and limit the invasive portion of the Phase II study. Following the remote sensing a targeted Phase II will be performed.

3. OES expressed an interest in moving directly to the feature investigation without remote sensing, expressing concern over the reliability of the remote sensing results, but agreed to move forward with the plan as presented. DHPA agreed that a multi-stage work plan could be approved for this location with a single 30-day review period. The multi-stage plan will consist of the remote sensing and feature investigation phases. DHPA will authorize the feature investigation via email once the informal results of the remote sensing have been reported. As other portions of the corridor are further studied it may be necessary to perform additional Phase II work that may or may not be pursued using a similar planning and authorization process. The option to bridge the encountered resources will also be further considered at that time. The group was of the opinion that the proposed plan will be the most responsible approach to the project's schedule.

4. Tribal consultation will be initiated at the same time as the Early Coordination for the project. This consultation should be started prior to any feature excavation activities associated with the mound structure near Alternate "E" so that the tribes have an opportunity to comment on the proposed investigation. After discussion regarding the consulting parties letter, it was decided to prepare a single letter that will include an additional enclosure for the tribes only. The additional enclosure will include specific location information relative to the proposed Phase II study. OES and DHPA gave approval for showing the archaeological sites and proposed alignment in the additional information. UNITED requested that a confidentiality clause be added to the letter, which was agreed to by the resource agencies.

5. FHWA recommended that the group consider public information meetings be started for the project.

6. OES requested that another update meeting be held when the results of the remote sensing are available and prior to the Phase II excavations.

7. The additional archaeological investigations are beyond the current scope of the project. As a result, UNITED will prepare and submit a supplement to INDOT for the additional studies, remote sensing and additional coordination that is required to be performed by the project development team.

The above minutes reflect our understanding of the discussions and decisions made at this meeting. If you have any questions, additions, or comments, please contact our office at your convenience.

Sincerely,
UNITED CONSULTING CRP

Matt Taylor, P.E., M.B.A.
Project Team Leader

c: All Attendees
File 14-402

REVIEW REQUEST SUBMITTAL

State Form 55031 (7-12)
Indiana Department of Natural Resources
Division of Historic Preservation and Archaeology, Indiana State Historic Preservation Office (SHPO)

MAR 2015
RECEIVED
DNR
DIV. OF WATER

HISTORIC PRESERVATION AND ARCHAEOLOGY

Please complete this form and attach it to front of all submittals, along with any reports or supplemental materials you are providing to the Indiana DHPA for review.

Date: March 27, 2015

Is this a new submission? ☑ Yes ☐ No

Reference for previous submittals: DHPA # _____ Des. No. 1382612

THIS REVIEW REQUEST SUBMITTED BY:

Name: Linda Weintraut

Company/Organization: Weintraut & Associates, Inc.

Address: P.O. Box 5034, Zionsville, Indiana 46077

Telephone number: 317-733-9770 Email address: linda@weintrautinc.com

PROJECT NAME & LOCATION ***[Please attach a map with location(s) marked]***

Project Name/Reference: Proposed Transportation Corridor Project/ Des # 1382612

Project Address/Location: Between Utica Pike and Old Salem Road

City: Jeffersonville Township(s): Utica Township

County/Counties: Clark County

STATE OR FEDERAL AGENCY INVOLVEMENT

Agency: Federal Highway Administration Program: _____

Type of funds, license, or permit to be obtained *(if applicable)*: _____

Name(s) of Agency Contact: Michelle Allen

Address: 575 North Pennsylvania Street, Room 254, Indianapolis, IN 46204

Telephone number: 317-226-7344 Email address: michelle.allen@dot.gov

APPLICANT *(if different than Federal Agency)* ***If available, please attach copy of authorization letter from federal agency***

Applicant: Indiana Department of Transportation

Name of Contact: Patrick Carpenter

Address: 100 North Senate Avenue, IGCN 642, Indianapolis, IN 462014

Telephone number: 317-233-2061 Email address: pacarpenter@indot.in.gov

CONSULTANT FOR THE APPLICANT OR AGENCY *(IF APPLICABLE)*

Consultant: United Consulting

Name of Contact: Matt Taylor

Address: 1625 North Post Road, Indianapolis, Indiana 46219

Telephone number: 317-895-2585 Email address: mattt@ucindy.com

Contact for DHPA questions regarding this review request: Weintraut & Associates

Comments:
Please find enclosed the "Work Plan: Phase II Testing at Sites 12Cl0533 and 12Cl0129 within the Proposed Transportation Corridor, Utica Township, Clark County, Indiana."

Please note that incomplete submissions may result in delays. To ensure an expeditious review, please be sure that the following has been provided:

- ☑ Full contact information for person/entity submitting form, including phone number and email *(if available)*
- ☑ Map of project location with project area(s) clearly marked *(provided in current or previous submission)*
- ☑ Clear photographs of project area and surroundings
- ☑ Project description
- ☑ Description of any proposed ground disturbance
- ☐ Name of Federal agency/agencies and program providing funds, license, or permit
- ☐ Letter of authorization from Federal agency/agencies *(if applicable)*

Return this Form and Attachments to:

Indiana Department of Natural Resources
Division of Historic Preservation and Archaeology
402 W. Washington Street, Room W274
Indianapolis, Indiana 46204

http://www.in.gov/dnr/historic

Michael R. Pence, Governor
Cameron F. Clark, Director

DNR Indiana Department of Natural Resources

Division of Historic Preservation & Archaeology•402 W. Washington Street, W274•Indianapolis, IN 46204-2739
Phone 317-232-1646•Fax 317-232-0693•dhpa@dnr.IN.gov•www.IN.gov/dnr/historic

April 1, 2015

Jason Goldbach
Principal Investigator
Weintraut & Associates, Inc.
P.O. Box 5034
Zionsville, Indiana 46077

Federal Agency: Indiana Department of Transportation

Re: Plan for Phase II Archaeological Testing at Site 12-Cl-129 / 533 for a proposed transportation corridor in Utica Township, Clark County, Indiana. (Designation No. 1382612) (DHPA No. 17495)

Mr. Goldbach:

Pursuant to Section 106 of the National Historic Preservation Act (54 U.S.C. § 306108) and 36 C.F.R. Part 800, the staff of the Indiana State Historic Preservation Officer ("Indiana SHPO") has conducted an analysis of the materials dated March 27, 2015 and received on March 27, 2015, for the above indicated project in Clark County, Indiana.

Thank you for providing the archaeological plan for a Phase II investigation for the above archaeological site. The Division of Historic Preservation and Archaeology ("DHPA") has reviewed the plan. The plan is acceptable with the following conditions:

1. All archaeological investigations must be directly supervised in the field and laboratory by an archaeologist meeting the professional qualification standards for archaeology in 312 IAC 21-3-4.
2. If any human remains dating on or before December 31, 1939 are encountered, the discovery must be reported to the Indiana Department of Natural Resources within two (2) business days. The discovery must be treated in accordance with IC 14-21-1 and 312 IAC 22. In that event, please call 317-232-3492.
3. A report detailing the methods, techniques, analysis, and results of the project must be submitted to the DHPA for review and comment within one year of the end of fieldwork.
4. If major revisions to the archaeological plan are implemented, please coordinate with DHPA and INDOT-CRS.

With these conditions, the proposed investigations may proceed. A copy of this letter, along with proper identification, should be carried by archaeologists in the field. If you have any questions regarding this matter, please contact me at (317) 232-3492.

Very truly yours,

Mitchell K. Zoll
Deputy State Historic Preservation Officer

MKZ:mkz

cc: Patrick Carpenter, INDOT - pacarpenter@indot.in.gov
Shaun Miller, INDOT - smiller@indot.in.gov
Mary Kennedy, INDOT - mkennedy@indot.in.gov
Shirley Clark, INDOT - sclark@indot.in.gov
Michelle Allen, FHW – michelle.allen@dot.gov
Linda Weintraut, Weintraut & Associates – linda@weintrautinc.com
Jason Goldbach, Weintraut & Associates – jason@weintrautinc.com
Matt Taylor, United Consulting – matt@ucindy.com

Weintraut & Associates, inc.

Transmittal Letter

DATE: June 3, 2015

TO: SHPO

FROM: Weintraut & Associates, Inc.

PROJECT: Proposed Transportation Corridor

# of copies	Title	Comments
1	Transmittal Letter	
1	DHPA Review Request Submittal	
1	Management Summary for the Proposed Transportation Corridor	

ADDITIONAL NOTES:

P.O. Box 5034, Zionsville, IN 46077 Tel: (317) 733-9770 Fax: (317) 733-9773 www.weintrautinc.com

REVIEW REQUEST SUBMITTAL

State Form 55031 (7-12)
Indiana Department of Natural Resources
Division of Historic Preservation and Archaeology, Indiana State Historic Preservation Office (SHPO)

HISTORIC PRESERVATION AND ARCHAEOLOGY

Please complete this form and attach it to front of all submittals, along with any reports or supplemental materials you are providing to the Indiana DHPA for review.

Date: June 3, 2015

Is this a new submission? ☑ Yes ☐ No

Reference for previous submittals: DHPA # _____ Des. No. _____

THIS REVIEW REQUEST SUBMITTED BY:

Name: Linda Weintraut

Company/Organization: Weintraut & Associates, Inc.

Address: 4649 Northwestern Drive, Zionsville, IN 46077

Telephone number: 317-733-9770 Email address: Linda@weintrautinc.com

PROJECT NAME & LOCATION *[Please attach a map with location(s) marked]*

Project Name/Reference: Proposed Transportation Corridor Project/ Des # 1382612

Project Address/Location: Between Utica Pike and Old Salem Road

City: Jeffersonville Township(s): Utica

County/Counties: Clark

STATE OR FEDERAL AGENCY INVOLVEMENT

Agency: Federal Highway Administration Program: _____

Type of funds, license, or permit to be obtained *(if applicable)*: _____

Name(s) of Agency Contact: Michelle Allen

Address: 575 N. Pennsylvania St., Room 254, Indianapolis, IN 46204

Telephone number: 317-226-7344 Email address: michelle.allen@dot.gov

APPLICANT *(if different than Federal Agency)* *If available, please attach copy of authorization letter from federal agency*

Applicant: Indiana Department of Transportation

Name of Contact: Patrick Carpenter

Address: 100 N. Senate Ave., IGCN 642, Indianapolis, IN 46204

Telephone number: 317-233-2061 Email address: pacarpenter@indot.in.gov

CONSULTANT FOR THE APPLICANT OR AGENCY *(IF APPLICABLE)*

Consultant: United Consulting

Name of Contact: Matt Taylor

Address: 1625 N. Post Rd, Indianapolis, IN 46219

Telephone number: 317-895-2585 Email address: mattt@ucindy.com

Contact for DHPA questions regarding this review request:

Comments:
Please find enclosed the Management Summary for Phase II testing at Sites 12CI0533 and 12CI0129.

Please note that incomplete submissions may result in delays. To ensure an expeditious review, please be sure that the following has been provided:

- ☑ Full contact information for person/entity submitting form, including phone number and email *(if available)*
- ☑ Map of project location with project area(s) clearly marked *(provided in current or previous submission)*
- ☐ Clear photographs of project area and surroundings
- ☐ Project description
- ☐ Description of any proposed ground disturbance
- ☐ Name of Federal agency/agencies and program providing funds, license, or permit
- ☐ Letter of authorization from Federal agency/agencies *(if applicable)*

Return this Form and Attachments to:

Indiana Department of Natural Resources
Division of Historic Preservation and Archaeology
402 W. Washington Street, Room W274
Indianapolis, Indiana 46204

http://www.in.gov/dnr/historic

Management Summary:
Clark County Transportation Corridor
INDOT Des. No.: 1382612
Phase II: Site 12Cl0129/0533 within Alternative E
May 29, 2015

Under contract with United Consulting (United), Weintraut& Associates, Inc. (W&A) completed Phase II testing on portions of site 12Cl0129/0533 within Alternative E of the proposed Transportation Corridor in Utica Township, Clark County, Indiana.

W&A archaeologists first encountered site 12Cl0533 within Alternative F. Subsequently, at the request of United, W&A performed limited shovel testing survey south of site 12Cl0533 and north of site 12Cl0129 to determine the presence or absence of archaeological materials within Alternative E. Based on the recommendations of previous investigations and the results of the Phase Ia archaeological field reconnaissance, W&A concluded that site 12Cl0129/0533 had the potential to contain information important to the regional prehistoric record and was considered potentially eligible for listing in the Indiana Register of Historic Sites and Structures and (IRHSS) and the National Register of Historic Places (NRHP). Therefore, in consultation with the State Historic Preservation Officer (SHPO) and the Indiana Department of Transportation-Cultural Resources Office (INDOT-CRO), W&A recommended site 12Cl0129/0533 for Phase II archaeological investigations to further evaluate eligibility based on site integrity and the potential to yield information important to the prehistoric record (Criterion D). A work plan was submitted to the SHPO March 27, 2015, and approved April 1, 2015.

As part of the Phase II investigations, remote sensing was performed throughout the project area on April 27, 28, and 29, 2015, which included electric resistivity and magnetometer survey. The results formed the basis for the placement of some hand excavation units and mechanically excavated trenches, work which was performed May 11 through May 14 and May 18 through 21, 2015. A total of 35 square meters (0.5%) were hand excavated, and a total of 704 square meters (10.1%) were machine excavated. No middens or burials were encountered during testing, and no evidence for the presence of mounds or other earthworks resulted from the remote sensing or excavations within the project area.

The results, or anomalies, of the remote sensing were rank-ordered from 1 to 3 in likelihood of being a cultural feature with 1 being the most likely and 3 being the least likely. No anomalies were ranked as 1. Eight anomalies were tested within the project area with hand-excavated block units. Of these eight anomalies, only two (Features 1 and 2) were confirmed as prehistoric features. One anomaly (Anomaly 18) was confirmed as a clinker dump from coal powered farm machinery. Mechanical excavations resulted in the excavation of an additional 25 features, 12 of which were determined to be noncultural. No evidence of features was recorded in the plowzone, and all features appear to be plow-truncated. No temporally diagnostic artifacts, bone, macrobotanical remains or radiocarbon dating samples were obtained from any of the features. Minor amounts charcoal flecking and soil discoloration were the only evidence for thermal features.

Small amounts of lithic debitage and highly fragmentary prehistoric ceramics were the only artifacts present within features, and very little fire-cracked rock was present. Phase II testing confirmed that this site has a low density of artifacts within the project area. The hand excavated block unit yielding the highest density of artifact averaged only 33 artifacts per square meter of excavation. This unit also yielded the only temporally diagnostic biface recovered during the Phase II testing, a Madison projectile point which was not associated with a feature.

The absence of temporally diagnostic artifacts and charcoal or other materials which could be radiocarbon dated within features makes it difficult to answer research questions set forth in the Phase II work plan beyond questions of site integrity. Due to this lack of evidence, research questions regarding specific behaviors, such as subsistence and lithic resource exploitation, cannot be contextualized within a specific time period or cultural affiliation. It is possible that flotation samples, once analyzed, may contain botanical evidence for seasonality or diet, but this evidence will have little temporal context.

Due to the absence of earthworks, mounds, middens, burials, or other significant subsurface deposits, low artifact density, and lack of temporal context, site 12Cl0129/0533 has limited potential to yield information important to the knowledge of the prehistory of the region. Based on the sample of site 12Cl0129/0533 within the project corridor, this portion of the site is recommended as not eligible to the IRHSS or the NRHP. Any portions of this site existing outside of the project area must be evaluated separately.

Michael R. Pence, Governor
Cameron F. Clark, Director

DNR Indiana Department of Natural Resources

Division of Historic Preservation & Archaeology•402 W. Washington Street, W274 · Indianapolis, IN 46204-2739
Phone 317-232-1646•Fax 317-232-0693 · dhpa@dnr.IN.gov

HISTORIC PRESERVATION AND ARCHAEOLOGY

June 12, 2015

Linda Weintraut, Ph.D.
Weintraut & Associates, Inc.
Post Office Box 5034
Zionsville, Indiana 46077

Federal Agency: Indiana Department of Transportation ("INDOT"), on behalf of Federal Highway Administration

Re: Management Summary (Goldbach, 5/29/2015) for Phase II Testing of Archaeological Site 12-Cl-129 / 533, Clark County Transportation Corridor, Alternative E, Clark County, Indiana (Des. No. 1382612; DHPA No. 17495)

Dr. Weintraut:

Pursuant to Section 106 of the National Historic Preservation Act of 1966, as amended (recently recodified at 54 U.S.C. § 306108), 36 C.F.R. Part 800, and the "Programmatic Agreement among the Federal Highway Administration, the Indiana Department of Transportation, the Advisory Council on Historic Preservation, the Indiana State Historic Preservation Officer regarding the implementation of the Federal Aid Highway Program in the State of Indiana," the staff of the Indiana State Historic Preservation Officer ("Indiana SHPO") has reviewed the Management Summary sent on June 3, 2015 and received on June 4, 2015 for the aforementioned project.

Based on the evidence documented during the testing and detailed in the Management Summary, we concur with Mr. Goldbach that the portion of archaeological site 12-Cl- 129 / 533 located within the project corridor is not eligible for inclusion in the State or National Registers of Historic Places. Please provide a full report of the excavation to our office by May 21, 2016.

If any archaeological artifacts or human remains are uncovered during construction, demolition, or earthmoving activities, state law (Indiana Code 14-21-1-27 and -29) requires that the discovery be reported to the Department of Natural Resources within two (2) business days. In that event, please call (317) 232-1646. Be advised that adherence to Indiana Code 14-21-1-27 and -29 does not obviate the need to adhere to applicable federal statutes and regulations.

If you have questions about archaeological issues, please contact Mitch Zoll at (317) 232-3492 or mzoll@dnr.IN.gov. Questions about buildings or structures should be directed to Chad Slider at (317) 234-5366 or cslider@dnr.IN.gov.

In all future correspondence regarding this project, please continue to refer to DHPA No. 17495.

Very truly yours,

Mitchell K. Zoll
Deputy State Historic Preservation Officer

MKZ:CWS:mkz

emc: Patrick Carpenter, Indiana Department of Transportation
Shaun Miller, Indiana Department of Transportation
Mary Kennedy, Indiana Department of Transportation

April 18, 2016

Example Consulting Party Invitation

Re: Des. No. 1382612
Heavy Haul Transportation Corridor
Port of Indiana – Jeffersonville to SR 265
Utica Township, Clark County, Indiana
Project No. 2013.01857

Dear Mr. Zoll:

The Indiana Department of Transportation (INDOT), in partnership with the Federal Highway Administration (FHWA), the Indiana Economic Development Corporation, the Ports of Indiana, the Board of Commissioners of Clark County, the City of Jeffersonville Redevelopment Commission, and the River Ridge Development Authority (RRDA), is developing a federal-aid road project to improve connectivity for the Ports of Indiana-Jeffersonville (Port) with other regional transportation assets. The proposed project is located in Utica Township, Clark County, Indiana.

The area is located on the Jeffersonville and Charlestown USGS 7.5 Minute Quadrangle Maps in Tracts 6-7, 14-17, 24-27, 38-40, and 52-53 and is within the Louisville Metropolitan Planning Area (LMPA), which consists of nine counties in Kentucky (Jefferson, Oldham, Trimble, Henry, Shelby, Spencer, Nelson, Bullit and Meade) and four Indiana counties (Washington, Harrison, Floyd and Clark). Preliminary corridor studies have identified an approximately 1.3-mile wide corridor between the Port of Indiana, Jeffersonville and State Road (SR) 265 to establish roadway alignment alternatives for the project. The alternatives are currently being developed and evaluated within the project corridor based upon environmental studies and coordination. Various maps and aerial photographs are enclosed showing the area being investigated.

The project area has several major generators of traffic that consist primarily of heavy trucks or heavy haul vehicles. However, the road network in the area is primarily made of up of local facilities not designed to handle such vehicle loading. Heavy haul vehicles (often referred to as Michigan truck trains) are generally 60 feet or more in length with a gross vehicle weight of 134,000 pounds, as compared to Indiana legal load limits of 80,000 pounds gross vehicle weight. Heavy haul vehicles require the design of facilities to take into account the maximum weight of the heavy haul vehicles and the anticipated number of heavy haul vehicles utilizing the facility on a daily basis. The resulting difference between a facility designed to carry heavy haul vehicles and standard load trucks is often a significant difference in pavement thickness. Based on current and predicted rapid industrial and commercial development associated with the major traffic generators in the project area it is anticipated that truck traffic will increase by 129 percent over the next 20 years.

The need for the proposed project is due to the current and predicted rapid industrial and commercial development in the area that would result in a significant increase in volume of heavy haul vehicles mixing with local traffic. This growth, combined with the lack of connectivity and suitable roadways for heavy haul vehicles in the area, indicates a need for the proposed project. The purpose of the proposed project is to provide a route built specifically for heavy haul vehicles that provides continuous connection between the River Ridge Commerce Center (RRCC) and the Port via the new SR 265/Old Salem Road interchange.

The proposed project corridor generally extends north from the Port to the SR 265/Old Salem Road interchange. The area is a combination of forest, open grass, industrial, and farmed areas. The forested areas are generally on steep slopes. Few existing roads

are located within this area. The proposed project corridor is bounded by the SR 265 corridor at the northern project limits. Lentzier Creek and several tributaries are located within the project corridor.

The proposed project consists of the construction of a 3-lane road designed to "heavy haul" specifications. The proposed road would have a design speed of 35 miles per hour with two 12-foot travel lanes and one 11- to 12-foot auxiliary lane. The road would likely be constructed on new alignment at a total length of approximately 1.75 miles. While only three lanes would be constructed, right-of-way would be wide enough to allow for future expansion to five lanes if required by traffic demand.

Section 106 of the National Historic Preservation Act requires federal agencies to take into account the effects of their undertakings on historic properties. In accordance with 36 CFR 800.2(c), you are hereby invited to be a consulting party to participate in the Section 106 process. This process involves efforts to identify historic properties potentially affected by the undertaking, assess the effects of the undertaking on historic properties, and seek ways to avoid, minimize, or mitigate any adverse effects on historic properties. For more information on Section 106 of the NHPA and the Section 106 review process, we recommend reviewing the Advisory Council on Historic Preservation's publication titled *Protecting Historic Properties: A Citizen's Guide to Section 106 Review.* It can be downloaded at the following website: http://www.achp.gov/docs/CitizenGuide.pdf.

Please return the enclosed postcard and check whether you "Do" or "Do Not" agree to be a consulting party. If you indicate on the postcard that you do not desire to be a consulting party, or if you do not return the postcard at all, you will not be included on the list of consulting parties for this project and you will not receive further information about the project unless the scope changes.

We realize you and/or your organization may want to perform a formal review of properties that may be affected as part of this project and, therefore, may require more detailed information regarding the scope of the project. If you choose to be a consulting party, as required under Section 800.11(e), documentation of our recommendations for the Determination of the Area of Potential Effect, the Determination of Eligibility of Historic Properties for the National Register of Historic Places, and the Finding of Effect on Historic Properties will be made available for your review in the future. The historic architecture and archaeological investigations will be completed by individuals that satisfy the *Secretary of the Interior Professional Qualification Standards.*

The intention of this mailing is to provide an opportunity for you to request involvement as a consulting party. To facilitate the development of this project, you are asked to reply within 30 days of receipt of this letter. If no response is received by that date, it will be assumed you have no comments at the present time and decline involvement in the Section 106 process. A list of all agencies and groups invited to be a Section 106 consulting parties is included with this letter for your reference.

Your timely cooperation in the development of this project is appreciated. For general inquiries please contact myself at (317) 233-6795 or by e-mail at smiller@indot.in.gov or Michelle Allen of FHWA at (317) 226-7344 or by e-mail at michelle.allen@dot.gov. However, please contact our consultant, Leah Boits of American Structurepoint at (317) 547-5580 or by e-mail at lboits@structurepoint.com for coordination purposes, questions, or if additional information is needed.

Respectfully,

Shaun Miller, Acting Manager
Cultural Resource Office
Environmental Services

Enclosures
- Response Postcard
- State Location Map
- USGS Topographic Mapping
- 2014 Aerial Photography
- Distribution List

Not included in this example letter

cc: Ms. Mary Kennedy, INDOT Cultural Resources
Mr. Shaun Miller, INDOT Cultural Resources
Ms. Michelle Allen, Federal Highway Administration
Ms. Linda Weintraut, Weintraut & Associates

April 18, 2016

Example Nation to Nation Coordination Letter

Re: Des. No. 1382612
Heavy Haul Transportation Corridor
Port of Indiana – Jeffersonville to SR 265
Utica Township, Clark County, Indiana
Project No. 2013.01857

Dear Ms. Hunter:

The Indiana Department of Transportation (INDOT), in partnership with the Federal Highway Administration (FHWA), the Indiana Economic Development Corporation, the Ports of Indiana, the Board of Commissioners of Clark County, the City of Jeffersonville Redevelopment Commission, and the River Ridge Development Authority (RRDA), is developing a federal-aid road project to improve connectivity for the Ports of Indiana-Jeffersonville (Port) with other regional transportation assets. The proposed project is located in Utica Township, Clark County, Indiana.

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The proposed project consists of the construction of a 3-lane road designed to "heavy haul" specifications. The proposed road would have a design speed of 35 miles per hour with two 12-foot travel lanes and one 11- to 12-foot auxiliary lane. The road would likely be constructed on new alignment at a total length of approximately 1.75 miles. While only three lanes would be constructed, right-of-way would be wide enough to allow for future expansion to five lanes if required by traffic demand.

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Please return the enclosed postcard and check whether you "Do" or "Do Not" agree to be a consulting party. If you indicate on the postcard that you do not desire to be a consulting party, or if you do not return the postcard at all, you will not be included on the list of consulting parties for this project and you will not receive further information about the project unless the scope changes.

We realize you and/or your organization may want to perform a formal review of properties that may be affected as part of this project and, therefore, may require more detailed information regarding the scope of the project. If you choose to be a consulting party, as required under Section 800.11(e), documentation of our recommendations for the Determination of the Area of Potential Effect, the Determination of Eligibility of Historic Properties for the National Register of Historic Places, and the Finding of Effect on Historic Properties will be made available for your review in the future. The historic architecture and archaeological investigations will be completed by individuals that satisfy the *Secretary of the Interior Professional Qualification Standards.*

As part of our preliminary corridor studies preliminary archaeological investigations have been initiated and are currently ongoing. A National Register archaeological site has been identified within the corridor and will be avoided by the alternative alignments considered. The Section 106 process is ongoing and will investigate potential impacts to historic sites and structures as well as archaeological resources. Native American tribes with an ancestral interest in the project area are being sent this letter. For those tribes that join consultation, proposed alignments and potential impacts will be discussed in more detail in subsequent coordination. In order to protect the integrity of cultural sites, locations of archaeological sites will not be included in any coordination with the public as a part of project development. Please help us protect these sites by keeping their locations confidential.

The intention of this mailing is to provide an opportunity for you to request involvement as a consulting party. To facilitate the development of this project, you are asked to reply within 30 days of receipt of this letter. If no response is received by that date, it will be assumed you have no comments at the present time and decline

involvement in the Section 106 process. A list of all agencies and groups invited to be a Section 106 consulting parties is included with this letter for your reference.

Your timely cooperation in the development of this project is appreciated. For general inquiries please contact Shaun Miller of INDOT at (317) 233-6795 or by e-mail at smiller@indot.in.gov or Michelle Allen of FHWA at (317) 226-7344 or by e-mail at michelle.allen@dot.gov. However, please contact our consultant, Leah Boits of American Structurepoint at (317) 547-5580 or by e-mail at lboits@structurepoint.com for coordination purposes, questions, or if additional information is needed.

Respectfully,

Shaun Miller, Acting Manager
Cultural Resource Office
Environmental Services

Enclosures
- Response Postcard ← Not included in this example letter
- State Location Map
- USGS Topographic Mapping
- 2014 Aerial Photography
- Distribution List

cc: Ms. Mary Kennedy, INDOT Cultural Resources
Mr. Shaun Miller, INDOT Cultural Resources
Ms. Michelle Allen, Federal Highway Administration
Ms. Linda Weintraut, Weintraut & Associates

From: Boits, Leah
Sent: Monday, March 27, 2017 1:43 PM
To: acrouch@cityofjeff.net; jeanne_b@hotmail.com; Zoll, Mitchell K <MZoll@dnr.IN.gov>; dormanlj@att.net
Cc: Miller, Shaun (INDOT) <smiller@indot.IN.gov>; Hope, Briana <bhope@structurepoint.com>; PACarpenter@indot.IN.gov; akumar@indot.in.gov; Kennedy, Mary <MKENNEDY@indot.IN.gov>
Subject: Heavy Haul Transportation Corridor (Des. No. 1382612) - Section 106 Consultation

All,

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Very truly yours,

Leah S. Boits

Leah Boits
Environmental Specialist, Environmental Services Group

ENHANCING COMMUNITIES SINCE 1966

AMERICAN STRUCTUREPOINT INC.

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Linda Weintraut <linda@weintrautinc.com>

Heavy Haul Transportation Corridor (Des. No. 1382612) - Section 106 Consultation

1 message

Miller, Shaun (INDOT) <smiller@indot.in.gov> Mon, Mar 27, 2017 at 3:19 PM
To: "rdushane@estoo.net" <rdushane@estoo.net>, Diane Hunter <dhunter@miamination.com>, Logan Pappenfort <lpappenfort@peoriatribe.com>, "Jason S. Wesaw - THPO" <Jason.Wesaw@pokagonband-nsn.gov>, "eoosahwee-voss@ukb-nsn.gov" <eoosahwee-voss@ukb-nsn.gov>
Cc: "Boits, Leah" <lboits@structurepoint.com>, "Hope, Briana" <bhope@structurepoint.com>, "Carpenter, Patrick A" <PACarpenter@indot.in.gov>, "Kumar, Anuradha" <akumar@indot.in.gov>, "Kennedy, Mary" <MKENNEDY@indot.in.gov>, "Allen, Michelle (FHWA)" <michelle.allen@dot.gov>, Linda Weintraut <linda@weintrautinc.com>

Dear Tribal Consultation Partners,

As part of the project development for the Heavy Haul Transportation Corridor project, studies were undertaken to evaluate the potential historic or cultural resources within the Area of Potential Effects (APE). The *Historic Property Report, Heavy Haul Transportation Corridor, Utica and Jeffersonville Townships, Clark county, Indiana, DES No.: 1382612* (June 2016) prepared by Weintraut & Associates, Inc. (W&A) has been uploaded to IN SCOPE for your review (https://erms.indot.in.gov/Section106Documents/).

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Please note that the Pokagon Band of Potawatomi Indians has recently requested to be consulted on all counties in Indiana and are being invited into consultation on this project now.

Best regards,

Shaun Miller

Archaeological Team Lead

INDOT, Cultural Resources Office

smiller@indot.in.gov

(317) 233-6795

From: Boits, Leah
Sent: Wednesday, April 05, 2017 12:26 PM
To: ragilmor@aol.com
Cc: Hope, Briana <bhope@structurepoint.com>; Carpenter, Patrick A <PACarpenter@indot.IN.gov>; Kumar, Anuradha <akumar@indot.IN.gov>; Miller, Shaun (INDOT) <smiller@indot.IN.gov>; Kennedy, Mary <MKENNEDY@indot.IN.gov>; Linda Weintraut (linda@weintrautinc.com) <linda@weintrautinc.com>
Subject: FW: Heavy Haul Transportation Corridor (Des. No. 1382612) - Section 106 Consultation

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Very truly yours,

Leah S. Boits

Leah Boits
Environmental Specialist, Environmental Services Group

7260 Shadeland Station, Indianapolis, IN 46256

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e lboits@structurepoint.com **w** www.structurepoint.com

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DNR Indiana Department of Natural Resources

Eric Holcomb, Governor
Cameron F. Clark, Director

Division of Historic Preservation & Archaeology·402 W. Washington Street, W274·Indianapolis, IN 46204-2739
Phone 317-232-1646·Fax 317-232-0693·dhpa@dnr.IN.gov

HISTORIC PRESERVATION AND ARCHAEOLOGY

April 24, 2017

Leah Boits
Environmental Scientist
American Structurepoint
7260 Shadeland Station
Indianapolis, Indiana 46256

Federal Agency: Indiana Department of Transportation ("INDOT"), on behalf of Federal Highway Administration

Re: Historic property report (Weintraut, 6/2016), phase Ia archaeological field reconnaissance report (Goldbach, 2/24/2017) and phase II archaeological excavations of site 12CL0129/0533 (Goldbach, 2/24/2017) for improvements to connectivity for the Ports of Indiana-Jeffersonville with other regional transportation assets Clark County, Indiana (Des. No. 1382612; DHPA No. 17495)

Ms. Boits:

Pursuant to Section 106 of the National Historic Preservation Act (54 U.S.C. § 306108), 36 C.F.R. Part 800, and the "Programmatic Agreement among the Federal Highway Administration, the Indiana Department of Transportation, the Advisory Council on Historic Preservation, the Indiana State Historic Preservation Officer regarding the implementation of the Federal Aid Highway Program in the State of Indiana," the staff of the Indiana State Historic Preservation Officer ("Indiana SHPO") has reviewed the materials sent on March 28, 2017 and received on March 29, 2017 for the aforementioned project.

For the purposes of the Section 106 review of this federal undertaking, we agree that the James A. Smith Farmstead (WA1 in the HPR) is eligible for inclusion in the National Register of Historic Places ("NRHP") under Criterion D and that it is the only above-ground property identified in the HPR that is eligible for the NRHP.

We also agree with the Phase Ia (Goldbach; February 24, 2017) and Phase II (Goldbach, Arnold and Hughes: February 24, 2017) archaeology reports addressing the archaeological aspects of this project. Archaeological sites 12-Cl-1004 through 1016 and 12-Cl-1051 through 1057 lack sufficient integrity to be considered potentially eligible. No additional work is necessary at these sites.

The Phase Ia survey documented that archaeological sites 12-Cl-129/943 and 12-Cl-533 were one large artifact scatter. As a result of the Phase Ia work conducted at these connected sites, the portions of archaeological site 12-Cl-129/533 located within the project area was determined to be potentially eligible for nomination to the State and National Registers and avoidance or archaeological testing was recommended.

Archaeological site 12-Cl-129/533 was subjected to archaeological testing (Goldbach, Arnold and Hughes; February 24, 2017) and determined to not be eligible for nomination to the State of National Registers of Historic Places. The portion of site 12-Cl-129/533 located within the project area will not require additional archaeological assessment.

If any archaeological artifacts or human remains are uncovered during construction, demolition, or earthmoving activities, state law (Indiana Code 14-21-1-27 and -29) requires that the discovery be reported to the Department of Natural Resources within two (2) business days. In that event, please call (317) 232-1646. Be advised that adherence to Indiana Code 14-21-1-27 and -29 does not obviate the need to adhere to applicable federal statutes and regulations.

If you have questions about archaeological issues, please contact Mitch Zoll at (317) 232-3492 or mzoll@dnr.IN.gov. Questions about buildings or structures should be directed to Chad Slider at (317) 234-5366 or cslider@dnr.IN.gov.

In all future correspondence regarding this project, please continue to refer to DHPA No. 17495.

Very truly yours,

Mitchell K. Zoll
Deputy State Historic Preservation Officer

MKZ:CWS:mkz

emc Anuradha Kumar, Indiana Department of Transportation
Shaun Miller, Indiana Department of Transportation
Mary Kennedy, Indiana Department of Transportation
Shirley Clark, Indiana Department of Transportation
Partick Carpenter, Indiana Department of Transportation
Leah Botts, American Structurepoint
Andy Crouch, City of Jeffersonville

Bethany Natali <bethany@weintrautinc.com>

Fwd: Heavy Haul Transportation Corridor (Des. No. 1382612) - Section 106 Consultation

1 message

Linda Weintraut <linda@weintrautinc.com> Thu, Aug 10, 2017 at 1:53 PM
To: bethany w <bethany@weintrautinc.com>

---------- Forwarded message ----------
From: **Hope, Briana** <bhope@structurepoint.com>
Date: Wed, Aug 9, 2017 at 5:34 PM
Subject: Heavy Haul Transportation Corridor (Des. No. 1382612) - Section 106 Consultation
To: "south@indianalandmarks.org" <south@indianalandmarks.org>
Cc: "Carpenter, Patrick A" <PACarpenter@indot.in.gov>, "Kumar, Anuradha" <akumar@indot.in.gov>, "Miller, Shaun (INDOT)" <smiller@indot.in.gov>, "Kennedy, Mary" <MKENNEDY@indot.in.gov>, "Linda Weintraut (linda@weintrautinc.com)" <linda@weintrautinc.com>

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Very truly yours,

Briana

Briana M. Hope
Project Manager, Environmental Services Group

American Structurepoint

7260 Shadeland Station, Indianapolis, Indiana, 46256

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e bhope@structurepoint.com **w** www.structurepoint.com

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Linda Weintraut, Ph.D.
Weintraut & Associates, Inc.
PO Box 5034
4649 Northwestern Drive
Zionsville, Indiana 46077
317.733.9770 ext. 310

www.weintrautinc.com

APPENDIX D. Report Summaries

WEINTRAUT & ASSOCIATES, INC.

AUTHORIZATION REQUEST

Work Plan: Phase II Testing at Sites 12Cl0533 and 12Cl0129 within the Proposed Transportation Corridor
Utica Township, Clark County, Indiana

Des. No.: 1382612

Prepared for:
United Consulting

Prepared by:
WEINTRAUT & ASSOCIATES, INC.
Author: Jason Goldbach, M.A.

P. O. Box 5034
Zionsville, Indiana 46077
317.733.9770

Principal Investigator: Jason Goldbach M.A., R.P.A.

Introduction

The Indiana Department of Transportation (INDOT), working in concert with the Indiana Economic Development Corporation, Port of Indiana, Clark County Commissioners, City of Jeffersonville, and River Ridge Development Authority, with funding from Federal Highway Administration (FHWA), proposes to construct a transportation corridor between Utica Pike and Old Salem Road. This study corridor ranges in width from 91.4 m (300 ft) to 243.8 m (800 ft). This document serves as the work plan for a Phase II archaeological investigation at sites 12Cl0533 and 12Cl0129 within a section of the project corridor measuring 91.4 m (300 ft) in width, prior to the planned construction activities. This is the official request for authorization to conduct this work according to the plan outlined below.

Under contract with United, W&A completed a Phase Ia archaeological field reconnaissance on portions of Alternatives B, C, E and F for the proposed transportation corridor in Utica Township, Clark County, Indiana. Archaeologists encountered site 12Cl0533 within Alternative F (Figure 1). Subsequently, at the request of United, W&A performed limited shovel testing survey south of site 12Cl0533 and north of site 12Cl0129 to determine the presence or absence of archaeological materials. Based on the recommendations of previous investigations and the results of the Phase Ia archaeological field reconnaissance, W&A concludes that sites 12Cl0533 and 12Cl0129 have the potential to contain information important to the regional prehistoric record and are considered potentially eligible for listing in the Indiana Register of Historic Sites and Structures and (IRHSS) and the National Register of Historic Places (NRHP). Therefore, in consultation with SHPO and INDOT-Cultural Resources Office, W&A recommends sites 12Cl0533 and 12Cl0129 for Phase II archaeological investigations to further evaluate eligibility based on site integrity and the potential to yield information important to the prehistoric record (Criterion D).

The Phase II investigation will be conducted in accordance and compliance with the Secretary of the Interior's *Standards and Guidelines for Archaeology and Historic Preservation* (48 FR 44716), the current version of the *Guidebook: Indiana Historic Sites and Structures Inventory – Archaeological Sites* issued by the Indiana Department of Natural Resources, Division of Historic Preservation and Archaeology (DHPA) and recent amendments to the Indiana Historic Preservation Act (IC 14-21-1). The field work, laboratory analysis, and preparation of the final report and recommendations will be accomplished or directly supervised by a professional archaeologist meeting the standards set forth in 36 CFR 61 of the National Historic Preservation Act and 312-IAC-21 of the Indiana Administrative Code.

Historic Property Report

Heavy Haul Transportation Corridor
Utica and Jeffersonville Townships, Clark County, Indiana
DES No.: 1382612

Prepared for

United Consulting and

Indiana Department of Transportation/Federal Highway Administration

Prepared by

WEINTRAUT & ASSOCIATES, INC.

Principal Investigator: Dr. Linda Weintraut

Authors: Douglas Fivecoat, M.A., and Kelly Lally Molloy, M.A.

With contributions from: Bethany Natali, M.A., M. Christine Manning, M.H.P. and M.S., Bethany Hughes, B.A.

P.O. Box | Zionsville, Indiana 46077 | 317.733.9770 | Linda@weintrautinc.com

June 2016

The Indiana Department of Transportation (INDOT), in partnership with the Federal Highway Administration (FHWA), the Indiana Economic Development Corporation, the Ports of Indiana, the Board of Commissioners of Clark County, the City of Jeffersonville Redevelopment Commission, and the River Ridge Development Authority (RRDA), is developing a federal-aid road project to improve connectivity for the Ports of Indiana-Jeffersonville (Port) with other regional transportation assets. The proposed project is located in Utica Township, Clark County, Indiana. The project area has several major generators of traffic that consist primarily of heavy trucks or heavy haul vehicles. The purpose of the proposed project is to provide a route built specifically for heavy haul vehicles that provides continuous connection between the River Ridge Commerce Center (RRCC) and the Port via the new State Road (SR) 265/Old Salem Road interchange. The proposed project corridor generally extends north from the Port to the SR 265/Old Salem Road interchange. The proposed project corridor is bounded by the SR 265 corridor at the northern project limits. The proposed project consists of the construction of a 2-lane road designed to "heavy haul" specifications.

The Area of Potential Effects (APE) is "the geographic area or areas within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties, if any such properties exist." [36 CFR § 800.16(d)] The Area of Potential Effects (APE) was originally drawn approximately one mile from the proposed project area's centerline but it was narrowed based upon existing topography and the limited view-shed due to existing structures and wooded terrain. (See Appendix 1: Maps.)

Project personnel for Weintraut & Associates, Inc. (W&A), who meet the Secretary of the Interior's Professional Standards and who are historians listed as Qualified Professionals by the Indiana Department of Natural Resources (IDNR), Indiana Division of Historic Preservation & Archaeology (DHPA), identified and evaluated resources for this project.

As part of these Section 106 identification and evaluation efforts, historians for W&A identified ten properties considered or rated Contributing or higher according to the Indiana Historic Sites and Structures Inventory (IHSSI) rating system. One of these properties, the **James A. Smith Farmstead (WA1)**, has previously been determined eligible for the National Register of Historic Places (NRHP) under Criterion D. Historians are not recommending any additional properties as eligible for listing in the NRHP.

Goldbach 2017a

Phase II Testing: Archaeological Excavations of Site 12CL0129/0533
Heavy Haul Transportation Corridor
Utica Township, Clark County, Indiana
Des. No.: 1382612; DHPA No. 17495

Prepared for:
United Consulting, Inc.

Prepared by:

WEINTRAUT & ASSOCIATES, INC.
Authors: Jason Goldbach, M.A., R.P.A., Craig Arnold, M.A., and Bethany Hughes, B.A.
P. O. Box 5034 | Zionsville, Indiana 46077 | 317.733.9770

Principal Investigator: Jason Goldbach M.A., R.P.A.

February 24, 2017

Management Summary

The Indiana Department of Transportation (INDOT) with funding from the Federal Highway Administration (FHWA), and in partnership with the Indiana Economic Development Corporation, Jeffersonville Port of Indiana, Clark County Commissioners, City of Jeffersonville Redevelopment Authority, and River Ridge Development Authority is developing a project in Utica Township, Clark County, Indiana. The area is located on the Jeffersonville and Charlestown USGS 7.5 Minute Quadrangle Maps in Tracts 6-7, 14-17, 24-27, 38-40, and 52-53. In 2014, during the Phase Ia reconnaissance conducted at the request of United Consulting (United), Weintraut & Associates, Inc. (W&A) archaeologists encountered site 12CL0533, located in proximity to site 12CL0129; both sites had been previously identified as containing Woodland and historic components.

Subsequently, at the request of United, W&A performed limited shovel testing survey south of site 12CL0533 and north of site 12CL0129 to determine the presence or absence of archaeological materials within one of the alternatives under investigation, Alternative E. Based on the recommendations of previous investigations and the results of the Phase Ia archaeological field reconnaissance, W&A concluded that that the area within Alternative E located between, and within, the previously-recorded sites 12CL0129 and 12CL0533 had the potential to contain information important to the regional prehistoric record. Prior studies had recommended both sites to be potentially eligible for listing in the Indiana Register of Historic Sites and Structures (IRHSS) and the National Register of Historic Places (NRHP). Therefore, in consultation with the State Historic Preservation Office (SHPO) and the Indiana Department of Transportation-Cultural Resources Office (INDOT-CRO), W&A recommended site 12CL0129/12CL0533 for Phase II testing to further evaluate NRHP eligibility based on site integrity and the potential to yield information important to the prehistoric record (Criterion D).

A work plan was submitted to the staff of the SHPO on March 27, 2015, and approved April 1, 2015 (DHPA No. 17495). Work was conducted in accordance to and compliance with the Secretary of the Interior's *Standards and Guidelines for Archaeology and Historic Preservation* (48 FR 44716), the *Cultural Resources Manual* issued by INDOT (2015), the current *Guidebook for Indiana Historic Sites and Structures Inventory—Archaeological Sites* issued by the IDNR, DHPA, and the Indiana Historic Preservation Act (IC 14-21-1). The field work, laboratory analysis, and preparation of the final report and recommendations

were completed or directly supervised by a Principal Investigator meeting the standards set forth in 36 CFR 61 of the National Historic Preservation Act and 312-IAC-21 of the Indiana Administrative Code.

As part of the Phase II investigations, remote sensing was performed on April 27, 28, and 29, 2015, which included electrical resistivity and magnetic gradiometer survey. The results assisted in the placement of hand excavation units and mechanically excavated trenches, work which was performed from May 11 through May 14 and from May 18 through May 21, 2015. A total of 35 square meters was hand excavated, and a total of 704 square meters was machine excavated.

The archaeological testing found an absence of earthworks, mounds, middens, burials, or other significant subsurface deposits. The low density of features and artifacts led the archaeologist to conclude that the tested portion of site 12CL0129/0533 has limited potential to yield information important to the knowledge of the prehistory of the region. Based on the Phase II sampling of site 12CL0129/0533 within the project corridor, this tested portion of the site is recommended as not eligible for inclusion in the IRHSS or the NRHP.

Goldbach 2017b

Phase Ia Archaeological Field Reconnaissance:

Proposed United Heavy Haul Transportation Corridor
Utica Township, Clark County, Indiana
Des. No.: 1382612

Prepared for

United Consulting &

Indiana Department of Transportation / Federal Highway Administration

Prepared by

WEINTRAUT & ASSOCIATES, INC.

Authors: Jason Goldbach, M.A., R.P.A. with contributions from Craig Arnold, M.A., Bethany Hughes, B.A. and M. Chris Manning, M.A., M.S.H.P.

P.O. Box 5034 | Zionsville, Indiana | (317) 733-9770 | (Jason@weintrautinc.com)

February 24, 2017

Management Summary

In response to a request from United Consulting (United), Weintraut & Associates, Inc. (W&A) archaeologists conducted a Phase Ia archaeological field reconnaissance and a records review for the proposed Heavy Haul Transportation Corridor in Utica Township, Clark County, Indiana. The Indiana Department of Transportation (INDOT) in partnership with the Federal Highway Administration (FHWA), the Indiana Economic Development Corporation, the Ports of Indiana, the Board of Commissioners of Clark County, the City of Jeffersonville Redevelopment Commission, and the River Ridge Development Authority is developing a federal-aid road project. The Preferred Alternative of the right-of-way (ROW) corridor for this project is referred to as the "project area" throughout this report. The project area measures 2611 meters (m) [(8566 feet [ft]) in length and ranges in width from 91.4 m (300 ft) to 243.8 m (800 ft). Areas surveyed for other alternatives are referred to as "additional survey areas."

W&A project archaeologists conducted an archaeological records check in the Indiana State Historic Architecture and Archaeological Research Database (SHAARD) as authorized by the Indiana Department of Natural Resources, Division of Historic Preservation and Archaeology (IDNR, DHPA). The results of this search showed that portions of the survey area had been previously surveyed by a professional archaeologist and contained six previously registered archaeological sites. An additional 257 previously recorded archaeological sites have been recorded within 1.6 kilometer (km) (1 mile [mi]) of the project area (Appendix A). The archaeological records check indicated 40 previous archaeological investigations have been conducted within 1.6 km (1 mi) of the project area (Appendix B). A review of the *Indiana Cemetery and Burial Registry (ICBR)* found no cemeteries registered within 30.5 m (100 ft) of the project area.

Principal Investigator Jason Goldbach, M.A., and W&A crew members completed the Phase Ia archaeological field reconnaissance of the survey area in May, July and August of 2014; and September and October of 2015. A total of approximately 64.91 hectares (ha) (160.6 acres [ac]), was subjected to Phase Ia archaeological field reconnaissance, including areas outside the project area or area of potential effects (APE) which were within alternatives that were later discarded.

Field methods employed during these investigations were determined by surface visibility, amount of previous disturbance, terrain, and existing vegetation within the project area. In areas where surface visibility was greater than 30 percent, surface inspection was conducted.

Areas having less than 30 percent ground surface visibilities were investigated by shovel probing.

Twenty-six archaeological sites were encountered during the Phase Ia archaeological field reconnaissance of the survey area. These included six previously recorded sites and 20 new sites. One previously reported archaeological site recorded within the project area could not be relocated during the current reconnaissance. None of the 20 new sites appear to have the potential to be eligible for listing in the Indiana Register of Historic Sites and Structures (IRHSS) or the National Register of Historic Places (NRHP), and none are, therefore, recommended for further investigation.

Two of the six previously recorded sites, 12CL0112 and 12CL0127, are located within the area surveyed for this project but outside the project area for the preferred alternative. One previously identified site, 12CL0614, was not relocated and is recommended for no further work. Another previously identified site, 12CL0944, was relocated but is recommended for no further work. Prior to the production of this report, portions of sites 12CL0533 and 12CL0129 were recommended for Phase II testing (Goldbach 2015). Subsequent Phase II testing resulted in a recommendation for no further work for those portions of sites 12CL0533 and 12CL0129 located within the project area of the Preferred Alternative (Goldbach 2016a).

Twenty previously undocumented sites were recorded as a result of this survey. Sites 12CL1004 through 12CL1016, and 12CL1051 through 12CL1057, included five prehistoric isolated finds, nine prehistoric lithic scatters, two historic artifact scatters and four multicomponent artifact scatters containing prehistoric and historic artifacts. Nine of these are located outside the project area in additional survey areas. None of the 20 new sites appear to meet eligibility criterion for listing in the IRHSS or the NRHP and are therefore not recommended for further investigation.

Based on results of this Phase Ia archaeological field reconnaissance, W&A recommends that construction be allowed to proceed as planned. This recommendation is presented with the understanding that in the event that archaeological deposits or human remains are encountered during the construction phase of this project, construction activities must cease within a 100-ft radius of the discovery and INDOT Cultural Resources Office (CRO) and IDNR, DHPA must be notified (per INDOT Standard Specification 107.10 and INDOT Construction Memo 13-14).

Goldbach 2017c

Phase Ia Archaeological Field Reconnaissance: Proposed Heavy Haul Transportation Corridor Utica Township, Clark County, Indiana, Addendum No. 1

Des. No.: 1382612

Prepared for

United Consulting &

Indiana Department of Transportation / Federal Highway Administration

Prepared by

WEINTRAUT & ASSOCIATES, INC.

Authors: Jason Goldbach, M.A., R.P.A. with contributions from Craig Arnold, M.A., and Bethany Hughes, B.A.

P.O. Box 5034 | Zionsville, Indiana | (317) 733-9770 | (Jason@weintrautinc.com)

October 24, 2017

Management Summary

The Indiana Department of Transportation (INDOT) in partnership with the Federal Highway Administration (FHWA), the Indiana Economic Development Corporation, the Ports of Indiana, the Board of Commissioners of Clark County, the City of Jeffersonville Redevelopment Commission, and the River Ridge Development Authority is developing a federal-aid road project. In response to a request from United Consulting (United), Weintraut & Associates, Inc. (W&A) archaeologists had previously conducted a Phase Ia archaeological reconnaissance and prepared a report for the Heavy Haul Transportation Corridor Project in Uttica Township, Clark County, Indiana (Goldbach et al. 2017b). Additional survey was undertaken after that report was submitted to the Indiana Department of Natural Resources, Division of Historic Preservation and Archaeology (IDNR, DHPA). This report, Addendum No. 1 to the Phase Ia Reconnaissance Report, has been prepared to document efforts to identify and evaluate archaeological resources within an additional "survey area" that was outside the preferred alternative but was developed to study an alternative that might include fewer impacts to natural resources. It has since been decided not to pursue this alternative "survey area" and the project area remains the same as that described in Goldbach (2017b). The "survey area" for this project is a contiguous area measuring 1.2 hectares (ha), or 3.0 acres (ac).

The survey area was situated in a combination of residential yards, horse pasture, and woods where surface visibility was less than 30 percent and was, therefore, investigated with shovel test probes. With the exception of the sloped area and areas adjacent to standing structures, the entire survey area was shovel tested, resulting in the documentation of additional portions of previously-recorded site 12CL1052.

All materials recovered from the survey area were associated with a previously-identified site 12CL1052; the recovery of these materials resulted in the extension of the boundary of site 12CL1052 to the north and south. The artifact assemblage for site 12CL1052 contained precontact artifacts associated with an unknown precontact period and historic artifacts associated with the nineteenth century. One shovel test probe contained mortar and other architectural artifacts, suggestive of a non-portable artifact or feature. Some historic artifacts dated to the early-nineteenth century and, therefore, site 12CL1052 has the potential to represent an occupation related to the early settlement of Clark County.

Based on results of this Phase Ia archaeological field reconnaissance, the eligibility of site 12CL1052 could not be fully assessed because of landowner constraints. However, since the "survey area" will not be moving forward as a

project alternative, the site will not be impacted by construction of the proposed project. If the portion of the site within the "survey area" of this report can not be avoided and becomes part of the preferred alternative, then additional Phase Ib investigation is recommended.

It is therefore recommended that the project area previously examined and cleared for archaeological resources (Goldbach 2017b) be allowed to proceed without additional work.

APPENDIX E. Consulting Parties

Consulting Party Invitation List			
Project Name:	Transportation Corridor		
Route/Street:	New Alignment		
DES No:	1382612		
Location:	Utica Township, Clark County, Indiana		
ASI Project No:	2013.01857		
Name	**Title**	**Federally Recognized Tribe/Agency/Company**	**Accepted Invitation**
Ms. Diane Hunter	Tribal Historic Preservation Officer	Miami Tribe of Oklahoma	✓
Ms. Robin Dushane	Tribal Historic Preservation Officer	Eastern Shawnee Tibe of Indians of Oklahoma	
Mr. Logan Pappenfort	Special Projects Manager/ NAGPRA Representative	Peoria Tribe of Indians of Oklahoma	
Mr. Jason Wesaw	Tribal Historic Preservation Officer	Pokagon Band of Potawatomi Indians	
Mr. Eric Oosahwee-Voss	Tribal Historic Preservation Officer	United Keetoowah Band of Cherokee Indians	
Mr. Mitch Zoll	Division Director	Indiana Department of Natural Resources	✓
Mr. Shaun Miller	Archaeological Team Lead	Indiana Department of Transportation	(Agency representative; copied on all correspondence)
Ms. Mary Kennedy	Historian Team Lead	Indiana Department of Transportation	(Agency representative; copied on all correspondence)
Ms. Michelle Allen	Planning/Environmental Specialist	Federal Highway Administration	(Agency representative; copied on all correspondence)
Mr. Greg Sekula	Director	Indiana Landmarks	✓
Mr. Marsh Davis	President	Indiana Landmarks	
Mr. Paul Koffman		Borden Institute Historical Society	
Mr. Bob Gallman	President	Clark's Grant Historical Society	
Mr. Rick Madden	President	Howard Steamboat Museum / Clark County Historical Society	
Mr. Keith Stayton	President	Jeff-Clark Preservation, Inc.	
Ms. Alice Davis	Recording Secretary	Jeffersonville Historic Board of Review	
Mr. Jay Ellis	Executive Director	Jeffersonville Main Street	
Ms. Jeanne Burke	Clark County Historian		✓

Mr. Mike Moore	Mayor	City of Jeffersonville	
Mr. Hank Dorman	President	Utica Town Board	✓
Ms. Jennifer Wahle		Kentuckiana Regional Planning and Development Agency	
Mr. Andy Crouch	City Engineer	City of Jeffersonville	✓
Mr. Rob Waiz	Director	Jeffersonville Department of Economic Development and Department of Redevelopment	
Mr. Jack Coffman	President	Clark County Board of Commissioners	
Ms. Barbara Hollis	Council President	Clark County Council	
Mr. Gary Gilmore	Property Owner		✓

Section 106 Consultation

PROJECT ID Transportation Corridor
Des. No. 1382612

AGENCY Clark County Board of Commissioners

WILL PARTICIPATE ☐ WILL NOT PARTICIPATE ☒

CONTACT PERSON _____

ADDRESS _____

_____

_____

PHONE _____ FAX _____

E-MAIL _____ DATE _____

Section 106 Consultation

PROJECT ID Transportation Corridor
Des. No. 1382612

AGENCY Indiana Landmarks

WILL PARTICIPATE [✓] WILL NOT PARTICIPATE [ ]

CONTACT PERSON Laura Renwick

ADDRESS 115 W. Chestnut St.
Jeffersonville, IN 47130

PHONE 812/284-4534 FAX 812/285-9923

E-MAIL southa@indianalandmarks.org DATE 4/22/16

Section 106 Consultation

PROJECT ID Transportation Corridor
Des. No. 1382612

AGENCY City of Jeffersonville

WILL PARTICIPATE [X] WILL NOT PARTICIPATE [ ]

CONTACT PERSON ANDY CROUCH

ADDRESS 500 QUARTERMASTER COURT
JEFFERSONVILLE, IN 47130

PHONE 502.553.8822 FAX

E-MAIL ACROUCH@CITYOFJEFF.NET DATE 4.22.16

Section 106 Consultation

PROJECT ID Transportation Corridor
Des. No. 1382612

AGENCY Clark County Historian

WILL PARTICIPATE [X] WILL NOT PARTICIPATE [ ]

CONTACT PERSON Jeanne Burke

ADDRESS 5807 Stacy Road
Charlestown IN
47111

PHONE 502-548-0259 FAX

E-MAIL jeanne_b@hotmail.com DATE 5-1-16

Section 106 Consultation

PROJECT ID Transportation Corridor
Des. No. 1382612

AGENCY Miami Tribe of Oklahoma

WILL PARTICIPATE [X] WILL NOT PARTICIPATE [ ]

CONTACT PERSON Diane Hunter

ADDRESS P.O. Box 1326
Miami, OK 74355

PHONE 918-541-8966 FAX

E-MAIL dhunter@miamination.com DATE 5-4-2016

Section 106 Consultation

PROJECT ID Transportation Corridor
Des. No. 1382612

AGENCY Indiana Department of Natural Resources

WILL PARTICIPATE [X] WILL NOT PARTICIPATE [ ]

CONTACT PERSON Mitch Zoll

ADDRESS DHPA
402 W. Washington St. Rm W274
Indianapolis, IN

PHONE _____ FAX _____

E-MAIL _____ DATE _____

Section 106 Consultation

PROJECT ID Transportation Corridor
Des. No. 1382612

AGENCY Utica Town Board

WILL PARTICIPATE [X] WILL NOT PARTICIPATE [ ]

CONTACT PERSON HENRY DORMAN

ADDRESS 736 UTICA-CHARLESTOWN Rd
Jeffersonville, IN
47130

PHONE 812 288-6748 FAX _____

E-MAIL dormanlj@att.net DATE 5-4-2016

From: Bethany Hughes [mailto:bhughes@weintrautinc.com]
Sent: Wednesday, February 22, 2017 3:11 PM
To: Hope, Briana <bhope@structurepoint.com>
Cc: Linda Weintraut <linda@weintrautinc.com>
Subject: Transportation Corridor/Heavy Haul

,

We had a property owner call today and he would like to be added to the consulting party list for this project. This is what I have for contact info: Mr. Gilmore

Gilmore Construction Inc.

900 Lighthouse Drive

Jeffersonville, IN 47130

ragilmor@aol.com

Thank you!

--

Bethany Hughes
Archaeology Technician
Weintraut & Associates, Inc.
PO Box 5034
Zionsville, Indiana 46077

Proof of Publication

Public Notice
Des. No. 1382612

The Indiana Department of Transportation (INDOT); in partnership with the Indiana Economic Development Corporation, Jeffersonville Port of Indiana, Clark County Commissioners, City of Jeffersonville Redevelopment Authority, and River Ridge Development Authority; is planning to undertake a road project funded in part by the Federal Highway Administration (FHWA). The project is located in Utica Township, Clark County, Indiana.

Under the preferred alternative, the proposed project would involve the construction of a two-lane road designed to "heavy haul" specifications. The proposed road would have a design speed of 35 miles per hour with two 13-foot travel lanes and 11-foot shoulders. The road would likely be constructed on new alignment at a total length of approximately 1.75 miles. The proposed corridor generally extends north from the Port to the SR 265/Old Salem Road interchange. The area is a combination of forest, open grass, industrial, and farmed areas. Few existing roads are located within this area. The proposed project corridor is bounded by the SR 265 corridor at the northern project limits. Lentzier Creek and several tributaries are located within the project corridor.

Properties listed in or eligible for the National Register of Historic Places (NRHP) located within the Area of Potential Effects (APE) include the Smith-Sutton Site and the James A. Smith Farmstead. The INDOT, on behalf of the FHWA, has issued a "No Historic Properties Affected" finding for the project due to the fact that the NRHP listed and eligible properties within the APE will not be impacted by the undertaking. In accordance with the National Historic Preservation Act, the views of the public are being sought regarding the effect of the proposed project on the historic elements as per 36 CFR 800.2(d), 800.3(e) and 800.6(a)(4). Pursuant to 36 CFR 800.4(d)(1), the documentation specified in 36 CFR 800.11(d) is available for inspection in American Structurepoint's office. Additionally, this documentation can be viewed electronically by accessing INDOT's Section 106 document posting website IN SCOPE at http://erms.indot.in.gov/Section106 Documents. This documentation serves as the basis for the "No Historic Properties Affected" finding. The views of the public on this effect finding are being sought. Please reply with any comments to Leah Boits, American Structurepoint, 7260 Shadeland Station, Ph: 317-547-5580, Fax: 317-543-0270, lboits@structureoint.com no later than January 22, 2017.

In accordance with the "Americans with Disabilities Act", if you have a disability for which INDOT needs to provide accessibility to the document(s) such as interpreters or readers, please contact Rickie Clark at 317-232-6601 or rclark@indot.in.gov. hspaxlp

1400864

STATE OF INDIANA
COUNTY OF CLARK -SS

Ginger Baxter on oath says that she is the bookkeeper of NEWS AND TRIBUNE and in the employ of the publisher of

NEWS AND TRIBUNE,

a daily newspaper of general circulation printed and published in the city of Jeffersonville, Clark County, State of Indiana, and further says that the annexed advertisement was published in said paper for #(1) time(s) to-wit: In issue of said NEWS AND TRIBUNE

Dated: 12-23 2017

(x) Ginger Baxter

STATE OF INDIANA
COUNTY OF CLARK

Subscribed and sworn to before me this

27TH day of December 2017

(X) Joann Galligan
Joann Galligan

JOANN GALLIGAN
Notary Public - Seal
State of Indiana
Clark County
My Commission Expires Aug 27, 2022

Notary Public, Clark County, Indiana
(My Commission Expires August 27, 2022

Indiana Department
of Natural Resources

Eric Holcomb, Governor
Cameron F. Clark, Director

Division of Historic Preservation & Archaeology • 402 W. Washington Street, W274 • Indianapolis, IN 46204-2739
Phone 317-232-1646 • Fax 317-232-0693 • dhpa@dnr.IN.gov • www.IN.gov/dnr/historic

January 22, 2018

Anuradha Kumar
Cultural Resources Manager
Environmental Services
Indiana Department of Transportation
100 North Senate Avenue, Room N642
Indianapolis, Indiana 46204

Federal Agency: Federal Highway Administration ("FHWA")

Re: Indiana Department of Transportation's finding of "no historic properties affected" on behalf of the Federal Highway Administration concerning Heavy Haul Transportation Corridor in Utica and Jeffersonville Townships, Clark County, Indiana (Designation No. 1382612; DHPA # 17495)

Dear Ms. Kumar:

Pursuant to Section 106 of the National Historic Preservation Act (54 U.S.C. § 306108), 36 C.F.R. Part 800, and the "Programmatic Agreement among the Federal Highway Administration, the Indiana Department of Transportation, the Advisory Council on Historic Preservation, the Indiana State Historic Preservation Officer regarding the implementation of the Federal Aid Highway Program in the State of Indiana," the staff of the Indiana State Historic Preservation Officer has conducted an analysis of the materials dated December 1, 2017, and received on December 22, 2017, for the above indicated project in Utica and Jeffersonville Townships, Clark County, Indiana.

As previously indicated, we have not identified any historic buildings, structures, districts, or objects listed in or eligible for inclusion in the National Register of Historic Places within the proposed project area.

In terms of archaeology, no currently known archaeological resources eligible for inclusion in the National Register of Historic Places have been recorded within the proposed project area.

Therefore, we concur with the INDOT's December 1, 2017 finding, on behalf of the FHWA, that there are no historic buildings, structures, districts, objects, or archaeological resources within the proposed project area that will be affected by the above indicated project.

If any prehistoric or historic archaeological artifacts or human remains are uncovered during construction, demolition, or earthmoving activities, state law (Indiana Code 14-21-1-27 and 29) requires that the discovery must be reported to the Department of Natural Resources within two (2) business days. In that event, please call (317) 232-1646. Be advised that adherence to Indiana Code 14-21-1-27 and 29 does not obviate the need to adhere to applicable federal statutes and regulations, including but not limited to 36 C.F.R. 800.

If you have questions about archaeological issues please contact Mitch Zoll at (317) 232-3492 or mzoll@dnr.IN.gov. If you have questions about buildings or structures please contact John Carr at (317) 233-1949 or jcarr@dnr.IN.gov.

Very truly yours,

Mitchell K. Zoll
Deputy State Historic Preservation Officer

MKZ:JRC:mkz

emc: Anuradha Kumar, INDOT - AKumar@indot.in.gov
Shaun Miller, INDOT - smiller@indot.in.gov
Susan Branigin, INDOT SBranigin@indot.in.gov
Mary Kennedy, INDOT - mkennedy@indot.in.gov
Shirley Clark, INDOT- sclark@indot.in.gov
Antonio Johnson, Federal Highway Administration - Antonio.johnson@dot.gov
Linda Weintraut, Weintraut & Associates - linda@weintrautinc.com
Jason Goldbach, Weintraut & Associates, Inc. - Jason@Weintrautinc.com.
Mitchell Zoll, Indiana Department of Natural Resources
John Carr, Indiana Department of Natural Resources

Appendix D: Red Flag and Hazardous Materials

- Red Flag Investigation – October 17, 2017

INDIANA DEPARTMENT OF TRANSPORTATION

Driving Indiana's Economic Growth

100 North Senate Avenue
Room N642
Indianapolis, Indiana 46204-2216 (317) 232-5348 FAX: (317) 233-4929

Eric Holcomb, Governor
Joe McGuinness, Commissioner

Date: October 17, 2017

To: Hazardous Materials Unit
Environmental Services
Indiana Department of Transportation
100 N Senate Avenue, Room N642
Indianapolis, IN 46204

From: Briana M. Hope
American Structurepoint, Inc.
7260 Shadeland Station
Indianapolis, IN 46256
bhope@structurepoint.com

Re: RED FLAG INVESTIGATION
DES. No. 1382612
Heavy Haul Transportation Corridor, Des. No. 1382612
From Jeffersonville Port of Indiana to SR 265
Utica Township, Clark County, Indiana

NARRATIVE

The Indiana Department of Transportation (INDOT) Central Office, in partnership with the Federal Highway Administration (FHWA), the Indiana Economic Development Corporation, the Ports of Indiana, the Board of Commissioners of Clark County, the City of Jeffersonville Redevelopment Commission, and the River Ridge Development Authority (RRDA), is developing a federal-aid road project to improve connectivity for the Ports of Indiana-Jeffersonville (Port) with other regional transportation assets.

The project area is located in Utica Township, Clark County, Indiana. The area is more specifically located on the Jeffersonville USGS 7.5 Minute Quadrangle Maps in Tracts 7, 15, and 16. The majority of the proposed project is on new alignment with some upgrades to existing roads. Corridor studies are ongoing. The approximately 30-acre project area shown on the attached mapping encompasses the area of the preferred alignment.

The need for the proposed project is due to the current and predicted rapid industrial and commercial development in the area that would result in a significant increase in volume of heavy haul vehicles mixing with local traffic. This growth, combined with the lack of connectivity and suitable roadways for heavy haul vehicles in the area, indicates a need for the proposed project. The purpose of the proposed project is to provide a route built specifically for heavy haul vehicles that provides continuous connection between the River Ridge Commerce Center and the Port via the new State Road (SR) 265/Old Salem Road interchange.

The proposed project consists of the construction of a 3-lane road designed to "heavy haul" specifications. The proposed road would have a design speed of 35 miles per hour with two 13-foot wide travel lanes and 11-foot wide shoulders. The road would likely be constructed on new alignment at a total length of approximately 1.75 miles. While only two lanes would be constructed, right-of-way would be wide enough to allow for future expansion to five lanes if required by traffic demand. It is anticipated that culverts will be installed along the new roadway corridor, and culverts located along

existing roads at the northern and southern termini of the project corridor will be impacted due to the proposed project. The details of these culverts are not known at this time.

Because the proposed roadway would be constructed on new terrain, Maintenance of Traffic (MOT) would not be required for the newly built roadway section. However, during the entire duration of the construction, barricades would be placed at the end of New Middle Road, which is currently a dead end, and connection point to Old Salem Road near the I-265/Old Salem Road interchange. A three-mile detour route for Utica Sellersburg Road would be utilized while the new Heavy Haul Transportation Corridor and Utica Sellersburg Road intersection is being constructed. The detour would direct traffic along Brown Foreman Road, to Utica Pike, to Port Road, to New Middle Road, to Utica Sellersburg Road. The detour would be in place for approximately 90 days.

SUMMARY - Infrastructure

Infrastructure Indicate the number of items of concern found within 0.5 mile and an explanation why each item within the 0.5 mile search radius will/will not impact the project. If there are no items, please indicate N/A.			
Religious Facilities	**N/A**	Recreational Facilities	**N/A**
Airports	**1**	Pipelines	**1**
Cemeteries	**2**	Railroads	**N/A**
Hospitals	**N/A**	Trails	**1**
Schools	**N/A**	Managed Lands	**1**

Explanation:

Airports

- One airport is located within 20,000 feet (3.8 miles) of the project area. This airport, the Clark County Regional Airport is a public airport; therefore, early coordination with INDOT Aviation should occur.

Cemeteries

- Two cemeteries are located within the one-half mile search radius. The closest of these, the Burtt Family Cemetery, is mapped on the USGS topographic mapping approximately 0.34 mile northwest of the project area. Coordination with INDOT Cultural Resources should occur.

Pipelines

- One natural gas pipeline owned by Indiana Gas Company, Inc. is mapped within the project area and therefore may be impacted by the proposed project. The pipeline runs northeast and southwest near the center of the project area. Coordination should occur with the INDOT utilities and railroads.

Trails

- One potential trail is located within the southern termini of the project area and therefore may be impacted by the proposed project. The Ohio River Greenway to Charlestown State Park Trail, which is managed by the City of Jeffersonville, is proposed to run southwest and northeast through the southwestern portion of the project area. Coordination should occur with the City of Jeffersonville.

Managed Lands

- One area of managed land is located within one-half mile of the project area. The Charlestown Military Reservation managed by the U.S. Department of Defense (US DOD) is located approximately 0.40 mile northeast of the project area. Due to the distance from the project area, no impacts are anticipated.

SUMMARY – Water Resources

Water Resources Indicate the number of items of concern found within 0.5 mile and an explanation why each item within the 0.5 mile search radius will/will not impact the project. If there are no items, please indicate N/A.			
NWI - Points	**2**	NWI - Wetlands	**23**
Karst Springs	**N/A**	IDEM 303d Listed Lakes	**N/A**
Canal Structures – Historic	**N/A**	Lakes	**10**
NWI - Lines	**5**	Floodplain - DFIRM	**5**
IDEM 303d Listed Rivers and Streams (Impaired)	**N/A**	Cave Entrance Density	**N/A**
Rivers and Streams	**5**	Sinkhole Areas	**N/A**
Canal Routes - Historic	**N/A**	Sinking-Stream Basins	**N/A**
Urbanized Area Boundary (UAB)	**1**		

Explanation:

NWI – Points

- Two National Wetland Inventory (NWI) points are located within one-half mile of the project area. The closest NWI point is adjacent to the southern termini of the project area. A Waters of the US Report will be prepared and coordination with INDOT ES Ecology and Waterway Permitting will occur.

NWI – Lines

- Five NWI lines are located within one-half mile of the project area. One NWI line crosses through the northern portion of the project area and is classified as Riverine, Upper Perennial, Unconsolidated Bottom, Permanently Flooded (R3UBH) under the Cowardin Classification System. A Waters of the US Report will be prepared and coordination with INDOT ES Ecology and Waterway Permitting will occur.

Rivers and Streams

- Five river and stream lines are located within one-half mile of the project area. Of those, two segments, one associated with Lentzier Creek and one with an UNT, are located within the northern and middle section of the project area and therefore may be impacted by the proposed project. A Waters of the US Report will be prepared and coordination with INDOT ES Ecology and Waterway Permitting will occur.

Urbanized Area Boundary (UAB)

- The project area lies within the Louisville-Clarksville-New Albany UAB. Post construction Storm Water Quality Best Management Practices (BMPs) may need to be considered. An early coordination letter with topographic and aerial maps showing the project area should be sent to the Jeffersonville Storm Water Department, Storm Water Coordinator, 1st Floor of City Hall, 500 Quartermaster Court, Jeffersonville, Indiana 47130.

NWI – Wetlands

- Twenty-three NWI wetlands are located within one-half mile of the project area. Three of the 23 wetlands are located adjacent to the project area. A Waters of the US Report will be prepared and coordination with INDOT ES Ecology and Waterway Permitting will occur.

Lakes

- Ten lakes are mapped within one-half mile of the project area. The closest lake is located approximately 0.03 mile east of the project area and is classified as Palustrine, Unconsolidated Bottom, Intermittently Exposed, Excavated (PUBGx) under the Cowardin Classification System. A Waters of the US Report will be prepared and coordination with INDOT ES Ecology and Waterway Permitting will occur.

Floodplain – DFIRM

- Five floodplain areas are located within one-half mile of the project area. Of these, one mapped floodplain associated with Lentzier Creek described above crosses the northern portion of the project area and therefore may be impacted by the proposed project. Coordination with INDOT ES Ecology and Waterway Permitting will occur.

SUMMARY – Mining/Mineral Exploration

Mining/Mineral Exploration Indicate the number of items of concern found within 0.5 mile and an explanation why each item within the 0.5 mile search radius will/will not impact the project. If there are no items, please indicate N/A.			
Petroleum Wells	**N/A**	Petroleum Fields	**N/A**
Mines – Surface	**N/A**	Mines – Underground	**N/A**

Explanation:

There are no Mining/Mineral Exploration features mapped within half-mile of the project area.

SUMMARY – Hazardous Material Concerns

Hazmat Concerns Indicate the number of items of concern found within 0.5 mile and an explanation why each item within the 0.5 mile search radius will/will not impact the project. If there are no items, please indicate N/A.			
Brownfield Sites	**N/A**	Restricted Waste Sites	**N/A**
Corrective Action Sites (RCRA)	**N/A**	Septage Waste Sites	**N/A**
Confined Feeding Operations	**N/A**	Solid Waste Landfills	**1**
Construction Demolition Waste	**N/A**	State Cleanup Sites	**N/A**
Industrial Waste Sites (RCRA Generators)	**2**	Tire Waste Sites	**1**
Infectious/Medical Waste Sites	**N/A**	Waste Transfer Stations	**N/A**
Lagoon/Surface Impoundments	**N/A**	RCRA Waste Treatment, Storage, and Disposal Sites (TSDs)	**N/A**
Leaking Underground Storage Tanks (LUSTs)	**N/A**	Underground Storage Tanks	**1**
Manufactured Gas Plant Sites	**N/A**	Voluntary Remediation Program	**N/A**
NPDES Facilities	**2**	Superfund	**N/A**
NPDES Pipe Locations	**3**	Institutional Control Sites	**N/A**
Open Dump Sites	**N/A**		

Explanation:

Industrial Waste Sites (RCRA Generators)

- Two points associated with a RCRA generator site are located at 5134 Loop Road and are associated with Steel Dynamics Incorporated. This RCRA generator is located approximately 0.20 mile southwest of the project area. Documentation obtained from the Indiana Department of Environmental Management's (IDEM) Virtual File Cabinet (VFC) indicates there have been several violations in the past for the Recourse Conservation and Recovery Act (RCRA) Small Quantity Generator (SQG) located at this facility. However, in each instance where

compliance was not met for this facility's RCRA SQG, compliance was eventually obtained. None of the violations this facility received are believed to have impacted the project area. Therefore, it is unlikely this facility has adversely impacted the project area, and no further investigation is recommended.

National Pollutants Discharge Elimination System (NPDES) Facilities

- Two NPDES facilities are mapped within one-half mile of the project area. One NPDES facility owned by Louisville & Indiana Railroad is mapped approximately 0.15 mile east of the project area. Documentation obtained from the IDEM VFC indicates that this facility is located at 2500 Old US 31, which is beyond the investigated area and therefore no impact is expected.
- The Tanco Clark Maritime, LLC facility is a special warehousing and storage facility located adjacent to the southern terminus of the project area at 5144 Utica Pike. This facility is listed under the NPDES database. The most recent Inspection Summary Letter for this facility was obtained on the IDEM VFC (dated October 7, 2014), and stated that there were no observed violations. No impact is expected; however, if the NPDES pipe outfall will be impacted by the proposed project, coordination with Tanco Clark Maritime, LLC, should occur.

NPDES Pipe Locations

- Three NPDES pipe locations are mapped within one-half mile of the project area. One NPDES pipe location associated with the facility owned by Louisville & Indiana Railroad (described above) is mapped approximately 0.15 mile east of the project area. No impact is expected.
- Two pipe locations are associated with the Tanco Clark Maritime, LLC facility (described above) located at 5144 Utica Pike. The closest of these is located 0.35 mile southeast of the project area along the Ohio River. No impact is expected.

Solid Waste Landfills

- One solid waste landfill is located within one-half mile of the project area. The Clark County Compost (Agency ID #7188) is located adjacent to the east of the project area at 5217 Utica Pike. This site was originally identified in the Red Flag Investigation prepared by American Structurepoint for the Heavy Haul Transportation Corridor in 2016. However, the solid waste landfill is no longer mapped on the DOT/RedFlagInvestigation database. Documentation obtained on the IDEM VFC indicates that this facility is no longer in operation as of December, 1997. In the Yard Waste Composting Facility Registration document for this facility, it was indicated that this facility was a holding-staging area and yard waste were removed from the site within 48 hours. Because this landfill is adjacent to the project area and may be assoicated with a historical tire waste site, a Phase II investigation is recommended in order to fully assess and characterize any contamination that has resulted from the past use of this site.

Underground Storage Tanks (UST)

- One UST is located within the project area. The UST is owned by Clark Maritime Centre (Agency ID #9103) is mapped between Brown Foreman Road and Loop Road, approximately 0.16 mile northwest of Utica Pike. However, documentation obtained from the IDEM VFC indicates this facility is located within the southern portion of the project area at 5100 Port Road, approximately 0.6 mile southwest of the project area. A UST closure report, dated February 2, 1999, was reviewed on the IDEM VFC. The report indicates that two USTs on site were removed from the ground on January 7, 1999. These USTs included one 550-gallon gasoline tank and one 550-gallon diesel tank. Analytical results from 14 soil samples collected after the removal of the USTs indicated THP levels were all below detection limits. Therefore, it is unlikely this site has impacted the project area, and no further investigation is recommended.

Tire Waste Site

- One tire waste site is mapped within the project area, at the southern terminus. The Pyco Regen Systems Incorporated, Tire Processing Site is located within the southern portion of the project area at 5100 Utica Pike. No documentation was available on the IDEM VFC for this facility. The lack of information regarding disposal methods, amounts, and types of waste resulting from this tire processing facility within the project area is considered a material threat of release. Therefore, this site is considered a recognized environmental condition. A Phase II investigation at this site is recommended in order to fully assess and characterize any contamination that has resulted from the past use of this site.

Ecological Information

The Clark County listing of the Indiana Natural Heritage Data Center information on endangered, threatened, or rare (ETR) species and high quality natural communities is attached with ETR species highlighted. The Indiana Department of Natural Resources (IDNR) and the U.S. Fish and Wildlife Service (USFWS) should be coordinated with regarding the potential for threatened and endangered species.

A review of the USFWS database conducted on December 6, 2016 indicated the presence of endangered bat species within one-half mile of the project area. The southern half of the project area is primarily industrial with streams traversing through the center. The northern half consists primarily of mature forest with stream corridors throughout.

A Mist Net Survey was conducted by Eco-Tech Consultants from June 28 through July 1, 2016. Eleven bats of three species were captured during the survey effort, including five gray bats (*Myotis grisescens*), four big brown bats (*Eptesicus fuscus*), and two eastern red bats *(Lasiurus borealis*). Although the area provides suitable foraging and roosting habitat for the federally endangered Indiana bat (*Myotis sodalis*) and the federally threatened northern long-eared bat (*Myotis septentrionalis*), neither species was encountered within the study area at the time of the survey. Therefore, the Scoping Sheet for the Indiana Bat and Northern Long-Eared Bat Range-Wide Programmatic Information Consultation will be prepared and submitted to INDOT Environmental Services for review and concurrence of the findings. If applicable, preparation of the Project Submittal Form for Range-wide Programmatic Consultation for Indiana Bat and Northern Long-Eared Bat will be required. The USFWS should be coordinated with to determine how to proceed with the presence of gray bats in the investigated area.

An inquiry using the USFWS Information for Planning and Consultation (IPaC) website did not indicate that the federal endangered species, the Rusty Patched Bumble bee (*Bombus affinis*), in or within one-half mile of the project area. No impact is expected.

Cultural Resources

The State Historic Architectural and Archaeological Research Database (SHAARD) was reviewed for the project area on August 25, 2017. According to SHAARD, there are two cemeteries, 2 county survey sites, no National Register Sites, and no Historic Bridges mapped within one-half mile of the project area.

The project area should be investigated for archaeological and historic resources for compliance with Section 106 of the National Historic Preservation Act. Coordination will occur with INDOT ES Cultural Resources.

RECOMMENDATIONS

INFRASTRUCTURE:

- One (1) airport, the Clark County Regional Airport, is located within 20,000 feet (3.8 miles) of the project area. This airport is a public airport; therefore, early coordination with INDOT Aviation should occur.
- One (1) natural gas pipeline crosses the project area. Appropriate coordination should occur with the INDOT utilities and railroads.
- One potential trail, the Ohio River Greenway to Charlestown State Park, is mapped within the project area. Appropriate coordination should occur with the City of Jeffersonville.

WATER RESOURCES: The presence of the following water resources will require the preparation of a Waters of the US Report and coordination with INDOT ES Ecology and Waterway Permitting:

- Two stream segments, one associated with Lentzier Creek and one with an UNT, flow through the project area.
- One NWI line (R3UBH) glows through the project area.
- The project area is located within a floodplain.
- One NWI-point is located adjacnet to the southern termini of the project area.

- Three wetlands are adjacent to the project area.
- One lake is located adjacent to the project area.

Lastly, the project area lies within the Louisville-Clarksville-New Albany UAB. Post construction Storm Water Quality Best Management Practices (BMPs) may need to be considered. An early coordination letter with topographic and aerial maps showing the project area should be sent to the Jeffersonville Storm Water Department, Storm Water Coordinator, 1st Floor of City Hall, 500 Quartermaster Court, Jeffersonville, Indiana 47130.

MINING/MINERAL EXPLORATION: N/A

HAZMAT CONCERNS:

- Solid Waste Landfill: One solid waste landfill is located within one-half mile of the project area. The Clark County Compost (Agency ID #7188) is located adjacent to the east of the project area at 5217 Utica Pike. Because this landfill is adjacent to the project area and may be assoicated with a historical tire waste site, a Phase II investigation is recommended in order to fully assess and characterize any contamination that has resulted from the past use of this site.
- Tire Waste Site: One tire waste site is mapped within the project area, at the southern terminus. The Pyco Regen Systems Incorporated, Tire Processing Site is located within the southern portion of the project area at 5100 Utica Pike. A Phase II investigation at this site is recommended in order to fully assess and characterize any contamination that has resulted from the past use of this site.

ECOLOGICAL INFORMATION: Early coordination should be conducted with the IDNR and the USFWS regarding the potential for threatened and endangered species in the proposed project area. Preparation of the Scoping Worksheet for the Range-Wide Programmatic Information Consultation for Indiana Bat and Northern Long-Eared Bat will be required. If applicable, preparation of the Project Submittal Form for Range-wide Programmatic Consultation for Indiana Bat and Northern Long-Eared Bat will be required.

CULTURAL RESOURCES: Coordination will occur with INDOT ES Cultural Resources.

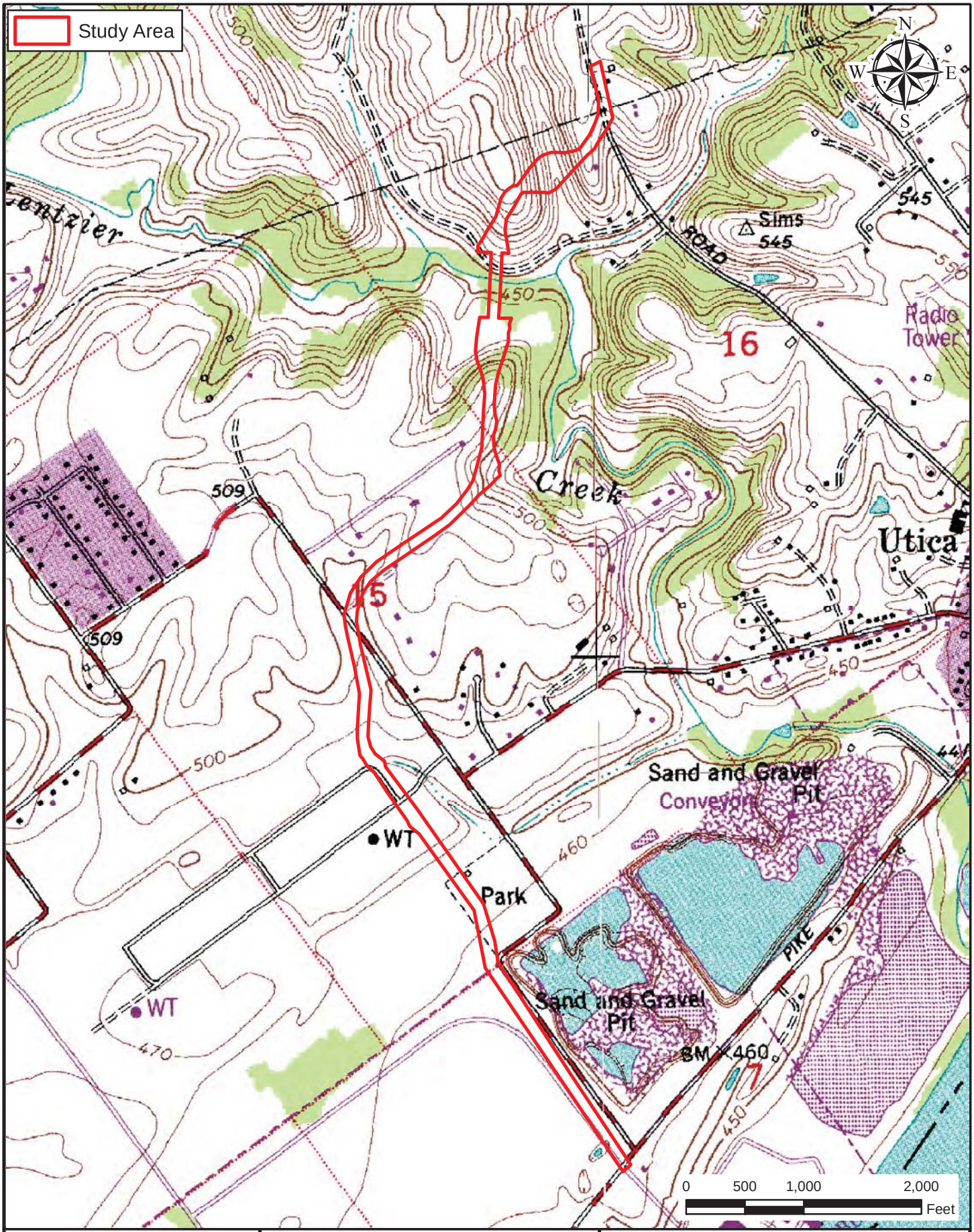
INDOT Environmental Services concurrence: Nicole Fohey-Breting Digitally signed by Nicole Fohey-Breting DN: cn=Nicole Fohey-Breting, o=INDOT, ou=Environmental Services, HazMat, email=NFoheyBreting@indot.in.gov, c=US Date: 2017.10.18 10:17:35 -04'00' (Signature)

Prepared by:

Briana M. Hope
American Structurepoint, Inc.

Graphics:
State Location Map
Topographic Map
2016 Aerial Photography
Red Flag Study Area Map
RFI Infrastructure Map
RFI Water Resources Map
RFI HazMat Concerns Map
RFI Urbanized Area Boundary Map
Clark County Natural Heritage Data Center ETR Listing

State Location map in Appendix A



AMERICAN STRUCTUREPOINT INC.

USGS Topographic Map
Jeffersonville Quadrangle

Indiana Department of Transportation
Central Office
100 North Senate Avenue
Indianapolis, Indiana 46204

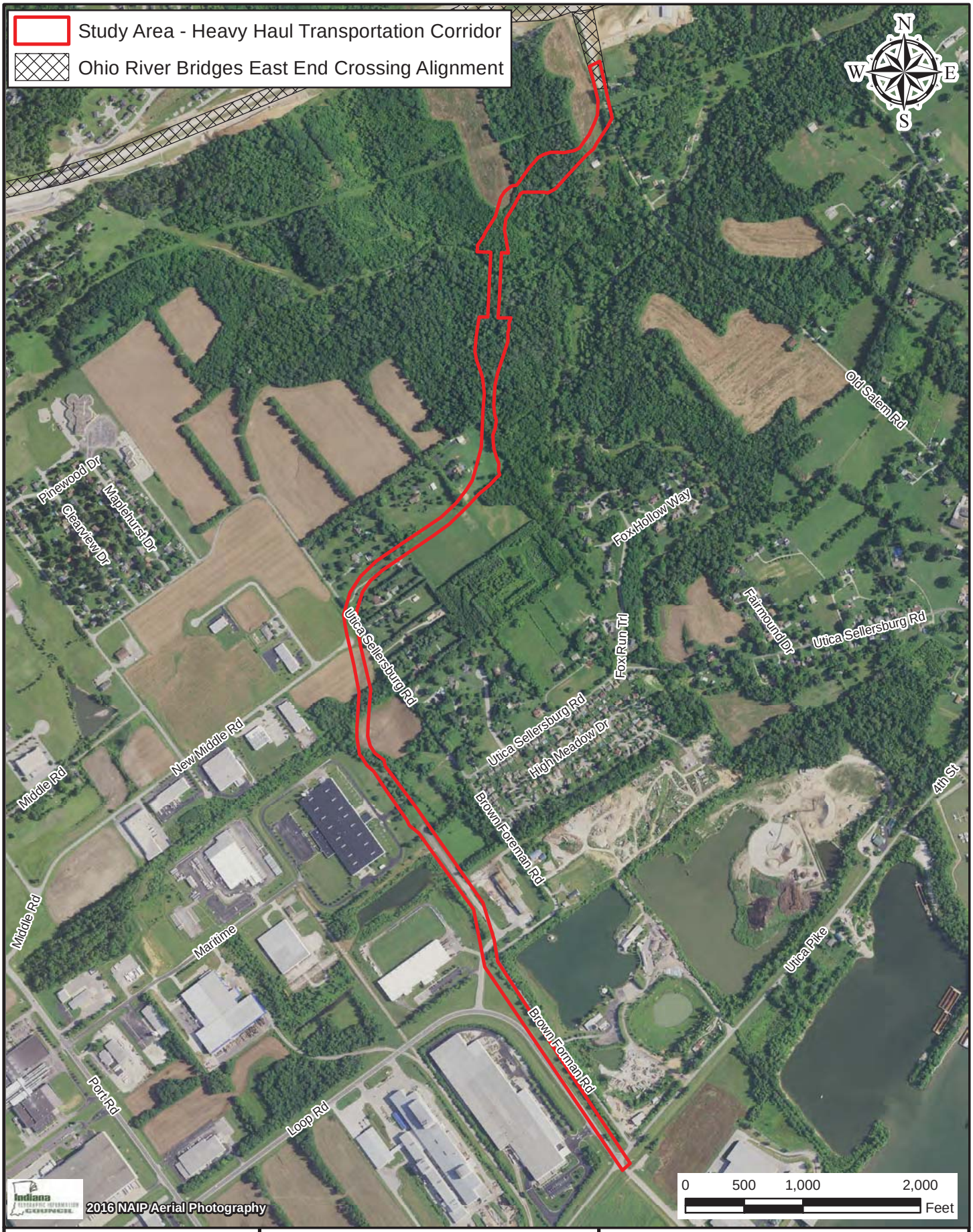
Heavy Haul Transportation Corridor
Des. No. 1382612

Location: Jeffersonville
Township: Utica
County: Clark
State: Indiana

Date: 08/23/2017

Appendix D
D-8

Path: P:\2013\01857\D. Drawings\ArcView\Exhibits\Red Flag\2015 Update\Prefered Alternative\2013.01857.EV.2017-08-23.Map.Topo map.md.mxd Date:8/23/2017 User:mdelreal



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AMERICAN STRUCTUREPOINT INC.

2016 Aerial Photography

Indiana Department of Transportation
Central Office
100 North Senate Avenue
Indianapolis, Indiana 46204

Heavy Haul Transportation Corridor
Des. No. 1382612

Location: Jeffersonville
Township: Utica
County: Clark
State: Indiana

Date: 08/23/2017

Path: P:\2013\01857\D. Drawings\ArcView\Exhibits\Red Flag\2015 Update\Prefered Alternative\2013.01857.EV.2017-08-23.Map.Base map.md.mxd Date:8/23/2017 User:mdelreal

AMERICAN STRUCTUREPOINT INC.

Red Flag Study Area

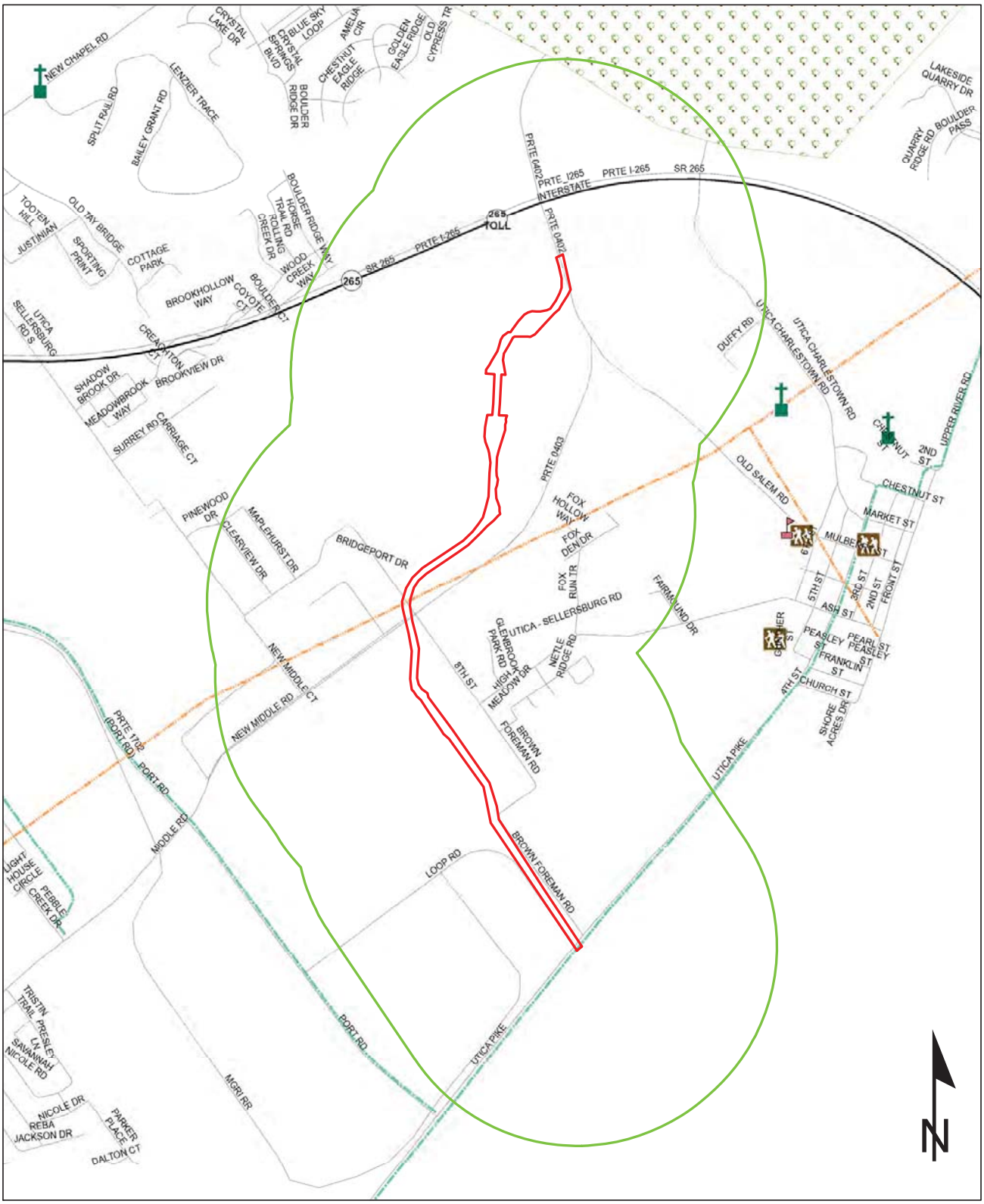
Indiana Department of Transportation
Central Office
100 North Senate Avenue
Indianapolis, Indiana 46204

Heavy Haul Transportation Corridor
Des. No. 1382612

Location: Jeffersonville
Township: Utica
County: Clark
State: Indiana

Date: 08/23/2017

Red Flag Investigation - Infrastructure
Heavy Haul Transportation Corridor
Des. No. 1382612
Utica Township, Clark County, Indiana



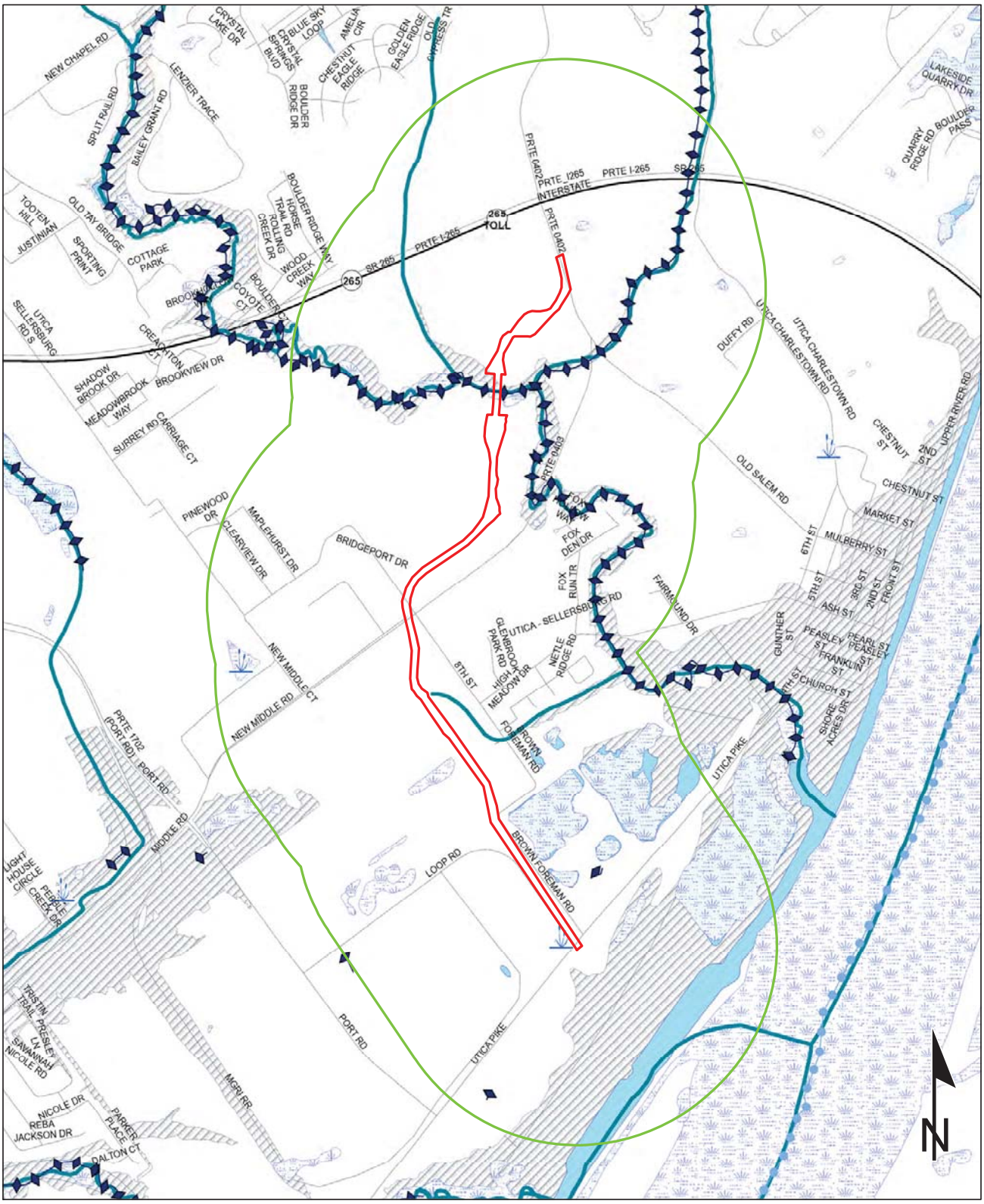
Sources:
Non Orthophotography Data - Obtained from the State of Indiana Geographical Information Office Library
Orthophotography - Obtained from Indiana Map Framework Data (www.indianamap.org)
Map Projection: UTM Zone 16 N **Map Datum:** NAD83

0.3 0.15 0 0.3 Miles

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

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

Red Flag Investigation - Water Resources
Heavy Haul Transportation Corridor
Des. No. 1382612
Utica Township, Clark County, Indiana



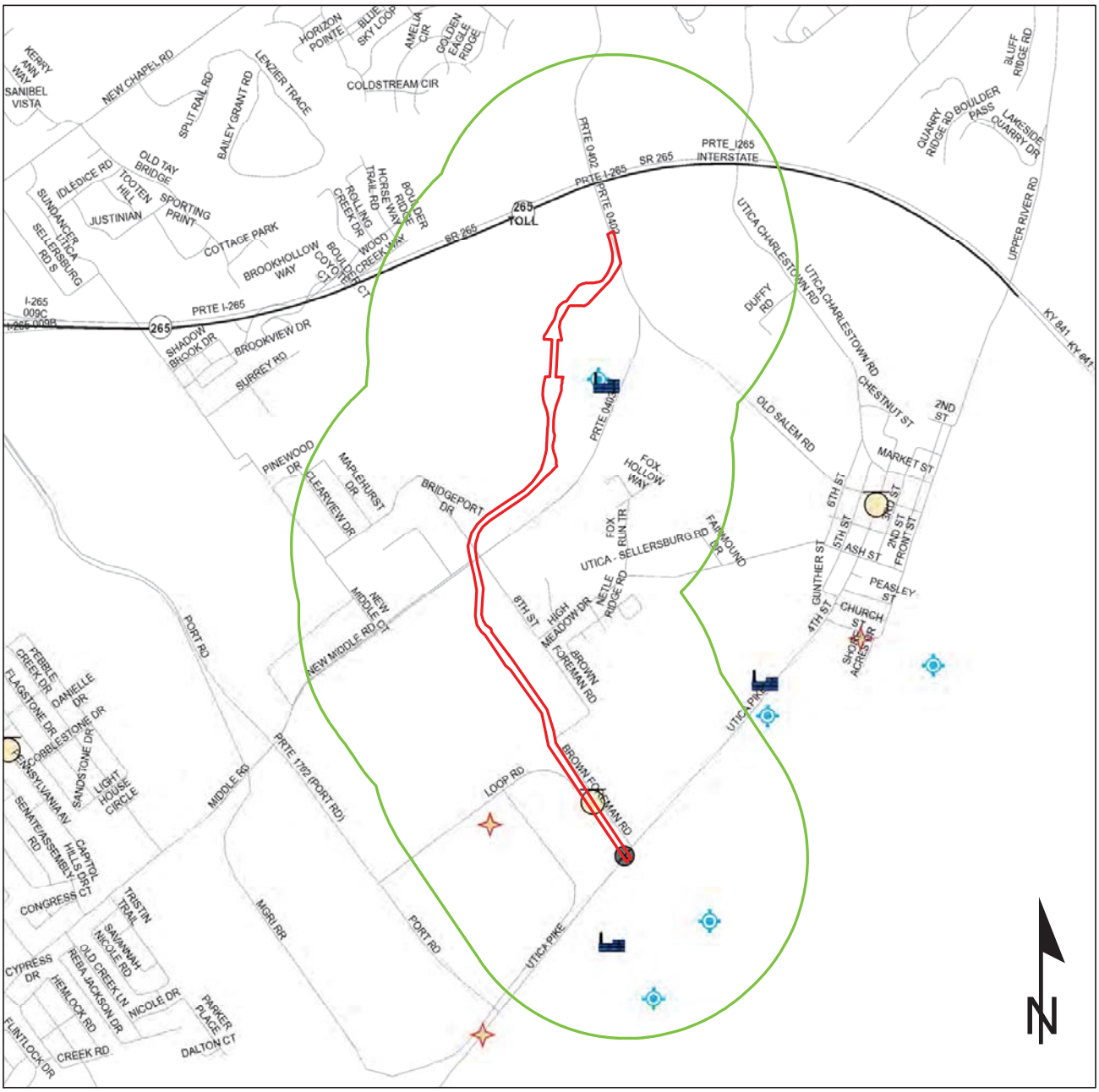
0.3 0.15 0 0.3 Miles

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

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

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

Red Flag Investigation - HazMat Concerns
Heavy Haul Transportation Corridor
Des. No. 1382612
Utica Township, Clark County, Indiana



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

0.35 0.175 0 0.35 Miles

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

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

Red Flag Investigation - Urban Area Boundary
Heavy Haul Transportation Corridor
Des. No. 1382612
Utica Township, Clark County, Indiana

0.3 0.15 0 0.3 Miles

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

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

Indiana County Endangered, Threatened and Rare Species List

County: Clark

Species Name	Common Name	FED	STATE	GRANK	SRANK
Platyhelminthes (Flatworms)					
Sphalloplana weingartneri	Weingartner's Cave Flatworm		WL	G4	S4
Diplopoda					
Pseudotremia nefanda	Clark Cave Millepede		SE	G3G4	S2
Dipluran					
Campodea plusiochaeta	A Dipluran		SE	GNR	S1
Crustacean: Malacostraca, Amphipods					
Crangonyx ohioensis	An Amphipod			G1G2	S1
Crangonyx packardi	Packard's Cave Amphipod		WL	G4	S3
Gammarus bousfieldi	Bousfield's spring amphipod		SE	G1	S1
Stygobromus mackini	Mackin's cave amphipod		SE	G5	S1
Synurella dentata	Dentate amphipod		WL	GNR	S4
Crustacean: Malacostraca, Isopods					
Caecidotea jordani	Jordan's groundwater isopod		SE	G2G3	S1
Crustacean: Copepoda					
Diacyclops jeanneli	Jeannel's Cave Copepod		ST	G3G4	S2
Mollusk: Bivalvia (Mussels)					
Fusconaia subrotunda	Longsolid		SE	G3	SX
Lampsilis fasciola	Wavyrayed Lampmussel		SSC	G5	S3
Potamilus capax	Fat Pocketbook	LE	SE	G2	S1
Villosa lienosa	Little Spectaclecase		SSC	G5	S3
Mollusk: Gastropoda					
Fontigens cryptica	Hidden Springs Snail		SE	G1	S1
Ellipluran: Collembola					
Pseudosinella fonsa	Fountain Cave Springtail		ST	G3G4	S2
Sinella alata	Springtail		WL	G5	S4
Sinella cavernarum	A Springtail		WL	G5	S4
Insect: Coleoptera (Beetles)					
Aleochara lucifuga	Rove beetle		WL	GNR	S4
Atheta annexa	Rove beetle		WL	G4	S4
Batrisodes krekeleri	Krekeler's cave ant beetle		SE	G1	S1
Dryobius sexnotatus	Six-banded Longhorn Beetle		ST	GNR	S2
Pseudanophthalmus barri	Cave Beetle		SE	G1G2	S1
Insect: Lepidoptera (Butterfly)					
Artogeia virginiensis	West Virginia White		SR	G3?	S3
Celastrina nigra	Sooty Azure		ST	G4	S2
Arachnida					
Dolomedes scriptus	Lined Nursery Web Spider			GNR	S1?
Dolomedes vittatus	Nursery Web Spider			GNR	S1

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

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

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

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

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

Indiana County Endangered, Threatened and Rare Species List

County: Clark

Species Name	Common Name	FED	STATE	GRANK	SRANK
Fish					
Acipenser fulvescens	Lake Sturgeon		SE	G3G4	S1
Etheostoma variatum	Variegate Darter		SE	G5	S1
Amphibian					
Acris blanchardi	Northern Cricket Frog		SSC	G5	S4
Cryptobranchus alleganiensis alleganiensis	Eastern Hellbender		SE	G3G4T3T4	S1
Reptile					
Clonophis kirtlandii	Kirtland's Snake		SE	G2	S2
Crotalus horridus	Timber Rattlesnake		SE	G4	S2
Opheodrys aestivus	Rough Green Snake		SSC	G5	S3
Tantilla coronata	Southeastern Crowned Snake		SE	G5	S1
Terrapene carolina carolina	Eastern Box Turtle		SSC	G5T5	S3
Bird					
Aimophila aestivalis	Bachman's Sparrow			G3	SXB
Ammodramus henslowii	Henslow's Sparrow		SE	G4	S3B
Coragyps atratus	Black Vulture			G5	S1N,S2B
Dendroica cerulea	Cerulean Warbler		SE	G4	S3B
Helmitheros vermivorus	Worm-eating Warbler		SSC	G5	S3B
Lanius ludovicianus	Loggerhead Shrike		SE	G4	S3B
Nycticorax nycticorax	Black-crowned Night-heron		SE	G5	S1B
Tyto alba	Barn Owl		SE	G5	S2
Mammal					
Mustela nivalis	Least Weasel		SSC	G5	S2?
Myotis grisescens	Gray Bat	LE	SE	G3	S1
Myotis sodalis	Indiana Bat or Social Myotis	LE	SE	G2	S1
Taxidea taxus	American Badger		SSC	G5	S2
Vascular Plant					
Acalypha deamii	Mercury		SR	G4?	S2
Asclepias viridis	Green Milkweed		SE	G4G5	S1
Asplenium resiliens	Black-stem Spleenwort		SE	G5	S1
Asplenium ruta-muraria	Wallrue Spleenwort		SR	G5	S2
Aster schreberi	Schreber Aster		SE	G4	S1
Azolla caroliniana	Carolina Mosquito-fern		ST	G5	S2
Calamagrostis porteri ssp. insperata	Reed Bent Grass		ST	G4T3	S1
Carex eburnea	Ebony Sedge		SR	G5	S2
Carex straminea	Straw Sedge		ST	G5	S2
Chaerophyllum procumbens var. shortii	Wild Chervil		ST	G5T3T4Q	S1
Cirsium carolinianum	Carolina Thistle		SR	G5	S2
Cuscuta indecora	Pretty Dodder		SE	G5	S1

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

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

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

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

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

Indiana County Endangered, Threatened and Rare Species List

County: Clark

Species Name	Common Name	FED	STATE	GRANK	SRANK
Eleocharis bifida	Glades spikerush		SE	G3G4	S1
Euphorbia obtusata	Bluntleaf Spurge		SE	G5	S1
Gonolobus obliquus	Angle Pod		SR	G4?	S2
Heliotropium tenellum	Slender Heliotrope		ST	G5	S2
Hexalectris spicata	Crested Coralroot		SR	G5	S2
Hottonia inflata	Featherfoil		ST	G4	S2
Iresine rhizomatosa	Eastern Bloodleaf		SR	G5	S2
Isoetes engelmannii	Appalachian Quillwort		SE	G4	S1
Lathyrus venosus	Smooth Veiny Pea		ST	G5	S2
Leavenworthia uniflora	Michaux Leavenworthia		SE	G4	S1
Lechea racemulosa	Illinois Pinweed		SE	G5	S1
Linum sulcatum	Grooved Yellow Flax		SR	G5	S2
Ludwigia decurrens	Primrose Willow		WL	G5	S2
Magnolia acuminata	Cucumber Magnolia		SE	G5	S1
Melica nitens	Three-flower Melic Grass		ST	G5	S2
Melothria pendula	Creeping Cucumber		SE	G5?	S1
Ophioglossum engelmannii	Limestone Adder's-tongue		SR	G5	S2
Oxalis illinoensis	Illinois Woodsorrel		WL	G4Q	S2
Panicum bicknellii	A Panic-grass		SE	G4?Q	S1
Passiflora incarnata	Purple Passion-flower		SR	G5	S2
Penstemon deamii	Deam Beardtongue		SR	G1	S1
Phlox amplifolia	Large-leaved Phlox		SR	G3G5	S2
Polypodium polypodioides	Resurrection Fern		SR	G5	S2
Rhexia mariana var. mariana	Maryland Meadow Beauty		ST	G5T5	S1
Rubus centralis	Illinois Blackberry		SE	G2?Q	S1
Satureja glabella var. angustifolia	Calamint		SE	G5	S1
Scutellaria parvula var. australis	Southern Skullcap		WL	G4T4?	S2
Sedum telephioides	Allegheny Stonecrop		SR	G4	S2
Solidago squarrosa	Stout-ragged Goldenrod		SE	G4?	S1
Spiranthes magnicamporum	Great Plains Ladies'-tresses		SE	G4	S1
Stachys clingmanii	Clingman Hedge-nettle		SE	G2	S1
Strophostyles leiosperma	Slick-seed Wild-bean		ST	G5	S2
Sullivantia sullivantii	Sullivantia		ST	G4	S2
Thalictrum pubescens	Tall Meadowrue		ST	G5	S2
Tragia cordata	Heart-leaved Noseburn		WL	G4	S2
Trifolium reflexum var. glabrum	Buffalo Clover		SE	G5T2T4Q	S1
Trifolium stoloniferum	Running Buffalo Clover	LE	SE	G3	S1
Valerianella chenopodiifolia	Goose-foot Corn-salad		SE	G5	S1
Viburnum molle	Softleaf Arrow-wood		SR	G5	S2
Viola hirsutula	Southern Wood Violet		SE	G4	S1

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

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

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

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

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Indiana County Endangered, Threatened and Rare Species List

County: Clark

Species Name	Common Name	FED	STATE	GRANK	SRANK
High Quality Natural Community					
Barrens - bedrock limestone	Limestone Glade		SG	G4	S2S3
Barrens - bedrock siltstone	Siltstone Glade		SG	G2	S2
Forest - upland dry	Dry Upland Forest		SG	G4	S4
Forest - upland dry-mesic	Dry-mesic Upland Forest		SG	G4	S4
Forest - upland mesic	Mesic Upland Forest		SG	G3?	S3
Other Significant Element					
Geomorphic - Nonglacial Erosional Feature - Water Fall and Cascade	Water Fall and Cascade			GNR	SNR

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Division of Nature Preserves
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This data is not the result of comprehensive county surveys.

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

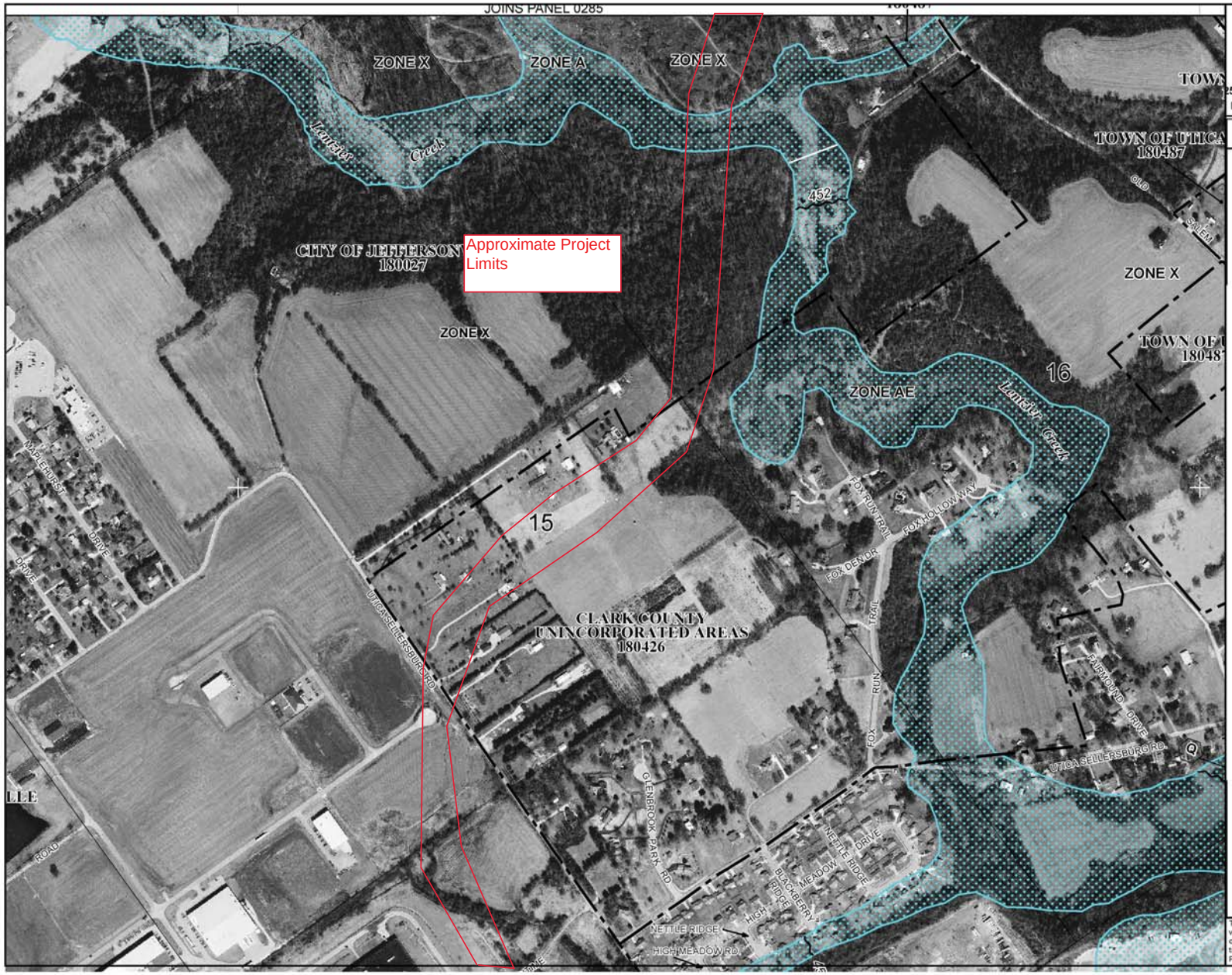
State: SE = state endangered; ST = state threatened; SR = state rare; SSC = state species of special concern; SX = state extirpated; SG = state significant; WL = watch list

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

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

Appendix E: Water Resources and Ecological Information

- FEMA FIRM Map (Panel #18019C0283E, April 16, 2014)
- Wetland Delineation and Waters Report – Approved October 13, 2017
- Karst Report – Approved January 3, 2018



MAP SCALE 1" = 500'

250 0 500 1000 FEET

METERS

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0283E

FIRM

FLOOD INSURANCE RATE MAP

CLARK COUNTY, INDIANA AND INCORPORATED AREAS

PANEL 283 OF 295

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
CLARK COUNTY	180426	0283	E
JEFFERSONVILLE, CITY OF	180027	0283	E
UTICA, TOWN OF	180487	0283	E

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
18019C0283E

EFFECTIVE DATE
APRIL 16, 2014

Federal Emergency Management Agency

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov

From:	Kang, Li
To:	Boits, Leah
Cc:	Heustis, Ronald; Hope, Briana
Subject:	RE: Heavy Haul Transportation Corridor (Des. No. 1382612) - Waters Report
Date:	Friday, October 13, 2017 2:56:28 PM
Attachments:	image001.png image002.png image003.png image004.png image005.png image006.png image007.png

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Leah,
The Waters Report review has been completed and no comments at this time. Please forward the report to the designer for the future permit application. If you have any questions please let me know.
Thanks,

Li Kang

Ecology & Waterway Permitting Office

INDOT N. 642

317-232-6766

From: Boits, Leah [mailto:lboits@structurepoint.com]
Sent: Friday, September 08, 2017 2:24 PM
To: Rehder, Crystal <CRehder@indot.IN.gov>
Cc: Bowman, Sandra A <SBowman@indot.IN.gov>; Kang, Li <LKANG@indot.IN.gov>; Hilden, Laura <lhilden@indot.IN.gov>; michelle.allen@dot.gov; Heustis, Ronald <RHEUSTIS@indot.IN.gov>; Andrews, Jeff <JeffA@ucindy.com>; Hope, Briana <bhope@structurepoint.com>
Subject: Heavy Haul Transportation Corridor (Des. No. 1382612) - Waters Report

**** This is an EXTERNAL email. Exercise caution. DO NOT open attachments or click links from unknown senders or unexpected email. ****

Crystal,

The Wetland Delineation and Waters Report for the above-referenced project has been uploaded to the Transportation Corridor – Des. No. 1382612 folder on our Sharefile site for your review and comment. Please use the link provided below to access the document:

https://structurepoint.sharefile.com/d-s1334060c9434aceb

If you have any issues accessing the document or need additional information, please feel free to contact me.

Thank you,
Leah

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WETLAND DELINEATION AND WATERS REPORT

HEAVY HAUL TRANSPORTATION CORRIDOR
UTICA TOWNSHIP, CLARK COUNTY, INDIANA
DES. NO. 1382612

Prepared for:

INDIANA DEPARTMENT OF TRANSPORTATION
100 NORTH SENATE AVENUE
INDIANAPOLIS, INDIANA 46204

Prepared by:

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Leah S. Boits Briana M. Hope

June 9, 2017

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1.0 Introduction

American Structurepoint, Inc. was contracted by the Indiana Department of Transportation (INDOT) Central Office, to perform a wetland delineation on the approximately 200-acre area surrounding the proposed Heavy Haul Transportation Corridor construction project in Utica Township, Clark County, Indiana. Several alignments have been proposed and are being analyzed as part of project development. The proposed project corridor generally extends north from the Port of Indiana-Jeffersonville (Port) to the State Road (SR) 265/Old Salem Road Interchange. The proposed project corridor width varies, but is generally 1,000 feet. The proposed project corridor (henceforth referred to as the area) is located on the Jeffersonville USGS 7.5 Minute Quadrangle Map in Tracts 7, 15-16, and 25. The location and approximate boundaries of the investigated area can be seen in the attached maps and aerial photographs (Appendix D).

Preliminary investigation of available data depicted Lentzier Creek and several tributaries to Lentzier Creek flowing through the area. Several businesses are located in the southern portion of the area, and residential homes are scattered near the center of the area. A large forested area is also apparent near the center of the area, north of residential homes. I-265 has been recently constructed and is depicted at the northern terminus of the area. Five National Wetland Inventory (NWI) wetlands are mapped within the investigated area. Two of the mapped wetlands are associated with open water features, one at the northern limits and one near the southern limits of the area. The three remaining mapped wetlands are located near the center of the investigated area adjacent to Lentzier Creek. Two FEMA-designated 100-year floodplains, one associated with Lentzier Creek and one associated with an unnamed tributary to Lentzier Creek, are mapped within the investigated area.

The USGS Topographic map depicts the southern portion of the investigated area as relatively flat developed land with an intermittent unnamed stream flowing through. An open water feature associated with a sand and gravel pit is mapped adjacent to the southern limits of the investigated area. The USGS Topographic map depicts a forested area near the center of the area with Lentzier Creek, a perennial stream (solid blue line), flowing through. Two unnamed intermittent streams (dashed blue lines) are depicted flowing into Lentzier Creek just at the boundaries of the investigated area in the northern half of the area. Topographic mapping depicts the northern half of the investigated area as steep, hilly terrain with little development. The *1974 Clark County Soil Survey* map depicts Lentzier Creek as an intermittent stream flowing through the center of the investigated area along with five intermittent unnamed tributaries. Two additional intermittent unnamed streams are shown on the *1974 Clark County Soil Survey* map within the investigated area, one near the northern terminus and one near the southern terminus of the investigated area limits.

The predominant soil types on this site are Caneyville-Rock outcrop complex, 25 to 60 percent slopes (CcaG); Crider silt loam, 2 to 6 percent slopes, eroded (CspB2); Crider-Haggatt silt loams, 6 to 12 percent slopes, eroded (CxhC2); Elkinsville-Millstone silt loams, 0 to 2 percent slopes (EesA), 2 to 6 percent slopes (EesB), 6 to 12 percent slopes, eroded (EesC2), and 12 to 18 percent slopes, eroded (EesD2); Haymond silt loam, 0 to 2 percent slopes, occasionally flooded, very brief duration (HcgAW); Haggatt-Caneyville silt loams, 12 to 25 percent slopes, eroded (HtwD2); Newark silt loam, 0 to 2 percent slopes, occasionally flooded, brief duration (NbhAK); Ryker silt loam, 2 to 6 percent slopes, eroded (RtcB2); Ryker-Grayford silt loams, 6 to 12 percent slopes, eroded (RztC2); Udorthents, cut and filled (Uaa); Urban land-Udarents, clayey substratum, complex,

hills, 2 to 10 percent slopes (UnsB). None of the soil series within the investigated area are mapped hydric soils.

American Structurepoint staff visited the site on May 6 and 7, 2014, and July 21, 2015, to conduct a wetland delineation. The proposed project is located in Land Resource Region (LRR) M, as recognized by the US Department of Agriculture. As such, this wetland delineation was conducted in accordance with the *Corps of Engineers Wetland Delineation Manual* (Environmental Laboratory, 1987) and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Midwest Region* (U.S. Army Corps of Engineers, 2010).

Ten wetlands (Wetlands A-J) totaling 4.42 acres, one open water feature (Pond 1) totaling 1.31 acres, and nine streams (Lentzier Creek and UNT 1 – UNT 8) totaling 8,575 linear feet (1.47 acres) were delineated within the investigated area. All of the delineated features appear to drain to Lentzier Creek, which drains to the Ohio River, a Traditional Navigable Waterway (TNW). Therefore, these 10 wetlands, nine streams (including Lentzier Creek), and one open water feature are anticipated to be considered jurisdictional "waters of the U.S."

2.0 Site Characterization – Records Review

2.1 USGS Topographic Mapping

The investigated area is shown on the Jeffersonville USGS 7.5 Minute Quadrangle Map. The topographic mapping depicts the southern half of the area as cleared, gently rolling land with several businesses along roadways. The northern half of the area is depicted as undeveloped land with steep changes in elevations. A forested area is mapped near the center of the area. Lentzier Creek is depicted as a solid blue line (perennial) within the area. Lentzier Creek is mapped flowing through the northern half of the area, entering from the west and exiting on the east. Lentzier Creek then reenters the area from the west, flows south through the center of the area and exits to the west again. Two unnamed tributaries to Lentzier Creek are depicted as dashed blue lines (intermittent) within the area. The confluence of one of these unnamed tributaries with Lentzier Creek is mapped in the northern half of the investigated area. The other is mapped in the southern half of the investigated area. An open water feature associated with a sand and gravel pit is mapped adjacent to the southern terminus of the investigated area. Lentzier Creek was field verified as a perennial stream during the 2014 and 2015 field investigations. The unnamed tributary entering Lentzier Creek from the north and the unnamed tributary located near the southern terminus of the investigated area were field verified as intermittent streams during the 2014 and 2015 field investigations.

2.2 National Wetlands Inventory Mapping (NWI) Maps

The NWI mapping was reviewed for the investigated area. Five NWI wetlands are mapped within the investigated area. The first of these is located near the southern terminus of the investigated area and is associated with an open water feature. It would be classified as Palustrine, Unconsolidated Bottom, Intermittently Exposed, Diked/Impounded (PUBGh) under the Cowardin Classification System. This NWI was identified as an open water feature (Pond 1) during the 2015 field investigation.

Three NWI wetlands are mapped within the forested area near the center of the project corridor adjacent to Lentzier Creek. Of these, two would be classified as Palustrine, Forested, Broad Leaf Deciduous, Temporarily Flooded (PFO1A) and one would be classified as Palustrine, Forested, Broad Leaf Deciduous, Seasonally Flooded (PFO1C) under the Cowardin Classification System. Several wetlands were delineated during the 2014 and 2015 field investigations within the area of these three mapped NWI wetlands. Wetlands E and F were associated with the most southern PFO1A mapped wetland, and Wetland H was associated with the mapped PFO1C wetland. The most northern PFO1A mapped wetland was not field verified.

The final mapped NWI wetland is associated with an open water feature located near the northern terminus of the investigated area and would be classified as a PUBGh wetland under the Cowardin Classification System. This NWI wetland was not field verified. The land in this area had been cleared and filled during the 2014 and 2015 field investigations for the construction of I-265.

2.3 County Soil Survey

The Natural Resources Conservation Service (NRCS) Web Soil Survey Geographic (SSURGO) (https://websoilsurvey.sc.egov.usda.gov) was reviewed on February 1, 2017 to determine soil classification and drainage features within the study area. Soil types mapped within the proposed project right-of-way include:

Soil Name	Soil Symbol	Hydric or Non-Hydric	SSURGO Hydric Rating by Mapped Unit
Caneyville-Rock outcrop complex, 25 to 60 percent slopes	CcaG	Non-Hydric	0%
Crider silt loam, 2 to 6 percent slopes, eroded	CspB2	Non-Hydric	0%
Crider-Haggatt silt loams, 6 to 12 percent slopes, eroded	CxhC2	Non-Hydric	0%
Elkinsville-Millstone silt loams, 0 to 2 percent slopes	EesA	Non-Hydric	0%
Elkinsville-Millstone silt loams, 2 to 6 percent slopes	EesB	Non-Hydric	0%
Elkinsville-Millstone silt loams, 6 to 12 percent slopes, eroded	EesC2	Non-Hydric	0%
Elkinsville-Millstone silt loams, 12 to 18 percent slopes, eroded	EesD2	Non-Hydric	0%
Haymond silt loam, 0 to 2 percent slopes, occasionally flooded, very brief duration	HcgAW	Non-Hydric	0%
Haggatt-Caneyville silt loams, 12 to 25 percent slopes, eroded	HtwD2	Non-Hydric	0%
Newark silt loam, 0 to 2 percent slopes, occasionally flooded, brief duration	NbhAK	Non-Hydric	1-32%
Ryker silt loam, 2 to 6 percent slopes, eroded	RtcB2	Non-Hydric	0%
Ryker-Grayford silt loams, 6 to 12 percent slopes, eroded	RztC2	Non-Hydric	0%
Udorthents, cut and filled	Uaa	Non-Hydric	0%
Urban land-Udarents, clayey substratum, complex, hills, 2 to 10 percent slopes	UnsB	Non-Hydric	0%

The *1974 Clark County Soil Survey* depicts Lentzier Creek as an intermittent stream traversing the investigated area in the northern half of the area. Lentzier Creek is depicted entering the area from the west, flowing generally east across the area, and exiting to the east. The stream appears to then flow south back into the investigated area, and exit the area again to the east near the center of the investigated area. Lentzier Creek was field verified during the 2014 and 2015 field investigations.

In addition to Lentzier Creek, eight unnamed intermittent tributaries to Lentzier Creek are depicted in the *1974 Clark County Soil Survey* mapping. The first intermittent stream is depicted entering the southern half of the investigated area from the west, generally flowing southeast through the area, and exiting to the east. This stream was field verified as UNT 3 during the 2015 field investigation.

The second intermittent stream is depicted entering near the center of the investigated area from the west and flowing west into Lentzier Creek within the investigated area limits. This intermittent stream was field verified as UNT 4 during the 2014 and 2015 field investigations. UNT 4 appears to be channeled to a

manmade pond outside of the investigated area limits, which then drains to Lentzier Creek outside of the area limits.

The third intermittent stream is mapped approximately 0.12 mile north of the second mapped stream (UNT 4). This stream is mapped entering the investigated area from the east and flowing west into Lentzier Creek within the area limits. This stream was not field verified during the 2014 or 2015 field investigations.

The fourth unnamed intermittent stream is mapped entering the investigated area from the west, across from the previously discussed mapped stream. The stream generally flows north to Lentzier Creek within the investigated area. This mapped stream was field verified as UNT 5 during the 2015 field investigation. UNT 5 was determined to begin within the investigated area limits, then generally flows north to Lentzier Creek.

The fifth and sixth unnamed intermittent streams are mapped flowing south into Lentzier Creek, near the mapped location of UNT 5. The fifth stream enters the investigated area from the west and flows into Lentzier Creek almost immediately upon entering the area. This stream was field verified as UNT 7 during the 2015 field investigation. The sixth mapped stream enters from the east and also flows into Lentzier Creek almost immediately upon entering the area. This stream was not field verified within the investigated area limits during the 2014 or 2015 field investigations, and appears to be located just outside of the area to the east.

The seventh unnamed intermittent stream is mapped flowing into the northern portion of the investigated area from the north. The stream traverses the area and flows out of the area to the south, where it drains to the mapped stream described above (sixth mapped stream) outside of the area limits. This intermittent stream was field verified as UNT 8 during the 2014 field investigation.

The eighth and final mapped intermittent stream is depicted beginning within the area limits at the northern terminus. The stream flows south and east, and exits to the east. This stream was not field verified during the 2014 or 2015 field investigation. The area appeared to have been recently cleared and filled for the construction of I-265.

2.4 Aerial Photography

The 2005 (IndianaMap) and 2016 (NAIP) Aerial Photography was reviewed for the investigated area. Both 2005 and 2016 aerial photography depict the southern half of the project corridor as developed with one open water feature within the project corridor and another immediately adjacent to the southern terminus of the project corridor. A stream appears to traverse the southern half of the investigated area in the 2005 aerial photography. The stream is not apparent on the 2016 photography likely due to tree canopy cover. One open water feature (Pond 1) was field verified within the investigated area and the other open water feature was verified to be located outside of the investigated area limits adjacent to the southern terminus. The apparent stream was field verified during the 2015 field investigation as an intermittent stream (UNT 3).

The northern half of the investigated area is depicted as heavily wooded in both 2005 and 2016 aerial photography. Land has been cleared in the northern terminus for the construction of I-265 in the 2005 photography; I-265 has been constructed in the 2016 photography. Lentzier Creek is visible flowing across the center of the investigated area in both the 2005 and 2016 aerial photography. Lentzier Creek was field

verified as a perennial stream during the 2014 and 2015 field investigations. An open water feature is apparent at the northern terminus of the area in the 2005 aerial photography, but is not visible on the 2016 photography. The open water feature was not field verified during the 2014 or 2015 field investigations because the area had recently been cleared and filled for the construction of I-265.

2.5 Floodways and Floodplains

Federal Emergency Management Agency (FEMA) Flood Insurance Rate Mapping (FIRM) was reviewed for the investigated area. The investigated area encroaches on two FEMA-designated 100-year floodplains, one associated with Lentzier Creek and one associated with UNT 3. Lentzier Creek and its associated floodplain are located within the forested area in the northern half of the investigated area. Lentzier Creek and its floodplain cross back into the investigated area from the east near the center of the area. UNT 3 and its associated floodplain are located near the southern terminus of the investigated area.

2.6 Legal Drain

The Clark County Drainage Board was contacted on March 13, 2017 to determine the presence or absence of regulated drains within the investigated area. In an emailed response on March 13, 2017, the Clark County Surveyor indicated that there were no regulated drains within the investigated area.

3.0 Field Reconnaissance

The approximately 200-acre area for the proposed Heavy Haul Transportation Corridor construction project was examined May 6 and 7, 2014 and July 21, 2015 for the presence of wetlands and "waters of the U.S." Data points were strategically placed to identify appropriate boundaries of delineated wetlands and to determine the presence or absence of jurisdictional wetlands and "waters of the U.S." A total of 10 wetlands, nine streams, and one open water feature were identified. Data sheets and a map indicating the location of data points documenting the field investigation are included in the appendix.

3.1 Wetlands

3.1.1 Wetland A

Wetland A is an emergent wetland located approximately 560 feet north of Loop Road near the southern terminus of the investigated area. The wetland appears to be associated with an unmaintained detention area that collects surface runoff from businesses to the south via a culvert. Wetland A appears to drain north to Pond 1, which is located approximately 90 feet north. Pond 1 drains east beneath a roadway via a culvert to Wetland B, which drains east to UNT 1. UNT 1 drains to UNT 3, which drains to Lentzier Creek. Lentzier Creek drains south to the Ohio River, a TNW. Since the wetland has a hydrologic connection to a TNW, it is anticipated that Wetland A will be considered a jurisdictional "waters of the U.S."

The dominant vegetation consisted of *Persicaria pensylvanica* (FACW) and *Carex trichocarpa* (OBL). Hydrologic indicators included High Water Table present at two inches below the surface (A2), Saturation at surface (A3), and FAC-Neutral Test (D5). The hydric soil indicator included Depleted Matrix (F3). Wetland A was delineated for 1.47 acres and would be considered a Palustrine, Emergent, Seasonally Flooded (PEMC) wetland under the Cowardin Classification System. The wetland appears to be associated with an unmaintained drainage area that collects surface runoff from businesses to the south via a culvert. On aerial

photography there appears to be a concrete drainage ditch running through the center of the wetland, but this was not observed during the 2015 field visit. Because this wetland collects surface runoff and appears to have developed due to lack of maintenance of a drainage ditch, it would be considered a poor quality wetland. For reference to the field data collected for this wetland, see Data Point (DP) 01 included in Appendix B. DP02 included in Appendix B is representative of the upland area surrounding Wetland A.

3.1.2 Wetland B

Wetland B is an emergent wetland located approximately 800 feet north of Brown Forman Road, east of Pond 1. The wetland is located at the toe of slope within the 100-year floodplain of UNT 1. The wetland appears to collect drainage from Pond 1 via a culvert under the roadway. Wetland B then drains west to UNT 1, which drains to UNT 3, which drains to Lentzier Creek. Lentzier Creek drains south to the Ohio River, a TNW. Since the wetland has a hydrologic connection to a TNW, it is anticipated that Wetland B will be considered a jurisdictional "waters of the U.S."

The dominant vegetation consisted of *Fraxinus pennsylvanica* (FACW) and *Carex cristatella* (FACW). Hydrologic indicators included High Water Table at seven inches below surface (A2), Saturation at two inches below surface (A3), Sediment Deposits (B2), Drift Deposits (B3), Iron Deposits (B5), and FAC-Neutral Test (D5). The hydric soil indicator included Depleted Matrix (F3). Wetland B was delineated for 0.04 acre. Although trees were listed as dominant within the wetland, the trees included on the datasheet were from the canopy cover. Therefore, Wetland B would be considered a PEMC wetland under the Cowardin Classification System. The wetland appears to be associated with a low area where drainage from Pond 1 and sheet flow from the abutting abandoned field is conveyed west to UNT 1. Because the wetland is used to convey drainage within a highly developed area and has a diverse plant community, it would be considered an average quality wetland. For reference to the field data collected for this wetland, see DP04 in Appendix B. DP05 included in Appendix B is representative of the upland area surrounding Wetland B.

3.1.3 Wetland C

Wetland C is an emergent wetland located in the northwest quadrant of the Utica-Sellersburg Road and Maritime intersection. The wetland is a depressed area in an open field. The wetland appears to drain south to UNT 3, which drains to Lentzier Creek. Lentzier Creek drains south to the Ohio River, a TNW. Since the wetland has a hydrologic connection to a TNW, it is anticipated that Wetland C will be considered a jurisdictional "waters of the U.S."

The dominant vegetation consisted of *Persicaria pensylvanica* (FACW) and *Pilea pumila* (FACW). Hydrologic indicators included Drainage Patterns (B10), Geomorphic Position (D2), and FAC-Neutral Test (D5). The hydric soil indicator included Depleted Matrix (F3). Wetland C was delineated for 0.12 acre and would be considered a Palustrine, Emergent, Seasonally Flooded/Saturated (PEME) wetland under the Cowardin Classification System. The wetland appears to be a large depressional area where sheet flow is collected from the surrounding field before draining to UNT 3. Because of the diverse vegetative community and surrounding undeveloped land, this wetland would be considered an average quality wetland. For reference to the field data collected for this wetland, see DP08 in Appendix B. DP07 included in Appendix B is representative of the upland area surrounding Wetland C.

3.1.4 Wetland D

Wetland D is a scrub-shrub wetland located approximately 340 feet south of New Middle Road. UNT 3 appears to drain to Wetland D from the north. A continuous bed and bank or ordinary high water mark (OHWM) are not apparent as the stream enters the wetland. A continuous bed and bank and OHWM become apparent again in the western half of the wetland and then UNT 3 drains out of the wetland via a culvert. Wetland D appears to drain to UNT 3, which drains to Lentzier Creek. Lentzier Creek drains south to the Ohio River, a TNW. Since the wetland has a hydrologic connection to a TNW, it is anticipated that Wetland D will be considered a jurisdictional "waters of the U.S."

The dominant vegetation consisted of *Fraxinus pennsylvanica* (FACW), *Salix nigra* (OBL), *Carex frankii* (OBL), and *Phragmites australis* (FACW). Hydrologic indicators included High Water Table present at six inches below surface (A2), Saturation at surface (A3), Sediment Deposits (B2), Drift Deposits (B3), and FAC-Neutral Test (D5). The hydric soil indicator included Depleted Matrix (F3). Wetland D was delineated for 0.59 acre and would be considered a Palustrine, Scrub-Shrub, Broad Leaf Deciduous, Seasonally Flooded (PSS1C) wetland under the Cowardin Classification System. The wetland appears to be a low area associated with the floodplain of UNT 3. Because of the association with a stream as well as tree and scrub-shrub cover, this wetland would be considered an average quality wetland. For reference to the field data collected for this wetland, see DP09 in Appendix B. DP10 included in Appendix B is representative of the upland area surrounding Wetland D.

3.1.5 Wetland E

Wetland E is an emergent wetland located within the FEMA-designated 100-year floodplain of Lentzier Creek. The wetland is a small depressional area located at the toe of slope in a cleared area near the center of the investigated area approximately 0.27 mile north of Fox Den. The wetland appears to drain south to Lentzier Creek, which drains south to the Ohio River, a TNW. Since the wetland has a hydrologic connection to a TNW, it is anticipated that Wetland E will be considered a jurisdictional "waters of the U.S."

The dominant vegetation consisted of *Platanus occidentalis* (FACW), *Juncus effusus* (OBL), and *Carex frankii* (OBL). Hydrologic indicators included Sediment Deposits (B2), Algal Mat or Crust (B4), Water-Stained Leaves (B-9), and FAC-Neutral Test (D5). The hydric soil indicator included Depleted Matrix (F3). Wetland E was delineated for 0.01 acre. Although trees were listed as a dominant species, the total coverage from trees was due to canopy cover; trees were not located within the wetland boundaries. Therefore, this wetland would be considered a PEME wetland under the Cowardin Classification System. Due to the relatively small size and location within a FEMA-designated 100-year floodplain, the wetland would be considered an average quality wetland. For reference to the field data collected for this wetland, see DP14 in in Appendix B. DP15 included in Appendix B is representative of the upland area surrounding Wetland E.

3.1.6 Wetland F

Wetland F is an emergent wetland located within the FEMA-designated 100-year floodplain of Lentzier Creek. The wetland is a small depressional area located at the toe of slope in a cleared area near the center of the investigated area approximately 38 feet north of Wetland E. The wetland appears to drain east to Lentzier Creek, which drains south to the Ohio River, a TNW. Since the wetland has a hydrologic connection to a TNW, it is anticipated that Wetland F will be considered a jurisdictional "waters of the U.S."

The dominant vegetation consisted of *Liquidambar styraciflua* (FACW), *Fraxinus pennsylvanica* (FACW), *Acer negundo* (FAC), *Schedonorus arundinaceus* (FACU), *Carex frankii* (OBL), *Lycopus asper* (OBL), and *Juncus effusus* (OBL). Hydrologic indicators included Sediment Deposits (B2), Algal Mat or Crust (B4), and FAC-Neutral Test (D5). The hydric soil indicator included Depleted Matrix (F3). Wetland F was delineated for 0.01 acre. Although trees were listed as a dominant species, the total coverage from trees was due to canopy cover; trees were not located within the wetland boundaries. Therefore, this wetland would be considered a PEME wetland under the Cowardin Classification System. Due to the relatively small size and location within a FEMA-designated 100-year floodplain, the wetland would be considered an average quality wetland. For reference to the field data collected for this wetland, see DP16 in Appendix B. DP15 included in Appendix B is representative of the upland area surrounding Wetland F.

3.1.7 Wetland G

Wetland G is a forested wetland located south of Lentzier Creek approximately 0.4 mile northwest of Fox Den. The wetland is a small depressional area located at the toe of slope. The wetland appears to drain east to UNT 6 (described below), which drains through Wetland H, which drains to Lentzier Creek. Lentzier Creek drains south to the Ohio River, a TNW. Since the wetland has a hydrologic connection to a TNW, it is anticipated that Wetland G will be considered a jurisdictional "waters of the U.S."

The dominant vegetation consisted of *Liquidambar styraciflua* (FACW), *Fraxinus pennsylvanica* (FACW), *Rosa multiflora* (FACU), *Persicaria virginiana* (FAC), *Lysimachia nummularia* (FACW), and *Elymus virginicus* (FACW). Hydrologic indicators included High Water Table present at one inch below surface (A2), Saturation at one inch below surface (A3), Sediment Deposits (B2, Water-Stained Leaves (B9), and FAC-Neutral Test (D5). The hydric soil indicator included Depleted Matrix (F3). Wetland G was delineated for 0.02 acre and would be considered a Palustrine, Forested, Broad Leaf Deciduous, Seasonally Flooded (PFO1C) wetland under the Cowardin Classification System. Because the wetland is forested and within close proximity of a stream, Wetland G would be considered an excellent quality wetland. For reference to the field data collected for this wetland, see DP19 in Appendix B. DP18 included in Appendix B is representative of the upland area surrounding Wetland G.

3.1.8 Wetland H

Wetland H is a forested wetland located south of Lentzier Creek within the FEMA-designated 100-year floodplain. The wetland is a large depressional area located at the toe of slope approximately 160 feet northeast of Wetland G. The wetland appears to drain north to Lentzier Creek via UNT 6 (described below). Lentzier Creek drains south to the Ohio River, a TNW. Since the wetland has a hydrologic connection to a TNW, it is anticipated that Wetland H will be considered a jurisdictional "waters of the U.S."

The dominant vegetation consisted of *Fraxinus pennsylvanica* (FACW), *Fagus grandifolia* (FACU), *Ulmus americana* (FACW), *Rosa multiflora* (FACU), *Iris virginica* (OBL), *Euonymus fortune* (UPL), and *Viola bicolor* (FACU). Hydrologic indicators included High Water Table at 10 inches below surface (A2), Saturation at eight inches below surface at DP21 and 12 inches below surface at DP23 (A3), Sediment Deposits (B2), and Drift Deposits (B3), and FAC-Neutral Test (D5). The hydric soil indicator included Depleted Matrix (F3). Wetland H was delineated for 1.00 acre within the investigated area and would be considered a PFO1C wetland under the Cowardin Classification System. Wetland H appears to extend outside of the investigated area to the east. Because the wetland is forested and within close proximity of a stream, Wetland H would be considered an excellent quality wetland. For reference to the field data collected for this wetland, see DP21 and DP23

in Appendix B. DP20 and DP22 included in Appendix B are representative of the upland area surrounding Wetland H.

3.1.9 Wetland I

Wetland I is a forested and emergent wetland located north of Lentzier Creek within the FEMA-designated 100-year floodplain. The wetland is a large depressional area located at the toe of slope, approximately 0.3 mile west of Old Salem Road. Wetland I was delineated for 1.06 acres within the investigated area and appears to extend west outside of the investigated area limits. The wetland appears to drain south to Lentzier Creek. Lentzier Creek drains south to the Ohio River, a TNW. Since the wetland has a hydrologic connection to a TNW, it is anticipated that Wetland I will be considered a jurisdictional "waters of the U.S."

For the emergent portion of Wetland I, the dominant vegetation consisted of *Fraxinus pennsylvanica* (FACW), *Platanus occidentalis* (FACW), *Salix nigra* (OBL), *Rosa palustris* (OBL), *Carex frankii* (OBL), *Plantago major* (FACU), *Lysimachia nummularia* (FACU), *Coleataenia rigidula* (FACW), *Lythrum salicaria* (OBL), *Juncus tenuis* (FAC), *Echinochloa crus-galli* (FACW), and *Phalaris arundinacea* (FACW). Hydrologic indicators included two inches of Surface Water present at DP32 (A1); High Water Table at 10 inches below surface at DP27, at six inches below surface at DP29, and above surface at DP32 (A2); Saturation at 10 inches below surface at DP27 and at surface at DP29 and DP32 (A3); Sediment Deposits (B2); Geomorphic Position (D2); and FAC-Neutral (D5). The hydric soil indicator included Depleted Matrix (F3). The emergent portion of the wetland was delineated for 0.47 acre within the investigated area, but appears to extend west outside of the investigated area limits. This portion of the wetland would be considered a PEMC wetland under the Cowardin Classification System.

For the forested portion of Wetland I, the dominant vegetation consisted of *Fraxinus pennsylvanica* (FACW), *Platanus occidentalis* (FACW), and *Lysimachia nummularia* (FACW). Hydrologic indicators included High Water Table present at seven inches below surface (A2), Saturation at seven inches below surface (A3), Geomorphic Position (D2), and FAC-Neutral Test (D5). The hydric soil indicator included Depleted Matrix (F3). The forested portion of the wetland was delineated for 0.59 acre within the investigated area, but appears to extend west out of the investigated area limits. This portion of the wetland would be considered a PFO1C wetland under the Cowardin Classification System.

Because the wetland is partially forested and located within a FEMA-designated 100-year floodplain, Wetland I would be considered an excellent quality wetland. For reference to the field data collected for the emergent portion of this wetland, see DPs 27, 29, and 32; for reference to the field data collected for the forested portion of this wetland, see DP 32 in Appendix B. DP28 and DP31 included in Appendix are representative of the upland area surrounding Wetland I.

3.1.10 Wetland J

Wetland J is a forested wetland located northeast of Lentzier Creek approximately 0.14 mile west of Old Salem Road. The wetland is not mapped within a FEMA-designated floodplain within the investigated area; however, the wetland appears to extend south outside of the investigated area into a FEMA-designated 100-year floodplain associated with UNT 8 (described below). The wetland is a low area surrounding UNT 8, which flows through Wetland J from the north. A continuous ordinary high water mark (OHWM) and defined bed and bank are apparent through the center of the wetland. Wetland J appears to drain to UNT 8, which eventually drains to Lentzier Creek. Lentzier Creek drains south to the Ohio River, a TNW. Since the wetland

has a hydrologic connection to a TNW, it is anticipated that Wetland J will be considered a jurisdictional "waters of the U.S."

The dominant vegetation consisted of *Acer negundo* (FAC), *Fraxinus pennsylvanica* (FACW), *Lonicera morrowii* (FACU), *Lindera benzoin* (FACW), *Geum canadense* (FAC), and *Elymus virginicus* (FACW). Hydrologic indicators included Saturation at 12 inches below surface (A3), Drift Deposits (B3), Drainage Patterns (B10), and FAC-Neutral Test (D5). The hydric soil indicator included Depleted Matrix (F3). Wetland J was delineated for 0.10 acre within the investigated area and would be considered a PFO1C wetland under the Cowardin Classification System. Because the wetland is forested and with an apparent association with the floodplain of a stream, Wetland J would be considered an excellent quality wetland. For reference to the field data collected for this wetland, see DP34 in Appendix B. DP 33 included in Appendix B is representative of the upland area surrounding Wetland J.

3.2 Drainage Features, Streams, and Other Potential "Waters of the US"

3.2.1 Unnamed Tributary 1 (UNT 1)

UNT 1 is an intermittent stream that generally flows east through the investigated area approximately 700 feet north of North Access Drive. UNT 1 begins at a culvert outfall located at the eastern terminus of Wetland B and extends approximately 195 linear feet through the investigated area to its confluence with UNT 3. The stream is located within the FEMA-designated 100-year floodplain associated with UNT 3 (described below) and has a drainage area of approximately 0.04 square mile. The stream is not depicted on the *1974 Clark County Soil Survey* map or on the USGS Topographic map. UNT 1 flows to UNT 3, which drains to Lentzier Creek. Lentzier Creek drains south to the Ohio River, a TNW. Since the stream has a hydrologic connection to a TNW, it is anticipated that UNT 1 will be considered a jurisdictional "waters of the U.S."

UNT 1 was delineated for approximately 195 linear feet within the investigated area. The OHWM was approximately one foot deep by three feet wide. The channel width at top of bank was five feet. Bank height was one foot on each bank. The flow regime appears to be intermittent. No riffle/runs were present within this segment of the stream at the time of the field investigation. The substrate was primarily silt and sand. Herbaceous vegetation dominated the northern bank and immature scrubby trees dominated the southern bank. This stream would be considered a Riverine, Intermittent, Unconsolidated Bottom, Seasonally Flooded/Saturated (R4UBE) stream under the Cowardin Classification System.

A Qualitative Habitat Evaluation (QHEI) was conducted for UNT 1 (QHEI 1) approximately 200 feet west of Brown Forman Road. The overall QHEI score for the 195-foot sampled stream was 38. This is a Poor narrative rating according to the manual. The stream scored highest in Bank Erosion and Riparian Zone (8/10). The stream scored lowest in Riffle/Run Quality (0/8) as no riffles were present.

3.2.2 Unnamed Tributary 2 (UNT 2)

UNT 2 is an intermittent stream that generally flows east through the investigated area adjacent to Maritime Road. UNT 2 enters the investigated area from the west within a ditchline running alongside Maritime Road. The stream continues south along the ditchline for approximately 785 linear feet. The stream then flows east through a culvert which conveys the stream under a roadway. The stream continues east through an undeveloped field to its confluence with UNT 3. The stream is not located within a FEMA-designated floodplain nor is it depicted on the 1*974 Clark County Soil Survey* map or USGS Topographic map. UNT 2 has

a drainage area of approximately 0.06 square mile. UNT 2 flows into UNT 3, which drains to Lentzier Creek. Lentzier Creek drains south to the Ohio River, a TNW. Since the stream has a hydrologic connection to a TNW, it is anticipated that UNT 2 will be considered a jurisdictional "waters of the U.S."

UNT 2 was delineated for approximately 1,489 linear feet within the investigated area. The OHWM was approximately 1.5-foot deep and two feet wide. The channel width at top of bank was two feet. Bank height was 1.5 feet on each bank. The flow regime appears to be intermittent. Riffle (5%) / Run (40%) complexes were observed in this segment of UNT 2. The substrate was primarily silt and sand. Herbaceous vegetation dominated both the north and south banks of the stream. The stream would be considered a R4UBE stream under the Cowardin Classification System.

A QHEI (QHEI 2) was conducted for UNT 2, approximately 390 feet west of Brown Forman Road. The overall QHEI score for the 200-foot sampled stream segment was 39.5. This is a Poor narrative rating according to the manual. The stream scored highest in Bank Erosion and Riparian Zone (6.5/10). The stream scored lowest in Riffle/Run Quality (2/8).

3.2.3 Unnamed Tributary 3 (UNT 3)

UNT 3 is an intermittent stream that generally flows south through the investigated area, approximately 235 feet west of the intersection of Utica Sellersburg Road and Brown Forman Road. UNT 3 begins within the investigated area west of Utica Sellersburg Road just south of the New Middle Road *cul de sac*. The stream flows south and west for approximately 666 linear feet through an open field into Wetland D. A continuous OHWM and defined bed and bank are absent as the stream enters the wetland from the east, and are then redefined at the southern boundary of Wetland D as the stream flows out of the wetland. UNT 3 continues southeast for approximately 1,786 linear feet through a wooded corridor. UNT 3 flows out of the investigated area near the southern terminus to the east. The southernmost 250 feet of the stream are located within a FEMA-designated 100-year floodplain. UNT 3 has a drainage area of approximately 0.23 square mile. UNT 3 is depicted as an intermittent stream on the 1*974 Clark County Soil Survey* map and on the USGS Topographic map (dashed blue line). UNT 3 drains to Lentzier Creek, which drains south to the Ohio River, a TNW. Since the stream has a hydrologic connection to a TNW, it is anticipated that UNT 3 will be considered a jurisdictional "waters of the U.S."

UNT 3 was delineated for approximately 2,452 linear feet within the investigated area. The OHWM was approximately two feet deep and five feet wide. Near the southern portion of the stream, the channel width at top of bank was five feet; near the northern portion of the stream, the channel width was seven feet. Near the south, bank height was two feet on each bank; near the northern end of the stream bank height was approximately four feet on each bank. The flow regime appears to be intermittent. Riffle (20%) / Run complexes (40%) were observed throughout UNT 3. The substrate was primarily sand, silt, and gravel. Near the northern terminus of the stream, herbaceous vegetation dominated both banks of the stream; woody trees dominated both banks of the remainder of the stream within the investigated area. The stream would be considered a Riverine, Intermittent, Unconsolidated Bottom, Semipermanently Flooded (R4UBF) stream under the Cowardin Classification System.

Two QHEIs (QHEI 3 and QHEI 4) were conducted for UNT 3. QHEI 3 was conducted approximately 315 feet southeast of the New Middle Road *cul de sac*, south of Wetland D. The overall score for the 200-foot sampled stream segment was 56.5. This segment of the stream scored highest in Substrate (14/20) and Bank Erosion

and Riparian Zone (7/10) and lowest in Channel Morphology (9/20). QHEI 4 was conducted approximately 330 feet southwest of the Utica Sellersburg Road and Brown Forman Road intersection, north of Wetland D. The overall score for the 200-foot sampled stream segment was 50.5. This segment of the stream scored highest in Pool/Glide Quality and Gradient (6/10) and lowest in Riffle/Run Quality (3/8). Overall, the scores average to 53.5, which is a Fair narrative rating according to the manual.

3.2.4 Unnamed Tributary 4 (UNT 4)

UNT 4 is an intermittent stream that generally flows east through a wooded area near the center of the investigated area. UNT 4 begins within the investigated area approximately 890 feet west of Fox Run, flows east for approximately 404 linear feet before flowing out of the investigated area to the east. The stream appears to flow to a pond located outside of the investigated area. The stream is not located within a FEMA-designated floodplain within the investigated area, but appears to be located within the FEMA-designated 100-year floodplain of Lentzier Creek immediately east of the investigated area. UNT 4 has a drainage area of less than 0.10 square mile. UNT 4 is depicted on the *1974 Clark County Soil Survey* map as an unnamed intermittent tributary to Lentzier Creek. The stream is not depicted on the USGS Topographic map. UNT 4 appears to drain east out of the area to a pond located within the FEMA-designated 100-year floodplain of Lentzier Creek, which drains south to the Ohio River, a TNW. Since the stream has a hydrologic connection to a TNW, it is anticipated that UNT 4 will be considered a jurisdictional "waters of the U.S."

UNT 4 was delineated for approximately 404 linear feet within the investigated area. The OHWM was six inches deep and three feet wide. The channel width at top of bank was five feet. Bank height was approximately three feet on each bank. The flow regime appears to be intermittent. Riffle (25%) / Run (45%) complexes were observed within UNT 4. The substrate was primarily hardpan and silt. Forest vegetation dominated both banks of the stream. The stream would be considered a R4UBE stream under the Cowardin Classification System.

A QHEI (QHEI 5) was conducted for UNT 4, approximately 775 feet northwest of Fox Run. The overall QHEI score for the 200-foot sampled stream segment was 59.5. This is a Good narrative rating according to the manual. The stream scored highest in Bank Erosion and Riparian Zone (9/10). The stream scored lowest in Pool/Glide Quality (3/12).

3.2.5 Unnamed Tributary 5 (UNT 5)

UNT 5 is an intermittent stream that generally flows northeast through the heavily wooded area near the center of the investigated area. UNT 5 begins within the investigated area approximately 0.50 mile west of Old Salem Road, flows northeast for approximately 413 linear feet to its confluence with Lentzier Creek. Approximately 328 linear feet of UNT 5 are located within the FEMA-designated 100-floodplain of Lentzier Creek. UNT 5 has a drainage area of approximately 0.04 square mile. The stream is depicted on the *1974 Clark County Soil Survey* map as an unnamed intermittent tributary to Lentzier Creek, but it is not depicted on the USGS Topographic map. UNT 5 flows north to Lentzier Creek, which drains south to the Ohio River, a TNW. Since the stream has a hydrologic connection to a TNW, it is anticipated that UNT 5 will be considered a jurisdictional "waters of the U.S."

UNT 5 was delineated for approximately 413 linear feet within the investigated area. The OHWM was six inches deep and three feet wide. The channel width at top of bank was four feet. Bank height was approximately one foot on each bank. The flow regime appears to be intermittent. Riffle (5%) / Run (15%)

complexes were observed within UNT 5. The substrate was primarily hardpan and silt. Forest vegetation dominated both banks of the stream. The stream would be considered a R4UBE stream under the Cowardin Classification System.

A QHEI (QHEI 6) was conducted for UNT 5, approximately 125 feet southeast of the confluence with Lentzier Creek. The overall QHEI score for the 200-foot sampled stream segment was 57.5. This is a Good narrative rating according to the manual. The stream scored highest in Bank Erosion and Riparian Zone (9/10). The stream scored lowest in Pool/Glide Quality (1/12).

3.2.6 Unnamed Tributary 6 (UNT 6)

UNT 6 is an intermittent stream that generally flows north through the heavily wooded area near the center of the investigated area. UNT 6 begins within the investigated area approximately 300 feet southeast of the start of UNT 5 (described above). The stream flows northeast for approximately 163 linear feet where it continues to flow through Wetland H (described above) for approximately 243 linear feet, and then flows out of the investigated area to the east. Approximately 161 linear feet of UNT 6 are located within the FEMA-designated floodplain of Lentzier Creek, and the stream has a drainage area of less than 0.10 square mile. The stream is not depicted on the *1974 Clark County Soil Survey* map or on the USGS Topographic map. East of the investigated area, UNT 6 appears to flow north and drain into another unnamed stream. The unnamed stream appears to drain to Lentzier Creek, which drains south to the Ohio River, a TNW. Since the stream has a hydrologic connection to a TNW, it is anticipated that UNT 6 will be considered a jurisdictional "waters of the U.S."

UNT 6 was delineated for approximately 406 linear feet within the investigated area. The OHWM was two inches deep and one foot wide. The channel width at top of bank was one foot wide. Bank height was approximately four inches on each bank. The flow regime appears to be intermittent. No riffle/run complexes were observed within UNT 6 during the field investigation. The primary substrate was silt and sand. Forest vegetation dominated both banks of the stream. The stream would be considered a R4UBE stream under the Cowardin Classification System.

A Primary Headwater Habitat Evaluation Index (HHEI) was conducted for UNT 6, approximately 287 feet southeast of the confluence with an unnamed tributary to Lentzier Creek (HHEI 1). The overall HHEI score for the 200-foot sampled stream segment was 17. Due to the absence of flow and presence of moderate erosion, this would be considered a poor quality stream. The stream scored highest in Substrate (12/40). The stream scored lowest in Maximum Pool Depth (0/30).

3.2.7 Unnamed Tributary 7 (UNT 7)

UNT 7 is an intermittent stream that generally flows southeast through the investigated area. The stream enters the investigated area from the west within the heavily wooded area in the northern half of the area, approximately 0.40 mile west of Old Salem Road and 0.30 mile south of I-265. Upon entering the investigated area, UNT 7 flows southeast approximately 123 feet through the southwestern point of Wetland I to its confluence with Lentzier Creek. UNT 7 is depicted on the *1974 Clark County Soil Survey* map and the USGS Topographic map as an unnamed intermittent stream (dashed blue line). UNT 7 is located within the FEMA-designated 100-year floodplain associated with Lentzier Creek and has a drainage area of approximately 0.61 square mile. The unnamed stream drains to Lentzier Creek, which drains south to the Ohio River, a

TNW. Since the stream has a hydrologic connection to a TNW, it is anticipated that UNT 7 will be considered a jurisdictional "waters of the U.S."

UNT 7 was delineated for approximately 123 feet within the investigated area. The OHWM was approximately 2.5 feet deep and 13 feet wide. The channel width at top of bank was 17 feet. Bank height was approximately five feet on each bank. The flow regime appears to be perennial. Riffle (5%) / Run (45%) complexes were observed in UNT 7. The primary substrate was hardpan and silt. Forest vegetation dominated both banks of the stream. UNT 7 would be considered a Riverine, Lower Perennial, Unconsolidated Bottom, Intermittently Exposed (R2UBG) stream under the Cowardin Classification System.

A QHEI (QHEI 7) was conducted for UNT 7, approximately 15 feet northwest of its confluence with a Lentzier Creek. The overall QHEI score for the 123-foot sampled stream was 62.5. This is a Good narrative rating according to the manual. The stream scored highest in Bank Erosion and Riparian Zone (9/10). The stream scored lowest in Substrate (7/20).

3.2.8 Unnamed Tributary 8 (UNT 8)

UNT 8 is an intermittent stream that generally flows south through the northern portion of the investigated area. The stream enters the investigated area from the north, approximately 683 feet west of Old Salem Road. The stream flows south adjacent to a utility corridor for approximately 902 feet where it enters Wetland J. UNT 8 continues through Wetland J for approximately 111 feet where it flows south out of the investigated area. UNT 8 is depicted on the *1974 Clark County Soil Survey* map as an intermittent stream. UNT 8 is not depicted on the USGS Topographic map. UNT 8 is not located within a FEMA-designated floodplain within the investigated area, but appears to be located in one associated with Lentzier Creek just south of the investigated area. The stream has a drainage area of approximately 0.14 square mile. UNT 8 appears to drain out of the investigated area to the south to an unnamed stream. The unnamed stream drains to Lentzier Creek, which drains south to the Ohio River, a TNW. Since the stream has a hydrologic connection to a TNW, it is anticipated that UNT 8 will be considered a jurisdictional "waters of the U.S."

