



Summary

Since the Draft Environmental Impact Statement (DEIS), the following substantive changes have been made to this chapter:

- S.1 – Volume III, Comments and Responses, was added to the FEIS in electronic format to accompany FEIS Volume I.
- S.7 – Design and development refinements to DEIS Alternative 2 are summarized. Refined Preferred Alternative 2 is identified as the Section 4 FEIS preferred alternative.
- S.7.1 – General information about cost and impact updates for DEIS Alternatives 1 – 4 are noted. This is followed by detailed costs and impacts for DEIS Alternatives 1 – 4 and Refined Preferred Alternative 2 in Sections S.7.1.1 through S.7.1.8. Refinements for the preferred alternative in each subsection are also noted in Sections S.7.1.1 through S.7.1.8.
- **Table S.7-10** – Subsection cost estimates were updated.
- **Table S.7-10a** – Cost estimates, by subsection, for Refined Preferred Alternative 2 are presented.
- **Table S.7-10b** – Total cost estimates for the DEIS alternatives and Refined Preferred Alternative 2. The total costs include mitigation costs.
- S.8 – Updated discussion about subsection recommendations for Alternative 2 as presented in the DEIS, new discussion about the subsection and interchange recommendations for Refined Preferred Alternative 2, and updated comparison of refined Preferred Alternative 2 costs and impacts with the Tier 1 estimates.
- S.10 – Discussion added about comments received on the DEIS.
- S.11 – New subsection discussing project mitigation.
- S.12 – New subsection that provides an overview of the project development.
- S.13 – Previously included in the DEIS as S.11. Regulatory actions associated with the project have been updated for Section 404 permits, clean air act compliance, and Class V injection wells.
- S.14 – Previously included in the DEIS as S.12. Updated for the locations for public viewing of the FEIS.
- S.15 – Previously included in the DEIS as S.13

S.1 Introduction

This Tier 2 Final Environmental Impact Statement (FEIS) has been prepared by the Federal Highway Administration (FHWA) and the Indiana Department of Transportation (INDOT) for



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Section 4 of the proposed I-69 Evansville to Indianapolis project. The termini of Section 4, as approved in the Tier 1 Record of Decision (ROD) for I-69, dated March 24, 2004, are US 231 in Greene County near Crane Naval Surface Warfare Center (NSWC) and SR 37 south of Bloomington in Monroe County.

This FEIS consists of three volumes:

Volume I is this volume.

Volume II contains the Appendices. The appendices include technical reports and other supporting materials. The appendices are provided electronically on media accompanying Volume I.

Volume III, Comments and Responses, contains a table listing all who submitted substantive¹ comments on the DEIS, the *Comments and Responses (C/R)* document, a copy of each written submittal, and a transcript of each oral statement made at the public hearing on the DEIS. In the C/R document, each substantive comment within a submittal is presented individually and is immediately followed by INDOT's response. Copies of the written submittals/transcribed statements follow the C/R Section of the volume. Volume III is provided electronically on DVD-ROM media accompanying Volume I.

This summary is organized as follows:

Section S.2 is an overview of the Tier 1 study which selected the corridor to be considered for Tier 2 alternatives. It describes the key role of Purpose and Need in the Tier 1 selection, key resource and regulatory considerations, and the determination of sections for Tier 2 studies.

Section S.3 describes the proposed federal action in Section 4.

Section S.4 describes important technical tools used in the Tier 2 studies, emphasizing updates to these tools since they were used in the Tier 1 study.

Section S.5 discusses the Tier 1 Re-evaluation issued in June 2006. This Re-evaluation analyzed the effect of tolling on Tier 1 alternatives, with a view toward consideration of toll financing for I-69 from Evansville to Indianapolis. In November 2006 INDOT informed FHWA that it no longer wished to consider toll financing for this project and that all Tier 2 studies would consider only non-toll alternatives.

Section S.6 describes the scoping, purpose and need/preliminary alternatives, and alternatives screening used in Section 4.

Section S.7 presents the cost and impact analysis of alternatives carried forward for detailed study in Section 4.

¹ Comments not considered "substantive" included those that only noted preference for or opposition to the project, without elaboration; and comments that did not relate specifically to the Tier 2 Section 4 study.



Section S.8 summarizes the rationale for the selection of the preferred alternative in Section 4.

Section S.9 describes other major governmental actions in the study area.

Section S.10 describes major issues raised by agencies and the public.

Section S.11 describes measures to mitigate impacts of the project in Section 4.

Section S.12 describes INDOT's proposed construction schedule.

Section S.13 enumerates state and federal regulatory actions associated with the project. These include permitting under Section 404 of the federal Clean Water Act; state permitting requirements for a Section 401 Water Quality Certification; Construction with a Floodway Permit under Indiana's Flood Control Act; state permitting requirements under the National Pollution Discharge Elimination System; obtaining a state Erosion Control permit; permitting for isolated wetlands; consultation under Section 106 of the National Historic Preservation Act; consultation under Section 7 of the federal Endangered Species Act; and conformity demonstration for the Clean Air Act. A discussion of Class V Injection Well permits was added since the DEIS.

Section S.14 summarizes the remaining steps in the Tier 2 process for Section 4.

Section S.15 provides a glossary of key terms used in the Summary. A more comprehensive glossary can be found in Chapter 13, along with a list of acronyms and an index.

S.2 Tier 1 Study

The Tier 1 study was initiated on January 5, 2000, when FHWA published a Notice of Intent in the Federal Register to advise that a Tier 1 Environmental Impact Statement would be prepared for the I-69, Evansville to Indianapolis project. This study was conducted under Council on Environmental Quality (CEQ) and FHWA regulations which allow studies under the National Environmental Policy Act (NEPA) to be carried out in a two-stage, "tiered" process. In the Tier 1 portion of the study (which was concluded with a Tier 1 ROD, dated March 24, 2004), the "big picture" issues were addressed on a corridor-wide basis, while taking into account the full range of impacts. The Tier 1 ROD approved a corridor for this project and approved termini for Tier 2 sections. Individual Tier 2 NEPA studies are being conducted to determine an exact alignment for the project in each of the six Tier 2 sections. This document is the FEIS for Tier 2 Section 4.

The Tier 1 Purpose and Need was guided by a series of policy decisions at both the state and federal level. It also was based on a comprehensive Needs Assessment of the no-build condition, using both the Indiana Statewide Travel Demand Model and a state-of-the-practice regional economic forecasting model (Regional Economic Model, Inc. Policy Insight Model). The degree to which alternatives satisfied the Purpose and Need was an important consideration both in the screening of alternatives as well as the selection of a preferred alternative.

The scoping process for the Tier 1 EIS began in February 2000. It included meetings with federal and state review agencies, as well as a series of public information meetings. As a result



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of the scoping process, a total of 14 route concepts, some with optional routings near Indianapolis, were determined; three of these route concepts were suggested by regulatory agency staff or the public. **Figure S-1** (p. S-89) shows these route concepts. (Figures appear at the end of this Summary chapter.)

A preliminary screening used performance on Purpose and Need, as well as preliminary cost estimates, to determine which route concepts should be advanced as alternatives for detailed study. Alternatives were grouped geographically into four groups, and route concepts were evaluated by comparison with others in their geographic groups. After a series of public meetings, as well as meetings with environmental review agencies and MPOs, five route concepts were selected as alternatives for detailed study. At least one alternative was selected from each geographic group. Most of these alternatives had optional routings in the northern part of the study area. Including these optional routes, there were a total of 12 different end-to-end corridors represented by these five alternatives: Alternatives 1, 2A, 2B, 2C, 3A, 3B, 3C, 4A, 4B, 4C, 5A, and 5B. **Figure S-2** (p. S-90) shows the alternatives selected for detailed study.

Each Tier 1 alternative was specified as a corridor, generally 2,000 feet in width. In some places the corridor was narrowed in order to avoid environmentally-sensitive resources. In other places, it was widened to provide the flexibility to avoid potential impacts to significant resources whose extent was not yet determined. Impacts and costs were estimated by specifying a varying-width working alignment within the corridor for each alternative. These working alignments varied from 240 to 470 feet in width, and took into account topography, the need for local service roads,² and the number of lanes required. Interchanges and grade separations also were identified for each alternative. These interchanges and grade separations were preliminary, and were used to compare the costs, impacts and performance of Tier 1 alternatives. The final determination of interchanges, grade separations and access treatments for the selected alternative is being made during Tier 2 studies.

These Tier 1 alternatives were analyzed for their impacts, costs, and performance on project goals, as defined by the Purpose and Need. Based on this analysis, the Tier 1 DEIS designated five of the 12 end-to-end corridors as “preferred,” and seven as “non-preferred.” Three were designated as non-preferred (Alternatives 3A, 5A, and 5B) for environmental reasons, even though they were among the better performers in terms of achieving the project’s goals. Four were designated as non-preferred (Alternatives 1, 2A, 2B and 4A) due to relatively poor performance in achieving project goals.

Three public hearings on the Tier 1 DEIS were held in August 2002. In addition, meetings were held with key resource agencies. Over 20,000 comments were received on the DEIS. As a result of this input, a number of major activities occurred after the conclusion of the comment period on the DEIS. Key steps among these major activities were:

- **Reconsideration of Alternative 1.** The non-preferred status of Alternative 1 was reconsidered at the request of the U.S. Environmental Protection Agency (USEPA). Because

² In Tier 1, any local service roads were assumed to be frontage roads alongside I-69, and part of the typical section for the highway. See Tier 1 FEIS, Appendix E. No access roads other than these were assumed in the Tier 1 analysis.



its performance was substantially inferior to DEIS preferred alternatives, and was neither a low-impact nor low-cost alternative, it was eliminated from further consideration.

- **Evaluation of Hybrid Alternatives.** In response to a request by USEPA, two hybrid alternatives were considered. These were studied to determine if critical environmental resources could be avoided while maintaining high levels of performance. Two such alternatives were considered, and it was determined that they did not warrant further study.
- **Shifts to Avoid Sensitive Resources.** In response to comments on the Tier 1 DEIS, all alternatives were evaluated to determine whether they could be modified to reduce impacts to sensitive resources. Three such shifts, all of which affected several alternatives, including the selected Alternative 3C, were made between the DEIS and FEIS.
- **Completion of Section 106 Consultation for Tier 1.** This consultation produced a Memorandum of Agreement (MOA) which identified mitigation measures and other actions to be further examined in Tier 2.
- **Completion of Section 7 Consultation for Tier 1.** This formal consultation concluded with the issuance of a Tier 1 Biological Opinion (BO) by the US Fish and Wildlife Service (USFWS). This Biological Opinion specified required mitigation measures to be imposed on a project-wide basis and procedures to be followed for Section 7 consultation in the Tier 2 projects. During this Tier 2, formal consultation was re-initiated, which resulted in a Revised Tier 1 BO, dated August 24, 2006.

The comment period for the Tier 1 DEIS ended on November 7, 2002. On January 9, 2003, Governor Frank O'Bannon announced the identification of Alternative 3C as INDOT's preferred alternative for the project. Based on this selection, INDOT and FHWA proceeded with the development of mitigation measures for this alternative. The Tier 1 FEIS, dated December 5, 2003, showed Alternative 3C as the preferred corridor. The selection of Alternative 3C was approved by FHWA in a Record of Decision (ROD) dated March 24, 2004. The ROD also approved termini for sections in Tier 2 studies. **Figure S-3** (p. S-91) shows the approved alternative 3C, including the sections for Tier 2 studies.

The selection of a single preferred corridor was made from among the five alternatives shown as preferred in the Tier 1 DEIS. A summary of the key considerations regarding these five DEIS preferred alternatives is as follows:

- **Alternative 3B** was eliminated due to its environmental impacts, which the USFWS described in its comments on the DEIS as “environmentally unacceptable.”
- **Alternative 4C** was eliminated primarily due to its high impacts on wetlands, floodplains, and farmland. This alternative would have the highest wetlands impacts of any DEIS preferred alternative.
- **Alternative 4B** was eliminated due to its substantially lower performance on project goals (compared with other preferred alternatives). Also, it had greater potential to encourage sprawl between Indianapolis and Bloomington than other DEIS preferred alternatives.



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- *Alternative 2C* was eliminated due to its lower travel-time savings between Indianapolis and Evansville. It had the lowest performance of any DEIS preferred alternative on this Tier 1 *core goal*. Also, it had the second-highest wetlands impact and the highest floodplain impact among the DEIS preferred alternatives.
- *Alternative 3C* best satisfied the project purposes while having an acceptable level of impacts. Its performance was “high” on eight of the nine project goals, including all three core goals. See Tier 1 FEIS Table 3-35.

On October 2, 2006, a group of individuals and non-governmental organizations filed a lawsuit in the United States District Court for the Southern District of Indiana, challenging the Tier 1 ROD (approved March 24, 2006) and the Revised Tier 1 Biological Opinion (BO) (submitted to FHWA August 24, 2006). The plaintiffs alleged a variety of violations under the National Environmental Policy Act (NEPA) and other environmental laws. On December 10, 2007, the district court issued a decision rejecting all of the plaintiffs’ claims. *Hoosier Environmental Council, et al. v. U.S. Department of Transportation, et al.*, S.D. Ind., Civ. No. 1:06-cv-1442, December 10, 2007. Plaintiffs did not file an appeal; therefore, the District Court’s decision is final. On April 17, 2007, FHWA issued a “Notice of Final Federal Agency Actions on Proposed Highway in Indiana,” which established a 180-day period in which to seek judicial review of decisions made in Tier 1, including both the Tier 1 ROD and Revised Tier 1 BO (72 Fed. Reg. 19228 – April 17, 2007). Because the district court’s decision is final, and the time for other judicial challenges to the Tier 1 decisions expired on October 14, 2007, no further legal challenges can be brought against these Tier 1 decisions.

S.3 Proposed Action – Tier 2 Section 4

The proposed action is the completion of an interstate highway within Section 4 of the approved I-69 corridor between Evansville and Indianapolis, Indiana. The termini of Section 4, which were determined in the Tier 1 ROD, are US 231 near Scotland in Greene County, which is northwest of Crane Naval Surface Warfare Center (NSWC), and SR 37 south of Bloomington in Monroe County. This Tier 2 FEIS fully evaluates alternatives which complete I-69 as a freeway between these termini. The impacts, benefits, and costs of alternatives are fully evaluated. This evaluation will include regulatory compliance under applicable laws, including Section 106 of the National Historic Preservation Act, Section 7 of the Endangered Species Act, and Section 404 of the Clean Water Act. Upon completion of this Tier 2 study, a Tier 2 ROD will be issued specifying the final Tier 2 alignment for this section.

S.4 Important Technical Tools – Tier 2 Studies

Three technical tools play a central role in the conduct of this study. Two of these tools were used in the Tier 1 Study and have been refined for use in this Tier 2 Study. These are a multi-level traffic forecasting tool and a corridor geographic information system. The third, Quantm, was not used in the Tier 1 study but has been used in the Tier 2 study. Each is briefly described below.



S.4.1 Traffic Forecasting Tools

The selection of a corridor in Tier 1 required an innovative approach to traffic forecasting for Tier 2 alternatives. Because the range of alternative alignments in this Tier 2 study is limited to the corridor selected in the Tier 1 decision, more detailed modeling tools are needed to evaluate alternatives. The traffic forecasts for this study are provided by a hierarchy of traffic models.

Both Version 4 of the Indiana Statewide Travel Demand Model (ISTDM) and a more detailed corridor model are used.³ The corridor model is “fed” by the results of the ISTDM. The corridor model includes the counties through which the approved corridor for I-69 passes, as well as all or part of other nearby counties. The Tier 1 ROD specified that the following would be key issues for distinguishing alternatives in Tier 2 studies.

- Interchange location and design
- Access to abutting properties
- Location of grade separations and intersecting roads

In preparation for Tier 2 studies, the ISTDM was refined to provide a more detailed highway network throughout Indiana.⁴ A significant amount of highway network and geographical detail were added to ISTDM Version 3, used in the Tier 1 study, to produce ISTDM Version 4. Once the ISTDM was updated to Version 4, an even more detailed model was created for the region proximate to the I-69 corridor. This “I-69 corridor model” was essentially an overlay on the standard ISTDM Version 4 model. The I-69 corridor model includes all of the roads that are included in Version 4, plus additional roads that are considered too minor to be included in the standard version of the statewide model. The level of detail in the corridor model is suitable for evaluating alternative interchange locations, grade separations, or access roads associated with Tier 2 alternatives. **Figure S-4** (p. S-92) portrays the highway network in the I-69 corridor model.

To provide Tier 2 forecasts, the first step is to run Version 4 of the ISTDM. Next, the results from the ISTDM are “fed into” the I-69 corridor model. The corridor model produces assignments for the morning (AM) peak hour, the afternoon (PM) peak hour, and total for a typical weekday (24 hour). The traffic forecasts used in the engineering analysis of alternatives are provided by the corridor model. In addition, the Tier 2 performance measures provided in Section 3.3 are calculated using postprocessors⁵ that analyze the traffic assignments provided by the corridor model.

³ In the urban areas of Bloomington, Martinsville, and Indianapolis (in Tier 2 Sections 5 and 6) a microsimulation model also is used. The use of this model will be described in the DEIS documents for these sections.

⁴ The Indiana Statewide Travel Demand Model (ISTDM) is regularly updated by INDOT to incorporate the most current data and transportation planning practices. ISTDM Version 3 was used for the Tier 1 Study; ongoing Tier 2 Studies are using ISTDM Version 4. Traffic forecasts for ISTDM Version 3 were for a forecast year of 2025; traffic forecasts in ISTDM Version 4 are for a forecast year of 2030.

⁵ A “postprocessor” is a computer program that analyzes a traffic assignment to compute measures of transportation performance. For example, an accessibility postprocessor may compare the travel times between any number of location pairs in the “no-build” and “build” networks in order to assess the improvement in accessibility provided by a particular alternative.

**S.4.2 Geographic Information System**

The selection of a corridor in Tier 1 (generally 2000 ft. wide) has allowed for more detailed mapping and evaluation of resources within the proposed project area. The Geographic Information System (GIS) for Tier 2 was developed and/or refined based on high resolution aerial photography used to develop planimetric mapping of the corridor. The low level aerial photography was flown in the winter of 2003-2004 with an image resolution of 0.5 ft. These were flown with ground control to develop mapping for the corridor of topographic and cultural features with an accuracy of ± 1.25 ft. In addition to the aerial mapping of the corridor, a complete field reconnaissance of the corridor was conducted to identify any previously unidentified features on the ground, as well as confirm and/or refine all earlier mapping utilizing Global Positioning System (GPS) data collection.

The development of Tier 2 GIS layers included both the replacement of some Tier 1 GIS layers with data derived from the aerial mapping and field reconnaissance, and revision of some Tier 1 GIS layers to update geographic location of features based on more accurate data, and/or update data regarding resources based on more detailed research. As a result of this mapping and field reconnaissance effort, the data layers that make up the GIS utilized for the Tier 2 analysis are very accurate and contain extensive detail regarding the resources identified within the corridor.

S.4.3 Quantm

Quantm is a computer-aided tool that facilitates the development and analysis of alternative horizontal and vertical roadway alignments. It imitates the otherwise manual functions of developing and assessing route alignments for transportation projects. Quantm has the capability to generate a set of alignments that minimize construction costs and negative impacts to selected environmental resources. Based on parameters provided, Quantm will generate a set of alignments; illustrate those alignments within a digital terrain model; superimpose them on aerial photographic images; track key statistics (e.g. wetland acreage impacted) for each alternative; and allow alternatives to be compared according to a variety of attributes, including construction cost.

Quantm develops a graphic representation of alternative horizontal and vertical roadway alignments and computes the cost of each based upon the input of geographic, topographic, and geologic information; geometric design criteria; unit cost data; and environmental constraint information. The program processes a large volume of data and generates a large number of alignment possibilities in a relatively short period of time.

Some of the cost-minimizing alternatives generated by Quantm were used in Section 4 as a beginning point and were refined to obtain the desired horizontal geometry, taking into account social, economic, and other non-construction cost-related considerations.



S.5 Tier 1 Re-evaluation

In August 2005, more than a year after the Tier 1 studies concluded, Congress enacted the “Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU)” giving states much more flexibility to combine toll and non-toll funding on interstate highway projects. Prior to enactment of SAFETEA-LU projects such as I-69 would not have been able to consider funding options that combined toll and non-toll funding. The provisions of SAFETEA-LU provided INDOT with the opportunity to tap toll funding for I-69, which had the potential to expedite construction.

In order to determine if the new funding options provided under SAFETEA-LU could be used in the development of the project, INDOT and FHWA decided to prepare a Re-evaluation of the Tier 1 FEIS. The Re-evaluation was not intended to determine whether I-69 would be tolled; rather, it was intended to determine what steps would be necessary to consider tolling as an option in Tier 2 studies.

The Re-evaluation was issued in late June 2006. Four Open House meetings were held on June 29 to receive public input on the Re-evaluation. Comments on the Re-evaluation also were accepted for a comment period extending through July 24, 2006.

On November 9, 2006, Gov. Mitch Daniels announced his decision that the I-69 Evansville to Indianapolis project would be developed as a non-tolled interstate. In a letter to the FHWA Indiana Division Administrator dated November 22, 2006, INDOT Commissioner Thomas Sharp confirmed this decision. He further requested that FHWA not finalize the Tier 1 Re-evaluation, which was issued in June 2006, nor issue a Tier 1 Amended ROD approving the consideration of tolling in the Tier 2 studies. In a letter dated December 1, 2006, the FHWA acknowledged INDOT’s decision to eliminate consideration of toll options for the project. FHWA also requested that INDOT complete a review of comments submitted on the Re-evaluation and address issues raised in those comments as appropriate. These responses to comments were transmitted by INDOT to FHWA on January 26, 2007. FHWA responded in a letter dated February 12, 2007, which stated in part, “we find that there are no changes in the proposed action that would result in significant environmental impacts that were not adequately evaluated in the Tier 1 Environmental Impact Statement (EIS); and any new information or circumstances relevant to the environmental concerns and bearings on the proposed action or its impacts would not result in significant environmental impacts not adequately evaluated in the Tier 1 EIS.”

S.6 Scoping, Purpose and Need, Preliminary Alternatives, and Alternatives Screening

S.6.1 Scoping

The Tier 2 scoping process defined the range of alternatives to be considered and the process to be used to address potential environmental impacts. The Tier 1 ROD limited the range of alternatives to freeways within the defined corridor, with Section 4 termini at US 231 and SR 37. The scoping of alternatives included both extensive opportunities for public and agency input, as well as use of innovative design engineering techniques.



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FHWA and INDOT provided numerous opportunities for involving the public and government agencies in the scoping process. See Sections 3.2.2.1, 3.2.2.2 and 11.3 for a detailed description of these opportunities, which included:

- A local project office on the southwest side of Bloomington has been staffed and open to the public during weekday business hours⁶ to allow convenient public access to project team members and materials.
- An open house held at the project office on July 1, 2004. This open house was held to acquaint public officials and the general public with the project office, introduce project staff, provide visitors with project information, and receive input regarding issues of concern.
- Two public information meetings were held to share project information with the public and receive feedback. The first, on June 16, 2005, in Bloomington, was held to present and receive input regarding Preliminary Alternatives and the draft Purpose and Need Statement. The second, on November 16, 2005, in Greene County, was held to present the screened alternatives and possible interchanges.
- A Community Advisory Committee (CAC) was developed in the fall of 2004 to facilitate communication between project team members and representatives of potentially impacted and key constituent groups in the project area. Through a series of five meetings, committee members learned details of the project and provided feedback on such subjects as community access, local needs, and the development of alternatives. A sixth CAC meeting is anticipated concurrent with the issuance of this FEIS
- Five overall meetings with environmental review agencies held on August 12, 2004, February 23-24, 2005, August 1-2, 2006, March 1, 2007, and April 30, 2009. The development and evaluation of alternatives were discussed.
- On November 11, 2005, Section 4's Purpose and Need and Preliminary Alternatives Package was circulated to review agencies. On December 19, 2005, FHWA and INDOT hosted a webcast meeting to review and receive resource agencies' comments on this package.
- On July 26, 2006, Section 4's Preliminary Alternatives Evaluation and Screening Package was circulated to review agencies. On August 31, 2006, FHWA and INDOT hosted a webcast meeting to review and receive resource agencies' comments on this package.

Section 4 also used Quantm to develop preliminary alternatives for public and agency input. Quantm is described in detail in Section 3.1.3.

⁶ The Section 4 Project Office was open Monday through Friday from June 2004 through September 2008. In October 2008 the weekly office hours were changed to Tuesday through Thursday.



S.6.2 Purpose and Need

Transportation performance goals in the Section 4 Study Area include the improvement of accessibility, a reduction in congestion, and improvement in safety. Economic development goals evaluated the role of the transportation system in leading to enhanced economic growth. Section 2.5 gives the specific Purpose and Need performance goals and associated performance measures.

S.6.3 Preliminary Alternatives

S.6.3.1 Alignment Alternatives

The development of Preliminary Alternatives for Section 4 involved dividing the corridor into eight segments referred to as Subsections 4A through Subsection 4H. Two or three preliminary alternatives, as represented by the centerline of the mainline alignment, were developed for each subsection. Alignment alternatives within one subsection may be connected to any of those in adjoining subsections to form continuous “end-to-end” alternatives extending the full length of the corridor. Additional information about the development of the Preliminary Alternatives, including key resources that were considered, is included in Section 3.2.2.3.

The eight subsections in Section 4 are:

- **Subsection 4A:** The subsection begins at the north terminus of Section 3; approximately 1,280 feet west of CR 200E (3,800 feet east of US 231). An interchange at US 231 and the mainline that extends I-69 east of the interchange to the Section 3-4 breakline are included in the Section 3 Tier 2 EIS. Subsection 4A generally proceeds east/northeast crossing CR 200E and CR 215E. The east terminus of Subsection 4A is approximately 1,400 feet east of CR 315E and 1,200 feet south of CR 600S. Two preliminary alternatives (4A-1 and 4A-2) were developed within Subsection 4A.
- **Subsection 4B:** The corridor continues on a general northeast bearing from the Subsection 4A-4B breakline to a point approximately 4,100 feet north of CR 600S and 2,400 feet west of CR 440E (Taylor Ridge Road). Two preliminary alternatives (4B-1 and 4B-2) were developed within Subsection 4B.
- **Subsection 4C:** The subsection continues from the Subsection 4B-4C breakline on a general northeast bearing toward Taylor Ridge Cemetery (near the CR 440E/CR 450S intersection). Near the cemetery, the corridor turns east across Black Ankle Creek and CR 600E. The subsection terminus is about 700 feet east of CR 600E. Two preliminary alternatives (4C-1 and 4C-2) were developed within Subsection 4C.
- **Subsection 4D:** The corridor proceeds east from the Subsection 4C-4D breakline across Dry Branch, CR 750E/900E (Dry Branch Road), CR 350S/CR 360S/CR 880E (Mineral-Koleen Road), and Plummer Creek. The subsection ends approximately 700 feet east of Mineral-Koleen Road. Two preliminary alternatives (4D-1 and 4D-2) were developed within Subsection 4D.



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- **Subsection 4E:** Subsection 4E proceeds east/northeast from the Subsection 4D-4E breakline before turning north/northeast to the subsection terminus located about 3,000 feet north/northeast of SR 54. The preliminary alternatives cross Cedar Road (Clifty Hills Subdivision), CR 920E/CR 975E (Old Clifty Road), SR 45, Mitchell Branch, CR 1250E, and SR 54. Potential interchanges were proposed at SR 45 and SR 54. Three preliminary alternatives (4E-1, 4E-2, and 4E-3) were developed within Subsection 4E.
- **Subsection 4F:** The corridor for Subsection 4F, which is the longest subsection within Section 4, proceeds generally north/northeast from the Subsection 4E-4F breakline along and to the west of the Greene/Monroe County Line. Near the southeast corner of the Timber Trace Subdivision (Greene County), the corridor turns east into Monroe County. Subsection 4F ends about 900 feet east of Breeden Road. The preliminary alternatives cross CR 1260E/CR 190S (Hobbieville Road), CR 35N (Carmichael Road), CR 150N (Carter Road), and Breeden Road. The preliminary alternatives also have three crossings of Indian Creek. Subsection 4F widens to about 5,300 feet (one mile) in the vicinity of CR 150N; this portion of the corridor was specified as wider in Tier 1 to provide the flexibility to avoid potential cultural resources associated with the Virginia Iron Works. The proposed Greene/Monroe County Line interchange is located in the vicinity of CR 150N. A connector extends west from the proposed interchange to SR 45 and includes a fourth crossing of Indian Creek. Three preliminary alternatives (4F-1, 4F-2, and 4F-3) were developed within Subsection 4F.
- **Subsection 4G:** The corridor proceeds east/northeast from the Subsection 4F-4G breakline across Burch Road. It then turns east across Evans Lane, Harmony Road, and Rockport Road. The alignment ends about 400 feet west of Lodge Road. Two preliminary alternatives (4G-1 and 4G-2) were developed within Subsection 4G.
- **Subsection 4H:** The subsection continues northeast from the Subsection 4G-4H breakline across Lodge Road and then turns north/northeast to SR 37. An interchange is proposed at SR 37. The subsection ends just north of the SR 37 interchange near That Road. The preliminary alternatives cross Lodge Road, Happy Creek, Tramway Road, May Creek, and Bolin Lane. Three preliminary alternatives (4H-1, 4H-2, and 4H-3) were developed within Subsection 4H.

All end-to-end alternatives in Section 4 have the same beginning point (1,280 feet west of CR 200E in Subsection 4A) and same ending point (SR 37 at That Road in Subsection 4H), are approximately the same length (26.9 to 27.7 miles), and located very near to one another. Because of these similarities, local Purpose and Need performance indicators were not applicable for the analysis of end-to-end alignment alternatives. Rather, a preferred end-to-end alignment alternative was selected on the basis of environmental impacts and cost.

S.6.3.2 Interchange Options

The Tier 1 Study identified interchanges at SR 45, SR 54, and SR 37 for Section 4. An interchange at the Greene/Monroe County Line was added for consideration during the Tier 2 scoping based upon input from the public, local officials, and the Section 4 CAC. The



Greene/Monroe County Line interchange includes two possible alignments (North Connector Road and South Connector Road) to connect the interchange with SR 45 in Greene County.

Because of the different potential interchange locations, five interchange options consisting of various combinations of interchanges were proposed for analysis. The five interchange options for Section 4 are presented in **Table S.6-1**. All options include interchanges at US 231 (which is addressed in the Section 3 Tier 2 EIS) and SR 37. Additional discussion about the interchange options is included in Section 3.2.2.3.

Table S.6-1: Section 4 Interchange Options*					
Potential Interchange Locations	1	2	3	4	5
SR 45	X		X	X	
SR 54			X		X
Greene/Monroe County Line	X	X			
*All interchange options include interchanges at US 231 (being studied by Section 3) and SR 37					

As examined in Section 3.3, the five interchange options provide differing levels of benefit for the local Purpose and Need measures of accessibility, congestion, and safety. Overall, the Greene/Monroe County Line interchange will have the greatest effect upon congestion relief and crash reduction in the five-county Study Area. This interchange is one of the two intermediate interchanges included in Interchange Option 1. Also, as a single intermediate interchange (Interchange Option 2), the Greene/Monroe County Line interchange will provide greater congestion relief as compared to Interchange Option 3, which has two intermediate interchanges (SR 45 and SR 54). Interchange Option 2 will also have greater congestion relief and safety benefits as compared to the other single intermediate interchange options (Interchange Options 4 and 5).

With regards to economic development indicators, the interchange options would have essentially equal performance in improving travel distances and times to the interstate system from the communities and employment centers in the Study Area. The relative ability to satisfy local Purpose and Need was an important basis of the recommendations of the number and location of interchanges for the preferred alternative.

S.6.4 Alternatives Screening

Preliminary alternatives for mainline alignments within the eight subsections and the five interchange options were presented to the public and included in the Purpose and Need and Preliminary Alternatives Package that was circulated to review agencies and discussed at a webcast meeting. An evaluation and screening of the preliminary mainline alignments along the eight subsections was then performed. This evaluation and screening concluded with preliminary recommendations for each subsection alignment. The preliminary recommendations were presented to the public at the November 16, 2005, public information meeting. They were



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also included in Preliminary Alternatives Evaluation and Screening Package that was circulated to review agencies on July 26, 2006, and discussed at a webcast meeting held August 31, 2006.

After reviewing additional data on resources and potential impacts, completing further engineering development of the alternative alignments, and considering public input and the agency comments, final recommendations were made for subsection alignment alternatives and interchange options to be carried forward for detailed study (see Section 3.4).

S.6.4.1 Alignment Alternatives

Continued development of the preliminary alignment alternatives indicated that at least a 400-foot right-of-way would likely be needed to accommodate the highway development along most of the Section 4 corridor. In some locations, however, it was determined that the right-of-way may need to be widened up to 600 feet in order to accommodate highway sections that require more extensive cuts and fill, which will be common in Section 4. Thus, both 400-foot and 600-foot screening zones centered along the centerline of the preliminary alignments were used to provide a range of potential impacts for the alternatives screening.

- **Subsection 4A:** Alternative 4A-1 was discarded due to prime farmland, managed property, core forest, pond and displacement impacts. Alternative 4A-2 was recommended to be carried forward for detailed study. USEPA Region 5 suggested in its letter dated September 26, 2006, that a new alignment be considered in Subsection 4A that would connect the west end of Alternative 4A-2 with the middle and eastern portions of the Alternative 4A-1 alignment. This new alternative was suggested in order to minimize possible wetland and forest impacts that may occur along Alternative 4A-2. IDNR also indicated concerns about forest loss and fragmentation along Alternative 4A-2. As a result, Alternative Hybrid 4A-1/4A-2 was developed, screened, and recommended to be carried forward for detailed study along with Alternative 4A-2.
- **Subsection 4B:** The alternatives screening indicated that Alternative 4B-1 would have fewer impacts upon forest, core forest, managed lands, and, with a slight alignment modification, no impacts upon wetlands. Alternative 4B-1 was recommended to be carried forward for detailed study and Alternative 4B-2 was discarded from further consideration.
- **Subsection 4C:** The alternatives screening indicated that Alternative 4C-1 and Alternative 4C-2 would have similar impacts. Both alternatives were recommended to be carried forward for detailed study.
- **Subsection 4D:** Alternative 4D-1 was recommended to be carried forward for detailed study. This alternative was preferred due to its greater avoidance of the recharge area of a major spring. Alternative 4D-2 was discarded from further consideration.
- **Subsection 4E:** After completion of the initial screening of the three preliminary alignments in Subsection 4E, Alternative 4E-1, Alternative 4E-2, and Alternative 4E-3 were replaced by a new alternative, named Alternative Hybrid 4E-1/4E-2. Hybrid Alternative 4E-1/4E-2 follows Alternative 4E-1 from the south terminus at Mineral-Koleen Road to a point near a



major electric transmission corridor west of SR 45. Between the electric transmission corridor and SR 45, Alternative Hybrid 4E-1/4E-2 shifts to the alignment of Alternative 4E-2. East of SR 45, Alternative Hybrid 4E-1/4E-2 generally follows the preliminary alignment depicted by Alternative 4E-2. Near the midpoint between SR 45 and SR 54 the alignment shifts slightly to the north towards the alignment of Alternative 4E-1 and then back to the alignment of Alternative 4E-2 across SR 54 to the subsection terminus. The analysis of the new hybrid alternative indicated that avoidance/minimization of specific resource concerns along portions of Alternatives 4E-1 and 4E-2 would be possible. Alternative Hybrid 4E-1/4E-2 was recommended to be carried forward for detailed study.

