

Attachment 4

Response to MOU agency comments received for the Karst Report – Pages 1-19

Response to MOU Agency Comments

Karst Report: Proposed Heavy Haul Transportation Corridor
Utica Township, Clark County, Indiana
DES No. 1382612

Comment: *The DNR issued three responses to American Structurepoint about this project, ER-19026 with two follow-up responses (-1 and -2) (attached). Those comments still apply, including comments regarding karst. Only the original response was included in the report. (IDNR)*

Response: The additional comments provided by IDNR in Early Coordination responses on October 16, 2017 and February 13, 2018 will be included in the revised Karst Report.

Comment: *Page 4 of the document states Waldron Shale is highly erodible in one paragraph and then the next paragraph calls Waldron Shale “more resistant rocks”. To me, those are contradictory statements so could you please explain how these two statements work together? (IDNR)*

Response: The Waldron Shale “more resistant rocks” is in reference to dissolution and forming karst features. The carbonate rocks (limestone and dolomite) are more conducive and less resistant to dissolution as opposed to shales which are not typically dominated by dissolvable minerals (e.g., calcite). While on the surface, shales are erodible by mechanical processes. **No modifications to the Karst Report Required.**

Comment: *The only comment we have is with regard to maintaining buffers around the various features. On pages 16 and 23, it mentions a minimum 10 foot buffer will be used, and on page 20, it suggests a 25 foot buffer. The Service typically recommends a minimum 25 foot vegetated/undisturbed buffer be maintained around karst features (from the edge of the highest contour line). (USFWS)*

Response: Pages 16 and 23 will be revised in the Revised Karst Report to reflect the minimum 25-foot vegetated buffer to be consistent with the buffer referenced on Page 20.

Comment: *The Service is also supportive of IDEM's comments and recommendations and generally gives deference to their expertise for karst-related issues. (USFWS)*

Response: No response required.

Comment: *Of note...There is a low angle inactive thrust fault present on the Indiana Army Ammunition Plant (INAAP) to the north of the project area. There is no information that we are aware of on how far south this fault extends to the south, but it may influence the formation of karst in the project area. Field staff should be aware of this possibility and report any potential faults expressed during pre-construction activities or during construction/excavation activities. (IDEM)*

Response: The location and alignment of the suggested thrust fault was not identified during background research on the study area. Further investigation of the structural geology of the area indicates regional jointing has been mapped in the area, in which development of karst features was identified on the INAAP site (Hendricks, 1995). The regional jointing (as mapped by Hendricks, 1995) will be incorporated into the geologic maps prepared for the project area (Exhibit 6). However, it should be noted that karst development at the INAAP is largely due to the discharge of acidic wastewater to the Jenny Run watershed, and therefore unrelated to karst development to the south and the study area for the Heavy Haul Transportation Route.

Response to MOU Agency Comments

Karst Report: Proposed Heavy Haul Transportation Corridor
Utica Township, Clark County, Indiana
DES No. 1382612

Comment: *IDEM agrees with the identified contact between the Bainbridge Group and the Muscatatuck Group as a spring horizon. Proper identification of these Groups and field verification is essential for the prediction of potential karst features. (IDEM)*

Response:

Comment: *Section 4.2.5 identifies the Office of Land Management as the IDEM reporting authority. It should be the Office of Water Quality (OWQ) as the IDEM reporting authority. (IDEM)*

Response: The Revised Karst Report will correctly identify the IDEM Office of Water Quality as the appropriate reporting authority with regards to coordination on the emergency response plan.

Comment: *Table 5, page 17; Summary of Impact to Karst Features and Recommended Measures for Avoidance and/or Mitigation, uses the term “facilitate runoff”. Where Section 5.2.1, page 20, first paragraph under the heading Sinkholes Left in Place states: “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.” IDEM agrees with the wording in Section 5.2.1 and recommends that the language in Table 5 should be similar. (IDEM)*

Response: The Revised Karst Report will modify the language used within Table 5 to read “... install appropriately sized culverts under roadway embankment to facilitate runoff **at pre-development volumes** to sinkhole.”