UNT 8 was delineated for approximately 1,012 linear feet within the investigated area. The OHWM was approximately one foot deep and six feet wide. The channel width at top of bank was seven feet. Bank height was approximately two feet on each bank. The flow regime appears to be intermittent. Riffle (5%) / Run (25%) complexes were observed in UNT 8. The primary substrate was hardpan and silt. Forest vegetation dominated both banks of the stream. The stream would be considered a R4UBE stream under the Cowardin Classification System.

A QHEI (QHEI 8) was conducted for UNT 8, approximately 370 feet north of Wetland J (described above). The overall QHEI score of the 200-foot sampled stream segment was 46. This is a Fair narrative rating according to the manual. The stream scored highest in Bank Erosion and Riparian Zone (9/10). The stream scored lowest in Pool/Glide and Riffle/Run Quality (3/12 and 2/8, respectively).

3.2.9 Lentzier Creek

Lentzier Creek is a perennial stream that generally flows east and south in the heavily wooded area near the center of the investigated area. The stream enters the investigated area from the east near the northern limits of the wooded area, approximately 0.50 mile west of Old Salem Road. The stream flows east across the area, then exits the investigated area to the east, just north of Wetland H (described above). Lentzier

Creek then flows south outside of the investigated area and reenters the investigated area from the east just south of Wetlands E and F (described above). Lentzier Creek generally flows south through the investigated area for approximately 756 linear feet before exiting the investigated area to the south. Lentzier Creek is depicted as an intermittent stream on the *1974 Clark County Soil Survey* map and as a perennial stream (solid blue line) on the USGS Topographic map. The Creek is located within a FEMA-designated 100-year floodplain. Lentzier Creek appears to drain south to the Ohio River, a TNW. Since the stream has a hydrologic connection to a TNW, it is anticipated that Lentzier Creek will be a jurisdictional "waters of the U.S."

Lentzier Creek was delineated for a total of 2,081 linear feet within the investigated area. The OHWM was approximately 3 feet deep and 18 feet wide. The channel width at top of bank was 20 feet. Bank height was approximately six feet on each bank. The flow regime appears to be perennial. Riffle (10%) / Run (50%) were observed in Lentzier Creek. The primary substrate was hardpan and silt. Forest vegetation dominated both banks of the stream. The stream would be considered a R2UBG stream under the Cowardin Classification System.

Two QHEIs (QHEI 9 and QHEI 10) were conducted for Lentzier Creek. QHEI 9 was conducted approximately 130 feet southwest of Wetland E (described above). The overall score for the 200-foot sampled stream segment was 63.5. This segment of the stream scored highest in Gradient (10/10) and lowest in Substrate (7/20). QHEI 10 was conducted approximately 85 feet southeast of the UNT 9 (described above) confluence. The overall score for the 200-foot sampled stream segment was 64.5. This segment of the stream scored highest in Gradient (10/10) and lowest in Substrate (7/10). Overall, the scores average a Good narrative rating according to the manual.

3.2.10 Pond 1

Pond 1 is located near the southern terminus of the investigated area approximately 750 feet west of Brown Forman Road. The pond is a manmade feature which, according to aerial photography, appears to have been constructed in upland soils sometime after 1998 for the purpose of stormwater detention. Approximately 1.31 acres were delineated within the investigated area, and the pond extends beyond the investigated area limits to the west. There appears to be a culvert on the eastern side of Pond 1 that drains water to the east under the road. The culvert was under water and not visible during the 2015 field investigation. However, the culvert is visible on several years of aerial photography. Pond 1 would be classified as Lacustrine, Limnetic, Unconsolidated Bottom, Permanently Flooded, Diked/Impounded (L1UBHh) under the Cowardin Classification System. Because this open water feature is manmade to collect surface runoff from the surrounding areas, Pond 1 would be considered poor quality. Pond 1 appears to drain east under a road to Wetland B via a culvert. Wetland B drains to UNT 1, which drains to UNT 3, which drains to Lentzier Creek. Lentzier Creek drains south to the Ohio River, a TNW. Since the pond has a hydrologic connection to a TNW, it is anticipated that Pond 1 will be considered a jurisdictional "waters of the U.S."

3.3 Non-Jurisdictional Features and Non-Wetland Data Points

All features delineated are anticipated to be considered jurisdictional "waters of the U.S." No other features were identified within the investigated area.

Eleven non-wetland data points (DPs 03, 06, 11-13, 17, 24-26, 35, and 36) were collected to confirm upland conditions within the area. DP03 was collected due to the presence of hydrophytic vegetation near a culvert

outlet, south of Wetland B. DP03 met hydrophytic vegetation, but did not meet hydric soil or wetland hydrology criteria.

DP06 was collected to confirm upland conditions adjacent to UNT 1. DP06 did not meet hydrophytic vegetation, hydric soil criteria, or wetland hydrology criteria.

DPs 11, 12, and 13 were collected to confirm upland conditions within the wooded area, near the center of the investigated area. DP11 was collected toward the western boundary of the area. DP12 was collected near the eastern boundary of the area on the east bank of Lentzier Creek, and DP13 was also collected near the eastern boundary of the area on the west bank of Lentzier Creek. Neither DP11 nor DP12 met any of the three wetland criteria. DP13 met hydrophytic vegetation and wetland hydrology criteria, but did not meet hydric soil criteria.

DP17 was collected due to the presence of hydrophytic vegetation between two streams (UNT 6 and Lentzier Creek). DP17 was collected near the eastern boundary of the area, east of UNT 6 and west of Lentzier Creek. DP17 met hydrophytic vegetation criteria, but did not meet hydric soil or wetland hydrology criteria.

DPs 24 and 26 were collected to confirm the upland conditions adjacent to two streams. DP24 was collected on the west bank of UNT 5 near the confluence with Lentzier Creek, and DP26 was collected on the east bank of Lentzier Creek near the UNT 7 confluence. DPs 24 and 26 met hydrophytic vegetation and wetland hydrology criteria, but not hydric soil criteria. Although water appears to move through these areas, the water appears to sheet flow toward the streams rather than standing.

DP25 was collected to confirm upland conditions within the floodplain of Lentzier Creek. DP25 was collected south of Lentzier Creek and west of UNT 5. DP25 did not meet any of the three wetland criteria.

DPs 35 and 36 were collected to confirm upland conditions adjacent to UNT 8. DP35 was collected along the west bank of UNT 8, approximately 340 feet northwest of Wetland J, and DP36 was collected east of UNT 8, approximately 830 feet northwest of Wetland J. DPs 35 and 36 met hydrophytic vegetation, but did not meet wetland hydrology or hydric soil criteria.

4.0 Conclusions

Ten wetlands (Wetlands A-J), one open water feature (Pond 1), and nine streams (Lentzier Creek and UNT 1-8) were delineated within the investigated area. The total delineated wetland acreage within the investigated area is approximately 4.42 acres. Pond 1 was delineated for 1.31 acres within the investigated area. Stream length within the investigated area totals approximately 8,575 linear feet and 1.47 acres. All ten wetlands, one open water feature, and nine streams are anticipated to be considered jurisdictional “waters of the U.S.”

If impacts to any of these water resources are necessary, permits from the USACE and IDEM will be required. Mitigation may be a condition of receiving these permits. The INDOT Environmental Services and the Seymour District Environmental Unit should be contacted immediately if impacts occur. The final determination of jurisdictional waters is ultimately made by the USACE.

4.1 Jurisdictional Analysis

The 10 wetlands delineated within the investigated area (Wetlands A-J) appear to drain to Lentzier Creek, which drains to the Ohio River, a TNW. Therefore, all 10 wetlands are anticipated to be considered jurisdictional "waters of the U.S."

The eight unnamed streams delineated within the investigated area (UNT 1-8) and one open water feature (Pond 1) appear to drain to Lentzier Creek, which drains to the Ohio River, a TNW. Therefore, Pond 1 and all nine streams (Lentzier Creek and UNT 1-8) are anticipated to be considered jurisdictional "waters of the U.S."

All jurisdictional wetlands are under the regulatory authority of the USACE under Section 404 of the Clean Water Act. Impacts to less than one acre of wetland are generally permitted under the RGP for Indiana. Impacts to jurisdictional wetlands and impacts to isolated wetlands are also under the regulatory authority of the IDEM under Section 401 of the Clean Water Act or the Indiana Isolated Wetlands Act.

Impacts to the wetlands identified in this report would require a determination of jurisdictional status by the USACE.

5.0 References

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Appendix A - Aquatic Resource Summary Tables

Table 1 – Data Points Summary

Data Points Summary						
Photos	**Data Point**	**Water Resource**	**Hydrophytic Vegetation**	**Hydric Soils**	**Wetland Hydrology**	**Within a Wetland**
3-4	01	Wetland A	Yes	Yes	Yes	Yes
5-6	02	Wetland A	No	Yes	No	No
9-10	03	N/A	Yes	No	No	No
11-12	04	Wetland B	Yes	Yes	Yes	Yes
13-14	05	Wetland B	No	No	No	No
20-21	06	UNT 2	No	No	No	No
23-24	07	Wetland C	No	Yes	No	No
25-26	08	Wetland C	Yes	Yes	Yes	Yes
32-33	09	Wetland D	Yes	Yes	Yes	Yes
35-36	10	Wetland D	No	Yes	No	No
52-53	11	N/A	No	No	No	No
50-51	12	N/A	No	No	No	No
54-55	13	N/A	Yes	No	Yes	No
58	14	Wetland E	Yes	Yes	Yes	Yes
58-59	15	Wetlands E & F	No	Yes	Yes	No
60-61	16	Wetland F	Yes	Yes	Yes	Yes
63-64	17	N/A	Yes	No	No	No
65-66	18	Wetland G	No	No	No	No
67-68	19	Wetland G	Yes	Yes	Yes	Yes
71-72	20	Wetland H	Yes	No	Yes	No
73-74	21	Wetland H	Yes	Yes	Yes	Yes
75-76	22	Wetland H	Yes	No	Yes	No
77-78	23	Wetland H	Yes	Yes	Yes	Yes
79-80	24	UNT 5	Yes	No	Yes	No
83-84	25	N/A	No	No	No	No
85-86	26	N/A	Yes	No	Yes	No
89-90	27	Wetland I	Yes	Yes	Yes	Yes
91-92	28	Wetland I	No	No	Yes	No
93-94	29	Wetland I	Yes	Yes	Yes	Yes
95-96	30	Wetland I	Yes	Yes	Yes	Yes
97-98	31	Wetland I	Yes	No	No	No
99-100	32	Wetland I	Yes	Yes	Yes	Yes
105-106	33	Wetland J	Yes	No	No	No
103-104	34	Wetland J	Yes	Yes	Yes	Yes
107-108	35	UNT 8	Yes	No	No	No
111-112	36	UNT 8	Yes	No	No	No

Table 2 – Aquatic Resources Summary

Aquatic Resources Summary: Wetlands & Open Water						
Delineated Resource	**Photos**	**Lat/ Long**	**Type**	**Quality**	**Jurisdiction**	**Total Acreage within Investigated Area**
Wetland A	3-6	38.32752 / -85.67099	PEMC	Poor	"waters of the U.S."	1.47
Wetland B	11-15	38.32877 / -85.67042	PEMC	Average	"waters of the U.S."	0.04
Wetland C	23-27	38.33096 / -85.67155	PEME	Average	"waters of the U.S."	0.12
Wetland D	32-36	38.33205 / -85.67445	PSS1C	Average	"waters of the U.S."	0.59
Wetland E	58-59, 61	38.33982 / -85.66754	PEME	Average	"waters of the U.S."	0.01
Wetland F	59-62	38.34001 / -85.66751	PEME	Average	"waters of the U.S."	0.01
Wetland G	65-68	38.34116 / -85.66964	PFO1C	Excellent	"waters of the U.S."	0.02
Wetland H	71-78	38.34177 / -85.66876	PFO1C	Excellent	"waters of the U.S."	1.00
Wetland I	89-100	38.34319 / -85.67087	PEMC/PFO1C	Excellent	"waters of the U.S."	1.06 0.47 PEMC; 0.59 PFO1C
Wetland J	103-106	38.34343 / -85.66734	PFO1C	Excellent	"waters of the U.S."	0.10
Pond 1	1-2	38.32815 / -85.67215	L1UBHh	Poor	"waters of the U.S."	1.31
Total						**5.73**

Aquatic Resources Summary: Streams											
Delineated Resource	**Photos**	**Lat/ Long**	**USGS Blue Line**	**OHWM Width**	**OHWM Depth**	**Narrative Quality**	**Riffle/Run Presence**	**Substrate**	**Jurisdiction**	**Total Linear Feet**	**Total Acres**
UNT 1	15-16	38.32903/ -85.66988	No	3’	1’	Poor	No riffle/run present	Silt and sand	“waters of the U.S.”	195	0.01
UNT 2	18-21	38.32938/ -85.67263	No	2’	1.5’	Poor	40% run/ 5% riffle present	Silt and sand	“waters of the U.S.”	1,489	0.07
UNT 3	22, 30-31	38.33089/ -85.67251	Yes	5’	2’	Fair	40% run / 20% riffle present	Sand, silt, and gravel	“waters of the U.S.”	2,452	0.28
UNT 4	48-49	38.33762/ -85.66877	No	3’	0.5’	Good	45% run / 25% riffle present	Hardpan and silt	“waters of the U.S.”	404	0.03
UNT 5	81-82	38.34196/ -85.66992	No	3’	0.5’	Good	15% run / 5% riffle present	Hardpan and silt	“waters of the U.S.”	413	0.03
UNT 6	69-70	38.34153/ -85.66893	No	1’	2”	Poor	None riffle/run present	Silt and sand	“waters of the U.S.”	406	0.01
UNT 7	101-102	38.34316/ -85.67144	Yes	13’	2.5’	Good	45% run / 5% riffle present	Hardpan and silt	“waters of the U.S.”	123	0.04
UNT 8	108-110	38.34383/ -85.66754	No	6’	1’	Fair	25% run / 5% riffle present	Hardpan and silt	“waters of the U.S.”	1,012	0.14
Lentzier Creek	56-57, 87-88, 101	38.34209/ -85.66905	Yes	18’	3’	Good	50% run / 10% riffle present	Hardpan and silt	“waters of the U.S.”	2,081	0.86
Total										**8,575**	**1.47**

**Narrative Rating assigned to streams evaluated with QHEI based on Narrative Rating scale provided in QHEI manual. Narrative Rating assigned to streams evaluated with HHEI based on visual observations; no Narrative Rating scale provided in HHEI manual.*

Appendix B - Routine Wetland Determination Data Forms

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Des. No. 1382612 Heavy Haul Transportation Corridor City/County: Jeffersonville / Clark County Sampling Date: 7/21/15

Applicant/Owner: INDOT State: IN Sampling Point: DP01

Investigator(s): Leah Boits, Chad Costa Section, Township, Range: Clark's Grant #15

Landform (hillslope, terrace, etc.): Limestone Hills Local relief (concave, convex, none): concave

Slope (%): 2.0 Lat: 38.3278 Long: 85.6711 Datum: WGS 1984

Soil Map Unit Name: Elkinsville-Millstone silt loams, 0 to 2 percent slopes (EesA) NWI classification: n/a

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

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

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

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

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

Remarks:

This data point is representative of Wetland A.

VEGETATION – Use scientific names of plants.

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

Sapling/Shrub Stratum (Plot size: 15 ft)			
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		

Herb Stratum (Plot size: 5 ft)			
1. *Persicaria pensylvanica*	50	Yes	FACW
2. *Carex trichocarpa*	35	Yes	OBL
3. *Ambrosia artemisiifolia*	20	No	FACU
4. *Cyperus strigosus*	20	No	FACW
5. *Echinochloa crus-galli*	10	No	FACW
6. *Andropogon gerardii*	5	No	FAC
7. *Solidago patula*	3	No	OBL
8.			
9.			
10.			
	143 = Total Cover		

Woody Vine Stratum (Plot size: 15 ft)			
1.			
2.			
	0 = Total Cover		

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

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

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

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

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

Hydrophytic Vegetation Present? Yes ◉ No ○

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

SOIL

Sampling Point: DP01

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-4	10YR 4/2	60	10YR 4/6	40	C	M	Silty Clay Loam	
4-18	10YR 4/6	100					Silty Clay Loam	

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

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ◉ No ○

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present? Yes ○ No ◉ Depth (inches): <0

Water Table Present? Yes ◉ No ○ Depth (inches): 2

Saturation Present? (includes capillary fringe) Yes ◉ No ○ Depth (inches): 0

Wetland Hydrology Present? Yes ◉ No ○

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

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Des. No. 1382612 Heavy Haul Transportation Corridor City/County: Jeffersonville / Clark County Sampling Date: 7/21/15

Applicant/Owner: INDOT State: IN Sampling Point: DP02

Investigator(s): Leah Boits, Chad Costa Section, Township, Range: Clark's Grant #15

Landform (hillslope, terrace, etc.): Limestone Hills Local relief (concave, convex, none): none

Slope (%): 2.0 Lat: 38.3279 Long: 85.6711 Datum: WGS 1984

Soil Map Unit Name: Elkinsville-Millstone silt loams, 0 to 2 percent slopes (EesA) NWI classification: n/a

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

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ◉ No ○

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

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

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

Remarks:

This data point is representative of the upland area surrounding Wetland A.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Morus alba*	15	Yes	FAC
2. *Acer saccharinum*	10	Yes	FACW
3.			
4.			
5.			
	25	= Total Cover	

Sapling/Shrub Stratum (Plot size: 15 ft)			
1.			
2.			
3.			
4.			
5.			
	0	= Total Cover	

Herb Stratum (Plot size: 5 ft)			
1. *Coronilla varia*	50	Yes	UPL
2. *Ambrosia artemisiifolia*	30	Yes	FACU
3. *Plantago lanceolata*	10	No	FACU
4. *Trifolium pratense*	5	No	FACU
5.			
6.			
7.			
8.			
9.			
10.			
	95	= Total Cover	

Woody Vine Stratum (Plot size: 15 ft)			
1.			
2.			
	0	= Total Cover	

Dominance Test worksheet:

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

Total Number of Dominant Species Across All Strata: 4 (B)

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

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species	10	x 2 =	20
FAC species	15	x 3 =	45
FACU species	95	x 4 =	380
UPL species		x 5 =	
Column Totals:	120 (A)		445 (B)

Prevalence Index = B/A = 3.71

Hydrophytic Vegetation Indicators:

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

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

Hydrophytic Vegetation Present? Yes ○ No ◉

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

SOIL

Sampling Point: DP02

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-4	10YR 4/2	60	10YR 4/6	40	C	M	Silty Clay Loam	
4-18	10YR 4/6	100					Silty Clay Loam	

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

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ◉ No ○

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present? Yes ○ No ◉ Depth (inches): < 0

Water Table Present? Yes ○ No ◉ Depth (inches): > 18

Saturation Present? (includes capillary fringe) Yes ○ No ◉ Depth (inches): > 18

Wetland Hydrology Present? Yes ○ No ◉

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

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Des. No. 1382612 Transportation Corridor City/County: Jeffersonville / Clark County Sampling Date: 7/21/15

Applicant/Owner: INDOT State: IN Sampling Point: DP03

Investigator(s): Leah Boits, Chad Costa Section, Township, Range: Clark's Grant #15

Landform (hillslope, terrace, etc.): Limestone Hills Local relief (concave, convex, none): concave

Slope (%): 1.0 Lat: 38.3282 Long: 85.6706 Datum: WGS 1984

Soil Map Unit Name: Udorthents, cut and filled (Uaa) NWI classification: n/a

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

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ◉ No ○

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

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

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

Remarks:

This datapoint was collected due to the presence of hydrophytic vegetation near a culvert.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Populus deltoides*	10	Yes	FAC
2.			
3.			
4.			
5.			
	10 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft)			
1. *Salix nigra*	30	Yes	OBL
2. *Fraxinus pennsylvanica*	10	No	FACW
3. *Juniperus communis*	5	No	UPL
4. *Daucus carota*	5	No	UPL
5. *Solidago patula*	5	No	OBL
	55 = Total Cover		
Herb Stratum (Plot size: 5 ft)			
1. *Festuca trachyphylla*	40	Yes	FACU
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	40 = Total Cover		
Woody Vine Stratum (Plot size: 15 ft)			
1.			
2.			
	0 = Total Cover		

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

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

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

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

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

Hydrophytic Vegetation Present? Yes ◉ No ○

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

SOIL

Sampling Point: DP03

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-2	10YR 4/2	100					Silty Clay Loam	Restrictive layer at 2 inches

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

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if observed):

Type: Riprap

Depth (inches): 2

Hydric Soil Present? Yes ○ No ◉

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present? Yes ○ No ◉ Depth (inches): <0

Water Table Present? Yes ○ No ◉ Depth (inches): >18

Saturation Present? (includes capillary fringe) Yes ○ No ◉ Depth (inches): >18

Wetland Hydrology Present? Yes ○ No ◉

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

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Des. No. 1382612 Heavy Haul Transportation Corridor City/County: Jeffersonville / Clark County Sampling Date: 7/21/15

Applicant/Owner: INDOT State: IN Sampling Point: DP04

Investigator(s): Leah Boits, Chad Costa Section, Township, Range: Clark's Grant #15

Landform (hillslope, terrace, etc.): Limestone Hills Local relief (concave, convex, none): concave

Slope (%): 2.0 Lat: 38.3286 Long: 85.6708 Datum: WGS 1984

Soil Map Unit Name: Elkinsville-Millstone silt loams, 0 to 2 percent slopes (EesA) NWI classification: n/a

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

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ◉ No ○

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

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

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

Remarks:

This data point is representative of Wetland B.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft)			
1. *Fraxinus pennsylvanica*	15	Yes	FACW
2.			
3.			
4.			
5.			
	15 = Total Cover		
Herb Stratum (Plot size: 5 ft)			
1. *Carex cristatella*	75	Yes	FACW
2. *Bidens frondosa*	10	No	FACW
3. *Glechoma hederacea*	5	No	FACU
4. *Microstegium vimineum*	2	No	FAC
5.			
6.			
7.			
8.			
9.			
10.			
	92 = Total Cover		
Woody Vine Stratum (Plot size: 15 ft)			
1.			
2.			
	0 = Total Cover		

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

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

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

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

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

Hydrophytic Vegetation Present? Yes ◉ No ○

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

SOIL

Sampling Point: DP04

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-7	10YR 4/1	85	10YR 4/6	15	C	M	Sandy Clay Loam	
7-18	10YR 5/2	60	10YR 5/4	40	C	M	Sandy Clay Loam	

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

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ◉ No ○

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present? Yes ○ No ◉ Depth (inches): <0

Water Table Present? Yes ◉ No ○ Depth (inches): 7

Saturation Present? (includes capillary fringe) Yes ◉ No ○ Depth (inches): 2

Wetland Hydrology Present? Yes ◉ No ○

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

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Des. No. 1382612 Heavy Haul Transportation Corridor City/County: Jeffersonville / Clark County Sampling Date: 7/21/15

Applicant/Owner: INDOT State: IN Sampling Point: DP05

Investigator(s): Leah Boits, Chad Costa Section, Township, Range: Clark's Grant #15

Landform (hillslope, terrace, etc.): Limestone Hills Local relief (concave, convex, none): none

Slope (%): 2.0 Lat: 38.3286 Long: 85.6708 Datum: WGS 1984

Soil Map Unit Name: Elkinsville-Millstone silt loams, 0 to 2 percent slopes (EesA) NWI classification: n/a

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

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ◉ No ○

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

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

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

Remarks:

The data point is representative of the upland area surrounding Wetland B.

VEGETATION – Use scientific names of plants.

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

Sapling/Shrub Stratum (Plot size: 15 ft)			
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		

Herb Stratum (Plot size: 5 ft)			
1. *Toxicodendron radicans*	30	Yes	FAC
2. *Rubus idaeus*	20	Yes	FACU
3. *Glechoma hederacea*	20	Yes	FACU
4. *Solidago caesia*	20	Yes	FACU
5. *Bidens frondosa*	5	No	FACW
6. *Sorghum halepense*	5	No	FACU
7.			
8.			
9.			
10.			
	100 = Total Cover		

Woody Vine Stratum (Plot size: 15 ft)			
1.			
2.			
	0 = Total Cover		

Dominance Test worksheet:

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

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 25 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species	5	x 2 =	10
FAC species	30	x 3 =	90
FACU species	65	x 4 =	260
UPL species		x 5 =	
Column Totals:	100 (A)		360 (B)

Prevalence Index = B/A = 3.60

Hydrophytic Vegetation Indicators:

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

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

Hydrophytic Vegetation Present? Yes ○ No ◉

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

SOIL

Sampling Point: DP05

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-18	10YR 5/4	100					Silty Clay Loam	

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

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ○ No ◉

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present? Yes ○ No ◉ Depth (inches): < 0

Water Table Present? Yes ○ No ◉ Depth (inches): > 18

Saturation Present? (includes capillary fringe) Yes ○ No ◉ Depth (inches): > 18

Wetland Hydrology Present? Yes ○ No ◉

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

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Des. No. 1382612 Heavy Haul Transportation Corridor City/County: Jeffersonville / Clark County Sampling Date: 7/21/15

Applicant/Owner: INDOT State: IN Sampling Point: DP06

Investigator(s): Leah Boits, Chad Costa Section, Township, Range: Clark's Grant #15

Landform (hillslope, terrace, etc.): Limestone Hills Local relief (concave, convex, none): none

Slope (%): 0.5 Lat: 38.3295 Long: 85.6721 Datum: WGS 1984

Soil Map Unit Name: Udorthents, cut and filled (Uaa) NWI classification: n/a

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

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ◉ No ○

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

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

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

Remarks:

This data point was collected to characterize the upland conditions next to UNT 1.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft)			
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		
Herb Stratum (Plot size: 5 ft)			
1. *Schedonorus arundinaceus*	20	Yes	FACU
2. *Melilotus officinalis*	15	Yes	FACU
3. *Daucus carota*	10	Yes	FACU
4. *Sorghum halepense*	10	Yes	FACU
5. *Ambrosia artemisiifolia*	7	No	FACU
6. *Dipsacus fullonum*	5	No	FACU
7. *Solidago caesia*	5	No	FACU
8.			
9.			
10.			
	72 = Total Cover		
Woody Vine Stratum (Plot size: 15 ft)			
1.			
2.			
	0 = Total Cover		

Dominance Test worksheet:

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

Total Number of Dominant Species Across All Strata: 4 (B)

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

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species		x 3 =	
FACU species	72	x 4 =	288
UPL species		x 5 =	
Column Totals:	72 (A)		288 (B)

Prevalence Index = B/A = 4.00

Hydrophytic Vegetation Indicators:

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

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

Hydrophytic Vegetation Present? Yes ○ No ◉

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

SOIL

Sampling Point: DP06

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-4	10YR 3/2	95	10YR 4/4	5	C	M	Silty Clay Loam	
4-18	10YR 4/6	90	10YR 5/2	10	C	M	Silty Clay Loam	

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

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ○ No ◉

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present? Yes ○ No ◉ Depth (inches): < 0

Water Table Present? Yes ○ No ◉ Depth (inches): > 18

Saturation Present? (includes capillary fringe) Yes ○ No ◉ Depth (inches): > 18

Wetland Hydrology Present? Yes ○ No ◉

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

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Des. No. 1382612 Heavy Haul Transportation Corridor City/County: Jeffersonville / Clark County Sampling Date: 7/21/15

Applicant/Owner: INDOT State: IN Sampling Point: DP07

Investigator(s): Leah Boits, Chad Costa Section, Township, Range: Clark's Grant #15

Landform (hillslope, terrace, etc.): Limestone Hills Local relief (concave, convex, none): convex

Slope (%): 1.0 Lat: 38.3308 Long: 85.6711 Datum: WGS 1984

Soil Map Unit Name: Urban land-Udarents, clayey substratum, complex, hills, 2 to 10 percent slopes (UnsB) NWI classification: n/a

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

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes (●) No ( )

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

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

Hydrophytic Vegetation Present?	Yes ( )	No (●)	**Is the Sampled Area within a Wetland?** Yes ( ) No (●)
Hydric Soil Present?	Yes (●)	No ( )	
Wetland Hydrology Present?	Yes ( )	No (●)	

Remarks:

This data point is representative of the upland area surrounding Wetland C.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Fraxinus pennsylvanica*	1	Yes	FACW
2.			
3.			
4.			
5.			
	1	= Total Cover	

Sapling/Shrub Stratum (Plot size: 15 ft)			
1.			
2.			
3.			
4.			
5.			
	0	= Total Cover	

Herb Stratum (Plot size: 5 ft)			
1. *Solidago altissima*	40	Yes	FACU
2. *Glycine max*	40	Yes	UPL
3. *Alopecurus pratensis*	20	No	FACW
4. *Sorghum halepense*	5	No	FACU
5.			
6.			
7.			
8.			
9.			
10.			
	105	= Total Cover	

Woody Vine Stratum (Plot size: 15 ft)			
1.			
2.			
	0	= Total Cover	

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	0	x 1 = 0
FACW species	21	x 2 = 42
FAC species	0	x 3 = 0
FACU species	45	x 4 = 180
UPL species	40	x 5 = 200
Column Totals:	106 (A)	422 (B)

Prevalence Index = B/A = 3.98

Hydrophytic Vegetation Indicators:

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

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

Hydrophytic Vegetation Present? Yes ( ) No (●)

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

SOIL

Sampling Point: DP07

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-4	10YR 3/2	100					Silty Clay Loam	
4-8	10YR 4/2	90	10YR 5/4	10	C	M	Silty Clay Loam	
8-18	10YR 4/2	85	10YR 4/6	10	C	M	Silty Clay Loam	
			10YR 5/8	5	C	M		

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

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ◉ No ○

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present? Yes ○ No ◉ Depth (inches): < 0

Water Table Present? Yes ○ No ◉ Depth (inches): > 18

Saturation Present? (includes capillary fringe) Yes ○ No ◉ Depth (inches): > 18

Wetland Hydrology Present? Yes ○ No ◉

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

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Des. No. 1382612 Heavy Haul Transportation Corridor City/County: Jeffersonville / Clark County Sampling Date: 7/21/15

Applicant/Owner: INDOT State: IN Sampling Point: DP08

Investigator(s): Leah Boits, Chad Costa Section, Township, Range: Clark's Grant #15

Landform (hillslope, terrace, etc.): Limestone Hills Local relief (concave, convex, none): concave

Slope (%): 2.0 Lat: 38.3310 Long: 85.6714 Datum: WGS 1984

Soil Map Unit Name: Urban land-Udarents, clayey substratum, complex, hills, 2 to 10 percent slopes (UnsB) NWI classification: n/a

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

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes (●) No ( )

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

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

Hydrophytic Vegetation Present?	Yes (●)	No ( )	**Is the Sampled Area within a Wetland?**	**Yes (●) No ( )**
Hydric Soil Present?	Yes (●)	No ( )		
Wetland Hydrology Present?	Yes (●)	No ( )		

Remarks:

This data point is representative of Wetland C.

VEGETATION – Use scientific names of plants.

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

Sapling/Shrub Stratum (Plot size: 15 ft)			
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		

Herb Stratum (Plot size: 5 ft)			
1. *Persicaria pensylvanica*	30	Yes	FACW
2. *Pilea pumila*	20	Yes	FACW
3. *Vernonia fasciculata*	10	No	FACW
4. *Rumex crispus*	7	No	FAC
5. *Sorghum halepense*	7	No	FACU
6. *Alopecurus pratensis*	7	No	FACW
7. *Solidago altissima*	5	No	FACU
8. *Cyperus strigosus*	3	No	FACW
9.			
10.			
	89 = Total Cover		

Woody Vine Stratum (Plot size: 15 ft)			
1.			
2.			
	0 = Total Cover		

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

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

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

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

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

Hydrophytic Vegetation Present? Yes (●) No ( )

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

SOIL

Sampling Point: DP08

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-4	10YR 3/2	100					Silty Clay Loam	
4-8	10YR 4/2	80	10YR 3/6	20	C	M	Clay Loam	
8-18	10YR 5/2	75	10YR 4/6	25	C	M	Clay Loam	

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

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ◉ No ○

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present? Yes ○ No ◉ Depth (inches): <0

Water Table Present? Yes ○ No ◉ Depth (inches): >18

Saturation Present? (includes capillary fringe) Yes ○ No ◉ Depth (inches): >18

Wetland Hydrology Present? Yes ◉ No ○

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

Remarks:

Wetland C appears to be depressional area that collects sheet flow from the surrounding field.

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Des. No. 1382612 Heavy Haul Transportation Corridor City/County: Jeffersonville / Clark County Sampling Date: 7/21/15

Applicant/Owner: INDOT State: IN Sampling Point: DP09

Investigator(s): Leah Boits, Chad Costa Section, Township, Range: Clark's Grant #15

Landform (hillslope, terrace, etc.): Limestone Hills Local relief (concave, convex, none): concave

Slope (%): 2.0 Lat: 38.3321 Long: 85.6743 Datum: WGS 1984

Soil Map Unit Name: Udorthents, cut and filled (Uaa) NWI classification: n/a

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

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ◉ No ○

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

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

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

Remarks:

This data point is representative of Wetland D.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Fraxinus pennsylvanica*	25	Yes	FACW
2. *Populus deltoides*	5	No	FAC
3.			
4.			
5.			
	30	= Total Cover	

Sapling/Shrub Stratum (Plot size: 15 ft)			
1. *Fraxinus pennsylvanica*	25	Yes	FACW
2. *Salix nigra*	15	Yes	OBL
3.			
4.			
5.			
	40	= Total Cover	

Herb Stratum (Plot size: 5 ft)			
1. *Carex frankii*	25	Yes	OBL
2. *Phragmites australis*	10	Yes	FACW
3. *Eleocharis equisetoides*	5	No	OBL
4. *Solidago altissima*	3	No	FACU
5.			
6.			
7.			
8.			
9.			
10.			
	43	= Total Cover	

Woody Vine Stratum (Plot size: 15 ft)			
1.			
2.			
	0	= Total Cover	

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

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

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

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

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

Hydrophytic Vegetation Present? Yes ◉ No ○

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

SOIL

Sampling Point: DP09

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-4	10YR 5/1	95	10YR 4/6	5	C	M	Silty Clay Loam	
4-18	10YR 6/1	85	7.5YR 4/6	15	C	M	Silty Clay Loam	

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

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ◉ No ○

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present? Yes ○ No ◉ Depth (inches): <0

Water Table Present? Yes ◉ No ○ Depth (inches): 6

Saturation Present? (includes capillary fringe) Yes ◉ No ○ Depth (inches): 0

Wetland Hydrology Present? Yes ◉ No ○

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

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Des. No. 1382612 Heavy Haul Transportation Corridor City/County: Jeffersonville / Clark County Sampling Date: 7/21/15

Applicant/Owner: INDOT State: IN Sampling Point: DP10

Investigator(s): Ben Harvey, Josh Price Section, Township, Range: Clark's Grant #16

Landform (hillslope, terrace, etc.): Limestone Hills Local relief (concave, convex, none): convex

Slope (%): 2.0 Lat: 38.3322 Long: 85.6742 Datum: WGS 1984

Soil Map Unit Name: Udorthents, cut and filled (Uaa) NWI classification: n/a

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

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes (●) No ( )

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

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

Hydrophytic Vegetation Present?	Yes ( )	No (●)	**Is the Sampled Area within a Wetland?** Yes ( ) No (●)
Hydric Soil Present?	Yes (●)	No ( )	
Wetland Hydrology Present?	Yes ( )	No (●)	

Remarks:

This data point is representative of the upland area surrounding Wetland D.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Pyrus calleryana*	65	Yes	NI
2. *Robinia pseudoacacia*	25	Yes	FACU
3. *Maclura pomifera*	25	Yes	FACU
4.			
5.			
	115	= Total Cover	

Sapling/Shrub Stratum (Plot size: 15 ft)			
1. *Lonicera morrowii*	10	Yes	FACU
2.			
3.			
4.			
5.			
	10	= Total Cover	

Herb Stratum (Plot size: 5 ft)			
1. *Lonicera morrowii*	5	Yes	FACU
2. *Carex blanda*	2	Yes	FAC
3. *Sanicula canadensis*	2	Yes	FACU
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	9	= Total Cover	

Woody Vine Stratum (Plot size: 15 ft)			
1.			
2.			
	0	= Total Cover	

Dominance Test worksheet:

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

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 14 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species		x 2 =
FAC species	2	x 3 = 6
FACU species	67	x 4 = 268
UPL species		x 5 =
Column Totals:	69 (A)	274 (B)

Prevalence Index = B/A = 3.97

Hydrophytic Vegetation Indicators:

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

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

Hydrophytic Vegetation Present? Yes ( ) No (●)

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

SOIL

Sampling Point: DP10

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-7	10YR 3/2	100					Silt Loam	
7-18	2.5YR 6/2	60	7.5YR 5/8	20	C	M	Silt Loam	
			10YR 2/1	20	D	M		

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

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ◉ No ○

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present? Yes ○ No ◉ Depth (inches): < 0

Water Table Present? Yes ○ No ◉ Depth (inches): > 18

Saturation Present? (includes capillary fringe) Yes ○ No ◉ Depth (inches): > 18

Wetland Hydrology Present? Yes ○ No ◉

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

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Des. No. 1382612 Heavy Haul Transportation Corridor City/County: Jeffersonville / Clark County Sampling Date: 7/21/15

Applicant/Owner: INDOT State: IN Sampling Point: DP11

Investigator(s): Audrey Hanner, Monica Del Real Section, Township, Range: Clark's Grant #16

Landform (hillslope, terrace, etc.): Limestone Hills Local relief (concave, convex, none): concave

Slope (%): 2.0 Lat: 38.3393 Long: 85.6698 Datum: WGS 1984

Soil Map Unit Name: Ryker-Grayford silt loams, 6 to 12 percent slopes, eroded (RztC2) NWI classification: n/a

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

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ◉ No ○

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

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

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

Remarks:

This datapoint was collected to characterize upland conditions within wooded area.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Juglans nigra*	45	Yes	FACU
2. *Tilia americana*	20	Yes	FACU
3. *Maclura pomifera*	15	No	FACU
4. *Carya glabra*	15	No	FACU
5.			
	95	= Total Cover	

Sapling/Shrub Stratum (Plot size: 15 ft)			
1.			
2.			
3.			
4.			
5.			
	0	= Total Cover	

Herb Stratum (Plot size: 5 ft)			
1. *Verbesina alternifolia*	35	Yes	FACW
2. *Dichanthelium clandestinum*	20	Yes	FACW
3. *Lonicera japonica*	15	No	FACU
4. *Sanicula canadensis*	10	No	FACU
5. *Elymus virginicus*	5	No	FACW
6.			
7.			
8.			
9.			
10.			
	85	= Total Cover	

Woody Vine Stratum (Plot size: 15 ft)			
1.			
2.			
	0	= Total Cover	

Dominance Test worksheet:

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

Total Number of Dominant Species Across All Strata: 4 (B)

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

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	0	x 1 = 0
FACW species	60	x 2 = 120
FAC species	0	x 3 = 0
FACU species	120	x 4 = 480
UPL species	0	x 5 = 0
Column Totals:	180 (A)	600 (B)

Prevalence Index = B/A = 3.33

Hydrophytic Vegetation Indicators:

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

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

Hydrophytic Vegetation Present? Yes ○ No ◉

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

SOIL

Sampling Point: DP11

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-18	10YR 4/4	100					Silty Clay Loam	

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

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ○ No ◉

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present? Yes ○ No ◉ Depth (inches): <0

Water Table Present? Yes ○ No ◉ Depth (inches): >18

Saturation Present? (includes capillary fringe) Yes ○ No ◉ Depth (inches): >18

Wetland Hydrology Present? Yes ○ No ◉

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

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Des. No. 1382612 Heavy Haul Transportation Corridor City/County: Jeffersonville / Clark County Sampling Date: 7/21/15

Applicant/Owner: INDOT State: IN Sampling Point: DP12

Investigator(s): Rick Paul, Monica Del Real Section, Township, Range: Clark's Grant #16

Landform (hillslope, terrace, etc.): Limestone Hills Local relief (concave, convex, none): concave

Slope (%): 2.0 Lat: 38.3390 Long: 85.6674 Datum: WGS 1984

Soil Map Unit Name: Elkinsville-Millstone silt loams, 12 to 18 percent slopes, eroded (EesD2) NWI classification: n/a

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

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

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

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

Hydrophytic Vegetation Present?	Yes ( )	No (●)	**Is the Sampled Area within a Wetland?** Yes ( ) No (●)
Hydric Soil Present?	Yes ( )	No (●)	
Wetland Hydrology Present?	Yes ( )	No (●)	

Remarks:

This datapoint was collected to characterize upland conditions within the wooded area adjacent to Lentzier Creek

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Liriodendron tulipifera*	45	Yes	FACU
2. *Carya glabra*	35	Yes	FACU
3. *Sassafras albidum*	15	No	FACU
4. *Tilia americana*	15	No	FACU
5.			
	110	= Total Cover	

Sapling/Shrub Stratum (Plot size: 15 ft)			
1. *Rosa multiflora*	15	Yes	FACU
2.			
3.			
4.			
5.			
	15	= Total Cover	

Herb Stratum (Plot size: 5 ft)			
1. *Microstegium vimineum*	17	Yes	FAC
2. *Vitis riparia*	15	Yes	FACW
3. *Fraxinus pennsylvanica*	7	No	FACW
4. *Rubus idaeus*	4	No	FACU
5. *Elymus virginicus*	2	No	FACW
6. *Parthenocissus quinquefolia*	2	No	FACU
7. *Persicaria pensylvanica*	2	No	FACW
8.			
9.			
10.			
	49	= Total Cover	

Woody Vine Stratum (Plot size: 15 ft)			
1.			
2.			
	0	= Total Cover	

Dominance Test worksheet:

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

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 20 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species	26	x 2 =	52
FAC species	17	x 3 =	51
FACU species	131	x 4 =	524
UPL species		x 5 =	
Column Totals:	174 (A)		627 (B)

Prevalence Index = B/A = 3.60

Hydrophytic Vegetation Indicators:

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

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

Hydrophytic Vegetation Present? Yes ( ) No (●)

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

SOIL

Sampling Point: DP12

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-18	2.5Y 5/4	100					Silty clay loam	

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

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ○ No ◉

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present? Yes ○ No ◉ Depth (inches): < 0

Water Table Present? Yes ○ No ◉ Depth (inches): > 18

Saturation Present? (includes capillary fringe) Yes ○ No ◉ Depth (inches): > 18

Wetland Hydrology Present? Yes ○ No ◉

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

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Des. No. 1382612 Heavy Haul Transportation Corridor City/County: Jeffersonville / Clark County Sampling Date: 7/21/15

Applicant/Owner: INDOT State: IN Sampling Point: DP13

Investigator(s): Ben Harvey, Josh Price Section, Township, Range: Clark's Grant #16

Landform (hillslope, terrace, etc.): Limestone Hills Local relief (concave, convex, none): none

Slope (%): 1.0 Lat: 38.3396 Long: 85.6673 Datum: WGS 1984

Soil Map Unit Name: Haymond silt loam, 0 to 2 percent slopes, occasionally flooded, very brief duration (HcgAW) NWI classification: n/a

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

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

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

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

Hydrophytic Vegetation Present?	Yes (●)	No ( )	**Is the Sampled Area within a Wetland?** Yes ( ) No (●)
Hydric Soil Present?	Yes ( )	No (●)	
Wetland Hydrology Present?	Yes (●)	No ( )	

Remarks:

This datapoint was collected to characterize the upland conditions adjacent to Lentzier Creek.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Ulmus americana*	65	Yes	FACW
2. *Fraxinus pennsylvanica*	30	Yes	FACW
3. *Morus alba*	15	No	FAC
4.			
5.			
	110	= Total Cover	

Sapling/Shrub Stratum (Plot size: 15 ft)			
1. *Acer negundo*	5	Yes	FAC
2.			
3.			
4.			
5.			
	5	= Total Cover	

Herb Stratum (Plot size: 5 ft)			
1. *Elymus riparius*	15	Yes	FACW
2. *Verbesina alternifolia*	15	Yes	FACW
3. *Pilea pumila*	10	Yes	FACW
4. *Viola sororia*	10	Yes	FAC
5. *Euonymus americanus*	5	No	FAC
6. *Amphicarpaea bracteata*	3	No	FAC
7. *Impatiens capensis*	2	No	FACW
8.			
9.			
10.			
	60	= Total Cover	

Woody Vine Stratum (Plot size: 15 ft)			
1. *Parthenocissus quinquefolia*	1	Yes	FACU
2.			
	1	= Total Cover	

Dominance Test worksheet:

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

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 83 (A/B)

Prevalence Index worksheet:

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

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

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

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

Hydrophytic Vegetation Present? Yes (●) No ( )

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

SOIL

Sampling Point: DP13

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-5	7.5YR 3/2	100					Silt Loam	
5-20	7.5YR 4/4	100					Silt Loam	

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

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ○ No ◉

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present? Yes ○ No ◉ Depth (inches): < 0

Water Table Present? Yes ○ No ◉ Depth (inches): > 18

Saturation Present? (includes capillary fringe) Yes ○ No ◉ Depth (inches): > 18

Wetland Hydrology Present? Yes ◉ No ○

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

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Des. No. 1382612 Heavy Haul Transportation Corridor City/County: Jeffersonville / Clark County Sampling Date: 7/21/15

Applicant/Owner: INDOT State: IN Sampling Point: DP14

Investigator(s): Ben Harvey, Josh Price Section, Township, Range: Clark's Grant #16

Landform (hillslope, terrace, etc.): Limestone Hills Local relief (concave, convex, none): concave

Slope (%): 2.0 Lat: 38.3398 Long: 85.6676 Datum: WGS 1984

Soil Map Unit Name: Haymond silt loam, 0 to 2 percent slopes, occasionally flooded, very brief duration (HcgAW) NWI classification: n/a

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

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ◉ No ○

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

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

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

Remarks:

This datapoint is representative of Wetland E.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Platanus occidentalis*	45	Yes	FACW
2.			
3.			
4.			
5.			
	45	= Total Cover	

Sapling/Shrub Stratum (Plot size: 15 ft)			
1.			
2.			
3.			
4.			
5.			
	0	= Total Cover	

Herb Stratum (Plot size: 5 ft)			
1. *Juncus effusus*	35	Yes	OBL
2. *Carex frankii*	20	Yes	OBL
3. *Carex vulpinoidea*	10	No	FACW
4. *Schedonorus arundinaceus*	10	No	FACU
5. *Leersia virginica*	5	No	FACW
6. *Salix interior*	5	No	FACW
7. *Bidens frondosa*	5	No	FACW
8.			
9.			
10.			
	90	= Total Cover	

Woody Vine Stratum (Plot size: 15 ft)			
1.			
2.			
	0	= Total Cover	

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

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

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

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

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

Hydrophytic Vegetation Present? Yes ◉ No ○

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

SOIL

Sampling Point: DP14

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-9	10YR 4/3	90	10YR 5/6	10	C	M	Silty Clay Loam	
9-18	5YR 5/2	70	10YR 5/6	30	C	M	Silty Clay Loam	

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

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ◉ No ○

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present? Yes ○ No ◉ Depth (inches): < 0

Water Table Present? Yes ○ No ◉ Depth (inches): > 18

Saturation Present? (includes capillary fringe) Yes ○ No ◉ Depth (inches): > 18

Wetland Hydrology Present? Yes ◉ No ○

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

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Des. No. 1382612 Heavy Haul Transportation Corridor City/County: Jeffersonville / Clark County Sampling Date: 7/21/15

Applicant/Owner: INDOT State: IN Sampling Point: DP15

Investigator(s): Ben Harvey, Josh Price Section, Township, Range: Clark's Grant #16

Landform (hillslope, terrace, etc.): Limestone Hills Local relief (concave, convex, none): concave

Slope (%): 2.0 Lat: 38.3399 Long: 85.6675 Datum: WGS 1984

Soil Map Unit Name: Haymond silt loam, 0 to 2 percent slopes, occasionally flooded, very brief duration (HcgAW) NWI classification: n/a

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

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

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

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

Hydrophytic Vegetation Present?	Yes ( )	No (●)	**Is the Sampled Area within a Wetland?** Yes ( ) No (●)
Hydric Soil Present?	Yes (●)	No ( )	
Wetland Hydrology Present?	Yes (●)	No ( )	

Remarks:

This point is representative of the upland area surrounding Wetland E.

VEGETATION – Use scientific names of plants.

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

Sapling/Shrub Stratum (Plot size: 15 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		

Herb Stratum (Plot size: 5 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Schedonorus arundinaceus*	60	Yes	FACU
2. *Trifolium repens*	5	No	FACU
3. *Acalypha rhomboidea*	5	No	FACU
4. *Bidens frondosa*	2	No	FACW
5.			
6.			
7.			
8.			
9.			
10.			
	72 = Total Cover		

Woody Vine Stratum (Plot size: 15 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
	0 = Total Cover		

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species	2	x 2 =	4
FAC species		x 3 =	
FACU species	70	x 4 =	280
UPL species		x 5 =	
Column Totals:	72 (A)		284 (B)

Prevalence Index = B/A = 3.94

Hydrophytic Vegetation Indicators:

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

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

Hydrophytic Vegetation Present? Yes ( ) No (●)

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

SOIL

Sampling Point: DP15

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-9	10YR 4/3	90	10YR 5/6	10	C	M	Silty Clay Loam	
9-18	5YR 5/2	70	10YR 5/6	30	C	M	Silty Clay Loam	

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

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ◉ No ○

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present? Yes ○ No ◉ Depth (inches): < 0

Water Table Present? Yes ○ No ◉ Depth (inches): > 18

Saturation Present? (includes capillary fringe) Yes ○ No ◉ Depth (inches): > 18

Wetland Hydrology Present? Yes ◉ No ○

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

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Des. No. 1382612 Heavy Haul Transportation Corridor City/County: Jeffersonville / Clark County Sampling Date: 7/21/15

Applicant/Owner: INDOT State: IN Sampling Point: DP16

Investigator(s): Ben Harvey, Josh Price Section, Township, Range: Clark's Grant #16

Landform (hillslope, terrace, etc.): Limestone Hills Local relief (concave, convex, none): concave

Slope (%): 2.0 Lat: 38.3400 Long: 85.6675 Datum: WGS 1984

Soil Map Unit Name: Haymond silt loam, 0 to 2 percent slopes, occasionally flooded, very brief duration (HcgAW) NWI classification: n/a

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

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes (●) No ( )

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

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

Hydrophytic Vegetation Present?	Yes (●)	No ( )	**Is the Sampled Area within a Wetland?** Yes (●) No ( )
Hydric Soil Present?	Yes (●)	No ( )	
Wetland Hydrology Present?	Yes (●)	No ( )	

Remarks:

This data point is representative of Wetland F.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Liquidambar styraciflua*	20	Yes	FACW
2. *Fraxinus pennsylvanica*	10	Yes	FACW
3. *Acer negundo*	10	Yes	FAC
4.			
5.			
	40	= Total Cover	

Sapling/Shrub Stratum (Plot size: 15 ft)			
1.			
2.			
3.			
4.			
5.			
	0	= Total Cover	

Herb Stratum (Plot size: 5 ft)			
1. *Schedonorus arundinaceus*	20	Yes	FACU
2. *Carex frankii*	15	Yes	OBL
3. *Lycopus asper*	15	Yes	OBL
4. *Juncus effusus*	15	Yes	OBL
5. *Salix interior*	5	No	FACW
6. *Juncus interior*	5	No	FAC
7. *Mimulus alatus*	3	No	OBL
8. *Eleocharis equisetoides*	3	No	OBL
9.			
10.			
	81	= Total Cover	

Woody Vine Stratum (Plot size: 15 ft)			
1.			
2.			
	0	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 6 (A)

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 86 (A/B)

Prevalence Index worksheet:

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

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

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

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

Hydrophytic Vegetation Present? Yes (●) No ( )

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

SOIL

Sampling Point: DP16

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-9	2.5YR 5/2	80	10YR 5/6	20	C	M	Clay Loam	
9-18	5YR 5/1	80	2.5YR 3/4	20	C	M	Clay Loam	

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

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ◉ No ○

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present? Yes ○ No ◉ Depth (inches): < 0

Water Table Present? Yes ○ No ◉ Depth (inches): > 18

Saturation Present? (includes capillary fringe) Yes ○ No ◉ Depth (inches): > 18

Wetland Hydrology Present? Yes ◉ No ○

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

Remarks:

Surface water adjacent

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Des. No. 1382612 Heavy Haul Transportation Corridor City/County: Jeffersonville / Clark County Sampling Date: 7/21/15

Applicant/Owner: INDOT State: IN Sampling Point: DP17

Investigator(s): Rick Paul, Monica Del Real Section, Township, Range: Clark's Grant #16

Landform (hillslope, terrace, etc.): Limestone Hills Local relief (concave, convex, none): none

Slope (%): 0.5 Lat: 38.3411 Long: 85.6682 Datum: WGS 1984

Soil Map Unit Name: Elkinsville-Millstone silt loams, 6 to 12 percent slopes, eroded (EesC2) NWI classification: n/a

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

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ◉ No ○

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

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

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

Remarks:

This data point was collected due to the presence of hydrophytic vegetation.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Liriodendron tulipifera*	40	Yes	FACU
2. *Liquidambar styraciflua*	40	Yes	FACW
3. *Juglans cinerea*	30	Yes	FACU
4.			
5.			
	110	= Total Cover	

Sapling/Shrub Stratum (Plot size: 15 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Liriodendron tulipifera*	25	Yes	FACU
2. *Lindera benzoin*	15	Yes	FACW
3. *Fraxinus pennsylvanica*	10	Yes	FACW
4.			
5.			
	50	= Total Cover	

Herb Stratum (Plot size: 5 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Fraxinus pennsylvanica*	10	Yes	FACW
2. *Viola sororia*	7	Yes	FAC
3. *Sanicula canadensis*	5	Yes	FACU
4. *Polystichum acrostichoides*	2	No	UPL
5.			
6.			
7.			
8.			
9.			
10.			
	24	= Total Cover	

Woody Vine Stratum (Plot size: 15 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
	0	= Total Cover	

Dominance Test worksheet:

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

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 56 (A/B)

Prevalence Index worksheet:

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

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

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

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

Hydrophytic Vegetation Present? Yes ◉ No ○

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

SOIL

Sampling Point: DP17

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-8	10YR 4/4	100					Silty Clay Loam	
8-16	10YR 5/6	100					Silty Clay Loam	

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

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ○ No ◉

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present? Yes ○ No ◉ Depth (inches): < 0

Water Table Present? Yes ○ No ◉ Depth (inches): > 18

Saturation Present? (includes capillary fringe) Yes ○ No ◉ Depth (inches): > 18

Wetland Hydrology Present? Yes ○ No ◉

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

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Des. No. 1382612 Heavy Haul Transportation Corridor City/County: Jeffersonville / Clark County Sampling Date: 7/21/15

Applicant/Owner: INDOT State: IN Sampling Point: DP18

Investigator(s): Rick Paul, Monica Del Real Section, Township, Range: Clark's Grant #16

Landform (hillslope, terrace, etc.): Limestone Hills Local relief (concave, convex, none): none

Slope (%): 2.0 Lat: 38.3411 Long: 85.6695 Datum: WGS 1984

Soil Map Unit Name: Elkinsville-Millstone silt loams, 6 to 12 percent slopes, eroded (EesC2) NWI classification: n/a

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

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ◉ No ○

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

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

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

Remarks:

This data point is representative of the upland area surrounding Wetland G.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Juglans nigra*	15	Yes	FACU
2. *Liriodendron tulipifera*	5	Yes	FACU
3.			
4.			
5.			
	20	= Total Cover	

Sapling/Shrub Stratum (Plot size: 15 ft)			
1. *Rosa multiflora*	10	Yes	FACU
2. *Lonicera morrowii*	10	Yes	FACU
3. *Acer negundo*	5	Yes	FAC
4.			
5.			
	25	= Total Cover	

Herb Stratum (Plot size: 5 ft)			
1. *Lonicera japonica*	15	Yes	FACU
2. *Ageratina altissima*	10	Yes	FACU
3. *Microstegium vimineum*	10	Yes	FAC
4. *Elymus villosus*	10	Yes	FACU
5.			
6.			
7.			
8.			
9.			
10.			
	45	= Total Cover	

Woody Vine Stratum (Plot size: 15 ft)			
1.			
2.			
	0	= Total Cover	

Dominance Test worksheet:

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

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 22 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species	15	x 3 =	45
FACU species	75	x 4 =	300
UPL species		x 5 =	
Column Totals:	90 (A)		345 (B)

Prevalence Index = B/A = 3.83

Hydrophytic Vegetation Indicators:

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

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

Hydrophytic Vegetation Present? Yes ○ No ◉

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

SOIL

Sampling Point: DP18

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-18	10YR 4/4	100					Silt Loam	

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

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ○ No ◉

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present? Yes ○ No ◉ Depth (inches): <0

Water Table Present? Yes ○ No ◉ Depth (inches): <18

Saturation Present? (includes capillary fringe) Yes ○ No ◉ Depth (inches): <18

Wetland Hydrology Present? Yes ○ No ◉

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

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Des. No. 1382612 Heavy Haul Transportation Corridor City/County: Jeffersonville / Clark County Sampling Date: 7/21/15

Applicant/Owner: INDOT State: IN Sampling Point: DP19

Investigator(s): Audrey Hanner, Briana Hope Section, Township, Range: Clark's Grant #16

Landform (hillslope, terrace, etc.): Limestone Hills Local relief (concave, convex, none): concave

Slope (%): 2.0 Lat: 38.3411 Long: 85.6696 Datum: WGS 1984

Soil Map Unit Name: Elkinsville-Millstone silt loams, 6 to 12 percent slopes, eroded (EesC2) NWI classification: n/a

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

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ◉ No ○

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

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

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

Remarks:

This data point is representative of Wetland G.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Liquidambar styraciflua*	45	Yes	FACW
2. *Fraxinus pennsylvanica*	25	Yes	FACW
3. *Liriodendron tulipifera*	15	No	FACU
4. *Platanus occidentalis*	15	No	FACW
5.			
	100	= Total Cover	

Sapling/Shrub Stratum (Plot size: 15 ft)			
1. *Fraxinus pennsylvanica*	15	Yes	FACW
2. *Rosa multiflora*	10	Yes	FACU
3.			
4.			
5.			
	25	= Total Cover	

Herb Stratum (Plot size: 5 ft)			
1. *Persicaria virginiana*	15	Yes	FAC
2. *Lysimachia nummularia*	15	Yes	FACW
3. *Elymus virginicus*	10	Yes	FACW
4. *Fraxinus pennsylvanica*	7	No	FACW
5.			
6.			
7.			
8.			
9.			
10.			
	47	= Total Cover	

Woody Vine Stratum (Plot size: 15 ft)			
1.			
2.			
	0	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 6 (A)

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 86 (A/B)

Prevalence Index worksheet:

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

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

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

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

Hydrophytic Vegetation Present? Yes ◉ No ○

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

SOIL

Sampling Point: DP19

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-6	2.5YR 5/2	75	10YR 3/6	15	C	M	Silty Clay Loam	
			10YR 3/1	10	D	M		
6-18	10YR 5/6	100					Silty Clay Loam	

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

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ○ No ◉

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present? Yes ○ No ◉ Depth (inches): <0

Water Table Present? Yes ◉ No ○ Depth (inches): 1

Saturation Present? (includes capillary fringe) Yes ◉ No ○ Depth (inches): 1

Wetland Hydrology Present? Yes ○ No ◉

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

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Des. No. 1382612 Heavy Haul Transportation Corridor City/County: Jeffersonville / Clark County Sampling Date: 7/21/15

Applicant/Owner: INDOT State: IN Sampling Point: DP20

Investigator(s): Ben Harvey, Josh Price Section, Township, Range: Clark's Grant #16

Landform (hillslope, terrace, etc.): Limestone Hills Local relief (concave, convex, none): concave

Slope (%): 2.0 Lat: 38.3421 Long: 85.6681 Datum: WGS 1984

Soil Map Unit Name: Haymond silt loam, 0 to 2 percent slopes, occasionally flooded, very brief duration (HcgAW) NWI classification: n/a

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

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ◉ No ○

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

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

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

Remarks:

This data point is representative of the upland area surrounding Wetland H.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Fraxinus nigra*	30	Yes	FACW
2. *Gleditsia triacanthos*	30	Yes	FAC
3. *Ulmus rubra*	20	Yes	FAC
4. *Celtis occidentalis*	10	No	FAC
5. *Fraxinus pennsylvanica*	10	No	FACW
	100	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15 ft)			
1. *Carya ovata*	7	Yes	FACU
2. *Lindera benzoin*	5	Yes	FACW
3.			
4.			
5.			
	12	= Total Cover	
Herb Stratum (Plot size: 5 ft)			
1. *Carex jamesii*	15	Yes	NI
2. *Verbesina alternifolia*	10	Yes	FACW
3. *Sanicula canadensis*	10	Yes	FACU
4. *Elymus riparius*	10	Yes	FACW
5. *Toxicodendron radicans*	5	No	FAC
6. *Amphicarpaea bracteata*	5	No	FAC
7. *Glechoma hederacea*	5	No	FACU
8. *Euonymus alatus*	3	No	NI
9. *Ageratina altissima*	3	No	FACU
10.			
	66	= Total Cover	
Woody Vine Stratum (Plot size: 15 ft)			
1.			
2.			
	0	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 6 (A)

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

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

Prevalence Index worksheet:

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

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

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

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

Hydrophytic Vegetation Present? Yes ◉ No ○

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

SOIL

Sampling Point: DP20

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-7	7.5YR 3/4	100					Silt Loam	
7-18	7.5YR 5/4	95	7.5YR 3/4	5	C	M	Silt Loam	

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

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ○ No ◉

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present? Yes ○ No ◉ Depth (inches): < 0

Water Table Present? Yes ○ No ◉ Depth (inches): > 18

Saturation Present? (includes capillary fringe) Yes ○ No ◉ Depth (inches): > 18

Wetland Hydrology Present? Yes ◉ No ○

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

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Des. No. 1382612 Heavy Haul Transportation Corridor City/County: Jeffersonville / Clark County Sampling Date: 7/21/15

Applicant/Owner: INDOT State: IN Sampling Point: DP21

Investigator(s): Audrey Hanner, Briana Hope Section, Township, Range: Clark's Grant #16

Landform (hillslope, terrace, etc.): Limestone Hills Local relief (concave, convex, none): concave

Slope (%): 2.0 Lat: 38.3420 Long: 85.6683 Datum: WGS 1984

Soil Map Unit Name: Haymond silt loam, 0 to 2 percent slopes, occasionally flooded, very brief duration (HcgAW) NWI classification: n/a

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

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ◉ No ○

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

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

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

Remarks:

This data point is representative of Wetland H.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Fraxinus pennsylvanica*	75	Yes	FACW
2. *Platanus occidentalis*	20	No	FACW
3. *Ulmus americana*	10	No	FACW
4.			
5.			
	105	= Total Cover	

Sapling/Shrub Stratum (Plot size: 15 ft)			
1. *Fraxinus pennsylvanica*	30	Yes	FACW
2.			
3.			
4.			
5.			
	30	= Total Cover	

Herb Stratum (Plot size: 5 ft)			
1. *Iris virginica*	40	Yes	OBL
2. *Persicaria virginiana*	12	No	FAC
3. *Cinna arundinacea*	7	No	FACW
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	59	= Total Cover	

Woody Vine Stratum (Plot size: 15 ft)			
1.			
2.			
	0	= Total Cover	

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

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

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

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

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

Hydrophytic Vegetation Present? Yes ◉ No ○

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

SOIL

Sampling Point: DP21

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-6	10YR 4/2	100					Silt Loam	
6-18	10YR 4/1	50	7.5YR 3/3	50	C	M	Silt Loam	

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

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ◉ No ○

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present? Yes ○ No ◉ Depth (inches): < 0

Water Table Present? Yes ◉ No ○ Depth (inches): 10

Saturation Present? (includes capillary fringe) Yes ◉ No ○ Depth (inches): 8

Wetland Hydrology Present? Yes ◉ No ○

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

Remarks:

Standing water adjacent

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Des. No. 1382612 Heavy Haul Transportation Corridor City/County: Jeffersonville / Clark County Sampling Date: 7/21/15

Applicant/Owner: INDOT State: IN Sampling Point: DP22

Investigator(s): Ben Harvey, Josh Price Section, Township, Range: Clark's Grant #16

Landform (hillslope, terrace, etc.): Limestone Hills Local relief (concave, convex, none): concave

Slope (%): 2.0 Lat: 38.3420 Long: 85.6688 Datum: WGS 1984

Soil Map Unit Name: Haymond silt loam, 0 to 2 percent slopes, occasionally flooded, very brief duration (HcgAW) NWI classification: n/a

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

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

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

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

Hydrophytic Vegetation Present?	Yes (●)	No ( )	**Is the Sampled Area within a Wetland?** Yes ( ) No (●)
Hydric Soil Present?	Yes ( )	No (●)	
Wetland Hydrology Present?	Yes (●)	No ( )	

Remarks:

This data point is representative of the upland area surrounding Wetland H.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Fraxinus nigra*	70	Yes	FACW
2. *Platanus occidentalis*	20	No	FACW
3. *Acer negundo*	20	No	FAC
4.			
5.			
	110	= Total Cover	

Sapling/Shrub Stratum (Plot size: 15 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Forestiera acuminata*	7	Yes	OBL
2. *Acer negundo*	7	Yes	FAC
3.			
4.			
5.			
	14	= Total Cover	

Herb Stratum (Plot size: 5 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Verbesina alternifolia*	35	Yes	FACW
2. *Elymus riparius*	25	Yes	FACW
3. *Boehmeria cylindrica*	15	No	OBL
4. *Smilax hispida*	10	No	FAC
5. *Leersia virginica*	5	No	FACW
6.			
7.			
8.			
9.			
10.			
	90	= Total Cover	

Woody Vine Stratum (Plot size: 15 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Toxicodendron radicans*	5	Yes	FAC
2. *Smilax hispida*	3	No	FAC
	8	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 6 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

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

Prevalence Index worksheet:

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

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

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

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

Hydrophytic Vegetation Present? Yes (●) No ( )

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

SOIL

Sampling Point: DP22

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-6	7.5YR 2.5/3	100					Silt Loam	
6-18	7.5YR 5/4	100					Silt Loam	

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

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ○ No ◉

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present? Yes ○ No ◉ Depth (inches): < 0

Water Table Present? Yes ○ No ◉ Depth (inches): > 18

Saturation Present? (includes capillary fringe) Yes ○ No ◉ Depth (inches): > 18

Wetland Hydrology Present? Yes ◉ No ○

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

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Des. No. 1382612 Heavy Haul Transportation Corridor City/County: Jeffersonville / Clark County Sampling Date: 7/21/15

Applicant/Owner: INDOT State: IN Sampling Point: DP23

Investigator(s): Audrey Hanner, Briana Hope Section, Township, Range: Clark's Grant #16

Landform (hillslope, terrace, etc.): Limestone Hills Local relief (concave, convex, none): concave

Slope (%): 2.0 Lat: 38.3418 Long: 85.6694 Datum: WGS 1984

Soil Map Unit Name: Haymond silt loam, 0 to 2 percent slopes, occasionally flooded, very brief duration (HcgAW) NWI classification: n/a

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

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes (●) No ( )

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

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

Hydrophytic Vegetation Present?	Yes (●)	No ( )	**Is the Sampled Area within a Wetland?** Yes (●) No ( )
Hydric Soil Present?	Yes (●)	No ( )	
Wetland Hydrology Present?	Yes (●)	No ( )	

Remarks:

This data point is representative of Wetland H.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Fraxinus pennsylvanica*	35	Yes	FACW
2. *Fagus grandifolia*	30	Yes	FACU
3. *Ulmus americana*	25	Yes	FACW
4.			
5.			
	90	= Total Cover	

Sapling/Shrub Stratum (Plot size: 15 ft)			
1. *Rosa multiflora*	15	Yes	FACU
2. *Fraxinus pennsylvanica*	12	Yes	FACW
3.			
4.			
5.			
	27	= Total Cover	

Herb Stratum (Plot size: 5 ft)			
1. *Euonymus fortunei*	9	Yes	UPL
2. *Viola bicolor*	7	Yes	FACU
3. *Sanicula canadensis*	5	No	FACU
4. *Smilax hispida*	3	No	FAC
5. *Cinna latifolia*	3	No	FACW
6. *Elymus virginicus*	3	No	FACW
7. *Bidens frondosa*	2	No	FACW
8.			
9.			
10.			
	32	= Total Cover	

Woody Vine Stratum (Plot size: 15 ft)			
1.			
2.			
	0	= Total Cover	

Dominance Test worksheet:

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

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 43 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	0	x 1 = 0
FACW species	80	x 2 = 160
FAC species	3	x 3 = 9
FACU species	56	x 4 = 224
UPL species	10	x 5 = 50
Column Totals:	149 (A)	443 (B)

Prevalence Index = B/A = 2.97

Hydrophytic Vegetation Indicators:

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

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

Hydrophytic Vegetation Present? Yes (●) No ( )

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

SOIL

Sampling Point: DP23

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-6	10YR 4/2	100					Silt Loam	
6-18	10YR 4/2	70	10YR 5/1	20	RM	M	Silt Loam	
			10YR 4/6	10	C	M		

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

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ◉ No ○

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present? Yes ○ No ◉ Depth (inches): <0

Water Table Present? Yes ○ No ◉ Depth (inches): 14

Saturation Present? (includes capillary fringe) Yes ◉ No ○ Depth (inches): 12

Wetland Hydrology Present? Yes ◉ No ○

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

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Des. No. 1382612 Heavy Haul Transportation Corridor City/County: Jeffersonville / Clark County Sampling Date: 7/21/15

Applicant/Owner: INDOT State: IN Sampling Point: DP24

Investigator(s): Ben Harvey, Josh Price Section, Township, Range: Clark's Grant #16

Landform (hillslope, terrace, etc.): Limestone Hills Local relief (concave, convex, none): none

Slope (%): 1.0 Lat: 38.3420 Long: 85.6696 Datum: WGS 1984

Soil Map Unit Name: Haymond silt loam, 0 to 2 percent slopes, occasionally flooded, very brief duration (HcgAW) NWI classification: n/a

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

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ◉ No ○

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

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

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

Remarks:

This data point was collected to confirm upland conditions adjacent to UNT 5. Water appears to sheet toward the streams rather than standing in this area.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Platanus occidentalis*	50	Yes	FACW
2. *Celtis occidentalis*	40	Yes	FAC
3. *Juglans nigra*	20	No	FACU
4. *Ulmus rubra*	10	No	FAC
5.			
	120	= Total Cover	

Sapling/Shrub Stratum (Plot size: 15 ft)			
1. *Acer negundo*	5	Yes	FAC
2. *Forestiera acuminata*	5	Yes	OBL
3. *Platanus occidentalis*	5	Yes	FACW
4.			
5.			
	15	= Total Cover	

Herb Stratum (Plot size: 5 ft)			
1. *Euonymus americanus*	45	Yes	FAC
2. *Rosa multiflora*	10	No	FACU
3. *Parthenocissus quinquefolia*	10	No	FACU
4. *Persicaria pensylvanica*	7	No	FACW
5. *Viola sororia*	6	No	FAC
6. *Smilax hispida*	5	No	FAC
7. *Elymus riparius*	3	No	FACW
8. *Sanicula canadensis*	1	No	FACU
9.			
10.			
	87	= Total Cover	

Woody Vine Stratum (Plot size: 15 ft)			
1.			
2.			
	0	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 6 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

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

Prevalence Index worksheet:

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

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

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

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

Hydrophytic Vegetation Present? Yes ◉ No ○

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

SOIL

Sampling Point: DP24

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-3	7.5YR 2.5/1	60	7.5YR 4/3	40	C	M	Silt Loam	
3-13	7.5YR 5/4	100					Silt Loam	
13-18	7.5YR 5/4	95	7.5YR 3/3	5	C	M	Clay	

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

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ○ No ◉

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present? Yes ○ No ◉ Depth (inches): < 0

Water Table Present? Yes ○ No ◉ Depth (inches): > 18

Saturation Present? (includes capillary fringe) Yes ○ No ◉ Depth (inches): > 18

Wetland Hydrology Present? Yes ◉ No ○

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

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Des. No. 1382612 Heavy Haul Transportation Corridor City/County: Jeffersonville / Clark County Sampling Date: 7/21/15

Applicant/Owner: INDOT State: IN Sampling Point: DP25

Investigator(s): Audrey Hanner, Briana Hope Section, Township, Range: Clark's Grant #16

Landform (hillslope, terrace, etc.): Limestone Hills Local relief (concave, convex, none): none

Slope (%): 0.5 Lat: 38.3423 Long: 85.6706 Datum: WGS 1984

Soil Map Unit Name: Elkinsville-Millstone silt loams, 6 to 12 percent slopes, eroded (EesC2) NWI classification: n/a

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

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ◉ No ○

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

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

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

Remarks:

This data point is representative of the upland conditions within the wooded area, south of Lentzier Creek

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Liriodendron tulipifera*	85	Yes	FACU
2. *Tilia americana*	15	No	FACU
3. *Fagus grandifolia*	10	No	FACU
4.			
5.			
	110	= Total Cover	

Sapling/Shrub Stratum (Plot size: 15 ft)			
1. *Liriodendron tulipifera*	15	Yes	FACU
2. *Asimina triloba*	15	Yes	FAC
3.			
4.			
5.			
	30	= Total Cover	

Herb Stratum (Plot size: 5 ft)			
1. *Liriodendron tulipifera*	15	Yes	FACU
2. *Persicaria virginiana*	13	Yes	FAC
3. *Sanicula canadensis*	10	Yes	FACU
4. *Acer saccharum*	7	No	FACU
5. *Elymus trachycaulus*	7	No	FACU
6. *Viola bicolor*	7	No	FACU
7. *Maianthemum canadense*	5	No	FAC
8. *Agrimonia gryposepala*	5	No	FACU
9.			
10.			
	69	= Total Cover	

Woody Vine Stratum (Plot size: 15 ft)			
1. *Lonicera japonica*	1	Yes	FACU
2.			
	1	= Total Cover	

Dominance Test worksheet:

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

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 29 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species	33	x 3 =	99
FACU species	177	x 4 =	708
UPL species		x 5 =	
Column Totals:	210 (A)		807 (B)

Prevalence Index = B/A = 3.84

Hydrophytic Vegetation Indicators:

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

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

Hydrophytic Vegetation Present? Yes ○ No ◉

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

SOIL

Sampling Point: DP25

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-8	10YR 4/4	100					Silt Loam	
8-14	10YR 5/4	85	10YR 4/2	15	D	M	Silt Loam	
14-18	10YR 5/6	95	10YR 4/2	5	D	M	Silty Clay Loam	

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

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ○ No ◉

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present? Yes ○ No ◉ Depth (inches): < 0

Water Table Present? Yes ○ No ◉ Depth (inches): > 18

Saturation Present? (includes capillary fringe) Yes ○ No ◉ Depth (inches): > 18

Wetland Hydrology Present? Yes ○ No ◉

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

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Des. No. 1382612 Heavy Haul Transportation Corridor City/County: Jeffersonville / Clark County Sampling Date: 7/21/15

Applicant/Owner: INDOT State: IN Sampling Point: DP26

Investigator(s): Ben Harvey, Josh Price Section, Township, Range: Clark's Grant #16

Landform (hillslope, terrace, etc.): Limestone Hills Local relief (concave, convex, none): none

Slope (%): 1.0 Lat: 38.3428 Long: 85.6712 Datum: WGS 1984

Soil Map Unit Name: Haymond silt loam, 0 to 2 percent slopes, occasionally flooded, very brief duration (HcgAW) NWI classification: n/a

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

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ◉ No ○

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

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

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

Remarks:

This data point was collected to confirm upland conditions adjacent to Lentzier Creek. Water appears to sheet flow toward the stream rather than stand in this area.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Fraxinus pennsylvanica*	30	Yes	FACW
2. *Acer negundo*	20	Yes	FAC
3. *Platanus occidentalis*	5	No	FACW
4.			
5.			
	55	= Total Cover	

Sapling/Shrub Stratum (Plot size: 15 ft)			
1. *Acer negundo*	15	Yes	FAC
2.			
3.			
4.			
5.			
	15	= Total Cover	

Herb Stratum (Plot size: 5 ft)			
1. *Elymus riparius*	30	Yes	FACW
2. *Elymus virginicus*	15	Yes	FACW
3. *Rosa multiflora*	10	No	FACU
4. *Verbesina alternifolia*	7	No	FACW
5. *Toxicodendron radicans*	7	No	FAC
6. *Glechoma hederacea*	5	No	FACU
7. *Ageratina altissima*	3	No	FACU
8.			
9.			
10.			
	77	= Total Cover	

Woody Vine Stratum (Plot size: 15 ft)			
1. *Vitis vulpina*	5	Yes	FAC
2. *Parthenocissus quinquefolia*	5	Yes	FACU
	10	= Total Cover	

Dominance Test worksheet:

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

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 83 (A/B)

Prevalence Index worksheet:

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

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

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

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

Hydrophytic Vegetation Present? Yes ◉ No ○

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

SOIL

Sampling Point: DP26

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-18	7.5YR 4/4	100					Silt Loam	

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

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ○ No ◉

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present?	Yes ○	No ◉	Depth (inches): < 0
Water Table Present?	Yes ○	No ◉	Depth (inches): > 18
Saturation Present? (includes capillary fringe)	Yes ○	No ◉	Depth (inches): > 18

Wetland Hydrology Present? Yes ◉ No ○

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

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Des. No. 1382612 Heavy Haul Transportation Corridor City/County: Jeffersonville / Clark County Sampling Date: 7/21/15

Applicant/Owner: INDOT State: IN Sampling Point: DP27

Investigator(s): Rick Paul, Monica Del Real Section, Township, Range: Clark's Grant # 16

Landform (hillslope, terrace, etc.): Limestone Hills Local relief (concave, convex, none): concave

Slope (%): 2.0 Lat: 38.3426 Long: 85.6698 Datum: WGS 1984

Soil Map Unit Name: Haymond silt loam, 0 to 2 percent slopes, occasionally flooded, very brief duration (HcgAW) NWI classification: n/a

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

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

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

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

Hydrophytic Vegetation Present?	Yes (●)	No ( )	**Is the Sampled Area within a Wetland?** Yes (●) No ( )
Hydric Soil Present?	Yes (●)	No ( )	
Wetland Hydrology Present?	Yes (●)	No ( )	

Remarks:

This data point is representative of the emergent portion of Wetland I.

VEGETATION – Use scientific names of plants.

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

Sapling/Shrub Stratum (Plot size: 15 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Fraxinus pennsylvanica*	7	Yes	FACW
2. *Platanus occidentalis*	7	Yes	FACW
3. *Salix nigra*	6	Yes	OBL
4. *Rosa palustris*	5	Yes	OBL
5.			
	25 = Total Cover		

Herb Stratum (Plot size: 5 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Carex frankii*	40	Yes	OBL
2. *Plantago major*	15	Yes	FACU
3. *Lysimachia nummularia*	15	Yes	FACW
4. *Ambrosia artemisiifolia*	10	No	FACU
5. *Mimulus alatus*	2	No	OBL
6.			
7.			
8.			
9.			
10.			
	82 = Total Cover		

Woody Vine Stratum (Plot size: 15 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 6 (A)

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 86 (A/B)

Prevalence Index worksheet:

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

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

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

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

Hydrophytic Vegetation Present? Yes (●) No ( )

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

SOIL

Sampling Point: DP27

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-18	10YR 4/2	90	10YR 4/6	10	C	M	Silty Clay Loam	

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

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ◉ No ○

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present? Yes ○ No ◉ Depth (inches): <0

Water Table Present? Yes ◉ No ○ Depth (inches): 10

Saturation Present? (includes capillary fringe) Yes ◉ No ○ Depth (inches): 10

Wetland Hydrology Present? Yes ◉ No ○

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

Remarks:

This wetland is located within a large depressional area at the toe of slope.

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Des. No. 1382612 Heavy Haul Transportation Corridor City/County: Jeffersonville / Clark County Sampling Date: 7/21/15

Applicant/Owner: INDOT State: IN Sampling Point: DP28

Investigator(s): Rick Paul, Monica Del Real Section, Township, Range: Clark's Grant #16

Landform (hillslope, terrace, etc.): Limestone Hills Local relief (concave, convex, none): concave

Slope (%): 2.0 Lat: 38.3427 Long: 85.6698 Datum: WGS 1984

Soil Map Unit Name: Caneyville-Rock outcrop complex, 25 to 60 percent slopes (CcaG) NWI classification: n/a

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

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ◉ No ○

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

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

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

Remarks:

This data point is representative of the upland area surrounding Wetland I.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Ulmus americana*	30	Yes	FACW
2. *Prunus serotina*	20	Yes	FACU
3. *Liriodendron tulipifera*	20	Yes	FACU
4.			
5.			
	70	= Total Cover	

Sapling/Shrub Stratum (Plot size: 15 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Lonicera morrowii*	30	Yes	FACU
2. *Juniperus virginiana*	30	Yes	FACU
3. *Quercus rubra*	20	Yes	FACU
4.			
5.			
	80	= Total Cover	

Herb Stratum (Plot size: 5 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Toxicodendron radicans*	10	Yes	FAC
2. *Dichanthelium clandestinum*	10	Yes	FACW
3. *Glechoma hederacea*	10	Yes	FACU
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	30	= Total Cover	

Woody Vine Stratum (Plot size: 15 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
	0	= Total Cover	

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species	40	x 2 =	80
FAC species	10	x 3 =	10
FACU species	130	x 4 =	520
UPL species		x 5 =	
Column Totals:	180 (A)		610 (B)

Prevalence Index = B/A = 3.39

Hydrophytic Vegetation Indicators:

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

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

Hydrophytic Vegetation Present? Yes ○ No ◉

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

SOIL

Sampling Point: DP28

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-18	10YR 4/3	100					Silty Clay Loam	

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

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ○ No ◉

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present? Yes ○ No ◉ Depth (inches): < 0

Water Table Present? Yes ○ No ◉ Depth (inches): > 18

Saturation Present? (includes capillary fringe) Yes ○ No ◉ Depth (inches): > 18

Wetland Hydrology Present? Yes ◉ No ○

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

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Des. No. 1382612 Heavy Haul Transportation Corridor City/County: Jeffersonville / Clark County Sampling Date: 7/21/15

Applicant/Owner: INDOT State: IN Sampling Point: DP29

Investigator(s): Rick Paul, Monica Del Real Section, Township, Range: Clark's Grant #16

Landform (hillslope, terrace, etc.): Limestone Hills Local relief (concave, convex, none): concave

Slope (%): 2.0 Lat: 38.3429 Long: 85.6704 Datum: WGS 1984

Soil Map Unit Name: Haymond silt loam, 0 to 2 percent slopes, occasionally flooded, very brief duration (HcgAW) NWI classification: n/a

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

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes (●) No ( )

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

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

Hydrophytic Vegetation Present?	Yes (●)	No ( )	**Is the Sampled Area within a Wetland?** Yes (●) No ( )
Hydric Soil Present?	Yes (●)	No ( )	
Wetland Hydrology Present?	Yes (●)	No ( )	

Remarks:

This Data Point is representative of the emergent portion of Wetland I.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Platanus occidentalis*	25	Yes	FACW
2.			
3.			
4.			
5.			
	25	= Total Cover	

Sapling/Shrub Stratum (Plot size: 15 ft)			
1. *Fraxinus pennsylvanica*	17	Yes	FACW
2. *Platanus occidentalis*	10	Yes	FACW
3. *Salix interior*	7	No	FACW
4. *Acer saccharinum*	5	No	FACW
5.			
	39	= Total Cover	

Herb Stratum (Plot size: 5 ft)			
1. *Coleataenia rigidula*	70	Yes	FACW
2. *Lythrum salicaria*	30	Yes	OBL
3. *Glechoma hederacea*	10	No	FACU
4. *Dichanthelium clandestinum*	10	No	FACW
5. *Lysimachia nummularia*	5	No	FACW
6. *Carex cristatella*	5	No	FACW
7.			
8.			
9.			
10.			
	130	= Total Cover	

Woody Vine Stratum (Plot size: 15 ft)			
1.			
2.			
	0	= Total Cover	

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

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

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

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

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

Hydrophytic Vegetation Present? Yes (●) No ( )

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

SOIL

Sampling Point: DP29

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-18	10YR 4/2	50	10YR 4/1	40	D	M	Silty Clay Loam	
			7.5YR 4/6	10	C	M		

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

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ◉ No ○

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present? Yes ○ No ◉ Depth (inches): <0

Water Table Present? Yes ◉ No ○ Depth (inches): 6

Saturation Present? (includes capillary fringe) Yes ◉ No ○ Depth (inches): 0

Wetland Hydrology Present? Yes ◉ No ○

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

Remarks:

This wetland is located in a large depression located at the toe of slope.

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Des. No. 1382612 Heavy Haul Transportation Corridor City/County: Jeffersonville / Clark County Sampling Date: 7/21/15

Applicant/Owner: INDOT State: IN Sampling Point: DP30

Investigator(s): Rick Paul, Monica Del Real Section, Township, Range: Clark's Grant 16

Landform (hillslope, terrace, etc.): Limestone Hills Local relief (concave, convex, none): concave

Slope (%): 2.0 Lat: 38.3432 Long: 85.6707 Datum: WGS 1984

Soil Map Unit Name: Haymond silt loam, 0 to 2 percent slopes, occasionally flooded, very brief duration (HcgAW) NWI classification: n/a

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

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ◉ No ○

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

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

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

Remarks:

This Data Point is representative of the forested portion of Wetland I.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Fraxinus pennsylvanica*	50	Yes	FACW
2. *Platanus occidentalis*	50	Yes	FACW
3.			
4.			
5.			
	100	= Total Cover	

Sapling/Shrub Stratum (Plot size: 15 ft)			
1.			
2.			
3.			
4.			
5.			
	0	= Total Cover	

Herb Stratum (Plot size: 5 ft)			
1. *Lysimachia nummularia*	5	Yes	FACW
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	5	= Total Cover	

Woody Vine Stratum (Plot size: 15 ft)			
1.			
2.			
	0	= Total Cover	

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

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

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

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

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

Hydrophytic Vegetation Present? Yes ◉ No ○

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

SOIL

Sampling Point: DP30

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-18	10YR 4/2	85	10YR 4/6	15	C	M	Silty Clay Loam	

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

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ◉ No ○

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present? Yes ○ No ◉ Depth (inches): <0

Water Table Present? Yes ◉ No ○ Depth (inches): 7

Saturation Present? (includes capillary fringe) Yes ◉ No ○ Depth (inches): 7

Wetland Hydrology Present? Yes ◉ No ○

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

Remarks:

This wetland is located within a large depression area located along the toe of slope.

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Des. No. 1382612 Heavy Haul Transportation Corridor City/County: Jeffersonville / Clark County Sampling Date: 7/21/15

Applicant/Owner: INDOT State: IN Sampling Point: DP31

Investigator(s): Rick Paul, Monica Del Real Section, Township, Range: Clark's Grant #16

Landform (hillslope, terrace, etc.): Limestone Hills Local relief (concave, convex, none): concave

Slope (%): 2.0 Lat: 38.3433 Long: 85.6706 Datum: WGS 1984

Soil Map Unit Name: Caneyville-Rock outcrop complex, 25 to 60 percent slopes (CcaG) NWI classification: n/a

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

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ◉ No ○

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

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

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

Remarks:

This data point is representative of the upland area surrounding Wetland I.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Platanus occidentalis*	90	Yes	FACW
2. *Acer negundo*	10	No	FAC
3.			
4.			
5.			
	100	= Total Cover	

Sapling/Shrub Stratum (Plot size: 15 ft)			
1.			
2.			
3.			
4.			
5.			
	0	= Total Cover	

Herb Stratum (Plot size: 5 ft)			
1. *Glechoma hederacea*	10	Yes	FACU
2. *Lonicera japonica*	5	Yes	FACU
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	15	= Total Cover	

Woody Vine Stratum (Plot size: 15 ft)			
1.			
2.			
	0	= Total Cover	

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species	90	x 2 =	180
FAC species	10	x 3 =	30
FACU species	15	x 4 =	60
UPL species		x 5 =	
Column Totals:	115 (A)		270 (B)

Prevalence Index = B/A = 2.35

Hydrophytic Vegetation Indicators:

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

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

Hydrophytic Vegetation Present? Yes ◉ No ○

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

SOIL

Sampling Point: DP31

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-18	7.5YR 4/6	100					Silty Clay Loam	

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

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ○ No ◉

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present? Yes ○ No ◉ Depth (inches): < 0

Water Table Present? Yes ○ No ◉ Depth (inches): > 18

Saturation Present? (includes capillary fringe) Yes ○ No ◉ Depth (inches): > 18

Wetland Hydrology Present? Yes ○ No ◉

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

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Des. No. 1382612 Heavy Haul Transportation Corridor City/County: Jeffersonville / Clark County Sampling Date: 7/21/15

Applicant/Owner: INDOT State: IN Sampling Point: DP32

Investigator(s): Rick Paul, Monica Del Real Section, Township, Range: Clark's Grant #16

Landform (hillslope, terrace, etc.): Limestone Hills Local relief (concave, convex, none): concave

Slope (%): 2.0 Lat: 38.3430 Long: 85.6715 Datum: WGS 1984

Soil Map Unit Name: Haymond silt loam, 0 to 2 percent slopes, occasionally flooded, very brief duration (HcgAW) NWI classification: n/a

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

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

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

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

Hydrophytic Vegetation Present?	Yes (●)	No ( )	**Is the Sampled Area within a Wetland?** Yes (●) No ( )
Hydric Soil Present?	Yes (●)	No ( )	
Wetland Hydrology Present?	Yes (●)	No ( )	

Remarks:

This Data Point is representative of the emergent portion of Wetland I.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Platanus occidentalis*	35	Yes	FACW
2.			
3.			
4.			
5.			
	35	= Total Cover	

Sapling/Shrub Stratum (Plot size: 15 ft)			
1. *Fraxinus pennsylvanica*	10	Yes	FACW
2.			
3.			
4.			
5.			
	10	= Total Cover	

Herb Stratum (Plot size: 5 ft)			
1. *Juncus tenuis*	15	Yes	FAC
2. *Echinochloa crus-galli*	10	Yes	FACW
3. *Phalaris arundinacea*	7	Yes	FACW
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	32	= Total Cover	

Woody Vine Stratum (Plot size: 15 ft)			
1.			
2.			
	0	= Total Cover	

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

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

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

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

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

Hydrophytic Vegetation Present? Yes (●) No ( )

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

SOIL

Sampling Point: DP32

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-18	10YR 4/2	85	10YR 4/6	15	C	M	Silty Clay Loam	

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

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ◉ No ○

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present? Yes ◉ No ○ Depth (inches): 2

Water Table Present? Yes ◉ No ○ Depth (inches): <0

Saturation Present? (includes capillary fringe) Yes ◉ No ○ Depth (inches): <0

Wetland Hydrology Present? Yes ◉ No ○

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

Remarks:

The wetland is located within a large depression located at the toe-of-slope.

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Des. No. 1382612 Transportation Corridor City/County: Jeffersonville / Clark County Sampling Date: 5/7/14

Applicant/Owner: INDOT State: IN Sampling Point: DP33

Investigator(s): Briana Hope, Leah Boits Section, Township, Range: Clark's Grant #16

Landform (hillslope, terrace, etc.): Limestone Hills Local relief (concave, convex, none): none

Slope (%): 1.0 Lat: 38.3433 Long: 85.6675 Datum: D_WGS_1984

Soil Map Unit Name: Haymond silt loam, 0 to 2 percent slopes, occasionally flooded, very brief duration (HcgAW) NWI classification: N/A

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

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes (●) No ( )

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

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

Hydrophytic Vegetation Present?	Yes (●)	No ( )	**Is the Sampled Area within a Wetland?** Yes ( ) No (●)
Hydric Soil Present?	Yes ( )	No (●)	
Wetland Hydrology Present?	Yes ( )	No (●)	

Remarks:

This data point is representative of the upland area surrounding Wetland J.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Fraxinus pennsylvanica*	30	Yes	FACW
2. *cer negundo*	20	Yes	FAC
3. *Morus rubra*	15	Yes	FACU
4.			
5.			
	65	= Total Cover	

Sapling/Shrub Stratum (Plot size: 15 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. *cer negundo*	30	Yes	FAC
2. *Rosa multiflora*	5	No	FACU
3. *Lonicera morro ii*	5	No	FACU
4.			
5.			
	40	= Total Cover	

Herb Stratum (Plot size: 5 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. *eranium maculatum*	30	Yes	FACU
2. *Verbesina alternifolia*	20	Yes	FACW
3. *Elymus virginicus*	10	No	FACW
4. *eum vernum*	5	No	FACU
5. *llium canadense*	3	No	FACU
6. *alium aparine*	2	No	FACU
7. *Viola sororia*	2	No	FAC
8. *Erigeron philadelphicus*	2	No	FACW
9. *eracleum mantega ianum*	1	No	FAC
10.			
	75	= Total Cover	

Woody Vine Stratum (Plot size: 15 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
	0	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

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

Prevalence Index worksheet:

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

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

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

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

Hydrophytic Vegetation Present? Yes (●) No ( )

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

SOIL

Sampling Point: DP33

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-8	10YR 3/3	95	10YR 2/2	5	D	M		
8-18	10YR 4/3	80	10YR 4/6	20	C	M		

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

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ○ No ◉

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present? Yes ○ No ◉ Depth (inches): < 0

Water Table Present? Yes ○ No ◉ Depth (inches): > 18

Saturation Present? (includes capillary fringe) Yes ○ No ◉ Depth (inches): > 18

Wetland Hydrology Present? Yes ○ No ◉

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

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Des. No. 1382612 Heavy Haul Transportation Corridor City/County: Jeffersonville / Clark County Sampling Date: 5/7/14

Applicant/Owner: INDOT State: IN Sampling Point: DP34

Investigator(s): Briana Hope, Leah Boits Section, Township, Range: Clark's Grant #16

Landform (hillslope, terrace, etc.): Limestone Hills Local relief (concave, convex, none): concave

Slope (%): 1.5 Lat: 38.3434 Long: 85.6673 Datum: D_WGS_1984

Soil Map Unit Name: Haymond silt loam, 0 to 2 percent slopes, occasionally flooded, very brief duration (HcgAW) NWI classification: N/A

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

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ◉ No ○

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

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

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

Remarks:

This data point is representative of Wetland J.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Acer negundo*	45	Yes	FAC
2. *Fraxinus pennsylvanica*	25	Yes	FACW
3.			
4.			
5.			
	70	= Total Cover	

Sapling/Shrub Stratum (Plot size: 15 ft)			
1. *Lonicera morrowii*	8	Yes	FACU
2. *Lindera benzoin*	8	Yes	FACW
3. *Rosa multiflora*	3	No	FACU
4.			
5.			
	19	= Total Cover	

Herb Stratum (Plot size: 5 ft)			
1. *Geum canadense*	20	Yes	FAC
2. *Elymus virginicus*	15	Yes	FACW
3. *Impatiens capensis*	7	No	FACW
4. *Viola sororia*	5	No	FACW
5.			
6.			
7.			
8.			
9.			
10.			
	47	= Total Cover	

Woody Vine Stratum (Plot size: 15 ft)			
1.			
2.			
	0	= Total Cover	

Dominance Test worksheet:

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

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 83 (A/B)

Prevalence Index worksheet:

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

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

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

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

Hydrophytic Vegetation Present? Yes ◉ No ○

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

SOIL

Sampling Point: DP34

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-8	10YR 4/2	60	10YR 4/1	40	D	M	silty loam	
8-18	10YR 4/2	85	7.5YR 4/6	5	C	M	silty loam	
			10YR 4/1	10	D	M		

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

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ◉ No ○

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present? Yes ○ No ◉ Depth (inches): < 0

Water Table Present? Yes ◉ No ○ Depth (inches): 14

Saturation Present? (includes capillary fringe) Yes ◉ No ○ Depth (inches): 12

Wetland Hydrology Present? Yes ◉ No ○

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

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Des. No. 1382612 Heavy Haul Transportation Corridor City/County: Jeffersonville / Clark County Sampling Date: 5/7/14

Applicant/Owner: INDOT State: IN Sampling Point: DP35

Investigator(s): Briana Hope, Leah Boits Section, Township, Range: Clark's Grant #16

Landform (hillslope, terrace, etc.): Limestone Hills Local relief (concave, convex, none): none

Slope (%): 0.5 Lat: 38.3445 Long: 85.6679 Datum: D_WGS_1984

Soil Map Unit Name: Haymond silt loam, 0 to 2 percent slopes, occasionally flooded, very brief duration (HcgAW) NWI classification: N/A

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

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes (●) No ( )

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

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

Hydrophytic Vegetation Present?	Yes (●)	No ( )	**Is the Sampled Area within a Wetland?**	**Yes ( ) No (●)**
Hydric Soil Present?	Yes ( )	No (●)		
Wetland Hydrology Present?	Yes ( )	No (●)		

Remarks:

This data point is representative of the upland conditions surrounding UNT 8.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Acer negundo*	35	Yes	FAC
2. *Celtis occidentalis*	15	Yes	FAC
3. *Fraxinus pennsylvanica*	15	Yes	FACW
4.			
5.			
	65	= Total Cover	

Sapling/Shrub Stratum (Plot size: 15 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Lonicera morrowii*	3	No	FACU
2. *Acer negundo*	2	No	FAC
3.			
4.			
5.			
	5	= Total Cover	

Herb Stratum (Plot size: 5 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Phacelia ranunculacea*	65	Yes	FACW
2. *Rosa multiflora*	10	No	FACU
3. *Elymus virginicus*	5	No	FACW
4. *Galium aparine*	5	No	FACU
5. *Boehmeria cylindrica*	5	No	OBL
6. *Geum vernum*	5	No	FACU
7. *Toxicodendron radicans*	5	No	FAC
8.			
9.			
10.			
	100	= Total Cover	

Woody Vine Stratum (Plot size: 15 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Parthenocissus quinquefolia*	10	Yes	FACU
2.			
	10	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 80 (A/B)

Prevalence Index worksheet:

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

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

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

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

Hydrophytic Vegetation Present? Yes (●) No ( )

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

SOIL

Sampling Point: DP35

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-4	10YR 3/3	100						
4-12	10YR 4/4	100						
12-18	10YR 4/4	80	10YR 4/1	20	D	M	silty loam	

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

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ○ No ◉

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present? Yes ○ No ◉ Depth (inches): < 0

Water Table Present? Yes ○ No ◉ Depth (inches): > 18

Saturation Present? (includes capillary fringe) Yes ○ No ◉ Depth (inches): > 18

Wetland Hydrology Present? Yes ○ No ◉

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

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Des. No. 1382612 Heavy Haul Transportation Corridor City/County: Jeffersonville / Clark County Sampling Date: 5/7/14

Applicant/Owner: INDOT State: IN Sampling Point: DP36

Investigator(s): Briana Hope, Leah Boits Section, Township, Range: Clark's Grant #16

Landform (hillslope, terrace, etc.): Limestone Hills Local relief (concave, convex, none): none

Slope (%): 0.5 Lat: 38.3458 Long: 85.6682 Datum: D_WGS_1984

Soil Map Unit Name: Caneyville-Rock outcrop complex, 25 to 60 percent slopes (CcaG) NWI classification: N/A

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

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ◉ No ○

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

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

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

Remarks:

This data point is representative of the upland conditions surrounding UNT 8

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Acer negundo*	25	Yes	FAC
2. *Platanus occidentalis*	20	Yes	FACW
3. *Ulmus americana*	5	No	FACW
4. *Prunus serotina*	1	No	FACU
5.			
	51	= Total Cover	

Sapling/Shrub Stratum (Plot size: 15 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Fraxinus pennsylvanica*	5	Yes	FACW
2. *Ulmus americana*	5	Yes	FACW
3. *Rosa multiflora*	5	Yes	FACU
4.			
5.			
	15	= Total Cover	

Herb Stratum (Plot size: 5 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Elymus virginicus*	8	Yes	FACW
2. *Geum vernum*	5	Yes	FACU
3. *Boehmeria cylindrica*	3	No	OBL
4. *Sanicula canadensis*	3	No	FACU
5. *Phacelia ranunculacea*	3	No	FACW
6. *Carex blanda*	3	No	FAC
7.			
8.			
9.			
10.			
	25	= Total Cover	

Woody Vine Stratum (Plot size: 15 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Vitis riparia*	6	Yes	FACW
2. *Parthenocissus quinquefolia*	4	No	FACU
	10	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 6 (A)

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 75 (A/B)

Prevalence Index worksheet:

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

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

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

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

Hydrophytic Vegetation Present? Yes ◉ No ○

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

SOIL

Sampling Point: DP36

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-6	10YR 3/3	98	10YR 4/1	2	D	M	silty loam	
6-18	10YR 3/3	94	10YR 4/2	6	D	M	loamy silt	

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

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ○ No ◉

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present? Yes ○ No ◉ Depth (inches): < 0

Water Table Present? Yes ○ No ◉ Depth (inches): > 18

Saturation Present? (includes capillary fringe) Yes ○ No ◉ Depth (inches): > 18

Wetland Hydrology Present? Yes ○ No ◉

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

Remarks:

Appendix C - Quality Assessment Forms

QHEI
HHEI

QHEI 1

OhioEPA Qualitative Habitat Evaluation Index and Use Assessment Field Sheet

QHEI Score: 38

Stream & Location: UNT 1, Heavy Haul (Des. 1382612) / Clark County, Indiana **RM:** ___.___ **Date:** 7 / 21 / 15

Scorers Full Name & Affiliation: Leah Boits, American Structurepoint

River Code: ___-___-___ **STORET #:** _____ **Lat./Long.:** 38 . 32904 /85 . 66987 (NAD 83 - decimal °) **Office verified location** ☐

1] SUBSTRATE

Check ONLY Two substrate TYPE BOXES; estimate % or note every type present

BEST TYPES	POOL	RIFFLE	OTHER TYPES	POOL	RIFFLE
☐ ☐ BLDR /SLABS [10]			☐ ☐ HARDPAN [4]		
☐ ☐ BOULDER [9]			☐ ☐ DETRITUS [3]		
☐ ☐ COBBLE [8]			☐ ☐ MUCK [2]		
☐ ☐ GRAVEL [7]	5		☑ ☐ SILT [2]	70	
☐ ☒ SAND [6]	25		☐ ☐ ARTIFICIAL [0]		
☐ ☐ BEDROCK [5]					

(Score natural substrates; ignore sludge from point-sources)

NUMBER OF BEST TYPES: ☐ 4 or more [2] ☑ 3 or less [0]

Check ONE (Or 2 & average)

ORIGIN	QUALITY
☑ LIMESTONE [1]	☐ HEAVY [-2]
☐ TILLS [1]	☑ MODERATE [-1]
☐ WETLANDS [0]	☐ NORMAL [0]
☐ HARDPAN [0]	☐ FREE [1]
☐ SANDSTONE [0]	SILT
☐ RIP/RAP [0]	☐ EXTENSIVE [-2]
☐ LACUSTURINE [0]	☑ MODERATE [-1]
☐ SHALE [-1]	☐ NORMAL [0]
☐ COAL FINES [-2]	☐ NONE [1]

EMBEDDEDNESS

Substrate 7 (Maximum 20)

Comments

2] INSTREAM COVER

Indicate presence 0 to 3: 0-Absent; 1-Very small amounts or if more common of marginal quality; 2-Moderate amounts, but not of highest quality or in small amounts of highest quality; 3-Highest quality in moderate or greater amounts (e.g., very large boulders in deep or fast water, large diameter log that is stable, well developed rootwad in deep / fast water, or deep, well-defined, functional pools.

___ UNDERCUT BANKS [1]	___ POOLS > 70cm [2]	___ OXBOWS, BACKWATERS [1]
2 OVERHANGING VEGETATION [1]	___ ROOTWADS [1]	___ AQUATIC MACROPHYTES [1]
___ SHALLOWS (IN SLOW WATER) [1]	___ BOULDERS [1]	1 LOGS OR WOODY DEBRIS [1]
___ ROOTMATS [1]		

AMOUNT Check ONE (Or 2 & average)

☐ EXTENSIVE >75% [11]
☑ MODERATE 25-75% [7]
☐ SPARSE 5-<25% [3]
☐ NEARLY ABSENT <5% [1]

Comments

Cover 9 (Maximum 20)

3] CHANNEL MORPHOLOGY

Check ONE in each category (Or 2 & average)

SINUOSITY	DEVELOPMENT	CHANNELIZATION	STABILITY
☐ HIGH [4]	☐ EXCELLENT [7]	☐ NONE [6]	☐ HIGH [3]
☐ MODERATE [3]	☐ GOOD [5]	☐ RECOVERED [4]	☑ MODERATE [2]
☐ LOW [2]	☐ FAIR [3]	☐ RECOVERING [3]	☐ LOW [1]
☑ NONE [1]	☑ POOR [1]	☑ RECENT OR NO RECOVERY [1]	

Comments

Channel 5 (Maximum 20)

4] BANK EROSION AND RIPARIAN ZONE

Check ONE in each category for EACH BANK (Or 2 per bank & average)

River right looking downstream

EROSION (L R)	RIPARIAN WIDTH (L R)	FLOOD PLAIN QUALITY (L R)	(L R)
☑ ☑ NONE / LITTLE [3]	☑ ☐ WIDE > 50m [4]	☐ ☐ FOREST, SWAMP [3]	☐ ☐ CONSERVATION TILLAGE [1]
☐ ☐ MODERATE [2]	☐ ☑ MODERATE 10-50m [3]	☐ ☑ SHRUB OR OLD FIELD [2]	☐ ☐ URBAN OR INDUSTRIAL [0]
☐ ☐ HEAVY / SEVERE [1]	☐ ☐ NARROW 5-10m [2]	☑ ☐ RESIDENTIAL, PARK, NEW FIELD [1]	☐ ☐ MINING / CONSTRUCTION [0]
	☐ ☐ VERY NARROW < 5m [1]	☐ ☐ FENCED PASTURE [1]	
	☐ ☐ NONE [0]	☐ ☐ OPEN PASTURE, ROWCROP [0]	

Indicate predominant land use(s) past 100m riparian.

Comments

Riparian 8 (Maximum 10)

5] POOL / GLIDE AND RIFFLE / RUN QUALITY

MAXIMUM DEPTH	CHANNEL WIDTH	CURRENT VELOCITY
Check ONE (ONLY!)	Check ONE (Or 2 & average)	Check ALL that apply
☐ > 1m [6]	☐ POOL WIDTH > RIFFLE WIDTH [2]	☐ TORRENTIAL [-1] ☑ SLOW [1]
☐ 0.7-<1m [4]	☑ POOL WIDTH = RIFFLE WIDTH [1]	☐ VERY FAST [1] ☐ INTERSTITIAL [-1]
☐ 0.4-<0.7m [2]	☐ POOL WIDTH < RIFFLE WIDTH [0]	☐ FAST [1] ☐ INTERMITTENT [-2]
☑ 0.2-<0.4m [1]		☐ MODERATE [1] ☐ EDDIES [1]
☐ < 0.2m [0]		*Indicate for reach - pools and riffles.*

Recreation Potential
Primary Contact
Secondary Contact
(circle one and comment on back)

Comments

Pool / Current 3 (Maximum 12)

Indicate for functional riffles; Best areas must be large enough to support a population of riffle-obligate species: Check ONE (Or 2 & average). ☑ NO RIFFLE [metric=0]

RIFFLE DEPTH	RUN DEPTH	RIFFLE / RUN SUBSTRATE	RIFFLE / RUN EMBEDDEDNESS
☐ BEST AREAS > 10cm [2]	☐ MAXIMUM > 50cm [2]	☐ STABLE (e.g., Cobble, Boulder) [2]	☐ NONE [2]
☐ BEST AREAS 5-10cm [1]	☐ MAXIMUM < 50cm [1]	☐ MOD. STABLE (e.g., Large Gravel) [1]	☐ LOW [1]
☐ BEST AREAS < 5cm [metric=0]		☐ UNSTABLE (e.g., Fine Gravel, Sand) [0]	☐ MODERATE [0]
			☐ EXTENSIVE [-1]

Comments

Riffle / Run 0 (Maximum 8)

6] GRADIENT

(6.79 ft/mi) ☐ VERY LOW - LOW [2-4] ☑ MODERATE [6-10] ☐ HIGH - VERY HIGH [10-6]

DRAINAGE AREA (0.04 mi²)

%POOL: 5 %GLIDE: 90
%RUN: 5 %RIFFLE: 0

Gradient 6 (Maximum 10)

A] SAMPLED REACH

Check ALL that apply

METHOD

- ☐ BOAT
- ☑ WADE
- ☐ L. LINE
- ☐ OTHER

STAGE

1st -sample pass- 2nd

- ☐ HIGH ☐
- ☐ UP ☐
- ☑ NORMAL ☑
- ☐ LOW ☐
- ☐ DRY ☐

DISTANCE

- ☐ 0.5 Km
- ☐ 0.2 Km
- ☐ 0.15 Km
- ☐ 0.12 Km
- ☐ OTHER

59 meters

CLARITY

1st --sample pass-- 2nd

- ☐ < 20 cm ☐
- ☐ 20-<40 cm ☐
- ☐ 40-70 cm ☐
- ☑ > 70 cm/ CTB ☐
- ☐ SECCHI DEPTH ☐

CANOPY

- ☐ > 85%- OPEN
- ☐ 55%-<85%
- ☒ 30%-<55%
- ☐ 10%-<30%
- ☐ <10%- CLOSED

1st pass _____ cm

2nd _____ cm

Comment RE: Reach consistency/ Is reach typical of steam?, *Recreation/* Observed - Inferred, *Other/* Sampling observations, Concerns, Access directions, etc.

Last precipitation: 2015-07-20, 0.02 inch

B] AESTHETICS

- ☐ NUISANCE ALGAE
- ☐ INVASIVE MACROPHYTES
- ☐ EXCESS TURBIDITY
- ☐ DISCOLORATION
- ☐ FOAM / SCUM
- ☐ OIL SHEEN
- ☐ TRASH / LITTER
- ☐ NUISANCE ODOR
- ☐ SLUDGE DEPOSITS
- ☐ CSOs/SSOs/OUTFALLS

C] RECREATION

AREA DEPTH

POOL: ☐ >100ft² ☐ >3ft

D] MAINTENANCE

PUBLIC / PRIVATE / BOTH / NA
ACTIVE / HISTORIC / BOTH / NA
YOUNG-SUCCESSION-OLD
SPRAY / SNAG / REMOVED
MODIFIED / DIPPED OUT / NA
LEVEED / ONE SIDED
RELOCATED / CUTOFFS
MOVING-BEDLOAD-STABLE
ARMOURED / SLUMPS
ISLANDS / SCOURED
IMPOUNDED / DESICCATED
FLOOD CONTROL / DRAINAGE

Circle some & *COMMENT*

E] ISSUES

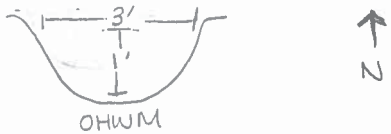
WWTP / CSO / NPDES / INDUSTRY
HARDENED / URBAN / DIRT&GRIME
CONTAMINATED / LANDFILL
BMPs-CONSTRUCTION-SEDIMENT
LOGGING / IRRIGATION / COOLING
BANK / EROSION / SURFACE
FALSE BANK / MANURE / LAGOON
WASH H_20 / TILE / H_20 TABLE
ACID / MINE / QUARRY / FLOW
NATURAL / WETLAND / STAGNANT
PARK / GOLF / LAWN / HOME
ATMOSPHERE / DATA PAUCITY

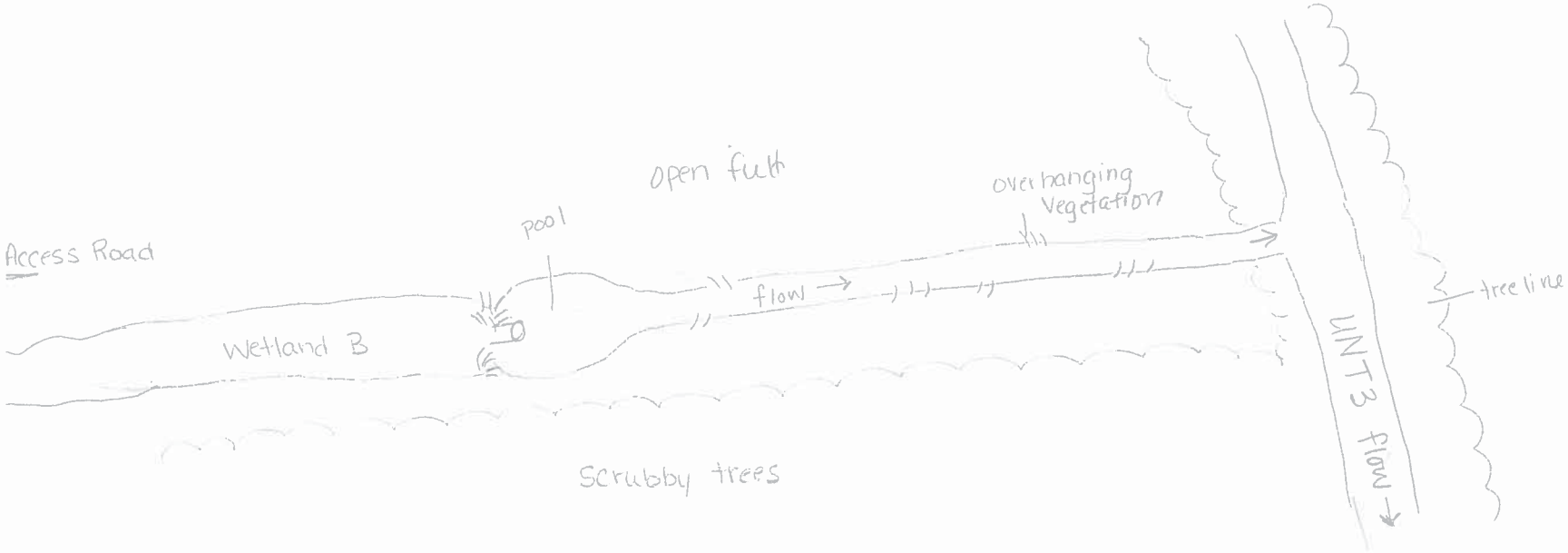
F] MEASUREMENTS

- $\bar{x}$ width
- $\bar{x}$ depth
- max. depth
- $\bar{x}$ bankfull width
- bankfull $\bar{x}$ depth
- W/D ratio
- bankfull max. depth
- floodprone x^2 width
- entrench. ratio

Legacy Tree:

Stream Drawing:





QHEI 2

OhioEPA Qualitative Habitat Evaluation Index and Use Assessment Field Sheet

QHEI Score: 39.5

Stream & Location: UNT 2, Heavy Haul (Des. 1382612) / Clark County, Indiana **RM:** ___ **Date:** 7 / 21 / 15

Scorers Full Name & Affiliation: Leah Boits, American Structurepoint

River Code: ___-___-___ **STORET #:** _____ **Lat./ Long.:** 38 . 33001 /85 . 67148 (NAD 83 - decimal °) **Office verified location** ☐

1] SUBSTRATE

Check ONLY Two substrate TYPE BOXES; estimate % or note every type present

BEST TYPES	POOL	RIFFLE	OTHER TYPES	POOL	RIFFLE
☐ ☐ BLDR /SLABS [10]			☐ ☐ HARDPAN [4]		
☐ ☐ BOULDER [9]			☐ ☐ DETRITUS [3]		
☐ ☐ COBBLE [8]			☐ ☐ MUCK [2]		
☐ ☐ GRAVEL [7]	10	20	☑ ☐ SILT [2]	70	50
☐ ☒ SAND [6]	20	30	☐ ☐ ARTIFICIAL [0]		
☐ ☐ BEDROCK [5]					

(Score natural substrates; ignore sludge from point-sources)

NUMBER OF BEST TYPES: ☐ 4 or more [2] ☑ 3 or less [0]

Check ONE (Or 2 & average)

ORIGIN	QUALITY	
☑ LIMESTONE [1]	☐ HEAVY [-2]	
☐ TILLS [1]	☑ MODERATE [-1]	SILT
☐ WETLANDS [0]	☐ NORMAL [0]	
☐ HARDPAN [0]	☐ FREE [1]	
☐ SANDSTONE [0]	☐ EXTENSIVE [-2]	EMBEDDEDNESS
☐ RIP/RAP [0]	☑ MODERATE [-1]	
☐ LACUSTURINE [0]	☐ NORMAL [0]	
☐ SHALE [-1]	☐ NONE [1]	
☐ COAL FINES [-2]		

Comments

Substrate 7 (Maximum 20)

2] INSTREAM COVER

Indicate presence 0 to 3: 0-Absent; 1-Very small amounts or if more common of marginal quality; 2-Moderate amounts, but not of highest quality or in small amounts of highest quality; 3-Highest quality in moderate or greater amounts (e.g., very large boulders in deep or fast water, large diameter log that is stable, well developed rootwad in deep / fast water, or deep, well-defined, functional pools.

___ UNDERCUT BANKS [1]	___ POOLS > 70cm [2]	___ OXBOWS, BACKWATERS [1]
2 OVERHANGING VEGETATION [1]	___ ROOTWADS [1]	___ AQUATIC MACROPHYTES [1]
___ SHALLOWS (IN SLOW WATER) [1]	___ BOULDERS [1]	___ LOGS OR WOODY DEBRIS [1]
___ ROOTMATS [1]		

AMOUNT

Check ONE (Or 2 & average)

☐ EXTENSIVE >75% [11]
☑ MODERATE 25-75% [7]
☐ SPARSE 5-<25% [3]
☐ NEARLY ABSENT <5% [1]

Comments

Cover 8 (Maximum 20)

3] CHANNEL MORPHOLOGY

Check ONE in each category (Or 2 & average)

SINUOSITY	DEVELOPMENT	CHANNELIZATION	STABILITY
☐ HIGH [4]	☐ EXCELLENT [7]	☐ NONE [6]	☐ HIGH [3]
☐ MODERATE [3]	☐ GOOD [5]	☐ RECOVERED [4]	☑ MODERATE [2]
☑ LOW [2]	☐ FAIR [3]	☐ RECOVERING [3]	☐ LOW [1]
☐ NONE [1]	☑ POOR [1]	☑ RECENT OR NO RECOVERY [1]	

Comments

Channel 6 (Maximum 20)

4] BANK EROSION AND RIPARIAN ZONE

Check ONE in each category for EACH BANK (Or 2 per bank & average)

River right looking downstream

EROSION (L R)	RIPARIAN WIDTH (L R)	FLOOD PLAIN QUALITY (L R)	(L R)
☐ ☐ NONE / LITTLE [3]	☐ ☐ WIDE > 50m [4]	☐ ☐ FOREST, SWAMP [3]	☐ ☐ CONSERVATION TILLAGE [1]
☑ ☑ MODERATE [2]	☐ ☐ MODERATE 10-50m [3]	☑ ☑ SHRUB OR OLD FIELD [2]	☐ ☑ URBAN OR INDUSTRIAL [0]
☐ ☐ HEAVY / SEVERE [1]	☑ ☑ NARROW 5-10m [2]	☑ ☐ RESIDENTIAL, PARK, NEW FIELD [1]	☐ ☐ MINING / CONSTRUCTION [0]
	☐ ☐ VERY NARROW < 5m [1]	☐ ☐ FENCED PASTURE [1]	
	☐ ☐ NONE [0]	☐ ☐ OPEN PASTURE, ROWCROP [0]	

Indicate predominant land use(s) past 100m riparian.

Comments

Riparian 6.5 (Maximum 10)

5] POOL / GLIDE AND RIFFLE / RUN QUALITY

MAXIMUM DEPTH	CHANNEL WIDTH	CURRENT VELOCITY
Check ONE (ONLY!)	Check ONE (Or 2 & average)	Check ALL that apply
☐ > 1m [6]	☐ POOL WIDTH > RIFFLE WIDTH [2]	☐ TORRENTIAL [-1] ☑ SLOW [1]
☐ 0.7-<1m [4]	☑ POOL WIDTH = RIFFLE WIDTH [1]	☐ VERY FAST [1] ☐ INTERSTITIAL [-1]
☑ 0.4-<0.7m [2]	☐ POOL WIDTH < RIFFLE WIDTH [0]	☐ FAST [1] ☐ INTERMITTENT [-2]
☐ 0.2-<0.4m [1]		☐ MODERATE [1] ☐ EDDIES [1]
☐ < 0.2m [0]		*Indicate for reach - pools and riffles.*

Recreation Potential
Primary Contact
Secondary Contact
(circle one and comment on back)

Comments

Pool / Current 4 (Maximum 12)

Indicate for functional riffles; Best areas must be large enough to support a population of riffle-obligate species: Check ONE (Or 2 & average). ☐ NO RIFFLE [metric=0]

RIFFLE DEPTH	RUN DEPTH	RIFFLE / RUN SUBSTRATE	RIFFLE / RUN EMBEDDEDNESS
☐ BEST AREAS > 10cm [2]	☐ MAXIMUM > 50cm [2]	☐ STABLE (e.g., Cobble, Boulder) [2]	☐ NONE [2]
☑ BEST AREAS 5-10cm [1]	☑ MAXIMUM < 50cm [1]	☐ MOD. STABLE (e.g., Large Gravel) [1]	☐ LOW [1]
☐ BEST AREAS < 5cm [metric=0]		☑ UNSTABLE (e.g., Fine Gravel, Sand) [0]	☑ MODERATE [0]
			☐ EXTENSIVE [-1]

Comments

Riffle / Run 2 (Maximum 8)

6] GRADIENT (ft/mi)

DRAINAGE AREA (0.06 mi²)

☐ VERY LOW - LOW [2-4]
☑ MODERATE [6-10]
☐ HIGH - VERY HIGH [10-6]

%POOL: 5 %GLIDE: 50
%RUN: 40 %RIFFLE: 5

Gradient 6 (Maximum 10)

A] SAMPLED REACH

Check ALL that apply

Comment RE: Reach consistency/ Is reach typical of steam?, *Recreation/* Observed - Inferred, *Other/* Sampling observations, Concerns, Access directions, etc.

Last precipitation: 2015-07-20, 0.02 inch

METHOD

- ☐ BOAT
- ☑ WADE
- ☐ L. LINE
- ☐ OTHER

STAGE

1st -sample pass-	2nd
☐ HIGH	☐
☐ UP	☐
☑ NORMAL	☑
☐ LOW	☐
☐ DRY	☐

DISTANCE

- ☐ 0.5 Km
- ☐ 0.2 Km
- ☐ 0.15 Km
- ☐ 0.12 Km
- ☐ OTHER

60 meters

CLARITY

1st --sample pass--	2nd
☐ < 20 cm	☐
☐ 20-<40 cm	☐
☐ 40-70 cm	☐
☑ > 70 cm/ CTB	☐
☐ SECCHI DEPTH	☐

CANOPY

- ☐ > 85%- OPEN
- ☒ 55%-<85%
- ☐ 30%-<55%
- ☐ 10%-<30%
- ☐ <10%- CLOSED

pass 1st _____ cm

pass 2nd _____ cm

B] AESTHETICS

- ☐ NUISANCE ALGAE
- ☐ INVASIVE MACROPHYTES
- ☐ EXCESS TURBIDITY
- ☐ DISCOLORATION
- ☐ FOAM / SCUM
- ☐ OIL SHEEN
- ☐ TRASH / LITTER
- ☐ NUISANCE ODOR
- ☐ SLUDGE DEPOSITS
- ☐ CSOs/SSOs/OUTFALLS

C] RECREATION

	AREA	DEPTH
POOL:	☐ >100ft²	☐ >3ft

D] MAINTENANCE

Circle some & *COMMENT*

PUBLIC / PRIVATE / BOTH / NA
ACTIVE / HISTORIC / BOTH / NA
YOUNG-SUCCESSION-OLD
SPRAY / SNAG / REMOVED
MODIFIED / DIPPED OUT / NA
LEVEED / ONE SIDED
RELOCATED / CUTOFFS
MOVING-BEDLOAD-STABLE
ARMOURED / SLUMPS
ISLANDS / SCOURED
IMPOUNDED / DESICCATED
FLOOD CONTROL / DRAINAGE

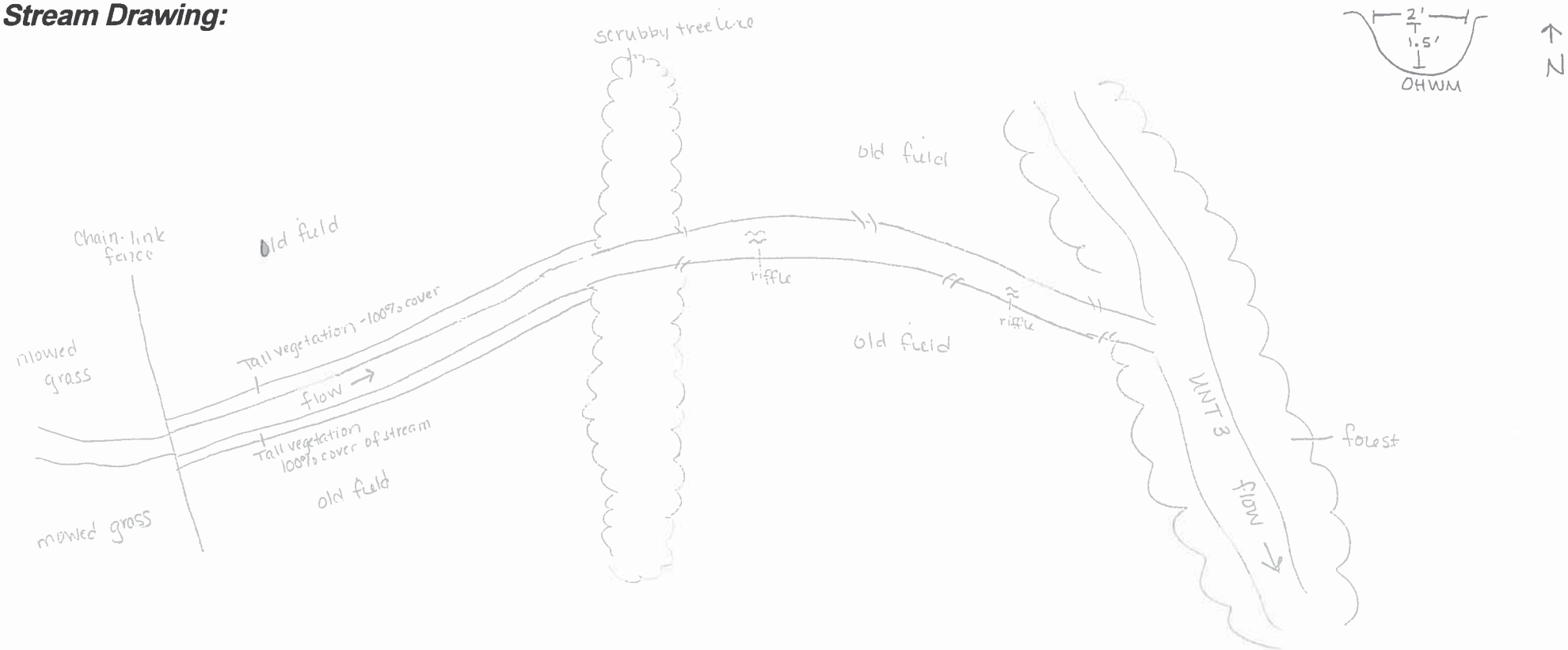
E] ISSUES

WWTP / CSO / NPDES / INDUSTRY
HARDENED / URBAN / DIRT&GRIME
CONTAMINATED / LANDFILL
BMPs-CONSTRUCTION-SEDIMENT
LOGGING / IRRIGATION / COOLING
BANK / EROSION / SURFACE
FALSE BANK / MANURE / LAGOON
WASH H_20 / TILE / H_20 TABLE
ACID / MINE / QUARRY / FLOW
NATURAL / WETLAND / STAGNANT
PARK / GOLF / LAWN / HOME
ATMOSPHERE / DATA PAUCITY

F] MEASUREMENTS

- $\bar{x}$ width
- $\bar{x}$ depth
- max. depth
- $\bar{x}$ bankfull width
- bankfull $\bar{x}$ depth
- W/D ratio
- bankfull max. depth
- floodprone x^2 width
- entrench. ratio
- *Legacy Tree:*

Stream Drawing:



QHEI 3

OhioEPA Qualitative Habitat Evaluation Index and Use Assessment Field Sheet

QHEI Score: 56.5

Stream & Location: UNT 3, Heavy Haul (Des. 1382612) / Clark County, Indiana **RM:** _ _ _._ **Date:** 7 / 21 / 15

Scorers Full Name & Affiliation: Leah Boits, American Structurepoint

River Code: _ _ _ - _ _ _ - _ _ _ **STORET #:** _ _ _ _ _ _ **Lat./ Long.:** (NAD 83 - decimal °) 38 . 32976 / 85 . 67069 **Office verified location** ☐

1] SUBSTRATE

Check ONLY Two substrate TYPE BOXES; estimate % or note every type present

BEST TYPES	POOL	RIFFLE	OTHER TYPES	POOL	RIFFLE
☐ ☐ BLDR /SLABS [10]			☐ ☐ HARDPAN [4]		
☐ ☐ BOULDER [9]			☐ ☐ DETRITUS [3]		
☐ ☐ COBBLE [8]	10	20	☐ ☐ MUCK [2]		
☐ ☑ GRAVEL [7]	20	20	☐ ☐ SILT [2]	20	10
☒ ☐ SAND [6]	50	50	☐ ☐ ARTIFICIAL [0]		
☐ ☐ BEDROCK [5]					

(Score natural substrates; ignore sludge from point-sources)

NUMBER OF BEST TYPES: ☐ 4 or more [2] ☑ 3 or less [0]

Check ONE (Or 2 & average)

ORIGIN	QUALITY
☑ LIMESTONE [1]	☐ HEAVY [-2]
☐ TILLS [1]	☐ MODERATE [-1]
☐ WETLANDS [0]	☑ NORMAL [0]
☐ HARDPAN [0]	☐ FREE [1]
☐ SANDSTONE [0]	☐ EXTENSIVE [-2]
☐ RIP/RAP [0]	☐ MODERATE [-1]
☐ LACUSTURINE [0]	☑ NORMAL [0]
☐ SHALE [-1]	☐ NONE [1]
☐ COAL FINES [-2]	

SILT

EMBEDDEDNESS

Comments

Substrate 14 Maximum 20

2] INSTREAM COVER

Indicate presence 0 to 3: 0-Absent; 1-Very small amounts or if more common of marginal quality; 2-Moderate amounts, but not of highest quality or in small amounts of highest quality; 3-Highest quality in moderate or greater amounts (e.g., very large boulders in deep or fast water, large diameter log that is stable, well developed rootwad in deep / fast water, or deep, well-defined, functional pools.

___ UNDERCUT BANKS [1]	___ POOLS > 70cm [2]	___ OXBOWS, BACKWATERS [1]
1 OVERHANGING VEGETATION [1]	___ ROOTWADS [1]	___ AQUATIC MACROPHYTES [1]
___ SHALLOWS (IN SLOW WATER) [1]	___ BOULDERS [1]	1 LOGS OR WOODY DEBRIS [1]
___ ROOTMATS [1]		

AMOUNT

Check ONE (Or 2 & average)

☐ EXTENSIVE >75% [11]
☑ MODERATE 25-75% [7]
☐ SPARSE 5-<25% [3]
☐ NEARLY ABSENT <5% [1]

Comments

Cover 10 Maximum 20

3] CHANNEL MORPHOLOGY

Check ONE in each category (Or 2 & average)

SINUOSITY	DEVELOPMENT	CHANNELIZATION	STABILITY
☐ HIGH [4]	☐ EXCELLENT [7]	☐ NONE [6]	☐ HIGH [3]
☐ MODERATE [3]	☐ GOOD [5]	☐ RECOVERED [4]	☐ MODERATE [2]
☑ LOW [2]	☑ FAIR [3]	☑ RECOVERING [3]	☑ LOW [1]
☐ NONE [1]	☐ POOR [1]	☐ RECENT OR NO RECOVERY [1]	

Comments

Channel 9 Maximum 20

4] BANK EROSION AND RIPARIAN ZONE

Check ONE in each category for EACH BANK (Or 2 per bank & average)

River right looking downstream

EROSION (L R)	RIPARIAN WIDTH (L R)	FLOOD PLAIN QUALITY (L R)	(L R)
☐ ☐ NONE / LITTLE [3]	☐ ☐ WIDE > 50m [4]	☑ ☐ FOREST, SWAMP [3]	☐ ☐ CONSERVATION TILLAGE [1]
☑ ☑ MODERATE [2]	☑ ☐ MODERATE 10-50m [3]	☐ ☑ SHRUB OR OLD FIELD [2]	☐ ☐ URBAN OR INDUSTRIAL [0]
☐ ☐ HEAVY / SEVERE [1]	☐ ☑ NARROW 5-10m [2]	☐ ☐ RESIDENTIAL, PARK, NEW FIELD [1]	☐ ☐ MINING / CONSTRUCTION [0]
	☐ ☐ VERY NARROW < 5m [1]	☐ ☐ FENCED PASTURE [1]	
	☐ ☐ NONE [0]	☐ ☐ OPEN PASTURE, ROWCROP [0]	

Indicate predominant land use(s) past 100m riparian.

Comments

Riparian 7 Maximum 10

5] POOL / GLIDE AND RIFFLE / RUN QUALITY

MAXIMUM DEPTH	CHANNEL WIDTH	CURRENT VELOCITY
Check ONE (ONLY!)	Check ONE (Or 2 & average)	Check ALL that apply
☐ > 1m [6]	☑ POOL WIDTH > RIFFLE WIDTH [2]	☐ TORRENTIAL [-1] ☑ SLOW [1]
☐ 0.7-<1m [4]	☐ POOL WIDTH = RIFFLE WIDTH [1]	☐ VERY FAST [1] ☐ INTERSTITIAL [-1]
☑ 0.4-<0.7m [2]	☐ POOL WIDTH < RIFFLE WIDTH [0]	☐ FAST [1] ☐ INTERMITTENT [-2]
☐ 0.2-<0.4m [1]		☑ MODERATE [1] ☐ EDDIES [1]
☐ < 0.2m [0]		*Indicate for reach - pools and riffles.*

Recreation Potential
Primary Contact
Secondary Contact
(circle one and comment on back)

Comments

Pool / Current 6 Maximum 12

Indicate for functional riffles; Best areas must be large enough to support a population of riffle-obligate species: Check ONE (Or 2 & average). ☐ NO RIFFLE [metric=0]

RIFFLE DEPTH	RUN DEPTH	RIFFLE / RUN SUBSTRATE	RIFFLE / RUN EMBEDDEDNESS
☐ BEST AREAS > 10cm [2]	☐ MAXIMUM > 50cm [2]	☑ STABLE (e.g., Cobble, Boulder) [2]	☐ NONE [2]
☑ BEST AREAS 5-10cm [1]	☑ MAXIMUM < 50cm [1]	☑ MOD. STABLE (e.g., Large Gravel) [1]	☑ LOW [1]
☐ BEST AREAS < 5cm [metric=0]		☐ UNSTABLE (e.g., Fine Gravel, Sand) [0]	☐ MODERATE [0]
			☐ EXTENSIVE [-1]

Comments

Riffle / Run 4.5 Maximum 8

6] GRADIENT

(ft/mi) ☐ VERY LOW - LOW [2-4] ☑ MODERATE [6-10] ☐ HIGH - VERY HIGH [10-6]

DRAINAGE AREA (0.23 mi²)

%POOL: 15 %GLIDE: 25 %RUN: 40 %RIFFLE: 20

Gradient 6 Maximum 10

A] SAMPLED REACH

Check ALL that apply

Comment RE: Reach consistency/ Is reach typical of steam?, *Recreation/* Observed - Inferred, *Other/* Sampling observations, Concerns, Access directions, etc.

Last precipitation: 2015-07-20, 0.02 inch

METHOD

- ☐ BOAT
- ☑ WADE
- ☐ L. LINE
- ☐ OTHER

STAGE

1st -sample pass-	2nd
☐ HIGH	☐
☐ UP	☐
☑ NORMAL	☑
☐ LOW	☐
☐ DRY	☐

DISTANCE

- ☐ 0.5 Km
- ☐ 0.2 Km
- ☐ 0.15 Km
- ☐ 0.12 Km
- ☐ OTHER

60 meters

CLARITY

1st --sample pass--	2nd
☐ < 20 cm	☐
☐ 20-<40 cm	☐
☐ 40-70 cm	☐
☑ > 70 cm/ CTB	☐
☐ SECCHI DEPTH	☐

CANOPY

- ☐ > 85%- OPEN
- ☐ 55%-<85%
- ☐ 30%-<55%
- ☐ 10%-<30%
- ☒ <10%- CLOSED

pass 1st _____ cm

2nd _____ cm

B] AESTHETICS

- ☐ NUISANCE ALGAE
- ☐ INVASIVE MACROPHYTES
- ☐ EXCESS TURBIDITY
- ☐ DISCOLORATION
- ☐ FOAM / SCUM
- ☐ OIL SHEEN
- ☐ TRASH / LITTER
- ☐ NUISANCE ODOR
- ☐ SLUDGE DEPOSITS
- ☐ CSOs/SSOs/OUTFALLS

C] RECREATION

	AREA	DEPTH
POOL:	☐ >100ft²	☐ >3ft

D] MAINTENANCE

Circle some & *COMMENT*

PUBLIC / PRIVATE / BOTH / NA
ACTIVE / HISTORIC / BOTH / NA
YOUNG-SUCCESSION-OLD
SPRAY / SNAG / REMOVED
MODIFIED / DIPPED OUT / NA
LEVEED / ONE SIDED
RELOCATED / CUTOFFS
MOVING-BEDLOAD-STABLE
ARMOURED / SLUMPS
ISLANDS / SCOURED
IMPOUNDED / DESICCATED
FLOOD CONTROL / DRAINAGE

E] ISSUES

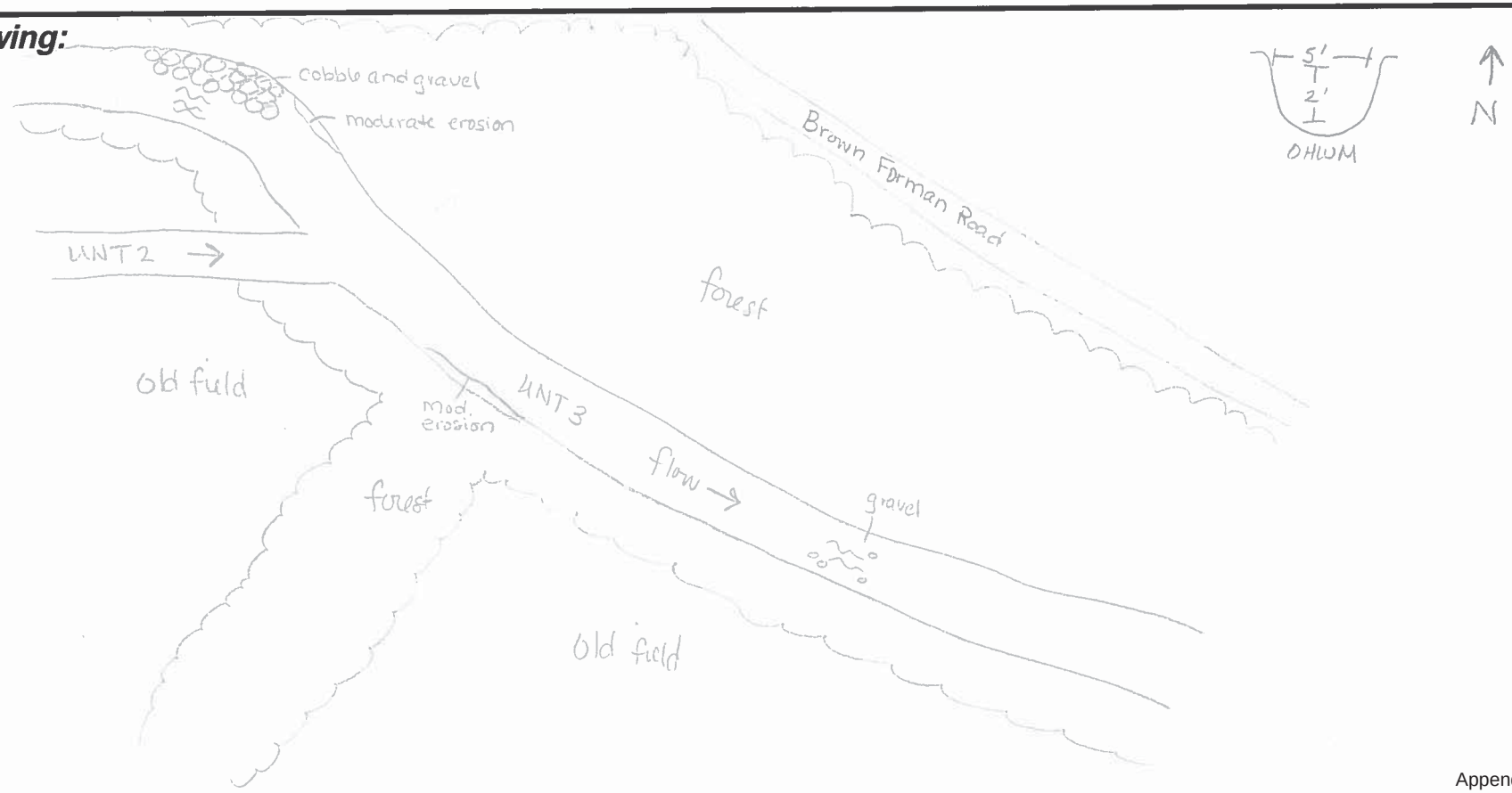
WWTP / CSO / NPDES / INDUSTRY
HARDENED / URBAN / DIRT&GRIME
CONTAMINATED / LANDFILL
BMPs-CONSTRUCTION-SEDIMENT
LOGGING / IRRIGATION / COOLING
BANK / EROSION / SURFACE
FALSE BANK / MANURE / LAGOON
WASH H_20 / TILE / H_20 TABLE
ACID / MINE / QUARRY / FLOW
NATURAL / WETLAND / STAGNANT
PARK / GOLF / LAWN / HOME
ATMOSPHERE / DATA PAUCITY

F] MEASUREMENTS

- $\bar{x}$ width
- $\bar{x}$ depth
- max. depth
- $\bar{x}$ bankfull width
- bankfull $\bar{x}$ depth
- W/D ratio
- bankfull max. depth
- floodprone x^2 width
- entrench. ratio

Legacy Tree:

Stream Drawing:



OhioEPA Qualitative Habitat Evaluation Index and Use Assessment Field Sheet

QHEI Score: 50.5

Stream & Location: UNT 3, Heavy Haul (Des. 1382612) / Clark County, Indiana **RM:** _ _ _._ **Date:** 7 / 21 / 15

Scorers Full Name & Affiliation: Leah Boits, American Structurepoint

River Code: _ _ _ - _ _ _ - _ _ _ **STORET #:** _ _ _ _ _ _ **Lat./ Long.:** (NAD 83 - decimal °) 38 . 33295 / 85 . 67324 **Office verified location** ☐

1] SUBSTRATE

Check ONLY Two substrate TYPE BOXES; estimate % or note every type present

BEST TYPES	POOL	RIFFLE	OTHER TYPES	POOL	RIFFLE
☐ ☐ BLDR /SLABS [10]			☐ ☐ HARDPAN [4]		
☐ ☐ BOULDER [9]	5	5	☐ ☐ DETRITUS [3]		
☐ ☐ COBBLE [8]	5	20	☐ ☐ MUCK [2]		
☐ ☐ GRAVEL [7]	10	25	☑ ☐ SILT [2]	50	10
☐ ☑ SAND [6]	30	40	☐ ☐ ARTIFICIAL [0]		
☐ ☐ BEDROCK [5]					

(Score natural substrates; ignore sludge from point-sources)

NUMBER OF BEST TYPES: ☑ 4 or more [2] ☐ 3 or less [0]

Check ONE (Or 2 & average)

ORIGIN	SILT	QUALITY
☑ LIMESTONE [1]		☐ HEAVY [-2]
☐ TILLS [1]		☐ MODERATE [-1]
☐ WETLANDS [0]		☑ NORMAL [0]
☐ HARDPAN [0]		☐ FREE [1]
☐ SANDSTONE [0]	EMBEDDEDNESS	☐ EXTENSIVE [-2]
☐ RIP/RAP [0]		☐ MODERATE [-1]
☐ LACUSTURINE [0]		☑ NORMAL [0]
☐ SHALE [-1]		☐ NONE [1]
☐ COAL FINES [-2]		

Substrate 11 (Maximum 20)

Comments

2] INSTREAM COVER

Indicate presence 0 to 3: 0-Absent; 1-Very small amounts or if more common of marginal quality; 2-Moderate amounts, but not of highest quality or in small amounts of highest quality; 3-Highest quality in moderate or greater amounts (e.g., very large boulders in deep or fast water, large diameter log that is stable, well developed rootwad in deep / fast water, or deep, well-defined, functional pools.

___ UNDERCUT BANKS [1]	___ POOLS > 70cm [2]	___ OXBOWS, BACKWATERS [1]
1 OVERHANGING VEGETATION [1]	___ ROOTWADS [1]	___ AQUATIC MACROPHYTES [1]
___ SHALLOWS (IN SLOW WATER) [1]	___ BOULDERS [1]	1 LOGS OR WOODY DEBRIS [1]
___ ROOTMATS [1]		

AMOUNT

Check ONE (Or 2 & average)

☐ EXTENSIVE >75% [11]
☑ MODERATE 25-75% [7]
☐ SPARSE 5-<25% [3]
☐ NEARLY ABSENT <5% [1]

Comments

Cover 9 (Maximum 20)

3] CHANNEL MORPHOLOGY

Check ONE in each category (Or 2 & average)

SINUOSITY	DEVELOPMENT	CHANNELIZATION	STABILITY
☐ HIGH [4]	☐ EXCELLENT [7]	☐ NONE [6]	☐ HIGH [3]
☑ MODERATE [3]	☑ GOOD [5]	☑ RECOVERED [4]	☑ MODERATE [2]
☐ LOW [2]	☐ FAIR [3]	☐ RECOVERING [3]	☐ LOW [1]
☑ NONE [1]	☑ POOR [1]	☑ RECENT OR NO RECOVERY [1]	

Comments

Channel 9.5 (Maximum 20)

4] BANK EROSION AND RIPARIAN ZONE

Check ONE in each category for EACH BANK (Or 2 per bank & average)

River right looking downstream

EROSION (L R)	RIPARIAN WIDTH (L R)	FLOOD PLAIN QUALITY (L R)	(L R)
☑ ☑ NONE / LITTLE [3]	☑ ☐ WIDE > 50m [4]	☑ ☐ FOREST, SWAMP [3]	☐ ☐ CONSERVATION TILLAGE [1]
☑ ☑ MODERATE [2]	☑ ☐ MODERATE 10-50m [3]	☐ ☐ SHRUB OR OLD FIELD [2]	☐ ☐ URBAN OR INDUSTRIAL [0]
☐ ☐ HEAVY / SEVERE [1]	☐ ☐ NARROW 5-10m [2]	☐ ☐ RESIDENTIAL, PARK, NEW FIELD [1]	☐ ☐ MINING / CONSTRUCTION [0]
	☐ ☑ VERY NARROW < 5m [1]	☐ ☐ FENCED PASTURE [1]	
	☐ ☑ NONE [0]	☐ ☑ OPEN PASTURE, ROWCROP [0]	

Indicate predominant land use(s) past 100m riparian.

Comments

Riparian 6 (Maximum 10)

5] POOL / GLIDE AND RIFFLE / RUN QUALITY

MAXIMUM DEPTH	CHANNEL WIDTH	CURRENT VELOCITY
Check ONE (ONLY!)	Check ONE (Or 2 & average)	Check ALL that apply
☐ > 1m [6]	☐ POOL WIDTH > RIFFLE WIDTH [2]	☐ TORRENTIAL [-1] ☑ SLOW [1]
☐ 0.7-<1m [4]	☑ POOL WIDTH = RIFFLE WIDTH [1]	☐ VERY FAST [1] ☐ INTERSTITIAL [-1]
☑ 0.4-<0.7m [2]	☐ POOL WIDTH < RIFFLE WIDTH [0]	☑ FAST [1] ☐ INTERMITTENT [-2]
☐ 0.2-<0.4m [1]		☑ MODERATE [1] ☐ EDDIES [1]
☐ < 0.2m [0]		*Indicate for reach - pools and riffles.*

Recreation Potential
Primary Contact
Secondary Contact
(circle one and comment on back)

Comments

Pool / Current 6 (Maximum 12)

Indicate for functional riffles; Best areas must be large enough to support a population of riffle-obligate species: Check ONE (Or 2 & average). ☐ NO RIFFLE [metric=0]

RIFFLE DEPTH	RUN DEPTH	RIFFLE / RUN SUBSTRATE	RIFFLE / RUN EMBEDDEDNESS
☐ BEST AREAS > 10cm [2]	☐ MAXIMUM > 50cm [2]	☐ STABLE (e.g., Cobble, Boulder) [2]	☐ NONE [2]
☑ BEST AREAS 5-10cm [1]	☑ MAXIMUM < 50cm [1]	☑ MOD. STABLE (e.g., Large Gravel) [1]	☐ LOW [1]
☐ BEST AREAS < 5cm [metric=0]		☐ UNSTABLE (e.g., Fine Gravel, Sand) [0]	☑ MODERATE [0]
			☐ EXTENSIVE [-1]

Comments

Riffle / Run 3 (Maximum 8)

6] GRADIENT

(ft/mi) ☐ VERY LOW - LOW [2-4] ☑ MODERATE [6-10] ☐ HIGH - VERY HIGH [10-6]

DRAINAGE AREA (0.23 mi²)

%POOL: 15 %GLIDE: 25
%RUN: 40 %RIFFLE: 20

Gradient 6 (Maximum 10)

A] SAMPLED REACH

Check ALL that apply

METHOD

- ☐ BOAT
- ☑ WADE
- ☐ L. LINE
- ☐ OTHER

DISTANCE

- ☐ 0.5 Km
- ☐ 0.2 Km
- ☐ 0.15 Km
- ☐ 0.12 Km
- ☐ OTHER

60 meters

STAGE

1st -sample pass-	2nd
☐ HIGH	☐
☐ UP	☐
☑ NORMAL	☑
☐ LOW	☐
☐ DRY	☐

CLARITY

1st --sample pass--	2nd
☐ < 20 cm	☐
☐ 20-<40 cm	☐
☐ 40-70 cm	☐
☑ > 70 cm/ CTB	☐
☐ SECCHI DEPTH	☐

CANOPY

- ☐ > 85%- OPEN
- ☐ 55%-<85%
- ☒ 30%-<55%
- ☐ 10%-<30%
- ☐ <10%- CLOSED

1st pass _____ cm

2nd _____ cm

Comment RE: Reach consistency/ Is reach typical of steam?, *Recreation/* Observed - Inferred, *Other/* Sampling observations, Concerns, Access directions, etc.

Last precipitation: 2015-07-20, 0.02 inch

B] AESTHETICS

- ☐ NUISANCE ALGAE
- ☐ INVASIVE MACROPHYTES
- ☐ EXCESS TURBIDITY
- ☐ DISCOLORATION
- ☐ FOAM / SCUM
- ☐ OIL SHEEN
- ☐ TRASH / LITTER
- ☐ NUISANCE ODOR
- ☐ SLUDGE DEPOSITS
- ☐ CSOs/SSOs/OUTFALLS

C] RECREATION

AREA DEPTH

POOL: ☐ >100ft² ☐ >3ft

D] MAINTENANCE

PUBLIC / PRIVATE / BOTH / NA
ACTIVE / HISTORIC / BOTH / NA
YOUNG-SUCCESSION-OLD
SPRAY / SNAG / REMOVED
MODIFIED / DIPPED OUT / NA
LEVEED / ONE SIDED
RELOCATED / CUTOFFS
MOVING-BEDLOAD-STABLE
ARMOURED / SLUMPS
ISLANDS / SCOURED
IMPOUNDED / DESICCATED
FLOOD CONTROL / DRAINAGE

Circle some & *COMMENT*

E] ISSUES

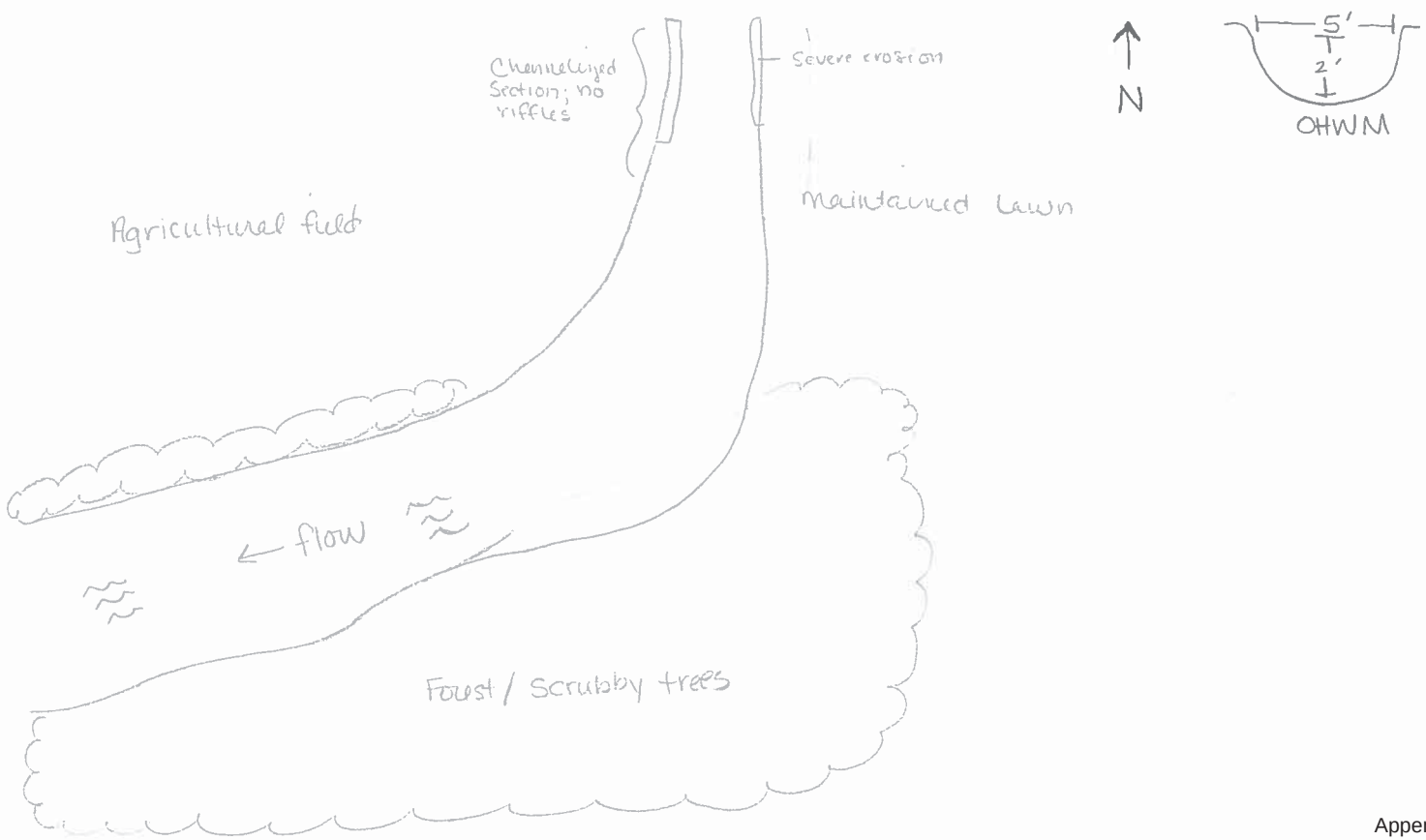
WWTP / CSO / NPDES / INDUSTRY
HARDENED / URBAN / DIRT&GRIME
CONTAMINATED / LANDFILL
BMPs-CONSTRUCTION-SEDIMENT
LOGGING / IRRIGATION / COOLING
BANK / EROSION / SURFACE
FALSE BANK / MANURE / LAGOON
WASH H_20 / TILE / H_20 TABLE
ACID / MINE / QUARRY / FLOW
NATURAL / WETLAND / STAGNANT
PARK / GOLF / LAWN / HOME
ATMOSPHERE / DATA PAUCITY

F] MEASUREMENTS

- $\bar{x}$ width
- $\bar{x}$ depth
- max. depth
- $\bar{x}$ bankfull width
- bankfull $\bar{x}$ depth
- W/D ratio
- bankfull max. depth
- floodprone x^2 width
- entrench. ratio

Legacy Tree:

Stream Drawing:



QHEI 5

OhioEPA Qualitative Habitat Evaluation Index and Use Assessment Field Sheet

QHEI Score: 59.5

Stream & Location: UNT 4, Heavy Haul (Des. 1382612) / Clark County, Indiana **RM:** ___.__ **Date:** 7 / 21 / 15

Scorers Full Name & Affiliation: Leah Boits, American Structurepoint

River Code: __ __ - __ __ - __ __ **STORET #:** _____ **Lat./ Long.:** (NAD 83 - decimal °) 38 . 33748 / 85 . 66907 **Office verified location** ☐

1] SUBSTRATE

Check *ONLY* Two substrate *TYPE BOXES*; estimate % or note every type present

BEST TYPES	POOL	RIFFLE	OTHER TYPES	POOL	RIFFLE
☐ ☐ BLDR /SLABS [10]			☑ ☐ HARDPAN [4]	40	35
☐ ☐ BOULDER [9]			☐ ☐ DETRITUS [3]		
☐ ☐ COBBLE [8]	5	10	☐ ☐ MUCK [2]		
☐ ☐ GRAVEL [7]	10	10	☐ ☑ SILT [2]	25	5
☐ ☐ SAND [6]	15	15	☐ ☐ ARTIFICIAL [0]		
☐ ☐ BEDROCK [5]	5	25			

(Score natural substrates; ignore sludge from point-sources)

NUMBER OF BEST TYPES: ☑ 4 or more [2] ☐ 3 or less [0]

Check ONE (*Or 2 & average*)

ORIGIN	QUALITY
☑ LIMESTONE [1]	☐ HEAVY [-2]
☐ TILLS [1]	☐ MODERATE [-1]
☐ WETLANDS [0]	☑ NORMAL [0]
☐ HARDPAN [0]	☐ FREE [1]
☐ SANDSTONE [0]	☐ EXTENSIVE [-2]
☐ RIP/RAP [0]	☐ MODERATE [-1]
☐ LACUSTURINE [0]	☑ NORMAL [0]
☐ SHALE [-1]	☐ NONE [1]
☐ COAL FINES [-2]	

SILT

EMBEDDEDNESS

Comments

Substrate 9 *Maximum 20*

2] INSTREAM COVER

Indicate presence 0 to 3: **0**-Absent; **1**-Very small amounts or if more common of marginal quality; **2**-Moderate amounts, but not of highest quality or in small amounts of highest quality; **3**-Highest quality in moderate or greater amounts (e.g., very large boulders in deep or fast water, large diameter log that is stable, well developed rootwad in deep / fast water, or deep, well-defined, functional pools.

___ UNDERCUT BANKS [1]	___ POOLS > 70cm [2]	___ OXBOWS, BACKWATERS [1]
2 OVERHANGING VEGETATION [1]	___ ROOTWADS [1]	___ AQUATIC MACROPHYTES [1]
___ SHALLOWS (IN SLOW WATER) [1]	___ BOULDERS [1]	2 LOGS OR WOODY DEBRIS [1]
___ ROOTMATS [1]		

AMOUNT

Check ONE (*Or 2 & average*)

☑ EXTENSIVE >75% [11]
☐ MODERATE 25-75% [7]
☐ SPARSE 5-<25% [3]
☐ NEARLY ABSENT <5% [1]

Comments

Cover 13 *Maximum 20*

3] CHANNEL MORPHOLOGY

Check ONE in each category (*Or 2 & average*)

SINUOSITY	DEVELOPMENT	CHANNELIZATION	STABILITY
☑ HIGH [4]	☐ EXCELLENT [7]	☑ NONE [6]	☐ HIGH [3]
☐ MODERATE [3]	☑ GOOD [5]	☐ RECOVERED [4]	☑ MODERATE [2]
☐ LOW [2]	☑ FAIR [3]	☐ RECOVERING [3]	☐ LOW [1]
☐ NONE [1]	☐ POOR [1]	☐ RECENT OR NO RECOVERY [1]	

Comments

Channel 16 *Maximum 20*

4] BANK EROSION AND RIPARIAN ZONE

Check **ONE** in each category for ***EACH BANK*** (*Or 2 per bank & average*)

River right looking downstream

EROSION (L R)	RIPARIAN WIDTH (L R)	FLOOD PLAIN QUALITY (L R)	(L R)
☐ ☐ NONE / LITTLE [3]	☑ ☑ WIDE > 50m [4]	☑ ☑ FOREST, SWAMP [3]	☐ ☐ CONSERVATION TILLAGE [1]
☑ ☑ MODERATE [2]	☐ ☐ MODERATE 10-50m [3]	☐ ☐ SHRUB OR OLD FIELD [2]	☐ ☐ URBAN OR INDUSTRIAL [0]
☐ ☐ HEAVY / SEVERE [1]	☐ ☐ NARROW 5-10m [2]	☐ ☐ RESIDENTIAL, PARK, NEW FIELD [1]	☐ ☐ MINING / CONSTRUCTION [0]
	☐ ☐ VERY NARROW < 5m [1]	☐ ☐ FENCED PASTURE [1]	
	☐ ☐ NONE [0]	☐ ☐ OPEN PASTURE, ROWCROP [0]	

Indicate predominant land use(s) past 100m riparian.

Comments

Riparian 9 *Maximum 10*

5] POOL / GLIDE AND RIFFLE / RUN QUALITY

MAXIMUM DEPTH	CHANNEL WIDTH	CURRENT VELOCITY
Check **ONE** (*ONLY!*)	Check ONE (*Or 2 & average*)	Check ALL that apply
☐ > 1m [6]	☐ POOL WIDTH > RIFFLE WIDTH [2]	☐ TORRENTIAL [-1] ☑ SLOW [1]
☐ 0.7-<1m [4]	☑ POOL WIDTH = RIFFLE WIDTH [1]	☐ VERY FAST [1] ☐ INTERSTITIAL [-1]
☐ 0.4-<0.7m [2]	☐ POOL WIDTH < RIFFLE WIDTH [0]	☐ FAST [1] ☐ INTERMITTENT [-2]
☐ 0.2-<0.4m [1]		☑ MODERATE [1] ☐ EDDIES [1]
☑ < 0.2m [0]		*Indicate for reach - pools and riffles.*

Recreation Potential
Primary Contact
Secondary Contact
(circle one and comment on back)

Comments

Pool / Current 3 *Maximum 12*

Indicate for functional riffles; Best areas must be large enough to support a population of riffle-obligate species: Check ONE (*Or 2 & average*). ☐ NO RIFFLE [metric=0]

RIFFLE DEPTH	RUN DEPTH	RIFFLE / RUN SUBSTRATE	RIFFLE / RUN EMBEDDEDNESS
☐ BEST AREAS > 10cm [2]	☐ MAXIMUM > 50cm [2]	☐ STABLE (e.g., Cobble, Boulder) [2]	☐ NONE [2]
☑ BEST AREAS 5-10cm [1]	☑ MAXIMUM < 50cm [1]	☑ MOD. STABLE (e.g., Large Gravel) [1]	☑ LOW [1]
☐ BEST AREAS < 5cm [metric=0]		☑ UNSTABLE (e.g., Fine Gravel, Sand) [0]	☐ MODERATE [0]
			☐ EXTENSIVE [-1]

Comments

Riffle / Run 3.5 *Maximum 8*

6] GRADIENT

(ft/mi) ☐ VERY LOW - LOW [2-4] ☑ MODERATE [6-10] ☐ HIGH - VERY HIGH [10-6]

DRAINAGE AREA (0.23 mi²)

%POOL: 10 %GLIDE: 20 %RUN: 45 %RIFFLE: 25

Gradient 6 *Maximum 10*

A] SAMPLED REACH

Check ALL that apply

Comment RE: Reach consistency/ Is reach typical of steam?, *Recreation/* Observed - Inferred, *Other/* Sampling observations, Concerns, Access directions, etc.