- **Subsection 4F:** Alternative 4F-2 was discarded due to potential impacts upon a major karst feature, residential displacements, neighborhood impacts, a skewed crossing of Indian Creek, and construction in a floodplain. Alternative 4F-1 and Alternative 4F-3 were recommended to be carried forward for detailed study. Alternative 4F-1 had higher forest and wetland impacts, while Alternative 4F-3 had higher aquatic (stream and floodplain) impacts. Since the alignments for Alternative 4F-1 and Alternative 4F-3 cross just south of CR 150N, this allowed for the creation of two new hybrid alternatives in subsection 4F. These alternatives, designated as Alternative 4F-4 and Alternative 4F-5, were also carried forward for detailed study. Alternatives 4F-4 and 4F-5 were formed by matching (at their intersecting point) the north half of Alternative 4F-1 with the south half of Alternative 4F-3, and vice-versa. These hybrid alternatives were added to determine if one of them would offer an overall reduction in costs and impacts to key resources.
- **Subsection 4G:** Alternative 4G-2 was recommended to be carried forward for detailed study. This alternative had fewer impacts to karst features as compared to Alternative 4G-1. Alternative 4G-1 was also located very close to the boundary for the National Register eligible John May House. Since the initial recommendation to carry Alternative 4G-2 forward for detailed study, the John May House was destroyed by fire. Subsequent studies determined that Alternative 4G-2 also would have fewer karst impacts than Alternative 4G-1 and also would avoid impact to karst features with connections to a cave in which state-endangered cave biota have been found. Alternative 4G-1 was discarded from further consideration.
- **Subsection 4H:** The alternatives screening indicated that Alternative 4H-1, Alternative 4H-2 and, Alternative 4H-3 would have similar impacts. All three alternatives were recommended to be carried forward for detailed study.

The detailed evaluation and screening of the Preliminary Alternatives is discussed in Section 3.4.1. The alternative alignments recommended to be carried forward for detailed study were:



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Subsection 4A	Alternatives 4A-2 and Hybrid 4A-1/A-2
Subsection 4B	Alternative 4B-1
Subsection 4C	Alternative 4C-1 and 4C-2
Subsection 4D	Alternative 4D-1
Subsection 4E	Alternative Hybrid 4E-1/4E-2
Subsection 4F	Alternatives 4F-1, 4F-3, 4F-4, and 4F-5
Subsection 4G	Alternative 4G-2
Subsection 4H	Alternatives 4H-1, 4H-2, and 4H-3

S.6.4.2 Interchange Options Screening

Interchange options advanced as alternatives carried forward were identified based upon a review of several factors. These were the results of the performance measures analyses, interchange spacing policies, predicted interchange use, potential environmental impacts, and input from environmental resource agencies and the public.

All of the Section 4 Build Alternatives, as represented by the five interchange options (with intermediate interchanges between US 231 and SR 37), provide essentially equal benefits for accessibility and safety measures. Interchange Option 1 will provide the greatest congestion relief, crash frequency reduction, and the most crash reduction on non-interstate roads. Interchange Option 5 will provide the least amount of congestion relief and the least safety improvement. The Greene/Monroe County Line interchange, which is included in Interchange Options 1 and 2, will have the greatest effect upon congestion relief and crash frequency reduction in the 5-county study area.

Interchange Option 3 does not meet the desired rural interchange spacing per INDOT policy. Further, this option does not result in even spacing of intermediate interchanges between US 231 and SR 37 and does not address concerns of emergency providers in responding to incidents along I-69 and in Eastern Greene County and Western Monroe County.

Interchange Option 5 had the lowest total interchange demand volume of all five interchange options and the lowest demand of the three options with a single intermediate interchange (Interchange Options 2, 4, and 5). Option 5 also generally provided the lowest level of benefits per the transportation performance measures.

The three interchange options that were recommended for detailed study were:

Interchange Option 1	SR 45, Greene/Monroe County Line, and SR 37
Interchange Option 2	Greene/Monroe County Line and SR 37
Interchange Option 4	SR 45 and SR 37



The following section, Section S.7, provides maps showing each of the alignment alternatives and interchange options carried forward for detailed study.

S.7 Cost and Impact Analysis

All end-to-end alternatives in Section 4 have the same beginning and ending points and are approximately the same length. They also assumed the same interchange option (Option 1 – SR 45, Monroe/Greene County Line, and SR 37) for analysis of costs and impacts. Because of these similarities, purpose and need performance indicators were not applicable for determining a preferred alignment alternative, as described in subsection S.7.1. Rather, a preferred end-to-end alignment alternative has been selected on the basis of costs and impacts. Subsection S.7.2 summarizes the selection of a preferred interchange option, which considered purpose and need in addition to cost and impacts.

The subsection alignment alternatives were combined to form four Section 4 end-to-end alternatives that extend from the southern Section 4 terminus, located just west of Greene CR 200E (about 3,800 feet east of US 231), to the northern Section 4 terminus located at the SR 37 interchange (between Victor Pike and That Road). **Table S.7-1** identifies the alternatives and the combination of subsections of which they are composed. All four alternatives include interchanges at SR 45, Greene/Monroe County Line, and SR 37.

Alternative 2 was identified in the DEIS as the preferred alternative. No comments on the DEIS provided any reason to select a different alternative. This FEIS presents refinements to Alternative 2 that have occurred since the issuance of the DEIS. These refinements are based on comments received on the DEIS, information received from CAC members and local public officials, additional engineering and environmental studies, and decisions made by INDOT. The product of these efforts is Refined Preferred Alternative 2. The impacts associated with Refined Preferred Alternative 2, which are also included in **Table S.7-1**, are presented in Chapter 5 and compared herein to the impacts for Alternatives 1 through 4 as presented in the DEIS.

Refined Preferred Alternative 2 is the product of further developments to DEIS Preferred Alternative 2. Refinements were made to reduce environmental impacts; reflect decisions made by INDOT based upon additional coordination with local public officials, public organizations and individuals; improve local access; refine the vertical road profile; make minor corrections to the project design; additional engineering and environmental analysis; and reduce project costs. These refinements were made along parts of all eight subsections.

Refinement of the vertical road profile under the initial design criteria was one of the most substantial changes for Refined Preferred Alternative 2. The typical cross section elements of the initial and low-cost design criteria for Refined Preferred Alternative 2 remained the same as those used for DEIS Alternatives 1, 2, 3, and 4. Refined Preferred Alternative 2 also maintains the same horizontal alignment as DEIS Alternative 2. Portions of the proposed vertical elevation and grades of the roadway (the vertical road profile), however, have been refined for the initial design criteria condition of Refined Preferred Alternative 2. The low-cost design criteria vertical road profile remains the same as that used for DEIS Alternative 2.

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The vertical road profile refinements for the initial design criteria were made to reduce, or narrow, the right-of-way requirements for the initial design criteria and thus reduce costs and environmental impacts, particularly forest impacts near bat hibernacula. This narrowing of the right-of-way and refinements for the Section 4 alignment occurred in two areas. The first area is from 0.48 miles east of SR 45 to 0.34 miles north of Hobbieville Road, which is located along Refined Hybrid 4E-1/4E-2 and the very south end of Refined 4F-3. The second area for refinement of the vertical road profile under the initial design criteria for Refined Preferred Alternative 2 occurs from 0.52 miles north of Carter Road in Refined 4F-3 to 0.18 mile west of Lodge Road in Refined 4G-2. In these two locations, the profile under the initial design criteria was revised to coincide with the low-cost vertical road profile; therefore, a maximum 20 mph truck speed reduction was utilized in calculating the maximum length of any upgrade.

The other substantial difference between DEIS Preferred Alternative 2 and FEIS Refined Preferred Alternative 2 involves local access changes and related access decisions that were made by INDOT in coordination with local public officials, public organizations, and individuals. These changes included:

- Greene CR 200E was changed from a grade separation in the DEIS to a closure in the FEIS.
- Greene CR 215E was changed from a closure in the DEIS to a grade separation in the FEIS.
- Dry Branch Road and Mineral-Koleen Road in Greene County, which were presented in the DEIS with options to provide a grade separation or close the road at I-69, will each have a grade separation at I-69.
- Access Road 2, which was proposed as an intersection improvement in the DEIS, would be replaced in the FEIS by a modification of the existing cul-de-sac at the south end of Spruce Road. The new access road is referred to as Access Road 2a.
- Access Road 6 was added on the east side of SR 45 to the north of I-69 to provide access to one residential property and one undeveloped parcel.
- Burch Road, Harmony Road and Bolin Lane in Monroe County, which were presented in the DEIS with options to provide a grade separation or close the road at I-69, will each have a grade separation at I-69.
- Evans Lane, which was presented in the DEIS with options to provide a grade separation or close the road at I-69, would be closed at I-69.
- Access Road 7 was added to maintain the current connection of Glenview Drive with Bolin Lane and the current connection of Glenview Drive to Wheaton Court.

Other refinements between DEIS Preferred Alternative 2 and FEIS Refined Preferred Alternative 2 included property acquisition changes and minor design corrections. Property acquisition changes included additional relocations and the acquisition of landlocked properties. The results of these changes are reflected in the total cost of the involved subsections but did not affect right-of-way or other impacts (except for the identified relocations). Minor design corrections were made at various locations for compliance with INDOT's Design Manual (IDM) and included such changes as slope grading and drainage. These refinements were made, where necessary, for both the initial design criteria and the low-cost design criteria. Some of these refinements did



not alter construction limits and/or right-of-way but did modify the total cost for a subsection alternative. Other minor design corrections did alter construction limits and/or right-of way and thus changed total cost and/or impacts for the involved subsection alternative(s).

Alternative	Combination	Length (Miles)
1	4A-2+4B-1+4C-1+4D-1+Hybrid 4E-1/4E-2+4F-1+4G-2+4H-1	26.67
2*	4A-2+4B-1+4C-2+4D-1+Hybrid 4E-1/4E-2+4F-3+4G-2+4H-2	26.68
3	Hybrid 4A-1/4A-2+4B-1+4C-2+4D-1+Hybrid 4E-1/4E-2+4F-4+4G-2+4H-3	26.55
4	4A-2+4B-1+4C-1+4D-1+Hybrid 4E-1/4E-2+4F-5+4G-2+4H-2	26.72
Refined Preferred Alternative 2	Refined 4A-2+ Refined 4B-1+ Refined 4C-2+ Refined 4D-1+ Refined Hybrid 4E-1/4E-2+ Refined 4F-3+ Refined 4G-2+ Refined 4H-2	26.68
* Preferred Alternative presented in the DEIS		

S.7.1 Comparison of Alignment Alternative Impacts

Tables S.7-2 through S.7-9 summarize cost and key environmental impacts for each alignment alternative by corridor subsection 4A through 4H. The following sections compare the costs and impacts for each alignment alternative with those of other alignment alternatives within the same corridor subsection. This comparison includes the range of impacts associated with the implementation of both the initial design criteria and the low-cost design criteria. Table S.7-10 contains cost estimates for each alignment alternative by corridor segment.

Updates of costs and impacts for DEIS Alternatives 1, 2, 3, and 4 as presented in DEIS Table 6-2 through Table 6-9 have also been made in the FEIS. These updates included:

- Total costs were revised for all of the alternative alignments in Subsections 4F and 4H due to updated residential relocations (see below).
- Total costs were revised for all of the alternative alignments from that presented in the DEIS to correct minor earthwork calculation errors that were identified.
- Two stream types (intermittent and ephemeral stream classifications) within Subsection 4G and the resulting stream impacts for Alternative 4G-2 were corrected. Total stream impacts did not change.
- Residential relocations were reviewed and updated with more recent field data . Residential relocation impact revisions were found and made for all alternative alignments in Subsections 4F and 4H.
- The location of a noise receptor in Subsection 4E was corrected in response to a public comment; noise impacts for Alternative Hybrid 4E-1/4E-2 were updated.
- The total number of impacted noise receptors in Subsections 4F and 4G were updated. The update in Subsection 4F was made for a residence, previously identified as impacted noise receptor, which will be relocated per the revised residential relocation methodology as



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discussed above. The update in Subsection 4G was to correct the methodology for calculating impacted noise receptors at the Fern Hills Club.

- One managed land property in Subsection 4H was removed from the Classified Forests and Wildlands program prior to publication of the DEIS. This change was not accounted for in the DEIS. Managed land impacts due to the unintended inclusion of this property in the DEIS have been corrected for Alternatives 4H-1, 4H-2, and 4H-3.
- Stream relocation impacts were updated for all alternative alignments in Subsection 4A and Subsections 4C through 4H, as some impacts were incorrectly classified as stream crossings (i.e. culverts, pipes) in the DEIS. These impacts have been reclassified as relocations in the FEIS, resulting in increased relocation impacts.
- There are no stream relocations within Subsection 4B.

The above updates of costs and impacts for DEIS Alternatives 1, 2, 3, and 4 did not substantially affect the subsection comparisons (advantages and disadvantages). The recommendations for the preferred subsection alternatives, as presented in the DEIS, have been reviewed and no changes to those recommendations were determined to be warranted.

S.7.1.1 Subsection 4A

Alternative 4A-2 (map pp. 1 and 2 of **Figure S-5**, **Figure S-6**, and **Figure S-8**) begins near the center of the Subsection 4A corridor and proceeds east/northeast crossing CR 200E about 1,100 feet north of SR 45/SR 58. The alignment continues generally east/northeast and crosses CR 215E about 2,000 feet northeast of SR 45/SR 58. Approximately 2,800 feet northeast of CR 215E, the alignment merges with Alternative Hybrid 4A-1/4A-2 and turns northeast to the subsection terminus. Alternative 4A-2 has a total length of 8,855 feet (1.68 miles). Alternative 4A-2 is the Subsection 4A component of Alternatives 1, 2, and 4.

Alternative Hybrid 4A-1/4A-2 (map pp. 1 and 2 of **Figure S-7**) begins in the northern portion of the Subsection 4A corridor and proceeds east. The alignment crosses CR 200E about 2,000 feet north of SR 45/SR 58 and then crosses CR 215E about 2,400 feet northeast of SR 45/SR 58. Alternative Hybrid 4A-1/4A-2 merges with Alternative 4A-2 northeast of CR 215E. It has a total length of 8,646 feet (1.64 miles). Alternative Hybrid 4A-1/4A-2 is the Subsection 4A component of Alternative 3.

Alternative 4A-2 and **Alternative Hybrid 4A-1/4A-2** traverse mainly farmland (row crops and pasture) and forest (woodlots). Hasler Cemetery is located along the north edge of the corridor east of CR 215E. There are no karst features in Subsection 4A. A grade separation would be built at CR 200E and CR 215E would be closed for both alternatives.

An interchange at US 231 and the mainline of I-69 extending east from the interchange (Section 3 Alternative 3E-1) was selected in the January 28, 2010, Tier 2 Record of Decision for Section 3. The Section 3 Alternative 3E-1 is on a tangent (straight) alignment that directly connects to **Alternative 4A-2**. Because **Alternative Hybrid 4A-1/4A-2** begins approximately 900 feet to the north of the Section 3 Alternative 3E-1 alignment, a modification of the Section 3 Alternative 3E-1 alignment would be needed to connect Section 3 with Section 4. The modification would



begin along the Section 3 Alternative 3E-1 alignment about 1,000 feet east of US 231.⁷ At that point, the alignment would curve to the northeast parallel to the east side of an electrical transmission line and then turn east to connect with **Alternative Hybrid 4A-1/4A-2**. **Figure S-9** (p. S-188) shows the two Section 3 alignments within the overlap area between Section 3 and Section 4.

The most notable differences between **Alternative 4A-2** and **Alternative Hybrid 4A-1/4A-2** are right-of-way acquisition and impacts upon forests, core forests, wetlands, streams, and displacements. A comparison of the impacts is presented in **Table S.7-2**. Impacts within the overlap area between Section 3 and Section 4 are also noted in the table. Notable differences for the Section 3 alignments within the overlap area (Alternative 3E-1 and modified 3E-1) include total cost, right-of-way acquisition, and impacts upon forest, core forest, wetland, and streams. Also, geometric differences within the overlap area include a straight alignment continuation between the Section 3 Alternative 3E-1 and **Alternative 4A-2** and an undesirable alignment within the US 231 interchange for the connection between a modified Alternative 3E-1 alignment with **Alternative Hybrid 4A-1/4A-2**. Longer interchange ramps would be needed to provide the required sight distance for motorists along this curved alignment. Finally, the differences for Subsection 4A also include a comparison of the combined impacts. This comparison is for Alternative 4A-2 with the Section 3 Alternative 3E-1 and Alternative Hybrid 4A-1/4A-2 with a modified Section 3 Alternative 3E-1. The most notable combined differences include total cost, right-of-way acquisition, and impacts upon forest, core forest, and streams.

Based on comments received on the DEIS from the public, resource agencies, CAC members and local public officials, additional engineering and environmental analysis, and decisions made by INDOT, Alternative 4A-2 has been further developed. With these refinements, Alternative 4A-2 is referred to in the FEIS as Refined Alternative 4A-2 (**Figure S-8a**, map pp. 1 and 2). Refined Alternative 4A-2 is the Subsection 4A alternative included in Refined Preferred Alternative 2. The following describes refinements and how those refinements changed the costs and impacts reported in the DEIS:

- The proposed grade separation at CR 200E, as included in the DEIS, has been replaced by a road closure for CR 200E at the mainline alignment under Refined Alternative 4A-2. This change was made for both the initial design criteria and the low-cost design criteria.
- The proposed road closure of at CR 215E at the mainline alignment, as included in the DEIS, has been replaced by a grade separation along CR 215E under Refined Alternative 4A-2. This change was made for both the initial design criteria and the low-cost design criteria.

⁷ The location of the US 231 interchange is constrained by the need to avoid significant resource impacts, including stream, forest and core forest impacts. Adoption of the tight-diamond configuration for this interchange (which reduces impacts just to the north and south of the Section 3 mainline at the interchange location) results in 1,560 fewer linear feet of perennial stream impacts; 19.8 fewer acres of forest impacts; 4.1 fewer acres of wetland impacts; and 5.0 fewer acres of core forest impacts. See Section 3 FEIS, Table 6-6 (p. 6-41). Any relocation of the US 231 interchange even slightly to the north would result in increased impacts to these resources, particularly in and near Doans Creek; see also Section 3 FEIS, Figure 6-7, p. 6-120). For these reasons, as well as to provide appropriate tie-ins to the US 231 interchange ramps, any modification to the Section 3 mainline would have to begin some distance east of the US 231 interchange.



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Table S.7-2: Overview of Key Impacts for Subsection 4A

	Alternatives							
	4A-2			Hybrid 4A-1/4A-2			Refined 4A-2	
	Low Cost*	Initial**	Section 3-4 Overlap***	Low Cost*	Initial**	Section 3-4 Overlap***	Low Cost*	Initial**
Total Cost (\$M)****	18.88	26.28	7.3	20.45	26.08	10.0	17.05	23.21
Right-of-Way (Ac)	76.50	88.53	44.7	72.26	79.84	54.0	75.57	89.08
Forest (Ac)	38.54	45.45	22.0	29.08	33.62	12.9	38.02	45.13
Core Forest (Ac)	3.39	3.50	3.2	3.81	4.01	0.0	3.39	3.50
Wetland Impacts (Ac)								
Emergent Wetland	0.00	0.00	0.24	0.00	0.00	0.3	0.00	0.00
Forested Wetland	0.00	0.00	0.07	0.00	0.00	0.07	0.00	0.00
Scrub/Shrub Wetland	0.18	0.45	0.00	0.00	0.00	0.00	0.18	0.45
Total Wetland Impacts	0.18	0.45	0.31	0.00	0.00	0.37	0.18	0.45
Stream Impacts (LF)								
Ephemeral	3,357	4,111	1,070.8	3,044	3,722	450.0	3,461	4,150
Intermittent	1,080	1,245	0.0	467	701	0.0	1,088	1,270
Perennial	0	0	1,513.1	0	0	1,465.3	0	0
Total Stream Impacts*****	4,437	5,356	2,583.9	3,511	4,423	1,915.3	4,549	5,420
Karst Features (#)	0	0	0	0	0	0	0	0
Displacements (#)								
Residential	0	0	0	2	2	0	0	0
Institutional	0	0	0	0	0	0	0	0
Business	0	0	0	0	0	0	0	0
Total Displacements	0	0	0	2	2	0	0	0
Noise Impacts (#)*****	4	6		4	4		5	6
Managed Land (Ac)	2.24	3.20	0.0	6.30	7.82	0.0	2.23	3.18
Farmland (Ac)	30.14	34.45	17.8	31.99	35.13	36.0	29.96	34.90
Stream Relocations (LF)	1,361	1,596		524	771		1,359	1,611
Floodplain (Ac)	0.00	0.00	6.5	0.00	0.00	6.2	0.00	0.00

* Low-Cost Design Criteria
 ** Initial Design Criteria
 *** Total cost, right of way, and all impacts are based upon the Section 3 FEIS
 **** 2010 Dollars, excluding mitigation costs
 ***** Impacted streams are shown in **Table 6-9a** (p. 6-45)
 ***** Noise impacts for the refined alternative were determined per the *Indiana Department of Transportation Traffic Noise Analysis Procedure, 2011*
 \$M = million dollars, Ac = acres, LF = linear feet
 All impacts are by preliminary right-of-way except wetland impacts which are by construction limits.
 Noise, farmland, and stream relocation impacts were not determined in the Section 3-4 overlap area.

S.7.1.2 Subsection 4B

In Subsection 4B, **Alternative 4B-1** continues from the Subsection 4A-4B break line on a general northeast bearing along the west edge of the corridor. A crossing is provided for the Dowden Branch. CR 600S would be closed. After crossing Dowden Branch, the alignment gradually shifts toward the center of the corridor and continues to the northeast ending at a point approximately 4,100 feet north of CR 600S and 2,400 feet west of CR 440E (Taylor Ridge Road). Farmland (row crops and pasture) and forest (woodlots) dominate the land use of this subsection. No karst features are located in Subsection 4B. Alternative 4B-1 is the only alternative under consideration in Subsection 4B and is the component of Alternatives 1, 2, 3,



and 4. The alternative is 6,400 feet (1.21 miles) in length. **Table S.7-3** summarizes the impacts associated with Alternative 4B-1. Alternative 4B-1 is shown on map pp. 2 and 3 of **Figure S-5** through **Figure S-8**.

Based on additional engineering and environmental analysis, Alternative 4B-1 has been further developed. With these refinements, Alternative 4B-1 is referred to in the FEIS as Refined Alternative 4B-1 (**Figure S-8a**, map pp. 2 and 3). Refined Alternative 4B-1 is the Subsection 4B alternative included in Refined Preferred Alternative 2.

The following describes refinements and how those refinements changed the costs and impacts reported in the DEIS:

- Minor design modifications were made at various locations. These refinements were made for both the initial design criteria and the low-cost design criteria.

Table S.7-3: Overview of Key Impacts for Subsection 4B				
	Alternatives			
	4B-1		Refined 4B-1	
	Low-Cost*	Initial**	Low-Cost*	Initial**
Total Cost (\$M)***	12.42	24.19	12.17	24.18
Right-of-Way (Ac)	48.44	57.91	48.46	57.87
Forest (Ac)	21.26	22.53	21.26	22.48
Core Forest (Ac)	10.42	10.81	10.42	10.80
Wetland Impacts (Ac)				
Emergent Wetland	0.00	0.00	0.00	0.00
Forested Wetland	0.00	0.00	0.00	0.00
Scrub/Shrub Wetland	0.00	0.00	0.00	0.00
Total Wetland Impacts	0.00	0.00	0.00	0.00
Stream Impacts (LF)				
Ephemeral	1,358	1,359	1,359	1,354
Intermittent	420	476	420	476
Perennial	0	0	0	0
Total Stream Impacts****	1,778	1,835	1,779	1,830
Karst Features (#)	0	0	0	0
Displacements (#)				
Residential	0	0	0	0
Institutional	0	0	0	0
Business	0	0	0	0
Total Displacements	0	0	0	0
Noise Impacts (#)*****	2	2	1	1
Managed Land (Ac)	2.53	2.88	2.53	2.88
Farmland (Ac)	26.02	34.21	26.03	34.21
Stream Relocations (LF)	0	0	0	0
Floodplain (Ac)	0.00	0.00	0.00	0.00

* Low-Cost Design Criteria, ** Initial Design Criteria, ***2010 Dollars, excluding mitigation costs
 **** Impacted streams are shown in **Table 6-9a** (p. 6-45)
 ***** Noise impacts for the refined alternative were determined per the *Indiana Department of Transportation Traffic Noise Analysis Procedure, 2011*
 \$M = million dollars, Ac = acres, LF = linear feet
 All impacts are by preliminary right-of-way except wetland impacts which are by construction limits.



S.7.1.3 Subsection 4C

Alternative 4C-1 (map pp. 3 to 5 of **Figure S-5** and **Figure S-8**) diverges from the common alignment with Alternative 4C-2 about 800 feet northeast of the Subsection 4B-4C break line. The alignment follows the west edge of the corridor and passes to the west of Taylor Ridge Cemetery and north of the CR 475E/CR 450S intersection. The alignment utilizes a single curve to turn east along the north edge of the corridor and merges with the alignment of Alternative 4C-2 about 500 feet west of Black Ankle Creek. Alternative 4C-1 has a total length of 14,000 feet (2.65 miles). Alternative 4C-1 is the Subsection 4C component of Alternatives 1 and 4.

Alternative 4C-2 (map pp. 3 to 5 of **Figure S-6** and **Figure S-7**) generally trends to the east edge of the corridor. To avoid Taylor Ridge Cemetery, the alignment curves to the northeast thru the CR 475E/CR 450S intersection just east of the cemetery. After a tangent (straight) section of roadway, the alignment curves to the east where it merges with the alignment of Alternative 4C-1 and continues east across Black Ankle Creek and CR 600E to the subsection terminus. Alternative 4C-2 has a total length of 13,302 feet (2.50 miles). Alternative 4C-2 is the Subsection 4C component of Alternatives 2 and 3.

Both alternatives would include a bridge/grade separation over Black Ankle Creek/CR 600E. CR 475E (north of CR 450S) and CR 400S (east of CR 600E) would be closed by both alternatives. Under Alternative 4C-2, Taylor Ridge Road (CR 440E) and CR 450S would be closed south of the new highway. Access Road 1 (north side of the highway) would be built to maintain access to Taylor Ridge Cemetery from CR 475E under Alternative 4C-2.

Alternative 4C-1 and Alternative 4C-2 both traverse mainly forest and some farmland (pasture). The most notable differences between the alternatives are total cost, right-of-way acquisition, and impacts upon core forest, streams, and karst features. A comparison of the impacts associated with the two alternatives is presented in **Table S.7-4**.

Based on comments received on the DEIS from the public, resource agencies, CAC members and local public officials, additional engineering and environmental analysis and decisions made by INDOT, Alternative 4C-2 has been further developed. With these refinements, Alternative 4C-2 is referred to in the FEIS as Refined Alternative 4C-2 (**Figure S-8a**, map pp. 3 to 5). Refined Alternative 4C-2 is the Subsection 4C alternative included in Refined Preferred Alternative 2.

The following describes refinements and how those refinements changed the costs and impacts reported in the DEIS:

- Minor design modifications were made at various locations. These refinements were made for both the initial design criteria and the low-cost design criteria.



Table S.7-4: Overview of Key Impacts for Subsection 4C

	Alternatives					
	4C-1		4C-2		Refined 4C-2	
	Low-Cost*	Initial**	Low-Cost*	Initial**	Low-Cost*	Initial**
Total Cost (\$M)***	45.37	74.33	41.33	72.71	41.43	71.78
Right-of-Way (Ac)	125.66	170.25	118.58	155.11	118.65	155.47
Forest (Ac)	73.42	98.06	71.97	92.32	72.03	92.55
Core Forest (Ac)	84.14	90.47	66.76	71.14	66.78	71.35
Wetland Impacts (Ac)						
Emergent Wetland	3.16	3.70	3.17	3.70	3.17	3.70
Forested Wetland	1.44	3.81	1.43	3.13	1.43	3.13
Scrub/Shrub Wetland	0.00	0.00	0.00	0.00	0.00	0.00
Total Wetland Impacts	4.60	7.51	4.60	6.83	4.60	6.83
Stream Impacts (LF)						
Ephemeral	2,921	3,551	3,648	4,678	3,649	4,739
Intermittent	3,310	4,290	1,277	1,795	1,277	1,794
Perennial	1,220	1,374	1,220	1,351	1,220	1,351
Total Stream Impacts****	7,451	9,215	6,145	7,824	6,146	7,884
Karst Features (#)	3	3	1	1	1	1
Displacements (#)						
Residential	1	1	1	1	1	1
Institutional	0	0	0	0	0	0
Business	0	0	0	0	0	0
Total Displacements	1	1	1	1	1	1
Noise Impacts (#)*****	4	4	6	5	5	4
Managed Land (Ac)	25.22	41.46	5.36	7.48	5.37	7.49
Farmland (Ac)	17.79	23.99	27.47	41.14	27.47	41.26
Stream Relocations (LF)	3,419	4,381	1,920	3,049	1,920	3,048
Floodplain (Ac)	4.64	6.60	4.62	6.33	4.62	6.33

* Low-Cost Design Criteria, ** Initial Design Criteria, ***2010 Dollars, excluding mitigation costs
**** Impacted streams are shown in **Table 6-9a** (p. 6-45)
***** Noise impacts for the refined alternative were determined per the *Indiana Department of Transportation Traffic Noise Analysis Procedure, 2011*
\$M = million dollars, Ac = acres, LF = linear feet
All impacts are by preliminary right-of-way except wetland impacts which are by construction limits.

S.7.1.4 Subsection 4D

In Subsection 4D, **Alternative 4D-1** proceeds east from the Subsection 4C-4D break line across Dry Branch Creek, CR 750E/900E (Dry Branch Road), CR 350S/CR 360S/CR 880E (Mineral-Koleen Road), and Plummer Creek. The alternative ends approximately 700 feet east of Mineral-Koleen Road. Land use is predominantly forest. Alternative 4D-1 would have grade separations/bridges over Dry Branch/Dry Branch Road and Mineral-Koleen Road/Plummer Creek. Alternative 4D-1 avoids Cooper Cemetery (and the 100-foot buffer around the cemetery). The alternative is 13,000 feet (2.46 miles) in length. Alternative 4D-1 is the only alternative under consideration in Subsection 4D and is a component of Alternatives 1, 2, 3, and 4. **Table S.7-5** summarizes the impacts associated with Alternative 4D-1. The alternative is shown on map pp. 5 and 6 of **Figure S-5** through **Figure S-8**.



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Based on additional engineering and environmental analysis, Alternative 4D-1 has been further developed. With these refinements, Alternative 4D-1 is referred to in the FEIS as Refined Alternative 4D-1 (**Figure S-8a**, map pp. 5 and 6). Refined Alternative 4D-1 is the Subsection 4D alternative included in Refined Preferred Alternative 2.

Cost and impacts of Refined Alternative 4D-1 are presented in **Table S.7-5**.

The following describes refinements and how those refinements changed the costs and impacts reported in the DEIS:

- Minor design modifications were made at various locations. These refinements were made for both the initial design criteria and the low-cost design criteria.

	Alternatives			
	4D-1		Refined 4D-1	
	Low-Cost*	Initial**	Low-Cost*	Initial**
Total Cost (\$M)***	66.53	90.19	66.54	90.16
Right-of-Way (Ac)	127.24	181.44	127.80	181.44
Forest (Ac)	115.90	162.33	116.45	162.34
Core Forest (Ac)	270.25	305.31	270.31	305.33
Wetland Impacts (Ac)				
Emergent Wetland	0.05	1.41	0.05	1.41
Forested Wetland	0.17	0.33	0.17	0.33
Scrub/Shrub Wetland	0.00	0.00	0.00	0.00
Total Wetland Impacts	0.22	1.74	0.22	1.74
Stream Impacts (LF)				
Ephemeral	3,189	4,945	3,189	4,946
Intermittent	2,855	3,907	2,855	3,907
Perennial	1,430	2,033	1,430	2,033
Total Stream Impacts****	7,474	10,885	7,474	10,886
Karst Features (#)	3	5	3	5
Displacements (#)				
Residential	2	2	2	2
Institutional	0	0	0	0
Business	0	0	0	0
Total Displacements	2	2	2	2
Noise Impacts (#)*****	2	2	1	1
Managed Land (Ac)	43.74	63.12	43.79	63.13
Farmland (Ac)	9.01	14.04	9.01	14.04
Stream Relocations (LF)	2,697	2,258	2,697	2,258
Floodplain (Ac)	5.88	9.80	5.88	9.80

* Low-Cost Design Criteria, ** Initial Design Criteria, ***2010 Dollars, excluding mitigation costs
 **** Impacted streams are shown in **Table 6-9a** (p. 6-45)
 ***** Noise impacts for the refined alternative were determined per the *Indiana Department of Transportation Traffic Noise Analysis Procedure, 2011*
 \$M = million dollars, Ac = acres, LF = linear feet
 All impacts are by preliminary right-of-way except wetland impacts which are by construction limits.



S.7.1.5 Subsection 4E

In Subsection 4E, **Alternative Hybrid 4E-1/4E-2** proceeds east/northeast from the Subsection 4D-4E break line and trends along the north and middle portions of the corridor before turning north/northeast to the subsection terminus located about 3,000 feet north/northeast of SR 54. Land use is predominantly forest west of SR 45 and a mix of forest, pasture, and rural residences east of SR 45. Several undeveloped lots fronting Cedar Road in the Clifty Hills Subdivision would be acquired for right-of-way or would become undevelopable due to loss of access. Ashcraft Chapel, Shoptaw Cemetery, and Ashcraft Cemetery are located near the center/south edge of the corridor. The chapel and both cemeteries (including 100-foot buffer) are located outside the preliminary right-of-way for Alternative Hybrid 4E-1/4E-2. The alternative is 26,100 feet (4.94 miles) in length.

An interchange is proposed at SR 45. The development of Alternative Hybrid 4E-1/4E-2 would require the closing of Cedar Road in Clifty Hills Subdivision, Old Clifty Road north of CR 415S, and CR 1250E on the north side of I-69. Access improvements include Access Road 2 on the north side of the highway that would maintain the current travel between Pine Road and Spruce Road within Clifty Hills Subdivision, Access Road 3 that would provide access to properties located adjacent to the west side of the SR 45 interchange south of I-69, Access Road 4 on the south side of the highway would connect CR 1250E south of I-69 with SR 54 and Access Road 5 that would provide access to properties located immediately east of SR 54 south of I-69. A Grade separation at SR 54 and bridge over Mitchell Branch are also proposed.