Comment: *The document does not state or provide details for water quality sampling of the springs (prior to, during, or after construction). Pre-construction sampling should take place as soon as possible to establish background in order to monitor potential impacts to water resources. Please advise. (IDEM)*

Response: It is anticipated that prior to construction of the Heavy Haul Transportation Route, a Monitoring and Maintenance Plan will be prepared to fulfill stipulation 8 of the 1993 Karst MOU which states “INDOT agrees to develop a monitoring and maintenance plan for the affected karst features. IDNR, IDEM and USFWS 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 IDNR, USFWS and IDEM on a regular basis.” The Heavy Haul Monitoring and Maintenance Plan (HHMMP) will include the following:

- Identification of water quality monitoring locations (i.e., representative springs throughout the corridor);
- Water quality sampling and analysis methodology, including a list of appropriate water quality parameters
- Water quality sampling schedule, including pre-construction conditions to establish baseline, regular sampling during construction, and regular monitoring post-construction.

Response to MOU Agency Comments

Karst Report: Proposed Heavy Haul Transportation Corridor
Utica Township, Clark County, Indiana
DES No. 1382612

- Criteria for remediation is established water quality thresholds are exceeded as a result of the project
- Roadway maintenance policy to protect karst features, such as use of de-icing compounds, herbicide applications, etc.
- Hazardous material spills, and
- Maintenance and periodic monitoring of karst feature treatments

From: Buffington, Matt
To: [Johnson, Paul](#)
Cc: [Bowman, Sandra A](#); [Hilden, Laura](#); [Heustis, Ronald](#); [Boits, Leah](#); [Braun, Randy](#); [JOHANSON, SCOTT](#); [SULLIVAN, JAMES](#); [McWilliams, Robin](#)
Subject: RE: [EXTERNAL] RE: Karst Report -- Proposed Heavy Haul Route, Clark County, Indiana (DES No 1382612)
Date: Monday, April 02, 2018 10:45:54 AM
Attachments: [ER19026-1.pdf](#)
[ER19026-2.pdf](#)
[ER19026.pdf](#)

Paul,

I admittedly went through the report quickly so may have missed something.

The DNR issued three responses to American Structurepoint about this project, ER-19026 with two follow-up responses (-1 and -2) (attached). Those comments still apply, including comments regarding karst. Only the original response was included in the report.

I'm no karst expert so please pardon this question: Page 4 of the document states Waldron Shale is highly erodible in one paragraph and then the next paragraph calls Waldron Shale "more resistant rocks". To me, those are contradictory statements so could you please explain how these two statements work together?

Otherwise, the DNR supports the comments from the other agencies.

Matt Buffington
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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

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

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, particularly if MSE walls and wide con-span 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 con-span 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

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

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.

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.


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

Date: June 3, 2016

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

DNR #: ER-19026-1

Request Received: October 16, 2017

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; addition of construction Alternative DE

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 animal species below have been documented within 1/2 mile of the project area.

1. Gray Bat (*Myotis grisescens*), also federally endangered
2. Osprey (*Pandion haliaetus*)

Fish & Wildlife Comments: Avoid and minimize impacts to fish, wildlife, and botanical resources to the greatest extent possible, and compensate for impacts. The following are recommendations that address potential impacts identified in the proposed project area:

1) Animal Species:

a. Gray Bat:

Gray bats roost in caves year round. The information submitted indicates impacts to a small number of karst features, which may not support potential gray bat roosts. If the karst features to be impacted represent substantial cave systems, then these karst features should not be impacted between April 1 and September 30 to avoid the potential possibility of disturbing an active gray bat roost site during the maternity season.

b. Osprey:

An osprey nest is located within the project study area near the intersection of Brown Foreman and Utica Pike. This nest had chicks in 2015, and a nesting pair was observed in 2016. Since ospreys reuse their nests, it is likely that this nest will remain active during the project. Construction for this project is much closer than the recommended 660' buffer distance for disturbance to this species. 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. The nesting season typically occurs from March 23 through August 1, but late nesting pairs sometimes nest until late August. After August 1, the nest should be checked for activity before proceeding with the project.

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

2) Alternatives:

As mentioned in our previous response letter, an alternative is needed that minimizes impacts to:

- wetlands (forested, scrub-shrub and emergent);
- non-wetland forested habitat (also referred to as upland woods);
- streams and floodway habitat; and
- fragmentation of habitat.

An alignment should be chosen that minimizes the construction footprint through forested habitat (wetland and non-wetland) and the number of forested areas such as stream valleys the alignment crosses. Where possible, mechanically stabilized earth (MSE) walls are recommended to reduce the footprint of the road when crossing forested areas. Due to the presence of sinkholes and springs along the alignments, we recommend a karst assessment conducted by a qualified geologist with knowledge and experience in karst geology.