Last precipitation: 2015-07-20, 0.02 inch

METHOD

- ☐ BOAT
- ☑ WADE
- ☐ L. LINE
- ☐ OTHER

STAGE

1st -sample pass-	2nd
☐ HIGH	☐
☐ UP	☐
☑ NORMAL	☑
☐ LOW	☐
☐ DRY	☐

DISTANCE

- ☐ 0.5 Km
- ☐ 0.2 Km
- ☐ 0.15 Km
- ☐ 0.12 Km
- ☐ OTHER

60 meters

CLARITY

1st --sample pass--	2nd
☐ < 20 cm	☐
☐ 20-<40 cm	☐
☐ 40-70 cm	☐
☑ > 70 cm/ CTB	☐
☐ SECCHI DEPTH	☐

CANOPY

- ☐ > 85%- OPEN
- ☐ 55%-<85%
- ☐ 30%-<55%
- ☐ 10%-<30%
- ☒ <10%- CLOSED

1st pass _____ cm

2nd _____ cm

B] AESTHETICS

- ☐ NUISANCE ALGAE
- ☐ INVASIVE MACROPHYTES
- ☐ EXCESS TURBIDITY
- ☐ DISCOLORATION
- ☐ FOAM / SCUM
- ☐ OIL SHEEN
- ☐ TRASH / LITTER
- ☐ NUISANCE ODOR
- ☐ SLUDGE DEPOSITS
- ☐ CSOs/SSOs/OUTFALLS

C] RECREATION

	AREA	DEPTH
POOL:	☐ >100ft²	☐ >3ft

D] MAINTENANCE

Circle some & *COMMENT*

PUBLIC / PRIVATE / BOTH / NA
ACTIVE / HISTORIC / BOTH / NA
YOUNG-SUCCESSION-OLD
SPRAY / SNAG / REMOVED
MODIFIED / DIPPED OUT / NA
LEVEED / ONE SIDED
RELOCATED / CUTOFFS
MOVING-BEDLOAD-STABLE
ARMOURED / SLUMPS
ISLANDS / SCOURED
IMPOUNDED / DESICCATED
FLOOD CONTROL / DRAINAGE

E] ISSUES

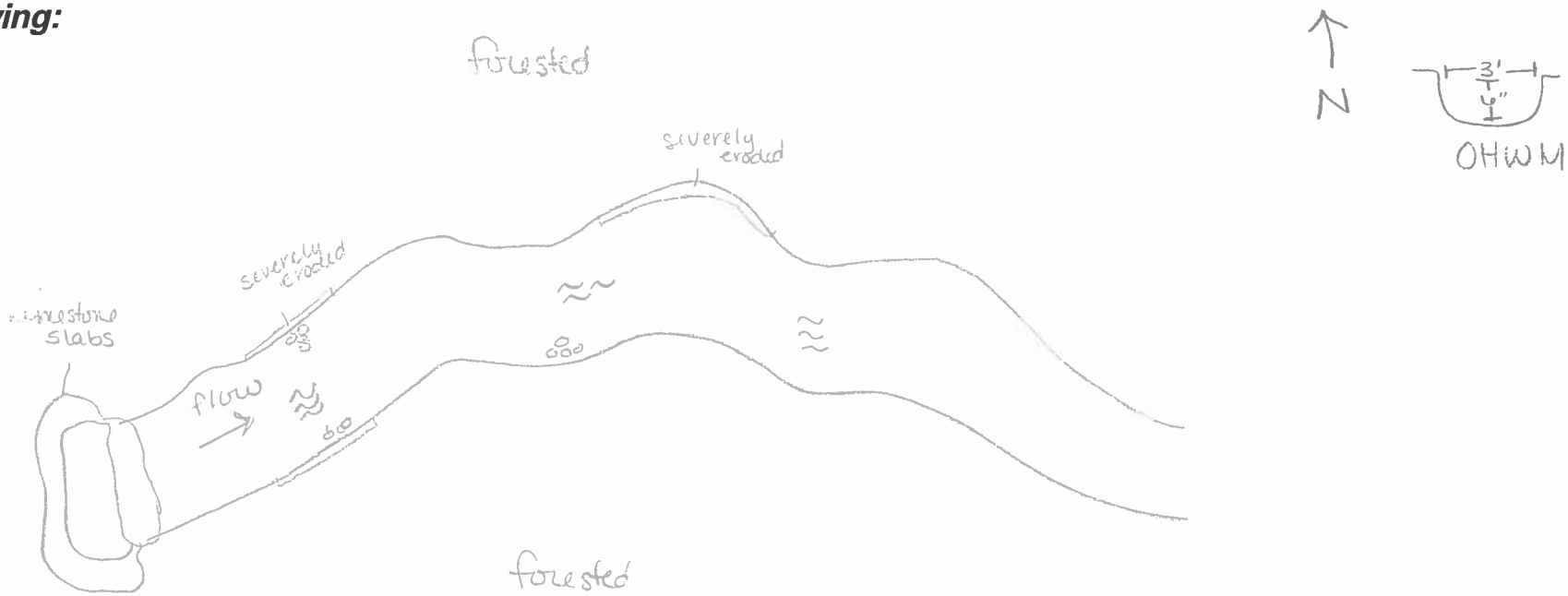
WWTP / CSO / NPDES / INDUSTRY
HARDENED / URBAN / DIRT&GRIME
CONTAMINATED / LANDFILL
BMPs-CONSTRUCTION-SEDIMENT
LOGGING / IRRIGATION / COOLING
BANK / EROSION / SURFACE
FALSE BANK / MANURE / LAGOON
WASH H_20 / TILE / H_20 TABLE
ACID / MINE / QUARRY / FLOW
NATURAL / WETLAND / STAGNANT
PARK / GOLF / LAWN / HOME
ATMOSPHERE / DATA PAUCITY

F] MEASUREMENTS

- $\bar{x}$ width
- $\bar{x}$ depth
- max. depth
- $\bar{x}$ bankfull width
- bankfull $\bar{x}$ depth
- W/D ratio
- bankfull max. depth
- floodprone x^2 width
- entrench. ratio

Legacy Tree:

Stream Drawing:



QHEI 6

OhioEPA Qualitative Habitat Evaluation Index and Use Assessment Field Sheet

QHEI Score: 57.5

Stream & Location: UNT 5, Heavy Haul (Des. 1382612) / Clark County, Indiana **RM:** ___.__ **Date:** 7 / 21 / 15

Scorers Full Name & Affiliation: Leah Boits, American Structurepoint

River Code: ___-___-___ **STORET #:** _____ **Lat./Long.:** (NAD 83 - decimal °) 38 . 34197 / 85 . 66974 **Office verified location** ☐

1] SUBSTRATE

Check *ONLY* Two substrate *TYPE BOXES*; estimate % or note every type present

BEST TYPES	POOL	RIFFLE	OTHER TYPES	POOL	RIFFLE
☐☐ BLDR /SLABS [10]			☐☐ HARDPAN [4]		
☐☐ BOULDER [9]			☐☐ DETRITUS [3]	5	5
☐☐ COBBLE [8]			☐☐ MUCK [2]		
☐☐ GRAVEL [7]	5	5	☐☑ SILT [2]	80	70
☒☐ SAND [6]	10	20	☐☐ ARTIFICIAL [0]		
☐☐ BEDROCK [5]			(Score natural substrates; ignore sludge from point-sources)		

NUMBER OF BEST TYPES: ☐ 4 or more [2] ☑ 3 or less [0]

Check ONE (*Or 2 & average*)

ORIGIN
- ☑ LIMESTONE [1]
- ☐ TILLS [1]
- ☐ WETLANDS [0]
- ☐ HARDPAN [0]
- ☐ SANDSTONE [0]
- ☐ RIP/RAP [0]
- ☐ LACUSTURINE [0]
- ☐ SHALE [-1]
- ☐ COAL FINES [-2]

QUALITY

SILT
- ☐ HEAVY [-2]
- ☐ MODERATE [-1]
- ☑ NORMAL [0]
- ☐ FREE [1]

EMBEDDEDNESS
- ☐ EXTENSIVE [-2]
- ☐ MODERATE [-1]
- ☑ NORMAL [0]
- ☐ NONE [1]

Comments

Substrate 9 (Maximum 20)

2] INSTREAM COVER

Indicate presence 0 to 3: 0-Absent; 1-Very small amounts or if more common of marginal quality; 2-Moderate amounts, but not of highest quality or in small amounts of highest quality; 3-Highest quality in moderate or greater amounts (e.g., very large boulders in deep or fast water, large diameter log that is stable, well developed rootwad in deep / fast water, or deep, well-defined, functional pools.

- ___ UNDERCUT BANKS [1]
- 1 OVERHANGING VEGETATION [1]
- ___ SHALLOWS (IN SLOW WATER) [1]
- ___ ROOTMATS [1]
- ___ POOLS > 70cm [2]
- ___ ROOTWADS [1]
- ___ BOULDERS [1]
- ___ OXBOWS, BACKWATERS [1]
- ___ AQUATIC MACROPHYTES [1]
- 1 LOGS OR WOODY DEBRIS [1]

AMOUNT

Check ONE (*Or 2 & average*)
- ☑ EXTENSIVE >75% [11]
- ☐ MODERATE 25-75% [7]
- ☐ SPARSE 5-<25% [3]
- ☐ NEARLY ABSENT <5% [1]

Comments

Cover 13 (Maximum 20)

3] CHANNEL MORPHOLOGY

Check ONE in each category (*Or 2 & average*)

SINUOSITY	DEVELOPMENT	CHANNELIZATION	STABILITY
☐ HIGH [4]	☐ EXCELLENT [7]	☑ NONE [6]	☐ HIGH [3]
☑ MODERATE [3]	☐ GOOD [5]	☐ RECOVERED [4]	☑ MODERATE [2]
☐ LOW [2]	☑ FAIR [3]	☐ RECOVERING [3]	☐ LOW [1]
☐ NONE [1]	☐ POOR [1]	☐ RECENT OR NO RECOVERY [1]	

Comments

Channel 14 (Maximum 20)

4] BANK EROSION AND RIPARIAN ZONE

Check ONE in each category for *EACH BANK* (*Or 2 per bank & average*)

River right looking downstream

EROSION (L R)	RIPARIAN WIDTH (L R)	FLOOD PLAIN QUALITY (L R)	(L R)
☐☐ NONE / LITTLE [3]	☑☑ WIDE > 50m [4]	☑☑ FOREST, SWAMP [3]	☐☐ CONSERVATION TILLAGE [1]
☑☑ MODERATE [2]	☐☐ MODERATE 10-50m [3]	☐☐ SHRUB OR OLD FIELD [2]	☐☐ URBAN OR INDUSTRIAL [0]
☐☐ HEAVY / SEVERE [1]	☐☐ NARROW 5-10m [2]	☐☐ RESIDENTIAL, PARK, NEW FIELD [1]	☐☐ MINING / CONSTRUCTION [0]
	☐☐ VERY NARROW < 5m [1]	☐☐ FENCED PASTURE [1]	
	☐☐ NONE [0]	☐☐ OPEN PASTURE, ROWCROP [0]	

Indicate predominant land use(s) past 100m riparian.

Comments

Riparian 9 (Maximum 10)

5] POOL / GLIDE AND RIFFLE / RUN QUALITY

MAXIMUM DEPTH — Check ONE (*ONLY!*)
- ☐ > 1m [6]
- ☐ 0.7-<1m [4]
- ☐ 0.4-<0.7m [2]
- ☐ 0.2-<0.4m [1]
- ☑ < 0.2m [0]

CHANNEL WIDTH — Check ONE (*Or 2 & average*)
- ☐ POOL WIDTH > RIFFLE WIDTH [2]
- ☐ POOL WIDTH = RIFFLE WIDTH [1]
- ☑ POOL WIDTH < RIFFLE WIDTH [0]

CURRENT VELOCITY — Check ALL that apply
- ☐ TORRENTIAL [-1]
- ☐ VERY FAST [1]
- ☐ FAST [1]
- ☐ MODERATE [1]
- ☑ SLOW [1]
- ☐ INTERSTITIAL [-1]
- ☐ INTERMITTENT [-2]
- ☐ EDDIES [1]

Indicate for reach - pools and riffles.

Recreation Potential
Primary Contact
Secondary Contact
(circle one and comment on back)

Comments

Pool / Current 1 (Maximum 12)

Indicate for functional riffles; Best areas must be large enough to support a population of riffle-obligate species: Check ONE (*Or 2 & average*). ☐ NO RIFFLE [metric=0]

RIFFLE DEPTH	RUN DEPTH	RIFFLE / RUN SUBSTRATE	RIFFLE / RUN EMBEDDEDNESS
☐ BEST AREAS > 10cm [2]	☐ MAXIMUM > 50cm [2]	☐ STABLE (e.g., Cobble, Boulder) [2]	☐ NONE [2]
☑ BEST AREAS 5-10cm [1]	☑ MAXIMUM < 50cm [1]	☑ MOD. STABLE (e.g., Large Gravel) [1]	☑ LOW [1]
☐ BEST AREAS < 5cm [metric=0]		☑ UNSTABLE (e.g., Fine Gravel, Sand) [0]	☐ MODERATE [0]
			☐ EXTENSIVE [-1]

Comments

Riffle / Run 3.5 (Maximum 8)

6] GRADIENT

(258 ft/mi)

DRAINAGE AREA (0.04 mi²)

- ☐ VERY LOW - LOW [2-4]
- ☐ MODERATE [6-10]
- ☑ HIGH - VERY HIGH [10-6]

%POOL: 3 %GLIDE: 77 %RUN: 15 %RIFFLE: 5

Gradient 8 (Maximum 10)

A] SAMPLED REACH
Check ALL that apply

Comment RE: Reach consistency/ Is reach typical of steam?, *Recreation/* Observed - Inferred, *Other/* Sampling observations, Concerns, Access directions, etc.

Last precipitation: 2015-07-20, 0.02 inch

METHOD
- ☐ BOAT
- ☑ WADE
- ☐ L. LINE
- ☐ OTHER

STAGE

1st -sample pass-	2nd
☐ HIGH	☐
☐ UP	☐
☑ NORMAL	☑
☐ LOW	☐
☐ DRY	☐

DISTANCE
- ☐ 0.5 Km
- ☐ 0.2 Km
- ☐ 0.15 Km
- ☐ 0.12 Km
- ☐ OTHER

60 meters

CLARITY

1st --sample pass--	2nd
☐ < 20 cm	☐
☐ 20-<40 cm	☐
☐ 40-70 cm	☐
☑ > 70 cm/ CTB	☐
☐ SECCHI DEPTH	☐

CANOPY
- ☐ > 85%- OPEN
- ☐ 55%-<85%
- ☐ 30%-<55%
- ☐ 10%-<30%
- ☒ <10%- CLOSED

pass 1st _____ cm
2nd _____ cm

B] AESTHETICS
- ☐ NUISANCE ALGAE
- ☐ INVASIVE MACROPHYTES
- ☐ EXCESS TURBIDITY
- ☐ DISCOLORATION
- ☐ FOAM / SCUM
- ☐ OIL SHEEN
- ☐ TRASH / LITTER
- ☐ NUISANCE ODOR
- ☐ SLUDGE DEPOSITS
- ☐ CSOs/SSOs/OUTFALLS

C] RECREATION
	AREA	DEPTH
POOL:	☐ >100ft²	☐ >3ft

D] MAINTENANCE
Circle some & *COMMENT*

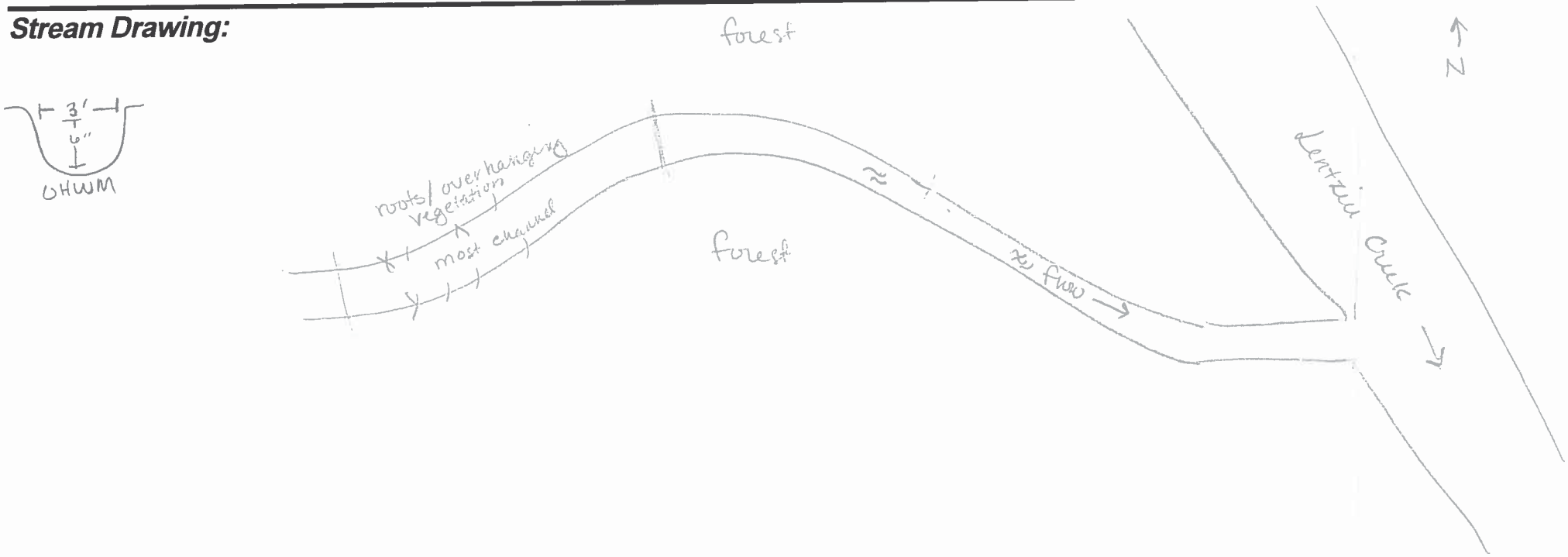
PUBLIC / PRIVATE / BOTH / NA
ACTIVE / HISTORIC / BOTH / NA
YOUNG-SUCCESSION-OLD
SPRAY / SNAG / REMOVED
MODIFIED / DIPPED OUT / NA
LEVEED / ONE SIDED
RELOCATED / CUTOFFS
MOVING-BEDLOAD-STABLE
ARMOURED / SLUMPS
ISLANDS / SCOURED
IMPOUNDED / DESICCATED
FLOOD CONTROL / DRAINAGE

E] ISSUES
WWTP / CSO / NPDES / INDUSTRY
HARDENED / URBAN / DIRT&GRIME
CONTAMINATED / LANDFILL
BMPs-CONSTRUCTION-SEDIMENT
LOGGING / IRRIGATION / COOLING
BANK / EROSION / SURFACE
FALSE BANK / MANURE / LAGOON
WASH H_20 / TILE / H_20 TABLE
ACID / MINE / QUARRY / FLOW
NATURAL / WETLAND / STAGNANT
PARK / GOLF / LAWN / HOME
ATMOSPHERE / DATA PAUCITY

F] MEASUREMENTS
- $\bar{x}$ width
- $\bar{x}$ depth
- max. depth
- $\bar{x}$ bankfull width
- bankfull $\bar{x}$ depth
- W/D ratio
- bankfull max. depth
- floodprone x^2 width
- entrench. ratio

Legacy Tree:

Stream Drawing:



HHEI 1

OhioEPA Primary Headwater Habitat Evaluation Form

HHEI Score (sum of metrics 1, 2, 3) : 17

SITE NAME/LOCATION **UNT 6, Heavy Haul (Des. 1382612) / Clark County, Indiana**

SITE NUMBER _____ RIVER BASIN _____ DRAINAGE AREA (mi²) _____

LENGTH OF STREAM REACH (ft) _____ LAT. **38.34143** LONG. _____ RIVER CODE _____ RIVER MILE _____

DATE **07/21/15** SCORER **A. Hanner** COMMENTS _____

NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for Instructions

STREAM CHANNEL MODIFICATIONS: ☑ NONE / NATURAL CHANNEL ☐ RECOVERED ☐ RECOVERING ☐ RECENT OR NO RECOVERY

1. SUBSTRATE (Estimate percent of every type of substrate present. Check *ONLY* two predominant substrate *TYPE* boxes (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.

TYPE		PERCENT	TYPE		PERCENT
☐	BLDR SLABS [16 pts]	0%	☑	SILT [3 pt]	85%
☐	BOULDER (>256 mm) [16 pts]	0%	☐	LEAF PACK/WOODY DEBRIS [3 pts]	5%
☐	BEDROCK [16 pt]	0%	☐	FINE DETRITUS [3 pts]	0%
☐	COBBLE (65-256 mm) [12 pts]	0%	☐	CLAY or HARDPAN [0 pt]	0%
☐	GRAVEL (2-64 mm) [9 pts]	0%	☐	MUCK [0 pts]	0%
☑	SAND (<2 mm) [6 pts]	10%	☐	ARTIFICIAL [3 pts]	0%

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock **0.00%** (A) 100% (B)

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: 9 **TOTAL NUMBER OF SUBSTRATE TYPES:** 3

2. Maximum Pool Depth ***(Measure the maximum pool depth within the 61 meter (200 ft)*** evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check *ONLY* one box):

- ☐ > 30 centimeters [20 pts]
- ☐ > 22.5 - 30 cm [30 pts]
- ☐ > 10 - 22.5 cm [25 pts]
- ☐ > 5 cm - 10 cm [15 pts]
- ☐ < 5 cm [5 pts]
- ☑ NO WATER OR MOIST CHANNEL [0 pts]

COMMENTS _____ **MAXIMUM POOL DEPTH (centimeters):** _____

3. BANK FULL WIDTH (Measured as the average of 3-4 measurements) **(Check *ONLY* one box):**

- ☐ > 4.0 meters (> 13') [30 pts]
- ☐ > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts]
- ☐ > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts]
- ☐ > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]
- ☑ ≤ 1.0 m (<=3' 3") [5 pts]

COMMENTS _____ **AVERAGE BANKFULL WIDTH (meters):** 0.20

HHEI Metric Points

Substrate Max = 40	12
A + B	
Pool Depth Max = 30	0
Bankfull Width Max=30	5

This information must also be completed

RIPARIAN ZONE AND FLOODPLAIN QUALITY ☆NOTE: River Left (L) and Right (R) as looking downstream☆

RIPARIAN WIDTH L	R	(Per Bank)	FLOODPLAIN QUALITY L	R	(Most Predominant per Bank)	L	R	
☑	☑	Wide >10m	☑	☑	Mature Forest, Wetland	☐	☐	Conservation Tillage
☐	☐	Moderate 5-10m	☐	☐	Immature Forest, Shrub or Old Field	☐	☐	Urban or Industrial
☐	☐	Narrow <5m	☐	☐	Residential, Park, New Field	☐	☐	Open Pasture, Row Crop
☐	☐	None	☐	☐	Fenced Pasture	☐	☐	Mining or Construction

COMMENTS

FLOW REGIME *(At Time of Evaluation)* (Check *ONLY* one box):

- ☐ Stream Flowing
- ☐ Subsurface flow with isolated pools (Interstitial)
- ☑ Moist Channel, isolated pools, no flow (Intermittent)
- ☐ Dry channel, no water (Ephemeral)

COMMENTS_ Moist channel

SINUOSITY (Number of bends per 61 m (200 ft) of channel) (Check *ONLY* one box):

☐ None	☐ 1.0	☐ 2.0	☐ 3.0
☑ 0.5	☐ 1.5	☐ 2.5	☐ >3

STREAM GRADIENT ESTIMATE

☐ Flat (0.5 ft/100 ft) ☐ Flat to Moderate ☐ Moderate (2 ft/100 ft) ☑ Moderate to Severe ☐ Severe (10 ft/100 ft)

ADDITIONAL STREAM INFORMATION (This Information Must Also be Completed):

QHEI PERFORMED? - ☐ Yes ☑ No QHEI Score _____ (If Yes, Attach Completed QHEI Form)

DOWNSTREAM DESIGNATED USE(S)

☐ WWH Name: _ _ Distance from Evaluated Stream _

☐ CWH Name: _ _ Distance from Evaluated Stream _

☐ EWH Name: _____ Distance from Evaluated Stream _

MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION

USGS Quadrangle Name: Jeffersonville NRCS Soil Map Page: _____ NRCS Soil Map Stream Order 1

County: Clark Township / City: Utica Township/Jeffersonville

MISCELLANEOUS

Base Flow Conditions? (Y/N): Y Date of last precipitation: 07/20/15 Quantity: 0.02

Photograph Information: Photos 69-70

Elevated Turbidity? (Y/N): N Canopy (% open): 10%

Were samples collected for water chemistry? (Y/N): N (Note lab sample no. or id. and attach results) Lab Number: _____

Field Measures: Temp (°C)_____ Dissolved Oxygen (mg/l) _____ pH (S.U.) _____ Conductivity (µmhos/cm) _____

Is the sampling reach representative of the stream (Y/N) Y If not, please explain: _____

Additional comments/description of pollution impacts: _____

BIOTIC EVALUATION

Performed? (Y/N): N (If Yes, Record all observations. Voucher collections optional. NOTE: all voucher samples must be labeled with the site ID number. Include appropriate field data sheets from the Primary Headwater Habitat Assessment Manual)

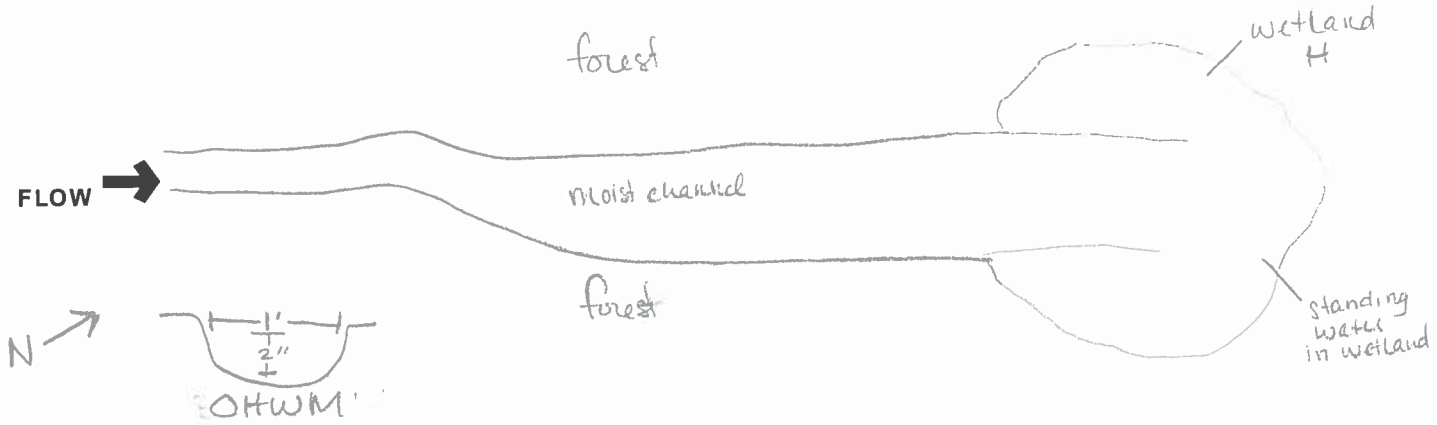
Fish Observed? (Y/N) N Voucher? (Y/N) N Salamanders Observed? (Y/N) N Voucher? (Y/N) N

Frogs or Tadpoles Observed? (Y/N) N Voucher? (Y/N) N Aquatic Macroinvertebrates Observed? (Y/N) N Voucher? (Y/N) N

Comments Regarding Biology: _____

DRAWING AND NARRATIVE DESCRIPTION OF STREAM REACH (This must be completed):

Include important landmarks and other features of interest for site evaluation and a narrative description of the stream's location



QHEI 7

OhioEPA Qualitative Habitat Evaluation Index and Use Assessment Field Sheet

QHEI Score: 62.5

Stream & Location: UNT 7, Heavy Haul (Des. 1382612) / Clark County, Indiana **RM:** ___.___ **Date:** 7 / 21 / 15

Scorers Full Name & Affiliation: Rick Paul, American Structurepoint

River Code: ___-___-___ **STORET #:** _____ **Lat./Long.:** 38 . 34197 /85 . 66974 (NAD 83 - decimal °) **Office verified location** ☐

1] SUBSTRATE

Check ONLY Two substrate TYPE BOXES; estimate % or note every type present

BEST TYPES	POOL	RIFFLE	OTHER TYPES	POOL	RIFFLE
☐ ☐ BLDR /SLABS [10]			☑ ☐ HARDPAN [4]	50	50
☐ ☐ BOULDER [9]			☐ ☐ DETRITUS [3]	0	5
☐ ☐ COBBLE [8]	5	10	☐ ☐ MUCK [2]		
☐ ☐ GRAVEL [7]	5	10	☐ ☑ SILT [2]	30	20
☐ ☐ SAND [6]	10	5	☐ ☐ ARTIFICIAL [0]		
☐ ☐ BEDROCK [5]					

(Score natural substrates; ignore sludge from point-sources)

NUMBER OF BEST TYPES: ☐ 4 or more [2] ☑ 3 or less [0]

Check ONE (Or 2 & average)

ORIGIN
- ☑ LIMESTONE [1]
- ☐ TILLS [1]
- ☐ WETLANDS [0]
- ☐ HARDPAN [0]
- ☐ SANDSTONE [0]
- ☐ RIP/RAP [0]
- ☐ LACUSTURINE [0]
- ☐ SHALE [-1]
- ☐ COAL FINES [-2]

QUALITY

SILT
- ☐ HEAVY [-2]
- ☐ MODERATE [-1]
- ☑ NORMAL [0]
- ☐ FREE [1]

EMBEDDEDNESS
- ☐ EXTENSIVE [-2]
- ☐ MODERATE [-1]
- ☑ NORMAL [0]
- ☐ NONE [1]

Comments

Substrate 7 (Maximum 20)

2] INSTREAM COVER

Indicate presence 0 to 3: 0-Absent; 1-Very small amounts or if more common of marginal quality; 2-Moderate amounts, but not of highest quality or in small amounts of highest quality; 3-Highest quality in moderate or greater amounts (e.g., very large boulders in deep or fast water, large diameter log that is stable, well developed rootwad in deep / fast water, or deep, well-defined, functional pools.

- 1 UNDERCUT BANKS [1]
- 2 OVERHANGING VEGETATION [1]
- ___ SHALLOWS (IN SLOW WATER) [1]
- ___ ROOTMATS [1]
- 1 POOLS > 70cm [2]
- ___ ROOTWADS [1]
- ___ BOULDERS [1]
- ___ OXBOWS, BACKWATERS [1]
- ___ AQUATIC MACROPHYTES [1]
- 1 LOGS OR WOODY DEBRIS [1]

AMOUNT Check ONE (Or 2 & average)
- ☑ EXTENSIVE >75% [11]
- ☐ MODERATE 25-75% [7]
- ☐ SPARSE 5-<25% [3]
- ☐ NEARLY ABSENT <5% [1]

Comments

Cover 16 (Maximum 20)

3] CHANNEL MORPHOLOGY

Check ONE in each category (Or 2 & average)

SINUOSITY	DEVELOPMENT	CHANNELIZATION	STABILITY
☐ HIGH [4]	☐ EXCELLENT [7]	☐ NONE [6]	☐ HIGH [3]
☐ MODERATE [3]	☐ GOOD [5]	☐ RECOVERED [4]	☑ MODERATE [2]
☑ LOW [2]	☑ FAIR [3]	☑ RECOVERING [3]	☐ LOW [1]
☐ NONE [1]	☐ POOR [1]	☐ RECENT OR NO RECOVERY [1]	

Comments

Channel 10 (Maximum 20)

4] BANK EROSION AND RIPARIAN ZONE

Check ONE in each category for EACH BANK (Or 2 per bank & average)

River right looking downstream

EROSION
- L R ☐ ☐ NONE / LITTLE [3]
- ☑ ☑ MODERATE [2]
- ☐ ☐ HEAVY / SEVERE [1]

RIPARIAN WIDTH
- L R ☑ ☑ WIDE > 50m [4]
- ☐ ☐ MODERATE 10-50m [3]
- ☐ ☐ NARROW 5-10m [2]
- ☐ ☐ VERY NARROW < 5m [1]
- ☐ ☐ NONE [0]

FLOOD PLAIN QUALITY
- L R ☑ ☑ FOREST, SWAMP [3]
- ☐ ☐ SHRUB OR OLD FIELD [2]
- ☐ ☐ RESIDENTIAL, PARK, NEW FIELD [1]
- ☐ ☐ FENCED PASTURE [1]
- ☐ ☐ OPEN PASTURE, ROWCROP [0]
- L R ☐ ☐ CONSERVATION TILLAGE [1]
- ☐ ☐ URBAN OR INDUSTRIAL [0]
- ☐ ☐ MINING / CONSTRUCTION [0]

Indicate predominant land use(s) past 100m riparian.

Comments

Riparian 9 (Maximum 10)

5] POOL / GLIDE AND RIFFLE / RUN QUALITY

MAXIMUM DEPTH Check ONE (ONLY!)
- ☑ > 1m [6]
- ☐ 0.7-<1m [4]
- ☐ 0.4-<0.7m [2]
- ☐ 0.2-<0.4m [1]
- ☐ < 0.2m [0]

CHANNEL WIDTH Check ONE (Or 2 & average)
- ☐ POOL WIDTH > RIFFLE WIDTH [2]
- ☑ POOL WIDTH = RIFFLE WIDTH [1]
- ☐ POOL WIDTH < RIFFLE WIDTH [0]

CURRENT VELOCITY Check ALL that apply
- ☐ TORRENTIAL [-1]
- ☐ VERY FAST [1]
- ☐ FAST [1]
- ☑ MODERATE [1]
- ☑ SLOW [1]
- ☐ INTERSTITIAL [-1]
- ☐ INTERMITTENT [-2]
- ☐ EDDIES [1]

Indicate for reach - pools and riffles.

Recreation Potential
Primary Contact
Secondary Contact
(circle one and comment on back)

Comments

Pool / Current 9 (Maximum 12)

Indicate for functional riffles; Best areas must be large enough to support a population of riffle-obligate species: Check ONE (Or 2 & average). ☐ NO RIFFLE [metric=0]

RIFFLE DEPTH
- ☐ BEST AREAS > 10cm [2]
- ☑ BEST AREAS 5-10cm [1]
- ☐ BEST AREAS < 5cm [metric=0]

RUN DEPTH
- ☑ MAXIMUM > 50cm [2]
- ☐ MAXIMUM < 50cm [1]

RIFFLE / RUN SUBSTRATE
- ☐ STABLE (e.g., Cobble, Boulder) [2]
- ☑ MOD. STABLE (e.g., Large Gravel) [1]
- ☑ UNSTABLE (e.g., Fine Gravel, Sand) [0]

RIFFLE / RUN EMBEDDEDNESS
- ☐ NONE [2]
- ☐ LOW [1]
- ☑ MODERATE [0]
- ☐ EXTENSIVE [-1]

Comments

Riffle / Run 3.5 (Maximum 8)

6] GRADIENT

(66.3 ft/mi) ☐ VERY LOW - LOW [2-4] ☐ MODERATE [6-10] ☑ HIGH - VERY HIGH [10-6]

DRAINAGE AREA (0.61 mi²)

%POOL: 5 %GLIDE: 45 %RUN: 45 %RIFFLE: 5

Gradient 8 (Maximum 10)

A] SAMPLED REACH

Check ALL that apply

METHOD

- ☐ BOAT
- ☑ WADE
- ☐ L. LINE
- ☐ OTHER

STAGE

1st -sample pass-	2nd
☐ HIGH	☐
☐ UP	☐
☑ NORMAL	☑
☐ LOW	☐
☐ DRY	☐

DISTANCE

- ☐ 0.5 Km
- ☐ 0.2 Km
- ☐ 0.15 Km
- ☐ 0.12 Km
- ☐ OTHER

37.5 meters

CLARITY

1st --sample pass--	2nd
☐ < 20 cm	☐
☑ 20-<40 cm	☐
☐ 40-70 cm	☐
☐ > 70 cm/ CTB	☐
☐ SECCHI DEPTH	☐

1st pass _____ cm

2nd _____ cm

CANOPY

- ☐ > 85%- OPEN
- ☐ 55%-<85%
- ☐ 30%-<55%
- ☒ 10%-<30%
- ☐ <10%- CLOSED

Comment RE: Reach consistency/ Is reach typical of steam?, *Recreation/* Observed - Inferred, *Other/* Sampling observations, Concerns, Access directions, etc.

Last precipitation: 2015-07-20, 0.02 inch

C] RECREATION

POOL: ☐ >100ft² ☐ >3ft (AREA DEPTH)

B] AESTHETICS

- ☐ NUISANCE ALGAE
- ☐ INVASIVE MACROPHYTES
- ☐ EXCESS TURBIDITY
- ☐ DISCOLORATION
- ☐ FOAM / SCUM
- ☐ OIL SHEEN
- ☐ TRASH / LITTER
- ☐ NUISANCE ODOR
- ☐ SLUDGE DEPOSITS
- ☐ CSOs/SSOs/OUTFALLS

D] MAINTENANCE

Circle some & *COMMENT*

PUBLIC / PRIVATE / BOTH / NA
ACTIVE / HISTORIC / BOTH / NA
YOUNG-SUCCESSION-OLD
SPRAY / SNAG / REMOVED
MODIFIED / DIPPED OUT / NA
LEVEED / ONE SIDED
RELOCATED / CUTOFFS
MOVING-BEDLOAD-STABLE
ARMOURED / SLUMPS
ISLANDS / SCOURED
IMPOUNDED / DESICCATED
FLOOD CONTROL / DRAINAGE

E] ISSUES

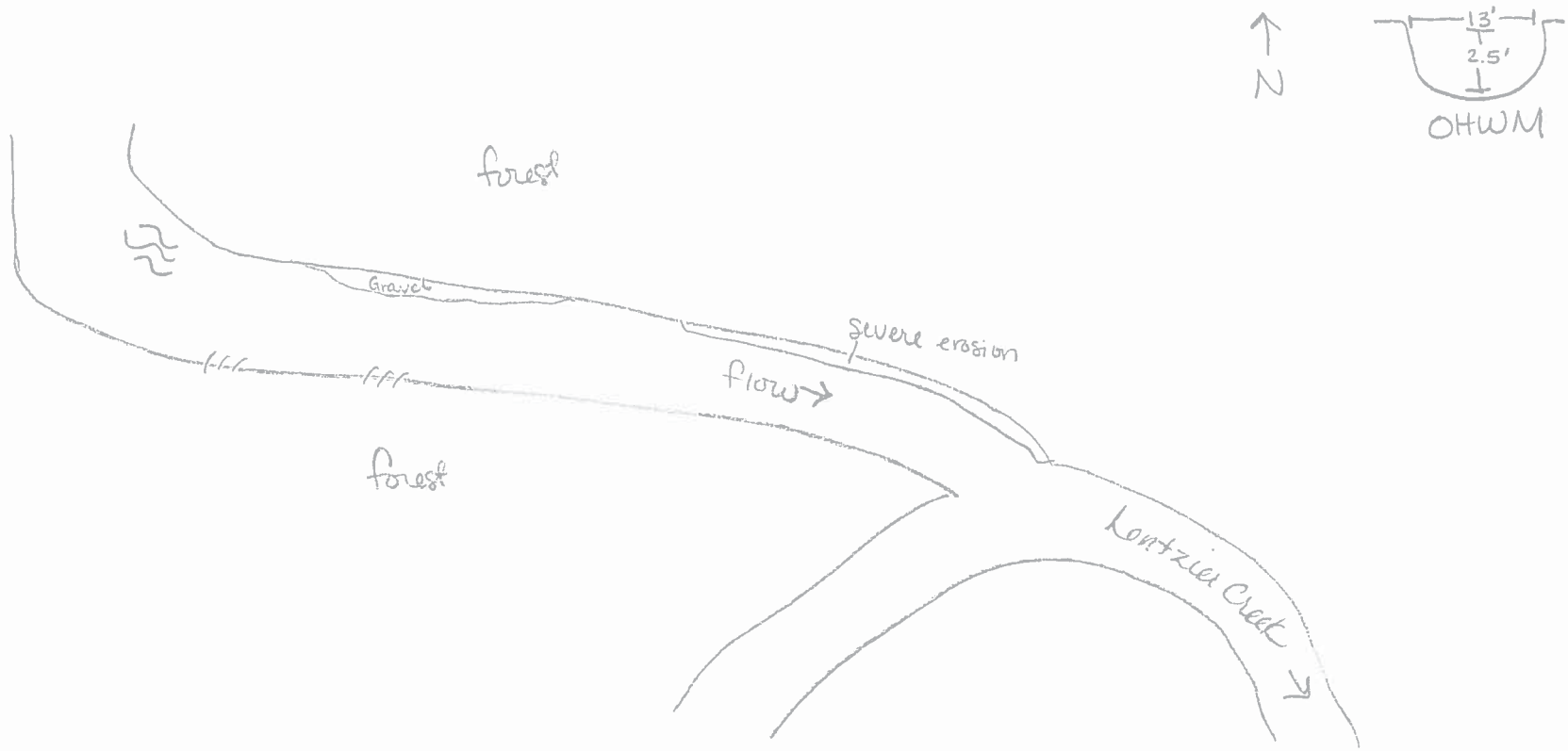
WWTP / CSO / NPDES / INDUSTRY
HARDENED / URBAN / DIRT&GRIME
CONTAMINATED / LANDFILL
BMPs-CONSTRUCTION-SEDIMENT
LOGGING / IRRIGATION / COOLING
BANK / EROSION / SURFACE
FALSE BANK / MANURE / LAGOON
WASH H_20 / TILE / H_20 TABLE
ACID / MINE / QUARRY / FLOW
NATURAL / WETLAND / STAGNANT
PARK / GOLF / LAWN / HOME
ATMOSPHERE / DATA PAUCITY

F] MEASUREMENTS

- $\bar{x}$ width
- $\bar{x}$ depth
- max. depth
- $\bar{x}$ bankfull width
- bankfull $\bar{x}$ depth
- W/D ratio
- bankfull max. depth
- floodprone x^2 width
- entrench. ratio

Legacy Tree:

Stream Drawing:



QHEI 8

OhioEPA Qualitative Habitat Evaluation Index and Use Assessment Field Sheet

QHEI Score: 46

Stream & Location: UNT 8, Heavy Haul (Des. 1382612) / Clark County, Indiana **RM:** _ _ _._ **Date:** 7 / 21 / 15

Scorers Full Name & Affiliation: Leah Boits, American Structurepoint

River Code: _ _ _ - _ _ _ - _ _ _ **STORET #:** _ _ _ _ _ _ **Lat./ Long.:** (NAD 83 - decimal °) 38 . 34473 / 85 . 66794 **Office verified location** ☐

1] SUBSTRATE

Check ONLY Two substrate TYPE BOXES; estimate % or note every type present

BEST TYPES	POOL	RIFFLE	OTHER TYPES	POOL	RIFFLE
☐ ☐ BLDR /SLABS [10]			☑ ☐ HARDPAN [4]	50	60
☐ ☐ BOULDER [9]			☐ ☐ DETRITUS [3]		
☐ ☐ COBBLE [8]	5	5	☐ ☐ MUCK [2]		
☐ ☐ GRAVEL [7]	5	15	☐ ☑ SILT [2]	25	10
☐ ☐ SAND [6]	15	10	☐ ☐ ARTIFICIAL [0]		
☐ ☐ BEDROCK [5]			(Score natural substrates; ignore sludge from point-sources)		

NUMBER OF BEST TYPES: ☐ 4 or more [2] ☑ 3 or less [0]

Check ONE (Or 2 & average)

ORIGIN	QUALITY	
☑ LIMESTONE [1]	☐ HEAVY [-2]	
☐ TILLS [1]	SILT: ☐ MODERATE [-1]	
☐ WETLANDS [0]	☑ NORMAL [0]	
☐ HARDPAN [0]	☐ FREE [1]	
☐ SANDSTONE [0]	EMBEDDEDNESS: ☐ EXTENSIVE [-2]	
☐ RIP/RAP [0]	☐ MODERATE [-1]	
☐ LACUSTURINE [0]	☑ NORMAL [0]	
☐ SHALE [-1]	☐ NONE [1]	
☐ COAL FINES [-2]		

Comments

Substrate 7 (Maximum 20)

2] INSTREAM COVER

Indicate presence 0 to 3: 0-Absent; 1-Very small amounts or if more common of marginal quality; 2-Moderate amounts, but not of highest quality or in small amounts of highest quality; 3-Highest quality in moderate or greater amounts (e.g., very large boulders in deep or fast water, large diameter log that is stable, well developed rootwad in deep / fast water, or deep, well-defined, functional pools.

___ UNDERCUT BANKS [1]	___ POOLS > 70cm [2]	___ OXBOWS, BACKWATERS [1]
2 OVERHANGING VEGETATION [1]	1 ROOTWADS [1]	___ AQUATIC MACROPHYTES [1]
___ SHALLOWS (IN SLOW WATER) [1]	___ BOULDERS [1]	1 LOGS OR WOODY DEBRIS [1]
1 ROOTMATS [1]		

AMOUNT

Check ONE (Or 2 & average)

☐ EXTENSIVE >75% [11]
☑ MODERATE 25-75% [7]
☐ SPARSE 5-<25% [3]
☐ NEARLY ABSENT <5% [1]

Comments

Cover 12 (Maximum 20)

3] CHANNEL MORPHOLOGY

Check ONE in each category (Or 2 & average)

SINUOSITY	DEVELOPMENT	CHANNELIZATION	STABILITY
☐ HIGH [4]	☐ EXCELLENT [7]	☐ NONE [6]	☐ HIGH [3]
☐ MODERATE [3]	☐ GOOD [5]	☐ RECOVERED [4]	☐ MODERATE [2]
☑ LOW [2]	☐ FAIR [3]	☑ RECOVERING [3]	☑ LOW [1]
☐ NONE [1]	☑ POOR [1]	☐ RECENT OR NO RECOVERY [1]	

Comments

Channel 7 (Maximum 20)

4] BANK EROSION AND RIPARIAN ZONE

Check ONE in each category for EACH BANK (Or 2 per bank & average)

River right looking downstream

EROSION (L R)	RIPARIAN WIDTH (L R)	FLOOD PLAIN QUALITY (L R)	(L R)
☐ ☐ NONE / LITTLE [3]	☑ ☑ WIDE > 50m [4]	☑ ☑ FOREST, SWAMP [3]	☐ ☐ CONSERVATION TILLAGE [1]
☑ ☑ MODERATE [2]	☐ ☐ MODERATE 10-50m [3]	☐ ☐ SHRUB OR OLD FIELD [2]	☐ ☐ URBAN OR INDUSTRIAL [0]
☐ ☐ HEAVY / SEVERE [1]	☐ ☐ NARROW 5-10m [2]	☐ ☐ RESIDENTIAL, PARK, NEW FIELD [1]	☐ ☐ MINING / CONSTRUCTION [0]
	☐ ☐ VERY NARROW < 5m [1]	☐ ☐ FENCED PASTURE [1]	
	☐ ☐ NONE [0]	☐ ☐ OPEN PASTURE, ROWCROP [0]	

Indicate predominant land use(s) past 100m riparian.

Comments

Riparian 9 (Maximum 10)

5] POOL / GLIDE AND RIFFLE / RUN QUALITY

MAXIMUM DEPTH	CHANNEL WIDTH	CURRENT VELOCITY
Check ONE (ONLY!)	Check ONE (Or 2 & average)	Check ALL that apply
☐ > 1m [6]	☐ POOL WIDTH > RIFFLE WIDTH [2]	☐ TORRENTIAL [-1] ☑ SLOW [1]
☐ 0.7-<1m [4]	☑ POOL WIDTH = RIFFLE WIDTH [1]	☐ VERY FAST [1] ☐ INTERSTITIAL [-1]
☐ 0.4-<0.7m [2]	☐ POOL WIDTH < RIFFLE WIDTH [0]	☐ FAST [1] ☐ INTERMITTENT [-2]
☑ 0.2-<0.4m [1]		☐ MODERATE [1] ☐ EDDIES [1]
☐ < 0.2m [0]		Indicate for reach - pools and riffles.

Recreation Potential
Primary Contact
Secondary Contact
(circle one and comment on back)

Comments

Pool / Current 3 (Maximum 12)

Indicate for functional riffles; Best areas must be large enough to support a population of riffle-obligate species: Check ONE (Or 2 & average). ☐ NO RIFFLE [metric=0]

RIFFLE DEPTH	RUN DEPTH	RIFFLE / RUN SUBSTRATE	RIFFLE / RUN EMBEDDEDNESS
☐ BEST AREAS > 10cm [2]	☐ MAXIMUM > 50cm [2]	☐ STABLE (e.g., Cobble, Boulder) [2]	☐ NONE [2]
☐ BEST AREAS 5-10cm [1]	☑ MAXIMUM < 50cm [1]	☑ MOD. STABLE (e.g., Large Gravel) [1]	☐ LOW [1]
☑ BEST AREAS < 5cm [metric=0]		☐ UNSTABLE (e.g., Fine Gravel, Sand) [0]	☑ MODERATE [0]
			☐ EXTENSIVE [-1]

Comments

Riffle / Run 2 (Maximum 8)

6] GRADIENT (ft/mi)

DRAINAGE AREA (0.14 mi²)

☐ VERY LOW - LOW [2-4]
☐ MODERATE [6-10]
☑ HIGH - VERY HIGH [10-6]

%POOL: 5 %GLIDE: 65
%RUN: 25 %RIFFLE: 5

Gradient 6 (Maximum 10)

A] SAMPLED REACH

Check ALL that apply

Comment RE: Reach consistency/ Is reach typical of steam?, *Recreation/* Observed - Inferred, *Other/* Sampling observations, Concerns, Access directions, etc.

Last precipitation: 2015-07-20, 0.02 inch

METHOD

- ☐ BOAT
- ☑ WADE
- ☐ L. LINE
- ☐ OTHER

STAGE

1st -sample pass-	2nd
☐ HIGH	☐
☐ UP	☐
☑ NORMAL	☑
☐ LOW	☐
☐ DRY	☐

DISTANCE

- ☐ 0.5 Km
- ☐ 0.2 Km
- ☐ 0.15 Km
- ☐ 0.12 Km
- ☐ OTHER

37.5 meters

CLARITY

1st --sample pass--	2nd
☐ < 20 cm	☐
☑ 20-<40 cm	☐
☐ 40-70 cm	☐
☐ > 70 cm/ CTB	☐
☐ SECCHI DEPTH	☐

CANOPY

- ☐ > 85%- OPEN
- ☐ 55%-<85%
- ☐ 30%-<55%
- ☒ 10%-<30%
- ☐ <10%- CLOSED

pass 1st _____ cm

pass 2nd _____ cm

B] AESTHETICS

- ☐ NUISANCE ALGAE
- ☐ INVASIVE MACROPHYTES
- ☐ EXCESS TURBIDITY
- ☐ DISCOLORATION
- ☐ FOAM / SCUM
- ☐ OIL SHEEN
- ☐ TRASH / LITTER
- ☐ NUISANCE ODOR
- ☐ SLUDGE DEPOSITS
- ☐ CSOs/SSOs/OUTFALLS

C] RECREATION

	AREA	DEPTH
POOL:	☐ >100ft²	☐ >3ft

D] MAINTENANCE

Circle some & *COMMENT*

PUBLIC / PRIVATE / BOTH / NA
ACTIVE / HISTORIC / BOTH / NA
YOUNG-SUCCESSION-OLD
SPRAY / SNAG / REMOVED
MODIFIED / DIPPED OUT / NA
LEVEED / ONE SIDED
RELOCATED / CUTOFFS
MOVING-BEDLOAD-STABLE
ARMOURED / SLUMPS
ISLANDS / SCOURED
IMPOUNDED / DESICCATED
FLOOD CONTROL / DRAINAGE

E] ISSUES

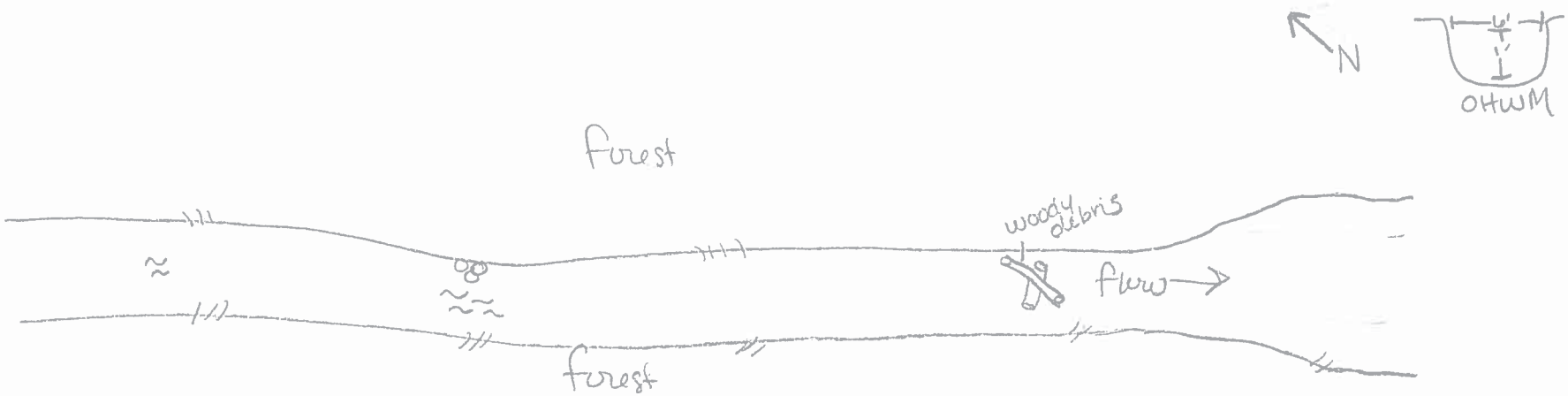
WWTP / CSO / NPDES / INDUSTRY
HARDENED / URBAN / DIRT&GRIME
CONTAMINATED / LANDFILL
BMPs-CONSTRUCTION-SEDIMENT
LOGGING / IRRIGATION / COOLING
BANK / EROSION / SURFACE
FALSE BANK / MANURE / LAGOON
WASH H_20 / TILE / H_20 TABLE
ACID / MINE / QUARRY / FLOW
NATURAL / WETLAND / STAGNANT
PARK / GOLF / LAWN / HOME
ATMOSPHERE / DATA PAUCITY

F] MEASUREMENTS

- $\bar{x}$ width
- $\bar{x}$ depth
- max. depth
- $\bar{x}$ bankfull width
- bankfull $\bar{x}$ depth
- W/D ratio
- bankfull max. depth
- floodprone x^2 width
- entrench. ratio

Legacy Tree:

Stream Drawing:



QHEI 9

OhioEPA Qualitative Habitat Evaluation Index and Use Assessment Field Sheet

QHEI Score: 63.5

Stream & Location: Lentzier Creek, Heavy Haul (Des. 1382612) / Clark County, Indiana **RM:** ___.___ **Date:** 7 / 21 / 15

Scorers Full Name & Affiliation: Leah Boits, American Structurepoint

River Code: ___-___-___ **STORET #:** _____ **Lat./ Long.:** 38 . 34473 / 85 . 66794 (NAD 83 - decimal °) **Office verified location** ☐

1] SUBSTRATE

Check ONLY Two substrate TYPE BOXES; estimate % or note every type present

BEST TYPES	POOL	RIFFLE	OTHER TYPES	POOL	RIFFLE
☐ ☐ BLDR /SLABS [10]			☑ ☐ HARDPAN [4]	55	60
☐ ☐ BOULDER [9]			☐ ☐ DETRITUS [3]		
☐ ☐ COBBLE [8]	5	15	☐ ☐ MUCK [2]		
☐ ☐ GRAVEL [7]	5	10	☐ ☑ SILT [2]	25	10
☐ ☐ SAND [6]	10	5	☐ ☐ ARTIFICIAL [0]		
☐ ☐ BEDROCK [5]			(Score natural substrates; ignore sludge from point-sources)		

NUMBER OF BEST TYPES: ☐ 4 or more [2] ☑ 3 or less [0]

Check ONE (Or 2 & average)

ORIGIN	QUALITY
☑ LIMESTONE [1]	☐ HEAVY [-2]
☐ TILLS [1]	☐ MODERATE [-1]
☐ WETLANDS [0]	☑ NORMAL [0]
☐ HARDPAN [0]	☐ FREE [1]
☐ SANDSTONE [0]	☐ EXTENSIVE [-2]
☐ RIP/RAP [0]	☐ MODERATE [-1]
☐ LACUSTURINE [0]	☑ NORMAL [0]
☐ SHALE [-1]	☐ NONE [1]
☐ COAL FINES [-2]	

SILT

EMBEDDEDNESS

Comments

Substrate 7 (Maximum 20)

2] INSTREAM COVER

Indicate presence 0 to 3: 0-Absent; 1-Very small amounts or if more common of marginal quality; 2-Moderate amounts, but not of highest quality or in small amounts of highest quality; 3-Highest quality in moderate or greater amounts (e.g., very large boulders in deep or fast water, large diameter log that is stable, well developed rootwad in deep / fast water, or deep, well-defined, functional pools.

___ UNDERCUT BANKS [1]	2 POOLS > 70cm [2]	___ OXBOWS, BACKWATERS [1]
2 OVERHANGING VEGETATION [1]	1 ROOTWADS [1]	___ AQUATIC MACROPHYTES [1]
___ SHALLOWS (IN SLOW WATER) [1]	___ BOULDERS [1]	1 LOGS OR WOODY DEBRIS [1]
___ ROOTMATS [1]		

AMOUNT

Check ONE (Or 2 & average)

☐ EXTENSIVE >75% [11]
☑ MODERATE 25-75% [7]
☐ SPARSE 5-<25% [3]
☐ NEARLY ABSENT <5% [1]

Comments

Cover 12 (Maximum 20)

3] CHANNEL MORPHOLOGY

Check ONE in each category (Or 2 & average)

SINUOSITY	DEVELOPMENT	CHANNELIZATION	STABILITY
☐ HIGH [4]	☐ EXCELLENT [7]	☑ NONE [6]	☐ HIGH [3]
☑ MODERATE [3]	☐ GOOD [5]	☐ RECOVERED [4]	☑ MODERATE [2]
☐ LOW [2]	☑ FAIR [3]	☐ RECOVERING [3]	☐ LOW [1]
☐ NONE [1]	☐ POOR [1]	☐ RECENT OR NO RECOVERY [1]	

Comments

Channel 14 (Maximum 20)

4] BANK EROSION AND RIPARIAN ZONE

Check ONE in each category for EACH BANK (Or 2 per bank & average)

River right looking downstream

EROSION (L R)	RIPARIAN WIDTH (L R)	FLOOD PLAIN QUALITY (L R)	(L R)
☐ ☐ NONE / LITTLE [3]	☑ ☑ WIDE > 50m [4]	☑ ☑ FOREST, SWAMP [3]	☐ ☐ CONSERVATION TILLAGE [1]
☑ ☑ MODERATE [2]	☐ ☐ MODERATE 10-50m [3]	☐ ☐ SHRUB OR OLD FIELD [2]	☐ ☐ URBAN OR INDUSTRIAL [0]
☐ ☐ HEAVY / SEVERE [1]	☐ ☐ NARROW 5-10m [2]	☐ ☐ RESIDENTIAL, PARK, NEW FIELD [1]	☐ ☐ MINING / CONSTRUCTION [0]
	☐ ☐ VERY NARROW < 5m [1]	☐ ☐ FENCED PASTURE [1]	
	☐ ☐ NONE [0]	☐ ☐ OPEN PASTURE, ROWCROP [0]	

Indicate predominant land use(s) past 100m riparian.

Comments

Riparian 9 (Maximum 10)

5] POOL / GLIDE AND RIFFLE / RUN QUALITY

MAXIMUM DEPTH	CHANNEL WIDTH	CURRENT VELOCITY
Check ONE (ONLY!)	Check ONE (Or 2 & average)	Check ALL that apply
☐ > 1m [6]	☐ POOL WIDTH > RIFFLE WIDTH [2]	☐ TORRENTIAL [-1] ☐ SLOW [1]
☑ 0.7-<1m [4]	☑ POOL WIDTH = RIFFLE WIDTH [1]	☐ VERY FAST [1] ☐ INTERSTITIAL [-1]
☐ 0.4-<0.7m [2]	☐ POOL WIDTH < RIFFLE WIDTH [0]	☑ FAST [1] ☐ INTERMITTENT [-2]
☐ 0.2-<0.4m [1]		☑ MODERATE [1] ☐ EDDIES [1]
☐ < 0.2m [0]		Indicate for reach - pools and riffles.

Recreation Potential
Primary Contact
Secondary Contact
(circle one and comment on back)

Comments

Pool / Current 7 (Maximum 12)

Indicate for functional riffles; Best areas must be large enough to support a population of riffle-obligate species: Check ONE (Or 2 & average). ☐ NO RIFFLE [metric=0]

RIFFLE DEPTH	RUN DEPTH	RIFFLE / RUN SUBSTRATE	RIFFLE / RUN EMBEDDEDNESS
☑ BEST AREAS > 10cm [2]	☑ MAXIMUM > 50cm [2]	☐ STABLE (e.g., Cobble, Boulder) [2]	☐ NONE [2]
☐ BEST AREAS 5-10cm [1]	☐ MAXIMUM < 50cm [1]	☑ MOD. STABLE (e.g., Large Gravel) [1]	☐ LOW [1]
☐ BEST AREAS < 5cm [metric=0]		☑ UNSTABLE (e.g., Fine Gravel, Sand) [0]	☑ MODERATE [0]
			☐ EXTENSIVE [-1]

Comments

Riffle / Run 4.5 (Maximum 8)

6] GRADIENT

(22.1 ft/mi) ☐ VERY LOW - LOW [2-4] ☐ MODERATE [6-10] ☑ HIGH - VERY HIGH [10-6]

DRAINAGE AREA (6.91 mi²)

%POOL: 10 %GLIDE: 30 %RUN: 50 %RIFFLE: 10

Gradient 10 (Maximum 10)

EPA 4520

A] SAMPLED REACH

Check ALL that apply

Comment RE: Reach consistency/ Is reach typical of steam?, *Recreation/* Observed - Inferred, *Other/* Sampling observations, Concerns, Access directions, etc.

Last precipitation: 2015-07-20, 0.02 inch

METHOD

- ☐ BOAT
- ☑ WADE
- ☐ L. LINE
- ☐ OTHER

STAGE

1st -sample pass-	2nd
☐ HIGH	☐
☐ UP	☐
☑ NORMAL	☑
☐ LOW	☐
☐ DRY	☐

DISTANCE

- ☐ 0.5 Km
- ☐ 0.2 Km
- ☐ 0.15 Km
- ☐ 0.12 Km
- ☐ OTHER

60 meters

CLARITY

1st --sample pass--	2nd
☐ < 20 cm	☐
☑ 20-<40 cm	☐
☐ 40-70 cm	☐
☐ > 70 cm/ CTB	☐
☐ SECCHI DEPTH	☐

CANOPY

- ☐ > 85%- OPEN
- ☐ 55%-<85%
- ☐ 30%-<55%
- ☒ 10%-<30%
- ☐ <10%- CLOSED

1st pass _____ cm

2nd _____ cm

B] AESTHETICS

- ☐ NUISANCE ALGAE
- ☐ INVASIVE MACROPHYTES
- ☐ EXCESS TURBIDITY
- ☐ DISCOLORATION
- ☐ FOAM / SCUM
- ☐ OIL SHEEN
- ☐ TRASH / LITTER
- ☐ NUISANCE ODOR
- ☐ SLUDGE DEPOSITS
- ☐ CSOs/SSOs/OUTFALLS

C] RECREATION

POOL: ☐ AREA >100ft² ☐ DEPTH >3ft

D] MAINTENANCE

Circle some & *COMMENT*

PUBLIC / PRIVATE / BOTH / NA
ACTIVE / HISTORIC / BOTH / NA
YOUNG-SUCCESSION-OLD
SPRAY / SNAG / REMOVED
MODIFIED / DIPPED OUT / NA
LEVEED / ONE SIDED
RELOCATED / CUTOFFS
MOVING-BEDLOAD-STABLE
ARMOURED / SLUMPS
ISLANDS / SCOURED
IMPOUNDED / DESICCATED
FLOOD CONTROL / DRAINAGE

E] ISSUES

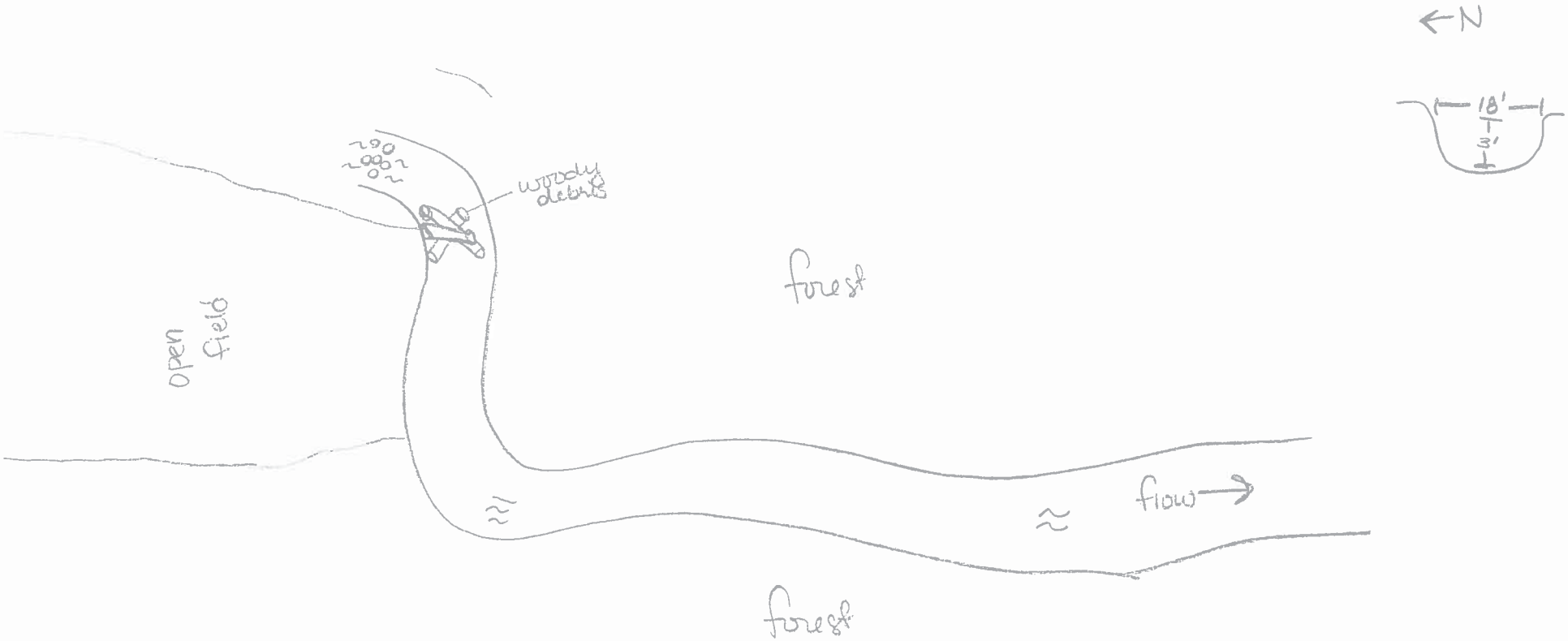
WWTP / CSO / NPDES / INDUSTRY
HARDENED / URBAN / DIRT&GRIME
CONTAMINATED / LANDFILL
BMPs-CONSTRUCTION-SEDIMENT
LOGGING / IRRIGATION / COOLING
BANK / EROSION / SURFACE
FALSE BANK / MANURE / LAGOON
WASH H_20 / TILE / H_20 TABLE
ACID / MINE / QUARRY / FLOW
NATURAL / WETLAND / STAGNANT
PARK / GOLF / LAWN / HOME
ATMOSPHERE / DATA PAUCITY

F] MEASUREMENTS

- $\bar{x}$ width
- $\bar{x}$ depth
- max. depth
- $\bar{x}$ bankfull width
- bankfull $\bar{x}$ depth
- W/D ratio
- bankfull max. depth
- floodprone x^2 width
- entrench. ratio

Legacy Tree:

Stream Drawing:



OhioEPA Qualitative Habitat Evaluation Index and Use Assessment Field Sheet

QHEI Score: 64.5

Stream & Location: Lentzier Creek, Heavy Haul (Des. 1382612) / Clark County, Indiana **RM:** ___.___ **Date:** 7 / 21 / 15

Scorers Full Name & Affiliation: Rick Paul, American Structurepoint

River Code: ___-___-___ **STORET #:** _____ **Lat./ Long.:** (NAD 83 - decimal °) 38 . 34230 / 85 . 66962 **Office verified location** ☐

1] SUBSTRATE

Check ONLY Two substrate TYPE BOXES; estimate % or note every type present

BEST TYPES	POOL	RIFFLE	OTHER TYPES	POOL	RIFFLE
☐☐ BLDR /SLABS [10]			☑☐ HARDPAN [4]	55	60
☐☐ BOULDER [9]			☐☐ DETRITUS [3]		
☐☐ COBBLE [8]	5	15	☐☐ MUCK [2]		
☐☐ GRAVEL [7]	5	10	☐☑ SILT [2]	25	10
☐☐ SAND [6]	10	5	☐☐ ARTIFICIAL [0]		
☐☐ BEDROCK [5]			(Score natural substrates; ignore sludge from point-sources)		

NUMBER OF BEST TYPES: ☐ 4 or more [2] ☑ 3 or less [0]

Comments

Check ONE (Or 2 & average)

ORIGIN	QUALITY	
☑ LIMESTONE [1]	SILT: ☐ HEAVY [-2]	
☐ TILLS [1]	☐ MODERATE [-1]	
☐ WETLANDS [0]	☑ NORMAL [0]	
☐ HARDPAN [0]	☐ FREE [1]	
☐ SANDSTONE [0]	EMBEDDEDNESS: ☐ EXTENSIVE [-2]	
☐ RIP/RAP [0]	☐ MODERATE [-1]	
☐ LACUSTURINE [0]	☑ NORMAL [0]	
☐ SHALE [-1]	☐ NONE [1]	
☐ COAL FINES [-2]		

Substrate 7 (Maximum 20)

2] INSTREAM COVER

Indicate presence 0 to 3: 0-Absent; 1-Very small amounts or if more common of marginal quality; 2-Moderate amounts, but not of highest quality or in small amounts of highest quality; 3-Highest quality in moderate or greater amounts (e.g., very large boulders in deep or fast water, large diameter log that is stable, well developed rootwad in deep / fast water, or deep, well-defined, functional pools.

___ UNDERCUT BANKS [1]	2 POOLS > 70cm [2]	___ OXBOWS, BACKWATERS [1]
2 OVERHANGING VEGETATION [1]	1 ROOTWADS [1]	___ AQUATIC MACROPHYTES [1]
___ SHALLOWS (IN SLOW WATER) [1]	___ BOULDERS [1]	2 LOGS OR WOODY DEBRIS [1]
___ ROOTMATS [1]		

AMOUNT — Check ONE (Or 2 & average)

☑ EXTENSIVE >75% [11]
☐ MODERATE 25-75% [7]
☐ SPARSE 5-<25% [3]
☐ NEARLY ABSENT <5% [1]

Comments

Cover 12 (Maximum 20)

3] CHANNEL MORPHOLOGY

Check ONE in each category (Or 2 & average)

SINUOSITY	DEVELOPMENT	CHANNELIZATION	STABILITY
☐ HIGH [4]	☐ EXCELLENT [7]	☑ NONE [6]	☐ HIGH [3]
☑ MODERATE [3]	☐ GOOD [5]	☐ RECOVERED [4]	☑ MODERATE [2]
☐ LOW [2]	☑ FAIR [3]	☐ RECOVERING [3]	☐ LOW [1]
☐ NONE [1]	☐ POOR [1]	☐ RECENT OR NO RECOVERY [1]	

Comments

Channel 14 (Maximum 20)

4] BANK EROSION AND RIPARIAN ZONE

Check ONE in each category for EACH BANK (Or 2 per bank & average)

River right looking downstream

EROSION (L R)	RIPARIAN WIDTH (L R)	FLOOD PLAIN QUALITY (L R)	(L R)
☐☐ NONE / LITTLE [3]	☑☑ WIDE > 50m [4]	☑☑ FOREST, SWAMP [3]	☐☐ CONSERVATION TILLAGE [1]
☑☑ MODERATE [2]	☐☐ MODERATE 10-50m [3]	☐☐ SHRUB OR OLD FIELD [2]	☐☐ URBAN OR INDUSTRIAL [0]
☐☐ HEAVY / SEVERE [1]	☐☐ NARROW 5-10m [2]	☐☐ RESIDENTIAL, PARK, NEW FIELD [1]	☐☐ MINING / CONSTRUCTION [0]
	☐☐ VERY NARROW < 5m [1]	☐☐ FENCED PASTURE [1]	
	☐☐ NONE [0]	☐☐ OPEN PASTURE, ROWCROP [0]	

Indicate predominant land use(s) past 100m riparian.

Comments

Riparian 9 (Maximum 10)

5] POOL / GLIDE AND RIFFLE / RUN QUALITY

MAXIMUM DEPTH	CHANNEL WIDTH	CURRENT VELOCITY
Check ONE (ONLY!)	Check ONE (Or 2 & average)	Check ALL that apply
☐ > 1m [6]	☐ POOL WIDTH > RIFFLE WIDTH [2]	☐ TORRENTIAL [-1] ☑ SLOW [1]
☑ 0.7-<1m [4]	☑ POOL WIDTH = RIFFLE WIDTH [1]	☐ VERY FAST [1] ☐ INTERSTITIAL [-1]
☐ 0.4-<0.7m [2]	☐ POOL WIDTH < RIFFLE WIDTH [0]	☑ FAST [1] ☐ INTERMITTENT [-2]
☐ 0.2-<0.4m [1]		☑ MODERATE [1] ☐ EDDIES [1]
☐ < 0.2m [0]		Indicate for reach - pools and riffles.

Recreation Potential
Primary Contact
Secondary Contact
(circle one and comment on back)

Comments

Pool / Current 8 (Maximum 12)

Indicate for functional riffles; Best areas must be large enough to support a population of riffle-obligate species: Check ONE (Or 2 & average). ☐ NO RIFFLE [metric=0]

RIFFLE DEPTH	RUN DEPTH	RIFFLE / RUN SUBSTRATE	RIFFLE / RUN EMBEDDEDNESS
☑ BEST AREAS > 10cm [2]	☑ MAXIMUM > 50cm [2]	☐ STABLE (e.g., Cobble, Boulder) [2]	☐ NONE [2]
☐ BEST AREAS 5-10cm [1]	☐ MAXIMUM < 50cm [1]	☑ MOD. STABLE (e.g., Large Gravel) [1]	☐ LOW [1]
☐ BEST AREAS < 5cm [metric=0]		☑ UNSTABLE (e.g., Fine Gravel, Sand) [0]	☑ MODERATE [0]
			☐ EXTENSIVE [-1]

Comments

Riffle / Run 4.5 (Maximum 8)

6] GRADIENT

(22.5 ft/mi) ☐ VERY LOW - LOW [2-4] ☐ MODERATE [6-10] ☑ HIGH - VERY HIGH [10-6]

DRAINAGE AREA (5.32 mi²)

%POOL: 10 %GLIDE: 30 %RUN: 50 %RIFFLE: 10

Gradient 10 (Maximum 10)

A] SAMPLED REACH

Check ALL that apply

Comment RE: Reach consistency/ Is reach typical of steam?, *Recreation/* Observed - Inferred, *Other/* Sampling observations, Concerns, Access directions, etc.

Last precipitation: 2015-07-20, 0.02 inch

METHOD

- ☐ BOAT
- ☑ WADE
- ☐ L. LINE
- ☐ OTHER

STAGE

1st -sample pass-	2nd
☐ HIGH	☐
☐ UP	☐
☑ NORMAL	☑
☐ LOW	☐
☐ DRY	☐

DISTANCE

- ☐ 0.5 Km
- ☐ 0.2 Km
- ☐ 0.15 Km
- ☐ 0.12 Km
- ☐ OTHER

60 meters

CLARITY

1st --sample pass--	2nd
☐ < 20 cm	☐
☑ 20-<40 cm	☐
☐ 40-70 cm	☐
☐ > 70 cm/ CTB	☐
☐ SECCHI DEPTH	☐

CANOPY

- ☐ > 85%- OPEN
- ☐ 55%-<85%
- ☐ 30%-<55%
- ☒ 10%-<30%
- ☐ <10%- CLOSED

1st pass _____ cm

2nd _____ cm

B] AESTHETICS

- ☐ NUISANCE ALGAE
- ☐ INVASIVE MACROPHYTES
- ☐ EXCESS TURBIDITY
- ☐ DISCOLORATION
- ☐ FOAM / SCUM
- ☐ OIL SHEEN
- ☐ TRASH / LITTER
- ☐ NUISANCE ODOR
- ☐ SLUDGE DEPOSITS
- ☐ CSOs/SSOs/OUTFALLS

C] RECREATION

	AREA	DEPTH
POOL:	☐ >100ft²	☐ >3ft

D] MAINTENANCE

Circle some & *COMMENT*

PUBLIC / PRIVATE / BOTH / NA
ACTIVE / HISTORIC / BOTH / NA
YOUNG-SUCCESSION-OLD
SPRAY / SNAG / REMOVED
MODIFIED / DIPPED OUT / NA
LEVEED / ONE SIDED
RELOCATED / CUTOFFS
MOVING-BEDLOAD-STABLE
ARMOURED / SLUMPS
ISLANDS / SCOURED
IMPOUNDED / DESICCATED
FLOOD CONTROL / DRAINAGE

E] ISSUES

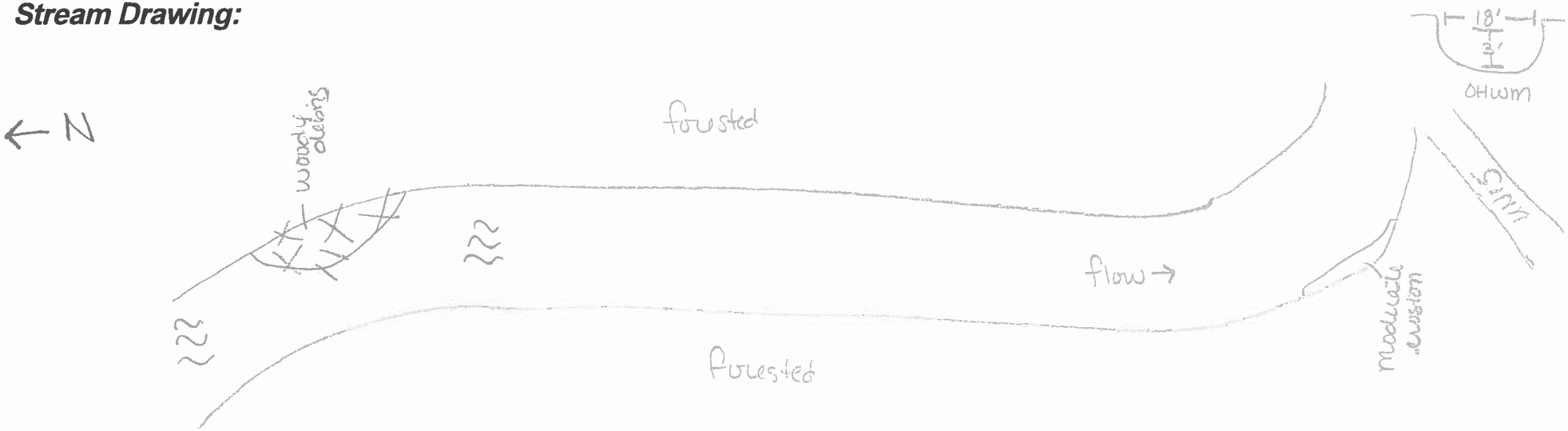
WWTP / CSO / NPDES / INDUSTRY
HARDENED / URBAN / DIRT&GRIME
CONTAMINATED / LANDFILL
BMPs-CONSTRUCTION-SEDIMENT
LOGGING / IRRIGATION / COOLING
BANK / EROSION / SURFACE
FALSE BANK / MANURE / LAGOON
WASH H_20 / TILE / H_20 TABLE
ACID / MINE / QUARRY / FLOW
NATURAL / WETLAND / STAGNANT
PARK / GOLF / LAWN / HOME
ATMOSPHERE / DATA PAUCITY

F] MEASUREMENTS

- $\bar{x}$ width
- $\bar{x}$ depth
- max. depth
- $\bar{x}$ bankfull width
- bankfull $\bar{x}$ depth
- W/D ratio
- bankfull max. depth
- floodprone x^2 width
- entrench. ratio

Legacy Tree:

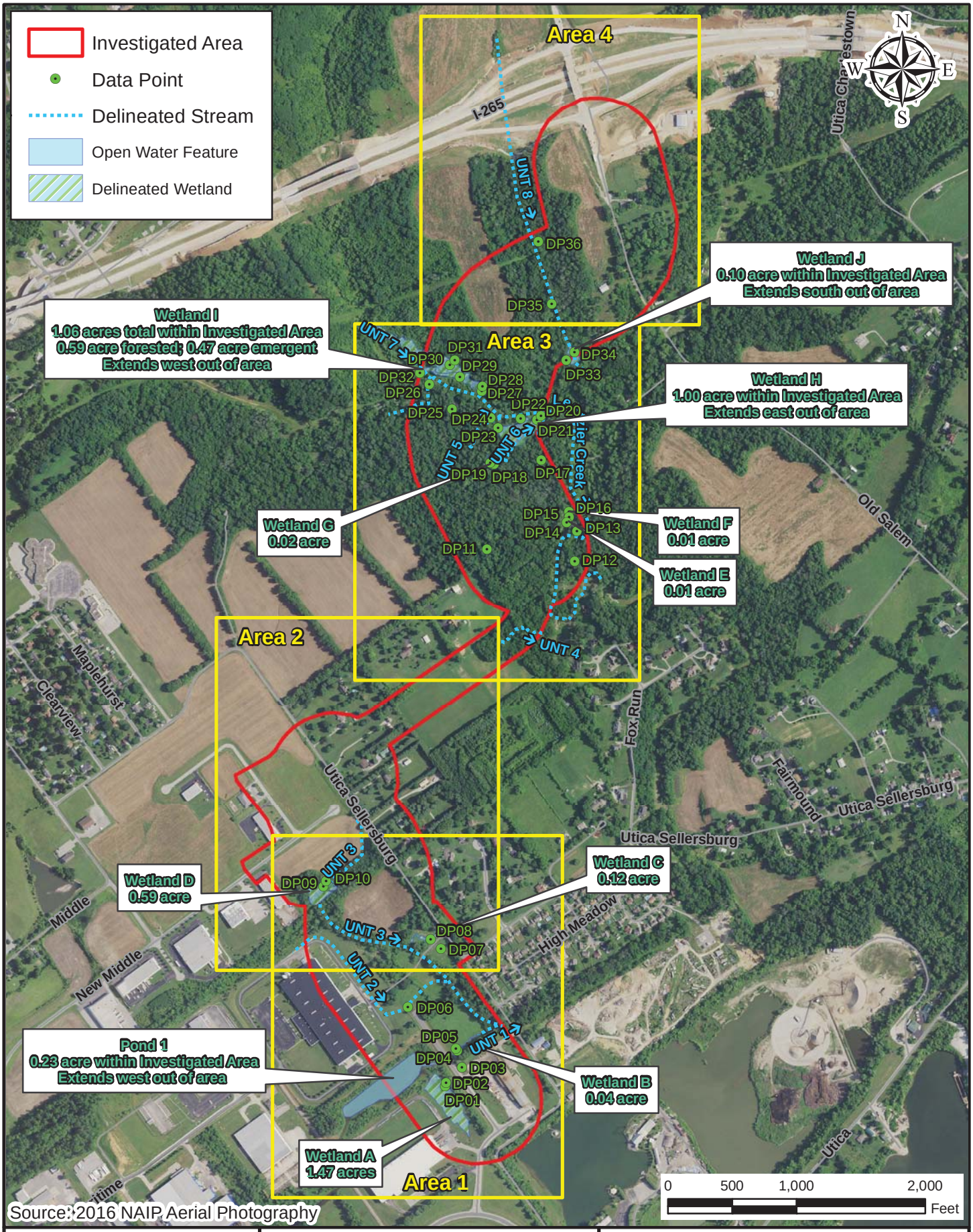
Stream Drawing:



Appendix D - Mapping

Figure 1 – Indiana State Highway Map
Figure 2 – USGS Topographic Mapping – Jeffersonville Quadrangle
Figure 3 – 1974 Clark County Soil Survey
Figure 4 – Clark County Mapped Soils - SURRGO
Figure 5 – National Wetland Inventory & FEMA 100-Year Floodplain Map
Figure 6 – 2005 Aerial Photography
Figure 7 – Field Investigation and Photo Location Maps
Figure 8 – Regional Supplement Map

Figures 1 and 2 found in Appendix B of the environmental document



Source: 2016 NAIP Aerial Photography

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Map Key

Indiana Department of Transportation
Central Office
100 North Senate Avenue
Indianapolis, Indiana 46204

Heavy Haul Transportation Corridor
Des. No. 1382612

Location: Jeffersonville
Township: Utica
County: Clark
State: Indiana

Date: 02/01/2017

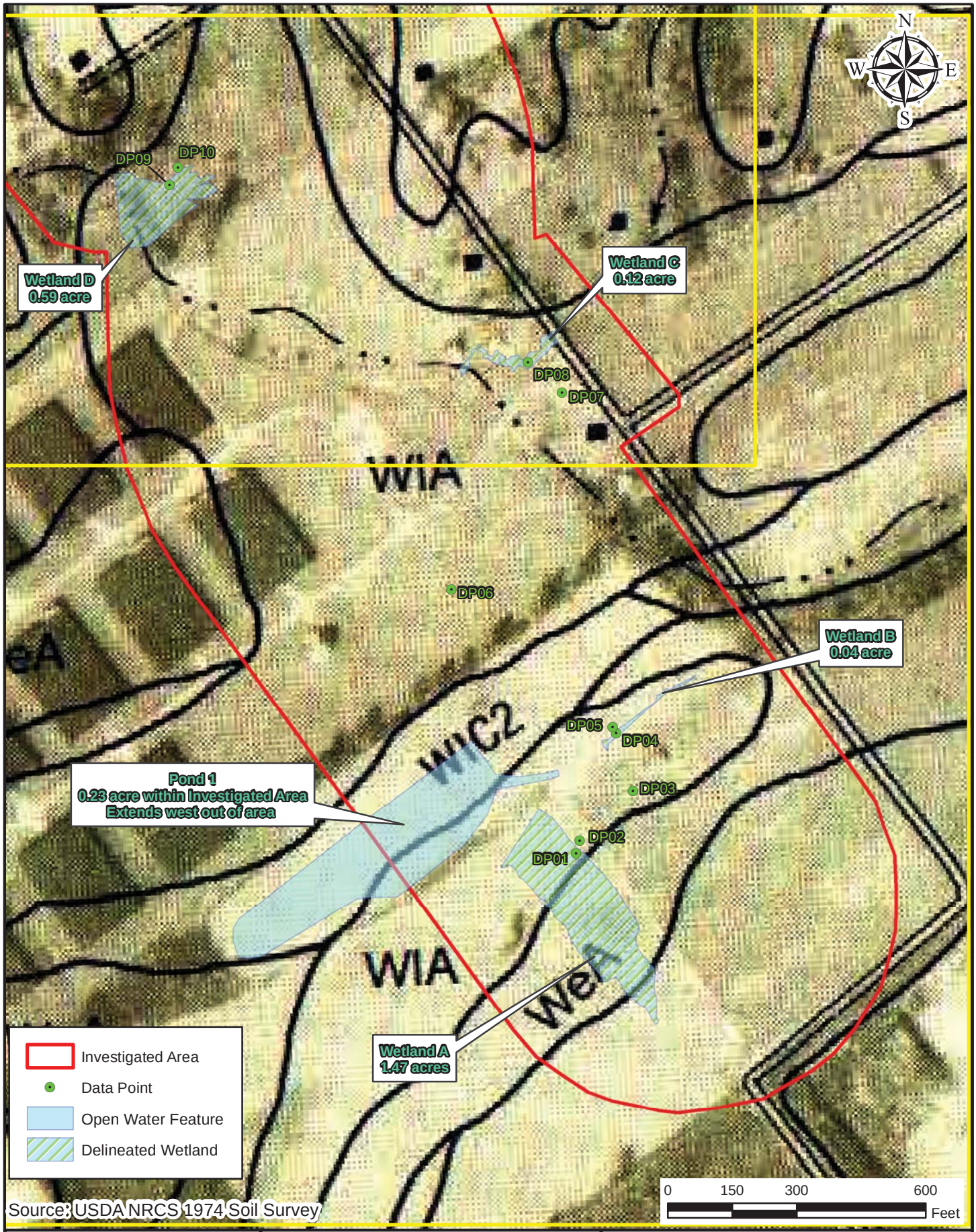

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Figure 3. 1974 Clark County Soil Survey - Area 1 of 4

Indiana Department of Transportation
Central Office
100 North Senate Avenue
Indianapolis, Indiana 46204

Heavy Haul Transportation Corridor
Des. No. 1382612

Location: Jeffersonville
Township: Utica
County: Clark
State: Indiana

Date: 02/01/2017

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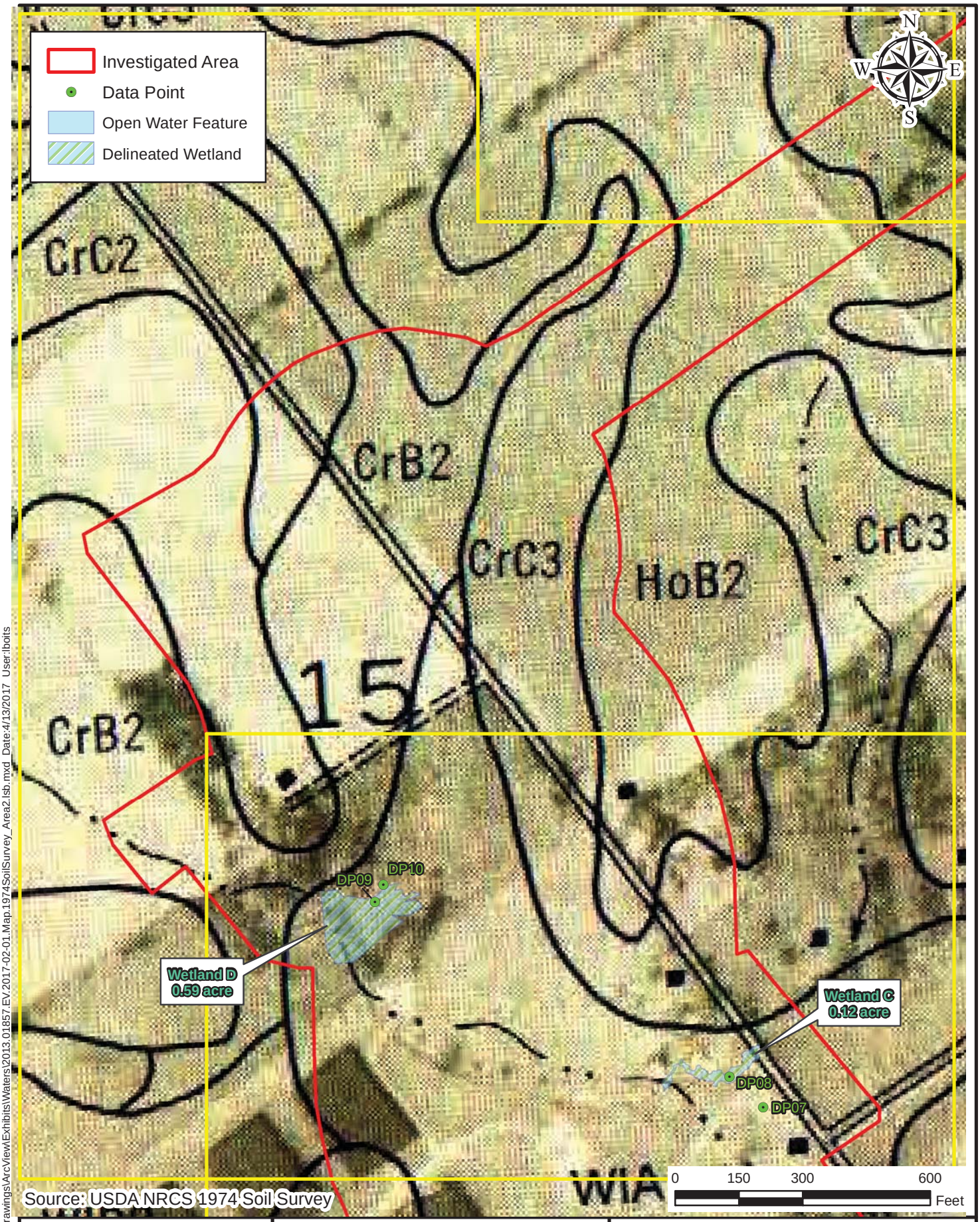

Source: USDA NRCS 1974 Soil Survey

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Figure 3. 1974 Clark County Soil Survey - Area 2 of 4

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Des. No. 1382612

Location: Jeffersonville
Township: Utica
County: Clark
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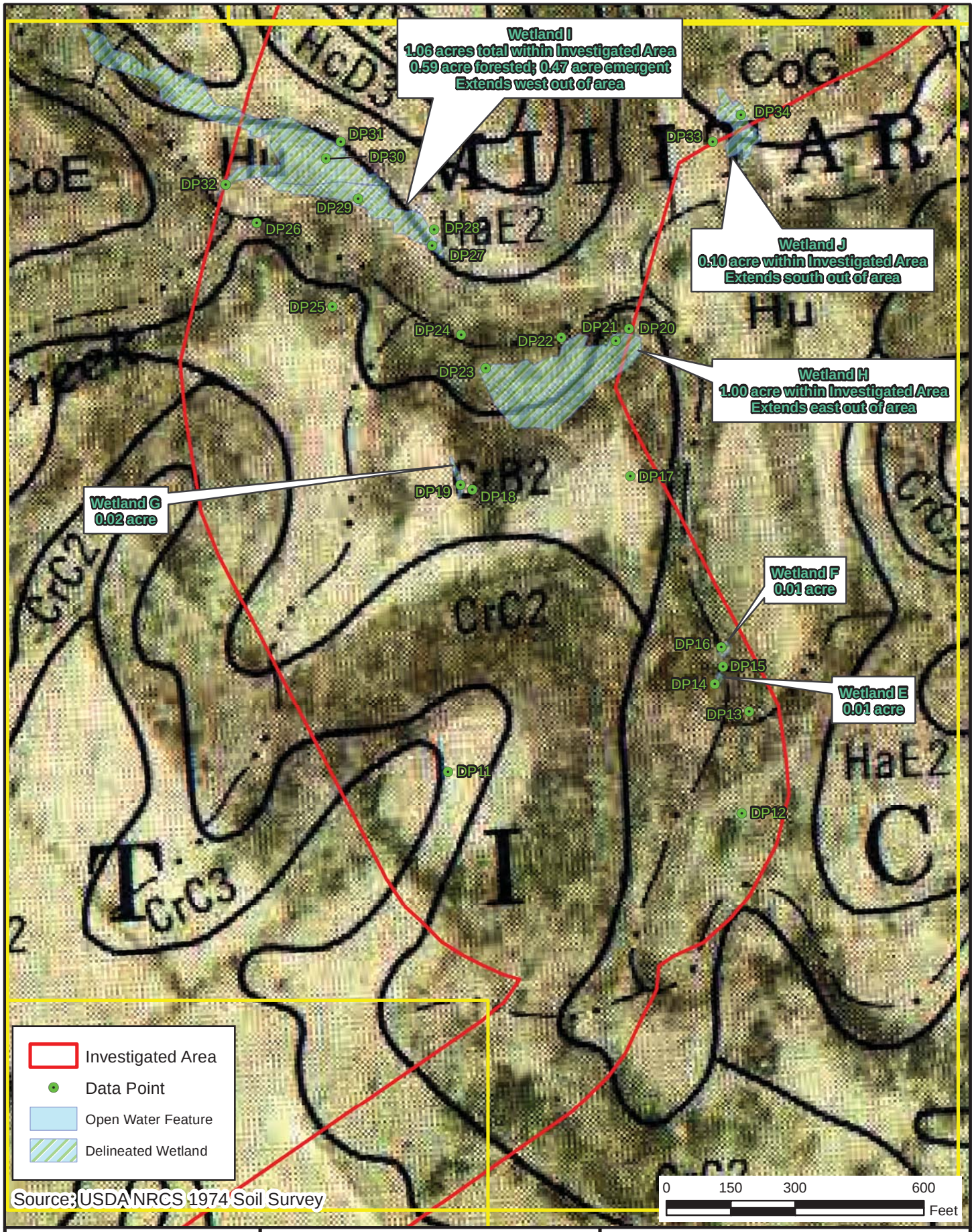

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Figure 3. 1974 Clark County Soil Survey - Area 3 of 4

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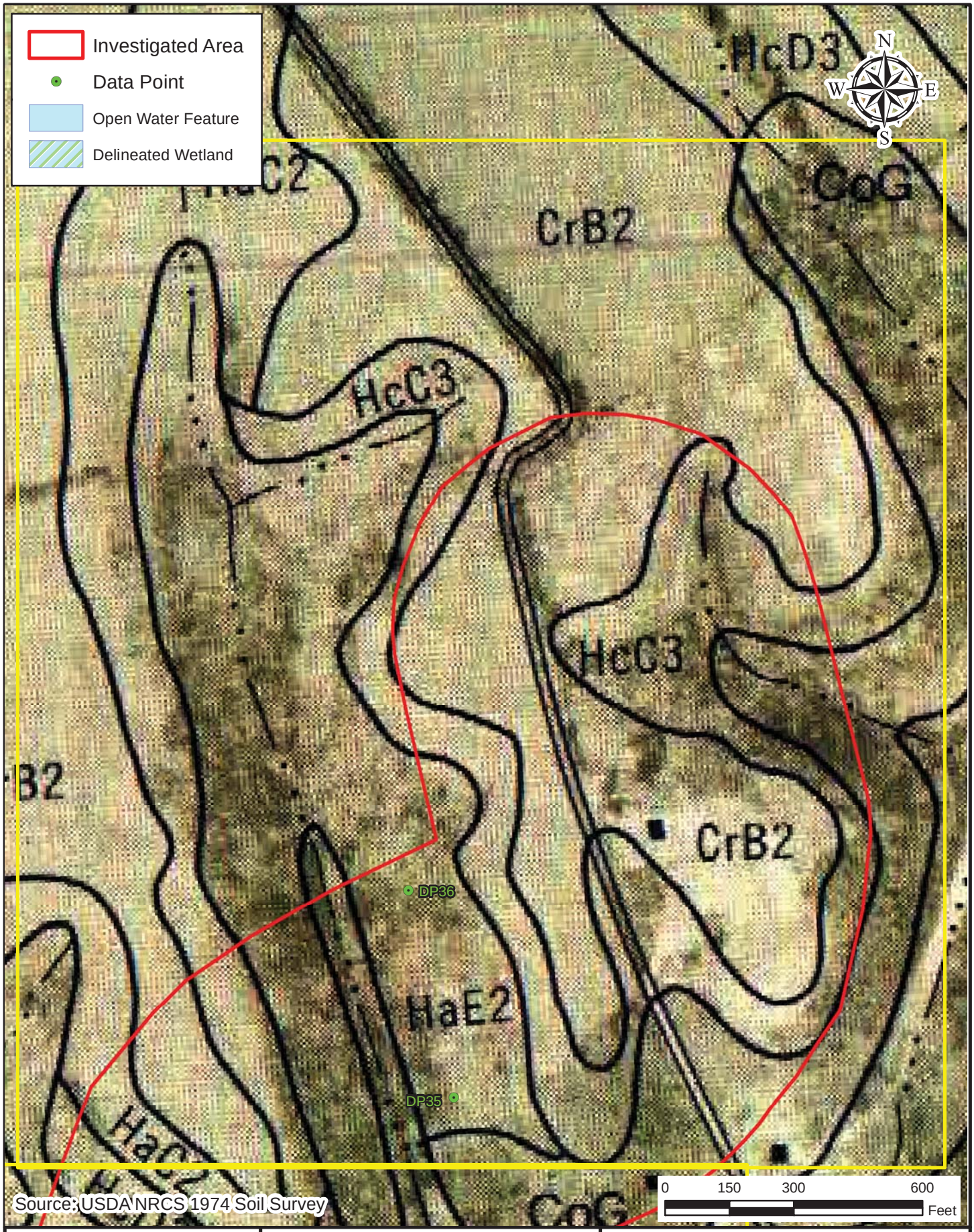

Source: USDA NRCS 1974 Soil Survey

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Figure 3. 1974 Clark County Soil Survey - Area 4 of 4

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Indianapolis, Indiana 46204

Heavy Haul Transportation Corridor
Des. No. 1382612

Location: Jeffersonville
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County: Clark
State: Indiana

Date: 02/01/2017

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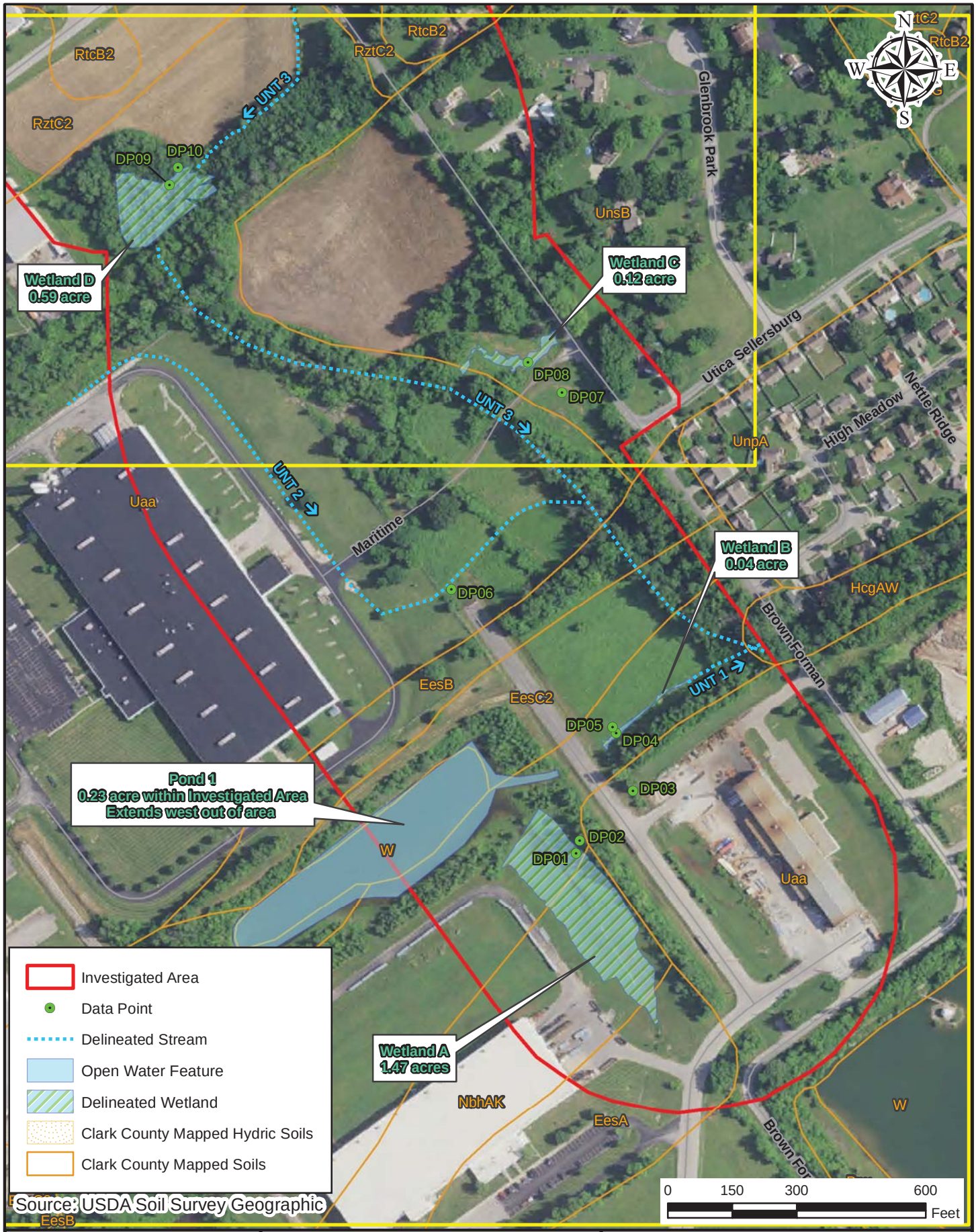

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Figure 4. Clark County Mapped Soils, SSURGO - Area 1 of 4

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100 North Senate Avenue
Indianapolis, Indiana 46204

Heavy Haul Transportation Corridor
Des. No. 1382612

Location: Jeffersonville
Township: Utica
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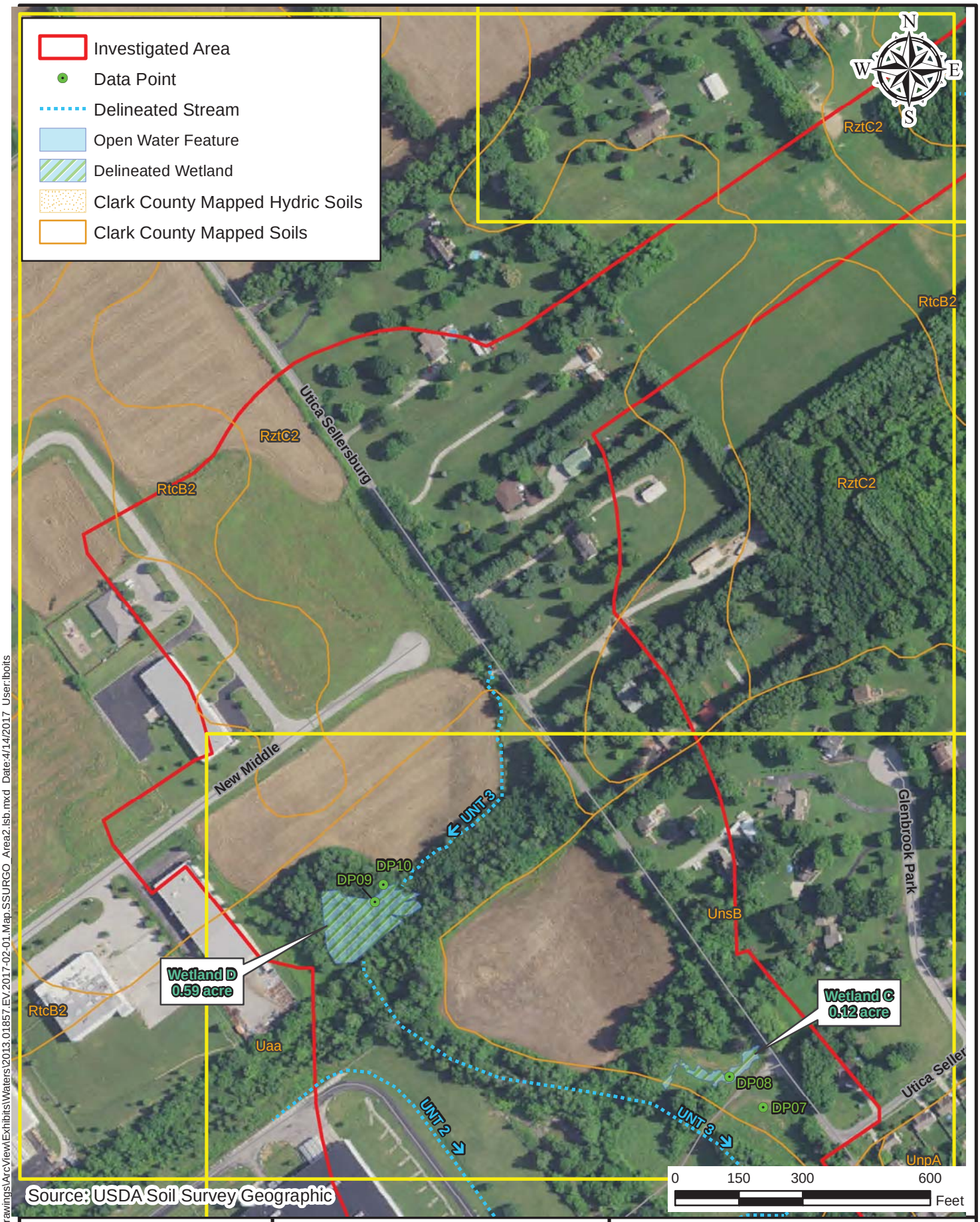

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Figure 4. Clark County Mapped Soils, SSURGO - Area 2 of 4

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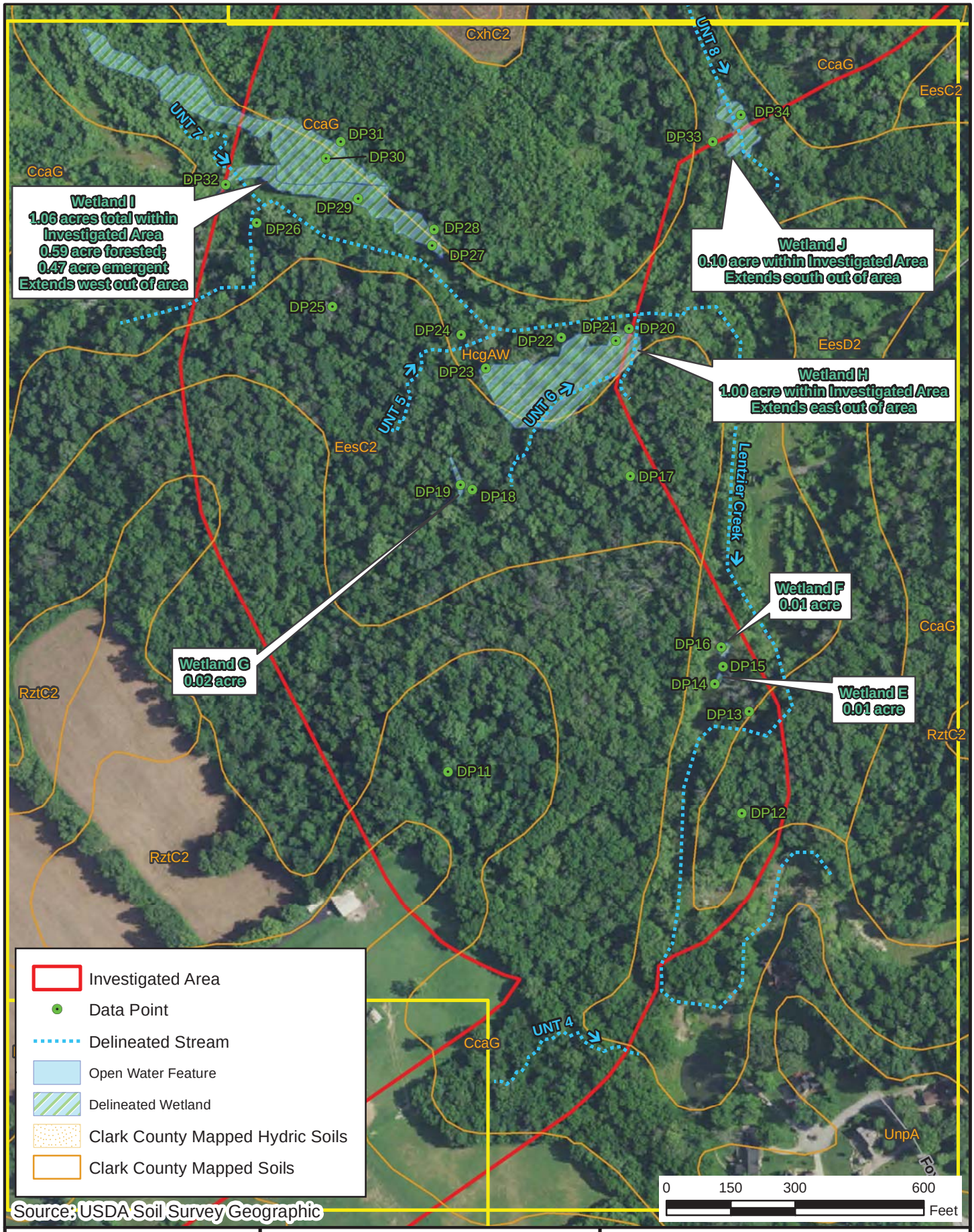

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Figure 4. Clark County Mapped Soils, SSURGO - Area 3 of 4

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Figure 4. Clark County Mapped Soils, SSURGO - Area 4 of 4

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Location: Jeffersonville
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County: Clark
State: Indiana

Date: 02/01/2017

Map Unit Legend

Clark County, Indiana

Map symbol	Map unit name
AddA	Avonburg silt loam, 0 to 2 percent slopes
AddB2	Avonburg silt loam, 2 to 4 percent slopes, eroded
BbhA	Bartle silt loam, 0 to 2 percent slopes
BcrAQ	Beanblossom silt loam, 1 to 3 percent slopes, rarely flooded
BcrAW	Beanblossom silt loam, 1 to 3 percent slopes, occasionally flooded, very brief duration
BdoA	Bedford silt loam, 0 to 2 percent slopes
BdoB	Bedford silt loam, 2 to 6 percent slopes
BfbC2	Blocher, soft bedrock substratum-Weddel silt loams, 6 to 12 percent slopes, eroded
BfcC3	Blocher, soft bedrock substratum-Weddel complex, 6 to 12 percent slopes, severely eroded
BnyD3	Bonnell clay loam, 12 to 22 percent slopes, severely eroded
BobE5	Bonnell-Hickory clay loams, 15 to 30 percent slopes, gullied
BodAW	Bonnie silt loam, 0 to 1 percent slopes, occasionally flooded, very brief duration
BvoG	Brownstown-Gilwood silt loams, 25 to 75 percent slopes
CcaG	Caneyville-Rock outcrop complex, 25 to 60 percent slopes
CkkB2	Cincinnati silt loam, 2 to 6 percent slopes, eroded
CldC2	Cincinnati-Blocher silt loams, 6 to 12 percent slopes, eroded
CldC3	Cincinnati-Blocher silt loams, 6 to 12 percent slopes, severely eroded
ClfA	Cobbsfork silt loam, 0 to 1 percent slopes
ComC	Coolville silt loam, 6 to 12 percent slopes
ConC3	Coolville-Rarden complex, 6 to 12 percent slopes, severely eroded
ConD	Coolville-Rarden complex, 12 to 18 percent slopes
CspA	Crider silt loam, 0 to 2 percent slopes
CspB2	Crider silt loam, 2 to 6 percent slopes, eroded
CtrB2	Crider silt loam, karst, undulating, eroded
CtwB	Crider-Bedford-Navilleton silt loams, 2 to 6 percent slopes
CwaAQ	Cuba silt loam, 0 to 2 percent slopes, rarely flooded
CxgC3	Crider-Haggatt complex, 6 to 12 percent slopes, severely eroded
CxhC2	Crider-Haggatt silt loams, 6 to 12 percent slopes, eroded
CxmC2	Crider-Haggatt silt loams, karst, rolling, eroded
CxnC3	Crider-Haggatt complex, karst, rolling, severely eroded
DbrG	Deam silty clay loam, 20 to 55 percent slopes
DdsAW	Dearborn silt loam, 0 to 2 percent slopes, occasionally flooded, very brief duration
DfnA	Dubois silt loam, 0 to 2 percent slopes
DtvC2	Deputy-Trappist silt loams, 6 to 12 percent slopes, eroded
EbpD2	Eden silty clay loam, 12 to 25 percent slopes, eroded
EesA	Elkinsville-Millstone silt loams, 0 to 2 percent slopes
EesB	Elkinsville-Millstone silt loams, 2 to 6 percent slopes
EesC2	Elkinsville-Millstone silt loams, 6 to 12 percent slopes, eroded
EesD2	Elkinsville-Millstone silt loams, 12 to 18 percent slopes, eroded
EesFQ	Elkinsville-Millstone silt loams, 18 to 40 percent slopes, rarely flooded
EsaG	Eden silty clay loam, 25 to 60 percent slopes, very rocky
GgbG	Gilwood-Brownstown silt loams, 25 to 75 percent slopes
GgfD	Gilwood-Wrays silt loams, 6 to 18 percent slopes
GgfE2	Gilwood-Wrays silt loams, 12 to 25 percent slopes, eroded
GmaG	Gnawbone-Kurtz silt loams, 20 to 60 percent slopes
GyaD2	Grayford silt loam, 12 to 25 percent slopes, eroded
GyaD3	Grayford silt loam, 12 to 25 percent slopes, severely eroded
GyaD5	Grayford silt loam, 12 to 25 percent slopes, gullied
GykD2	Grayford silt loam, karst, hilly, eroded

Map Unit Legend

Clark County, Indiana

Map symbol	Map unit name
GykD3	Grayford silt loam, karst, hilly, severely eroded
HcaA	Hatfield silt loam, 0 to 2 percent slopes
HccB2	Haubstadt silt loam, 2 to 6 percent slopes, eroded
HcdC2	Haubstadt-Shircliff silt loams, 6 to 15 percent slopes, eroded
HceC3	Haubstadt-Shircliff complex, 6 to 15 percent slopes, severely eroded
HcgAH	Haymond silt loam, 0 to 2 percent slopes, frequently flooded, brief duration
HcgAV	Haymond silt loam, 0 to 2 percent slopes, frequently flooded, very brief duration
HcgAW	Haymond silt loam, 0 to 2 percent slopes, occasionally flooded, very brief duration
HerE	Hickory-Bonnell complex, 12 to 25 percent slopes
HtwD2	Haggatt-Caneyville silt loams, 12 to 25 percent slopes, eroded
HtzD3	Haggatt-Caneyville complex, 12 to 25 percent slopes, severely eroded
HufAK	Huntington silt loam, 0 to 2 percent slopes, occasionally flooded, brief duration
HuhD2	Haggatt-Caneyville silt loams, karst, hilly, eroded
HujD3	Haggatt-Caneyville complex, karst, hilly, severely eroded
JaeB2	Jennings silt loam, 2 to 6 percent slopes, eroded
JafC2	Jennings-Blocher, hard bedrock substratum, silt loams, 6 to 12 percent slopes, eroded
JafC3	Jennings-Blocher, hard bedrock substratum, silt loams, 6 to 12 percent slopes, severely eroded
KxkC2	Knobcreek-Navilleton silt loams, 6 to 12 percent slopes, eroded
KxlC3	Knobcreek-Haggatt-Caneyville complex, 6 to 12 percent slopes, severely eroded
KxlE3	Knobcreek-Haggatt-Caneyville complex, 12 to 25 percent slopes, severely eroded
KxmE2	Knobcreek-Haggatt-Caneyville silt loams, 12 to 25 percent slopes, eroded
KxoC2	Knobcreek-Navilleton-Haggatt silt loams, karst, rolling, eroded
KxpD2	Knobcreek-Haggatt-Caneyville silt loams, karst, hilly, eroded
LpoAK	Lindside silt loam, 0 to 2 percent slopes, occasionally flooded, brief duration
McgC2	Markland silt loam, 6 to 12 percent slopes, eroded
McnGQ	Markland silt loam, 18 to 50 percent slopes, rarely flooded
McpC3	Markland silty clay loam, 6 to 12 percent slopes, severely eroded
McuDQ	Markland silty clay loam, 12 to 25 percent slopes, severely eroded, rarely flooded
MdqDQ	Markland silt loam, 12 to 25 percent slopes, eroded, rarely flooded
MhuA	McGary silt loam, 0 to 2 percent slopes
MhyA	Medora silt loam, 0 to 2 percent slopes
MhyB2	Medora silt loam, 2 to 6 percent slopes, eroded
MhyC2	Medora silt loam, 6 to 12 percent slopes, eroded
MhyC3	Medora silt loam, 6 to 12 percent slopes, severely eroded
MsvA	Montgomery silty clay loam, 0 to 1 percent slopes
NaaA	Nabb silt loam, 0 to 2 percent slopes
NaaB2	Nabb silt loam, 2 to 6 percent slopes, eroded
NbhAK	Newark silt loam, 0 to 2 percent slopes, occasionally flooded, brief duration
OfbAW	Oldenburg loam, 0 to 2 percent slopes, occasionally flooded, very brief duration
PcrB2	Pekin silt loam, 2 to 6 percent slopes, eroded
PcrC2	Pekin silt loam, 6 to 12 percent slopes, eroded
PcrC3	Pekin silt loam, 6 to 12 percent slopes, severely eroded
PhaA	Peoga silt loam, 0 to 1 percent slopes
Pml	Pits, quarry
Ppu	Pits, sand and gravel
RblD3	Rarden silty clay loam, 12 to 18 percent slopes, severely eroded
RbmD5	Rarden silty clay, 6 to 18 percent slopes, gullied
RptG	Rohan-Jessietown complex, 25 to 60 percent slopes, rocky
RtcA	Ryker silt loam, 0 to 2 percent slopes

Map Unit Legend

Clark County, Indiana

Map symbol	Map unit name
RtcB2	Ryker silt loam, 2 to 6 percent slopes, eroded
RzrB2	Ryker silt loam, karst, undulating, eroded
RztC2	Ryker-Grayford silt loams, 6 to 12 percent slopes, eroded
RztC3	Ryker-Grayford silt loams, 6 to 12 percent slopes, severely eroded
RzvC2	Ryker-Grayford silt loams, karst, rolling, eroded
RzvC3	Ryker-Grayford silt loams, karst, rolling, severely eroded
SceB2	Scottsburg silt loam, 2 to 4 percent slopes, eroded
SfyB	Shircliff silt loam, 2 to 6 percent slopes
SoaB	Spickert silt loam, 2 to 6 percent slopes
SodB	Spickert silt loam, terrace, 1 to 4 percent slopes
SolC2	Spickert-Wrays silt loams, 6 to 12 percent slopes, eroded
StaAQ	Steff silt loam, 0 to 2 percent slopes, rarely flooded
StdAQ	Stendal silt loam, 0 to 2 percent slopes, rarely flooded
StdAW	Stendal silt loam, 0 to 2 percent slopes, occasionally flooded, very brief duration
ThaC2	Trappist silt loam, 6 to 12 percent slopes, eroded
ThbC3	Trappist silty clay loam, 6 to 12 percent slopes, severely eroded
ThbD5	Trappist silty clay loam, 6 to 18 percent slopes, gullied
ThcD3	Trappist-Rohan complex, 12 to 25 percent slopes, severely eroded
ThdD	Trappist-Rohan silt loams, 12 to 25 percent slopes
TsaC3	Trappist-Deputy complex, 6 to 12 percent slopes, severely eroded
Uaa	Udorthents, cut and filled
UaoAK	Udifluvents, cut and filled-Urban land complex, 0 to 2 percent slopes, occasionally flooded, brief duration
UedA	Urban land-Aquents, clayey substratum, complex, lake plain, 0 to 3 percent slopes
UndAY	Urban land-Udifluvents complex, leveed, 0 to 2 percent slopes
UngB	Urban land-Udarents, fragipan substratum, complex, till plain, 0 to 12 percent slopes
UnkB	Urban land-Udarents, silty substratum, complex, terrace, 0 to 6 percent slopes
UnpA	Urban land-Udarents, loamy substratum, complex, terrace, 0 to 3 percent slopes
UnsB	Urban land-Udarents, clayey substratum, complex, hills, 2 to 10 percent slopes
W	Water
WaaAV	Wakeland silt loam, 0 to 2 percent slopes, frequently flooded, very brief duration
WaaAW	Wakeland silt loam, 0 to 2 percent slopes, occasionally flooded, very brief duration
WedB2	Weddel silt loam, 2 to 6 percent slopes, eroded
WhcD	Wellrock-Gnawbone silt loams, 6 to 20 percent slopes
WnmA	Whitcomb silt loam, 0 to 2 percent slopes
WokAV	Wilbur silt loam, 0 to 2 percent slopes, frequently flooded, very brief duration
WokAW	Wilbur silt loam, 0 to 2 percent slopes, occasionally flooded, very brief duration
WprAW	Wirt loam, 0 to 2 percent slopes, occasionally flooded, very brief duration

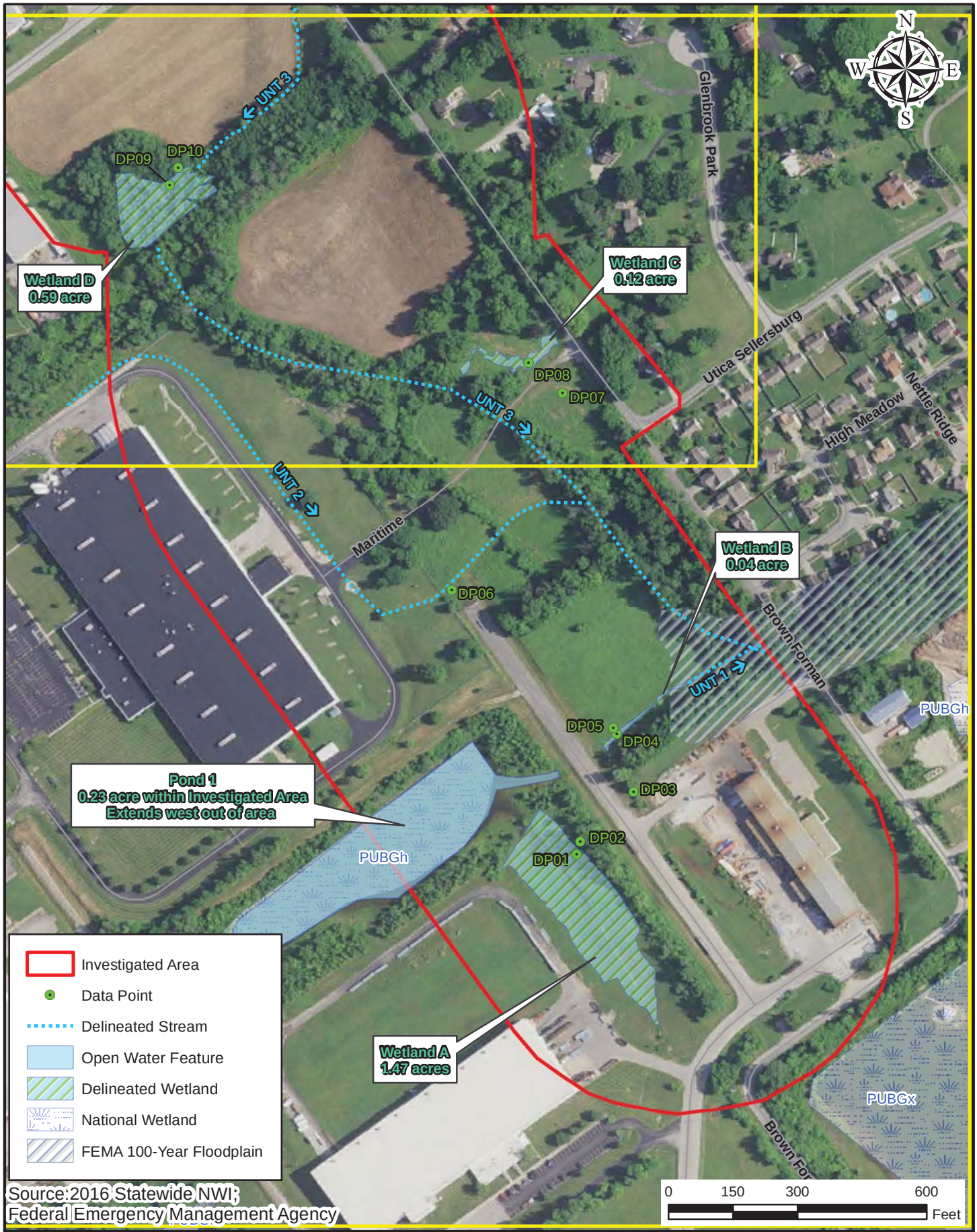

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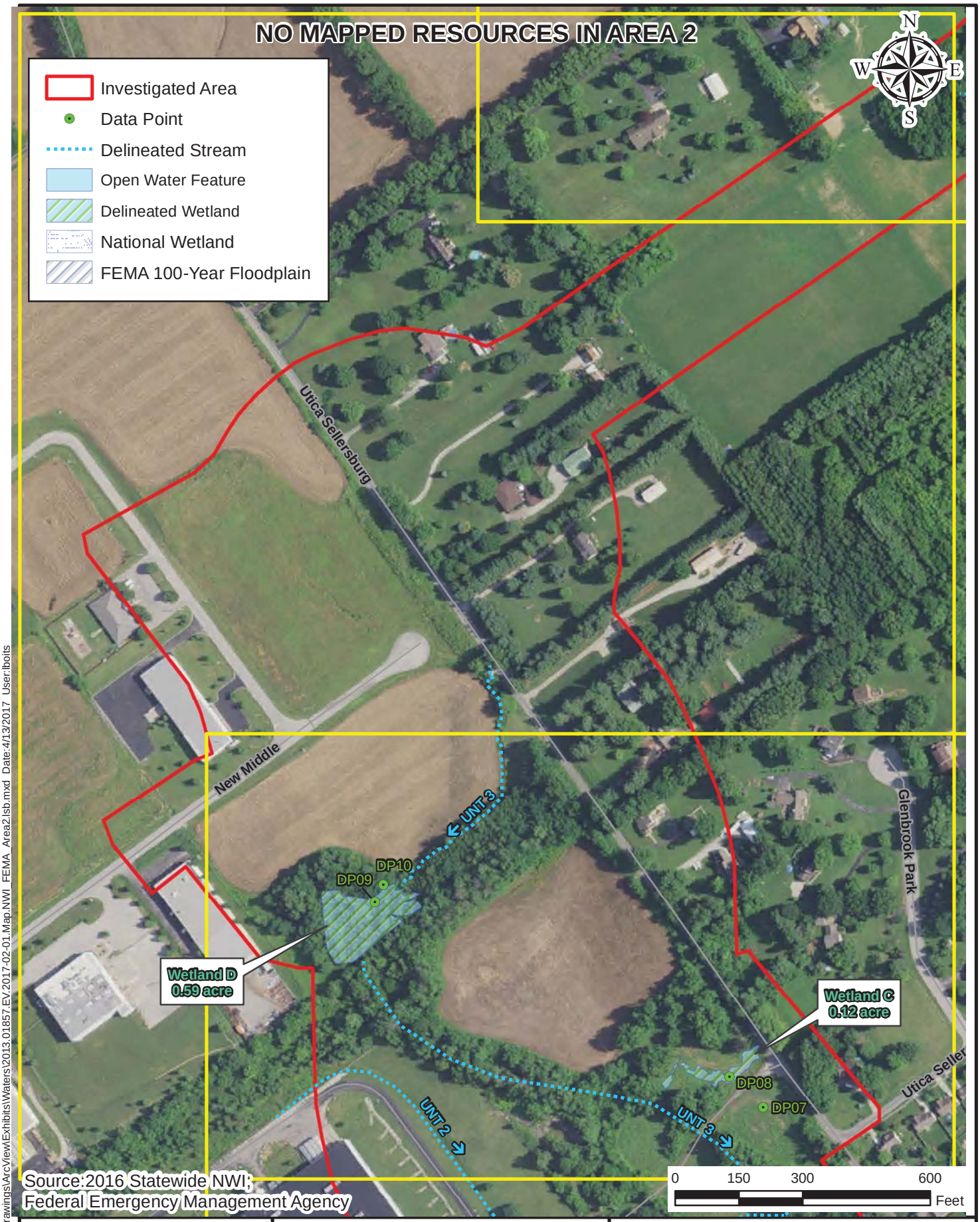
Figure 5. NWI and FEMA
100-Year Floodplain - Area 1 of 4

Indiana Department of Transportation
Central Office
100 North Senate Avenue
Indianapolis, Indiana 46204

Heavy Haul Transportation Corridor
Des. No. 1382612

Location: Jeffersonville
Township: Utica
County: Clark
State: Indiana

Date: 02/01/2017



Source:2016 Statewide NWI;
Federal Emergency Management Agency

Path: P:\2013\01857\D. Drawings\ArcView\Exhibits\Waters\2013.01857.EV.2017-02-01.Map.NWI_FEMA_Area2.lsb.mxd Date:4/13/2017 User:lboits

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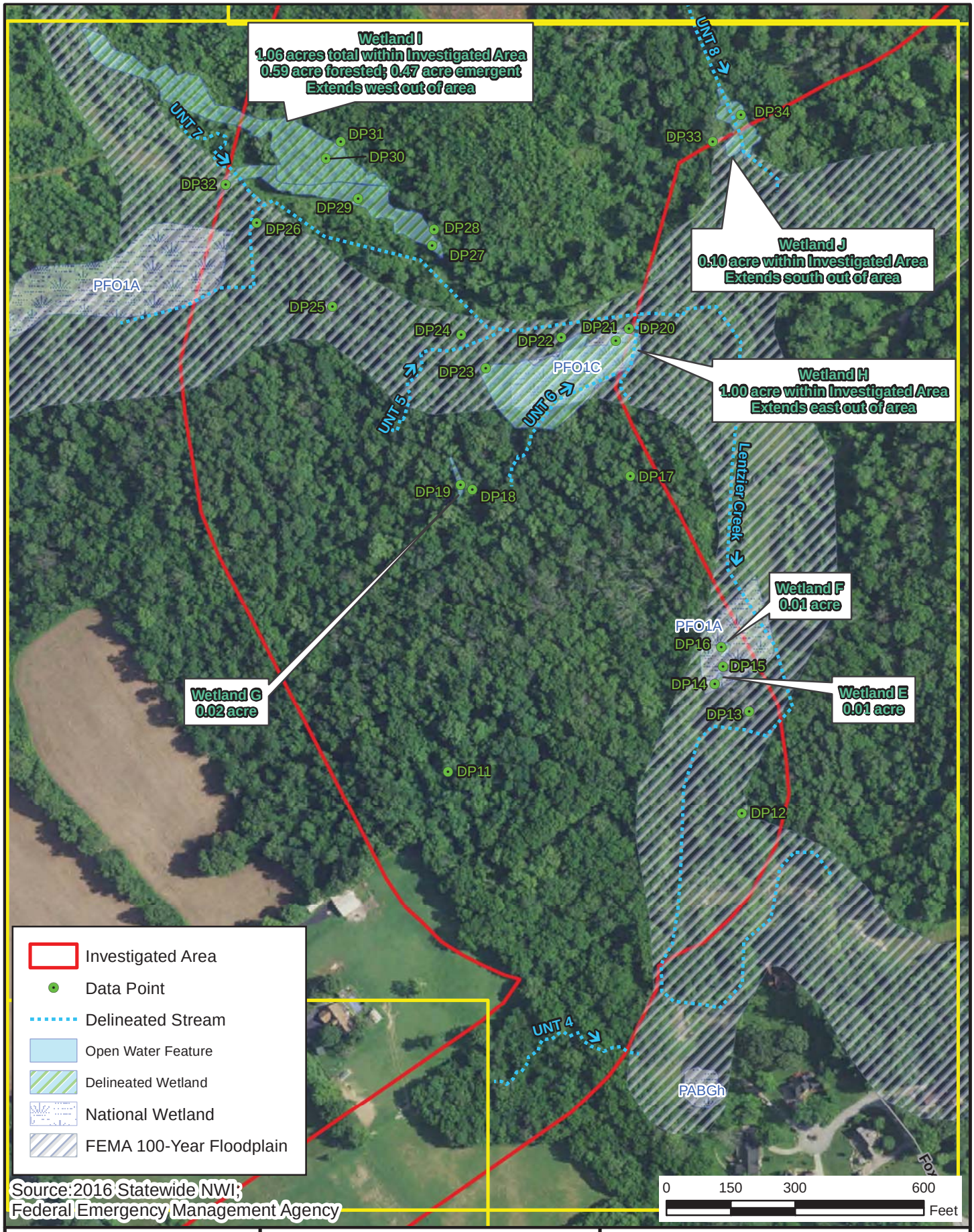
Figure 5. NWI and FEMA
100-Year Floodplain - Area 2 of 4

Indiana Department of Transportation
Central Office
100 North Senate Avenue
Indianapolis, Indiana 46204

Heavy Haul Transportation Corridor
Des. No. 1382612

Location: Jeffersonville
Township: Utica
County: Clark
State: Indiana

Date: 02/01/2017



Source: 2016 Statewide NWI; Federal Emergency Management Agency

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Figure 5. NWI and FEMA 100-Year Floodplain - Area 3 of 4

Indiana Department of Transportation
Central Office
100 North Senate Avenue
Indianapolis, Indiana 46204

Heavy Haul Transportation Corridor
Des. No. 1382612

Location: Jeffersonville
Township: Utica
County: Clark
State: Indiana

Date: 02/01/2017

Path: P:\2013\01857\D. Drawings\ArcView\Exhibits\Waters\2013.01857.EV.2017-02-01.Map.NWI_FEMA_Area4.lsb.mxd Date:4/13/2017 User:lboits

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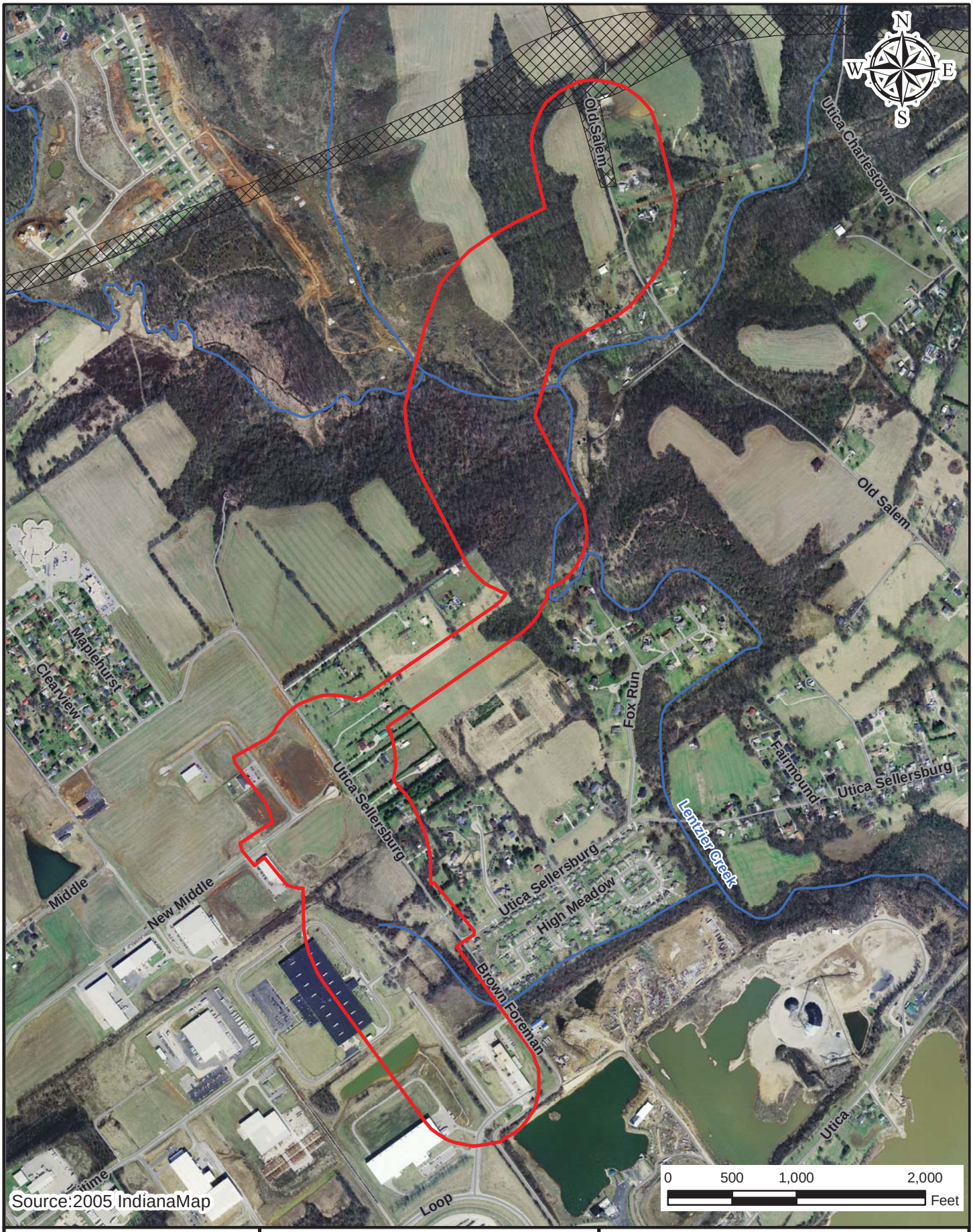
Figure 5. NWI and FEMA
100-Year Floodplain - Area 4 of 4

Indiana Department of Transportation
Central Office
100 North Senate Avenue
Indianapolis, Indiana 46204

Heavy Haul Transportation Corridor
Des. No. 1382612

Location: Jeffersonville
Township: Utica
County: Clark
State: Indiana

Date: 02/01/2017



Source:2005 IndianaMap

Path: P:\2013\01857\D. Drawings\ArcView\Exhibits\Waters\2013.01857.EV.2017-02-01.Map.2005Aerial.lsb.mxd Date:3/13/2017 User:lboits

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Figure 6. 2005 Aerial Photography

Indiana Department of Transportation
Central Office
100 North Senate Avenue
Indianapolis, Indiana 46204

Heavy Haul Transportation Corridor
Des. No. 1382612

Location: Jeffersonville
Township: Utica
County: Clark
State: Indiana

Date: 02/01/2017

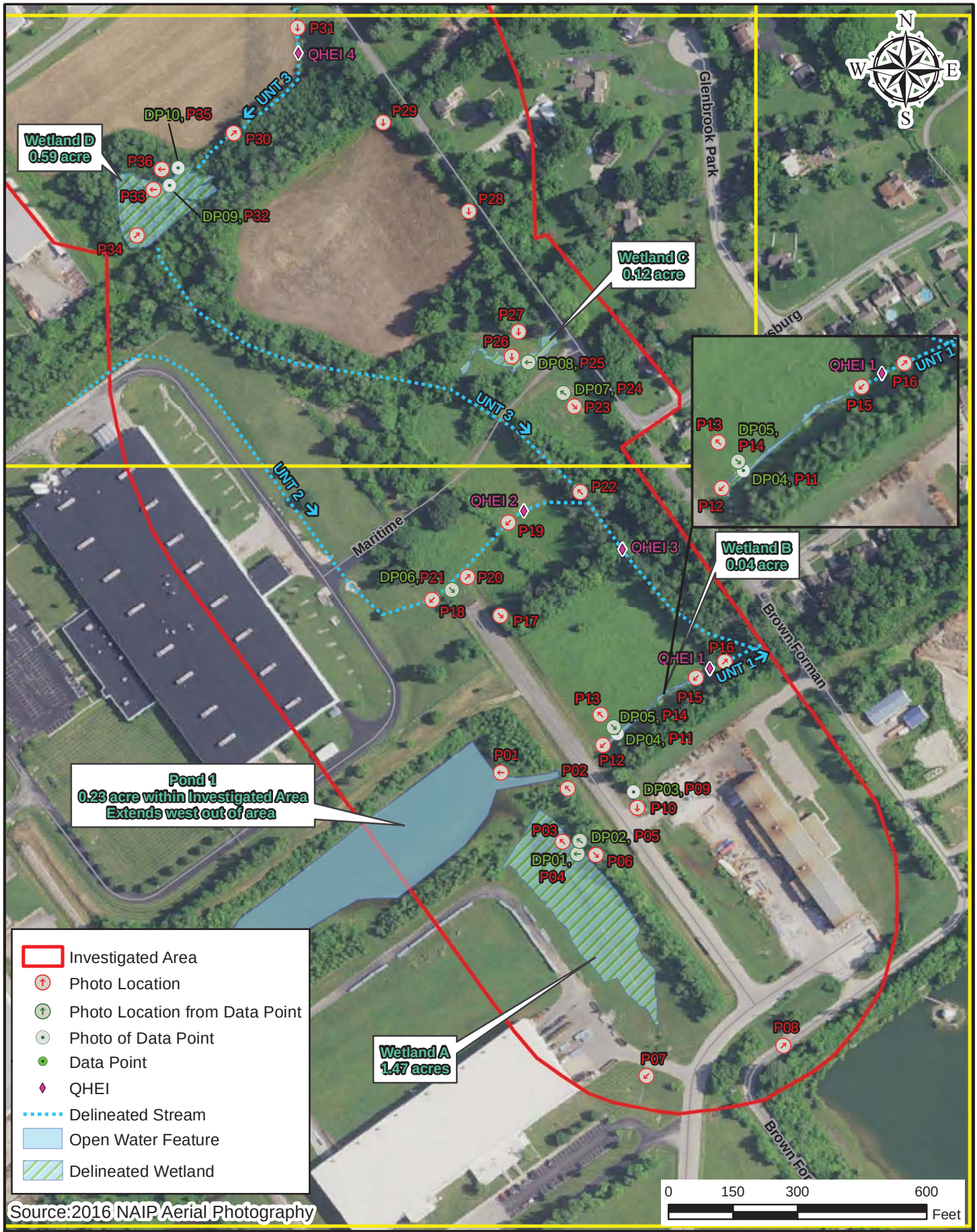

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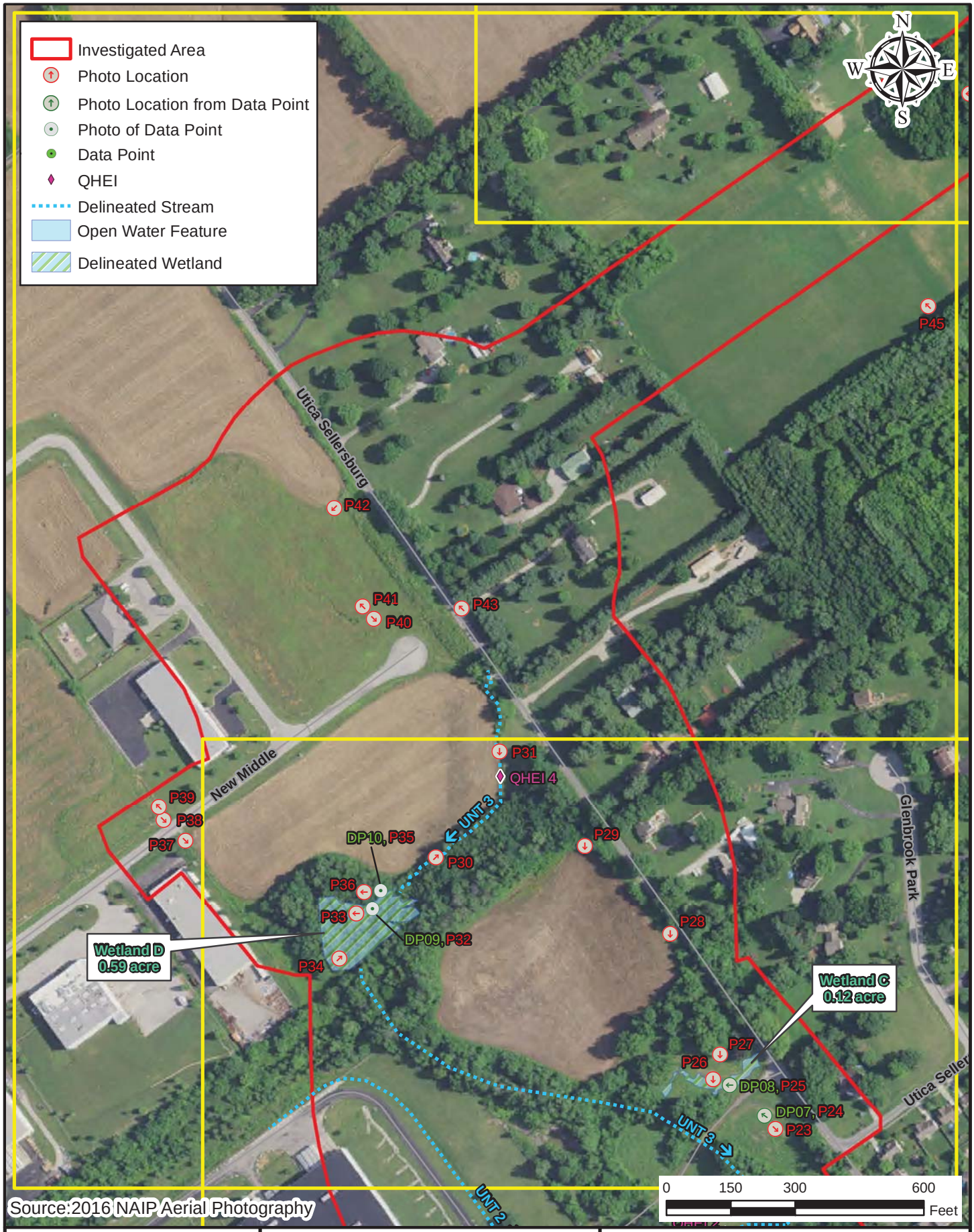
Figure 7. Field Investigation and Photo Location Map - Area 1 of 4

Indiana Department of Transportation
Central Office
100 North Senate Avenue
Indianapolis, Indiana 46204

Heavy Haul Transportation Corridor
Des. No. 1382612

Location: Jeffersonville
Township: Utica
County: Clark
State: Indiana

Date: 02/01/2017



Source:2016 NAIP Aerial Photography

Path: P:\2013\01857\D. Drawings\ArcView\Exhibits\Waters\2013.01857.EV.2017-02-01.Map.FieldInv_Photos_Area2.lsb.mxd Date:4/13/2017 User:lboits

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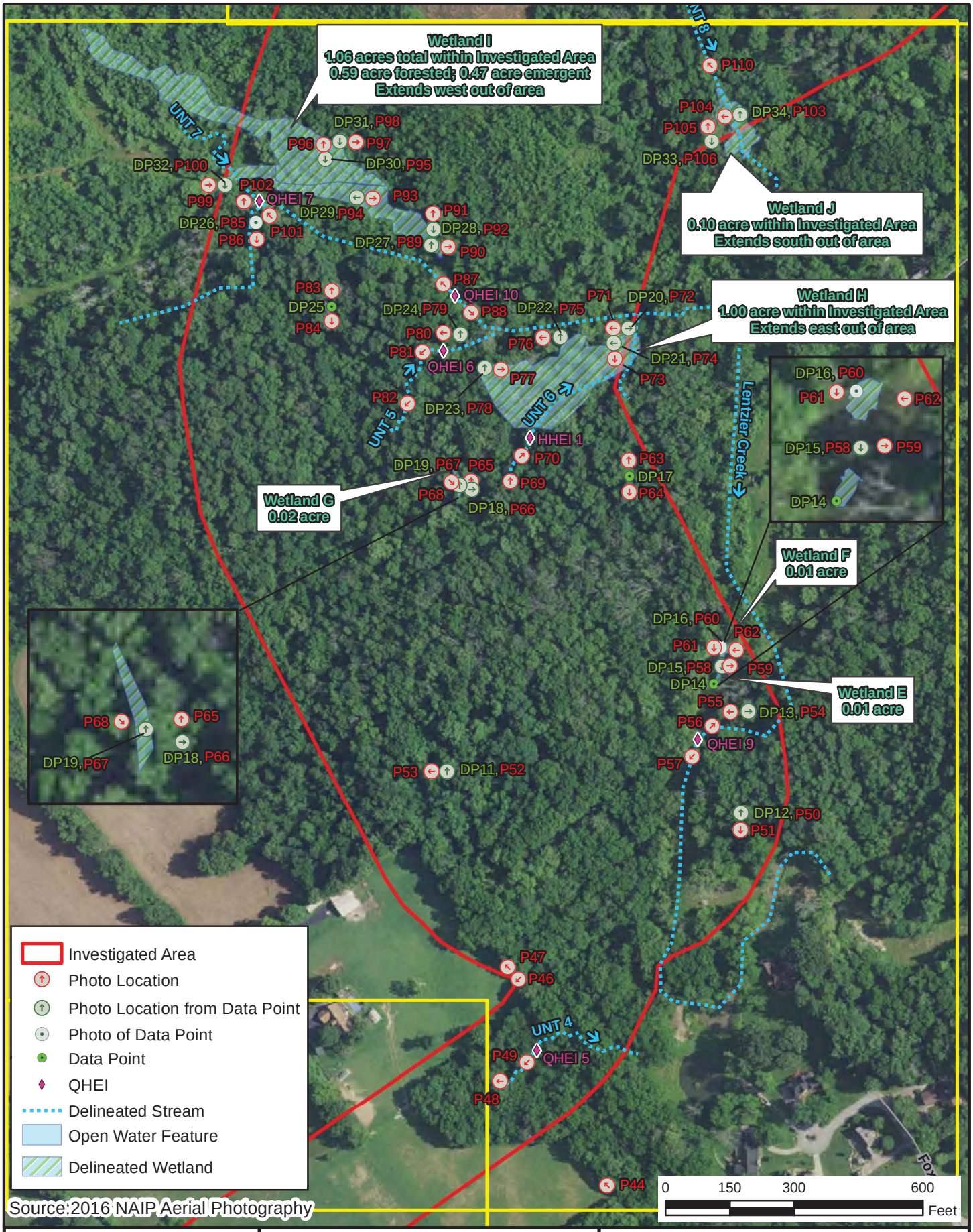
Figure 7. Field Investigation and Photo Location Map - Area 2 of 4

Indiana Department of Transportation
Central Office
100 North Senate Avenue
Indianapolis, Indiana 46204

Heavy Haul Transportation Corridor
Des. No. 1382612

Location: Jeffersonville
Township: Utica
County: Clark
State: Indiana

Date: 02/01/2017



Source:2016 NAIP Aerial Photography

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Figure 7. Field Investigation and Photo Location Map - Area 3 of 4

Indiana Department of Transportation
Central Office
100 North Senate Avenue
Indianapolis, Indiana 46204

Heavy Haul Transportation Corridor
Des. No. 1382612

Location: Jeffersonville
Township: Utica
County: Clark
State: Indiana

Date: 02/01/2017

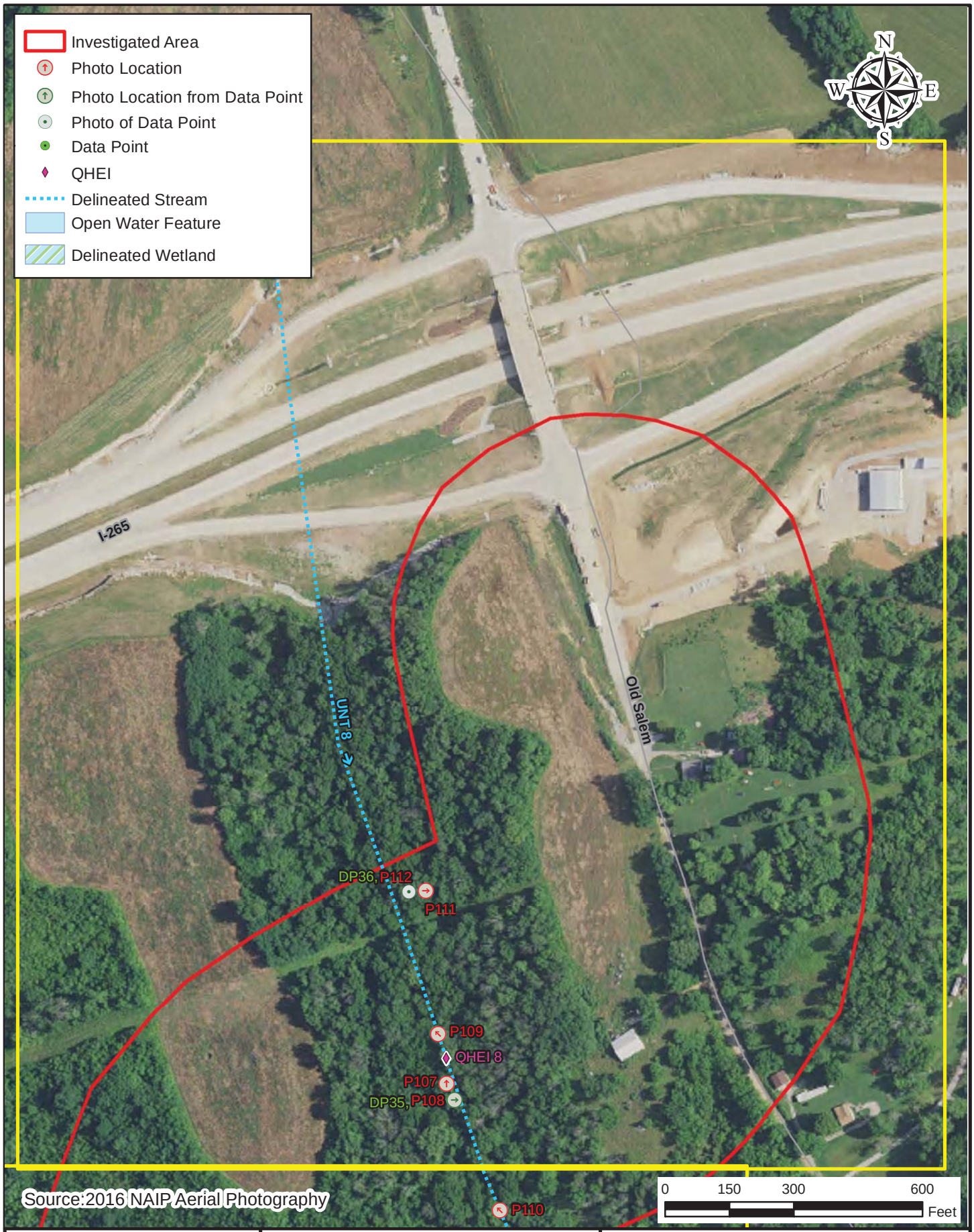

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Figure 7. Field Investigation and Photo Location Map - Area 4 of 4

Indiana Department of Transportation
Central Office
100 North Senate Avenue
Indianapolis, Indiana 46204

Heavy Haul Transportation Corridor
Des. No. 1382612

Location: Jeffersonville
Township: Utica
County: Clark
State: Indiana

Date: 02/01/2017

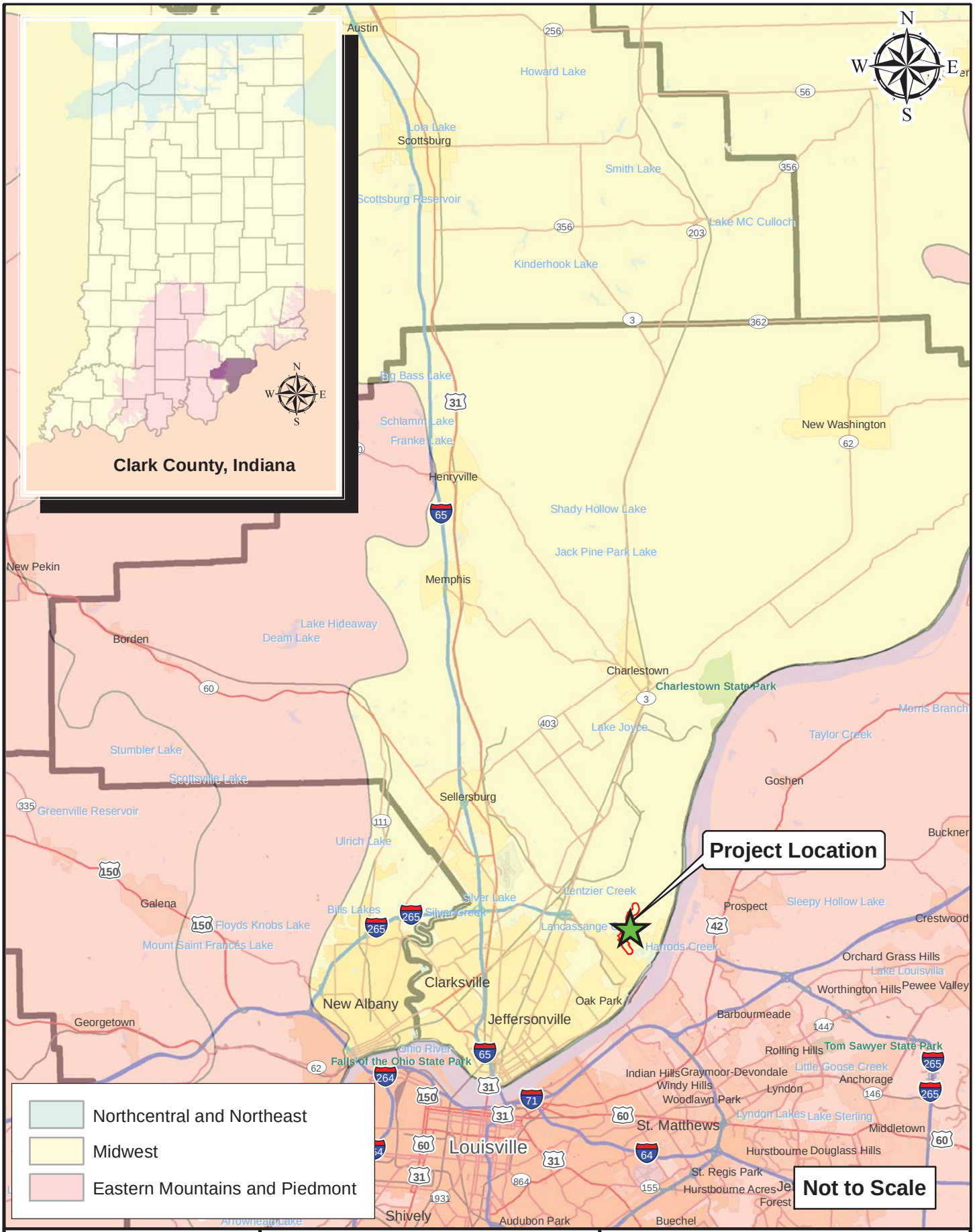

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Figure 8. Regional Supplement Map

Indiana Department of Transportation
Central Office
100 North Senate Avenue
Indianapolis, Indiana 46204

Heavy Haul Transportation Corridor
Des. No. 1382612

Location: Jeffersonville
Township: Utica
County: Clark
State: Indiana

Date: 04/14/2017

Path: P:\2013\01857\D. Drawings\ArcView\Exhibits\Waters\2013.01857.EV.2017-02-01.Map.RegionalSupplement.lsb.mxd Date:4/17/2017 User:lboits

Appendix E - Photographs

Heavy Haul Transportation Corridor – Des. No. 1382612

May 6 & 7, 2014 & July 21, 2015

Photo 1. Looking west toward Pond 1

Photo 3. Looking northwest from DP01 within Wetland A

Photo 5. Looking northwest from DP02 toward the upland area surrounding Wetland A

Photo 7. Looking southwest from south of Wetland A toward constructed drainage

Photo 9. Looking at DP03 (non-wetland datapoint)

Photo 11. Looking at DP04 within Wetland B

Photo 13. Looking northwest from DP05 toward the upland area surrounding Wetland B (Wetland B on right side of photo)

Photo 15. Looking southwest toward the beginning of UNT 1 adjacent to Wetland B

Photo 17. Looking southeast along northbound lanes of Access Road

Photo 19. Looking southwest along UNT 2 from QHEI 2 location

Photo 21. Looking southeast from DP06 toward Access Road

Photo 23. Looking southeast from DP07 toward the upland area surrounding Wetland C

Photo 25. Looking west from DP08 toward Wetland C

Photo 27. Looking south from Utica Sellersburg Road toward Wetland C

Photo 29. Looking south, from west of Utica Sellersburg Drive, toward UNT 3

Photo 31. Looking south toward UNT 3, north of the woodline and Wetland D

Photo 33. Looking west from DP09 toward Wetland D

Photo 35. Looking at DP10 and the upland area surrounding Wetland D

Photo 37. Looking southeast along non-wetland ditch.

Photo 39. Looking northwest along riprapped ditch, north of New Middle Road

Photo 41. Looking northwest toward agricultural field from north of New Middle Road cul-de-sac

Photo 43. Looking northwest along Utica Sellersburg Road, east of New Middle Road cul-de-sac

Photo 45. Looking northwest across the project corridor from near the center of the investigated area

Photo 47. Looking northwest across the project corridor from near the center of the investigated area (December 19, 2016)

Photo 49. Looking upstream (southwest) along UNT 4

Photo 51. Looking south from DP12, east of Lentzier Creek

Photo 53. Looking west from DP11, west of Lentzier Creek

Photo 55. Looking west from DP13, west of Lentzier Creek

Photo 57. Looking southwest (downstream) along Lentzier Creek from QHEI 9 location near the center of the investigated area

Photo 59. Looking east from DP15 toward the upland area surrounding Wetlands E and F

Photo 61. Looking south from DP16 toward Wetlands E (background) and F (foreground)

Photo 63. Looking north from DP17, south of Wetland H

Photo 65. Looking north from DP18 toward the upland area surrounding Wetland G

Photo 67. Looking north from DP19 toward Wetland G

Photo 69. Looking north (downstream) from the start of UNT 6

Photo 71. Looking west from DP20 toward the upland area surrounding Wetland H

Photo 73. Looking south from DP21 toward Wetland H

Photo 75. Looking north from DP22 toward the upland area surrounding Wetland H

Photo 77. Looking east from DP23 toward Wetland H

Photo 79. Looking north from DP24, north of UNT 5

Photo 81. Looking southwest (upstream) along UNT 5 near QHEI 6 location

Photo 83. Looking north from DP25, south of Lentzier Creek

Photo 85. Looking at DP26, east of Lentzier Creek and Wetland I

Photo 87. Looking northwest (upstream) along Lentzier Creek from QHEI 10 location

Photo 89. Looking north from DP27 toward the emergent portion of Wetland I

Photo 91. Looking north from DP28 toward the upland area surrounding the emergent portion of Wetland I

Photo 93. Looking east from DP29 toward the emergent portion of Wetland I

Photo 95. Looking south from DP30 toward the forested portion of Wetland I

Photo 97. Looking east from DP31 toward the upland area surrounding the forested portion of Wetland I

Photo 99. Looking east from DP32 toward the emergent portion of Wetland I

Photo 101. Looking northwest toward the UNT 7 confluence with Lentzier Creek from QHEI 7 location

Photo 103. Looking north from DP34 toward Wetland J

Photo 105. Looking north from DP33 toward the upland area surrounding Wetland J

Photo 107. Looking north from DP35, west of UNT 8

Photo 109. Looking northwest (upstream) along UNT 8 near QHEI 8 location

Photo 111. Looking east from DP36, east of UNT 8

Appendix F - Preliminary Jurisdictional Determination

Appendix 2 - PRELIMINARY JURISDICTIONAL DETERMINATION (PJD) FORM

BACKGROUND INFORMATION

A. REPORT COMPLETION DATE FOR PJD: June 9, 2017

B. NAME AND ADDRESS OF PERSON REQUESTING PJD: Monica Del Real, American Structurepoint, Inc.

C. DISTRICT OFFICE, FILE NAME, AND NUMBER:

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

State: IN County/parish/borough: Clark City: Jeffersonville

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

Lat.: 38.337842 Long.: -85.668723

Universal Transverse Mercator: 16S 616346 4244138 UTM

Name of nearest waterbody: Lentzier Creek

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

☐ Office (Desk) Determination. Date:

☐ Field Determination. Date(s):

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

Site number	Latitude (decimal degrees)	Longitude (decimal degrees)	Estimated amount of aquatic resource in review area (acreage and linear feet, if applicable)	Type of aquatic resource (i.e., wetland vs. non-wetland waters)	Geographic authority to which the aquatic resource "may be" subject (i.e., Section 404 or Section 10/404)
Wetland A	38.32752	-85.67099	1.47 acres	Wetland	Section 404
Wetland B	38.32877	-85.67042	0.04 acre	Wetland	Section 404
Wetland C	38.33096	-85.67155	0.12 acre	Wetland	Section 404
Wetland D	38.33205	-85.67445	0.59 acre	Wetland	Section 404
Wetland E	38.33982	-85.66754	0.01 acre	Wetland	Section 404
Wetland F	38.34001	-85.66751	0.01 acre	Wetland	Section 404

Site number	Latitude (decimal degrees)	Longitude (decimal degrees)	Estimated amount of aquatic resource in review area (acreage and linear feet, if applicable)	Type of aquatic resource (i.e., wetland vs. non-wetland waters)	Geographic authority to which the aquatic resource "may be" subject (i.e., Section 404 or Section10/4040)
Wetland G	38.34116	-85.66964	0.02 acre	Wetland	Section 404
Wetland H	38.34177	-85.66876	1.00 acre	Wetland	Section 404
Wetland I	38.34319	-85.67087	1.06 acres	Wetland	Section 404
Wetland J	38.34343	-85.66734	0.10 acre	Wetland	Section 404
Pond 1	38.32815	-85.67215	1.31 acres	Non-Wetland Waters	Section 404
Lentzier Creek	38.34209	-85.66905	2,081 linear feet	Non-Wetland Waters	Section 404
UNT 1	38.32903	-85.66988	195 linear feet	Non-Wetland Waters	Section 404
UNT 2	38.32938	-85.67263	1,489 linear feet	Non-Wetland Waters	Section 404
UNT 3	38.33089	-85.67251	2,452 linear feet	Non-Wetland Waters	Section 404
UNT 4	38.33762	-85.66877	404 linear feet	Non-Wetland Waters	Section 404
UNT 5	38.34196	-85.66992	413 linear feet	Non-Wetland Waters	Section 404
UNT 6	38.34153	-85.66893	406 linear feet	Non-Wetland Waters	Section 404
UNT 7	38.34316	-85.67144	123 linear feet	Non-Wetland Waters	Section 404
UNT 8	38.34383	-85.66754	1,012 linear feet	Non-Wetland Waters	Section 404

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

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

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

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

- [x] Maps, plans, plots or plat submitted by or on behalf of the PJD requestor:
  Map: _____.
- [x] Data sheets prepared/submitted by or on behalf of the PJD requestor.
  - [ ] Office concurs with data sheets/delineation report.
  - [ ] Office does not concur with data sheets/delineation report. Rationale: _____.
- [ ] Data sheets prepared by the Corps: _____.
- [ ] Corps navigable waters' study: _____.
- [ ] U.S. Geological Survey Hydrologic Atlas: _____.
  - [ ] USGS NHD data.
  - [ ] USGS 8 and 12 digit HUC maps.
- [x] U.S. Geological Survey map(s). Cite scale & quad name: 1:24,000 Jeffersonville Quadrangle.
- [x] Natural Resources Conservation Service Soil Survey. Citation: USDA NRCS 1974 Soil Survey.
- [ ] National wetlands inventory map(s). Cite name: _____.
- [x] State/local wetland inventory map(s): 2016 Statewide NWI.
- [x] FEMA/FIRM maps: FEMA 100-Year Floodplain.
- [ ] 100-year Floodplain Elevation is: _____.(National Geodetic Vertical Datum of 1929)
- [x] Photographs: [x] Aerial (Name & Date): 2005 IndianaMap; 2016 NAIP.
  or [x] Other (Name & Date): Wetland Delineation Report photolog.
- [ ] Previous determination(s). File no. and date of response letter: _____.
- [ ] Other information (please specify): _____.