Alternative Hybrid 4E-1/4E-2 is the only alternative under consideration in Subsection 4E and is a component of Alternatives 1, 2, 3, and 4. **Table S.7-6** summarizes the impacts associated with Alternative Hybrid 4E-1/4E-2. The alternative is shown on map pp. 6 to 9 of **Figure S-5** through **Figure S-8**.

Based on comments received on the DEIS from the public, resource agencies, CAC members and local public officials, additional engineering and environmental analysis, and decisions made by INDOT, Alternative Hybrid 4E-1/4E-2 has been further developed. With these refinements, Alternative Hybrid 4E-1/4E-2 is referred to in the FEIS as Refined Alternative Hybrid 4E-1/4E-2 (**Figure S-8a**, map pp. 6 to 9). Refined Alternative Hybrid 4E-1/4E-2 is the Subsection 4E alternative included in Refined Preferred Alternative 2.

The following describes refinements and how those refinements changed the costs and impacts reported in the DEIS:

- Refinement of the vertical road profile under the initial design criteria from approximately 0.48 miles east of SR 45 to the Subsection 4E/Subsection 4F breakline. This refinement was made to reduce forest impacts near an Indiana bat hibernaculum. It was not made for Refined Alternative Hybrid 4E-1/4E-2 under the low-cost design criteria.
- Access Road 2 at the junction of Spruce Road and Pine Road in the Clifty Hills subdivision was proposed as an intersection improvement in the DEIS. This access road was changed for Refined Alternative Hybrid 4E-1/4E-2 to a modification of the existing cul-de-sac at the



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south end of Spruce Road. The modified cul-de-sac, known as Access Road 2a, would be constructed slightly north of the existing cul-de-sac and would include a new connection to Pine Road. Access Road 2a is included under the initial design criteria and the low-cost design criteria for Refined Alternative Hybrid 4E-1/4E-2 and is further described in Section 5.6.3.2.

- Access Road 6 was added to Refined Alternative Hybrid 4E-1/4E-2. This access road would provide access to properties located immediately east of SR 45 north of I-69. This access road was added to Refined Preferred Alternative Hybrid 4E-1/4E-2 after completion of the DEIS (see Section 5.6.3.2). It is not part of Alternative Hybrid 4E-1/4E-2.
- Minor design modifications were made at various locations. These refinements were made for both the initial design criteria and low-cost design criteria.

	Alternatives			
	Hybrid 4E-1/4E-2		Refined Hybrid 4E-1/4E-2	
	Low-Cost*	Initial**	Low-Cost*	Initial**
Total Cost (\$M)***	79.90	116.79	81.80	105.83
Right-of-Way (Ac)	270.75	327.73	268.81	318.13
Forest (Ac)	187.78	227.86	187.89	224.26
Core Forest (Ac)	194.99	214.80	194.98	213.12
Wetland Impacts (Ac)				
Emergent Wetland	0.11	0.22	0.11	0.20
Forested Wetland	0.06	0.15	0.06	0.15
Scrub/Shrub Wetland	0.00	0.00	0.00	0.00
Total Wetland Impacts	0.17	0.37	0.17	0.35
Stream Impacts (LF)				
Ephemeral	16,108	17,096	16,111	16,927
Intermittent	2,754	2,972	2,754	2,967
Perennial	607	927	607	735
Total Stream Impacts****	19,469	20,995	19,472	20,629
Karst Features (#)	5	5	5	5
Displacements (#)				
Residential	10	10	10	10
Institutional	0	0	0	0
Business	0	0	0	0
Total Displacements	10	10	10	10
Noise Impacts (#)*****	19	21	6	5
Managed Land (Ac)	71.19	88.43	71.29	85.59
Farmland (Ac)	44.26	57.46	44.32	53.63
Stream Relocations (LF)	5,893	7,600	5,894	6,526
Floodplain (Ac)	0.00	0.11	0.00	0.11
* Low-Cost Design Criteria, ** Initial Design Criteria, ***2010 Dollars, excluding mitigation costs **** Impacted streams are shown in Table 6-9a (p. 6-45) ***** Noise impacts for the refined alternative were determined per the <i>Indiana Department of Transportation Traffic Noise Analysis Procedure, 2011</i> \$M = million dollars, Ac = acres, LF = linear feet All impacts are by preliminary right-of-way except wetland impacts which are by construction limits.				



S.7.1.6 Subsection 4F

Alternative 4F-1 (map pp. 9 to 14 of **Figure S-5**), along with the alignment for Alternative 4F-4, diverges from the common alignment with Alternatives 4F-3 and 4F-5 in the vicinity of CR 1260E/CR 190S (Hobbieville Road) and proceeds north/northeast across Indian Creek. The alignment crosses Indian Creek about one mile south of Carmichael Road and proceeds along the valley on the east side of the creek. Turning north to avoid the Whippoorwill Subdivision, it then crosses Carmichael Road. Alternative 4F-1 diverges from the alignment with Alternative 4F-4 and merges with the alignment of Alternative 4F-5 near CR 150N. This crossover point between the four Subsection 4F alignments is also near the proposed Greene/Monroe County Line interchange. North of CR 150N, the alignment for Alternative 4F-1 (and Alternative 4F-5) proceeds on a north/northeast bearing west of CR 150N (Carter Road). It curves slightly north to avoid Sparks Cemetery and makes a second crossing of Indian Creek. At a point east of Timber Trace Subdivision, all four Subsection 4F alignments merge and turn east, avoiding Adams/Breedon Cemetery, and crossing Indian Creek (third crossing) and Breedon Road. Alternative 4F-1 has a total length of 31,351 feet (5.94 miles).

Alternative 4F-3 (map pp. 9 to 14 of **Figure S-6**), along with the alignment for Alternative 4F-5, proceeds north from Hobbieville Road along the west edge of the corridor. The alignment proceeds along higher ground west of Indian Creek before crossing the creek adjacent to the south side of Carmichael Road. Near CR 150N (and the proposed Greene/Monroe County Line interchange), the alignment diverges from the alignment with Alternative 4F-5 and merges with the alignment of Alternative 4F-4. The alignment for Alternative 4F-3 (and Alternative 4F-4) proceeds northeast on the east side of CR 150N, passing through the area of the proposed interchange and then turns north/northwest across Carter Road and a second crossing of Indian Creek. The four Subsection 4F alignments then merge and proceed east, avoiding Adams/Breedon Cemetery, and crossing Indian Creek (third crossing) and Breedon Road into Monroe County. Alternative 4F-3 has a total length of 31,700 feet (5.94 miles).

Alternative 4F-4 (map pp. 9 to 14 of **Figure S-8**) follows the same alignment as described above for Alternative 4F-1 south of the proposed Greene/Monroe County Line interchange. North of the proposed interchange, Alternative 4F-4 follows the same alignment as described above for Alternative 4F-3. Alternative 4F-4 has a total length of 31,735 feet (6.01 miles).

Alternative 4F-5 (map pp. 9 to 14 of **Figure S-8**) follows the same alignment as described above for Alternative 4F-3 south of the proposed Greene/Monroe County Line interchange. North of the proposed interchange, Alternative 4F-5 follows the same alignment as described above for Alternative 4F-1. Alternative 4F-5 has a total length of 31,113 feet (5.89 miles).

The Greene/Monroe County Line interchange, which is included with all four alternatives, is located near CR 150N. The impacts reported for each of the alternatives use the South Connector Road for access between the interchange and SR 45. The connector road includes a bridge over Indian Creek. In addition to the connector road bridge over Indian Creek, all four alignment alternatives will also have three mainline crossings of Indian Creek.



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Land use in Subsection 4F is a mix of forest, farmland (pasture and row crops), and residential development including Whippoorwill Subdivision, Timber Trace Subdivision, and scattered rural residences. The Indian Creek Township fire station is located along the south side of CR 35N (Carmichael Road). Carmichael Cemetery is located in the eastern portion of the corridor along Carmichael Road. Freeman Cemetery is located along the east edge of the corridor south of Carmichael Road. Sparks Cemetery is located near the center of the corridor just north of the second crossing of Indian Creek. Adams/Breeden Cemetery is located near the east edge of the corridor where the corridor turns east into Monroe County.

The four Subsection 4F alignment alternatives are components of the four end-to-end alternatives as follows:

- Alternative 4F-1: Alternative 1
- Alternative 4F-3: Alternative 2
- Alternative 4F-4: Alternative 3
- Alternative 4F-5: Alternative 4

The alignment for the South Connector Road is shown on page 12 of **Figure S-5** through **Figure S-8**.

Alternative 4F-1, Alternative 4F-3, Alternative 4F-4, and Alternative 4F-5 are similar in the following respects: relocation of SR 445 west of SR 45 and reconstruction of SR 45 north and south of the South Connector Road for construction of the South Connector Road intersection, grade separation over Hobbieville Road, a bridge over Indian Creek (south crossing) and a grade separations at Carmichael Road, bridges at the middle and north crossings of Indian Creek, and a grade separation over Breeden Road. All of the alternative alignments avoid Freeman Cemetery, Carmichael Cemetery, and Adams/Breeden Cemetery, including the 100-foot buffer around each cemetery. Notable differences among the four alternatives include total cost, right-of-way, and impacts upon forest, core forest, wetland, streams, karst features, and displacements. A comparison of the impacts of each alternative is presented in **Table S.7-7**.

Based on additional engineering and environmental analysis, and decisions made by INDOT, Alternative 4F-3 has been further developed. With these refinements, Alternative 4F-3 is referred to in the FEIS as Refined Alternative 4F-3 (**Figure S-8a**, map pp. 9 to 14). Refined Alternative 4F-3 is the Subsection 4F alternative included in Refined Preferred Alternative 2.

The following describes refinements and how those refinements changed the costs and impacts reported in the DEIS:

- Refinement of the vertical road profile under the initial design criteria from the Subsection 4E/Subsection 4F breakline to approximately 0.34 miles north of Hobbieville Road. This refinement was made to reduce forest impacts near an Indiana bat hibernaculum. It was not made for Refined Alternative 4F-3 under the low-cost design criteria.



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- Refinement of the vertical road profile under the initial design criteria from 0.52 miles north of Carter Road to the Subsection 4F/Subsection 4G breakline. This refinement was made to reduce forest impacts near an Indiana bat hibernaculum. It was not made for Refined Alternative 4F-3 under the low-cost design criteria.
- Minor design modifications were made at various locations for both the initial design criteria and low-cost design criteria. These corrections were not included in any of the DEIS alternatives, including Alternative 4F-3.

Table S.7-7: Overview of Key Impacts for Subsection 4F

	Alternatives									
	4F-1		4F-3		4F-4		4F-5		Refined 4F-3	
	Low Cost*	Initial**	Low Cost*	Initial**	Low Cost*	Initial**	Low Cost*	Initial**	Low Cost*	Initial**
Total Cost (\$M)***	123.71	182.83	123.62	168.92	124.84	188.91	125.43	181.45	124.93	169.55
Right-of-Way (Ac)	402.20	482.42	405.96	492.91	406.16	506.44	398.47	477.76	406.11	491.91
Forest (Ac)	284.76	338.35	235.10	282.03	263.03	324.75	252.87	298.27	235.05	283.22
Core Forest (Ac)	275.70	292.88	172.32	185.66	223.21	243.05	219.48	237.01	171.19	185.52
Wetland Impacts (Ac)										
Emergent Wetland	1.90	2.41	0.00	0.01	0.00	0.01	1.89	2.36	0.00	0.00
Forested Wetland	0.45	0.54	0.15	0.15	0.27	0.38	0.33	0.33	0.15	0.15
Scrub/Shrub Wetland	0.04	0.07	0.00	0.00	0.00	0.07	0.04	0.07	0.00	0.00
Total Wetland Impacts	2.39	3.02	0.15	0.16	0.27	0.46	2.26	2.76	0.15	0.15
Stream Impacts (LF)										
Ephemeral	22,243	24,453	21,161	24,508	22,274	26,006	21,326	24,091	21,147	24,395
Intermittent	3,081	3,529	6,475	7,748	7,846	8,666	1,852	2,404	6,484	7,625
Perennial	1,839	2,543	1,796	2,882	1,876	2,736	1,891	2,534	1,796	2,676
Total Stream Impacts****	27,163	30,525	29,432	35,138	31,996	37,408	25,069	29,029	29,427	34,696
Karst Features (#)	10	13	6	7	6	7	10	11	6	7
Displacements (#)										
Residential	31	31	23	23	28	29	26	26	23	23
Institutional	0	0	0	0	0	1	0	0	0	0
Business	3	3	3	3	3	3	3	3	3	3
Total Displacements	34	34	26	26	31	33	29	29	26	26
Noise Impacts (#)*****	28	29	31	32	34	36	17	19	20	21
Managed Land (Ac)	57.52	68.03	59.33	72.97	56.87	71.81	57.45	69.66	58.89	72.98
Farmland (Ac)	60.67	75.66	101.34	131.18	80.27	107.56	81.70	106.38	101.43	129.63
Stream Relocations (LF)	7,105	7,640	13,768	15,477	14,721	15,337	6,318	7,956	13,801	15,329
Floodplain (Ac)	20.49	27.22	23.09	32.75	25.73	33.43	19.06	24.61	23.09	30.65

* Low-Cost Design Criteria, ** Initial Design Criteria, ***2010 Dollars, excluding mitigation costs
**** Impacted streams are shown in **Table 6-9a** (p. 6-45)
***** Noise impacts for the refined alternative were determined per the *Indiana Department of Transportation Traffic Noise Analysis Procedure, 2011*
\$M = million dollars, Ac = acres, LF = linear feet
All impacts are by preliminary right-of-way except wetland impacts which are by construction limits.



S.7.1.7 Subsection 4G

In Subsection 4G, **Alternative 4G-2** proceeds east/northeast from the Subsection 4F-4G break line across Burch Road staying on the south side of the corridor to minimize forest impacts. Burch Road would be realigned to eliminate a sharp curve and create a more perpendicular bridge crossing over I-69. Alternative 4G-2 then turns east across Evans Lane and Harmony Road. At Harmony Road, Alternative 4G-2 stays near a low point near the center of the corridor where the alignment crosses the highest ridge within the Section 4 corridor. The alignment then curves slightly north across Rockport Road. The slight alignment shift to the north minimizes residential displacements along West Evans Lane. Alternative 4G-2 ends about 400 feet west of Lodge Road. The alternative is 22,200 feet (4.20 miles) in length.

The Subsection 4G corridor is dominated by forest with some pasture, rural residences, and three commercial (business) properties near Rockport Road. The alternative alignment would have grade separations over Burch Road, Evans Lane, and Harmony Road. Rockport Road would have a grade separation over the I-69 mainline alignment.

Alternative 4G-2 is the only alternative under consideration in Subsection 4G and is a component of Alternatives 1, 2, 3, and 4. **Table S.7-8** summarizes the impacts associated with Alternative 4G-2. The alternative is shown on map pp. 14 to 16 of **Figure S-5** through **Figure S-8**.

Based on comments received on the DEIS from the public, resource agencies, CAC members and local public officials, additional engineering and environmental analysis, and decisions made by INDOT, Alternative 4G-2 has been further developed. With these refinements, Alternative 4G-2 is referred to in the FEIS as Refined Alternative 4G-2 (**Figure S-8a**, map pp. 15 to 16). Refined Alternative 4G-2 is the Subsection 4G alternative included in Refined Preferred Alternative 2.

The following describes refinements and how those refinements changed the costs and impacts reported in the DEIS:

- Refinement of the vertical road profile under the initial design criteria from the Subsection 4F/Subsection 4G breakline to the Subsection 4G/Subsection 4H breakline. This refinement was made to reduce forest impacts near an Indiana bat hibernaculum. It was not made for Refined Alternative 4G-2 under the low-cost design criteria.
- A grade separation at Evans Lane was shown as optional in the DEIS. Based upon comments received from local governments, public organizations, and public individuals and additional review of environmental impacts, traffic, engineering and cost factors, it was decided that Evans Lane would be closed at I-69.
- Minor design modifications were made for both the initial design criteria and the low-cost design criteria. These corrections were not included in Alternative 4G-2.



Table S.7-8: Overview of Key Impacts for Subsection 4G

	Alternatives			
	4G-2		Refined Preferred 4G-2	
	Low-Cost*	Initial**	Low-Cost*	Initial**
Total Cost (\$M)***	56.83	100.69	58.02	69.86
Right-of-Way (Ac)	192.44	259.05	191.90	248.20
Forest (Ac)	141.76	189.10	141.80	184.41
Core Forest (Ac)	155.48	179.34	155.49	173.87
Wetland Impacts (Ac)				
Emergent Wetland	0.00	0.00	0.00	0.00
Forested Wetland	0.00	0.00	0.00	0.00
Scrub/Shrub Wetland	0.00	0.00	0.00	0.00
Total Wetland Impacts	0.00	0.00	0.00	0.00
Stream Impacts (LF)				
Ephemeral	11,581	14,472	11,581	13,866
Intermittent	4,269	5,891	4,271	5,630
Perennial	0	0	0	0
Total Stream Impacts****	15,850	20,363	15,852	19,496
Karst Features (#)	16	19	16	20
Displacements (#)				
Residential	17	21	26	29
Institutional	0	0	0	0
Business	1	2	1	1
Total Displacements	18	23	27	30
Noise Impacts (#)*****	36	25	24	23
Managed Land (Ac)	0.00	0.00	0.00	0.00
Farmland (Ac)	22.78	31.62	22.77	29.73
Stream Relocations (LF)	4,624	6,654	4,626	6,631
Floodplain (Ac)	0.00	0.00	0.00	0.00

* Low-Cost Design Criteria, ** Initial Design Criteria, ***2010 Dollars, excluding mitigation costs
**** Impacted streams are shown in **Table 6-9a** (p. 6-45)
***** Noise impacts for the refined alternative were determined per the *Indiana Department of Transportation Traffic Noise Analysis Procedure, 2011*
\$M = million dollars, Ac = acres, LF = linear feet
All impacts are by preliminary right-of-way except wetland impacts which are by construction limits.

S.7.1.8 Subsection 4H

In Subsection 4H, the three alignment alternatives carried forward for detailed study in the DEIS were **Alternative 4H-1**, **Alternative 4H-2**, and **Alternative 4H-3**. The Subsection 4H corridor continues northeast from the Subsection 4G-4H break line across Lodge Road and then turns north/northeast to SR 37. An interchange is proposed at SR 37. After crossing Lodge Road, the alternative alignments traverse a ridge located south of Happy Creek and negotiate an elevation difference of about 200 feet between the ridge top and creek valley. After crossing May Creek, the terrain generally rises and the alignments curve north to existing SR 37. The merge with SR 37 is located just north of an existing rock cut along SR 37. Land use is a mix of forest, pasture, two small abandoned limestone quarries, and developed land uses consisting of five residential subdivisions, scattered rural residences, and one industrial business site (3D Stone, Inc.). The three Subsection 4H alignment alternatives are components of the Alternatives under the build condition as follows:



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- Alternative 4H-1: Alternative 1
- Alternative 4H-2: Alternative 2 and Alternative 4
- Alternative 4F-3: Alternative 3

Alternative 4H-1 (map pp. 16 to 19 of **Figure S-5**) and Alternative 4H-2 diverge from the alignment for Alternative 4H-3 about 1,000 feet northeast of Lodge Road. The common alignment for Alternative 4H-1 and Alternative 4H-2 follows the west boundary of the Subsection 4H corridor. Alternative 4H-1 diverges from Alternative 4H-2 just south of Happy Creek and continues on a north/northeast bearing along the west edge of the corridor across Happy Creek and Tramway Road. It then shifts toward the center of the corridor where it crosses May Creek and Bolin Lane. North of Bolin Lane the alignment turns north to SR 37. Alternative 4H-1 has a total length of 18,946 feet (3.59 miles).

Alternative 4H-2 (map pp. 16 to 19 of **Figure S-6** and **Figure S-8**) follows the same alignment as Alternative 4H-1 to a point just south of Happy Creek. At that point, the alignment proceeds northeast across Happy Creek and Tramway Road to the east edge of the Section 4H corridor. About 1,300 feet north of Tramway Road the alignment merges with Alternative 4H-3. The common alignment for Alternative 4H-2 and Alternative 4H-3 continue along the east side of the corridor across Bolin Lane and then turn north to SR 37. Alternative 4H-2 has a total length of 19,500 feet (3.69 miles).

Alternative 4H-3 (map pp. 16 to 19 of **Figure S-7**) diverges from the common alignment for Alternative 4H-1 and Alternative 4H-2 about 1,000 feet northeast of Lodge Road and continues along the east edge of the Subsection 4H corridor across Happy Creek and Tramway Road. The alignment then merges with the alignment of Alternative 4H-2, as described above. Alternative 4H-3 has a total length of 19,970 feet (3.78 miles).

Alternative 4H-1, **Alternative 4H-2**, and **Alternative 4H-3** are similar in the following respects: grade separations over Lodge Road, Tramway Road, and Bolin Lane, and bridges over Happy Creek and May Creek.

For all alternatives, That Road would be closed on both sides of the mainline alignment. A frontage road would connect That Road on the east side of the mainline alignment with Rockport Road. The frontage road would be developed by Section 5. In the interim before Section 5 is constructed, That Road would maintain its access to SR 37. See **Appendix QQ**, *SR 37 Operational and Safety Analysis*, for more information.

Notable differences in the alternatives are total cost, right-of-way, and impacts upon forest, core forest, streams, and karst features. A comparison of the advantages and disadvantages of each alternative is presented below. **Table S.7-9** summarizes the impacts associated with the three alternatives.

Based on comments received on the DEIS from the public, resource agencies, CAC members and local public officials, additional engineering and environmental analysis, and decisions made by INDOT, Alternative 4H-2 has been further developed. With these refinements, Alternative



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4H-2 is referred to in the FEIS as Refined Alternative 4H-2 (**Figure S-8a**, map pp. 9 to 14). Refined Alternative 4H-2 is the Subsection 4H alternative included in Refined Preferred Alternative 2.

The following describes refinements and how those refinements changed the costs and impacts reported in the DEIS:

- Access Road 7 was added to Refined Alternative 4H-2. This access road relocates and extends Glenview Drive to Bolin Lane and maintains a second access into Rolling Glen Estates subdivision. Access Road 7 was not included in DEIS Alternatives 4H-1, 4H-2 or 4H-3.
- Minor design modifications for Refined Alternative 4H-2 for the both the initial design criteria and low-cost design criteria. These corrections were not included in DEIS Alternatives 4H-1, 4H-2 or 4H-3.

Table S.7-9: Overview of Key Impacts for Subsection 4H

	Alternatives							
	4H-1		4H-2		4H-3		Refined Preferred 4H-2	
	Low Cost*	Initial**	Low Cost*	Initial**	Low Cost*	Initial**	Low Cost*	Initial**
Total Cost (\$M)***	75.35	111.01	74.63	108.28	79.57	112.00	73.94	108.42
Right-of-Way (Ac)	224.84	268.18	217.18	267.16	218.25	263.88	218.20	267.29
Forest (Ac)	72.71	89.55	61.51	76.73	69.79	85.63	61.43	76.74
Core Forest (Ac)	25.19	27.39	22.03	23.74	32.59	35.09	22.03	23.74
Wetland Impacts (Ac)								
Emergent Wetland	0.00	0.00	0.00	0.03	0.00	0.03	0.00	0.03
Forested Wetland	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Scrub/Shrub Wetland	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Wetland Impacts	0.00	0.00	0.00	0.03	0.00	0.03	0.00	0.03
Stream Impacts (LF)								
Ephemeral	8,030	9,616	5,910	6,828	5,497	6,136	5,882	6,829
Intermittent	727	1,045	994	1,366	994	1,390	994	1,366
Perennial	1,088	1,890	1,621	2,211	896	1,439	1,621	2,211
Total Stream Impacts****	9,845	12,551	8,525	10,405	7,387	8,965	8,497	10,406
Karst Features (#)	71	77	57	70	57	66	57	70
Displacements (#)								
Residential	12	12	9	10	9	10	9	10
Institutional	0	0	0	0	0	0	0	0
Business	0	0	0	0	1	1	0	0
Total Displacements	12	12	9	10	10	11	9	10
Noise Impacts (#)*****	55	81	63	72	53	70	28	27
Managed Land (Ac)	25.27	27.24	19.71	21.40	19.83	21.38	19.72	21.40
Farmland (Ac)	89.02	111.06	94.99	123.93	85.90	107.98	95.04	123.96
Stream Relocations (LF)	3,239	3,940	564	1,922	949	2,281	564	1,922
Floodplain (Ac)	0.00	0.00	2.67	4.08	2.22	4.26	2.67	4.08

* Low-Cost Design Criteria, ** Initial Design Criteria, ***2010 Dollars, excluding mitigation costs

**** Impacted streams are shown in **Table 6-9a** (p. 6-45)

***** Noise impacts for the refined alternative were determined per the *Indiana Department of Transportation Traffic Noise Analysis Procedure, 2011*

\$M = million dollars, Ac = acres, LF = linear feet

All impacts are by preliminary right-of-way except wetland impacts which are by construction limits.

**S.7.2 Comparison of Interchange Options**

Three interchange options were recommended to be carried forward for detailed study. The comparison of the interchange options reviewed transportation performance measures, traffic, environmental impacts, resource agency and public input, and Tier 2 Purpose and Need.

The three interchange options are identified below. US 231, located near the western terminus of Section 4, is included in the Section 3 study and is an interchange location approved in the January 28, 2010, Tier 2 Section 3 Record of Decision. The US 231 interchange is included in the traffic analysis of all of the Section 4 interchange options. All three interchange options include an interchange at SR 37.

- Interchange Option 1 includes two intermediate interchanges: SR 45 and the Greene/Monroe County Line. Because this option includes interchanges at both intermediate locations, this interchange option effectively represents a combination of Interchange Options 2 and 4. Interchange Option 1 was included in all four end-to-end DEIS alternatives and the Refined Preferred Alternative 2 in order to provide a conservative estimate of impacts for the Section 4 Alternatives.
- Interchange Option 2 includes one intermediate interchange at the Greene/Monroe County Line.
- Interchange Option 4 includes one intermediate interchange at SR 45.

The evaluation of the three interchanges options relative to transportation performance measures indicated that Interchange Option 1 would provide the greatest congestion relief and reduction in crash rates in the five-county Study Area. Interchange Option 2 would not be as effective as Interchange Option 1 in providing congestion relief and improving safety, but is more effective than Interchange Option 4. Overall, the Greene/Monroe County Line interchange would have the greater benefits for congestion relief and safety as a single interchange, as compared with the SR 45 interchange.

The highest predicted total interchange volumes as well as the highest mainline volumes north (east) of the Greene/Monroe County line would occur under Option 1. This option would have over 36,000 vehicles per day (VPD) entering and exiting the interchanges along Section 4 and about 29,500 VPD using I-69 between the Greene/Monroe County Line and SR 37. The lowest predicted volumes would occur under Option 4 with just over 31,000 VPD using the interchanges and mainline traffic volumes between the Greene/Monroe County Line and SR 37 around 24,500 VPD. Interchange Option 2 would have a higher usage than Interchange Option 4.

The greatest benefit provided by the Section 4 intermediate interchanges on local Purpose and Need performance measures for congestion relief would occur along SR 45 between US 231 and SR 37. The Greene/Monroe County Line interchange (Interchange Options 1 and 2) provides the greatest benefit to SR 45 between the SR 445 intersection near Cincinnati in Greene County and Curry Pike/South Leonard Springs in Monroe County. Along this segment of SR 45, the predicted 2030 no-build Level of Service (LOS) is LOS E. Because traffic would be diverted



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from SR 45 to I-69, SR 45 traffic operations would improve significantly under the build scenario. In Greene County, about 6,600 to 7,500 VPD are predicted to divert to the new highway in 2030 with travel conditions improving to LOS B. Interchange Option 4 would also reduce traffic volumes on SR 45 between the SR 445 intersection and Curry Pike, however, the reductions are not as great and less benefit is predicted when compared to Interchange Options 1 and 2. The level-of-service would improve slightly from a LOS E to LOS D on the segment north of SR 445 but no improvement is forecasted for SR 45 between the Greene/Monroe County Line and Leonard Springs Road.

Another beneficial traffic impact would occur in the environmentally-sensitive Garrison Chapel Valley area in Monroe County. In the 2002 and 2004 Long Range Plan (LRP) updates, INDOT showed SR 45 as being upgraded from a 2-lane to a 4-lane road between Leonard Springs Road and Garrison Chapel Road. The improvement along SR 45 would likely increase accessibility to the Garrison Chapel Valley area and could encourage development in an area that has sensitive bat habitat. This improvement project along SR 45 has since been “demoted” and no funding has been identified for the improvements. All three interchange options would reduce traffic along SR 45, especially Interchange Option 1 which would provide the greatest benefit to the Garrison Chapel Valley area with a traffic volume reduction of about 46% (7,400 VPD) compared to the no-build scenario. Interchange Option 2 is the second best option for reducing traffic in this area with a 41% (6,600 VPD) reduction. Interchange Option 4 provides the least benefit with only about a 17% reduction in the traffic volume on SR 45 when compared to the no-build scenario.

Interchange Option 4 least impact, requiring the least right-of-way. Interchange Option 2 would have a greater impact because it includes the South Connector Road and additional right-of-way on SR 45 and SR 445. The combination of the two interchanges in Interchange Option 1 would require the most right-of-way. Costs and environmental impacts for the three interchange options are generally proportionate to the overall right-of-way required for the improvements. Key environmental impacts include forest, core forest, streams and displacements.

Tier 2 consultation with U.S. Fish and Wildlife Service (USFWS) has been ongoing since the issuance of the Tier 1 ROD. Prior to issuance of the DEIS, USFWS expressed concerns about possible increases in indirect development impacts in karst areas due to the County Line interchange. The U.S. Environmental Protection Agency also expressed concerns about secondary (indirect) development for the proposed Greene County/Monroe County Line interchange. To address these concerns several factors were evaluated including: means to control highway induced growth, area constructability issues, and beneficial traffic impacts. One means of keeping roadway-induced development within established development areas is by restricting access to the roadway. In addition to the full access control along I-69, the Greene/Monroe County Line interchange connector road would also be fully access-controlled. The only access to the interchange would be from SR 45.

Another means of controlling the location and type of development is through land use planning. This project is included in the *Greene County Comprehensive Plan*, which identifies I-69 growth areas near the proposed interchange with SR 45 and at the Greene/Monroe County Line



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interchange. The comprehensive plan provides guidance for land use changes in and around the proposed highway corridor and provides support for the continuance of desired land uses. The project also is included in the *Monroe County Comprehensive Plan*. This plan identifies land along and in the vicinity of SR 37 south of the I-69/SR 37 interchange for commercial and industrial development. Given the availability of agricultural land, it is reasonable to assume that the majority of land required for induced commercial development will be converted from agricultural land. It is anticipated that land requiring extraordinary site preparation or permitting through a time-consuming and often expensive process presents an economic disadvantage and is typically less desirable to a commercial business. Potential impacts due to secondary development for the proposed Greene County/Monroe County Line interchange are expected to be minimal under Interchange Options 1 and 2. In addition to the comparison of interchange options, a comparison was also made for the South Connector Road and North Connector Road for the Greene/Monroe County Line interchange.

Total cost would be less along the North Connector Road and right-of-way acquisition and environmental impacts would also be less as compared to the South Connector Road.

About 500 more VPD are predicted to divert from SR 45 to I-69 with the South Connector Road as compared to the North Connector Road. Traffic on SR 45 between SR 445 and the point of intersection with the North Connector Road is predicted to be reduced by only about 2,000 VPD and operate at LOS-D. In comparison, traffic on this segment of SR 45 with the South Connector Road is predicted to be reduced by about 7,500 VPD and operate at LOS-B.

One of the advantages of the Greene/Monroe County Line interchange is that it increases accessibility to Eastern Greene County and Bloomfield. SR 54 and SR 445 is the major route between this area and the Bloomington urban area. The South Connector Road design option would provide a more desirable and safer direct connection at the point that this traffic normally joins with the SR 45 traffic stream. The unconventional signalized “Y” intersection that exists at the intersection of SR 45 and SR 445 would be replaced by a conventional four-leg intersection where the highest volume traffic movement would be the through movement along SR 445 and the South Connector Road, exceeding traffic volumes on SR 45. The South Connector Road also would have a 0.5 mile shorter travel distance to the Greene/Monroe County Line interchange from the SR 445 and SR 45 junction as compared to the North Connector Road.

The location of the North Connector Road would leave an approximate 3,500 feet (0.67 mile) segment of SR 45, immediately north of the SR 445 intersection, at a congested LOS D. The current unconventional “Y” intersection at SR 45/SR 445 would remain and traffic from the Bloomfield and the Eastern Greene County area would have to continue north along SR 45 prior to accessing the Greene/Monroe County Line interchange via the North Connector Road. The added distance travel distance from the SR 45 and SR 445 junction to the interchange would be approximately two miles, 0.5 mile longer than the South Connector Road. The uncontrolled access and higher traffic volumes on this segment of SR 45 (between SR 445 and the North Connector Road) may also stimulate some undesirable indirect development in this environmentally sensitive area.



S.7.3 Comparison of Costs

Tables S.7-10 and S.7-10a contain cost estimates for each alignment alternative by corridor subsection. Project cost estimates for each subsection included costs for engineering and design, right-of-way acquisition (land acquisition and relocations), and construction. Mitigation cost estimates were not a factor in the evaluation of alternatives within subsections because some mitigation measures cannot be segmented and provide meaningful data.

Total cost estimates for Alternatives 1, 2 (DEIS Preferred), 3, 4, and Refined Preferred Alternative 2 are presented in **Table S.7-10b**. The total cost estimates included mitigation costs.

Alternative Cross Sections

In Section 5.1.2, typical cross sections were developed and further detailed engineering development was completed. Interchange and access treatment design details were also added along with refinements of the alignments and design profiles. The initial design criteria typical cross section has two 12-foot wide lanes in each direction separated by a 60-foot wide depressed median. The median includes two 5-foot wide usable inside shoulders (4-feet paved). To the outside of each pair of travel lanes there is a minimum 35-foot wide outside clear zone⁸ containing 11-foot wide usable shoulders (10-feet paved). These design elements satisfy and, in some cases, exceed Indiana Design Manual (IDM) requirements. In addition to this footprint required for the roadway, median, and shoulders, sufficient land is needed to provide for cut and fill slopes, right-of-way maintenance (maneuverability of equipment for mowing, shrub clearing, etc.), drainage, and right-of-way fencing. Safety also is a consideration; there must be sufficient distance from freeway travel lanes so that, should a tree or structure outside the right-of-way fall into the right-of-way toward the freeway, it would not cause a significant risk to motorists. Considering all of these elements, the average right-of-way width using the initial design criteria is approximately 500 feet; however, the right-of-way widths would vary from about 300 feet to over 850 feet depending upon the alignment, terrain features, and local access treatments. The typical cross sections for the initial design criteria are shown in **Figure 5.1-3** (p. 5-15).