Alternative HH would result in the fewest stream crossings and impacts to karst features and wetland habitat, and would result in the second lowest number of linear feet of stream channel impacted. Also, based on the scale bar in the map provided, HH has the narrowest overall footprint at about 220' at its widest. Alternative F is about 255' wide, while DE has a footprint of about 285' wide at the southern bridge approach. Despite similarities in all three in terms of impacts to forested habitat acreage, HH appears to have the least impacts overall.

Therefore, we recommend alternative HH if feasible based on the results of archeological impacts. If HH is not feasible, we recommend alternative DE as alternative F appears to enter the Lentzier creek valley below the ridgetop of one of the forested tributary valleys which could result in more cut and fill impacts than the other alternatives.

All of the other recommendations regarding "Botanical Resource Impacts and Mitigation", "Stream Impacts", and the additional measures to minimize impacts to fish, wildlife, and botanical resources that were included in our previous letter dated June 3, 2016, still apply.

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.



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

Date: November 16, 2017

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

DNR #: ER-19026-2

Request Received: February 13, 2018

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

Project: Heavy Haul Transportation Corridor Draft EA: 1.48 miles of new roadway from North Access Road (St. 10+00) to SR 265/Old Salem Road interchange (St. 88+32.65), Ports of Indiana; Des #1382612

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(s) 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, unless it qualifies for a bridge exemption (see enclosure). Please include a copy of this letter with the permit application if the project does not meet the bridge exemption criteria.

Natural Heritage Database: The Natural Heritage Program's data have been checked. The US Department of Defense's Charlestown Military Reservation is located within 1/2 mile north of the project area. Also, the state endangered animal species below have been documented within 1/2 mile of the project area.
1. Gray Bat (*Myotis grisescens*), also federally endangered
2. Osprey (*Pandion haliaetus*)

Fish & Wildlife Comments: Avoid and minimize impacts to fish, wildlife, and botanical resources to the greatest extent possible, and compensate for impacts. We recommend an alignment that minimizes the construction footprint through forested habitat (wetland and non-wetland) and minimizes the number of forested areas (e.g. stream valleys) it crosses. Impacts to fish, wildlife, and botanical resources resulting from alternatives DE, F and HH appear to be relatively similar and significantly reduced since the previous review of the project. Therefore, either DE or HH would be close to equally recommended, with HH having a slight advantage due to lower forested habitat impacts (though only by 0.1 acre) and lower stream impacts than DE. Due to higher linear feet of streams within the construction limits than the other alternatives, F is the least recommended. The following are recommendations that address potential impacts identified in the proposed project area:

1) Animal Species:

a. GRAY BAT: Gray bats roost in caves year round. If any karst features to be impacted represent substantial cave systems, then these karst features should not be impacted between April 1 and September 30 to avoid the potential possibility of disturbing an active gray bat roost site during the maternity season.

Attachments: A - Bridge Exemption Criteria

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Division of Fish and Wildlife
Early Coordination/Environmental Assessment

b. OSPREY: Since the southern terminus of the project is at North Access Road, this is well over the recommended 660' construction buffer to avoid impacts to nesting ospreys.

2) Forest & Riparian Habitat:

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.

Where possible, we recommend the use of MSE walls to reduce the footprint of the road when crossing forested areas. Habitat assessment studies, especially for areas that appear to be above-average quality should be conducted to guide the design of the required mitigation (e.g. floristic quality assessments; amphibian/herpetological surveys, etc.). If any high-quality areas are encountered, they should be avoided altogether through alignment shifts or methods such as MSE walls to reduce the footprint of the project.

We recommend a mitigation plan be developed (and submitted with the permit application, if required) for any unavoidable habitat impacts that will occur. 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>.

Impacts to non-wetland forest of one (1) acre or more should be mitigated at a minimum 2:1 ratio. If less than one acre of non-wetland forest is removed in a rural setting, replacement should be at a 1:1 ratio based on area. Impacts to non-wetland forest under one (1) acre in an urban setting should be mitigated by planting five trees, at least 2 inches in diameter-at-breast height (dbh), for each tree which is removed that is 10" dbh or greater (5:1 mitigation based on the number of large trees).

The mitigation site should be located in the floodway, downstream of the one (1) square mile drainage area of that stream (or another stream within the 8-digit HUC, preferably as close to the impact site as possible) and adjacent to existing forested riparian habitat.

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 (see <http://www.epa.ohio.gov/dsw/wqs/headwaters/index.aspx>). 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.