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

_____	8/14/2017
Signature and date of Regulatory staff member completing PJD	Signature and date of person requesting PJD (REQUIRED, unless obtaining the signature is impracticable)[1]

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

From:	Bowman, Sandra A
To:	Boits, Leah
Cc:	Rehder, Crystal; Kang, Li; Mathas, Marlene; Hope, Briana; Johnson, Paul; Bales, Ronald; Heustis, Ronald; Hilden, Laura; michelle.allen@dot.gov; Andrews, Jeff; Phillabaum, Richard; Meyer, Michele; Simpson, Garrett
Subject:	RE: HHTC (Des. No. 1382612) - Karst Report
Date:	Wednesday, January 03, 2018 1:59:07 PM
Attachments:	image002.png image003.png image004.png image005.png image006.png image007.png image008.png

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Leah,

The report is approved as revised. I saved the feature inventory table from the original version for our files (not for public release).

I will drop it in the project folder on ProjectWise.

Have a great start to 2018!

Sandy

From: Boits, Leah [mailto:lboits@structurepoint.com]
Sent: Tuesday, January 02, 2018 12:31 PM
To: Bowman, Sandra A <SBowman@indot.IN.gov>
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Subject: RE: HHTC (Des. No. 1382612) - Karst Report

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Sandy,

The revised Karst Report has been uploaded to our sharefile site for your review and approval: https://structurepoint.sharefile.com/d-sef0b926f53c4af7a. Please note that all comments received were addressed and a response to comments document is saved in the same folder, and an email from the INDOT project manager addressing the question about SR 265/I-265 has also been uploaded. Please let me know if you have any issues accessing the documents or need additional information.

Karst Features Evaluation

Heavy Haul Transportation Corridor (Des. No. 1382612)

Indiana Department of Transportation
100 North Senate Avenue, IGC-N 642
Indianapolis, Indiana 46204

November 17, 2017 (revised December 29, 2017)

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1.0 Introduction

The Indiana Department of Transportation (INDOT), in partnership with the Federal Highway Administration (FHWA), the Indiana Economic Development Corporation, the Ports of Indiana, the Board of Commissioners of Clark County, the City of Jeffersonville Redevelopment Commission, and the River Ridge Development Authority (RRDA), is developing a federal-aid road project to improve connectivity for the Ports of Indiana-Jeffersonville (Port) with other regional transportation assets. The proposed project is located in Utica Township, Clark County, Indiana.

The area is located on the Jeffersonville and Charlestown USGS 7.5 Minute Quadrangle Maps in Tracts 6-7, 14-17, 24-27, 38-40, and 52-53 and is within the Louisville Metropolitan Planning Area (LMPA), which consists of nine counties in Kentucky (Jefferson, Oldham, Trimble, Henry, Shelby, Spencer, Nelson, Bullit and Meade) and four Indiana counties (Washington, Harrison, Floyd and Clark). Preliminary corridor studies have identified an approximately 1.3-mile wide corridor between the Port of Indiana, Jeffersonville and State Road (SR) 265 to establish roadway alignment alternatives for the project. The alternatives are currently being developed and evaluated within the project corridor based upon environmental studies and coordination.

The need for the proposed project is due to the current and predicted rapid industrial and commercial development in the area that would result in a significant increase in volume of heavy haul vehicles mixing with local traffic. This growth, combined with the lack of connectivity and suitable roadways for heavy haul vehicles in the area, indicates a need for the proposed project.

The purpose of the proposed project is to provide a heavy haul vehicle route that completes a continuous connection between the River Ridge Commerce Center (RRCC) and the Port of Indiana via the new SR 265/Old Salem Road interchange. Such a facility would also limit likely damages to the town of Utica's infrastructure by diverting a majority of the traffic traveling southbound from the new interchange around the town center along a continuous route to a new connection with New Middle Road. The presence of a continuous heavy haul route would also address providing an alternative route capable of handling heavy truck traffic to accessing the Port and RRCC from SR 265. The preferred project corridor, consists of the construction of a two-lane road designed to "heavy haul" specifications which consists of a more robust pavement section to withstand the heavier vehicles. The proposed road would have a design speed of 35 miles per hour with two 13-foot travel lanes and 11-foot shoulders. The road would likely be constructed on new alignment at a total length of approximately 1.75 miles.

A desk-top analysis (Red Flag Investigation) was conducted as part of the preliminary environmental evaluation of the project corridor. This analysis determined the project is located near known sinkhole areas and several mapped sinkhole locations are within the project study area. Noting the potential location of the project within a karst region of Indiana, as defined by the mapped presence of karst features in the study area, an investigation of karst features, as outlined by the Karst Memorandum of Understanding (Karst MOU), was performed to identify and characterize karst features in the study area and to evaluate potential impacts due to the proposed project.

1.1 Indiana Karst Memorandum of Understanding

The Karst memorandum of understanding (MOU) was entered into by the Indiana Department of Transportation (INDOT), the Indiana Department of Natural Resources (IDNR), the Indiana Department of Environmental Management (IDEM), and the U.S. Fish and Wildlife Service (USFWS) on October 13, 1993, and establishes the basic processes and guidelines for identifying karst features, minimizing impacts to karst features, and establishing mitigation measures or best management practices (BMPs), where applicable. Although the study area is not located within the "Karst areas of the State", as defined in the MOU, there are known karst features within the project vicinity. Therefore, this investigation was conducted to identify and accurately locate all karst features within the study area, and document that all surface runoff or other potential impacts to identified karst features are treated with similar measures included in the MOU. A copy of the Karst MOU is provided in Appendix E.

1.2 Purpose of Investigation

Although the study area is not specifically located within the "Karst regions of the State", as defined in the MOU, there are known karst features within the project vicinity, specifically within the Silurian-aged Louisville Limestone and Salamonie Dolomite. Because the project is located within areas with mapped features, an investigation is required by the Karst MOU to identify the existence of karst features within the proposed project limits and determine the impacts from the proposed project on identified karst features. The purpose of this investigation is to comply with the requirements of the Karst MOU.

1.3 Study Methods

Methods used during this investigation were consistent with the procedures outlined in the 1993 Indiana Karst MOU. Specifically, the following process was observed:

- Determine the location of karst features, including sinkholes, caves, underground streams and other related karst features, and characterize their relationship prior to proposed alterations or construction,
- Research public and private information sources for information relative to karst features,
- Conduct a field check of karst and cave features that appear during the research task and identify any additional karst features within the proposed project limits, and
- Identify drainage areas, and the land use within the drainage area, for each sinkhole or karst feature.

1.4 Project Area Characteristics

The overall study area generally extends north from the Port of Indiana (Utica) to the State Road 265/Old Salem Road interchange (Exhibits 1 -3). The overall study area provided the general limits of the desk-top study of the project characteristics, namely literature reviews, regional and local geology and historic aerial photography review. Within the overall study area, a 300 foot wide area around the alignment alternatives under consideration for the project, including their anticipated construction limits was investigated in detail (investigated area).

The study area is a combination of forest, open grass, industrial, and farmed areas. The forested areas are generally on steep slopes with few existing roads or other development. Lentzier Creek and several tributaries are located within the study area.

1.5 Literature Review

Literature sources reviewed as part of this investigation included:

- LIDAR-based 2-foot contours from the Clark County GIS,
- Historical aerial photography (1940, 1955, 1960, and 1968) available from the Indiana Historical Aerial Photo Index (http://igs.indiana.edu/IHAPI/),
- Soil Survey of Clark and Floyd Counties, Indiana (USDA-SCS, 1974),
- IndianaMAP GIS data (cave entrance density, sinkhole areas and sinking-stream basins, karst springs, karst areas, and karst area dye points),
- Bedrock mapping of Clark County (Gray, 1987),
- Habitats and Ecological Communities of Indiana (Whitaker Jr. and Amlaner Jr., 2012),
- The Devastation and Recovery of Caves and Karst Affected by Industrialization (Lewis, 1996),
- Accelerated Erosion Due to Industrial Waste (Wickwire, 1947),
- Dye Trace Monitoring and Karst Feature Investigation (Linebach and Funkhouser, 2013).

A review of regional karst data, as published by Powel et al. (2002), shows the dynamic connection of the karst aquifer network in southern Indiana. No karst dye points or lines, as mapped by the IGS, are located near the study area. No known caves are located within the study area and Indiana Map indicates the cave density is zero. However, according to Indiana Map, three (3) sinkholes are located within the study area based on the 2011 Sinkhole Inventory – See Exhibit 4.

Several sinkholes and caves were discovered by Wickwire (1947) and Lewis (1996) during a study performed northeast of the study area, near Jenny Lind Run. According to Wickwire (1947), several caves, less than 1-mile long, and 12 to 15 sinkholes per square mile were observed during this investigation (Wickwire, 1947). This karst area is reported by Wickwire (1947), Whitaker Jr. and Amlaner Jr. (2012), and Lewis (1996), to have been modified by the discharge of up to 32,000 gallons per minute of acidic effluent by the Indiana Army Ammunition Plant (INAAP) during the 1940s and 1950s. The karst investigations performed by Wickwire (1947) and Lewis (1996) did not extend to the study area; however, according to bedrock geology maps (Gray, 1987) the geology of the northern portion of the study area is consistent with the Wickwire and Lewis investigated areas.

Linebach and Funkhouser (2013) performed dye tracing on the Indiana Arsenal Ammunition Plant (INAAP), north of the study area. These investigations included several dye traces on the INAAP property to determine subsurface flow routes on the INAAP property. Results of the dye trace investigations showed the subsurface flow was typically confined by local topographic divides. Moreover, typical flow paths were relatively short (<2 miles) and dye recovery was relatively rapid (within 24 hours). Subsurface flow was toward established surface streams, particularly Lentzier Creek, which flows through the INAAP property.

Based on topographic and regional hydrogeologic data, groundwater flow including subsurface flow within karst terrain, likely occurs in a southerly direction; however, karst terrain can result in erratic subsurface flow conditions due to solution cavities and fracture plains in the limestone bedrock. Precise flow patterns in the subsurface have not been documented.

2.0 Geologic, Hydrologic and Geomorphic Setting

2.1 Physiography

The study area resides in the Charlestown Hills division of the Southern Hills and Lowlands Physiographic Region (Gray, 2000) – see Exhibit 4. This section is bounded on the west by the Knobstone Escarpment, separating it from the Norman Upland. The Charlestown Hills section is characterized by low hills with thin and scattered till deposits. This entire section was glaciated (pre-Wisconsin glacial epochs); however, glacial influence on the landform is relatively minor (Gray, 2000).

2.2 Regional and Local Geologic Setting

Surficial deposits within the project area largely consist of a thin veneer of till overlying bedrock in the northern portion of the project area (Exhibit 5). A review of IDNR Water Well records within the study area indicates the thickness of till overlying the bedrock varies from less than 5-feet in the River Ridge area, to over 20-feet north of Utica-Sellersburg Road. Soils were primarily comprised of red, yellow, and brown clays with some sand and gravel. Upon field reconnaissance, bedrock outcrops were identified at the surface in several locations throughout the northern portion of the study area.

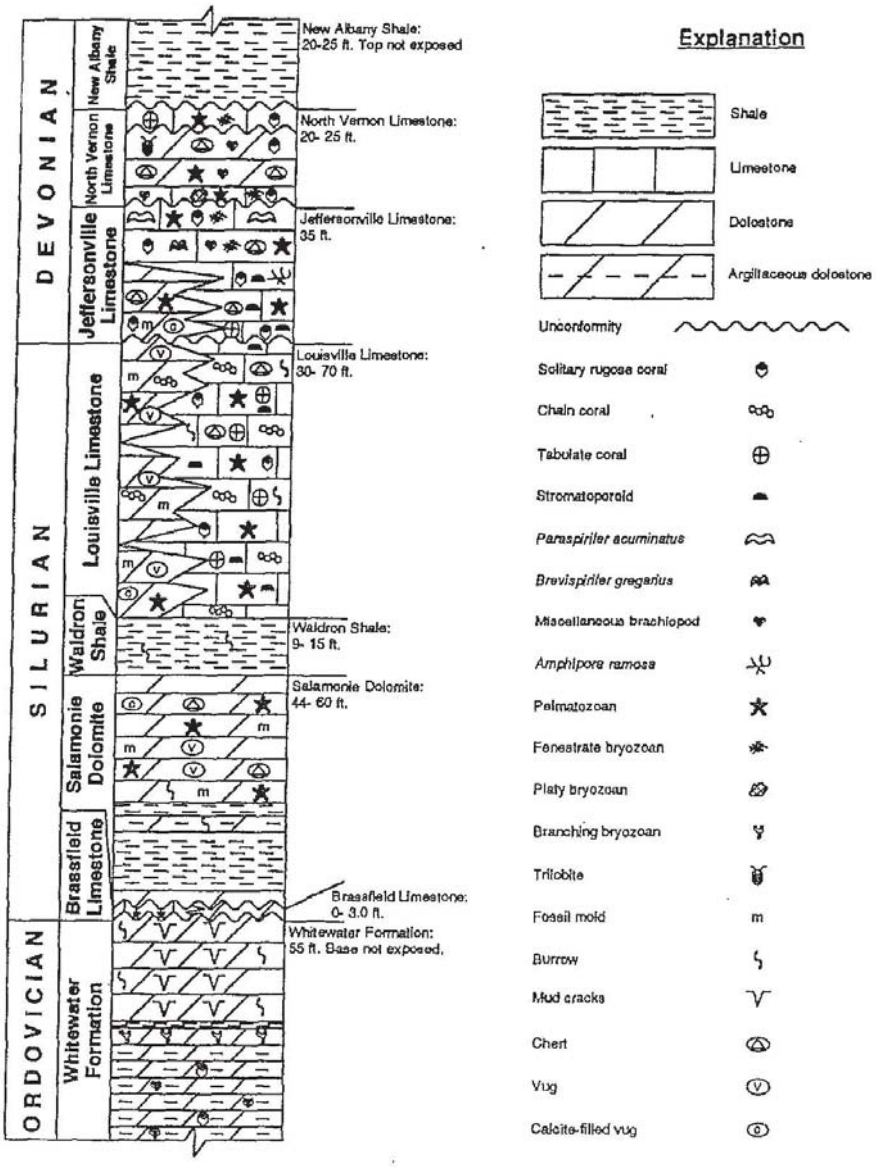
Relatively thick sequences of undifferentiated outwash and recent alluvial deposits comprise the surficial geology in the south, adjacent to the Ohio River (Exhibit 5). The thickness of the unconsolidated deposits in the southern portion of the project area (just north of Utica-Sellersburg Road to the Ohio River) ranges from 50 to over 100 feet thick (Gray, 1983). A review of IDNR water well records within the study area indicates bedrock ranges from approximately 60-feet below ground surface (ft-bgs) to over 120 ft-bgs.

The underlying bedrock formations mapped in the study area consist of , Devonian-age Muscatatuck Group (primarily Jeffersonville and North Vernon Limestones), Silurian-age Louisville Limestone and Silurian-age Bainbridge Group (Salamonie Dolomite and Brassfield Limestone). Figure 1 below provides a stratigraphic section of the bedrock formations in the project area, as modified from Hendricks (1995).

As shown on Exhibit 6, Silurian-age Bainbridge Group rocks area exposed within the entrenched valley of Lentzier creek and its tributaries. Principal formations include Salamonie Dolomite, which is a pure dolomite ranging from 26-50 feet thick (upper Laurel Member), and is relatively resistant to dissolution (Hendricks, 1995; Linebach-Funkhouser, 2013). Overlying the Salamonie is the Waldron Shale, described locally as a dolomitic-clay shale which is highly erodible (Linebach-Funkhouser, 2013). Erosion of the Waldron may facilitate subsurface flow. Above the Bainbridge Group rocks, is the Silurian-age Louisville Limestone, which has noted development of karst, including cave entrances, sinkholes and swallets (Linebach-Funkhouser, 2013). The Louisville Limestone, and overlying Muscatatuck Group rocks (principally the Devosian-age Jeffersonville Limestone) appear to be present at higher elevations, forming the hills and ridges surrounding the valley of Lentzier Creek and its tributaries.

Based on site geologic conditions observed during site reconnaissance, both shale and limestone outcrop on site. Karst features were documented from the desktop review of site conditions, and observed in multiple locations on site, suggesting karst feature development is primarily in the lower sections of the Louisville and Jeffersonville Limestones, and underlain by more resistant rocks, namely the Waldron Shale and Salamonie Dolomite. Extensive karst development is unlikely throughout the project area.

Figure 1: Composite Stratigraphic Column of the study area showing formation names, gross lithologies, apparent thickness and major faunal types (modified from Hendricks, 1995)



2.3 Soils

A review of mapping included in the 1974 Soil Survey of Clark and Floyd Counties (USDA-SCS, 1974) was conducted to identify potential karst features within the project area. Although several small depressions/sinkholes are noted in the general vicinity of the project, no sinkholes or other depressions were specifically identified within the project area. Review of the soil series maps also provided information regarding potential spring locations, based on mapped intermittent streams; however, no springs were specifically identified on the Soil Series maps within the project area.

The NRCS Web Soil Survey was reviewed to identify soils within the project area. Crider Silt Loam soils, as noted in the Soil Survey (UDSA_SCS, 1974) are typical in areas of karst development, comprise 1.9% of the total project area. These soils are noted in the northern portion of the project area – primarily in the vicinity of the north project terminus (Exhibit 7).

Table 1: Mapped Soil within the Study Area (from: NRCS Web Soil Survey)
http://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx **(accessed 04/10/2017)**

Map Unit Symbol	Map Unit Name	Percent of Study Area
CcaG	Caneyville-Rock outcrop complex, 25 to 60 percent slopes	17.2
CspB2	Crider silt loam, 2 to 6 percent slopes, eroded	1.9
CxhC2	Crider-Haggatt silt loams, 6 to 12 percent slopes, eroded	3.0
EesA	Elkinsville-Millstone silt loams, 0 to 2 percent slopes	4.7
EesB	Elkinsville-Millstone silt loams, 2 to 6 percent slopes	1.4
EesC2	Elkinsville-Millstone silt loams, 6 to 12 percent slopes, eroded	3.6
EesD2	Elkinsville-Millstone silt loams, 12 to 18 percent slopes, eroded	0.6
GykD2	Grayford silt loam, karst, hilly, eroded	0.3
HcgAW	Haymond silt loam, 0 to 2 percent slopes, occasionally flooded, very brief duration	5.2
HtwD2	Haggatt-Caneyville silt loams, 12 to 25 percent slopes, eroded	4.1
HtzD3	Haggatt-Caneyville complex, 12 to 25 percent slopes, severely eroded	0.8
HufAK	Huntington silt loam, 0 to 2 percent slopes, occasionally flooded, brief duration	1.4
MdqDQ	Markland silt loam, 12 to 25 percent slopes, eroded, rarely flooded	0.6
NbhAK	Newark silt loam, 0 to 2 percent slopes, occasionally flodded, brief duration	0.6
Ppu	Pits, sand and gravel	5.5
RtcB2	Ryker silt loam, 2 to 6 percent slopes, eroded	7.2
RztC2	Ryker-Grayford silt loams, 6 to 12 percent slopes, eroded	11.0
Uaa	Udorthents, cut and filled	16.2
UnpA	Urban land-Udarents, loamy substratum, complex, terrace, 0 to 3 percent slopes	7.1
UnsB	Urban land-Udarents, clayey substratum, complex, hills, 2 to 10 percent slopes	1.8
W	Water	6.1

2.4 Hydrology and Hydrogeology

The project area is located within the drainage area of Lentzier Creek. According to the IDNR (1975), Lentzier Creek has a total drainage area of 8.34 square miles (5,337.6 acres). No stream gauging data is available for Lentzier Creek to report average daily stream flow. The calculated 100-year flood discharge is reported as greater than 2,300 cubic feet per second (CFS) (IDNR, *undated*).

No residential or industrial water supply wells were identified within the investigated corridor of the alignments currently under consideration. Wells identified within the overall study area on the IDNR Water Well Record database were drilled in the 1960s and 1980s (see Exhibit 5). The study area is mostly served by the City of Jeffersonville Municipal Utilities. No significant water withdrawal facilities were identified within the study area.

2.5 Available Mapping

Topographic mapping for the study area provided general locations of possible surface depressions, indicated by closed contours. Four locations of potential sinkholes or karst windows were identified from the topographic mapping review (see Exhibit 8).

IndianaMap GIS data indicated three sinkholes near the study area. However, no sinkholes were identified by IndianaMap within the investigated area. No other mapped karst areas were identified within the study area (see Exhibit 4).

2.6 Agency Coordination

Early coordination with appropriate natural resources agencies was initiated in April 2016. Responses received from the Indiana Geological Survey (IGS), Indiana Department of Natural Resources (IDNR) and the US Fish & Wildlife Service (USFWS) all noted the presence of karst resources within the proposed project limits. Responses received from both IDNR and USFWS recommended an assessment of karst features be conducted for the project area pursuant to the 1993 Karst MOU. Copies of relevant agency coordination responses are provided in Appendix C.

Following approval of this Karst Investigation by INDOT, this assessment will be reviewed by the Karst MOU agencies (IDNR, USFWS and Indiana Department of Environmental Management). Any suggested updates or revisions from these agencies will be incorporated into the report. Moreover, it is anticipated a project-specific Mitigation and Monitoring Plan (MMP) will be prepared outlining the specific karst feature mitigation measures to be implemented during and following construction, as well as any required construction and post-construction monitoring. The Karst MMP will be incorporated into the project special provisions.

2.7 Field Reconnaissance

Field reconnaissance within the study area was conducted on April 22 – 23, and May 6, 2014, as well as on December 19, 2016, and on April 11, 2017. The area was surveyed for apparent karst features (sinkholes, springs, sinking streams, and cave entrances) along the length of the corridor, centered along the proposed alignments, from the I-265/Old Salem Road Interchange to the town of Utica near Port Road. The investigated corridor includes three alternate routes currently under consideration for the HHTC, each of which consists of the construction limits. Identified karst features were photo-documented, and the

locations of each feature were mapped using a hand-held, sub-meter accuracy GPS unit. Feature locations were also noted on aerial maps, and measurements of feature dimensions and notes regarding the features were recorded. A photo log compiled from the field reconnaissance is included in Appendix B.

3.0 Identified Karst Features

3.1 Regional Features

Several sinkholes and caves were discovered by Wickwire (1947) and Lewis (1995) during a study concerning the effects of discharging waste water and acid into the Jenny Lind Run (northeast of the study area) and a manmade channel of connected sinks. According to Wickwire (1947), several caves, less than 1-mile long, were discovered in the area near the Jenny Lind Run. Lewis (1995) reported four caves on the Indiana Army Ammunition Plant (INAAP) grounds. Additionally, 12 to 15 sinkholes per square mile were observed during the Wickwire (1947) study. This karst area is reported by Wickwire (1947), Whitaker Jr. and Amlaner Jr. (2012), and Lewis (1996), to have been modified by the discharge of up to 32,000 gallons per minute of acidic effluent (pH = 2.3). Specifically, over the years of operation of the INAAP, approximately 1941 through 1945 and 1950 through 1953, the acidic effluent was discharged into the Jenny Lind Run and would disappear in swallets and reappear in springs. This caused dissolution of the surrounding bedrock and entrenched the stream as much as 8 feet (Wickwire, 1947 and Lewis, 1995). Whitaker Jr. and Amlaner Jr. (2012) summarized that the biota in the caves injected with effluent were permanently altered and only some of the biota had recovered.

3.2 Features Identified within the Study Area

A total of thirty-six (36) Karst features were identified within the overall study area, including two (2) swallets, nine (9) sinkholes and twenty-five (25) springs. No caves/cave entrances were identified during the field reconnaissance or in the background research. Swallets, or swallow holes, are defined as concentrated inflows of water from upland sources (typically overland flow) that sink underground (Ford and Williams, 1989). Within the proposed Heavy Haul project area the swallets were identified as distinct openings into the underlying bedrock within intermittent stream channels. Sinkholes, or dolines, are any small to intermediate enclosed depression formed in karstic rock (e.g., limestone) and are generally circular to subcircular in plan form (Ford and Williams, 1989). Based on the characteristics of the sinkholes identified in the Heavy Haul project area, these depressions appear to be formed by solution or suffusion, where surface soils and rock are eroded into underlying solution-enlarged fractures. Evidence of collapse type sinkholes (collapse of surface rock/soil into a subsurface conduit) was not observed. Springs are discreet emergence points for groundwater discharging to the surface (Ritter, 1978), typically through openings in exposed bedrock such as fractures or joints, or through soil.

Twenty (20) of the features identified are located within the investigated corridor, as shown on Exhibits 9-11. Tables 2 and 3 provide a summary of all features identified, including estimated drainage areas (for insurgence features) and surrounding land use. Site/Feature photographs are provided in Appendix B and additional information, including UTM coordinates of the identified karst features, are provided in Table 6 in Appendix B.

3.2.1. Insurgence Feature Summary

Insurgence features, including sinkholes and swallets identified within the HHTC study area are described below and summarized in Table 2. Within the overall study area, nine (9) sinkholes and two (2) swallets were identified (Exhibit 10). Of these identified features, one (1) sinkhole (SI-9) would be directly impacted by alternate F. Alternate DE and HH is anticipated to impact a portion of the drainage areas for two sinkholes (SI-1 and SI-8) and two (2) swallets (SW-1 and SW-2), as shown on Exhibit 10. The features are located

outside the proposed construction limits of Alternates DE and HH. Further discussion of feature impacts is provided in Section 4 of this report.

Feature SI-1 is a 20-foot diameter, 10 – 12 foot deep sinkhole located within the investigated corridor. An 8 – 12 inch eye/throat is located on the southwest wall of feature SI-1. A mower deck was located on the east wall of SI-1 (Photo 1).

Feature SI-2 is a relatively large sinkhole located in a farm field within the investigated corridor, approximately 1,700-feet southwest of the proposed I-265 / Salem Road interchange. Feature SI-2 is a conical sinkhole approximately 18-feet in diameter and 10-feet in depth with no obvious bedrock exposure. A 1-foot eye/throat is located on the eastern wall of feature SI-2 (Photo 2).

Feature SI-3 is a small cover subsidence sinkhole located within lawn/pasture area adjacent to the east of the investigated corridor, within the study area. This feature is a soil cover collapse sinkhole within a minor drainage way adjacent to the east of Old Salem Road (Photo 3).

Feature SI-4 is a 4-foot wide depression with a 1-foot diameter pit or opening, visible down to approximately 10-foot depth. This feature is located 1,150-feet east of the investigated corridor, in the northeast portion of the study area (Photo 4).

Feature SI-5 is a large diameter (30-feet) subsidence, approximately 3-feet deep. This feature has no exposed bedrock or throat, and is overgrown with vegetation. Feature SI-5 is located approximately 950-feet east of the investigated corridor, in the northeast portion of the study area (Photo 5).

Feature SI-6 a 6-foot diameter soil subsidence that is approximately 3-feet deep. The subsidence area associated with feature SI-6 is located under a tree, and appears to continue 4-5-feet underground to the southeast. This feature is located 75 feet to the west of the investigated corridor (Photo 6).

Feature SI-7 is located approximately 90-feet southwest of Old Salem Road and is outside of the investigated corridor. This feature is a soil subsidence that is approximately 4-5 feet in diameter (Photo 7).

Feature SI-8 is a small sinkhole located within the investigated corridor, approximately 1,700-feet northeast of Utica-Sellersburg Road. This feature is a 4-foot wide, 3-foot long sinkhole that extends to 20-inch depth. A visible throat extending approximately 8-inches exists within SI-8, and was filled with soil and vegetation debris upon inspection (Photo 8).

Feature SI-9 is a large sinkhole approximately 20-feet long and 15-feet wide. This feature has an unknown depth as it was filled with yard debris (brush, stumps, etc.) at the time of the field inspection. Feature SI-9 is located within the investigated corridor, approximately 1,300-feet northeast of Utica-Sellersburg Road (Photo 9).

Feature SW-1 is a sink/swallet feature approximately 6-8 inches in diameter. This feature is an opening in the bed of an intermittent stream located within the investigated corridor. Based on field observations, approximately 80% of the stream flow enters SW-1 at this location (Photo 10).

Feature SW-2 is a sink/swallet feature that is a 2-foot deep opening in bedrock, approximately 6-inches wide and 12-inches long. This feature is located in an intermittent stream bed within the investigated corridor (Photo 11).

Table 2: Sinkhole/Insurgence Feature Summary

Feature No.	Dimensions (ft)				Eye/Throat Data				Drainage Area	
	Length	Width	Diameter	Depth	Present? (Y/N)	Diameter (in)	Relative Position	Direction	Total Area (ac)	Land Use
SI-1	15	15	20	12	Y	8-12	SW	W	3.00	Forested
SI-2	17	18	NA	11	Y	12	NA	E	0.71	Agricultural
SI-3	10	2	3	2	N	NA	NA	NA	0.79	Residential / Forested
SI-4	1	4	1	10	Y	NA	NA	NA	0.55	Agricultural / Forested
SI-5	NA	NA	30	3	N	NA	NA	NA	1.60	Forested
SI-6	6	2	6	3	Y	NA	NA	SE	0.75	Forested
SI-7	NA	NA	NA	NA	N	NA	NA	NA	4.94	Agricultural / Forested
SI-8*	3	4	3.5	1.66	Y	6	NW	N	5.37	Agricultural / Forested
SI-9	20	15	17	NA	NA	NA	NA	NA	0.47	Residential
SW-1*	0.5	0.5	0.5	NA	Y	NA	NA	W	5.37	Agricultural / Forested
SW-2*	1	0.5	0.75	2	Y	NA	NA	NW	5.37	Agricultural / Forested
							Total Drainage Area (ac)		18.18	

NA = Not Available / Not Applicable
* = Overlapping drainage areas

3.2.2 Springs/Emergence Feature Summary

Twenty-five (25) springs were identified within the HHTC study area; fourteen (14) springs are within the investigated corridor (Exhibit 11). In general, the springs identified are ephemeral in nature, with estimated discharge rate typically less than 1 gallon per minute (gpm).In general, spring discharge rates were measured using a 16 ounce container and timed until the container filled. In some cases, flow rates were estimated based on a comparison to other measured spring flows.

Springs within the project area are generally located along side slopes and at heads of ephemeral drainage ways, adjacent to surface streams. In addition, the springs identified appear to be located at the base of Muscatatuck Group and underlain by Bainbridge Group carbonates (Salamonie Dolomite). As noted in Section 2.2, the Salamonie Dolomite is relatively resistant to dissolution and likely serves as an impeding layer, where infiltrating groundwater runs along the bedrock surface and discharges where surface topography allows. Site photographs for springs identified in the study area are included in Appendix B, and individual spring descriptions are provided below and summarized in Table 3.

Features SP-1 and SP-2 are ephemeral spring seeps along bedrock bedding planes within the investigated corridor. Both SP-1 and SP-2 have flow of less than 0.1 gallon per minute (gpm) (Photos 12 and 13).

Feature SP-3 is an ephemeral spring in an incised ravine within the investigated corridor. This feature produces less than 0.1 gpm which eventually flows into the Lentzier Creek (Photo 14).

Feature SP-4 is an ephemeral spring with a 60-inch undercut head within a ravine located in the investigated corridor. Approximately 0.1 – 0.2 gpm of flow results from this spring, which eventually flows into the Lentzier Creek (Photo 15).

Feature SP-5 is an ephemeral spring along a 4 - 5-foot exposed bedrock ledge that extends approximately 8 – 12-inches from the surface. This feature is located within the investigated corridor. Less than 0.1 gpm of flow was observed during the field investigation (Photo 16).

Feature SP-6 is an ephemeral spring along a 10-foot long exposed bedrock ledge. This feature is located within the investigated corridor. Less than 0.1 gpm of flow was observed during the field investigation (Photo 17).

Feature SP-7 is an ephemeral spring along a 20 – 30-foot long exposed bedrock ledge. This feature is located within the investigated corridor. Less than 0.1 gpm of flow was observed during the field investigation (Photo 18).

Feature SP-8 is a spring located within a 12-inch conduit in bedrock. This spring is located within an incised ravine, and extends at least 4-feet into bedrock, with flow estimated at approximately 5 gpm. Feature SP-8 is located within the investigated corridor (Photo 19 and 20).

Feature SP-9 is a small spring/emergence feature with 1-2 gpm of flow that emerges from the soil at the base of a slope within the investigated corridor. Some bedrock cobbles were observed in the vicinity of SP-9 (Photo 21).

Feature SP-10 is a 4-inch wide spring located below a bedrock shelf in the slope of a gully within the investigated corridor. This feature was observed to have 3-4 gpm of flow (Photo 22).

Feature SP-11 is a point emergence spring located approximately 650-feet west of Old Salem Road and is within the investigated corridor (Photo 23). Flow emerging from the spring was estimated at 2-3 gpm.

Feature SP-12 is an ephemeral spring located below a culvert on the west side of Utica-Sellersburg Road, within the investigated corridor (Photo 24). This feature was observed with flow less than 0.1 gpm.

Feature SP-13 is a spring with a 15 – 20-foot emergence along a bedrock bedding plane on the west side of Utica Sellersburg Road. SP-13 was observed flowing at 10 – 20 gpm. This feature is located within the investigated corridor (Photo 25).

Feature SP-14 is a point emergence spring with soil piping feature with flow estimated at 3-5 gpm. This feature is located within the investigated corridor, approximately 300-feet southeast of Utica-Sellersburg Road (Photo 26).

Feature SP-15 is an ephemeral spring with exposed bedrock. This feature is located in the northeast portion of the study area, approximately 850-feet northeast of the investigated corridor (Photo 27).No flow was observed emerging from the spring during the field reconnaissance.

Feature SP-16 is a 4-foot wide ephemeral spring along a bedrock bedding plane with flow estimated at approximately 1 gpm. This feature is located approximately 140-feet east of the investigated corridor (Photo 28).

Feature SP-17 is an ephemeral spring that emerges from the soil along a stream valley with flow estimated at less than 1 gpm. This feature is located outside of the investigated corridor, approximately 160-feet east (Photo 29).

Feature SP-18 is an ephemeral spring located within an ephemeral channel. This spring emerges from the base of a bedrock outcrop approximately 1.5-feet high, and is located 1,000-feet east of the investigated corridor (Photo 30). No flow was observed emerging from the spring during the field reconnaissance.

Feature SP-19 is an ephemeral spring that emerges from the south bank of an ephemeral channel with flow estimated at approximately 1 gpm. This spring emerges from the top of a bedrock bedding plane, and is located on the eastern side of the study area, 2,000-feet east of the investigated corridor (Photo 31).

Feature SP-20 is an ephemeral spring that emerges in a channel bank along a bedrock bedding plane with flow estimated at approximately 1 gpm. Feature SP-20 is located approximately 1,700-feet southeast of the investigated corridor (Photo 32).

Feature SP-21 is an ephemeral spring that emerges from a 2-foot wide opening at the base of a bedrock bedding plane outcrop. This feature is located approximately 1,750-feet southeast of the investigated corridor (Photo 33). No flow was observed emerging from the spring during the field reconnaissance.

Feature SP-22 is an ephemeral spring approximately 90-feet west of the investigated corridor. This feature is indicated by a slight depression and erosion around the feature. Exposed limestone bedrock was noted around the edges of the depression (Photo 34). No flow was observed emerging from the spring during the field reconnaissance.

Feature SP-23 is an ephemeral spring located approximately 150-feet west of the northern portion of the investigated corridor. This feature was not flowing during the time of investigation, but evidence of minor groundwater seepage within the head-cut was observed (Photo 35).

Feature SP-24 is a spring located approximately 525-feet southeast of the investigated corridor. This feature was observed as a point emergence spring flowing at 4 -5 gpm. Spring SP-24 appeared to be sourced from a bedrock bedding plane (Photo 36).

Feature SP-25 is a spring located approximately 1,300-feet southeast of the investigated corridor. This feature is located on the up-stream side of a ponded wetland, and was observed flowing at 5 gpm. No obvious bedrock exposure was observed near SP-25 (Photo 37).

Table 3: Springs/Emergence Feature Summary		
Feature No.	**Characteristics**	
	Emergence Opening Size	**Estimated Flow (gpm)**
SP-1	20'	<0.1
SP-2	4'	<0.1
SP-3	8'	<0.1-0.2
SP-4	60"	0.1-0.2
SP-5	4-5'	<0.1-0.2
SP-6	10'	<0.1
SP-7	20-30'	<0.1
SP-8	12"	5
SP-9	3-4"	1-2
SP-10	4"	3-4
SP-11	NA	2-3
SP-12	NA	<0.1
SP-13	15-20'	10-20
SP-14	NA	3-5
SP-15	1-2'	0
SP-16	6"	1
SP-17	NA	<1
SP-18	NA	0
SP-19	NA	1
SP-20	NA	1
SP-21	6"	0
SP-22	NA	0
SP-23	NA	0
SP-24	10'	4-5
SP-25	12"	5

NA = Not Avaliable

3.2.3 Cave Feature Summary

No caves were identified within the study area and investigated corridor.

3.2.4 Features within Alternate Alignment DE

A total of three (3) karst features are located within the proposed construction limits of Alternate DE, namely springs SP-2, SP-3, and SP-11.

In addition to the three (3) springs, a portion of the drainage areas/watershed areas for features SI-1, SI-8, SW-1, and SW-2 are included within the construction limits of Alternative Route DE. Feature SI-1 is a relatively large subsidence (suffosion) sinkhole (See Photo 2 in Appendix B). Suffosion sinkholes (or dolines) form where seepage through thick unconsolidated regolith over karst rocks (Ford and Williams, 1989). The seepage of water through the regolith removes the fine sediment of the regolith into the underlying fractures and solution enlarged conduits. Features SW-1 and SW-2 are relatively small (less than 1' diameter) swallet features located within a stream bed just outside the proposed construction limits.

3.2.5 Features within Alternate Alignment F

Three (3) karst features are located within the construction limits of alignment Alternate F, namely springs SP-2 and SP-11, as well as SI-9 (sinkhole).

3.2.6 Features within Alternate Alignment HH

Three (3) karst features are located within the construction limits of the alignment Alternate HH, namely springs SP-2, SP-4, and SP-11.

In addition to the three (3) springs, a portion of the drainage areas/watershed areas for features SI-1, SI-8, SW-1, and SW-2 are included within the construction limits of Alternative Route HH.

4.0 Impacts to Karst Features

4.1 Identified Feature Impacts

In general, avoidance of karst features is the preferred mechanism to protect sensitive habitat for flora and fauna associated with karst features. Based on the proposed roadway alignment and field observations in the study area, avoidance of all features present within the study area is not feasible. The study area is located within a karst geomorphic setting, and all alignments considered would impact extant features. As proposed, the recommended alignments appear to have avoided direct impacts to a significant number of karst features in the study area.

Typical impacts to karst features from the proposed roadway may include the following:

- Permanent closure/destruction of the feature (loss of habitat or natural drainage function)
- Routing of highway runoff into the feature (contamination of surface and groundwater, accelerating dissolution/subsidence)
- Excess sedimentation due to erosion or runoff
- Loss of habitat or fragmentation of habitat
- Exposure of the feature due to clearing (inducing vandalism)

4.2 General and Specific Mitigation Measures

General measures to avoid or minimize impacts to the affected karst features include the following:

1. BMPs should be incorporated into the design of the roadway improvements to minimize runoff generated by construction to be directed toward the identified features. Erosion control treatments should be installed surrounding the topographic depressions at the highest closed contour. Use of temporary earthen berms with rip rap armor is highly recommended. Where possible, the existing vegetation surrounding features should be maintained throughout construction, including a minimum 10-foot buffer measured from the rim, or highest closed contour, surrounding the depression. The buffer area and depression should be fenced for the duration of construction.

2. Material storage and staging areas, as well as equipment storage, maintenance and re-fueling areas should not be located within the drainage area of karst features.

3. An Emergency Response Plan should be prepared for project construction which includes a site-specific Spill Response Plan. IDEM should be provided a copy of the Emergency Response Plan and the locations of mapped karst features within the project area.

4. A low salt and no spray strategy should be implemented prior to project completion. This strategy may include the use of road signs that indicate the no spray zone.

5. Signage throughout the corridor is recommended to alert the public and users to report all spills – these recommended signs should include the Indiana Department of Environmental Management (IDEM) toll-free spill line phone number. In addition, coordination with the IDEM office of Land

Management to facilitate development of an emergency response plan, including locations of potentially affected sinkholes and springs in case of a release on the proposed roadway.

Table 5 provides a summary of impacted karst features within the proposed Alternative Routes DE, F, and HH, along with proposed feature treatment and/or mitigation measures.

Table 5
Summary of Impacts to Karst Features and Recommended Measures for Avoidance and/or Mitigation

Feature #	Impacted Area (acres)	Recommended Treatment/Mitigation Measure(s)
Alternative DE		
SP-2	NA	1. Small spring box with outlet to adjacent drainageway. 2. Install appropriate erosion and sediment control measures to minimize sediment movement to the spring during construction
SP-3	NA	1. Small spring box with outlet to adjacent drainageway; 2. Install appropriate erosion and sediment control measures to minimize sediment movement to the spring during construction
SP-11	NA	1. Small spring box with outlet to adjacent drainageway; 2. Install appropriate erosion and sediment control measures to minimize sediment movement to the spring during construction
SI-1	2.19	1. Install appropriate erosion and sediment control measures to minimize sediment movement to the sinkhole during construction; 2. Re-vegetate the impacted drainage area immediately following construction; 3. Install appropriately sized culverts under roadway embankment to facilitate runoff to sinkhole
SI-8	1.61	1. Install appropriate erosion and sediment control measures to minimize sediment movement to the sinkhole during construction; 2. Re-vegetate the impacted drainage area immediately following construction; 3. Install appropriately sized culverts under roadway embankment to facilitate runoff to sinkhole
SW-1		Install appropriate erosion and sediment control measures to minimize sediment movement to the swallet during construction
SW-2		Install appropriate erosion and sediment control measures to minimize sediment movement to the swallet during construction

Table 5 Summary of Impacts to Karst Features and Recommended Measures for Avoidance and/or Mitigation		
Feature #	**Impacted Area (acres)**	**Recommended Treatment/Mitigation Measure(s)**
Alternative F		
SP-2	NA	1. Small spring box with outlet to adjacent drainageway; 2. Install appropriate erosion and sediment control measures to minimize sediment movement to the spring during construction
SP-11	NA	1. Small spring box with outlet to adjacent drainageway 2. Install appropriate erosion and sediment control measures to minimize sediment movement to the spring during construction
SI-9	0.24	1. Install appropriate erosion and sediment control measures to minimize sediment movement to the sinkhole during construction; 2. Re-vegetate the impacted drainage area immediately following construction; 3. Close sinkhole using aggregate cap to perpetuate recharge from non-roadway runoff, or if sinkhole is under proposed pavement, close with concrete cap.
Alternative HH		
SP-2	NA	1. Small spring box with outlet to adjacent drainageway; 2. Install appropriate erosion and sediment control measures to minimize sediment movement to the spring during construction
SP-4	NA	1. Small spring box with outlet to adjacent drainageway; 2. Install appropriate erosion and sediment control measures to minimize sediment movement to the spring during construction
SP-11	NA	1. Small spring box with outlet to adjacent drainageway; 2. Install appropriate erosion and sediment control measures to minimize sediment movement to the spring during construction

Table 5 Summary of Impacts to Karst Features and Recommended Measures for Avoidance and/or Mitigation		
Feature #	**Impacted Area (acres)**	**Recommended Treatment/Mitigation Measure(s)**
SI-1	0.69	1. Install appropriate erosion and sediment control measures to minimize sediment movement to the sinkhole during construction; 2. Re-vegetate the impacted drainage area immediately following construction; 3. Install appropriately sized culverts under roadway embankment to facilitate runoff to sinkhole
SI-8	0.31	1. Install appropriate erosion and sediment control measures to minimize sediment movement to the sinkhole during construction; 2. Re-vegetate the impacted drainage area immediately following construction; 3. Install appropriately sized culverts under roadway embankment to facilitate runoff to sinkhole
SW-1		Install appropriate erosion and sediment control measures to minimize sediment movement to the swallet during construction
SW-2		Install appropriate erosion and sediment control measures to minimize sediment movement to the swallet during construction

NA = Not Applicable

5.0 Recommendations for Feature Protection and Mitigation

5.1 Feature Protection During Construction

Throughout construction, installation of erosion control treatments surrounding individual features is recommended. In particular, filter berms should be installed around the highest closed contour of sinkhole depressions (see Detail 5 in Appendix D). Existing vegetation around the features should be maintained for the duration of construction.

Silt fencing or other appropriate sediment control features should be installed adjacent to stream channels, particularly Lentzier Creek and UNT 11, to minimize siltation or release of contaminants to downstream karst features.

5.2 Management of Post-Construction Runoff

In general, management of post-construction runoff should be implemented by the installation of side ditches to collect surface runoff from the roadway and embankments. All side drainage ditches should be directed to existing surface streams (Lentzier Creek and un-named tributaries to Lentzier Creek) throughout the length of the proposed project. Discharge of roadway runoff into existing karst features (e.g., sinkholes) is not recommended.

5.2.1 Sinkhole Treatments

Treatments for sinkholes within the project generally fall into two basic categories, namely sinkholes to be left in place that are outside the proposed construction limits and sinkholes to be permanently closed.

Sinkholes Left In Place

The objective for sinkholes that will be left in place (no disturbance) is to minimize changes to the volume of surface water that enters a sinkhole, as increased flow may disturb the underground hydrology and/or increase the potential for accelerated enlargement of the feature. To the extent possible, the surface water flow should be maintained at pre-development volumes. Pre-existing concentrated flow channels should be stabilized, but should not otherwise be altered.

Drainage areas of Features SI-1, SI-8, SI-9, SW-1, and SW-2 are anticipated to be affected, based on the proposed alignments. Where the proposed roadway extends over the mapped sinkhole/swallet drainage areas (e.g., SI-1, SI-2, SW-2 and SW-1 on Alternates DE and HH), flow to the features should be maintained via culverts or other drainage structures and allowed to continue down-gradient to the feature.

Placement of a vegetated buffer a minimum of 25 feet wide measured from the rim of the sinkhole, or highest closed contour surrounding the depression, is recommended for all sinkholes left in place, within the proposed right-of-way. The buffer area should be extended laterally to control development of concentrated flow channels entering the sinkhole. The width of the vegetated buffer should be established and maintained in accordance with the type of buffer vegetation selected. It is further recommended that sinkholes left in place and the surrounding buffer be fenced.

Vegetation of the buffer areas should include a mixture of native grasses, wildflowers, and native shrub and hardwood tree species, as recommended by the IDNR-Division of Fish and Wildlife. Seeding should not include any varieties of Tall Fescue or other non-native plants, such as crown-vetch. All slopes 3:1 or greater

should be protected by installation of erosion control blankets. “Do Not Mow or Spray” signs should be posted within the right-of-way area, particularly near maintained sinkholes.

Sinkhole Closure

Sinkholes located within the proposed pavement and drainage areas should be permanently closed to prevent future collapse and surface runoff from entering the subsurface. At these features, soils, loose rock, trash, and other materials should be removed. The resulting excavation should be backfilled with a graded aggregate or concrete cap – see Details 1 and 2, Appendix D. Sinkholes under or adjacent to pavement are recommended to be treated with a concrete cap to maintain structural integrity of the roadway. Aggregate caps are recommended in areas outside of pavement to maintain some level of recharge to the subsurface karst groundwater system.

5.2.2 Springs

Springs identified in the project area were identified as ephemeral, with the exception of features SP-8, SP-9, SP-10, SP-11, SP-13, SP-14, SP-24, and SP-25, which had flowing water at the time of the investigation in excess of 1 gpm. The springs and fissures noted are surface expressions of the subsurface water level and release water to surface drainage during precipitation events. Therefore, permanent closure of identified springs and fissures is not recommended.

Treatment of existing springs within proposed fill areas should include installation of appropriately sized pipe or box culverts to extend the drainage beyond the right-of-way (see Details 3 and 4, Appendix D). The culvert should follow the existing drainage channel to maintain existing drainage patterns. Springs located within construction limits of the Alternative Routes include Features SP-2, SP-3, SP-4, and SP-11. It is recommended adequate drainage be provided to allow flow from these features during storm events to be routed to the proposed side ditch.

5.2.3 Caves

No caves were identified within the study area.

6.0 Conclusions and Recommendations

The proposed Heavy Haul Route alternate alignments were investigated for the presence of karst features within the proposed roadway project area. The proposed roadway is located on the south-side of Bloomington, Clark County, Indiana, an area characterized by mature karst topography.

A total of nine (9) karst features were identified within the proposed construction limits of alternate alignments DE, F and HH, consisting of three sinkholes, two swallets and four springs. The associated drainage areas of sinkholes SI-1 and SI-8 and swallets SW-1 and SW-2 are anticipated to be affected by proposed Alternate DE. Approximately 2.19 acres of the drainage area of feature SI-1, and 1.61 acres of drainage area for features SI-8, SW-1 and SW-2 will be impacted by Alternate DE. These impacts can be mitigated with installation of appropriately sized drainage structures under the roadway to facilitate drainage to the features. Three small springs (SP-2, SP-3 and SP-11) will be affected by alternate DE; however, these impacts can be mitigated by placement of spring boxes to allow continuation of flow emerging from the springs.

Alternate F will impact one sinkhole (SI-9); based on the location of the sinkhole, it is anticipated this feature will be capped. Alternate F will also affect two springs (SW-2 and SW-11); however, these impacts can be mitigated by placement of spring boxes to allow continuation of flow emerging from these springs.

Alternate HH will impact the associated drainage areas of sinkholes SI-1 and SI-8 and swallets SW-1 and SW-2. Approximately 0.69 acre of the drainage area of feature SI-1, and 0.31 acre of drainage area for features SI-8, SW-1 and SW-2 will be impacted. As discussed for Alternate DE, these impacts can be mitigated with installation of appropriately sized drainage structures under the roadway to facilitate drainage to the features. Three small springs (SP-2, SP-4 and SP-11) will also be affected by alternate HH; however, these impacts can be mitigated by placement of spring boxes to allow continuation of flow emerging from the springs.

Additional investigations prior to the development of final design of the Heavy Haul route is recommended, including geotechnical and subsurface geophysical surveys of the selected alignment to determine the presence of potential buried karst features which may affect the stability of the roadway and on-going maintenance and operations. Where sinkholes are overlain by glacially-derived soils, subsidence can occur even with no apparent surface expression prior to the collapse. Loess and glacial till are susceptible to soil piping upward due to their fine-grained matrix. Soil piping occurs when soil erosion begins at a seepage exit point (void or fracture in underlying bedrock) and erodes backwards, supporting a “pipe” or “roof” along the way. In addition, placement of impervious surface modifies surface runoff, infiltration and recharge patterns. In this, runoff can be concentrated in an area which may induce infiltration to a buried sinkhole or fracture causing the feature to destabilize. Construction within karst areas may increase the potential for destabilizing buried features during excavation and rock-cutting activities.

Dye trace analysis of the proposed project area is not recommended, as no caves or significant springs supporting sensitive habitat were identified in the study area. Based on the distribution of insurgence features and springs throughout the study area, it is apparent the spring discharge is primarily supplied from diffuse recharge through the overlying soil rather than discreet sources such as sinkholes. Therefore, design of an effective dye-trace investigation is impractical.

General recommendations to minimize the impacts to karst features include:

- Use erosion and sediment control measures, including temporary earthen berms to control sediment from construction zones entering sinkholes (See Appendix D, Detail 5);
- Bare and disturbed areas within sinkhole drainage areas should be re-vegetated as soon as practical following construction with a mixture of grasses (excluding all varieties of tall fescue), legumes, and native shrubs and hardwood tress species;
- Where possible, the existing vegetation surrounding features should be maintained throughout construction, including a minimum 10-foot buffer measured from the rim, or highest closed contour, surrounding the depression;
- All sinkholes and surrounding buffer areas should be fenced for the duration of construction;

  Closure or repair of sinkholes within the project limits, particularly at feature SI-9 (Alternate F), should use an aggregate or concrete cap. A typical detail for these treatment measures is provided in Appendix D (Details 1 and 2);
- If the proposed drainage design is modified to use existing karst features, a full-scale pollutant loading calculation should be performed to estimate the potential loads anticipated for the specific karst feature and dye-tracing should be performed to determine flow paths from these features;
- A low salt and no spray strategy should be implemented, including the use of road signs that indicate the no spray zone;
- An Emergency Response Plan, including a site-specific Spill Response Plan, will be developed prior to the start of project construction to identify response protocols if a spill occurs during construction;
- Material storage and staging areas, as well as equipment storage, maintenance and re-fueling areas should not be located within the drainage are of any karst features; and
- Use of structural BMPs (e.g., water quality filters and hydrodynamic devices) should be considered at the stormwater outfalls to surface streams in the area to minimize pollutant loading and contain releases from spills.

7.0 References

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This Karst Features Evaluation Report, prepared for the proposed Heavy Haul Route, in Clark County, Indiana was prepared by Paul A. Johnson, a Licensed Professional Geologist in the State of Indiana (Indiana License # 1881).

Certified By:

Date: December 29, 2017

Appendix A – Exhibits

See Appendix A for State Location Map

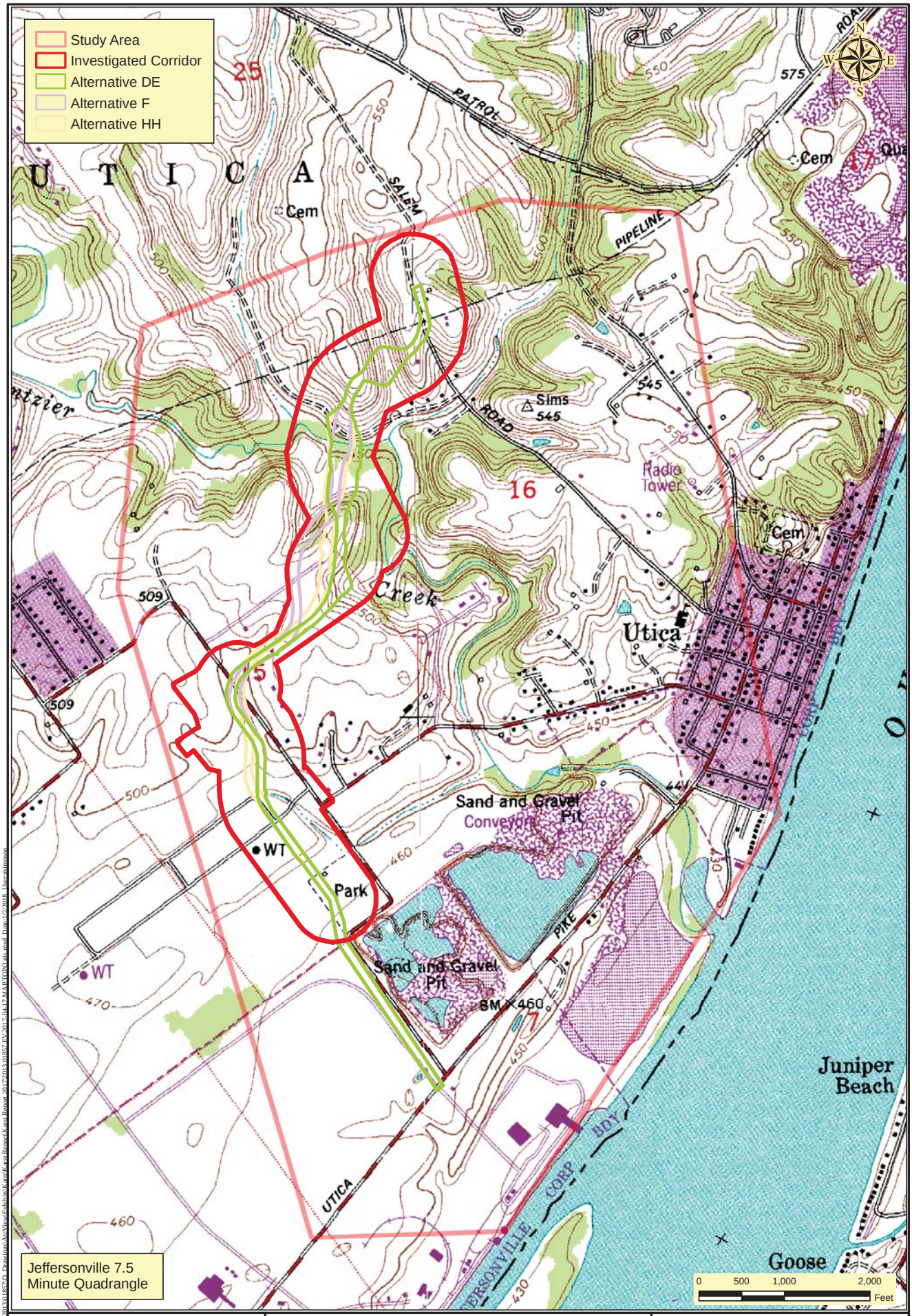

Exhibit 2: USGS Topographic Map

Indiana Department of Transportation
Central Office
100 North Senate Avenue
Indianapolis, Indiana 46204

Heavy Haul Karst Features Evaluation
Des. No. 1382612

Location: Jeffersonville
Township: Utica
County: Clark
State: Indiana

Date: 11/21/2017

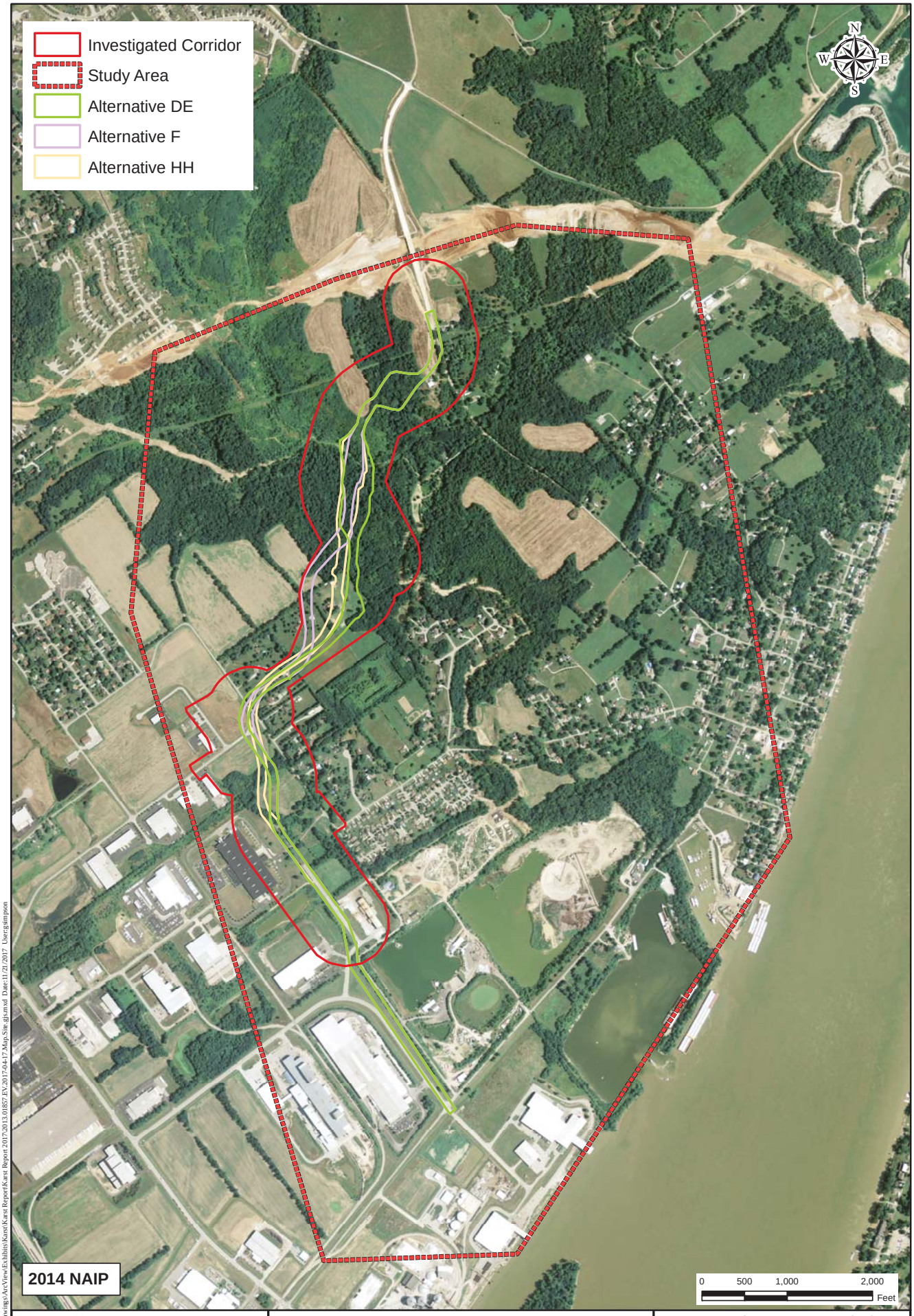

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Exhibit 3: Aerial Site Map

Indiana Department of Transportation
Central Office
100 North Senate Avenue
Indianapolis, Indiana 46204

Heavy Haul Karst Features Evaluation
Des. No. 1382612

Location: Jeffersonville
and Utica
Township: Utica
County: Clark

Date: 11/21/2017

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Exhibit 4: Aerial Map - Physiography

Indiana Department of Transportation
Central Office
100 North Senate Avenue
Indianapolis, Indiana 46204

Heavy Haul Karst Features Evaluation
Des. No. 1382612

Location: Jeffersonville
and Utica
Township: Utica
County: Clark

Date: 11/21/2017

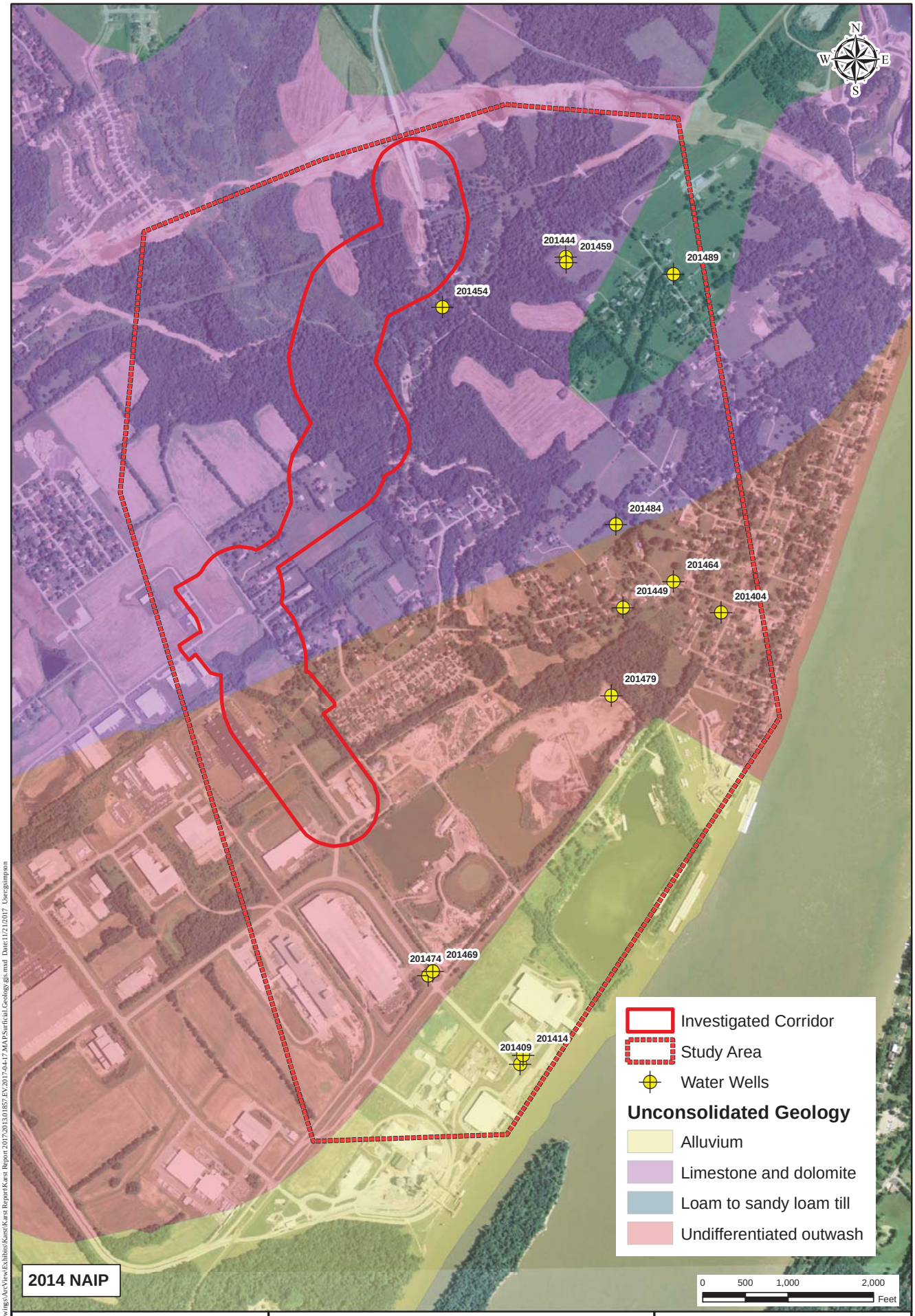

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Exhibit 5: Surficial Geologic Map

Indiana Department of Transportation
Central Office
100 North Senate Avenue
Indianapolis, Indiana 46204

Heavy Haul Karst Features Evaluation
Des. No. 1382612

Location: Jeffersonville
and Utica
Township: Utica
County: Clark

Date: 11/21/2017

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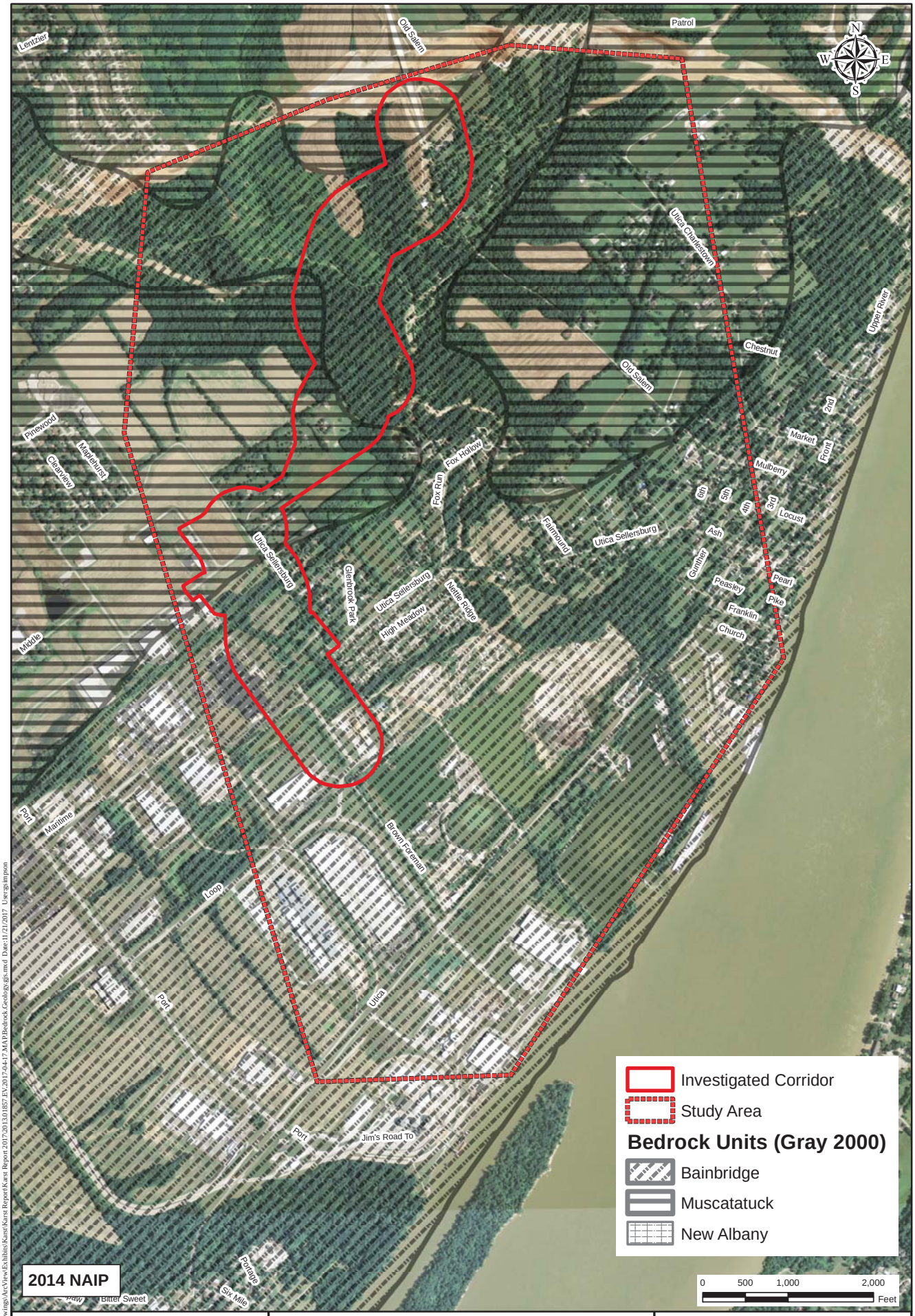

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Exhibit 6: Bedrock Geologic Map

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Indianapolis, Indiana 46204

Heavy Haul Karst Features Evaluation
Des. No. 1382612

Location: Jeffersonville
and Utica
Township: Utica
County: Clark

Date: 11/21/2017

Appendix E

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Exhibit 7: SSURGO Soils Map

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Central Office
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Indianapolis, Indiana 46204

Heavy Haul Karst Features Evaluation
Des. No. 1382612

Location: Jeffersonville
and Utica
Township: Utica
County: Clark

Date: 11/21/2017

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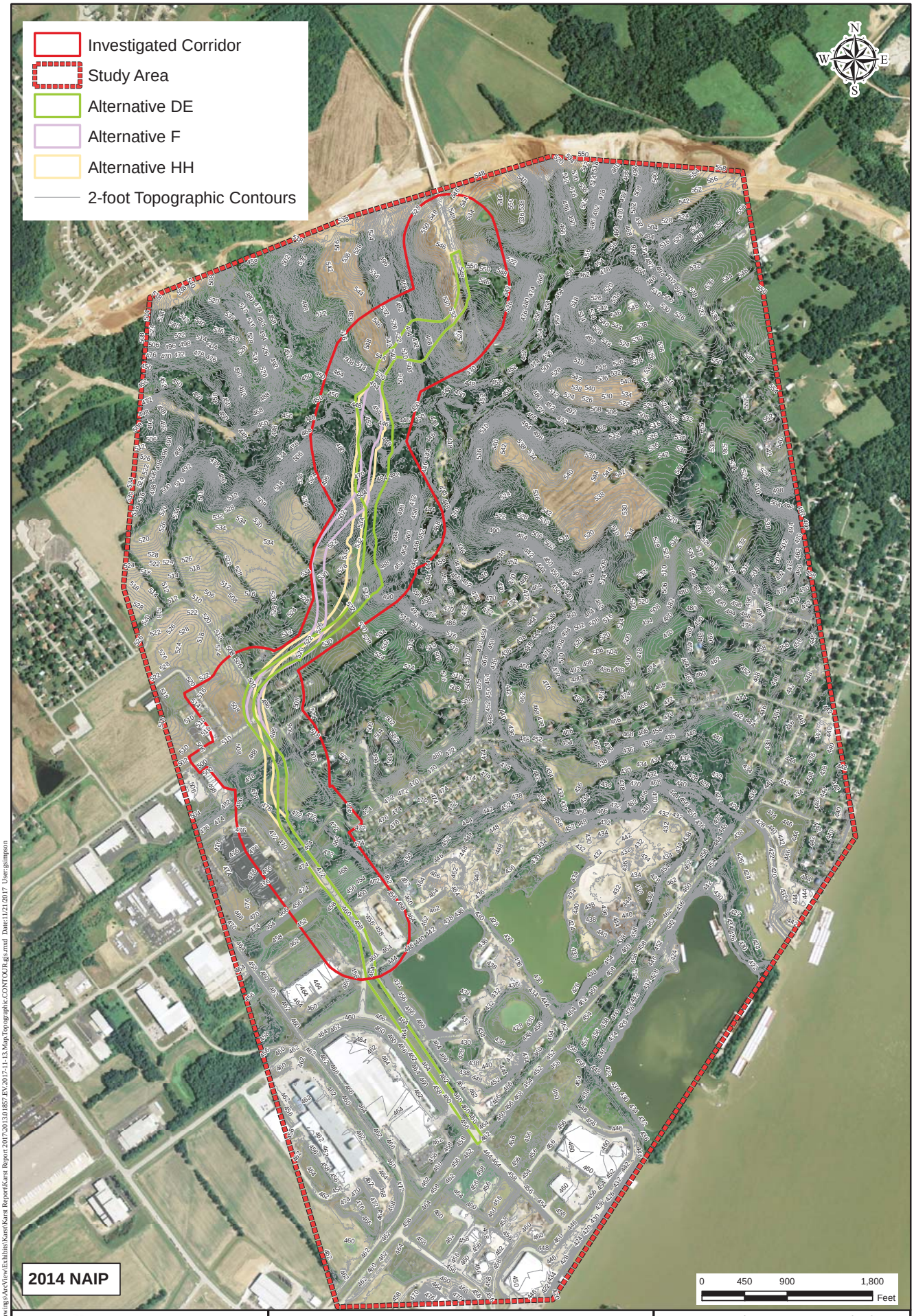

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Exhibit 8: Topographic Map

Indiana Department of Transportation
Central Office
100 North Senate Avenue
Indianapolis, Indiana 46204

Heavy Haul Karst Features Evaluation
Des. No. 1382612

Location: Jeffersonville
and Utica
Township: Utica
County: Clark

Date: 11/21/2017

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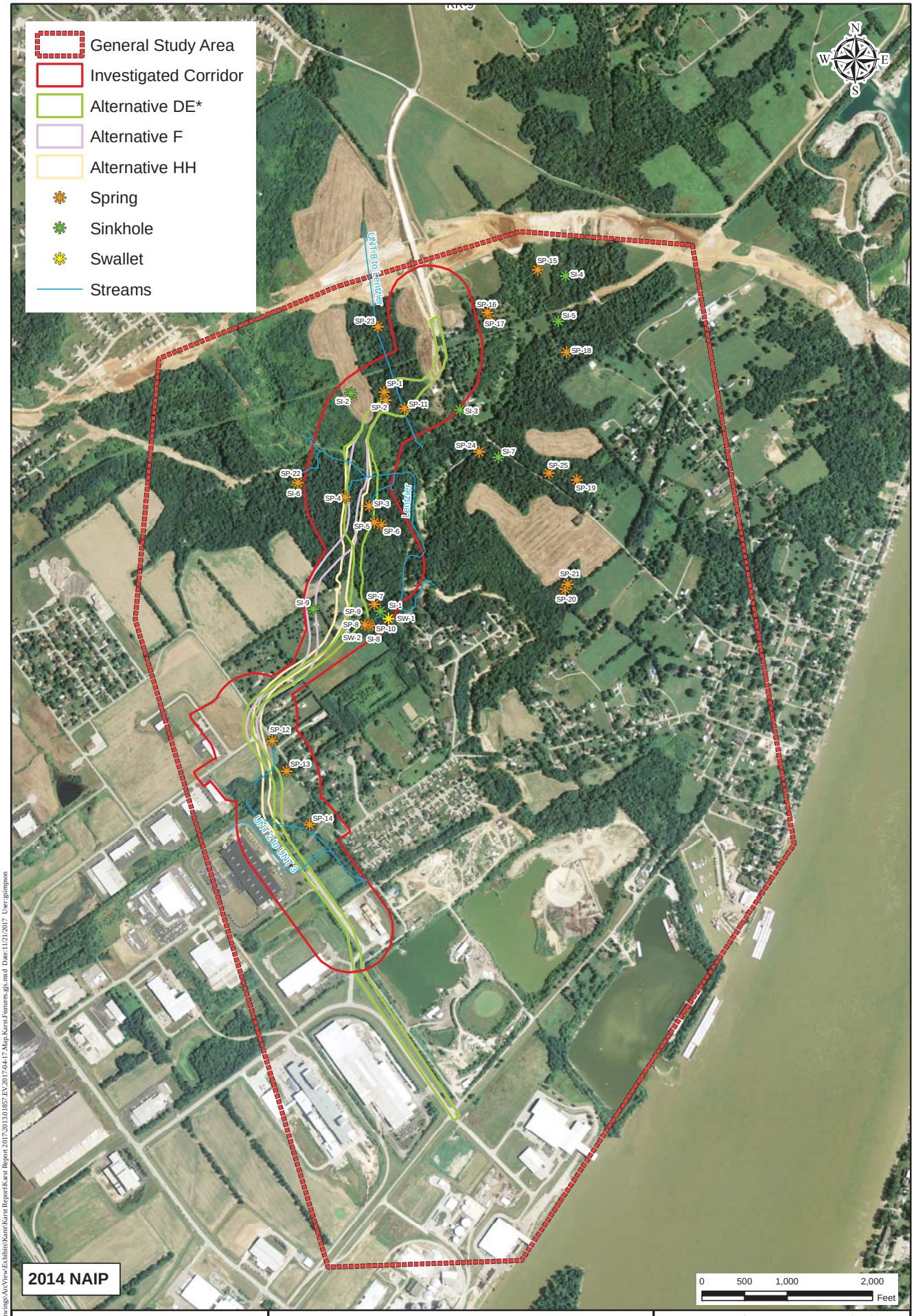

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AMERICA'S STRUCTUREPOINT INC.
www.structurepoint.com

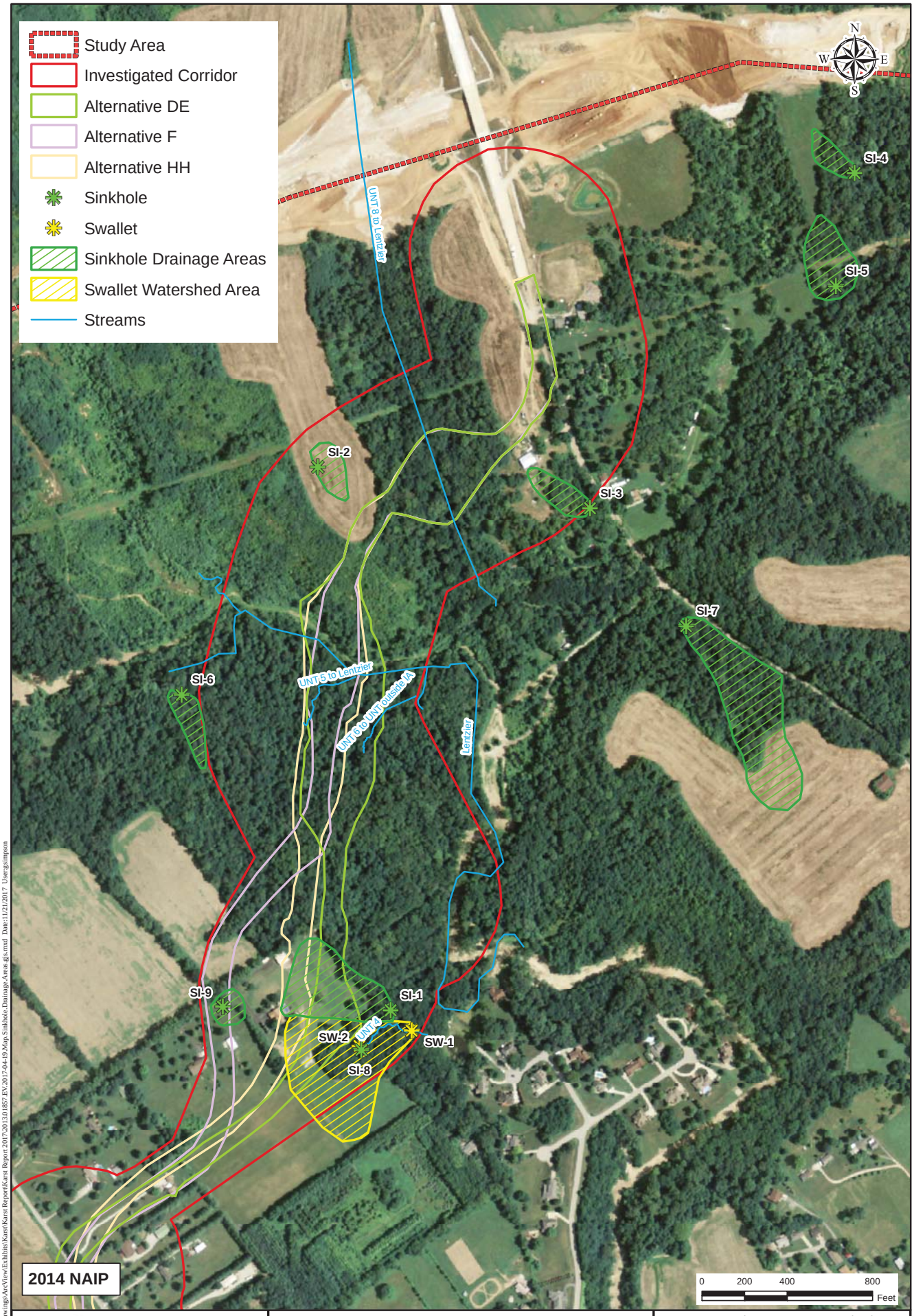
Exhibit 9: Identified Karst Features

Indiana Department of Transportation
Central Office
100 North Senate Avenue
Indianapolis, Indiana 46204

Heavy Haul Karst Features Evaluation
Des. No. 1382612

Location: Jeffersonville
and Utica
Township: Utica
County: Clark

Date: 11/21/2017



Path: P:\2013\01857\D. Drawings\ArcView\Exhibits\Karst\Karst Report\Karst Report 2017\2013\01857 EV\2017-04-19 Map Sinkhole Drainage Areas.gis.mxd Date:11/21/2017 User:gsimpson

AMERICA'S STRUCTUREPOINT INC.
www.structurepoint.com

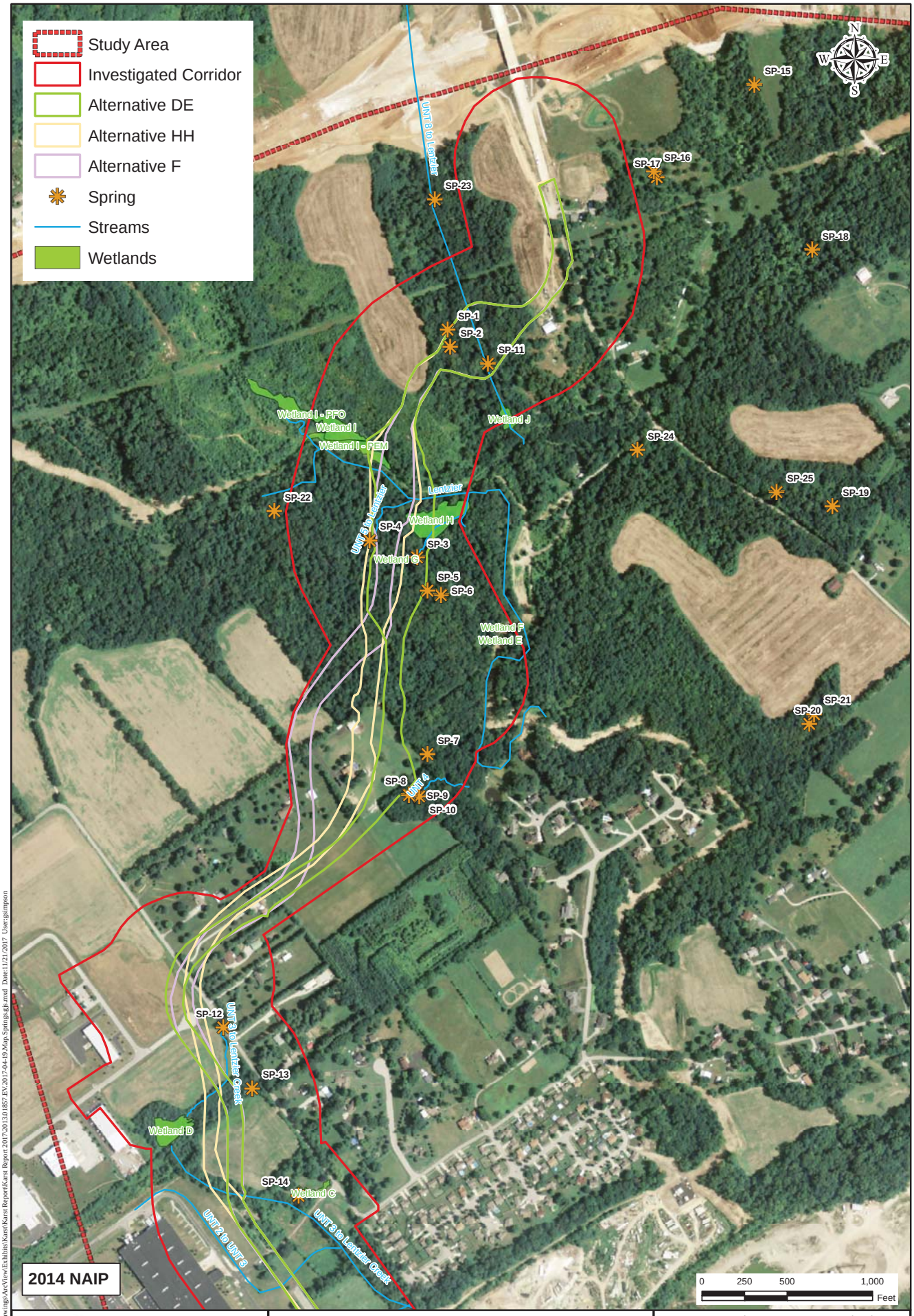
Exhibit 10: Sinkhole/Insurgence Drainage Areas

Indiana Department of Transportation
Central Office
100 North Senate Avenue
Indianapolis, Indiana 46204

Heavy Haul Karst Features Evaluation
Des. No. 1382612

Location: Jeffersonville
and Utica
Township: Utica
County: Clark

Date: 11/21/2017



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AMERICA'S STRUCTUREPOINT INC.
www.structurepoint.com

Exhibit 11: Spring/Emergence Features

Indiana Department of Transportation
Central Office
100 North Senate Avenue
Indianapolis, Indiana 46204

Heavy Haul Karst Features Evaluation
Des. No. 1382612

Location: Jeffersonville
and Utica
Township: Utica
County: Clark

Date: 11/21/2017

Appendix B – Site/Feature Photographs

Heavy Haul Karst Features Evaluation
Des. No. 1382612
April 22, 23, 2014 - May 6, 2014 - December 19, 2016 – April 11, 2017
Project No. 2013.01857

Photo 1: Sinkhole SI-1.

Photo 2: Sinkhole SI-2

Photo 3: Sinkhole SI-3

Photo 4: Sinkhole SI-4.

Photo 5: Sinkhole SI-5

Photo 6: Sinkhole SI-6

Photo 7: Sinkhole SI-7

Photo 8: Sinkhole SI-8

Photo 9: Sinkhole SI-9.

Photo 10: Swallet SW-1.

Photo 11: Swallet SW-2

Photo 12: Spring SP-1

Photo 13: Spring SP-2.

Photo 14: Spring SP-3.

Photo 15: Spring SP-4

Photo 16: Spring SP-5.

Photo 17: Spring SP-6.

Photo 18: Spring SP-7.

Photo 19: Spring SP-8.

Photo 20: Spring SP-8.

Photo 21: Spring SP-9.

Photo 22:. Spring SP-10.

Photo 23: Spring SP-11.

Photo 24: Spring SP-12.

Photo 25: Spring SP-13

Photo 26: Spring SP-14.

Photo 27: Spring SP-15.

Photo 28: Spring SP-16

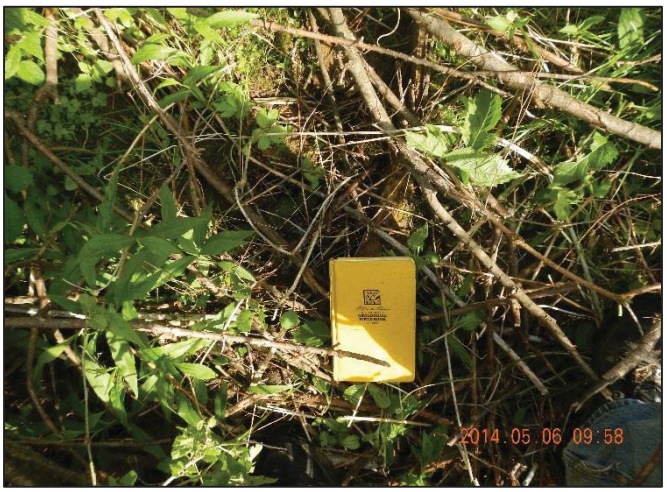


Photo 29: Spring SP-17.

Photo 30: Spring SP-18

Photo 31: Spring SP-19.

Photo 32: Spring SP-20.

Photo 33: Spring SP-21

Photo 34: Spring SP-22

Photo 35: Spring SP-23.

Photo 36: Spring SP-24.

Photo 37: Spring SP-25

Photo 38: Animal burrow

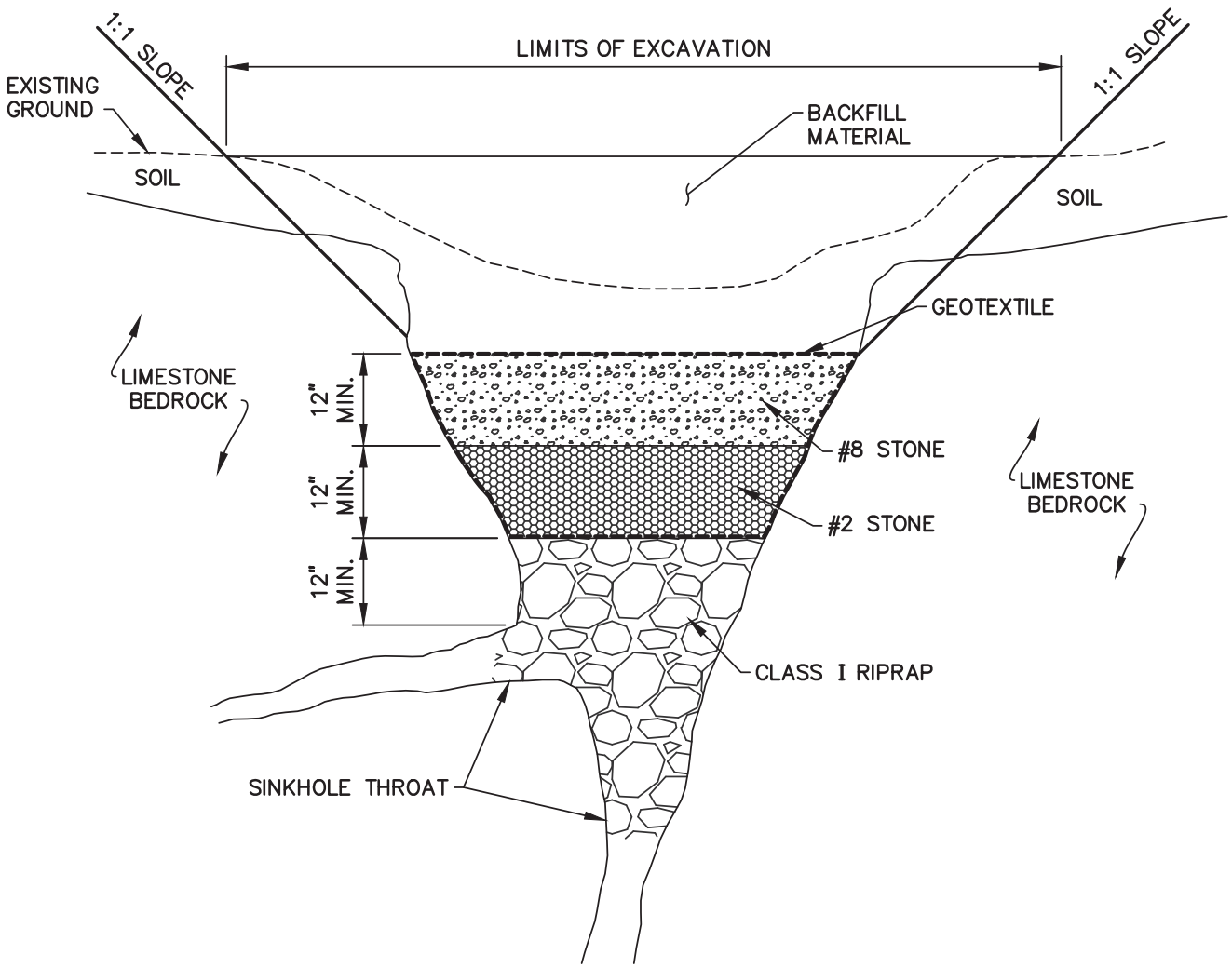
Photo 39: Interior of animal burrow

Photo 40: Interior length of animal burrow

Appendix C – Agency Coordination

See Appendix B of this document for coordination with IGS, IDNR, and USFWS

Appendix D – Recommended Feature Treatment Details



TYPICAL SINKHOLE TREATMENT AGGREGATE CAP

NOT TO SCALE

Notes:

1. Contractor shall perform exploratory excavations to determine extent of the sinkhole throat prior to installing the treatment.

2. All loose and fragmented rock, soil, trash and debris shall be removed from the excavation, down to stable rock walls/surfaces at the sinkhole throat.

3. If during exploratory excavation, the sinkhole throat is determined to be greater than 36–inches, Class II Riprap shall be used in lieu of Class I Riprap.

4. Contractor shall overlap the ends of the geotextile material an minimum of 24–inches.

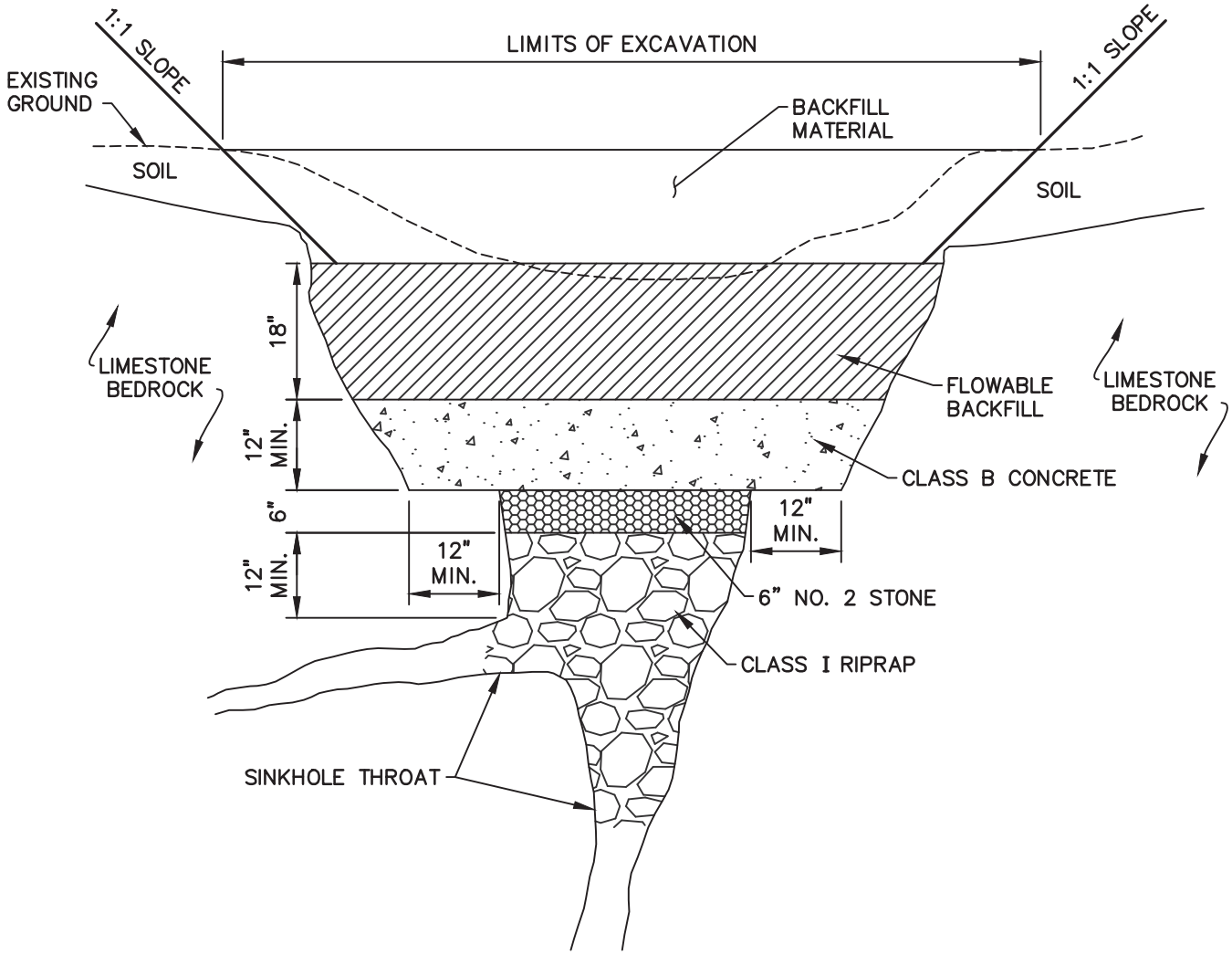
AMERICAN STRUCTUREPOINT INC.

TYPICAL SINKHOLE TREATMENT AGGREGATE CAP

INDIANA DEPARTMENT OF TRANSPORTATION
HEAVY HAUL ROUTE

DETAIL NO: 1

PLOT SCALE: 1:1 EDIT DATE: 8/9/13 – 2:42 PM EDITED BY: JGRIFFITH DRAWING FILE: P:\2013\01857\D. DRAWINGS\ENVIRONMENTAL\2013.01857.EV.EXB.DWG



TYPICAL SINKHOLE TREATMENT CONCRETE CAP

NOT TO SCALE

Notes:

1. Contractor shall perform exploratory excavations to determine extent of the sinkhole throat prior to installing the treatment.
2. All loose and fragmented rock, soil, trash and debris shall be removed from the excavation, down to stable rock walls/surfaces at the sinkhole throat.
3. If during exploratory excavation, the sinkhole throat is determined to be greater than 36–inches, Class II Riprap shall be used in lieu of Class I Riprap.
4. Prior to placing concrete, all rock surfaces shall be free of soil and organic material.

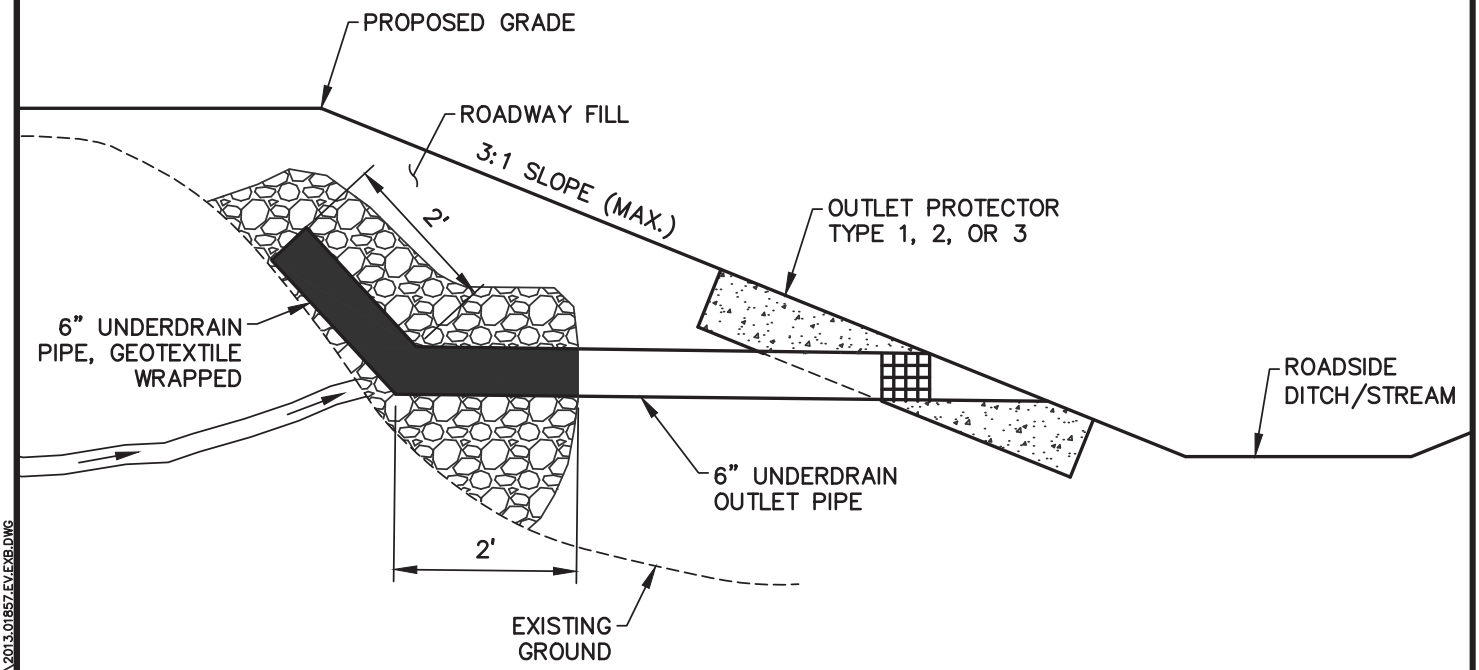
AMERICAN STRUCTUREPOINT INC.

TYPICAL SINKHOLE TREATMENT CONCRETE CAP

INDIANA DEPARTMENT OF TRANSPORTATION
HEAVY HAUL ROUTE

DETAIL NO: 2

PLOT SCALE: 1:1 EDIT DATE: 8/9/13 – 3:32 PM EDITED BY: JGRIFFITH DRAWING FILE: P:\2013\01857\D. DRAWINGS\ENVIRONMENTAL\2013.01857.EV.EXB.DWG



TYPICAL SPRING OR SEEP OUTLET
(FLOW <5 GPM)

NOT TO SCALE

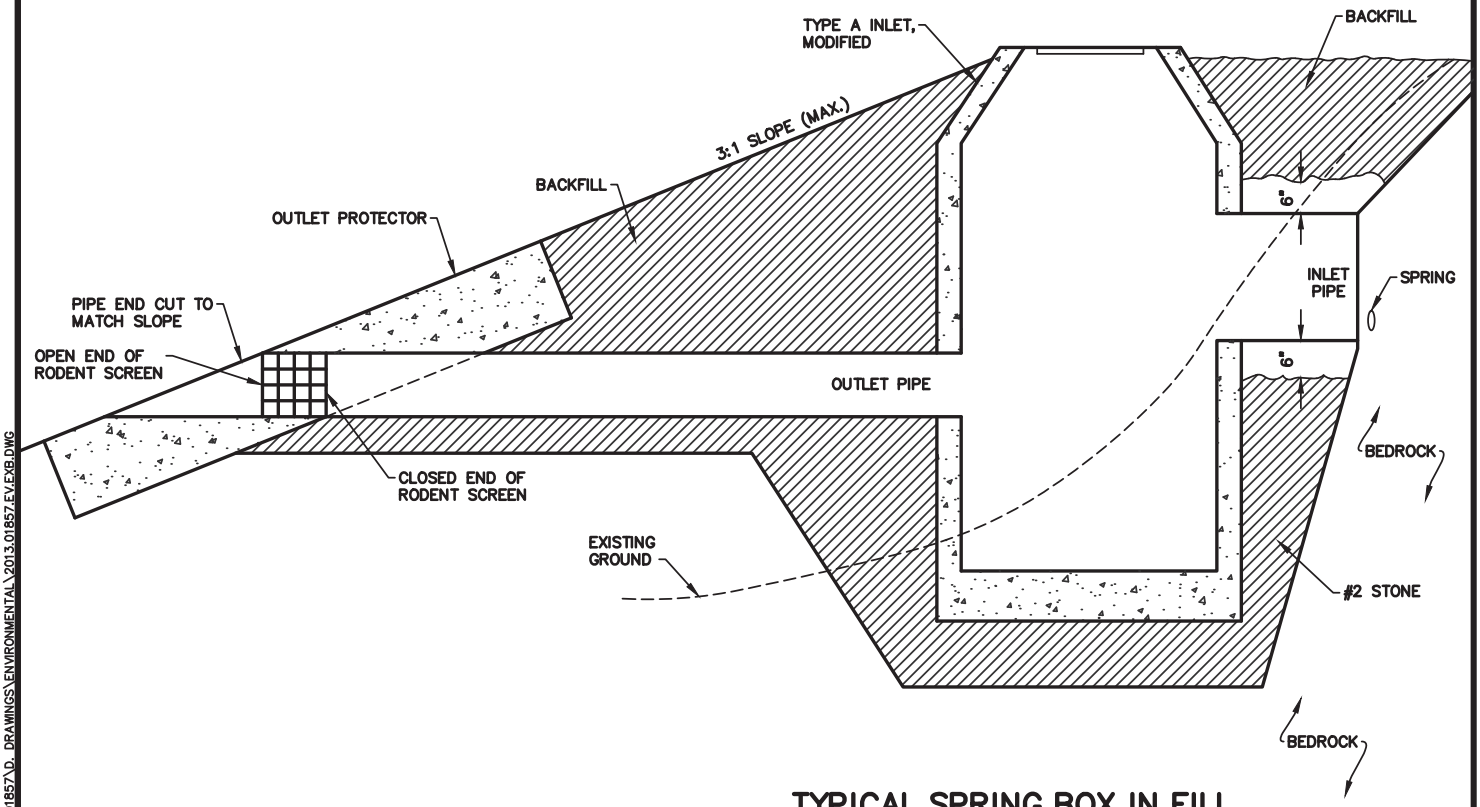
PLOT SCALE: 1:1 EDIT DATE: 8/9/13 – 2:42 PM EDITED BY: JGRIFFITH DRAWING FILE: P:\2013\01857\D. DRAWINGS\ENVIRONMENTAL\2013.01857.EV.EXB.DWG

AMERICAN STRUCTUREPOINT INC.

TYPICAL SPRING OR SEEP OUTLET (FLOW <5GPM)

INDIANA DEPARTMENT OF TRANSPORTATION
HEAVY HAUL ROUTE

DETAIL NO: 3



TYPICAL SPRING BOX IN FILL SECTION DITCH (FLOW >5 GPM)

NOT TO SCALE

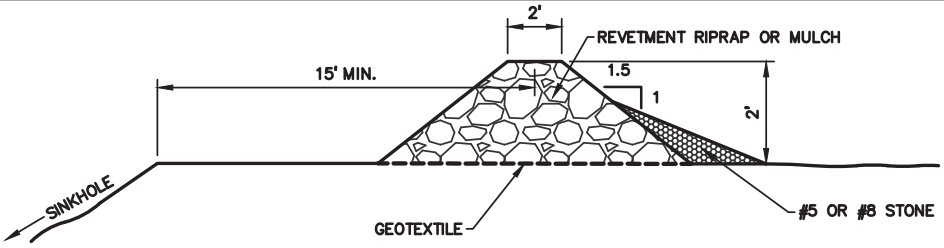
PLOT SCALE: 1:1 EDIT DATE: 8/9/13 – 2:42 PM EDITED BY: JGRIFFITH DRAWING FILE: P:\2013\01857\D. DRAWINGS\ENVIRONMENTAL\2013.01857.EV.EXB.DWG

AMERICAN STRUCTUREPOINT INC.

TYPICAL SPRING BOX FILL SECTION DITCH (FLOW >5 GPM)

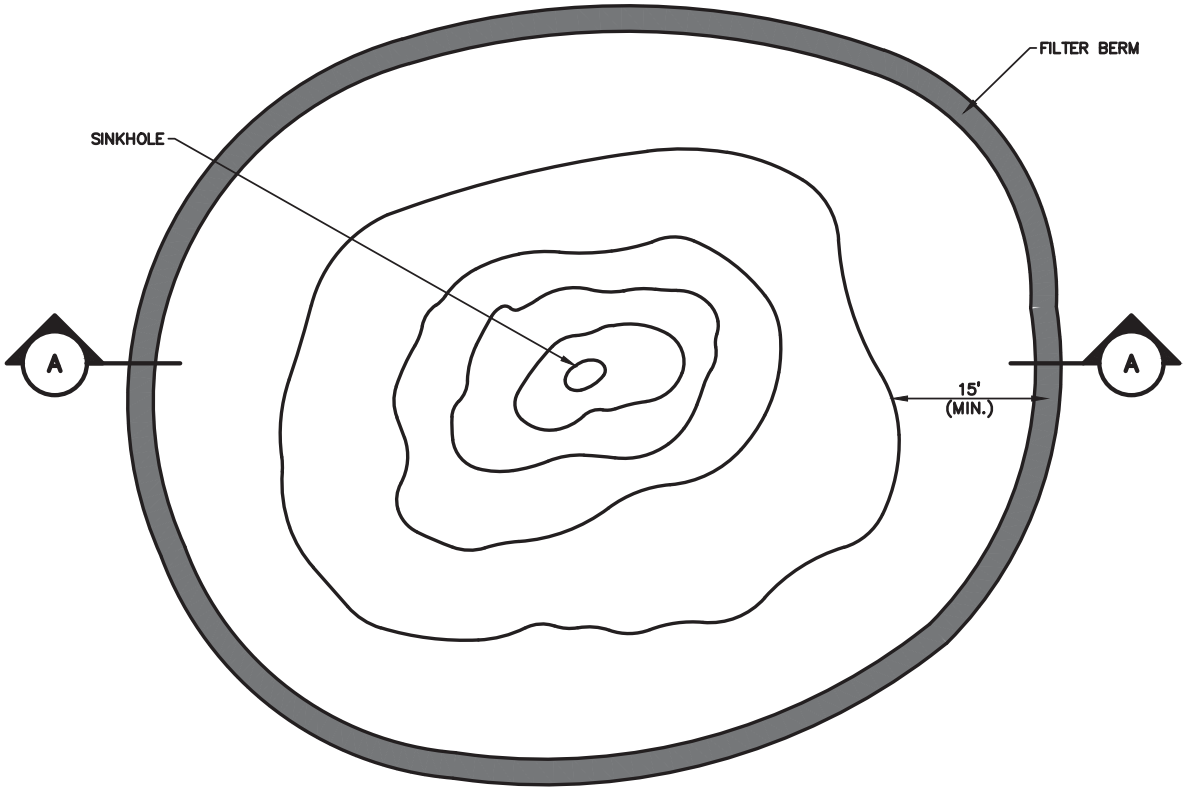
INDIANA DEPARTMENT OF TRANSPORTATION
HEAVY HAUL ROUTE

DETAIL NO: 4

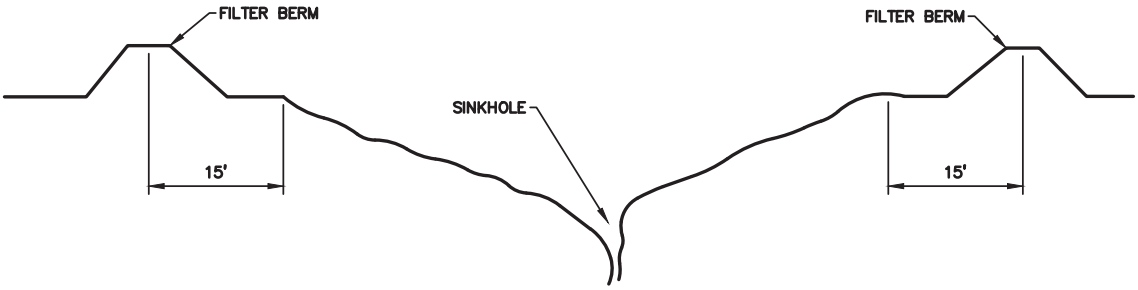


TYPICAL FILTER BERM SECTION

NOT TO SCALE



PLAN VIEW



SECTION A–A

TYPICAL FILTER BERM AT ADJACENT SINKHOLES

NOT TO SCALE

AMERICAN STRUCTUREPOINT INC.

TYPICAL FILTER BERM AT ADJACENT SINKHOLES

INDIANA DEPARTMENT OF TRANSPORTATION
HEAVY HAUL ROUTE

DETAIL NO:

5

PLOT SCALE: 1:1 EDIT DATE: 8/9/13 – 2:42 PM EDITED BY: JGRIFFITH DRAWING FILE: P:\2013\01857\D. DRAWINGS\ENVIRONMENTAL\2013.01857.EV.EXB.DWG

Appendix E – Indiana Karst Memorandum of Understanding (1993)

Karst Geology

Karst landscapes are usually formed on limestone from the surface and subsurface removal of rock mass by dissolution of calcite or dolomite. This forms irregularities on the land surface. Karst areas normally have caves that developed as a result of dissolution along joints, bedding planes, or other openings. As ground water dissolves subsurface limestone, cave systems enlarge and eventually the overburden causes roofs of caves to collapse creating, on the surface, a bowl shaped land feature called a **sinkhole.** Sinkholes are a direct conduit to ground water. Because the dissolution along the joints and bedding planes, ground water can travel extremely fast relative to ground water in other types of aquifers. Adsorption to aquifer material, biological uptake, and microbial activity are a few processes that reduce ground water pollution. However, in a karst region, ground water flows through joints and along bedding planes much like water flows through pipes in our homes. This fast flow rate does not allow adsorption, microbial activity, or uptake processes to remove pollution from the ground water before it is pumped from the ground by a landowner. **Nearly all spills that occur in karst areas have the potential to be lethal to the animals that live in the cave systems.** If a project is located near a sinkhole or other karst feature, the regulatory agencies will require control of the drainage such that the acute and chronic criteria for surface water quality criteria are not exceeded.

Karst features exist in an area of southern Indiana. This area ranges from 10-50 miles wide and stretches from Crawfordsville to the Ohio River (see attached map). Much attention has been given by INDOT in the planning, design, and construction of road projects in the karst area. There are, however, certain responsibilities assigned to construction activities. INDOT has entered into a **Memorandum of Understanding** (attached) with other agencies in an effort to minimize any deleterious effects of construction projects in the karst area and to regulate certain activities in these areas. Included in this Memorandum of Understanding is a commitment from INDOT, Indiana Department of Natural Resources, Indiana Department of Environmental Management, and the U.S. Fish and Wildlife Service to determine the location of sinkholes, caves, underground streams, and other related karst features and their relationship prior to determining the potential impacts of the proposed rehabilitations or construction.

Roadways typically have runoff such as salt and unknown spills that pollute soils near the road. In karst terrain, construction activities may cause soil releases to ground water via nearby sink holes. Excess silt introduced into a sink hole may seal a fissure system effectively removing means of draining the roadway. A wide range of toxic contaminants adhere to soils and may be liberated when soils are introduced into water. Contractors are required to have an erosion control plan, however, timely implementation of the plans are very important in the karst terrain. Maintenance of heavy machinery, such as oil changes, should be done in a designated area which should not be near the sinkhole. After adverse weather conditions, check erosion control measures for damage. The use of peat and other types of filters and wide grassy areas to catch and clean contaminants are some methods currently being used by INDOT to protect the groundwater. Likewise a project in a karst area might include the construction of

detention and/or retention basins. Regular inspections should be scheduled to ensure minimum and satisfactory compliance with the Memorandum of Understanding.

Clearing right-of-way, grading, excavation, tile drains, pesticide and herbicide treatment, and runoff from roadways are a few activities that may endanger the ground water quality in karst regions. It is important therefore, that you are aware of potential environmental impacts that could occur if construction activities were conducted in the usual manner. In addition to the possible lethal effects on wildlife, contamination of ground water used for drinking water could occur. Regular inspections should be scheduled to ensure minimum and satisfactory compliance with the Memorandum of Understanding, particularly erosion control features. Any sinkhole modification may result in the need for an EPA Injection Well Permit. The Division of Operations Support should be contacted in this event or to answer any questions concerning karst area activities.

MEMORANDUM OF UNDERSTANDING

This memorandum of understanding is made and entered into this thirteenth day of October: 1993 between the Indiana Department of Transportation, Indiana Department of Natural Resources, Indiana Department of Environmental Management and the U.S. Fish and Wildlife Service for the purpose of delineating guidelines for construction of transportation projects in karst regions of the state.

Whereas, Indiana Department of Transportation, Indiana Department of Natural Resources, Indiana Department of Environmental Management, and the U.S. Fish and Wildlife Service wish to cooperate in the identification, study and treatment of drainage in karst regions related to the construction of transportation projects and,

Whereas, Indiana Department of Transportation, Indiana Department of Natural Resources, Indiana Department of Environmental Management, and the U.S. Fish and Wildlife Service accept responsibility to ensure the transportation needs of Indiana are met in an environmentally sensitive manner that protects the habitat of all species and,

Whereas, design and constructions practices must protect ground water quality, public health and safety, and the environment.

Whereas, Indiana Department of Natural Resources will conform to the terms and conditions of this MOU on their transportation projects. Likewise, it will be Indiana Department of Natural Resource's responsibility to provide standard biological review for project in the karst region.

Therefore, in consideration of the terms and conditions set forth herein the Indiana Department of Transportation, Indiana Department of Natural Resources, Indiana Department of Environmental Management, and the U.S. Fish and Wildlife Service agree as follows:

1. Indiana Department of Transportation in cooperation with the Indiana Department of Natural Resources, Indiana Department of Environmental Management, and the U.S. Fish and Wildlife Service shall determine the location of sinkholes, caves, underground streams, and other related karst features and their relationship prior to proposed alterations or construction in karst regions of the state. A consultant with expertise in karst geology/hydrology may assist in the identification and characterization of the karst features. The choice of the consultant retained by Indiana Department of Transportation will be subject to the review of Indiana Department of Natural Resources, Indiana Department of Environmental Management, and the U.S. Fish and Wildlife Service.

2. Tasks to accomplish this work will include:

   Research available from public and private sources for information relative to karst features.

Field check karst and cave features that appear form the first task and identify and additional karst features.

Prepare a draft report, with photographs and maps, drainage areas, and land use of that drainage area for each sinkhole or karst feature, dye-tracing and/or other geotechnical information to determine subsurface flow of water in the project area and surface water drainage patterns of the area. Calculations of estimates of annual pollutant loads from the highway and drainage within the right-of-way will be made, including prior to, during and post construction estimates. The design of the treatment of the karst features will take into consideration treatments necessary to meet the standards of the monitoring and maintenance plan.

That report will be used as a tool to assist in determining the proposed highway alignment. The intent of Indiana Department of Transportation is t avoid karst areas and use alternate drainage where possible.

3. Indiana Department of Natural Resources, Indiana Department of Environmental Management, and the U.S. Fish and Wildlife Service will be requested to review and comment on the findings at the early coordination phase of project development.

4. Indiana Department of Transportation, using the input form Indiana Department of Natural Resources, Indiana Department of Environmental Management, and the U.S. Fish and Wildlife Service will begin to formulate appropriate measures to offset unavoidable impacts to the karst features. It is understood by all parties that some of the methods proposed at this time will be generic and could be applied throughout the length of the corridor. Other methods may be specific to a particular cave or karst feature. Some of the approaches may require additional investigations to determine their necessity and/or their feasibility. A revised draft report will be prepared by Indiana Department of Transportation's consultant and provided to the Indiana Department of Natural Resources, Indiana Department of Environmental Management, and the U.S. Fish and Wildlife Service as part of the design review process.

5. Drainage entering from beyond the right-of-way will be treated according to the same process as drainage generated by the project.

6. As the project progresses further into the design phase, the Indiana Department of Natural Resources, Indiana Department of Environmental Management, and the U.S. Fish and Wildlife Service will be invited and will attend field checks and meetings dealing with efforts to negate or minimize adverse impacts.

7. Hazardous materials traps (HMT's) will be constructed at storm water outfalls and other locations that will protect karst features from spill contamination.

8. Indiana Department of Transportation agrees to develop a monitoring and maintenance plan for the affected karst features. Indiana Department of Natural Resources, Indiana Department of Environmental Management and the U.S. Fish and

Wildlife Service will be provided an opportunity to review this plan. The establishment of water quality and a point at which a standard is established for remediation will be a part of each monitoring plan. The results of the monitoring will be submitted to Indiana Department of Natural Resources, Indiana Department of Environmental Management, and the U.S. Fish and Wildlife Service on a regular basis.

9. A low salt, and no spray strategy will be developed for each future project. A signing strategy for these items will also be developed for each project.

10. Prior to acceptance of the final design plans an agreement will be developed which will set out the appropriate and practicable measures to offset unavoidable impacts to karst features. This agreement will be signed by the department director of Indiana Department of Natural Resources. The commissioner of Indiana Department of Environmental Management, the commissioner of Indiana Department of Transportation and the supervisor of the U.S. Fish and Wildlife Service Bloomington Indiana field office. The agreement will become a part of the contract documents for the project, will be discussed at the pre-construction conference and will be on file at the office of the project administrator.

11. Indiana Department of Transportation will assure that the terms of the agreement will be completed with all safeguards given to the karst area. Special provisions, which are binding provisions that are a part of the contract, will be included outlining the precautions to be taken. Construction and design strategies for handling karst features will be discussed with the contractor(s) and project administrator during the pre-construction conference. Project administrator shall ensure that the contractor is following the new erosion control standards that meet rule 5 of 327 IAC 15 and any special precautions outlined in the design plans that the sinkhole treatment is being handled correctly. The erosion control plan must be available at the project administrator's office. An emergency response plan will be made a part of the contract documents. In addition, the contract documents will contain a strategy for signing to alert the public to the fact that all types of spills are potentially hazardous to the karst environment. For Indiana Department of Transportation, this plan would be procedure 20 of the Field Operations Manual dated 6/24/92 (attached).

12. The location and nature of the sinkholes and drainage schematic will be provided to the Indiana Department of Environmental Management. They will provide the information to the appropriate local authorities and the hazmat teams. An emergency response plan will be followed. This constitutes procedure 20. Included in this information is an understanding that all types of spills are potentially hazardous to karst regions.

13. Indiana Department of Natural Resources, Indiana Department of Environmental Management, and the U.S. Fish and Wildlife Service personnel will monitor construction and maintenance to the agreed upon terms, as deemed necessary.

14. If during construction it is found that the mitigation agreement must be altered, all of the agencies will be contacted and agreement reached prior to work continuing in that specific area of the project. In order to not unduly delay projects, a two working days response time is needed form the resource agencies.

15. Treatments will be maintained during construction by means of a visual inspection on a weekly basis or after every rain. Corrective action will be taken as needed.

16. If after the above procedure is followed and a state/federal endangered/threatened species is found during construction, work in that area of the project will stop. The Indiana Department of Natural Resources and the U.S. Fish and Wildlife Service will be immediately notified. The Indiana Department of Natural Resources and the U.S. Fish and Wildlife Service will promptly investigate the situation, advise the project administrator and assume responsibility for protecting the endangered species and taking the appropriate action.

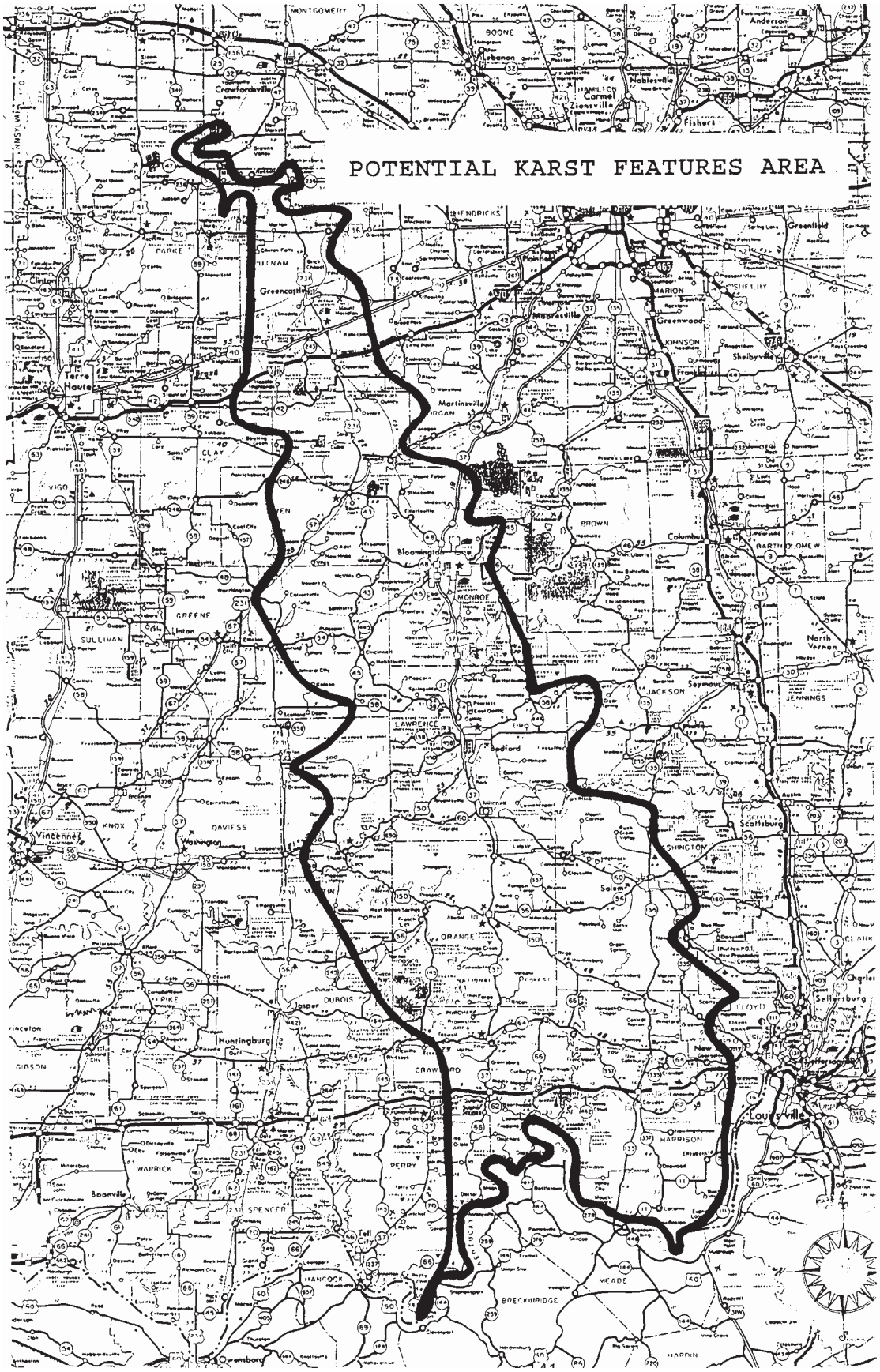
17. This document will be reviewed annually or more frequently at the request of any of the foregoing agencies.

MR. FREDERICK C. P POOL, COMMISSIONER
INDIANA DEPARTMENT OF TRANSPORTATION

MR. PATRICK R. RALSTON, DIRECTOR
INDIANA DEPARTMENT OF NATURAL RESOURCES

MS. KATHY PROSSER, COMMISSIONER
INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

MR. DAVID C HUDAK, FIELD SUPERVISOR, BLOOMINGTON FIELD OFFICE
U. S. FISH AND WILDLIFE SERVICE


POTENTIAL KARST FEATURES AREA
MONTGOMERY
BOONE
Lebanon
Anderson
Noblesville
Fishers
Zionsville
Carmel
Crawfordsville
HENDRICKS
Greenfield
Greencastle
Mooresville
MARION
Greenwood
JOHNSON
Shelbyville
Terre Haute
Brazil
Martinsville
CLAY
VIGO
BROWN
Columbus
Bloomington
MONROE
GREENE
Linton
SULLIVAN
North Vernon
JACKSON
Seymour
JENNINGS
LAWRENCE
Bedford
KNOX
DAVIESS
Vincennes
Washington
Scottsburg
SCHINGTON
Salem
ORANGE
PIKE
DUBOIS
Jasper
Huntingburg
GIBSON
CRAWFORD
Louisville
HARRISON
WARRICK
PERRY
Boonville
SPENCER
Tell City
HANCOCK
MEADE
BRECKINRIDGE
Owensboro

Appendix F: Public Involvement

- Notice of Survey – July 17, 2015 and February 22, 2017
- Public Information Meeting – January 28, 2015
- Public Information Meeting – April 5, 2017
- Community Advisory Committee Meeting – October 26, 2017

UNITED Consulting

ENGINEERING
ENVIRONMENTAL
INSPECTION
LAND SURVEYING
LAND ACQUISITION
PLANNING
WATER & WASTEWATER
SINCE 1965

OFFICERS
William E. Hall, PE
Dave Richter, PE, PLS
Steven W. Jones
Christopher R. Pope, PE
B. Keith Bryant, PE
Michael Rowe, PE

PROFESSIONAL STAFF
Andrew T. Wolka, PE
Devin L. Stettler, AICP
Darryl P. Wineinger, PE
Adam C. Post, PE
Michael S. Oliphant, AICP
E. Rachelle Pemberton, PE
Timothy J. Coomes, PLS
Jon E. Clodfelter, PE
Steven R. Passey, PE
Kurt C. Courtney, PE
Brian J. Pierson, PE
Christopher L. Hammond, PE
Paul D. Glotzbach, PE
Brian S. Frederick, PE
Jay N. Ridens, PE
Christopher J. Dyer, PE
Matthew R. Lee, PE
Christopher J. Wheeler, PE
William R. Curtis, PE
Jeromy A. Richardson, PE
Heather E. Kilgour, PE
Adam J. Greulich, PLS
Scott M. Siple, PE
Whitney D. Neukam, PE
Matthew A. Taylor, PE
Josh O. Betz, PLS
Dann C. Barrett, PE
Scott G. Minnich, PE
Jack R. Stocks, PE
Nicholas J. Kocher, PE
Jennifer L. Hart, PE
Jeffrey R. Andrews, PE
Kelton S. Cunningham, PE

1625 N. Post Road, Indianapolis, IN 46219 (317) 895-2585 www.ucindy.com

July 17, 2015

Notice of Survey Letter

RE: Notice of Survey
Heavy Haul Route
Des. No. 1382612
Clark County, Indiana

Dear Property Owner,

County records indicate that you own or occupy property near the subject highway project. We have been retained by the Indiana Department of Transportation for this project and our employees will be performing a field survey of the project area in the near future. It may be necessary for them to come onto your property to complete the work. This is permitted by law under Indiana Code IC 8-23-7-26. They will show you their identification, if you are available, before coming onto your property. If you have sold this property, or it is occupied by someone else, please let us know the name and address of the new owner or current occupant so we can contact them about the survey.

At this state we generally do not know what effect, if any, the project may eventually have on your property. If it is determined later that your property is involved, you will be contacted with additional information.

This survey work will include mapping the location of such features as trees, buildings, fences, drives, obtaining ground elevations, and evaluation of land use for completion of environmental documentation. The survey is needed for the proper planning and design of this highway project. Please be assured of our sincere desire to cause you as little inconvenience as possible during this survey. If any problems do occur, please contact the undersigned, or the project manager, Matt Taylor, at the phone number or address shown to the left.

Sincerely,

UNITED CONSULTING

Tim Coomes, PLS
Manager, Survey Dept.

C: file (14-402)

February 4, 2014 Notice of Survey Mailing List

Name	Address	City	State	Zip
State of Indiana	150 W. Market St., Ste. 603	Indianapolis	IN	46204
Jeffersonville Redevelopment Authority	501 court Ave. East	Jeffersonville	IN	47130
PGP Corp	701 Loop Rd.	Jeffersonville	IN	47130
State of Indiana c/o American Commercial	5146 Loop Rd.	Jeffersonville	IN	47130
Clark W. Nickles	1501 Tunnel Mill Rd.	Charlestown	IN	47111
PGP Corp.	7925 Beech Daly Rd.	Taylor	MI	48180
Crown Jewel Investments, LLC	617 Brown Forman Rd.	Jeffersonville	IN	47130
Roll Forming Corp	P.O. Box 369 Industrial Park	Shelbyville	KY	40066
State of Indiana c/o Gateway Galvanizing, Inc.	1117 Brown Forman Rd.	Jeffersonville	IN	47130
Griffin Powell Properties, LLC	5171 Maritime Dr.	Jeffersonville	IN	47130
R K Properties	7393 Pete Andres Rd.	Floyds Knobs	IN	47119
JPMC, LLC	4750 New Middle Rd.	Jeffersonville	IN	47130
Koetter Development, Inc.	7393 Pete Andres Rd.	Floyds Knobs	IN	47119
Coldwater Veneer Investments LLC	548 Race St.	Coldwater	MI	49036
Jeffery A. & Rebecca J. Corbett	2709 Blackiston Mill Rd.	Clarksville	IN	47129
Donald L. & N. Vivian Smith	1622 Utica-Sellersburg Rd.	Jeffersonville	IN	47130
Floyd L. & Donna M. Kittrell	1702 Utica-Sellersburg Rd.	Jeffersonville	IN	47130
Daniel R. & Cheri Lea Keller	1706 Utica-Sellersburg Rd.	Jeffersonville	IN	47130
Garland G. & Paulette Oakes	1808 Utica-Sellersburg Rd.	Jeffersonville	IN	47130
Steven M. & Bonita E. Willman	1720 Utica-Sellersburg Rd.	Jeffersonville	IN	47130
John E. & Sandra M. Clark, Jr.	1722 Utica-Sellersburg Rd.	Jeffersonville	IN	47130
Gary & Melinda Romans	1726 Utica-Sellersburg Rd.	Jeffersonville	IN	47130
Stephen M. & Anne Starck	1804 Utica-Sellersburg Rd.	Jeffersonville	IN	47130
Arthur W. & Virginia Sutton, Jr., Trustees	2458 N. Mariposa St.	Pomona	CA	91767
Greater Clark County School	2112 Utica-Sellersburg Rd.	Jeffersonville	IN	47130
Roger L. & Annette L. Clipp	2114 Utica-Sellersburg Rd	Jeffersonville	IN	47130
Thomas E. Trich, Jr. & Melinda Anderson	2118 Utica-Sellersburg Rd.	Jeffersonville	IN	47130
Gilmore Construction, Inc.	900 Lighthouse Dr.	Jeffersonville	IN	47130
Thomas L. Stillwell	8010 Weyanoke Ct.	Prospect	KY	40059
Charles John Raven II	1415 Old Salem Rd.	Utica	IN	47130
David Ray & Phyllis James	1318 Old Salem Rd.	Jeffersonville	IN	47130
Joe & Peggy Nealy	1508 Salem Rd.	Jeffersonville	IN	47130
Lee Allen & Darrell Lee James	1510 Old Salem Rd.	Jeffersonville	IN	47130
T.J. Mark, LLC	926 Baxter Ave.	Louisville	KY	40204
John E. & Demetria D. Frazier	3014 Old Cypress Trail	Jeffersonville	IN	47130

May 27, 2014 - Survey Notice List

Name	Address	City	State	Zip
Amanda & Luke Huffman	1622 Utica Sellersburg Rd.	Jeffersonville	IN	47130
Brian & Debra Hill	1616 Utica Sellersburg Rd.	Jeffersonville	IN	47130
William & Deborah Wanke	1513 Fox Den Dr.	Jeffersonville	IN	47130
Douglas Womack	1610 Utica Sellersburg Rd.	Jeffersonville	IN	47130
John & Cheryl Skinner	1608 Utica Sellersburg Rd.	Jeffersonville	IN	47130
Stephen & Julie Byers	1515 Glenbrook Park Rd.	Jeffersonville	IN	47130
Douglas & Tammy Sneed	1519 Glenbrook Park Rd.	Jeffersonville	IN	47130
Cheryl VanHorn	1520 Glenbrook Park Rd.	Jeffersonville	IN	47130
Donnie & Amanda Edlin	1516 Glenbrook Park Rd.	Jeffersonville	IN	47130
Barbara Roy	Barbaros Bay PO Box 1271	Jeffersonville	IN	47130
Henry & Barbara William	1320 Utica Sellersburg Rd.	Jeffersonville	IN	47130
Scott & Rhonda Baldwin	1318 Utica Sellersburg Rd.	Jeffersonville	IN	47130
William & Deborah Wanke	1513 Fox Den Dr.	Jeffersonville	IN	47130
David & Lori Lewis	1507 Fox Run Trail	Jeffersonville	IN	47130
William & Deborah Wanke	1513 Fox Run Trail	Jeffersonville	IN	47130
William & Davis Templeton	1509 Fox Trail	Jeffersonville	IN	47130
Holloway & Sons	13115 Aiken Rd.	Louisville	KY	40223
James & Pamela Buss	1701 Fox Hollow Way	Jeffersonville	IN	47130
Larry Hazuga	1800 Fox Hollow Way	Jeffersonville	IN	47130
Scott & Rosemary Slaughter	1707 Fox Hollow Way	Jeffersonville	IN	47130

July 17, 2015 - Notice Survey Mailing List

Name	Address	City	State	Zip
R K Properties	7393 Pete Andres Rd.	Floyds Knobs	IN	47119
State of Indiana c/o Gateway Galvanizing, Inc.	1117 Brown Forman Rd.	Jeffersonville	IN	47130
Koetter Development, Inc.	7393 Pete Andres Rd.	Floyds Knobs	IN	47119
John E. & Sandra M. Clark, Jr.	1722 Utica-Sellersburg Rd.	Jeffersonville	IN	47130
Gilmore Construction, Inc.	900 Lighthouse Dr.	Jeffersonville	IN	47130
Larry Hazuga	1800 Fox Hollow Way	Jeffersonville	IN	47130

WEINTRAUT & ASSOCIATES, INC.

RE: Des. No. 1382612, Clark County Transportation Corridor

Notice of Entry for Survey or Investigation
February 22, 2017

Dear Property Owner,

Our information indicates that you own property near the above proposed transportation project. Representatives of the Indiana Department of Transportation will be conducting environmental surveys of the project area in the near future. It may be necessary for them to enter onto your property to complete this work. This is permitted under Indiana Code § 8-23-7-26. Anyone performing this type of work has been instructed to identify him or herself to you, if you are available, before they enter your property. If you no longer own this property or it is currently occupied by someone else, please let us know the name of the new owner or occupant so that we can contact them about the survey.

Please read the attached notice to inform you of what the "Notice of Entry for Survey or Investigation" means. The survey work may include the identification and mapping of wetlands, archaeological investigations (which may involve the survey, testing, or excavation of identified archaeological sites), and various other environmental studies. The information we obtain from such studies is necessary for the proper planning and design of this highway project. It is our sincere desire to cause you as little inconvenience as possible during this survey.

If any problems do occur, please contact INDOT representative Matt Taylor of United Consulting at 317-895-2585 or mattt@ucindy.com. You may also call or write to the INDOT Archaeological Team Lead Shaun Miller at 317-233-6795 or smiller@indot.gov. His address is: Indiana Department of Transportation, Indiana Government Center North, Room 642, 100 North Senate Avenue, Indianapolis, IN, 46204.

Please be aware that Indiana Code § 8-23-7-27 and 28 provides that you may seek compensation from INDOT for damages occurring to your property (land or water) that result from INDOT's entry for the purposes mentioned above in Indiana Code § 8-23-7-26. In this case, a basic procedure that may be followed is for you and/or an INDOT employee or representative to present an account of the damages to one of the two above named contacts. They will check the information and forward it to the appropriate person at INDOT who will contact you to discuss the situation and compensation.

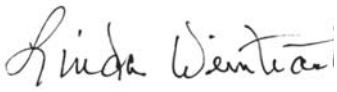
In addition, you may contact Nicole Curry, the Seymour District Real Estate and Right-of-Way Manager (DREM) at 812-524-3970. Her address is: Indiana Department of Transportation, Seymour District, 185 Agrico Lane, Seymour, Indiana 47274. The DREM can provide you with a form to request compensation for damages. After filling out the form, you can return it to the DREM for consideration, and the DREM may be contacted if you have questions regarding the matter, rights, and procedures.

If you are not satisfied with the compensation that INDOT determines is owed you, Indiana Code § 8-23-7-8 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 the 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.

It our sincere desire to cause as little inconvenience as possible during our work, and we thank you in advance for your cooperation.

Sincerely,



Linda Weintraut, Ph.D.
Weintraut & Associates
PO Box 5034
Zionsville, Indiana
(317) 733-9770

January 28, 2015 Public Information meeting materials

From: Indiana Department of Transportation
To: Nichols, Angela L
Subject: Open House Scheduled Jan. 28 for New Road from Jeff Port to S.R. 265
Date: Friday, January 15, 2016 3:46:24 PM

Indiana Department of Transportation News Release

Open House Scheduled Jan. 28 for New Road from Jeff Port to S.R. 265

The public is invited to attend an open house on Thursday, Jan. 28, to learn preliminary information about a proposed new road, known locally as Segment A of the Heavy-Haul Route, which would connect the Ports of Indiana-Jeffersonville with the future State Road 265 exit at Old Salem Road.

The open house will be held from 6:30 p.m. to 8 p.m. at Utica Elementary School, located at 210 Maplehurst Drive in Jeffersonville, just off Utica Sellersburg Road near the Greater Clark County Schools Administration Building. Project maps and other information will be on display. The public is invited to share comments and questions with project-team members during the informal open house before and after a presentation that begins at 7 p.m.

About the project

The Indiana Economic Development Corporation, the Ports of Indiana, the Kentuckiana Regional Planning and Development Agency, Clark County, the City of Jeffersonville Redevelopment Commission and the River Ridge Development Authority are partnering with the Indiana Department of Transportation to develop the federally funded project. The need for the proposed project is to address rapid industrial and commercial growth in the area that will increase heavy-haul vehicles mixing with local traffic.

Federal law requires review and documentation of the project's potential impacts. The ongoing impact review has identified an approximately 1.3-mile-wide study area in which route alternatives are being assessed.

Other nearby projects

The Thursday, Jan. 28, open house will only discuss the proposed new road connecting the Ports of Indiana-Jeffersonville with State Road 265, known locally as Segment A of the Heavy-Haul Route.

There are two separate projects that connect with the future State Road 265 exit at Old Salem Road. State, local and private organizations broke ground in October on Segment B of the Heavy-Haul Route between State Road 265 and the River Ridge Commerce Center.

In addition, Clark County is developing a project with INDOT to improve Old Salem Road from N. 6th Street in Utica to State Road 265.

View this message on the web

Customer Service:
Angela Nichols
1030 Spring Street
Jeffersonville, IN 47130
812-920-0586
anichols@indot.in.gov

Media Contact:
Will Wingfield
317-233-4675
wwingfield@indot.in.gov

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From: Indiana Department of Transportation
To: Nichols, Angela L
Subject: Reminder: Open House Scheduled Jan. 28 for New Road from Jeff Port to S.R. 265
Date: Monday, January 25, 2016 9:32:08 AM

Indiana Department of Transportation News Release

Reminder: Open House Scheduled Jan. 28 for New Road from Jeff Port to S.R. 265

The public is invited to attend an open house on Thursday, Jan. 28, to learn preliminary information about a proposed new road, known locally as Segment A of the Heavy-Haul Transportation Corridor, which would connect the Ports of Indiana-Jeffersonville with the future State Road 265 exit at Old Salem Road.

The open house will be held from 6:30 p.m. to 8 p.m. at Utica Elementary School, located at 210 Maplehurst Drive in Jeffersonville, just off Utica Sellersburg Road near the Greater Clark County Schools Administration Building. Project maps and other information will be on display. The public is invited to share comments and questions with project-team members during the informal open house before and after a presentation that begins at 7 p.m.

About the project

The Indiana Economic Development Corporation, the Ports of Indiana, the Kentuckiana Regional Planning and Development Agency, Clark County, the City of Jeffersonville Redevelopment Commission and the River Ridge Development Authority are partnering with the Indiana Department of Transportation to develop the federally funded project. The need for the proposed project is to address rapid industrial and commercial growth in the area that will increase heavy-haul vehicles mixing with local traffic.

Federal law requires review and documentation of the project's potential impacts. The ongoing impact review has identified an approximately 1.3-mile-wide study area in which route alternatives are being assessed.

Other nearby projects

The Thursday, Jan. 28, open house will only discuss the proposed new road connecting the Ports of Indiana-Jeffersonville with State Road 265, known locally as Segment A of the Heavy-Haul Route.

There are two separate projects that connect with the future State Road 265 exit at Old Salem Road. State, local and private organizations broke ground in October on Segment B of the Heavy-Haul Route between State Road 265 and the River Ridge Commerce Center.

In addition, Clark County is developing a project with INDOT to improve Old Salem Road from N. 6th Street in Utica to State Road 265.

View this message on the web

Customer Service:
Angela Nichols
1030 Spring Street
Jeffersonville, IN 47130
812-920-0586
anichols@indot.in.gov

Media Contact:
Will Wingfield
317-233-4675
wwingfield@indot.in.gov

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SIGN-IN SHEET	PLEASE PRINT	DATE: 2016-01-28

HEAVY HAUL TRANSPORTATION CORRIDOR (SEGMENT A)
PUBLIC MEETING

Before including your address, phone number, e-mail address, or other personal identifying information on the meeting Sign-In Sheet or on your comment submittal, be advised that your comment ~ including your personal identifying information ~ may be made publicly available at any time. While you can ask us to withhold personal identifying information from public review, we cannot guarantee that we will be able to do so.

NAME	ADDRESS	EMAIL-OPTIONAL
Kim Harbin	105 N 6th Street	kimray56@hotmail.com
Joanna Peyron	3110 New Chapel	jkpeyron@hotmail.com
Tom Trich	2118 Utica Sellersburg	tounthedutchman1@live.com
Melinda Anderson	2118 Utica-Sellersburg Rd	minanderson@sbcglobal.net
Scott Stewart	1302 Pont Road, Jeff	sstewart@pontsofindiana.com
Stuart May	179 W. 150 E, Washington, IN 47501	Stuartm@ucindy.com
Donna Kittrell	1702 Utica S'Burg Rd.	
Garland G. Ocker III	1808 Utica Sellersburg Rd.	
Daniel Keller	1706 Utica-Sellersburg Rd.	CheriKeller77@yahoo.com

www.in.gov/indot

SIGN-IN SHEET	PLEASE PRINT	DATE: 2016-01-28

HEAVY HAUL TRANSPORTATION CORRIDOR (SEGMENT A)
PUBLIC MEETING

Before including your address, phone number, e-mail address, or other personal identifying information on the meeting Sign-In Sheet or on your comment submittal, be advised that your comment ~ including your personal identifying information ~ may be made publicly available at any time. While you can ask us to withhold personal identifying information from public review, we cannot guarantee that we will be able to do so.

NAME	ADDRESS	EMAIL-OPTIONAL
RANDY WARMAN	7260 SHADELAND STN	rwarman@structurepoint.com
Marc Hildenbrand	10200 E Hwy 62	marc@riverridgecc.com
Bob Stein		
RICK STEPHENSON	3615 ALYN CT 47130	RickyWStephenson@YAHOO.COM
Tanya D Stephenson	3615 Alyn Ct 4730	tanya.diane@gmail.com
JYM HORTON	5515 CORYDON RIDGEDALE	
MICHELLE HORTON	" " "	
BRIAN LENFERT	655 PARKWOOD CLARKSVILLE	
Bill + Debbie Wanke	1513 Foxden Dr Jeff	

www.in.gov/indot

SIGN-IN SHEET	PLEASE PRINT	DATE: 2016-01-28

HEAVY HAUL TRANSPORTATION CORRIDOR (SEGMENT A)
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NAME	ADDRESS	EMAIL-OPTIONAL
JIMMY CARTER	115 54th UTICA	
Jim Buss	1701 Fox Hollow	BUSSMAN1701@GMAIL.COM
BONITA STEWE WILLMAN	1720 Utica Sellersburg	bw.bluedog@gmail.com
STEPHEN M. STARCK	1804 UTICA-SELLERSBURG	STEPHEN STARCK @ GMAIL
Josh Culver	1260 Shadeland Stn Indianapolis, IN	jculver@structurepoint.com
John W Shoan	5312 Chateau Court Jeff'v.	Jshean@twc.com
DENNIS HILL	5753 LANTZIER JEFF	DMHDHERITAGELINES LLC.COM
Elizabeth Beilman	News & Tribune	elizabeth.beilman@newsandtribune.com
Rick Marquis		rick.marquis@dot.gov
Mohammad Hajeer		Mohammad.Hajeer@dot.gov

www.in.gov/indot

SIGN-IN SHEET	PLEASE PRINT	DATE: 2016-01-28

HEAVY HAUL TRANSPORTATION CORRIDOR (SEGMENT A)
PUBLIC MEETING

Before including your address, phone number, e-mail address, or other personal identifying information on the meeting Sign-In Sheet or on your comment submittal, be advised that your comment ~ including your personal identifying information ~ may be made publicly available at any time. While you can ask us to withhold personal identifying information from public review, we cannot guarantee that we will be able to do so.

NAME	ADDRESS	EMAIL-OPTIONAL
Rob Waiz	3313 Lakewood Blvd	
Kevin Wilkerson	221 Webster Blvd	
Leon Noel	711 Old Salem Rd.	
Ed Green		ed@C2Strategic.com
Janet Hill	1011 Utica Charlestown Rd	
Matt Owen	909 Capitol Hills Dr. Jeff	mowen@cityofjeff.net
Doug Sneed	1519 Glenbrook Pk.	

www.in.gov/indot

January 28, 2016

Heavy Haul Transportation Corridor – Segment A

The Heavy Haul Transportation Corridor is a set of projects that will connect the River Ridge Commerce Center with the Port of Indiana-Jeffersonville through the new SR 265/Old Salem Rd interchange being constructed as part of the Ohio River Bridges East End Crossing Project.

These projects, which total $30.4 million, are being facilitated by the Indiana Department of Transportation (INDOT). They will be funded through a partnership of the Federal Highway Administration (FHWA), INDOT, River Ridge Development Authority (RRDA), Ports of Indiana (POI), Clark County and the City of Jeffersonville. United Consulting and American Structurepoint are acting on behalf of the parties to plan and design these three projects, each on an independent schedule and each with its own function.

Segment A - between SR 265 and Port of Indiana-Jeffersonville

This project will connect the POI to the SR 265 interchange at Old Salem Road. A timeline for this project has not been finalized. An Environmental Assessment (EA) for Segment A is in progress and is expected to be completed in early 2017. Right-of-way acquisition will follow during 2017 and 2018 and the construction contract should be let in spring of 2019.
Project Budget - $18,600,000

Other Segments of the Heavy Haul Transportation Corridor

Segment B - from SR 265 through River Ridge Commerce Center to SR 62

This project will be designed and constructed without any Federal funds. The project was advertised for bids on Aug. 18, 2015, by RRDA and is scheduled to open to traffic by end of 2016 to coincide with the scheduled opening of the new East End Bridge across the Ohio River, connecting Utica in Southern Indiana to Prospect, Kentucky.
Project Budget - $10,500,000

Segment C - New rail corridor between POI and RRDA

This project will acquire the separate right-of-way for a new rail connection between River Ridge and the Port that will be designed and constructed at a later date under a separate project. Ultimately, this project will enable the Port to handle more freight capacity and transfer bulk products more efficiently from trucks and rail to barges.
Project Budget - $1,300,000

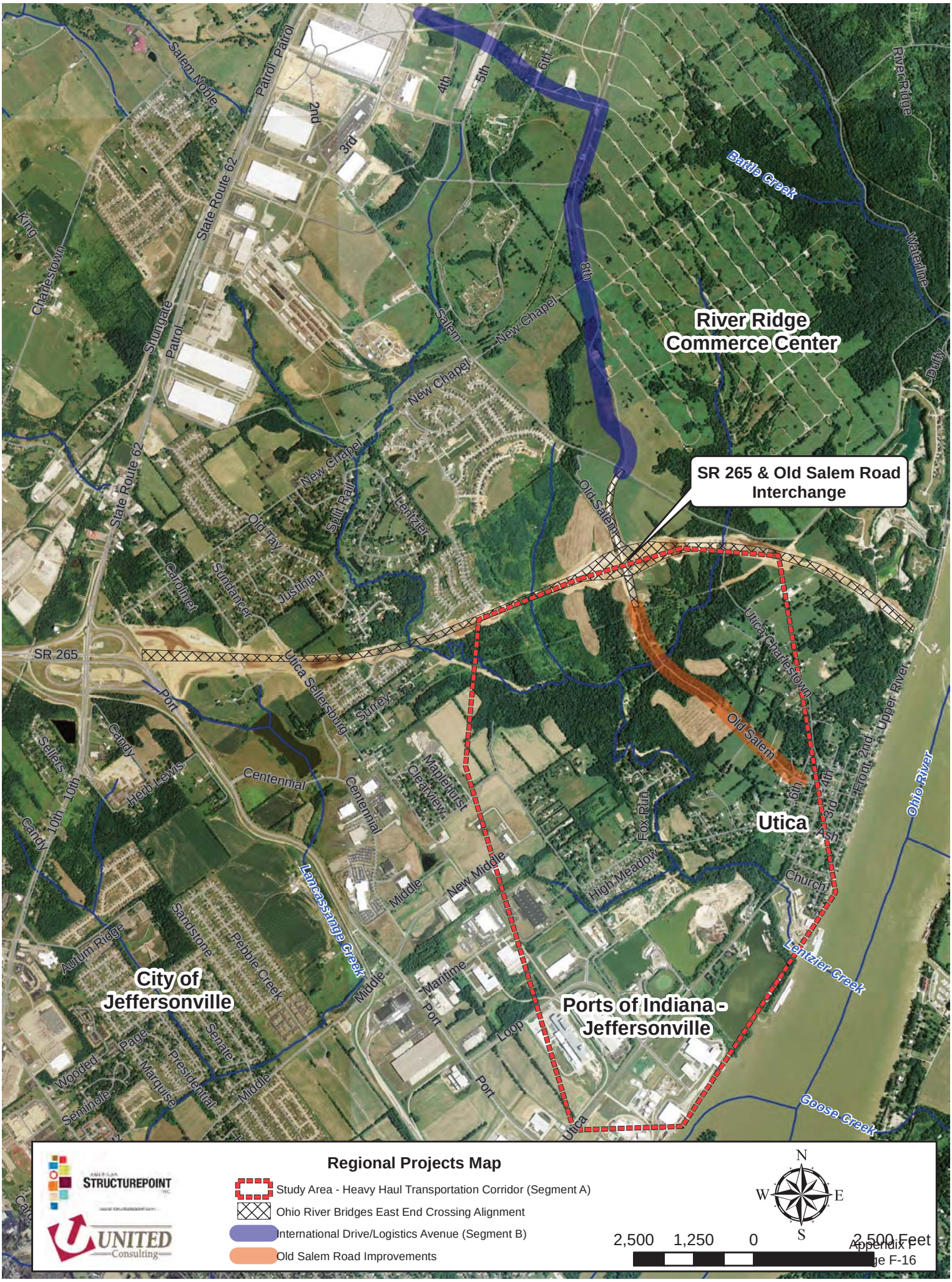
Other Regionally Significant Projects

Old Salem Road Improvement

Separate from the three Heavy Haul Transportation Corridor projects, the Old Salem Road improvement project will improve the existing roadway to two 11 foot lanes with shoulders and improved drainage from SR 265 to 6th Street in Utica. The northern end near SR 265 will intersect with Segment A of the Heavy Haul Transportation Corridor. The proposed letting date is August 2016. Right-of-way acquisition is currently underway. HNTB is acting as the consultant for INDOT for planning and design of the project.
Project Budget - $3,700,000

Ohio River Bridges East End Crossing

As part of the Louisville-Southern Indiana Ohio River Bridges Project, the East End Crossing will construct a new connection between SR 265 in Indiana and I-71 in Kentucky, improving cross-river mobility, safety, and alleviating traffic congestion. The project started construction in 2013 and is scheduled to be open to traffic in late 2016.
Project Budget - $1,050,000,000



Regional Projects Map

- Study Area - Heavy Haul Transportation Corridor (Segment A)
- Ohio River Bridges East End Crossing Alignment
- International Drive/Logistics Avenue (Segment B)
- Old Salem Road Improvements

N W E S

2,500 1,250 0 2,500 Feet

Heavy Haul Transportation Corridor – Segment A Open House

Ron Heustis, PE
Project Manager, INDOT

January 28, 2016

Heavy Haul Transportation Corridor – Segment A

- **Project Team**
  - Indiana Department of Transportation
  - Federal Highway Administration
  - City of Jeffersonville
  - Clark County
  - Indiana Economic Development Corporation
  - Ports of Indiana
  - River Ridge Development Authority
  - United Consulting
  - American Structurepoint

Heavy Haul Transportation Corridor – Segment A

- **Meeting Agenda**
  - Public Information Meeting
  - Proposed Purpose and Need
  - Project Area/Description
  - Proposed Project Schedule
  - Environmental Process
  - Open House

Heavy Haul Transportation Corridor – Segment A

Heavy Haul Transportation Corridor – Segment A

- **Proposed Purpose and Need**
  - Provide a continuous heavy haul vehicle route that completes a continuous connection between the RRCC and the Port via the new SR 265 / Old Salem Road interchange
  - Improve System Linkage
  - Provide Infrastructure Designed to Heavy Haul Standards

Heavy Haul Transportation Corridor – Segment A

- **Major Traffic Generators**
  - The Port of Indiana – Jeffersonville
  - River Ridge Commerce Center
  - City of Jeffersonville
  - East End Crossing Bridge

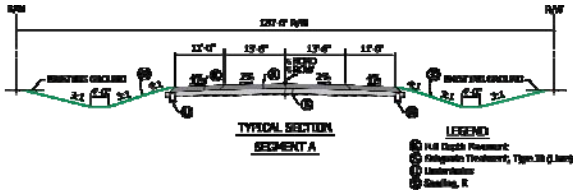
Heavy Haul Transportation Corridor – Segment A

- **Existing Infrastructure**
  - Port Road
  - Old Salem Road
  - International Drive / Logistics Avenue (Transportation Corridor Segment B)
  - Middle Road / New Middle Road
  - Utica Pike
  - SR 62 / 10th Street
  - SR 265 / East End Crossing

Heavy Haul Transportation Corridor – Segment A

- **Project Description**
  - Proposed Project Plans:
    - New two lane roadway
    - New bridge over Lentzier Creek
    - Designed to Heavy Haul Standards
      - Maximum vehicle weight of 134,000 lbs
    - 35 mph Speed Limit

Heavy Haul Transportation Corridor – Segment A



Heavy Haul Transportation Corridor – Segment A

- **Funding:**
  - Segment A is $18.6 Million
    - Includes Federal funds
  - Segment B is $10.5 Million
    - Does not include Federal funds
  - Segment C is $1.3 Million
    - Does not include Federal funds
- **Total Cost - $30.4 Million**

Heavy Haul Transportation Corridor – Segment A

- **Proposed Project Schedule**
  - Environmental
    - Started in 2nd Quarter of 2014 and continues to 1st Quarter of 2017
  - Design
    - Started in 1st Quarter of 2016 and continues to 2nd Quarter of 2019

Project Schedule may be adjusted due to environmental, land acquisition or other circumstances

Heavy Haul Transportation Corridor – Segment A

- **Proposed Project Schedule (cont'd)**
  - Right-of-Way Acquisition
    - Starts in 2nd Quarter of 2017 and continues to 2nd Quarter of 2019
  - Construction
    - Starts in 2nd Quarter of 2019 and continues into the 4th Quarter of 2020.

Project Schedule may be adjusted due to environmental, land acquisition or other circumstances

Heavy Haul Transportation Corridor – Segment A

Regional Projects Proposed Timeline

Project	Phase	Budget	2016 1st Qtr	2016 2nd Qtr	2016 3rd Qtr	2016 4th Qtr	2017 1st Qtr	2017 2nd Qtr	2017 3rd Qtr	2017 4th Qtr	2018 1st Qtr	2018 2nd Qtr	2018 3rd Qtr	2018 4th Qtr	2019 1st Qtr	2019 2nd Qtr	2019 3rd Qtr	2019 4th Qtr	2020 1st Qtr	2020 2nd Qtr	2020 3rd Qtr	2020 4th Qtr
Transportation Corridor Segment A	**Environmental**	**$ 18.6M**																				
	Design																					
	Land Acquisition																					
	Construction																					
Transportation Corridor Segment B	Design	$ 10.5M													complete							
	Land Acquisition														complete							
	Construction																					
Transportation Corridor Segment C	Design	$ 1.3M																				
	Land Acquisition																					
	Construction																					
Ohio River Bridges East End Crossing	Design	$ 1.05B													complete							
	Land Acquisition														complete							
	Construction																					
Old Salem Road	Design	$ 3.7M																				
	Land Acquisition																					
	Construction																					

Heavy Haul Transportation Corridor – Segment A

- **National Environmental Policy Act (NEPA)**
  - Perform investigation of potential impacts to natural and human environment
    - Waterways, wetlands, endangered species, etc.
    - Historical properties
    - Social and economic factors
  - Environmental document (Environmental Assessment)
    - Prepared in accordance with state and federal guidelines
    - Evaluates impacts of proposed project
  - Establishes the purpose and need for the improvements
  - Evaluates a number of possible alternatives, including a "do nothing"

Heavy Haul Transportation Corridor – Segment A

- **NEPA Status**
  - Gather Information
    - Coordination with Local, State, and Federal agencies
    - Ecological Resources
    - Karst Features
    - Section 106 (Cultural Resources)
    - Community Involvement

Heavy Haul Transportation Corridor – Segment A

- **Ecological Resources Status**
  - Field work for Wetland Delineation and Waters Investigation Completed
    - Multiple wetland areas delineated
    - Lentzier Creek and multiple unnamed tributaries identified

Heavy Haul Transportation Corridor – Segment A

- **Karst Features Status**
  - Project located within a known sinkhole area
  - Previous studies indicated several small caves (<1 mile long) and sinkholes
  - Initial field studies conducted in spring 2014 identified:
    - 13 Springs
    - 4 Sinkholes
  - Additional field investigations are on going

Heavy Haul Transportation Corridor – Segment A

- **Section 106 Status**
  - Archaeological
    - Aware of culturally sensitive resources within the study area
  - Historic Properties Report
    - Field investigations are on going
  - Next Steps
    - Determination of Effect Finding

Heavy Haul Transportation Corridor – Segment A

- **Community Involvement Status**
  - Public Information Meetings
  - Citizens Advisory Committee (CAC)
    - Group of individuals serving as representatives of their local community acting as liaisons
    - Play important advisory role in developing a project that might better "fit" into their community
    - *INDOT and FHWA maintain final authority and responsibility for decision–making*

Heavy Haul Transportation Corridor – Segment A

Feel free to view visuals and project layout displayed around the room and ask project questions to the Transportation Corridor Team.

INDIANA DEPARTMENT OF TRANSPORTATION
Driving Indiana's Economic Growth

100 North Senate Avenue
Room N642
Indianapolis, Indiana 46204

PHONE: (317) 234-0796
FAX: (317) 233-4929

Michael R. Pence, Governor
Brandye L. Hendrickson, Commissioner

JANUARY 28, 2016

THE PURPOSE OF THIS MEETING IS TO PROVIDE INFORMATION TO CONCERNED CITIZENS AND TO RECEIVE INPUT AND FEEDBACK. THIS FORM IS PROVIDED FOR YOUR CONVENIENCE TO COMMENT ON THE PROJECT OR THE PRESENTATION. COMMENTS MAY BE SUBMITTED TODAY, OR MAILED ANYTIME IN THE NEXT 2 WEEKS TO OUR CONSULTANT:

American Structurepoint, Inc.
Attn: Briana M. Hope, Environmental Project Manager
7260 Shadeland Station
Indianapolis, Indiana 46256
Fax: (317) 543-0270
E-mail: bhope@structurepoint.com

FINAL COMMENT DATE: FEBRURAY 11, 2016

PROJECT: HEAVY HAUL TRANSPORTATION CORRIDOR-SEGMENT A
CLARK COUNTY (DES #: 1382612)

NAME: (PLEASE PRINT) BONITA WILLMAN

ADDRESS: 1720 Utica Sellersburg Rd
Jeffersonville, IN 47130

E-MAIL: bw.bluedog@gmail.com

COMMENTS:
We still need more direct communication

SIGNATURE: _____

PLEASE TURN OVER FOR COMMUNITY ADVISORY COMMITTEE INFORMATION AND NOMINATION

Community Advisory Committee
Nomination

A Community Advisory Committee (CAC) is being organized to participate in the development of the environmental and engineering evaluations, potentially continuing its direct involvement with the project through the preparation of final design plans.

The CAC will be selected from area residents, businesses and officials having direct interest in the project. Committee members will be selected as representatives of larger groups and will be responsible for coordinating and facilitating communications with their represented group.

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Nominee: BONITA WILLMAN

Address: 1720 UTICA SELLERSBURG RD

Phone: 812-284-5080

E-Mail: _____

Is the nominee a resident/business in the area? _____

What group or organization does the nominee represent? _____

What specific interests does the nominee have regarding this project? _____

Additional Comments: _____

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Fax: (317) 543-0270
E-mail: bhope@structurepoint.com

FINAL COMMENT DATE: FEBRURAY 11, 2016

PROJECT: HEAVY HAUL TRANSPORTATION CORRIDOR-SEGMENT A
CLARK COUNTY (DES #: 1382612)

NAME: (PLEASE PRINT) Donna Kittrell

ADDRESS: 1702 Utica Sellersburg Rd.
Jeff, IN 47130

E-MAIL: donna.kittrell@yahoo.com

COMMENTS:

SIGNATURE: _____

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Nominee: Bonita Willman

Address: 1720 Utica Sellersburg Rd.

Phone: Jeffersonville, IN. 47130

E-Mail: b.w.bluedog@gmail.com

Is the nominee a resident/business in the area? _____

What group or organization does the nominee represent? _____

What specific interests does the nominee have regarding this project? _____

Additional Comments: _____

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FINAL COMMENT DATE: FEBRURAY 11, 2016

PROJECT: HEAVY HAUL TRANSPORTATION CORRIDOR-SEGMENT A
CLARK COUNTY (DES #: 1382612)

NAME: (PLEASE PRINT) _____

ADDRESS: _____

_____

E-MAIL: _____

COMMENTS:

_____

_____

_____

_____

_____

_____

_____

_____

SIGNATURE: _____

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Nomination

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Nominee: Bob Hill

Address: 1011 Utica Charlestown Rd, Jeff. 47130

Phone: 812-282-0524

E-Mail: farmerbob@hiddenhillnursery.com

Is the nominee a resident/business in the area? both

What group or organization does the nominee represent? Utica

What specific interests does the nominee have regarding this project?

Additional Comments: He is very good at asking the right questions. He is a retired journalist.