Similar to Sections 1 through 3, further engineering analysis identified a lower cost alternative to applying the initial guidelines in every case. This analysis considered variations in design criteria in order to better estimate the possible range of construction costs. Additional low-cost design criteria were also identified in Section 4 that were not used for the Section 1, 2, or 3 projects. Many of these measures focused on minimizing the effects of the topography within Section 4. A practical design approach was adopted in Section 4, and several measures were examined and evaluated for their safety implications. After consideration of the potential cost savings and safety implications, several of the measures identified have been incorporated into the Section 4 low-cost design criteria. **Appendix GG, *Low Cost Design Memo***, is a technical memo summarizing the additional cost savings measures that were studied in Section 4.

⁸ A clear zone is the unobstructed, relatively flat area provided beyond the edge of the traveled way. The clear zone is intended to allow errant vehicles to stop or maneuver without striking any fixed objects. The clear zone includes any shoulders and auxiliary lanes.



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The low-cost design criteria under consideration for I-69 Section 4 satisfy, but do not exceed, IDM requirements and provide a mainline typical cross section similar to the initial design criteria, including a 60-foot median and 5-foot wide usable inside shoulders (4-feet paved). The most notable cross-sectional difference between the initial design criteria and low-cost design criteria is the 30-foot wide outside clear zone containing 11-foot wide usable shoulders (10-feet paved). The initial design criteria use a minimum 35-foot wide outside clear zone. The low-cost design criteria would also consider alternative length of grade criteria, rock cut slope treatment, fill slope treatments, and different pavement materials (See **Appendix D**, *Cost Estimation Methodology*). As with the initial design criteria cross section, additional right-of-way is required beyond this footprint for cut and fill slopes, right-of-way maintenance, drainage, and right-of-way fencing. Similar to the initial design criteria, safety also is a consideration. Considering these elements, the average right-of-way width for the low-cost design criteria is approximately 380 feet; however, the right-of-way widths would vary from about 270 feet to 700 feet depending upon the alignment, terrain features, and local access treatments. The typical cross sections for the low-cost design criteria are shown in **Figure 5.1-5** (p. 5-19).

Due to the different physical characteristics of most of Section 4 (when compared with Sections 1, 2 and 3 projects), application of the initial design criteria and low-cost design criteria leads to a significant variation in the lateral footprints of alternatives. Therefore, the impact calculations provided in Chapter 5 and summarized in this chapter 6 applied both the initial design criteria and low-cost design criteria to determine the range of impacts.

While a range of both costs and impacts are shown, it would not be correct to treat the initial design criteria and low-cost design criteria for a particular alternative as distinct alternatives for purposes of NEPA evaluation. As **Appendix GG** describes, post-NEPA geotechnical investigations and follow-up final design are required to identify whether some of the design criteria can be used in specific areas. Under the low-cost design criteria, the impacts are estimated by applying all the low-cost design elements. This provides an estimate of the minimum level of impacts possible for a particular alternative. If, during final design, it is determined that all low-cost design elements can and should be used in a portion of the project, then the impacts for that portion of the project will be at the lower end of the predicted range of impacts for that particular alternative. It is anticipated that the low-cost design elements will be suitable in some portions of the project, but not in others. Accordingly, the selection of a preferred NEPA alternative has been made by comparing the range of impacts and costs for alternatives.



Table S.7-10: Cost Estimates* for Alternatives in Subsections 4A, 4B, 4C, 4D, 4E, 4F, 4G and 4H

Estimated Costs (Rounded)	Subsection A		Subsection B	Subsection C		Subsection D	Subsection E	Subsection F				Subsection G	Subsection H		
	4A-2	Hybrid 4A-1/ 4A-2	4B-1	4C-1	4C-2	4D-1	Hybrid 4E-1/ 4E-2	4F-1	4F-3	4F-4	4F-5	4G-2	4H-1	4H-2	4H-3
Construction															
Initial Design Criteria	\$22,358,000	\$21,737,000	\$21,348,000	\$65,353,000	\$63,768,000	\$77,784,000	\$95,079,000	\$150,704,000	\$140,826,000	\$157,010,000	\$150,921,000	\$84,267,000	\$92,468,000	\$90,797,000	\$90,101,000
Low-Cost Design Criteria	\$15,656,000	\$16,636,000	\$10,791,000	\$39,367,000	\$35,625,000	\$56,487,000	\$61,904,000	\$97,471,000	\$100,129,000	\$99,837,000	\$100,503,000	\$45,458,000	\$60,613,000	\$61,027,000	\$61,402,000
Design/Engineering															
Initial Design Criteria	\$912,000	\$940,000	\$967,000	\$2,958,000	\$2,884,000	\$3,806,000	\$4,219,000	\$6,710,000	\$6,552,000	\$7,182,000	\$6,751,000	\$3,565,000	\$4,213,000	\$4,275,000	\$4,204,000
Low-Cost Design Criteria	\$699,000	\$734,000	\$515,000	\$1,953,000	\$1,802,000	\$2,920,000	\$2,885,000	\$4,612,000	\$4,831,000	\$4,802,000	\$4,811,000	\$2,111,000	\$2,840,000	\$2,928,000	\$2,926,000
Administration															
Initial Design Criteria	\$1,597,000	\$1,553,000	\$1,525,000	\$4,668,000	\$4,555,000	\$5,556,000	\$6,791,000	\$10,765,000	\$10,059,000	\$11,215,000	\$10,780,000	\$6,019,000	\$6,605,000	\$6,486,000	\$6,436,000
Low-Cost Design Criteria	\$1,146,000	\$1,217,000	\$790,000	\$2,880,000	\$2,607,000	\$4,133,000	\$4,530,000	\$7,132,000	\$7,327,000	\$7,305,000	\$7,354,000	\$3,326,000	\$4,435,000	\$4,465,000	\$4,493,000
Right-of-Way															
Initial Design Criteria	\$1,100,000	\$1,592,000	\$350,000	\$1,091,000	\$1,047,000	\$2,739,000	\$4,635,000	\$11,135,000	\$7,909,000	\$10,141,000	\$9,255,000	\$6,319,000	\$5,201,000	\$4,478,000	\$9,006,000
Low-Cost Design Criteria	\$1,070,000	\$1,600,000	\$327,000	\$912,000	\$839,000	\$2,681,000	\$4,514,000	\$10,984,000	\$7,750,000	\$9,534,000	\$9,013,000	\$5,414,000	\$4,933,000	\$3,972,000	\$8,496,000
Utility Relocation															
Initial Design Criteria	\$312,000	\$261,000	\$0	\$258,000	\$458,000	\$309,000	\$6,064,000	\$3,511,000	\$3,578,000	\$3,359,000	\$3,747,000	\$519,000	\$2,524,000	\$2,241,000	\$2,253,000
Low-Cost Design Criteria	\$312,000	\$261,000	\$0	\$258,000	\$458,000	\$309,000	\$6,064,000	\$3,511,000	\$3,578,000	\$3,359,000	\$3,747,000	\$519,000	\$2,524,000	\$2,241,000	\$2,253,000
Total Cost															
Initial Design Criteria	\$26,279,000	\$26,083,000	\$24,190,000	\$74,328,000	\$72,712,000	\$90,194,000	\$116,788,000	\$182,825,000	\$168,924,000	\$188,907,000	\$181,454,000	\$100,689,000	\$111,011,000	\$108,277,000	\$112,000,000
Low-Cost Design Criteria	\$18,883,000	\$20,448,000	\$12,423,000	\$45,370,000	\$41,331,000	\$66,530,000	\$79,897,000	\$123,710,000	\$123,615,000	\$124,837,000	\$125,428,000	\$56,828,000	\$75,345,000	\$74,633,000	\$79,570,000

* Cost estimates include access roads and grade separations. Subsection cost estimates do not include mitigation costs.

Table S.7-10a: Cost Estimates* for Refined Preferred Alternative 2 in Subsections 4A, 4B, 4C, 4D, 4E, 4F, 4G and 4H

Estimated Costs (Rounded)	Subsection A	Subsection B	Subsection C	Subsection D	Subsection E	Subsection F	Subsection G	Subsection H
	4A-2	4B-1	4C-2	4D-1	Hybrid 4E-1/4E-2	4F-3	4G-2	4H-2
Construction								
Initial Design Criteria	\$19,527,000	\$21,335,000	\$62,820,000	\$77,751,000	\$85,288,000	\$141,417,000	\$55,500,000	\$90,930,000
Low-Cost Design Criteria	\$14,042,000	\$10,566,000	\$35,604,000	\$56,498,000	\$63,616,000	\$101,289,000	\$45,303,000	\$60,394,000
Design/Engineering								
Initial Design Criteria	\$873,000	\$966,000	\$2,839,000	\$3,805,000	\$3,778,000	\$6,521,000	\$2,467,000	\$4,288,000
Low-Cost Design Criteria	\$595,000	\$507,000	\$1,800,000	\$2,922,000	\$2,987,000	\$4,885,000	\$2,099,000	\$2,913,000
Administration								
Initial Design Criteria	\$1,395,000	\$1,524,000	\$4,487,000	\$5,554,000	\$6,092,000	\$10,101,000	\$3,964,000	\$6,495,000
Low-Cost Design Criteria	\$1,027,000	\$773,000	\$2,605,000	\$4,134,000	\$4,655,000	\$7,411,000	\$3,315,000	\$4,419,000
Right-of-Way								
Initial Design Criteria	\$1,105,000	\$350,000	\$1,175,000	\$2,739,000	\$4,612,000	\$7,928,000	\$7,412,000	\$4,467,000
Low-Cost Design Criteria	\$1,070,000	\$327,000	\$963,000	\$2,681,000	\$4,481,000	\$7,766,000	\$6,782,000	\$3,972,000
Utility Relocation								
Initial Design Criteria	\$312,000	\$0	\$458,000	\$309,000	\$6,064,000	\$3,578,000	\$519,000	\$2,241,000
Low-Cost Design Criteria	\$312,000	\$0	\$458,000	\$309,000	\$6,064,000	\$3,578,000	\$519,000	\$2,241,000
Total Cost								
Initial Design Criteria	\$23,212,000	\$24,175,000	\$71,779,000	\$90,158,000	\$105,834,000	\$169,545,000	\$69,862,000	\$108,421,000
Low-Cost Design Criteria	\$17,046,000	\$12,173,000	\$41,430,000	\$66,544,000	\$81,803,000	\$124,929,000	\$58,018,000	\$73,939,000

* Cost estimates include access roads and grade separations. Subsection cost estimates do not include mitigation costs.



	Alternative 1		Alternative 2 (DEIS Preferred)		Alternative 3		Alternative 4		Refined Preferred Alternative 2	
	Low Cost	Initial	Low Cost	Initial	Low Cost	Initial	Low Cost	Initial	Low Cost	Initial
Construction	\$387,747,000	\$609,361,000	\$387,077,000	\$596,227,000	\$388,140,000	\$611,094,000	\$391,193,000	\$607,907,000	\$387,312,000	\$554,568,000
Design/Engineering	\$18,535,000	\$27,350,000	\$18,691,000	\$27,180,000	\$18,695,000	\$27,767,000	\$18,822,000	\$27,453,000	\$18,708,000	\$25,537,000
Administration	\$28,372,000	\$43,526,000	\$28,324,000	\$42,588,000	\$28,401,000	\$43,650,000	\$28,624,000	\$43,422,000	\$28,339,000	\$39,612,000
Right-of-Way	\$30,835,000	\$32,570,000	\$26,567,000	\$28,577,000	\$33,405,000	\$35,829,000	\$27,903,000	\$29,967,000	\$28,042,000	\$29,788,000
Utility Relocation	\$13,497,000	\$13,497,000	\$13,481,000	\$13,481,000	\$13,223,000	\$13,223,000	\$13,450,000	\$13,450,000	\$13,481,000	\$13,481,000
Mitigation	\$56,124,000	\$69,705,600	\$56,124,000	\$69,705,600	\$56,124,000	\$69,705,600	\$56,124,000	\$69,705,600	\$56,124,000	\$69,705,600
TOTAL COST	\$535,110,000	\$796,009,600	\$530,264,000	\$777,758,600	\$537,988,000	\$801,268,600	\$536,116,000	\$791,904,600	\$532,006,000	\$732,691,600
Alternative 1 includes Subsection Alternatives 4A-2, 4B-1, 4C-1, 4D-1, Hybrid 4E-1/4E-2, 4F-1, 4G-2, 4H-1 (see Table S.7-10) Alternative 2 includes Subsection Alternatives 4A-2, 4B-1, 4C-2, 4D-1, Hybrid 4E-1/4E-2, 4F-3, 4G-2, 4H-2 (see Table S.7-10) Alternative 3 includes Subsection Alternatives Hybrid 4A-1/4A-2, 4B-1, 4C-2, 4D-1, Hybrid 4E-1/4E-2, 4F-4, 4G-2, 4H-3 (See Table S.7-10) Alternative 4 includes Subsection Alternatives 4A-2, 4B-1, 4C-1, 4D-1, Hybrid 4E-1/4E-2, 4F-5, 4G-2, 4H-2 (see Table S.7-10) Refined Preferred Alternative 2 includes all Subsection Alternatives shown in Table S.7-10a										



S.8 Preferred Alignment Alternative

S.8.1 Selection of a Preferred Alignment Alternative

Alternative 2 is recommended as the preferred alternative for Section 4. **Alternative 2** is comprised of subsection alignments 4A-2, 4B-1, 4C-2, 4D-1, Hybrid 4E-1/4E-2, 4F-3, 2G-2, and 4H-2. **Alternative 2** would have interchanges at SR 45, Greene/Monroe County Line (with the South Connector Road), and SR 37. The recommendation for **Alternative 2** followed a period of public and regulatory agency comments on the preliminary subsection alignment alternatives and the preliminary interchange options and an evaluation and screening analysis of the alternatives to meet Purpose and Need (See Chapter 3, *Alternatives*, and Chapter 11, *Comments, Coordination, and Public Involvement*). Alternatives Carried Forward were identified and four end-to-end alternatives were established for detailed study. The four end-to-end alternatives were evaluated for potential impacts on the natural and human environment (See Chapter 5, *Environmental Consequences*), and costs (Section 6.2). As shown in Chapter 3, *Alternatives*, the end-end-to-end alternatives all provide significant benefits in satisfying the local Purpose and Need goals and differences in performance of the mainline alignment alternatives were negligible. Therefore, the preferred alignment alternative in each subsection was selected primarily based upon impacts and cost. As discussed in Section 6.3, interchange recommendations were based primarily on the ability of the interchanges to meet Purpose and Need including increased accessibility, reduced travel time for regional destinations, congestion relief, and safety benefits.

Refinements to each of the preferred subsection alternatives have been completed and are described in Sections 6.2.1 through 6.2.8. The eight refined subsection alternatives are also discussed in Sections 6.2.1 through 6.2.8 and have been incorporated within this FEIS as Refined Preferred Alternative 2. The subsection segments that comprise DEIS Alternative 2 are the same as are used to from the end-to-end alternatives for FEIS Refined Preferred Alternative 2. The reasons why these segments were preferred are summarized below.

Table 6.17 in Chapter 6, *Comparison of Alternatives* of this document tabulates in detail the potential impacts and estimated costs associated with Refined Preferred Alternative 2 in comparison with the other four build alternatives presented in the DEIS. **Figure S-8a** (p. S-169 to S-187) shows the alignment of Refined Preferred Alternative 2 and the potential impacts to wetlands, streams, forested areas, and access associated with that alternative.

Subsection 4A

Alternative 4A-2 was the recommended preferred alternative for Subsection 4A in the DEIS because the alternative had the following primary advantages:

- Alternative 4A-2, continuing to the west into the Section 3-4 overlap area along Section 3 Alternative 3E-1, is a substantively safer alignment than Alternative Hybrid 4A-1/4A-2 continuing to the west along a Section 3 modified Alternative 3E-1 alignment. The tangent (straight) alignment of Alternative 4A-2 creates a more desirable and safer approach for motorists entering and exiting the US 231 interchange.



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- Total cost would be less using the low-cost design criteria.
- Combined total cost (Alternative 4A-2 plus Section 3 Alternative 3E-1 within the overlap area) would be less than Alternative Hybrid 4A-1/4A-2 plus a Section 3 modified Alternative 3E-1 alignment within the overlap area.
- Right-of-way acquisition would be less than the Section 3 modified Alternative 3E-1 alignment within the overlap area. The combined right-of-way for Alternative 4A-2 plus Section 3 Alternative 3E-1 would also be less than Alternative Hybrid 4A-1/4A-2 plus Section 3 modified Alternative 3E-1.
- Core forest impacts would be less than Alternative Hybrid 4A-1/4A-2.
- No displacements would occur for Alternative 4A-2.
- Managed land impacts would be less than Alternative Hybrid 4A-1/4A-2.
- Farmland impacts would be less than Alternative Hybrid 4A-1/4A-2 and less than the Section 3 modified Alternative 3E-1 alignment within the overlap area.

Refined Alternative 4A-2 is the recommended preferred alternative for Subsection 4A in the FEIS. Refined Alternative 4A-2 would have the same connection with the Section 3 Alternative 3E-1 alignment as described above for Alternative 4A-2. Impacts within the Section 3-4 Overlap Area for Refined Alternative 4A-2 would be the same as described for Alternative 4A-2. Refined Alternative 4A-2 has the following advantages:

- Provides improved local access by closing CR 200E and constructing a grade separation at CR 215E. This change is not included in Alternative 4A-2 and Alternative Hybrid 4A-1/4A-2.
- The tangent (straight) alignment for Refined Alternative 4A-2 creates a more desirable and safer approach for motorists entering and exiting the US 231 interchange. This is consistent with Alternative 4A-2.
- Combined total cost (Refined Alternative 4A-2 plus Section 3 Alternative 3E-1 within the overlap area) would be less than combined Alternative 4A-2 and combined Alternative Hybrid 4A-1/4A-2.
- Combined right-of-way acquisition (Refined Alternative 4A-2 plus Section 3 Alternative 3E-1 within the overlap area) under the low-cost design criteria would be less than combined Alternative 4A-2 and combined Alternative Hybrid 4A-1/4A-2.
- Total cost and managed land impacts would be less than Alternative 4A-2 and Alternative Hybrid 4A-1/4A-2.
- Forest impacts would be less than Alternative 4A-2.
- Right-of-way acquisition, stream relocation impacts, and farmland impacts would be less than Alternative 4A-2 using the low-cost design criteria.
- Core forest, displacement, managed land, and farmland impacts would be less than Alternative Hybrid 4A-1/4A-2.



Subsection 4B

Alternative 4B-1 was the recommended Preferred Alternative for Subsection 4B in the DEIS because the alternative had the following features:

- Alternative 4B-1 has no wetland impacts. A small wetland situated along the west edge of the alignment that was recommended for avoidance during the screening of the preliminary alternatives (See Chapter 3, *Alternatives*) is not impacted by the preliminary right-of-way.
- Forest and stream impacts would be less than estimated during the preliminary alternatives screening for Alternative 4B-1 (See Chapter 3, *Alternatives*).
- Implementation of the low-cost design criteria could reduce total cost, right-of-way acquisition, and impacts upon forest, core forest, streams, managed land, and farmland.

Refined Alternative 4B-1 is the recommended preferred alternative for Subsection 4B in the FEIS. Refined Alternative 4B-1 has the following advantages:

- Total cost would be less than Alternative 4B-1.
- Right-of-way acquisition and forest, core forest, stream, and noise impacts would be less than Alternative 4B-1 using the initial design criteria.

Subsection 4C

Alternative 4C-2 was the recommended Preferred Alternative for Subsection 4C in the DEIS because the alternative had the following primary advantages:

- Total cost could be less than Alternative 4C-1.
- Right-of-way acquisition would be less than Alternative 4C-1.
- Forest, core forest, stream, and karst feature impacts would be less than Alternative 4C-1.
- Wetland impacts would be less than Alternative 4C-1 under the initial design criteria and would be the same as Alternative 4C-1 under the low-cost design criteria.
- Managed land, stream relocation, and floodplain impacts would be less than Alternative 4C-1.

Refined Alternative 4C-2 is the recommended preferred alternative for Subsection 4C in the FEIS. Refined Alternative 4C-2 has the following advantages:

- Total cost would be less than Alternative 4C-1 and would be less than Alternative 4C-2 using the low-cost design criteria.
- Right-of-way acquisition and forest, core forest, stream, karst feature, and managed land impacts would be less than Alternative 4C-1.
- Noise impacts would be less than Alternative 4C-2.
- Wetland and farmland impacts would be less than Alternative 4C-1 using the initial design criteria.



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- Stream relocation impacts would be less than Alternative 4C-1 and would be less than Alternative 4C-2 using the initial design criteria.

Subsection 4D

Alternative 4D-1 was the recommended Preferred Alternative for Subsection 4D in the DEIS because the alternative had the following features:

- Forest, wetland, and stream impacts would be less than estimated during the preliminary alternatives screening for Alternative 4D-1 (See Chapter 3, *Alternatives*).
- The alignment avoids the recharge area of a major spring.
- Implementation of the low-cost design criteria could reduce total cost, right-of-way acquisition, and impacts upon forests, core forests, wetlands, streams, karst features, managed lands, farmland, stream relocations, and floodplains.

Refined Alternative 4D-1 is the recommended preferred alternative for Subsection 4D in the FEIS. Refined Alternative 4D-1 has the following advantages:

- Total cost would be less than Alternative 4D-1 using the initial design criteria.
- Noise impacts would be less than Alternative 4D-1.

Subsection 4E

Alternative Hybrid 4E-1/4E-2 was the recommended Preferred Alternative for Subsection 4E in the DEIS because the alternative had the following features:

- Forest impacts would be less than estimated during the preliminary alternatives screening for Alternative Hybrid 4E-1/4E-2 (See Chapter 3, *Alternatives*).
- Implementation of the low-cost design criteria could reduce total cost, right-of-way acquisition, and impacts upon forests, core forests, wetlands, streams, noise, managed lands, farmland, stream relocations, and floodplains.

Refined Alternative Hybrid 4E-1/4E-2 is the recommended preferred alternative for Subsection 4E in the FEIS. Since the publication of the DEIS, ongoing public outreach led to the identification of an additional karst feature. This feature did not exist when surveys were completed in 2004 – 2006. It has been identified and added to the impacts for both alternatives (Alternative Hybrid 4E-1/4E-2 and Refined Alternative Hybrid 4E-1/4E-2). See Section 5.21.3.10 for more details. Refined Alternative Hybrid 4E-1/4E-2 has the following advantages:

- Refinement of the vertical road profile under the initial design criteria would reduce total cost, right-of-way acquisition, and forest, core forest, wetland, stream, noise, managed land, farmland, and stream relocation impacts as compared to Alternative Hybrid 4E-1/4E-2.
- Access Road 6 would provide access to properties located immediately east of SR 45 north of I-69.



- Right-of-way acquisition and core forest impacts would be less than Alternative Hybrid 4E-1/4E-2 using the low-cost design criteria.
- Noise impacts would be less than Alternative Hybrid 4E-1/4E-2.

Subsection 4F

Alternative 4F-3 was the recommended Preferred Alternative for Subsection 4F in the DEIS because the alternative had the following primary advantages:

- Total cost would be the least of all four Subsection 4F alternatives.
- Forest, core forest, wetland, and displacement impacts would be the least of all four Subsection 4F alternatives. Alternative 4F-3 would also have the lowest overall forested wetland impact and fewest overall residential displacements of all four Subsection 4F alternatives.
- Karst feature impacts (initial design criteria and low-cost design criteria) would be less than Alternatives 4F-1 and 4F-5. Alternatives 4F-3 and 4F-4 have the same impacts to karst features.
- Maintains direct access to all Greene County properties situated along CR 150N west of the county line including access by Greene County emergency service vehicles and school busses.
- Avoids properties in Whippoorwill Subdivision, Sparks Cemetery, and the Indian Creek Township fire station.

Refined Alternative 4F-3 is the recommended preferred alternative for Subsection 4F in the FEIS. Refined Alternative 4F-3 has the following advantages:

- Refinement of the vertical road profile under the initial design criteria would reduce right-of-way acquisition, and core forest, wetland, stream, noise, farmland, stream relocation, and floodplain impacts as compared to Alternative 4F-3.
- Forest, core forest, wetland, karst feature, displacement, and noise impacts would be less than Alternative 4F-1 and total cost would be less than Alternative 4F-1 under the initial design criteria.
- Forest, core forest, noise, and managed land impacts would be less than Alternative 4F-3 under the low-cost design criteria.
- Right-of-way acquisition and forest, core forest, wetland, stream, displacement, noise, stream relocation, and floodplain impacts would be less than Alternative 4F-4 and total cost would be less than Alternative 4F-4 under the initial design criteria.
- Total cost and forest, core forest, wetland, karst feature, and displacement impacts would be less than Alternative 4F-5.



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Subsection 4G

Alternative 4G-2 was the recommended Preferred Alternative for Subsection 4G in the DEIS because the alternative had the following features:

- Avoids a cave in which state-endangered cave biota have been found.
- Forest and stream impacts would be less than estimated during the preliminary alternatives screening for Alternative 4G-2 (See Chapter 3, *Alternatives*).
- Implementation of the low-cost design criteria would reduce total cost, right of way impacts, and impacts to forests, core forests, streams, karst features, displacements, farmland and stream relocations.

Refined Alternative 4G-2 is the recommended preferred alternative for Subsection 4G in the FEIS. Refined Alternative 4G-2 has the following advantages:

- Refinement of the vertical road profile under the initial design criteria would reduce total cost, right-of-way acquisition, and forest, stream, farmland, and stream relocation impacts as compared to Alternative 4G-2.
- Total cost, right-of-way acquisition, noise impacts, and farmland impacts would be less than Alternative 4G-2 using the low-cost design criteria.

Subsection 4H

Alternative 4H-2 was the recommended Preferred Alternative for Subsection 4H in the DEIS. Alternative 4H-1 would have more right-of-way acquisition and would have more forest, stream, karst feature, noise, and managed land impacts as compared to Alternatives 4H-2 and 4H-3. As such, the selection of a Preferred Alternative was made by comparing Alternatives 4H-2 and 4H-3. Alternative 4H-2 had the following primary advantages as compared to Alternative 4H-3:

- Total cost would be less than Alternative 4H-3.
- Forest impacts would be less than Alternative 4H-3.
- Core forest impacts would be less than Alternative 4H-3.
- Alternative 4H-2 would have more impacts to karst features than Alternative 4H-3 using the initial design criteria, however, Alternatives 4H-2 and 4H-3 have the same (and fewest) number of karst features impacts using the low-cost design criteria.
- Total displacements would be less than Alternative 4H-3 and Alternative 4H-2 would not displace 3D Stone, Inc. located along Victor Pike.
- Stream relocation impacts would be less than Alternative 4H-3.

Refined Alternative 4H-2 is the recommended preferred alternative for Subsection 4H in the FEIS. Refined Alternative 4H-2 has the following advantages:

- Total cost and forest impacts are less than Alternatives 4H-1 and 4H-3 and less than Alternative 4H-2 using the low-cost design criteria.



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- Noise impacts are less than Alternatives 4H-1, 4H-2, and 4H-3.
- Right-of-way acquisition and core forest, stream, karst feature, managed land, and stream relocation impacts are less than Alternative 4H-1 and noise impacts are less than Alternative 4H-1 using the initial design criteria.
- Forest, stream and noise impacts are less than Alternative 4H-2 using the low-cost criteria.
- Core forest and stream relocation impacts are less than Alternative 4H-3 and managed land impacts are less than Alternative 4H-3 using the initial design criteria.

In the comparison of interchanges, **Interchange Option 1** (SR 45 and Greene/Monroe County Line) is the recommended interchange option because it has the following advantages:

- It would provide the greatest congestion relief and reduction in crash rates in the five-county Study Area especially along SR 45.
- It has the greatest traffic volume usage.
- The SR 45 interchange would provide regional access for southeast Greene County and a direct I-69 connection to Crane NSWC. It also provides congestion relief on SR 45 between US 231 and SR 54.
- The Greene/Monroe County Line interchange has nearly double the overall interchange demand volume of SR 45 and would provide increased accessibility to Eastern Greene County and Bloomfield area residences. It has considerable local government and public support and provides accessibility for emergencies along I-69 and in Eastern Greene County and Western Monroe County and reduced traffic volumes and congestion relief on SR 45 from SR 445 into Bloomington.

With the recommendation for Interchange Option 1, the Greene/Monroe County Line interchange would be included as a component of the Preferred Alternative. Of two connector roads for the interchange, the **South Connector Road** design option is the recommended Greene/Monroe County Line interchange configuration because the alternative has the following advantages as compared to North Connector Road option:

- Demonstrates the best transportation performance with greater than 500 VPD traffic reductions on SR 45 from SR 445 to SR 37 compared to the North Connector.
- Provides a direct connection for travel between Eastern Greene County/Bloomfield and the Bloomington urbanized area at the point this traffic joins with SR 45.
- Replaces an unconventional, potentially confusing intersection with a safer conventional four-leg intersection.

While the South Connector Road is approximately 1,000 feet longer than the North Connector Road Option and subsequently has more impacts, it also demonstrates overall superior transportation performance and better meets the Section 4 local purpose and need goals of: increased personal accessibility for area residents, reduced existing and forecasted traffic congestion, and improved traffic safety.



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S.8.2 Preferred Alternative Costs and Impacts Compared with Tier 1 Estimates

The Tier 1 FEIS presented tables that included estimates of cost and major impacts for each Section of the proposed I-69 preferred alternative. Table 6-28 of that document presented the estimates for Section 4.

The differences in the impacts shown in **Table S.8-2** are primarily due to the level of detail in the Tier 1 and Tier 2 analyses. The Tier 1 analyses relied upon data available from existing literature, mapping and aerial photography for a 26-county area. Tier 2 studies included detailed field surveys and research to determine current conditions within a much smaller study area. As an example, forest cover in Tier 1 was determined using satellite photography that could not accurately define small collections of trees, while the Tier 2 field surveys identified all wooded areas. The Tier 2 studies were also based on a more precise location of the proposed alignments whereas the Tier 1 studies assumed a general right-of-way width within a broad corridor. Where the Tier 1 studies made general assumptions about the location and quantity of resources that would be affected by the proposed roadway, the Tier 2 studies identified and quantified the resources that would be affected by the project after the alignments and their associated improvements (i.e., cross roads and interchanges) were accurately located.

The comparison between the estimated cost and potential environmental impacts associated with the preferred alternative (Alternative 2) and those from the Tier 1 FEIS are shown in **Table S.8-2**. A complete discussion about the comparative cost and impacts is in Section 6.4.2.

Data and Resources	Tier 1	Preferred Alternative 2 (4A-2, 4B-1, 4C-2, 4D-1, Hybrid 4E-1/4E-2, 4F-3, 4G-2, 4H-2)	
		Low-Cost Design Criteria**	Initial Design Criteria**
Length	26.6	26.7	26.7
Project Cost (\$ million)*	705 – 718	532	733
Area of New Right-of-Way (acres)	1,560	1,456	1,809
Farmland (acres)	670	356	461
Forest (acres)	890	874	1,091
Wetlands (acres)	20	5.3	9.6
Floodplain (acres)	130	36	51
Residential Displacements	33	71	75
Business Relocations	1	4	4

* Cost estimates are for the year 2010. Tier 1 estimates have been adjusted to account for inflation so that an accurate comparison can be made between estimated Tier 1 and Tier 2 costs. Tier 1 estimate does not include the cost for construction administration, utility relocation or mitigation. Tier 2 cost estimates include construction administration, utility relocation and mitigation.

** See Section 5.1.2 for a description of Low-Cost and Initial Design Criteria. See **Figures 5.1-3** through **5.1-5** (pp. 5-15 through 5-19) for typical sections associated with each set of design criteria.



S.9 Other Major Governmental Actions in Study Area

Other major governmental projects in the area in addition to I-69 Section 4 include the following:

- **I-69 From Evansville to Indianapolis: Section 3 and 5**—FHWA’s March 2004 Tier 1 ROD for the Evansville to Indianapolis section of I-69 selected a corridor for I-69 between Evansville and Indianapolis. In addition, the Tier 1 ROD divided the Evansville to Indianapolis project into six separate sections for more detailed Tier 2 studies. Section 4 begins at US 231 north of Scotland in Greene County and proceeds eastward approximately 27 miles to SR 37 near Bloomington in Monroe County, and runs between Section 3 and Section 5. Section 3 begins at the terminus of Section 2 in Daviess County at US 50 and proceeds north and east approximately 26 miles to its terminus at US 231 north of Scotland in Greene County. The Record of Decision (ROD) for Section 3 was approved on January 28, 2010; Section 3 currently is under design and construction. Section 5 begins at the point where I-69 joins SR 37 near Bloomington, and proceeds along SR 37 approximately 22 miles to SR 39 at Martinsville. It is important to note that all traffic modeling conducted for the I-69 Evansville to Indianapolis I-69 project takes into account that these projects will be constructed.

S.10 Major Controversies and Unresolved Issues Raised by Agencies and the Public

FHWA and INDOT have provided opportunities for government agency and public involvement throughout the Tier 2 study in Section 4. The project newsletter, hotline, website, outreach meetings, and other means were used to solicit input. In addition, a local project office on the southwest side of Bloomington has been staffed and open to the public to allow convenient public access to project team members and materials. Public agency input was also sought at key milestones in this Tier 2 study. Several of these opportunities are listed in Section S.6.1, *Scoping*. Other significant opportunities for agency and public input included:

- **Environmental Resource Agency Meeting, August 12, 2004** – A meeting was held with federal and state review agencies. The purpose of the meeting was to familiarize the environmental review agencies with the scope and status of environmental survey activities associated with the Tier 2 studies; to introduce the Project Management Team, agency representatives, and consultants responsible for each of the six sections; acquaint agency representatives with the Tier 2 project corridor, overall project Purpose and Need, public involvement efforts, and project schedules; and identify major issues to be addressed in the study.
- **Environmental Resource Agency Meeting, February 23-24, 2005** – The first day’s agenda of this two day meeting included a general meeting of all participants followed by breakout sessions to discuss specific topics. The general session focused on explaining the steps in the formal agency coordination process that each Tier 2 study will follow; identifying project schedules and timeframes; explaining how local needs and goals will be identified and



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incorporated into the Purpose and Need Statements of each section; and discussing how preliminary alternatives will be developed and evaluated. Each section's consultant project manager gave a brief presentation summarizing activities to date and future planned activities. These presentations were followed by questions and comments from the agencies. In the afternoon the following three breakout sessions were held: (1) the Interagency Water Resources Coordination Team discussed issues related to wetlands, water quality, floodplains, floodways and stream crossings; (2) the Interagency Karst Geology Team discussed issues related to sink holes; and (3) a demonstration and training session was provided for the Quantm program. The second day of the agency coordination activities was primarily devoted to a bus tour to provide agency representatives with an overview of notable features in Sections 1, 2, and 3.