The encapsulation of UNT 8 (as depicted in the EA) with a pipe culvert only 6' wide and approximately 320-330' long should be avoided, if possible. Crossing structures should have a minimum openness ratio (height x width / length) of 0.25. Stream depth and water velocities in the crossing structure during low-flow conditions should approximate those in the natural stream channel. The openness ratio of a 72" culvert pipe for the crossing of UNT 8 would be about 0.11 based on an approximate length of 321' (width of the footprint on the aerial image figure) so a significantly larger crossing structure,

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

preferably a spanning bridge or three-sided culvert, should be used to prevent a substantial impairment of aquatic organism passage through the structure.

Any riprap needed at the outlet should be placed in a way that facilitates aquatic organism passage. The riprap should be mixed with smaller stone and fines to match the existing stream substrate particle distribution (if there is an unconsolidated substrate present) and to provide impermeability of the substrate so the water doesn't percolate through the voids below the riprap apron's surface. The slope of the riprap should be no steeper than 20:1 from the lip of the culvert pipe to the streambed. Riprap on the inlet side should have a slope no steeper than 5:1.

4) Stream Crossings:

If possible, road crossings over tributaries to Lentzier Creek should be constructed using a channel-spanning bridge or three-sided culvert structures instead of pipe or 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 to allow a natural streambed to form within or under the crossing structure.

Stream simulation techniques should be implemented in the culvert installation that will result in a stable, natural substrate placed within the length of the pipe based on the stream gradient, bedforms such as riffles, runs and pools, and substrate/particle size analysis documented in a selected reference reach (see <https://www.fhwa.dot.gov/engineering/hydraulics/pubs/11008/hif11008.pdf>). Where consolidated substrates such as silt are present, stream simulation within the culvert may not be feasible; therefore, the structure must instead span the width of the channel and parts of the banks (i.e. 1.2 times the bankfull width).

5) Karst:

Any fill footprint/alignment refinements should be made as needed to avoid impacts to karst features wherever possible. Implement the 1993 INDOT-IDNR-IDEM-USFWS KARST Memorandum of Understanding during all phases of the project (see http://www.in.gov/indot/files/38_karst.pdf).

6) Bank Stabilization:

Do not place riprap in the bed of the channel. Limit the use of riprap on the channel banks to toe protection extending up to the ordinary high water mark (OHWM). From the OHWM to the top of the banks, heavy duty erosion control blankets or turf reinforcement mats or a similar bioengineering method should be used. These materials should be seeded with native plants to allow a natural, vegetated stream bank to develop.

Information about bioengineering techniques can be found at <http://www.in.gov/legislative/iac/20120404-IR-312120154NRA.xml.pdf>. Also, the following is a USDA/NRCS document that outlines many different bioengineering and other bank stabilization techniques: <http://directives.sc.egov.usda.gov/17553.wba>.

7) Erosion Control Blankets:

Rolled erosion control products that include plastic netting can snare and kill small-bodied wildlife such as snakes and should not be used (see https://efotg.sc.egov.usda.gov/references/public/IN/Fact_Sheet_Biology_Snake-Friendly_Netted.pdf). Seed and protect disturbed stream banks that are 3:1 or steeper with heavy-duty, net-free or biodegradable (Leno-woven netting), erosion control blankets to minimize the entrapment and snaring of small wildlife such as snakes and turtles (follow manufacturer's recommendations for selection and installation; seed and apply mulch on all other disturbed areas). The type of erosion control blanket to be used should be

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

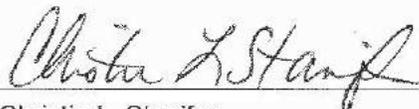
called out on the plans.

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. Do not construct any temporary runarounds, causeways, cofferdams, pump around or stream diversion systems.
6. Use minimum average 6 inch graded riprap stone extended below the normal water level to provide habitat for aquatic organisms in the voids.
7. Plant native hardwood trees along the top of the bank and right-of-way to replace the vegetation destroyed during construction.
8. Post "Do Not Mow or Spray" signs along the right-of-way.
9. 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.

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: March 19, 2018

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

The Flood Control Act (IC 14-28-1) contains a provision (Section 22), which exempts certain bridge projects from its permitting requirement. Specifically, the 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 not more than fifty (50) square miles..."

Therefore, in order for a bridge project to be exempt, it must:

- be a state or county highway department project;
- be a bridge;
- be located in a rural area; and
- cross a stream having an upstream drainage area of less than 50 square miles.