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7260 Shadeland Station
Indianapolis, Indiana 46256
Fax: (317) 543-0270
E-mail: bhope@structurepoint.com

FINAL COMMENT DATE: FEBRURAY 11, 2016

PROJECT: HEAVY HAUL TRANSPORTATION CORRIDOR-SEGMENT A
CLARK COUNTY (DES #: 1382612)

NAME: (PLEASE PRINT) GARLAND M OAKES III

ADDRESS: 1808 UTICA-SELLERSBURG RD
JEFFERSONVILLE IN 47130

E-MAIL: NONE

COMMENTS:
Bought first tract of property in 1988. Built home and purchased tract next to home. We have approximately 21 acres with rescue horses, donkey's cats, and dogs. We have taken extreme pride in our homestead and we don't want to give it up. Our place is beautiful quiet and we enjoy it very much. We have a wild life refuge beside and behind us. We also have a Indian Village next to us.

SIGNATURE: Garland M Oakes III

PLEASE TURN OVER FOR COMMUNITY ADVISORY COMMITTEE INFORMATION AND NOMINATION

Community Advisory Committee
Nomination

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Nominee: Bonita Willman

Address: 1720 Utica Sellersburg Rd. Jeff. Ind. 47130

Phone: 812 - 284-5080

E-Mail:

Is the nominee a resident/business in the area? yes

What group or organization does the nominee represent? homeowner

What specific interests does the nominee have regarding this project? possibly be affected by henryville road.

Additional Comments:

April 5, 2017 Public Information meeting materials

From: Indiana Department of Transportation
To: Nichols, Angela L
Subject: April 5 Open House Scheduled for Heavy Haul Transportation Corridor
Date: Tuesday, March 28, 2017 8:36:14 AM

Having trouble viewing this email? View it as a Web page.

Indiana Department of Transportation News Release

April 5 Open House Scheduled for Heavy Haul Transportation Corridor

Update on proposed routes connecting ports with State Road 265

CLARK COUNTY, Ind. -- The public is invited to attend an open house on Wednesday, April 5 to learn about route alternatives being considered for the Heavy Haul Transportation Corridor connecting the Ports of Indiana-Jeffersonville with the State Road 265 exit at Old Salem Road.

The open house will be held from 6:30 to 8 p.m. at Utica Elementary School, 210 Maplehurst Drive in Jeffersonville. The school is just off Utica Sellersburg Road near the Greater Clark County Schools Administration Building.

Project maps and other information will be on display. The public is invited to share comments and questions with members of the project team during the informal open house before and after a presentation that begins at 7 p.m.

With advance notice, special accommodations will be made for individuals needing auxiliary aids or services of interpreters, signers, readers, or large print. Anyone with such needs should contact Rickie Clark with the Indiana Department of Transportation's Office of Public Involvement at 317-232-6601 or rclark@indot.in.gov.

About the project

The Indiana Economic Development Corporation, the Ports of Indiana, the Kentuckiana Regional Planning and Development Agency, Clark County, the City of Jeffersonville Redevelopment Commission, and the River Ridge Development Authority are partnering with INDOT to develop the federally funded project. The proposed project is needed to address rapid industrial and commercial growth in the area that will increase heavy-haul vehicles mixing with local traffic.

Federal law requires review and documentation of the project's potential impacts. The ongoing impact review has identified an approximately 1.3-mile-wide study area in which route alternatives are being assessed.

The April 5 open house will focus only on the proposed new road connecting the Ports of Indiana-Jeffersonville with State Road 265, known as Segment A of the Heavy-Haul Transportation Corridor. Segment B connecting State Road 265 with River Ridge Commerce Center was completed in December 2016 and is now known as International Drive. The impact review for the purchase of rail right of way, known as Segment C, will be completed after the Segment A review is completed and approved.

Old Salem Road

INDOT and Clark County have awarded a separate, $3 million contract to T & C Contracting Inc. of

Louisville to rebuild and improve about 1 mile of Old Salem Road from 6th Street in Utica to the State Road 265 interchange.

Old Salem Road remains closed just south of State Road 265 as crews clear trees and relocate utility lines ahead of road construction. Access to Utica from State Road 265 remains via the State Road 62/Port Road exit.

Under the contract, work will shift from tree clearing and utility relocation to road construction beginning on or after May 1. The newly improved Old Salem Road is scheduled to open for traffic by Dec. 31, 2017, pending weather and other factors.

Customer Service
INDOT Seymour District
185 Agrico Lane
Seymour, IN 47274
877-305-7611
secommunications@indot.IN.gov

Media Contacts
Will Wingfield, 317-233-4675 or wwingfield@indot.in.gov
Andy Dietrick, 317-232-4005 or adietrick@indot.in.gov

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From: Indiana Department of Transportation
To: Nichols, Angela L
Subject: Reminder: Wednesday Open House Scheduled for Heavy Haul Transportation Corridor
Date: Monday, April 03, 2017 10:11:39 AM

Having trouble viewing this email? View it as a Web page.

Indiana Department of Transportation News Release

Reminder: Wednesday Open House Scheduled for Heavy Haul Transportation Corridor

Update on proposed routes connecting ports with State Road 265

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Customer Service
INDOT Seymour District
185 Agrico Lane
Seymour, IN 47274
877-305-7611
secommunications@indot.IN.gov

Media Contact
Andy Dietrick
317-232-4005
adietrick@indot.in.gov

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SIGN-IN SHEET	PLEASE PRINT	DATE: 2017-04-05

HEAVY HAUL TRANSPORTATION CORRIDOR
PUBLIC MEETING

Before including your address, phone number, e-mail address, or other personal identifying information on the meeting Sign-In Sheet or on your comment submittal, be advised that your comment ~ including your personal identifying information ~ may be made publicly available at any time. While you can ask us to withhold personal identifying information from public review, we cannot guarantee that we will be able to do so.

NAME	ADDRESS	EMAIL-OPTIONAL
Marty Sabla		MartySabla@Gmail.Com
Ken Rush		Ken.Rush@IRVMAT.com
Jack Coffman		JCOFFMAN@CO.CLARK.IN.US
Bonita/Steve Willman		bw.bluedog@gmail.com
Daniel & Cheri Keller		
Joseph Rhodea		jrhodea@VossIndustries.Com
James Buss		BUSSMAN1701@GMAIL.COM
Garland G. Odes III		
Nathan Pruitt	500 Quartermaster Quart	npruitt@cityofjeff.net

www.in.gov/indot

SIGN-IN SHEET	PLEASE PRINT	DATE: 2017-04-05

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PUBLIC MEETING

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NAME	ADDRESS	EMAIL-OPTIONAL
Brian Hill	1616 UTICA/Sellersburg Rd. ~~UTICA~~ Jeffersonville	
Ruth Gilmore	900 Lighthouse Dr. Jeff	ragilmor@aol.com
John E Clark Jr	1722 utica/Sellersburg Rd	Jclark1722@AOL.com

www.in.gov/indot

SIGN-IN SHEET	PLEASE PRINT	DATE: 2017-04-05

HEAVY HAUL TRANSPORTATION CORRIDOR
PUBLIC MEETING

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NAME	ADDRESS	EMAIL-OPTIONAL
Mike Mathis	6514 Longview Beach	DOCMMATHIS@BELLSOUTH.NET
Scott Stewart	1402 Port Road, Jeff.	SSTEWART@POINTSOFINDIANA.COM
Kathy Eaton McKalip		
Rob Waiz		rwaiz@cityofjeff.net

www.in.gov/indot

SIGN-IN SHEET	PLEASE PRINT	DATE: 2017-04-05

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NAME	ADDRESS	EMAIL-OPTIONAL
Melinda Romans	1726 Utica Sellersburg Rd	melindaromans@yahoo.com
Donna & Floyd Kittrell	1702 Utica Sellersburg Rd	donna.kittrell@yahoo.com
Roberta Kent (Kent)	1806 Utica-Sellersburg Rd	
Brian Dixon	501 E. Court Ave	bdixon@co.clark.in.us
Rodney Gross	717 Meyers Grove Clarksville IN	rgross@partsofindiana.com

www.in.gov/indot

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NAME	ADDRESS	EMAIL-OPTIONAL
Paul Tinnell	1200 Brown Forman Rd 47130	PaulTinnell@LakesideReflections.com
Debbie Wanke	1513 Fox Den Dr. 47130	dajwanke@gmail.com
John Groan	4415 Chickasawhaw Dr	JohnGroan@gmail.com
Chad Reischl	827 mechanic St. Jeff.	creischl@cityofjeff.net.
STEPHEN M. STARCK	1804 UTICA-S-BURG Rd.	STEPHEN STARCK @ GMAIL
Ronnie Hattabaugh	1806 UTICA-SBurg Rd	Ronnie Hattabaugh
BZ WANKE	1513 FOX DEN DRIVE	W.WANKE@INSIGHTBB.COM
Victoria Rommes	6015 Aurora Ave	Charlestown, IN 47111
Brian Rommes	" "	

www.in.gov/indot

INDIANA DEPARTMENT OF TRANSPORTATION

April 5, 2017 Open House - Heavy Haul Transportation Corridor

Update on proposed routes connecting ports with State Road 265

About the project

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Customer Service

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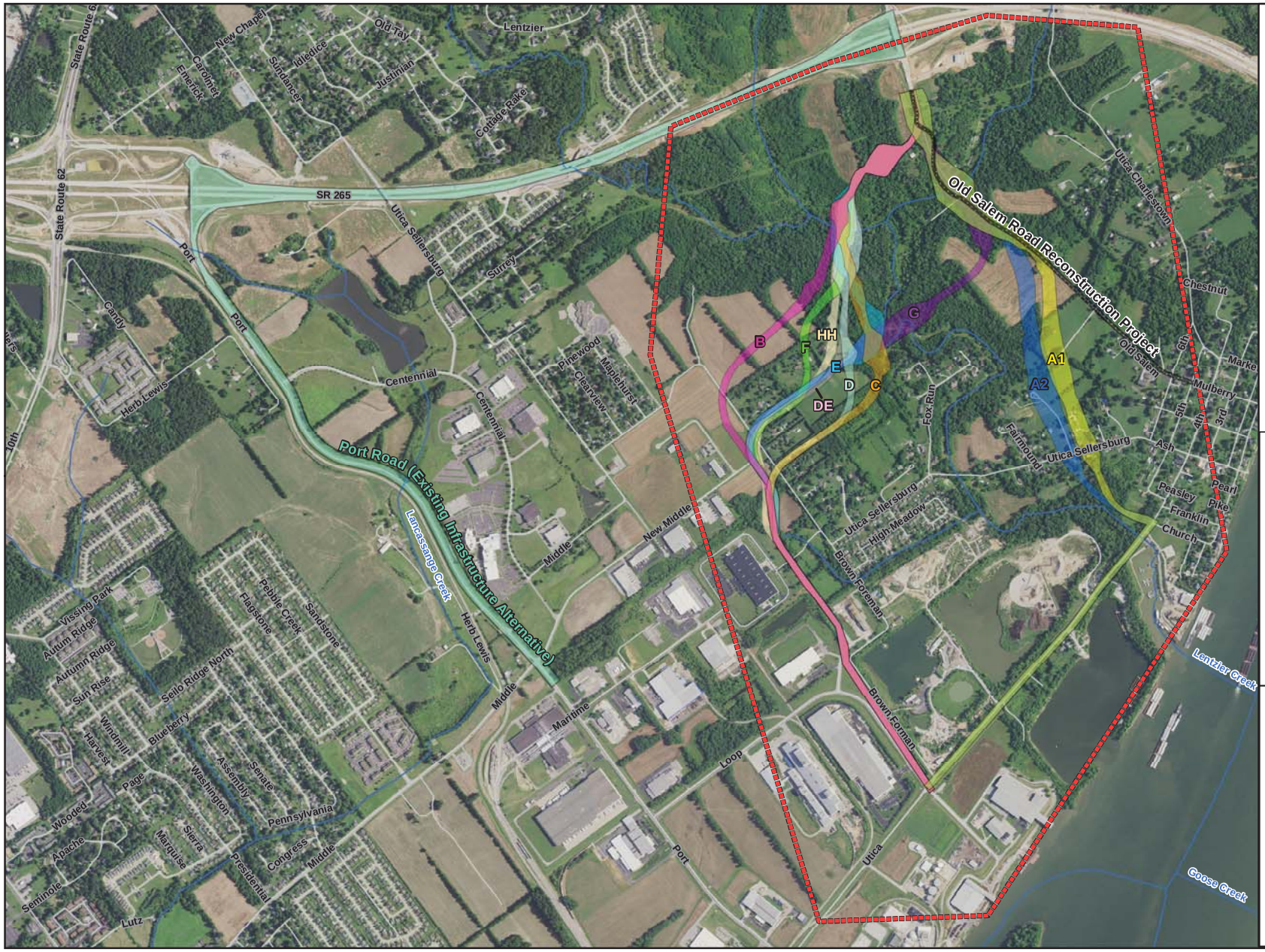
secommunications@indot.IN.gov



Heavy Haul Transportation Corridor
Des. No. 1382612

Location: Jeffersonville
Township: Utica
County: Clark
State: Indiana

N
W E
S

1,250 625 0 1,250 Feet

- Study Area - Heavy Haul Transportation Corridor
- Old Salem Road Reconstruction Project
- Alternative A1
- Alternative A2
- Alternative B
- Alternative C
- Alternative D
- Alternative DE
- Alternative E
- Alternative F
- Alternative G
- Alternative HH
- Port Road (Existing Infrastructure Alternative)

UNITED Consulting

AMERICAN STRUCTUREPOINT INC.
www.structurepoint.com

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Path: P:\2013\01857\D. Drawings\ArcView\Exhibits\2013.01857.EV.2017-03-30.Map.Alternatives_vertical.lsb.mxd Date: 4/5/2017 User: lbolts

INDIANA DEPARTMENT OF TRANSPORTATION

100 North Senate Avenue
Room N642
Indianapolis, Indiana 46204

PHONE: (317) 234-0796
FAX: (317) 233-4929

Eric Holcomb, Governor
Joe McGuinness, Commissioner

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7260 Shadeland Station
Indianapolis, Indiana 46256
Fax: (317) 543-0270
E-mail: bhope@structurepoint.com

FINAL COMMENT DATE: April 19, 2017

PROJECT: HEAVY HAUL TRANSPORTATION CORRIDOR
CLARK COUNTY (DES #: 1382612)

NAME: (PLEASE PRINT) _____

ADDRESS: _____

_____

E-MAIL: _____

COMMENTS:

_____

_____

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_____

_____

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_____

_____

SIGNATURE: _____

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Nominee: _____

Address: _____

Phone: _____

E-Mail: _____

Is the nominee a resident/business in the area? _____

What group or organization does the nominee represent? _____

What specific interests does the nominee have regarding this project? _____

_____

Additional Comments: _____

_____

_____

_____

_____

Heavy Haul Transportation Corridor Open House

Ron Heustis, PE
Project Manager, INDOT

Project Team

- Indiana Department of Transportation
- Federal Highway Administration
- City of Jeffersonville
- Clark County
- Indiana Economic Development Corporation
- Ports of Indiana
- River Ridge Development Authority
- United Consulting
- American Structurepoint

Meeting Agenda

- Public Information Meeting
- Alternatives for Consideration
- Proposed Project Schedule
- Alternatives Screening Matrix
- Land Acquisition Process
- Open House

Alternatives Development

- All alternatives are initially developed based on engineering considerations specific to the proposed project (speed, vehicles, known site conditions)
- Consideration given to constructability, including factors such as deviations from standards, accessibility to site, traffic maintenance, unusual construction techniques required
- Design Criteria
  - New 2-lane roadway or sufficient capacity for additional demand on existing alternatives
  - Designed to Heavy Haul standards (maximum vehicle weight of 134,000 lbs)
  - 35-mph speed limit

Alternatives Development (cont.)

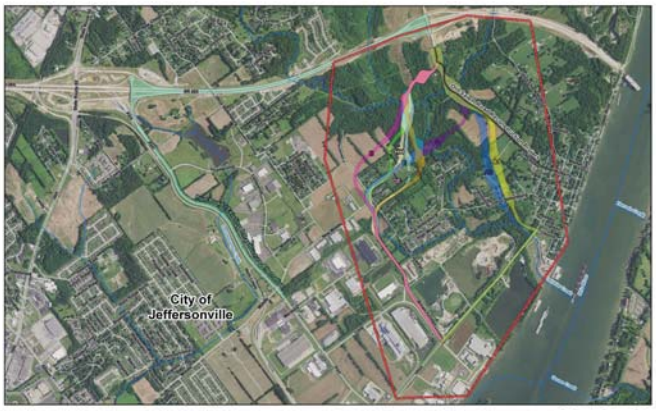
- Existing infrastructure alternatives
  - Widen and reconstruct Port Road (Alternate Port Road)
    - Additional capacity required
    - Additional pavement structure required for Heavy Haul vehicles
    - Widen SR 265 over Lentzier Creek tributary for extension of acceleration lane
  - Utica Pike and Old Salem Road alternatives (Alternatives A1 and A2)
    - Widen and reconstruct Utica Pike and Old Salem Road
    - Additional capacity required
    - Additional pavement structure required for Heavy Haul vehicles
    - Address roadway grades that exceed allowable grade for Heavy Haul vehicles

Alternatives Development (cont.)

- New terrain alternatives
  - Alternates B, C, D, E, F, G, DE, HH
    - New 2-lane roadway
    - New bridge over Lentzier Creek

Alternatives Development (cont.)

- Alternatives A1, A2, and B
  - Based on connectivity, engineering considerations and environmental information available to desktop review
- Alternatives C, D, E, F, G
  - Changes made based on initial input from resource agencies and field investigations
- Alternatives DE, HH
  - Further changes made based on additional input from resource agencies and additional field investigations

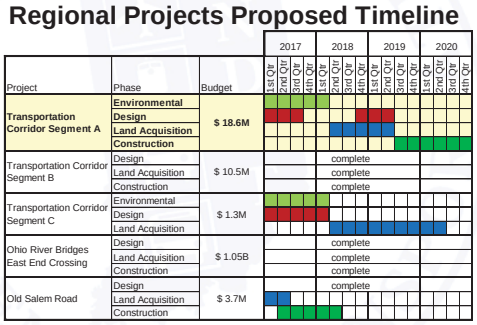


Proposed Project Schedule

Project schedule may be adjusted due to environmental, land acquisition, or other circumstances

- **Environmental** started in second quarter of 2014 and continues to first quarter of 2018
- **Design** started in first quarter of 2016 and continues to second quarter of 2019
- **Right-of-way** acquisition starts in first quarter of 2018 and continues to second quarter of 2019
- **Construction** starts in third quarter of 2019 and continues into fourth quarter of 2020.

Regional Projects Proposed Timeline



Alternative Screening Matrix

- Working to identify a preferred alternative
- Considerations
  - Purpose and need
  - Environmental
  - Engineering

Alternative Screening Matrix (cont.)

- Purpose and Need
  - Does alternative provide connectivity between existing infrastructure and major traffic generators?
  - Does the alternative address inadequate system connection south of the SR 265/Old Salem Road interchange?
  - Will the infrastructure be designed to effectively handle Heavy Haul vehicles?

Alternative Screening Matrix (cont.)

- Environmental considerations
  - Archaeological
  - Environmental justice
  - Farmland
  - Forest
  - Hazardous materials sites
  - Historic properties
  - Karst
  - Noise
  - New permanent right-of-way
  - Residential/business relocations
  - Section 4(f) property use
  - Streams
  - Surface water
  - Wetlands

Alternative Screening Matrix (cont.)

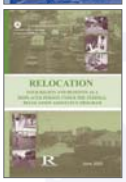
- Engineering considerations
  - Constructability
  - Estimated cost
  - Length
  - New construction
  - Structure length

Community Involvement Status

- Public information meetings
- Citizens Advisory Committee (CAC)
  - Group of individuals serving as representatives of their local community acting as liaisons (neighborhood organizations, first responders, schools, etc.)
  - Play important advisory role in developing a project that might better "fit" into your community
  - *INDOT and FHWA maintain final authority and responsibility for decision making*
  - CAC meeting to be scheduled within next 3 to 6 months

Land Acquisition Process

- How land is purchased by local agencies – explains the process of buying property needed for highway improvements
- Land acquisition process must follow the Uniform Act of 1970
- Uniform Act of 1970
  - All federal, state, and local governments must comply
  - Requires just compensation
- Acquisition process
  - Appraisals
  - Review appraisals
  - Negotiations (buying)
- Amount of compensation cannot be less than fair market value



Land Acquisition Process (cont.)

- Partial acquisition
  - Agency will state amount to be paid of the part of the land to be acquired.
  - Separate amount will be stated for damages to the portion retained.
  - If remainder has little or no value, agency will consider purchasing remainder.
- Agreement
  - When agreement is reached, owner will be asked to sign an option to buy, purchase agreement, easement, or deed.
- No agreement
  - Mediation
  - Condemnation

Feel free to view visuals and project layout displayed around the room and ask project questions to the Transportation Corridor Team.

CAC meeting materials

October 6, 2017

Ms. Pamela Fisher
Director
Indiana Economic Development Corporation
1 North Capitol Ave., Suite 700
Indianapolis, IN 46204

Re: Community Advisory Committee (CAC) Meeting
Heavy Haul Transportation Corridor
Utica Township, Clark County, Indiana
Des. No. 1382612

Dear Ms. Fisher:

The Indiana Department of Transportation (INDOT); in partnership with the Indiana Economic Development Corporation, Jeffersonville Port of Indiana, Clark County Commissioners, City of Jeffersonville Redevelopment Authority, and River Ridge Development Authority; is developing a road project to provide a direct connection between the Jeffersonville Port of Indiana, the River Ridge Commerce Center (RRCC), and State Road 62. The project corridor generally extends north approximately 1.75 miles from the Port of Indiana to the SR 265/Old Salem Road interchange. The project is funded, in part, by the Federal Highway Administration (FHWA).

As part of the environmental analysis of this project, INDOT is forming a Community Advisory Committee (CAC) to gain input from the community and its leaders. CAC members serve as liaisons between the project management team and the groups/organizations they represent, as well as the larger community. The purpose of the CAC is to provide input regarding the transportation needs to be addressed by the project, alternatives to be considered, potential environmental impacts of the alternatives, and the means to address these impacts. Local residents, business leaders, and local stakeholders are being invited to serve on the CAC.

United Consulting and American Structurepoint, Inc., have been contracted by INDOT to perform the engineering design and environmental documentation and are also responsible for coordinating the public involvement process, which includes the CAC. You have been identified through coordination with the participating project partners as a possible member of the CAC because of your involvement in the community and/or your neighborhood.

You or one representative from your organization are being invited to participate at the CAC meeting, which will be held on Thursday, October 26, 2017, at the Indiana Department of Transportation Project Office, 1030 Spring Street, Jeffersonville, Indiana 47130. The meeting will begin at 1:00 PM and continue for approximately one hour.

A tentative agenda for this meeting is as follows:

- Introduction of the project team and history of the project
- Explanation of the Community Advisory Committee and its role in the development of the project
- Project timeline and project development process
- Review of Alternatives Screening Matrix and overview of the project and current design
- Questions and discussion
- Next steps

We appreciate your participation in the development of the Heavy Haul Transportation Corridor Project. Please do not hesitate to contact me at (317) 547-5580 or by email at lboits@structurepoint.com if you have any questions on the CAC process or about this meeting specifically. We look forward to meeting you on October 26, 2017.

Very truly yours,
American Structurepoint, Inc.

Leah S. Boits
Environmental Project Manager

Distribution List:

Pam Fisher, Indiana Economic Development Corporation
Scott Stewart, Ports of Indiana
Jack Coffman, Clark County Commissioners
Rob Waiz, City of Jeffersonville
Jerry Acy, River Ridge Development Authority
Larry Chaney, Kentuckiana Regional Planning and Development Agency
Stacia Franklin, Clark County Planning and Zoning
Les Kavanaugh, Clark County Emergency Management Agency
Jamey Noel, Clark County Sheriff's Office
Leon Noel, Utica Township Volunteer Fire Department
Bonita Willman
Bob Hill
Henry Dorman, Town of Utica
Kenny Kavanaugh, City of Jeffersonville Police Department
Eric Hedrick, City of Jeffersonville Fire Department
Gary Gilmore, Gilmore Construction, Inc.

SIGN-IN SHEET	PLEASE PRINT	DATE: 2017-10-26

HEAVY HAUL TRANSPORATION CORRIDOR

COMMUNITY ADVISORY COMMITTEE

Before including your address, phone number, e-mail address, or other personal identifying information on the meeting Sign-In Sheet or on your comment submittal, be advised that your comment ~ including your personal identifying information ~ may be made publicly available at any time. While you can ask us to withhold personal identifying information from public review, we cannot guarantee that we will be able to do so.

Name	Initials	Representative	Agency/Corporation
Pamela Fisher			Indiana Economic Development Corporation
Scott Stewart	SS		Ports of Indiana
Jack Coffman			Clark County Commissioners
Rob Waiz	RW		City of Jeffersonville, Economic Development
Marc Hildenbrand			River Ridge Development Authority
Larry Chaney			Kentuckiana Regional Planning and Development Agency
Henry Dorman	HD.	Utica Town Board	Town of Utica, Planning and Zoning Board
Stacia Franklin			Clark County Planning and Zoning
Les Kavanaugh			Clark County Emergency Management Agency
Jamey Noel			Clark County Sheriff's Office
Kenny Kavanaugh	LKK.		City of Jeffersonville Police Department
Eric Hedrick			City of Jeffersonville Fire Department
Leon Noel			Utica Township Volunteer Fire Department
Bonita Willman			
Bob Hill	BH		
Gary Gilmore	RG	Gary + Ruth Gilmore	Gilmore Construction, Inc.
Andy Dietrick	AD	INDOT Communications	INDOT
Dan Moore	DEM	GILMORE	
Becky Boyd	RSB	Gilmore	
Marc Hildenbrand	MH	RRDA	

SIGN-IN SHEET	PLEASE PRINT	DATE: 2017-10-26

HEAVY HAUL TRANSPORATION CORRIDOR

COMMUNITY ADVISORY COMMITTEE

Before including your address, phone number, e-mail address, or other personal identifying information on the meeting Sign-In Sheet or on your comment submittal, be advised that your comment ~ including your personal identifying information ~ may be made publicly available at any time. While you can ask us to withhold personal identifying information from public review, we cannot guarantee that we will be able to do so.

Name	Initials	Representative	Agency/Corporation
Michelle Allen			FHWA - IN
Anuradha Kumar	AK		INDOT - CRO
Mohammad Hajir	MH		FHWA - IN
Jeff Andrews	JRA		United Consulting
Laura Hilden	LEH		INDOT - ES
Ron Heustis			INDOT PM

Meeting Agenda

October 26, 2017

1. Welcome and Introductions • CAC Members	Ron Heustis INDOT
2. Community Advisory Committee (CAC) • Purpose and Objectives • Rules of Engagement • Comments and Feedback	Briana Hope American Structurepoint
3. Project Background • Purpose and Need • Project History and General Description • Project Development Process and Project Timeline	Ron Heustis INDOT
4. Project Alternatives • Initial Alternatives – mapping and screening matrix • Refined Alternatives – mapping and screening matrix	Briana Hope American Structurepoint

5. Design Issues and Community Concerns
• Noise
• Construction Timeline
• Access
  o During Construction
  o Permanent Access
	Ron Heustis/Briana Hope
	INDOT/American Structurepoint

6. Open Forum	CAC Members
7. Public Comment	

CAC Purpose and Objectives

A Community Advisory Committee (CAC) is a group of individuals serving as representatives of their local community and neighborhood groups to act as a liaison for the exchange of information between the community and transportation officials. CAC members are given the opportunity to participate in the development of project evaluations, potentially continuing its direct involvement with the project through the preparation of final design plans for the proposed project. The Indiana Department of Transportation (INDOT), in partnership with Federal Highway Administration (FHWA) maintain final authority and responsibility concerning decision-making regarding the Heavy Haul Transportation Corridor project.

The purpose of a Community Advisory Committee (CAC) is, just as the name states, an advisory group. The CAC serves in an advisory capacity and its members play a role helping with the development of a transportation facility that fits its physical settings and preserves aesthetic, historic, and environmental resources within the community. The Committee will be solicited for input and comments which will assist in preparation of the environmental and engineering documents. Your input will be considered as the project advances through the planning studies into the detailed design and eventually into construction.

The Community Advisory Committee has been selected from area residents, businesses and officials having direct interest in the project. Committee members were selected as representatives of larger groups and will be responsible for coordinating and facilitating communications between INDOT, United Consulting, and American Structurepoint, Inc. as the project is developed.

Rules of Engagement

Mission: To assist INDOT and its partners by providing input on community issues and feedback on specific areas of project development. Members of the CAC will serve as liaisons to their respective groups/organizations and the community at-large.

Individuals selected to serve on the CAC will actively participate in the CAC process. The CAC meeting will be open to the public; however, space may be limited, and non-CAC members will be present in the capacity of observers. Time will be provided at the end of each CAC meeting for members of the public to provide comments.

All meetings will conform to the following Rules of Engagement, requiring participants to be:

- Considerate
- Open to new ideas
- Flexible
- Concise, and
- Brief

Discussion within the CAC will be limited to those specific areas of the project included in the agenda. Issues raised outside the agenda that are related to the project will be identified as "Parking Lot" items and will be discussed during the open forum. In general, discussion issues include such items as identification of community concerns, further refinements of issues discussed during project development, and other design features that might allow for the project to better "fit" into the community.

Meeting summaries will be prepared and sent out to CAC members.

Comments and Feedback

Your comments on the proposed project are important to the environmental assessment process. CAC meeting minutes will be prepared to capture comments, ideas, and issues raised during the meeting. In addition to comments provided during the CAC meeting, the following options are offered as opportunities to submit comments on the project:

1. 4x6 index cards are available to write down any comments. These can be handed to one of the members of the Project Team, or mailed to:

   Heavy Haul Transportation Corridor (Des. No. 1382612)
   American Structurepoint, Inc.
   Attn: Leah Boits
   7260 Shadeland Station
   Indianapolis, Indiana 46256

2. Submit comments via e-mail to: lboits@structurepoint.com

AMERICAN STRUCTUREPOINT INC.

7260 Shadeland Station, Indianapolis, Indiana 46256
TEL 317.547.5580 FAX 317.543.0270

www.structurepoint.com

HEAVY HAUL TRANSPORTATION CORRIDOR (DES. NO. 1382612)
COMMUNITY ADVISORY COMMITTEE (CAC) MEETING
MEETING MINUTES

Location: INDOT Project Office, 1030 Spring Street, Jeffersonville, Indiana
Date: October 26, 2017
Project Name: Heavy Haul Transportation Corridor
Des. No.: 1382612
Owner: INDOT
Minutes By: Leah Boits

Attendees	Representing	Email
Michelle Allen	FHWA	michelle.allen@dot.gov
Mohammad Hajeer	FHWA	mohammad.hajeer@dot.gov
Anuradha Kumar	INDOT - CRO	akumar@indot.IN.gov
Laura Hilden	INDOT – ES	lhilden@indot.IN.gov
Ron Heustis	INDOT	rheustis@indot.IN.gov
Andy Dietrick	INDOT Communications	adietrick@indot.IN.gov
Scott Stewart	Ports of Indiana	sstewart@portsofindiana.com
Rob Waiz	City of Jeffersonville	rwaiz@cityofjeff.net
Marc Hidenbrand	River Ridge Development Authority	marc@riverridgecc.com
Henry Dorman	Utica Town Board	N/A
Kenny Kavanaugh	City of Jeffersonville Police Department	kkavanaugh@cityofjeff.net
Bob Hill	Neighborhood Representative	farmerbob@hiddenhillnursery.com
Dan Moore	Gilmore Construction, Inc.	contact@danmooreattorney.com
Gary and Ruth Gilmore	Gilmore Construction, Inc.	ragilmor@aol.com
Becky Boyd	Gilmore Construction, Inc.	N/A
Chris Pope	United Consulting	chrisp@ucindy.com
Jeff Andrews	United Consulting	jeffa@ucindy.com
Briana Hope	American Structurepoint, Inc.	bhope@structurepoint.com
Leah Boits	American Structurepoint, Inc.	lboits@structurepoint.com

The following notes reflect our understanding of the discussions at this meeting.
If you have any questions, additions, or comments, please contact the issuer of these minutes.

ITEMS DISCUSSED:

Welcome and Introductions (Briana Hope)

1. The meeting began at 1:00 PM with introductions.

Community Advisory Committee (Briana Hope)

2. A Community Advisory Committee (CAC) is a group of individuals serving as representatives of their local community and neighborhood groups to act as a liaison for the exchange of information between the community and transportation officials.

3. The committee has been selected from area residents, businesses, and officials having direct interest in the project, as well as from applications received at previous public information meetings.
4. The purpose of the CAC is to be an advisory group that helps with the development of a transportation facility that fits within the community.
5. The purpose of the meeting was to give CAC members the opportunity to participate in the development of the project.
6. INDOT, in partnership with FHWA maintain the final authority and responsibility concerning the decision-making regarding the Heavy Haul Transportation Corridor project.
7. Receiving comments on the proposed project. Comments were accepted during the meeting as well as via email to Leah Boits.

Project Background (Ron Heustis and Briana Hope)

8. The project purpose and need includes providing connectivity between existing infrastructure major traffic generators; providing system connection south of the SR 265/Old Salem Road interchange; and providing infrastructure designed to effectively handle "heavy haul" vehicles.
9. The proposed project would construct two 13-foot travel lanes with 11-foot shoulders; the proposed corridor would be approximately 1.75 miles long. Guardrail would be installed where needed. The "heavy haul" road would consist of 14.5-inch thick pavement with lime subgrade.
10. The project history and public involvement includes a public information meeting on January 28, 2016 and April 5, 2017. At these information meetings at alternatives were under consideration and presented and comments solicited.

Project Alternatives (Ron Heustis and Briana Hope)

11. A total of 12 alternatives have been presented to the public and discussed over the past two public information meetings: No-Build, A1, A2, B, C, D, DE, E, F, G, HH, Port Road – Existing Infrastructure).
12. Through coordination with resource agencies and the public, three alternatives (DE, HH, F) are considered viable options and are still being evaluated.

Design Issues and Community Concerns (Ron Heustis and Briana Hope)

13. Noise: initial study is complete and no noise barriers are warranted at this time
14. Construction timeline: Spring 2019 letting; two construction seasons
15. Environmental timeline: last public information meeting was in April 2017; a public hearing is slated for January 2018; Finding of No Significant Impact (FONSI) anticipated by February 2018
16. Access:
    a. During construction: access maintained to all residences/properties
    b. Permanent Access: current access will be maintained or a new access point of the same standards will be provided (like for like)

Open Forum (CAC Members)

17. Dan Moore (representing Gilmore Construction)
    a. Suggested upgrading Port Road to meet "heavy haul" standards in order to avoid the Gilmore property
    b. Indicated that this would be the third acquisition from the Gilmore property for transportation projects
        a. INDOT Response: Port Road is one of the alternatives considered and evaluated as part of the environmental process. However, this alternative currently does not appear to meet the system connection south of SR 265/Old Salem Road interchange criteria of the purpose and need. Therefore, it has been removed from consideration.

18. Town of Utica
    a. Would like the selected alternative to avoid the Gilmore property; avoidance of this property will help development in Utica
        a. INDOT response: see #17(a) above
    b. Will access roads be built to the Heavy Haul Transportation Corridor
        a. The owner/manager of the facility will have the final decision of if and where access roads will be built or permitted
        b. Final jurisdiction of this facility is still being considered

<u>Public Comment</u>

19. 4x6 index cards were available to write down comments. Comments could be handed to any team member at the time of the meeting or mailed to Leah Boits at American Structurepoint.
20. Comments could also be submitted via email to Leah Boits at American Structurepoint.
21. Comments provided during the discussion will be taken into consideration as the development of the project design continues.

cc: Attendees

Very truly yours,
American Structurepoint, Inc.

Leah S. Boits
Project Manager

Appendix G: Air Quality

- Pages from the *2018-2021 STIP*
- Pages from the *KIPDA 2018-2021 TIP*
- County List: All Regulated Criteria Pollutants

INDOT STIP

2018-2021

This is INDOT STIP document for the Fiscal Year 2018-2021.

INDOT STIP

Indiana Department of Transportation (INDOT)
State Preservation and Local Initiated Projects FY 2018 - 2021

SPONSOR	CONTRACT # / LEAD DES	STIP NAME	ROUTE	WORK TYPE	LOCATION	DISTRICT	MILES	FEDERAL CATEGORY	Estimated Cost left to Complete Project*	PROGRAM	PHASE	FEDERAL	MATCH	2018	2019	2020	2021
Clark County																	
	1401342	Init.	VA VARI	Road Reconstruction (3R/4R Standards)	Heavy Haul Road - 2019 KIPDA STP Funds	Seymour	0	STP		Louisville MPO	CN	$2,140,152.00	$0.00		$2,140,152.00		
	29549 / 0500176	Init.	ST 1016	Added Travel Lanes	Charlestown-New Albany from Veterans Pkwy to Holman Lane (Veterans Phase II)	Seymour	2.75	STP		Louisville MPO	RW	$800,000.00	$0.00	$800,000.00			
										100% Local Funds	RW	$0.00	$200,000.00	$200,000.00			
	29550 / 0400935	Init.	ST 1010	Road Construction	From SR 62 to SR 403 on Salem Noble Road	Seymour	3.9	STP		100% Local Funds	CN	$0.00	$400,000.00				$400,000.00
	29550 / 0400935	A 07	ST 1010	Road Construction	From SR 62 to SR 403 on Salem Noble Road	Seymour	3.9	STP		100% Local Funds	CN	$0.00	$400,000.00				$400,000.00
	Comments: KIPDA TIP																
	29550 / 0500173	Init.	IR 1014	Bridge Replacement, Concrete	Bridge over Pleasant Run on Salem Noble Road	Seymour	0	STP		Louisville MPO	CN	$316,500.00	$0.00				$316,500.00
										100% Local Funds	CN	$0.00	$79,125.00		$79,125.00		
	31759 / 0710003	Init.	IR 1024	Road Reconstruction (3R/4R Standards)	Bethany Road; 2.73 mi from SR 62 to SR 403	Seymour	2.73	STP		Group IV Program	CN	$5,053,000.00	$0.00	$5,053,000.00			
										SMFR	CN	$1,263,250.00	$0.00	$1,263,250.00			
	35230 / 1296560	Init.	US 31	Small Structure Replacement	1.35 mile N of Memphis Road on US 31	Seymour	0	STP		Bridge Construction	CN	$341,440.00	$85,360.00	$426,800.00			
	36175 / 1006394	Init.	SR 60	Small Structure Replacement	Over unnamed tributary to Muddy Fork Creek, 5.76 miles East of SR 335.	Seymour	0	STP		Bridge Construction	CN	$582,800.00	$145,700.00	$728,500.00			
	36175 / 1298629	Init.	SR 60	Bridge Replacement, Concrete	4.93 miles W of SR 111 over Persimmon Run	Seymour	0	STP		Bridge Construction	CN	$636,464.00	$159,116.00	$795,580.00			
	36260 / 1382612	Init.	VA 1038	New Road Construction	Port of Indiana to SR 265 and from SR 265 to and within River Ridge Development.	Seymour	4	STP		SMFR	CN	$1,338,560.00	$334,640.00	$1,673,200.00			
										100% Local Funds	PE	$197,120.00	$49,280.00	$246,400.00			
										Statewide Construction	CN	$5,201,235.20	$1,300,308.80	$6,501,544.00			
										Louisville MPO	PE	$788,480.00	$197,120.00		$985,600.00		
										100% Local Funds	CN	$983,084.80	$245,771.20	$1,228,856.00			
										Louisville MPO	CN	$923,641.60	$230,910.40		$1,154,552.00		

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

Indiana Department of Transportation (INDOT)
State Preservation and Local Initiated Projects FY 2018 - 2021

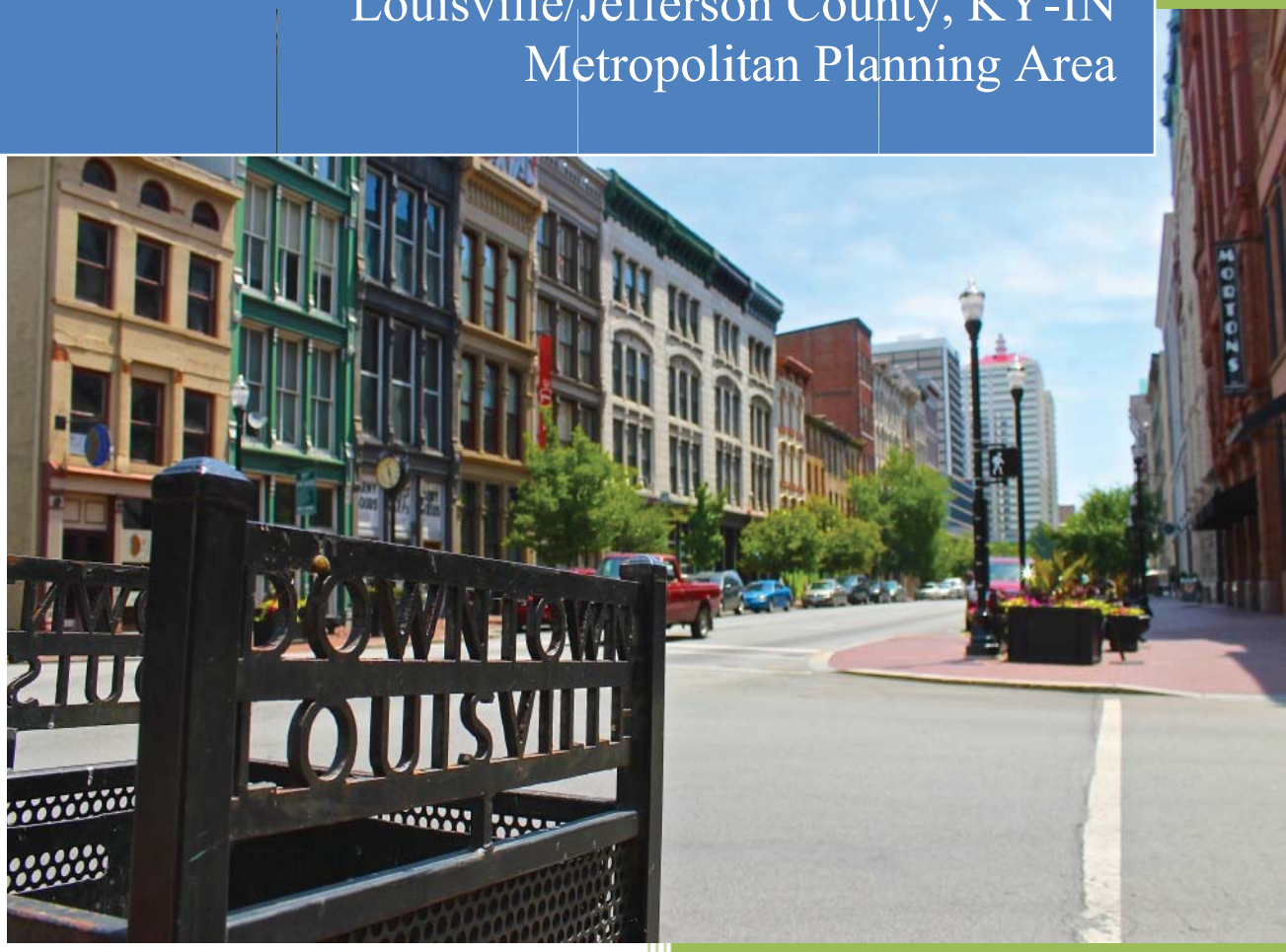
SPONSOR	CONTRACT # / LEAD DES	STIP NAME	ROUTE	WORK TYPE	LOCATION	DISTRICT	MILES	FEDERAL CATEGORY	Estimated Cost left to Complete Project*	PROGRAM	PHASE	FEDERAL	MATCH	2018	2019	2020	2021
	36260 / 1382612	A 11	VA 1038	New Road Construction	Port of Indiana to SR 265 and from SR 265 to and within River Ridge Development.	Seymour	4	Multiple	$15,380,153.00	SMFR	RW	$381,440.00	$95,360.00		$476,800.00		
										100% Local Funds	RW	$753,287.21	$188,321.80		$941,609.01		
										Statewide ROW	RW	$1,435,208.00	$358,802.00		$1,794,010.00		
	Comments: Amend RW phase in FY 2019 per KIPDA Administrative Modification 6 dated 11/21/17.																
	37605 / 1400779	Init.	ST 1022	Bike/Pedestrian Facilities	Located on various streets within the unincorporated community of New Washington	Seymour	1.01	STP		Local Transportation Alternatives	CN	$720,000.00	$0.00	$720,000.00			
										100% Local Funds	CN	$0.00	$180,000.00	$180,000.00			
	37764 / 1400142	Init.	I 65	Small Structure Pipe Lining	1.62 miles N of SR 160	Seymour	0	NHPP		Bridge Construction	CN	$406,800.00	$45,200.00		$452,000.00		
	38091 / 1401343	Init.	VA VARI	Bike/Pedestrian Facilities	Greenway Connector between Jeffersonville and Clarksville	Seymour	0	STP		Louisville MPO	CN	$534,331.00	$0.00			$534,331.00	
										100% Local Funds	CN	$0.00	$133,583.80			$133,583.80	
	38097 / 1401350	Init.	VA VARI	Road Reconstruction (3R/4R Standards)	Reconstruct 580' Blackiston Mill Road North of Lewis&Clark Parkway	Seymour	0	STP		Louisville MPO - PYB	CN	$169,927.00	$0.00	$169,927.00			
										Louisville MPO	CN	$649,011.00	$0.00	$649,011.00			
										100% Local Funds	CN	$0.00	$81,000.00	$81,000.00			
	38097 / 1401350	A 10	VA VARI	Road Reconstruction (3R/4R Standards)	Reconstruct 580' Blackiston Mill Road North of Lewis&Clark Parkway	Seymour	0	STP	$1,910,000.00	Louisville MPO - PYB	RW	$169,927.00	$0.00	$169,927.00			
										Louisville MPO - PYB	CN	-$169,927.00	$0.00	($169,927.00)			
										100% Local Funds	CN	$0.00	$9,931.00	($81,000.00)		$90,931.00	
										Louisville MPO	CN	$169,927.00	$0.00	($649,011.00)		$818,938.00	
										Louisville MPO	RW	$649,011.00	$0.00	$649,011.00			
										100% Local Funds	RW	$0.00	$181,062.00	$181,062.00			
	Comments: Add FY18 R/W funds. Move FY18 CN funds to FY20. Amendment approved through KIPDA TIP Modification dated 10/30/2017.																

 Report Created:1/16/2018 7:28:25AM

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

FY 2018 – FY 2021
Transportation Improvement Program

Louisville/Jefferson County, KY-IN
Metropolitan Planning Area



KIPDA
Kentuckiana Regional Planning and Development Agency

July 2017

Adopted July 27, 2017

TPC approved 3/23/17

KIPDA 5 Year Plan of Projects - Indiana
FY 2018 - FY 2021
June 2017

Federal Funds Only

Project	Project Description	KIPDA ID	DES Number	Project Sponsor	Funding Program	FY 2018 Phase	FY 2018 Federal Dollars	FY 2018 Allocation Funds	FY 2018 PYB Funds	FY 2019 Phase	FY 2019 Federal Dollars	FY 2019 Allocation Funds	FY 2019 PYB Funds	FY 2020 Phase	FY 2020 Federal Dollars	FY 2020 Allocation Funds	FY 2020 PYB Funds	FY 2021 Phase	FY 2021 Federal Dollars	FY 2021 Allocation Funds	FY 2021 PYB Funds	Future Phase	Future Federal Dollars
Blackiston Mill Phase 2	Improvements to Blackiston Mill Road from just north of the Kroger entrance to Blackiston View Drive, including the addition of siedewalks, a new turn lane into Peddler's Mall entrance, improved site lines, and improved access control and drainage improvements.		1700724	Clarksville	STP									C	$1,168,860	$1,168,860							
Bridge 51	Replace Bridge 51 on Blackiston Mill Dr. over Silver Creek.			Floyd County	STP									PE	$404,420	$404,420						R U C	$360,000 $40,000 $3,319,008
Charlestown Rd.	Reconstruction of Charlestown Road from Hedden Court to Genung Drive, 0.31 miles, includes construction of curb and gutter, sidewalk		1700727	New Albany	STP									PE	$298,400	$298,400						R U C	$165,120 $40,000 $1,529,979
Grantline Rd.	Reconstruct Grantline Rd. from McDonald Ln south to Beechwood Ave. for a distance of 1.6 miles	1586	0901276	New Albany	STP	C	$2,081,904	$1,516,539	$565,365														
Heavy Haul Rd.	Construction of a new 2 lane road from the Port of Indiana to I-265, and construction of a 3 lane road from the I-265/Old Salem Road interchange through River Ridge to IN 62. The project will also identify a direct railroad route from the Port of Indiana to River Ridge.	2119	1382612	INDOT	STP					C	$2,140,152	$2,140,152											
E. Main St.	Reconstruct E. Main Street from State Street to E. 5th Street, including sidewalk improvements and bicycle and pedestrian safety improvements.		1700730	New Albany	STP					PE	$173,600	$173,600										U C	$24,800 $1,753,400
McDonald Ln.	Reconstruct 2 lane road from Grantline Rd. to Charlestown Rd.	95	0300779	New Albany	STP	Add'l C	$428,536	$428,536															
Mt. Tabor	Reconstruct 2 lane road from Grantline Rd. to Charlestown Rd.	309	0710808	New Albany	STP	Add'l R C	$375,030 $3,624,380	$375,030	$3,624,380														
Riverside Dr.	Reconstruct Riverside Drive from the Town limits to Ashland Park, including parking on both sides of roadway and an elevated cycle track on the south side of roadway.		1700725	Clarksville	STP									PE	$346,916	$346,916		R	$1,643,520	$1,643,520		C	$4,293,080
Ticket to Ride	Regional Rideshare Program	56		KIPDA	STP	1401656	$127,000	$127,000		1401654	$127,000	$127,000			$127,000	$127,000			$127,000	$127,000		X	$762,000
Charlestown Road Corridor Complete Streets	Construction of sidewalks along Charlestown Road from Sunset Drive to County Line Road.	2128	1400550	Floyd County	CMAQ	R	$150,000		$150,000														
Kentuckiana Air Education	Kentuckiana Air Education (KAIRE): Ozone prevention and awareness program	370		APCD	CMAQ	1401655	$200,000	$200,000			$200,000	$200,000			$200,000	$200,000			$200,000	$200,000			$1,200,000
Grantline Rd. Pedway	Construction of pedestrian bicycle path and sidewalks along Grant Line Road from Beechwood Avenue to Cherokee Drive where it connects with existing pedway and sidewalk.	1432	0710810	New Albany	CMAQ	C	$965,000	$808,461	$156,539														
TARC Cross River Connectors	Implementation of 2 routes to improve cross river mobility over the Kennedy/Lincoln bridges and the Lewis and Clark Bridge to provide access to jobs between Kentucky and Southern Indiana.			TARC	CMAQ					Operating	$800,000	$800,000		Operating	$800,000	$800,000		Operating	$800,000	$800,000			
Bus Stop & Access Improvements - Spring Street	Purchase and installation of 7 benches, 8 boarding pads, 8 trash receptacles, 1 bus shelter and over 1,700 feet of new sidewalk within the public right of way on Spring Street and Eastern Blvd in Jeffersonville.	2224		TARC	TAP	C	$226,805	$226,805															
Blackiston Mill Road Improvements, Phase 1	Reconstruction and improvement of approximately 580 feet of Blackiston Mill Road, just north of Lewis & Clark Parkway. Included in the improvements are the installation of turn lanes into and out of Kroger Drive, the addition of a raised center curb, improvement of sight lines and drainage improvements.	2187	1401350	Clarksville	HSIP	C	$818,938	$649,011	$169,927														

P- Prelimiary Engineering, D- Design, R - Right-of-Way, U- Utilities Relocation, C- Construction, X- Other

FY 2015-2021 Transportation Improvement Program: Indiana Project List

Project Name	2nd Name	Description	State ID	KIPDA ID	County	Contact	Year	Phase	Federal	Other	Total	Funding
Heavy Haul Road		Construction of a new 2 lane road from the Port of Indiana to I-265, and construction of a 3 lane road from the I-265/Old Salem Road interchange through River Ridge to IN 62. The project will also identify a direct railroad route from the Port of Indiana to River Ridge.	1382612	2119	Clark	INDOT						
							2015	ROW	$0	$506,450	$506,450	Local
							2016	C	$0	$9,600,000	$9,600,000	Local
							2016	PE	$0	$17,750	$17,750	Local
							2016	C	$0	$8,600,000	$8,600,000	Local
							2017	C	$0	$7,000,000	$7,000,000	Local
							2017	C	$0	$1,000,000	$1,000,000	Local
							2017	ROW	$0	$1,196,000	$1,196,000	Local
							2017	ROW	$1,525,760	$381,440	$1,907,200	STP-ST
							2017	PE	$0	$304,544	$304,544	Local
							2017	ROW	$381,440	$95,360	$476,800	SMFR
							2018	ROW	$381,440	$95,360	$476,800	SMFR
							2018	C	$1,338,560	$334,640	$1,673,200	SMFR
							2018	C	$5,201,235	$1,300,309	$6,501,544	STP-ST
							2018	C	$0	$1,475,256	$1,475,256	Local
							2018	ROW	$0	$941,609	$941,609	Local
							2018	PE	$0	$246,400	$246,400	Local
							2018	C	$0	$1,228,856	$1,228,856	Local
							2018	ROW	$0	$1,789,300	$1,789,300	State
							2019	PE	$788,480	$197,120	$985,600	STP-U
							2019	C	$891,520	$222,880	$1,114,400	STP-U
							Total		$10,508,435	$36,533,274	$47,041,709	
Hoosier Helper Vehicles		Purchase Hoosier Helper Freeway Service Patrol Vehicles for the Indianapolis, Northwest Indiana, & Southern Indiana Advanced Traffic Management System areas.	1500220	2254	Clark, Floyd	INDOT						
							2018	C	$900,000	$100,000	$1,000,000	CMAQ-State
							Total		$900,000	$100,000	$1,000,000	
I- 64		Paint I-64 bridge over the Ohio River (Main Bridge).	0501153	1519	Floyd	INDOT						
							2020	C	$19,800,000	$2,200,000	$22,000,000	IM
							Total		$19,800,000	$2,200,000	$22,000,000	
I- 64		Bridge maintenance and repair on I-64, I-64 bridge over Norfolk Southern Railroad.	1006049	1888	Floyd	INDOT						
							2015	C	$135,000	$15,000	$150,000	NHS
							Total		$135,000	$15,000	$150,000	

PE - Preliminary Engineering, D - Design, ROW - Right-of-Way Acquisition, U - Utility Relocation, C - Construction, Oper - Operating

Appendix B: Indiana Comprehensive List By State ID# (sorted by State ID)

State ID	Project Name	2nd Name	Description	KIPDA ID	County	Contact	Year	Phase	Federal	Other	Total	Funding
1382612	**Heavy Haul Road**		Construction of a new 2 lane road from the Port of Indiana to I-265, and construction of a 3 lane road from the I-265/Old Salem Road interchange through River Ridge to IN 62. The project will also identify a direct railroad route from the Port of Indiana to River Ridge.	2119	Clark	INDOT						
							2015	ROW	$0	$506,450	$506,450	Local
							2016	PE	$0	$17,750	$17,750	Local
							2016	C	$0	$8,600,000	$8,600,000	Local
							2016	C	$0	$9,600,000	$9,600,000	Local
							2017	PE	$0	$304,544	$304,544	Local
							2017	ROW	$381,440	$95,360	$476,800	SMFR
							2017	ROW	$1,525,760	$381,440	$1,907,200	STP-ST
							2017	ROW	$0	$1,196,000	$1,196,000	Local
							2017	C	$0	$1,000,000	$1,000,000	Local
							2017	C	$0	$7,000,000	$7,000,000	Local
							2018	C	$1,338,560	$334,640	$1,673,200	SMFR
							2018	ROW	$0	$941,609	$941,609	Local
							2018	ROW	$381,440	$95,360	$476,800	SMFR
							2018	C	$0	$1,475,256	$1,475,256	Local
							2018	C	$0	$1,228,856	$1,228,856	Local
							2018	ROW	$0	$1,789,300	$1,789,300	State
							2018	C	$5,201,235	$1,300,309	$6,501,544	STP-ST
							2018	PE	$0	$246,400	$246,400	Local
							2019	PE	$788,480	$197,120	$985,600	STP-U
							2019	C	$891,520	$222,880	$1,114,400	STP-U
							Total		$10,508,435	$36,533,274	$47,041,709	
1400131	**IN 335**		Construct a small structure replacement project on IN 335, 1.27 miles north of US 150 over unnamed tributary to Richland Creek.	2317	Floyd	INDOT						
							2017	PE	$122,560	$30,640	$153,200	STP-ST
							2020	C	$208,800	$52,200	$261,000	STP-ST
							Total		$331,360	$82,840	$414,200	
1400142	**I- 65**		Small structure pipe lining 1.62 miles north of IN 160.	2396	Clark	INDOT						
							2019	C	$406,800	$45,200	$452,000	IM
							Total		$406,800	$45,200	$452,000	
1400461	**IN 111**		Bridge Deck Overlay on IN 111 over I-265.	2140	Floyd	INDOT						
							2015	PE	$16,000	$4,000	$20,000	STP-ST
							2016	C	$233,375	$58,344	$291,719	IM
							Total		$249,375	$62,344	$311,719	

County List: All Regulated Criteria Pollutants

County Name	Area	Pollutant	Date Designated Nonattainment	Effective Date of Nonattainment Designation	Nonattainment Classification Type (if applicable)	State Implementation Plan Due (if applicable)	Attainment Date (5 Yrs. from Effective Date of Designation) (if applicable)	Date Reclassified to Attainment w/Maintenance Plan (if applicable)	Date Maintenance Plan is to be Revised (8 Yrs. after being Redesignated) (if applicable)	Notes
Allen	Entire County	1-Hour Ozone	3/3/1978	3/3/1978				5/4/1984		The 1-hour ozone standard was revoked effective June 15, 2005. An updated maintenance plan was never done for this county since the 1-hour standard was replaced by the 8-hour standard.
Allen	Entire County	8-Hour Ozone (1997)	4/15/2004	6/15/2004	Basic	6/15/2007	6/15/2009	2/12/2007		The 1997 8-hour ozone standard was revoked in the March 6, 2015 Federal Register (FR) published at 80 FR 12264 with an effective date of April 6, 2015. Therefore, an updated maintenance plan is no longer required.
Boone	Entire County	8-Hour Ozone (1997)	4/15/2004	6/15/2004	Basic	6/15/2007	6/15/2009	10/19/2007		The 1997 8-hour ozone standard was revoked in the March 6, 2015 Federal Register (FR) published at 80 FR 12264 with an effective date of April 6, 2015. Therefore, an updated maintenance plan is no longer required.
Clark	Entire County	1-Hour Ozone	3/3/1978 11/15/1990	1/6/1992	Moderate	1/6/1995	1/6/1997	11/23/2001		The 1-hour ozone standard was revoked effective June 15, 2005. An updated maintenance plan was never done for this county since the 1-hour standard was replaced by the 8-hour standard.
Clark	Entire County	8-Hour Ozone (1997)	4/15/2004	6/15/2004	Basic	6/15/2007	6/15/2009	7/19/2007		The 1997 8-hour ozone standard was revoked in the March 6, 2015 Federal Register (FR) published at 80 FR 12264 with an effective date of April 6, 2015. Therefore, an updated maintenance plan is no longer required.

County List: All Regulated Criteria Pollutants

County Name	Area	Pollutant	Date Designated Nonattainment	Effective Date of Nonattainment Designation	Nonattainment Classification Type (if applicable)	State Implementation Plan Due (if applicable)	Attainment Date (5 Yrs. from Effective Date of Designation) (if applicable)	Date Reclassified to Attainment w/Maintenance Plan (if applicable)	Date Maintenance Plan is to be Revised (8 Yrs. after being Redesignated) (if applicable)	Notes
Clark	Charlestown, Jeffersonville, Silver Creek, and Utica Townships	24-Hour TSP	3/3/1978 10/5/1978 (Primary) 4/22/1985 (Jefferson Township designation changed to secondary attainment)							Charlestown, Silver Creek, and Utica Townships redesignated to attainment on November 2, 1982. TSP designations removed from the Code of Federal Regulations on June 16, 1997.
Clark	Entire County	Annual $PM_{2.5}$ (1997)	12/17/2004	4/5/2005	Basic	4/5/2008	4/5/2010	9/9/2016		The 1997 annual fine particles standard was revoked in the August 24, 2016 Federal Register (FR) published at 81 FR 58010 with an effective date of October 24, 2016. Therefore, an updated maintenance plan is no longer required.

Appendix H: Noise

- INDOT Approval – January 24, 2018
- Noise Analysis and Report (Excerpts) – January 19, 2018

From:	Hope, Briana
To:	Boits, Leah
Subject:	Fwd: Des No. 1382612, Heavy Haul Transportation Corridor, Clark County, Indiana (Noise Report)
Date:	Wednesday, January 24, 2018 8:45:05 AM
Attachments:	image001.png image002.png image003.png image004.png

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Sent from my iPhone

Begin forwarded message:

From: "Miller, Brandon" <BraMiller1@indot.IN.gov>
Date: January 24, 2018 at 7:50:37 AM EST
To: Kurt Fowerbaugh <kfowerbaugh@journeyeng.com>, "CHRISP@ucindy.com" <CHRISP@ucindy.com>
Cc: "Bales, Ronald" <rbales@indot.IN.gov>, "Heustis, Ronald" <RHEUSTIS@indot.IN.gov>, "Nichols, Angela L" <ANichols@indot.IN.gov>, "Jeromy.Richardson@ucindy.com" <Jeromy.Richardson@ucindy.com>, "bhope@structurepoint.com" <bhope@structurepoint.com>
Subject: Des No. 1382612, Heavy Haul Transportation Corridor, Clark County, Indiana (Noise Report)

A traffic noise analysis report was completed by Journey Engineering in January 2018 to evaluate potential traffic noise impacts for the proposed Heavy Haul Transportation Corridor Project in Clark County, Indiana. Traffic noise was evaluated at all receptors within 500 feet of edge of pavement within the study area. Traffic noise levels were evaluated for the existing (2010) and projected (2040) traffic volumes for the build alternative.

This report evaluated potential noise impacts for the proposed improvements for the Heavy Haul Transportation Corridor project in compliance with the Federal Highway Administration's (FHWA) Procedures for Abatement of Highway Traffic Noise and Construction Noise as presented in the Code of Federal Regulations, Title 23 Part 772 (23 CFR 772) and the Indiana Department of Transportation (INDOT) *Traffic Noise Analysis Procedure* (2017).

Existing modeled (2010) peak hour noise levels ranged from 29.4 to 51.9 dB(A). Based on noise measurements taken, there is more ambient noise from existing industrial activities than from traffic sources. As a result, the existing noise measurements were averaged for an existing base peak noise level of 51.7 dB(A). Predicted design year (2040) noise levels would approach or exceed the Noise Abatement Criteria (NAC) at 2 (two) receptors, resulting in the need to evaluate noise abatement. A third receptor would exceed the NAC but it is a planned relocation. Noise abatement was analyzed, however no noise barrier met both the feasibility and reasonableness criterion established by the INDOT *Traffic Noise Analysis Procedure* (2017).

Based on the studies thus far accomplished, the State of Indiana has not identified any locations where noise abatement is likely. A re-evaluation of the noise analysis will occur during final design. If during final design it has been determined that conditions have changed such that noise abatement

is feasible and reasonable, the abatement measures might be provided. The final decision on the installation of any abatement measure(s) will be made upon the completion of the project's final design and the public involvement process.

This email will serve as INDOT's approval of the traffic noise analysis report for the Heavy Haul Transportation Corridor Project (Des 1382612).

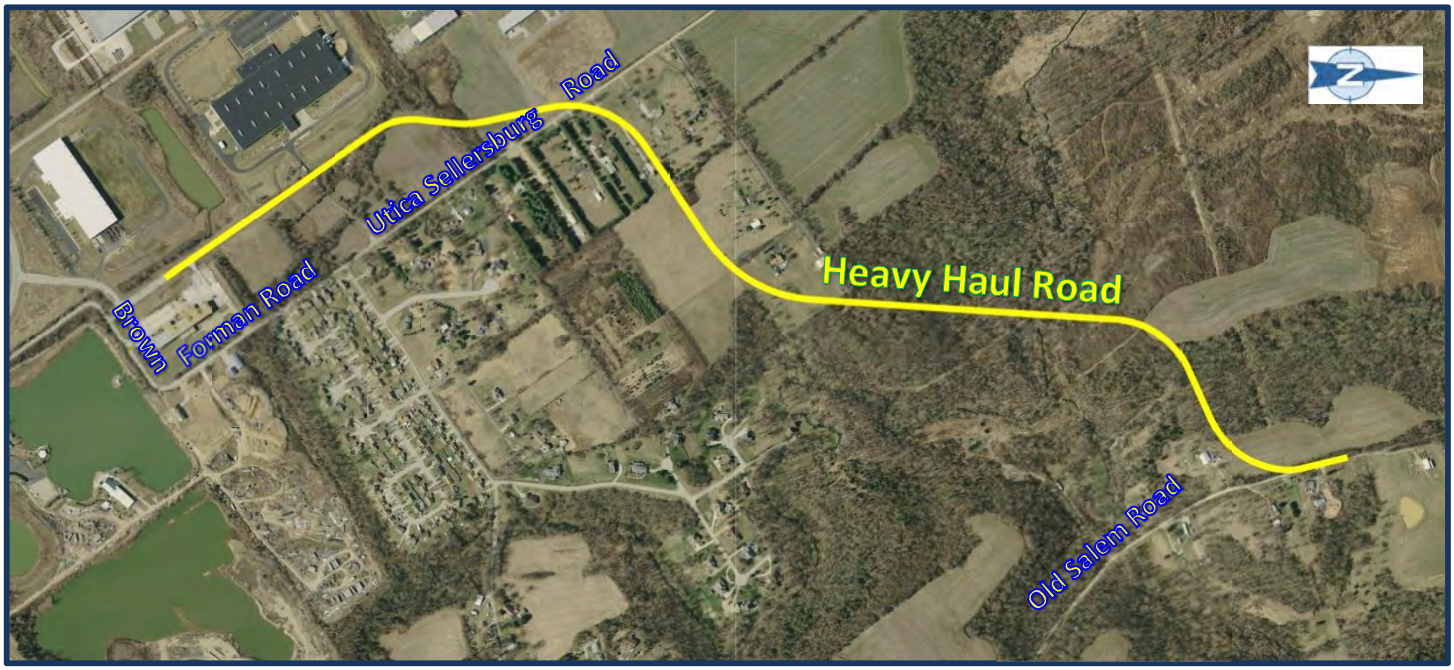
Brandon Miller
Major Projects/LPA Review Liaison
INDOT Environmental Services
100 N. Senate Ave., Rm. 642
Indianapolis, IN 46204
Office: (317) 234-5108
Email: bramiller1@indot.in.gov

Noise Analysis & Report

Heavy Haul Transportation Corridor

Clark County, Indiana

INDOT DES. #1382612



Prepared by: Kurt Fowerbaugh, P.E.

Date: January 19, 2017

KURT E. FOWERBAUGH
REGISTERED
No. 19900634
STATE OF INDIANA
PROFESSIONAL ENGINEER

JOURNEY ENGINEERING

Executive Summary

The Indiana Department of Transportation (INDOT), in partnership with the Federal Highway Administration (FHWA), the Indiana Economic Development Corporation (IEDC), the Ports of Indiana (Port), the Board of Commissioners of Clark County (Clark County), the City of Jeffersonville Redevelopment Commission (Jeffersonville), and the River Ridge Development Authority (RRDA) is in the process of constructing Segment B of the Heavy Haul Transportation Corridor (HHTC) in the southern central portion of Clark County, Indiana. Preliminary corridor studies have identified an approximately 1.3 mile wide corridor between the Port of Indiana, Jeffersonville and recently constructed State Road 265 to establish roadway alignments for the HHTC. The main proposed scope items on this project include construction of the HHTC on new terrain alignments, building a bridge for the HHTC crossing at Lentizer Creek, tying current dead end commercial development roads into the HHTC alignment, and constructing cul-de-sacs for local surface roads that are intercepted by new HHTC alignments. Refer to Figure 1 for a comprehensive project site map.

Due to the construction of new terrain roadways, the proposed project improvements are categorized as a Type I project from criteria set forth by the FHWA and INDOT. Therefore, in accordance with 23 CFR Part 772-*Procedures for Abatement of Highway Noise* and the INDOT Traffic Noise Policy approved by FHWA effective July 1, 2017, a noise impact analysis is required as part of project development.

All receptors of noise (dwelling, office, commercial building, undeveloped lands, etc.) within 500 feet of the proposed construction of the HHTC were identified and classified according to land uses and applicable noise abatement criteria (NAC). Identified receptors were incorporated into the project's traffic noise model as generated by the Federal Highway Administration Traffic Noise Model, Version 2.5 (FHWA-TNM). Existing noise levels were applied based on ambient sound measurements taken from representative receptor locations. Future noise levels were generated from projected traffic volumes (2040) and proposed edges of pavement for the developed HHTC alignment.

If future noise levels impact identified receptors, possible abatement of traffic noise impacts will be evaluated to accomplish specific noise reduction goals. FHWA defines highway traffic noise impacts as: 1) projected traffic noise levels approach or exceed the NAC specified, or 2) projected traffic noise levels substantially exceed existing traffic noise levels in an area. INDOT further defines a substantial noise level growth as an increase of at least 15.0 dB(A) between existing and future noise levels.

The goal of any proposed noise abatement measure is to satisfy what has been defined as the "Noise Reduction Design Goal". For Type I projects, INDOT defines this Noise Reduction Design Goal as reducing noise levels at least 7 dB(A) for a majority (> 50%) of benefited first row receptors.

Furthermore, first row receptors have been defined as the first parcel that exhibits the qualities of a receptor that is directly adjacent to the roadway.

Noise abatement measures incorporated into Type I projects must be both *feasible* and *reasonable*. There are two components to a feasible determination; acoustic feasibility and engineering feasibility. To satisfy the acoustic feasibility benchmarks, INDOT requires proposed noise barriers provide at least a 5.0 dB(A) reduction in future traffic noise levels for a majority of the impacted receptors. To meet engineering feasibility criteria, the physical location and geometry of noise barriers including offsets, heights, and lengths are considered for optimum noise absorption performance.

The reasonableness of noise abatement measures is firstly based on cost effectiveness of construction. INDOT considers proposed noise abatement measures reasonable if the construction year cost of the proposed noise barriers is no more than $30,000 per benefited receptor for new terrain construction. Results from opinion surveys of benefited receptors (residents and property owners) can also factor into the final determination of reasonableness for any proposed noise barriers.

This project's traffic noise model identified twenty-seven (27) receptors within 500 feet of the proposed HHTC alignment. Of the total identified study area receptors, three (3) are planned for relocations as part of the project construction. A summary of project receptors is included in Table 2. Of the twenty-four (24) remaining receptors, two are predicted to experience future traffic noise impacts. These receptors are classified as residential and are projected to experience a future traffic noise level equal to or above 66.0 dB(A). These future noise levels are within 1.0 dB(A) of the NAC defined value of 67.0 dB(A) for Activity Category B.

The presence of existing ambient noise from nearby industrial operations also limits the feasibility of noise barriers. As evidenced by ambient noise measurements, the existing traffic noise from modeling underrepresented existing noise levels throughout the project site. An average value of five out of six existing ambient noise measurements is 51.7 dB(A). Only three receptor locations have existing traffic noise levels within three dB(A) of the average ambient noise measurement. The existing modeled noise levels for the remaining twenty-four (24) receptors ranged from 28.9 dB(A) to 46.2 dB(A). As a result of this increased ambient noise level, the average existing noise levels were assumed to be the existing average noise level.

All developed land uses and activities near the project site will be affected by noise generated from the contractor's equipment during construction of the HHTC. To minimize these temporary noise impacts, the contractor should operate and maintain all equipment in compliance with all Federal, state and local applicable rules and regulations.

With only two impacted receptors remaining after construction is complete the issue of feasibility was examined with potential noise barrier wall geometry at each impacted receptor. Proposed noise barrier geometry included a horizontal alignment near the 16'-0" clear zone (roadway on fill) and wall heights varying from thirteen to sixteen feet. Providing uninterrupted lengths of noise barrier at both impacted receptor locations can result in noise reductions that satisfy the feasibility goal of 7.0 dB(A). However, the noise barrier heights and lengths required to meet feasibility criteria at each location has a corresponding construction cost that exceeds the cost-effectiveness criteria established for reasonability.

In summary, noise abatement measures in the form of two separate noise barriers for the potential benefit of the two impacted receptors are feasible but the cost of noise abatement is not reasonable. We do ***not*** recommend noise barriers be constructed as a part of this project.

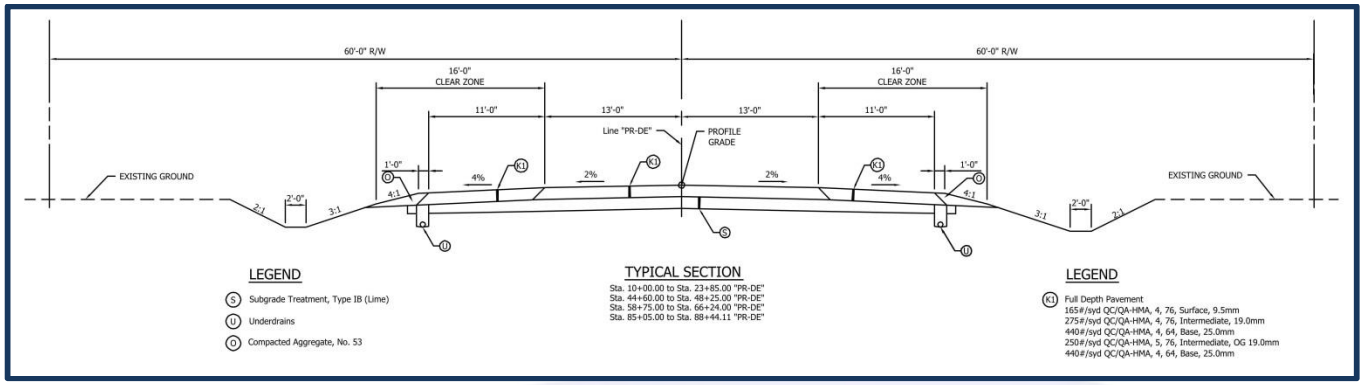


Figure 2: Proposed Section for Heavy Haul Transportation Corridor

The proposed pavement configuration for HHTC shown in Figure 2 consists of 13-foot through lanes in each direction bordered by 11-foot paved shoulders. A proposed intersection where HHTC intercepts Utica Sellersburg Road and the extension of New Middle Road will be controlled with stop signs for Utica Sellersburg Road and New Middle Road. All signage and pavement markings will be updated and in accordance with the current Indiana Manual on Uniform Traffic Control Devices (MUTCD) as published by INDOT.

Traffic Noise Calculations

This noise analysis and report quantifies traffic noise impacts to sound receptors (dwellings, offices, commercial buildings, etc.) within the study area. Existing ambient noise levels are measured in accordance with FHWA guidance for "Existing Noise Measurements in the Vicinity of Highways" and future traffic noise levels are predicted within the model from forecast traffic volumes. Existing ambient noise levels and future traffic noise levels for each receptor are considered for "traffic noise impacts". As defined by FHWA, a highway traffic noise impact occurs when the projected highway traffic noise levels approach or exceed the noise abatement criteria in 23 CFR 772, or the projected highway traffic noise levels substantially exceed existing ambient noise levels in the study area.

The FHWA-TNM is required for use in all highway traffic noise analysis projects on federally funded projects. Any numeric modeling effort is inherently limited to the assumptions and inputted values and represents a simplification of actual environments. The modeling results are affected by the internal calculations used to solve noise equations and the accuracy of inputted values such as receptor elevations, traffic data, and surrounding terrain characteristics.

Traffic Data

Future traffic data splits for HHTC came from forecasted traffic volumes in 2040 as shown on the title sheet of the proposed construction plans. Hourly traffic volumes input into FHWA-TNM are separated

into automobiles, heavy and medium trucks, buses, and motorcycles. Existing and future traffic data splits for Utica Sellersburg Road, Brown Forman Road, and Old Salem Road were provided by United Consulting and utilized for existing and future traffic noise levels. The FHWA-TNM input values for this project attributed to automobiles, medium trucks, and heavy trucks were determined by calculating the Design Hourly Volume (DHV) with a K-factor of 12% or 15% applied to the Average Daily Traffic (ADT) values provided. A summary of each roadway's traffic count data is presented in Appendix B. Intersecting roads within the study area are New Middle Road, Utica Sellersburg Road, and Old Salem Road.

Classification of Receptors

Based on FHWA's descriptions of land use activity for potential receptors, an NAC value is assigned to each receptor identified within the study area. Table 1 includes a complete description of activity categories. The study area extends 500 feet from proposed edges of pavement of HHTC and includes twenty-seven (27) total receptors. Land use in the study area includes manufacturing, industrial, warehousing, residential, and undeveloped lands. Due to construction of HHTC on a new terrain alignment, some existing receptors are planned for relocation as part of the construction project. A summary of receptors by activity category is included in Table 2 on the following page.

Activity Category	NAC	Activity Description
A	**57** *(exterior)*	Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose.
B	**67** *(exterior)*	Residential
C	**67** *(exterior)*	Active sport areas, amphitheaters, auditoriums, campgrounds, cemeteries, daycare centers, hospitals, libraries, medical facilities, parks, picnic areas, places of worship, playgrounds, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, recreation areas, Section 4(f) sites, schools , television studios, trails, and trail crossings.
D	**52** *(interior)*	Auditoriums, day care centers, hospitals, libraries, medical facilities, places of worship, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, schools, and television studios.
E	**72** *(exterior)*	Hotels, motels, offices, restaurants/bars, and other developed lands, properties or activities not included in Activity Category A, B, C, D or F.
F	-	Agriculture, airports, bus yards, emergency services, industrial, logging, maintenance facilities, manufacturing, mining, rail yards, retail facilities, shipyards, utilities (water resources, water treatment, electrical), and warehousing.
G	-	Undeveloped lands that are not permitted.

Table 1: Noise Abatement Criteria (NAC)

Activity Category	Total # of Receptors	
	Existing	Future
A	0	0
B	17	14
C	0	0
D	0	0
E	0	0
F	6	6
G	4	4
∑ =	**27**	**24**

Table 2: Summary of Study Area Receptors

A single family residence is evaluated as a single receptor regardless of the number of occupants. A commercial or office building is considered a single receptor notwithstanding the size or business type. Manufacturing and industrial facilities within the study area were added to the modeling for informational purposes. Undeveloped lands without permitting or foundations in place were also added to the modeling for informational purposes. These manufacturing facilities and undeveloped properties are not evaluated for noise impacts since there is no NAC established for these parcels. There are no public parks, trails, or multiple occupancy dwellings such as apartments or hotels within the study area. A complete, detailed listing of study area receptors is included in Appendix C.

Determination of Existing Noise Levels

Ambient noise measurements representing common noise environments were taken August 29, 2017 between 9:00 AM and 12:30 PM to provide a baseline for existing noise levels to compare with predicted existing traffic noise levels from the traffic noise model. Noise measurements were taken at six representative locations throughout the project length with a Quest Technologies model 2800 integrating sound level meter. Field measurement data sheets for each ambient noise measurement location are included in Appendix E. Ambient noise measurements taken August 29, 2017 were significantly above existing traffic noise values from the FHWA-TNM modeling. A consistent and prevalent noise source during these measurements was flying insects such as crickets and/or cicadas. A second round of ambient noise measurements were taken November 16, 2017 to quantify the seasonal influence from the insects. Sound readings without insects measured 7.3 dB(A) to 18.8 dB(A) lower than readings with insects present. A summary of ambient noise measurements within the study area is offered in Table 3 on the following page.

Traffic volumes for 2010 were provided to United Consulting by the Kentuckiana Regional Planning & Development Agency (MPO). These volumes were modeled for Utica Sellersburg Road, Old Salem Road, and Brown Forman Road to generate existing noise levels. The existing traffic modeling produced noise values ranging from 28.9 dB(A) to 51.9 dB(A).

During both the August 2017 and the November 2017 field measurements, there was continual and appreciable noise originating from the variety of manufacturing and industrial activities occurring adjacent to the Port of Indiana and the Clark Maritime Center. Other outside influences included a number of commercial aircraft descending from points north of the sampling sites toward Louisville International Airport to the south. These activities proved to be a considerable influence on noise levels throughout the study area and yielded ambient noise readings between 49.5 dB(A) and 57.7 dB(A). These ambient readings clearly exceeded all but one existing noise levels predicted by FHWA-TNM inputs.

Location	Noise Levels (dB(A))			Outside influences
	8/29/2017	11/16/2017	Modeled	
#11) 1702 Utica Sellersburg Road	67.0	49.7	44.5	*industrial activities, aircraft*
#3) 1722 Utica Sellersburg Road	65.5	54.0	38.1	*industrial activities, aircraft*
#14) 5171 Maritime Road	68.3	49.5	34.3	*Industrial activities*
#24) 1415 Old Salem Road	65.0	57.7	40.5	*Contractor paving Old Salem Road*
#18) New Middle Road cul-de-sac	65.1	53.2	37.6	*Industrial activities*
#22) new terrain HHTC alignment	65.7	52.1	28.9	*SR 265 to the north*
Noise $level_{avg}$ *(excluding #24)* =		51.7		

Table 3: Ambient Noise Measurements

The ambient noise measurements taken August 29, 2017 were disregarded due to inflated readings from flying insects such as crickets and/or cicadas. The measurements taken November 16, 2017 were more representative of principal ambient noise levels from existing traffic volumes, manufacturing, and industrial activities. Due to the differences between noise levels predicted by existing traffic volumes influences and the November 2017 ambient noise measured from non-traffic related sources, an average value of ambient noise measurements should be considered for "substantial noise increase" impacts to receptors. The average ambient noise measurement value should not include the reading that was elevated by contractor operations paving Old Salem Road at the time noise levels were sampled. Therefore, the overall existing noise level to be used for evaluation of substantial noise increases (≥ 15 dB(A)) at each receptor should be 51.7 dB(A).

Validation of the model created for this project considered the ambient measurement locations with respect to existing roadways and external noise sources. Five of six ambient measurement locations were within 3.0 dB(A) of the model when adjusted for external noise sources as shown below.

Location	Noise Levels (dB(A))			
	Ambient Measurement	Noise Model Output	Adjusted Model Output	Difference
#11) 1702 Utica Sellersburg Road	49.7	44.5	52.5	2.8
#3) 1722 Utica Sellersburg Road	54.0	38.1	51.9	-2.1
#14) 5171 Maritime Road	49.5	34.3	51.8	2.3
#24) 1415 Old Salem Road	57.7	40.5	52.0	-5.7
#18) New Middle Road cul-de-sac	53.2	37.6	51.9	-1.3
#22) new terrain HHTC alignment	52.1	28.9	51.7	-0.4

Table 4: Noise Modeling Validation

Contractors were working on Old Salem Road at the time ambient measurements were taken for the sixth location (#24). The external influences from the asphalt paving operations distorted the ambient readings and precluded this location from model validation. For these reasons, the noise model is considered valid.

Prediction of Future Noise Levels

Future traffic noise levels were calculated with FHWA-TNM for each identified receptor with proposed edges of pavement, proposed profile grades, projected traffic volumes, design speeds, and receptor elevations inputted into the traffic noise model. Future traffic noise levels for receptors that are planned for removal during construction were still calculated as a means to verify output with expected results. The future traffic noise levels calculated by FHWA-TNM are listed by receptor in Appendix C and the actual output from FHWA-TNM is contained in Appendix D. Appendix C also tabulates noise level increases for each receptor that were considered to determine if any receptors experience future noise level increases at or above 15 dB(A), INDOT's definition of substantial noise increase.

Three (3) residential receptors within the study area are predicted to experience future traffic noise levels within 1.0 dB(A) or above the prescribed NAC value of 67.0 dB(A). One of the receptors, located at 1722 Utica Sellersburg Road is a single family residence located immediately adjacent to the proposed HHTC alignment and will be relocated as part of the proposed construction. A second receptor, located at 1726 Utica Sellersburg Road, is also a single family residence located immediately adjacent to the

proposed HHTC alignment. This receptor has a predicted noise level of 66.4 dB(A); above the cutoff INDOT has defined as an impacted receptor. A third receptor, located at 1415 Old Salem Road, is also a single family residence with a predicted noise level of 69.2 dB(A). This location is also predicted to experience a "substantial increase" in future noise of 17.5 dB(A). The two impacted receptors that will remain after roadway construction is complete are separated by 4,500 feet and would require separate noise abatement evaluations.

Noise Abatement Measures

The most common form of traffic noise abatement specified by INDOT is the construction of noise barriers. Other forms of abatement measures such as buffering land, berms or vegetation are evaluated on a case by case basis. Given the proximity of existing residences to impacted receptors, buffering land is not realistic. Also, current project right-of-way limits and project topography don't offer enough sufficient areas to construct berms or plant satisfactory vegetation to effectively screen impacted receptors.

Noise abatement measures incorporated into Type I projects must be both *feasible* and *reasonable*. There are two components to a feasible determination; acoustic feasibility and engineering feasibility. To satisfy the acoustic feasibility benchmarks, INDOT requires proposed noise barriers provide at least a 5 dB(A) reduction in future traffic noise levels for a majority of the impacted receptors. To meet engineering feasibility criteria, the physical location and geometry of noise barriers including offsets, heights, and lengths are considered for optimum noise absorption performance.

The reasonableness of noise abatement measures is based on cost effectiveness of construction. INDOT considers proposed noise abatement measures reasonable if the construction year cost of the proposed noise barriers is no more than $30,000 per benefited receptor for new terrain construction. Results from opinion surveys of benefited receptors (residents and property owners) can also play a role in the determination of reasonableness for proposed noise barriers.

On this project, the geometry of proposed noise barriers for both impacted receptors on the project were evaluated first for acoustic feasibility goals. Because HHTC alignments are proposed as fill sections in the vicinity of the impacted receptors, horizontal alignments of the noise barrier were located just outside the 16'-0" clear zone. The proposed noise barrier benefiting receptor #4 meets the 7 dB(A) design goal for feasibility with an average height of 15.57 feet and a length of 732 feet. The resulting construction cost of $341,977 per benefited receptor exceeds the reasonable cost threshold of $30,000. The proposed noise barrier benefiting receptor #24 meets the 7 dB(A) design goal with an average height of 13.49 feet for 428 feet in length. The resulting construction cost for this proposed barrier is $173,444 and also exceeds the reasonable cost threshold. Therefore, a noise barrier is not reasonable for either receptor.

Recommendations

In accordance with INDOT's Traffic Noise Policy, Journey Engineering has conducted a traffic noise analysis and report for the Heavy Haul Transportation Corridor project between the Port of Indiana, Jeffersonville and Old Salem Road in south central Clark County, Indiana. Based on the results of the traffic noise model and in agreement with INDOT's Traffic Noise Policy, Journey Engineering ***does not recommend construction of noise abatement measures as a part of this project***.

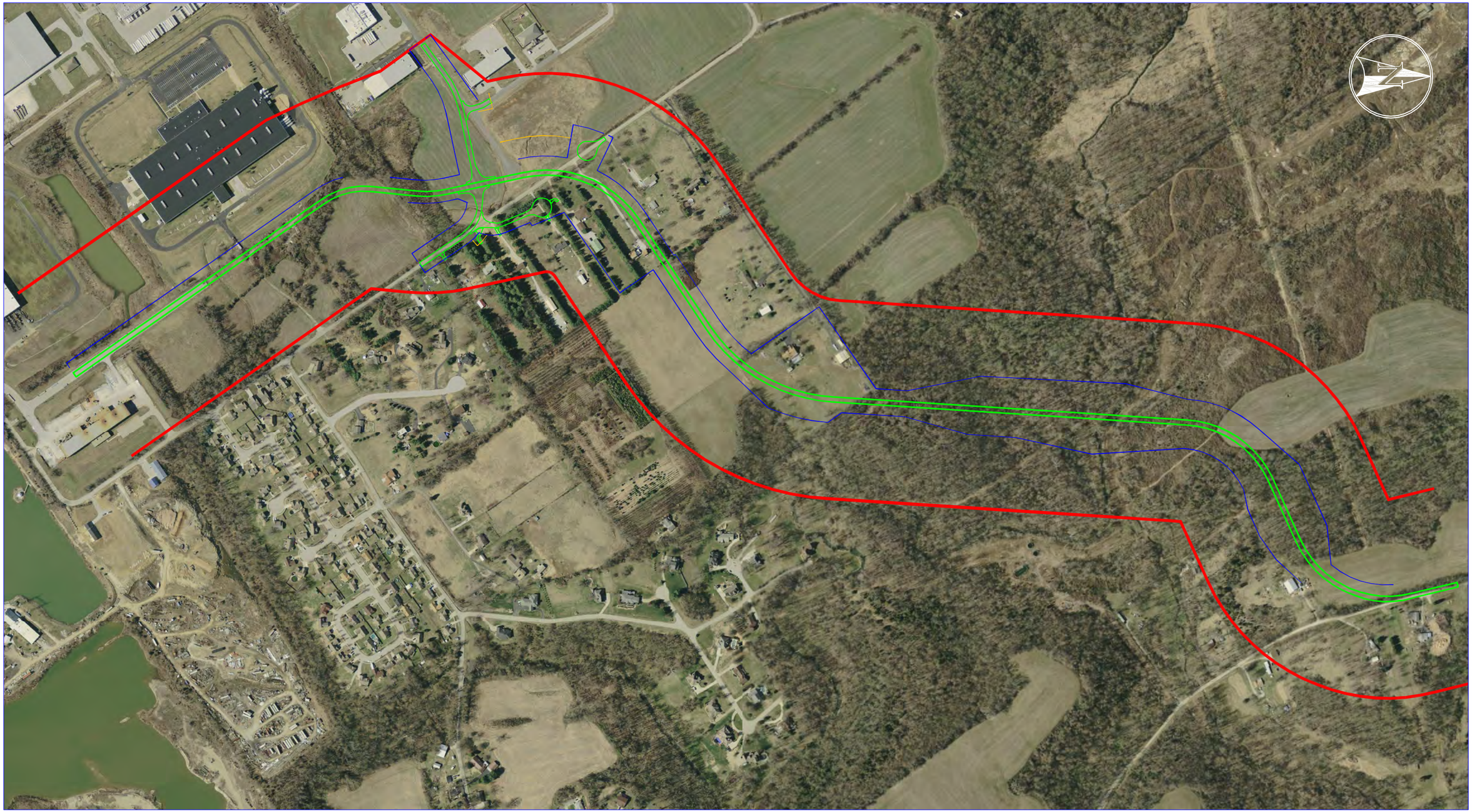
Statement of Likelihood [1]

Based on the studies thus far accomplished, the State of Indiana has not identified any locations where noise abatement is likely. Noise abatement measures that were studied at these locations were based upon preliminary design costs and design criteria. Noise abatement has not been found to be reasonable based on noise abatement construction costs exceeding the established cost-effective criteria. A re-evaluation of the noise analysis will occur during final design. If during final design it has been determined that conditions have changed such that noise abatement is feasible and reasonable, the abatement measures might be provided. The final decision on the installment of any abatement measure(s) will be made upon the completion of the project's final design and the public involvement processes.

[1] INDOT Traffic Noise Analysis Procedure, July 2017, page 9

Appendix A

Site Maps with Receptors



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0 250 500

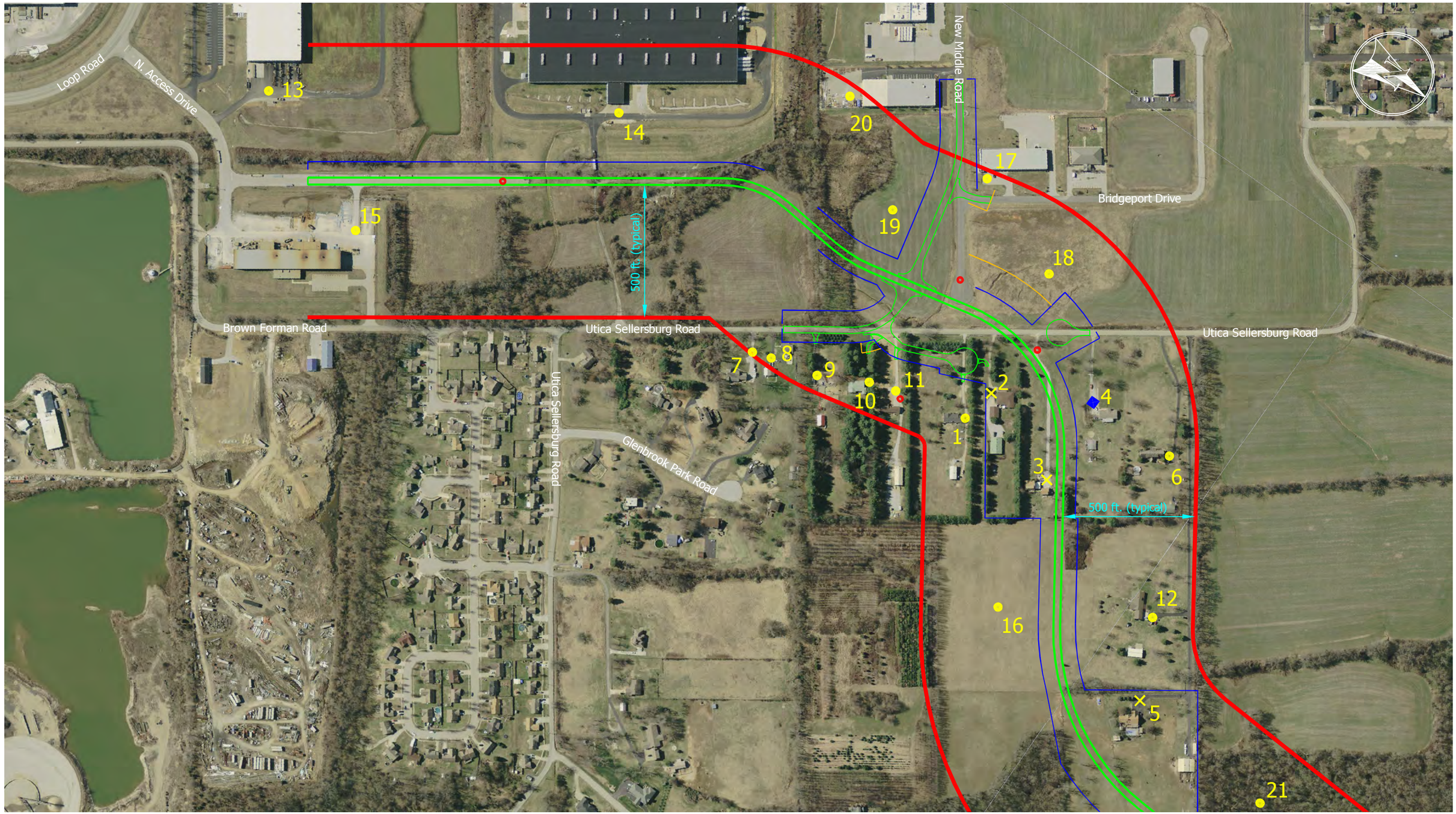
LEGEND

- Noise Analysis Study Area
- Edge of Proposed Travel Lanes
- Proposed Right-of-Way
- Temporary Right-of-Way

INDIANA
DEPARTMENT OF TRANSPORTATION

HEAVY HAUL TRANSPORTATION CORRIDOR
NOISE ANALYSIS STUDY AREA

SCALE	BRIDGE FILE
	DESIGNATION
	1382612
SURVEY BOOK	SHEETS
	of
CONTRACT	PROJECT



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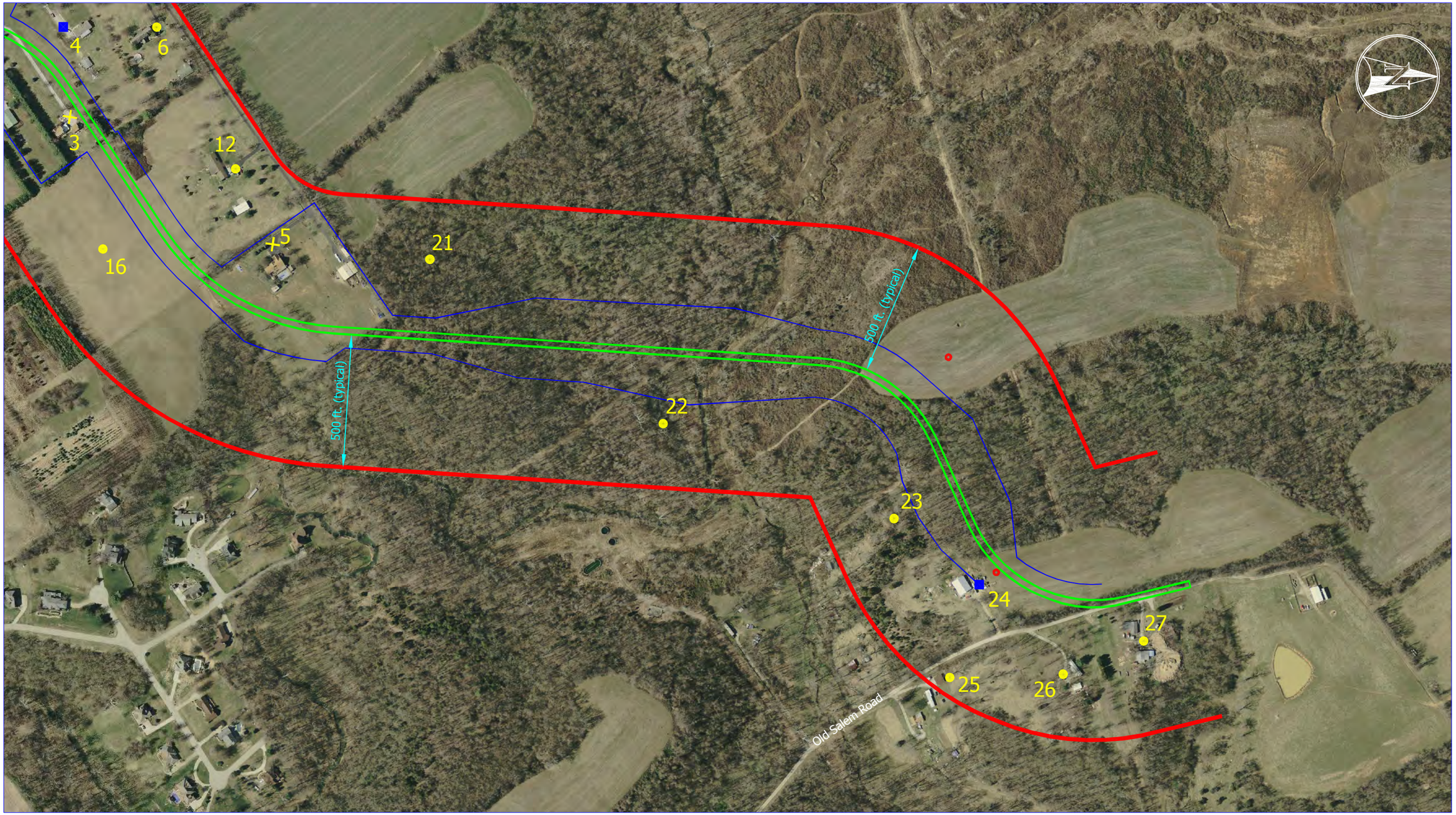
LEGEND

- Noise Analysis Study Area
- Edge of Proposed Travel Lanes
- Proposed Right-of-Way
- Temporary Right-of-Way
- Receptor Location
- Existing Noise Measurement
- Impacted Receptor
- Eliminated Receptor

INDIANA
DEPARTMENT OF TRANSPORTATION

HEAVY HAUL TRANSPORTATION CORRIDOR
NOISE ANALYSIS RECEPTOR LOCATIONS

SCALE	BRIDGE FILE
	DESIGNATION
	1382612
SURVEY BOOK	SHEETS
	of
CONTRACT	PROJECT



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LEGEND

- Noise Analysis Study Area
- Edge of Proposed Travel Lanes
- Proposed Right-of-Way
- Temporary Right-of-Way
- Receptor Location
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- Impacted Receptor
- Eliminated Receptor

INDIANA
DEPARTMENT OF TRANSPORTATION

HEAVY HAUL TRANSPORTATION CORRIDOR
NOISE ANALYSIS RECEPTOR LOCATIONS

SCALE	BRIDGE FILE
	DESIGNATION 1382612
SURVEY BOOK	SHEETS
	of
CONTRACT	PROJECT

Appendix C

Detailed Receptors Summary

Project Receptors Summary

Heavy Haul Transportation Corridor in Clark County, IN (DES No. 1382612)

Receptor #	Existing Noise *(dB)*		Future Noise *(dB)*	Measured Increase	NAC	Owner	Address	Future status	Front Row receptor ?
	Measured	*Modeled*							
1		41.8	62.5	10.8	B	Daniel & Cheri Keller	1706 Utica Sellersburg Road		Yes
2		44.7	65.2	13.5	B	Steven & Bonita Willman	1720 Utica Sellersburg Road	relocated	Yes
3	54.0	38.1	75.5	23.8	B	John & Sandra Clark	1722 Utica Sellersburg Road	relocated	Yes
4		44.2	66.7	15.0	B	Gary & Melinda Romans	1726 Utica Sellersburg Road		Yes
5		30.8	61.8	10.1	B	Stephen & Anne Starck	1804 Utica Sellersburg Road	relocated	Yes
6		33.1	64.7	13.0	B	Roberta Kent	1806 Utica Sellersburg Road		Yes
7		51.9	59.7	8.0	B	John & Cherl Skinner	1608 Utica Sellersburg Road		Yes
8		49.4	59.8	8.1	B	Douglas Womack	1610 Utica Sellersburg Road		Yes
9		46.2	60.3	8.6	B	Brian & Debra Hill	1616 Utica Sellersburg Road		Yes
10		45.6	61.4	9.7	B	Cheryl & Brian Bunn	1622 Utica Sellersburg Road		Yes
11	49.7	44.5	61.5	9.8	B	Floyd & Donna Kittrell	1702 Utica Sellersburg Road		Yes
12		39.4	59.8	8.1	B	Garland & Paulette Oakes	1808 Utica Sellersburg Road		Yes
13		37.9	49.0	-2.7	F	Roll Forming Corporation	1205 Brown Forman Road		Yes
14	49.5	34.3	62.0	10.3	F	Griffin Powell Properties, LLC	5171 Maritime Road		Yes
15		39.8	53.5	1.8	G	State of Indiana	1117 Brown Forman Road		Yes
16		30.7	64.6	12.9	G	Garland & Paulette Oakes	1808 Utica Sellersburg Road		Yes
17		42.9	64.8	13.1	F	JPMC, LLC	4750 New Middle Road		Yes
18	53.2	37.6	58.1	6.4	F	Coldwater Veneer Investments, LLC	1201 Bridgeport Drive		Yes
19		38.7	60.1	8.4	F	Koetter Development, Inc.	4008 Utica Sellersburg Road		Yes
20		46.1	62.6	10.9	G	R K Properies	4750 New Middle Road		Yes
21		29.4	64.7	13.0	F	Arthur & Virginia Sutton	2000 Utica Sellersburg Road		Yes
22	52.1	29.7	65.3	13.6	G	Gilmore Construction, Inc.	New Chapel Road		Yes
23		32.1	63.1	11.4	B	Thomas Stillwell	1311 Old Salem Road		Yes
24	57.7	41.6	69.7	18.0	B	Charles Reven	1415 Old Salem Road		Yes
25		49.6	62.3	10.6	B	Clark County Bd. of Commissioners	1318 Old Salem Road		Yes
26		41.6	63.6	11.9	B	Joe & Peggy Nealy	1508 Old Salem Road		Yes
27		42.5	65.6	13.9	B	James Lee	1510 Old Salem Road		Yes

Average = **51.7**

≥ 66 dB	≥ 15 dB

Receptor numbering generated by FHWA-TNM

NAC = Noise Abatement Criteria

Appendix I: Section 7 Consultation

- USFWS/INDOT Coordination
- Biological Assessment – January 2018

From: Boits, Leah
To: McWilliams, Robin
Cc: michelle.allen@dot.gov; Hilden, Laura; Hope, Briana
Subject: RE: HHTC, Des. No. 1382612 - Section 7
Date: Friday, February 10, 2017 11:49:00 AM

Hi Robin,

Thanks for getting through the review so quickly. We'd like to include Michelle Allen and Laura Hilden (copied) in the conversation about proceeding with Section 7 consultation as it pertains to the gray bat. We were thinking that we could arrange a meeting at INDOT Central Office during the week of February 20th to have this discussion.

If meeting at INDOT works, would everyone let me know their availability that week?

Thank you,
Leah

Leah Boits
Environmental Specialist, Environmental Services Group

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From: McWilliams, Robin [mailto:robin_mcwilliams@fws.gov]
Sent: Thursday, February 09, 2017 11:33 AM
To: Boits, Leah <lboits@structurepoint.com>
Subject: Re: HHTC, Des. No. 1382612 - Section 7

Great, thanks! I sent my supervisor a note today explaining where things currently are on the project. I hope to meet with him to discuss on Monday. My guess is that we will need to do formal consultation for the gray bat but I'll let you know what route is best next week if that is ok.

Robin

Robin McWilliams Munson

U.S. Fish and Wildlife Service
620 South Walker Street
Bloomington, Indiana 46403
812-334-4261 x. 207 Fax: 812-334-4273

Monday, Tuesday - 7:30a-3:00p
Wednesday, Thursday - telework 8:30a-3:00p

On Thu, Feb 9, 2017 at 11:18 AM, Boits, Leah <lboits@structurepoint.com> wrote:

> Hi Robin,
>
> We are still working through the process of evaluating all alternatives, including one that would utilize Port Road. However, we have not developed exhibits for this alternative at this time. We plan to have that alternative assessed and included in the alternatives matrix prior to our next agency meeting.
>
> Thanks,
> Leah
>
> ---
>
> Leah Boits
> Environmental Specialist, Environmental Services Group
>
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> **From:** McWilliams, Robin [mailto:robin_mcwilliams@fws.gov]
> **Sent:** Thursday, February 09, 2017 10:11 AM
>
> **To:** Boits, Leah <lboits@structurepoint.com>

Subject: Re: HHTC, Des. No. 1382612 - Section 7

Thanks Leah. I was wondering if there was any more discussion about developing a Port Road alternative. I know some of the agencies had asked about that as well.

Sincerely,
Robin

Robin McWilliams Munson

U.S. Fish and Wildlife Service
620 South Walker Street
Bloomington, Indiana 46403
812-334-4261 x. 207 Fax: 812-334-4273

Monday, Tuesday - 7:30a-3:00p
Wednesday, Thursday - telework 8:30a-3:00p

On Thu, Feb 9, 2017 at 9:58 AM, Boits, Leah <lboits@structurepoint.com> wrote:

> Robin,
>
> Attached are two photos showing the cave-like feature; the field notebook is placed near the opening for scale. It is worth noting that scat (not guano) was found near the entrance of the karst feature. The opening was approximately 1' high x 1.5' wide. Please let me know if I can get you any additional information at this point in your review.
>
> Thanks,
> Leah
>
> ---
>
> Leah Boits
> Environmental Specialist, Environmental Services Group
>
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From: McWilliams, Robin [mailto:robin_mcwilliams@fws.gov]
Sent: Thursday, February 09, 2017 9:18 AM

To: Boits, Leah <lboits@structurepoint.com>
Subject: Re: HHTC, Des. No. 1382612 - Section 7

Good morning Leah,

I am just curious about the cave-like feature that was discovered and wondered if you had more info on that feature for now.

Thanks,
Robin

Robin McWilliams Munson

U.S. Fish and Wildlife Service
620 South Walker Street
Bloomington, Indiana 46403
812-334-4261 x. 207 Fax: 812-334-4273

Monday, Tuesday - 7:30a-3:00p
Wednesday, Thursday - telework 8:30a-3:00p

On Thu, Feb 9, 2017 at 7:41 AM, Boits, Leah <lboits@structurepoint.com> wrote:

> Hi Robin,
>
> We are scheduled to have the draft karst report ready for agency review by mid- to end of March. Is there any specific karst information you need prior to this date to finish reviewing the Section 7 information that I sent to you?
>
> Thanks,
> Leah
>
> ---
>
> Leah Boits
> Environmental Specialist, Environmental Services Group

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From: McWilliams, Robin [mailto:robin_mcwilliams@fws.gov]
Sent: Wednesday, February 08, 2017 12:24 PM
To: Boits, Leah <lboits@structurepoint.com>
Subject: Re: HHTC, Des. No. 1382612 - Section 7

Will there be a karst report with photos, etc.?
robin

Robin McWilliams Munson

U.S. Fish and Wildlife Service
620 South Walker Street
Bloomington, Indiana 46403
812-334-4261 x. 207 Fax: 812-334-4273

Monday, Tuesday - 7:30a-3:00p
Wednesday, Thursday - telework 8:30a-3:00p

On Wed, Feb 8, 2017 at 12:17 PM, McWilliams, Robin <robin_mcwilliams@fws.gov> wrote:

> HI Leah,
>
> Do you have a map of all of the karst features that were found?
>
> Robin
>
> Robin McWilliams Munson
>
> U.S. Fish and Wildlife Service
> 620 South Walker Street
> Bloomington, Indiana 46403

812-334-4261 x. 207 Fax: 812-334-4273

Monday, Tuesday - 7:30a-3:00p
Wednesday, Thursday - telework 8:30a-3:00p

On Thu, Jan 26, 2017 at 4:35 PM, Boits, Leah <lboits@structurepoint.com> wrote:

Robin,

Please find attached documents related to Section 7 Coordination for the above-referenced project. The following documents are included for your review and comment:

- Scoping Worksheet for the Indiana Bat and Northern Long-Eared Bat Range-Wide Programmatic Informal Consultation
- USFWS Official List of Species as requested through IPaC
- Bat Mist Net Survey Report prepared by Eco-Tech Consultants, Inc.
- Karst Feature mapping

Because three of the questions in Step 1 of the Scoping Worksheet resulted an answer of "yes," (Numbers 1, 2, and 5), the project is not covered by the range-wide programmatic informal consultation and per the instructions, the rest of the worksheet was not completed. Due to these results, a Bat Mist Survey was completed in July 2016. Eleven bats of three species were captured during the mist net survey, including five federally endangered gray bats. No Indiana bats or northern long-eared bats were captured. Due to the findings of the Mist Net Survey, we believe the project "May Affect, Not Likely to Adversely Effect – Without Avoidance and Minimization Measures" the Indiana bat and/or NLEB.

Since the completion of the Mist Net Survey, the fieldwork for karst investigation has been completed (December 19, 2016). Karst features identified within the Heavy Haul Transportation corridor primarily consisted of springs and subsidence-type sinkholes. However, one karst feature appeared to possess an open conduit into the subsurface which could possibly provide habitat for gray bats. This karst feature is highlighted on the attached mapping and is within two of the proposed alignments (Alignments D & E). No other karst features (caves/cave entrances, blind valleys, swallets or other insurgence features) were identified within the study area. Please note that Alternative DE (light pink) is a new alignment that is being considered based off of the comments received after the May 2016 agency meeting.

After your review, we would like to schedule a meeting to discuss the findings of the Mist Net Survey and Karst Study and how to proceed with Section 7 Consultation considering the presence of the gray bat within the study area. Please

let us know if you have any issues accessing the documents or if additional information is needed.

Thank you,
Leah

Leah Boits
Environmental Specialist, Environmental Services Group

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SCOPING WORKSHEET

INDIANA BAT AND NORTHERN LONG-EARED BAT RANGE-WIDE PROGRAMMATIC INFORMAL CONSULTATION

Complete the following steps to determine whether a project is within the scope of the range-wide programmatic informal consultation and to identify potential project effects on either the Indiana bat or Northern long-eared bat. The following information is needed to complete this form: project scope (including any construction methods to be used), project location, habitat characterization, completed survey results, and Avoidance and Minimization Measures (AMMs) to be included in the project.

STEP 1: PROGRAMMATIC SCOPE (Users Guide p. 3)

If answers to any of these questions are "yes", the project is NOT covered by the range-wide programmatic informal consultation. Proceed no further in completing this worksheet. Separate consultation with the appropriate Service field office is necessary. If answers to all of the questions are "no", proceed with Step 2 of this Worksheet.

	Yes	No
1. Will the project construct a new road corridor (new alignment, not minor realignments)?	X	
2. Will project activities impact suitable forest habitat for bats > 100 feet from existing road/rail surfaces *at any time of year* (unless summer bat Presence/Probable Absence (P/A) surveys are negative)?	X	
3. Will the project raise the road profile above the tree canopy within 1,000 feet of known summer habitat (based on documented roosts and/or captures)?		X
4. Is the project within 0.5 mile of hibernacula (including Indiana bat critical habitat) and 1) include construction activities extending outside the existing road/rail surface or 2) include construction activities wholly within the existing road/rail service but include percussive or other activities that increase noise above existing traffic/background levels?		X
5. Will the project clear suitable forest habitat at any distance from a road during the active season[1] for bats (unless summer bat P/A surveys are negative)?	X	
6. Will the project remove documented roosts or foraging areas/travel corridors (based on radio telemetry) *at any time of year* or remove trees within 0.25 miles of documented roosts *at any time of year?*		X
7. Bridge Projects *at any time of year*: (a) Will the project remove a bridge with bat colonies known to be roosting under the bridge? (b) Will the project modify a bridge with bat colonies known to be roosting under the bridge so that it is no longer suitable for roosting?		X
8. Will bridge or structure maintenance activities likely disturb bats while bats are documented to be present?		X

STEP 2: POTENTIAL PROJECT EFFECTS

No Effect (NE) (User's Guide p. 4)

If answers to any of the criteria below are "yes" the project will have "No Effect" on the Indiana bat and/or NLEB. Stop here. Document "no effect" on the Project Submittal Form (Appendix B of the User Guide) and retain for your files. No coordination with the Service is required. If answers to all of the criteria below are "no", proceed with this Worksheet.

Check "NA" if the project will not involve the listed activity or condition.	Yes	No	N/A
1. Is the project(s) outside the species range, based on USFWS IPaC database?			

[1] Coordinate with the local Service field office for active season dates.

2. Is the project inside the range and outside 0.5 mile of hibernacula, but no suitable summer habitat is present (e.g., high-density urban area or non-forested areas)?			
3. Are all project activities (anywhere, including within 0.5 miles of hibernacula) conducted completely within the existing road/rail surface and do not involve percussive or other activities that increase noise above existing traffic/background levels, such as blasting, use of pile drivers, rock drills, or hoe rams?			
4. Does the project involve maintenance, alteration, or demolition of bridge/structures and the results of a bridge assessment indicate no signs of bats?			
5. Does the project consist of non-construction activities (e.g., bridge assessment, property inspections, property sales, property easements, and equipment purchases?			

May Affect (MA) (User's Guide page 4)

If the answer to each of the criteria below is "true", assume the presence of Indiana bat and/or NLEB. Proceed with this Worksheet.

	True	False
1. Project is in range of species, and		
2. Suitable habitat is present (for foraging, roosting, traveling, hibernating, swarming, nursing or other bat activities), and		
3. No bat surveys have been conducted or surveys are positive for presence of Indiana bat or NLEB.		

If the answers to any of the criteria below are "yes" the project "May Affect" the Indiana bat and/or NLEB. Proceed with Step 3 of this Worksheet.

Does the project action involve any of the following activities?	Yes	No	Unknown
1. Tree removal within suitable habitat			
2. Percussive activities that will increase noise above existing traffic/background levels (e.g., blasting, use of pile drivers, rock drills, or hoe rams)			
3. Increased lighting, either temporary or permanent (e.g., construction lighting or permanent lighting installation as part of project)			
4. Smoke/heat associated with burning brush piles			
5. Impacts to water bodies/wetlands where suitable bat habitat is present (e.g., piping a section of stream)			
6. Bridge or structure maintenance, repair or replacement at sites with bat activity			

STEP 3: AVOIDANCE AND MINIMIZATION MEASURES (User's Guide page 5-6)

The next sets of questions will step through the process for determining whether a project "May Affect, but is Not Likely to Adversely Affect" the Indiana bat and/or NLEB. Avoidance and Minimization Measures (AMM's) may be required.

May Affect, Not Likely to Adversely Affect (NLAA)

If answers to any of the questions below are "Yes", the project "May Affect, but is Not Likely to Adversely Affect" the Indiana bat and/or NLEB, and IS covered by the range-wide programmatic informal consultation. AMM's are not required for these activities. Document on the Project Submittal Form (Appendix B of the User Guide). If answers to all of these questions are "No" or "Unknown", proceed with this worksheet.

Do any of the conditions below describe the project?	Yes	No	Unknown
1. Project is inside the range and in or near suitable habitat, but			

with negative bat P/A surveys. *If no bat surveys have been performed check "no" - presence of bats is to be assumed and AMM's will be required.			
2. Work activities will be conducted completely within the existing road/rail surface and involve percussive activities such as blasting and use of pile drivers, rock drills, or hoe rams.			
3. Work activities will take place in areas that contain suitable forested habitat, but no tree removal or habitat alteration will occur (e.g., landscaping rest areas, mowing, brush removal, sign or guardrail replacement, storm water management).			
4. No slash pile burning will occur.			
5. Wetland or stream protection activities associated with mitigation that do not clear suitable habitat.			

May Affect, Not Likely to Adversely Affect - AMMs Required

For the actions below, site-specific AMM(s) may be required to make the project NLAA for either bat species. If there is an applicable AMM, it MUST be implemented for the project to be eligible for use within the range-wide programmatic informal consultation. If an AMM listed below is not applicable (based on the type of action/effect), document why it is not applicable. For some projects, additional project-specific AMM(s) not listed below may be needed. If such additional AMM(s) are implemented, document them.

	Yes	No
TREE REMOVAL Will the project remove trees that are suitable maternity, roosting, foraging, or traveling habitat for Indiana Bat or NLEB? *If "No", proceed to next activity.*		
1. Will tree removal *at any time of year* occur entirely within 100 feet of existing road surface? (Note: If "no", this action is not covered under the range-wide programmatic Informal consultation. Proceed no further with worksheet. Separate consultation with the appropriate Service field office is necessary.)		
2. Will documented roosts or foraging habitat (based on radio telemetry) be removed *at any time of year*? (Note: If "yes", this action is not covered under the range-wide programmatic informal consultation. Proceed no further with worksheet. Separate consultation with the appropriate Service field office is necessary.)		
3. Will trees be removed within 0.25 miles of documented roosts *at any time of year?* (Note: If "yes", this action is not covered under the range-wide programmatic informal consultation. Proceed no further with worksheet. Separate consultation with the appropriate Service field office is necessary.)		
Unless current surveys document that the species are not present, all of the AMMs listed below will be applied, unless not relevant (e.g., no bridge work will occur). Indicate on the project submittal form which of the following tree removal AMMs will be implemented.		
TREE REMOVAL AMM 1: Modify all phases/aspects of project (e.g. temporary work areas, alignments) to avoid tree removal in excess of what is required to implement project safely. (Note: If this cannot be applied, project can still be MANLAA as long as removal is in winter and avoids known roosts.)		
TREE REMOVAL AMM 2: Apply time of year restrictions for tree removal when bats are not likely to be present.		
TREE REMOVAL AMM 3: Ensure tree removal is limited to that specified in project plans. Install bright orange flagging/fencing prior to any tree clearing to ensure contractors stay within clearing limits. Ensure that contractors understand the clearing limits and how they are marked in the field.		

TREE REMOVAL AMM 4: Avoid cutting down documented bat roosts that are still suitable for roosting or documented foraging habitat *at any time of year.* Avoid cutting down trees within 0.25 miles of documented roosts *at any time of year*. Ensure that suitable roosts remain on the landscape rather than focusing on general forest loss.		

*Note: "Trees" refers to trees that are suitable habitat for each species.

LIGHTING	**Yes**	**No**
1. Will the project involve the use of lighting during construction? *If "No", proceed to next activity.*		
2. Will the project action install permanent lighting? *If "No", proceed to next activity.*		
If the answer to either of above is "yes", indicate on the project submittal form which lighting AMM's will be implemented.		
LIGHTING AMM 1: Direct temporary lighting away from suitable habitat during construction.		
LIGHTING AMM 2: Use downward-facing, full cut-off lens lights, and direct lighting away from suitable habitat when installing new or replacing existing permanent lights.		

BRIDGE MAINTENANCE, ALTERATION OR REMOVAL	**Yes**	**No**
Does the project involve bridge maintenance, removal or other alteration? *If "No", proceed to next activity.*		
Unless current surveys or inspections document that the species are not present, the AMMs listed below will be applied, as appropriate. Indicate on the project submittal form which of the following AMMs will be implemented.		
BRIDGE AMM 1: Perform any bridge repair, retrofit, maintenance, and/or rehabilitation work outside of the active season.[2]		
BRIDGE AMM 2: Bridge repair, retrofit, maintenance, and/or rehabilitation work outside of pup season (June 1 – July 31) will occur in the evening while the bats are feeding, starting one hour after sunset, and ending one hour before daylight excluding the hours between 10 pm and midnight. Lighting must be kept localized (See lighting AMM).		
BRIDGE AMM 3: If bridge repair, retrofit, maintenance, and/or rehabilitation work alters the bridge during the inactive season, then ensure suitable roosting sites remain after any bridge work. Suitable roosting sites may be incorporated into the design of a new bridge.		

STRUCTURE (ARTIFICIAL ROOSTS) MAINTENANCE, ALTERATION OR REMOVAL	**Yes**	**No**
Does the project involving any artificial roost such as a building, barn, shed, mobile home, telephone poles or other structure?		
Unless current surveys or inspections document that the species are not present, the AMMs listed below will be applied, as appropriate. Indicate on the project submittal form which of the following AMMs will be implemented.		
STRUCTURE AMM 1: If the goal of the project is to exclude bats, coordinate with the local Service field office.		
STRUCTURE AMM 2: Perform any maintenance and/or repair work outside of the active season.		
STRUCTURE AMM 3: If maintenance and/or repair work will be performed during the		

[2] Coordinate with the local Service field office for active season dates.

active season, determine if work will occur in an area with roosting bats. If so, coordinate with the local Service field office. If bat activity or signs of frequent bat activity are observed, avoid work or install bat exclusions or similar structure alteration during the active season, unless there are concerns about human health/safety/property and coordinate with the local USFWS Field Office and a nuisance wildlife control officer.		
STRUCTURE AMM 4: If bat activity or signs of frequent bat activity are observed, avoid structure removal unless there are concerns about human health/safety/property and coordinate with the local Service field office and a nuisance wildlife control officer.		

A project that involves these activities and implements all applicable AMMs "May Affect, but is not likely to Adversely Affect" the Indiana bat and/or NLEB. With the implementation of the applicable AMMs, the project IS covered by the range-wide programmatic informal consultation. Document on the Project Submittal Form (Appendix B of the User Guide).

Worksheet Prepared By: _____ _____

Name (Please print) Firm/Organization Date

Worksheet Reviewed By: _____ _____

Name (Please print) Firm/Organization Date

Federal Highway Administration (FHWA), Federal Railroad Administration (FRA), and Federal Transit Administration (FTA)

Range-wide Programmatic Consultation for Indiana Bat and Northern Long-eared Bat

Project Submittal Form

Updated May 2016

In order to use the range-wide programmatic consultation to fulfill Endangered Species Act consultation requirements, transportation agencies must use this submittal form (or a comparable Service approved form) to provide project-level information for all actions that may affect the Indiana bat and/or northern long-eared bat (NLEB). The completed form should be submitted to the appropriate U.S. Fish and Wildlife Service (Service) Field Office prior to project commencement. For more information, see the Standard Operating Procedure for Site Specific Project(s) Submission in the User's Guide.

By submitting this form, the transportation agency ensures that the proposed project(s) adhere to the criteria and conditions of the range-wide programmatic consultation, as outlined in the biological assessment (BA) and biological opinion (BO). Upon submittal of this form, the appropriate Service Field Office may review the project-specific information provided and request additional information. For projects that may affect, but are not likely to adversely affect (NLAA) the Indiana bat and/or NLEB, if the applying transportation agency is **not** contacted by the Service with any questions or concerns within 14 calendar days of form submittal, it may proceed under the range-wide programmatic consultation and assume concurrence of the NLAA determination made by the Service in the BO. For projects that may affect, and are likely to adversely affect (LAA) the Indiana bat and/or the NLEB, the appropriate Service Field Office will respond (see recommended response letter template) within 30 calendar days of receiving a complete project-level submission, which includes, but may not be limited to this completed form.

Further instructions on completing the submittal form can be found by hovering your cursor over each text box.

---

1. Date: December 1, 2016

2. Lead agency: Federal Highway Association
This refers to the Federal governmental lead action agency initiating consultation; select FHWA, FRA or FTA as appropriate

3. Requesting agency: Indiana Department of Transportation
This refers to the transportation agency completing the form (it may or may not be the same as the Lead Agency.

- Name: Laura Hilden
- Title: Environmental Services Director

- Phone: (317) 232-5018
- Email: lhilden@indot.in.gov

4. Consultation code[1]: 03E12000-2017-SLI-0166

5. Project name(s): Heavy Haul Transportation Corridor, Des. No. 1382612

6. Project description:
Please attach additional documentation or explanatory text if necessary

The Indiana Department of Transportation (INDOT), in partnership with the Federal Highway Administration (FHWA), the Indiana Economic Development Corporation, the Ports of Indiana, the Board of Commissioners of Clark County, the City of Jeffersonville Redevelopment Commission, and the River Ridge Development Authority (RRDA), is developing a federal-aid road project to improve connectivity for the Ports of Indiana-Jeffersonville (Port) with other regional transportation assets. The proposed project is located in Utica Township, Clark County, Indiana.

See attached document for project location and details of proposed work.

7. Project location (county, state): Utica Township, Clark County, Indiana
If not delineated in IPaC, attach shape files

8. For other species from IPaC official species list:

No effect – project(s) are inside the range, but no suitable habitat (see additional information attached).

✔ May affect – see additional information provided for those species (see attached or forthcoming).

Please confirm and identify how the proposed project(s) adhere to the criteria of the BO by completing the following (see User Guide Section 2.0):

[1] Available through IPaC System Official Species List: https://ecos.fws.gov/ipac/

NO EFFECT

9. For Indiana bat/NLEB, if applicable, select your no effect determination:

No effect – project(s) are outside the species' range. *submittal form complete*

No effect – project(s) are inside the species range but no suitable forested bat habitat; must also be greater than 0.5 miles from any hibernaculum. *submittal form complete*

No effect – project(s) do not involve any construction activities (e.g., bridge assessments, property inspections, planning and technical studies, property sales, property easements, and equipment purchases). *submittal form complete*

No effect – project(s) are completely within existing road/rail surface and do not involve percussive or other activities that increase noise above existing traffic/background levels (e.g., road line painting). *submittal form complete*

No effect – project(s) includes maintenance, alteration, or demolition of bridge(s)/structure(s) and indicate(s) no signs of bats from results of a bridge/structure assessment. *submittal form complete*

Otherwise, please continue below.

MAY AFFECT, NOT LIKELY TO ADVERSELY EFFECT – W/O AMMS

10. For Indiana bat/NLEB, if applicable, select your may affect, NLAA determination (without implementation of AMMs):

Bat Mist Net Survey (July 2016) uploaded to IPaC December 2016

✔ NLAA – project(s) are inside the range and suitable bat habitat is present, but **negative** bat presence/absence (P/A) surveys; must also be greater than 0.5 miles from any hibernaculum. *submittal form complete*

NLAA – project(s) within suitable bat habitat that involve maintenance of existing facilities (e.g., rest areas, stormwater detention basins) but do not remove or alter the habitat (e.g., mowing, brush removal). *submittal form complete*

NLAA – project(s) within 300 feet of existing road/rail surfaces in areas that contain suitable habitat but do not remove or alter the habitat (e.g., mowing, brush removal). *submittal form complete*

NLAA – project(s) limited to slash pile burning. *submittal form complete*

NLAA –project(s) are limited to wetland or stream protection activities associated with compensatory wetland mitigation that do not clear suitable habitat. *submittal form complete*

Otherwise, please continue below.

MAY EFFECT, NOT LIKELY TO ADVERSELY AFFECT – WITH AMMs

11. For Indiana bat/NLEB, if applicable, document your may affect, NLAA determination by completing the following section (**with implementation of AMMs**; use #13 to document AMMs).

Affected Resource/Habitat Type:

a. Trees

Verify that all tree removal occurs greater than 0.5 mile from any hibernaculum:

Verify that the project is within 100 feet of existing road/rail surfaces:

Verify that no documented Indiana bat and/or NLEB roosts and/or surrounding summer habitat within 0.25 mile of documented roosts will be impacted: ☐

Verify that all tree removal will occur outside the active season (i.e., will occur in winter)[2]:

Acres of trees proposed for removal:

b. Bridge/Structure Work Projects

Proposed work:

Timing of work:

Evidence of bat activity on/in bridge/structure? Y/N

Verify that work will be conducted outside the active season, or if during the active season, verify that no roosting bats will be harmed or disturbed in any way:

Verify that work will not alter roosting potential in any way:

Verify that all applicable lighting minimization measures will be implemented: ☐

c. Other (please explain)

[2] Coordinate with the local Service Field Office for appropriate dates.

MAY AFFECT, LIKELY TO ADVERSELY AFFECT

12. For Indiana bat/NLEB, if applicable, document your may affect, LAA determination by completing the following section (use #13 to document AMMs).

Affected Resource/Habitat Type:

a. Trees

Verify that all tree removal occurs greater than 0.5 mile from any hibernaculum: ☐

Project Location:

0-100 feet from edge of existing road/rail surface ☐

100-300 feet from edge of existing road/rail surface ☐

Verify that no documented Indiana bat roosts or surrounding summer habitat within 0.25 mile of documented roosts will be impacted between May 1 and July 31: ☐

Verify that no documented NLEB roosts or surrounding summer habitat within 150 feet of documented roosts will be impacted between June 1 and July 31: ☐

Timing of tree removal:

Acres of trees proposed for removal:

b. Bridge/Structure Work Projects

Proposed work:

Timing of work:

Verify no signs of a colony: ☐

Verify that work wiill not alter roosting potential in any way: ☐

13. For Indiana bat/NLEB, **if applicable to the action type**, the following AMMs will be implemented[3] unless P/A surveys and/or bridge assessments document that the species are not likely to be present:

General AMM 1(required for all projects):

[3] See AMMs Fact Sheet (Appendix C) for more information on AMMs

Tree Removal AMM 1: ☐
Tree Removal AMM 2 (required for NLAA): ☐
Tree Removal AMM 3 (required for all projects): ☐
Tree Removal AMM 4 (required for NLAA): ☐
Tree Removal AMM 5 (required for LAA): ☐
Tree Removal AMM 6 (required for LAA): ☐

Tree Removal AMM 7 (required for LAA):

Bridge AMM 1: ☐
Bridge AMM 2 (required for all projects during active season): ☐
Bridge AMM 3 (required for NLAA during active season): ☐
Bridge AMM 4 (required for NLAA during active season): ☐
Bridge AMM 5 (required for all projects): ☐

Structure AMM 1 (required for all Indiana bat projects, required for NLAA NLEB projects): ☐
Structure AMM 2 (required for all Indiana bat projects, required for NLAA NLEB projects): ☐
Structure AMM 3 (required for all Indiana bat projects, required for NLAA NLEB projects: ☐
Structure AMM 4 (required for all Indiana bat projects, required for NLAA NLEB projects): ☐

Lighting AMM 1 (required for all projects during the active season): ☐
Lighting AMM 2 (required for all projects): ☐

Hibernacula AMM 1 (required for all projects): ☐

14. For Indiana bat, if applicable, compensatory mitigation measures will also be required to offset adverse effects on the species (see Section 2.10 of the BA). Please verify the mechanism in which compensatory mitigation will be implemented and that sufficient information is provided to the Service.

Range-wide In Lieu Fee Program, The Conservation Fund ☐

State, Regional, Recovery Unit-Specific In Lieu Fee Program
Name:

Conservation Bank,
Name:
Location:

Local Conservation Site(s)
Name:
Location:
Description:

Project Description

The Indiana Department of Transportation (INDOT), in partnership with the Federal Highway Administration (FHWA), the Indiana Economic Development Corporation, the Ports of Indiana, the Board of Commissioners of Clark County, the City of Jeffersonville Redevelopment Commission, and the River Ridge Development Authority (RRDA), is developing a federal-aid road project to improve connectivity for the Ports of Indiana-Jeffersonville (Port) with other regional transportation assets. The proposed project is located in Utica Township, Clark County, Indiana.

The area is located on the Jeffersonville USGS 7.5 Minute Quadrangle Maps in Tracts 6-7, 14-17, and 24-25 and is within the Louisville Metropolitan Planning Area (LMPA), which consists of nine counties in Kentucky (Jefferson, Oldham, Trimble, Henry, Shelby, Spencer, Nelson, Bullit and Meade) and four Indiana counties (Washington, Harrison, Floyd and Clark). Preliminary corridor studies have identified an approximately 1.3-mile wide corridor between the Port of Indiana, Jeffersonville and State Road (SR) 265 to establish roadway alignment alternatives for the project. The alternatives are currently being developed and evaluated within the project corridor based upon environmental studies and coordination.

The project area has several major generators of traffic that consist primarily of heavy trucks or heavy haul vehicles. However, the road network in the area is primarily made of up of local facilities not designed to handle such vehicle loading. Heavy haul vehicles are generally 60 feet or more in length with a gross vehicle weight of 134,000 pounds, as compared to Indiana legal load limits of 80,000 pounds gross vehicle weight. Heavy haul vehicles require the design of facilities to take into account the maximum weight of the heavy haul vehicles and the anticipated number of heavy haul vehicles utilizing the facility on a daily basis. The resulting difference between a facility designed to carry heavy haul vehicles and standard load trucks is often a significant difference in pavement thickness. Based on current and predicted rapid industrial and commercial development associated with the major traffic generators in the project area it is anticipated that truck traffic will increase by 129 percent over the next 20 years.

The proposed project corridor is approximately 168 acres and generally extends north from the Port to the SR 265/Old Salem Road interchange. The area is a combination of forest, open grass, industrial, and farmed areas. Approximately 44%of the project area is forested, and the forested areas are generally on steep slopes. Few existing roads are located within this area. The proposed project corridor is bounded by the SR 265 corridor at the northern project limits. Lentzier Creek and several tributaries are located within the project corridor.

The proposed project consists of the construction of a 3-lane road designed to “heavy haul” specifications. The proposed road would have a design speed of 35 miles per hour with two 12-foot travel lanes and one 11- to 12-foot auxiliary lane. The road would likely be constructed on new alignment at a total length of approximately 1.75 miles. While only three lanes would be constructed, right-of-way would be wide enough to allow for future expansion to five lanes if required by traffic demand.

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Bloomington Ecological Services Field Office
620 SOUTH WALKER STREET
BLOOMINGTON, IN 47403
PHONE: (812)334-4261 FAX: (812)334-4273
URL: www.fws.gov/midwest/Endangered/section7/s7process/step1.html

Consultation Code: 03E12000-2017-SLI-0166 December 06, 2016
Event Code: 03E12000-2017-E-00141
Project Name: Heavy Haul Transportation Corridor, Des. No. 1382612

Subject: Updated list of threatened and endangered species that may occur in your proposed project location, and/or may be affected by your proposed project

To Whom It May Concern:

The attached species list identifies any federally threatened, endangered, proposed and candidate species that may occur within the boundary of your proposed project or may be affected by your proposed project. The list also includes designated critical habitat if present within your proposed project area or affected by your project. This list is provided to you as the initial step of the consultation process required under section 7(c) of the Endangered Species Act, also referred to as Section 7 Consultation.

Section 7 of the Endangered Species Act of 1973 requires that actions authorized, funded, or carried out by Federal agencies not jeopardize federally threatened or endangered species or adversely modify designated critical habitat. To fulfill this mandate, Federal agencies (or their designated non-federal representative) must consult with the Service if they determine their project “may affect” listed species or critical habitat.

Under 50 CFR 402.12(e) (the regulations that implement Section 7 of the Endangered Species Act) the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally. You may verify the list by visiting the ECOS-IPaC website http://ecos.fws.gov/ipac/ at regular intervals during project planning and implementation and completing the same process you used to receive the attached list. As an alternative, you may contact this Ecological Services Field Office for updates.

Please use the species list provided and visit the U.S. Fish and Wildlife Service's Region 3 Section 7 Technical Assistance website at - http://www.fws.gov/midwest/endangered/section7/s7process/index.html. This website contains step-by-step instructions which will help you determine if your project will have an adverse effect on listed species and will help lead you through the Section 7 process.

For all **wind energy projects** and **projects that include installing towers that use guy wires or are over 200 feet in height**, please contact this field office directly for assistance, even if no federally listed plants, animals or critical habitat are present within your proposed project or may be affected by your proposed project.

Although no longer protected under the Endangered Species Act, be aware that bald eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 *et seq.*) and Migratory Bird Treaty Act *(*16 U.S.C. 703 *et seq*), as are golden eagles. Projects affecting these species may require measures to avoid harming eagles or may require a permit. If your project is near an eagle nest or winter roost area, see our Eagle Permits website at http://www.fws.gov/midwest/midwestbird/EaglePermits/index.html to help you determine if you can avoid impacting eagles or if a permit may be necessary.

We appreciate your concern for threatened and endangered species. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment

Official Species List

Provided by:

Bloomington Ecological Services Field Office
620 SOUTH WALKER STREET
BLOOMINGTON, IN 47403
(812) 334-4261
http://www.fws.gov/midwest/Endangered/section7/s7process/step1.html

Consultation Code: 03E12000-2017-SLI-0166
Event Code: 03E12000-2017-E-00141

Project Type: DEVELOPMENT

Project Name: Heavy Haul Transportation Corridor, Des. No. 1382612
Project Description: INDOT, in partnership with the FHWA, the Indiana Economic Development Corporation, the Ports of Indiana, the Board of Commissioners of Clark County, the City of Jeffersonville Redevelopment Commission, and the River Ridge Development Authority (RRDA), is developing a federal-aid road project to improve connectivity for the Ports of Indiana-Jeffersonville (Port) with other regional transportation assets. The proposed project is located in Utica Township, Clark County, Indiana.

The area is located on the Jeffersonville USGS 7.5 Minute Quadrangle Maps in Tracts 6-7, 14-17, and 24-25 and is within the Louisville Metropolitan Planning Area, which consists of nine counties in Kentucky (Jefferson, Oldham, Trimble, Henry, Shelby, Spencer, Nelson, Bullit and Meade) and four Indiana counties (Washington, Harrison, Floyd and Clark). Preliminary corridor studies have identified an approximately 1.3-mile wide corridor between the Port of Indiana, Jeffersonville and SR 265 to establish roadway alignment alternatives for the project. The alternatives are currently being developed and evaluated within the project corridor based upon environmental studies and coordination.

The project area has several major generators of traffic that consist primarily of heavy trucks or heavy haul vehicles. However, the road network in the area is primarily made of up of local facilities not designed to handle such vehicle loading. Heavy haul vehicles are generally 60 feet or more in length with a gross vehicle weight of 134,000 pounds, as compared to Indiana legal load

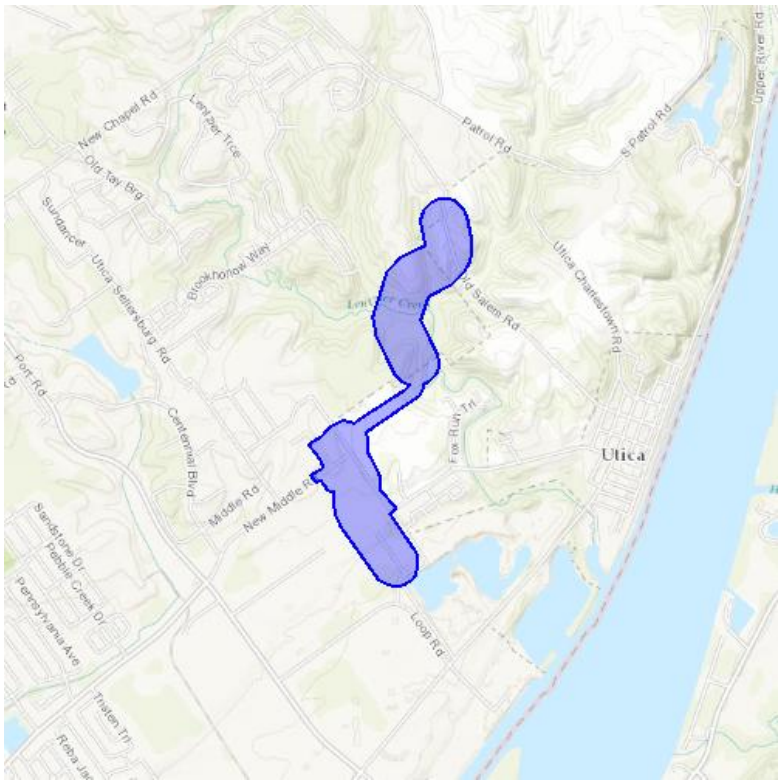
limits of 80,000 pounds gross vehicle weight. Heavy haul vehicles require the design of facilities to take into account the maximum weight of the heavy haul vehicles and the anticipated number of heavy haul vehicles utilizing the facility on a daily basis. The resulting difference between a facility designed to carry heavy haul vehicles and standard load trucks is often a significant difference in pavement thickness. Based on current and predicted rapid industrial and commercial development associated with the major traffic generators in the project area it is anticipated that truck traffic will increase by 129 percent over the next 20 years.

The proposed project corridor is approximately 168 acres and generally extends north from the Port to the SR 265/Old Salem Road interchange. The area is a combination of forest, open grass, industrial, and farmed areas. Approximately 44%of the project area is forested, and the forested areas are generally on steep slopes. Few existing roads are located within this area. The proposed project corridor is bounded by the SR 265 corridor at the northern project limits. Lentzier Creek and several tributaries are located within the project corridor.

The proposed project consists of the construction of a 3-lane road designed to “heavy haul” specifications. The proposed road would have a design speed of 35 miles per hour with two 12-foot travel lanes and one 11- to 12-foot auxiliary lane. The road would likely be constructed on new alignment at a total length of approximately 1.75 miles. While only three lanes would be constructed, right-of-way would be wide enough to allow for future expansion to five lanes if required by traffic demand.

Please Note: The FWS office may have modified the Project Name and/or Project Description, so it may be different from what was submitted in your previous request. If the Consultation Code matches, the FWS considers this to be the same project. Contact the office in the 'Provided by' section of your previous Official Species list if you have any questions or concerns.

Project Location Map:



Project Coordinates: The coordinates are too numerous to display here.

Project Counties: Clark, IN

Endangered Species Act Species List

There are a total of 3 threatened or endangered species on your species list. Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species. Critical habitats listed under the **Has Critical Habitat** column may or may not lie within your project area. See the **Critical habitats within your project area** section further below for critical habitat that lies within your project. Please contact the designated FWS office if you have questions.

Clams	**Status**	**Has Critical Habitat**	**Condition(s)**
Sheepnose Mussel *(Plethobasus cyphyus)* Population: Wherever found	Endangered		
Mammals			
Gray bat *(Myotis grisescens)* Population: Wherever found	Endangered		
Indiana bat *(Myotis sodalis)* Population: Wherever found	Endangered		

Critical habitats that lie within your project area

There are no critical habitats within your project area.

BIOLOGICAL ASSESSMENT

Myotis grisescens
Gray Bat

INDOT Heavy Haul Transportation Corridor
Indiana Ports-Jeffersonville to State Road 265
Des. No. 1382612
Clark County, Indiana

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Executive Summary

Indiana Department of Transportation (INDOT), in partnership with the Federal Highway Administration, the Indiana Economic Development Corporation, the Ports of Indiana, the Boards of Commissioners of Clark County, the City of Jeffersonville Redevelopment Commission, and the River Ridge Development Authority (RRDA), is developing a federal-aid road project to improve connectivity for the Ports of Indiana-Jeffersonville with other regional transportation assets. This heavy haul transportation corridor Des. No. 1382612 (Proposed Alternative) is located in Utica Township, Clark County, Indiana and would also address expected increase in volume of heavy haul vehicles. The project is located within the Silver-Little Kentucky River Watershed, Hydrologic Unit Code (HUC) 05140101 with an approximate project midpoint located at coordinates 38.335539˚, -85.6773004˚. The total length of the project is 2.1 miles.

The Project Action Area includes all areas in which listed bat species would be directly and/or indirectly affected by the Proposed Alternative. Based on coordination with U.S. Fish and Wildlife Service's (USFWS) Indiana Field Office, the Proposed Alternative may directly or indirectly affect the federally endangered gray bat (*Myotis grisescens*). The Project Action Area was designated as a 1-mile radius of the Proposed Alternative (approximately 4,627 acres) as discussed with the USFWS through early agency coordination. The Project Action Area makes up approximately 15% of the Lentzier Creek - Ohio River 14-digit HUC watershed, which spans 27,080 acres in Indiana and Kentucky and is comprised of approximately 25% forest (1,178 acres). Desktop assessment of available gray bat foraging and flyway habitat within the Project Action Area documented 97.1 acres of total forest habitat and 42,799 linear feet of named perennial streams.

Bat presence/likely absence mist net surveys were conducted from June 28 - July 1, 2016. A total of 11 bats of three species were captured during the survey, including five federally-endangered gray bats. Records provided by USFWS documents a known maternity colony located within the Sellersburg limestone quarry approximately 4.5 miles northwest of the Proposed Alternative's northern terminus.

In addition to existing riparian forest habitat, Lentzier Creek, Lancassange Creek, Goose Creek, and their associated perennial tributaries provide suitable foraging and/or flyway corridors for gray bats. A desktop habitat evaluation within the Project Action Area determined that removal 9.1 acres of forest and impacts to 90 linear feet of Lentzier Creek by the Proposed Alternative would be minimal for maintaining gray bat riparian forest flyway and foraging habitat.

At this time, no critical habitat has been designated for the gray bat and no designated critical habitat for any federally listed bat species, including the Indiana bat (*M. sodalis*) or northern long-eared bat (*M. septentrionalis*) is present within the Project Action Area. Thus, the Proposed Alternative would have no effect on critical habitat for the gray bat or any other listed bat species.

Direct and indirect effects on gray bats would be avoided or minimized with implementation of construction and post-construction best management practices (BMPs) for water quality treatment of stormwater runoff to protect aquatic resources that support important macroinvertebrate food sources for gray bats. Temporary erosion control measures including sediment traps, check dams, silt fences, ditch inlet protections, temporary construction entrance stabilization, and temporary sediment basins are included within the preliminary construction plans to protect aquatic habitats. Permanent erosion control features include riprap installation over geotextile at the outflow of all culverts and paved side ditches in areas of 3 percent or steeper grades. All temporary ground disturbance will be protected using mulch and/or temporary grass seeding, usually an annual species. Permanent grass seeding will be applied to all permanent slopes and exposed surfaces prior to project completion. Sod will be installed along all ditch bottoms where grades are equal to or greater than 1% up to 3%.

While it is unknown if permanent lighting will be included within the construction plans, downward facing lights with full cutoff lenses are recommended to prevent disturbance to foraging bats. While it is unknown if blasting of subsurface minerals will be required for construction of the Proposed Alternative, all construction activities will take place during daylight hours to prevent blasting percussion disturbance to foraging bats. Construction of the Proposed Alternative will meet all requirements of 107.08(b) of the INDOT standard specifications for dust control.

The project team should consult with the United States Fish and Wildlife Service regarding the potential need for project-specific mitigation measures for the permanent loss of listed bat habitat associated with the Proposed Alternative. Upon implementation of these conservation measures and conditions, a determination that the proposed project “may affect, and is likely to adversely affect”, federally listed bat species is recommended.

No other federally listed bat species or other listed fauna were identified within the Proposed Alternative.

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1. Introduction

Eco-Tech Consultants, Inc. (Eco-Tech) was contracted by United Consulting to prepare a Biological Assessment (BA) for the proposed Indiana Department of Transportation (INDOT) Heavy Haul transportation corridor, Des. No. 1382612 (project), in Clark County, Indiana (Figure 1). The project is located within the Silver-Little Kentucky River Watershed, Hydrologic Unit Code (HUC) 05140101 with an approximate project midpoint located at coordinates 38.335539˚, -85.6773004˚. The total length of the project is 2.1 miles.

This BA addresses the proposed action in compliance with Section 7(c) of the Endangered Species Act (ESA) of 1973, as amended. Section 7 of the ESA requires that, through consultation with the U.S. Fish and Wildlife Service (USFWS), federal actions do not jeopardize the continued existence of any threatened or endangered species or result in the destruction or adverse modification of critical habitat. The Proposed Alternative is within the range of the federally endangered gray bat (*Myotis grisescens*) (Figure 2), the federally endangered Indiana bat (*M. sodalis*), and the federally threatened northern long-eared bat *(M. septentrionalis*), as well as the sheepnose mussel (*Plethoobasus cyphyus*). This BA will evaluate potential direct, indirect, and cumulative effects of the proposed transportation project to the gray bat. Mist net surveys did not result in any captures of Indiana bat or northern long-eared bat and thus are not expected to be impacted from the Proposed Alternative. The sheepnose mussel is endemic to large rivers such as the adjacent Ohio River, which will not be impacted by the Proposed Alternative.

2. Project Overview

The need and purpose for project Des. No. 1382612 is to construct a roadway designed to accommodate heavy trucks and haul vehicles. INDOT, in partnership with the Federal Highway Administration, the Indiana Economic Development Corporation, the Ports of Indiana-Jeffersonville (Port), the Board of Commissioners of Clark County, the City of Jeffersonville Redevelopment Commission, and the River Ridge Development Authority (RRDA), is developing a federal-aid road project to improve connectivity for the Ports of Indiana-Jeffersonville with other regional transportation assets. Due to an expected increase in volume of heavy haul vehicles in the area, a three-lane roadway designed to accommodate heavy trucks and haul vehicles is needed. A roadway with an adjacent auxiliary lane will allow for heavy haul traffic to avoid using the local roadways that are not meant to handle vehicles of such size and weight.

The Proposed Alternative is located in Utica Township in Clark County, Indiana, where a corridor that is approximately 2.1 miles long between the Port of Indiana-Jeffersonville and State Road (SR) 265. The area is located on the Jeffersonville and Charlestown USGS 7.5 Minute Quadrangle Maps in Tracts 6-7, 14-17, 24-27, 38-40, and 52-53 and is within the Louisville Metropolitan Planning Area (LMPA), which consists of nine counties in Kentucky (Jefferson, Oldham, Trimble, Henry, Shelby, Spencer, Nelson, Bullit and Meade) and four Indiana counties (Washington, Harrison, Floyd and Clark).

The project area has several major generators of traffic that consist primarily of heavy trucks or heavy haul vehicles. However, the road network in the area is primarily made of up of local facilities not designed to handle such vehicle loading. Heavy haul vehicles are generally 60 feet or more in length with a gross vehicle weight of 134,000 pounds, as compared to Indiana legal load limits of 80,000 pounds gross vehicle weight. Heavy haul vehicles require the design of facilities to take into account the maximum weight of the heavy haul vehicles and the anticipated number of heavy haul vehicles utilizing the facility on a daily basis. The resulting difference between a facility designed to carry heavy haul vehicles and standard load trucks is often a significant difference in pavement thickness. Based on current and predicted rapid industrial and commercial development associated with the major traffic generators in the project area, it is anticipated that truck traffic will increase by 129 percent over the next 20 years. The purpose of the proposed project is to provide a route built specifically for heavy haul vehicles that provides continuous connection from the RRCC and the Port to the new SR-265/Old Salem Road interchange.

The proposed project consists of the construction of a two-lane road designed to "heavy haul" specifications. The proposed road would have a design speed of 35 miles per hour with two 13-foot wide travel lanes and two 11-foot wide shoulders. The road would likely be constructed on new alignment at a total length of approximately 1.75 miles. The proposed project corridor generally extends north from the Indiana-Jeffersonville Port to the SR-265/Old Salem Road interchange. The area is a combination of steeply sloped forest, old fields, industrial properties, and farmed areas. The proposed project area contains few existing roads, Lentzier Creek and several tributaries.

3. Project Setting

The Proposed Alternative includes an area of 29.4 acres of potential disturbance while the Project Action Area is approximately 4,627 acres, and includes all planned project operations and the surrounding area that could be affected by the Proposed Alternative (Figure 3). For the purpose of the effects assessment, this Project Action Area includes a 1-mile (1.6-kilometer) buffer around the Proposed Alternative, which encompasses approximately 2.1 miles of construction, including all areas within the permanent and temporary ROW for construction. The 1-mile buffer was used to account for potential indirect effects to gray bats including noise, barrier effects, and disturbances with associated secondary development.

The Project Action Area is located within the Pre-Wisconsonian Drift Plains (55d) Level IV Ecoregion as mapped by Woods et al. (1998). This ecoregion is comprised of rolling till plain with local end moraines characterized by deeply-leached, acidic, pre-Wisconsonian till and thin loess. The area features widespread areas of flat, poorly-drained soils. Originally, the area was dominated by beech forests and elm-ash swamp, but is now commonly dominated by agriculture including soybeans, corn, tobacco, and livestock.

Land use classifications from the "USDA Land Use Land Cover Dataset 2011" (USDA 2011) indicate the Project Action Area consists of approximately 15% Open Water, 25% Forest, 27% Agricultural Land, and 33% Developed land. The large amount of open water in the Project Action Area is almost entirely comprised of the Ohio River. The large amount of developed land includes elements of an urban landscape: suburbs, residential lots, commercial development, and existing roadways.

Ares within the Proposed Alternative are comprised primarily of deciduous forest, developed/residential, and agricultural areas. The most notable bat habitat were the numerous trails, small access roads, ROW, and streams throughout the temperate deciduous forest. Lentzier Creek, a direct tributary to the Ohio River, provided a reliable water source and foraging corridor. The majority of the available forested land in and around the Proposed Alternative was younger forest with dense understory, especially when adjacent to agricultural fields. These mid-successional edge forests were dominated by American sycamore (*Platanus occidentalis*), tulip poplar (*Liriodendron tulipifera*), black walnut (*Juglans nigra*), and boxelder (*Acer negundo*), hackberry (*Celtis occidentalis*), and honey locust (*Gleditsia triacanthos*), with an average diameter at breast height (dbh) of 18 inches. The dense understory was dominated by tulip poplar, black walnut, and poison ivy (*Toxicodendron radicans*) with an average dbh of 2 inches.

4. Consultation History

Early coordination with the Indiana Department of Natural Resources (IDNR) and USWFS was initially conducted prior to ecological surveys by INDOT in April, 2016. This coordination was provided in an effort to solicit survey recommendations for the gray bat, Indiana bat, and northern long-eared bat.

A bat survey study plan outlining mist net survey methodologies and level of survey effort was submitted to USFWS on June 14 and June 23, 2016, with concurrence received from USFWS on June 23, 2016. This letter provided authorization to conduct summer mist net survey and radio-telemetry of listed bat within the range of the Proposed Alternative. Mist net surveys were conducted June 28-July 1 2016, capturing three lactating adult female gray bats, one non-reproductive adult male gray bat, and one non-reproductive juvenile female gray bat (Tables 1 & 2).

A teleconference was held by the project team and attended by personnel from the USFWS Indiana Field Office on June 14, 2017. Based on feedback from this meeting the project team elected to use a 1-mile radius to establish the Project Action Area.

Early coordination specific to gray bat records was again conducted with USFWS on April 13, 2017, which revealed records related to a nearby gray bat maternity colony located within a flooded limestone quarry known as the Sellersburg Quarry, approximately 4.5 miles northwest of the project's northern terminus. Periodic emergence counts at this "cave" opening performed from 1982 through 2000 documented a steady increase in colony size from 400 individuals in 1982 to 3,768

individuals in 2000 (Whitaker et al. 2001). Additional emergence counts were also conducted by Whitaker, Pruitt, and Pruitt in 2001, 2002, 2003, 2004, 2006, and 2010 (R. M. Munson, pers. comm. 2017). Those counts also documented a continuous increase in colony sizes ranging from 1,144 individuals in 2001 to 6,530 individuals in 2010. Preliminary results form 2017 emergence surveys indicate a continued increase in colony size (R.M. Munson, pers. comm. 2017). These colony estimates were performed through visual observation of emerging bats without the aid of near infrared thermal infrared videography or with statistical software packages, and should be considered as a visual estimate of population size.

5. Species Description and Life History

5.1 Myotis grisescens A. H. Howell, 1909 (gray bat)

5.1.1 Listing Status

The gray bat was listed as a federally-endangered species on April 28, 1976 by the USFWS (1976), affording it protection under the Endangered Species Act of 1973 (Public Law 93-205), as amended. The USFWS biologists subsequently developed and released a recovery plan for the species in 1982 (USFWS 1982). A 5-year review summary and evaluation was completed in 2009 by the Service's Columbia, Missouri Ecological Services Field Office (USFWS 2009b).

5.1.2 Description

Gray bats have several morphological characteristics that differentiate them from other *Myotis* species. They are typically heavier, weighing 7 to 16 grams (Decher and Choate 1995). The wing membrane is attached to the foot at the ankle, often making the foot appear larger than other *Myotis* species. The fur is uniformly colored from base to tip (Decher and Choate 1995). There is a notch on the underside of the claws. The calcar is not keeled and the toe hairs are medium in length and sparse. Forearm length is 40 to 46 millimeters (Brack et al. 2010).

5.1.3 Distribution

The primary range of the gray bat is restricted to the karst regions of Alabama, Arkansas, Kentucky, Missouri, and Tennessee, with smaller populations found in adjacent states like Indiana (Barbour and Davis 1969). Although numerous caves are available throughout the range, only 5% of available caves provide suitable gray bat habitat (Tuttle 1979). The majority of the range-wide gray bat population hibernates in nine Priority 1 hibernacula (sites that currently and/or historically contained more than 25,000 individuals), which are located in Alabama (one site), Arkansas (one site), Kentucky (one site), Missouri (three sites), and Tennessee (three sites) (USFWS 1982).

In Indiana, gray bats have been documented in the following counties: Clark, Crawford, Floyd, Harrison, Jennings, Lawrence, Perry, and Spencer (Brack et al. 1983; Whitaker et al. 2001). While there is no known gray bat priority 1 or priority 2 hibernacula in Indiana, a limestone quarry at Camp Chelan near Sellersburg (Clark Co., IN) and the Indiana Army Ammunition Plant at Charlestown (Clark Co., IN) both harbor summer gray bat maternity colonies (Brack et al. 1984; Pruitt 1999; Whitaker et al. 2001, King 2005).

5.1.4 Natural History

Gray bats are year-round cave residents. Females congregate in maternity caves and give birth to a single young in late May or early June (Tuttle 1976). Maternity colonies may contain tens of thousands of females and their young (USFWS 1982). Most young are volant within 20 to 25 days of birth (Saugey 1978). Lactation typically ends by late July, and most females and juveniles subsequently leave the maternity caves (LaVal and LaVal 1980). Most males and non-reproductive females use non-maternity caves during this part of the summer (Thomas 1994).

During late July and August, gray bats of mixed ages and sexes roost in caves throughout the summering area, and frequently move among caves in the home range of the colony (LaVal and LaVal 1980; Thomas 1994). In September, females begin to congregate at transitional caves, and by the end of the month most females have left to return to hibernacula (Gore 1992; LaVal and LaVal 1980). Most male gray bats leave summer habitat by November, although a small number of males may remain in transitional caves through winter (LaVal and LaVal 1980; USFWS 1982). Prior to entering hibernacula, gray bats will swarm at the entrance of the cave (USFWS 1982). By this time, males will be reproductively active and copulation takes place upon arrival at the cave (USFWS 1982). The majority of mating occurs in October and November (Barbour and Davis 1969). Females enter hibernation immediately after mating occurs, while males and some juveniles may stay active until early November (USFWS 1982). Supplemental copulation may occur during the period of hibernation (Saugey 1978). Females store sperm through the winter and fertilization is delayed until after emergence from hibernation (Guthrie and Jeffers 1938).

Upon emergence from roosts, gray bats typically follow a stream path to foraging areas (Tuttle 1976), though they may fly directly over land with little hydrological features to reach foraging areas (Thomas 1994). Foraging areas consist of water bodies (streams, reservoirs, lakes, wetlands), and adjacent riparian vegetation along wide sections of rivers (LaVal et al. 1977; Mitchell and Martin 2002; Rabinowitz and Tuttle 1982). Newly volant young often forage in forests that provide feeding cover surrounding the maternity cave (USFWS 1982). Both large and small perennial streams provide suitable foraging habitat for gray bats (LaVal et al. 1977). Forested riparian zones may improve the suitability of a river or reservoir for foraging gray bats.

Gray bats may fly up to 21 miles during nightly foraging trips (USFWS 1982). Tuttle (1976) indicated gray bats regularly made trips of 9 to 21 miles in a single night. In Tennessee, gray bat

foraging territories were identified up to 12 miles from the roost cave. In Missouri, gray bats were observed foraging as far as 12 miles from their roost cave, and other individuals traveled approximately 15 miles to reach a foraging area over a large lake (LaVal and LaVal 1980). In Alabama, gray bats foraged 3 to 13 miles from the roost cave (Goebel 1996).

5.1.5 Habitat Requirements

Gray bats inhabit caves year-round (Gore 1992). They occupy cold, often vertical, hibernacula that trap cold air during winter and form clusters with some aggregations up to thousands of individuals (Barbour and Davis 1969; Tuttle and Kennedy 2005). In summer, gray bats choose warmer caves for the summer maternity season. Gray bats show strong philopatry to both summer and winter sites (Tuttle 1976). During autumn and spring migration, gray bats may roost temporarily in caves and under bridges, referred to as transitional roosts, which may not otherwise be typically used for maternity or hibernation (Tuttle 1976). Gray bats (especially males and juveniles) have also been found day and night roosting under bridges (Keeley and Tuttle 1999; Johnson et al. 2002), which may be important resting places during foraging because of the long distances they travel. Moreover, bridges provide a thermal refuge for bats due to their tendency to retain radiant heat better than other types of night roosts (Johnson et al. 2002).

Gray bats may migrate long distances to and from their hibernacula. Reproductively active females leave their summer habitat and arrive at the caves in September before males and juveniles arrive in October (Tuttle 1976). Hall and Wilson (1966), documented that gray bats would travel 126 miles from a summer cave to a hibernaculum, when a bat banded in Hardin County, Illinois, was recovered at Coach Cave in Edmonson County, Kentucky. Tuttle (1976) found that the bats may travel 11 to 272 miles to and from hibernacula. Hall and Wilson (1966) point to the small number of hibernacula for a relatively wide-ranging species to account for this difference in migration distances. In 2016, an adult female gray bat caught and banded during surveys within the Proposed Action Area was subsequently discovered in Jesse James Cave in Kentucky later that year during winter hibernacula counts. Jesse James Cave is approximately 85 miles from the capture site (T. Wethington pers. comm. 2017).

Each summer colony occupies a home range that often contains several roost caves (Thomas 1994; Tuttle 1976). The colony home range may encompass up to 40 miles of river or reservoir shoreline (USFWS 1982). Thomas and Best (2000) found that gray bats in the Guntersville Reservoir area of northern Alabama had large home ranges with a minimum average size of 37.5 square miles. Individually, the bats exhibit fidelity to the colony home ranges, but may roost in several caves within the range (Goebel 1996; Tuttle 1976; USFWS 1982).

5.1.6 Threats

Five primary causes for the decline in gray bat populations outlined in the recovery plan are: direct human disturbance to individual bats, human disturbance to the environment, destruction

of roost caves by collapse or river impoundment, cave commercialization/ improper gating, and natural sources of mortality (USFWS 1982).

Since the 1982 Recovery Plan, the most severe and immediate threat to bats as a whole is White-Nose Syndrome (WNS). WNS is an epizootic disease in hibernating bats caused by the fungus *Pseudogymnoascus destructans* (Lorch et al. 2011). The fungus kills bats during hibernation by disrupting physiology and natural torpor arousal patterns (Reeder et al 2012; Verant et al. 2014). First documented in 2006 in New York, the fungus is now in 31 states and 5 Canadian provinces (USFWS 2017). The fungus was first discovered in Indiana in 2011 and is now confirmed in 9 counties in Indiana, but not including Clark County (IDNR 2017). The USFWS estimates bat mortality to be at least 5.7–6.2 million (USFWS 2017) individuals and some hibernaculum are reporting 90-100% mortality in infected bats (USFWS 2009a). While effects of WNS on gray bat populations does not appear to be as severe as those documented in other cave-dwelling species such as little brown bats and tri-colored bats, the long-term consequence of WNS to gray bats is still unknown at this time. Habitat protection, especially karst and cave winter habitat conservation, is still a priority for the perpetual maintenance of this species.

5.1.7 Status of the Gray Bat

Following the protection of hibernacula and maternity caves from human disturbance, gray bat populations started to recover. In 2002, the range-wide gray bat population was estimated to be 2,678,137 bats, a 62% increase from 1,657,900 bats when the recovery plan was written in 1982 (Ellison et al. 2003). Gray bat numbers have continued to rebound and the 2009 range-wide population was estimated at 3.4 million individuals through the USFWS' Midwest Region's 2009 5-Year Review of the species (USFWS 2009b).

Even with the slow recovery of the species, two continuing issues currently negatively affect gray bats. Continued problems with human disturbance at some sites have led gray bat populations at the nine Priority 1 hibernacula to only reach 37% of its maximum historic populations in 2005 (Elliott 2008). Also, the fungus that causes WNS has continued to spread and is now throughout the range of gray bats. WNS was first confirmed to affect gray bats in Tennessee in 2012 (Holliday 2012). In the winter of 2013, WNS was discovered in Fern Cave, AL, the largest gray bat hibernaculum in the country. Based on winter counts at accessible portions of Fern Cave's Morgue and Little Morgue Pits on February 11, 2017, the USFWS estimates this hibernaculum to currently house 1,289,848 gray bats. (P. Pattavina, pers. comm. 2017). While gray bats seem to have lower fungal loads (Janicki et al. 2015) and do not suffer as high mortality as other bat species, it may be too early in this disease's development within the eastern United States to understand the residual effects of WNS on this species.