- **Preliminary Alternatives and Draft Purpose & Need Public Information Meeting, June 16, 2005** – A public information meeting was held to present and receive input from local governments and the public regarding Preliminary Alternatives and the draft Purpose and Need Statement.
- **Alternatives Screening Public Information Meeting, November 16, 2005** – A public information meeting was held to present and receive input from local governments and the public regarding alternatives screening.
- **Purpose and Need/Preliminary Alternatives Coordination Meeting, December 19, 2005** – A resource agency coordination meeting/web cast was conducted to review and receive resource agencies' comments on the Section 4 Purpose and Need and Preliminary Alternatives package that had been submitted to the agencies on November 11, 2005.
- **Environmental Resource Agency Meeting, August 1-2, 2006** – The first day's agenda of this two-day environmental resource agency meeting included a general meeting of all participants, as well as updates on the status of each section, a summary of the findings of the Tier 1 Re-evaluation (See Chapter 1, Background), and the potential role of public-private partnerships in this project. Three general sessions also were held to discuss progress and seek agency input on cumulative impacts analysis in Tier 2 EIS documents, water resource analysis, and special karst studies in Tier 2 Sections 4 and 5. The second day activities were primarily devoted to a bus tour to provide agency representatives with an overview of notable features in Section 4.
- **Alternatives Screening Coordination Meeting, August 31, 2006** – FHWA and INDOT held a meeting with the environmental resource agencies to review and receive comments on Section 4's Preliminary Alternatives Evaluation and Screening package, which was submitted to the agencies on July 26, 2006.
- **Environmental Resource Agency Meeting, March 1, 2007** – A fourth one-day meeting with federal and state review agencies was held to provide an update on the status of environmental survey and documentation activities for the Tier 2 studies. The agenda included an update about each section's schedule, as well as updates on the status of each section. The agenda included a summary of and discussion of comments on the Section 1



DEIS published in December 2006; the status of permitting and mitigation related to wetlands, streams and forests; a discussion of the methodology for tracking and reporting mitigation activities to permitting agencies and the U.S. Environmental Protection Agency (USEPA); and an update on the status of potential impacts to karst resources in Sections 4 and 5.

- **Environmental Resource Agency Meeting, April 30, 2009** – This coordination meeting with federal and state environmental resource agencies focused on overview presentations and discussions about the Section 2 DEIS and Section 3 DEIS. The agenda also included updates on the schedules and project status for Sections 4, 5 and 6; the Section 1 design and construction; project permitting and mitigation; karst studies in Sections 4 and 5; the I-69 community planning grant studies, and a video documentary on Indiana caves was shown by the USEPA.
- **Draft Environmental Impact Statement (DEIS) Public Hearing Phase** – The DEIS was issued on July 23, 2010. A 5th project CAC meeting was held on August 24, 2010. A public officials briefing was held on August 26, 2010. The formal DEIS public hearing was held on August 26, 2010 at Eastern Greene Middle School in Greene County. Approximately 400 people attended the hearing. The comment period on the DEIS extended through October 28, 2010.

During this highly public and highly participative process, a wide range of issues were raised in the comments on the DEIS and in other comments received during the study process. Some of these issues were raised by environmental resource agencies. Others were raised by local elected officials and government representatives, interest groups, and citizens. All of these issues were considered and addressed as part of the process of identifying Alternative 2, which was recommended in the DEIS. No comments on the DEIS provided any reason to select a different alternative. This FEIS presents refinements to Alternative 2 that have occurred since the issuance of the DEIS. These refinements are based on comments received on the DEIS, information received from CAC members and local public officials, additional engineering and environmental studies, and decisions made by INDOT. The product of these efforts is Refined Preferred Alternative 2.

This section provides general responses to the major issues raised in the comments. Section 11.2 of this FEIS includes a more extensive summary of major issues and the manner in which they have been addressed. Section 11.3 summarizes the public and community outreach process. Section 11.4 summarizes the coordination process with federal and state agencies.

S.10.1 Issues Raised Prior to the DEIS

The major issues raised by the public and resource agencies were as follows. For a more detailed discussion of these issues, see Section 11.2.1, *Issues Raised Prior to the DEIS*.

- Local Access and Public Road Connectivity
- Farmland Impacts

Summary

Section S.10 – Major Controversies and Unresolved Issues Raised by Agencies and the Public



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- Interchange Areas

Local Access and Public Road Connectivity – Major questions and issues were raised before the issuance of the DEIS. The need to provide controlled access to Interstate systems at designated interchanges can result in the severance and closure of local public roads, thereby requiring motorists to change familiar routes and find new routes to familiar destinations. This could be a significant adjustment for emergency responders, along with the business, residential, and farming communities in the project area. The change in travel patterns related to road closings could produce longer trips and slower response times for emergency responders. And for farmers and businesses such as limestone quarries that have large, slow-moving equipment, added distance means added time and reduced productivity.

Local farmers and emergency responders have joined area residents, business owners and others in voicing their concerns about road closings and expressing their opinions about which roads should remain open. Grade separations and road closures proposed in the preliminary planning stages were shown to the public to elicit comment and advice. Public input resulted in the inclusion of Access Road 4 (CR 1250E connection to SR 54 south of I-69) in Preferred Alternative 2 and maintaining the existing SR 37/Victor Pike signalized intersection.

Farmland Impacts – Farming is an important local industry. One of the top priorities expressed by the local farming community regarding the development of Section 4 alternatives was to avoid where possible, or minimize where unavoidable, the creation of farmland severances and uneconomic remnants. Another major concern echoed by most of the farming community has been the need to have access to fields, many of which are not contiguous to the farmstead but are scattered through the project area. While direct impacts on farmland will result from the acquisition of farmland for right-of-way needed for road construction (See Section 5.4, Farmland Impacts), extensive efforts have been made to avoid or minimize severances, and to facilitate access to farm fields via overpasses that are conveniently located and spaced, and wide enough to accommodate large farming equipment.

Interchange Areas – Throughout the Tier 2 Section 4 public involvement process, accessibility has been one of the topics most often raised by local residents. Access for local residents and communities has been highlighted as a key factor to be considered in choosing the final Section 4 alignment. Two interchange locations were identified based upon local input.

During Section 4's Tier 2 public involvement process, the Greene County Commissioners and Council requested that the SR 45 interchange be included in the Preferred Alternative. Many letters and website comments were also received from citizens and interested individuals with the same request. The interchange is considered necessary to serve the north gate at the Crane NSWC facility. An interchange at SR 45 was included in Alternative 2 as the DEIS preferred alternative.

The I-69 Evansville to Indianapolis Tier 1 Study did not identify a potential interchange in the Greene/Monroe County Line area. Elected officials from Greene and Monroe counties, the CAC, and members of the public requested an interchange near the county line to ease traffic along existing SR 45 and provide an access point to I-69 in a convenient location. The traffic



model for the project was used to determine the traffic predicted to use this interchange. The model showed an Average Daily Traffic (ADT) of almost 6,000 vehicles using this interchange by 2030. Due to the high traffic numbers, it was decided to include this interchange in the the DEIS preferred Alternative 2. The interchange was also included to provide an access point for emergency responders.

S.10.2 Issues Raised in Comments on the DEIS

During and subsequent to the comment period on the DEIS, many issues similar to and in addition to those described above were raised. Comments on the DEIS were received from:

- Federal agencies:
 - US Department of the Interior, Office of Environmental Policy Compliance
 - US Environmental Protection Agency, Region 5, Office of Enforcement and Compliance Assurance
- Tribal agencies:
 - The Delaware Nation
 - Peoria Tribe of Indians of Oklahoma
- State agencies:
 - Indiana Department of Natural Resources, Division of Historic Preservation & Archaeology
 - Indiana Department of Environmental Management, Office of Water Quality
 - Indiana Department of Natural Resources, Division of Fish and Wildlife

Comments were also received from representatives of 21 local government units, 7 public organizations, and 786 individuals. Form letters prepared by a local organization and which included standardized comment boxes, were received from 437 individuals/families. Three-hundred seventeen (317) of the form letters also included additional comments on the project. Substantive comments⁹ submitted on the DEIS can be categorized as follows:

- Tally of Impacts and Tracking of Impacts and Mitigation
- Alternatives Evaluation and Selection of Preferred Alternative
- Purpose and Need
- Air Quality
- Noise
- Water Resources
- Threatened and Endangered Species (TES) / Other Wildlife Issues
- Indirect Impacts
- Section 106 Resource and Section 4(f)
- Local Access and Public Road Connectivity
- Neighborhood and Socio-Economic Impacts
- Funding / Costs

⁹ Comments not considered “substantive” included those that only noted preference for or opposition to the project, without elaboration; and comments that did not relate specifically to the Tier 2 Section 4 study.



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- Greene County/Monroe County Line Interchange
- Karst Resources
- SR 37 Traffic
- Construction Impacts, Mitigation and Permitting
- Design Criteria
- Tier 1 Issues
- Additional Agency Input

A summary of key issues raised and responses is presented below. A more comprehensive summary of comments and responses is included in Section 11.2.2, *Issues Raised in Comments on the DEIS*. A complete set of the substantive comments and responses is presented in Volume III, *Comments and Response*, of this FEIS.

Tally of Impacts and Tracking of Impacts and Mitigation – Commentators requested a tally of direct and indirect impacts be provided for all six sections of the project, and also requested the tracking of impacts and mitigation to ensure that impacts are adequately compensated. A tally of direct impacts of all six sections, based on the most current available data, is provided in **Appendix KK, Tier 1-Tier 2 Impact Comparisons**. An overall I-69 direct impacts, permitting and mitigation tracking system is being developed in consultation with permitting agencies and USEPA.

Alternatives Evaluation and Selection of Preferred Alternative – Alternative 2 was recommended as the preferred alternative in the DEIS. There were no substantive comments on Alternative 2 that provided any reason to select a different alternative. The most prominent comments on the evaluation and selection of the preferred alternative as presented in the DEIS were on purpose and need and the Greene County/Monroe County Line interchange. A summary of comments on these two issues are discussed below.

Purpose and Need – Several comments were received from public organizations and individuals with regards to the ability of the Section 4 project to satisfy the Tier 2 Purpose and Need goals. A few of the comments questioned the ability of the project to increase local accessibility due to the closure of some local roads, as well as the limited access nature of the highway. As discussed in Chapter 3.3.1.1, all interchange options provide a significant level of improved accessibility to population and employment centers served by Section 4, and thereby satisfy Tier 2 Goal 2 on accessibility.

Several purpose and need comments were about congestion. Some of these questioned whether congestion relief along SR 45 is appropriate as a selection criterion for interchange options which include the Greene County/Monroe County Line interchange. As discussed in Chapter 3.3.1.2, all five interchange options will reduce congestion for the Section 4 study area. Furthermore, Interchange Option 1 will have the greatest reduction in congestion.

The most cited purpose and need comment on safety was about the crash rates that were used in the safety analysis for Tier 2 Goal 4. Subsequent to the completion of the DEIS, more current crash rates were identified and the safety analysis presented in Chapter 3.3.1.3 was updated.



Several comments were received about the purpose and need goal of the project to support local economic development (Goal 5). As discussed in Chapter 3.3.2, each interchange option would provide a similar and substantial reduction in total distance and travel time to employment centers and business markets.

Air Quality – USEPA noted that Greene County is a designated maintenance area for the eight-hour ozone standard and that the County is currently in attainment of the standard and is under an approved maintenance plan. USEPA also reiterated that the DEIS identified that the conformity determination requirements for the I-69 project in Greene County will be determined after further agency consultation.

A conformity demonstration for Greene County, Indiana’s 8-hour ozone maintenance area for the I-69 Tier 2 Section 4 FEIS was completed in December 2010. The conformity demonstration found that Section 4 demonstrates conformity to the State Implementation Plan budgets as required by the conformity rule. FHWA, IDEM and the USEPA completed their reviews and found that the analyses and documentation meet the criteria outlined in the conformity rule.

Local government comments expressed concerns about potential air quality impacts in Bloomington and Monroe County. The FEIS demonstrates that Monroe County will not be adversely affected by CO or MSAT emissions related to I-69, and the particulate matter (PM) monitoring data cited actually indicates that PM is at healthy levels, and actually are the lowest such levels monitored within the State of Indiana.

Noise – Many comments were received from representatives of local government, public organizations, and individuals about noise. These comments were about noise impacts in general, the accuracy of the noise modeling, and noise mitigation.

As part of the FEIS, a Highway Traffic Noise Analysis was performed in accordance with the Indiana Department of Transportation *Traffic Noise Policy (2007)* and the *Traffic Noise Analysis Procedure (2011)*. Highway Traffic Noise Mitigation will be provided in areas where the traffic noise abatement measures evaluated met the criteria to be considered both “reasonable” and “feasible”. A commitment has been made in the FEIS that additional noise analysis will be performed during the design phase to more accurately determine barrier performance, barrier characteristics (length and height), and the optimal barrier location for any potential noise barriers that may be recommended for noise abatement.

Note: On July 13, 2011, INDOT implemented a new noise policy, as required by recent changes in federal regulations. The noise impact analysis in this FEIS has been prepared to satisfy the requirements of this new noise policy. See Section 5.10, *Highway Noise*, for more information.

Water Resources – USEPA requested that specific locations and structures to reduce stream impacts at specific stream reaches be clearly depicted in the FEIS and noted that special attention should be given to sedimentation control for construction impacts. USEPA also requested that Best Management Practices (BMPs) suited to Section 4’s resources be identified and used. Regarding specific locations and structures, such specific information will not be determined



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until final design after the FEIS and ROD. Best Management Practices (BMPs) and Rule 5 will be followed.

USEPA expressed concern for potential indirect water quality effects relating to an “additional” interchange and resulting increased accessibility to southwest Monroe, eastern Greene and northwest Lawrence Counties, as compared to interchanges discussed in Tier 1 documents. The Tier 1 EIS identified two proposed intermediate interchanges in Section 4 between US 231 and SR 37 (See Tier 1 FEIS, Figure 6-20 (p. 6-61). While the Greene/Monroe County line interchange was added for consideration, it is proposed as a replacement for one of the proposed interchanges in Tier 1. This is clarified in FEIS Sections 3.2.2.3 and 3.4.2.

USEPA expressed concern for the potential for impacts to waters and/or wetlands located near the construction limits but not directly impacted by construction. All water resource areas within the right-of-way that are not impacted by construction will be identified on the design plans and these areas will have erosion control measures approved by IDEM. This commitment is noted in FEIS Section 5.19.2.4 and Section 7.3.9.

USEPA requested that discussion of ongoing stream mitigation related work be reflected in the FEIS. Additional mitigation information is included in the FEIS and also defined in the Biological Assessment (BA) which is included as FEIS **Appendix JJ1**, *Redacted Section 4 Tier 2 Biological Assessment*.

USEPA commented that the FEIS discussion of stream impacts should not be based solely on linear feet of impacts, and that the habitat quality of affected streams should be considered. Discussion of the habitat quality affected by the Section 4 alternatives has been incorporated into FEIS Sections 5.19.2.3, 5.19.2.4 and **Table 5.19-6a**, and FEIS **Appendix M**, *Final Stream Assessment Report*.

USEPA also suggested clarification in the FEIS that USEPA Class V injection well permits may be required for various types of projects. The requested clarification regarding Class V injection well permits was included in FEIS Section 5.19.2.4

IDEM recommended that consideration be given in the design phase to planting trees and shrubs along relocated streams and the outside right-of-way edge. A commitment for consideration of tree and shrub planting along relocated streams and the outside right-of-way edge were included in the Section 5.1.9.2.4 of the FEIS.

IDNR suggested that consideration be given during the design phase to the use of armoring materials other than riprap. Commitments relating to stream bank armoring were added to FEIS Section 5.19.2.4 and FEIS Section 7.3.12.

Threatened and Endangered Species (TES) / Other Wildlife Issues – DOI noted that the USFWS strongly supports the proposed development of wildlife crossing throughout Section 4 project; minimizing habitat gaps and barriers to wildlife movement is very important because of the rural and densely forested nature of this part of the project area.



IDNR made several recommendations related to the locations of proposed wildlife crossings, as well as minimum design criteria for consideration with bridges and culverts. IDNR also recommended other appropriate mitigation measures be implemented where the highway crosses significant habitat area, including placing any lights on the shortest poles possible to limit the spread of light and shielding the light so it only shines on the highway and not up or out from the road. Wildlife crossings and wildlife crossing related commitments are discussed in detail in FEIS Section 5.18.4 and FEIS Section 7.3.13. As noted in the Sections 5.18.4, 7.3.6 and 7.3.13, any highway/interchange lighting will be at least 40 feet above the highway in order to minimize collisions between bats and vehicles.

A public individual commented that the cerulean warbler (*Dendroica cerulean*) and the hooded warbler (*Wilsonia citrina*) should be added to the Section 4 list of species discussed in FEIS. Section 5.17.3.3 discussions regarding the potential for species occurrence and potential impact have been updated accordingly.

Indirect Impacts – USEPA requested additional spatial and narrative information for potential karst resource and water quality impacts in the areas of anticipated induced growth resulting from the construction of I-69. Various text and mapping were added to Section 5.24.3 to address these concerns.

Section 106 Resource and Section 4(f) – USDOJ concurred that there are no public park/recreation or refuge properties eligible to be considered under Section 4(f) of the Department of Transportation Act of 1966 (48 U.S.C. 1653(f)). USDOJ also acknowledged that none of the historic properties eligible for inclusion in the National Register of Historic Places in the project area were found to be adversely affected by the project.

SHPO agreed with the findings relating to aboveground historic resources but requested additional information on archaeological investigations. Further archaeological studies were performed since the DEIS, the results of which are discussed in FEIS Section 5.14. In a letter dated February 15, 2011, the SHPO concurred with the Adverse Effect finding for the undertaking and agreed with the previously-identified historic properties and with the archaeological districts identified. The SHPO also concurred that the archaeological sites impacted within the archaeological districts do not warrant preservation in place.

Several consulting party and public comments were received suggesting that the Dowden Farm in Greene County should be considered as eligible for listing on the National Register of Historic places. In follow up to such comments, the Keeper of the National Register of Historic Places was asked to determine whether this is a National Register-eligible resource. FEIS Section 5.13.2.6 documents that the Keeper determined that this farmstead is not National Register-eligible.

Public comments expressing objection to the assessment of auditory effects upon National Register listed and eligible properties were received. The comments suggested that the project would cause adverse auditory effects. As explained in Section 5.13.4, no noise impacts were predicted for historic properties.



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Local Access and Public Road Connectivity – Access and connectivity issues continued to be prominent topics of commentary after the issuance of the DEIS. Options to either maintain travel along Dry Branch Road and Mineral-Koleen Road in Greene County and at Burch Road, Harmony Road, and Bolin Lane in Monroe County by construction of a grade separation or to close these roads at I-69 were evaluated in the FEIS. The evaluation included detailed engineering development of the highway, traffic volumes, travel patterns, (including school bus and emergency vehicle access), potential environmental impacts and costs as well as resource agency, local government, and public comments. As discussed in detail in Section 5.6.3.2, INDOT has determined that local travel will be maintained by the construction of grade separations at these local roads.

An options to either maintain travel along Evans Lane in Monroe County by construction of a grade separation or to close this roads was also presented in the DEIS. It was decided by INDOT that Evans Lane would be closed. A detailed study is included in **Appendix Z**, *Documentation of Local Access Decisions*. The decision to close this road is supported by representatives of local government and property owners in the Evans Lane neighborhood.

Several comments from representatives of local government, public organizations and individuals were received about the proposed grade separation at CR 200E and the proposed closing of CR 215E in Greene County as presented in the DEIS. In consideration of these comments and further evaluation of the engineering, traffic, environmental affects, and costs, INDOT has decided that CR 200E will be closed at I-69 and travel along CR 215E will be maintained by the construction of a grade separation. Additional discussion about these two roads is included in Section 5.6.3.2.

A few comments were received from representatives of local government and public individuals about the proposed closing of Taylor Ridge Road (CR 440E and CR 475E) and CR 450S in Greene County. The primary concern was about modifications that would be required for school bus travel in this area. A detailed study of these roads was performed and is included in **Appendix Z**. It has been decided that portions of the steeper grades along Taylor Ridge Road will be paved in order to maintain the roadway surface for travel by school buses during snow and ice conditions that may occur at certain times of the year. The improvements to Taylor Ridge Road will be made by Greene County, using funding provided by INDOT.

Comments were received from individuals about the closing of Carter Road (CR 100N/CR 150N) at the Greene/Monroe County line. These comments stated that the closing of this road would require use of the bridge on CR 100N/CR 150N over Indian Creek by heavy vehicles and farm equipment. An inspection of this bridge has since been performed and the previous vehicle weight restriction on the bridge has been removed by Greene County.

Glenview Drive in Rolling Glen Estates was proposed to be closed at Wheaton Court in the DEIS. Comments from representatives of local government and individuals were expressed about this road closing and the loss of a second access to the subdivision. Additional evaluation has been performed and Glenview Drive will be extended and reconnected to Bolin Lane.



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The construction of the SR 37 interchange will require the closing of That Road at SR 37. As presented in the DEIS, a frontage road will be constructed to connect That Road to Rockport Road on the east side of SR 37. Comments were received from representatives of local government, public organizations and individuals about this improvement during the interim time between the construction of I-69 Section 4 and the complete construction of the frontage road on the east side of SR 37 that would not occur until construction of I-69 Section 5.¹⁰ Concerns included increased local travel and affects upon school bus routes during the interim time period. Further review of the SR 37 interchange has recommended that an interim signalized “T” intersection be constructed at the junction of I-69 and SR 37. The interim intersection will enable That Road to remain open on both sides of SR 37 until such time as the full SR 37 interchange and Section 5 improvements are constructed (see Section 5.6.3.2 and **Appendix QQ**, *SR 37 Operational and Safety Analysis*).

Neighborhood and Socio-Economic Impacts – Many comments were received from individuals about the project effects upon neighborhoods and other potential socio-economic impacts.

Various comments were received from property owners in Rolling Glen Estates, Victor Heights, Farmers Field Acres, and Shea Estates subdivisions and other individual residential properties located along the highway. Potential noise impacts were the most common concern expressed by these property owners. Other prominent concerns included changes in property values, crime/neighborhood safety, visual impacts, drainage/flooding concerns, and ambient light impacts. Comments about noise and access for Rolling Glen Estates are discussed in Section 11.2.2.5 and Section 11.2.2.10, respectively.

Various comments were received from property owners about property acquisition. At this time, only property that is directly affected by the construction of I-69 is anticipated to be purchased. Property acquisition will occur as part of final design. If during that time, INDOT determines that the remaining property will have little or no values or use to the owner, INDOT will consider this remainder to be an uneconomic remnant and will offer to purchase it.

INDOT has had coordination with all local public school corporations about the proposed improvements and roads that may be closed or relocated. Many public comments were received about potential road closings and the affects upon school bus routes or access to properties by school buses. With the decisions provide grade separations at I-69 for Dry Branch Road, Mineral-Koleen Road, Burch Road, Harmony Road and Bolin Lane, most concerns about impacts upon school bus routes have been resolved (see Section 11.2.2.10). Concern about school bus travel along Taylor Ridge Road in Greene County has been addressed and mitigation measures will be provided (see Section 11.2.2.10 and **Appendix Z**). Concern about school bus travel along That Road has also been addressed (see Section 11.2.2.10 and **Appendix QQ**).

¹⁰ Portions of the frontage road to connect with That Rd. on the east side of I-69 are parts of both the Section 4 and Section 5 projects.



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Comments about bicycling and alternative transportation (non-motorized) were received from representatives of local governments, a public organization, and many individuals. Most of these comments were about the possible closing of Burch Road, Harmony Road and Bolin Lane in Monroe County. With the decision to maintain travel along these roads, the use of these roads by bicyclists will be unaffected by the project.

Coordination with local government representatives in Monroe County has included consideration of the recommendations of the *Monroe County Alternative Transportation & Greenway System Plan*. It has been decided that additional shoulder width will be provided along Breeden Road, Harmony Road, Rockport Road, Tramway Road and Bolin Lane in order to accommodate a shared bicycle lane/shoulder as recommended in the alternative transportation plan. The development of the bicycle lane will be implemented at a future time by Monroe County (see **Appendix Z**). An I-69 greenway, as included in the alternative transportation plan, will not be implemented along Section 4 but will continue to be analyzed by INDOT for other sections of I-69 located to the north of Section 4.

INDOT has had multiple meetings with all local agencies that provide police, fire, emergency medical services, hazardous material response services, and ambulance services within the Section 4 study area. With the decision to maintain travel along Dry Branch Road, Mineral-Koleen Road, Burch Road, Harmony Road and Bolin Lane along with the review of all other local roads that will either be closed or relocated, no significant concerns about emergency services are unaddressed or unresolved.

The only remaining emergency service issue that will require additional consideration is the suggested development of an emergency access ramp to I-69 in Monroe County. This issue has been commented upon by several representatives of local government. Studies have been undertaken to develop a potential emergency ramp at Burch Road. A final decision will be made during the project design phase. Local comments about this emergency ramp, the evaluations that have been performed to date, and an outline of future consideration of this potential emergency access ramp is included in **Appendix BB**, *Emergency Responder Coordination*.

Funding / Costs – Several representatives of local government, public organization and individuals indicated concerns about the cost estimates including increases in project costs from the Tier 1 study and maintenance costs. Some commentators stated that INDOT does not have sufficient funding to complete the project and expressed concern about the funding source and INDOT priorities.

Regarding project cost estimates, the DEIS cost estimates were completed in accordance with the cost estimating methodology presented in **Appendix D**, *Cost Estimating Methodology*. Since the DEIS, the cost estimating methodology has been modified because of recent decreases in construction costs that have been experienced on recent INDOT comparable construction projects. With regards to the project funding, INDOT will fund the Section 4 project with traditional transportation funding, using both federal and state funds. The current INDOT Long Range Plan provides for significant expenditures to preserve the existing highway network.



Greene County/Monroe County Line Interchange – Several comments were received from federal and state agencies, representatives of local governments, public groups and individuals about the Greene County/Monroe County Line interchange. The comments included requests for additional clarification about the Tier 1 recommendations for Section 4 intermediate interchanges, the need for adding the Greene County/Monroe County Line interchange, the reasons for selecting Interchange Option 1 (which includes the Greene County/Monroe County Line interchange), the selection of the South Connector Road, and potential induced growth impacts associated with the Greene County/Monroe County Line interchange.

Interchange Option 1 is the recommended combination of interchanges for Refined Preferred Alternative 2. This interchange option includes intermediate interchanges at SR 45 and the Greene County/Monroe County line interchange. It has been selected because it performs significantly better in fulfilling the project purposes.

The South Connector Road generally has higher impacts and costs than the North Connector Road, since it is longer. These higher costs and impacts were considered along with traffic performance and safety for the North and South Connector Road options. The South Connector Road was included in the Preferred Alternative because it had the best transportation performance and traffic reductions on SR 45 between SR 445 and SR 37, provides a direct connection for travel between Eastern Greene County/Bloomfield and the Bloomington urbanized area, and replaces an unconventional and confusing intersection (SR 45/SR 445) with a safer conventional four-leg intersection.

Karst Resources – USEPA expressed concern that the lack of subsurface karst feature data poses a threat to karst environments during construction of the proposed highway facility and noted the importance of identifying subsurface karst features early in the design phase. As explained in Section 5.21.1, the project is being developed in accordance with the Karst MOU, which provides seventeen procedural steps/guidelines for development of highway projects in karst terrain.

USEPA expressed concern that the project could result in changes in drainage patterns to and from karst features, resulting in a reduction in water available to landowners who rely on these water supply features for residential or agricultural uses. Appropriate BMPs will be utilized throughout the project to avoid and minimize impacts to karst features and water quality. A list of potential BMPs for use in karst areas is presented as **Table 5.21-2a**. As explained in Section 5.21.3.9, areas where induced growth is predicted to occur are served by water utilities.

USEPA commented that a cave fauna survey of all accessible caves within, or directly adjacent to, the Section 4 corridor would better characterize cave fauna. As explained in Section 5.21.3.7 caves surveyed for biota were selected based on potential impacts to features hydrologically connected to the corridor.

USEPA commented that the pollutant loading analysis presented in the DEIS appeared biased in its assumptions of the quantity of water involved in pollutant mobilization. Pollutant loading



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estimates have been updated since publication of the DEIS and are included in **Appendix AA**, *Final Karst Report/Addendum to Karst Report (Redacted)*.

USEPA commented that blasting can cause structural damage to buildings and wells, and cause the collapse of karst subsurface openings. Commitments are contained in Section 7.3.3 pertaining to blasting in areas within 0.5 mile of known Indiana bat hibernacula.

The USEPA commented that one of the most important mitigation BMPs is the nature of drainage ditch lining where ditches intercept karst conduits. A firm commitment has been added to Section 7.3.4, that if active groundwater flow paths are discovered, measures will be taken to perpetuate the flow and protect water quality.

USEPA also suggested clarification in the FEIS that USEPA Class V injection well permits may be required for various types of projects. The requested clarification regarding Class V injection well permits was included in FEIS Section 5.19.2.4, 5.21.4, and 7.3.4.

Public comments were received suggesting that impacts to karst resources could be reduced significantly if the highway alignment were shifted easterly, significantly outside the Section 4 corridor, in the area approximately between Carmichael Road and Lodge Road. Commenters provided two separate but similar recommended alignments. It was determined that the Tier 2 analysis has not identified any unexpected resources or impacts in the portions of the project which these alternatives would bypass. Also, the resources and impacts in the corridor are not significantly or materially different than what was known when the Tier 1 corridor was approved. Because neither suggested alignment meets the standard established in the Tier 1 ROD to consider alignments outside the approved corridor (“to avoid significant impacts within the selected corridor”)¹¹, no further analysis of these proposed alignments is warranted. Refer to response to Comment PI322-01 in Volume III of this FEIS for further information.

SR 37 Traffic – Comments were received from representatives of local government, public organizations, and individuals about the overall capacity of SR 37 and about various existing intersections along SR 37 in the Bloomington area. A traffic operations and safety assessment of 12 intersections along SR 37 has been prepared and is included as **Appendix QQ**, *SR 37 Operational and Safety Analysis*, of the FEIS. This study identifies potential improvements at these intersections that will be further reviewed by INDOT and, if implemented, would be performed as improvements independent of the I-69 Section 4 project.

Construction Impacts, Mitigation and Permitting – USEPA suggested FEIS text revisions to clarify the discussion of USEPA Underground Injection Control and Class V Permits under the Safe Drinking Water Act. These revisions were made in FEIS Section 5.19.2.4.

USEPA suggested a clarification that the USEPA reviews jurisdictional determinations made by the USACE under the Clean Water Act. This revision was made to FEIS Section 5.19.2.3.

USEPA recommended that if active groundwater flow paths are discovered during construction, measures should be taken to perpetuate flow and protect water quality. A commitment in this

¹¹ See Tier 1 ROD, Section 2.3.5.



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regard was added to FEIS Section 7.3.17. Per IDEM comments, Chapter 5.19.2.4 was revised to include a firm commitment to evaluate measures for bank stabilization, reinforcement and erosion control for final design of the South Connector Road bridge over Indian Creek to minimize natural channel migration.

Design Criteria – Comments were received from public organizations and individuals about the design criteria that will be used for Section 4. Most of these comments questioned the use of the low-cost design criteria and concerns that such design will make the road less safe. Other comments were received about changes in pavement material that may result in increased long term costs.

As outlined in the DEIS, INDOT is considering a range of design criteria for I-69, Section 4. Detailed information about the low-cost design criteria is included in **Appendix GG**, *Low-Cost Design Memorandum*. These criteria satisfy INDOT's Design Manual and there is no evidence that the road will be less safe. The decision regarding which criteria will be used for I-69 will be finalized during design.

With regards to the pavement material, pavement design is finalized during the design stage. Choices such as pavement thickness and types are made in consideration of forecasted traffic levels, current material costs, as well as life-cycle maintenance costs for different pavement types.

Tier 1 Issues – Many comments about the Tier 1 study were received from individuals during the Section 4 DEIS review and comment phase. Most of these were about the I-69 route that was selected during the Tier 1 study, support for an alternative Tier 1 route for I-69, and potential impacts upon social, economic, and/or environmental resources located outside of the Section 4 study area. The Tier 1 ROD selected Alternative 3C corridor as the build alternative for I-69 between Evansville and Indianapolis. Comments that deal with Tier 1 issues, such as alternative routes/corridors or the build/no build decision, require no further response in this Tier 2 document.

Additional Agency Input – On February 21, 2011, a draft of the Comments and Responses (C/R) document was submitted for review and consideration to the following federal and state agencies: USEPA, FWS, Natural Resources Conservation Service (NRCS), NPS, USACE, IDEM and IDNR. Comments were received from USEPA, IDEM, and IDNR. Volume III, Part A of this FEIS contains the original agency comments on the DEIS, as well as responses to these comments. The three agency letters and an e-mail from IDNR which commented on the draft responses to comments are included in Volume III, Part B. The draft responses to comments were modified to address the agency comments in these letters and e-mail. Responses which were thus modified are so noted in Volume III, Part A.

The I-69 Evansville to Indianapolis Tier 1 Study did not identify a potential interchange in the Greene/Monroe County Line area. Elected officials from Greene and Monroe counties, the



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CAC, and members of the public requested an interchange near the county line to ease traffic along existing SR 45 and provide an access point to I-69 in a convenient location. The traffic model for the project was used to determine the traffic predicted to use this interchange. The model showed almost 6,000 ADT using this interchange by 2030. Due to the high traffic numbers, it was decided to include this interchange in the preferred alternative. The interchange was also included to provide an access point for emergency responders. This FEIS recommends that the interchange be located at the Greene/Monroe County Line.

There are no major issues raised by the public or agencies which are considered unresolved. Advocacy groups have continued to raise disagreements with the corridor approved in the Tier 1 Record of Decision. As described in Chapter 1 (p. 1-1), these issues were addressed in a lawsuit in US District Court. The district court rejected all of the plaintiff’s claims. Plaintiffs did not file an appeal, and the time for other judicial challenges to the Tier 1 decisions expired on October 14, 2007. No further legal challenges can be brought against the Tier 1 decisions.

S.11 Mitigation

Throughout this study, efforts have been made to avoid human and natural resources. In particular, avoidance and the opportunity to minimize impacts were used in the decision making process to identify a preferred alternative. Alternative 2 was identified as the preferred alternative in the DEIS. Subsequent to the DEIS, additional engineering and refinement of Alternative 2 was performed to reduce overall project costs and impacts, resulting in Refined Preferred Alternative 2. Further efforts were undertaken to develop comprehensive mitigation measures. Environmental agencies and the public have been instrumental in providing assistance to avoid and minimize impacts upon both the human and natural environment, and helped develop many of the mitigation measures identified in this FEIS.

During the Tier 1 process, conceptual mitigation proposals were developed as the starting point for identifying the total mitigation for constructing I-69 from Evansville to Indianapolis. During the Tier 2 process in Section 4, mitigation measures specific to the conditions and potential impacts within Section 4 were developed based on the more detailed information and interactions with the public and resource agencies. Where applicable, these mitigation measures incorporated and, in some cases, expand upon the “major mitigation initiatives” developed during Tier 1. These initiatives are summarized in **Table S.11-1**. Initiatives that apply to Section 4 are identified in the text that follows. For more detailed discussion of mitigation measures, see the FEIS Chapter 7, *Mitigation and Commitments*.

Major Initiatives	Description
Context Sensitive Solutions (CSS)/ Community Advisory Committees (CAC)	CSS is a collaborative, interdisciplinary approach that involves all stakeholders to develop a transportation facility that fits its physical setting and preserves scenic, aesthetic, historic, and environmental resources, while maintaining safety and mobility. CSS is an approach that considers the total context within which a transportation improvement project will exist, which has been implemented during the Tier 1 and Tier 2 EIS development and will continue through subsequent design.
Indiana Bat Hibernacula	INDOT and FHWA will attempt to purchase and protect hibernacula (winter habitat) for the Indiana bat.