The initial criterion is very specific - the structure must be a state or county highway department project.

The second requirement mandates that the project be a bridge (for this provision, the Department of Natural Resources considers a culvert to be a bridge). Projects such as bank protection, spoil disposal, borrow pits, etc. are not automatically exempt. Anyone proposing to undertake a non-bridge related activity should consult with the Division of Water's Technical Services Section staff at 317-232-4160 (or toll free at 1-877-928-3755) regarding the applicability of the exemption prior to initiating work.

The third criterion states that the project must be located in a rural area. The phrase "rural area" is defined as an area:

- 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 100 year flood elevation with the project in place;
- located outside the corporate boundaries of a consolidated or an incorporated city or town; and
- located outside of the territorial authority for comprehensive planning (generally, a 2 mile planning buffer around a city or town).

The final criterion limits the exemption to a project crossing a stream having an upstream drainage area of less than 50 square miles. The drainage area includes all land area contributing to runoff above the project site and is determined from the United States Geological Survey 7½ minute series quadrangle maps. The Department of Natural Resources will determine the drainage area upon written request.

This exemption has been grossly misunderstood and liberally applied in the past. As a result, the Department of Natural Resources 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 Department that all 4 criteria have been satisfied. Failure to do so will result in the Department initiating litigation with the potential for the imposition of fines in amounts up to \$10,000 per day.

Note: This exemption only applies to the Flood Control Act. If a bridge is to be constructed over a navigable waterway, or over or near a public freshwater lake, a permit will be required.

From: McWilliams, Robin
To: [Johnson, Paul](#)
Cc: [Buffington, Matt](#); [Bowman, Sandra A](#); [Hilden, Laura](#); [Heustis, Ronald](#); [Boits, Leah](#); [Braun, Randy](#); [JOHANSON, SCOTT](#); [Jim Sullivan \(jsulliva@idem.IN.gov\)](mailto:jsulliva@idem.IN.gov) (jsulliva@idem.IN.gov)
Subject: Re: [EXTERNAL] RE: Karst Report -- Proposed Heavy Haul Route, Clark County, Indiana (DES No 1382612)
Date: Thursday, March 29, 2018 4:29:42 PM

Dear Paul,

Our office has reviewed the Heavy Haul Corridor karst report. The only comment we have is with regard to maintaining buffers around the various features. On pages 16 and 23, it mentions a minimum 10 foot buffer will be used, and on page 20, it suggests a 25 foot buffer. The Service typically recommends a minimum 25 foot vegetated/undisturbed buffer be maintained around karst features (from the edge of the highest contour line).

The Service is also supportive of IDEM's comments and recommendations and generally gives deference to their expertise for karst-related issues.

If you have any questions or if project plans or information changes, please contact me.

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

From: SULLIVAN, JAMES
To: [Johnson, Paul](mailto:Johnson.Paul@fws.gov); [Buffington, Matt](mailto:Buffington.Matt@fws.gov); robin_mckilliams@fws.gov
Cc: Jeromy.Richardson@ucindy.com; CHRISP@ucindy.com; [Rehder, Crystal](mailto:Rehder.Crystal@fws.gov); [Bowman, Sandra A](mailto:Bowman.Sandra@fws.gov); [Kang, Li](mailto:Kang.Li@fws.gov); [Hilden, Laura](mailto:Hilden.Laura@fws.gov); [Heustis, Ronald](mailto:Heustis.Ronald@fws.gov); [Hope, Briana](mailto:Hope.Briana@fws.gov); [Boits, Leah](mailto:Boits.Leah@fws.gov); [Braun, Randy](mailto:Braun.Randy@fws.gov); [JOHANSON, SCOTT](mailto:JOHANSON.SCOTT@fws.gov)
Subject: RE: Karst Report -- Proposed Heavy Haul Route, Clark County, Indiana (DES No 1382612)
Date: Monday, March 26, 2018 1:17:35 PM

Paul,

Regarding the Karst Investigation Report for the proposed Heavy Haul Route in Clark County, Indiana (DES No. 1382612); IDEM has the following comments:

- 1) Of note...There is a low angle inactive thrust fault present on the Indiana Army Ammunition Plant (INAAP) to the north of the project area. There is no information that we are aware of on how far south this fault extends to the south, but it may influence the formation of karst in the project area. Field staff should be aware of this possibility and report any potential faults expressed during pre-construction activities or during construction/excavation activities.
- 2) IDEM agrees with the identified contact between the Bainbridge Group and the Muscatatuck Group as a spring horizon. Proper identification of these Groups and field verification is essential for the prediction of potential karst features.
- 3) Section 4.2.5 identifies the Office of Land Management as the IDEM reporting authority. It should be the Office of Water Quality (OWQ) as the IDEM reporting authority.
- 4) Table 5, page 17; *Summary of Impact to Karst Features and Recommended Measures for Avoidance and/or Mitigation*, uses the term "facilitate runoff". Where Section 5.2.1, page 20, first paragraph under the heading *Sinkholes Left In Place* states: "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." IDEM agrees with the wording in Section 5.2.1 and recommends that the language in Table 5 should be similar.
- 5) The document does not state or provide details for water quality sampling of the springs (prior to, during, or after construction). Pre-construction sampling should take place as soon as possible to establish background in order to monitor potential impacts to water resources. Please advise.

Note: This document was not reviewed for activities that would potentially fall within the regulatory authority of the Section 41 Water Quality Certification Program, the State Wetland Regulatory Program, or 327 IAC 15-5 (Rule 5)... Please contact Randy Braun (cc'd) for IDEM's input regarding potential impact to these Programs.

We appreciate the opportunity to review/comment upon this project. Please contact either myself or Scott Johanson (sjohnanso@idem.in.gov) if you have questions regarding our comments.

Best Regards,
Jim

James Sullivan, Chief
Ground Water Section
IDEM
317/234-7476

From: Johnson, Paul [mailto:PJohnson@structurepoint.com]

Sent: Monday, March 19, 2018 4:47 PM

To: SULLIVAN, JAMES <JSULLIVA@idem.IN.gov>; Buffington, Matt <MBuffington@dnr.IN.gov>; robin_mcwilliams@fws.gov

Cc: Jeromy.Richardson@ucindy.com; CHRISP@ucindy.com; Rehder, Crystal <CRehder@indot.IN.gov>; Bowman, Sandra A <SBowman@indot.IN.gov>; Kang, Li <LKANG@indot.IN.gov>; Hilden, Laura <lhilden@indot.IN.gov>; Heustis, Ronald <RHEUSTIS@indot.IN.gov>; Hope, Briana <bhope@structurepoint.com>; Boits, Leah <lboits@structurepoint.com>

Subject: Karst Report -- Proposed Heavy Haul Route, Clark County, Indiana (DES No 1382612)

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Jim, Matt and Robin –

As requested by INDOT Environmental Services, below please find a link to our Sharefile site which contains the Karst Investigation Report for the proposed Heavy Haul Route in Clark County, Indiana (DES No. 1382612). This proposed project is a new alignment roadway to serve heavy haul vehicles from the Port of Indiana and River Ridge Commerce Center with connection to State Route 265.

<https://structurepoint.sharefile.com/d-sdb7cb13b3e041ba9>

As outlined in the report, the karst investigation was initiated due to reported sinkholes in the vicinity of the project. The River Ridge Commerce Center (formerly Indiana Army Ammunition Plant) is also known for karst features within the facility boundaries.

Our investigation identified 22 karst features (14 springs and 8 sinkholes/swallets) within the investigated corridor. No caves or significant springs supporting karst-related fauna were identified in the project area. Based on the preliminary roadway plans, 3 springs will be impacted by the preferred alternative (Alternate DE) and we are recommending the springs be modified with appropriately sized spring boxes to mitigate the impacts. In addition, the drainage areas of 2 sinkholes and 2 swallets will be affected by the preferred alternative. To avoid and minimize potential impacts, appropriate erosion and sediment control measures are recommended, as well as installation of drainage culverts to perpetuate overland flow to the existing features. According to the plans, no sinkholes, swallets or caves will be directly affected by the proposed project. Moreover, roadway runoff will be directed to adjacent roadside ditches that will outlet to surface streams in the area (i.e., runoff will not be directed to sinkholes).

At this time, American Structurepoint, on behalf of INDOT, is seeking your review of the attached report and recommendations. We are requesting you provide any comments or concerns with the investigation report within two weeks (April 3, 2018) to facilitate completing design plans being prepared for the proposed roadway. Please do not hesitate to contact me at (317) 547-5580 or by e-mail at pjohnson@structurepoint.com if you have any questions during your review.

Thank you in advance for your assistance in this important transportation project!

Paul A. Johnson, LPG

Group Leader, Environmental Services



7260 Shadeland Station, Indianapolis, IN 46256

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