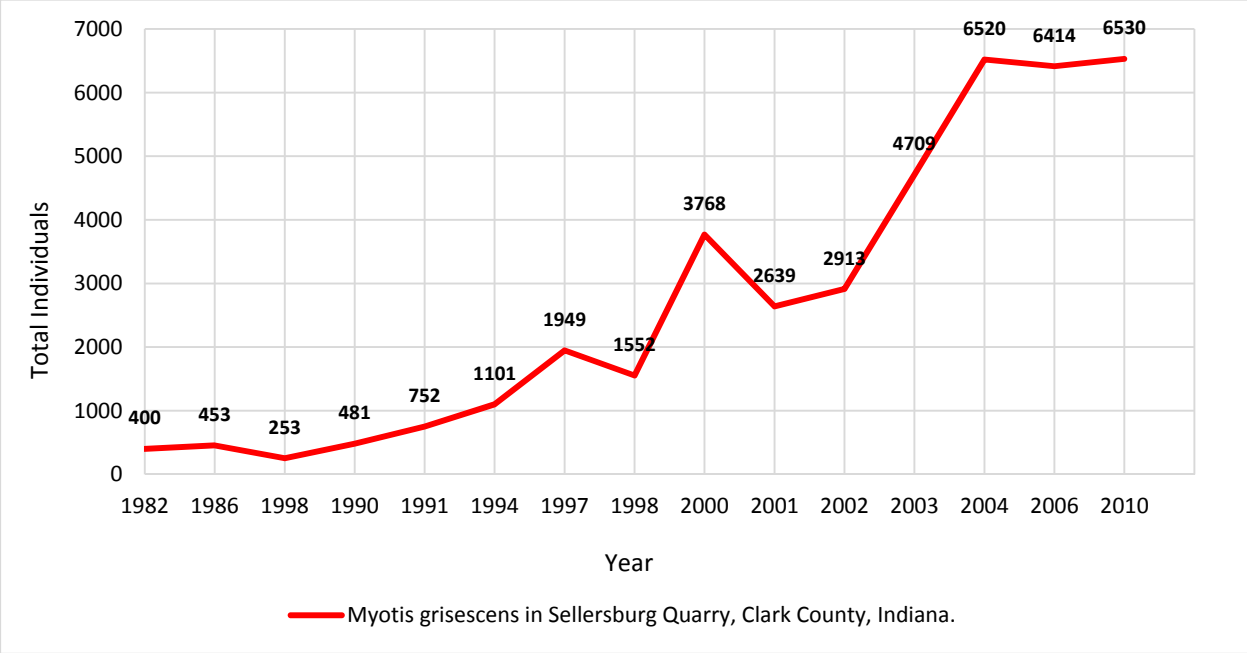
6. ENVIRONMENTAL BASELINE

The environmental baseline describes the biological status of the gray bat and their physical habitat within the Project Action Area. This evaluation demonstrates the current status within the Project Action Area and does not include direct, indirect, or cumulative effects associated with the proposed action. The proposed project effects are discussed later in this section. The environmental baseline also includes anticipated impacts of other proposed projects with a federal nexus within the Project Action Area.

Limited data has been collected about gray bat population metrics, distribution, or roost ecology within southern Indiana. Survey efforts for gray bats first began in the early 1980s with the discovery of a gray bat maternity colony in a limestone quarry at Camp Chelan near Sellersburg (Clark Co., IN) (Brack et al. 1984). By the late 1990s, gray bats were radiotracked from the limestone quarry and the Indiana Army Ammunition Plant at Charlestown (Clark Co., IN) (Pruitt 1995; Pruitt 1997; 1999; Whitaker et al. 2001). Surveys in 1999 and 2000 recorded captures of gray bats within the Project Action Area along Lancassange Creek (R.M. Munson, pers. comm. 2017).

The closest confirmed maternity colony records of gray bat presence in Indiana is located within a flooded limestone quarry known as the Sellersburg Quarry Silver Creek Cave approximately 4.5 miles northwest of the project's northern terminus. Periodic emergence counts at this cave opening performed by from 1982 through 2000 documented a steady increase in colony size from 400 individuals in 1982 to 3,768 individuals in 2000 (Whitaker et al. 2001). Additional emergence counts were also conducted by Whitaker and Pruitt in 2001, 2002, 2003, 2004, 2006, and 2010. Those counts also documented a continuous increase from 2001 through 2004, with colony sizes ranging from 2,639 individuals in 2001 to 6,520 in 2004. Since that time colony size has remained stable with 6,530 individuals in 2010, although preliminary data from 2017 may indicate more growth of this colony size.

Graphic 1: Summary of gray bat emergence counts at Sellersburg Quarry from 1982-2010 in Clark County, Indiana (Whitaker and Pruitt, 2001; R.M. Munson pers. comm. 2017).



Several additional gray bat captures have been documented on the former Indiana Army Ammunition Plant (IAAP) approximately 3.5 miles to the north of the proposed alignment in studies conducted by USFWS within the last 20 years (USFWS 1997, 1998, 2004). Radiotracking of gray bat females from these projects seemed to indicate secondary maternity sites could be present in the vicinity of a cave opening complex along Jenny Lind Run. The conclusions of these reports were that bats using this area were part of the Sellersburg quarry colony five miles to the west and individuals may at times occupy karst features temporary during the maternity season and use the drainages as commuting corridors to foraging grounds along the Ohio River (USFWS 1997, 1998, 2004). Several records are also known from the Goose Creek drainage which is situated approximately four miles southeast of the Project Action Area in Jefferson County, Kentucky (R.M. Munson, pers. comm. 2017).

6.1 Biological Baseline Assessment Methods

6.1.1 Mist Net Survey Methods

A presence/likely absence mist net survey was conducted in 2016 in accordance with guidelines contained in the "2016 Range-wide Indiana Bat Summer Survey Guidelines" (USFWS 2015), which were acceptable for use for gray bat surveys in 2016, and survey modifications specific to the state of Indiana as approved by the USFWS Bloomington Field Office and the IDNR. These guidelines call for one net site, consisting of two independent net sets at least 30 meters apart,

to be netted for two calendar nights (i.e., four total “net nights”) per kilometer of suitable habitat for linear projects. Surveys are to be conducted between May 15 and August 15 and are temperature and precipitation dependent.

During the 2016 survey, two survey sites were surveyed for two consecutive calendar nights and during each night, two net sets were erected (i.e., four total “net-nights” per site) (Figure 4). Net sets were customized for each site and placed approximately perpendicular across flight corridors, filling the corridor from side to side and from the ground or stream bed to the overhanging canopy to completely block the flight corridor. Various combinations of ropes and poles were used to support the mist nets and were based on the specific flight corridor height to be covered.

The surveys commenced at sunset and lasted for no less than five hours. Nets were checked for bats in 10-minute intervals by two-person teams at each survey site. Netting did not take place during nights of continuous rain, cold temperatures (<50˚F), or heavy wind.

Data collected for all captured bats included:

- species identification,
- sex,
- weight,
- age,
- sexual condition,
- wing damage index (Reichard and Kunz 2009), and
- right forearm length.

The teams adhered to the National White-Nose Syndrome Decontamination Protocol as set forth by the USFWS version 04.12.2016 (USFWS 2016).

6.2 Environmental Baseline Assessment Methods

6.2.1 Watershed Assessment Methods

To qualitatively assess potential project impacts on gray bat foraging and flyway habitat, the USGS Landcover Classification layer was analyzed within the Project Action Area. In order to quantify expected direct effects associated with the proposed project, land cover classification areas proposed for disturbance within the Project Alternative were deducted from the baseline watershed landcover quantities. These data were also used to qualitatively assess project impacts to gray bat travel corridors in the watershed.

6.2.2 Suitable Habitat Assessment Methods

Early coordination with the IDNR and USFWS was conducted in spring of 2016 and early 2017 to identify any known caves or other karst features that may serve as roosting habitat and/or winter hibernaculum within the Project Action Area. Gray bat foraging habitat in the Project Action Area was assessed through interpretation of publicly available GIS data and aerial photography. Forested areas within the Project Alternative were hand digitized at a scale of 1:5,000 using the most current available USGS aerial imagery. Early successional scrub forest and forest edges comprised of a single row of mature trees or stand-alone individual stems were not included as suitable in this assessment of foraging habitat.

A review of the Indiana Department of Environmental Managements' "Indiana Integrated Water Monitoring and Assessment Report to the U.S. EPA" (2016) identified any water quality data available for each of the named streams in the Project Action Area. These data provide assessment of existing water quality conditions and macroinvertebrate communities within a given watershed that may provide an indication of gray bat prey availability and foraging habitat quality.

6.3 Biological Baseline Assessment Results

6.3.1 Status of the Species within the Project Action Area

The 2016 mist net survey captured reproductive adult females, adult males, and juvenile females, documenting the presence of both nearby maternity and male bachelor colonies. Gray bats are present within the vicinity of the Project Action Area outside of the winter hibernation season in maternity, bachelor, and transient populations. Because of the known proximity to a large maternity colony, and connectivity to both the Ohio River and several large perennial tributaries suitable for gray bat foraging and travel, it is assumed that gray bats can be present within the Project Action Area at any time outside of winter hibernation.

6.3.2 Mist Net Survey Results

During the 2016 survey, 11 bats were captured at two sites in and around the approved study area boundary provided by American Structurepoint. Two eastern red bats, four big brown bats, and five gray bats were captured (Tables 1 and 2). No other bat species were encountered, including Indiana bats or northern long-eared bats.

Table 1. Bat capture summary table for the proposed INDOT heavy hall transportation corridor in Clark County, Indiana; June 28-July 1, 2016.

Survey Site	Species Captured			Total
	Eptesicus fuscus	***Lasiurus borealis***	***Myotis grisescens***	
1	3	1	1	**5**
2	1	1	4	**6**
Total	**4**	**2**	**5**	**11**

Table 2. Comprehensive bat capture data for the proposed INDOT project in Clark County, Indiana; June 28 – July 1, 2016.

Site	Date	Species	Net	Time	Age	Sex	RC	Weight (g)	FA Length (mm)
1	6/28/2016	*Myotis grisescens*	A	22:10	A	F	L	10.5	43.0
		Eptesicus fuscus	B	22:20	J	F	NR	13.5	49.0
		Eptesicus fuscus	B	22:50	A	F	L	19.5	49.0
		Lasiurus borealis	B	00:50	A	M	NR	12	37.0
	6/29/2016	*Eptesicus fuscus*	C	22:25	A	F	NR	10.9	44.0
2	6/30/2016	*Myotis grisescens*	B	22:10	A	F	L	10.5	44.0
		Myotis grisescens	B	22:10	A	F	L	10.5	43.0
		Lasiurus borealis	A	22:30	A	M	NR	14	39.0
	7/1/2016	*Eptesicus fuscus*	B	21:50	A	F	L	17.0	47.0
		Myotis grisescens	B	22:05	A	M	NR	10.0	43.0
		Myotis grisescens	B	22:40	J	F	NR	8.5	43.0

Note: **RC**=reproductive condition, **FA**=forearm, **A**=adult, **F**=female, **L**=lactating, **J**=juvenile, **NR**=non-reproductive, **M**=male.

6.4 Environmental Baseline Assessment Results

6.4.1 Watershed Assessment Results

Approximately 25% (1,178 acres) of the Project Action Area is forest, with 1,174.4 acres of deciduous forest, 2.5 acres of evergreen forest, and 1.1 acres of woody wetlands. Agriculture and developed land made up 17% and 47% of the remaining landcover within the Project Action Area, respectively. The high amount of disturbed land speaks to the urban and suburban landscape that encompasses most of the Project Action Area. Core forest (forest at least 100 meters from the forest edge) constitutes only 4% (1,084 acres) of the Lentzier Creek - Ohio River 14-digit HUC

watershed. Of all core forest in this watershed, approximately 13% (142 acres) of it is in the Project Action Area.

6.4.2 Suitable Foraging Habitat Assessment Results

The Project Action Area is mostly agriculture and urban land (Figure 5). The northwestern edge of the Project Action Area is a residential development, while the majority of the southern portion of the Project Action Area is mainly industrial. Agricultural fields and pasture are spread throughout the Project Action Area, while most of the forest blocks are in the north-central portion of the Project Action Area. About 25% (1,174 acres) of the Project Action Area is forested, with about 12% (142 acres) of that being core forest. Core forest is important for many species, including bat, which use large blocks of interior forest to commute between roost sites and nightly foraging grounds. These large blocks of core forest provide cover from nocturnal avian predators, as well as protection from anthropogenic disturbance.

Over 78,353 linear feet of streams are present in the Project Action Area, including 30,401 linear feet of large named streams such as Lentzier Creek, Lancassange Creek, Goose Creek, and the Ohio River (Figure 6). Goose Creek extends for 596 feet solely on the Kentucky side of the Project Action Area. Lancassange Creek accounts for 10,538 feet in the Southwest corner of the Project Action Area, and has several unnamed tributaries. Lentzier Creek and its tributaries flow across the northern and central parts of the Project Action Area. Lentzier Creek flows approximately 19,267 feet through the Project Action Area, and its tributaries account for much of the stream lengths in the Project Action Area. The remaining streams are short, unnamed streams immediately adjacent to the Ohio River, mainly on the eastern side of the Project Action Area. All named and unnamed streams in the Project Action Area drain southward into the Ohio River. Many of these streams, especially the named streams, most likely provide foraging and/or flyway corridors for gray bats.

A length of Lancassange Creek within the Project Action Area is listed by the Indiana Department of Environmental Management as a 303(d)-listed stream non-supporting its designated use due to elevated levels of *Escherichia coli* (E. coli) bacteria (IDEM 2016). E. Coli has also been found in the Ohio River just north of its confluence with Lentzier Creek. No impairments have been found in Lentzier Creek, but it is listed as having insufficient data in all 303(d) categories.

Approximately 57% of the stream lengths in the Project Action Area contain forested riparian habitat. Riparian corridors provide suitable commuting routes between roosting and foraging sites, woody debris stream inputs beneficial to macroinvertebrate habitat, stream shading affecting water quality and macroinvertebrate communities, and stormwater runoff amelioration that lessens sedimentation and streambank erosion related to increased stream velocities. The majority of the streams in the Project Action Area have only a single row of trees

along the streambank that presumably does not function at the same capacity as a fully forested corridor.

Table 3. Baseline gray bat riparian forest and riparian habitat metrics associated with the proposed INDOT Heavy Haul Transportation Corridor in Clark County, Indiana.

Foraging Habitat Metrics	Project Action Area (4,627 acres)		
	NLCD Forest Landcover Area (acres)	NHD Blue-Line Stream Length (feet)	NHD Named Stream Length (feet)
Baseline	1,178.0	66,979	30,401

*

No known summer roosts or winter hibernacula, including caves, mines, or other suitable roosting karst features are known to occur within the Project Action Area. The closest known maternity colony and hibernaculum are approximately 4.5 miles to the northwest of the Project Action Area within the Sellersburg Quarry Silver Creek Cave. An emergence count was last performed on this colony in 2010, estimating the population at 6,530 gray bats at that time. While gray bats captured during the 2016 mist net survey were not radio tagged or tracked, it is suspected that these individuals resided at the Sellersburg Quarry maternity site at the time of capture.

6.5 Federal Actions within the Project Action Area

One project with a federal nexus requiring formal section 7 consultations or estimation of incidental take is currently known from the Project Action Area. The River Ridge Commerce Center is a 6,000 acres multi-use industrial complex located less than 1-mile northeast of the Proposed Alternatives northern terminus. The United States Congress declared the pre-existing Indiana Army Ammunition Plant surplus in 1998 and authorized this 6,000-tract to be conveyed to the River Ridge Development Authority for economic development. This development center has been in planning and development for several years and is not understood to be reliant or dependent up on the Proposed Alternative. During the Base Realignment and Closure process (BRAC), bat surveys performed by the USFWS recorded several gray bat records within this property. It was assumed that these individuals were occupying several nearby caves and utilizing the foraging corridor along various perennial streams. The Endangered Species Management Plan prepared for the INAAP committed to several perpetual conservation measures recorded as legal covenants that are retained regardless of property ownership. A review of the River Ridge Commerce Center's Declaration of Covenants, Conditions, and Restrictions revealed that all karst features, caves, lakes, and perennial streams within the River Ridge Commerce Center are subject to a 100-foot undisturbed buffer and all intermittent streams are subject to a 50-foot undisturbed

buffer. These measures also include tree clearing restrictions within the Jenny Lind Run and Little Battle Creek watersheds.

7. PROJECT DETAILS

7.1 Construction

As this Proposed Alternative is currently within the preliminary design phase many aspects of project construction are not yet finalized. It is unknown if any temporary detours will be necessary in order to reconstruct several side road connections. The extent of earthwork and grading is unknown at this time. By definition, new impervious area will be added as part of the Proposed Alternative which is on new alignment. The Proposed Alternative design consists of two 13-foot wide travel lanes and two 11-foot wide shoulders and will increase impervious surface within the Project Action Area.

7.2 Project Timeline and Sequencing

A construction schedule is to be developed by the selected contractor. The total anticipated construction duration for this project is uncertain at this time. It is expected that the Proposed Alternative will be constructed in its entirety since it is on new location and traffic shifts are not required.

7.3 Site Preparation

As this Proposed Alternative is currently within the preliminary design phase many aspects of the erosion control plan are not yet finalized. The project's Erosion and Sediment Control Plan will conform to National Pollutant Discharge Elimination System (NPDES) for infrastructure projects. Prior to land clearing and grubbing operations, or any activity that disturbs existing ground, perimeter erosion control BMPs will be installed in order to prevent sediment from leaving the project area. These BMPs include sediment traps, check dams, silt fences, ditch inlet protections, temporary construction entrance stabilization, and temporary sediment basins are included within the preliminary construction plans to protect aquatic habitats. Permanent erosion control features include riprap installation over geotextile at the outflow of all culverts and paved side ditches in areas of 3 percent or steeper grades. Preliminary plans currently include riprap check dams that are subject to revision to transversable check dams should they be located within the final clearing zone.

All temporary ground disturbance will be protected using mulch and/or temporary grass seeding, usually an annual species. Permanent grass seeding will be applied to all permanent slopes and exposed surfaces prior to project completion. Sod will be installed along all ditch bottoms where grades are equal to or greater than 1% up to 3%. See Exhibit C for preliminary construction plans.

7.4 Construction Access and Staging

All staging areas will be determined by the selected contractor. This includes the placement of a project office trailer, which will likely be located in a displaced property either in an existing house or business or an office trailer delivered by the selected contractor. Any storage or laydown areas designated by the selected contractor will need to be within the permitted area, otherwise the selected contractor will need to permit those areas separately with the appropriate agencies.

7.5 In-Water Work

Culvert extensions will be done by utilizing existing culvert boxes and barrels as baseline channel conveyances, with diversions being used where the extension portion is being installed.

7.6 Flow Diversion

Flow diversions will be temporary when it comes to the new construction and extension of culverts. These diversions will be lined with heavy plastic to prevent erosion and scour of the temporary diversion stream bed.

7.7 Potential Impacts on Water Quality

All land disturbing activities associated with the proposed project action have the potential of affecting water quality negatively. The Proposed Alternative construction will adhere to all necessary water quality BMPs to minimize impacts to water quality within the Project Action Area.

7.8 Post-Project Site Restoration

The project area will be restored from temporary impacts by revegetation of native trees, shrubs, wildflowers, and suitable grasses, wherever possible. Permanent grassing will be applied to all permanent slopes and exposed surfaces prior to project completion. Sod will be installed along all ditch bottoms where grades are equal to or greater than 1% up to 3%. See Exhibit C for preliminary construction plans.

7.9 Operations

The widening portion of the project will extend or replace all stream crossings and won't result in additional barriers to aquatic species. There are no listed terrestrial species on this project. Stormwater will be conveyed via traditional highway stormwater drainage structures, i.e. catch basins, drop inlets, median inlets, and cross drains emptying into side ditches which ultimately drain to adjacent streams and wetlands. Post-construction stormwater BMPs will be constructed along with this project and maybe include filters, spill containment, and pollutant trapping storm drain

inserts. Construction of the Proposed Alternative will also meet all requirements of 107.08(b) of the INDOT standard specifications for dust control.

Vehicle volume per time-of-day is unknown at this time but most heavy truck traffic should be present during daylight hours, although some trucks will utilize the roadway at night when bats are active.

7.10 Maintenance

The routine maintenance requirements for this finished project will include mostly mowing of shoulders, medians and ditches. This mowing is normally done 2-3 times per year during the growing season.

The selected contractor will be required to clean the drainage pipes of all silt as part of final compliance requirements before transferring maintenance responsibilities to INDOT. This is normally done by hand if the culvert or pipe is big enough to accommodate a worker. If not, a high-pressure hose connected to a fire hydrant or water truck is used to loosen and disperse the accumulated silt. Milling of existing pavement and resurfacing or pavement cracks is normally done approximately every 20 years. No other routine maintenance items are anticipated.

8. EFFECTS OF THE PROPOSED PROJECT ACTION

Direct effects are caused by a proposed project action and occur at the same time and place as the action (e.g., tree removal, soil disturbance from digging). Indirect effects are caused by an action but the effects are dispersed over time and space (e.g., growth-inducing effects, population density or growth rate effects, lessened air and water quality). The cumulative effects of the project include the effects of future state and private activities that are reasonably certain to occur within the Project Action Area.

8.1 Direct Effects

Five gray bats were captured during mist net surveys in 2016. The potential for direct adverse effects to the gray bat is likely. Tree clearing can directly affect gray bats. While the gray bats' roosting habitat includes caves, not trees, the loss of travel corridors to foraging habitat could directly impact gray bats.

The Proposed Alternative will result in the direct loss of 9.1 acres of forested habitat and will directly impact 90 linear feet of Lentzier Creek suitable for gray bat foraging and traveling, which makes up 0.1% of the mapped blue-line streams available within the Project Action Area (Figure 6). 9.1 acres of general forest habitat, which may be suitable for gray bat foraging and traveling.

These proposed impacts would affect 0.8% of the total forest landcover within the Project Action Area.

Although the majority of the forest landcover in the Project Action Area would be retained, the removal of riparian forest and disturbance to large perennial streams in potential gray bat foraging habitat along Lentzier Creek may result in a slight loss of energy reserves during transit and foraging. However, with the nearest roost site located over 4 miles away from the Project Action Area across mainly urban and agricultural land, the energy lost to avoid this minor habitat void is likely to be negligible.

Reviewing historic imagery available from 1992, a large forest block north of Lentzier Creek within the Proposed Alternative was harvested in 2004. Currently, this forest is still considered early successional forest, and is not preferred foraging, flyway, or roosting habitat for bats, including gray bats. Removal of a portion of this forest should be relatively inconsequential to gray bats. The forest south of Lentzier Creek is older forest, and based on available aerial imagery, is at least 25 years in age. Traveling corridors like Lentzier Creek, forest roads, and electrical utility ROWs are more likely to be used by gray bats for traveling from roost to foraging sites through this landscape.

The proposed clearing area for this project does not contain the necessary resources (e.g., caves or mines) to support a gray bat maternity colony.

Table 4. Post-Action gray bat foraging and flyway habitat fragmentation bats for the proposed INDOT Heavy Haul Transportation Corridor Clark County, Indiana.

Habitat Metrics	**Project Action Area (4,627 acres)**		
	Baseline Conditions	**Post Action Impacts**	**Percent Impacted**
Total NLCD Forested Area (ac)*	1,178.0	9.1	0.8%
Total NHD Blue-Line Stream Length (l.f)	66,979	90	0.1%
Named NHD Blue-Line Stream Length (l.f)	42,799	90	0.2%

Note: **NLCD** = 2010 National Land Cover Data, **NHD** = National Hydrography Dataset, **ac** = acres; **l.f** = linear feet
* = deciduous forest, evergreen forest, & woody wetlands;

Noise disturbance created during construction is a potential direct effect to gray bats. If construction activities are completed during nighttime hours, it may disturb traveling/foraging activities of gray bats in the area. No nighttime construction is proposed at this time.

Construction of the proposed project may require blasting in various locations throughout the project corridor to allow for roadway widening at the proposed road grade. Explosive blasting

has the potential to affect gray bats directly if conducted during hibernation or indirectly when carried out in the spring, summer, or fall. Additionally, noise and vibration disturbance associated with blasting, along with changes to microclimate, have the potential to disturb roosting bats and degrade cave suitability. However, if blasting is necessary, this activity will utilize blasting mats to contain rock fragments (flyrock) within the construction limits of the Project Alternative. No known caves, tunnels, or underground mines are located within, or within the immediate vicinity of, the Project Action Area. The nearest known caves are located approximately 4.5 miles northwest of the proposed project clearing limits, and have known records of swarming, roosting, or hibernating gray bats. While a blasting plan has not been prepared at this time, no known gray bat maternity colony or hibernaculum is located within the Project Action Area. Thus, the likelihood of gray bat death, disturbance, or habitat degradation from blasting is negligible.

Construction of the Proposed Alternative may lead to increased dust accumulation in and around the project's construction limits. Dense clouds of construction-related dust may deter bats from the construction area or prevent successful foraging. Construction of the Proposed Alternative will meet all requirements of 107.08(b) of the INDOT standard specifications for dust control. These BMPs, along with the absence of night work when bats are actively foraging, should limit the negative effects of air born dust on active gray bats.

At this time, no critical habitat has been designated for the gray bat and no designated critical habitat for any federally listed bat species, including the Indiana bat (*M. sodalis*) or northern long-eared bat (*M. septentrionalis*) is present within the Project Action Area. Thus, the Proposed Alternative would have no effect on critical habitat for the gray bat or any other listed bat species.

8.2 Indirect Effects

Indirect effects to the gray bat created by maintenance and use of the improved and new roadway are possible, but are expected to be negligible. Noise disturbance and chemical contamination may be associated with maintenance activities, which may include, but are not limited to lighting, mowing, sidewalk repairs, painting, ditch maintenance, and management of woody species. Impacts associated with use of the roadway may include noise disturbance, stormwater runoff, and other contamination associated with increased vehicular use. Potential indirect effects to the aquatic environment may affect gray bats because they forage extensively on insects, and many insects have aquatic larvae.

Watersheds made up of urban, agricultural, or other converted landcover are potential indicators of poor stream and wetland health as those basins are subjected to higher levels of streambank erosion, pollutant runoff, sedimentation, aquatic habitat degradation, and hydrologic alteration of riverine wetlands. As such, evaluation of the percent forest landcover within a project areas drainage basin may provide an indication of watershed health. Assessment of percent forest cover removal may then provide an indication of proposed impacts to the aquatic environment

through the implementation of the project.

Because gray bats are nocturnal insectivores dependent upon prey born from aquatic habitats, the degradation of aquatic macroinvertebrate habitats has the potential to negatively affect these predator-prey relationships. The gray bats diet is largely comprised of insects that are dependent upon healthy streams free of sediment, such as those from the order Trichoptera, and as such is dependent upon clean streams within healthy watersheds. Conversion of forest lands within a given watershed can lead to increased sedimentation, alteration of stream pH balance and water temperature, and increase pollutants, all of which can degrade macroinvertebrate habitats leading to higher energy expenditure for gray bats searching for preferred prey. Approximately 75% (3,449 acres) of the 4,627-acre Project Action Area is currently classified as non-forest and the Proposed Alternative impacts 0.8% (9.1 acres) of the remaining forested acreage of the Project Action Area. As such, is not expected that the Proposed Alternative will have a significant impact on aquatic resources that may indirectly affect gray bats within the Project Action Area.

Predatory-prey relationships can also be altered through the removal of riparian forest as bat utilize overstory vegetative cover to avoid nocturnal avian predators such as owls. In addition to new roadway alignment creating canopy gaps that subject foraging bats to vehicular collisions, this forest removal may also increase vulnerability to natural predators or result in bats avoiding these portions of the riparian corridor thereby disrupting their preferred foraging corridors, decreasing foraging success and increasing energy expenditure. Gray bats are currently successfully foraging in the Project Action Area despite 75% of the available lands classified as non-forest. The Proposed Alternative will impact 0.8% of the forested habitat that gray bats are likely relying on for foraging and commuting. As such, it is not expected that the Proposed Alternative will have a significant impact on gray bat predation from nocturnal avian predators or vehicular collisions.

Artificial lighting can deter gray bats from otherwise suitable habitat, just as it exposes other types of active bats to avian predators (USFWS 2016). Gray bat foraging and flyway habitat can be disturbed from both permanent lighting installed for roadway safety considerations, as well as temporary lighting used for nighttime construction of roadway projects. No nighttime construction work is planned for the proposed project and thus no temporary lighting will be used to aid construction efforts. A permanent lighting plan has not been developed at this time but should consider the use of downward facing full cut-off lenses. Thus, the likelihood of habitat degradation and/or gray bat disturbance due to installation of new permanently fixed, downward facing lighting is negligible.

The proposed project action may indirectly lead to gray bat mortality later through collisions of bats with vehicles traversing the new roadway. Russell et al. (2009) documented mortality of 27 little brown bats, one Indiana bat, and one unidentifiable *Myotis* spp. found during searches of a 4.5-kilometer section of road in Pennsylvania over a four-month survey. In addition, Russell et al. (2009)

found that bats generally used forest canopy to cross roads. Tall forest canopy led to high-flying bats, while lower canopies (≤6 meters) led to bats crossing the highway at heights of two to three meters. Despite bat usage of canopy closure for crossings, bats have been recorded actively avoiding road crossings with vehicle noise (Zurcher et al. 2010). Because of the width of the proposed roadway, there should be little to no canopy cover remaining over the roads for bats to use when crossing. With this lack of cover and high volume of large truck traffic, bats should be expected to cross the road less frequently when automobiles are present. Additionally, the heavy haul road crossing over Lentzier Creek, the presumed primary gray bat travel corridor, will be accomplished with a 553-ft long bridge span with a height of 60-80 feet from the creek bed. This should allow for ample flyway area under the bridge, further reducing the potential for vehicle encounters. Bat mortality related to vehicle strikes is not expected to be significant within this 2.1-mile corridor.

Construction projects within karst areas have the potential to indirectly affect gray bats through alteration of airflow within cave systems, flooding due to increased runoff, and introduction of contaminants. However, the nearest known cave is located approximately 4.5 miles to the northwest. Therefore, it is unlikely that karst systems will be impacted indirectly or by increased runoff potentially generated from project activities. In addition, design of the proposed project proposes temporary construction and permanent post-construction BMPs for water quality treatment of stormwater runoff from impervious areas within the proposed clearing limits and associated ROW. These measures including sediment traps, check dams, silt fences, ditch inlet protections, temporary construction entrance stabilization, temporary sediment basins, riprap installation over geotextile at the outflow of all culverts, and paved side ditches in areas of 3 percent or steeper grades are included within the preliminary construction plans to protect aquatic habitats. Permanent erosion control features include riprap installation over geotextile at the outflow of all culverts and paved side ditches in areas of 3 percent or steeper grades would alleviate potential contamination to nearby karst habitat, as well as protect aquatic environments that support vital macroinvertebrate food sources for gray bats. All temporary ground disturbance will be protected using mulch and/or temporary grass seeding, usually an annual species. Permanent grass seeding will be applied to all permanent slopes and exposed surfaces prior to project completion. Sod will be installed along all ditch bottoms where grades are equal to or greater than 1% up to 3%. Upon implementation of these erosion and sedimentation control BMPS it is not expected that the Proposed Alternative will have a significant effect on the water quality or macroinvertebrate communities within the Project Action Area, and will thus not significantly affect gray bat foraging habitat.

8.3 Cumulative Effects

The cumulative effects of the proposed project include the effects of future state and private activities that are reasonably certain to occur within the Project Action Area. The primary need and purpose for the proposed project is to construct a roadway designed to accommodate heavy trucks and haul vehicles. INDOT, in partnership with the Federal Highway Administration, the Indiana Economic Development Corporation, the Ports of Indiana-Jeffersonville, the Board of Commissioners

of Clark County, the City of Jeffersonville Redevelopment Commission, and the River Ridge Development Authority, is developing this federal-aid road project to improve connectivity for the Ports of Indiana-Jeffersonville with other regional transportation assets. As such, a variety of currently-planned federal and non-federal actions may affect gray bats or bat habitat in the area.

Secondary development, such as industrial and commercial/retail construction, is likely and could impact gray bat habitat in the Project Action Area. Additional forest clearing, noise, and lighting would deter bats from using these areas in the future. However, the majority of the expected development within the Project Action Area is associated with the River Ridge Commerce Center and Ports of Indiana-Jeffersonville, which are existing commercial/industrial development projects and considered independent of the Proposed Alternative. Additionally, the Ohio River lies adjacent to a large portion of the Project Action Area. This is advantageous because this corridor provides resilient suitable foraging and flyway habitat within the immediate vicinity of the proposed clearing limits; providing bats with alternative habitat to stream corridors that may be cleared or disturbed from future secondary development in this region.

Habitat impacts related to commercialized and/or plantation forestry are negligible in this portion of southern Indiana with most forest stand sales originating from single-family parcels. The proposed project action is not expected to increase commercial forestry production within the Project Action Area.

The effects of secondary residential development are difficult to predict because this type of development is heavily dependent on outside factors such as economic and population growth. The majority of the Project Action Area is centered around industrial and commercial development and not conducive to residential growth. However, a small residential neighborhood is currently under construction approximately 0.4-mile east of the Proposed Alternative's intersection of Lentzier Creek along Old Salem Road. This residential development appears to be constructed within an existing homesite that previously cleared of forested habitat prior to 1992. It is unknown if the current development, or any future expansions of the site, would result in additional forested habitat clearing or impacts to Lentzier Creek at this location.

9. Conservation Measures

Approximately 9.1 acres of forested habitat were described from within the Proposed Alternative's clearing limits. This habitat, as well as Lentzier Creek, Lancassange Creek, Goose Creek, their associated perennial tributaries provide suitable foraging and/or flyway corridors for gray bats and may provide travel corridors to more suitable maternity habitat for gray bats within the nearby Sellersburg Limestone Quarry. Based on the information collected, including captures of gray bats in 2016 and the presence of an existing gray bat maternity colony within approximately 4.5 miles of the Proposed Alternative, the following conservation measures are proposed:

9.1 Avoidance and Minimization Measures

- The project shall not remove trees or forested habitat outside of the proposed construction limits;

- Low-water in-stream work will be limited to installation of culverts, piers, pilings and/or footings, shaping of spill slopes adjacent to bridge abutments, and placement of riprap;

- Culverts will span the active stream channel and shall either be embedded or a 3-sided/open-arch culvert, and be installed where practicable on an essentially flat slope. When applicable, culverts placed in streams with high quality substrate such as gravel, cobbles and boulders, shall not disturb the native substrate within the stream bed in order to provide natural habitat for the aquatic community;

- In-stream channel work and vegetation clearing shall be restricted to the minimum necessary for installation of the stream crossing structure;

- Construction shall minimize the extent of hard armor (riprap) in bank stabilization by using bioengineering techniques whenever possible. If rip rap is utilized for bank stabilization, extend it below low-water elevation to provide aquatic habitat;

- Temporary erosion and sediment control BMPs will be utilized within areas of disturbed soil. All disturbed soil areas upon project completion will be vegetated following INDOT's standard specifications;

- Work within the inundated part of the stream channel (in perennial streams and larger intermittent streams) will be restricted to outside of the fish spawning season (April 1 through June 30), except for work within sealed structures such as caissons or cofferdams that were installed prior to the spawning season. No equipment shall be operated below the Ordinary High Water Mark during this time unless the machinery is within the caissons or on the cofferdams;

- The project proposes temporary construction and permanent post-construction BMPs for water quality treatment of stormwater runoff from impervious areas within the Proposed Alternative limits and INDOT ROW. Temporary construction BMPs will include sediment traps, check dams, silt fences, ditch inlet protections, temporary construction entrance stabilization, and temporary sediment basin within the preliminary construction plans to protect aquatic habitats. Permanent erosion control features include riprap installation over geotextile at the outflow of all culverts and paved side ditches in areas of 3 percent or steeper grades. Structural BMPs may also be employed to reduce stormwater pollution through filtration, biological uptake, and microbial activity. Post-construction BMPs are

effective in treating for total suspended solids, nutrients, and metals as well as reducing impervious area stormwater runoff, thereby protecting aquatic resources that support important macroinvertebrate food sources for gray bats;

- The project proposes any explosive blasting will be conducted in daylight hours and will utilize blasting mats to prevent flyrock from escaping the project's construction limits;

- If necessary, the project proposes downward facing permanent lighting to reduce disturbance to nearby suitable bat foraging habitat. No temporary lighting to facilitate nighttime construction will be used;

- If appropriate, the proposed project will evaluate wildlife crossings under bridges and culverts. Suitable crossings include flat areas below bridge abutments with suitable ground cover, high water shelves in culverts, amphibian tunnels and diversion fencing.

9.2 Mitigation

The project team should consult with the USFWS' Bloomington Field Office regarding implementation of project-specific mitigation measures for the permanent loss of 9.1 acres of forested habitat associated with the Proposed Alternative. Mitigation will need be provided at a minimum ratio of 1:1 for forest restoration along with 2:1 for forest preservation to compensate for forest impacts.

10. Determination of Effect

The bat mist net survey was conducted with the appropriate level of effort and under the appropriate conditions to investigate presence/likely absence of gray bats during the maternity season for the proposed INDOT Heavy Haul Transportation Corridor in Clark County, Indiana. Additionally, other potential roosting features, such as bridges and culverts, were inspected for the presence of bats. No caves or underground mines were located within, or within the immediate vicinity of, the Proposed Alternative or Project Action Area. The 2016 Bat Mist Net Survey Report can be found in Exhibit B.

The results of the 2016 mist net survey verified the presence of the gray bat within the immediate vicinity of the Proposed Alternative during the summer maternity season and documented presence of suitable foraging and flyway habitat in the Project Action Area (Table 5). Upon implementation of the aforementioned conservation measures, a determination that the proposed action "may affect, and is likely to adversely affect" is recommended for the federally-endangered gray bat (Table 6).

Table 5. Gray bat suitable habitat associated with the proposed INDOT Heavy Haul Transportation Corridor Clark County, Indiana.

Species	Roosting Habitat/Structures Present? If so, describe.	Habitat Suitable for Foraging? (Yes/No)	Habitat Suitable for Flyway? (Yes/No)
Gray bat	None present	Yes	Yes

Table 6. Determination of potential effects to gray bats for the proposed INDOT Heavy Haul Transportation Corridor Clark County, Indiana.

Common Name	Scientific Name	Current Listing Status	Recommended Effect Determination
Gray bat	*Myotis grisescens*	Federally Endangered	"May Affect, and is Likely to Adversely Affect"

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INDOT Heavy Haul Corridor
Gray Bat Biological Assessment
Clark County, Indiana
INDOT Des. No. 1382612

0 0.125 0.25 0.5 0.75 1 Miles

Imagery Source: USGS 7.5' Topographic Quadrangle (Jeffersonville, IN)

FIGURE 1

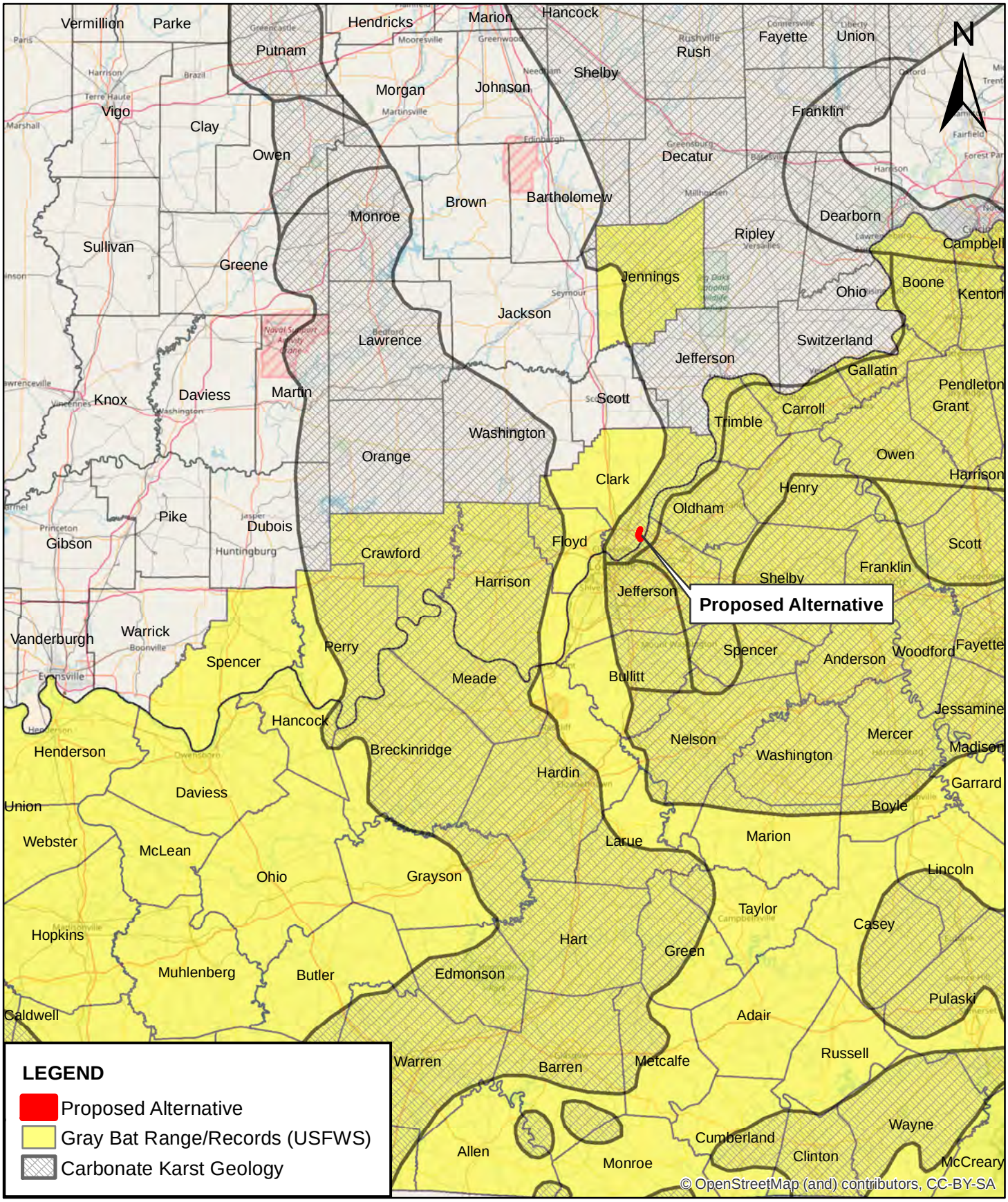
Des. No. 1382612
Location Map

Eco-Tech CONSULTANTS

Drawn by: ABO | Print Date: 10/10/17

Prepared For: United Consulting

ETC File: LV2016025



INDOT Heavy Haul Corridor
Gray Bat Biological Assessment
Clark County, Indiana
INDOT Des. No. 1382612

0 5 10 20 30 40 Miles

Imagery Source: USGS 7.5' Topographic Quadrangle (Jeffersonville, IN)

FIGURE 2

Des. No. 1382612
Gray Bat Range Map

Eco-Tech CONSULTANTS

Drawn by: ABO | Print Date: 10/10/17

Prepared For: United Consulting

ETC File: LV2016025

INDOT Heavy Haul Corridor
Gray Bat Biological Assessment
Clark County, Indiana
INDOT Des. No. 1382612

0 650 1,300 2,600 3,900 5,200 Feet

Imagery Source: USGS 7.5' Topographic Quadrangle (Jeffersonville, IN)

FIGURE 3

Des. No. 1382612
Project Action Area Map

Eco-Tech CONSULTANTS

Drawn by: ABO | Print Date: 10/10/17

Prepared For: United Consulting

ETC File: LV2016025

Page I-62 (Figure 4) Removed
Due to Sensitive Information

INDOT Heavy Haul Corridor
Gray Bat Biological Assessment
Clark County, Indiana
INDOT Des. No. 1382612

0 650 1,300 2,600 3,900 5,200 Feet

Imagery Source: ESRI, World Imagery

FIGURE 5

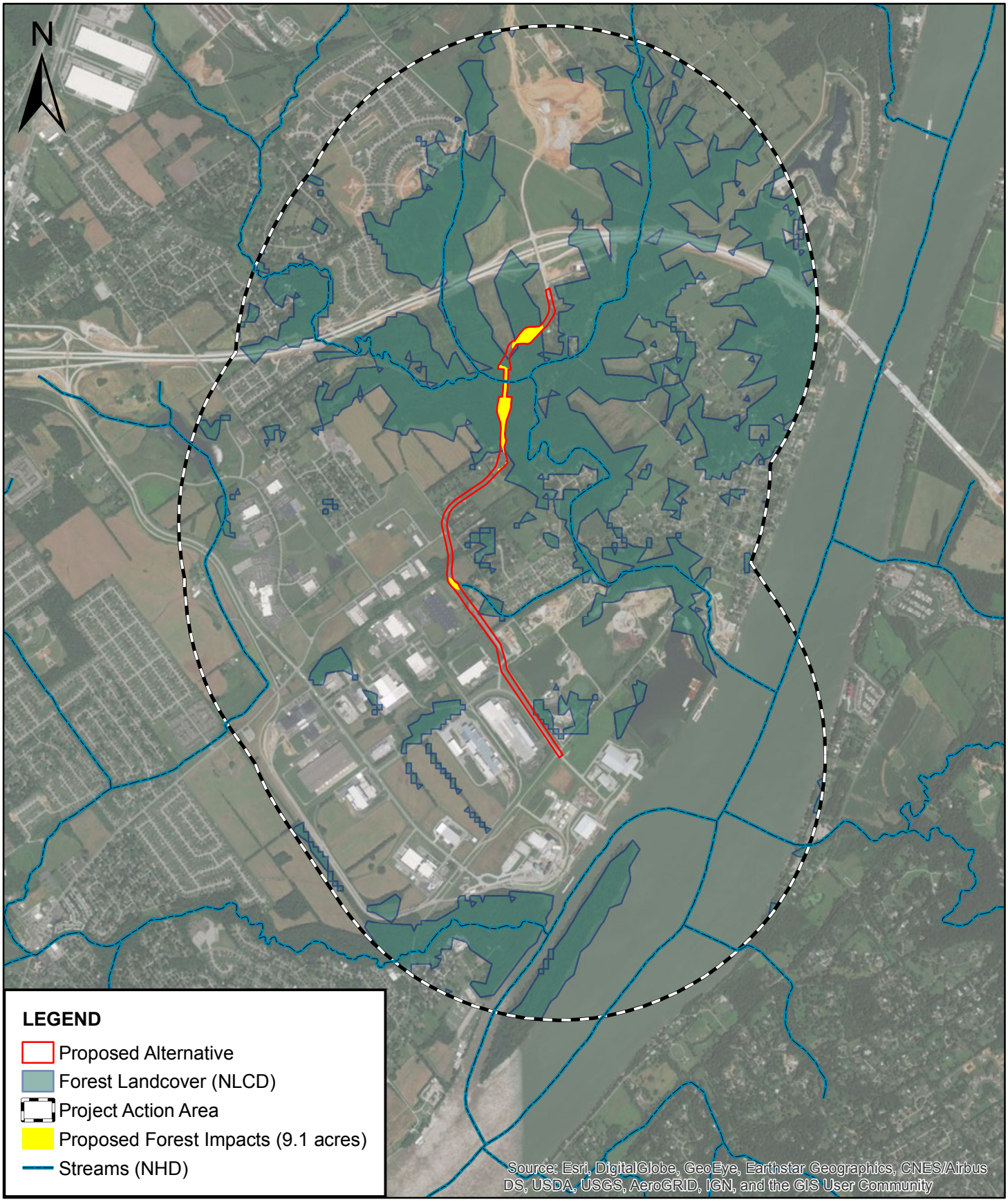
Des. No. 1382612
Baseline Forest Habitat Map

Eco-Tech CONSULTANTS

Drawn by: ABO | Print Date: 10/10/17

Prepared For: United Consulting

ETC File: LV2016025



INDOT Heavy Haul Corridor
Gray Bat Biological Assessment
Clark County, Indiana
INDOT Des. No. 1382612

0 650 1,300 2,600 3,900 5,200 Feet

Imagery Source: ESRI, World Imagery

FIGURE 6

Des. No. 1382612
Forest Impact Map

Eco-Tech CONSULTANTS

Drawn by: ABO | Print Date: 1/17/18

Prepared For: United Consulting

ETC File: LV2016025

EXHIBIT A – LISTED BAT CONSULTATION HISTORY

INDIANA DEPARTMENT OF TRANSPORTATION

100 North Senate Avenue
Room N642
Indianapolis, Indiana 46204

PHONE: (317) 233-6795
FAX: (317) 233-4929

Michael R. Pence, Governor
Brandye L. Hendrickson, Commissioner

April 8, 2016

«F2»
«F3»
«F4»
«F5»
«F6»
«F7»
«F8», «F9» «F10»

Re: Des. No. 1382612
Heavy Haul Transportation Corridor
Port of Indiana – Jeffersonville to SR 265
Utica Township, Clark County, Indiana
Project No. 2013.01857

Dear «Early_Coordination_Mailing_List»:

The Indiana Department of Transportation (INDOT), in partnership with the Federal Highway Administration (FHWA), the Indiana Economic Development Corporation, the Ports of Indiana, the Board of Commissioners of Clark County, the City of Jeffersonville Redevelopment Commission, and the River Ridge Development Authority (RRDA), is developing a federal-aid road project to improve connectivity for the Ports of Indiana-Jeffersonville (Port) with other regional transportation assets. The proposed project is located in Utica Township, Clark County, Indiana.

The area is located on the Jeffersonville and Charlestown USGS 7.5 Minute Quadrangle Maps in Tracts 6-7, 14-17, 24-27, 38-40, and 52-53 and is within the Louisville Metropolitan Planning Area (LMPA), which consists of nine counties in Kentucky (Jefferson, Oldham, Trimble, Henry, Shelby, Spencer, Nelson, Bullit and Meade) and four Indiana counties (Washington, Harrison, Floyd and Clark). Preliminary corridor studies have identified an approximately 1.3-mile wide corridor between the Port of Indiana, Jeffersonville and State Road (SR) 265 to establish roadway alignment alternatives for the project. The alternatives are currently being developed and evaluated within the project corridor based upon environmental studies and coordination. Various maps and aerial photographs are enclosed showing the area being investigated.

The project area has several major generators of traffic that consist primarily of heavy trucks or heavy haul vehicles. However, the road network in the area is primarily made of up of local facilities not designed to handle such vehicle loading. Heavy haul vehicles (often referred to as Michigan truck trains) are generally 60 feet or more in length with a gross vehicle weight of 134,000 pounds, as compared to Indiana legal load limits of 80,000 pounds gross vehicle weight. Heavy haul vehicles require the design of facilities to take into account the maximum weight of the heavy haul vehicles and the anticipated number of heavy haul vehicles utilizing the facility on a daily basis. The resulting difference between a facility designed to carry heavy haul vehicles and standard load trucks is often a significant difference in pavement thickness. Based on current and predicted

rapid industrial and commercial development associated with the major traffic generators in the project area it is anticipated that truck traffic will increase by 129 percent over the next 20 years.

The need for the proposed project is due to the current and predicted rapid industrial and commercial development in the area that would result in a significant increase in volume of heavy haul vehicles mixing with local traffic. This growth, combined with the lack of connectivity and suitable roadways for heavy haul vehicles in the area, indicates a need for the proposed project. The purpose of the proposed project is to provide a route built specifically for heavy haul vehicles that provides continuous connection between the RRCC and the Port via the new SR 265/Old Salem Road interchange.

The proposed project corridor generally extends north from the Port to the SR 265/Old Salem Road interchange. The area is a combination of forest, open grass, industrial, and farmed areas. The forested areas are generally on steep slopes. Few existing roads are located within this area. The proposed project corridor is bounded by the SR 265 corridor at the northern project limits. Lentzier Creek and several tributaries are located within the project corridor.

The proposed project consists of the construction of a 3-lane road designed to "heavy haul" specifications. The proposed road would have a design speed of 35 miles per hour with two 12-foot travel lanes and one 11- to 12-foot auxiliary lane. The road would likely be constructed on new alignment at a total length of approximately 1.75 miles. While only three lanes would be constructed, right-of-way would be wide enough to allow for future expansion to five lanes if required by traffic demand.

A Red Flag Investigation has been conducted to identify potential infrastructure, water, mining, hazardous materials, cultural resources, and ecological resources that may impact or be impacted by the proposed project. Potential concerns and recommendations are listed below:

- Noting the potential location of the project within the karst region of Indiana, as defined by the Karst Memorandum of Understanding (Karst MOU), an investigation of karst features in the project corridor and determination of potential impacts will be conducted.

- Multiple water resources including National Wetland Inventory (NWI) wetlands and streams were mapped with the project corridor. A wetland delineation and waters investigation will be completed to identify resources within the project corridor.

- Coordination will be conducted with the Indiana Department of Natural Resources and the US Fish and Wildlife Service regarding the potential for threatened and endangered species in the proposed project area. The Gray Bat (*Myotis grisescens*), the Indiana Bat (*Myotis sodalis*), and the Northern Long-Eared Bat (*Myotis septentrionalis*) have all been identified as potentially occurring in or near the proposed project corridor.

- Two potential trails, Ohio River Greenway to Charlestown State Park and Porter Road Corridor, run through the proposed project area. Both are managed by the City of Jeffersonville. Appropriate coordination should occur with the City of Jeffersonville if work is proposed along either of these corridors.

- One natural gas pipeline, owned by Indiana Gas Co. Inc., crosses the proposed project area. Appropriate coordination should occur with the INDOT utilities coordinator if excavation is to occur in the area.

- Several potential hazardous materials sites were identified. Environmental Site Assessments will be conducted to further investigate several of these areas.

- Based on preliminary review of the State Historic Architectural and Archaeological Research Database (SHAARD) and the Clark County Interim Report, several historical sites and structures are located

within or near the project corridor. A Historic Property Report and an Archaeology Report will be prepared for the project. The Section 106 process will further investigate potential impacts to historic sites and structures.

This letter is part of the early coordination phase of the environmental review process. You are asked to review this information and provide any comments you may have relative to anticipated impacts of the project on areas in which you have jurisdiction or special expertise. We will incorporate your comments into a study of the project's environmental impacts. To facilitate the development of this project, you are asked to reply within 30 days of receipt of this letter. If no response is received by that date, it will be assumed you have no comments at the present time.

Your timely cooperation in the development of this project is appreciated. For general inquiries please contact myself at (317) 234-4916 or by e-mail at rbales@indot.in.gov or Michelle Allen of FHWA at (317) 226-7344 or by e-mail at michelle.allen@dot.gov. However, please contact our consultant, Leah Boits of American Structurepoint at (317) 547-5580 or by e-mail at lboits@structurepoint.com for coordination purposes, questions, or if additional information is needed.

Respectfully,

Ron Bales
Environmental Policy Manager
Indiana Department of Transportation

Enclosures

- State Location Map
- USGS Topographic Mapping
- 2014 Aerial Photography
- Red Flag Investigation Infrastructure Map
- Red Flag Investigation Water Resources Map
- Red Flag Investigation Mining/Mineral Exploration Map
- Red Flag Investigation Hazardous Material Concerns Map
- Early Coordination Distribution List

United States Department of the Interior
Fish and Wildlife Service

Bloomington Field Office (ES)
620 South Walker Street
Bloomington, IN 47403-2121
Phone: (812) 334-4261 Fax: (812) 334-4273

23 June 2016

Mr. Lee Droppelman
Eco-Tech Consultants, Inc.
11321 Decimal Drive
Louisville, KY 40299

RE: Pre-survey site-specific coordination and Bloomington, Indiana Field Office authorization for conducting mist-net surveys for the Federally endangered Indiana bat (*Myotis sodalis*) and the federally threatened northern long-eared bat (*Myotis septentrionalis*) for the proposed Indiana Department of Transportation (INDOT) heavy haul road construction from the Indiana Ports-Jeffersonville to Interstate 265, Clark County, Indiana.

Dear Mr. Droppelman:

This letter is in response to your bat survey plan and follow-up email dated June 14th and June 23rd, 2016, respectively, for authorization from the U.S. Fish and Wildlife Service's (USFWS) Bloomington Field Office (BFO) to conduct summer surveys and radio-telemetry of the federally endangered Indiana bat (*Myotis sodalis*) and the federally threatened northern long-eared bat (*Myotis septentrionalis*). We have reviewed the study plan and subsequent location maps and photos and agree that the survey effort will be sufficient for the scope of the proposed project.

Specifically, your request covers mist netting and telemetry activities at 2 sites along Lentzier Creek and its tributaries (and potentially an alternative location) in association with the above referenced project. Studies will be carried out under USFWS Federal Fish and Wildlife Permit issued to Peter Lee Droppelman (TE810274-11).

Up to two female Indiana and northern long-eared bats from each site will be radio-tagged and tracked to roost trees. Male Indiana and northern long-eared bats will be tagged and tracked from a site if: 1) no females are caught on night 1; and 2) a male is captured on night 2 prior to the capture of a female. If tagged bats are not found, then search efforts will continue for a minimum of 40 hours of ground searching. Bats will be tracked to roost trees for a minimum of 7 days. A minimum of two emergence counts will be conducted on any roost tree that is located. Additional counts and telemetry will be included if time permits.

Captures of Indiana bats and northern long-eared bats should be reported directly to Robin McWilliams Munson at this office within 24 hours (voice mail should be left at 812-334-4261 ext. 1207).

This letter serves as your authorization to conduct the work as specified in the request you submitted and must be carried with your federal permit when conducting work for this project. All activities must be carried out with strict adherence to permit conditions and authorizations specified in your federal permit (as well as your permit from the State of Indiana), including WNS decontamination protocols. This authorization is not valid if you have not obtained permission from the owner of the lands where activities will occur.

Region 3 of the USFWS has developed a new spreadsheet for reporting bat survey data; this spreadsheet must be used for reporting your survey results. The spreadsheet is available on the USFWS Indiana Bat Summer Survey Guidance website:
http://www.fws.gov/midwest/endangered/mammals/inba/inbasummersurveyguidance.html.

Finally, we want to remind you of the need for you and your staff to obtain or amend your State permits, as appropriate, for this project.

If the work expands beyond the scope of the request you provided or if there are adverse effects to bats that were not anticipated, cease all bat research activities and contact this office prior to continuing. If you have any questions please contact Robin McWilliams Munson (812-334-4261, extension 1207).

Sincerely,

Scott E. Pruitt
Field Supervisor

cc: Scott Johnson, Indiana Department of Natural Resources
Leah Boits, American StructurePoint, 7260 Shadeland Station, Indianapolis, IN 46256

From: McWilliams, Robin
To: Amanda Janicki
Subject: Re: data request for gray bats in Clark Co., Indiana
Date: Monday, May 1, 2017 2:51:14 PM

Hi again. Here are the two reports by Lori Pruitt. I scanned them so let me know if they don't work.

Robin

Robin McWilliams Munson

U.S. Fish and Wildlife Service
620 South Walker Street
Bloomington, Indiana 46403
812-334-4261 x. 207 Fax: 812-334-4273

Monday, Tuesday - 7:30a-3:00p
Wednesday, Thursday - telework 8:30a-3:00p

On Fri, Apr 28, 2017 at 8:35 AM, Amanda Janicki <AJanicki@ecotechinc.com> wrote:

> Thanks Robin!
>
> Two additional questions – do you have a link for the BA/BO from the US265 bridge? I'm having trouble finding it. Also, Lori Pruitt has two unpublished reports that are relevant to this project (see below). Do you happen to have a copy of these or should I contact Lori directly?
>
> Pruitt, L. 1997. 1997 Bat Survey at the Indiana Army Ammunition Plant at Charleston, Clark
>
> County, Indiana. USFWS Report. Bloomington. 25 pp. (Unpubl. report)
>
> Pruitt, L. 1998. 1998 Gray Bat Study at the Indiana Army Ammunition Plant at Charlestown,
>
> Clark County, Indiana. USFWS Report. Bloomington. 23 pp. (Unpubl. report)
>
> Thanks again. -Amanda

******PLEASE NOTE******

Our main office is moving on May 15th and 16th, 2017.

Please update your records with our new address:

311 Clark Station Road

Fisherville, KY 40023

Amanda Janicki

Terrestrial Ecologist

Eco-Tech Consultants, Inc.

311 Clark Station Road

Fisherville, KY 40023

(502) 259-0454 Main

(502) 259-0462 Direct

(585) 730-9751 Mobile

ajanicki@ecotechinc.com

www.ecotechinc.com

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From: McWilliams, Robin [mailto:robin_mcwilliams@fws.gov]
Sent: Thursday, April 13, 2017 12:04 PM
To: Amanda Janicki <AJanicki@ecotechinc.com>
Subject: Re: data request for gray bats in Clark Co., Indiana

For starters, these papers discuss status of gray bat in Indiana:

1) Gray bat account from Mammals of Indiana

2) Whitaker et al. 2001. Gray bat in Indiana. http://www.indianaacademyofscience.org/Documents/Proceedings/V110/PIAS_v110_p114-122.aspx

The 2001 paper has the counts for our only known maternity colony at Sellersburg Quarry. That paper summarizes counts through 2001. John Whitaker and Lori Pruitt (FWS) have continued to survey this colony sporadically since. Here are the data since 2000 (although not since 2010):

May 9, 2001	1,144
June 14, 2001	1,601
Aug 21, 2001	2,639
Aug 21, 2002	2,913
Aug 29, 2003	4,709
Aug 11, 2004	6,520
Aug 22, 2006	6,414
Sept 2, 2010	6,530

This is a flooded limestone quarry that has multiple openings. Visual counts are made at dusk as bats emerge by counters sitting adjacent to the openings used by bats. We are unassisted by any modern technology -- just error-prone humans. As such, estimates are certainly subject to error. On a few occasions when we had enough people we'd have 2 people independently estimate at the same opening -- estimates were generally close.

We haven't done any counts since 2010.

As I mentioned, the environmental docs from the 265 east end bridge should have some

survey info as well.

Robin

Robin McWilliams Munson

U.S. Fish and Wildlife Service

620 South Walker Street

Bloomington, Indiana 46403

812-334-4261 x. 207 Fax: 812-334-4273

Monday, Tuesday - 7:30a-3:00p

Wednesday, Thursday - telework 8:30a-3:00p

On Thu, Apr 13, 2017 at 9:19 AM, McWilliams, Robin <robin_mcwilliams@fws.gov> wrote:

> Hi Amanda,
>
> I am checking to see what we have a what format we have it in. The BA/BO that was done for the US265 bridge should have some data and information for gray bats in the area. We do have a maternity colony at Sellersburg but have not surveyed there in a while (since 2010 I believe). According to the property owners, they still see quite a few bats.
>
> I'll let you know what else I can find.
>
> Robin

Robin McWilliams Munson

U.S. Fish and Wildlife Service

620 South Walker Street

Bloomington, Indiana 46403

812-334-4261 x. 207 Fax: 812-334-4273

Monday, Tuesday - 7:30a-3:00p

Wednesday, Thursday - telework 8:30a-3:00p

On Thu, Apr 13, 2017 at 8:54 AM, Amanda Janicki <AJanicki@ecotechinc.com> wrote:

> Hi Robin,
>
> I am working on the gray bat biological assessment for the INDOT heavy haul transportation corridor in Clark County, Indiana for United Consulting and American Structurepoint, and I was told that data requests for this project go through you. I would like to request any gray bat records you may be aware of in the area, including any maternity, roosting, or foraging data. Thanks. -Amanda
>
> Amanda Janicki, MS x2
>
> Ecologist
>
> **Eco-Tech Consultants, Inc.**
>
> www.ecotechinc.com

11321 Decimal Drive

Louisville, KY 40299

502-259-0462 ext 1002 (office)

585-730-9751 (cell)

ajanicki@ecotechinc.com

From: McWilliams, Robin
To: Amanda Janicki
Subject: Fwd: pdf copy of 2005 gray bat report for Charlestown/INAAP
Date: Tuesday, May 2, 2017 9:10:30 AM

Hi Amanda,

here is another report from our office I found.

robin
Robin McWilliams Munson

U.S. Fish and Wildlife Service
620 South Walker Street
Bloomington, Indiana 46403
812-334-4261 x. 207 Fax: 812-334-4273

Monday, Tuesday - 7:30a-3:00p
Wednesday, Thursday - telework 8:30a-3:00p

---------- Forwarded message ----------
From: **King, Andrew** <andrew_king@fws.gov>
Date: Mon, May 1, 2017 at 3:39 PM
Subject: Re: pdf copy of 2005 gray bat report for Charlestown/INAAP
To: "McWilliams, Robin" <robin_mcwilliams@fws.gov>

Hi Robin. It's attached.

RAK

_____
R. Andrew King
Fish and Wildlife Biologist
U.S. Fish and Wildlife Service
Indiana Field Office
620 S. Walker Street
Bloomington, IN 47403
Phone: 812-334-4261 x1216
Fax: 812-334-4273

On Mon, May 1, 2017 at 2:50 PM, McWilliams, Robin <robin_mcwilliams@fws.gov> wrote:

> Hi Andy,
>
> Do you have an electronic copy of this report I can share with a consultant writing the BA for the new road at the port?
>
> Robin

Robin McWilliams Munson

U.S. Fish and Wildlife Service
620 South Walker Street
Bloomington, Indiana 46403
812-334-4261 x. 207 Fax: 812-334-4273

Monday, Tuesday - 7:30a-3:00p
Wednesday, Thursday - telework 8:30a-3:00p

EXHIBIT B – 2016 BAT MIST NET SURVEY REPORT

Bat Mist Net Survey for the INDOT Heavy Haul Transportation Corridor
Des. No. 1382612

CLARK COUNTY, INDIANA

Prepared for:
United Consulting
Indianapolis, IN

Prepared by:
Eco-Tech Consultants, Inc.
Louisville, KY

July 2016

BAT MIST NET SURVEY
INDOT HEAVY HAUL TRANSPORTATION CORRIDOR
DES. NO. 1382612

CLARK COUNTY, INDIANA

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Figure 1. Proposed Study Area Location Map.
Figure 2. Proposed Study Area and Mist Net Survey Site Locations.

Photographic Log

Appendices

Appendix A Approved Study Plan and USFWS Correspondence.
Appendix B Field Data Forms.

1. INTRODUCTION

Eco-Tech Consultants, Inc. (Eco-Tech) has been contracted by United Consulting to conduct bat mist net surveys for the proposed Indiana Department of Transportation (INDOT) Heavy Haul Transportation Corridor, Des. No. 1382612 (project) in Clark County, Indiana. The proposed project is within the known range of the federally endangered Indiana bat (*Myotis sodalis*), federally endangered gray bat (*Myotis grisescens*), and federally threatened northern long-eared bat (*Myotis septentrionalis*).

This report outlines mist net survey purpose, methodology, results, and conclusions based on field data collection and habitat present within the proposed study area.

2. PROJECT DESCRIPTION

INDOT, in partnership with the Federal Highway Administration, the Indiana Economic Development Corporation, the Ports of Indiana-Jeffersonville, the Board of Commissioners of Clark County, the City of Jeffersonville Redevelopment Commission, and the River Ridge Development Authority, is developing a federal-aid road project to improve connectivity for the Ports of Indiana-Jeffersonville with other regional transportation assets. Due to an expected increase in volume of heavy haul vehicles in the area, a three-lane roadway designed to accommodate heavy trucks and haul vehicles is needed. A roadway with an adjacent auxiliary lane will allow for heavy haul traffic to avoid using the local roadways that are not meant to handle vehicles of such size and weight.

The proposed project is located in Utica Township in Clark County, Indiana, where a corridor that is less than 2 miles long between the Port of Indiana-Jeffersonville, and State Road (SR) 265 may provide suitable roadway alignment alternatives (Figure 1). While only three lanes would be constructed, right-of-way would be wide enough to allow for future expansion to five lanes if required by traffic demand. The proposed project corridor generally extends north from the Indiana-Jeffersonville Port to the SR 265/Old Salem Road interchange. The area is a combination of steeply sloped forest, old fields, industrial properties, and farmed areas. The proposed project area contains few existing roads, Lentzier Creek and several tributaries.

3. QUALIFYING STATEMENT

Eco-Tech biologists have completed federally protected plant and animal surveys across the nation. Eco-Tech holds scientific collection permits for over 50 federally-listed species in more than 20 states, including bats and other small mammals, freshwater mussels, fish, and plants. Eco-Tech has conducted bat species surveys from California to New Jersey using a host of survey techniques, including mist nets, harp traps, passive/active acoustic monitoring, infrared/thermal video recording, aerial/ground telemetry, and technical cave searches. Eco-Tech has worked with numerous organizations to develop scientifically sound survey plans, biological assessments, protection and enhancement plans, and mitigation strategies.

The principal investigator for this project was Mr. Lee Droppelman. Mr. Droppelman has led and actively participated in bat surveys across the U.S. since 1998. He holds a federal collection permit (TE810274-11) for all eastern bats and over 50 other listed species throughout their ranges. Mr. Droppelman directs all agency formal consultations and is proficient in the determination of effects and development of cost-effective minimization, avoidance, and mitigation measures to offset potential project impacts.

Additionally, Eco-Tech has a qualified and extensive staff of federally permitted biologists. This scientific staff includes published authors, MS bat biologists, and trained Section 7 consultants with experience ranging from four to 25 years.

4. Study Area

The proposed study area boundary encompassing 199.5 acres was provided by American Structurepoint (Structurepoint), an environmental sub-consultant to United Consulting. Eco-tech completed a desktop analysis of the area using recent aerial photography and United States Department of Agriculture land cover data in a GIS to determine land use within the boundary. Approximately 44% of the land inside the study area boundary (study area) is forested while the remainder is categorized as developed or agricultural.

The study area is located within the Pre-Wisconsonian Drift Plains (55d) Level IV Ecoregion as mapped by Woods et al. (1998). This ecoregion is comprised of rolling till plain with local end moraines characterized by deeply-leached, acidic, pre-Wisconsonian till and thin loess. The area features widespread areas of flat, poorly-drained soils. Originally, the area was dominated by beech forests and elm-ash swamp, but is now commonly dominated by agriculture including soybeans, corn, tobacco, and livestock.

5. Species Description and Life History

***Myotis sodalis* Miller & Allen, 1928 (Indiana bat)**

Species Status

The Indiana bat is a temperate, insectivorous, migratory bat that hibernates in caves and abandoned mines during winter and spends the summer season in forested areas. It was listed as an endangered species on March 11, 1967, by the United States Fish and Wildlife Service (USFWS) (USFWS 1967). However, the Indiana bat did not receive formal protection until enactment of the Endangered Species Act in 1973 (Public Law 93-205), as amended.

Indiana bat estimated population numbers consistently declined from 1965 to 2001. This steady overall decline was attributed to several causes including: human modifications to hibernacula and surrounding areas, disturbance and vandalism of hibernacula, natural catastrophes,

disturbance of summer habitat, and disturbance of migration pathways including loss and degradation of forested habitat (USFWS 2007).

However, estimates of range wide Indiana bat population totals from surveys conducted post-2001 actually increased. In 2007, a 23% population increase over a 2001 survey was found, yielding an approximate total of 467,947 Indiana bats (USFWS 2007). This large increase was likely due to increases in the local populations at 34 known high-priority hibernacula (USFWS 2007). Since then, however, white-nose syndrome (WNS), an affliction resulting in torpor disturbance from the fungus *Pseudogymnoascus destructans* (Minnis and Lindner 2013), has emerged as a new and severe threat to Indiana bats and all cave-dwelling bats (USFWS 2015a).

Distribution/Abundance

The Indiana bat's range includes most of the eastern United States, including Indiana. It is known to historically occur from Oklahoma, Iowa, and Wisconsin east to Vermont, and south to northwestern Florida (Barbour and Davis 1969, Gardner and Cook 2002). The species' core range is generally consistent with the presence of limestone caves that serve as hibernacula in the winter (Menzel et al. 2001). According to the USFWS (2007) winter survey results from 2005, over 90% of the total Indiana bat population hibernates in only five states: Indiana, Missouri, Kentucky, Illinois, and New York. Although most of the population overwinters in only a few states, Indiana bats are known to migrate up to 360 miles from their hibernacula to find suitable summer habitat to raise offspring (Kurta and Murray 2002, Winhold and Kurta 2006).

Habitat Requirements

Selection of roost trees by Indiana bat colonies are based on structural and situational characteristics. Tree diameter, solar exposure, and height in canopy are among the most important characteristics (Romme et al. 1995, Kurta and Murray 2002). Reproductive female Indiana bats tend to choose roosts in mature forests with large trees, scattered gaps in the canopy, and an open understory (Gardner et al. 1991, Callahan et al. 1997). The number of available roost trees in an area influences the suitability of habitat for female Indiana bats (Kurta 2005), and roost trees are an ephemeral resource (Gardner et al. 1991). Indiana bats require more than one roost tree to fulfill their needs during the summer (Callahan et al. 1997), with some using more than 18 roost trees in a summer (Barclay and Kurta 2004).

Maternity colonies have been found under sloughing bark of dead, partially dead, and live trees (Carter 2003, Gardner et al. 1991, Kurta et al. 1993, Kurta et al. 2002, Romme et al. 1995). Maternity roosts can contain over 350 individual bats during July and August (Kiser et al. 1998). More than 30 tree species have been found to be maternity roost trees for reproductive female Indiana bats, and most have been found to be deciduous species like ashes (*Fraxinus* spp.), elms (*Ulmus* spp.), hickories (*Carya* spp.), maples (*Acer* spp.), eastern cottonwood (*Populus deltoides*), and oaks (*Quercus* spp.) (USFWS 2007, Harvey 2002, Britzke et al. 2003). It appears that tree species use is more closely related to local availability and suitable structure than to broad regional preferences (USFWS 2007, Farmer et al. 1997)

Indiana bats hibernate primarily in caves, but they have also been documented using abandoned mines. As of November 2006, the USFWS (2007) has winter records of 281 distinct hibernacula in 19 states that have been occupied continually since 1995.

***Myotis grisescens* A. H. Howell, 1909 (gray bat)**

Species Status

The gray bat was listed as a federally-endangered species on April 28, 1976 by the USFWS (1976), affording it protection under the Endangered Species Act of 1973 (Public Law 93-205), as amended. USFWS biologists subsequently developed and released a recovery plan several years later. Five primary causes for the decline in gray bat populations are outlined in the recovery plan: direct human disturbance to individuals, human disturbance to the environment, destruction of roost caves by collapse or river impoundment, cave commercialization, and natural sources of mortality.

Following the protection of hibernacula and maternity caves from human disturbance, gray bat populations started to recover at all protected caves. Harvey (2001) reported a population increase of 16.5% since the time of listing.

In 2012, WNS was confirmed to affect gray bats in two counties in Tennessee (USFWS 2012). It has since been found in several caves harboring wintering gray bats across their range. In the winter of 2013, WNS was discovered in Fern Cave, AL. This hibernaculum contains more than one million gray bats, which is a significant portion of the entire population.

Distribution/Abundance

The range of the gray bat is restricted to the cave regions of Alabama, Arkansas, Florida, Georgia, Illinois, Indiana, Kansas, Kentucky, Mississippi, Missouri, Oklahoma, Tennessee, and Virginia (Barbour and Davis 1969). Most of the large concentrations of gray bats occur in Alabama, Kentucky, Missouri, and Tennessee. The majority of the range-wide population hibernates in nine Priority 1 hibernacula (sites that currently and/or historically contained more than 25,000 individuals), which are located in Alabama (one site), Arkansas (one site), Kentucky (one site), Missouri (three sites), and Tennessee (three sites) (USFWS 1982). There are no known gray bat priority 1 or priority 2 hibernacula in Indiana.

Habitat Requirements

Gray bats inhabit caves with different temperatures in the summer and winter months (Gore 1992). They typically hibernate in large groups and hang loosely with their forearms stuck out at angles, rather than parallel to the body (Barbour and Davis 1969). During autumn and spring migration, gray bats may roost temporarily in caves and under bridges, referred to as transitional roosts, which may not otherwise be typically used for maternity or hibernation (Tuttle 1976).

Each summer colony occupies a home range that often contains several roost caves (Thomas 1994, Tuttle 1976). Female gray bats often return to the same summer range each year (Tuttle 1976). The colony home range may encompass up to 40 miles of river or reservoir shoreline (USFWS 1982). Thomas and Best (2000) found that gray bats in the Guntersville Reservoir area of northern Alabama had large home ranges with a minimum average size of 37.5 square miles. Individually, the bats exhibit fidelity to the colony home ranges, but may roost in several caves within the range (Goebel 1996, Tuttle 1976, USFWS 1982).

Myotis septentrionalis Trouessart, 1897 (northern long-eared bat)

Species Status

In 2010 the Center for Biological Diversity (CBD) petitioned the USFWS to list the northern long-eared bat as threatened or endangered under the Endangered Species Act (CBD 2010). The USFWS concluded a 12-month finding on the status of the northern long-eared bat and on October 2, 2013, USFWS published its finding that protection is warranted under the Endangered Species Act. The northern long-eared bat was listed as a federally threatened species on May 4, 2015, by the USFWS (USFWS 2015b), affording it protection under the Endangered Species Act of 1973 (Public Law 93-205), as amended.

The status of northern long-eared bat populations is difficult to characterize, because they have a large geographic range, yet tend to hibernate in colonies smaller than 100 individuals (Barbour and Davis 1969, Caire et al. 1989). Their sparse distribution prevents biologists from counting a large percentage of the population at relatively few caves, as is possible with Indiana bats and federally-endangered gray bats. However, as part of the 12-month finding on the CBD petition, it was determined that several threats have caused and will continue to cause dramatic declines in the range-wide population of the northern long-eared bat (USFWS 2013). The status review and subsequent listing identified that the primary threat to the northern long-eared bat is WNS. The disease has led to dramatic and rapid population declines in northern long-eared bats of up to 99% from pre-WNS levels in some areas (USFWS 2013). Other sources of mortality to the species include: wind-energy development, habitat modification, destruction and disturbance (e.g., vandalism to hibernacula, roost tree removal), effects of climate change, and contaminants. Although no significant decline has been observed due to these factors, they may have cumulative effects to the species in addition to WNS (USFWS 2013).

Distribution/Abundance

The northern long-eared bat ranges widely across much of Canada and the U.S., but is patchily distributed (Barbour and Davis 1969). It occurs in all Canadian provinces, in the Yukon and Northwest Territories, and in eastern, midwestern, and some southern states (e.g., Crnkovic 2003). A small number of sightings have also been reported in Montana and Wyoming (Schmidt 2001). In Indiana, the species range includes the entire state. It is more common in the northern

part of its range than in the southern portion (Harvey 1992), and relatively rare in the northwestern part of its range (Caceres and Barclay 2000).

Habitat Requirements

Northern long-eared bats use caves or mines in winter and generally roost in trees during the summer. This species is not considered to be migratory, as summer habitat and hibernacula have been found to be as far apart as 35 miles (Nagorsen and Brigham 1993). Maternity colonies are typically housed in cavities and under the peeling bark of snags and decaying trees (Caceres and Pybus 1997). Within winter hibernacula, the northern long-eared bat appears to prefer deep crevices (Caceres and Barclay 2000).

Summer habitat for the northern long-eared bat generally consists of mature forest. Characteristics of potential summer roosting habitat were summarized by the CBD (2010) as an uneven forest age, containing trees with advanced age (100 years old or older), a multi-layered vertical structure, single and multiple tree-fall gaps, standing snags, and woody debris.

In addition to its preference for more mature forests, northern long-eared bats are reliant on diverse, intact, interior forest; site occupancy has been documented as being inversely related to the proportion of edge habitat within a patch (Yates and Muzika 2006, Lacki and Schwierjohann 2001). Also, northern long-eared bats have a noted preference for feeding in the vicinity of ephemeral upland pools (Brooks and Ford 2005, Owen et al. 2003).

6. Survey Methodology

Level of Effort

Eco-Tech determined the level of survey effort through review of listed bat records within the proposed project vicinity and aerial photography to identify suitable forested habitat within the proposed study area. On-site habitat evaluations confirmed presence of approximately 1.9 km (~1 mile) of linear forested habitat scheduled for potential clearing within the proposed study area as previously identified with aerial photography.

Surveys were conducted in compliance with guidelines contained in the “2016 Rangewide Indiana Bat Summer Survey Guidelines” (USFWS 2016a), which are acceptable for use for northern long-eared bat surveys in 2016, and survey modifications specific to the state of Indiana as approved by the USFWS Bloomington Field Office and the Indiana Department of Natural Resources (INDNR). These guidelines call for a minimum of four net nights per km (0.6 miles) of suitable summer habitat. Surveys are to be conducted between May 15 and August 15 and are temperature and precipitation dependent.

Agency Coordination

On 14 June 2016, Eco-Tech submitted a study plan detailing methodology and level of effort for mist net surveys of the proposed project to the USFWS' Bloomington Field Office. The USFWS approved the study plan on 23 June 2016. A copy of the approved study plan can be found in Appendix A. Mist net surveys were conducted under Eco-Tech's USFWS Federal Fish and Wildlife Permit #TE810274-11 and Indiana Department of Natural Resources Scientific Purposes License #16-230.

Mist Net Survey

Two sites were surveyed for two consecutive calendar nights, and during each calendar night, two net sets were erected and monitored at each site (four total "net-nights" per survey site). Net sets were customized for each site and placed approximately perpendicular across flight corridors, filling the corridor from side to side and from the ground or stream bed to the overhanging canopy to completely block the flight corridor.

The surveys commenced at sunset and lasted for no less than five hours. Nets were checked for bats in 10-minute intervals by a two-person team at each survey site. Netting did not take place during nights of continuous rain, cold temperatures (<50˚F), or heavy wind. If capture rates were low at a particular site, nets were relocated on the second night of sampling in an effort to increase capture success.

Captured bats were identified to species, sexed, weighed, aged, had their sexual condition determined, and right forearm length measured. Potential evidence of WNS was determined using the Reichard Wing Damage Index (Reichard and Kunz 2009). Bats were released, unharmed, at the capture site within 30 minutes of removal from the net.

The survey crews adhered to the National White-Nose Syndrome Decontamination Protocol as set forth by the USFWS Version 04.12.2016 (the most current version at the time of survey) (USFWS 2016b).

7. Field Survey Conditions

Mist net survey sites were selected within the northern portion of the study area in accessible areas with the best available habitat (Figure 2). Eco-Tech and the USFWS agreed that both net sites should be located in and around the large forest block in the northern portion of the study area, due to the lack of potential habitat in the southern section of the study area. Because of this, the southern forests in the study area were not scouted for mist net survey sites.

The most notable potential bat capture locations, based on available foraging habitat, were the numerous trails, small access roads, right-of-ways, and streams throughout the temperate deciduous forest in and around the study area. Lentzier Creek, a direct tributary to the Ohio River, provided a reliable water source and foraging corridor within the study area (Figure 1). Many

streams connected to Lentzier Creek appear to be ephemeral, and appeared to be little more than drainage ditches that were dry during scouting and surveys. Much of the accessible forested land in and around the study area was younger forest with thick understory, especially when adjacent to agricultural fields. Unfortunately, the majority of the contiguous forest within the study area was inaccessible due to a landowner dispute. Because of the inaccessible land and poor habitat quality throughout most of the study area, one of the survey sites was to the west of the study area (Figure 2).

Weather conditions from June 28 to July 1, 2016, were generally favorable for conducting mist net surveys. Night time temperatures ranged from 59°F to 80°F over the survey period with wind and fog being negligible. Relative humidity was greater than 56%.

Photographs of net sites are included in Section 11. Descriptions and sketches of each net site, along with additional wildlife observed and general comments pertaining to each net site are included on survey data forms in Appendix B. Detailed descriptions of the mist net locations are included below.

Mist Net Site 1

Mist Net Site 1 was located on private property that spanned across Lentzier Creek in the central region of the proposed study area. This section of Lentzier Creek provides portions of suitable foraging corridors for Indiana bats, gray bats, and northern long-eared bats. Throughout the study area and along this property, Lentzier Creek was deep and narrow with areas of forested banks that provided a suitable flyway for bats. Most of the surveyed private property was forested and provided potential suitable summer roosting habitat for Indiana and northern long-eared bats.

Nets A and B were both 20 feet wide and 17 feet high. Net A was deployed across Lentzier Creek, and Net B was stretched across a forested road leading up a hill. The canopy at Site 1 was dominated by American sycamore (*Platanus occidentalis*), tulip poplar (*Liriodendron tulipifera*), black walnut (*Juglans nigra*), and boxelder (*Acer negundo*) with an average diameter at breast height (dbh) of 18 inches. The understory at Site 1 was moderately dense and was dominated by tulip poplar, black walnut, and poison ivy (*Toxicodendron radicans*) with an average dbh of 2 inches. Canopy closure at Nets A and B was 60% and 70%, respectively, at the time of the survey.

Due to low capture rates, Net A was moved to block a canopy opening that led across Lentzier Creek and was renamed Net C. Net C measured 30 feet wide and 17 feet high. The canopy closure at Net C was 60% at the time of the survey.

Mist Net Site 2

Due to limited access, Mist Net Site 2 was located just west of the central portion of the study area boundary, in the same forest block that extended throughout the northern portion of the study area. The location of a mist net site outside the approved study area boundary was coordinated with the USFWS Bloomington Field Office prior to netting activities.

Site 2 was located within a privately-owned soybean farm with an abandoned residence. Net A was 30 feet wide and 17 feet high and Net B was 20 feet wide and 17 feet high. Net A was deployed across a forested corridor leading up to the residence and Net B was deployed across a forested opening between agricultural fields. The canopy closure at Nets A and B was 95% and 85%, respectively. The canopy was dominated by hackberry (*Celtis occidentalis*), honey locust (*Gleditsia triacanthos*), and black walnut and the average dbh was 18 inches. The forested understory was very dense and was dominated by bush honeysuckle (*Lonicera maackii*), multiflora rose (*Rosa multiflora*), and hackberry. The average understory dbh was 2 inches.

Due to low capture rates, Net A was moved to a second forested opening between farm fields and was renamed Net C on the second night of sampling. It measured 30 feet wide and 17 feet high with 25% canopy closure at the time of the survey.

8. Results

Eleven bats of three species were captured during the survey effort including five gray bats, four big brown bats (*Eptesicus fuscus*), and two eastern red bats (*Lasiurus borealis*) (Table 1).

Table 1. Summary of bat capture data at the proposed INDOT heavy haul transportation corridor in Clark County, Indiana; 28 June through 1 July 2016.

Site	Date	Species	Net	Time	Height in Net (m)	Age	Sex	RC	Weight (g)	FA Length (mm)	Wing Scar Score
1	6/28/2016	*Myotis grisescens*	A	22:10	0	A	F	L	10.5	43.0	0
		Eptesicus fuscus	B	22:20	0	J	F	NR	13.5	49.0	1
		Eptesicus fuscus	B	22:50	3	A	F	L	19.5	49.0	0
		Lasiurus borealis	B	00:50	3.5	A	M	NR	12	37.0	0
	6/29/2016	*Eptesicus fuscus*	C	22:25	4	A	F	NR	10.9	44.0	0
2	6/30/2016	*Myotis grisescens*	B	22:10	2	A	F	L	10.5	44.0	0
		Myotis grisescens	B	22:10	2.5	A	F	L	10.5	43.0	0
		Lasiurus borealis	A	22:30	3.5	A	M	NR	14	39.0	0
	7/1/2016	*Eptesicus fuscus*	B	21:50	1.5	A	F	L	17.0	47.0	0
		Myotis grisescens	B	22:05	3	A	M	NR	10.0	43.0	0
		Myotis grisescens	B	22:40	4.5	J	F	NR	8.5	43.0	1P

Note: RC=reproductive condition, FA=forearm, A=adult, F=female, L=lactating, J=juvenile, NR=non-reproductive, M=male.

Five federally endangered gray bats were captured during the survey effort. A single adult female was captured at Site 1. Two adult females, a juvenile female, and an adult male were captured at Site 2. Structurepoint, Indiana Department of Natural Resources, and USFWS were notified of the endangered species captures. The project team will consult with the USFWS on the need for

further informal or formal consultation necessary to address the presence of gray bats within the proposed study area.

9. CONCLUSIONS

Eco-Tech completed mist net surveys with appropriate levels of effort and under the appropriate conditions to investigate presence/probable absence of federally listed bats during the maternity season at the proposed INDOT Heavy Haul Transportation Corridor in Clark County, Indiana.

A total of 11 bats of three species were captured during this survey, including five federally endangered gray bats. Habitat in the study area is approximately 44% forested with several small creeks. The area provides suitable foraging habitat for Indiana bats, gray bats, and northern long-eared bats, and suitable roosting habitat for Indiana and northern long-eared bats. However, Indiana and northern long-eared bats were not encountered within the study area at the time of the survey and may not be present within the proposed study area during the summer maternity season. No impact avoidance or minimization measures related to Indiana bat and northern long-eared bat roosting such as seasonal tree clearing restrictions, are suggested for this proposed project.

Lentzier Creek provides suitable and confirmed foraging habitat for gray bats and as such, it is recommended that INDOT follow best management practices for erosion and sedimentation control to avoid or minimize impacts to this habitat (*e.g.* selective tree clearing and riparian width expansion/retention).

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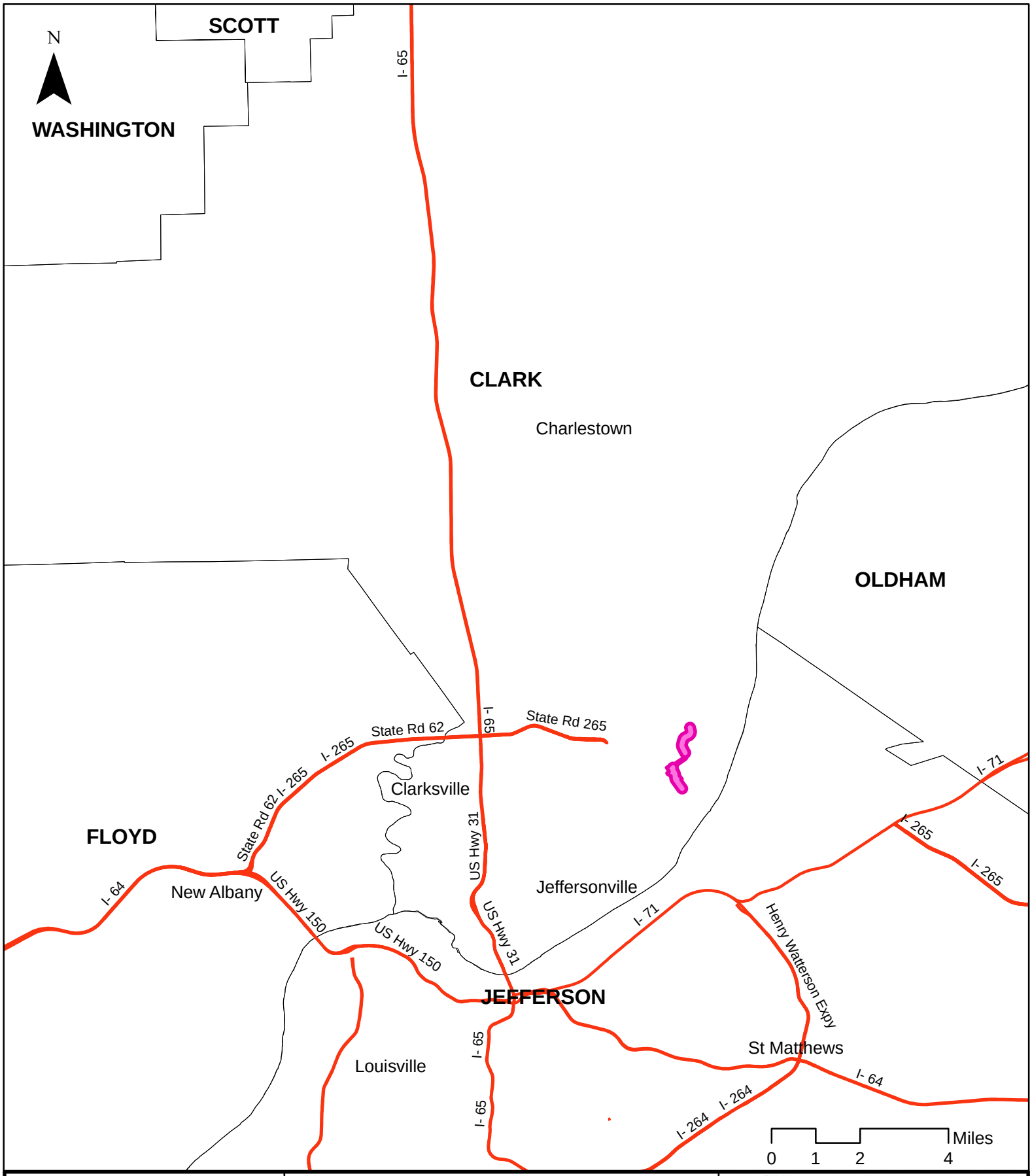
Figures

Figure 1. Proposed Study Location Area Map.

Figure 2. Proposed Study Area and Mist Net Survey Site Locations.



Legend

Road

Study area

Figure 1

Proposed Study Area Location Map

INDOT Heavy Haul Road
Clark County, Indiana

Eco-Tech CONSULTANTS

Date: 7-21-2016	Drawn by: RRN
Project number: LV2016025	

Page I-98 (Figure 2) Removed
Due to Sensitive Information

Photographic Log

Mist Net Study Site 1 – Net A

Mist Net Study Site 1 – Net B

Mist Net Study Site 1 – Net C

Mist Net Study Site 2 – Net A

Mist Net Study Site 2 – Net B

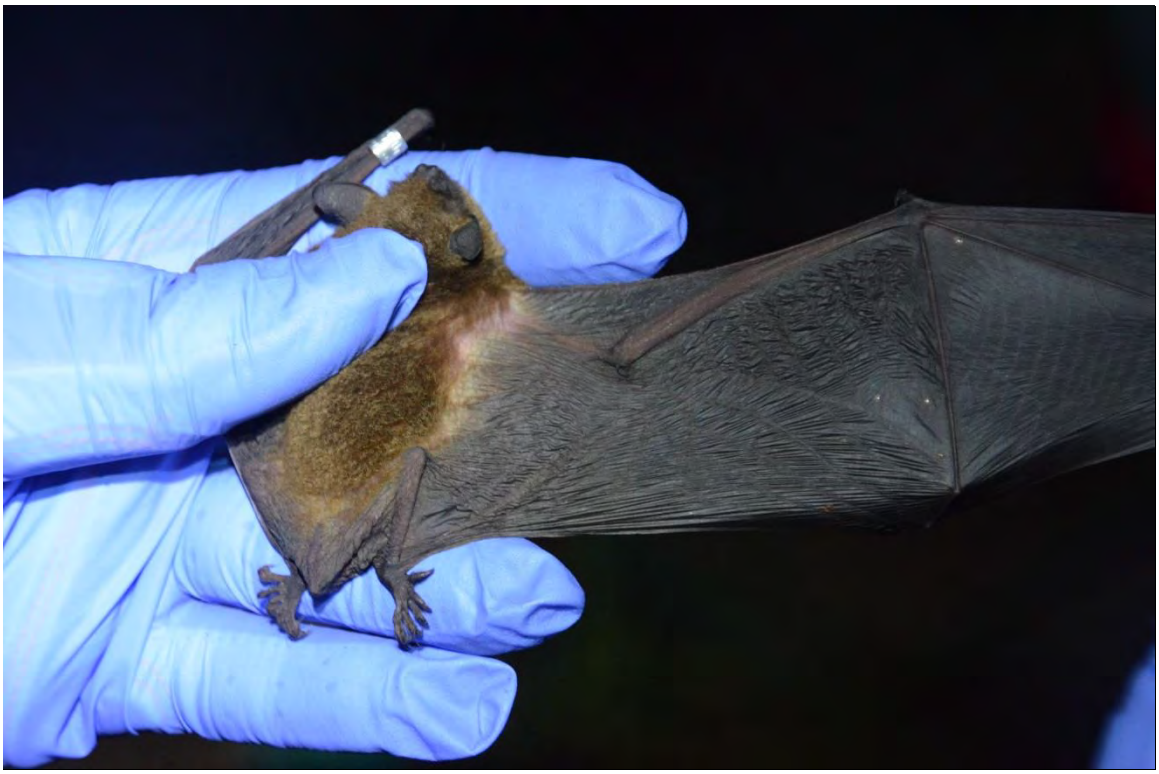
Mist Net Study Site 2 – Net C

Gray Bat (Myotis grisescens) band #360 facial features diagnostic photo.

Gray Bat (*Myotis grisescens*) band #359 facial features diagnostic photo.

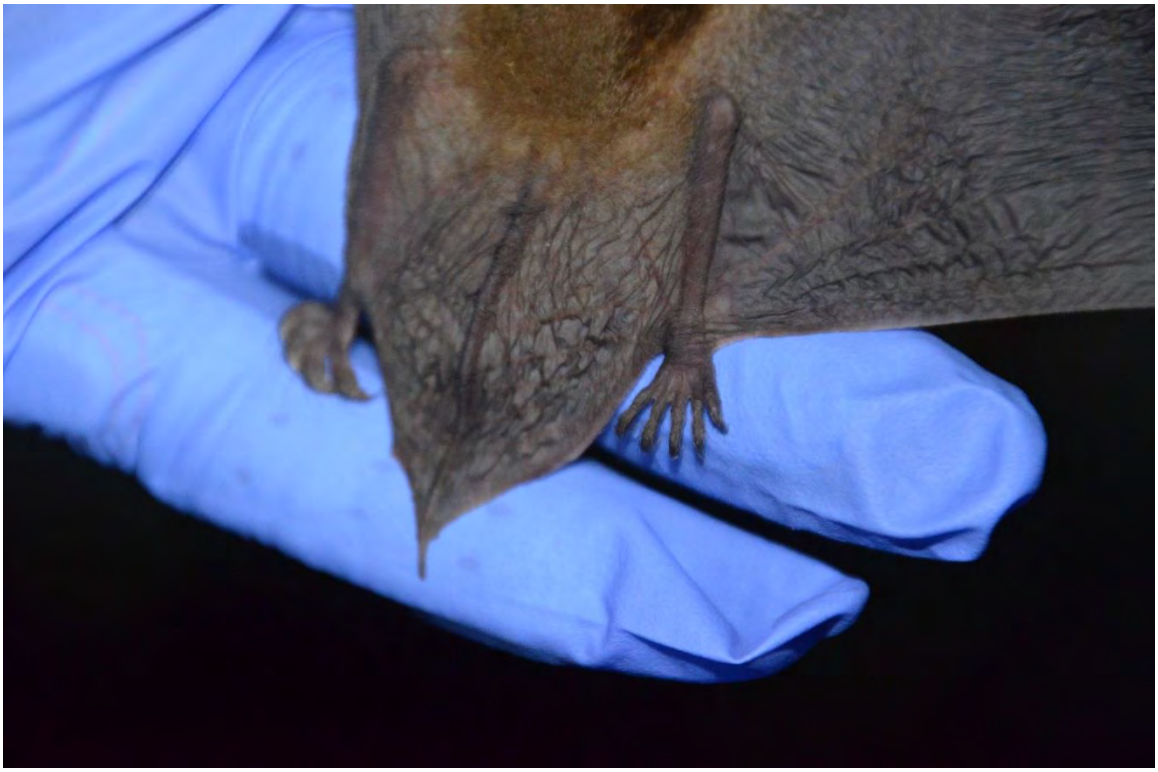
Gray Bat (*Myotis grisescens*) band #361 facial features diagnostic photo.

Gray Bat (*Myotis grisescens*) band #360 dorsum diagnostic photo.



Gray Bat (*Myotis grisescens*) band # 359 dorsum diagnostic photo.

Gray Bat (*Myotis grisescens*) band # 361 dorsum diagnostic photo.



Gray Bat (*Myotis grisescens*) band # 360 ankle/wing attachment diagnostic photo.

Gray Bat (*Myotis grisescens*) band # 359 ankle/wing attachment diagnostic photo.

Gray Bat (*Myotis grisescens*) band # 361 ankle/wing attachment diagnostic photo.

Appendix A

Approved Study Plan and USFWS Correspondence

United States Department of the Interior
Fish and Wildlife Service

Bloomington Field Office (ES)
620 South Walker Street
Bloomington, IN 47403-2121
Phone: (812) 334-4261 Fax: (812) 334-4273

23 June 2016

Mr. Lee Droppelman
Eco-Tech Consultants, Inc.
11321 Decimal Drive
Louisville, KY 40299

RE: Pre-survey site-specific coordination and Bloomington, Indiana Field Office authorization for conducting mist-net surveys for the Federally endangered Indiana bat (*Myotis sodalis*) and the federally threatened northern long-eared bat (*Myotis septentrionalis*) for the proposed Indiana Department of Transportation (INDOT) heavy haul road construction from the Indiana Ports-Jeffersonville to Interstate 265, Clark County, Indiana.

Dear Mr. Droppelman:

This letter is in response to your bat survey plan and follow-up email dated June 14th and June 23rd, 2016, respectively, for authorization from the U.S. Fish and Wildlife Service's (USFWS) Bloomington Field Office (BFO) to conduct summer surveys and radio-telemetry of the federally endangered Indiana bat (*Myotis sodalis*) and the federally threatened northern long-eared bat (*Myotis septentrionalis*). We have reviewed the study plan and subsequent location maps and photos and agree that the survey effort will be sufficient for the scope of the proposed project.

Specifically, your request covers mist netting and telemetry activities at 2 sites along Lentzier Creek and its tributaries (and potentially an alternative location) in association with the above referenced project. Studies will be carried out under USFWS Federal Fish and Wildlife Permit issued to Peter Lee Droppelman (TE810274-11).

Up to two female Indiana and northern long-eared bats from each site will be radio-tagged and tracked to roost trees. Male Indiana and northern long-eared bats will be tagged and tracked from a site if: 1) no females are caught on night 1; and 2) a male is captured on night 2 prior to the capture of a female. If tagged bats are not found, then search efforts will continue for a minimum of 40 hours of ground searching. Bats will be tracked to roost trees for a minimum of 7 days. A minimum of two emergence counts will be conducted on any roost tree that is located. Additional counts and telemetry will be included if time permits.

Captures of Indiana bats and northern long-eared bats should be reported directly to Robin McWilliams Munson at this office within 24 hours (voice mail should be left at 812-334-4261 ext. 1207).

This letter serves as your authorization to conduct the work as specified in the request you submitted and must be carried with your federal permit when conducting work for this project. All activities must be carried out with strict adherence to permit conditions and authorizations specified in your federal permit (as well as your permit from the State of Indiana), including WNS decontamination protocols. This authorization is not valid if you have not obtained permission from the owner of the lands where activities will occur.

Region 3 of the USFWS has developed a new spreadsheet for reporting bat survey data; this spreadsheet must be used for reporting your survey results. The spreadsheet is available on the USFWS Indiana Bat Summer Survey Guidance website:
http://www.fws.gov/midwest/endangered/mammals/inba/inbasummersurveyguidance.html.

Finally, we want to remind you of the need for you and your staff to obtain or amend your State permits, as appropriate, for this project.

If the work expands beyond the scope of the request you provided or if there are adverse effects to bats that were not anticipated, cease all bat research activities and contact this office prior to continuing. If you have any questions please contact Robin McWilliams Munson (812-334-4261, extension 1207).

Sincerely,

Scott E. Pruitt
Field Supervisor

cc: Scott Johnson, Indiana Department of Natural Resources
Leah Boits, American StructurePoint, 7260 Shadeland Station, Indianapolis, IN 46256

Appendix B

Field Data Forms

Eco-Tech Consultants, Inc. 1220 Kennestone Circle, Suite 100, Marietta, GA 30066

NET SITE DESCRIPTION

SITE: 1 **PROJECT:** INDOT Heavy Haul Rd **DATES:** 6/28/2016 & 6/29/2016

ID BY: L. Droppelman **QUAD:** Jeffersonville **COUNTY:** Clark **STATE:** IN

Net A	Width (m):	6	Height (m):	5.2	Lat/Long:	38.338342	-85.6666017
Net B	Width (m):	6	Height (m):	5.2 (dbl)	Lat/Long:	38.33893	-85.667749
Net C (Night 2)	Width (m):	9	Height (m):	5.2	Lat/Long:	38.33842	-85.666605
Net D	Width (m):		Height (m):		Lat/Long:		
Anabat	Lat/Long:	N/A					
Anabat	Lat/Long:	N/A					

NIGHT 1 ~ nets A & B, NIGHT 2 ~ nets B & C

VEGETATION

Dominant Canopy Species:
1) Sycamore
2) Tulip poplar
3) Black walnut
Boxelder

Percent Canopy Closure:
Net A 60 Net C 60
Net B 70 Net D

Average Canopy DBH (in): 18

Dominant Understory Species:
1) Poison ivy
2) Black walnut
3) Tulip poplar

Understory Density:

Very Dense	
Moderate	X
Clear	

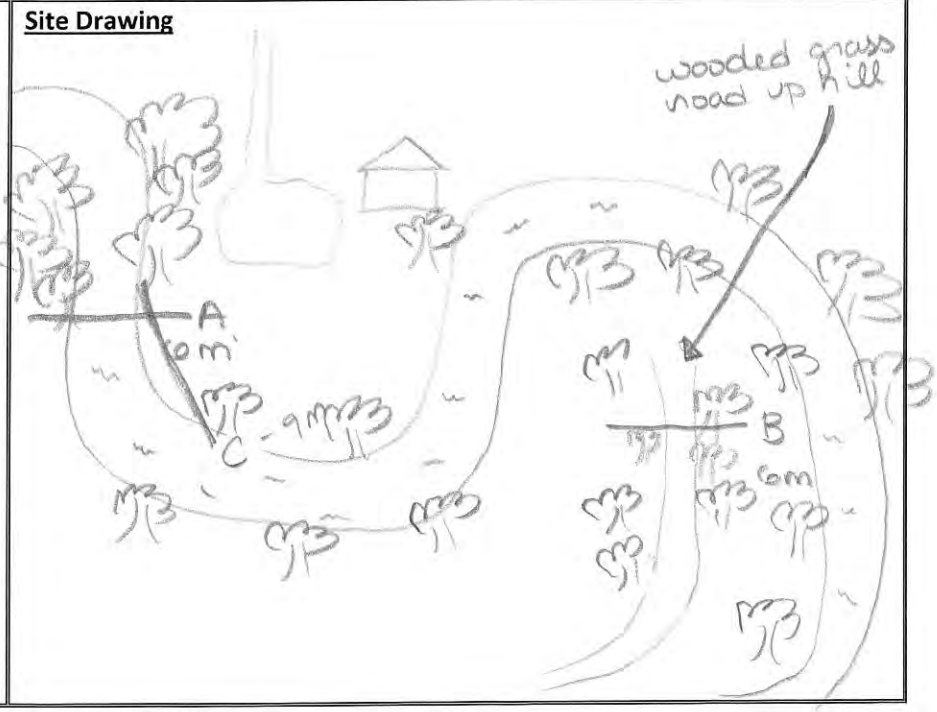
Average Understory DBH (in): 2

STREAM NAME:

Bank Height (m): 1.5
Channel Width (m): 6
Water Width (m): 5
Average Water Depth (m): 2.5
Dominant Substrate: mud
Turbidity (clear/cloudy): cloudy

Comments/Descriptions

Site Drawing



Eco-Tech Consultants, Inc., 1220 Kennestone Circle, Suite 100, Marietta, GA 30066

BAT CAPTURE DATA FORM

PROJECT: INDOT Heavy Haul Rd

SITE: 1 **INVESTIGATORS:** L. DROPPELMAN, S. HATCH, D. HERLIHY **DATE:** 28 JUNE 2016

Eco-Tech CONSULTANTS	TIME (24 HR)	AIR TEMP (F)	RH (%)	Fog (Y/N)	SKY CONDITIONS (0 = clear, 1 = few clouds, 2 = partly cloudy, 3 = cloudy or overcast, 4 = smoke or fog, 5 = drizzle or light rain, 6 = thunderstorm)	WIND Beaufort Scale (0 = calm (0 mph), 1 = lightwind (1-3 mph), 2 = lightbreeze (4-7 mph), 3 = gentle breeze (8-12 mph), 4 = moderate breeze (13-18 mph)
MISTNET START	21:15	~~14.7C~~ 28.7	~~97.8~~ 56	N	0 1 (2) 3 4 5 6	(0) 1 2 3 4
MISTNET END	02:15	20	72	N	(0) 1 2 3 4 5 6	(0) 1 2 3 4

LUNAR PHASE & % ILLUMINATION			RISE (24 HR)	SET (24 HR)
	New moon | Waxing crescent | First quarter | Waxing gibbous Full moon | Waning gibbous | Third quarter | (Waning crescent) 40%	MOON	2:00	14:52
		SUN	6:22	21:10

COMMENTS AND OTHER WILDLIFE NOTED: GREEN FROG, GREAT BLUE HERON, AMERICAN TOAD, BARRED OWL

weather from weatherunderground.com station ME2401 @ 21:16 + 2:24 ~~am~~

* KESTREL APPEARS BROKEN

BAGS WEIGH 3g-4

Species	Net	Time	Height in net (m)	Age	Sex	Reprod. Cond.	Weight (g)	RFA (mm)	Wing Scar Score	Frequency	Band #
1. MYGR	A	22:10	0	A	F	L	10.5	43	0	N/A	358
2. EPFU	B	22:20	0	J	F	NR	13.5	49	1	—	—
3. EPFU	B	22:50	3	A	F	L	19.5	49	0	N/A	—
4. LABO	B	00:50	3.5	A	M	NR	12.0	37	0	N/A	—
5.											
6.											
7.											
8.											
9.											
10.											
11.											
12.											
13.											
14.											
15.											

Reproductive Condition: N: non-reproductive; L: lactating; P: pregnant; PL: post-lactating; TD: testes descended **Age:** A: adult; J: juvenile Sex: M: male; F: female

Eco-Tech Consultants, Inc., 1220 Kennestone Circle, Suite 100, Marietta, GA 30066

BAT CAPTURE DATA FORM

PROJECT: INDOT Heavy Haul Rd

SITE: 1 **INVESTIGATORS:** L. Droppelman, S. Hatch, D. Herling **DATE:** 29 JUNE 2016

Eco-Tech CONSULTANTS	TIME (24 HR)	AIR TEMP (F)	RH (%)	Fog (Y/N)	SKY CONDITIONS 0 = clear, 1 = few clouds, 2 = partly cloudy, 3 = cloudy or overcast, 4 = smoke or fog, 5 = drizzle or light rain, 6 = thunderstorm	WIND Beaufort Scale 0 = calm (0 mph), 1 = lightwind (1-3 mph), 2 = lightbreeze (4-7 mph), 3 = gentle breeze (8-12 mph), 4 = moderate breeze (13-18 mph)
MISTNET START	21:10	21.4	79.8	N	0 (1) 2 3 4 5 6	(0) 1 2 3 4
MISTNET END	02:10	14.8	93.4	N	(0) 1 2 3 4 5 6	(0) 1 2 3 4

LUNAR PHASE & % ILLUMINATION			RISE (24 HR)	SET (24 HR)
	New moon | Waxing crescent | First quarter | Waxing gibbous Full moon | Waning gibbous | Third quarter | (Waning crescent) 29 %	MOON	2:37	16:00
		SUN	6:22	21:10

COMMENTS AND OTHER WILDLIFE NOTED:

Species	Net	Time	Height in net (m)	Age	Sex	Reprod. Cond.	Weight (g)	RFA (mm)	Wing Scar Score	Frequency	Band #
1. EPFU	C	22:25	4	J	F	NR	10.9	44	0	—	—
2.											
3.											
4.											
5.											
6.											
7.											
8.											
9.											
10.											
11.											
12.											
13.											
14.											
15.											

Reproductive Condition: N: non-reproductive; L: lactating; P: pregnant; PL: post-lactating; TD: testes descended **Age:** A: adult; J: juvenile Sex: M: male; F: female

Eco-Tech Consultants, Inc. 1220 Kennestone Circle, Suite 100, Marietta, GA 30066

NET SITE DESCRIPTION

SITE: 2 **PROJECT:** INDOT Heavy Haul Rd **DATES:** 6/30/2016

ID BY: L. Droppelman **QUAD:** Jeffersonville **COUNTY:** Clark **STATE:** IN

Net A	Width (m): 9	Height (m): 5.2	Lat/Long: 38.33962	-85.67683
Net B	Width (m): 6	Height (m): 5.2	Lat/Long: 38.33954	-85.67800
Net C	Width (m): 9	Height (m): 5.2	Lat/Long: 38.340521	-85.67985
Net D	Width (m):	Height (m):	Lat/Long:	

Anabat Lat/Long:

Anabat Lat/Long:

VEGETATION

Dominant Canopy Species:
1) Hackberry
2) Honey locust
3) Black walnut

Percent Canopy Closure:
Net A 95 Net C 25
Net B 85 Net D

Average Canopy DBH (in): 18

Dominant Understory Species:
1) bush honeysuckle
2) multiflora rose
3) hackberry

Understory Density:
Very Dense [X] (in forested patches)
Moderate [ ]
Clear [ ]

Average Understory DBH (in): 2

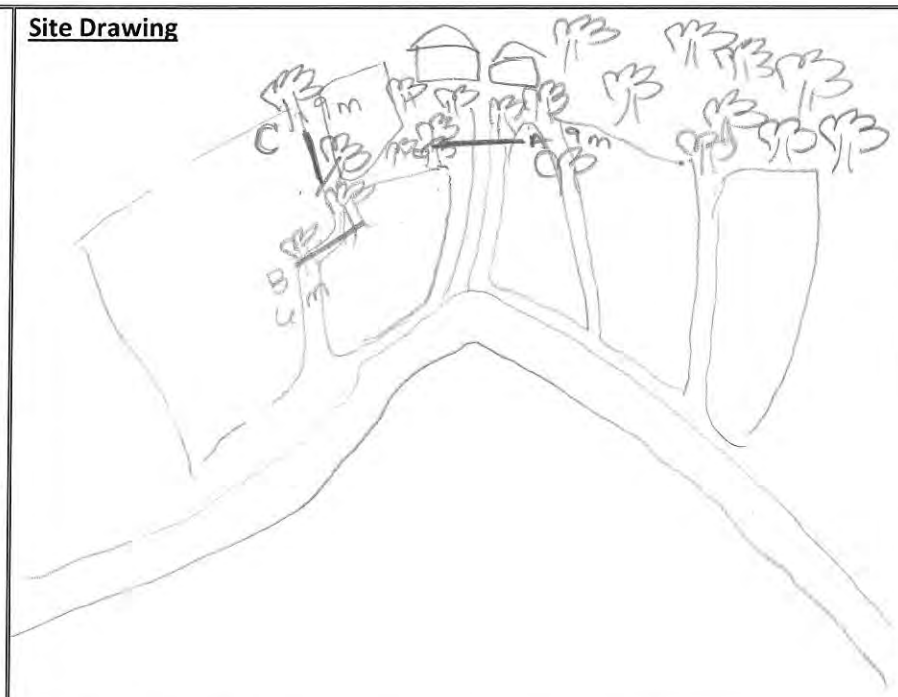
STREAM NAME:

Bank Height (m): N/A
Channel Width (m): N/A
Water Width (m): N/A
Average Water Depth (m): N/A
Dominant Substrate: N/A
Turbidity (clear/cloudy): N/A

Comments/Descriptions

site on farm with several planted soy fields.

Site Drawing



BAT CAPTURE DATA FORM

PROJECT: INDOT Heavy Haul Rd

SITE: 2 **INVESTIGATORS:** L. Drappelman, S. Hatch, D. Herlihy **DATE:** 30 JUNE 2016

Eco-Tech CONSULTANTS	TIME (24 HR)	AIR TEMP (F)	RH (%)	Fog (Y/N)	SKY CONDITIONS 0 = clear, 1 = few clouds, 2 = partly cloudy, 3 = cloudy or overcast, 4 = smoke or fog, 5 = drizzle or light rain, 6 = thunderstorm	WIND Beaufort Scale 0 = calm (0 mph), 1 = lightwind (1-3 mph), 2 = lightbreeze (4-7 mph), 3 = gentle breeze (8-12 mph), 4 = moderate breeze (13-18 mph)
MISTNET START	21:15	21.4	83.7	N	0 (1) 2 3 4 5 6	(0) 1 2 3 4
MISTNET END	02:15	21.1	92.9	N	0 1 2 (3) 4 5 6	(0) 1 2 3 4

LUNAR PHASE & % ILLUMINATION			RISE (24 HR)	SET (24 HR)
	New moon | Waxing crescent | First quarter | Waxing gibbous Full moon | Waning gibbous | Third quarter | (Waning crescent) 19%	MOON	3:18	17:08
		SUN	6:23	21:10

COMMENTS AND OTHER WILDLIFE NOTED: COYOTES, eastern Hercules beetle,

Species	Net	Time	Height in net (m)	Age	Sex	Reprod. Cond.	Weight (g)	RFA (mm)	Wing Scar Score	Frequency	Band #
1. MYGR	B	22:10	2	A	F	L	10.5	44	0	—	359
2. MYGR	B	22:10	2.5	A	F	L	10.5	43	0	—	360
3. LABO	A	22:30	3.5	A	m	NR	14.0	39	0	—	—
4.											
5.											
6.											
7.											
8.											
9.											
10.											
11.											
12.											
13.											
14.											
15.											

Reproductive Condition: N: non-reproductive; L: lactating; P: pregnant; PL: post-lactating; TD: testes descended **Age:** A: adult; J: juvenile Sex: M: male; F: female

Eco-Tech Consultants, Inc., 1220 Kennestone Circle, Suite 100, Marietta, GA 30066

BAT CAPTURE DATA FORM

PROJECT: INDOT Heavy Haul Rd

SITE: 2 **INVESTIGATORS:** S. Hatch, L. Droppelman, D. Herlihy **DATE:** 1 JULY 2016

Eco-Tech CONSULTANTS	TIME (24 HR)	AIR TEMP (F)	RH (%)	Fog (Y/N)	SKY CONDITIONS 0 = clear, 1 = few clouds, 2 = partly cloudy, 3 = cloudy or overcast, 4 = smoke or fog, 5 = drizzle or light rain, 6 = thunderstorm	WIND Beaufort Scale 0 = calm (0 mph), 1 = lightwind (1-3 mph), 2 = lightbreeze (4-7 mph), 3 = gentle breeze (8-12 mph), 4 = moderate breeze (13-18 mph)
MISTNET START	21:15	22.4	77.6	N	0 (1) 2 3 4 5 6	0 (1) 2 3 4
MISTNET END	02:15	17.8	80.6	N	(0) 1 2 3 4 5 6	(0) 1 2 3 4

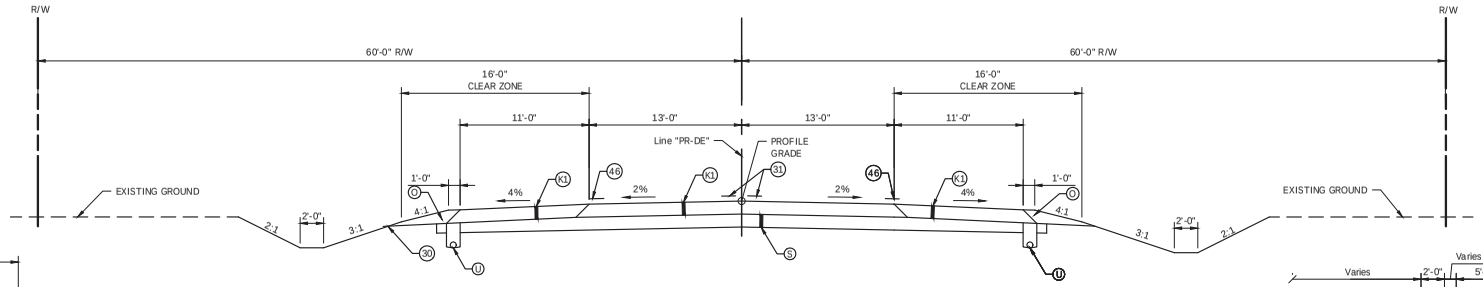
LUNAR PHASE & % ILLUMINATION			RISE (24 HR)	SET (24 HR)
	New moon | Waxing crescent | First quarter | Waxing gibbous Full moon | Waning gibbous | Third quarter | (Waning crescent) 11 %	MOON	4:02	18:16
		SUN	6:23	21:10

COMMENTS AND OTHER WILDLIFE NOTED: nets B+C opened tonight.

Species	Net	Time	Height in net (m)	Age	Sex	Reprod. Cond.	Weight (g)	RFA (mm)	Wing Scar Score	Frequency	Band #
1. EPFU	B	21:50	1.5	A	F	L	17.0	47	0	—	—
2. MYGR	B	22:05	3.0	A	M	NR	10.0	43	0	—	361
3. MYGR	B	22:40	4.5	J	F	NR	8.5	43	1P	photo 24	362 mites
4.											
5.											
6.											
7.											
8.											
9.											
10.											
11.											
12.											
13.											
14.											
15.											

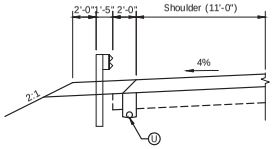
Reproductive Condition: N: non-reproductive; L: lactating; P: pregnant; PL: post-lactating; TD: testes descended **Age:** A: adult; J: juvenile Sex: M: male; F: female

EXHIBIT C – PROJECT CONSTRUCTION DRAWINGS AND SITE PLANS

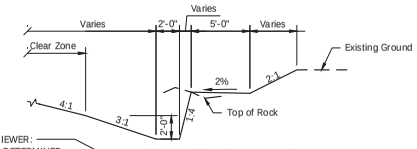


TYPICAL SECTION

Sta. 10+00.00 to Sta. 23+85.00 "PR-DE"
Sta. 44+60.00 to Sta. 48+25.00 "PR-DE"
Sta. 58+75.00 to Sta. 66+24.00 "PR-DE"
Sta. 85+05.00 to Sta. 88+44.11 "PR-DE"

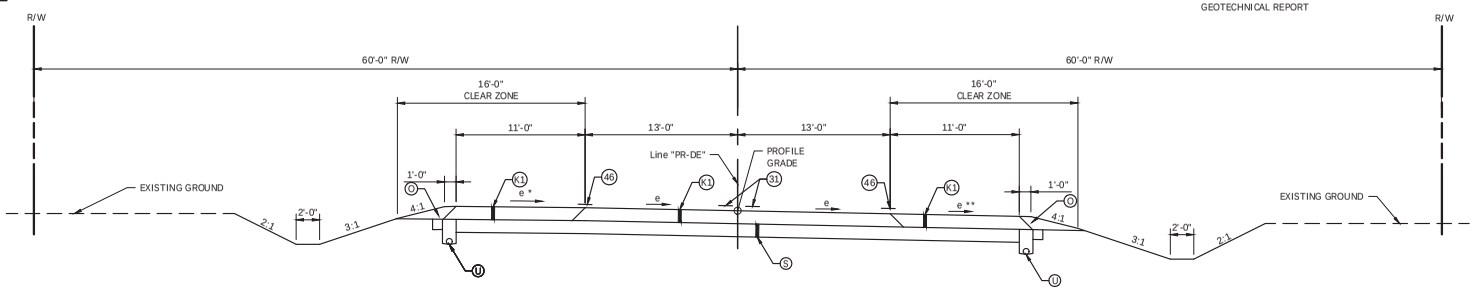


TYPICAL GUARDRAIL SECTION



NOTE TO REVIEWER:
LIMITS TO BE DETERMINED
AFTER WE RECEIVE THE
GEOTECHNICAL REPORT

TYPICAL ROCK CUT DITCH



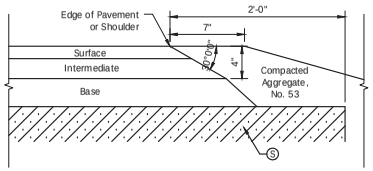
* High Side Shoulder - If e is 4% or less, grade shoulder at 4% down.
If e is greater than 4% and less than or equal to 6%, grade shoulder at 2% down.
If e greater than 6%, grade shoulder at 1% up.

** Low Side Shoulder - If e is 4% or less, grade shoulder at 4% down.
If e is greater than 4%, grade shoulder in plane with the mainline pavement.

SUPERELEVATION SECTION

Sta. 23+85.00 to Sta. 44+60.00 "PR-DE"
Sta. 48+25.00 to Sta. 58+75.00 "PR-DE"
Sta. 66+24.00 to Sta. 85+05.00 "PR-DE"

Curve to the right shown, curves to the left reversed.



SAFETY EDGE DETAIL (NOT TO SCALE)

LEGEND

- (K1) Full Depth Pavement
  165#/syd QC/QA-HMA, 4, 76, Surface, 9.5mm
  275#/syd QC/QA-HMA, 4, 76, Intermediate, 19.0mm
  440#/syd QC/QA-HMA, 4, 64, Base, 25.0mm
  250#/syd QC/QA-HMA, 5, 76, Intermediate, OG 19.0mm
  440#/syd QC/QA-HMA, 4, 64, Base, 25.0mm
- (S) Subgrade Treatment, Type IB (Lime)
- (U) Underdrains
- (30) Seeding, U
- (31) Line, Thermoplastic, Solid, Yellow, 4"
- (46) Line, Thermoplastic, Solid, White, 4"
- (O) Compacted Aggregate, No. 53

UNITED Consulting
1625 N. Post Road
Indianapolis, IN 46219
Phone 317-895-2585
Fax 317-895-2596
www.ucindy.com

RECOMMENDED FOR APPROVAL
DESIGN ENGINEER DATE

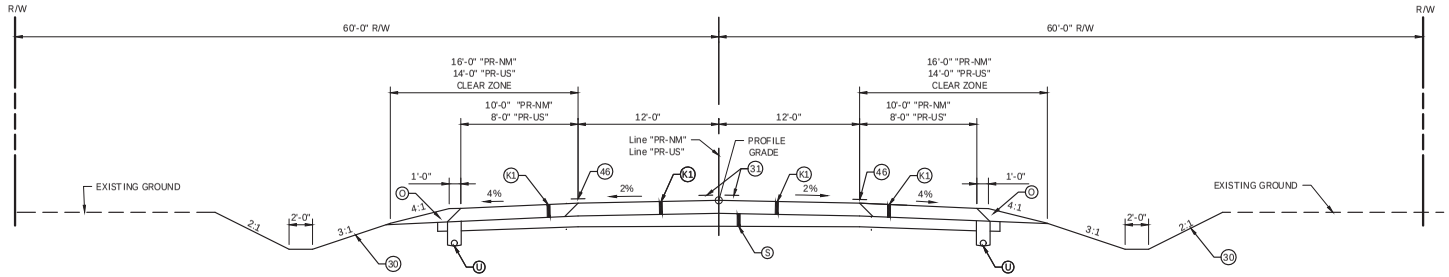
DESIGNED: JRA
DRAWN: EAM
CHECKED: MAT
CHECKED: MAT

INDIANA
DEPARTMENT OF TRANSPORTATION

TYPICAL CROSS SECTIONS
TRANSPORTATION CORRIDOR

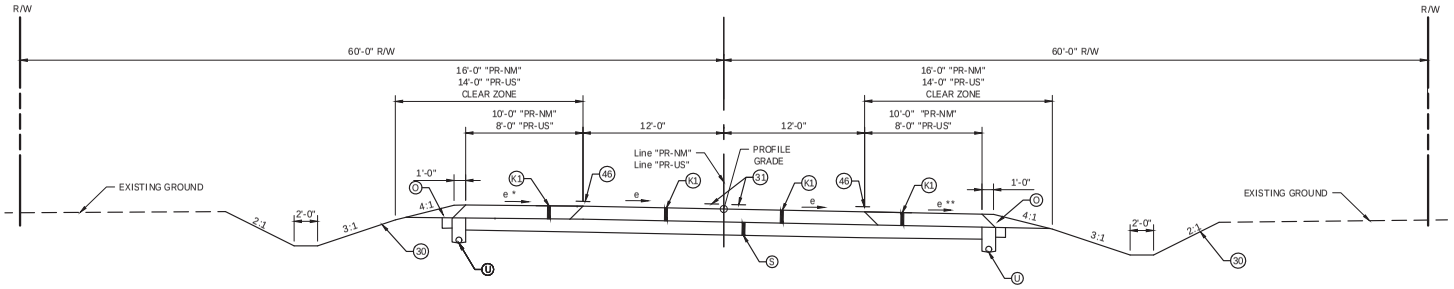
HORIZONTAL SCALE	BRIDGE FILE
1" = 5'	XX
VERTICAL SCALE	DESIGNATION
1"=5'	1382612
SURVEY BOOK	SHEETS
	3 of XX
CONTRACT	PROJECT
R-36260	1382612

File Name: P:\CSD\14-402\Road\Dwg\Plans\Line DE\Typical Line DE.dwg Plot Date: 8/25/2017 Plotted By: Wolka, Andy



TYPICAL SECTION

Sta. 400+00.00 to Sta. 400+60.00 "PR-NM"
Sta. 405+35.00 to Sta. 406+80.43 "PR-NM"
Sta. 500+00.00 to Sta. 501+00.00 "PR-US"



SUPERELEVATION SECTION
LINE "PR-NM", PR-US

Sta. 400+60.00 to Sta. 405+35.00 "PR-NM"
Sta. 406+80.43 to Sta. 407+79.65 "PR-NM"
Sta. 501+00.00 to Sta. 505+43.81 "PR-US"

* High Side Shoulder - If e is 4% or less, grade shoulder at 4% down.
If e is greater than 4% and less than or equal to 6%, grade shoulder at 2% down.
If e greater than 6%, grade shoulder at 1% up.

** Low Side Shoulder - If e is 4% or less, grade shoulder at 4% down.
If e is greater than 4%, grade shoulder in plane with the mainline pavement.

Curve to the right shown, curves to the left reversed.

LEGEND

- (K1) Full Depth Pavement
  165#/syd QC/QA-HMA, 4, 76, Surface, 9.5mm
  275#/syd QC/QA-HMA, 4, 76, Intermediate, 19.0mm
  440#/syd QC/QA-HMA, 4, 64, Base, 25.0mm
  250#/syd QC/QA-HMA, 5, 76, Intermediate, OG 19.0mm
  440#/syd QC/QA-HMA, 4, 64, Base, 25.0mm
- (S) Subgrade Treatment, Type IB (Lime)
- (U) Underdrains
- (30) Seeding, U
- (31) Line, Thermoplastic, Solid, Yellow, 4"
- (46) Line, Thermoplastic, Solid, White, 4"
- (O) Compacted Aggregate, No. 53

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TYPICAL CROSS SECTIONS
TRANSPORTATION CORRIDOR

HORIZONTAL SCALE	BRIDGE FILE
1" = 5'	
VERTICAL SCALE	DESIGNATION
1"=5'	1382612
SURVEY BOOK	SHEETS
	4 of XX
CONTRACT	PROJECT
R-36260	1382612

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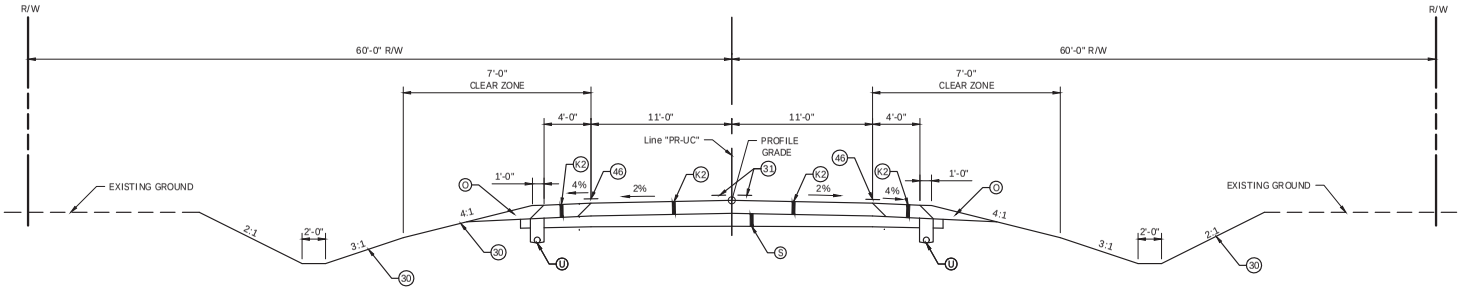
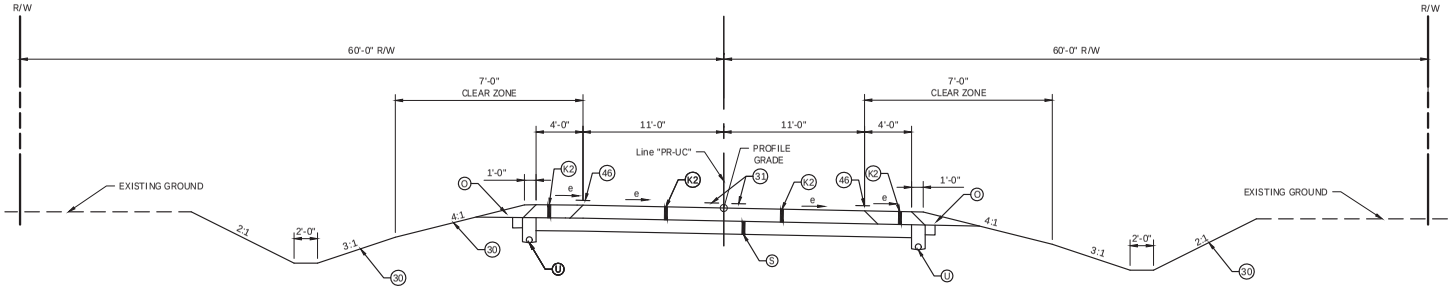


TYPICAL SECTION
LINE "PR-UC"

Sta. 902+65.00 to Sta. 903+96.81 "PR-UC"



SUPERELEVATION SECTION
LINE "PR-UC"

Sta. 900+12.05 to Sta. 902+65.00 "PR-UC"

Curve to the right shown, curves to the left reversed.

LEGEND

- (K2) Full Depth Pavement
  165#/syd QC/QA-HMA, 4, 76, Surface, 9.5mm
  275#/syd QC/QA-HMA, 4, 76, Intermediate, 19.0mm
  6" Compacted Aggregate, Base, No. 53
- (S) Subgrade Treatment, Type IB (Lime)
- (U) Underdrains
- (30) Seeding, U
- (31) Line, Thermoplastic, Solid, Yellow, 4"
- (46) Line, Thermoplastic, Solid, White, 4"
- (O) Compacted Aggregate, No. 53

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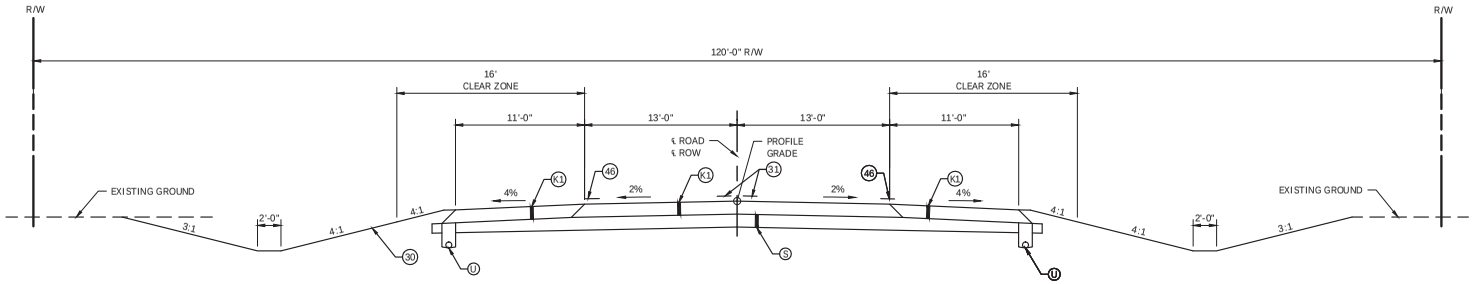
TYPICAL CROSS SECTIONS
TRANSPORTATION CORRIDOR

HORIZONTAL SCALE	BRIDGE FILE
1" = 5'	
VERTICAL SCALE	DESIGNATION
1"=5'	1382612
SURVEY BOOK	SHEETS
	5 of XX
CONTRACT	PROJECT
R-36260	1382612

File Name: P:\C3D\14-402\Road\Dwg\Plans\Line DE\Typical Line DE.dwg Plot Date: 8/25/2017 Plotted By: Wolka, Andy



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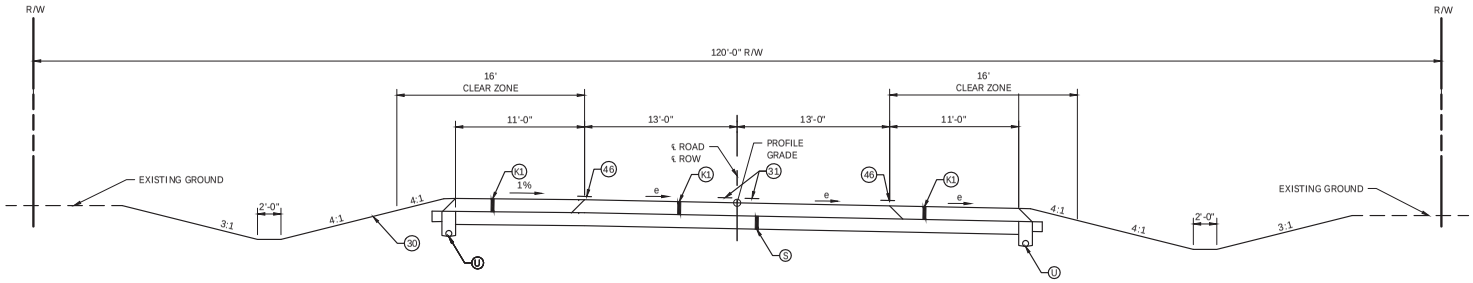

SUPERELEVATION SECTION

Sta. 23+85.00 to Sta. 33+90.00 "PR-DE"
Sta. 34+70.00 to Sta. 44+60.00 "PR-DE"
Sta. 48+25.00 to Sta. 58+75.00 "PR-DE"
Sta. 73+75.00 to Sta. 88+82.62 "PR-DE"

LEGEND

(K1) Full Depth Pavement
165#/syd C/ A-HMA, 4, 76, Surface, 9.5mm
275#/syd C/ A-HMA, 4, 76, Intermediate, 19.0mm
440#/syd C/ A-HMA, 4, 64, Base, 25.0mm
250#/syd C/ A-HMA, 5, 76, Intermediate, OG 19.0mm
440#/syd C/ A-HMA, 4, 64, Base, 25.0mm
Subgrade Treatment, Type II

(S) Subgrade Treatment, Type IB (Lime)

(U) Underdrains

(30) Seeding, R

(31) Line, Thermoplastic, Solid, Yellow, 4"

(46) Line, Thermoplastic, Solid, White, 4"

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TYPICAL CROSS SECTIONS
TRANSPORTATION CORRIDOR

HORIZONTAL SCALE	BRIDGE FILE
1" = 5'	XX
VERTICAL SCALE	DESIGNATION
	1382612
SURVEY BOOK	SHEETS
	3 of XX
CONTRACT	PROJECT
R-36260	

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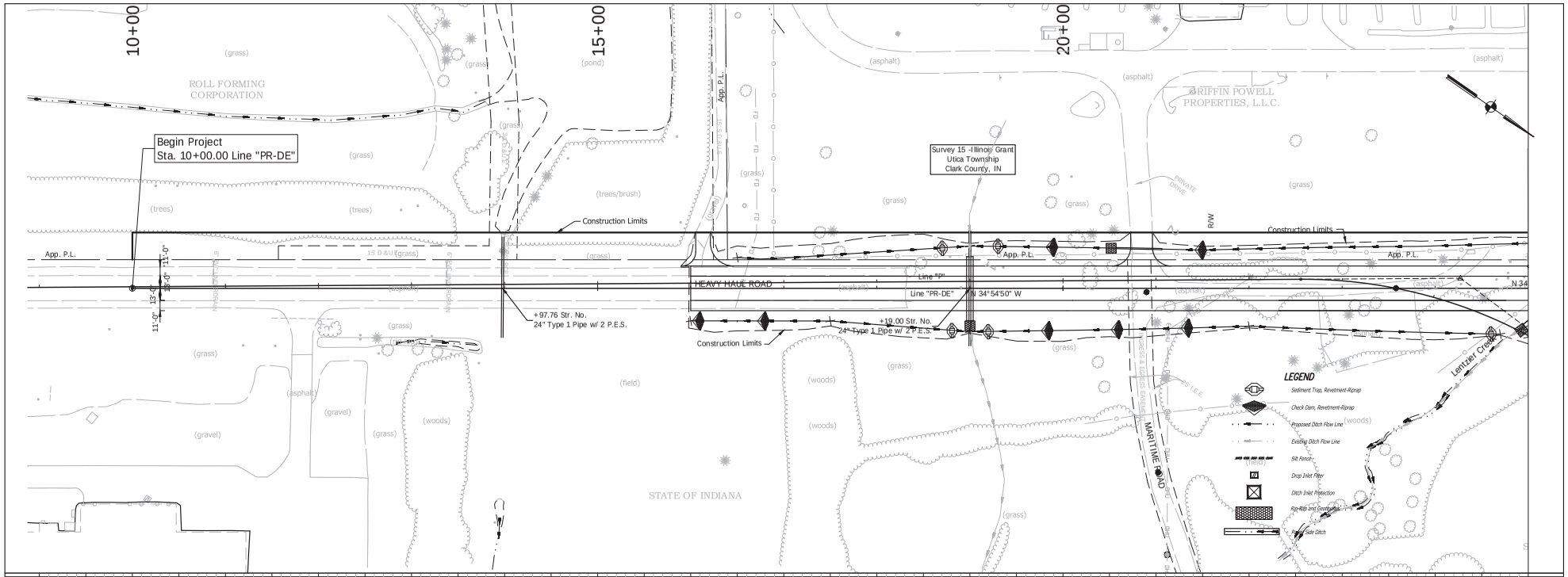

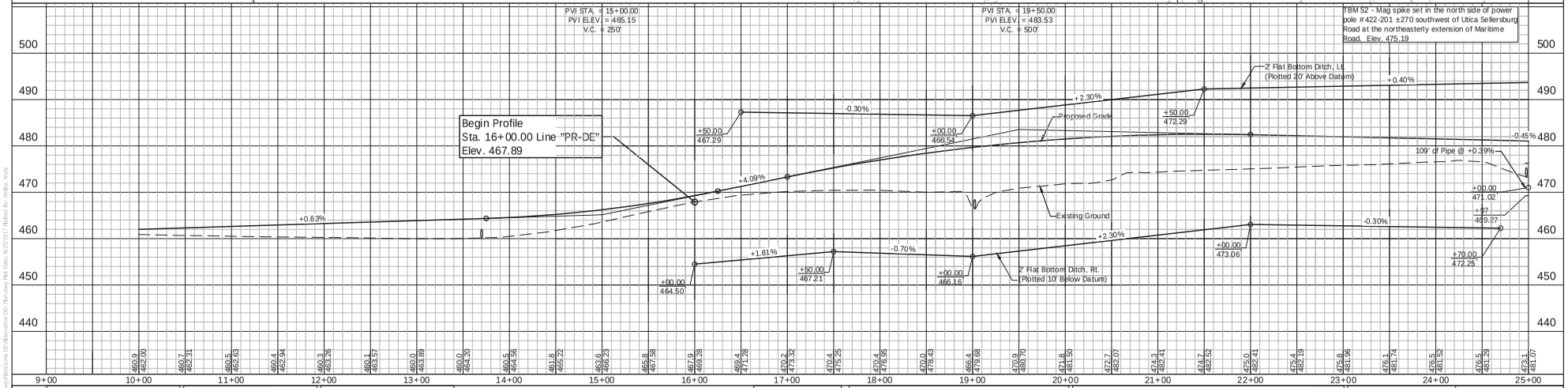

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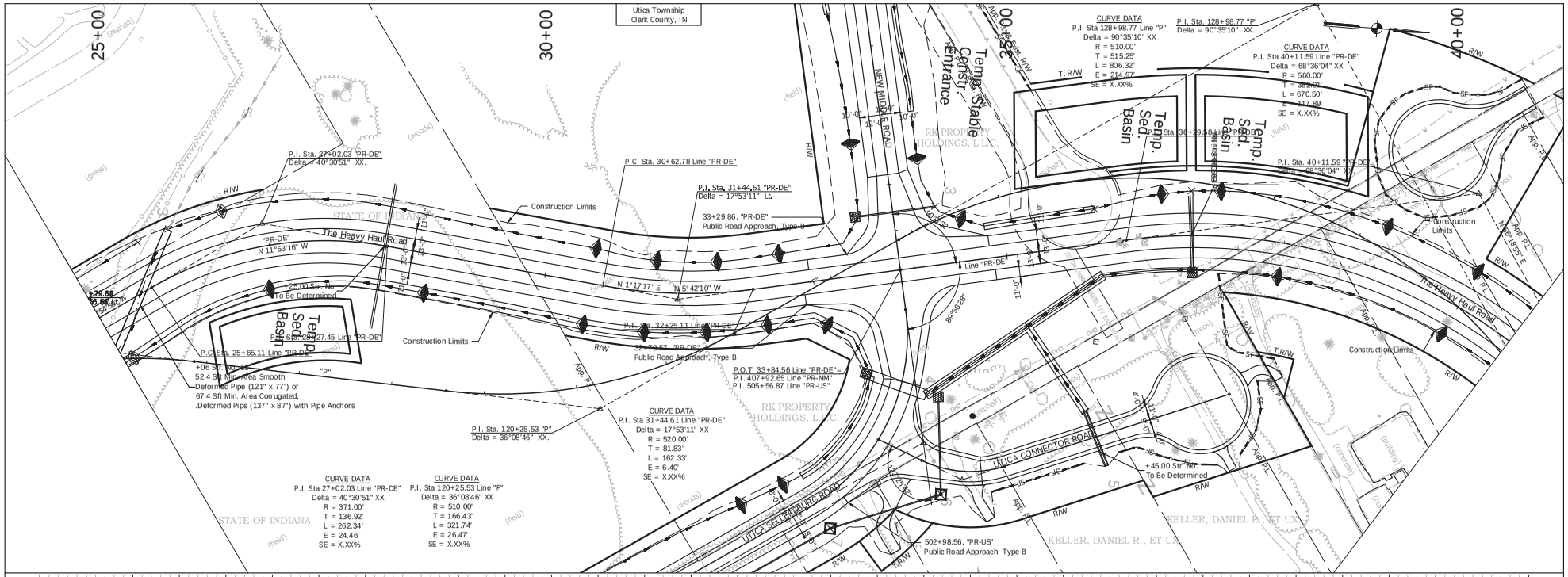
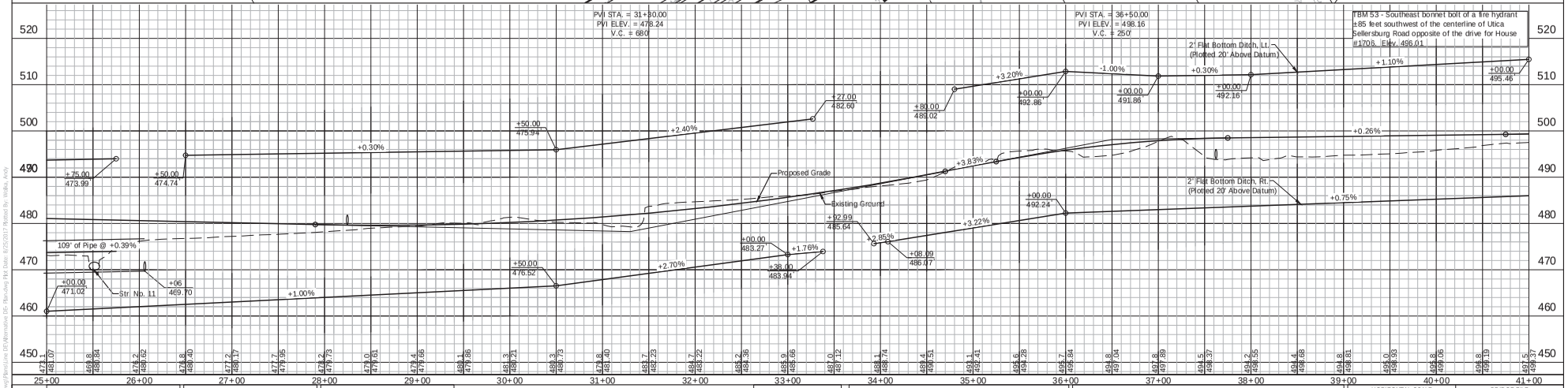
PLAN & PROFILES
LINE "PR-DE"

HORIZONTAL SCALE	BRIDGE FILE
1" = 50'	-
VERTICAL SCALE	DESIGNATION
1" = 10'	1382612
SURVEY BOOK	SHEETS
-	— of XX
CONTRACT	PROJECT
R-36260	—





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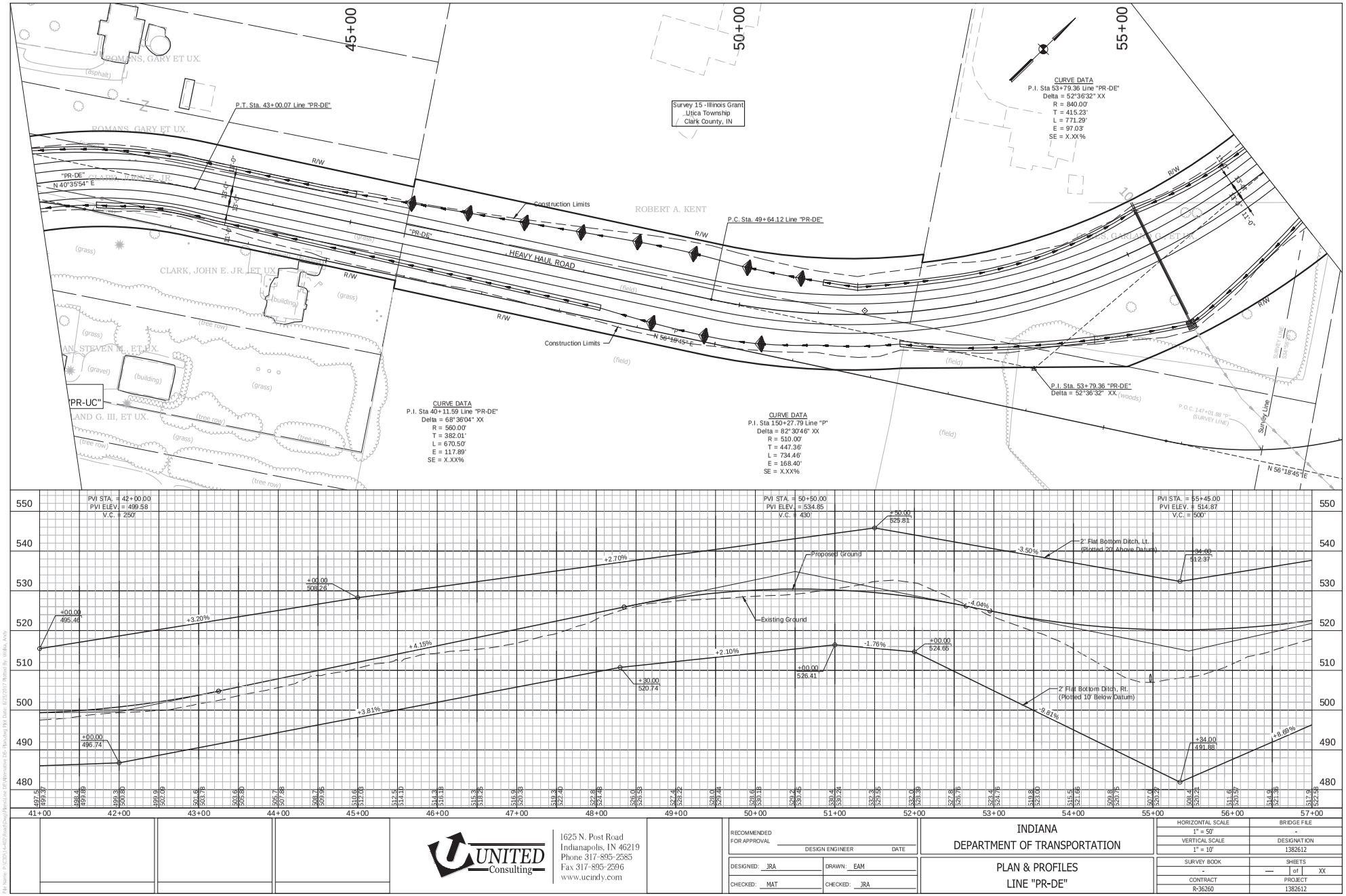
PLAN & PROFILES
LINE "PR-DE"

HORIZONTAL SCALE	BRIDGE FILE
1" = 50'	-
VERTICAL SCALE	DESIGNATION
1" = 10'	1382612
SURVEY BOOK	SHEETS
-	— of XX
CONTRACT	PROJECT
R-36260	1382612



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PLAN & PROFILES
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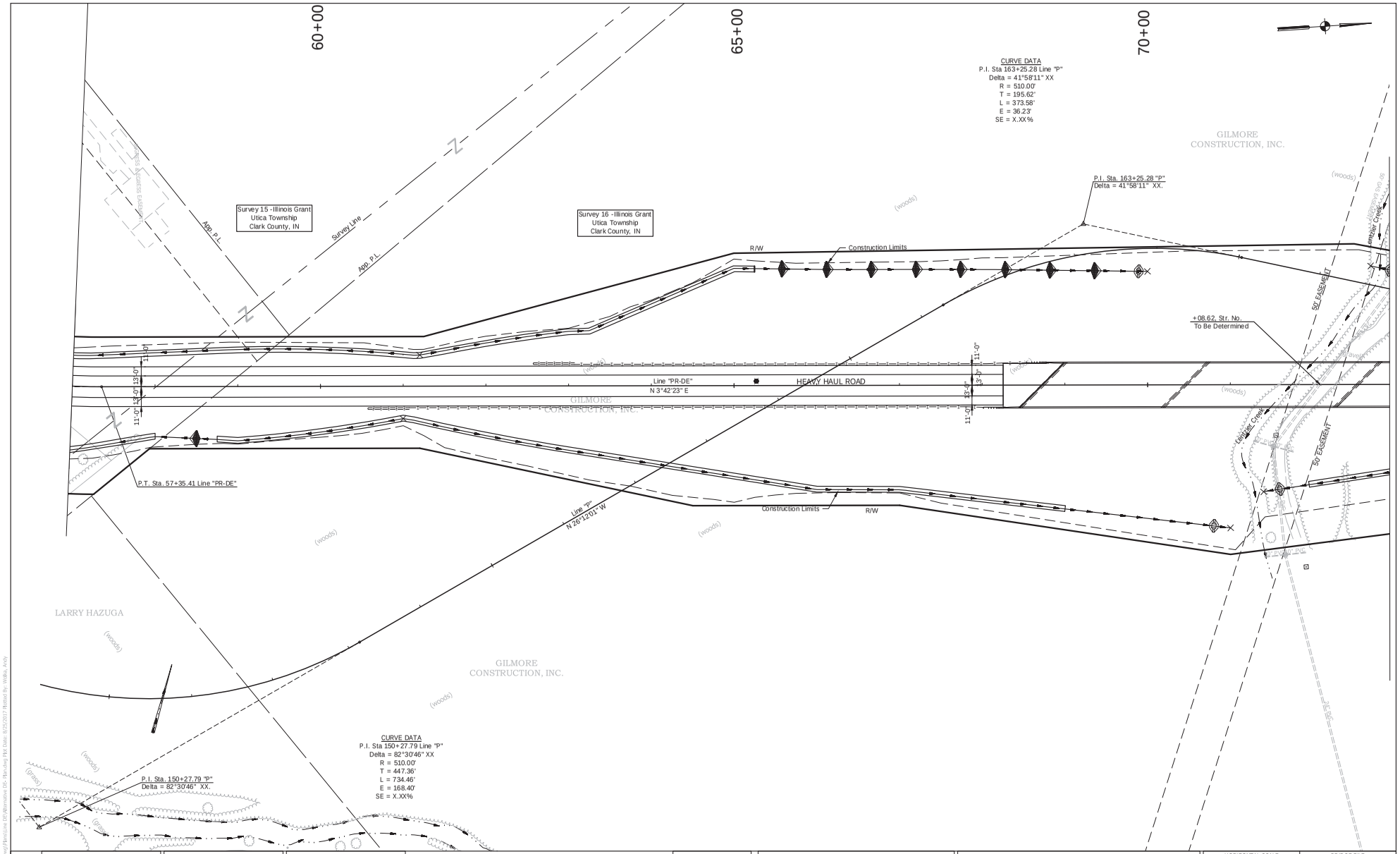
HORIZONTAL SCALE	BRIDGE FILE
1" = 50'	-
VERTICAL SCALE	DESIGNATION
1" = 10'	1382612
SURVEY BOOK	SHEETS
-	— of XX
CONTRACT	PROJECT
R-36260	1382612



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Plan and Profile
LINE "PR-DE"

HORIZONTAL SCALE	BRIDGE FILE
1" = 50'	-
VERTICAL SCALE	DESIGNATION
1" = 10'	1382612
SURVEY BOOK	SHEETS
-	— of XX
CONTRACT	PROJECT
R-36260	1382612

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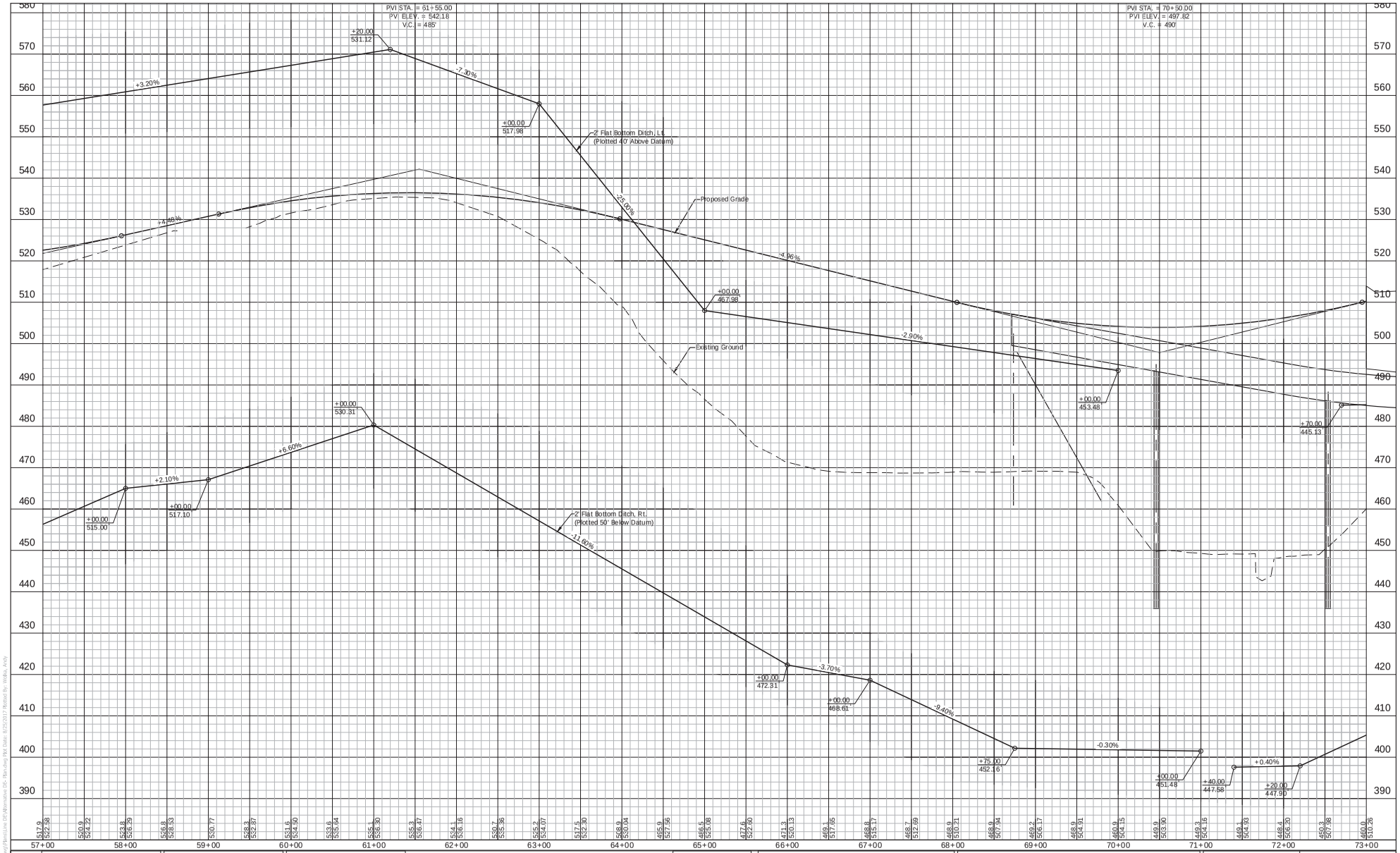

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Plan and Profile
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VERTICAL SCALE	DESIGNATION
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SURVEY BOOK	SHEETS
-	— of XX
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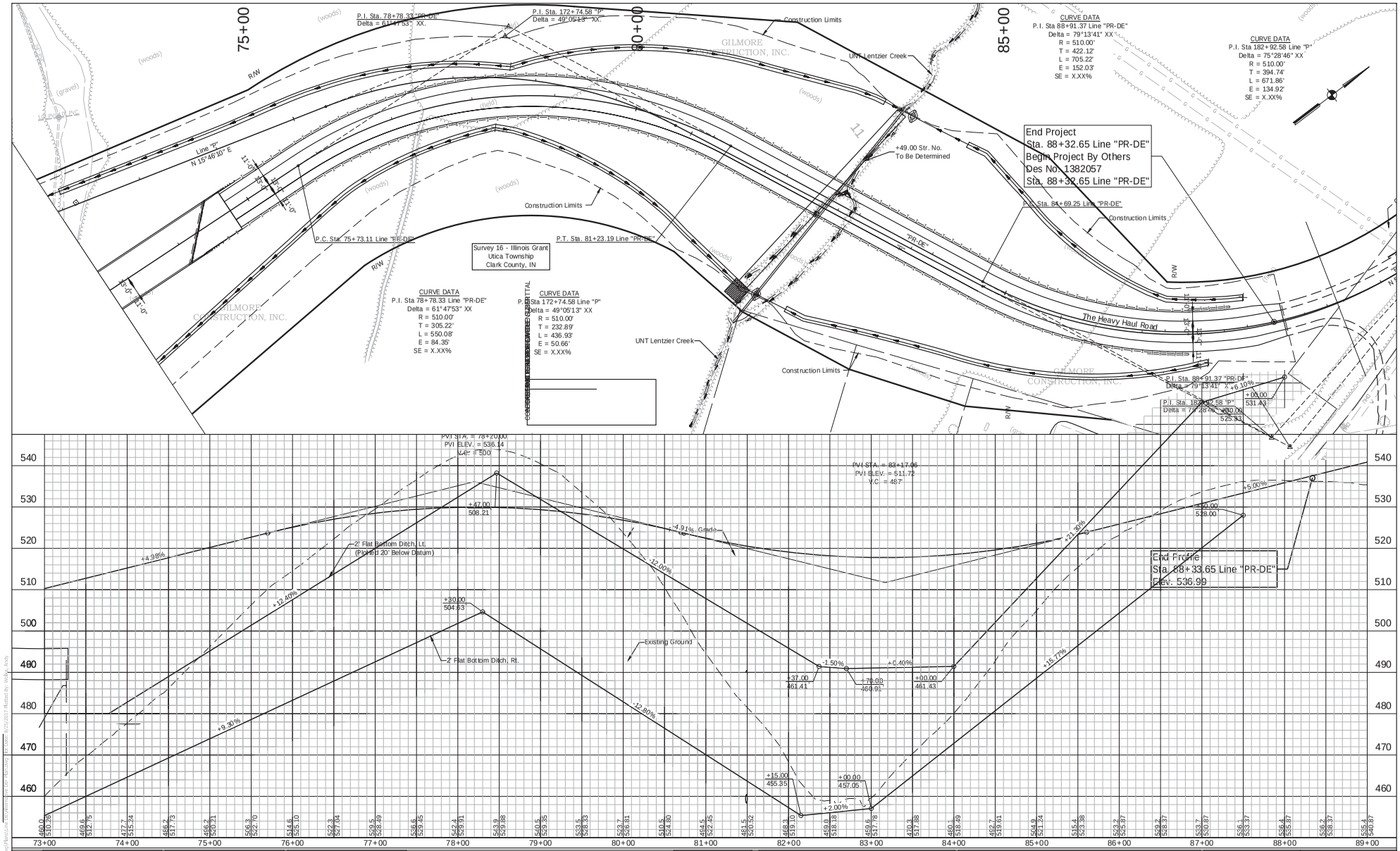

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VERTICAL SCALE	DESIGNATION
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-	— of XX
CONTRACT	PROJECT
R-36260	1382612

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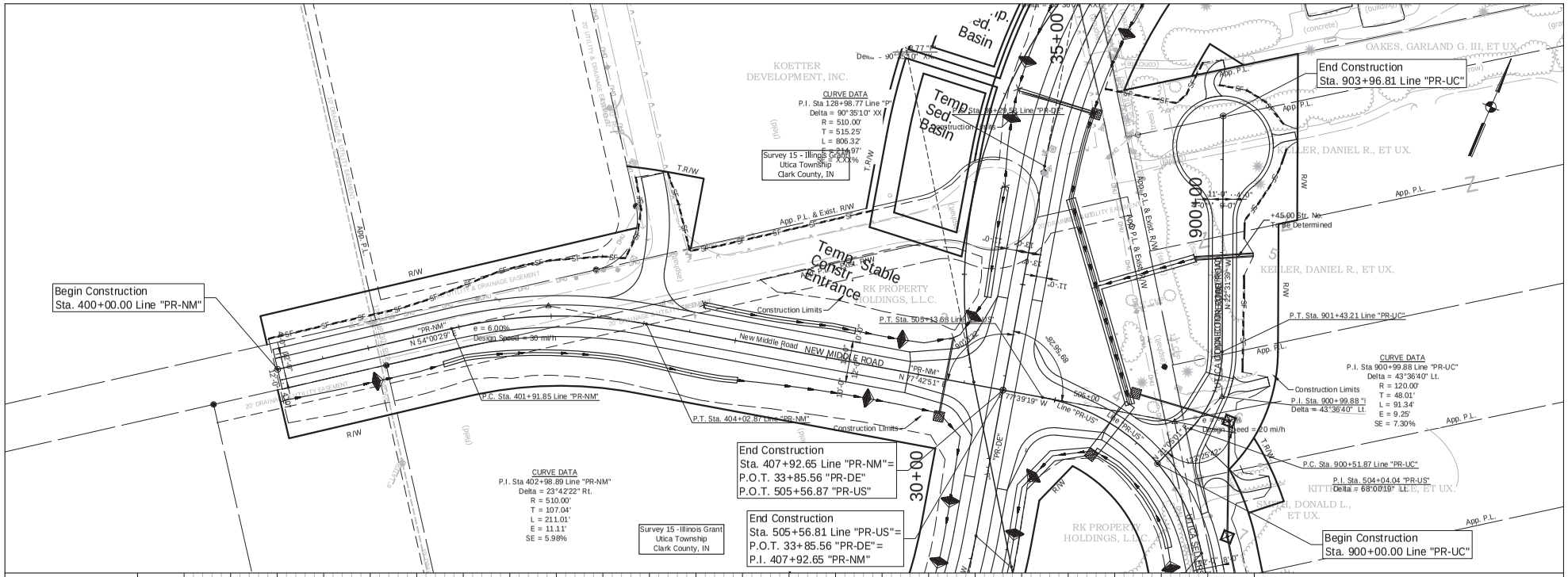

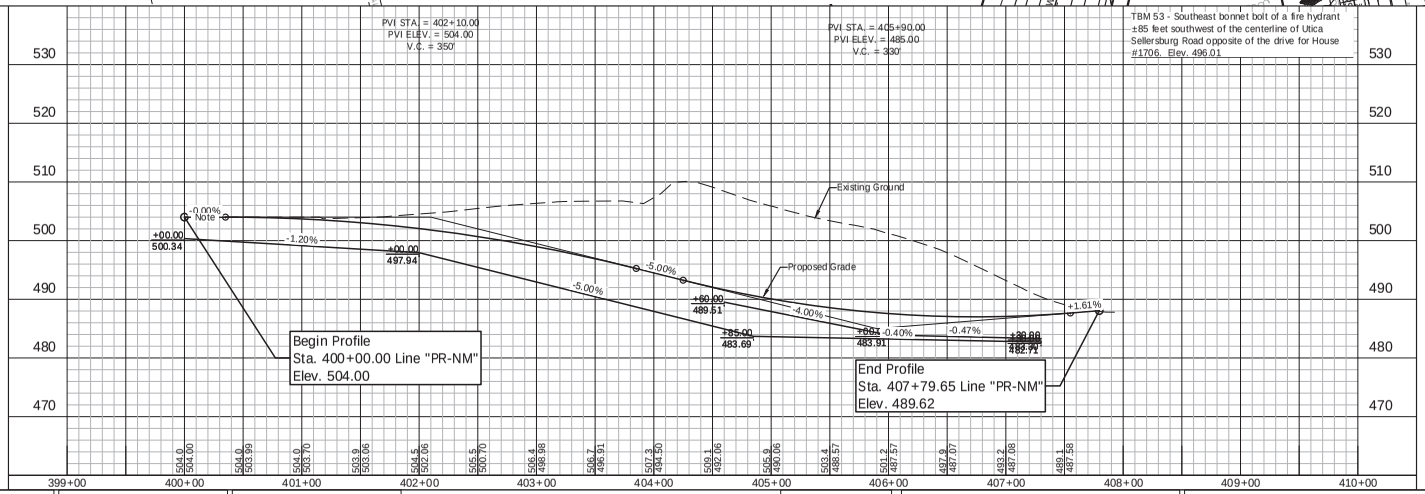

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SUPER ELEVATIONS
Line "PR-DE"

HORIZONTAL SCALE	BRIDGE FILE
1" = 50'	-
VERTICAL SCALE	DESIGNATION
1" = 10'	1382612
SURVEY BOOK	SHEETS
-	— of XX
CONTRACT	PROJECT
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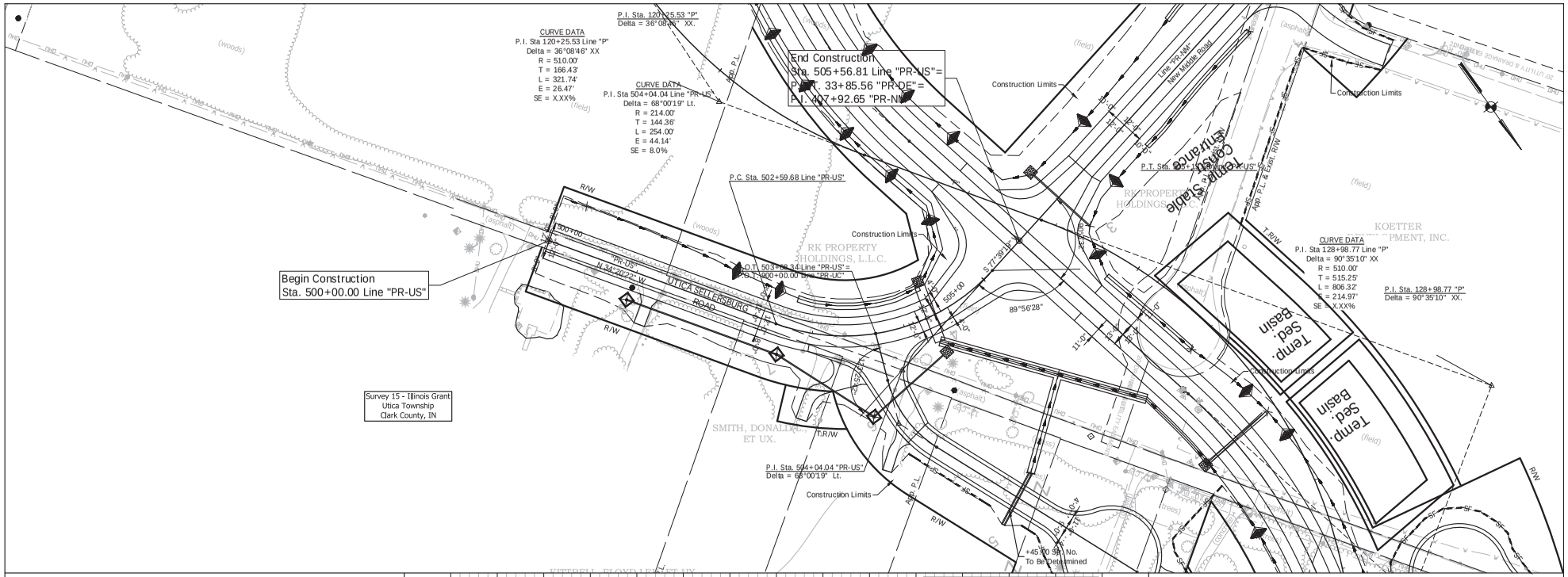

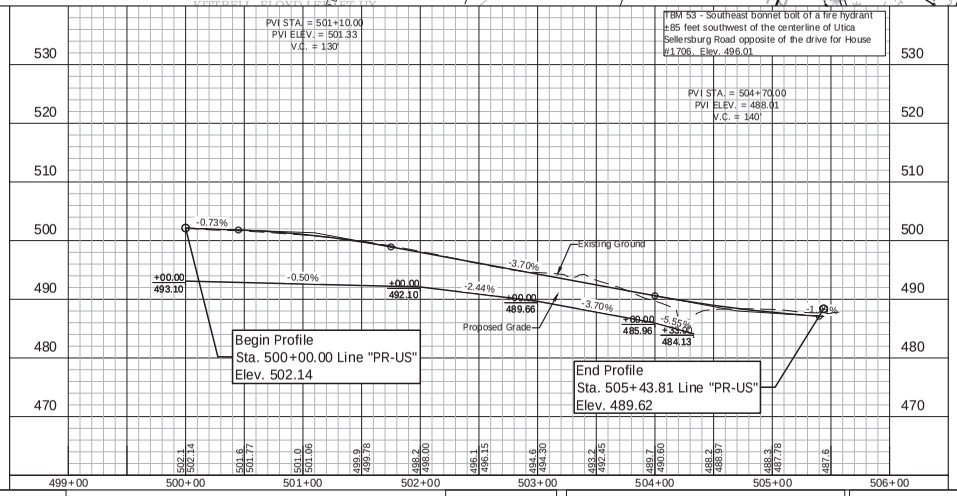

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SUPER ELEVATIONS
Line "PR-DE"

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SURVEY BOOK	SHEETS
-	— of XX
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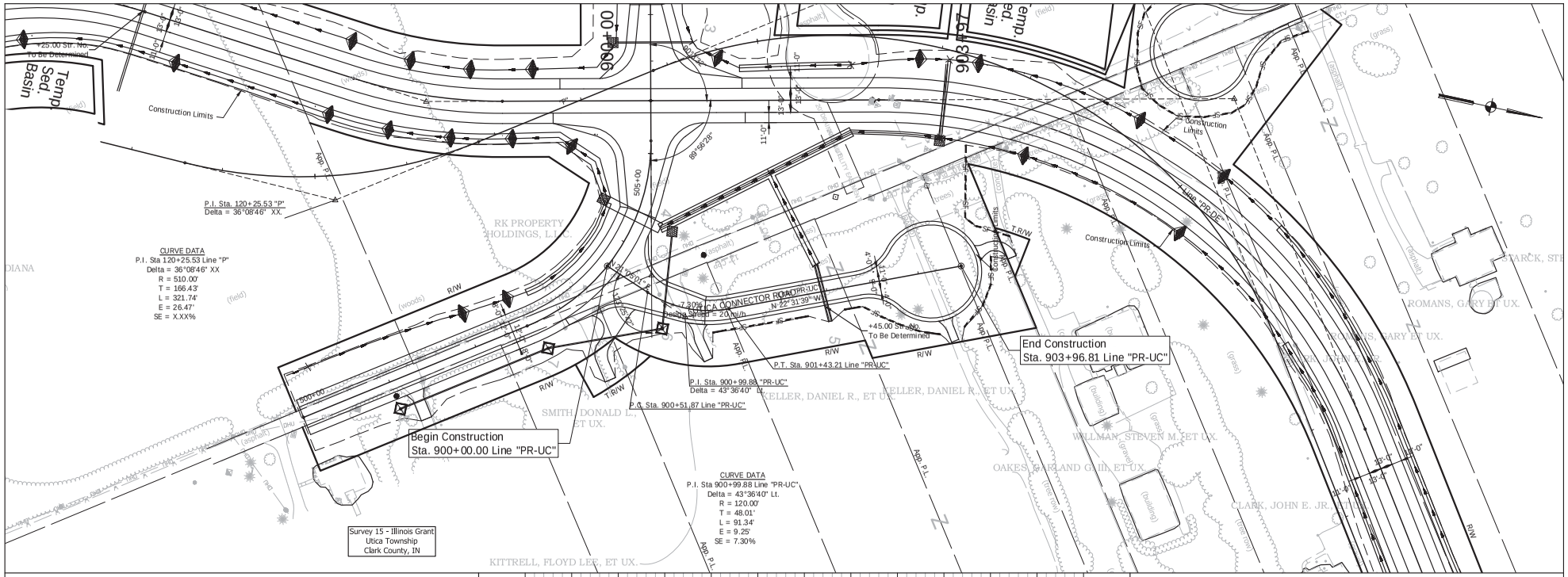

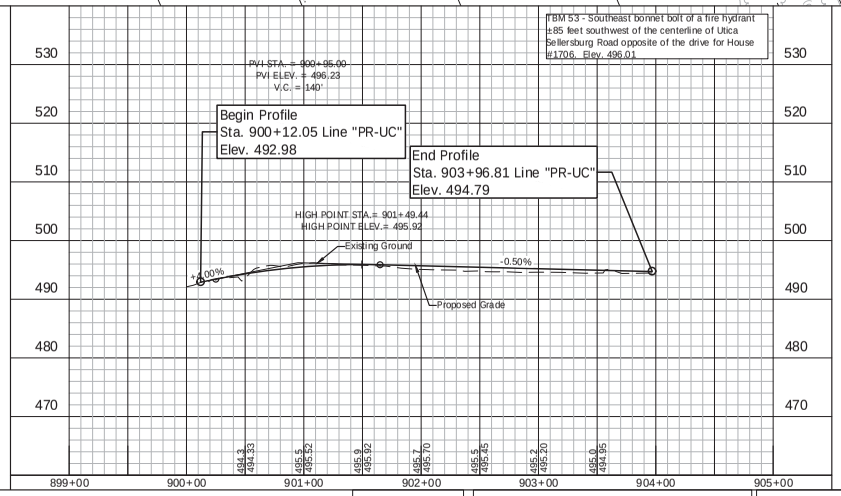

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SUPER ELEVATIONS
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SURVEY BOOK	SHEETS
-	— of XX
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Appendix J: Additional Studies

- Independent Utility Memo – March 22, 2016
- Environmental Justice Mapping and Census Data
- Hydraulic Report– Approved August 25, 2017

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Michael R. Pence, Governor
Brandye L. Hendrickson, Commissioner

March 22, 2016

Michelle Allen
Planning and Environmental Specialist
FHWA, Indiana Division
575 N Pennsylvania St
Room 254
Indianapolis, IN 46204

Re: Independent Utility of Regional Transportation Projects in Clark County, Indiana

Dear Ms. Allen:

The purpose of this letter is to summarize several current transportation projects in Clark County in southern Indiana that are in various stages of completion. Each of the projects is generally located in the vicinity of the SR 265 corridor east of SR 62 and north of the City of Jeffersonville. Please see the attached Regional Projects Map for location of the projects.