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Table S.11-1: Major Initiatives

Major Initiatives	Description
Wetland Mitigation	INDOT and FHWA will replace wetlands impacted by the Refined Preferred Alternative 2 in accordance with INDOT's Wetlands MOU. Sites have been secured and mitigation construction is underway for some sections in advance of highway construction.
Forest Mitigation	INDOT and FHWA will mitigate upland forests impacted by the Refined Preferred Alternative 2 at a ratio of 3:1. Multiple sites have been secured for this mitigation effort.
I-69 Community Planning Program	INDOT and FHWA have developed a program that establishes a regional strategy for managing growth.
Geographic Information System (GIS)	INDOT and FHWA have developed a statewide GIS Atlas that is comprised of more than 170 different layers. This Atlas is available on the Indiana Map website.
Update County Historic Surveys	INDOT and FHWA will provide financial and technical assistance to IDNR to support the completion of field surveys and publication of County Interim Reports.
Biological Surveys on Wildlife and Plants	INDOT has worked with resource agencies to conduct biological surveys for threatened and endangered species. Follow-up surveys for the Indiana bat are also being made prior to and during construction. These Indiana bat surveys are being initiated prior to construction.
Bridging of Floodplains	INDOT and FHWA will bridge the Patoka Rivers and Flat Creek floodplains. This bridging has been incorporated into the Section 2 Alternatives. There are no floodplains in Section 4 which are anticipated to be bridged in their entirety.
Distance Learning	INDOT and FHWA will continue to support distance-learning opportunities for students in Southwest Indiana as part of the public outreach for transportation projects.

Context Sensitive Solutions (CSS)/Community Advisory Committees (CAC): Five CAC meetings were held in Section 4 prior to the publication of the FEIS. A sixth CAC meeting is anticipated concurrent with the issuance of this FEIS. At these meetings, CAC members provided valuable input in matters relating to local community and access needs, particularly in regard to the need for an interchange along the Greene County/Monroe County Line. The use of CACs and CSS in Section 4 has resulted in:

- Construction of a Greene/Monroe County Line interchange.
- Construction of an overpass at Dry Branch Road and Mineral-Koleen Road (CR 350S, CR 360S, and CR 880E) in Greene County, and at Burch Road, Harmony Road and Bolin Lane in Monroe County.
- Development of a set of low-cost design criteria that minimizes costs and the environmental footprint of the interstate.
- Construction of six Access Roads

INDOT will continue the coordination during the design phase to obtain input on the use of CSS. The use of CSS and CACs may result in the development of measures to improve the aesthetics of the highway by planting native wildflowers.

Wetland Mitigation and Indiana Bat Hibernacula: INDOT and FHWA will follow the mitigation ratios listed in their Wetlands MOU signed January 28, 1991. Wetland impacts in Section 4 are relatively small: Refined Preferred Alternative 2 would impact approximately 5.32 acres to 9.55 acres of wetlands, consisting of 3.33 to 5.34 acres of emergent wetlands, 1.81 to



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3.76 acres of forested wetlands and 0.18 to 0.45 acres of scrub/shrub wetlands. Based on the MOU ratios (See Section 7.3.9), mitigation for wetland impacts in Section 4 could range from approximately 15.79 acres to 29.14 acres. The MOU is provided in **Appendix W**, *Wetlands Memorandum of Understanding*, of this FEIS.

For Section 4, three potential mitigation sites were identified in the *Revised Tier 1 Conceptual Forest and Wetland Mitigation and Enhancement Plan* (see **Appendix S** for this Plan and a comparison to the original *Tier 1 Forest and Wetland Mitigation and Enhancement Plan*, which was provided as Appendix NN in the Tier 1 FEIS):

- The Doans Creek mitigation area is located along Doans Creek just north of the Crane NSWC and south of SR 58. Within the proposed mitigation area there were two Indiana bat secondary roost trees found south of Doans Creek. Opportunities for mitigation in this area are excellent due to the vast amount of forest in the adjacent Crane NSWC. This area has the potential to preserve existing core forest areas, which would serve as habitat for many interior forest bird species and the Indiana bat. If there are non-forested tracts in the area, additional core forest could be obtained through reforestation. In addition, preservation of existing core forest habitat will protect it from being impacted by others.
- The Plummer Creek mitigation site in Greene County includes unique geological features. In addition, a significant spring is located immediately to the south. This area would be an excellent opportunity for increasing summer and winter habitat for the Indiana bat and increasing wetlands along Black Ankle Creek that are fed by a spring. There are a number of springs in this area that can offer unique cool water habitat. Prior converted wetlands are common in the Plummer Creek bottoms and flooding is not unusual in this floodplain. A reproductive female Indiana bat was tracked to 2 secondary roost trees within this proposed mitigation site.
- The Indian Creek mitigation area is located east of SR 45 around the Breeden Road area. Forest mitigation may come in the form of protecting existing woods and the planting of additional upland and bottomland woods. An Indiana bat secondary roost site was found within this area. Trees may be planted to create additional core forest habitat for this area. There are also many karst features, which include 3 caves within this mitigation area.

It is important to note that mitigation for the Indiana bat is focused in the Summer Action Area and/or the Winter Action Area. Indiana bat summer habitat will be created and enhanced through wetland and forest mitigation focused on riparian corridors and existing forest blocks to provide habitat connectivity. The Plan noted that the mitigation sites identified in the Plan were conceptual, and that specific mitigation sites would be determined during or after Tier 2, and further noted that INDOT would acquire mitigation sites only from willing sellers at fair market value.

Subsequent mitigation planning for Section 4 has included the refinement of mitigation focus areas based on Indiana bat maternity colony areas, Indiana bat hibernacula, review of existing managed lands and existing habitat blocks which could be expanded and/or preserved. In consultation with the environmental resource agencies, these refined mitigation focus areas have been reviewed and landowner contacts made to identify willing sellers and determine specific



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parcels which could be acquired for mitigation purposes. The Tier 2 Section 4 BA includes mitigation information for Section 4. The BA identifies 36 possible mitigation sites for Section 4. Seven focus areas were targeted for the Section 4 mitigation: SR 57, Doan's Creek Maternity Colony, Plummer Creek Maternity Colony, Little Clifty Branch Maternity Colony, Indian Creek Maternity Colony Area, a cave known to be an important Indiana bat hibernaculum and Garrison Chapel Valley. Eleven parcels have been acquired for Section 4 mitigation, with an additional 25 parcels which are still in the acquisition phase. Details on the specific Section 4 sites are included in the Tier 2 Section 4 BA, in **Appendix JJ1**, *Redacted Section 4 Tier 2 Biological Assessment*, of this FEIS.

Forest Mitigation: Refined Preferred Alternative 2 impacts approximately 872.12 to 1,087.37 acres of upland forest. Upland forest will be mitigated at a 3:1 ratio (2:1 by purchase and protection of existing tracts and 1:1 by planting trees). A total of approximately 2,616 to 3,262 acres could be needed for mitigation. In the case of any forests in a floodway, a 2 to 1 replacement or 10 to 1 preservation ratio would apply.

In Section 4, the proposed forest mitigation sites are the same as those described above for wetland mitigation. Preference will be given to areas contiguous to large forested tracts that have recorded federal- and state-listed threatened and endangered species. Coordination with resource agencies will assure that these forest mitigation sites are strategically situated in biologically attractive ecosystems.

I-69 Community Planning Program: The I-69 Community Planning Program will set in place a regional strategy for providing resources to local communities to manage the growth and economic development associated with I-69. The program has provided grants for local communities (cities, towns, and counties) to prepare plans to manage potential new developments along with the I-69 corridor. Eligible communities in Section 4 are as follows: Greene and Monroe counties and the cities/towns of Linton, Bloomfield, Ellettsville and Bloomington.

On October 29, 2007, INDOT awarded \$950,000 in grants to communities located along the I-69 corridor in Southwest Indiana. Greene County, the town of Bloomfield, and the city of Linton together were awarded a grant for \$150,000. Monroe County and the city of Ellettsville together were awarded a grant for \$100,000. Using this grant, Greene County developed its Draft Comprehensive Plan on August 3, 2009. On February 1, 2008, Monroe County submitted an application for a \$50,000 grant. The grant was awarded to Monroe County in the second phase of the program on July 30, 2008, and this grant was used for the preparation of a transportation corridor plan for SR 37/I-69.

Geographic Information System (GIS): The GIS maps and databases developed during Tier 1 are being updated to include the more detailed data obtained during the Tier 2 studies. GIS maps and databases developed and compiled for use in the proposed I-69 planning will be made available to the public.

Update County Historic Surveys: As part of a Tier 1 commitment, FHWA and INDOT will provide funding and technical assistance to support a comprehensive effort to update the Interim



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Reports for Martin and Greene counties, and further development of GIS-based tools for identifying and recording archaeological sites.

Biological Surveys on Wildlife and Plants: During Tier 1 studies, formal and informal consultation with USFWS was conducted. Within the counties through which the alternatives traverse, there are two federally-listed endangered species—the Indiana bat and the fanshell mussel, and one federally-protected species—the bald eagle.¹² This consultation was concluded with the I-69 Tier 1 Biological Opinion, approved on December 3, 2003. It is provided in Appendix LL of the I-69 Tier 1 FEIS.

Formal consultation with USFWS has been reinitiated twice during Tier 2 studies. The first reinitiation occurred in 2006, as a result of additional information provided by Tier 2 bat surveys in 2004 and 2005. A Tier 1 Revised Biological Opinion (BO) was issued in August 2006. Current information shows no bald eagle nests within the corridor, and mussel surveys found no eastern fanshell mussels. Thus, there was no reinitiation of formal consultation on the bald eagle or eastern fanshell mussel.

This first re-initiation of formal consultation resulted in the preparation of an Addendum to the Tier 1 BA which was provided to the USFWS. The BA Addendum detailed information gathered on the Indiana bat during Tier 2 studies and after the original BO was issued. Upon completion of its review of the Addendum, USFWS submitted a revised Tier 1 BO, including an Incidental Take Statement, to FHWA and INDOT on August 24, 2006. In the revised Tier 1 BO, USFWS confirmed its original opinion that the I-69 project is “not likely to adversely affect the eastern fanshell mussels” (p. 37); and “is not likely to jeopardize the continued existence of either the Indiana bat or the bald eagle.” Regarding the Indiana bat, USFWS concluded “the proposed extension of I-69 from Evansville to Indianapolis will have greater impacts to Indiana bats than were originally considered,” but the project “is not likely to jeopardize the continued existence of the Indiana bat and is not likely to adversely modify the bat’s designated Critical Habitat.” In addition, a Tier 2 BA specific to Section 4 was submitted to USFWS on November 1, 2010.

Tier 1 consultation was re-initiated a second time in 2011. The identification of a new Indiana bat maternity colony in Section 4 and the reported confirmation of White Nose Syndrome within hibernacula in Indiana constitute new information that was not considered during the original Revised Tier 1 BO. USFWS amended the Revised Tier 1 BO on May 25, 2011.

Pursuant to the BO, INDOT is cooperating with USFWS, IDNR, and other agencies and organizations to complete the following: (1) biological surveys for rare and endangered species;

¹²Note: On July 9, 2007, the USFWS removed the bald eagle from the list of endangered and threatened species under the Endangered Species Act. Since that time; however, the bald eagle has been protected by the Bald Eagle and Golden Eagle Protection Act, 16 U.S.C. §§ 668-668d. On May 20, 2008, the USFWS issued regulations governing permits under the Bald and Golden Eagle Protection Act for the projects that obtained an incidental take permit under the ESA. 50 C.F.R. Part 22. On June 25, 2009, the USFWS issued INDOT and FHWA a permit under the Bald and Golden Eagle Protection Act for the I-69 Evansville to Indianapolis project based on the incidental take permit under the ESA. 50 C.F.R. Part 22. FHWA and INDOT will comply with the Bald and Golden Eagle Protection Act permit requirements established by FWS, which include the Terms and Conditions associated with the Incidental Take Statement.



(2) surveys of known Indiana bat hibernacula (i.e., caves); (3) funding of research for discovery of new hibernacula; (4) funding of research on autumn and spring habitat for the Indiana bat; (5) funding for captive-rearing research on mussels; and (6) funding for the writing and printing of informative pamphlets on bats, bald eagles, and mussels in Indiana. Field studies in Section 4 included generalized pedestrian surveys during project field work, harp and mist netting for Indiana bats with radiotelemetry and Anabat, bridge habitat surveys and cave fauna survey. Tier 2 studies related to the Indiana bat began in the summer of 2004 and continued through the winter of 2006. All survey results have been included as an Addendum to the previous Tier 1 BA. In addition, pre-construction mist netting was conducted for a portion of Section 4 in the summer of 2010. The results of this mist netting were included in a separate report which was provided to USFWS.FHWA and INDOT agreed to commitments and mitigation documented in the revised Tier 1 BO, which incorporates by reference the revised *Tier 1 Conceptual Forest and Wetlands Mitigation and Enhancement Plan* (see **Appendix S**). Proposed mitigation for the Indiana bat includes providing additional forested and wetland habitat for this species, purchasing Indiana bat hibernacula, and installation of bat friendly gates at hibernacula.

Conservation measures were jointly developed by the FHWA, INDOT, and USFWS during informal consultation and were subsequently incorporated into the Tier 1 BA and the Tier 1 BA Addendum as part of the official Proposed Action for the I-69 project. Since conservation measures are part of the Proposed Action, their implementation is required under the terms of the consultation. These measures were specifically designed to avoid and minimize impacts of the proposed action on Indiana bats and bald eagles and to further their recovery. Section 7.3.15 presents the conservation measures applicable to Section 4. Section 5.17, *Threatened and Endangered Species*, and **Appendix DD (Revised Tier 1 BO)** provide a history of the Section 7 consultation for this project, and the revised Tier 1 BO contains the complete list of conservation measures for the I-69 project as a whole.

Bridging of Floodplains: Within Section 4, floodplains are crossed at Black Ankle Creek, Dry Branch, Plummer Creek, Indian Creek, and an unnamed tributary to Clear Creek. Complete bridging is not proposed; however, the majority of these floodplains will be bridged. INDOT will work closely with IDNR to adequately study the impacts to floodplains during further development of the I-69 project. A final hydraulic design study that addresses various structure size alternatives will be completed during a future final design phase of I-69, and a summary of this will be included with the Field Check Plans and Design Summary.

Distance Learning: INDOT and FHWA have been involved and will continue to promote distance learning opportunities for students in Southwest Indiana.

Section 7.3, *Section 4 Mitigation Measures and Commitments*, provides specific proposed mitigation measures and commitments for each resource category in Section 4. In addition to the mitigation measures identified above, mitigation measures for the following categories of impacts are presented in that section:

- Land use, (see CSS and the I-69 Community Planning Program described above).



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- Social and Neighborhood, which includes providing for local access via access roads and overpasses; and assistance available to all residential relocates.
- Noise, which explains there were no noise barriers that meet the cost-effectiveness portion of the “reasonableness” criteria (\$30,000 per benefited receptor). Discusses other potential noise abatement measures and indicates that a final determination on noise abatement will be made during final design.
- Construction, which lists several measures to mitigate impacts including:
 - **Construction Plans** – Environmentally-sensitive locations will be clearly shown on construction plans and will not be permitted for use as staging areas, borrow, or wasted sites.
 - **Erosion Control** – Erosion control devices will be used to minimize sediment and debris from leaving the project site in runoff. If slopes exceed 2 to 1, they will include stabilization techniques. Soil bioengineering techniques for bank stabilization will be considered where situations allow.
 - **Groundwater and Karst** – Best Management Practices (BMP) will be implemented during construction to protect groundwater. Stormwater runoff protection measures will be installed at all karst features in the right-of-way at the initiation of construction and maintained until all stormwater drainage has been diverted away from the feature, or final permanent stormwater treatment measures are in place. Procedures to reduce the impacts to karst will be implemented in accordance with INDOT’s *Standard Specifications* and the 1993 Karst MOU between INDOT, IDNR, IDEM and USFWS. If active groundwater flow paths are discovered, measures will be taken to perpetuate the flow and protect water quality. If a Class V injection well is proposed, construction of such a well will be coordinated through the USEPA and will be authorized by rule or by permit. Any permit will be obtained prior to construction of the Class V well.
 - **Air Quality** – Construction equipment will be maintained. Fugitive dust will be controlled. All bituminous and Portland cement concrete proportioning plants and crushers will meet the requirements of the Indiana Department of Environmental Management (IDEM). Dust collectors must also be provided on all bituminous plants.
 - **Parking and Turning Areas** – Planning for heavy equipment parking and turning areas outside the construction limits but within the right-of-way for will minimize soil erosion and impacts to identified resources.
 - **Tree Clearing** – Tree and snag removal will be avoided or minimized. No trees with a diameter of three or more inches will be removed between April 1 and November 15 within the Winter Action Area and April 1 and September 30 within the Summer Action Area to avoid any direct take of Indiana bats.



- **Emerald Ash Borer** – INDOT will consult IDNR to determine appropriate measures during tree clearing to address concerns about the emerald ash borer.
- **Eastern Box Turtle** – INDOT and FHWA will continue to coordinate with IDNR with regard to potential impacts upon eastern box turtles.
- **Revegetation** – Revegetation of disturbed areas will occur in accordance with INDOT standard specifications. Revegetation of disturbed soils in the right-of-way and medians will utilize native grasses and native wildflowers as appropriate.
- **Spill Prevention/Containment** – Contractors will be required to provide an acceptable spill response plan. The Rule 5 permit that contractors must obtain will require that all have spill containment plans in their contract documents.
- **Heavy Blasting** – Heavy blasting is anticipated, and strict blasting specifications will be followed. All blasting in the Winter Action Area (WAA) will follow the specifications developed in consultation with the USFWS. Blasting within areas where dimension limestone will be in accordance with specifications developed in consultation with limestone industry representatives as well as the Indiana Geological Survey and other geology experts.
- **Maintenance of Traffic** – Coordination with local agencies, emergency responders and schools will be conducted to ensure that appropriate access is maintained during construction.
- **Construction Noise** – Construction noise abatement measures may be required in areas where residences or other sensitive noise receivers are subjected to excessive noise from highway operations.
- **Construction in a Floodway** – Construction in a Floodway permit(s) will be applied for before or during the design phase of this project.
- **Bridge Surveys for Bats**– The undersides of existing bridges that must be removed for construction of I-69 will be visually surveyed and/or netted to determine their use as night roosts by Indiana bats during the summer.
- **Memoranda of Understandings (MOUs)** – Construction will adhere to the Wetland MOU and the Karst MOU.
- **Borrow Sites/Waste Disposal** – BMPs will be used in the construction of this project to minimize impacts related to borrow and waste disposal activities. Contractors are required to follow safeguards established in INDOT’s *Standard Specifications* (Section 203.08 Borrow or Disposal) that include obtaining required permits.
- **Wetlands within the Right-of-Way** – Wetlands within the right-of-way that are not within the construction limits will be delineated and protected from construction impacts.

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- **Training of Construction and Maintenance Personnel** – All I-69 engineering supervisors, equipment operators, and other construction personnel and INDOT and/or other maintenance staff will attend a mandatory environmental Indiana bat awareness training.
- Historic and Archaeological Resources (See Section S.13.6, below).
- Visual Impacts, which could include vegetation screening, CSS, and use of nondiffuse lighting if lighting is needed. Any lights installed will be at least 40 feet above the highway in order to discourage collisions between bats and vehicles.
- Hazardous Materials Impacts, noting that appropriate cleanup of hazardous materials, if any, will be coordinated with appropriate agencies and property owners.
- Floodplain Impacts, (See Bridging of Floodplains, above).
- Wetland Impacts, (See Wetland Mitigation, above).
- Farmland Impacts, including minimization of severances and landlocked parcels where possible.
- Forest Impacts, (See Forest Mitigation, above).
- Water Body Modifications, including keeping tree clearing and snag removal to a minimum and limited to within calendar requirements and the construction limits, mitigating unavoidable stream impacts in coordination with permitting agencies (IDEM, IDNR, and USACE), using soil bioengineering techniques for bank stabilization where situations allow, placing culverts and other devices so they do not preclude the movement of fish and other aquatic organisms where situations allow, and using erosion control devices to minimize sediment and debris. Natural channel stream designs for perennial and larger intermittent stream relocation located within the Indiana bat maternity colony areas and the Winter Action Area may include stream designs that incorporate riffle/run/pool/glide or step/pool sequences and sinuosity to replicate natural channel geomorphology, and riparian buffer plantings outside the clear zone of the roadway.
- Ecosystem Impacts, including controlling invasive plants, coordinating with USFWS pursuant to the Migratory Bird Treaty Act of 1918, and providing wildlife corridors (See CSS, above).
- Water Quality Impacts, including crossing streams at their narrowest floodway width, developing stream mitigation plans where necessary, returning disturbed stream habitats to their original condition when possible, minimizing tree clearing and snag removal, avoiding wetlands as much as possible and following the 1991 Wetland MOU, following Best Management Practices (BMP) for erosion control, providing grass-lined ditches connected to filter strips and containment where appropriate, minimizing the amount of salt used for de-icing, and possible mitigation for a wellhead protection area that includes clay lined ditches



to help contain any possible spills, the restriction of borrow pits within the protection area, and the diversion of deicing chemicals and runoff from the protection area.

- Managed Lands, including the NRCS Conservation Reserve Program and the IDNR Classified Forest and Wildlands Program could include repayment to the resource agencies of amount associated with each cost-sharing agreement. These mitigation measures would apply only if the agreements are still in force.
- Threatened and Endangered Species (See the discussion of the Indiana bat in Biological Surveys on Wildlife and Plants, above). Conservation measures identified in the Tier 1 revised BO to address impacts to Indiana bats are listed in their entirety. Mitigation measures for the Indiana bat include restrictions on tree cutting between April 1 and September 30, adherence to the 1991 Wetland MOU, measures to avoid water quality contamination, summer habitat creation and enhancement, mitigation of forest impacts at ratios greater than those identified in the revised Tier 1 BO, and providing for educational opportunities to inform the public about the presence and protection of bats, particularly the Indiana bat.

Tracking of mitigation commitments and mitigation activities associated with each will be performed by INDOT within a GIS database. INDOT has coordinated with agencies to identify agency-specific information to be included in the database. INDOT will provide to permitting agencies and USEPA a tracking summary on an annual basis. The summary will identify the mitigation commitments and describe the status of the activities-to-date associated with each commitment.

S.12 Section 4 Project Development

INDOT intends to begin construction in Section 4 as soon as possible after the issuance of a ROD. INDOT has selected a design firm for Section 4 and early design activities have begun. Field surveys and utility coordination have begun. Title research and right-of-way engineering have started for land acquisition activities. These activities, and other land acquisition activities, are proceeding with the use of state funds only. Right-of-way acquisitions made prior to a Tier 2 ROD may be credited toward the State's share of project costs pursuant to FHWA regulations. In addition, federal funds may be used for property acquisition to the extent that such acquisitions meet the conditions for a hardship or protective acquisition, as defined in applicable FHWA regulations. The FHWA has made no commitment to issue a ROD for any alternative or to fund any alternative. These activities are necessary to facilitate the development of mitigation measures and concurrent compliance with other environmental laws. The comparison of alternatives will be done in a fair and balanced manner such that the greater design detail will not prejudice the consideration of other alternatives. The final decision on the specific alignment of the highway and its related design elements such as frontage roads and access roads will not be affected by the early acquisition of these properties. State ownership of property will not be used to "pre-determine" the location of the highway. These acquisitions are considered "at risk". If it is determined that the property is not necessary for the construction of the approved project or committed mitigation, the state will not be able to claim any credit towards the project for that acquisition.



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Preliminary plans that could be used for identification of needed right-of-way and design-build projects are being developed to refine impact identification and complete applicable permits. Design for Section 4 has begun with construction contracts to be let in late 2011. See **Appendix LL**, *Year of Expenditure Costs*, for a year of construction cost estimate and Section 6.4.3 for right-of-way acquisition and design status.

S.13 Regulatory Actions Associated with this Project

Coordination with all appropriate state and federal regulatory agencies occurred throughout the Tier 1 process and has continued in Tier 2. Major regulatory requirements applicable to this project include permitting under Section 404 of the Clean Water Act (CWA), which requires permits for discharges into wetlands or other waters of the United States; water quality certification under Section 401 of the CWA; permitting of construction in a floodway under Indiana Flood Control Act; National Pollutant Discharge Elimination System (NPDES) permitting for point source storm water discharges under the CWA; permitting under Rule 5 of Indiana State Regulations regarding erosion and sediment control; consultation regarding historic and archaeological resources under Section 106 of the National Historic Preservation Act; consultation regarding threatened and endangered species under Section 7 of the Endangered Species Act (ESA); certification of conformity under the Clean Air Act (CAA); and USEPA Class V Injection Well Permit for permit approval. Actions taken or committed to be taken to comply with these requirements are summarized below.

S.13.1 Section 404 Permits

Projects involving excavation in or discharges of material into waters of the United States, or within jurisdictional wetlands require a Permit, or a letter of permission from the U.S. Army Corps of Engineers (USACE), prior to the commencement of construction. As part of the Tier 1 process FHWA and INDOT consulted with the USACE and reached an agreement on the approach to be used to obtain permits during the Tier 2 process. As part of the Tier 2 studies, streams and potential wetlands within the project area were assessed. The assessment identified the streams and wetland areas within the project area that would be subject to USACE permitting jurisdiction. Each alternative being considered has different degrees of impact on the streams and wetlands. Section 404 permit applications require specific location and design details for each place a permit is required. Once the process has reached the stage where sufficient design information is available for the selected alternative, the applications for Section 404 permits will be submitted to the USACE.

At the same time as this FEIS was being finalized for publication, coordination was initiated with the USACE to make a Jurisdictional Determination for waters of the United States that will be regulated under Section 404 of the CWA. USACE has not issued its jurisdictional determinations that will take into account all aquatic resources (including wetlands, streams and ditches) subject to Section 404 jurisdiction. The nature of the Section 404 permits (whether individual, nationwide, or general) requires USACE to make a jurisdictional determination on all wetland and stream impacts prior to the permit application. A Waters of the United States Jurisdictional Determination Report will be prepared for each individual section of I-69 and submitted to USACE prior to the submittal of the permit applications. USEPA will review and



has the authority to make the final decision on the Federal jurisdictional determinations as part of its responsibility in jointly administering Section 404 of the Clean Water Act.

S.13.2 Section 401 Water Quality Certification

In addition to a Section 404 Permit, any activity involving dredging, excavation, or filling within waters of the United States requires a Section 401 Water Quality Certification from the Indiana Department of Environmental Management (IDEM). This certification is based on IDEM's review of applications for Section 404 USACE permits for compliance with state water quality standards. Section 401 Water Quality Certifications must be obtained prior to issuance of the Section 404 permit.

S.13.3 Construction within a Floodway Permit

Indiana's Flood Control Act requires that any person proposing to construct a structure, place fill, or excavate material at a site located within the floodway of any river or stream must obtain the written approval of the Indiana Department of Natural Resources (IDNR) prior to initiating the activity. Since its enactment, the scope of IDNR's analysis has been expanded to protect Indiana's natural resources located in the floodway. Construction in a Floodway permit(s) would be applied for before or during the design phase of this project.

S.13.4 National Pollution Discharge Elimination (NPDES) Permit

The NPDES permit program regulates point sources that discharge pollutants into waters of the United States. Point sources are discrete conveyances such as pipes or man-made ditches. Owners of facilities which have discrete separate stormwater discharges directly to surface waters, must obtain NPDES Permits under 327 IAC 15-13 (Rule 13). INDOT, similarly, is required to permit discrete separate stormwater discharges under 327 IAC 5-4-6. While the INDOT permit requirements and process have not yet been finalized by IDEM, this project may require permitting under this process.

S.13.5 Rule 5 Erosion Control

Rule 5 is a state regulation (327 IAC 15-5) to control erosion resulting from construction activity that results in the disturbance of one acre or more of total land area. Compliance with Rule 5 requires the development of an erosion control plan and application for a permit from the Indiana Department of Environmental Management (IDEM).

An erosion control plan will be developed during the design phase. This plan will be submitted for review to IDEM. Once the plan is approved, it will be incorporated into the design plans and included in the contract documents. INDOT will also submit a Notice of Intent to IDEM for review and to obtain a permit.



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S.13.6 Section 106 – Historic and Archaeological Resources

During the Tier 1 process FHWA and INDOT consulted with the Indiana State Historic Preservation Office (SHPO)¹³ and other consulting parties and developed a Memorandum of Agreement (MOA) that defined the mitigation measures and other actions that would be examined during the Section 106 consultation process in Tier 2. The Tier 2 process has continued the consultation with the SHPO and consulting parties to refine the Area of Potential Effects (APE) defined in Tier 1, identify potential resources within the area and define the scope of the field investigations that would be required.

As part of the Tier 2 study for Section 4, a literature search and field survey of the standing structures within the APE was conducted to determine if there were any properties or districts currently listed or eligible for listing in the National Register of Historic Places (NRHP). Based on the survey and evaluation, FHWA determined that eleven aboveground resources in Section 4 are listed in, or determined eligible to be listed in the NRHP. No above-ground historic properties are adversely affected by the preferred alternative.

For Tier 2 a phased approach to investigating archaeological resources was developed. The phased approach included research of existing records and literature to identify known and potential resources in the area. The literature review and research phase has been completed. The research phase is to be followed by a Phase Ia above ground survey and visual inspection to locate potential resources within the area of the preferred alternative. If warranted, further field investigations will be conducted to identify whether NRHP-eligible archaeological resources may be located within the project area.

The final results of the Phase Ia survey and other required surveys are included in this FEIS. Commitments to mitigate adverse impacts to archaeological resources that are determined eligible for the NRHP as a result of the project have been developed in a Memorandum of Agreement (MOA). Any further required investigations (such as Phase Ic surveys) are documented in the MOA for Section 4. All information described in this paragraph may be found in **Appendix N, Section 106 Documentation**.

S.13.7 Section 7 – Threatened and Endangered Species

Federally-listed species are protected under Section 7 of the Endangered Species Act (ESA). During the Tier 1 process the FHWA and INDOT consulted with the USFWS regarding the project's potential impacts on federally-listed threatened and endangered species. In July 2003 FHWA and INDOT submitted a Biological Assessment (BA) that examined the impact of the project on the Indiana bat, the bald eagle and the eastern fanshell mussel. The USFWS reviewed the BA and issued a Tier 1 Biological Opinion in December 2003, which determined that the project would not adversely impact the mussel and is not likely to jeopardize the continued existence of the Indiana bat or bald eagle. The Tier 1 BO also included conservation measures,

¹³ For the State of Indiana, the Director of the Department of Natural Resources (IDNR) has been designated as the SHPO. Members or his or her staff in the Division of Historic Preservation and Archaeology (DHPA) typically are involved in Section 106 consultation.



an incidental take statement covering both the Indiana bat and the bald eagle, and specified the procedures to be followed in Tier 2.

The consultation process has continued in Tier 2 and further studies have included pedestrian transect surveys and mist netting for Indiana bats. The mist netting confirmed the potential habitat of Indiana bats near the Section 4 study area, though no roost trees were found within the project corridor. The USFWS issued a Revised Tier 1 BO for the entire I-69 Evansville to Indianapolis project (all six sections) on August 24, 2006. Following the issuance of the DEIS, a Tier 2 BA for Section 4 on the preferred alternative was provided to USFWS in November, 2010. USFWS issued a Tier 2 BO for Section 4 on July 6, 2011.

On June 28, 2007, the Secretary of the Interior announced that the bald eagle would be removed from the endangered species list. In the announcement the Secretary noted that the bald eagle would continue to be protected by the Bald and Golden Eagle Protection Act and the Migratory Bird Treaty Act. Both of these federal laws prohibit the “taking” of bald eagles. In guidance issued in June 2007 the Department of the Interior stated that the Fish and Wildlife Service would honor existing Endangered Species Act authorizations in place before the effective date of the delisting. The guidance indicates that the Fish and Wildlife Service does not intend to seek prosecution of a “take” of any bald eagle under either the Migratory Bird Treaty Act or the Bald and Golden Eagle Protection Act, if the “take” is in full compliance with the terms and conditions of an incidental take statement issued to the action agency. FHWA and INDOT intend to comply fully with the terms and conditions imposed by the incidental take statement that is included in the August 24, 2006, Revised Tier 1 BO, as it proceeds with this project. In addition, FHWA and INDOT will comply, as appropriate, with future Bald and Golden Eagle Act permitting requirements established by the Fish and Wildlife Service.

S.13.8 Clean Air Act Compliance

Conformity Requirements: Under the Clean Air Act, USEPA set forth NAAQS for six principal pollutants—PM, sulfur dioxide (SO₂), CO, ozone, oxides of nitrogen (NO_x), and lead. Generally, when levels of pollutants do not exceed the annual average standards and do not exceed the short-term standards more than once per year, an area is considered in attainment of the NAAQS. An area that does not meet the NAAQS for one or more pollutants will be designated by the USEPA as a “nonattainment area.” An area that was formerly in nonattainment and now meets the NAAQS is known as a “maintenance area” for a period of 20 years after coming into attainment. Under the CAA, each state is required to establish a plan for achieving the NAAQS in nonattainment areas and maintaining the NAAQS in maintenance areas. This plan is known as the State Implementation Plan (SIP).

Greene County has been designated a maintenance area for the 8-hour ozone standard. The county is currently in attainment of the standard and is under an approved maintenance plan. Section 176 of the CAA prohibits federal agencies from approving, funding, or supporting in any way actions in nonattainment or maintenance areas unless the federal agency determines that the action “conforms” to the applicable SIP for that area. The requirements for project-level conformity apply to federal transportation projects. At the regional level a project must be



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included in a regional emission analysis which demonstrates that future emissions from the transportation system are below the SIP budget for any pollutants contributing to the designation of an area as nonattainment or maintenance for NAAQS. At the project level CO and/or PM (for projects of air quality concern) “hot spot” analyses are required to demonstrate that emission concentrations adjacent to the new roadway are below the USEPA health standard if the project falls in a nonattainment or maintenance area for CO and/or PM. Since Greene County has been designated an 8-hour Ozone Maintenance Area, a regional-level conformity analysis must demonstrate that emissions with the I-69 Section 4 project are below the SIP budgets for volatile organic compounds (VOCs) and NO_x, which are the major precursors to ozone. Since Greene County is attainment for CO and PM, project-level “hot spot” analyses are not required for a transportation conformity determination for the proposed project in Section 4. Nevertheless, a CO “hot spot” was performed for information purposes to demonstrate that there are no local air quality impacts associated with CO.

Given that there is no Metropolitan Planning Organization (MPO) associated with Greene County, the regional conformity demonstration must be made in conjunction with FHWA's project approval (I-69 Section 4 EIS/ROD). A joint FHWA/Federal Transit Administration (FTA) policy memorandum of May 20, 2003, provides guidance concerning air quality conformity requirements for projects in nonattainment or maintenance areas requiring Environmental Impacts Statements (EIS). For a copy of this memorandum, see **Appendix L**, *USDOT Air Quality Guidance*. The memorandum states that, in general, any required conformity determination should be made by the time of the FEIS, but in any event, “the conformity determination must be made prior to the issuance of the Record of Decision (ROD).” Therefore, the conformity requirements for Section 4 must be completed before the Tier 2 ROD for Section 4 can be signed. A conformity demonstration for Greene County, Indiana’s 8-hour ozone maintenance area for the I-69 Tier 2 Section 4 Final Environmental Impact Statement (FEIS) was completed in December 2010. The conformity demonstration found that the I-69 Section 4 Tier 2 FEIS demonstrates conformity to the State Implementation Plan budgets as required by the conformity rule. FHWA, IDEM and the US EPA completed their reviews and found that the analyses and documentation meet the criteria outlined in the conformity rule. For more details regarding the analysis and FHWA, IDEM and the USEPA comments see **Appendix MM**, *Greene County Air Conformity*.

Mobile Source Air Toxics (MSATs): This FEIS includes a qualitative analysis of the likely MSAT emission impacts of this project. However, available technical tools do not enable prediction of the project-specific health impacts of the emission changes associated with the alternatives in this FEIS. Due to these limitations, the following information¹⁴ is included in accordance with Council on Environmental Quality (CEQ) regulations (40 CFR 1502.22(b)) regarding incomplete or unavailable information.

Because there are no established criteria for determining when MSAT emissions should be considered a significant issue in the NEPA context, the FHWA recommends a qualitative analysis of emissions to compare or differentiate among proposed project alternatives.

¹⁴ The source of the text is FHWA’s Memorandum, September 30, 2009: *Interim Guidance on Mobile Air Toxic Analysis in NEPA Documents*, Appendix C.



Regional and localized increases in MSAT emissions in Greene County, Martin County, Monroe County, and the Total 5-County region plus localized increases in MSAT emissions would be expected for the Build Alternative versus the No-Build Condition because of the projected increase in VMT in the future. However, MSAT emissions are projected to decrease substantially in the future as a result of new USEPA programs to reduce MSAT emissions nationwide. As a result, the I-69 Section 4 project is expected to result in low potential MSAT effects. Additionally, the I-69 Section 4 corridor is situated in a rural setting (the closest communities to the Preferred Alternative are the unincorporated communities of Scotland and Hobbieville, which are about one-half mile away), which would tend to lessen any impact from MSAT emissions.

Carbon Monoxide (CO): For the Tier 2 study, a CO hot-spot analysis comparing existing, future build, and future no-build conditions was performed for the interchange carrying the highest predicted traffic volume in the corridor and which also includes a proposed traffic signal or stop controlled intersection on a ramp junction (worst case scenario). The results of the Existing Condition analysis indicate that the highest predicted 1-hour concentration of CO is 4.8 ppm, while the highest 8-hour concentration is 3.2 ppm.

The results of the Future No-Build Condition analysis indicate that the highest predicted 1-hour concentration is 2.6 ppm, while the highest 8-hour concentration is 1.6 ppm. These concentrations occur at receptor Site 17 located at the mixing zone boundary (10 feet from the edge of pavement along the east side of SR 445 north of the intersection). When compared to the Existing Condition, the predicted 1-hour and 8-hour CO concentrations for the Future No-Build Condition are decreased at all receptor sites.

The results of the Build Alternative analysis indicate that the highest 1-hour concentration is 2.2 ppm, while the highest 8-hour concentration is 1.3 ppm. These concentrations occur at receptor Site 12. When compared to the Existing Condition, the 1-hour and 8-hour CO concentrations for the Build Alternative are predicted to decrease at all receptor sites. When compared to the Future No-Build Condition, the 1-hour and 8-hour CO concentrations for the Build Alternative are the same at almost all receptor sites. For those receptors where minor differences occur, all concentrations are within 0.3 ppm of the other scenario.

The maximum 1-hour CO concentration for the Interim SR 37 Build Alternative is 2.3 ppm, while the highest 8-hour concentration is 1.4 ppm. These concentrations occur at receptor Site 2, located just beyond the proposed southbound right-of-way limits. None of the CO values pertaining to I-69, either now or in 2020 exceeds the ambient air quality standards mandated by USEPA.

The results of a project level CO hotspot analysis, for all of the I-69 Section 4 DEIS alternatives, indicate no violation of CO NAAQS.

PM_{2.5}: FHWA and USEPA issued Transportation Conformity Guidance for Qualitative Hot-spot Analysis for PM_{2.5} and PM₁₀ on March 29, 2006. Qualitative PM_{2.5} assessments are required

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for projects of air quality concern only within a PM_{2.5} nonattainment area. All of the Section 4 study area is in attainment for PM_{2.5} so hot-spot analysis is not required.

S.13.9 Class V Injection Well Permit

Class V injection well permits may be required for various types of projects. For example such a permit could be required by EPA Region 5 if a Class V injection well is located within the karst region of the state, a sole source aquifer area, a state designated source water protection area for a public water supply, or anywhere untreated fluids discharged through a Class V well may otherwise endanger an underground source of drinking water. If there are measures in place to prevent contamination of groundwater, a Class V well could be authorized by rule rather than by a permit. A Class V Well Inventory Form would need to be provided to EPA Region 5 prior to construction of a Class V injection well so that EPA could determine if a Class V injection well permit will be required for any Class V wells. For the I-69 project, if the inventory information provided indicates that any injection well would likely contaminate any underground source of drinking water, a permit would be required. Any permit would need to be applied for and obtained prior to construction of the Class V well.

S.14 Remaining Steps – Tier 2 Process

Following issuance of this FEIS, the following steps will be undertaken to complete the Tier 2 NEPA process in Section 4.

S.14.1 FEIS Availability

The FEIS has been distributed according to federal regulations and made available for public review at the project website (www.i69indyevn.org) and the following locations:

- INDOT Central Office, Indiana Government Center North, Indianapolis, Indiana
- INDOT Transportation District Office, Vincennes, Indiana
- INDOT Transportation District Office, Seymour, Indiana
- I-69 Section 2/Section 3 Project Office, Washington, Indiana
- I-69 Section 4/Section 5 Project Office, Bloomington, Indiana
- I-69 Section 6 Project Office, Indianapolis, Indiana
- Bloomfield-Eastern Greene County Public Library, Eastern Branch (Cincinnati Area), Bloomfield, Indiana
- Monroe County Public Library, Bloomington, Indiana
- Herman B. Wells Library, Indiana University, Bloomington, Indiana

S.14.2 Record of Decision (ROD)

No sooner than 30 days after publication of the Notice of Availability of this FEIS in the Federal Register, FHWA intends to issue a Tier 2 ROD for Section 4. The ROD will document the decision reached by FHWA at the conclusion of the Tier 2 NEPA process in Section 4. It is anticipated that the Tier 2 ROD will approve Refined Preferred Alternative 2 for Section 4 of I-69 from Evansville to Indianapolis. Issuance of the Tier 2 ROD will allow FHWA and INDOT



to proceed with federally-funded final design and land purchases, and will allow INDOT to proceed with construction in Section 4 of I-69 once all necessary permits have been obtained.

S.15 Glossary of Key Terms

A number of key terms used in this summary are defined here. A more comprehensive glossary can be found in Chapter 13, along with a list of acronyms and an index.

Alternatives – Possible routes for I-69. In the Tier 1 study, alternative corridors were evaluated, and Alternative 3C was selected as the preferred alternative. In Tier 2, alternative roadway alignments are being studied within each of the six sections of the Alternative 3C corridor. Section 4's four alternatives were identified for detailed analysis. They extended from US 231 near Scotland in Greene County, Indiana, to SR 37 south of Bloomington in Monroe County, Indiana.

Archaeological Research – Indiana guidelines define the phases of archaeological research as follows:

- **Phase Ia** includes background research and limited field reconnaissance to assess **potential** for cultural resources within a project area. The reconnaissance consists of a surface survey and visual inspection of the soil when ground surface visibility and survey conditions are adequate; or, when ground surface and survey conditions are not adequate, the use of shovel probes, cores, and/or augering techniques to discover site evidence at or near the surface of the site.
- **Phase Ib** is an intensive survey with the use of controlled surface collections, piece plotting, or subsurface sampling.
- **Phase Ic** is subsurface reconnaissance to locate archaeological sites buried in alluvial (sediment deposited by flowing water), colluvial (loose deposit of rock debris), or eolian (wind-borne) landforms.
- **Phase 2** testing is conducted for sites identified through Phase I investigations that are potentially eligible for the National Register of Historic Places. Sites are tested to determine the vertical extent of the site, the presence of subsurface cultural features (i.e. hearths, trash/storage pits, living surfaces), the nature and context of deposits, and extent of disturbance, if any. Field research is conducted through the controlled excavation of test units (usually measuring between 1x1 m to 2x2 m). Testing also may involve the stripping of top soil in areas to identify cultural features. Sites determined eligible for NHRP listing are recommended for avoidance and/or mitigation.
- **Phase 3** archaeological projects are designed to mitigate or recover data from significant archaeological sites that cannot be avoided. These projects involve large-scale excavations and recovery efforts to mitigate adverse effects on a site. Mitigation plans are developed to



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determine the methodology and research design for the project.

Biological Assessment (BA) – Information prepared by, or under the direction of, a federal agency to determine whether a proposed action is likely to: (1) adversely affect listed species or designated critical habitat; (2) jeopardize the continued existence of species that are proposed for listing; or (3) adversely modify proposed critical habitat. Biological assessments must be prepared for major construction activities. The outcome of the biological assessment determines whether *formal consultation* or a *conference* with appropriate regulatory agency (i.e., USFWS or the National Marine Fisheries Service) is necessary.

Biological Opinion (BO) – A document that includes: (1) the opinion of USFWS or the National Marine Fisheries Service as to whether or not a federal action is likely to jeopardize the continued existence of listed species, or result in the destruction or adverse modification of designated critical habitat; (2) a summary of the information on which the opinion is based; (3) a detailed discussion of the effects of the action on listed species or designated critical habitat; and (4) the terms and conditions (mitigation requirements) associated with the incidental take statement.

Community Advisory Committee (CAC) – A committee developed to facilitate communication between project team members and representatives of potentially impacted and key constituent groups in the project area. Through a series of meetings, committee members learned details of the project and provided feedback on such subjects as community access, local needs, and development of alternatives.

Core Goal – In Tier 1, certain project goals were identified as *core* goals. A Tier 1 project goal was identified as a *core goal* based upon consideration of the policy/legislative framework as well as the transportation and economic development needs assessment. A substantial improvement for each core goal was expected for the selected Tier 1 alternative. In Tier 2 studies, there is no designation of core goals.

Direct Impacts – Are defined by the CEQ Requirements as “effects that are caused by the action and occur at the same time and place” (CEQ Regulations). For this project, an example of a direct impact would be the taking of a wetland for right-of-way for an interchange.

Environmental Impact Statement (EIS) – A detailed document prepared as part of the NEPA process. A draft EIS (DEIS) is published to seek agency and public input. A final EIS (FEIS) adds (1) the comments and responses to the DEIS and (2) selects a preferred alternative.

Flood Easement - Flood easements may be acquired in some areas where the I-69 and new local access road bridge designs result in increased backwater exceeding 0.14 feet during the regulatory flood (the allowable limit identified in the Flood Control Act – IC 14-28). All bridge designs will comply with FHWA approved design standards, which allow a maximum backwater increase of 1.0 foot during the regulatory flood.

Floodplain – Mostly level land along rivers and streams that may be submerged by floodwater. A 100-year floodplain is an area that can be expected to flood once in every 100 years.



Forecast Year – A year that is 20 years into the future for which traffic forecasts are made. The design of any transportation facility must accommodate travel that would occur in the forecast year. For this study, the Forecast Year is 2030.

Geographic Information System (GIS) – A computer representation of data that is geographically distributed. These data can be generated and displayed to show their physical location. Each data set with a certain type of information (e.g., the location of wetlands) constitutes a “layer” in the GIS. GIS layers can be superimposed to show the relationship between the locations of different items.

Grade Separation – Overpass or underpass.

Historic Properties – Buildings, structures, sites, objects, or districts, which are an important part of the historical and cultural heritage of the United States and are on or eligible for the National Register of Historic Places (NRHP).

Horizontal Alignment – Location of the road as it can be moved from side to side, usually done by using curves.

Interchange – A grade-separated crossing with entrance and exit ramps to allow access to and from the route crossed.

Karst – Landscapes characterized by caves, sinkholes, underground streams, and other features formed by slow dissolution, rather than mechanical erosion, of bedrock. Karst areas can be especially sensitive to groundwater pollution.

Metropolitan Planning Organization (MPO) – The forum for cooperative transportation decision-making for a metropolitan area. Title 23 USC Section 134 requires that (1) a MPO be designated for each Urbanized Area (UZA) containing 50,000 or more persons based on the latest US Census, and (2) the metropolitan area has a continuing, cooperative and comprehensive transportation planning process.

Mitigation – In the context of the NEPA process, CEQ regulations define mitigation as: avoiding the impact altogether by not taking a certain action or parts of an action; minimizing impacts by limiting the degree or magnitude of the action and its implementation; rectifying the impact by repairing, rehabilitating, or restoring the affected environment; reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action; compensating for the impact by replacing or providing substitute resources or environments. The mitigation of impacts must be considered whether or not the impacts are significant.

National Environmental Policy Act (NEPA) – Legislation passed by Congress in 1969 that requires preparation of an environmental impact statement (EIS) for federal actions that may significantly impact the environment.

Performance Measure – A rating (typically numerical) that assesses the degree to which an alternative satisfies a project goal.



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Public Hearing – INDOT holds public hearings for all transportation projects that involve the development of an Environmental Impact Statement (EIS) under the National Environmental Policy Act (NEPA). A public hearing, which is held following the approval of the draft environmental document, is an opportunity for the public to make formal statements of position immediately before project decision-making and preparation of the final environmental document. The disposition of both oral and written comments is included in the final approved NEPA document that constitutes FHWA location approval.

Public Meetings – Public meetings, held as needed during the development of the NEPA document, provide additional opportunities for early and continuing public involvement. The disposition of comments made during a public meeting is not required to be included in the environmental document.

Purpose and Need – The section of an environmental project that discusses the needs and defines the goals (purposes) of the project.

Quantm – A computer-aided engineering alignment tool used to help generate alternatives within the selected I-69 corridor.

Record of Decision (ROD) – A NEPA requirement for an EIS, which explains the reasons for the project decision and summarizes any mitigation measures that will be incorporated in the project.

Relocation – The purchase of private property (land and/or structures) for a public purpose, such as a transportation facility. The purchase price includes the costs of relocating residents or businesses. Also referred to as a displacement.

Scoping – The initial step of an environmental study. It includes the determination of a range of possible alternatives and analysis of Purpose and Need for the project.

Screening – The second step of an environmental study. It applies Purpose and Need criteria to all alternatives to arrive at a set of alternatives for detailed study.

Section 7 Consultation – Section 7 of the Endangered Species Act of 1973 requires federal agencies to consult with the USFWS on all federal actions that may affect a federally-listed species to ensure that their actions do not jeopardize listed species or destroy or adversely modify critical habitat.

Section 106 Consultation – Consultation between a federal agency and interested parties, including the State Historic Preservation Officer, regarding potential impacts of a federal action on historic sites and mitigation measures to reduce impacts. This consultation and review process is required by Section 106 of the National Historic Preservation Act of 1968.

Section 404 – Section 404 of the Clean Water Act establishes a program to regulate the discharge of dredged and fill material into “waters of the United States,” including wetlands. Activities in “waters of the United States” that are regulated under this program include fills for



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development, water resource projects (such as dams and levees), infrastructure development (such as highways and airports), and conversion of wetlands to uplands for farming and forestry.

State Historic Preservation Officer (SHPO) – Administers the National Historic Preservation Program at the state level, reviews National Register of Historic Places nominations, maintains data on historic properties that have been identified but not yet nominated, and consults with federal agencies during the Section 106 process.

Tiering – A two-step process applied to NEPA evaluations where the first step (tier) focuses on broad issues such as general location, mode, choice and area-wide air quality and land use implications of the major alternatives. The second step (tier) addresses site-specific details on project impacts, costs, and mitigation measures.

Tier 1 EIS – An EIS that may be completed for large studies that require certain major questions to be answered before a more detailed study (Tier 2 EIS) can be done.

Tier 2 NEPA Studies – More detailed NEPA studies completed after the Tier 1 EIS has been done.

Tier 2 Sections – Shorter sections of the alternative that are selected in the Tier 1 ROD. Each Tier 2 Section is evaluated in a separate NEPA study.

Travel Demand Model – A computerized representation of the population, employment, socioeconomic characteristics, and transportation network of a region. Travel on the transportation network is forecasted as a function of population, employment, and socioeconomic characteristics. If proposed projects (such as an alternative of I-69) can be added to the transportation network, the model can forecast the effects of that proposed project.

Wetland – A type of land protected by various state and federal laws. Wetlands are characterized by plants adapted to a wet environment, soils which are characterized by anaerobic conditions, and which are inundated or saturated to the surface for at least 5% of the growing season in most years.



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Figure S-1: Tier 1 Route Concepts

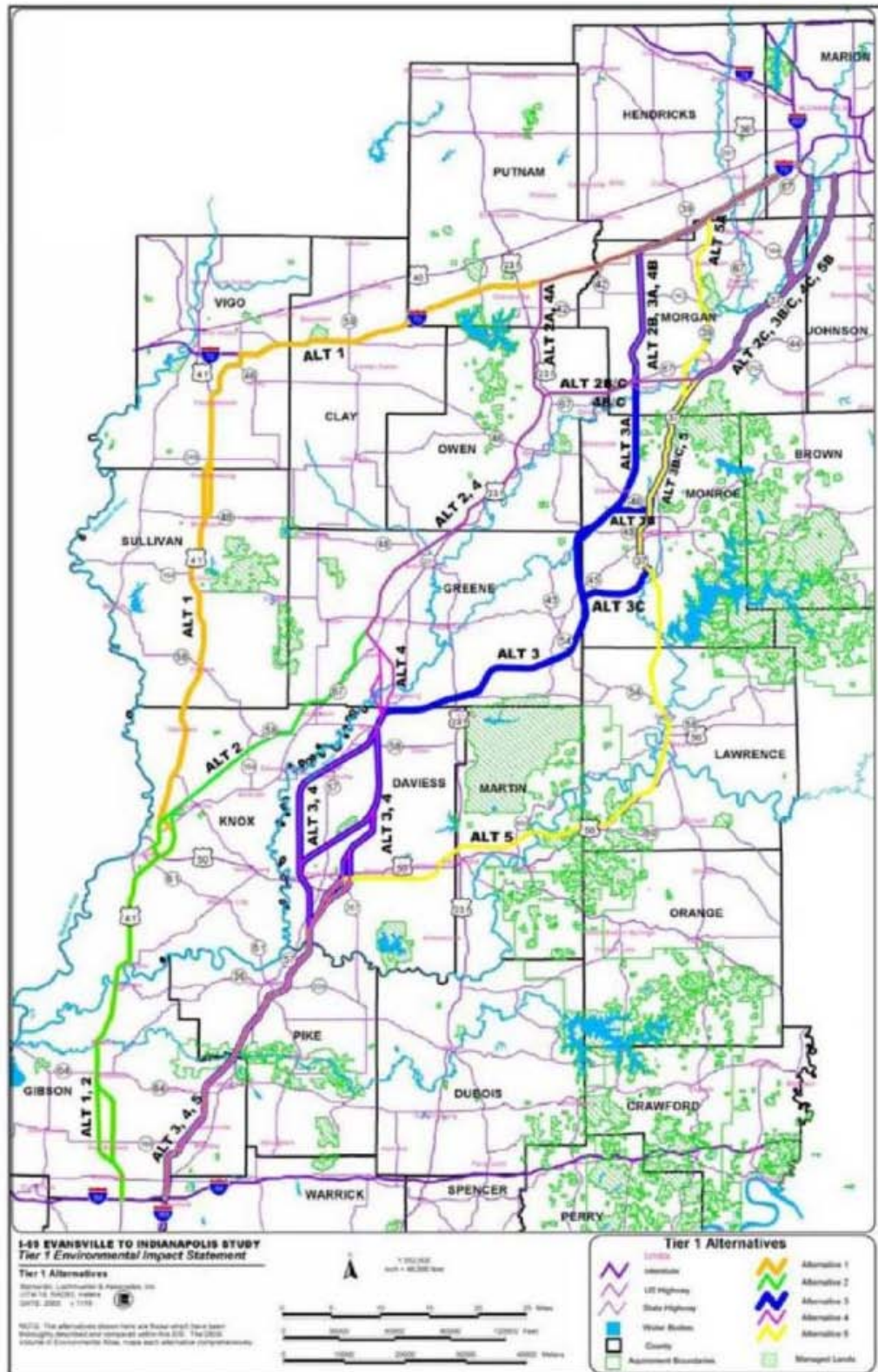


Figure S-2: Alternatives Carried Forward for Detailed Study



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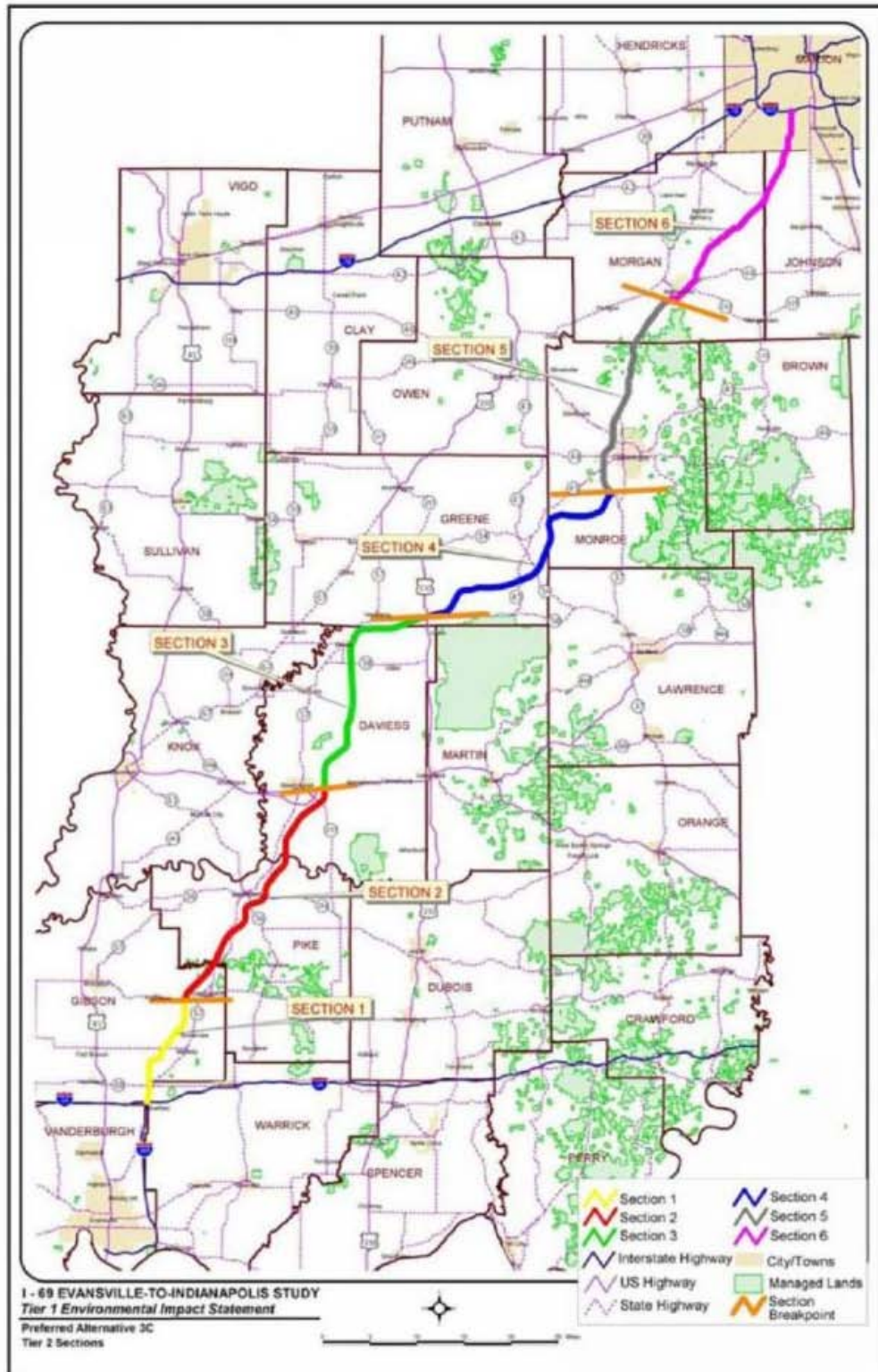


Figure S-3: Tier 1 Preferred Alternative Showing Tier 2 Sections

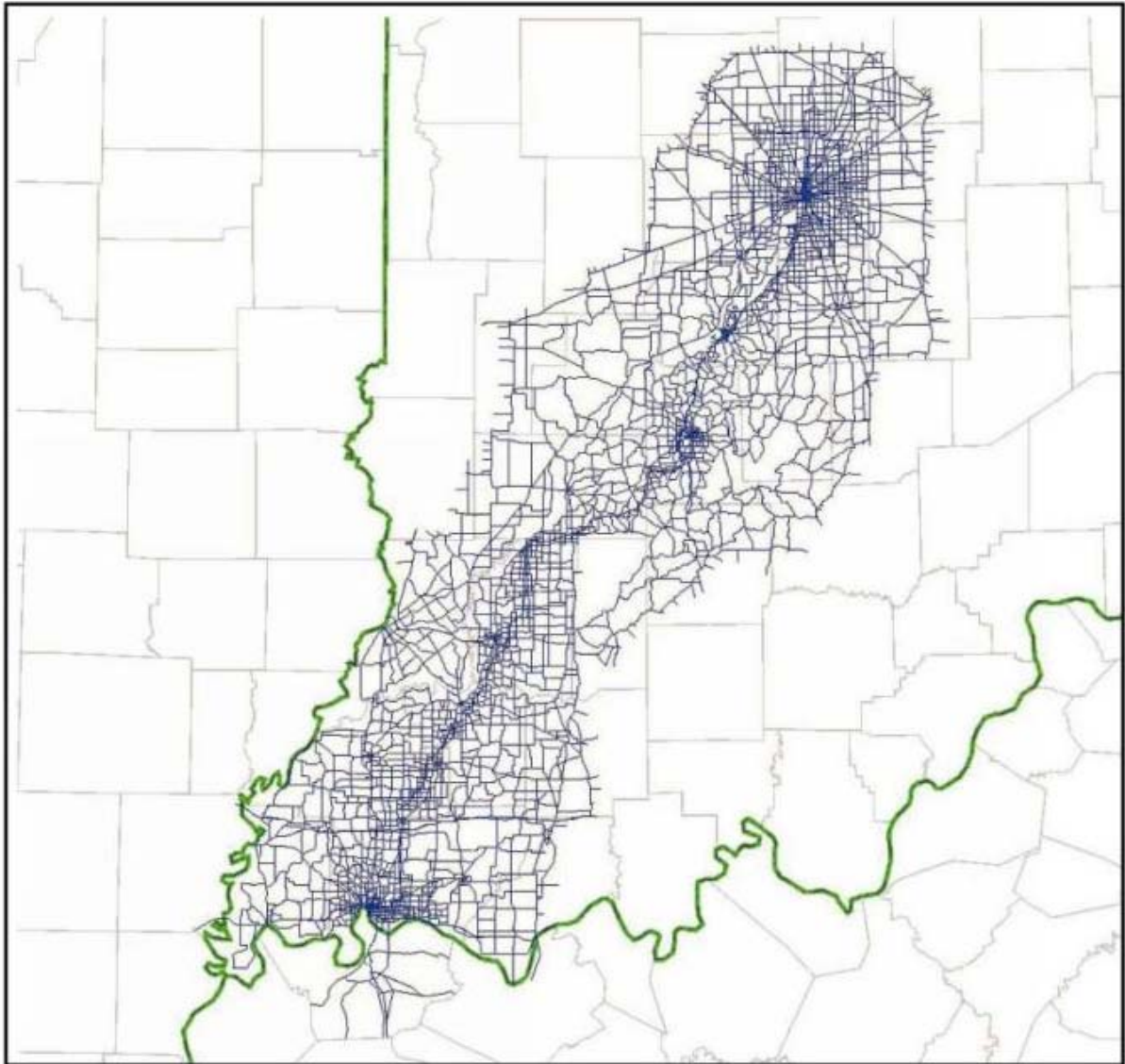
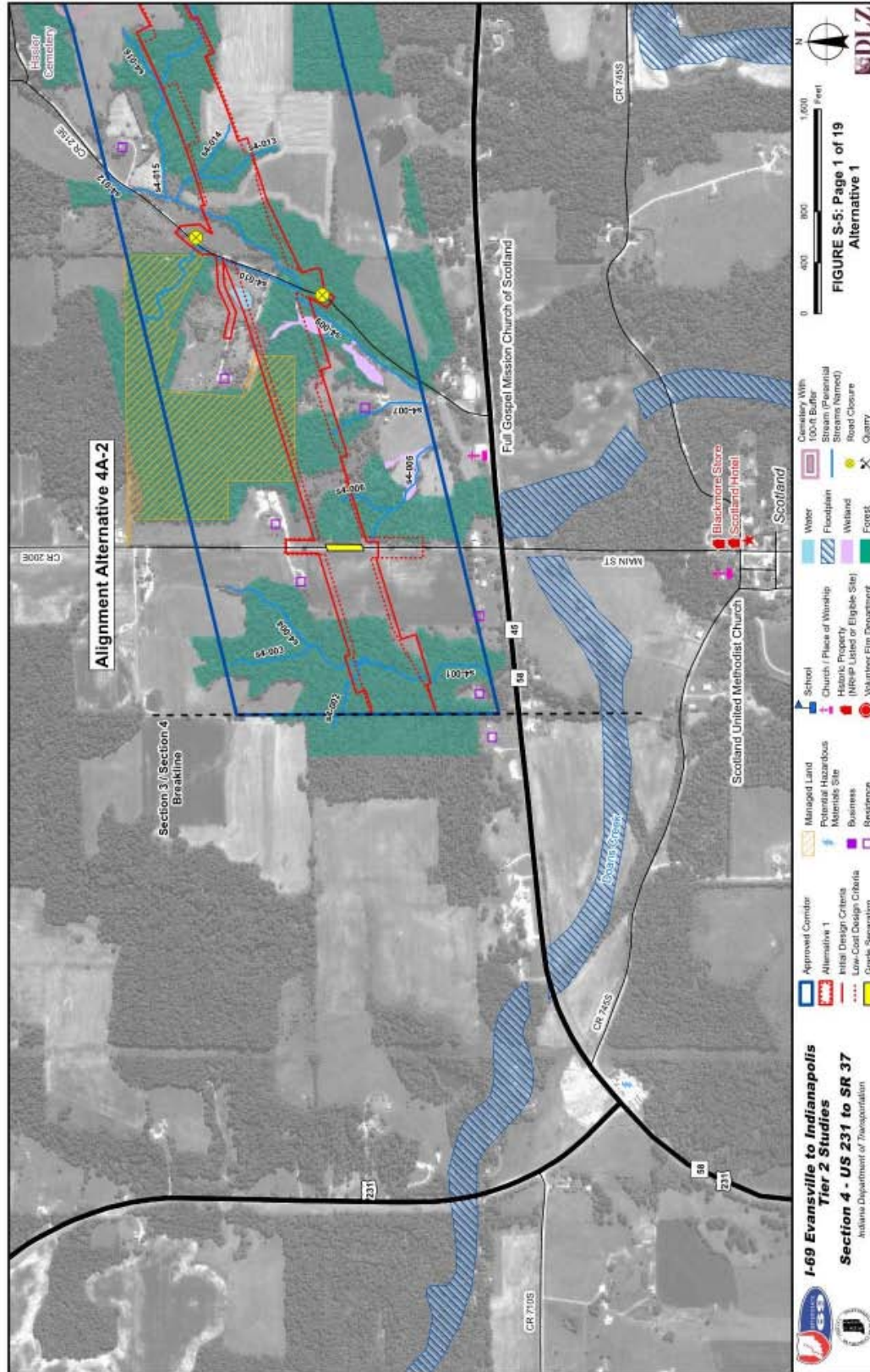


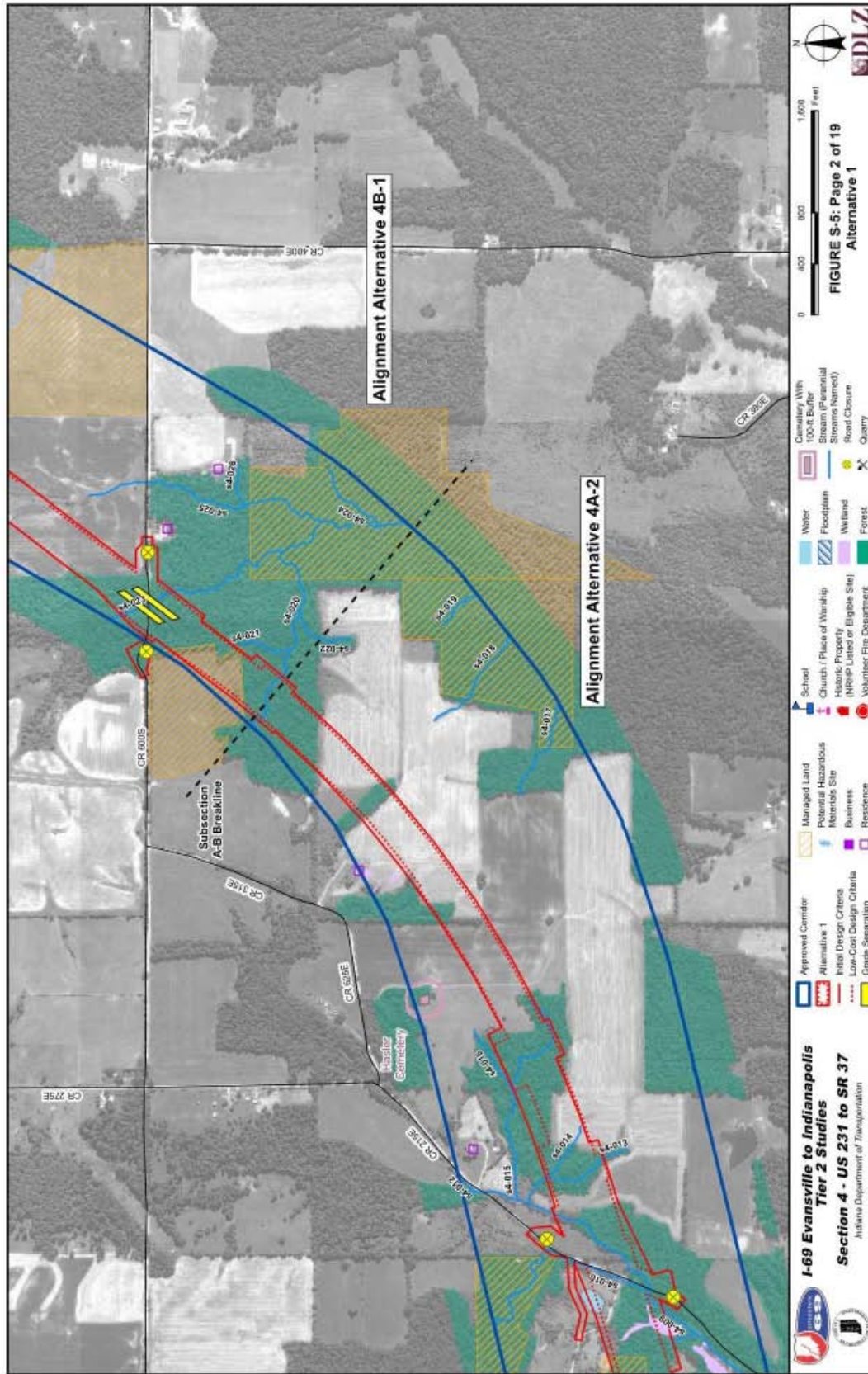
Figure S-4: I-69 Tier 2 Corridor Model Network