Recently, FHWA requested additional information regarding the evaluation of the corridor under NEPA, specifically with respect to the independent utility of each of the projects.

According to 23 CFR § 771.111(f):

In order to ensure meaningful evaluation of alternatives and to avoid commitments to transportation improvements before they are fully evaluated, the action evaluated in each EIS or finding of no significant impact (FONSI) shall:

(1) Connect logical termini and be of sufficient length to address environmental matters on a broad scope;
(2) Have independent utility or independent significance, i.e., be usable and be a reasonable expenditure even if no additional transportation improvements in the area are made; and
(3) Not restrict consideration of alternatives for other reasonably foreseeable transportation improvements.

The FHWA request is addressed for each of the projects below:

<u>Louisville-Southern Indiana Ohio River Bridges Project – East End Crossing</u>

The Louisville-Southern Indiana Ohio River Bridges Project (LSIORBP) is an approximately $2.3 billion project currently under construction under a Record of Decision approved on June 20, 2012. The purpose of the LSIORBP is to improve cross-river mobility and safety and to reduce traffic congestion in the Louisville Metropolitan Area. The LSIORBP is bifurcated into two separate procurements: (1) the Downtown Crossing (DTC), a KYTC contract for design and construction of new roadway and a new cross-river bridge connecting downtown Louisville and Jeffersonville, and (2) the East End Crossing (EEC), a P3 contract between the Indiana Finance Authority (IFA) and a developer, WVB East End Partners, LLC (WVB) to design, build, finance, operate and maintain the EEC, consisting of new roadway

and a new cross-river bridge connecting KY 841 near Prospect, KY with SR 265 near Utica, IN.

Construction of the EEC began in June of 2013 and it is scheduled to be open to traffic in late 2016. The budget of the EEC is $1.05 billion. The LSIORBP has Federal and state funding and oversight.

Old Salem Road Improvement

Logical Termini

Old Salem Road currently has 8-foot wide travel lanes with no shoulders. The road is very steeply sloping just northwest of the town of Utica and immediately after the Lentzier Creek crossing. Sight distances and grades are not compliant with current design criteria. The need for the project is the sub-standard and unsafe roadway conditions along the route.

The purpose of the project is to improve safety for the increased traffic that will utilize Old Salem Road as the connection between the Town of Utica and the new SR 265 alignment, being constructed as part of the LSIORBP. The project limits are from 4th St in Utica to the southern limits of the new Old Salem Rd interchange at SR 265.

Independent Utility

Old Salem Road currently terminates at a dead end approximately 1.0 miles northeast of 4th St. in Utica. Approximately 16 residents live along the route and generate all of the current traffic volume for Old Salem Rd. When the new interchange with SR 265 is opened to traffic in late 2016, Old Salem Rd will become the connection for Utica commuters to and from the new freeway. Traffic volumes are expected to increase from less than 100 vehicles per day now to over 1,000 vehicles per day by 2030. The functional classification of Old Salem Rd. was upgraded to Urban Minor Arterial in 2013. The improvement to Old Salem Rd. will not accommodate heavy vehicles or any significant volume of truck traffic. Development of the project includes methods to reduce truck traffic on Old Salem Road by use of signs and roadway geometry.

Project Funding and Schedule

The Old Salem Road improvement project is an INDOT and Clark County project under DES 1382057 that was documented as a Level 3 Categorical Exclusion and approved July 21, 2015. The project budget is $3.7 million and has Federal and state funding and oversight. The project is currently in the right-of-way acquisition stage and is scheduled for letting in August of 2016. That date will likely move to January 2017 to allow completion of right-of-way acquisition.

Heavy Haul Transportation Corridor

The Heavy Haul Transportation Corridor (HHTC) is a combination of three independent projects that will connect the Ports of Indiana-Jeffersonville (Port) with SR 62 through the River Ridge Commerce Center (RRCC) via the new interchange of SR 265 and Old Salem Rd being constructed as part of the LSIORBP EEC. Currently, trucks travelling between the Port and RRCC travel on Port Road to SR 62 through the SR 265 interchange. None of these roads are designed to accommodate heavy vehicles, and reaching the interior of RRCC requires further travel to the east from SR 62. The HHTC makes two improvements to the local network: (1) a northern project (Project B) which will connect SR 62 to SR 265, through RRCC, on a facility compatible with a high volume of heavy vehicle traffic, and (2) a southern project (Project A) which will connect the Port to SR 265 on a facility compatible with a high volume of heavy vehicle traffic. A third project (Project C) is being proposed to acquire R/W for a future rail connection between the Port and RRCC.

The projects, each with its own funding, are being facilitated by INDOT under DES 1382162 through an inter-local agreement between INDOT, Clark County, the City of Jeffersonville, the Port and the River Ridge Development Authority. The projects are identified in the inter-local agreement as Segment A, Segment B and Segment C for identification purposes only. However, each project has its own independent utility as described below:

Project A

Logical Termini

The existing road network between SR 265 and the Port requires heavy vehicles to access Port Rd via the SR 265/SR 62 interchange, which was not specifically designed for heavy vehicle traffic. Project A will connect SR 265 directly to the Port via the SR 265/Old Salem Rd interchange and New Middle Road.

Independent Utility

The exiting road network between the Port and SR 265 was not specifically designed for heavy vehicles and is seeing a significant increase in commuter traffic due to development along the Port Rd and SR 62 corridors. Project A will provide a fully functional heavy haul route between SR 265 and the Port without the construction of the Old Salem Road improvement project or any other aspect of the HHTC.

Project Funding and Schedule

Project A is being funded through a combination of Federal, state, local and private funds and will have Federal and state oversight.

An Environmental Assessment is currently under way for Project A and is expected to be complete by the beginning of 2017. Right-of-way acquisition will be done in 2018 with a contract letting in 2019 for construction completion by end of 2020. The project budget is $18.6 million.

Project B

Logical Termini

The existing road network between RRCC and SR 265 requires heavy vehicles to access SR 265 via the SR 62 corridor, which was not specifically designed for heavy vehicle traffic. Project B will connect RRCC directly to SR 265 via the SR 265/Old Salem Rd interchange.

Independent Utility

Project B of the HHTC will provide a fully functional heavy haul roadway independent of any other aspect of the HHTC or the Old Salem Road improvement. The project will provide direct access for heavy haul vehicles from RRCC to SR 265 on a road specifically designed for heavy vehicles and will reduce the need for heavy trucks to use the already congested SR 62 corridor.

Project Funding and Schedule

Project B is being financed without Federal or state highway funding and has no Federal or state oversight. The project, currently under construction, was bid by River Ridge Development Authority in August 2015 and is scheduled to open to traffic by the end of 2016 to coincide with opening of the LSIORBP, which includes the SR 265/Old Salem Rd interchange. The project budget is $10.5 million.

Project C

Logical Termini

Project C is a separate project to acquire right-of-way for a new direct, grade separated rail connection between the Port and RRCC.

Independent Utility

The current rail connection between the Port and RRCC requires the use of two at-grade crossings on SR 62 and use of the CSX mainline. A new direct rail connection will function as an independent mode of freight movement utilizing a rail line to move goods and services between the Port and RRCC without

at-grade crossings and use of a rail mainline. The rail line route will be analyzed separately from any road corridor projects, and will function as an independent project.

In late 2015, the Port announced it had received a TIGER grant for $10 million to improve rail connections within the Port. That project by the Port will be entirely within the Port's property and is independent of and separate from the HHTC Project C project.

Project Funding and Schedule:

Project C will require a separate environmental document and will include Federal, state and local funding and oversight. The project is only intended to acquire right-of-way with design and construction to follow later under a separate project. The right-of-way for Project C is not a part of any right-of-way being obtained for Project A or B of the HHTC. The project budget is $1.3 million.

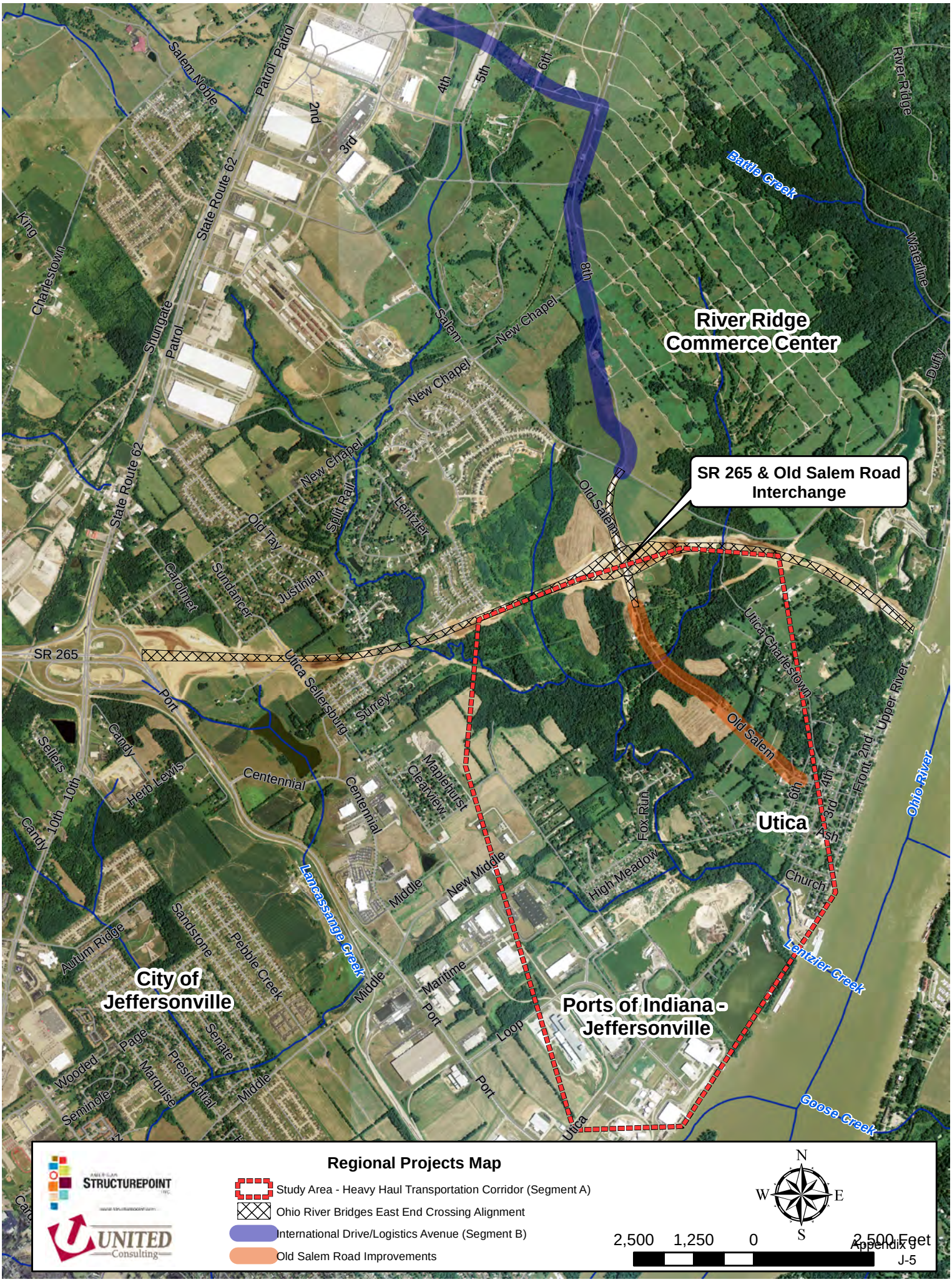
Please let me know if you require any further information in regards to any of the projects discussed above.

Sincerely,

Ronald Heustis, P.E. (Indiana)
INDOT Senior Project Manager

Cc: Mohammad, Hajeer, Ron Bales, Laura Hilden, file

Attachment (1)



River Ridge Commerce Center
SR 265 & Old Salem Road Interchange
Utica
City of Jeffersonville
Ports of Indiana - Jeffersonville
Battle Creek
Lancassange Creek
Lentzier Creek
Goose Creek
Ohio River
Salem Noble
Patrol
State Route 62
Shungate
Charlestown
King
Salem
New Chapel
Split Rail
Lentzier
Old Salem
Old Tay
Justinian
Sundancer
Carolmet
SR 265
Utica Sellersburg
Surrey
Port
Candy
Sellers
Herb Lewis
Centennial
Maplehurst
Clearview
Middle
New Middle
Fox Run
High Meadow
Church
Ash
Front
Upper River
Utica Charlestown
Waterline
River Ridge
Duffy
Sandstone
Pebble Creek
Autum Ridge
Maritime
Loop
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8th
10th
Regional Projects Map
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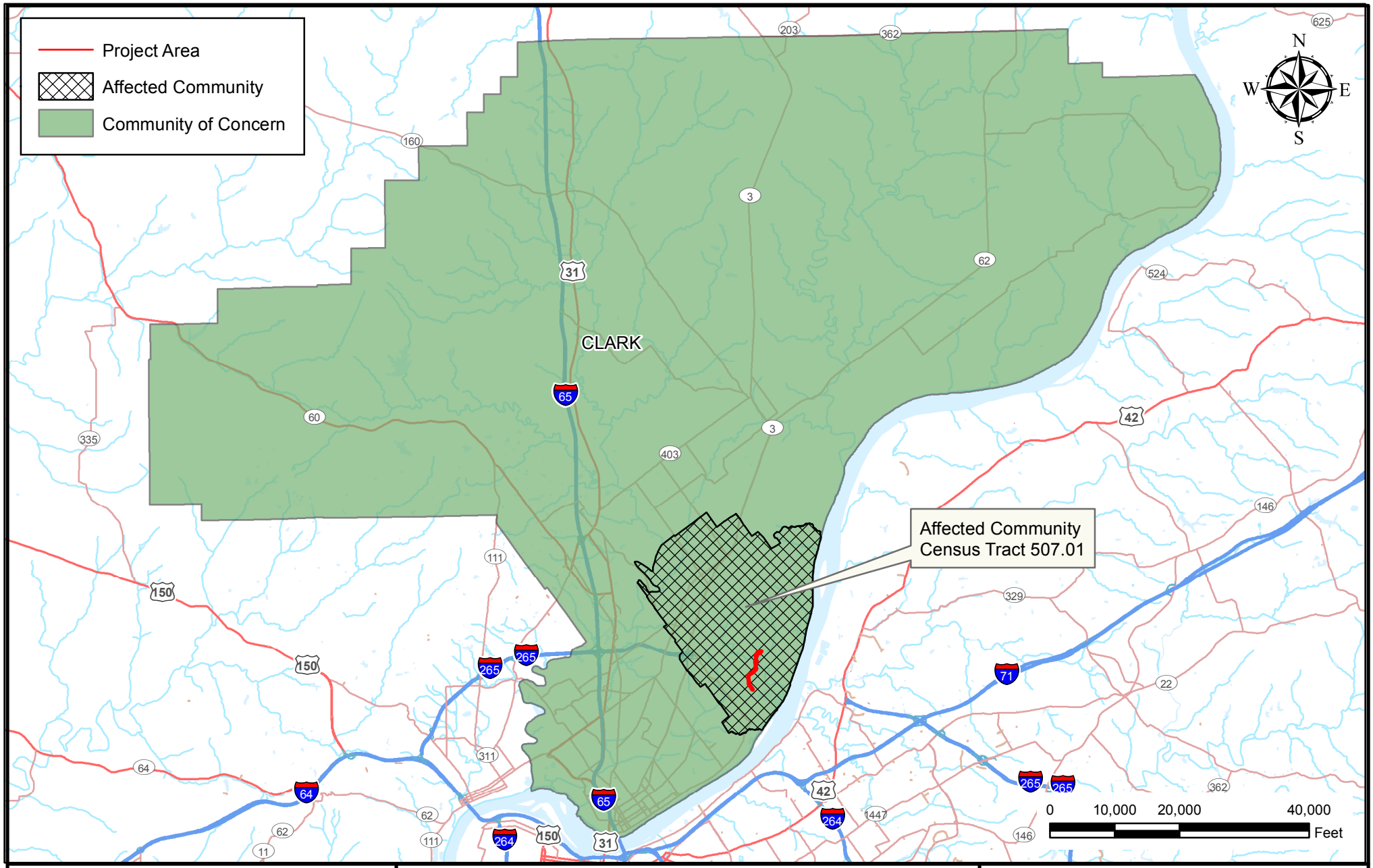
Ohio River Bridges East End Crossing Alignment
International Drive/Logistics Avenue (Segment B)
Old Salem Road Improvements
N
S
E
W
2,500 1,250 0 2,500 Feet
STRUCTUREPOINT
UNITED Consulting

Path: P:\2013\01857\D. Drawings\ArcView\Exhibits\Environmental Justice\2013.01857.EV.EnvironmentalJustice.Landscape.kaj.mxd Date:1/19/2018 User:kjones



AMERICAN STRUCTUREPOINT INC.

Environmental Justice Mapping

Indiana Department of Transportation
Central Office
100 North Senate Avenue
Indianapolis, Indiana 46204

Heavy Haul Transportation Corridor
Des. No. 1382612

Location: Jeffersonville
Township: Utica
County: Clark
State: Indiana

Date: 01/19/2018

B03002

HISPANIC OR LATINO ORIGIN BY RACE

Universe: Total population
2012-2016 American Community Survey 5-Year Estimates

Supporting documentation on code lists, subject definitions, data accuracy, and statistical testing can be found on the American Community Survey website in the Data and Documentation section.

Sample size and data quality measures (including coverage rates, allocation rates, and response rates) can be found on the American Community Survey website in the Methodology section.

Tell us what you think. Provide feedback to help make American Community Survey data more useful for you.

Although the American Community Survey (ACS) produces population, demographic and housing unit estimates, it is the Census Bureau's Population Estimates Program that produces and disseminates the official estimates of the population for the nation, states, counties, cities and towns and estimates of housing units for states and counties.

	Clark County, Indiana		Census Tract 507.01, Clark County, Indiana	
	Estimate	Margin of Error	Estimate	Margin of Error
Total:	113,993	*****	5,521	+/-253
Not Hispanic or Latino:	108,160	*****	5,314	+/-272
White alone	96,063	+/-89	4,582	+/-355
Black or African American alone	7,876	+/-331	417	+/-114
American Indian and Alaska Native alone	83	+/-64	1	+/-4
Asian alone	876	+/-288	3	+/-5
Native Hawaiian and Other Pacific Islander alone	15	+/-24	0	+/-16
Some other race alone	83	+/-91	0	+/-16
Two or more races:	3,164	+/-489	311	+/-282
Two races including Some other race	12	+/-20	0	+/-16
Two races excluding Some other race, and three or more races	3,152	+/-489	311	+/-282
Hispanic or Latino:	5,833	*****	207	+/-200
White alone	4,443	+/-493	195	+/-198
Black or African American alone	41	+/-42	0	+/-16
American Indian and Alaska Native alone	55	+/-67	0	+/-16
Asian alone	15	+/-25	0	+/-16
Native Hawaiian and Other Pacific Islander alone	0	+/-27	0	+/-16
Some other race alone	1,170	+/-458	0	+/-16
Two or more races:	109	+/-70	12	+/-22
Two races including Some other race	65	+/-52	0	+/-16
Two races excluding Some other race, and three or more races	44	+/-47	12	+/-22

Data are based on a sample and are subject to sampling variability. The degree of uncertainty for an estimate arising from sampling variability is represented through the use of a margin of error. The value shown here is the 90 percent margin of error. The margin of error can be interpreted roughly as providing a 90 percent probability that the interval defined by the estimate minus the margin of error and the estimate plus the margin of error (the lower and upper confidence bounds) contains the true value. In addition to sampling variability, the ACS estimates are subject to nonsampling error (for a discussion of nonsampling variability, see Accuracy of the Data). The effect of nonsampling error is not represented in these tables.

While the 2012-2016 American Community Survey (ACS) data generally reflect the February 2013 Office of Management and Budget (OMB) definitions of metropolitan and micropolitan statistical areas; in certain instances the names, codes, and boundaries of the principal cities shown in ACS tables may differ from the OMB definitions due to differences in the effective dates of the geographic

entities.

Estimates of urban and rural population, housing units, and characteristics reflect boundaries of urban areas defined based on Census 2010 data. As a result, data for urban and rural areas from the ACS do not necessarily reflect the results of ongoing urbanization.

Source: U.S. Census Bureau, 2012-2016 American Community Survey 5-Year Estimates

Explanation of Symbols:

1. An '**' entry in the margin of error column indicates that either no sample observations or too few sample observations were available to compute a standard error and thus the margin of error. A statistical test is not appropriate.
2. An '-' entry in the estimate column indicates that either no sample observations or too few sample observations were available to compute an estimate, or a ratio of medians cannot be calculated because one or both of the median estimates falls in the lowest interval or upper interval of an open-ended distribution.
3. An '-' following a median estimate means the median falls in the lowest interval of an open-ended distribution.
4. An '+' following a median estimate means the median falls in the upper interval of an open-ended distribution.
5. An '***' entry in the margin of error column indicates that the median falls in the lowest interval or upper interval of an open-ended distribution. A statistical test is not appropriate.
6. An '*****' entry in the margin of error column indicates that the estimate is controlled. A statistical test for sampling variability is not appropriate.
7. An 'N' entry in the estimate and margin of error columns indicates that data for this geographic area cannot be displayed because the number of sample cases is too small.
8. An '(X)' means that the estimate is not applicable or not available.

B17001

POVERTY STATUS IN THE PAST 12 MONTHS BY SEX BY AGE

Universe: Population for whom poverty status is determined
2012-2016 American Community Survey 5-Year Estimates

Supporting documentation on code lists, subject definitions, data accuracy, and statistical testing can be found on the American Community Survey website in the Data and Documentation section.

Sample size and data quality measures (including coverage rates, allocation rates, and response rates) can be found on the American Community Survey website in the Methodology section.

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Although the American Community Survey (ACS) produces population, demographic and housing unit estimates, it is the Census Bureau's Population Estimates Program that produces and disseminates the official estimates of the population for the nation, states, counties, cities and towns and estimates of housing units for states and counties.

	Clark County, Indiana		Census Tract 507.01, Clark County, Indiana	
	Estimate	Margin of Error	Estimate	Margin of Error
Total:	112,188	+/-321	5,483	+/-253
Income in the past 12 months below poverty level:	11,153	+/-1,142	230	+/-128
Male:	5,181	+/-622	124	+/-91
Under 5 years	562	+/-180	0	+/-16
5 years	128	+/-65	0	+/-16
6 to 11 years	640	+/-176	10	+/-17
12 to 14 years	244	+/-104	0	+/-16
15 years	139	+/-104	33	+/-51
16 and 17 years	198	+/-103	0	+/-16
18 to 24 years	451	+/-166	0	+/-16
25 to 34 years	700	+/-190	0	+/-16
35 to 44 years	639	+/-156	27	+/-30
45 to 54 years	706	+/-205	46	+/-55
55 to 64 years	401	+/-99	3	+/-5
65 to 74 years	212	+/-84	5	+/-6
75 years and over	161	+/-86	0	+/-16
Female:	5,972	+/-665	106	+/-55
Under 5 years	498	+/-156	2	+/-3
5 years	132	+/-80	0	+/-16
6 to 11 years	434	+/-142	9	+/-16
12 to 14 years	305	+/-143	0	+/-16
15 years	38	+/-37	0	+/-16
16 and 17 years	201	+/-97	17	+/-16
18 to 24 years	499	+/-166	6	+/-10
25 to 34 years	1,026	+/-208	6	+/-8
35 to 44 years	555	+/-159	0	+/-16
45 to 54 years	757	+/-163	3	+/-4
55 to 64 years	819	+/-206	16	+/-19
65 to 74 years	389	+/-106	0	+/-16
75 years and over	319	+/-104	47	+/-42
Income in the past 12 months at or above poverty level:	101,035	+/-1,194	5,253	+/-270
Male:	49,135	+/-691	2,542	+/-231

	Clark County, Indiana		Census Tract 507.01, Clark County, Indiana	
	Estimate	Margin of Error	Estimate	Margin of Error
Under 5 years	3,083	+/-195	169	+/-91
5 years	534	+/-158	57	+/-69
6 to 11 years	3,624	+/-293	282	+/-110
12 to 14 years	2,163	+/-266	103	+/-79
15 years	600	+/-138	28	+/-32
16 and 17 years	1,188	+/-165	54	+/-40
18 to 24 years	3,990	+/-170	158	+/-59
25 to 34 years	6,789	+/-269	434	+/-145
35 to 44 years	7,024	+/-206	390	+/-131
45 to 54 years	7,006	+/-222	330	+/-98
55 to 64 years	6,702	+/-141	328	+/-96
65 to 74 years	4,154	+/-94	105	+/-46
75 years and over	2,278	+/-79	104	+/-51
Female:	51,900	+/-769	2,711	+/-237
Under 5 years	3,023	+/-163	111	+/-61
5 years	817	+/-181	29	+/-31
6 to 11 years	3,465	+/-302	309	+/-122
12 to 14 years	1,931	+/-275	104	+/-69
15 years	650	+/-155	70	+/-57
16 and 17 years	1,408	+/-163	44	+/-32
18 to 24 years	4,091	+/-238	217	+/-150
25 to 34 years	6,888	+/-244	380	+/-142
35 to 44 years	7,155	+/-219	445	+/-122
45 to 54 years	7,127	+/-237	327	+/-98
55 to 64 years	7,129	+/-236	423	+/-120
65 to 74 years	4,852	+/-112	99	+/-46
75 years and over	3,364	+/-166	153	+/-74

Data are based on a sample and are subject to sampling variability. The degree of uncertainty for an estimate arising from sampling variability is represented through the use of a margin of error. The value shown here is the 90 percent margin of error. The margin of error can be interpreted roughly as providing a 90 percent probability that the interval defined by the estimate minus the margin of error and the estimate plus the margin of error (the lower and upper confidence bounds) contains the true value. In addition to sampling variability, the ACS estimates are subject to nonsampling error (for a discussion of nonsampling variability, see Accuracy of the Data). The effect of nonsampling error is not represented in these tables.

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Source: U.S. Census Bureau, 2012-2016 American Community Survey 5-Year Estimates

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August 25, 2017

TO: Coordinator 8

FROM: Alex Schwinghamer, E.I.
Hydraulics Engineer

THROUGH: Shahriar Shahnaz, PE
Sr. Hydraulics Engineer

SUBJECT: Hydraulic Review

Str. #:	TBD
Des. #:	1382612
County:	Clark
Location:	New Road – Heavy Hall Rd 0.30 miles west of Old Salem Rd
Crossing:	Lentzier Cr
Consultant:	United Consulting

After review of the above noted project, the following hydraulic sizing parameters are recommended:

Drainage Area	= 5.30	sq. mi.
Q100	= 1700	cfs
Elevation @ Q100	=452.95	ft.
Approximate Skew	= 45	deg.

Proposed Conditions:

Proposed Backwater	= 0.12	ft.
Velocity @ Q100	= 2.58	ft./sec.
Proposed Waterway Opening Below Q100 Elevation (Str.)	= 762	sq. ft.
Proposed Road Overflow Waterway Area	= 0.00	sq. ft.
Proposed Low Structure Elevation	= 488.5	ft.

The scour analysis for the proposed bridge is approved. The application of revetment riprap on the spill slopes should be used to a depth of 1.5 ft with a key trench at the toe that has a depth and width of 2.5 ft.

Q100	= 1700	cfs.
Q100 Elevation	= 452.95	ft.
Q100 Contraction Scour	= 0.00	ft.
Q100 Total Scour	= 7.49	ft.
Q100 Low Scour Elevation	= 434.67	ft.
Q100 Max Velocity	= 6.07	ft/s.

Q500	= 2380	cfs.
Q500 Elevation	= 454.15	ft.
Q500 Contraction Scour	= 0.00	ft.
Q500 Total Scour	= 7.81	ft.
Q500 Low Scour Elevation	= 434.35	ft.
Q500 Max Velocity	= 6.43	ft/s.

Scour data is based on a flowline of 442.16 ft. and erodible material and a pier width of 5 ft. was assumed due to the proposed height of the bridge. The original model was for DNR Permit FW-26753. Discharge was obtained from a FARA Discharge letter. A Construction-in-a-Floodway (CIF) permit will be needed for this project.

If you have any questions or comments, please contact me at (317) 233-2273.

AJS
cc: file

The assignment of the Bridge Des. Number is being coordinated with Ron Heustis, INDOT Project Manager.

HYDRAULIC REPORT

BRIDGE FILE NUMBER: TBD

NBI NUMBER: TBD

ROAD DESIGNATION NUMBER: 1382612

ROUTE IDENTIFICATION AND FEATURE CROSSED:
Heavy Haul Road over Lentzier Creek

Picture From 2016 Google Earth Image

PROJECT LOCATION: 0.30 mile west of Old Salem Rd in Section 16, T-44-N, R-16-E, Utica Township, Clark County, Indiana

REFERENCE POINT: TBD

PREPARED BY: Nick J. Kocher, P.E., United Consulting

DATE: July 27, 2017

NICHOLAS J. KOCHER
REGISTERED
No. PE11100665
STATE OF
INDIANA
PROFESSIONAL ENGINEER

Nicholas J. Kocher
7/27/2017

UNITED Consulting

HEAVY HAUL ROAD OVER LENTZIER CREEK
Hydraulic Report
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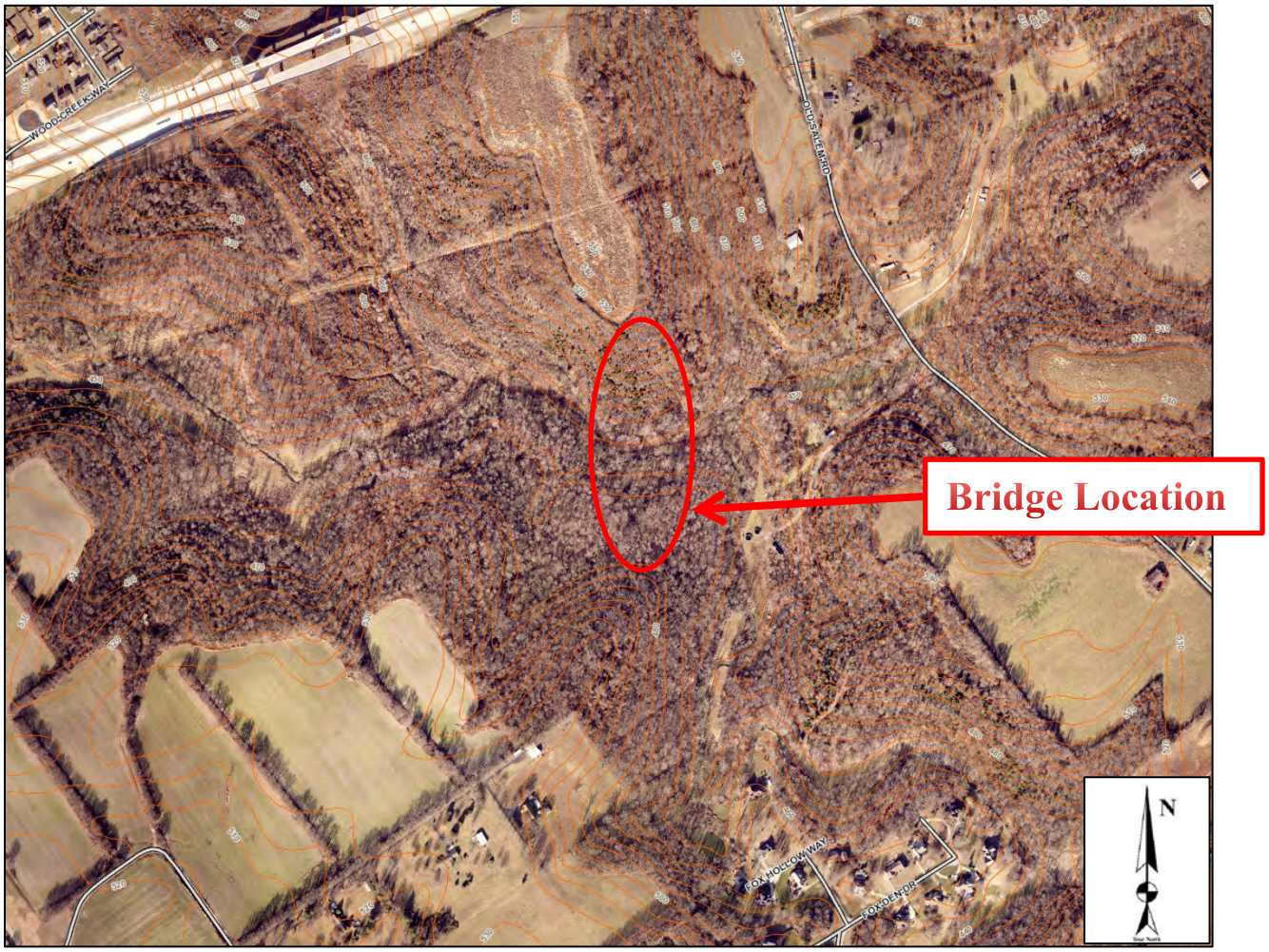
NARRATIVE

PROJECT LOCATION SHOWN BY

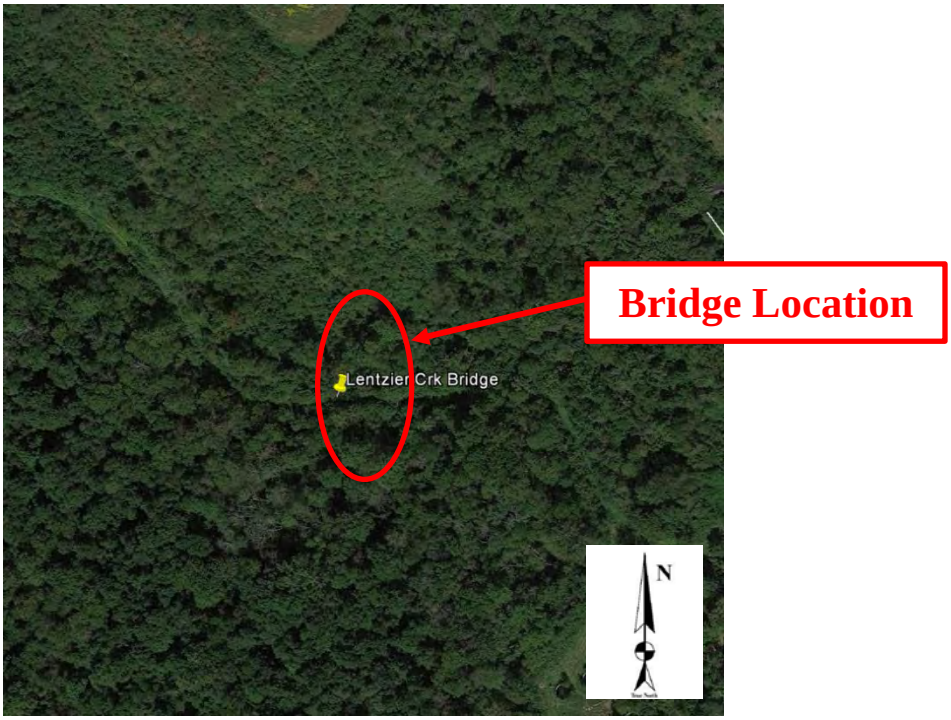
LATITUDE: **38°20’32”N** LONGITUDE: **85°40’10”W**

Project Location Map



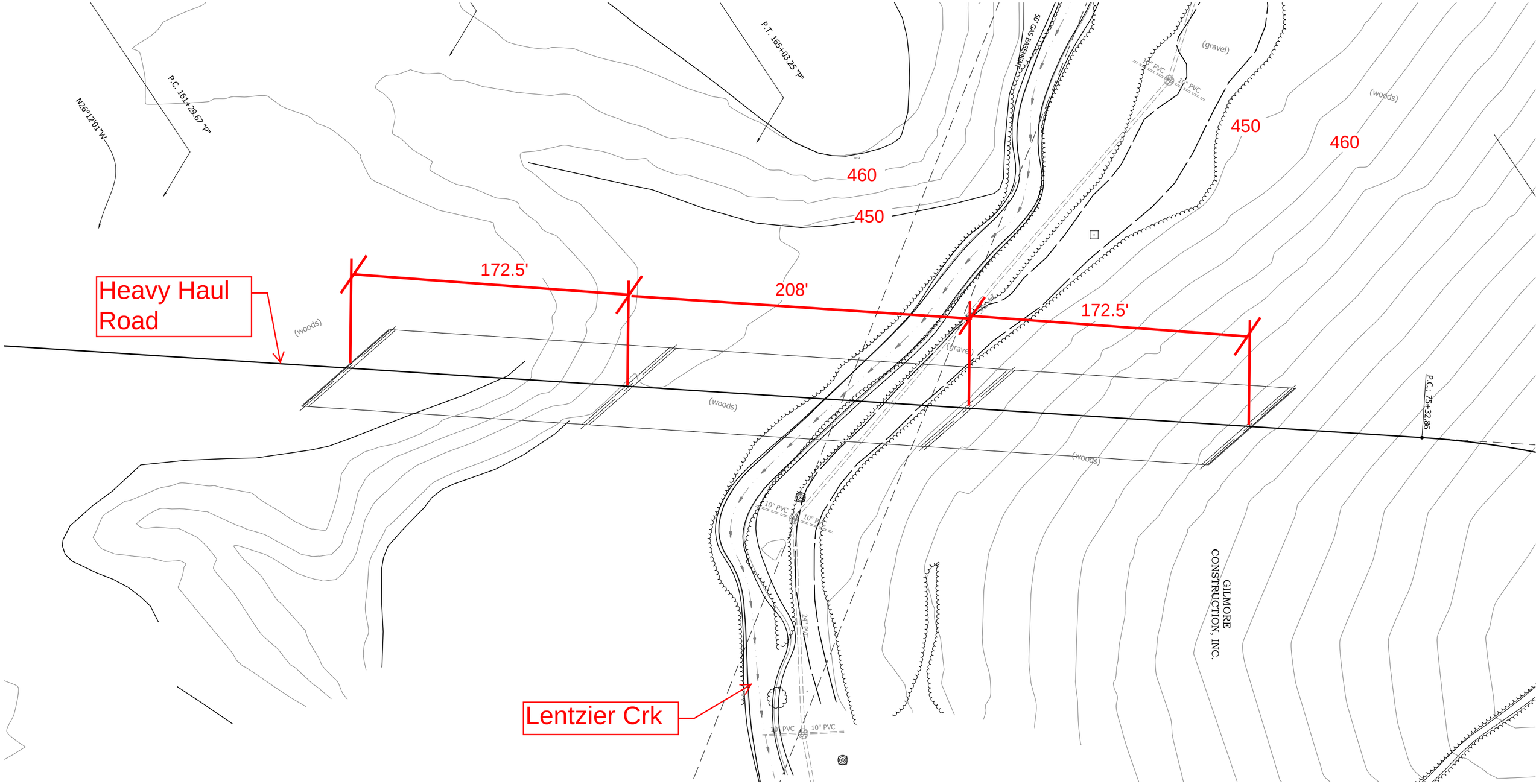
Clark County GIS

Project Location Maps



2017 Google Aerial

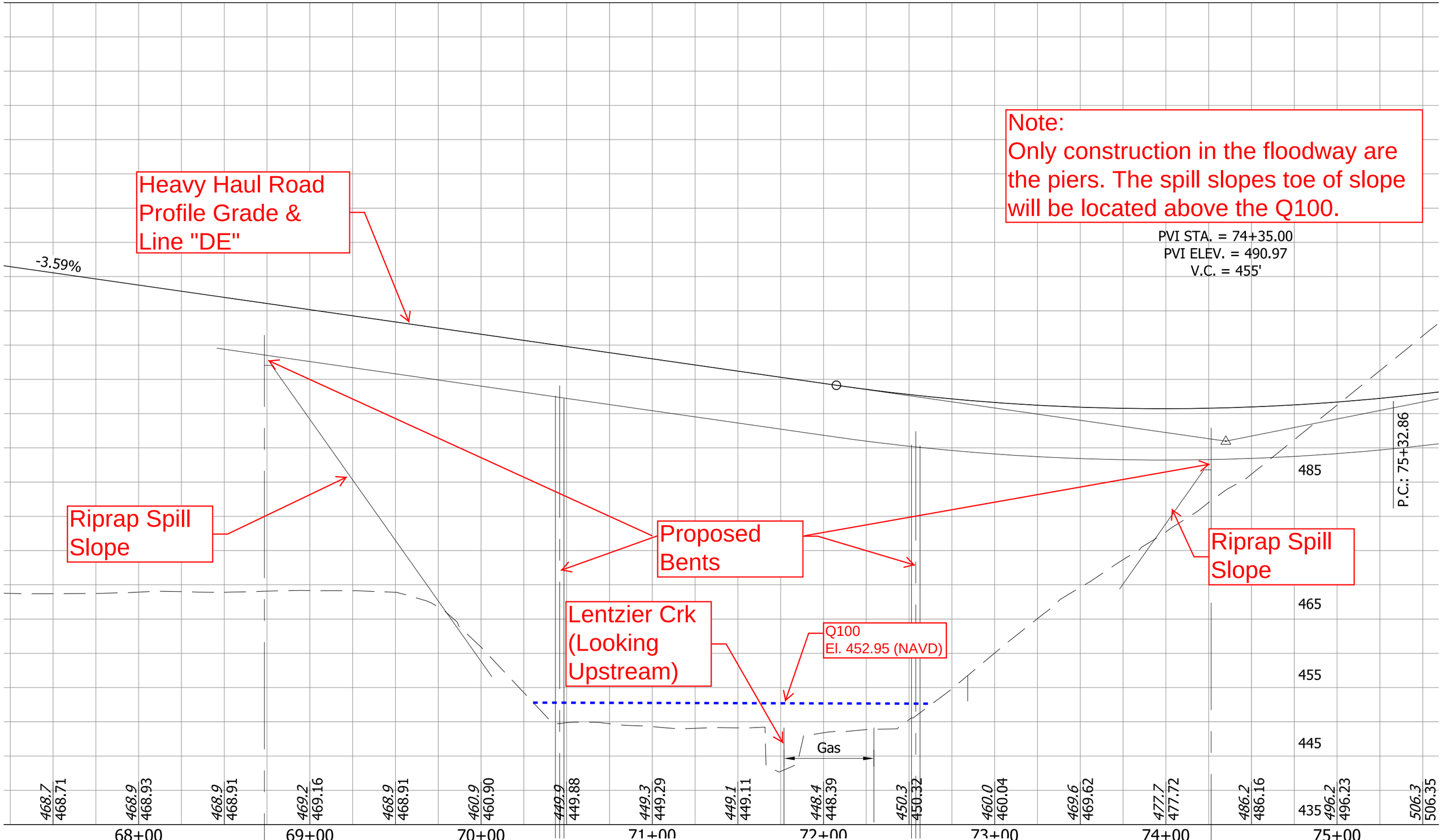
IDNR Floodplain Portal



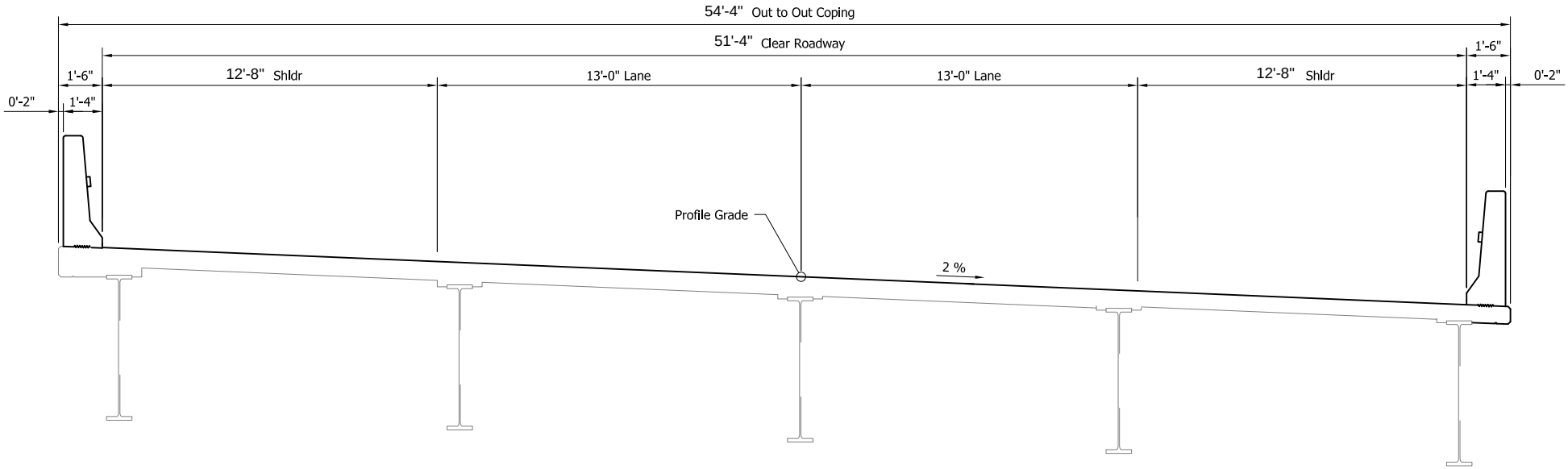
N

PROPOSED LAYOUT

(5' Contours)



PROPOSED ELEVATION



TYPICAL SECTION

Heavy Haul Road over Lentzier Creek

Introduction & Project Summary

A hydraulic analysis of the proposed Heavy Haul Road Bridge over Lentzier Creek has been completed to determine the effects of the proposed construction in a floodway. The following analysis has determined that the Heavy Haul Road over Lentzier Creek Bridge will produce 0.12 ft. of backwater due to the proposed piers, which is below the acceptable backwater of 0.14 ft. for new construction on a new roadway alignment per IDM 203-3.02(01). A submittal to IDNR for the construction in a floodway permit will be completed following this submittal.

The Heavy Haul Road over Lentzier Creek Bridge is part of a new roadway corridor from the Port of Indiana in Utica, IN and Jeffersonville, IN and ends at Old Salem Road, south of the newly constructed I-265 interchange. The proposed Heavy Haul Road is to support development of the River Ridge Commerce Center and the Port of Indiana. The proposed Heavy Haul Road is classified as urban with rolling terrain.

The roadway alignment crosses Lentzier Creek at a 45 degree skew right. The proposed roadway profile has the proposed bridge crossing Lentzier Creek approximately 50.0 ft. above the creek. The proposed bridge has a 54.33 ft. out-to-out coping width, a 51.33 ft. clear bridge width, and a 553.0 ft. out-to-out bridge length. The anticipated superstructure is steel plate girders. The bridge has three spans: 172.5 ft., 208.0 ft., and 172.5 ft. The substructures consist of two reinforced concrete wall piers that are placed parallel to the direction of Lentzier Creek's flow.

The floodway naturally expands from cross section 3 to 2. The proposed toe of slopes from the bridge's spill slopes will be placed outside of the naturally occurring expansion. The proposed toe of slopes will also be placed above the Q100 elevations. The only proposed element of the bridge that will be placed within the floodplain will be the two concrete piers. Due to the bridge height the piers were conservatively modeled as 5 ft. wide.

The floodway width varies over 150 ft. from cross section 3 and 2 of the bridge. Lentzier Creek at the Heavy Haul Road crossing has a narrow floodplain upstream. The right overbank floodplain widens just upstream of the Heavy Haul Road crossing and continues to widen downstream of the proposed bridge.

Engineering judgement indicates that the soil consists of ten feet of loam before reaching competent rock. Survey has been completed for the stream and proposed roadway alignment. The channel survey limits extended approximately 2,000 ft. upstream and 275 ft. downstream of the crossing. An existing surface in CAD was created which was used to create and import new cross sections into HEC-RAS.

The Heavy Haul Road Bridge is located 2.2 miles above the confluence with the Ohio River. The bridges and approaches do not get overtopped.

Hydrologic Data

Starting HEC-RAS Model:
There is no official Flood Insurance Study (FIS) hydraulic model available for this location. The Clark County FIS from April 16, 2014 is the latest information available (18019CV000A) but did not contain flood data for Lentzier Creek. Coordination with Charles Dewes, at IDNR revealed that IDNR had a Zone A approximate model for this location. Mr. Dewes provided the HEC-RAS model and stated the model might be a good start but is not required. This model was used in developing the Natural Condition model.

The HEC-RAS version used for this model is 5.0.3.

Research:
A search of existing permits found two permits: FW-21357 and FW-26753. Both permits were found to be outside of the project location's reach length and were not incorporated into the model. Permit FW-26753 is the nearest permit to the bridge crossing at over 5,400 ft. upstream. Permit FW-26753 was completed in 2012 and has a HEC-RAS model. The FW-26753 Permit's HEC-RAS model was used for comparing boundary conditions and determining a reach length.

Manning Values:
Manning's values were provided in the IDNR HEC-RAS model and verified with aerial photography. The overbank manning values ranged from 0.1 to 0.06 for downed trees, and little undergrowth or cleared land with heavy growth. The channel manning value is 0.06 for clean winding stream with weeds and stones.

Vertical Datum:
The hydraulic model data, county reference elevations, and field survey were all completed in the NAVD 1988. There is no need to use a conversion factor within this report because all elevations are NAVD 1988.

Reach Length:
The reach length calculated based on the DNR General Guidelines equation 3.5.1 is 3,050 ft. The average hydraulic depth was determined from the FW-26753 Permit's HEC-RAS model. The slope was calculated based on USGS 10 ft. contours.

The reach length upstream is at a point where backwater effects begin to dissipate which was found to be 4,300 ft. upstream from the bridge.

Discharges:
The Q100 was determined from the Coordinated Discharge Graph for Lentzier Creek dated October 2005. There are two unnamed tributaries of Lentzier Creek, one located 700 ft. upstream and one located 600 ft. downstream. An IDNR letter of discharge was requested for the structure which recommended a Q100 discharge of 1700 cfs. at the

structure. The HEC-RAS model contains three discharges of 1500 cfs. for the upstream reach limit, 1700 cfs. downstream of the upstream unnamed tributary, and 2100 downstream of the downstream unnamed tributary.

The Q500 discharge for the scour analysis is determined by a multiplier of 1.4 of the Q100 discharge because there are no discharges published in the FIS or in a coordinated discharge curve. The Q500 discharge used in this model for the scour analysis is 2,380 cfs.

Drainage Area:
The drainage area at the Heavy Haul Road crossing was determined to be 5.3 square miles. There is no published drainage areas for this location. The drainage areas were determined using the Indiana StreamStats and cross referenced with the IDNR letter of discharge and the Jeffersonville USGS Quadrangle map.

Boundary Conditions:
The Q100 and Q500 starting water surface elevations are 447.08 (NAVD) and 448.51 (NAVD) respectively at cross section 1.688. The starting water surface elevations were determined by running the Natural HEC-RAS model with a normal slope boundary condition of 0.0015 ft/ft. The water surface elevation, given above, at the downstream reach cross section was used for the proposed boundary condition.

The downstream Q100 and Q500 base flood elevations are 452.95 and 454.15 respectively. The base flood elevations were taken from this HEC-RAS model natural conditions at the downstream face of the bridge.

Hydraulic Model

Natural Model:
The natural model is a copy of the IDNR approximate model, with the discharges adjusted as discussed above. Cross sections 2.204 and 2.199 were added upstream and downstream of the proposed bridge to better represent the terrain near the proposed crossing. Due to the 150 ft. of floodplain change between these cross sections, interpolated cross sections were added (see email correspondence with INDOT hydraulics regarding interpolated cross sections). The channel elevations were revised for the cross sections within the surveyed limits, which consisted of cross sections 2.411 and 2.253. On average, the IDNR model's channel elevations were 1.25 ft. higher than the surveyed channel elevations. This 1.25 ft. difference was thought to be the water depth, which is common for cross sections produced with LiDAR survey. Therefore all of the remaining cross section's thalweg points were lowered 1.25 ft. Finally the model was truncated to the location's reach lengths; cross sections 3.015 and 1.688.

Existing Model:
There is no existing structure, so the existing model is the same as the natural model.

Proposed Model:
The proposed model is a copy of the natural model. A bridge was added at cross section 2.201. The high chord was estimated based on the preliminary roadway profile. The low chord was estimated based on a 9.0 ft. structure depth. The low chord is over 30 ft. above the Q100. The proposed bridge has a 54.33 ft. out-to-out coping width and a 553.0 ft. out-to-out bridge length. The bridge width of 54.33 ft. was skewed along the stream and inputted as 78.0 ft. The anticipated bridge spans are 172.5 ft., 208.0 ft., and 172.5 ft. but was modeled as three equal spans of 184 ft. The three 184 ft. spans measured along the road were skewed perpendicular to the stream and inputted as three 130.0 ft. spans. The wall piers were placed outside of the main channel, within the floodplain, and assumed to be 5.0 ft. in width. The spill slopes at the end bents will be placed outside of the floodplain, graded at 2:1, and protected with riprap. The toe of the spill slopes started at El. 455.0 (above the Q100).

Scour Countermeasures

The proposed pier foundations will be placed below the low scour elevation. The maximum flow velocity is less than 6.5 fps; therefore, the abutments will be protected with revetment riprap. The riprap will only be extended five feet above the Q500 elevation to limit the amount of riprap placed on the tall spill slopes.

HYDRAULICS SUMMARY TABLE

HYDRAULIC DATA (NAVD 1988 DATUM)

Drainage Area	= 5.3 sq. mi.
Flowline Elevation	= 442.16

Existing Structure Summary

N/A

Proposed Structure Summary

Low Structure Elevation	= 488.5
Structure Skew	= 45 degrees
Q100 Discharge	= 1,700 cfs
Q100 Elevation	= 452.95
Q100 Headwater Elevation	= 453.26
Q100 Gross Waterway Area	= 762 sft
Q100 Road-Overflow Area	= 0.0 sft
Q100 Average Velocity	= 2.58 fps
Q100 Backwater	= 0.12 ft
Scour Data:	
Q100 Maximum Velocity	= 6.07 fps
Q100 Contraction Scour	= 0.0 ft
Q100 Total Scour	= 8.0 ft
Q100 Low Scour Elevation	= 434.16
Q500 Discharge	= 2,380 cfs
Q500 Elevation	= 454.15
Q500 Headwater Elevation	= 454.44
Q500 Gross Waterway Area	= 1,001 sft
Q500 Road-Overflow Area	= 0.0 sft
Q500 Average Velocity	= 2.78 fps
Q500 Backwater	= 0.14 ft
Scour Data:	
Q500 Maximum Velocity	= 6.43 fps
Q500 Contraction Scour	= 0.0 ft
Q500 Total Scour	= 8.0 ft
Q500 Low Scour Elevation	= 434.16

Heavy Haul Road over Lentzier Creek

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
LOCATION DESCRIPTION			MODELING RESULTS				COMPARISONS*			
Model Cross Section	Location Description	PUBLISHED OR EFFECTIVE DATA (Ft. NGVD)	Duplicate Effective Model (Ft. NGVD)	Corrected Effective Model (Ft. NGVD)	Existing Pre-project Model (Ft. NGVD)	Proposed Post-Project Model (Ft. NGVD) (same as Existing)	Cumulative Impacts w/o Project (ft.) (6)-(5)	Cumulative Impacts with Project (ft.) (7)-(5)	Project Impacts (ft.) (7)-(6)	NOTES
3.015				456.70	456.70	456.71	0.00	0.01	0.01	
2.807				455.84	455.84	455.86	0.00	0.02	0.02	
2.717				455.55	455.55	455.58	0.00	0.03	0.03	
2.611				455.15	455.15	455.18	0.00	0.03	0.03	
2.411				454.39	454.39	454.45	0.00	0.06	0.06	
2.253				453.82	453.82	453.90	0.00	0.08	0.08	
2.204				453.35	453.35	453.46	0.00	0.11	0.11	
2.20328				453.21	453.21	453.33	0.00	0.12	0.12	
2.20257				453.14	453.14	453.26	0.00	0.12	0.12	
2.201	New Bridge									
2.20042				452.81	452.81	452.81	0.00	0.00	0.00	
2.19971				452.72	452.72	452.72	0.00	0.00	0.00	
2.199				452.71	452.71	452.71	0.00	0.00	0.00	
2.155				452.08	452.08	452.08	0.00	0.00	0.00	
2.016				450.84	450.84	450.84	0.00	0.00	0.00	
1.917				450.23	450.23	450.23	0.00	0.00	0.00	
1.866				449.34	449.34	449.34	0.00	0.00	0.00	
1.688				447.08	447.08	447.08	0.00	0.00	0.00	

NOTES: **Project is a new bridge on a new alignment. There is no published FIS. Therefore the Corrected Eff. Model is the same as the Existing Pre-project model.**

* Project is considered permittable if maximum surcharges outside the property are no more than 0.14 feet in both columns (9) and (10). If the maximum surcharge outside the applicants property exceeds 0.14 feet in columns (8) and (9), the project may still be permittable if the project impacts shown under column (10) do not exceed 0.00 feet outside the applicant's property.

Appendix A

- Correspondence
- Hydraulic QA Checklist
- IDNR Hydraulic Checklist
- Pictures

Email Correspondence:

The following email is in regard to the use of interpolated cross sections located around the proposed bridge.

From:	Bailey, Mark
To:	Ridens, Jay
Cc:	Kocher, Nick
Subject:	FW: Heavy Haul Transportation Corridor - Lentzier Creek Hydraulics
Date:	Wednesday, July 19, 2017 1:09:04 PM
Attachments:	image001.png

Jay,

We agree with your proposed use of interpolated cross sections.

Let me know if you have any additional questions,

-Mark

From: Finley, David
Sent: Wednesday, July 19, 2017 10:56 AM
To: Bailey, Mark <MBailey1@indot.IN.gov>
Subject: RE: Heavy Haul Transportation Corridor - Lentzier Creek Hydraulics

Mark:

Yes, it does look like the interpolated cross section in the natural model are the right approach.

Here is some reasoning on why it could be allowed: In the natural model without the interpolated sections, it looks like cross section 3 would likely default to critical depth because of the difference in conveyance between the two cross sections. When the bridge is put into that model, it would kick XS 3 out of critical and return a water surface that is a lot higher – may be the 6 inches mentioned in United's e-mail. Thus, the interpolated cross sections are needed to resolve the critical depth issue in the natural model and get a more accurate analysis of the bridge model.

Thanks.

David Finley, PE
Hydraulic Engineer
INDOT Division of Bridges
100 N. Senate Avenue, Room N642-BR
Indianapolis, IN 46204
(317) 232-5228
DFinley@indot.IN.gov

From: Bailey, Mark
Sent: Wednesday, July 19, 2017 9:40 AM
To: Finley, David <DFinley@indot.IN.gov>
Subject: FW: Heavy Haul Transportation Corridor - Lentzier Creek Hydraulics

Hopefully that all makes sense. If not, or if you would like to meet to get more information, just let me know.

Thanks Mark!

Jay N. Ridens, P.E.
Project Team Leader
Bridge Department

UNITED CONSULTING
1625 N. Post Road
Indianapolis, IN 46219
Phone: (317) 895-2585
Fax: (317) 895-2596

Hydraulics QA Checklist

Route: Heavy Haul Road Des No. TBD
County: Clark City or Town: Utica
Description: New road and bridge construction over Lentzier Creek
Designer: Nick Kocher, P.E. Reviewer: Jay N. Ridens, P.E.

MAPS

- ☒ USGS Quad. Scale 1:24000 Date 1993
- ☐ ARC GIS Date
- ☐ Flood-Insurance Firm and FHBM
- ☐ Soils Map
- ☒ Aerial Photos Scale NTS Date 10/2015

STUDIES BY EXTERNAL AGENCIES

- ☐ FEMA Flood-Insurance Studies
- ☐ NRCS Watershed Studies
- ☐ USGS Gages and Studies
- ☒ Interim Floodplain Studies

STUDIES BY INTERNAL SOURCES

- ☐ Office Records
- ☐ Flood Record (High Water, Newspaper)

☐ **BRIDGE INSPECTION REPORTS** Gaging Da

CALIBRATION OF HIGH-WATER DATA

- ☐ Discharge and Frequency of H.W. el.
- ☐ Influences Responsible for H.W. el. - Check Maps for Larger Streams Nearby that May Backwater the Site
- ☐ Analyze Hydraulic Performance of Existing Facility for 100-Year Flood
- ☒ Analyze Hydraulic Performance of Proposed Facility for 100-Year Flood
- ☐ Field Reconnaissance Revisions Report

DESIGN APPURTENANCES

- ☒ Dissipators, Riprap
- ☒ Scour Analysis/Evaluation

TECHNICAL RESOURCES

- ☒ *Indiana Design Manual*, Part II
- ☒ Other IDNR *General Guidelines for the Hydrologic-Hydraulic Assessment of Floodplains in Indiana*

DISCHARGE CALCULATIONS

- ☐ Drainage Area Delineation
- ☒ Drainage Areas of IN Streams
- ☒ DNR Discharge Letter
- ☐ Rational Formula
- ☐ HEC-HMS / TR-20
- ☐ NRCS
- ☐ Regional Analysis
- ☒ Coordinated Discharges of IN Streams
- ☐ Log-Pearson Type III Gage Rating

HIGH-WATER ELEVATIONS

- ☐ INDOT Survey
- ☐ Plans for Existing Structure
- ☐ DNR Historic Flood Profiles
- ☐ Maintenance Records
- ☐ External Sources
- ☐ Personal Reconnaissance

ENVIRONMENTAL REPORTS

- ☐ INDOT

TECHNICAL AIDS

- ☒ *Indiana Design Manual*, Part II
- ☐ INDOT and FHWA Directives
- ☐ FHWA Publications

COMPUTER PROGRAMS

- ☐ HY8
- ☒ HEC-RAS River Analysis System
- ☐ Log-Pearson Type III Analysis
- ☐ WSPRO Water-Surface Profile
- ☐ PFP-HYDRA
- ☐ HEC-HMS / TR 20
- ☒ HEC-RAS Scour Analysis

- ☐ Other_____

Designed by: _____ **Date:** 7/26/17

Reviewed by: _____ **Date:** 7/26/17

HYDRAULIC Modeling Checklist

State Form 52882 (5-14)
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF WATER

This checklist will assist the staff at the Division of Water in the review of modeling for the definition of the floodway, for evaluation of a Construction in a Floodway permit application, for state concurrence of a Letter of Map Revision or a Flood Insurance Study or any other modeling that is submitted for review. The checklist items are based on the document "General Guidelines for the Hydrologic-Hydraulic Assessment of Floodplains in Indiana." The modeler should be familiar with this document and any discrepancies between the general guidelines and the submitted modeling should be discussed with the Division of Water Engineering Services staff prior to submittal.

This completed checklist must be submitted to the Division of Water along with your models. The Division of Water <u>will not</u> review any modeling submittal that is not accompanied by a completed checklist.

Please keep in mind that these questions were written primarily for the application of HEC-RAS computer models. HEC-RAS is preferred by the Division of Water, however, other modeling programs may be used provided their use has been discussed previously with Division of Water Staff. Should you have any questions, please contact Division of Water staff at (317) 232–4160 or toll free at (877) 928-3755.

1. **General Information**
   a. Preparer Name: Nick Kocher, P.E.
   b. Preparer Firm: United Consulting
   c. Date: July 20, 2017

2. **Project Location and Background Information**
   a. Waterbody Name: Lentzier Creek
   b. Location Description: Proposed crossing of Lentzier Creek is 2.2 miles upstream of the Ohio River mouth.
   c. Nearest Town/City: Utica, IN
   d. County: Clark

Waterbody Name: Lentzier Creek
Preparer: Nick Kocher, P.E.
Date: July 20, 2017

e. Modeling Study Reach: Downstream Limit 1.688 miles *(unit of distance)*

Upstream Limit 3.015 miles *(unit of distance)*

f. Reach Length Equation $L = \frac{150\ HD^{0.8}}{S}$ 3,000 ft

Comments The model study reach extends 4,300 ft. upstream at a point where backwater effects dissipate.

g. Type of Model

☒ HEC-RAS ☐ HEC-2 ☐ WSPRO ☐ WSP2 ☐ HY-8

Other _____

Program Version: _____

h. Base Model

☐ FIS ☐ IDNR Model ☒ New See correspondence

i. H&H Model Library Stream Name: _____

j. Models used for Cumulative Impacts:

Previous FARA/Floodway Permits within study reach

	Permit or FARA Number	H&H Model Library Stream Name	Comment
1	FW-21357	Lentzier Creek	Outside of reach; I-265 crossing; 11/13/01
2	FW-26753	Lentzier Creek	Outside of reach; 1-265 crossing; 2/7/13
3			
4			
5			

Waterbody Name: Lentzier Creek
Preparer: Nick Kocher, P.E.
Date: July 20, 2017

3. Model Purpose

Please indicate for what purpose the models are submitted for review and approval:

- ☐ Floodway / Base Flood Elevation Determination (FARA)
- ☒ Construction in a Floodway Application
- ☐ Letter of Map Revision (LOMR)
- ☐ Flood Insurance Study modeling
- ☐ Other (*please describe*) _____

4. Discharges

The source of the 1% annual chance flood discharges used in a hydraulic model need to be fully documented by completing the questions listed below.

It is strongly suggested that a preparer-determined 1% annual chance discharge be submitted for approval prior to the submittal of hydraulic models. Discharge determinations and hydraulic models are considered to be separate items, each subject to review.

a. What is the source of the discharges used in the submitted model *(Please check one.)*:

- ☒ Curve published in "Coordinated Discharges of Selected Streams in Indiana" *(Please attach copy of applicable graph.)*
- ☒ Determination approved by the Department of Natural Resources *(Please attach copy of letter from IDNR.)*
- ☐ Hydrologic analyses submitted with this application
- ☐ Flood Insurance Study
- ☐ Other modeling *(Indicate source.)* _____

b. Table of Discharges used in the model *(Expand table as needed.)*

Location Name	Drainage Area (sq. mi.)	Flow Rate (cfs)	Cross Section range on Stream Reach
Upstream Reach Limit		1350	3.015 to 2.611
Upstream Reach Limit	4.55	1500	2.611 to 2.253
Mouth of U/S UNT of Lentzier	5.33	1700	2.253 to 2.016
Mouth of D/S UNT of Lentzier	6.87	2100	2.016 to 1.688

c. Are discharges unchanged from base condition model to other model plans (corrected effective, proposed, etc.)?

☒ Yes ☐ No

Waterbody Name: Lentzier Creek
Preparer: Nick Kocher, P.E.
Date: July 20, 2017

d. Comments regarding discharge determination:

The discharges were determined based on the Coordinated Discharge Graph and the drainage area within the reach. The IDNR model had only one discharge for the entire creek (2100 cfs). There is an UNT upstream and downstream of the proposed crossing. Therefore it was determined that the proposed model should have flow rates that change at each UNT.

5. Starting Elevation / Boundary Conditions

Complete the following section fully to document the starting elevations and boundary conditions for starting the model:

a. Boundary condition used to derive starting elevations: *(Please check one.)*

- ☐ Known water surface *(Indicate source.)*: _____
- ☐ Energy slope estimated from historic flood profile *(Indicate date.)*: _____
- ☒ Energy slope estimated from stream thalweg *(Indicate mapping used.)*: County GIS
- ☐ Other *(Please Describe.)*: _____

b. Datum (*if applicable*) NAVD88

c. Description (*show any calculations*):

6. Manning's Roughness Coefficients ("n" Values)

Complete the following section fully to document the Manning's roughness coefficients:

a. How were the roughness coefficients estimated? *(Check all that apply.)*

- ☐ Flood Insurance Study
- ☒ Other modeling
- ☐ Field inspection
- ☐ Site photos
- ☒ Aerial photography or mapping
- ☐ Calibration
- ☐ Other *(Describe)* _____

b. What is the range of the roughness coefficients?

Left Overbank	Minimum 0.06	Maximum 0.1
Channel	Minimum 0.06	Maximum 0.06
Right Overbank	Minimum 0.06	Maximum 0.1

Waterbody Name: Lentzier Creek
Preparer: Nick Kocher, P.E.
Date: July 20, 2017

c. Are proposed roughness coefficients different from the base roughness coefficients?

☐ Yes ☒ No

d. Description of "n" values

"n" of 0.06 for the stream is for clean winding stream with weeds and stones. "n" of 0.06 for the floodplain is for cleared land with heavy growth and sprouts. "n" of 0.1 for the floodplain is for heavy stand of timber, downed trees, little undergrowth, and flood stage below branches.

e. Is Check-RAS output submitted with this checklist?

☒ Yes ☐ No

Waterbody Name: Lentzier Creek
Preparer: Nick Kocher, P.E.
Date: July 20, 2017

7. **Cross Sections**

The following questions have to do with the cross section information that is the basis of the submitted modeling:

a. What is the source of the cross section information *(Check all that apply.)*:
- ☐ Flood Insurance Study
- ☒ Field survey *(Date)* 5/20/2014
- ☐ Detailed topographic mapping *(Date)* _____
- ☒ Other modeling *(Indicate source.)* IDNR model
- ☐ Other *(Please specify.)* _____

b. Vertical Datum: NAVD 1988
Conversion factor (*if necessary*): not applicable

c. Are cross sections stationed increasing from left to right looking downstream?
☒ Yes ☐ No

d. How are sections labeled *(check one)* (Note: The following list is in order of preference)
- ☐ Consistent with FIS / other studies
- ☒ Miles above mouth
- ☐ Feet above other landmark *(Please specify landmark.)* _____
- ☒ Other *(Please specify.)* IDNR model was labeled as miles above mouth of Ohio River

e. Are sections oriented perpendicular to flow at all portions of the cross section?
☒ Yes ☐ No

f. Are the full cross section extents shown on submitted mapping?
☒ Yes ☐ No

g. Do the cross sections extend fully across the floodplain *(above expected 1% annual chance flood elevations)*?
☒ Yes ☐ No

h. Do the cross sections represent average conditions in the reach at which they are located?
☒ Yes ☐ No

i. Are areas of blocked or ineffective flow indicated on the submitted cross sections?
☒ Yes ☐ No ☐ N/A

j. Are cross sections located at places where discharge values change along the stream reach?
☒ Yes ☐ No ☐ N/A

k. Are cumulative reach lengths the same in different plans or model runs?
☒ Yes ☐ No

Waterbody Name: Lentzier Creek
Preparer: Nick Kocher, P.E.
Date: July 20, 2017

l. For any "No" answers above, please provide an explanation:

m. Are interpolated sections used anywhere in the model (*If yes, state reasons for using interpolated sections.)*

☒ Yes ☐ No

Reason:

Interpolated cross section were used between the proposed bridge cross sections 2 & 3 due to the change in floodplain width. The interpolated cross sections were adjusted per field survey after their creation and adjusted for proposed bridge spillslopes. See email correspondence with INDOT Hydraulics regarding these interpolated cross sections.

n. Is Check-RAS output submitted with this checklist?

☒ Yes ☐ No

Waterbody Name: Lentzier Creek
Preparer: Nick Kocher, P.E.
Date: July 20, 2017

8. Stream Crossings

The following questions should be answered for each bridge in the model being submitted. Use a separate sheet for additional stream crossings.

Name of stream Crossing	Heavy Haul Road	
Type of Crossing	Bridge	
Stream crossing section locations		
Section 1 Cross section number:	2.155	
Section 2 Cross section number:	2.199	
Section 3 Cross section number:	2.204	
Section 4 Cross section number:	2.253	
This crossing is in support of a construction in a floodway application	■	☐
The same number of sections are used in the existing (pre-project) and the proposed (post-project)	■	☐
Cross sections extend across the entire valley to the 1% annual chance flood elevation	■	☐
Cross section 1 is located at a 2:1 flow expansion ratio downstream of the bridge face	■	☐
Cross section 4 is located at a 1:1 flow contraction ratio upstream of the bridge face	■	☐
Expansion/Contraction coefficients have been adjusted to reflect the effects of the bridge	■	☐
Ineffective flow limits are set a sections 2 and 3	■	☐
Selected low flow modeling method	Energy	
Selected high flow modeling method	Energy	
The approach roadway profile data extend across the full valley cross section	■	☐
Bridges piers are included at this crossing	■	☐
HEC-RAS default embankment side slopes were applied at all stream crossings in the model	■	☐

For all unmarked answers above, please explain.

The ineffective flow stations and elevations do not change from the existing to the proposed conditions. The bridge's side slopes do not restrict the floodplain. The topography of the crossing and the structure size does not allow typical contraction and expansion. There is no left ineffective flow due to the topography. The right ineffective flow is due to the upstream natural restrictive flow and not due to the bridge.

Is Check-RAS output submitted with this checklist?

■ Yes ☐ No

Waterbody Name: Lentzier Creek
Preparer: Nick Kocher, P.E.
Date: July 20, 2017

Stream Crossings (cont.)

The following questions should be answered for each bridge in the model being submitted. Use a separate sheet for additional stream crossings.

Name of stream Crossing		
Type of Crossing		
Stream crossing section locations		
Section 1 Cross section number:		
Section 2 Cross section number:		
Section 3 Cross section number:		
Section 4 Cross section number:		
This crossing is in support of a construction in a floodway application	☐	☐
The same number of sections are used in the existing (pre-project) and the proposed (post-project)	☐	☐
Cross sections extend across the entire valley to the 1% annual chance flood elevation	☐	☐
Cross section 1 is located at a 2:1 flow expansion ratio downstream of the bridge face	☐	☐
Cross section 4 is located at a 1:1 flow contraction ratio upstream of the bridge face	☐	☐
Expansion/Contraction coefficients have been adjusted to reflect the effects of the bridge	☐	☐
Ineffective flow limits are set a sections 2 and 3	☐	☐
Selected low flow modeling method		
Selected high flow modeling method		
The approach roadway profile data extend across the full valley cross section	☐	☐
Bridges piers are included at this crossing	☐	☐
HEC-RAS default embankment side slopes were applied at all stream crossings in the model	☐	☐

For all unmarked answers above, please explain.

Is Check-RAS output submitted with this checklist?

☐ Yes ☐ No

Waterbody Name: Lentzier Creek
Preparer: Nick Kocher, P.E.
Date: July 20, 2017

9. Floodways

Has floodway determination been done in accordance with Section 8.14 of the Guidelines?

☐ Yes ☐ No ☒ N/A

10. Model Output

For all model outputs review the "errors and warnings" and address those comments not already addressed.

A conveyance ratio warning is given at cross section 3.015, 2.253, 2.199, and 2.155. The cross sections were reviewed and determined accurate. Multiple critical depth warnings were given for most cross sections through the bridge. The terrain of Lentzier Creek is rocky with abrupt drops along the banks.

11. Documentation

Submitted documentation *(Check all that apply.)*:

- ☒ Narrative regarding modeling
- ☒ Project Evaluation Results *(Mandatory – See Figure 3.1)*
- ☐ Application Forms and/or LOMR Application Forms
- ☒ Pictures of stream reach *(w/ orientation map)*
- ☐ FIS map / profile
- ☒ Check-RAS output
- ☒ Cross Section plots
- ☒ HEC-RAS "Standard Table 1"
- ☐ HEC-RAS "Encroachment 1" table *(only for floodways)*
- ☐ Profile plots (only for LOMR and FIS)
- ☐ Floodplain mapping including:
  - ☐ Stream in question
  - ☐ Roads *(With street names)*
  - ☐ Existing features *(Buildings, parking lots, woods, etc.)*

Waterbody Name: Lentzier Creek
Preparer: Nick Kocher, P.E.
Date: July 20, 2017

- ☐ The full extent of each cross section included in the model, with each cross section clearly labeled *(Include the location of initial and end points as used in the model.)*
- ☐ Topographic data *(If available)*
- ☐ Property limits *(Approximate property limits are acceptable only if surcharges are 0.14' or less at all cross sections.)*
- ☐ North arrow
- ☐ Scale *(Numerical and graphical)*
- ☐ Horizontal and vertical control benchmark used *(See Section 5.3 of the Guidelines for benchmark guidance.)*
- ☐ Horizontal and vertical datums
- ☐ Delineated flood fringe and floodway limits

☒ Computer Model Plans submitted *(Check all that apply.)*

HEC-RAS project name LentzierHvyHaul .prj

- ☐ Base Condition (FIS, IDNR Regulatory) Plan name: n/a
- ☐ Duplicate Effective Plan name: n/a
- ☒ Corrected Effective Plan name: LentzierHvyHaul.p01
- ☐ Existing (Pre-project) Plan name: n/a
- ☒ Proposed (Post-project) Plan name: LentzierHvyHaul.p02

Waterbody Name: Lentzier Creek
Preparer: Nick Kocher, P.E.
Date: July 20, 2017

12. Affirmation

By signing this document you are indicating that the submitted models have been developed and reviewed in accordance with accepted Division of Water guidelines. Should the Division of Water find inconsistencies between your submitted models and the checklist or other deficiencies in the submittal, you will be notified in writing of the deficiencies and given a limited number of days to correct these problems. If you cannot correct the deficiencies in the given time, you must contact the Division to avoid closure of the file or denial of the permit application due to lack of supporting information.

July 20, 2017
Date:

Signature

Nick Kocher, P.E.
Name

United Consulting
Firm

Photo 1: Looking Upstream

Photo 2: Looking Downstream

Appendix B

- Reach Length
- Permit Research
- Drainage Area
- Discharge
- Manning “n” Values
- Supplemental Support Information

Determine Reach

3.4.3 *Revisions to Published Studies*

The process to revise a FIS is referred to as a Letter of Map Revision (LOMR). LOMR application forms (referred to as the MT2 forms) are available on the FEMA website (http://www.fema.gov/). Required modeling submittals are explained in Section 3.5 of this chapter, while the process for review and approval of a LOMR is described in Section 3.7 of this chapter.

3.5 Models Required for IDNR Approval of a Permit or Map Revision Request

3.5.1 *Defining the Study Reach*

The total study reach, or the area of revision, is defined by an effective tie-in or transition of the reach of interest with reaches immediately upstream and downstream. For streams that require a detailed study, the study reach should begin downstream at a point where there is currently no cumulative flood surcharge effect from previously permitted or allowed floodway encroachments, or where the cumulative flood surcharge effect from previously permitted or allowed encroachments is known. The study reach should extend upstream, at a minimum, to the point where there are no remaining flood surcharge effects from the proposed floodway encroachment for the project in question.

The following equation, taken from USACE Hydrologic Engineering Center - Technical Paper No. 114, can be used to estimate the distance upstream or downstream the study reach should extend to adequately account for cumulative effects and to estimate a point to tie-in to an existing profile.

$$L=150\ HD^{0.8} / S$$

Where,

L is the reach length in feet,

HD is the average hydraulic depth for the assumed 100-year frequency flood profile through the project reach in feet (cross sectional flow area in ft^2 divided by top width in feet), and

S is the average reach slope in percent (e.g., feet per 100 feet).

Revisions of both the downstream and upstream extents of the study reach may be necessary if additional flood profile information becomes available during preparation of a detailed flood study. IDNR staff should be contacted to consider allowing a shorter study reach if the applicant believes the required study reach is excessive in light of the fact that the surcharges are consistently decreasing upstream and that potential for

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E-mail: info@ucindy.com
www.ucindy.com

BY JNR DATE 2/24/14 SUBJECT Heavy Haul Road over Lentzier Cr. SHEET NO. ____ OF ____
CHKD BY NJK DATE 2/25/14 JOB NO. 14-402

Reach Length

Per DNR General Guidelines (3.5.1)

$$L = 150\, HD^{0.8} / S$$

HD : Use Permit FW-26753 (I-265 over Lentzier - Upstream)

Max. Hydraulic Depth ~ 5' / Avg. ~ 4' → Use Average

$$S = \frac{(450' - 440')}{6640'} = 0.0015 = 0.15$$

Check Slope with FW-26753 Hec-RAS File:

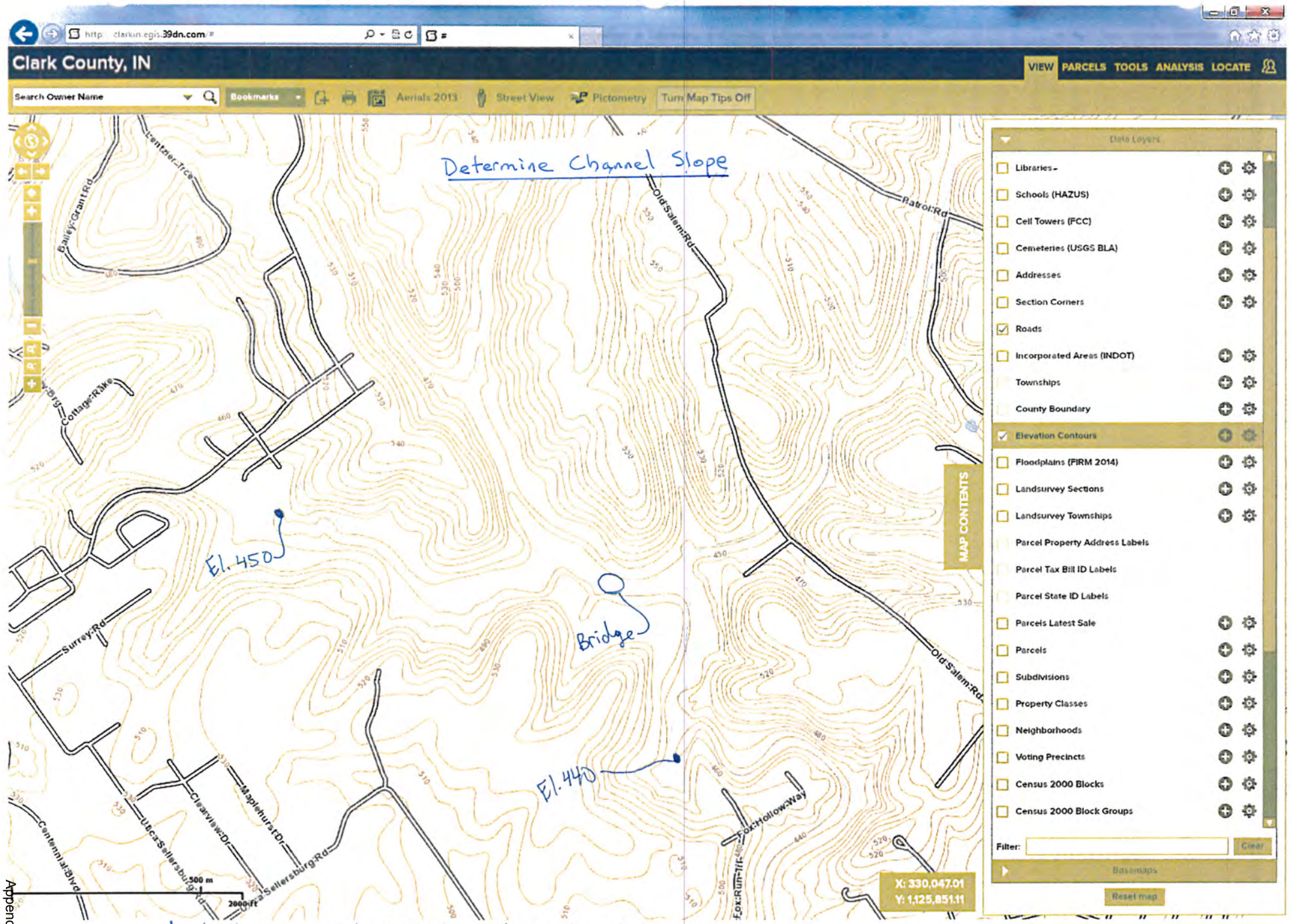
Checks

$L = 1{,}660'$

$$S = \frac{(452.3' - 449.8')}{1660'} = 0.0015$$

$$L = 150 \frac{HD^{0.8}}{S} = \frac{150\,(4')^{0.8}}{0.15} = 3{,}050'$$

Actual Used, L = 4,300'



Length between El. 450' & El. 440' = 6,640 feet

Permit Research

http://dnrmaps.dnr.in.gov/appsphp/model/index.php

Indiana Hydrology and Hydraulics Model Library

Indiana Department of Natural Resources DNR

Jump to a county

Select your county from below

Clark

Have questions? Check out the Frequently Asked Questions tab.

Click and drag your mouse across the map to pan.

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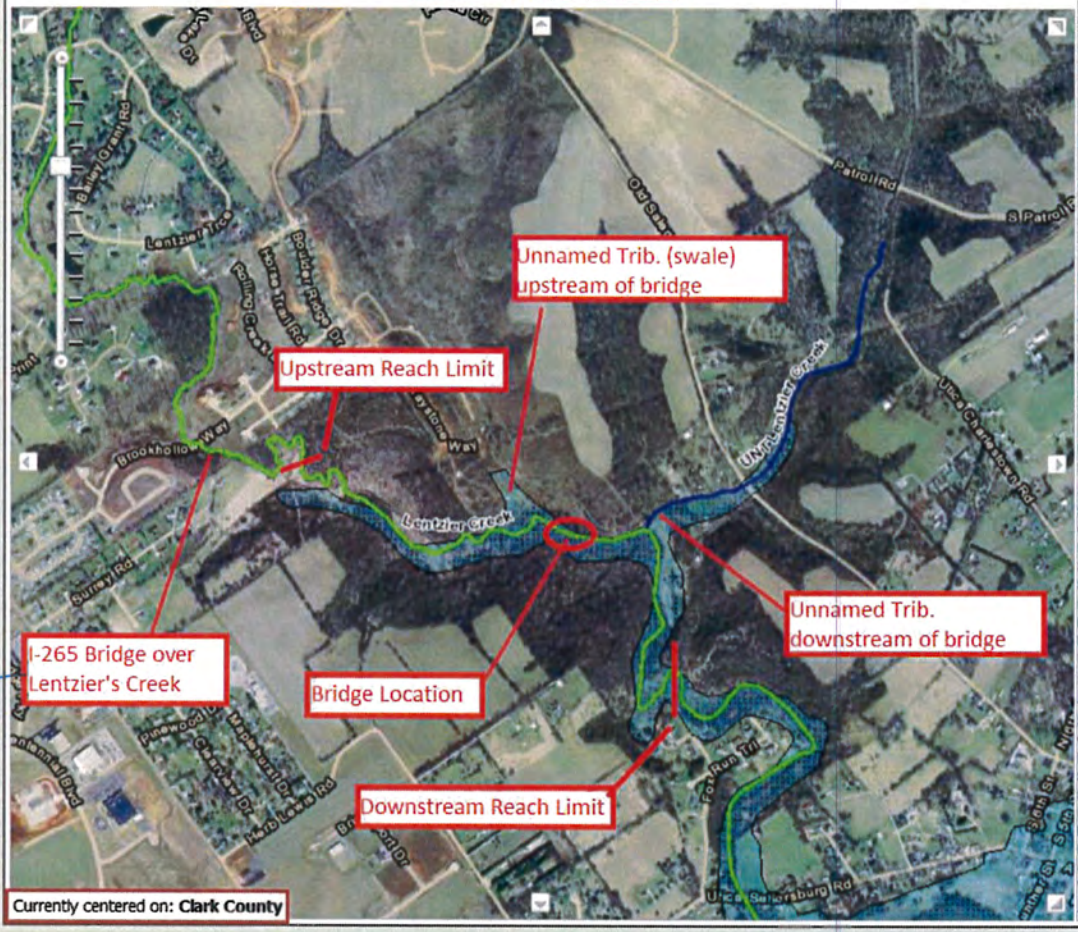
Map | Frequently Asked Questions

Layers | Legend | Help



FW-26753

Stream Name: Lentzier Creek
County: Clark
Date : 05/11/1998
Study Type: FARA
Software: WSPRO
Model By:
Folder ID: GN-1764
Description: *No description available*
Download

Stream Name: Lentzier Creek
County: Clark
Date : 05/30/2002
Study Type: FARA
Software: HEC-RAS 3.0.1
Model By: Division of Water
Folder ID: GN-17090
Description: A proposed subdivision on a tract of land.
Download

Stream Name: Lentzier Creek
County: Clark
Date : 07/24/2002
Study Type: FARA
Software: HEC-RAS 3.0.1
Model By: Division of Water
Folder ID: GN-17590
Description: *No description available*
Download

Stream Name: Lentzier Creek
County: Clark
Date : 11/13/2001
Study Type: PERMIT
Software: HEC-RAS (version unknown)
Model By: null
Folder ID: FW-21357
Description: Three culverts will be constructed along the flow line of Lentzier Creek to provide access to a proposed residential subdivision located landward of the floodway.
Download

Stream Name: Lentzier Creek
County: Clark
Date : 02/07/2013
Study Type: PERMIT
Software: HEC-RAS 4.1.0
Model By: Parsons Transportation Group
Folder ID: FW-26753
Description: A total of three new bridges will be constructed over Lentzier Creek including I-265 Eastbound, I-265 Westbound, and the replacement of Brookhollow Way.
Download

W3C XHTML 1.0

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CHKD BY NJK DATE 2/25/14 Permit Research JOB NO. 14-402

Permit FW-26753:

Proposed I-265 structures over Lentzier Creek (ORB project)

- Terminates upstream of Heavy Haul Crossing
  - Probably won't need to incorporate - verify w/ DNR

Permit FW-21357:

Structure to be replaced by ↑. Approved in 2001.

THIS IS NOT A PERMIT

Indiana Department of Natural Resources / Division of Water
Floodplain Analysis and Regulatory Assessment

File Number: BQ-29173-0
Request Date: 03/05/2014
County: Clark
Waterbody: Lentzier Creek

402 West Washington Street, Room W264
Indianapolis, IN 46204-2641
Telephone: (317) 232-4160 or (877) 928-3755
Fax: (317) 233-4579 Website: www.in.gov/dnr/water

Site Location: Approximately 5500' upstream (northwest) of the Utica-Sellersburg Road stream crossing, Utica Township, Grant: Clark Military Grant, 16

Discharge Recommendation: 1700 cfs (Q100)
Drainage Area: 5.3 square miles
Base Flood Elevation (BFE): Not Determined

Q500 = 1700 (1.4)
= 2380 cfs

1.4 Per IDM Fig. 202-3C

Special Information

Division of Water Permitting

- Unless the bridge project meets the exemption criteria outlined below, approval of the DNR, Division of Water under the Flood Control Act (IC 14-28-1) is required for any construction in a floodway area including obstructing, filling, excavating, or building a structure. A provision which exempts certain bridge projects from permitting requirements under the Flood Control Act states: "A permit is not required for... a construction or reconstruction project on a state or county highway bridge in a rural area that crosses a stream having an upstream drainage area of ... 50 square miles or less ... "

  Therefore, in order for a bridge project to be exempt from the permit requirements, it must meet all of the following criteria:

  - be a state or county highway department project;
  - be a bridge (span structure, culverts, etc.);
  - be located in a rural area*; and
  - cross a stream having an upstream drainage area of less than 50 square miles

  * Rural area is defined as an area:
  1) where the lowest floor elevation, including a basement, of any residential, commercial, or industrial building impacted by the project is at least 2 feet above the base flood elevation with the project in place;
  2) located outside the corporate boundaries of a consolidated or an incorporated city or town; and
  3) located outside of the territorial authority for comprehensive planning (generally, a 2 mile planning buffer around a city or town)

  All construction associated with the rural bridge within the project right-of-way such as bank protection, spoil disposal, borrow pits, etc. are considered part of this exemption.

  This exemption has been grossly misunderstood and liberally applied in the past. As a result, the DNR, Division of Water is taking a firm stance on future violations. If challenged, it will be the responsibility of the person claiming the exemption to prove to the DNR, Division of Water that all 4 criteria have been satisfied. Failure to do so may result in the DNR, Division of Water initiating litigation with the potential for the imposition of fines.

  Note: This exemption only applies to the Flood Control Act (IC 14-28-1). If a bridge is to be constructed over a navigable waterway, or over or near a public freshwater lake, a permit may be required under the Navigable Waterways Act (IC 14-29-1), the Lowering of the Ten Acre Lake Act (IC 14-26-5) or the Lake Preservation Act (IC 14-26-2).

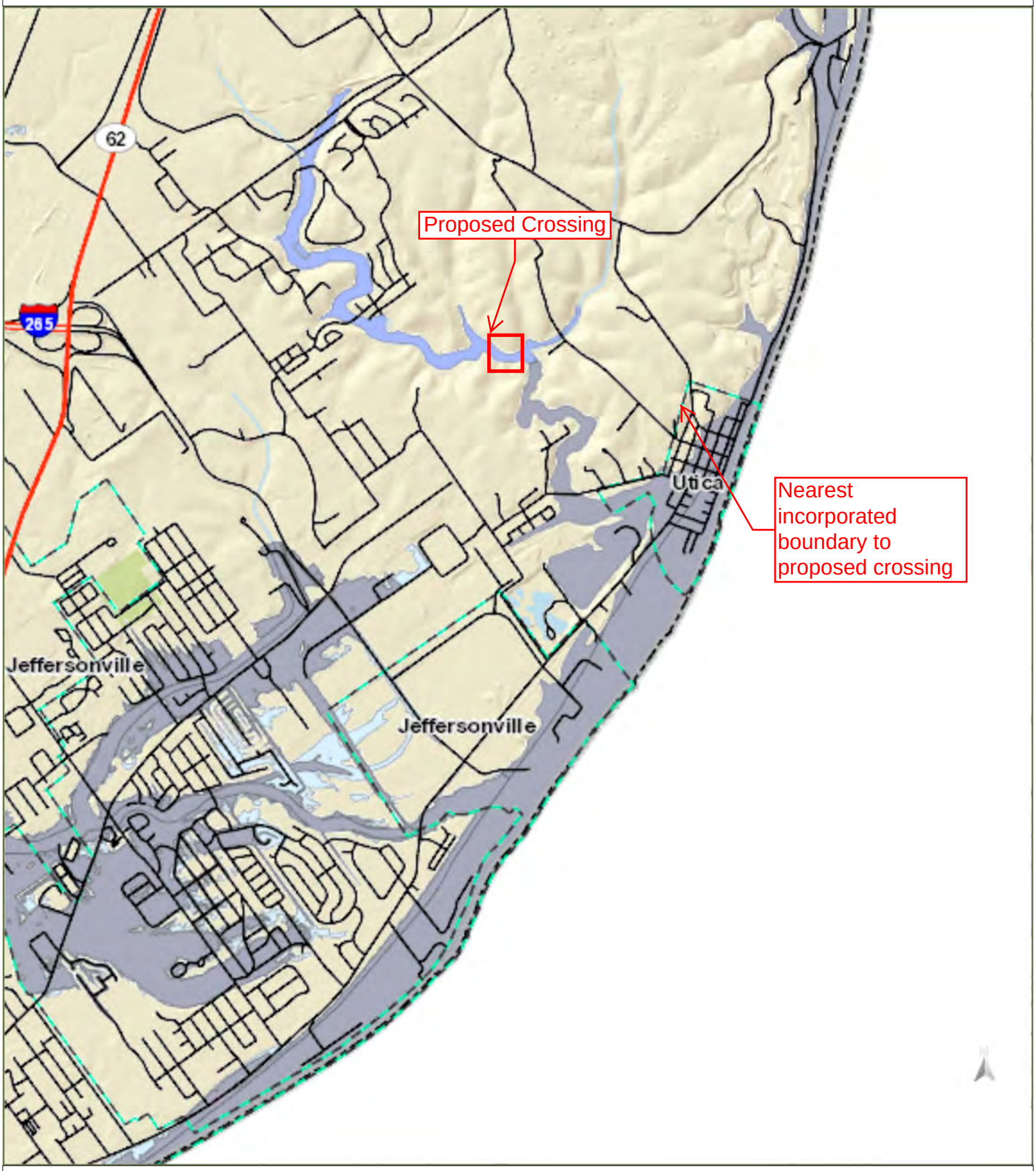
This Floodplain Analysis and Regulatory Assessment is not a building permit, approval of any project, or a waiver of provisions of local or zoning ordinances. Additionally, projects must comply with all other applicable federal, state, and local permit requirements.

If you have any questions concerning this letter, please contact Joseph D. Mapes, CFM at (317) 234-1049.

Joseph D. Mapes, CFM 03/05/2014

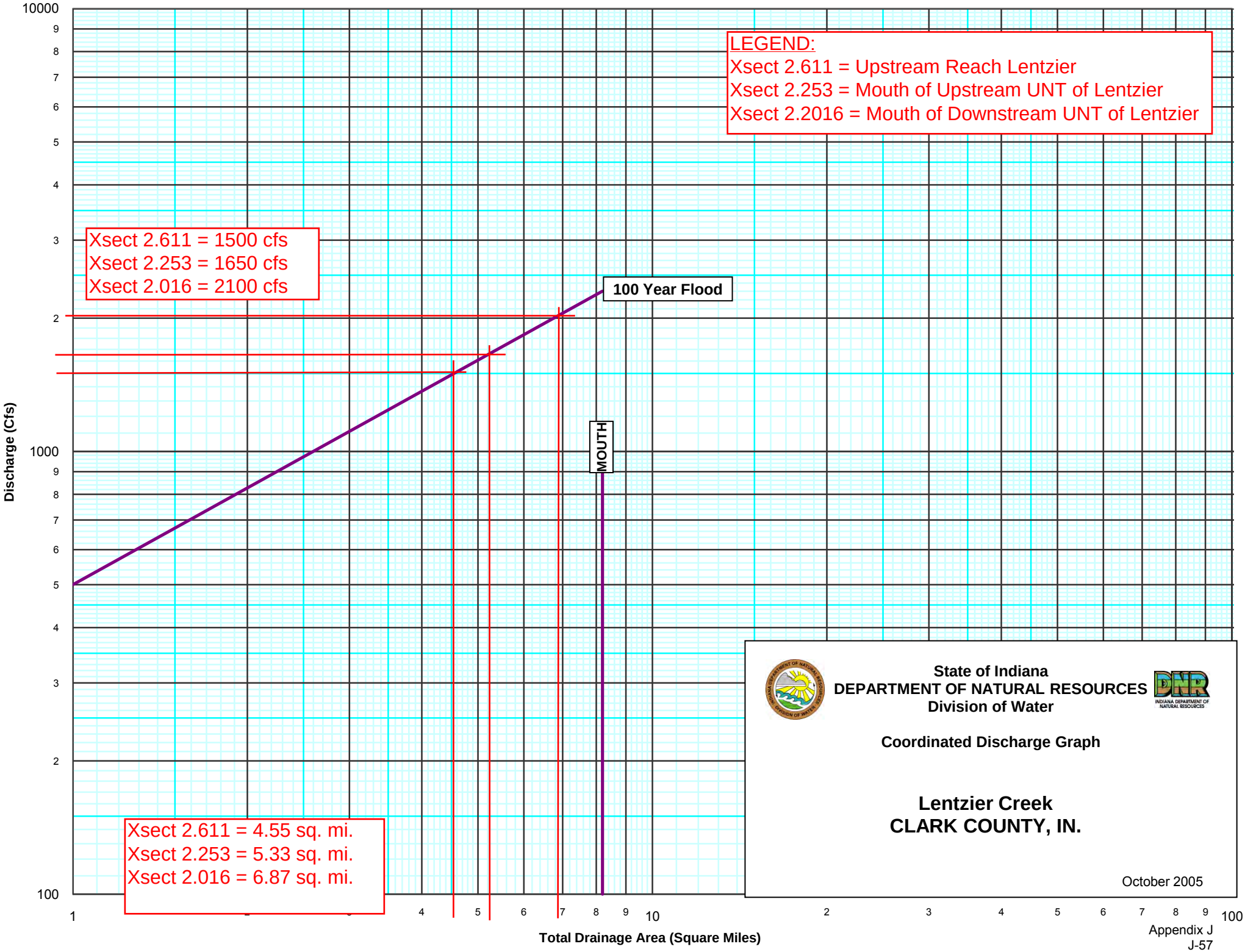
Copies Sent To: Jay N Ridens (Requestor)

Clark County, IN



Clark County GIS

Printed: 03/25/14


LEGEND:
Xsect 2.611 = Upstream Reach Lentzier
Xsect 2.253 = Mouth of Upstream UNT of Lentzier
Xsect 2.2016 = Mouth of Downstream UNT of Lentzier
Xsect 2.611 = 1500 cfs
Xsect 2.253 = 1650 cfs
Xsect 2.016 = 2100 cfs
100 Year Flood
MOUTH
Xsect 2.611 = 4.55 sq. mi.
Xsect 2.253 = 5.33 sq. mi.
Xsect 2.016 = 6.87 sq. mi.
Discharge (Cfs)
Total Drainage Area (Square Miles)
10000
1000
100
1
10
100
State of Indiana
DEPARTMENT OF NATURAL RESOURCES
Division of Water
Coordinated Discharge Graph
Lentzier Creek
CLARK COUNTY, IN.
October 2005

Drainage Area of Lentzier Creek at the U/S Reach

StreamStats Version 3.0

Basin Characteristics Ungaged Site Report

Date: Mon Nov 21, 2016 4:40:06 PM GMT-5
Study Area: Indiana
NAD 1983 Latitude: 38.3426 (38 20 33)
NAD 1983 Longitude: -85.676 (-85 40 34)

Label	Value	Units	Definition
DRNAREA	4.553	square miles	Area that drains to a point on a stream
CSL10_85	23.1	feet per mi	Change in elevation divided by length between points 10 and 85 percent of distance along main channel to basin divide - main channel method not known
HIGHREG	1007	dimensionless	High-Flow Hydrologic Region code
URBAN	9.15	percent	Percentage of basin with urban development
WETLAND	0.0382	percent	Percentage of Wetlands
CONTDA	4.553	square miles	Area that contributes flow to a point on a stream (total drainage area minus non-contributing areas within basin)
BFREGNO	1567		undefined
LC11IMP	8.15	percent	Average percentage of impervious area determined from NLCD 2011 impervious dataset
LC11DEV	32.7	percent	Percentage of developed (urban) land from NLCD 2011 classes 21-24

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URL: http://streamstatsags.cr.usgs.gov/v3_beta/BCreport.htm
Page Contact Information: StreamStats Help
Page Last Modified: 01/26/2016 11:44:09 (Web2)
Streamstats Status News
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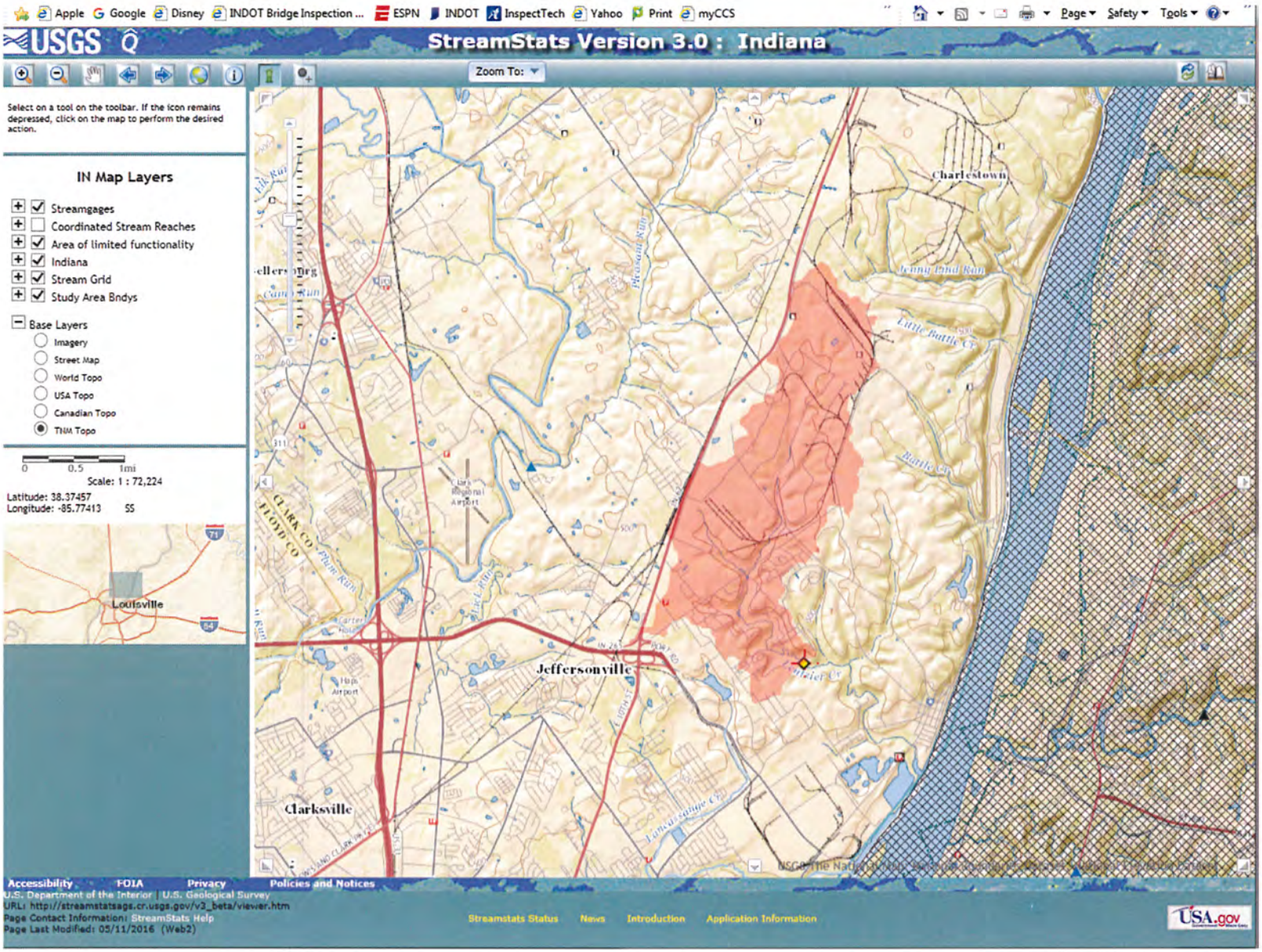
Drainage Area of Lentzier Creek at the U/S Reach



Drainage Area of Lentzier Creek U/S of the Proposed Crossing & the U/S UNT of Lentzier Creek

StreamStats Version 3.0

Basin Characteristics Ungaged Site Report

Date: Sat Nov 5, 2016 8:25:49 AM GMT-4
Study Area: Indiana
NAD 1983 Latitude: 38.342 (38 20 31)
NAD 1983 Longitude: -85.6688 (-85 40 08)

Label	Value	Units	Definition
DRNAREA	5.328	square miles	Area that drains to a point on a stream
CSL10_85	22.5	feet per mi	Change in elevation divided by length between points 10 and 85 percent of distance along main channel to basin divide - main channel method not known
HIGHREG	1007	dimensionless	High-Flow Hydrologic Region code
URBAN	7.87	percent	Percentage of basin with urban development
WETLAND	0.0326	percent	Percentage of Wetlands
CONTDA	5.328	square miles	Area that contributes flow to a point on a stream (total drainage area minus non-contributing areas within basin)
BFREGNO	1567		undefined
LC11IMP	7.26	percent	Average percentage of impervious area determined from NLCD 2011 impervious dataset
LC11DEV	30.6	percent	Percentage of developed (urban) land from NLCD 2011 classes 21-24

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http://streamstatsags.cr.usgs.gov/v3_beta/viewer.htm?stabbr=IN

StreamStats in Indiana | StreamStats National Applic...

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StreamStats Version 3.0 : Indiana

Zoom To:

Select on a tool on the toolbar. If the icon remains depressed, click on the map to perform the desired action.

IN Map Layers

- [x] Streamgages
- [ ] Coordinated Stream Reaches
- [x] Area of limited functionality
- [x] Indiana
- [x] Stream Grid
- [x] Study Area Bndys

Base Layers

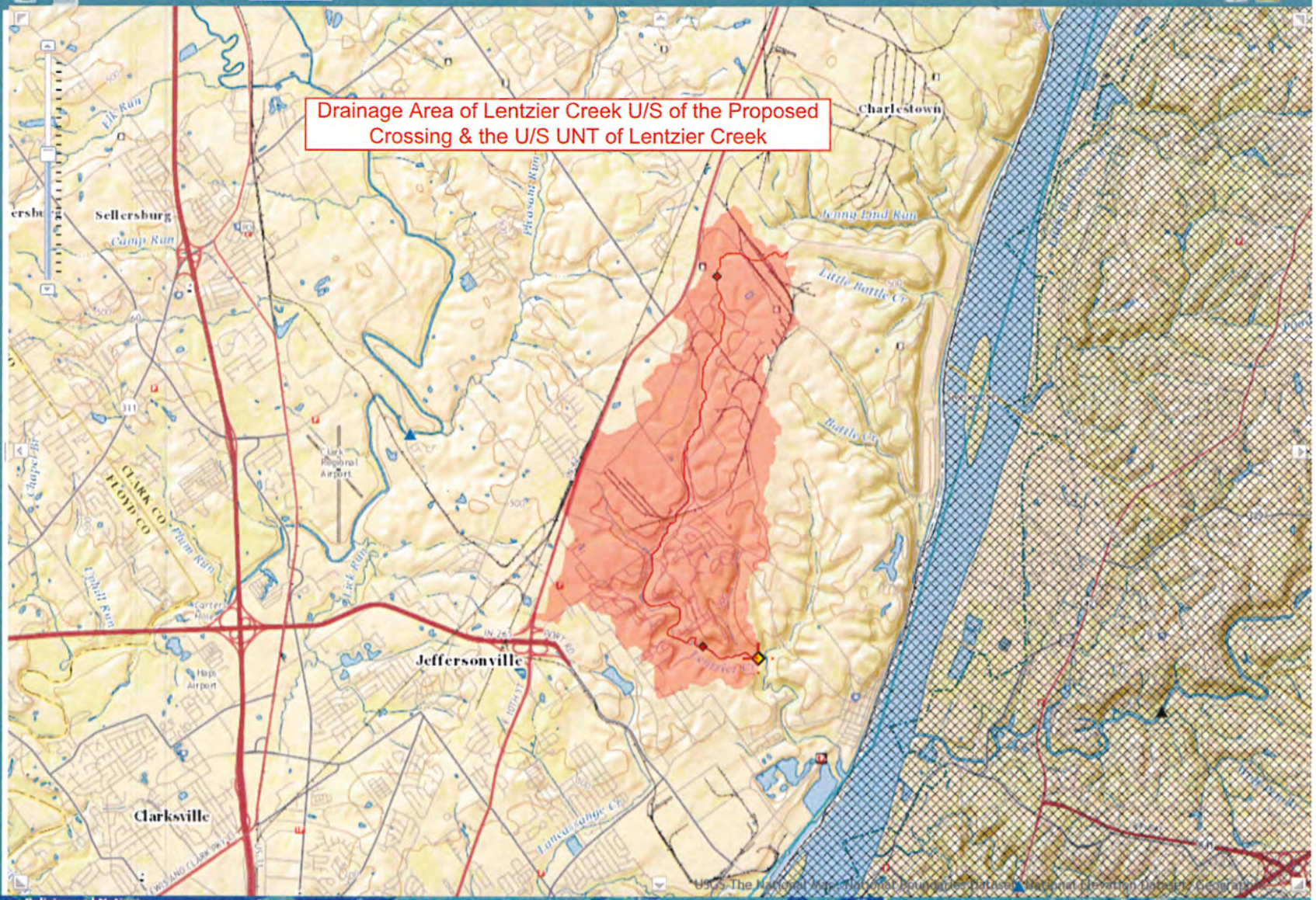
- Imagery
- Street Map
- World Topo
- USA Topo
- Canadian Topo
- (•) TNM Topo

0 0.5 1mi

Scale: 1 : 72,224

Latitude: 38.31859

Longitude: -85.68748 SS



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Drainage Area of Lentzier Creek D/S of the Proposed Crossing & the D/S UNT of Lentzier Creek

StreamStats Version 3.0

Basin Characteristics Ungaged Site Report

Date: Sat Nov 5, 2016 8:12:28 AM GMT-4
Study Area: Indiana
NAD 1983 Latitude: 38.3419 (38 20 31)
NAD 1983 Longitude: -85.6673 (-85 40 03)

Label	Value	Units	Definition
DRNAREA	6.874	square miles	Area that drains to a point on a stream
CSL10_85	22.4	feet per mi	Change in elevation divided by length between points 10 and 85 percent of distance along main channel to basin divide - main channel method not known
HIGHREG	1007	dimensionless	High-Flow Hydrologic Region code
URBAN	6.24	percent	Percentage of basin with urban development
WETLAND	0.0253	percent	Percentage of Wetlands
CONTDA	6.874	square miles	Area that contributes flow to a point on a stream (total drainage area minus non-contributing areas within basin)
BFREGNO	1567		undefined
LC11IMP	5.67	percent	Average percentage of impervious area determined from NLCD 2011 impervious dataset
LC11DEV	24.3	percent	Percentage of developed (urban) land from NLCD 2011 classes 21-24

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http://streamstatsags.cr.usgs.gov/v3_beta/viewer.htm?stabbr=IN

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USGS

StreamStats Version 3.0 : Indiana

Zoom To:

Select on a tool on the toolbar. If the icon remains depressed, click on the map to perform the desired action.

IN Map Layers

- [x] Streamgages
- [ ] Coordinated Stream Reaches
- [x] Area of limited functionality
- [x] Indiana
- [x] Stream Grid
- [x] Study Area Bndys

Base Layers

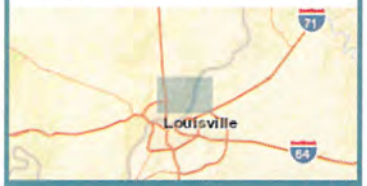
- Imagery
- Street Map
- World Topo
- USA Topo
- Canadian Topo
- TNM Topo

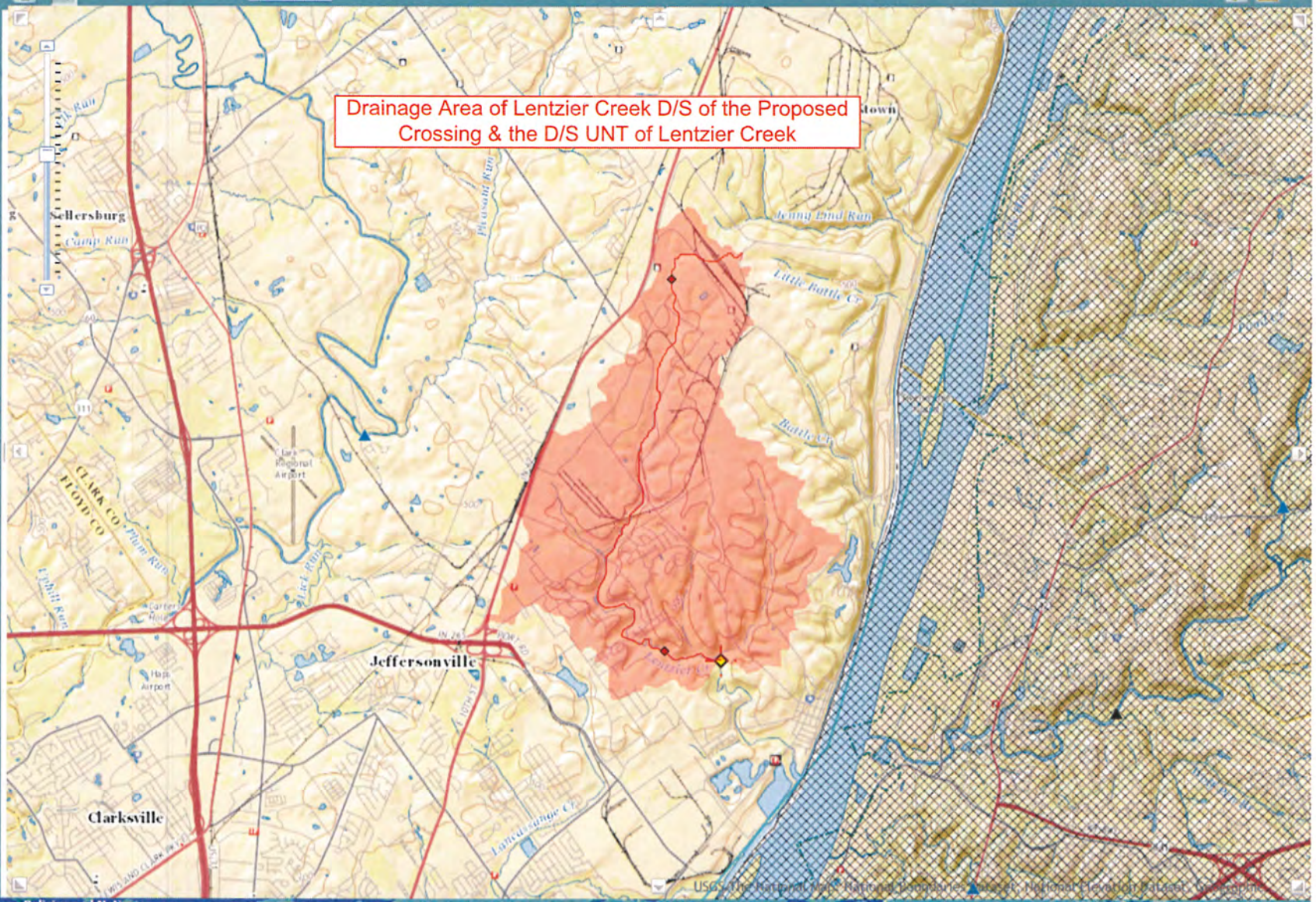
0 0.5 1mi

Scale: 1 : 72,224

Latitude: 38.33514

Longitude: -85.76786 SS





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NJK 3/24/14

watershed storage, or a very large drainage basin. This method is also used for design of a detention/retention pond or storage facility.

3. HEC-HMS. This hydrograph method can be used under the same conditions shown above for TR-20.

4. IDNR Letter of Discharge. The IDNR Letter of Discharge must be requested for a structure that requires a Construction in a Floodway Permit.

5. IDNR Coordinated Discharge Curves. This is the preferred method for a stream for which the information is available. The reference is *Coordinated Discharges of Selected Streams in Indiana*. It also appears on the IDNR-Water website.

6 Streamstats. This method can be used in conjunction with other methods. This method is valuable for setting parameters or justification as to what the appropriate discharge can be.

7. Frequency Analysis of Stream-Gaging Records. This method is considered to have high confidence on a larger watershed for which data is available, since it involves real-time data. The USGS, and the IDNR Division of Water, maintain a database of discharges for various frequencies computed using methodologies included in Water Resources Council Bulletin 17B.

8. Purdue Regression Equations. This method can be used in a rural area for estimating if no other method is available.

9. FEMA. The 1% exceedance probability specified in the applicable FEMA flood-insurance study should be used to analyze impacts of a proposed crossing on a regulatory floodway. However, if the discharge is considered outdated, the discharge based on current methods can be used subject to receiving the necessary regulatory approvals.

202-3.03 Q_{500} Determination for Scour Calculations [Added Feb. 2014]

The following methods, listed by preference, should be used to determine the Q_{500} for scour calculations.

1. Discharge published in a FEMA Flood Insurance Study (FIS). If there is a 0.2% annual EP discharge published by FEMA in a FIS, this discharge should take precedence over any other methodology. No published FIS (3/24/14)

NJK 3/24/14

2. Discharge derived from a coordinated discharge curve. The 0.2% annual EP discharge can be estimated by extrapolation from the Coordinated Discharge curves, using the following technique:

   a. Find the drainage area of the stream at the site of interest, and then determine the 10, 25, 50, and 100 year peak values from the graph.
   b. Plot these values on a semi log graph, with the peak discharge on the normal(y) axis, and the inverse of the return interval on the log (x) axis.
   c. Fit a straight line between these points, and the use the equation to derive a value at 0.002 (0.2%).

   No Q10, Q25, Q50 coordinated discharge curves.

   See Figure 202-3B for an example.

3. Use a multiplier of the 1% annual EP discharge. If there are no discharges published in the FIS or in a coordinated discharge curve, then the 0.2% annual EP discharge can be derived from the 1% annual EP discharge by use of a multiplier, which varies by region. The different regions and the relevant multiplier are shown in Figure 202-3C. A GIS shape file is also available for download from the Department's Editable Documents page.

202-3.04 Selection of Discharge for Pump Station

The federal design criteria shown in HEC-24, *Highway Stormwater Pump Station Design*, should be followed for a pump station. The hydrological considerations shown in of HEC-24 Sections 5.3 through 5.5 should be utilized.

202-3.05 Selection of Methods Table

See Figure 202-3A for the typical methods choices based on facility.

202-4.0 DOCUMENTATION FOR HYDROLOGY

The following provides an explanation of the submittal requirements for a hydraulic report as it pertains to hydrology. See Chapter 203 for a list what should be included in the hydraulic report.

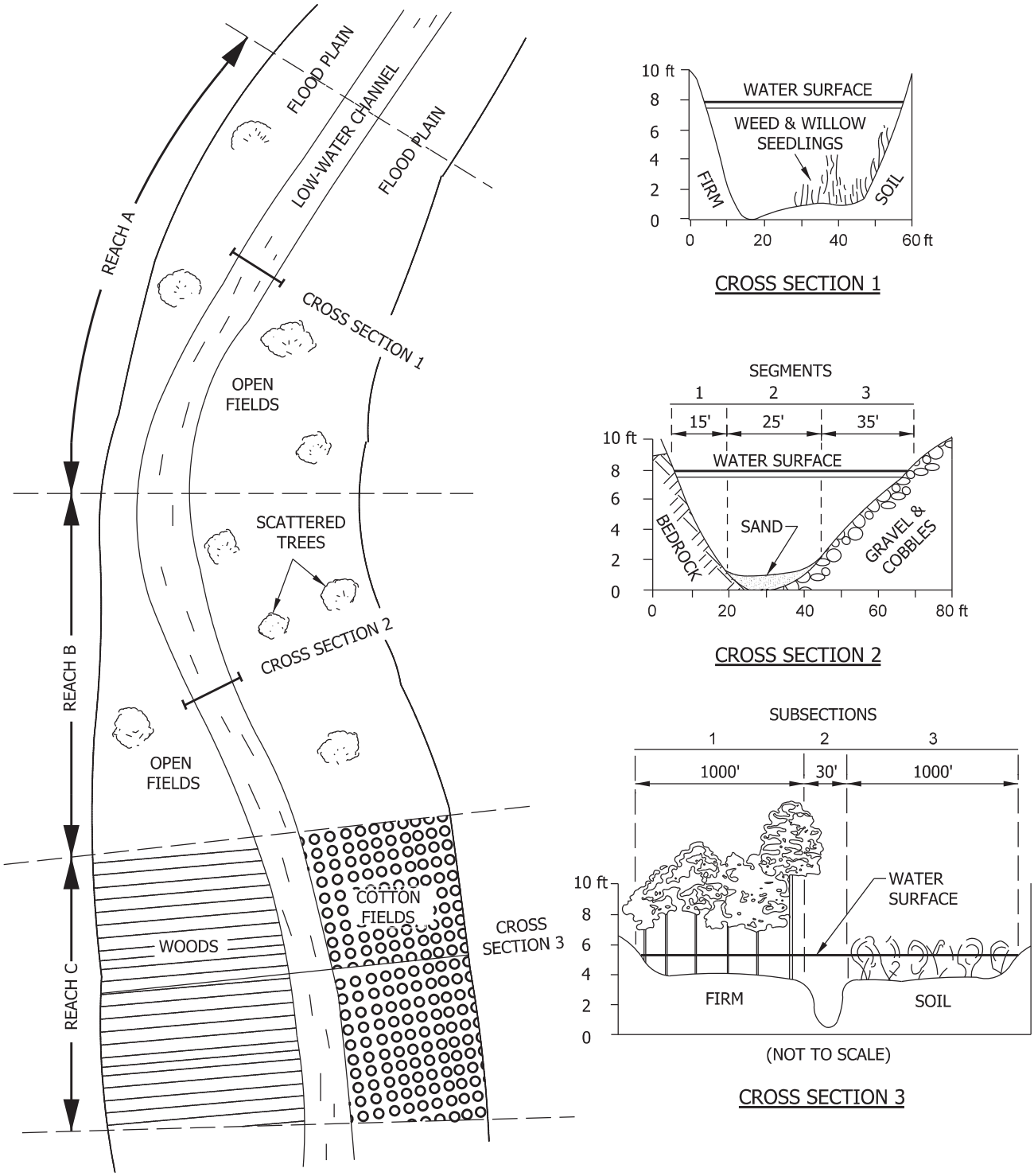
NJK 3/24/14

2013

REGIONAL MULTIPLIERS FOR DETERMINATION OF 0.2% ANNUAL EP

Figure 202-3C

Back



HYPOTHETICAL CROSS SECTION SHOWING REACHES, SEGMENTS, AND SUBSECTIONS USED IN ASSIGNING n VALUES

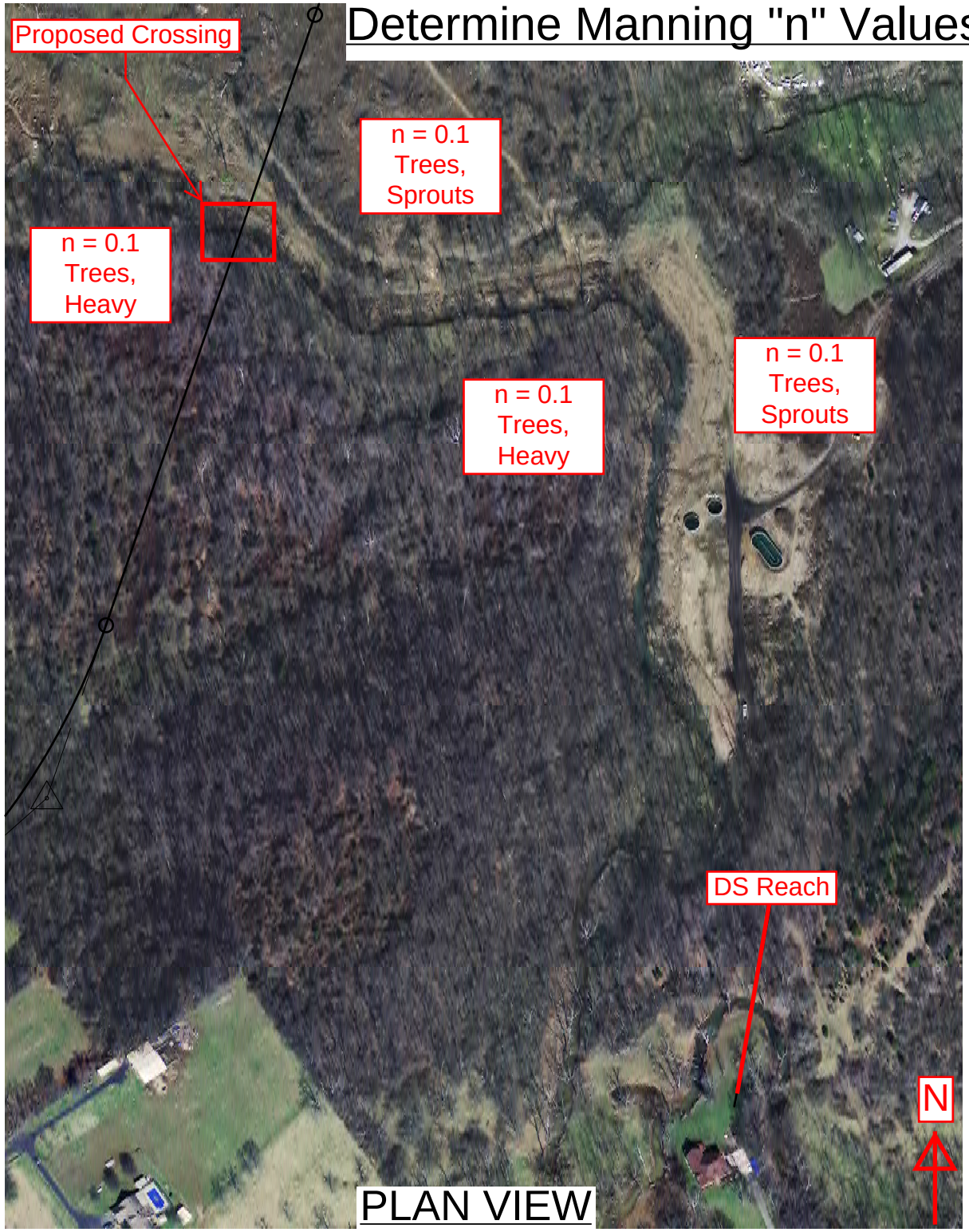
Figure 203-6B

Back

Determine Manning "n" Values

PLAN VIEW

Determine Manning "n" Values



PLAN VIEW

Type of Channel and Description	Minimum	Normal	Maximum
EXCAVATED OR DREDGED			
1. Earth, Straight and Uniform	0.016	0.018	0.020
a. Clean, recently completed	0.018	0.022	0.025
b. Clean, after weathering	0.022	0.025	0.030
c. Gravel, uniform section, clean	0.022	0.027	0.033
2. Earth, Winding and Sluggish			
a. No vegetation	0.023	0.025	0.030
b. Grass, some weeds	0.025	0.030	0.033
c. Dense weeds or aquatic plants in deep channel	0.030	0.035	0.040
d. Earth bottom and rubble sides	0.025	0.030	0.035
e. Stony bottom and weedy sides	0.025	0.035	0.045
f. Cobble bottom and clean sides	0.030	0.040	0.050
3. Dragline, Excavated or Dredged			
a. No vegetation	0.025	0.028	0.033
b. Light brush on banks	0.035	0.050	0.060
4. Rock Cut			
a. Smooth and uniform	0.025	0.035	0.040
b. Jagged and irregular	0.035	0.040	0.050
5. Channel Not Maintained, Weeds and Brush Uncut			
a. Dense weeds, high as flow depth	0.050	0.080	0.120
b. Clean bottom, brush on sides	0.040	0.050	0.080
c. Clean bottom, highest stage of flow	0.045	0.070	0.110
d. Dense brush, high stage	0.080	0.100	0.140
NATURAL STREAM			
1. Minor Stream (top width at flood stage < 100 ft)			
a. Stream on plain			
(1) Clean, straight, full stage, no rifts or deep pools	0.025	0.030	0.033
(2) Same as above, but more stones or weeds	0.030	0.035	0.040
(3) Clean, winding, some pools or shoals	0.033	0.040	0.045
(4) Same as above, but some weeds or stones	0.035	0.045	0.050
(5) Same as above, lower stages, more ineffective slopes and sections	0.040	0.048	0.055
(6) Same as (4), but more stones	0.045	0.050	0.060
(7) Sluggish reaches, weedy, deep pools	0.050	0.070	0.080
(8) Very weedy reaches, deep pools, or floodway with heavy stand of timber and underbrush	0.075	0.100	0.150

Back

Type of Channel and Description	Minimum	Normal	Maximum
NATURAL STREAM (contd.)			
1. Minor Stream (contd.)			
b. Mountain stream, no vegetation in channel, banks usually steep, trees and brush along banks submerged at high stages			
(1) Bottom: gravel, cobbles, and few boulders	0.030	0.040	0.050
(2) Bottom: cobbles with large boulders	0.040	0.050	0.07
2. Floodplain			
a. Pasture, no brush			
(1) Short grass	0.025	0.030	0.035
(2) High grass	0.030	0.035	0.050
b. Cultivated area			
(1) No crop	0.020	0.030	0.040
(2) Mature row crops	0.025	0.035	0.045
(3) Mature field crops	0.030	0.040	0.050
c. Brush			
(1) Scattered brush, heavy weeds	0.035	0.050	0.070
(2) Light brush and trees, in winter	0.035	0.050	0.060
(3) Light brush and trees, in summer	0.040	0.060	0.080
(4) Medium to dense brush, in winter	0.045	0.070	0.110
(5) Medium to dense brush, in summer	0.070	0.100	0.160
d. Trees			
(1) Dense willows, in summer, straight	0.110	0.150	0.200
(2) Cleared land with tree stumps, no sprouts	0.030	0.040	0.050
(3) Same as above, but with heavy growth of sprouts	0.050	0.060	0.080
(4) Heavy stand of timber, a few downed trees, little undergrowth, flood stage below branches	0.080	0.100	0.120
(5) Same as above, but with flood stage reaching branches	0.100	0.120	0.160
3. Major Stream (top width at flood stage > 100 ft). The *n* value is less than that for a minor stream of similar description, because banks offer less effective resistance.			
a. Regular section with no boulders or brush	0.025	n/a	0.060
b. Irregular and rough section	0.035	n/a	0.100

Source: Chow, V.T.

VALUES OF MANNING'S *n* FOR UNIFORM FLOW, Figure 203-3A

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Supplemental Support Information

21. The proposed structure's span should be equal to or greater than the existing span unless prior approval is given from the Office of Hydraulics.

203-3.03 Design Procedure and Criteria

203-3.03(01) Bridge Sizing

The following criteria are required for hydraulic bridge sizing.

✓ 1. Design-Storm Frequency. Figure 203-2C should be used to determine the appropriate storm event for design. It shows the design-storm requirements for allowable backwater, outlet velocity, and road-serviceability freeboard. Use 1% (Q100) for 2 Lane AADT > 3,000

✓ 2. Allowable Backwater. This is the difference caused by a bridge between the upstream water-surface elevation and the natural condition with no bridge at the same location. The backwater is the maximum proposed bridge value that occurs at a given cross-section location. The design-storm requirements are shown in Figure 203-2C.

If the existing bridge has a backwater of greater than 1 ft, the proposed bridge has an allowable backwater equal to or less than 1 ft. If the existing bridge has a backwater less than or equal to 1 ft., the proposed bridge has an allowable backwater equal to or less than the backwater of the existing bridge. If the proposed bridge is on new alignment, the allowable backwater is 0.14 ft. For exceptions, see item 10 below. Proposed is 0.12'

FHWA does not require economic justification for a bridge that causes less than 1 ft. of backwater. Therefore, a formal risk assessment will not be required.

✓ 3. Outlet Velocity. The design-storm frequency shown in Figure 203-2C should be used to determine the appropriate storm event for design. Figure 203-2D should be used to determine the appropriate riprap size based on outlet velocity. < 6.5 fps ⇒ Revetment along abutments

✓ 4. Road-Serviceability Freeboard. The headwater elevation from the bridge should maintain a road-serviceability freeboard to the edge of pavement based on the facility level shown in Figure 203-2C. If the facility level allows, embankment overtopping may be incorporated into the design, but should be located away from the bridge abutments and superstructure. The required road serviceability should be maintained throughout the entire flood reach of the stream. A larger downstream waterway should be checked to determine if its floodwaters can backwater through the system and affect road serviceability. If this potential exists, a joint-stream probability analysis should be performed to check the

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correct storm events that should be analyzed for potential road overtopping. See Figure 203-2G. The joint-stream probability analysis is based on the peak discharges of both the design stream and the larger downstream waterway occurring at different times. The analysis compares the streams at different storm designs based on their difference in drainage area. OK, rdwy profile/alignment controls bridge

✓ 5. Structure Freeboard. Where practical, a minimum clearance of 2 ft should be provided between the Q_{100} elevation and the low chord of the bridge to allow for passage of ice and debris. Where this is not practical, the clearance should be established based on the type of stream and level of protection desired as approved by the Office of Hydraulics. For example, 1 ft should be adequate for a small stream that normally does not transport drift. An urban bridge with a grade limitation can provide no freeboard. A 3-ft freeboard is desirable for a major river which is known to carry large debris. The crest vertical-curve profile is the preferred highway crossing profile in allowing for embankment overtopping at a lower discharge. OK, rdwy profile/alignment controls bridge.

✓ 6. Span Lengths. Where possible, a single-span bridge is desired in lieu of a multi-span bridge, though this may sacrifice desired structure freeboard. The minimum span length for a bridge with more than three spans should be 100 ft for those spans over the main channel. A three-span bridge should have the center span length maximized at a site where debris can be a problem. For a two-span bridge, span lengths are subject to approval of the Office of Hydraulics. Needed 3 span bridge for hydraulic opening. Center span is > 100'

✓ 7. Channel Clearing. This consists of the removal of sediment to enlarge the waterway opening. Channel clearing should not occur within 1 ft of the Ordinary High Water elevation. Where the Ordinary High Water elevation is less than 1 ft above the flowline elevation, channel clearing should not occur within 2 ft of the flowline elevation.
Did not consider due to unknown rock depth

N/A 8. Multiple-Opening Structure. A multiple-opening structure is used in a wide floodplain to pass a portion of the flow once the stream reaches a certain stage. The objectives in choosing the location of a multiple opening include the following:

a. maintenance of flow distribution and flow patterns;
b. accommodation of relatively large flow concentrations on the floodplain;
c. avoidance of floodplain flow along the roadway embankment for a long distance;
d. crossing of significant tributary channels; and
e. possible reduction of the size of the main bridge and the overall cost of the project.

The technological weakness in modeling a multiple opening is in the use of a one-dimensional model, such as HEC-RAS, to analyze two-dimensional flow. The development of a two-dimensional model, such as FESWMS, is a step toward more-

adequate analysis of a complex stream-crossing system. The most complex factor in designing a multiple opening is determining the division of flow between two or more structures. If incorrectly proportioned, one or more of the structures can be overtaxed during a flood event. The design of a multiple opening should be generous to guard against that possibility.

9. Temporary-Runaround Structure. A temporary-runaround structure is typically operational for three months to two years. Therefore, the serviceability criteria are greatly reduced. At a minimum, such a structure should be serviceable during a 50% annual EP discharge.

N/A

Figure 203-2C should be checked to determine the road-serviceability design storm required. The edge of pavement should be above the headwater elevation of the required design storm.

The backwater should be determined for the 1% annual EP discharge event. For a structure requiring an IDNR permit, the backwater at 1% annual EP should not exceed 0.14 ft over existing conditions. IDNR should be contacted for further guidance. For a structure not requiring an IDNR permit, the backwater from the 1% annual EP event should not exceed 1 ft below the finished-floor elevations of nearby buildings or residences. Impacts to crops and yards should be allowed for only a short duration.

The most cost-efficient temporary-runaround structure is achieved by lowering the roadway profile as much as possible while still obtaining the required road serviceability.

10. New-Alignment Bridge. For a new bridge on a new alignment, the maximum backwater should not exceed 0.14 ft. The 0.14 ft maximum may be modified as follows:

Proposed backwater is < 0.14'

a. the backwater dissipates to 0.14 ft or less at the right-of-way line;
b. the channel is sufficiently deep to contain the increased water height without overtopping the banks; the backwater is less than or equal to 1 ft; and the maximum velocity is not excessive; or
c. a flood easement can be purchased upstream of the bridge to allow for greater than 0.14 ft of backwater.

In a rural area where land costs are minimal, the cost savings may be substantial to purchase flood easements and reduce the bridge-structure size. The use of flood easements should be identified early in the design stage so that they can be included in any land purchasing. However, flood easements are still limited to the maximum 1-ft backwater requirement.

An exception to the 0.14-ft backwater allowance for a new bridge on a new alignment is subject to approval of The Office of Hydraulics.

✓ 11. Bridge that Requires an IDNR CIF Permit. The water-surface elevation cannot be increased more than 0.14 ft from existing conditions outside the right of way. The IDNR *Floodplain Guidelines Manual* should be checked to determine if a CIF permit is required, and for the definition of what the existing or base conditions are.
Proposed W.S. elev. is < 0.14'

203-3.03(02) Bridge-Hydraulics Modeling

The regulatory agencies require the use of computer hydraulic-modeling software to support calculations used in flood modeling. The required modeling program is HEC-RAS. The HEC-RAS procedures are followed as stated in the IDNR manual, *General Guidelines for the Hydrologic-Hydraulic Assessment of Floodplains in Indiana*, or *Floodplain Guidelines*, and the USACE HEC-RAS manuals. The following should be considered in performing a HEC-RAS model.

Survey used for xsections at bridge (4, 3, Br. U, Br. D, 2, 1)

✓ 1. Survey Accuracy. A survey is performed for the purpose of bridge or road design. However, the survey does not always extend far enough up- and downstream to cover the entire reach used in hydraulic-modeling design. It may be necessary to propagate the last cross-section up- and downstream as necessary to extend to the full reach length desired. If available, some county, city, or USGS maps include contours that can be useful in determining the cross-section shape outside the general project survey area. These tend to be most useful in sizing the flood plain. Current aerial photography should be used where current land uses may have changed from the original survey, such as new levees, structures, etc. Other available types of mapping should be discussed with the Office of Hydraulics prior to use. The hydraulic model should have adjusted the survey to the NAVD 88 datum. The *Floodplain Guidelines* Chapters 4 and 5 provide information on survey and mapping requirements. Xsect. from DNR HEC-RAS model, Assumed Xsect's created from LiDAR which gave top of water, therefore, flowline adjusted

✓ 2. Cross-Sections and Ineffective Flow. The cross-sections should extend far enough up- and downstream to include areas that can affect the water surface as it passes through the bridge of interest. This can include other downstream bridges or structures that can have potential backwater effects to the bridge of interest. The beginning cross-section should be the same for natural, existing, and proposed conditions for the same discharge. The ending cross-section should show a decline in backwater converging back towards the natural water-surface elevation. There are no structures u/s or D/s w/in reach.

The individual cross-sections should have data points that extend higher than the water-surface elevation at its extents. Extending the cross-sections beyond the water-surface ✓

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elevation can affect the scale of the cross-section so that the channel itself is difficult to visualize in the model display. The cross-sections should be chosen at appropriate locations that are perpendicular to the channel. However, the overbank section may have to be manipulated so that two cross-sections do not overlap. If possible, scour holes and large sediment mounds near the bridge should be avoided as cross-section locations. If such a location is necessary, manipulation of the flowline may be necessary to avoid large rises and drops.

See *Floodplain Guidelines* Chapter 8 for more information on modeling. For the appropriate roughness *n* value, see Figure 203-3A.

DNR Model roughness values were compared to site photos and figure 203-3A

3. Bridge. In HEC-RAS, a bridge automatically uses the adjacent cross sections in the modeling. It may be necessary to investigate the internal cross-sections to make changes for channel clearing or lowering the channel's *n* value through the bridge. The bridge should be modeled such that is normal to the direction of flow. This can be done manually or by using the skew function. Xsections based on survey were used for the bridge's internal cross-sections. The bridge was modeled normal to the direction of flow.

4. Check-RAS. - Check-RAS is a separate program that can be used in conjunction with HEC-RAS to help determine if errors occurred during the modeling procedure.

203-3.03(03) Scour

Scour is the most common cause of bridge failure. Therefore, potential scour problems should be recognized. The appropriate countermeasures should be used as necessary to improve bridge safety. HEC-18 and HEC-20 are FHWA documents that provide information and appropriate analysis procedure for determining scour. The scour can be computed using hand calculations from HEC-18, or by using the bridge modeling from HEC-RAS.

The types of scour that are used in bridge-hydraulics calculations include contraction, pier or local, and abutment. Only contraction and pier scour should be computed. Abutment scour is accounted for, due to riprap protection required at each abutment. Abutment scour has been shown to be overestimated.

For a new or replacement bridge, the scour should be computed for both the 1% annual EP and 0.2% annual EP. The 0.2% annual EP discharge should not be computed using the traditional 1.7 multiplier of the 1% annual EP discharge method, as this has typically overestimated scour and increased foundation costs. The 0.2% annual EP discharge should be determined using the same methods described in Chapter 202 as used to determine other storm events. Scour countermeasures are not required, as all bridge pier piles will be driven below the low-scour elevation. However, the embankment should have appropriately-sized riprap placed on it in a cone shape around the

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203-3.03(05) Pressure-Flow Scour

With pressure flow, the local scour depth at a pier or abutment is larger than for free-surface flow with a similar depth and approach velocity. The increase in local scour at a pier subject to pressure flow results from the flow being directed downward toward the bed by the superstructure and by increasing the intensity of the horseshoe vortex. The vertical contraction of the flow is a more significant cause of the increase in scour depth. However, where a bridge becomes submerged, the average velocity under it is reduced due to a combination of additional backwater caused by the bridge superstructure impeding the flow, and a reduction of discharge which must pass under the bridge due to weir flow over the bridge and approach embankments. As a consequence, an increase in local scour due to pressure flow can be offset by a lesser velocity through the bridge opening due to increased backwater, and a reduction in discharge due to overtopping.

In using HEC-RAS in a pressure-flow scenario, the program usually will not determine some variables, such as the average flow depth at the bridge for contraction scour. They should be entered manually.

HEC-RAS can be used to determine the discharge through the bridge and the velocity of approach and depth upstream of the piers where flow impacts the bridge superstructure. These values should be used to calculate local pier scour. Engineering judgment should then be used to determine the appropriate multiplier times the calculated pier-scour depth for the pressure-flow scour depth. This multiplier ranges from 1.0 for a low-approach Froude number $Fr = -0.1$, to 1.6 for a high-approach Froude number, $Fr = 0.6$. If the bridge is overtopped, the depth to be used in the pier-scour equations and for computing the Froude number is the depth to the top of the bridge deck or guardrail obstructing the flow. Research sponsored by FHWA has a listed procedure for three separate pressure-flow situations. See FHWA-HRT-09-041 October 2009 for more information on this process.

203-3.04 Determination of Hydraulic- and Scour-Data Parameters

The method used to determine the hydraulic- and scour-data parameters using HEC-RAS is described below. The parameters should be shown for both existing and proposed conditions where applicable.

✓ 1. Hydraulic Data.

✓ a. Drainage Area. The drainage area is the delineated area that drains to the structure in question. See Chapter 202. DNR Discharge letter; verified w/ StreamStats.

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✓ b. Q_{100}. The 1% annual EP discharge should be determined using the methods described in Chapter 202. Used coordinated discharge graph; Verified w/ DNR Letter

✓ c. Q_{100} Elevation. This elevation is determined for natural conditions at the downstream face of the bridge. If using HEC-RAS, this can be determined by using interpolated sections between the adjacent bridge sections in natural conditions to the downstream bridge face. (See Appendix "C")

✓ d. Q_{100} Headwater Elevation. This elevation is determined for the proposed conditions at the closest upstream cross section from the bridge. This information is used so that the reviewer can check road-serviceability requirements across the entire floodplain and watershed. at XSect. 2.204, El. = 453.26

e. Gross Waterway Area Opening Below Q_{100} Elevation. The required area is determined by using the Q_{100} natural water surface elevation at the downstream bridge face. Since this is to be the gross area, the flow-area output from HEC-RAS, which is net area, should include the piers and adjusted flow-area water-surface elevation to the Q_{100} elevation. The gross waterway area should be taken in a direction parallel to the flow. (See Appendix "C")

N/A ✓ f. Road-Overflow Area. This is the actual flow area that will go over the road. This is not based on the Q_{100} elevation. It should use the approach-crest elevation along with the road profile to determine the area.

✓ g. Q_{100} Velocity. This is the outlet velocity at the downstream face of the bridge as it exits the structure. This is shown in the HEC-RAS Bridge Output as velocity for the downstream side of the bridge. No other adjustments should be made, and the continuity equation should not be used. The outlet velocity is the average velocity across the whole structure. (See Appendix "C")

✓ h. Minimum Low-Structure Elevation. The low-structure elevation should be taken at the lowest elevation point along the bottom of a beam, slab, or concrete flat section under the bridge. If the structure is an arch, the low-structure elevation is at the top inside of the arch structure. Low-structure elev. is estimated, but well above Q100.

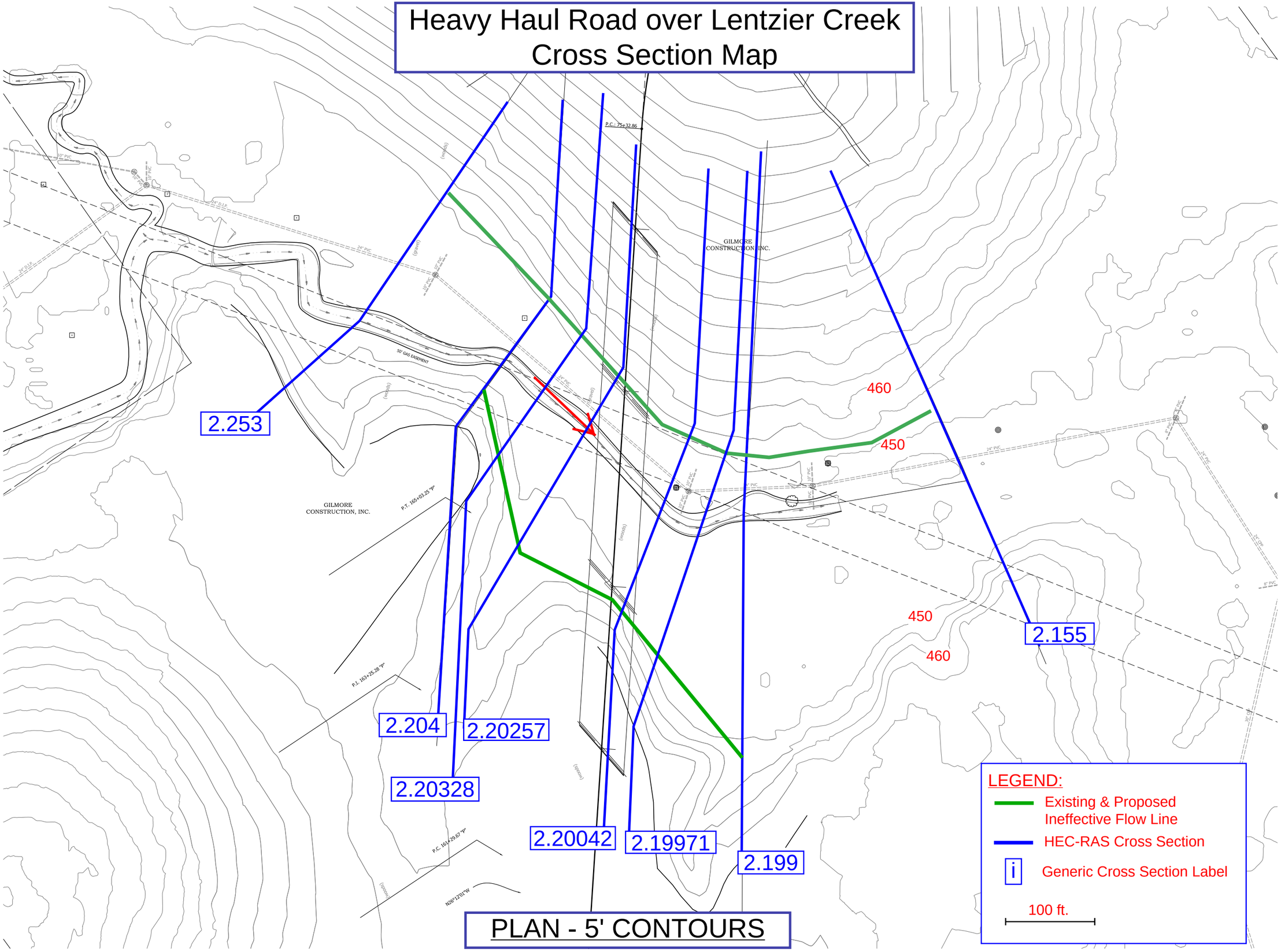
✓ i. Skew. The bridge skew is offset from the perpendicular to the roadway centerline. $\theta = 45°$

2. Scour Data. Q_{100} and Q_{100} elevation are as described above.

Appendix C

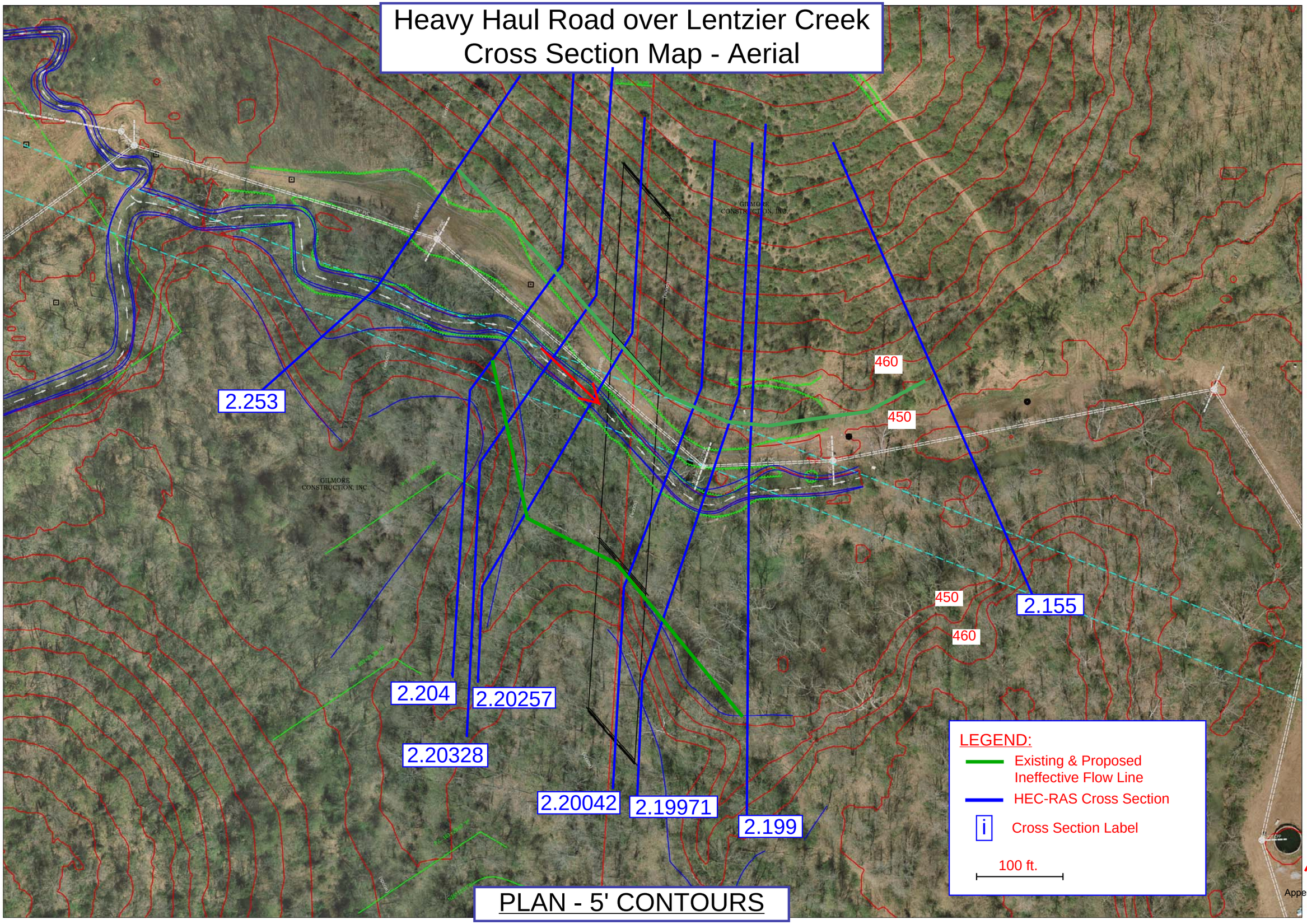
- Cross Section Map
- HEC-RAS File Name List
- Starting Water Surface Elevation
- HEC-RAS Cross Sections
- HEC-RAS Hydraulic Design Outputs & Calculations
- Scour Countermeasure Recommendations
- Check-RAS Output & Responses

Heavy Haul Road over Lentzier Creek
Cross Section Map



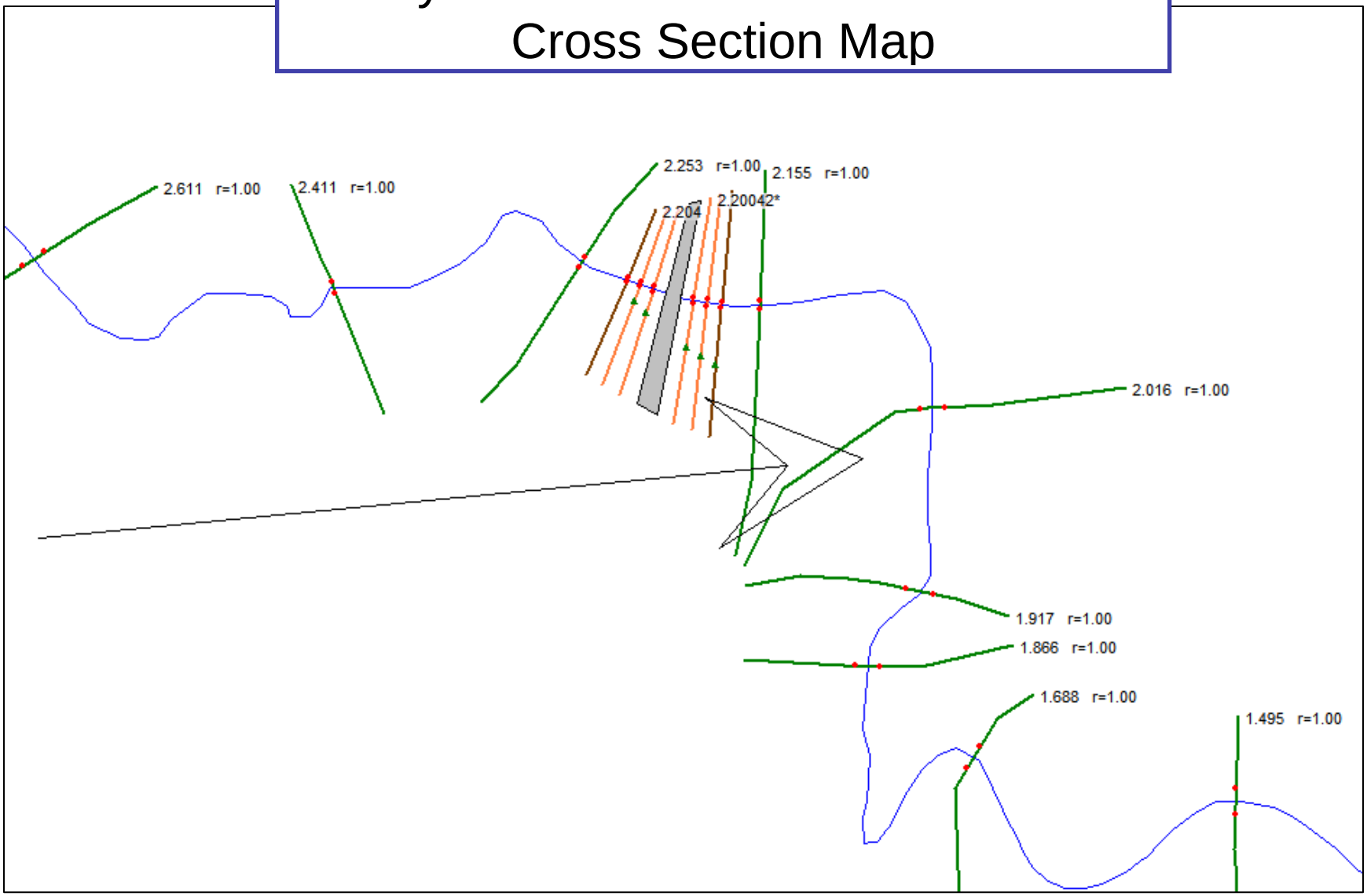
PLAN - 5' CONTOURS

Heavy Haul Road over Lentzier Creek
Cross Section Map - Aerial



PLAN - 5' CONTOURS

Heavy Haul Road over Lentzier Creek Cross Section Map



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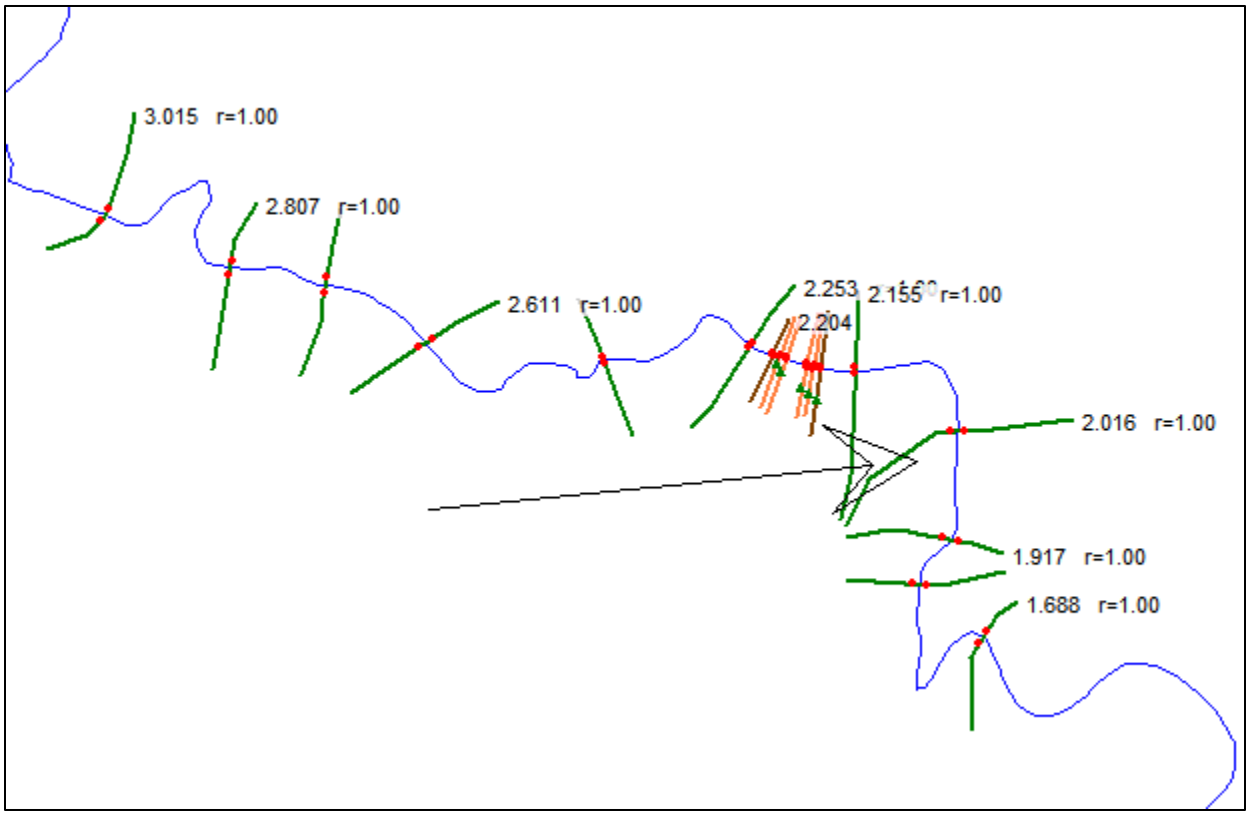
HEC-RAS Filenames:

RE: Hydraulics Computations
Heavy Haul Road over Lentzier Creek

Description	HEC-RAS Filename
Project File	LentzierHvyHaul.prj
Steady Flow File	LentzierHvyHaul.f01
Natural Geometry File	Same as existing
Existing Geometry File	LentzierHvyHaul.g01
Proposed Geometry File	LentzierHvyHaul.g02
Natural Plan File	Same as existing
Existing Plan File	LentzierHvyHaul.p01
Proposed Plan File	LentzierHvyHaul.p02
Hydraulic/Scour Design	LentzierHvyHaul..h01 & LentzierHvyHaul..O01

Heavy Haul Road over Lentzier Creek

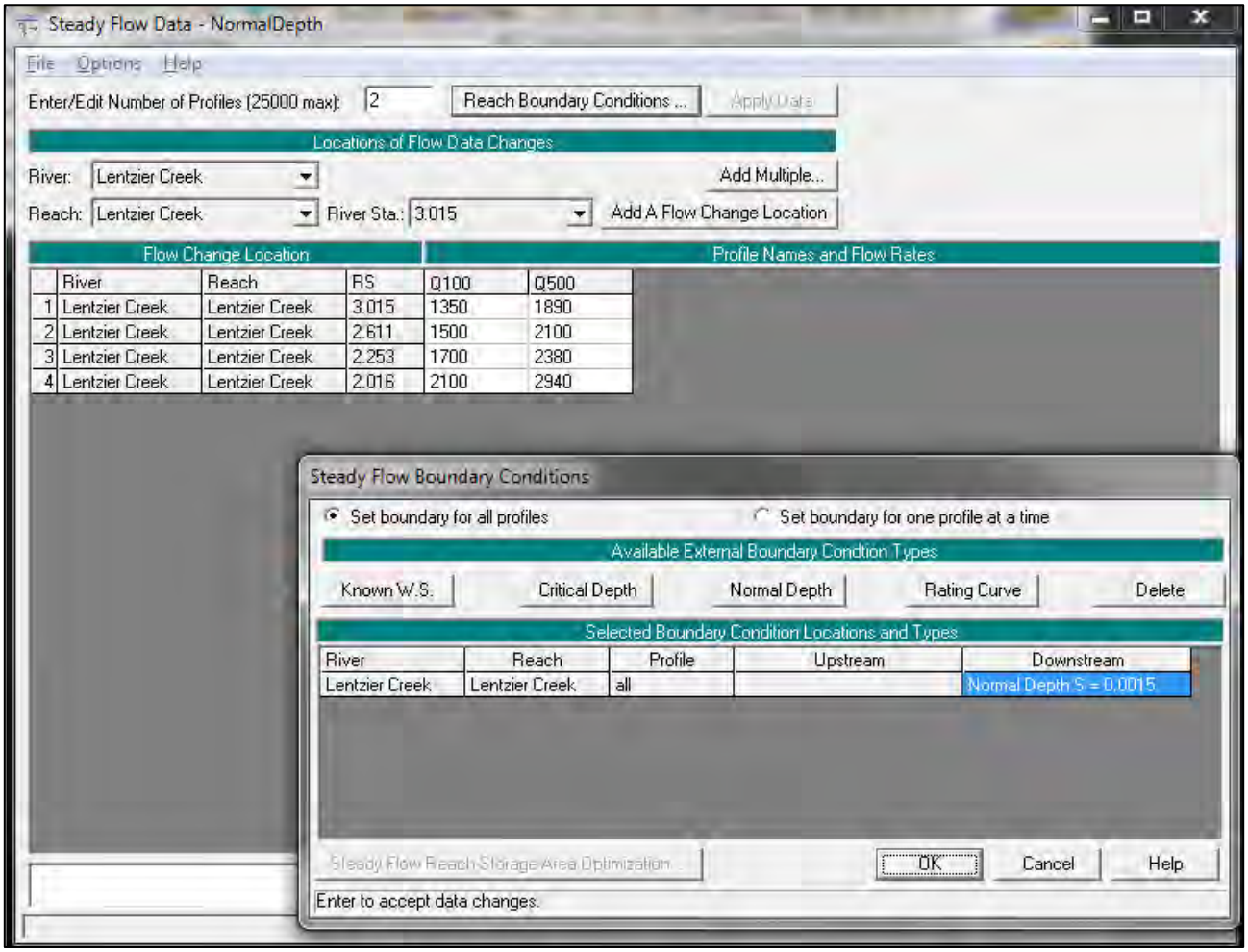
Starting Water Surface Elevations



(Existing HEC-RAS Geometry)

Heavy Haul Road over Lentzier Creek

Starting Water Surface Elevations



(Flow data with normal slope to determine starting water surface elevation)

Heavy Haul Road over Lentzier Creek

Starting Water Surface Elevations

Profile Output Table - Standard Table 1

File Options Std. Tables Locations Help

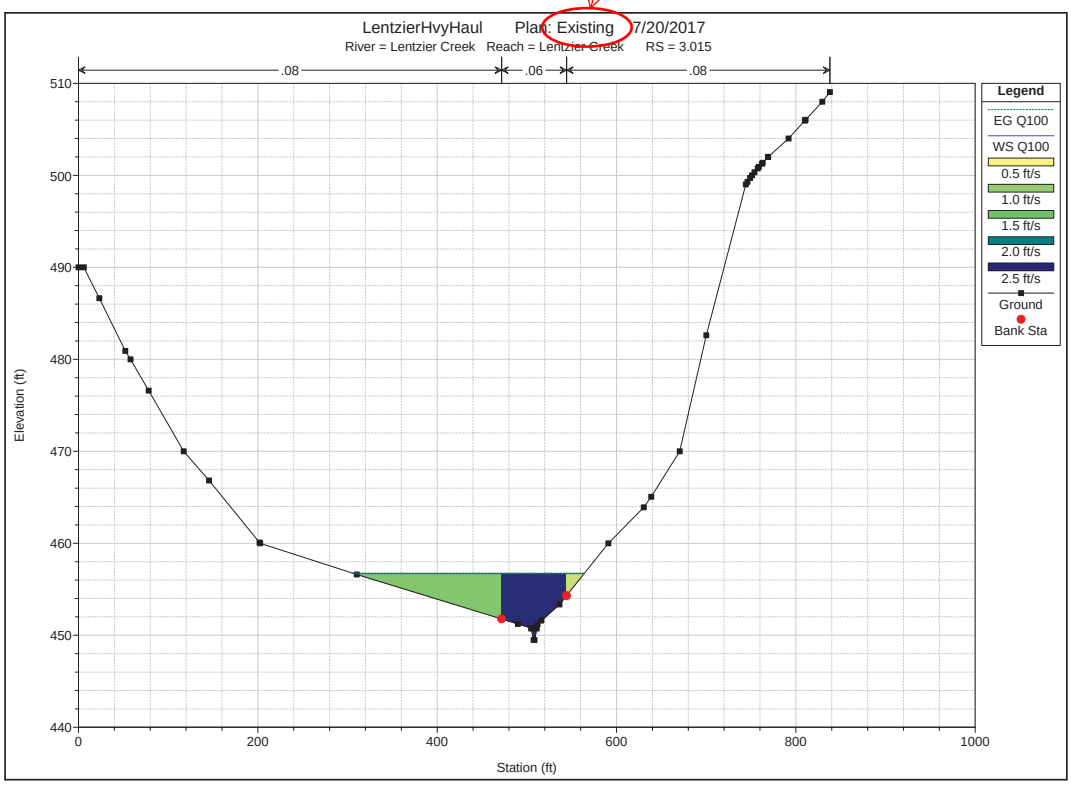
HEC-RAS Plan: Start WSE River: Lentzier Creek Reach: Lentzier Creek

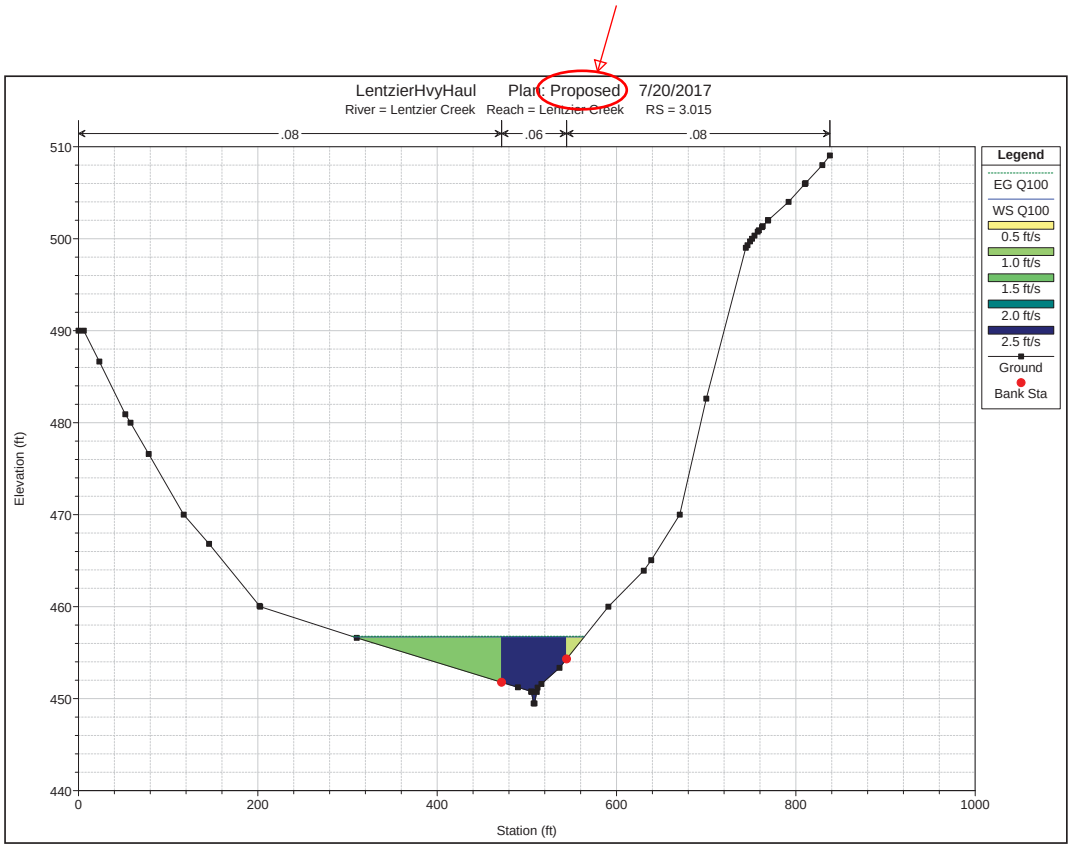
Reload Data

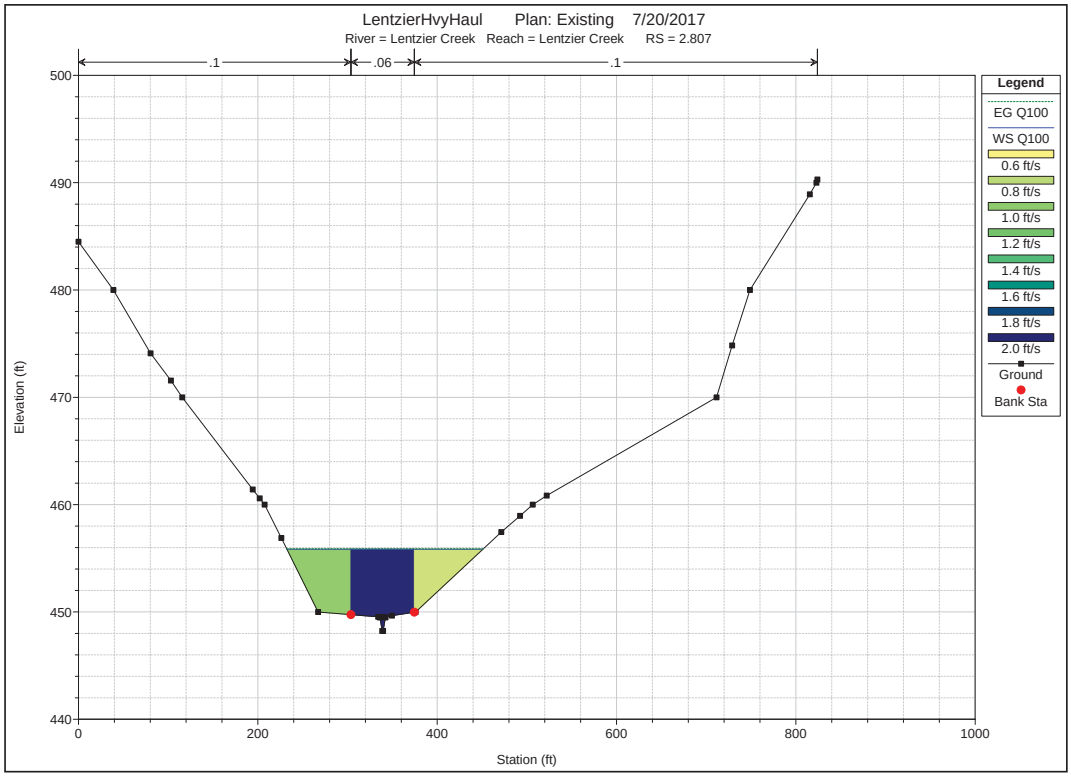
Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Lentzier Creek	2.199	Q100	1700.00	441.89	452.71	449.87	452.76	0.001020	2.80	1186.99	350.73	0.17
Lentzier Creek	2.199	Q500	2380.00	441.89	453.94	450.35	454.00	0.000925	2.92	1532.74	370.08	0.16
Lentzier Creek	2.155	Q100	1700.00	441.76	452.08		452.34	0.002784	4.79	590.74	162.76	0.28
Lentzier Creek	2.155	Q500	2380.00	441.76	453.33		453.60	0.002688	5.13	802.19	176.60	0.28
Lentzier Creek	2.016	Q100	2100.00	441.01	450.84		450.95	0.001372	3.13	970.49	216.53	0.22
Lentzier Creek	2.016	Q500	2940.00	441.01	452.16		452.29	0.001261	3.40	1265.08	227.70	0.22
Lentzier Creek	1.917	Q100	2100.00	440.11	450.23		450.34	0.000988	2.92	995.21	216.03	0.19
Lentzier Creek	1.917	Q500	2940.00	440.11	451.58		451.71	0.000975	3.24	1297.76	232.28	0.19
Lentzier Creek	1.866	Q100	2100.00	439.65	449.34		449.79	0.005484	5.46	423.39	98.57	0.42
Lentzier Creek	1.866	Q500	2940.00	439.65	450.65		451.17	0.004920	5.96	564.23	116.82	0.41
Lentzier Creek	1.688	Q100	2100.00	437.99	447.08	442.83	447.26	0.001502	3.59	735.47	145.20	0.23
Lentzier Creek	1.688	Q500	2940.00	437.99	448.51	443.56	448.72	0.001502	4.04	955.04	162.59	0.24

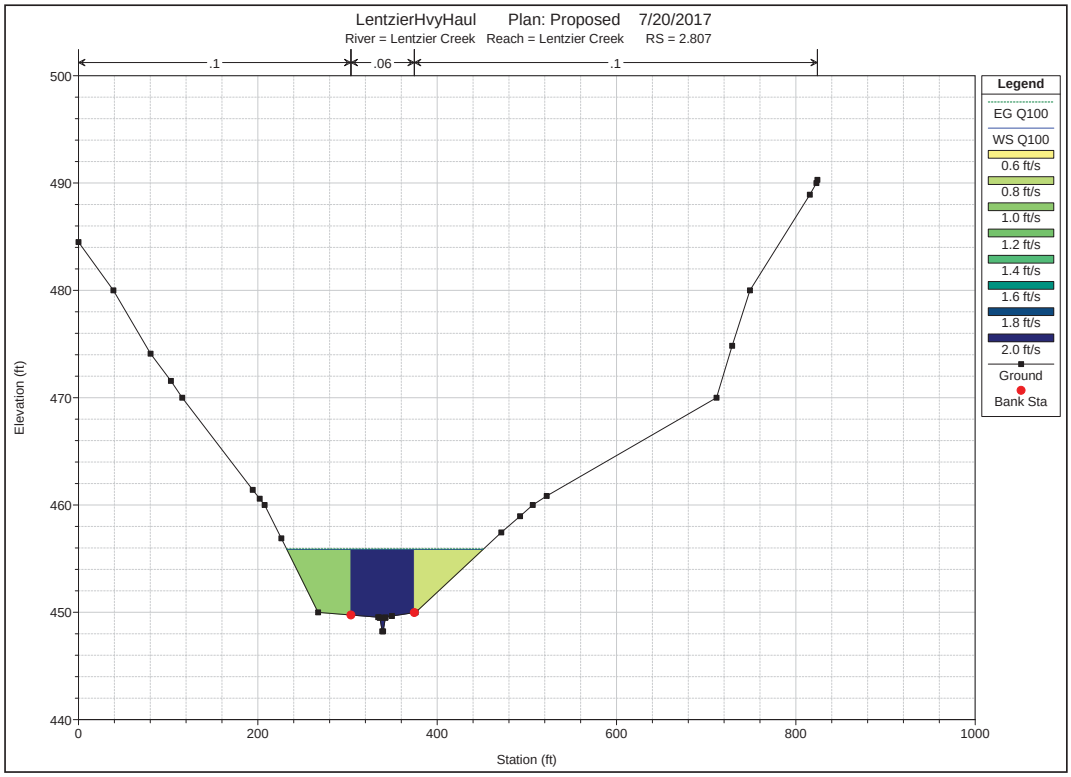
Starting Water Surface Elevations for the Existing and Proposed Conditions

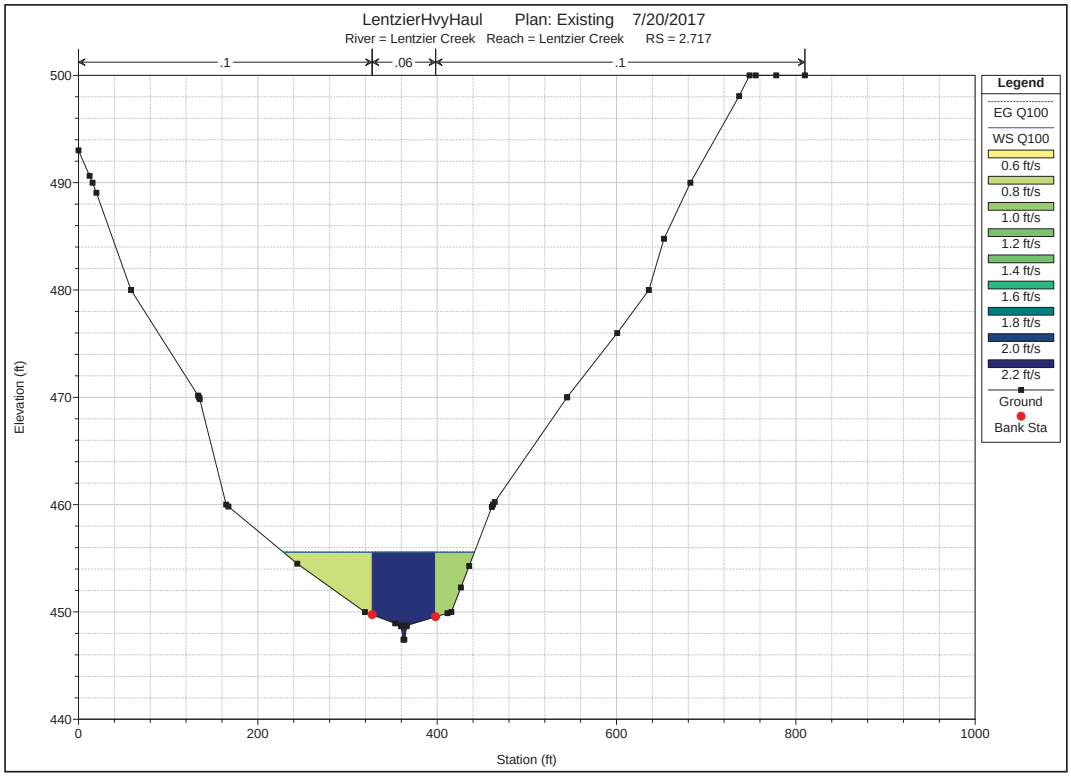
Existing & Proposed Cross Sections

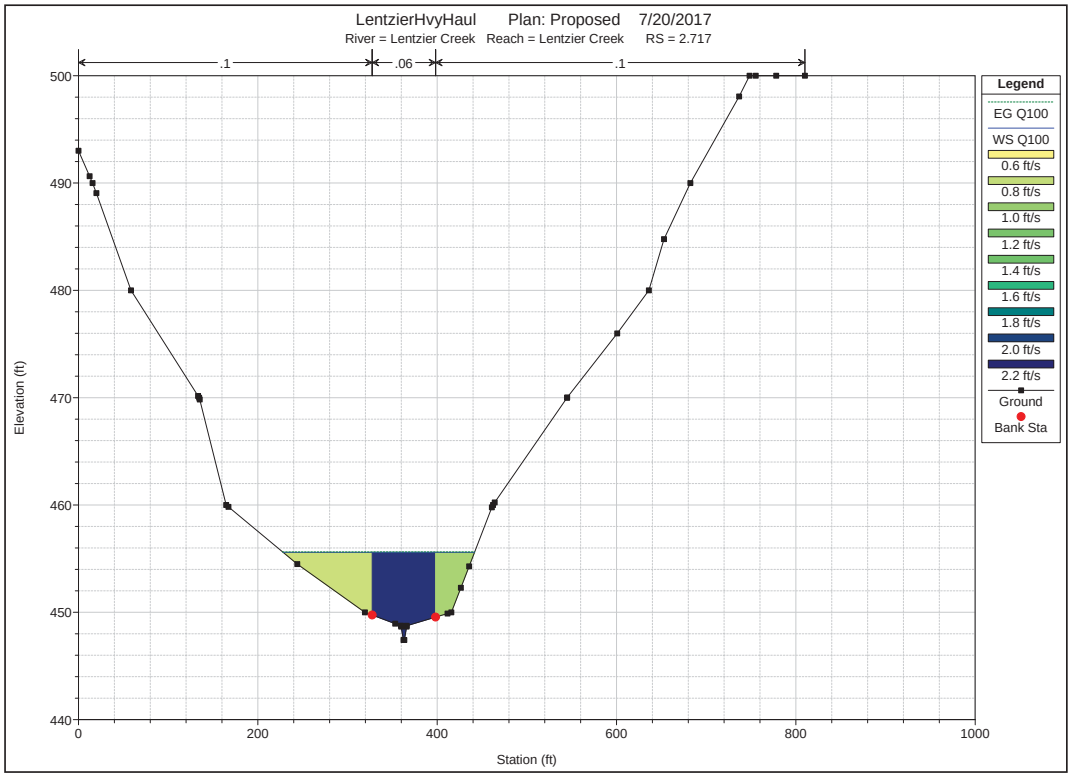


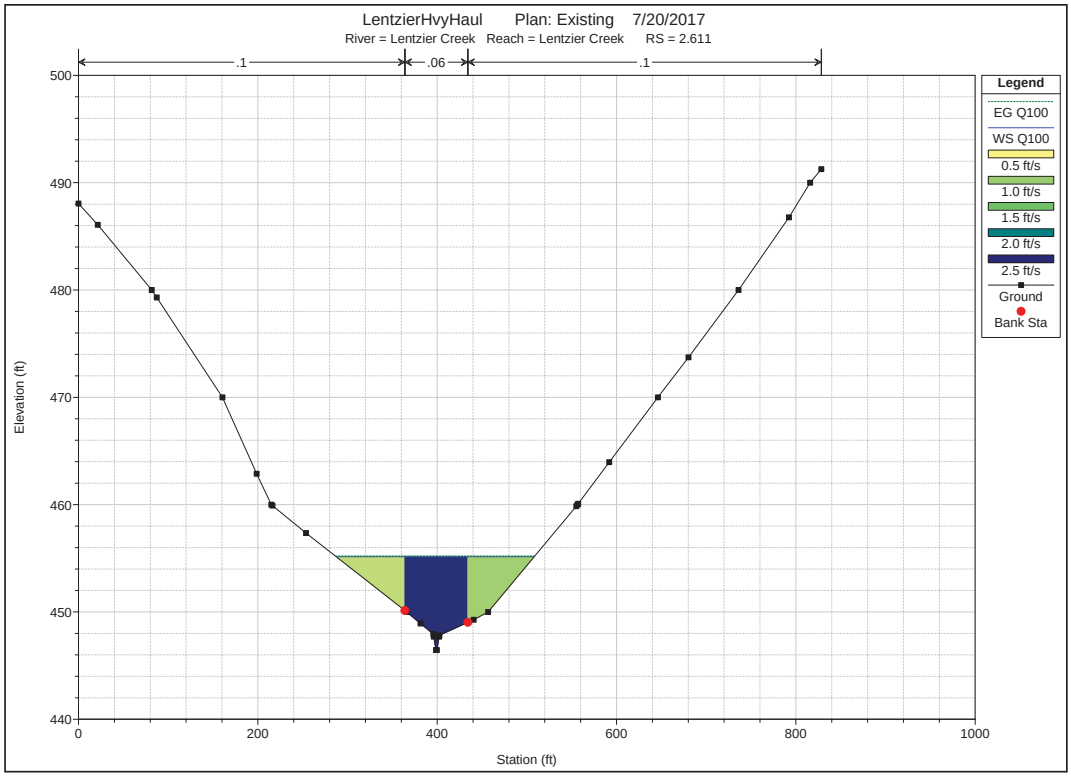


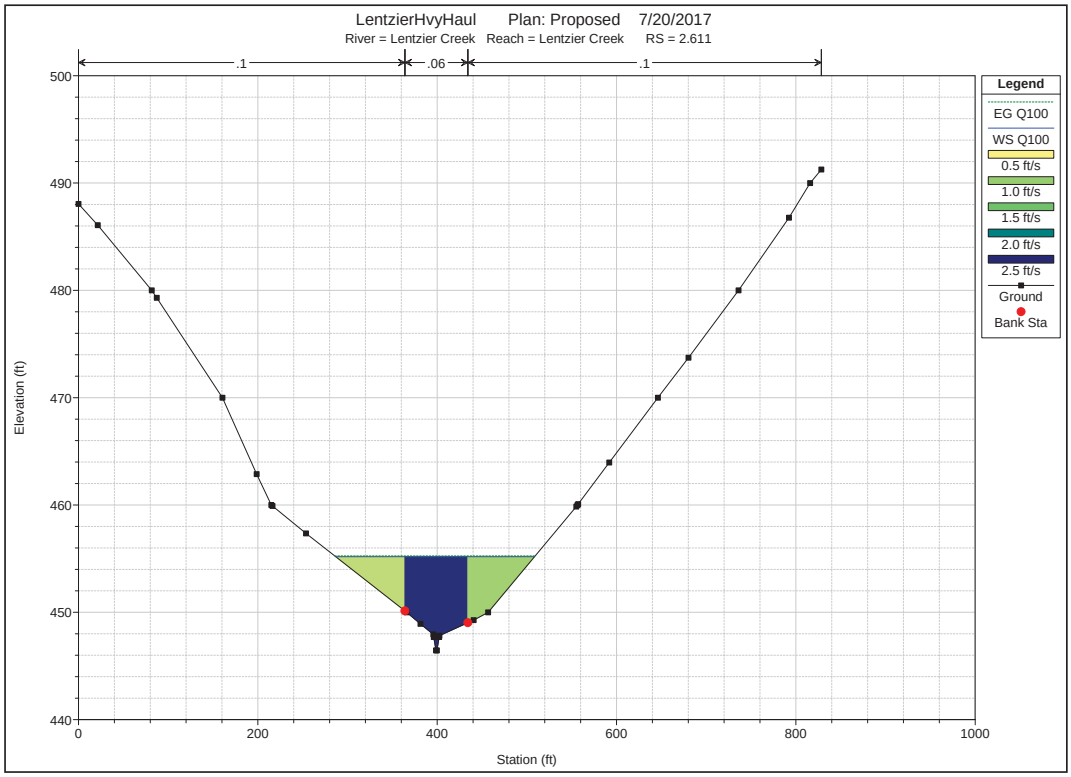

LentzierHvyHaul Plan: Existing 7/20/2017
River = Lentzier Creek Reach = Lentzier Creek RS = 2.807
.1
.06
.1
Legend
EG Q100
WS Q100
0.6 ft/s
0.8 ft/s
1.0 ft/s
1.2 ft/s
1.4 ft/s
1.6 ft/s
1.8 ft/s
2.0 ft/s
Ground
Bank Sta
Elevation (ft)
Station (ft)
500
490
480
470
460
450
440
0
200
400
600
800
1000

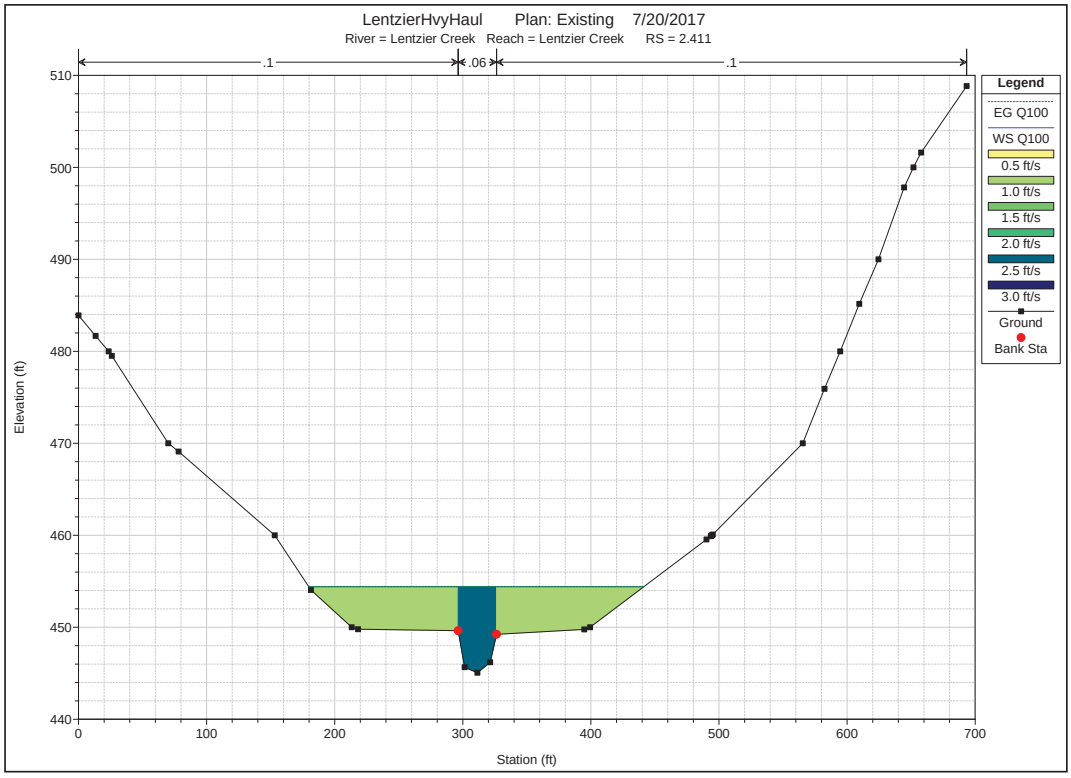

LentzierHvyHaul Plan: Proposed 7/20/2017
River = Lentzier Creek Reach = Lentzier Creek RS = 2.807
.1
.06
.1
Legend
EG Q100
WS Q100
0.6 ft/s
0.8 ft/s
1.0 ft/s
1.2 ft/s
1.4 ft/s
1.6 ft/s
1.8 ft/s
2.0 ft/s
Ground
Bank Sta
Elevation (ft)
Station (ft)
500
490
480
470
460
450
440
0
200
400
600
800
1000

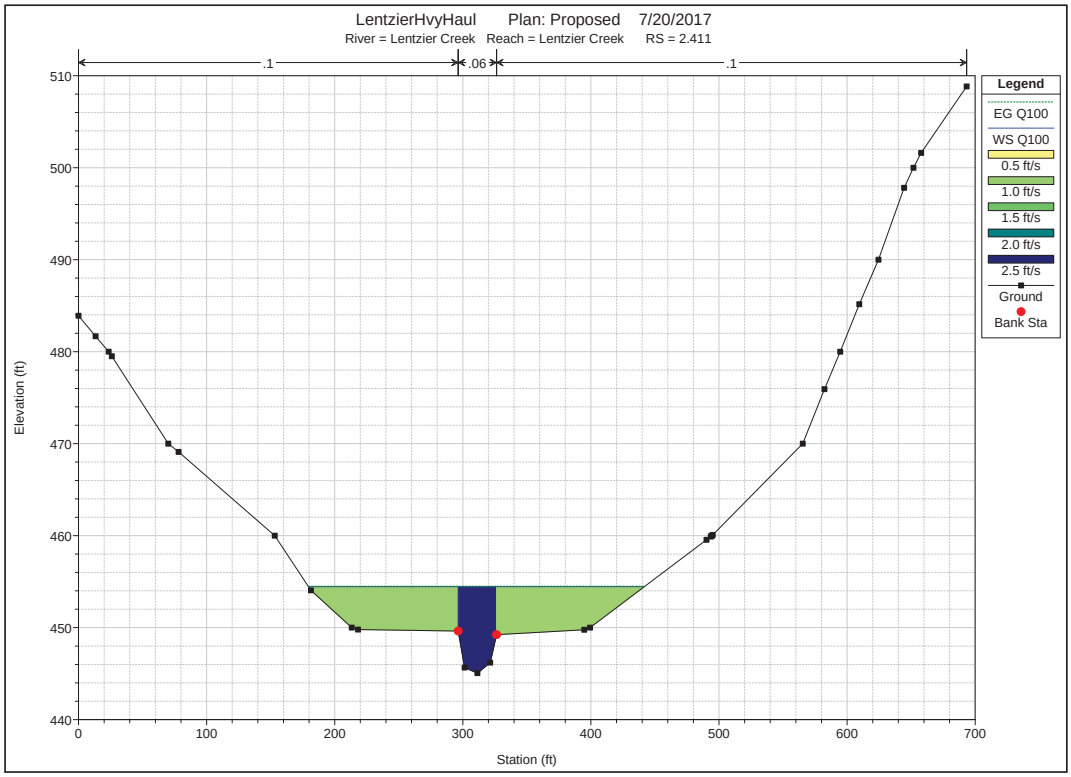

LentzierHvyHaul Plan: Existing 7/20/2017
River = Lentzier Creek Reach = Lentzier Creek RS = 2.717
.1
.06
.1
Elevation (ft)
Station (ft)
Legend
EG Q100
WS Q100
0.6 ft/s
0.8 ft/s
1.0 ft/s
1.2 ft/s
1.4 ft/s
1.6 ft/s
1.8 ft/s
2.0 ft/s
2.2 ft/s
Ground
Bank Sta

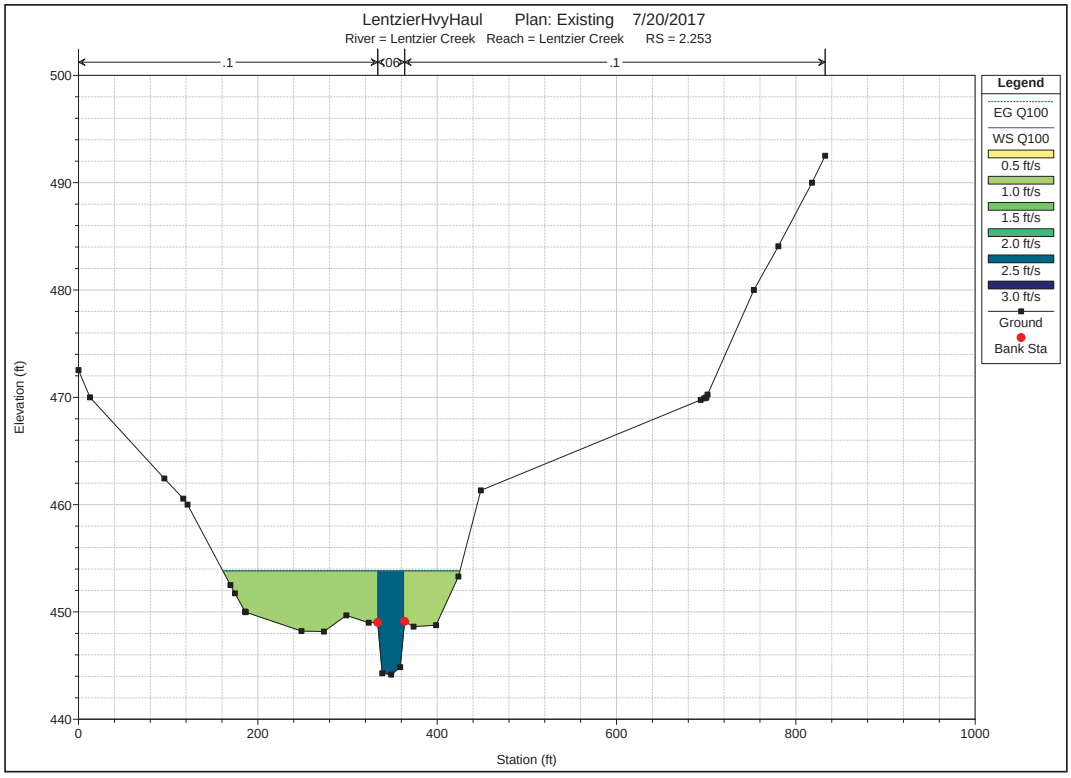

LentzierHvyHaul Plan: Proposed 7/20/2017
River = Lentzier Creek Reach = Lentzier Creek RS = 2.717
.1
.06
.1
Elevation (ft)
Station (ft)
Legend
EG Q100
WS Q100
0.6 ft/s
0.8 ft/s
1.0 ft/s
1.2 ft/s
1.4 ft/s
1.6 ft/s
1.8 ft/s
2.0 ft/s
2.2 ft/s
Ground
Bank Sta

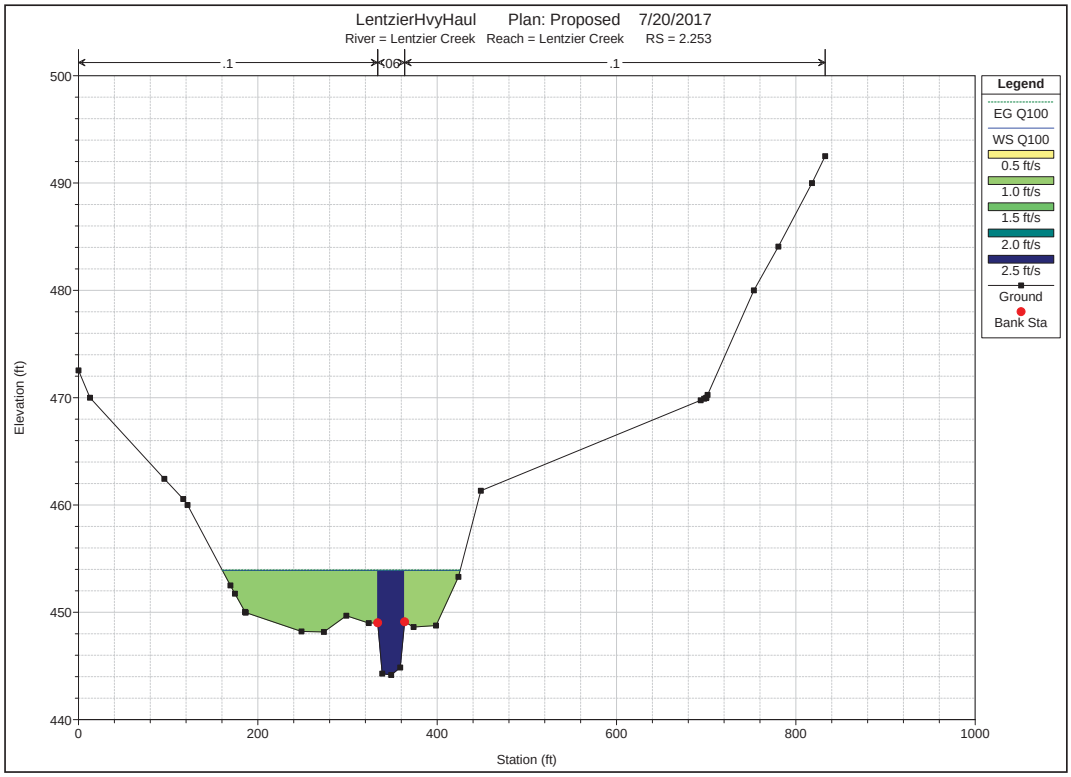

LentzierHvyHaul Plan: Existing 7/20/2017
River = Lentzier Creek Reach = Lentzier Creek RS = 2.611
.1
.06
.1
Legend
EG Q100
WS Q100
0.5 ft/s
1.0 ft/s
1.5 ft/s
2.0 ft/s
2.5 ft/s
Ground
Bank Sta
Elevation (ft)
Station (ft)
500
490
480
470
460
450
440
0
200
400
600
800
1000

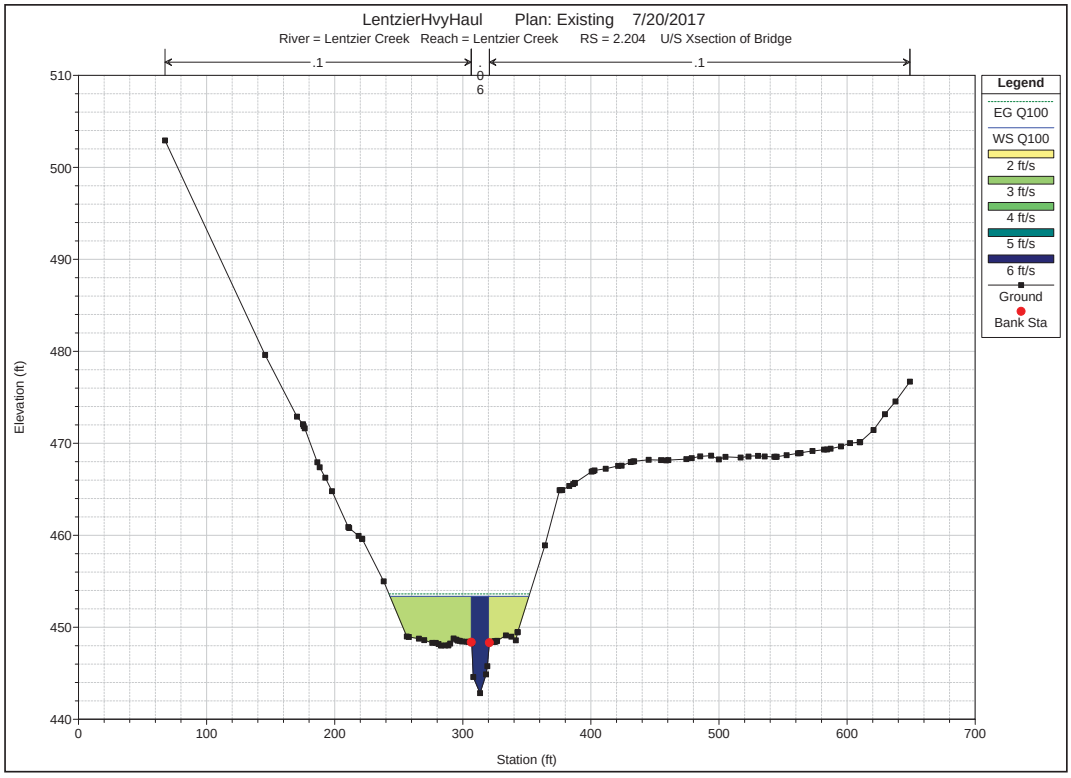

LentzierHvyHaul Plan: Proposed 7/20/2017
River = Lentzier Creek Reach = Lentzier Creek RS = 2.611
.1
.06
.1
Legend
EG Q100
WS Q100
0.5 ft/s
1.0 ft/s
1.5 ft/s
2.0 ft/s
2.5 ft/s
Ground
Bank Sta
Elevation (ft)
Station (ft)
500
490
480
470
460
450
440
0
200
400
600
800
1000

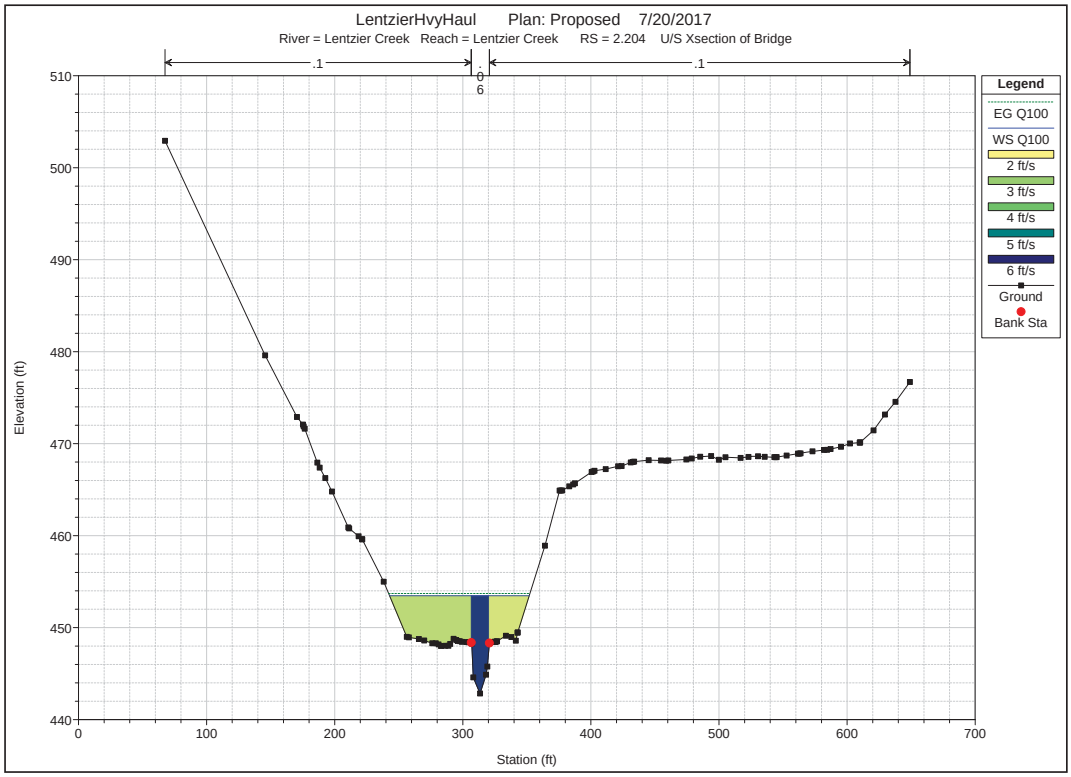

LentzierHvyHaul Plan: Existing 7/20/2017
River = Lentzier Creek Reach = Lentzier Creek RS = 2.411
.1
.06
.1
Legend
EG Q100
WS Q100
0.5 ft/s
1.0 ft/s
1.5 ft/s
2.0 ft/s
2.5 ft/s
3.0 ft/s
Ground
Bank Sta
Elevation (ft)
Station (ft)

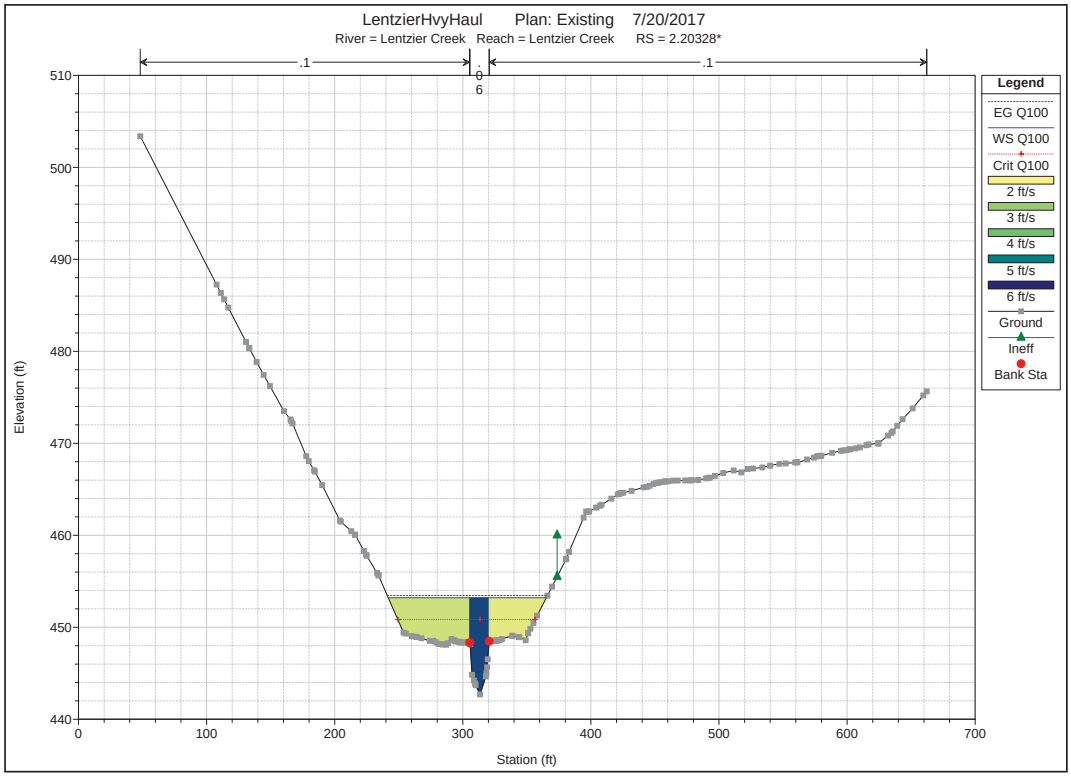

LentzierHvyHaul Plan: Proposed 7/20/2017
River = Lentzier Creek Reach = Lentzier Creek RS = 2.411
.1
.06
.1
Legend
EG Q100
WS Q100
0.5 ft/s
1.0 ft/s
1.5 ft/s
2.0 ft/s
2.5 ft/s
Ground
Bank Sta
Elevation (ft)
Station (ft)

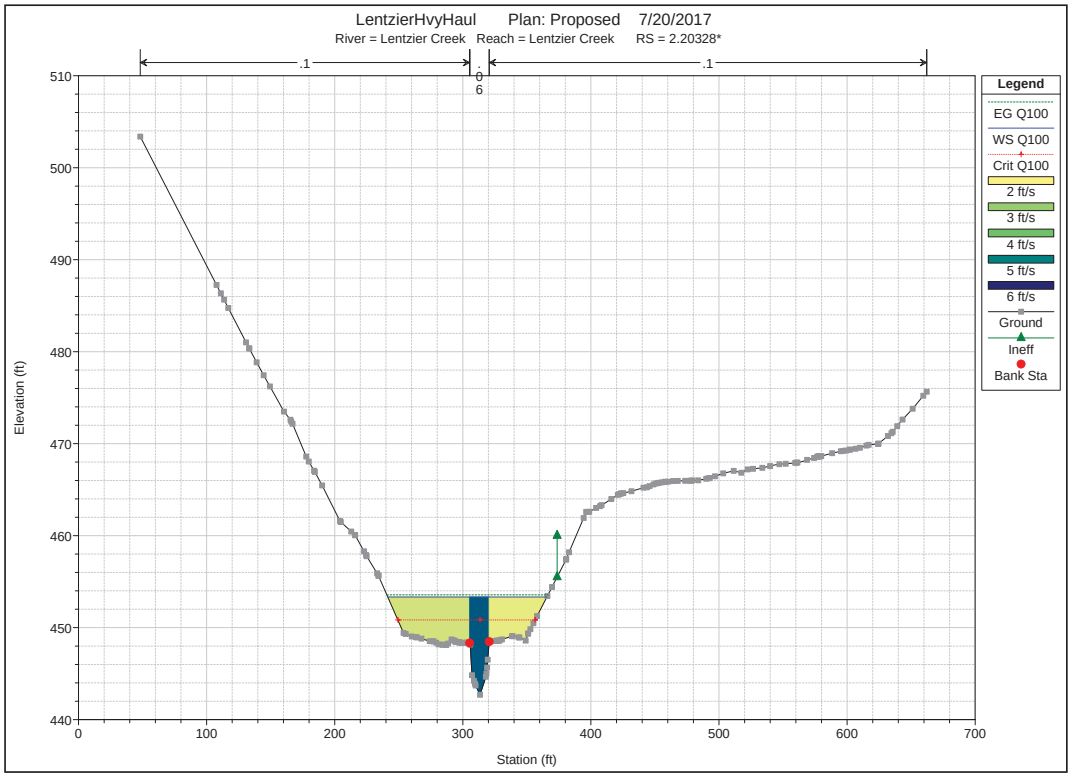

LentzierHvyHaul Plan: Existing 7/20/2017
River = Lentzier Creek Reach = Lentzier Creek RS = 2.253
.1
.06
.1
Legend
EG Q100
WS Q100
0.5 ft/s
1.0 ft/s
1.5 ft/s
2.0 ft/s
2.5 ft/s
3.0 ft/s
Ground
Bank Sta
Elevation (ft)
Station (ft)

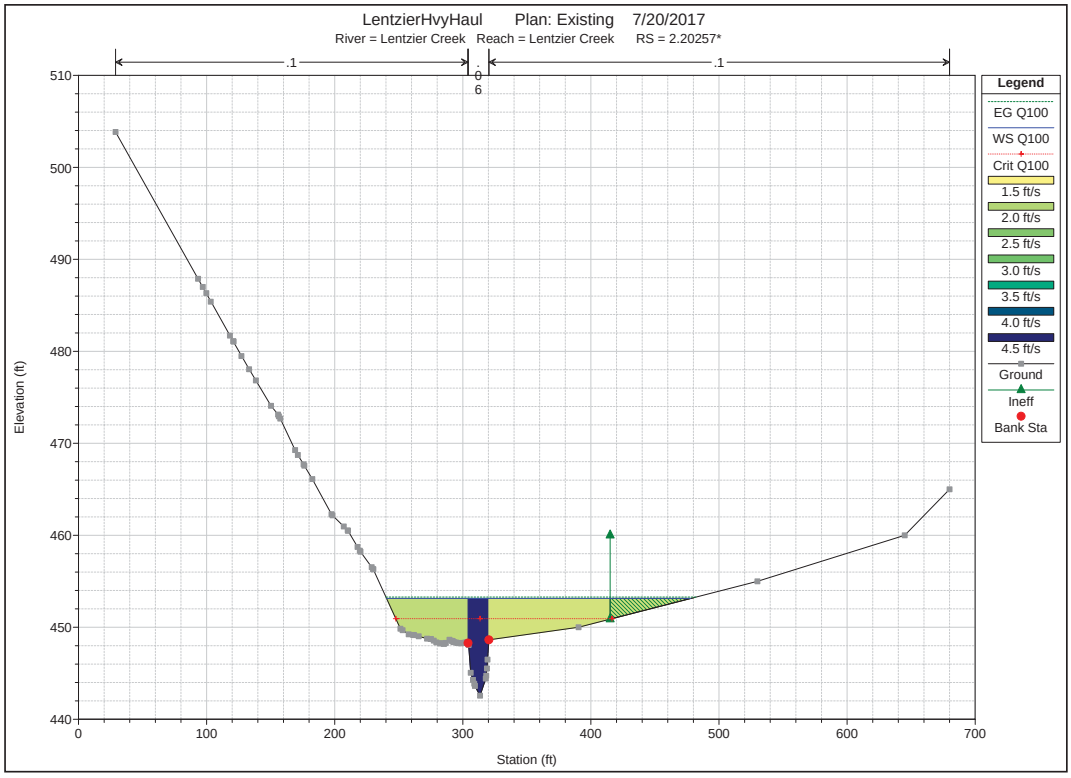

LentzierHvyHaul Plan: Proposed 7/20/2017
River = Lentzier Creek Reach = Lentzier Creek RS = 2.253
.1
.06
.1
Legend
EG Q100
WS Q100
0.5 ft/s
1.0 ft/s
1.5 ft/s
2.0 ft/s
2.5 ft/s
Ground
Bank Sta
Elevation (ft)
Station (ft)

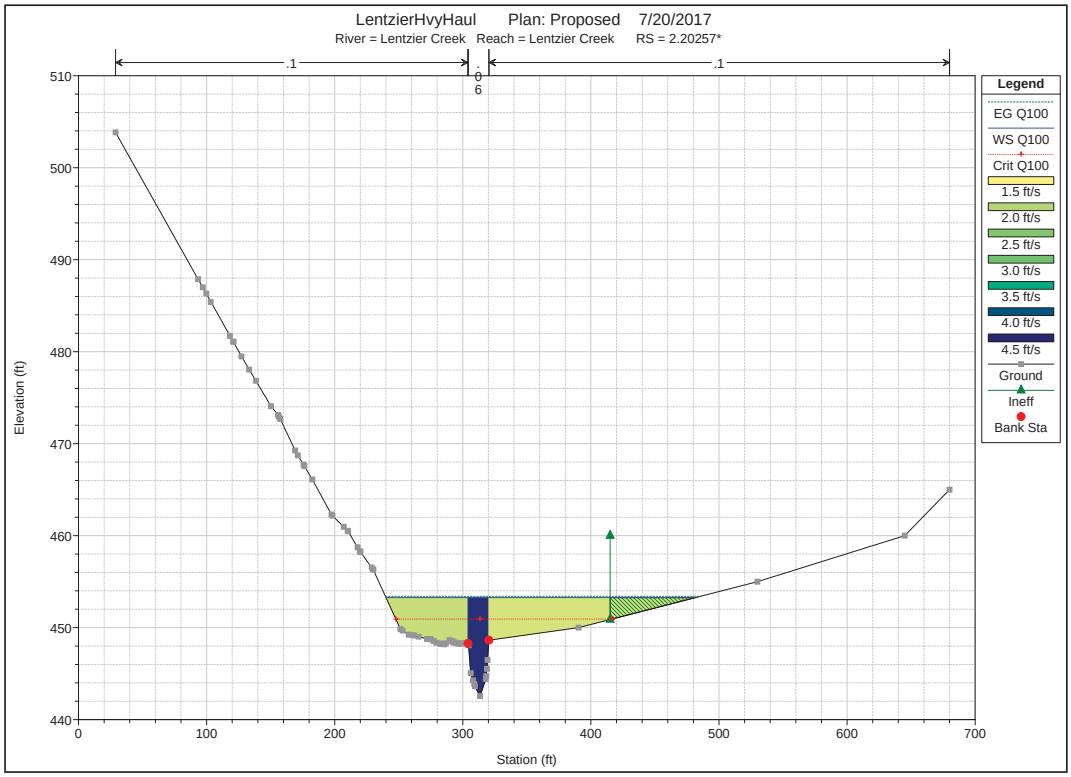

LentzierHvyHaul Plan: Existing 7/20/2017
River = Lentzier Creek Reach = Lentzier Creek RS = 2.204 U/S Xsection of Bridge
.1
.06
.1
Legend
EG Q100
WS Q100
2 ft/s
3 ft/s
4 ft/s
5 ft/s
6 ft/s
Ground
Bank Sta
Elevation (ft)
Station (ft)

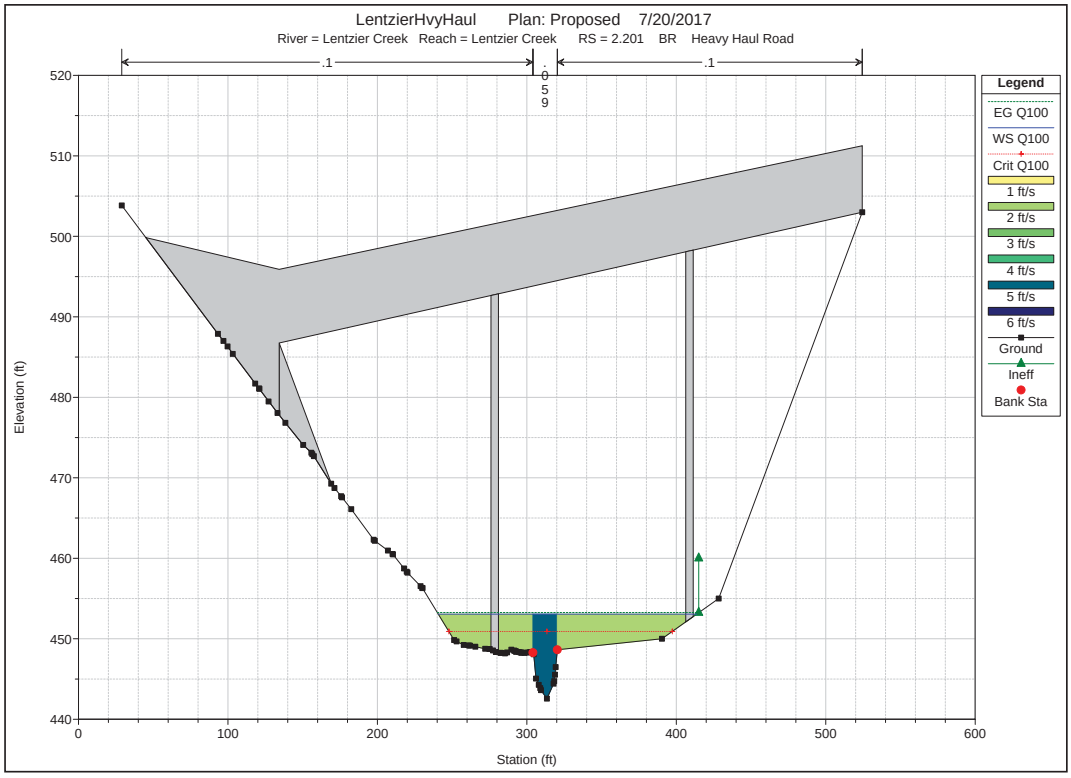

LentzierHvyHaul Plan: Proposed 7/20/2017
River = Lentzier Creek Reach = Lentzier Creek RS = 2.204 U/S Xsection of Bridge
.1
.06
.1
Legend
EG Q100
WS Q100
2 ft/s
3 ft/s
4 ft/s
5 ft/s
6 ft/s
Ground
Bank Sta
Elevation (ft)
Station (ft)

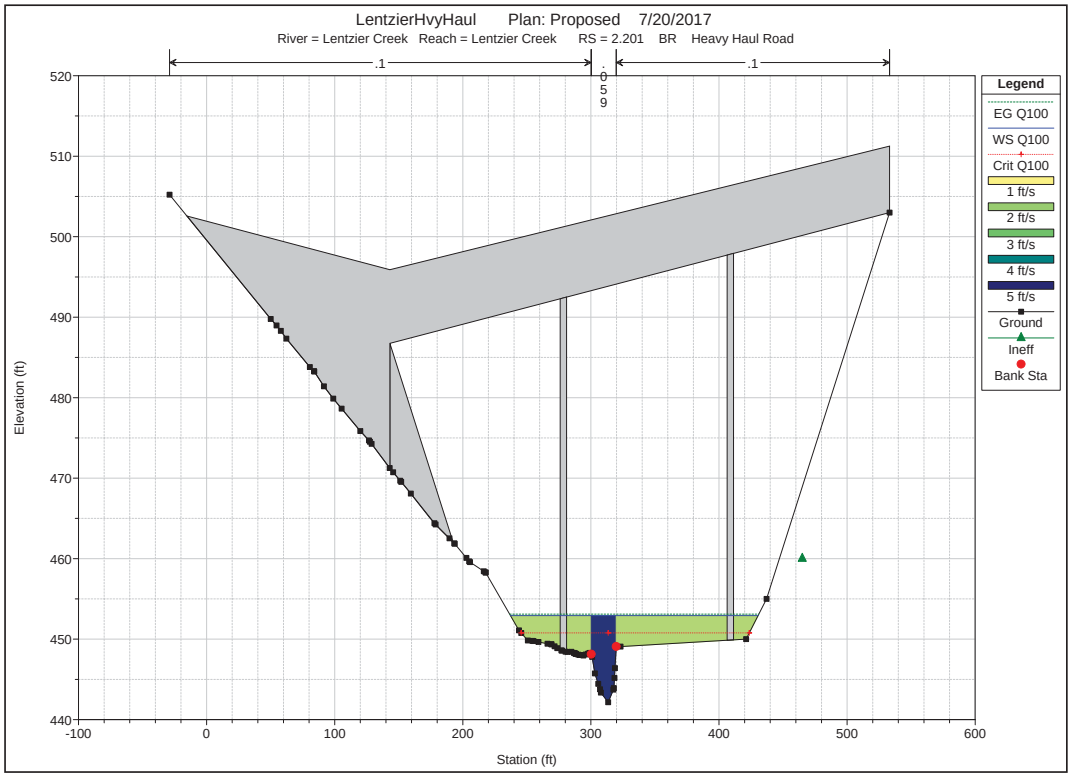

LentzierHvyHaul Plan: Existing 7/20/2017
River = Lentzier Creek Reach = Lentzier Creek RS = 2.20328*
.1
.1
.06
Legend
EG Q100
WS Q100
Crit Q100
2 ft/s
3 ft/s
4 ft/s
5 ft/s
6 ft/s
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)

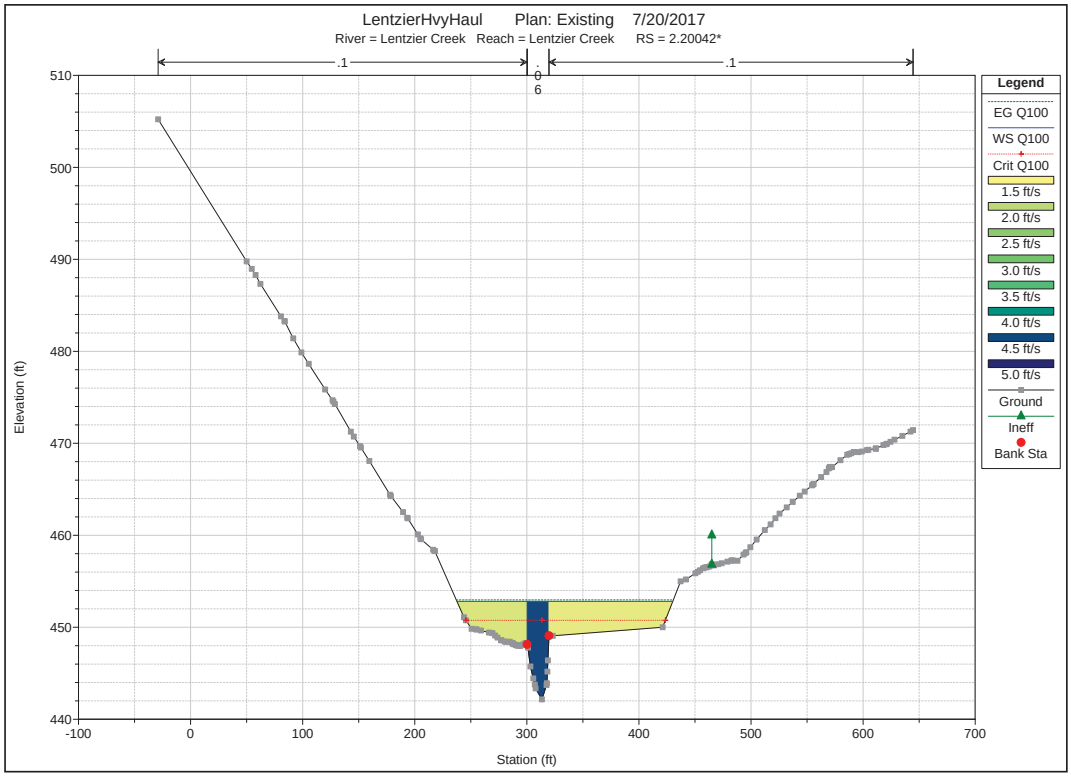

LentzierHvyHaul Plan: Proposed 7/20/2017
River = Lentzier Creek Reach = Lentzier Creek RS = 2.20328*
.1
.1
.06
Legend
EG Q100
WS Q100
Crit Q100
2 ft/s
3 ft/s
4 ft/s
5 ft/s
6 ft/s
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)

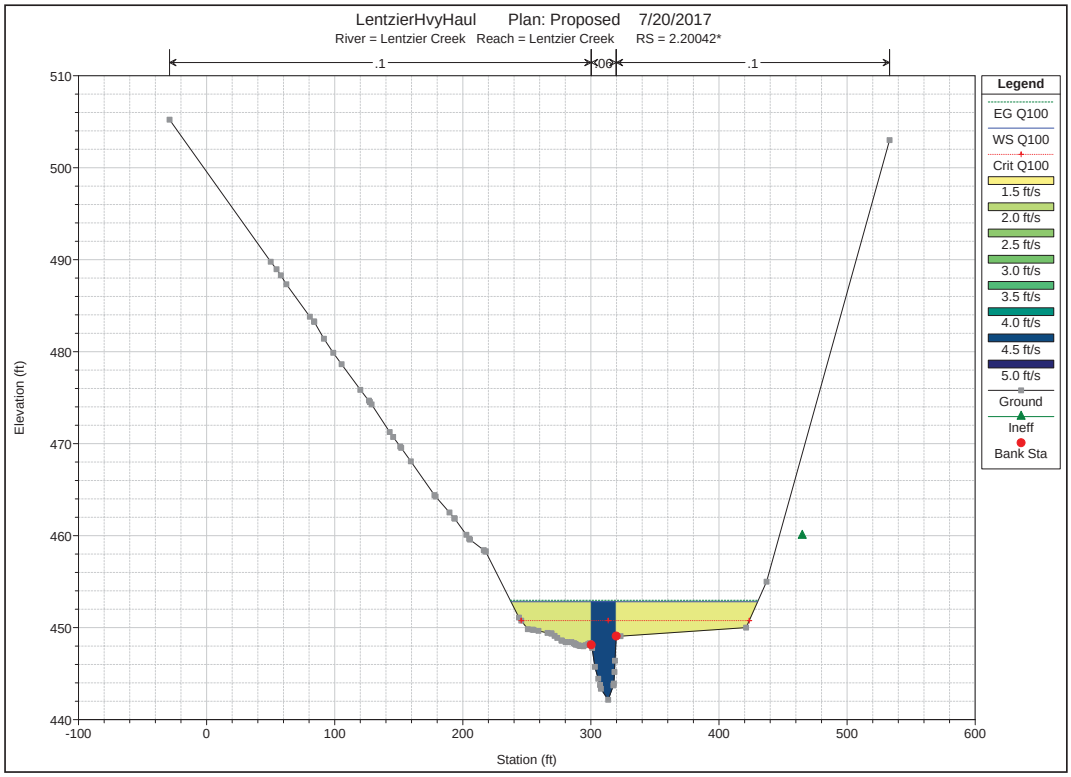

LentzierHvyHaul Plan: Existing 7/20/2017
River = Lentzier Creek Reach = Lentzier Creek RS = 2.20257*
.1
.06
.1
Legend
EG Q100
WS Q100
Crit Q100
1.5 ft/s
2.0 ft/s
2.5 ft/s
3.0 ft/s
3.5 ft/s
4.0 ft/s
4.5 ft/s
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)

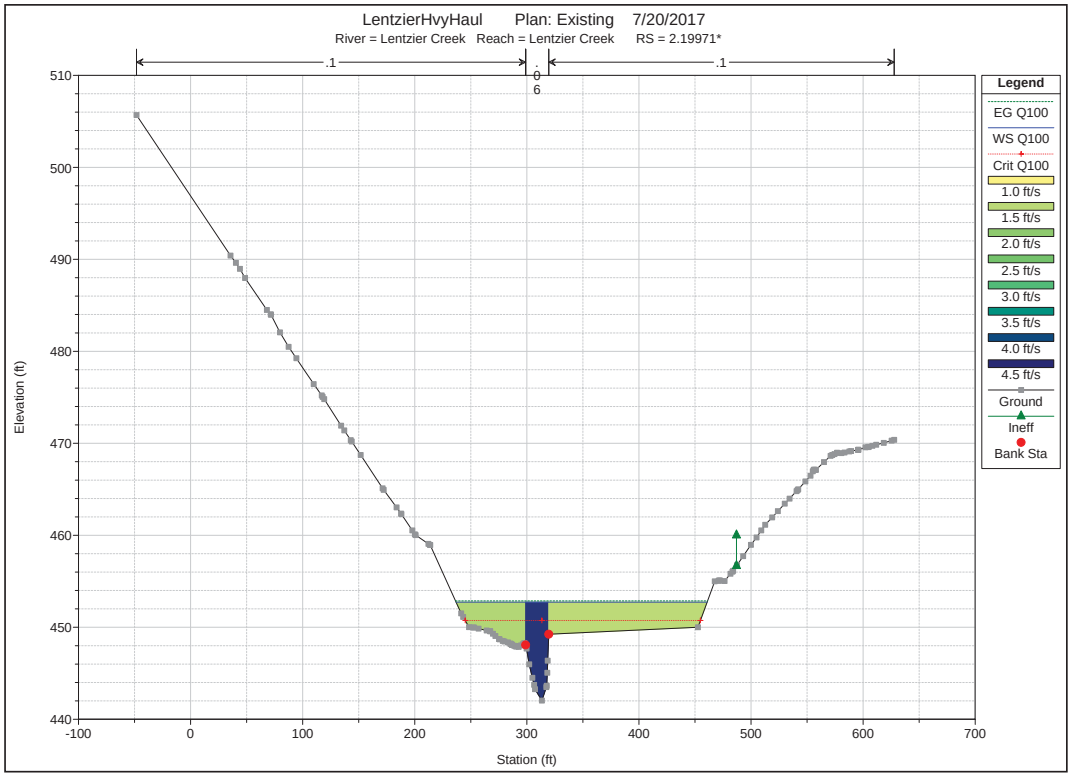

LentzierHvyHaul Plan: Proposed 7/20/2017
River = Lentzier Creek Reach = Lentzier Creek RS = 2.20257*
.1
.06
.1
Legend
EG Q100
WS Q100
Crit Q100
1.5 ft/s
2.0 ft/s
2.5 ft/s
3.0 ft/s
3.5 ft/s
4.0 ft/s
4.5 ft/s
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)

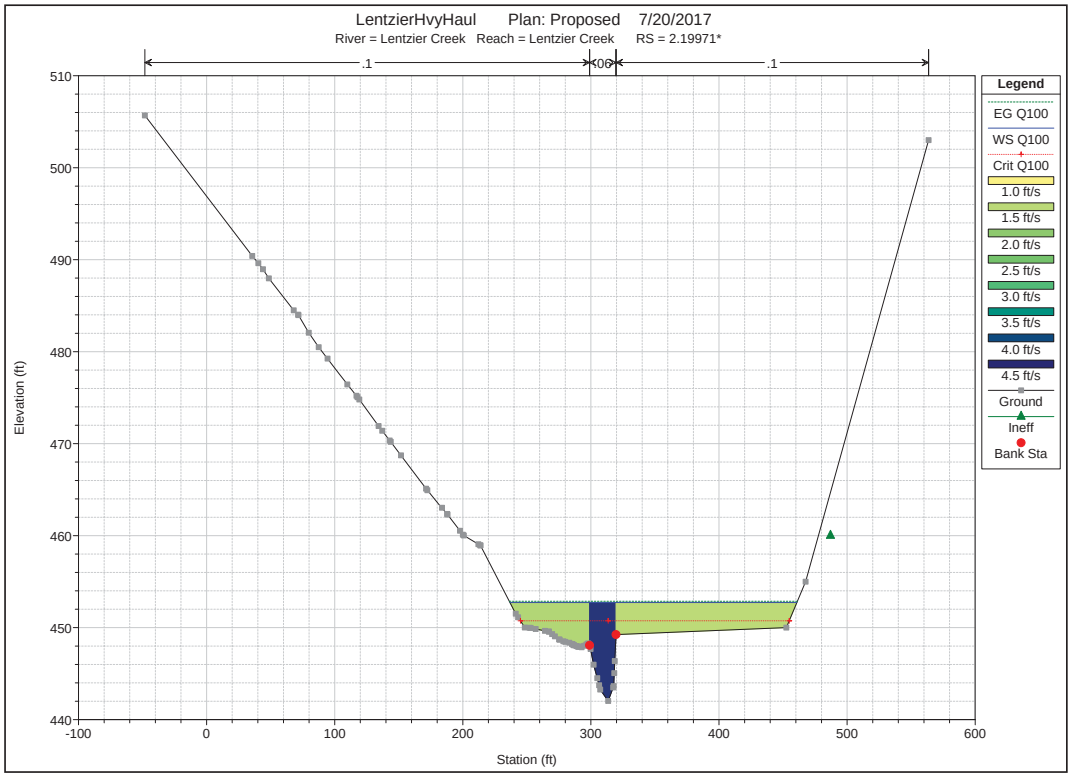

LentzierHvyHaul Plan: Proposed 7/20/2017
River = Lentzier Creek Reach = Lentzier Creek RS = 2.201 BR Heavy Haul Road
.1
.059
.1
Legend
EG Q100
WS Q100
Crit Q100
1 ft/s
2 ft/s
3 ft/s
4 ft/s
5 ft/s
6 ft/s
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)

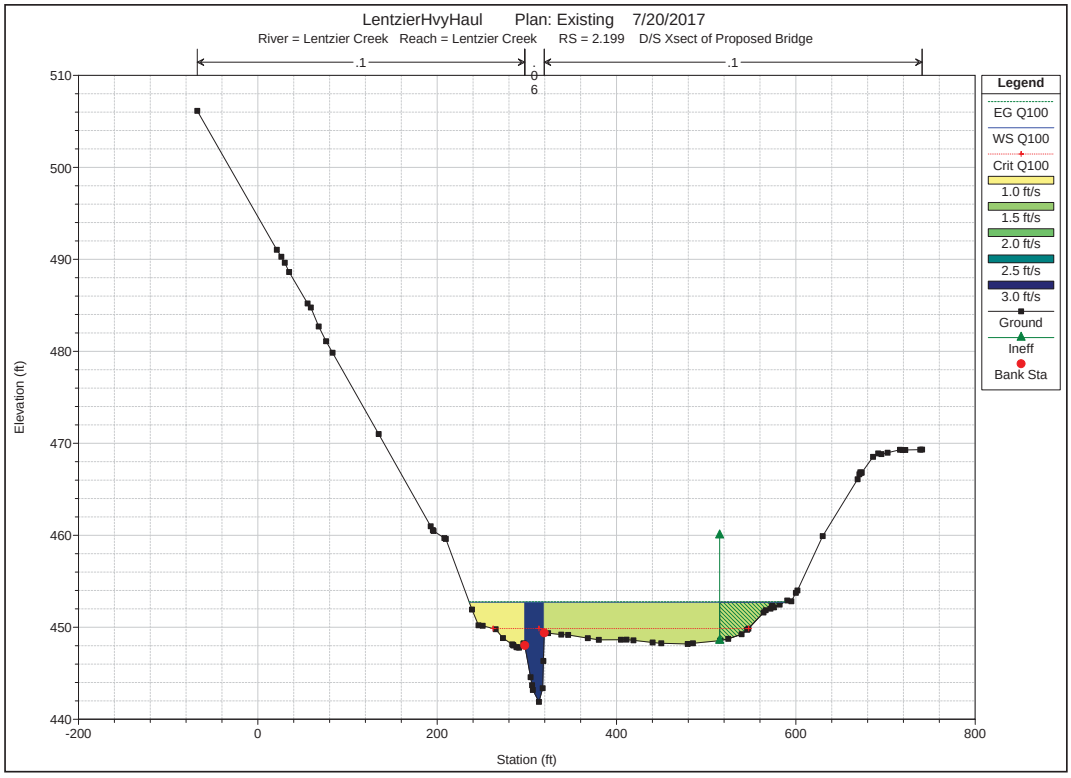

LentzierHvyHaul Plan: Proposed 7/20/2017
River = Lentzier Creek Reach = Lentzier Creek RS = 2.201 BR Heavy Haul Road
.1
.059
.1
Legend
EG Q100
WS Q100
Crit Q100
1 ft/s
2 ft/s
3 ft/s
4 ft/s
5 ft/s
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)

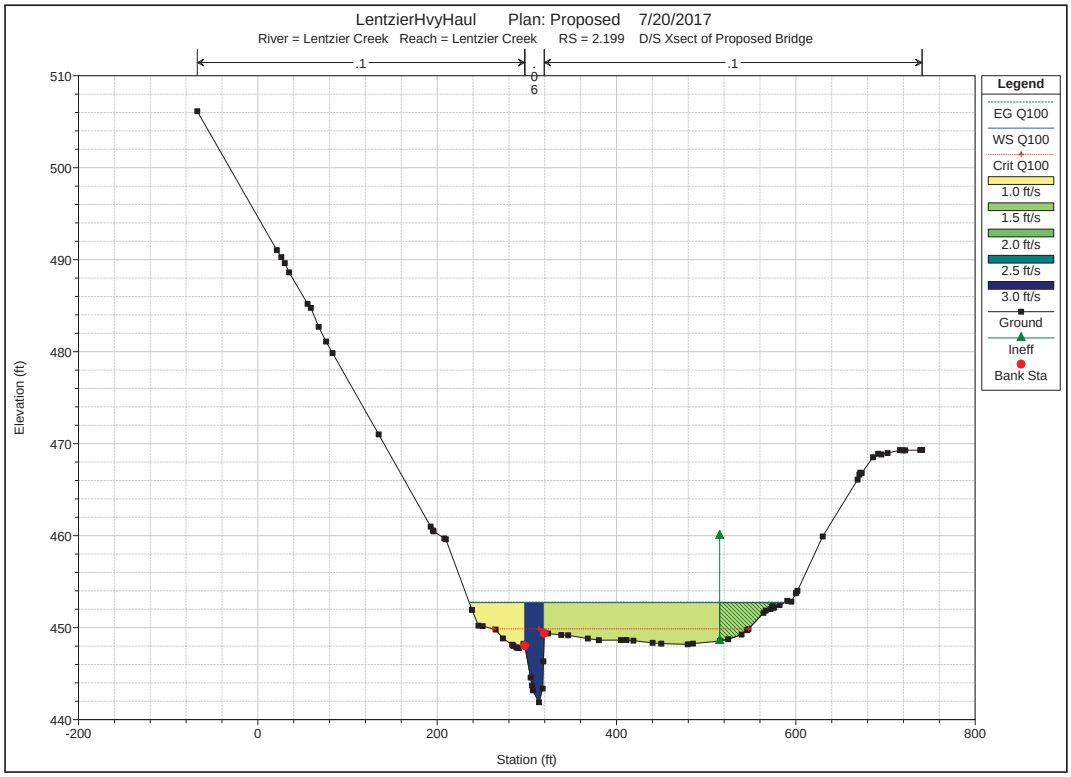

LentzierHvyHaul Plan: Existing 7/20/2017
River = Lentzier Creek Reach = Lentzier Creek RS = 2.20042*
.1
.1
Elevation (ft)
Station (ft)
Legend
EG Q100
WS Q100
Crit Q100
1.5 ft/s
2.0 ft/s
2.5 ft/s
3.0 ft/s
3.5 ft/s
4.0 ft/s
4.5 ft/s
5.0 ft/s
Ground
Ineff
Bank Sta

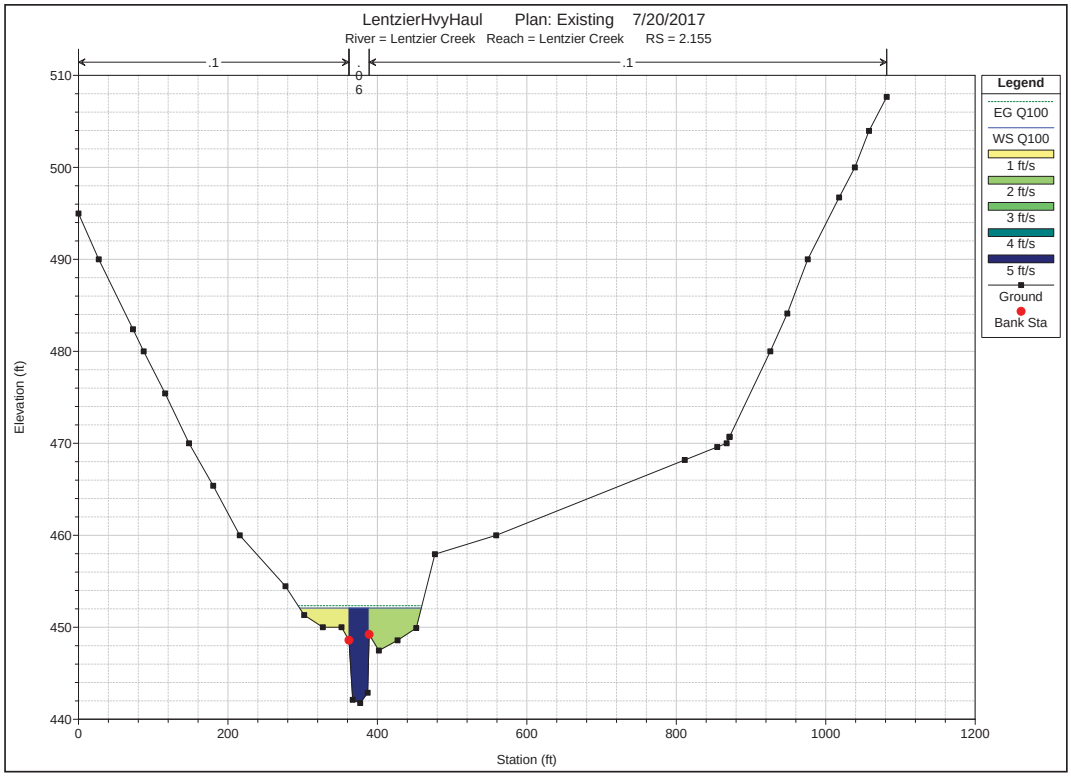

LentzierHvyHaul Plan: Proposed 7/20/2017
River = Lentzier Creek Reach = Lentzier Creek RS = 2.20042*
.1
.1
Elevation (ft)
Station (ft)
Legend
EG Q100
WS Q100
Crit Q100
1.5 ft/s
2.0 ft/s
2.5 ft/s
3.0 ft/s
3.5 ft/s
4.0 ft/s
4.5 ft/s
5.0 ft/s
Ground
Ineff
Bank Sta

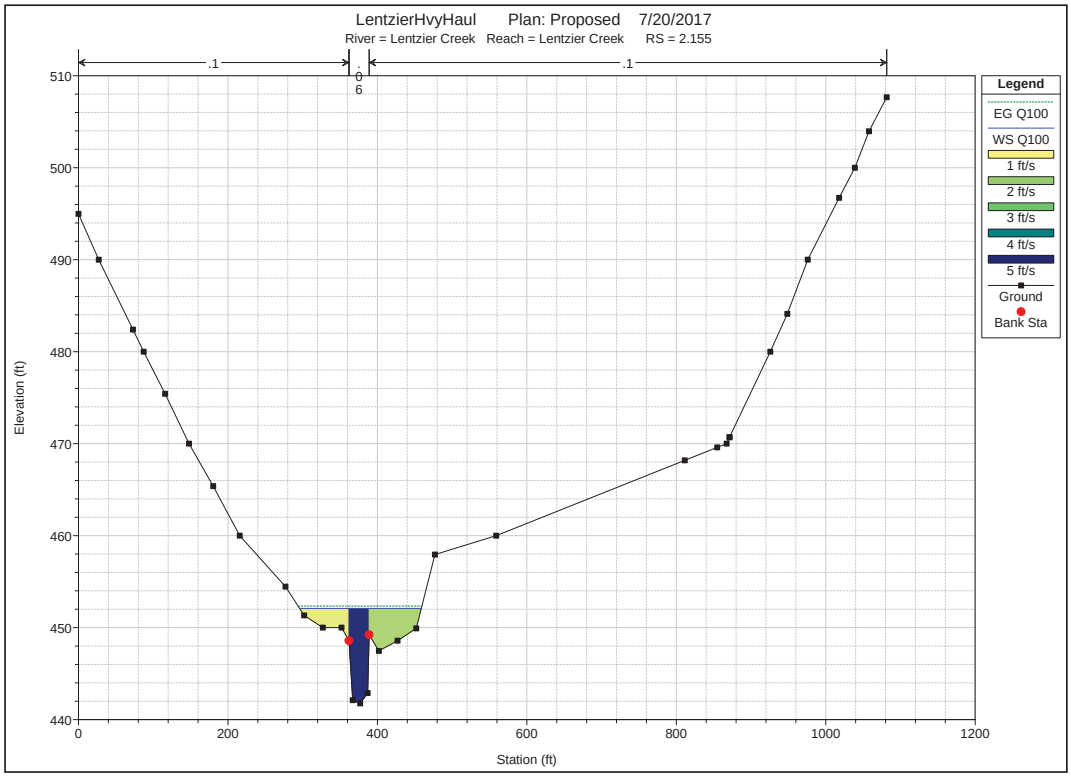

LentzierHvyHaul Plan: Existing 7/20/2017
River = Lentzier Creek Reach = Lentzier Creek RS = 2.19971*
.1
.06
.1
Elevation (ft)
Station (ft)
Legend
EG Q100
WS Q100
Crit Q100
1.0 ft/s
1.5 ft/s
2.0 ft/s
2.5 ft/s
3.0 ft/s
3.5 ft/s
4.0 ft/s
4.5 ft/s
Ground
Ineff
Bank Sta

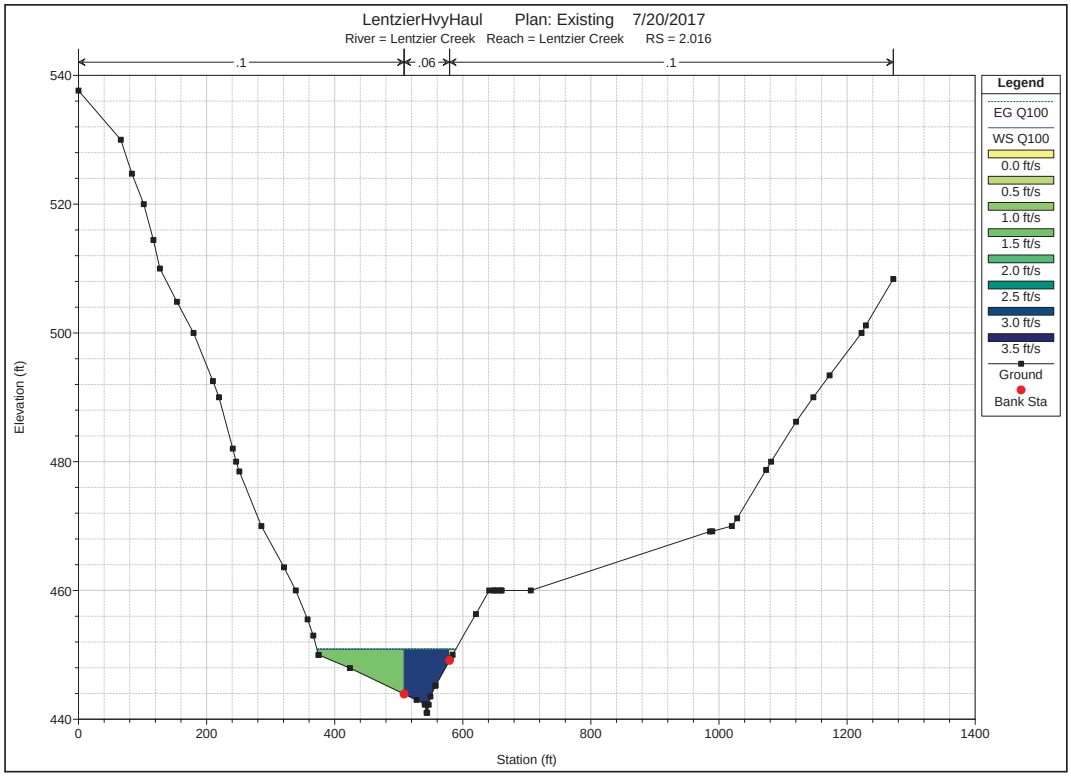

LentzierHvyHaul Plan: Proposed 7/20/2017
River = Lentzier Creek Reach = Lentzier Creek RS = 2.19971*
.1
.06
.1
Elevation (ft)
Station (ft)
Legend
EG Q100
WS Q100
Crit Q100
1.0 ft/s
1.5 ft/s
2.0 ft/s
2.5 ft/s
3.0 ft/s
3.5 ft/s
4.0 ft/s
4.5 ft/s
Ground
Ineff
Bank Sta

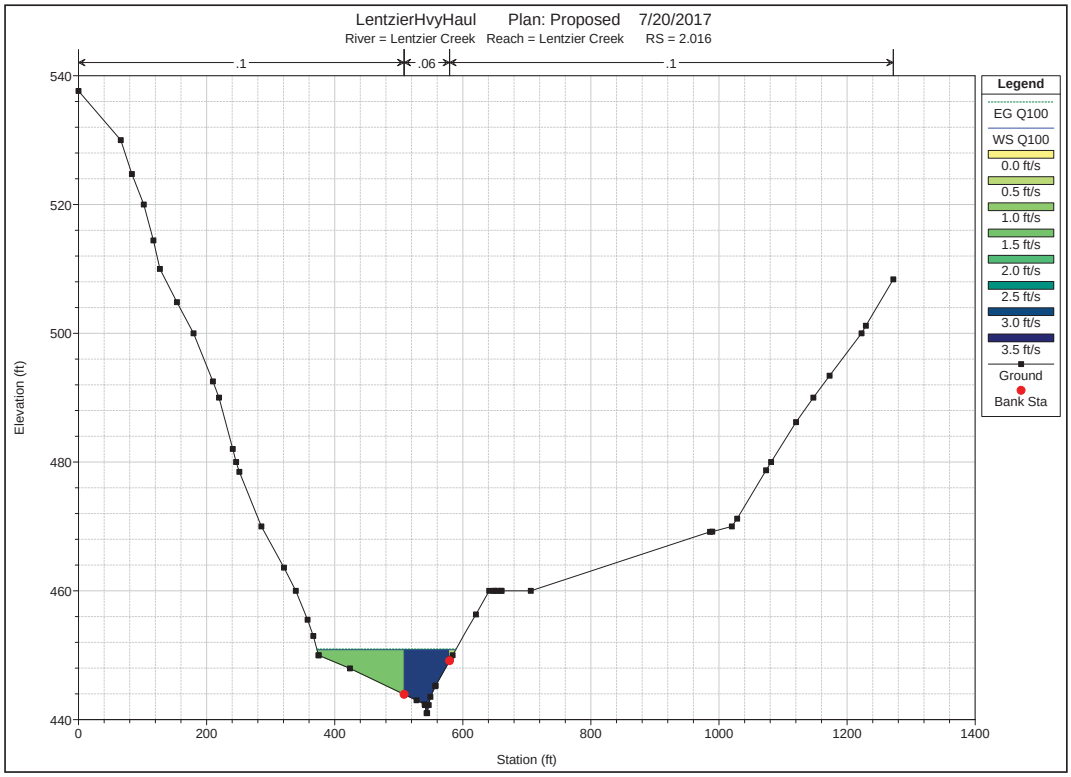

LentzierHvyHaul Plan: Existing 7/20/2017
River = Lentzier Creek Reach = Lentzier Creek RS = 2.199 D/S Xsect of Proposed Bridge
.1
.06
.1
Legend
EG Q100
WS Q100
Crit Q100
1.0 ft/s
1.5 ft/s
2.0 ft/s
2.5 ft/s
3.0 ft/s
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
510
500
490
480
470
460
450
440
-200
0
200
400
600
800

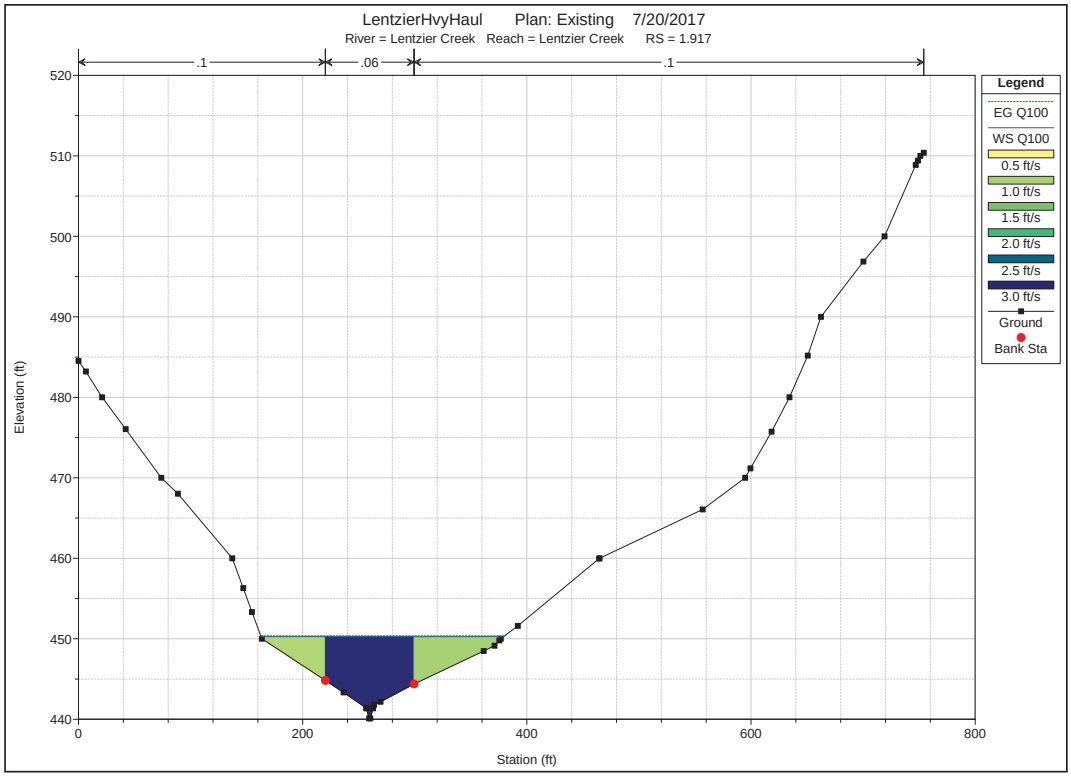

LentzierHvyHaul Plan: Proposed 7/20/2017
River = Lentzier Creek Reach = Lentzier Creek RS = 2.199 D/S Xsect of Proposed Bridge
.1
.06
.1
Legend
EG Q100
WS Q100
Crit Q100
1.0 ft/s
1.5 ft/s
2.0 ft/s
2.5 ft/s
3.0 ft/s
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
510
500
490
480
470
460
450
440
-200
0
200
400
600
800

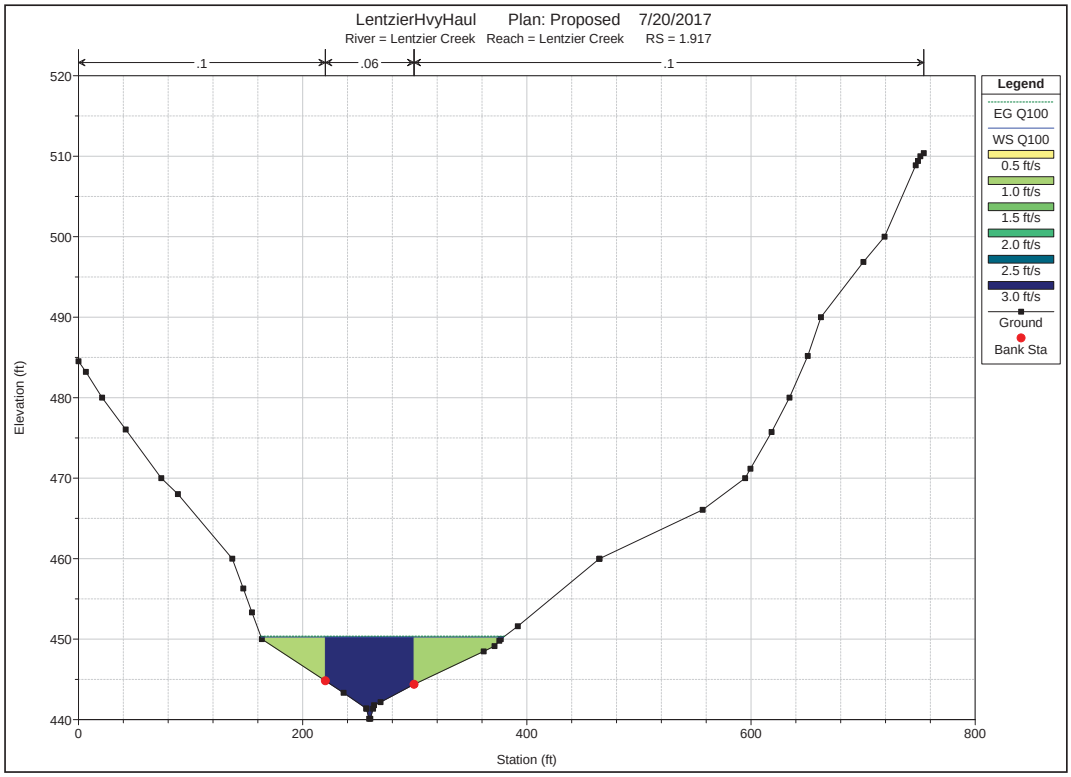

LentzierHvyHaul Plan: Existing 7/20/2017
River = Lentzier Creek Reach = Lentzier Creek RS = 2.155
.1
.06
.1
Legend
EG Q100
WS Q100
1 ft/s
2 ft/s
3 ft/s
4 ft/s
5 ft/s
Ground
Bank Sta
Elevation (ft)
Station (ft)
510
500
490
480
470
460
450
440
0
200
400
600
800
1000
1200

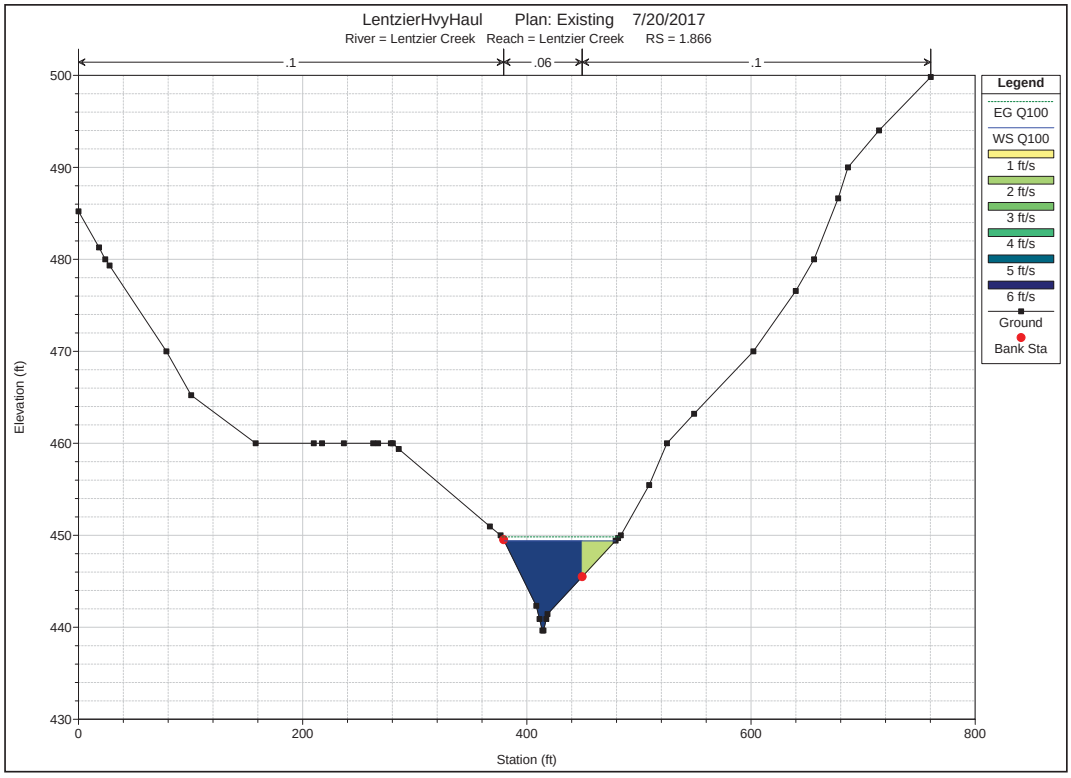

LentzierHvyHaul Plan: Proposed 7/20/2017
River = Lentzier Creek Reach = Lentzier Creek RS = 2.155
.1
.06
.1
Legend
EG Q100
WS Q100
1 ft/s
2 ft/s
3 ft/s
4 ft/s
5 ft/s
Ground
Bank Sta
Elevation (ft)
Station (ft)
510
500
490
480
470
460
450
440
0
200
400
600
800
1000
1200

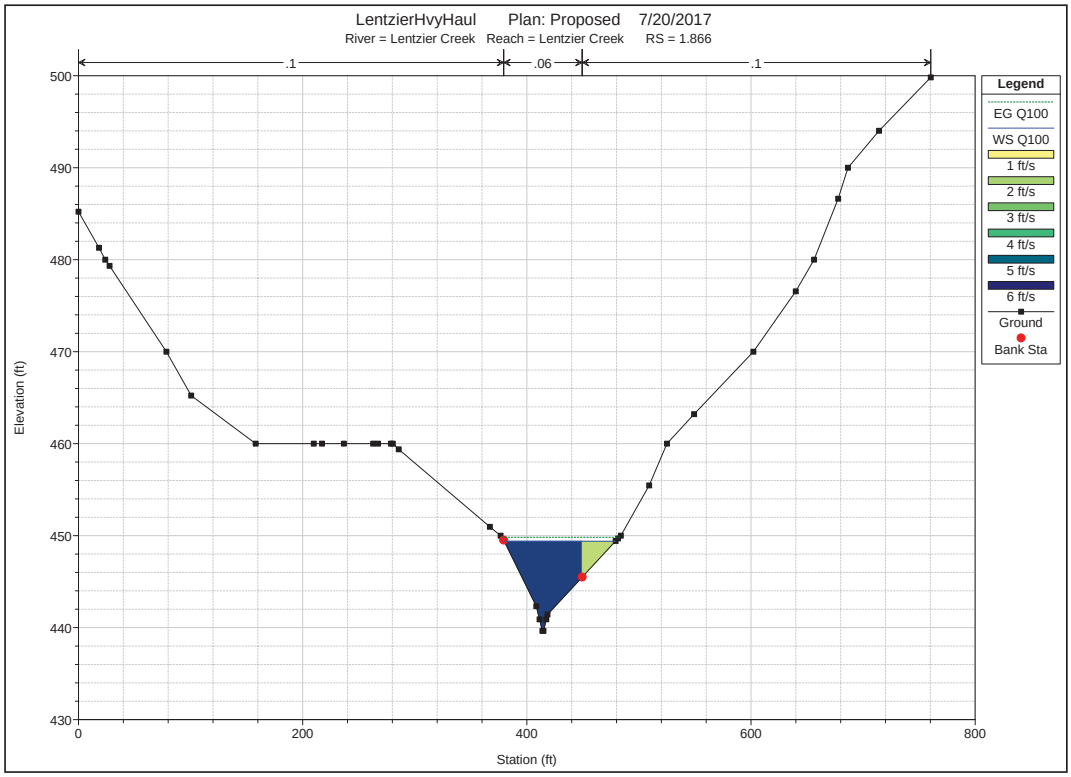

LentzierHvyHaul Plan: Existing 7/20/2017
River = Lentzier Creek Reach = Lentzier Creek RS = 2.016
.1
.06
.1
Elevation (ft)
Station (ft)
Legend
EG Q100
WS Q100
0.0 ft/s
0.5 ft/s
1.0 ft/s
1.5 ft/s
2.0 ft/s
2.5 ft/s
3.0 ft/s
3.5 ft/s
Ground
Bank Sta

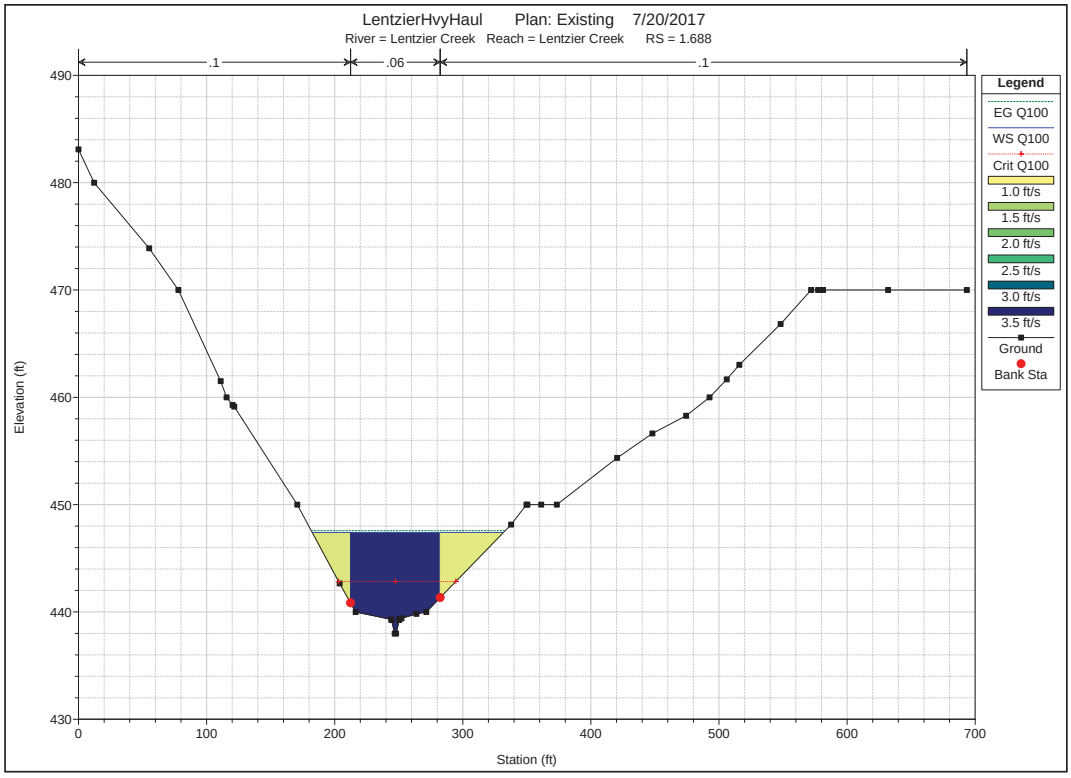

LentzierHvyHaul Plan: Proposed 7/20/2017
River = Lentzier Creek Reach = Lentzier Creek RS = 2.016
.1
.06
.1
Elevation (ft)
Station (ft)
Legend
EG Q100
WS Q100
0.0 ft/s
0.5 ft/s
1.0 ft/s
1.5 ft/s
2.0 ft/s
2.5 ft/s
3.0 ft/s
3.5 ft/s
Ground
Bank Sta

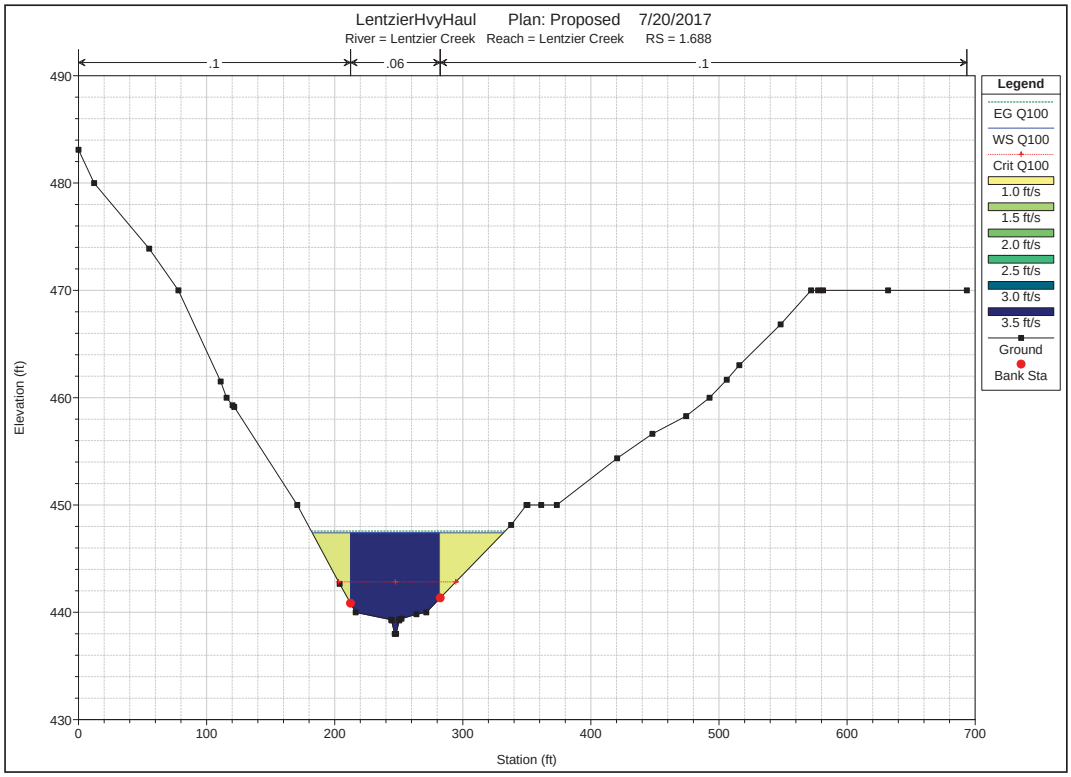

LentzierHvyHaul Plan: Existing 7/20/2017
River = Lentzier Creek Reach = Lentzier Creek RS = 1.917
.1
.06
.1
Legend
EG Q100
WS Q100
0.5 ft/s
1.0 ft/s
1.5 ft/s
2.0 ft/s
2.5 ft/s
3.0 ft/s
Ground
Bank Sta
Elevation (ft)
Station (ft)

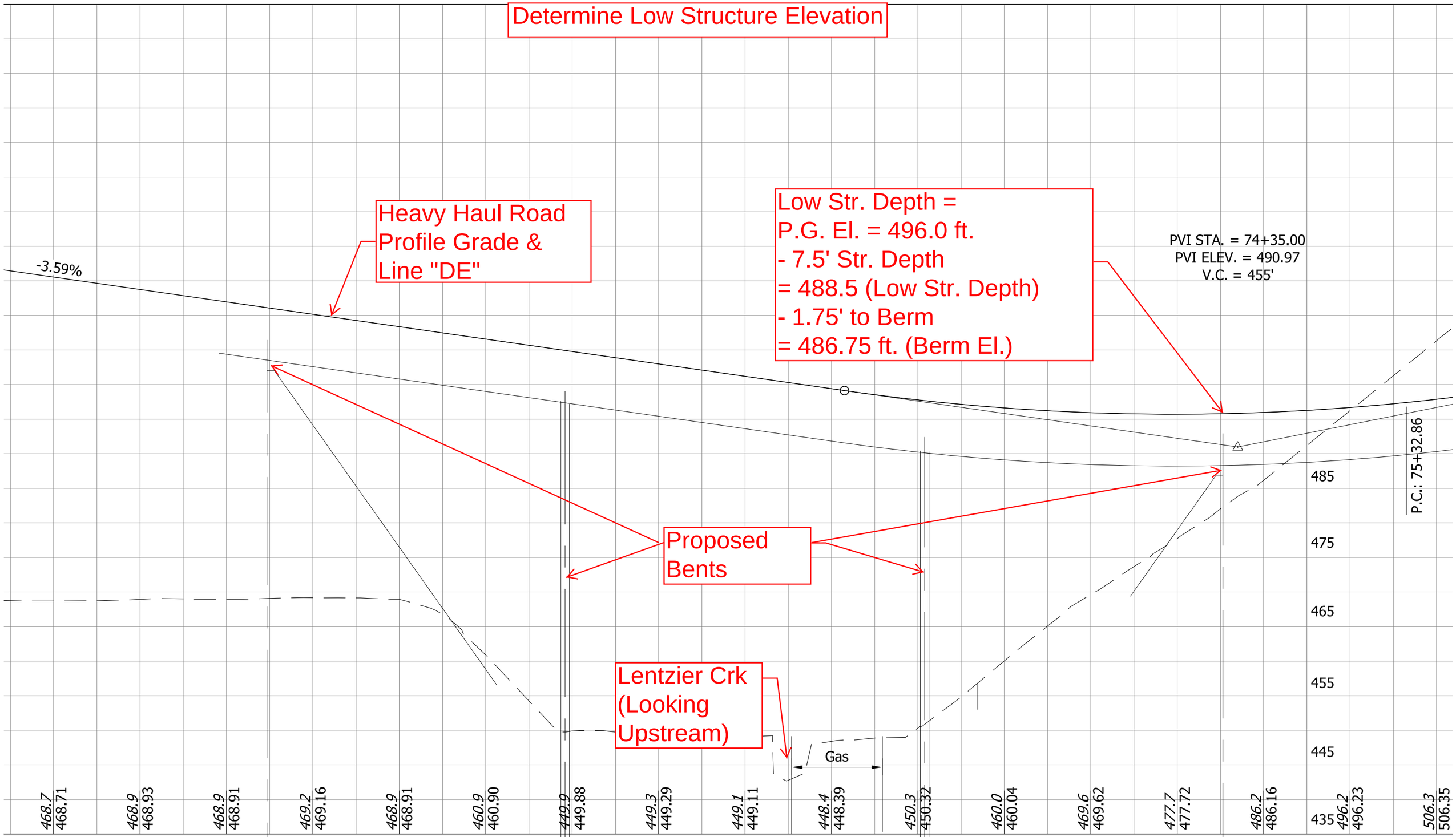

LentzierHvyHaul Plan: Proposed 7/20/2017
River = Lentzier Creek Reach = Lentzier Creek RS = 1.917
.1
.06
.1
Legend
EG Q100
WS Q100
0.5 ft/s
1.0 ft/s
1.5 ft/s
2.0 ft/s
2.5 ft/s
3.0 ft/s
Ground
Bank Sta
Elevation (ft)
Station (ft)


LentzierHvyHaul Plan: Existing 7/20/2017
River = Lentzier Creek Reach = Lentzier Creek RS = 1.866
.1
.06
.1
Legend
EG Q100
WS Q100
1 ft/s
2 ft/s
3 ft/s
4 ft/s
5 ft/s
6 ft/s
Ground
Bank Sta
Elevation (ft)
Station (ft)
500
490
480
470
460
450
440
430
0
200
400
600
800

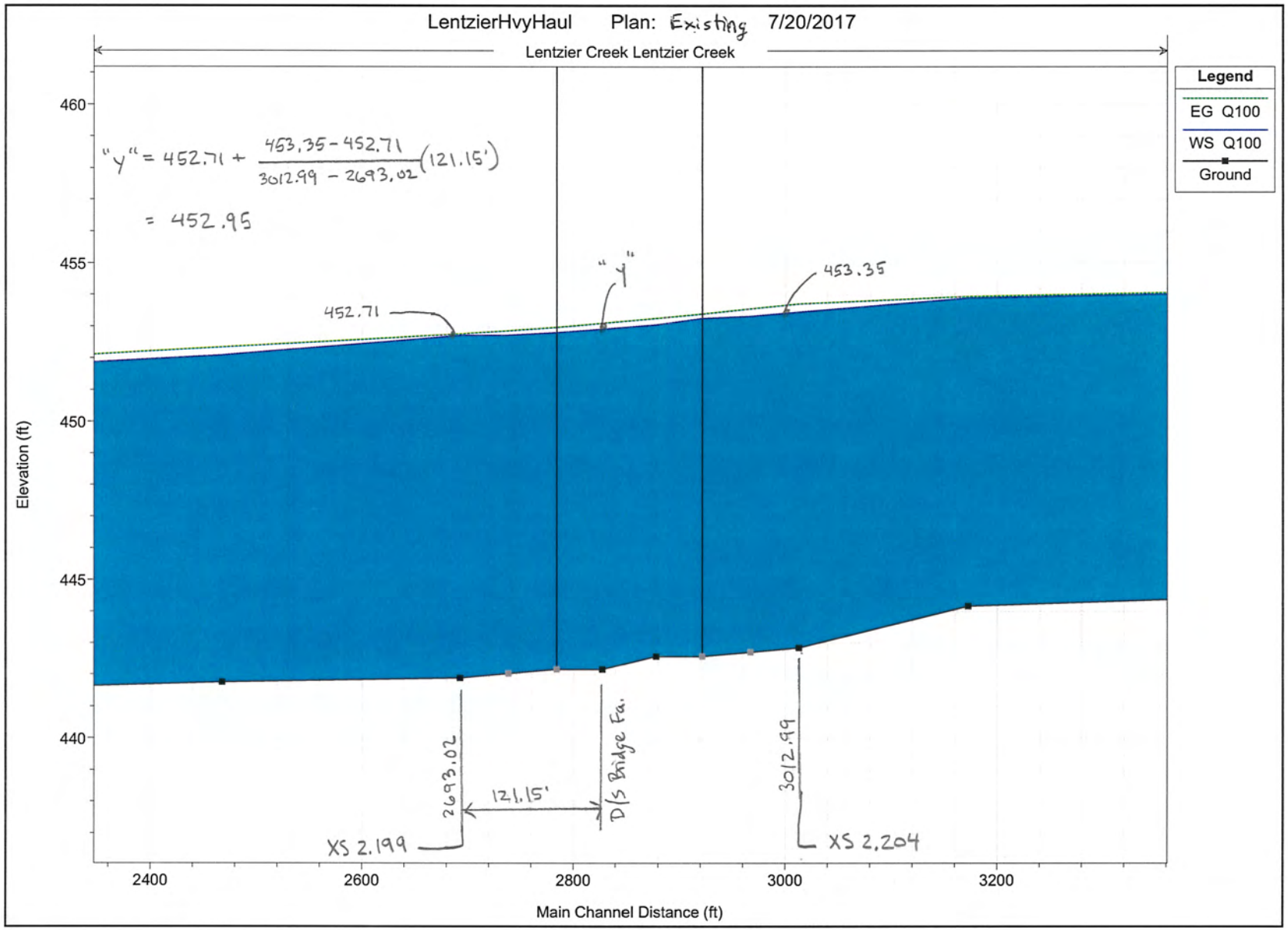

LentzierHvyHaul Plan: Proposed 7/20/2017
River = Lentzier Creek Reach = Lentzier Creek RS = 1.866
.1
.06
.1
Legend
EG Q100
WS Q100
1 ft/s
2 ft/s
3 ft/s
4 ft/s
5 ft/s
6 ft/s
Ground
Bank Sta
Elevation (ft)
Station (ft)
500
490
480
470
460
450
440
430
0
200
400
600
800


LentzierHvyHaul Plan: Existing 7/20/2017
River = Lentzier Creek Reach = Lentzier Creek RS = 1.688
.1
.06
.1
Legend
EG Q100
WS Q100
Crit Q100
1.0 ft/s
1.5 ft/s
2.0 ft/s
2.5 ft/s
3.0 ft/s
3.5 ft/s
Ground
Bank Sta
Elevation (ft)
Station (ft)

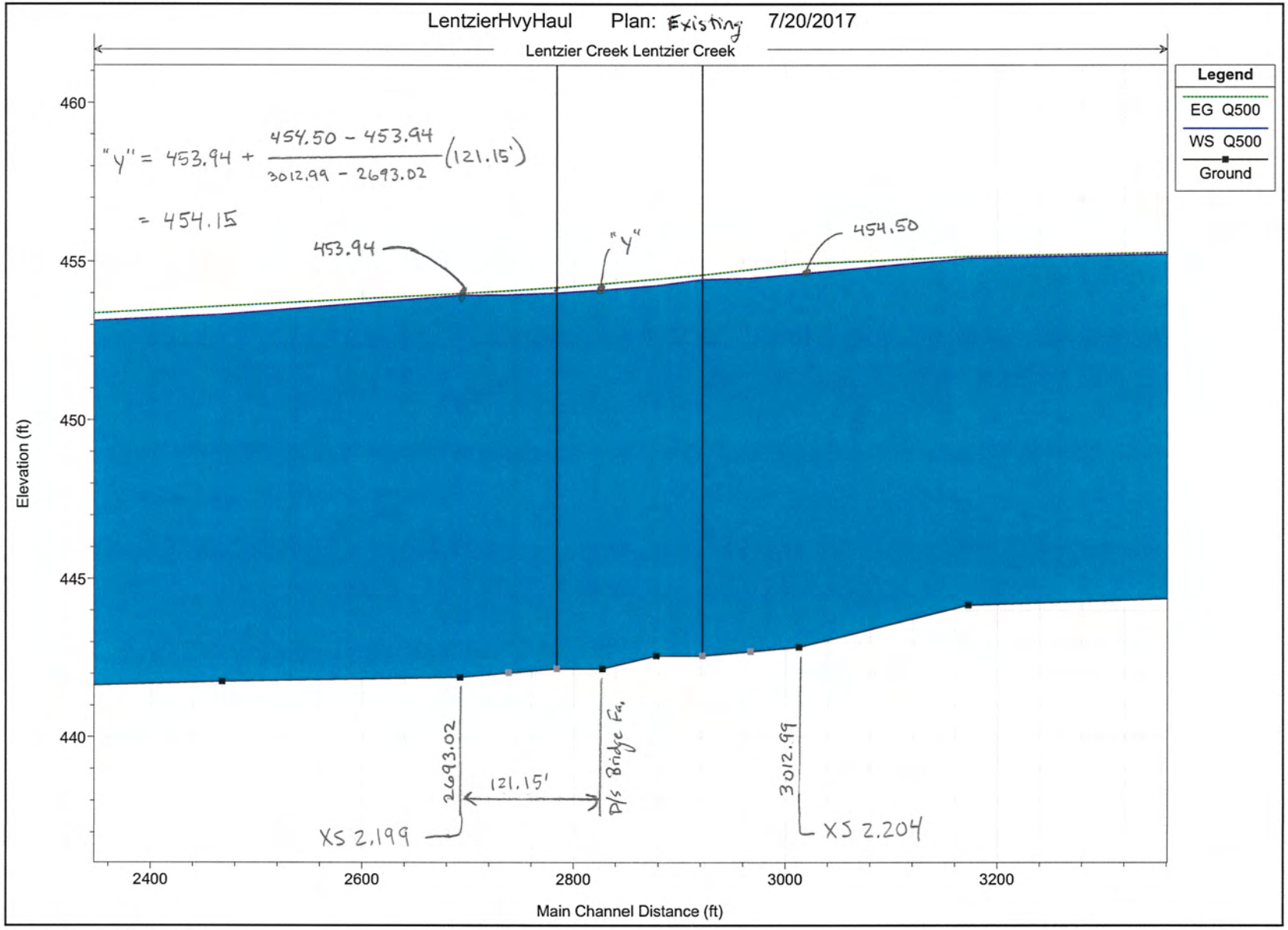

LentzierHvyHaul Plan: Proposed 7/20/2017
River = Lentzier Creek Reach = Lentzier Creek RS = 1.688
.1
.06
.1
Legend
EG Q100
WS Q100
Crit Q100
1.0 ft/s
1.5 ft/s
2.0 ft/s
2.5 ft/s
3.0 ft/s
3.5 ft/s
Ground
Bank Sta
Elevation (ft)
Station (ft)


Determine Low Structure Elevation
Heavy Haul Road Profile Grade & Line "DE"
Low Str. Depth =
P.G. El. = 496.0 ft.
- 7.5' Str. Depth
= 488.5 (Low Str. Depth)
- 1.75' to Berm
= 486.75 ft. (Berm El.)
PVI STA. = 74+35.00
PVI ELEV. = 490.97
V.C. = 455'
-3.59%
P.C.: 75+32.86
Proposed Bents
Lentzier Crk (Looking Upstream)
Gas
485
475
465
455
445
435
468.7 468.71
468.9 468.93
468.9 468.91
469.2 469.16
468.9 468.91
460.9 460.90
449.9 449.88
449.3 449.29
449.1 449.11
448.4 448.39
450.3 450.32
460.0 460.04
469.6 469.62
477.7 477.72
486.2 486.16
496.2 496.23
506.3 506.35
68+00
69+00
70+00
71+00
72+00
73+00
74+00
75+00
PROPOSED ELEVATION

Determine Q100 Elevation



Determine Q500 Elevation



HEC-RAS River: Lentzier Creek Reach: Lentzier Creek

Reach	River Sta	Profile	Plan	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
				(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Lentzier Creek	2.253	Q100	Existing	1700.00	444.16	453.82		453.86	0.000684	2.53	1272.09	264.20	0.15
Lentzier Creek	2.253	Q100	Proposed	1700.00	444.16	453.90		453.95	0.000652	2.49	1293.93	264.99	0.15
Lentzier Creek	2.253	Q500	Existing	2380.00	444.16	455.02		455.07	0.000702	2.80	1596.33	275.62	0.16
Lentzier Creek	2.253	Q500	Proposed	2380.00	444.16	455.11		455.17	0.000669	2.75	1623.26	276.55	0.15
Lentzier Creek	2.204	Q100	Existing	1700.00	442.84	453.35		453.62	0.004461	5.70	515.74	108.41	0.34
Lentzier Creek	2.204	Q100	Proposed	1700.00	442.84	453.46		453.72	0.004197	5.58	527.23	108.97	0.33
Lentzier Creek	2.204	Q500	Existing	2380.00	442.84	454.50		454.82	0.004735	6.38	643.18	114.44	0.36
Lentzier Creek	2.204	Q500	Proposed	2380.00	442.84	454.62		454.93	0.004457	6.24	657.31	115.09	0.35
Lentzier Creek	2.20328*	Q100	Existing	1700.00	442.70	453.21	450.84	453.46	0.004000	5.46	554.56	123.36	0.33
Lentzier Creek	2.20328*	Q100	Proposed	1700.00	442.70	453.33	450.84	453.56	0.003730	5.32	569.00	124.15	0.32
Lentzier Creek	2.20328*	Q500	Existing	2380.00	442.70	454.36	451.48	454.64	0.004138	6.03	700.75	131.21	0.34
Lentzier Creek	2.20328*	Q500	Proposed	2380.00	442.70	454.49	451.48	454.76	0.003865	5.88	718.38	132.13	0.33
Lentzier Creek	2.20257*	Q100	Existing	1700.00	442.57	453.14	450.93	453.28	0.002636	4.48	726.40	237.46	0.27
Lentzier Creek	2.20257*	Q100	Proposed	1700.00	442.57	453.26	450.93	453.40	0.002422	4.34	748.13	241.34	0.26
Lentzier Creek	2.20257*	Q500	Existing	2380.00	442.57	454.30	451.44	454.46	0.002500	4.75	932.26	273.87	0.27
Lentzier Creek	2.20257*	Q500	Proposed	2380.00	442.57	454.44	451.44	454.59	0.002313	4.61	957.22	278.23	0.26
Lentzier Creek	2.20042*	Q100	Existing	1700.00	442.16	452.81	450.77	452.97	0.002662	4.53	729.10	192.51	0.27
Lentzier Creek	2.20042*	Q100	Proposed	1700.00	442.16	452.81	450.77	452.97	0.002662	4.53	729.10	192.51	0.27
Lentzier Creek	2.20042*	Q500	Existing	2380.00	442.16	454.02	451.31	454.18	0.002400	4.70	967.03	200.75	0.26
Lentzier Creek	2.20042*	Q500	Proposed	2380.00	442.16	454.02	451.31	454.18	0.002400	4.70	967.03	200.75	0.26

Q100 Backwater is 0.12 ft.
Q500 Backwater is 0.14 ft.

Q100

Flow Distribution Output

File Type Options Help

River: Lentzier Creek Profile: Q100

Reach Lentzier Creek RS: 2.201 BR U Plan: Proposed

Plan: Proposed Lentzier Creek Lentzier Creek RS: 2.201 BR U Profile: Q100

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)	Shear (lb/sq ft)	Power (lb/ft s)
10	Chan	308.49	309.12	30.77	5.72	0.68	1.81	9.14	5.38	1.72	9.25
11	Chan	309.12	309.74	32.69	5.89	0.67	1.92	9.41	5.55	1.80	9.99
12	Chan	309.74	310.37	34.61	6.00	0.65	2.04	9.60	5.76	1.91	10.98
13	Chan	310.37	310.99	35.61	6.11	0.65	2.09	9.76	5.83	1.94	11.30
14	Chan	310.99	311.62	36.62	6.21	0.65	2.15	9.92	5.90	1.97	11.62
15	Chan	311.62	312.25	37.63	6.31	0.65	2.21	10.09	5.96	2.00	11.94
16	Chan	312.25	312.87	38.66	6.42	0.65	2.27	10.25	6.03	2.04	12.27
17	Chan	312.87	313.50	39.60	6.52	0.65	2.33	10.42	6.07	2.06	12.52
18	Chan	313.50	314.12	38.01	6.47	0.68	2.24	10.34	5.87	1.96	11.52
19	Chan	314.12	314.75	36.43	6.31	0.68	2.14	10.08	5.78	1.91	11.04
20	Chan	314.75	315.37	34.88	6.14	0.68	2.05	9.82	5.68	1.86	10.57
21	Chan	315.37	316.00	33.35	5.98	0.68	1.96	9.56	5.58	1.81	10.11
22	Chan	316.00	316.63	31.85	5.82	0.68	1.87	9.30	5.47	1.76	9.65
23	Chan	316.63	317.25	30.38	5.66	0.68	1.79	9.04	5.37	1.71	9.21
24	Chan	317.25	317.88	28.94	5.49	0.68	1.70	8.78	5.27	1.66	

Max. Velocity

Flow Distribution Output

File Type Options Help

River: Lentzier Creek Profile: Q100

Reach Lentzier Creek RS: 2.201 BR D Plan: Proposed

Plan: Proposed Lentzier Creek Lentzier Creek RS: 2.201 BR D Profile: Q100

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)	Shear (lb/sq ft)	Power (lb/ft s)
13	Chan	307.77	308.52	37.98	7.23	0.77	2.23	9.62	5.26	1.59	8.38
14	Chan	308.52	309.27	39.25	7.35	0.77	2.31	9.78	5.34	1.63	8.73
15	Chan	309.27	310.02	40.32	7.47	0.77	2.37	9.94	5.40	1.66	8.97
16	Chan	310.02	310.77	41.41	7.59	0.77	2.44	10.11	5.46	1.69	9.21
17	Chan	310.77	311.52	42.51	7.71	0.77	2.50	10.27	5.52	1.71	9.45
18	Chan	311.52	312.27	43.62	7.83	0.77	2.57	10.43	5.57	1.74	9.70
19	Chan	312.27	313.02	44.74	7.95	0.77	2.63	10.59	5.63	1.77	9.95
20	Chan	313.02	313.77	44.97	8.04	0.78	2.65	10.70	5.60	1.75	9.80
21	Chan	313.77	314.52	42.72	7.87	0.80	2.51	10.49	5.43	1.67	9.07
22	Chan	314.52	315.28	40.78	7.66	0.80	2.40	10.20	5.33	1.63	8.66
23	Chan	315.28	316.03	38.88	7.44	0.80	2.29	9.91	5.22	1.58	8.26
24	Chan	316.03	316.78	37.02	7.23	0.80	2.18	9.62	5.12	1.53	7.86
25	Chan	316.78	317.53	35.18	7.01	0.80	2.07	9.34	5.02	1.49	7.47
26	Chan	317.53	318.28	20.96	6.60	1.50	1.23	8.79	3.18	0.75	2.38
27	Chan	318.28	319.03	10.87	5.21	2.23	0.64	6.93	2.09	0.40	0.83

Q500

Flow Distribution Output

File Type Options Help

River: Lentzier Creek Profile: Q500

Reach Lentzier Creek RS: 2.201 BR U Plan: Proposed

Plan: Proposed Lentzier Creek Lentzier Creek RS: 2.201 BR U Profile: Q500

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)	Shear (lb/sq ft)	Power (lb/ft s)
13	Chan	310.37	310.99	42.44	6.85	0.65	1.78	10.95	6.19	2.07	12.83
14	Chan	310.99	311.62	43.51	6.95	0.65	1.83	11.11	6.26	2.10	13.15
15	Chan	311.62	312.25	44.59	7.06	0.65	1.87	11.28	6.32	2.13	13.48
16	Chan	312.25	312.87	45.68	7.16	0.65	1.92	11.44	6.38	2.16	13.81
17	Chan	312.87	313.50	46.66	7.26	0.65	1.96	11.61	6.43	2.19	14.06
18	Chan	313.50	314.12	44.84	7.21	0.68	1.88	11.53	6.22	2.08	12.94
19	Chan	314.12	314.75	43.17	7.05	0.68	1.81	11.27	6.12	2.04	12.46
20	Chan	314.75	315.37	41.52	6.89	0.68	1.74	11.01	6.03	1.99	11.98
21	Chan	315.37	316.00	39.90	6.72	0.68	1.68	10.75	5.93	1.94	11.52
22	Chan	316.00	316.63	38.30	6.56	0.68	1.61	10.49	5.84	1.89	11.06
23	Chan	316.63	317.25	36.73	6.40	0.68	1.54	10.23	5.74	1.85	10.60
24	Chan	317.25	317.88	35.19	6.24	0.68	1.48	9.97	5.64	1.80	10.16
25	Chan	317.88	318.50	27.35	5.99	0.90	1.15	9.58	4.56	1.31	5.97
26	Chan	318.50	319.13	18.42	5.45	1.27	0.77	8.70	3.38	0.84	2.83
27	Chan	319.13	319.75	13.42	4.68	1.40	0.56	7.48	2.87	0.65	1.87

Errors, Warnings and Notes

Max. Velocity

Flow Distribution Output

File Type Options Help

River: Lentzier Creek Profile: Q500

Reach Lentzier Creek RS: 2.201 BR D Plan: Proposed

Plan: Proposed Lentzier Creek Lentzier Creek RS: 2.201 BR D Profile: Q500

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)	Shear (lb/sq ft)	Power (lb/ft s)
14	Chan	308.52	309.27	46.71	8.25	0.77	1.96	10.98	5.66	1.74	9.84
15	Chan	309.27	310.02	47.85	8.37	0.77	2.01	11.14	5.72	1.76	10.08
16	Chan	310.02	310.77	49.00	8.49	0.77	2.06	11.30	5.77	1.79	10.32
17	Chan	310.77	311.52	50.16	8.61	0.77	2.11	11.46	5.83	1.81	10.57
18	Chan	311.52	312.27	51.33	8.73	0.77	2.16	11.62	5.88	1.84	10.82
19	Chan	312.27	313.02	52.52	8.85	0.77	2.21	11.78	5.94	1.86	11.07
20	Chan	313.02	313.77	52.68	8.93	0.78	2.21	11.90	5.90	1.84	10.88
21	Chan	313.77	314.52	50.22	8.77	0.80	2.11	11.69	5.72	1.76	10.10
22	Chan	314.52	315.28	48.18	8.56	0.80	2.02	11.40	5.63	1.72	9.69
23	Chan	315.28	316.03	46.17	8.34	0.80	1.94	11.11	5.54	1.68	9.29
24	Chan	316.03	316.78	44.19	8.12	0.80	1.86	10.82	5.44	1.63	8.89
25	Chan	316.78	317.53	42.23	7.91	0.80	1.77	10.53	5.34	1.59	8.49
26	Chan	317.53	318.28	25.46	7.50	1.50	1.07	9.99	3.40	0.81	2.74
27	Chan	318.28	319.03	13.92	6.10	2.23	0.58	8.13	2.28	0.44	1.01
28	Chan	319.03	319.78	8.60	4.54	2.19	0.36	6.05	1.89	0.34	0.63

Determine Q_{100} Waterway Area

Plan: Proposed Lentzier Creek Lentzier Creek RS: 2.201 Profile: Q100

E.G. US. (ft)	453.40	Element	Inside BR US	Inside BR DS
W.S. US. (ft)	453.26	E.G. Elev (ft)	453.26	453.10
Q Total (cfs)	1700.00	W.S. Elev (ft)	453.06	452.92
Q Bridge (cfs)	1700.00	Crit W.S. (ft)	450.91	450.77
Q Weir (cfs)		Max Chl Dpth (ft)	10.49	10.76
Weir Sta Lft (ft)		Vel Total (ft/s)	2.58	2.38
Weir Sta Rgt (ft)		Flow Area (sq ft)	657.86	712.79
Weir Submerg		Froude # Chl	0.30	0.28
Weir Max Depth (ft)		Specif Force (cu ft)	1795.12	1896.84
Min El Weir Flow (ft)	495.91	Hydr Depth (ft)	4.04	3.89
Min El Prs (ft)	503.00	W.P. Total (ft)	179.18	204.46
Delta EG (ft)	0.42	Conv. Total (cfs)	29641.0	32510.3
Delta WS (ft)	0.45	Top Width (ft)	162.88	183.24
BR Open Area (sq ft)	12580.59	Frctn Loss (ft)	0.15	0.12
BR Open Vel (ft/s)	2.58	C & E Loss (ft)	0.01	0.01
Coef of Q		Shear Total (lb/sq ft)	0.75	0.60
Br Sel Method	Energy only	Power Total (lb/ft s)	28.93	-28.93

Average Velocity

Net Area

Q_{100} Approx. Ground Line

Add Area of Piers : (452.95 − 448.6) 2 Piers (5' width) = 43.5 SFT

Top width

Add Area above Q_{100} : (452.95 − 452.92) 183.24 = 5.5 SFT

Total Q_{100} Waterway Area = 712.79 + 43.5 + 5.5

= 761.79

USE 762 SFT

Determine Q_{500} Waterway Area

Plan: Proposed Lentzier Creek Lentzier Creek RS: 2.201 Profile: Q500

E.G. US. (ft)	454.59	Element	Inside BR US	Inside BR DS
W.S. US. (ft)	454.44	E.G. Elev (ft)	454.46	454.30
Q Total (cfs)	2380.00	W.S. Elev (ft)	454.25	454.11
Q Bridge (cfs)	2380.00	Crit W.S. (ft)	451.49	451.35
Q Weir (cfs)		Max Chl Dpth (ft)	11.68	11.95
Weir Sta Lft (ft)		Vel Total (ft/s)	2.78	2.54
Weir Sta Rgt (ft)		Flow Area (sq ft)	855.08	937.05
Weir Submerg		Froude # Chl	0.30	0.28
Weir Max Depth (ft)		Specif Force (cu ft)	2769.45	2953.53
Min El Weir Flow (ft)	495.91	Hydr Depth (ft)	5.09	4.90
Min El Prs (ft)	503.00	W.P. Total (ft)	189.39	217.75
Delta EG (ft)	0.41	Conv. Total (cfs)	42517.3	46758.8
Delta WS (ft)	0.42	Top Width (ft)	175.80	191.40
BR Open Area (sq ft)	12580.59	Frctn Loss (ft)	0.14	0.11
BR Open Vel (ft/s)	2.78	C & E Loss (ft)	0.01	0.01
Coef of Q		Shear Total (lb/sq ft)	0.88	0.70
Br Sel Method	Energy only	Power Total (lb/ft s)	28.93	-28.93

Average Velocity

Net Area

Q_{500}

Add Area of Piers: (454.15 − 448.6) 2 (5' width) = 55.5 SFT

Add Area above Q_{500}: (454.15 − 454.11) 191.40 = 7.7 SFT

Total Q_{500} Waterway Area = 937.05 + 55.5 + 7.7

= 1000.25

USE 1,001 SFT

Q100

Contraction Scour

	Left	Channel	Right
Input Data			
Average Depth (ft):	4.40	8.86	3.91
Approach Velocity (ft/s):	2.56	5.58	2.33
Br Average Depth (ft):	3.83	8.63	3.33
BR Opening Flow (cfs):	425.79	710.88	563.32
BR Top WD (ft):	58.36	16.27	88.25
Grain Size D50 (mm):	0.01	0.01	0.01
Approach Flow (cfs):	719.83	697.01	283.16
Approach Top WD (ft):	63.81	14.10	31.06
K1 Coefficient:	0.690	0.690	0.690
Results			
Scour Depth Ys (ft):	0.00	0.00	0.10
Critical Velocity (ft/s):			
Equation:	Live	Live	Live

Pier Scour

All piers have the same scour depth

Input Data	
Pier Shape:	Round nose
Pier Width (ft):	5.00
Grain Size D50 (mm):	0.01000
Depth Upstream (ft):	8.83
Velocity Upstream (ft/s):	4.34
K1 Nose Shape:	1.00
Pier Angle:	0.00
Pier Length (ft):	50.33
K2 Angle Coef:	1.00
K3 Bed Cond Coef:	1.10
Grain Size D90 (mm):	
K4 Armouring Coef:	1.00
Results	
Scour Depth Ys (ft):	7.49
Froude #:	0.26
Equation:	CSU equation

Combined Scour Depths

Pier Scour + Contraction Scour (ft):

Left Bank:	7.49
Right Bank:	7.59

Use 8 ft.

Q500

Contraction Scour

	Left	Channel	Right
Input Data			
Average Depth (ft):	5.30	10.02	4.72
Approach Velocity (ft/s):	2.99	6.24	2.72
Br Average Depth (ft):	4.74	9.82	4.47
BR Opening Flow (cfs):	620.94	860.07	898.99
BR Top WD (ft):	62.26	16.27	89.62
Grain Size D50 (mm):	0.01	0.01	0.01
Approach Flow (cfs):	1066.16	881.81	432.03
Approach Top WD (ft):	67.30	14.10	33.68
K1 Coefficient:	0.69	0.69	0.69
Results			
Scour Depth Ys (ft):	0.00	0.00	0.03
Critical Velocity (ft/s):			
Equation:	Live	Live	Live

Pier Scour

All piers have the same scour depth

Input Data

Pier Shape:	Round nose
Pier Width (ft):	5.00
Grain Size D50 (mm):	0.01000
Depth Upstream (ft):	10.02
Velocity Upstream (ft/s):	4.61
K1 Nose Shape:	1.00
Pier Angle:	0.00
Pier Length (ft):	72.00
K2 Angle Coef:	1.00
K3 Bed Cond Coef:	1.10
Grain Size D90 (mm):	
K4 Armouring Coef:	1.00

Results

Scour Depth Ys (ft):	7.82
Froude #:	0.26
Equation:	CSU equation

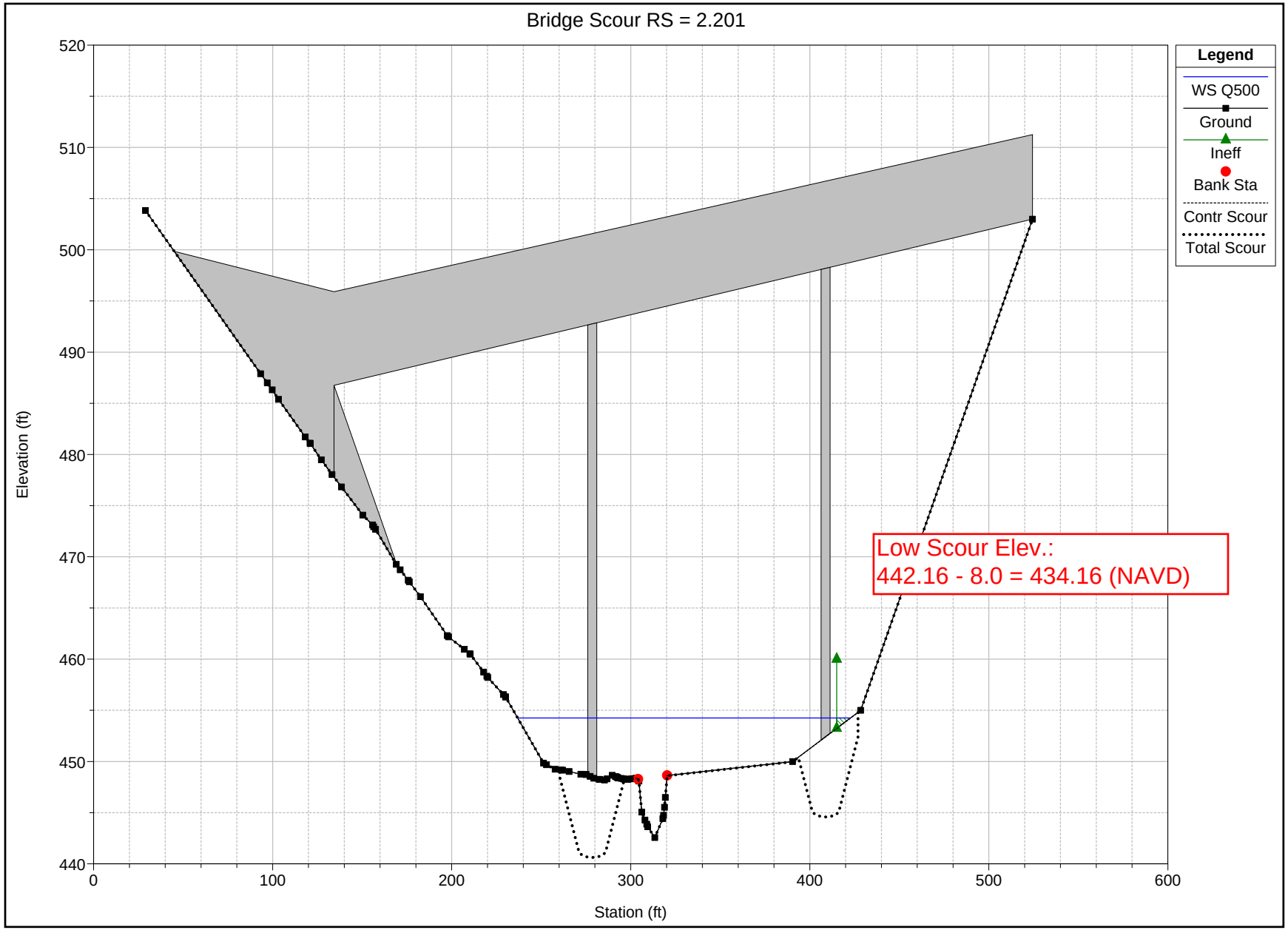
Combined Scour Depths

Pier Scour + Contraction Scour (ft):

Left Bank:	7.82
Right Bank:	7.85

Use 8 ft.

Q100 & Q500


Bridge Scour RS = 2.201
Elevation (ft)
Station (ft)
520
510
500
490
480
470
460
450
440
0
100
200
300
400
500
600
Legend
WS Q500
Ground
Ineff
Bank Sta
Contr Scour
Total Scour
Low Scour Elev.:
442.16 - 8.0 = 434.16 (NAVD)

Scour Countermeasures

Erosion-Protection Method	Velocity, v (ft/s)
Revetment Riprap	≤ 6.5
Class 1 Riprap	$6.5 < v < 10$
Class 2 Riprap	$10 \leq v \leq 13$
Energy Dissipator	> 13

Revetment required per max. stream velocity in channel

Note: If clear-zone or other issues prohibit the use of the required erosion-protection method, the Office of Hydraulics should be contacted for additional instructions.

STREAM VELOCITY FOR EROSION PROTECTION

Figure 203-2D

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Scour Countermeasure

Type	Minimum Thickness	
	Abutment	Pier
Revetment	1.5 ft	2.0 ft
Class 1	2.0 ft	3.0 ft
Class 2	2.5 ft	4.0 ft

2' thickness of Revetment around the piers

Riprap-Lay Thickness

Note: The thickness is measured such that the top is at the ground elevation.

Substructure Type	Lay Width
Sloping Abutment	The cone is covered top to toe, a square toe trench is placed below the riprap, based on lay thickness.
Vertical Abutment	2 times the water depth or a minimum of 10 ft
Pier	2 times the pier width or a minimum of 6 ft. The lay width is from the outside wall of the pier, all the way around.

2x5' = 10' > 6', USE 10'

Riprap-Lay Width

Note: For an oversized-box or three-sided structure, see the INDOT *Standard Drawings*.

RIPRAP SCOUR PROTECTION

Figure 203-3B

If scour countermeasures are provided then lay Revetment Riprap a minimum of 10 ft. wide from the face of the pier for the entire pier's perimeter. The Revetment Riprap minimum thickness shall be 2 ft.

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cHECk-RAS Report

Existing Model

HEC-RAS Project: *lentzierhvyhaul.prj*
Plan File: *lentzierhvyhaul.p01*
Geometry File: *lentzierhvyhaul.g01*
Flow File: *lentzierhvyhaul.f01*
Report Date: *7/20/2017*

Message ID	Message	Cross sections affected	Comments
MP SW 01DK	The name of the stream is ($streamname$). The flow regime is subcritical or mixed flow. Starting water-surface elevations are computed from Known WSELs as the downstream boundary condition. Provide backup information on Known water-surface elevations or use same energy slope for all the profiles as the starting boundary condition and rerun the plan.		
NT TL 02	Contraction and expansion loss coefficients are cc and ce, respectively. However, this cross section is not at a hydraulic structure. They should be equal to 0.1 and 0.3 according to page 5-8 of the HEC-RAS Hydraulic Reference Manual (HEC, 2010).	2.199; 2.19971; 2.20042; 2.20257; 2.20328	
XS IF 01R	Flow code will be IR. The area to the right of the ineffective flow station may be considered effective. The $assignedname$ WSEL of $wsel$ is higher than the ground elevation $grelv$ of the Right Ineffective Flow Station. However, it is equal to or lower than the right ineffective flow elevation of $ineffelr$. The lateral structure was not modeled downstream of this River Station. Lower the ineffective flow elevation to the ground elevation to consider the area right of the ineffective flow station as effective, or model a lateral structure if the overflow will take a different flow path. The ineffective flow elevation could be accepted if the area right of the ineffective flow station is non conveyance.	2.199; 2.20257	

cHECk-RAS Report

Proposed Model

HEC-RAS Project:	*lentzierhvyhaul.prj*
Plan File:	*lentzierhvyhaul.p02*
Geometry File:	*lentzierhvyhaul.g02*
Flow File:	*lentzierhvyhaul.f01*
Report Date:	*7/20/2017*

Message ID	Message	Cross sections affected	Comments
BR LF 01	This is ($strucname$). The selected profile is $profilename$. Type of flow is low flow because, 1. EGEL 3 of $egel3$ is less than or equal to MinTopRd of $minelweirflow$. 2. EGEL 3 of $egel3$ is less than MxLoCdU of $mxlocdu$.	2.201(Bridge-UP)	
MP SW 01DK	The name of the stream is ($streamname$). The flow regime is subcritical or mixed flow. Starting water-surface elevations are computed from Known WSELs as the downstream boundary condition. Provide backup information on Known water-surface elevations or use same energy slope for all the profiles as the starting boundary condition and rerun the plan.		Taken from IDNR HEC-RAS model & verified with Indiana Floodplain Information Portal
NT TL 02	Contraction and expansion loss coefficients are cc and ce, respectively. However, this cross section is not at a hydraulic structure. They should be equal to 0.1 and 0.3 according to page 5-8 of the HEC-RAS Hydraulic Reference Manual (HEC, 2010).	2.199	The floodplain naturally contracts and expands at this cross section.
ST DT 01B	This is ($strucname$). 'Upstream Dist' of $distup$ in "Bridge Width Table" is less than the height of the bridge opening of $height$. This indicates that Section 3 may not be placed at the foot of the road embankment or wing walls and may not represent the natural valley cross section. Section 3 should be relocated or provide a statement that it represents the natural valley cross section. The HEC-RAS geometry file may need to be recreated using a GIS program. Lengths at Sections 4, 3 and 2 and 'Upstream Dist' should be adjusted.	2.201(Bridge-UP)	The bridge height is approximately 50 ft. above the channel. Additional cross sections were added between the bridge and section 3 because the flood width varies significantly and it helps represent the natural valley.
ST DT 02B	This is ($strucname$). 'Downstream Dist' of $distdn$ in 'Bridge Width Table' is less than the height of the bridge opening of $height$. This indicates that Section 2 may not be placed at the foot of the road embankment or wing walls and may not represent the natural valley cross section. Section 2 should be relocated or provide a statement that it represents the natural valley cross section. A HEC-RAS geometry file may need to be recreated using a GIS program. Lengths at Sections 3 and 2 should be adjusted.	2.201(Bridge-DN)	The bridge height is approximately 50 ft. above the channel. Additional cross sections were added between the bridge and section 2 because the flood width varies significantly and it helps represent the natural valley.

ST GD 02BD	This is the Downstream Bridge Section. There is only one bridge. However, the low cord line crosses the ground line at more than two locations. The ground and deck/roadway data should be checked.	2.201(Bridge)	Geometry verified and additional low chord to ground line could not be identified.
ST GD 02BU	This is the Upstream Bridge Section. There is only one bridge. However, the low cord line crosses the ground line at more than two locations. The ground and deck/roadway data should be checked.	2.201(Bridge)	Geometry verified and additional low chord to ground line could not be identified.
ST IF 01S2L	This is Section 2 of a hydraulic structure. The highest flood frequency that has low or pressure flow is $profilename$. However, the Left Ineffective Flow station was not considered at Section 2. The ineffective flow station and elevation should be inserted. The left ineffective flow elevation should be equal to wsel2 of $wsel$. The placement of the left ineffective flow station is explained on page 5-7 of Hydraulic Reference Manual (HEC, 2010).	2.201(Bridge)	The channel and structure is not typical. The flow does not contract at the structure because the structure completely spans the floodplain.
ST IF 01S3L	This is Section 3. The highest flood frequency that has low or pressure flow is $profilename$. However, the Left Ineffective Flow station was not considered at Section 3. The ineffective flow station and elevation should be inserted. The left ineffective flow elevation should be equal to lmntprdu of $lmntprdu$. The placement of the left ineffective flow station is explained on page 5-7 of Hydraulic Reference Manual (HEC, 2010).	2.201(Bridge)	The channel and structure is not typical. The flow does not contract at the structure because the structure completely spans the floodplain.
ST IF 05S3R	This is Section 3 of a hydraulic structure. The right ineffective flow station is within the opening area of the structure. The right ineffective flow station of $ineffstar$ is less than the upstream right abutment station of $abutstar$ at ($strucname$). The Right ineffective flow station should be adjusted.	2.20257(Bridge)	The channel and structure is not typical. The flow does not contract at the structure because the structure completely spans the floodplain. The IF is due to natural conditions.
ST IF 06S2R	This is Section 2. The selected profile is $profilename$. Low or pressure flow occurs at ($strucname$). The Dn_Dist of $dndist$ at the structure is less than the opening height of $openheight$ of the structure. The cHECk-RAS computed right ineffective flow station of $compineffstar$ is greater than the input right ineffective flow station of $ineffstar$. The right ineffective flow station should be adjusted per the help instructions and the HEC-RAS manual.	2.20042(Bridge)	The channel and structure is not typical. The flow does not contract at the structure because the structure completely spans the floodplain. The IF is due to natural conditions.

ST IF 06S3R	This is Section 3. The selected profile is $profilename$. Low or pressure flow occurs at ($strucname$). The Up_Dist of $updist$ at the structure is less than the opening height of $openheight$ of the structure. The cHECk-RAS computed right ineffective flow station of $compineffstar$ is greater than the input right ineffective flow station of $ineffstar$. The right ineffective flow station should be adjusted per the help instructions and the HEC-RAS manual.	2.20257(Bridge)	The channel and structure is not typical. The flow does not contract at the structure because the structure completely spans the floodplain. The IF is due to natural conditions.
ST IF 07S1R	This is Section 1. Right Ineffective flow option was considered at this section. However, it should be a fully expanded cross section. Ineffective flow stations and elevations should be cleared from this section, unless the areas beyond the ineffective flow stations are not within the flow path of the stream. This message should be ignored if this section is Section 3 of the downstream structure.	2.19971(Bridge)	The bridge height is approximately 50 ft. above the channel. Additional cross sections were added between the bridge and section 2 because the flood width varies significantly and it helps represent the natural valley.
ST IF 07S4R	This is Section 4. Right Ineffective flow option was considered at this section. However, it should be a fully expanded cross section. Ineffective flow stations and elevations should be cleared from this section, unless the areas beyond the ineffective flow stations are not within the flow path of the stream. This message should be ignored if this section is Section 2 of the upstream structure.	2.20328(Bridge)	The bridge height is approximately 50 ft. above the channel. Additional cross sections were added between the bridge and section 2 because the flood width varies significantly and it helps represent the natural valley.
ST IF 09S2L	This is Section 2. The highest flood frequency that is having low flow or pressure flow is $profilename$. The leftineffective flow elevation, Ineff_El_Left, should be equal to or higher than the WSEL at Section 2. However, the Ineff_El_Left of $ineffell$ at the left ineffective flow station $ineffstal$ is lower than the WSEL of $wsel2$ at Section 2. The Ineff_El_Left should be raised to or above the WSEL at Section 2.	2.20042(Bridge)	The channel and structure is not typical. The flow does not contract at the structure because the structure completely spans the floodplain.

ST IF 09S3L	This is Section 3. The highest flood frequency that is having low flow or pressure flow is $profilename$. The left ineffective flow elevation, Ineff_El_Left, should be equal to or higher than the WSEL at Section 3. However, the Ineff_El_Left of $ineffell$ at the left ineffective flow station $ineffstal$ is lower than the WSEL of $wsel3$ at Section 3. The computed Left Upstream Minimum Top Road elevation, LMnTpRdU of $lmntprdu$ is higher than the WSEL of $wsel3$ at Section 3. The Ineff_El_Left should be raised to the computed LMnTpRdU.	2.20257(Bridge)	The bridge height is approximately 50 ft. above the channel. Additional cross sections were added between the bridge and section 3 because the flood width varies significantly and it helps represent the natural valley.
XS IF 01R	Flow code will be IR. The area to the right of the ineffective flow station may be considered effective. The $assignedname$ WSEL of $wsel$ is higher than the ground elevation $grelv$ of the Right Ineffective Flow Station. However, it is equal to or lower than the right ineffective flow elevation of $ineffelr$. The lateral structure was not modeled downstream of this River Station. Lower the ineffective flow elevation to the ground elevation to consider the area right of the ineffective flow station as effective, or model a lateral structure if the overflow will take a different flow path. The ineffective flow elevation could be accepted if the area right of the ineffective flow station is non conveyance.	2.199	The channel and structure is not typical. The flow does not contract at the structure because the structure completely spans the floodplain. The IF is due to natural conditions.