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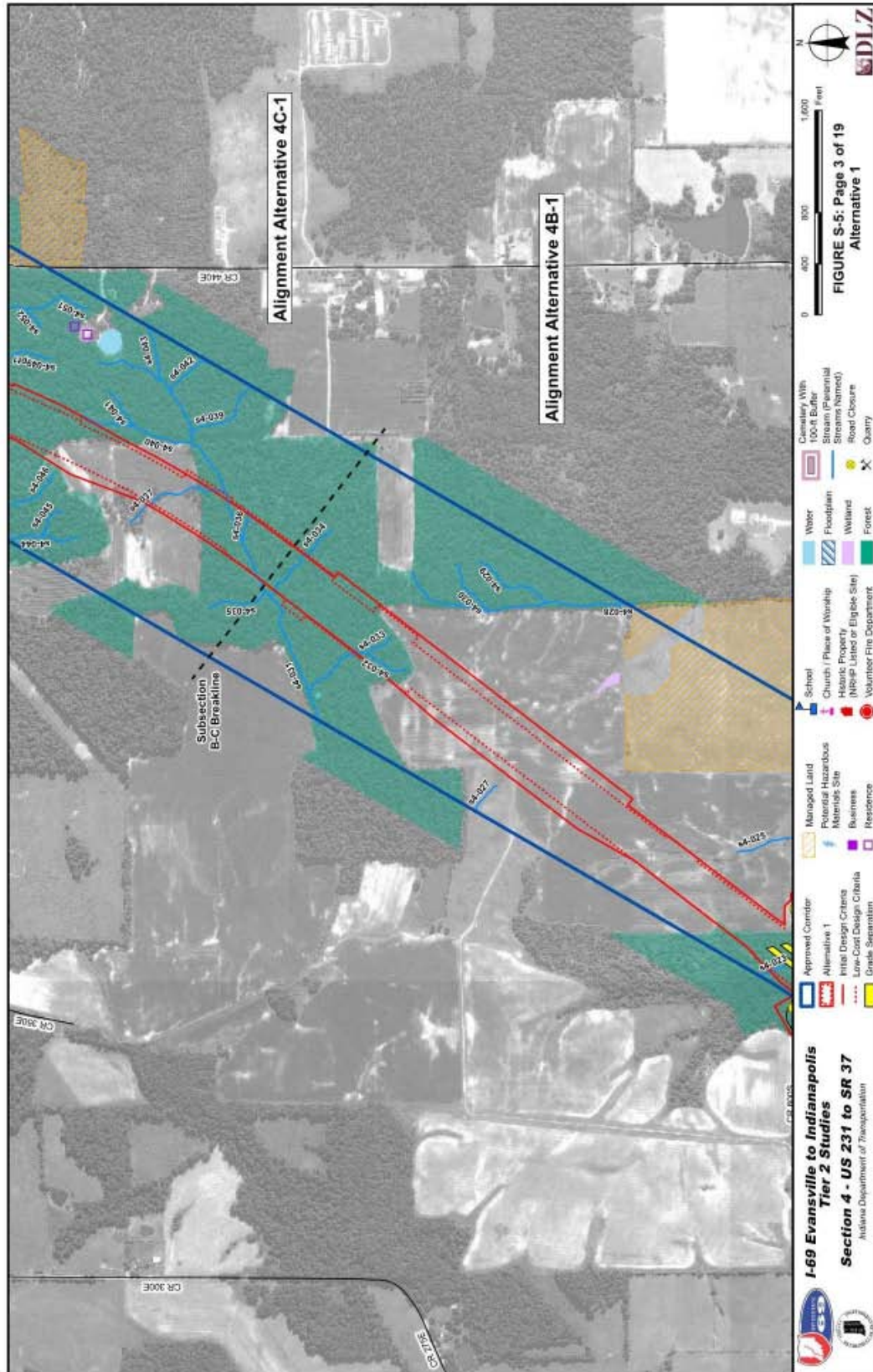


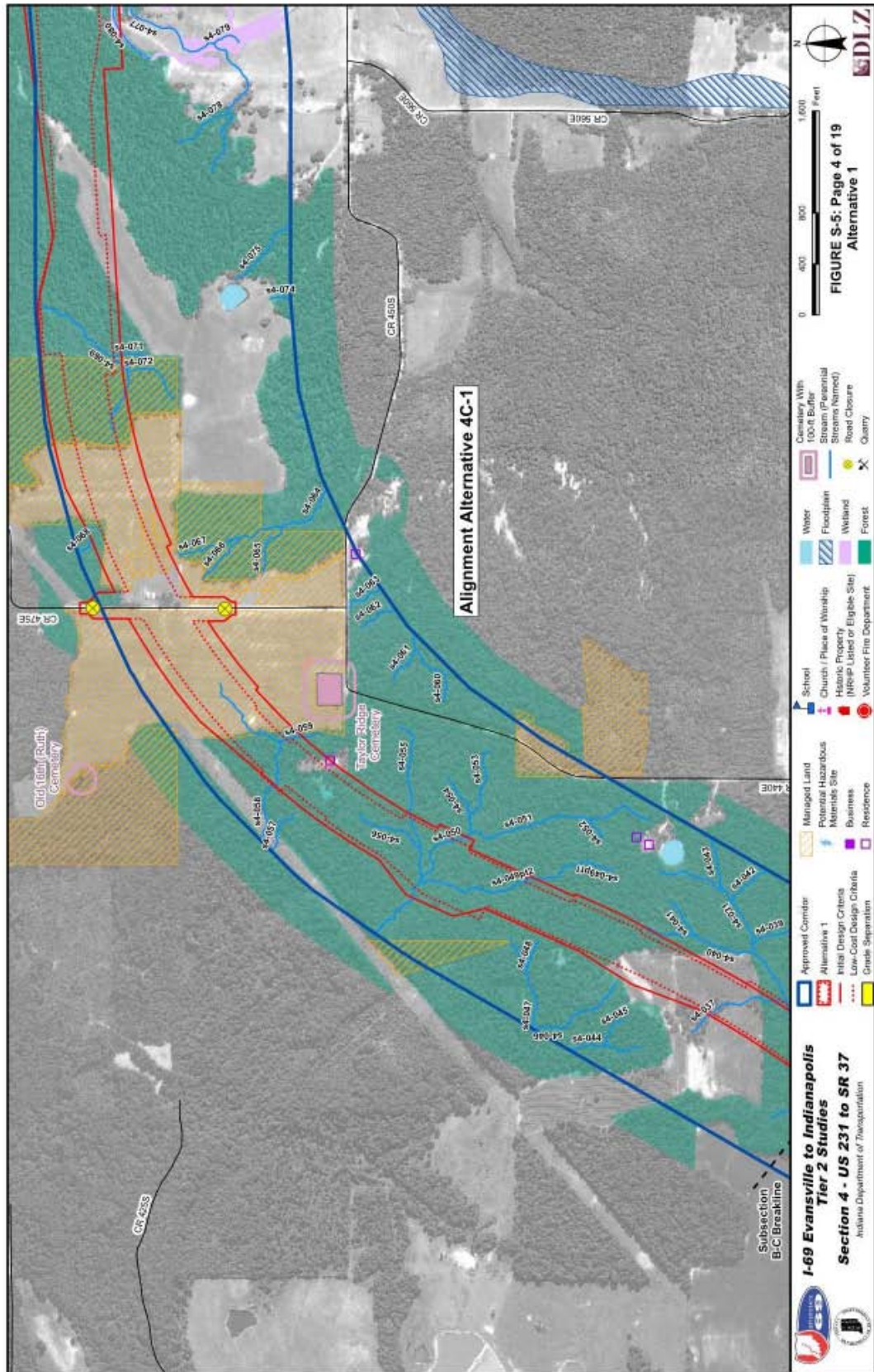


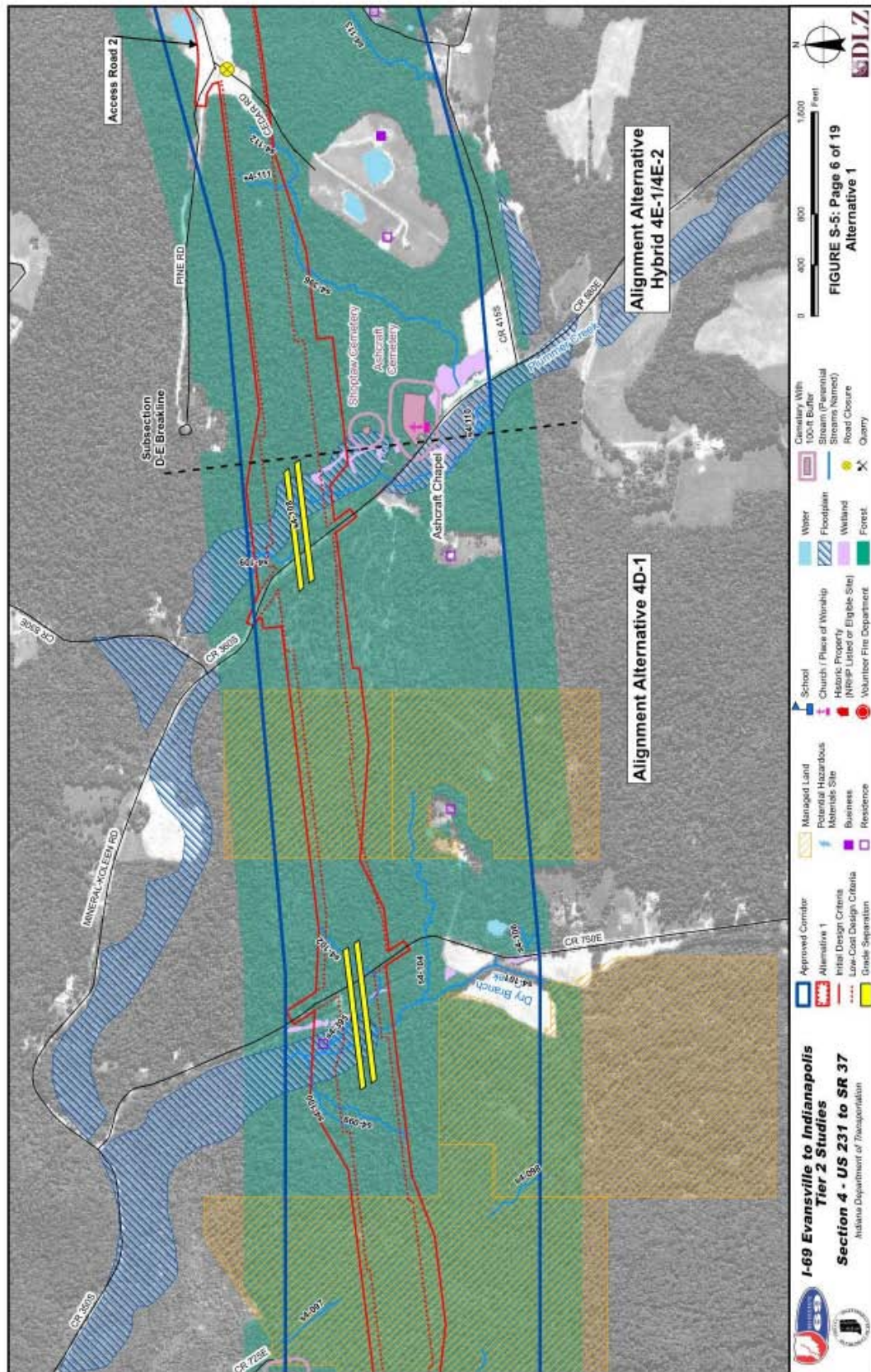


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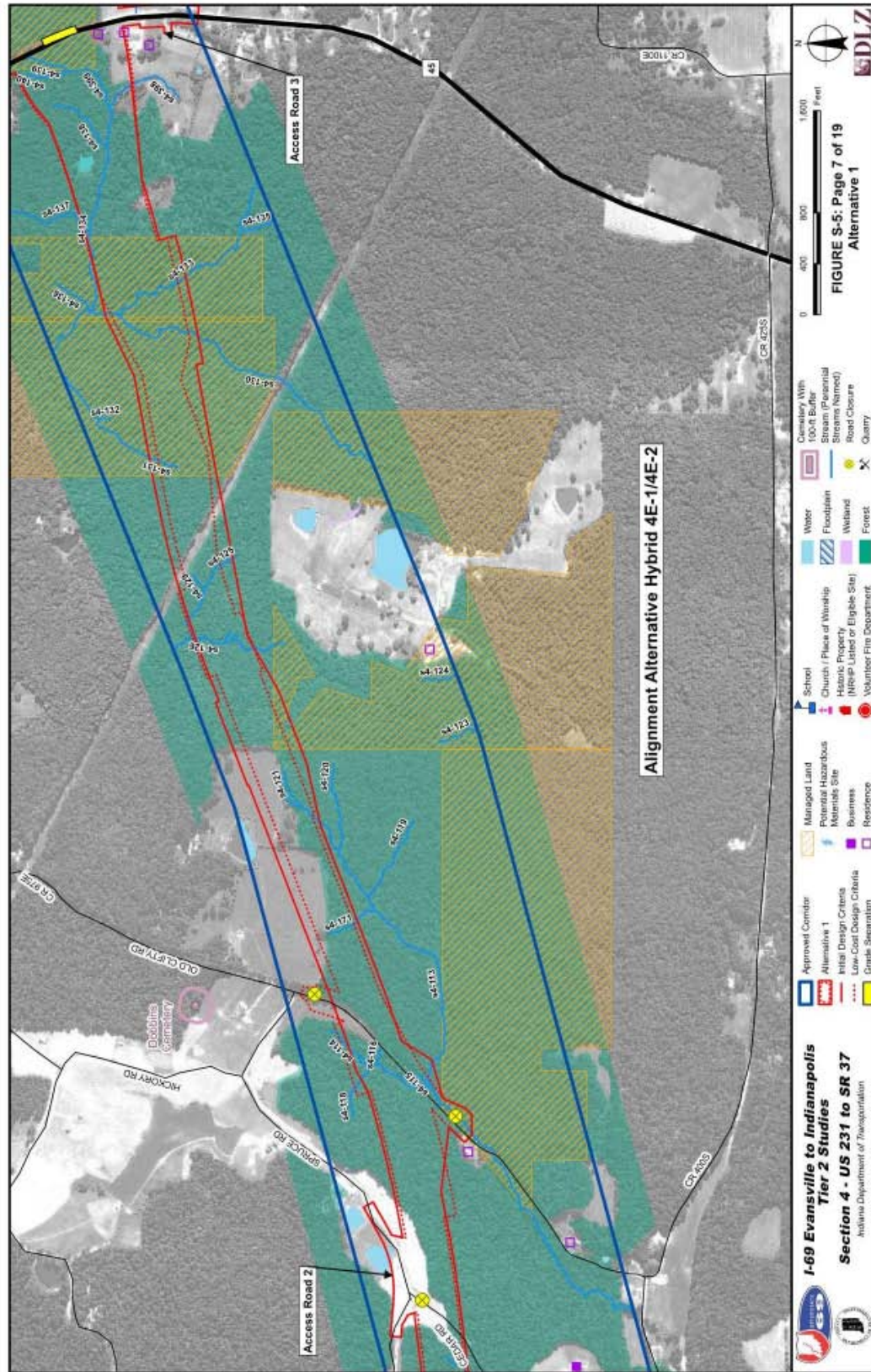


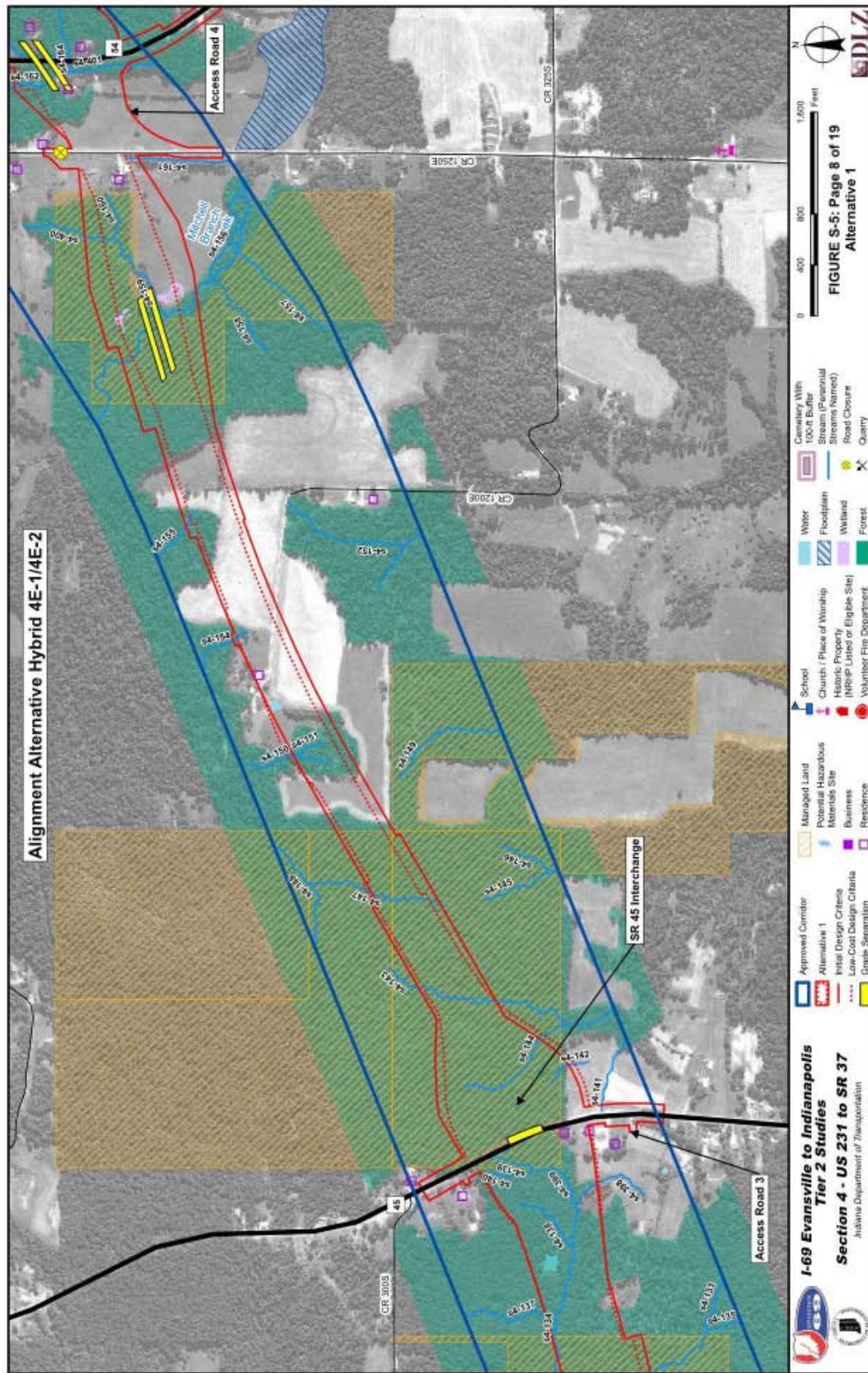




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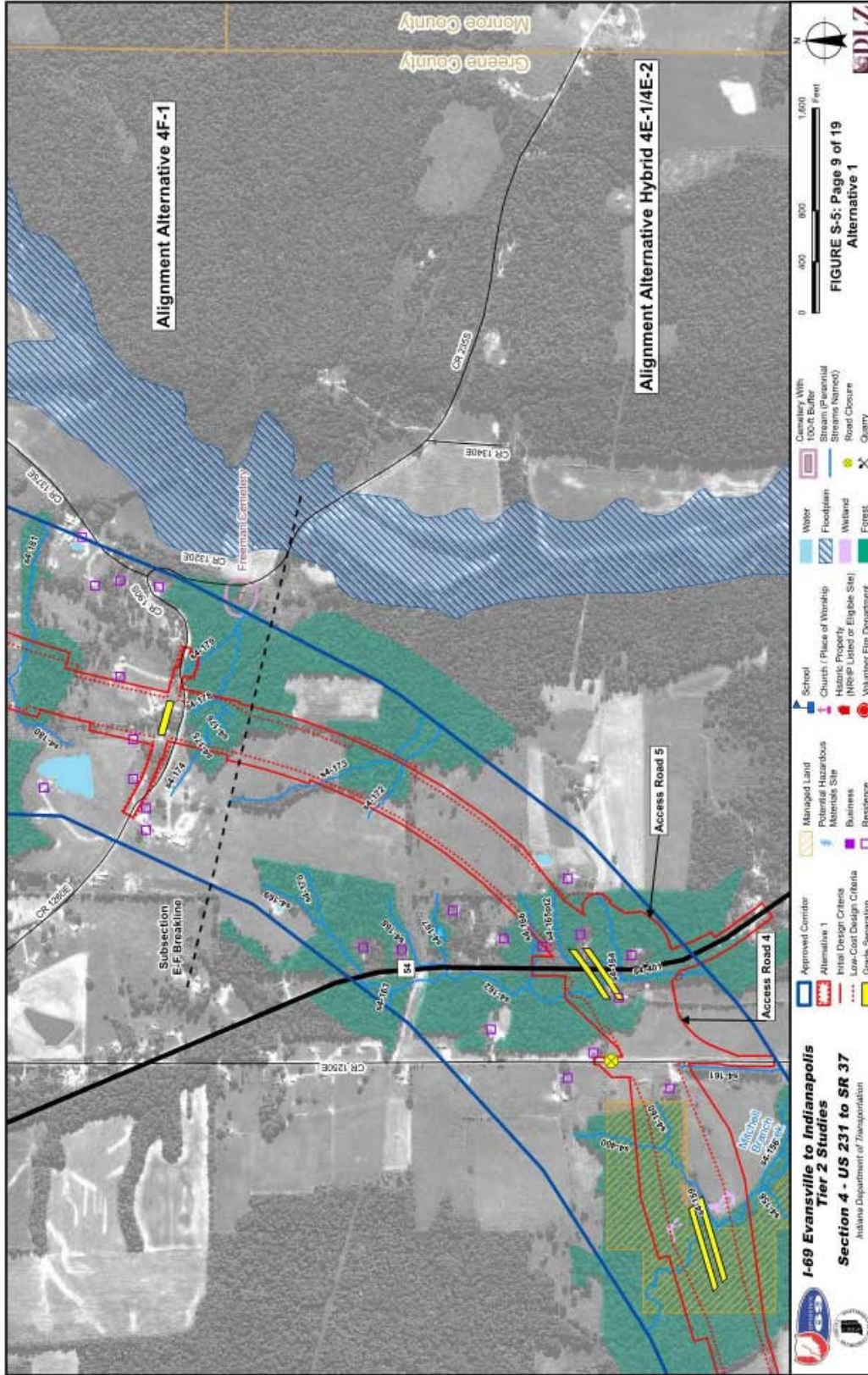


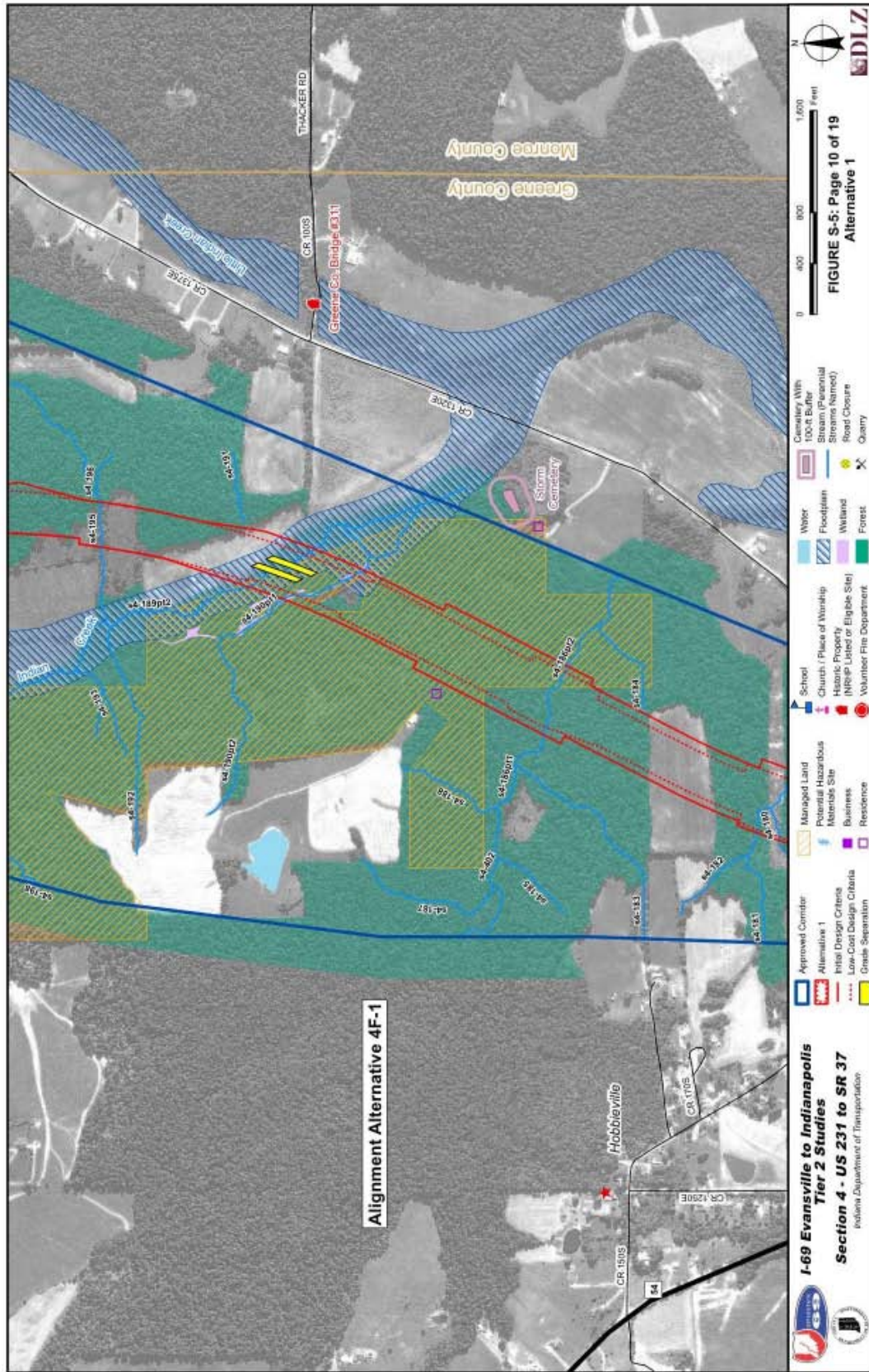




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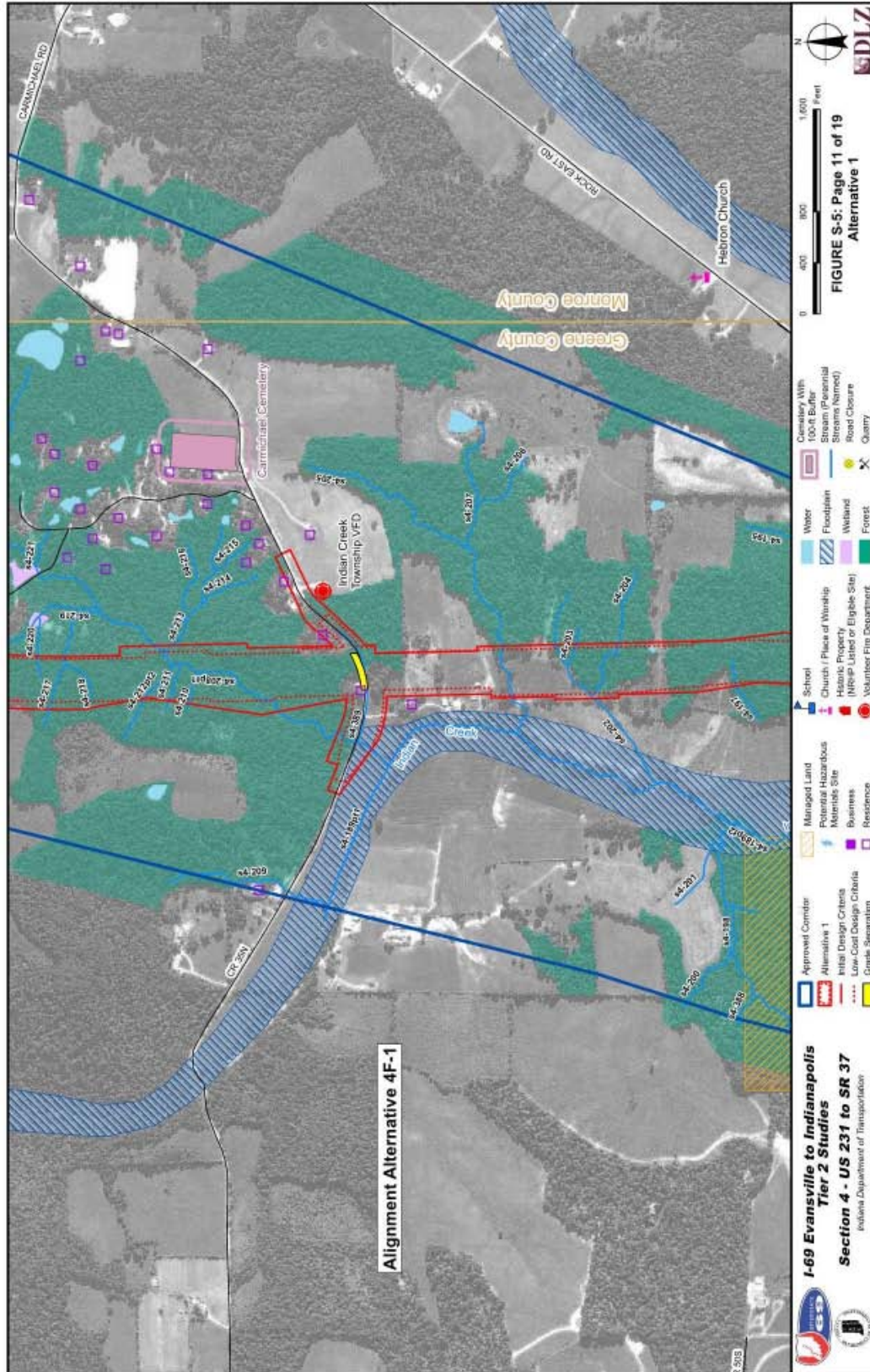




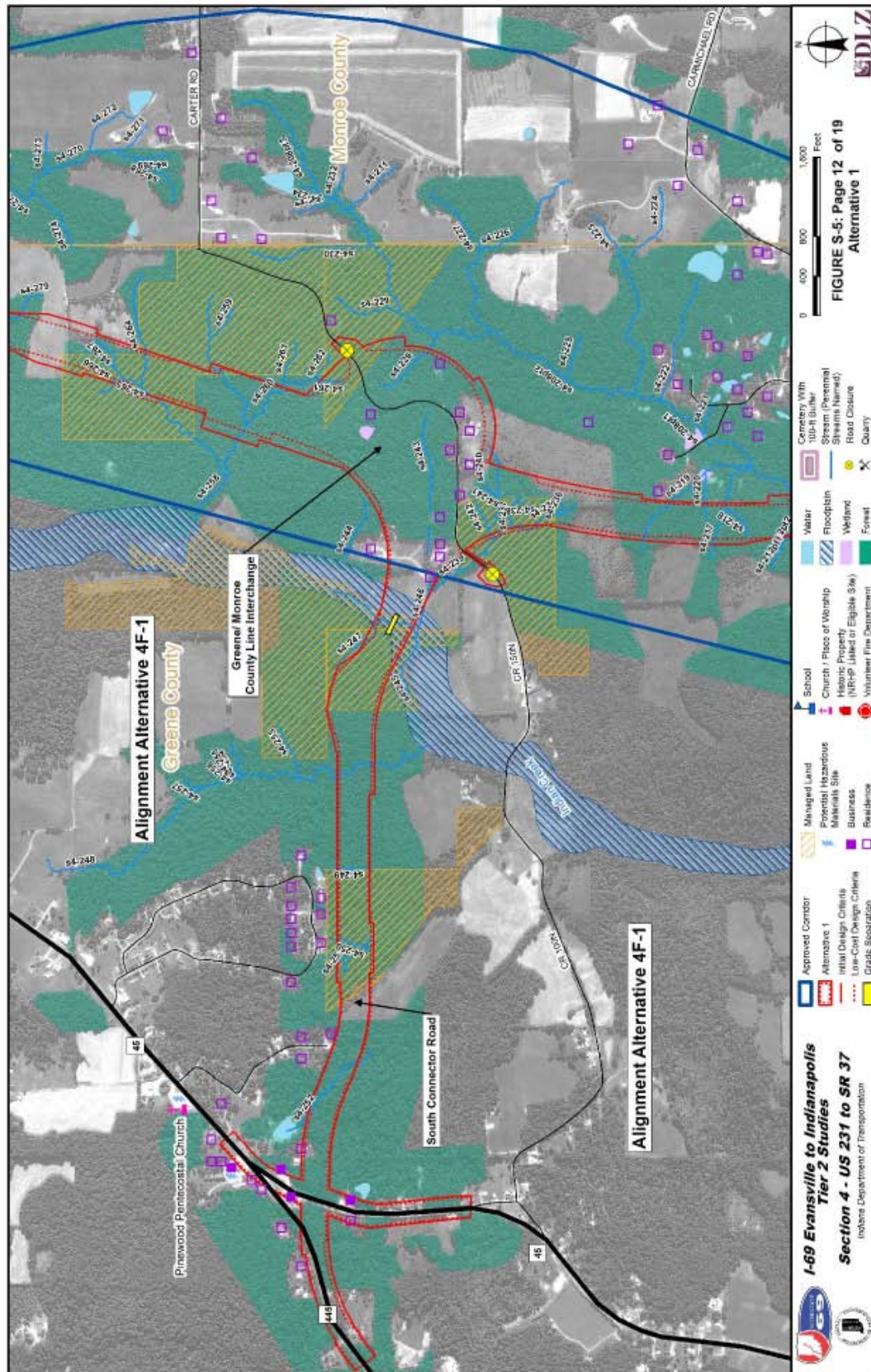


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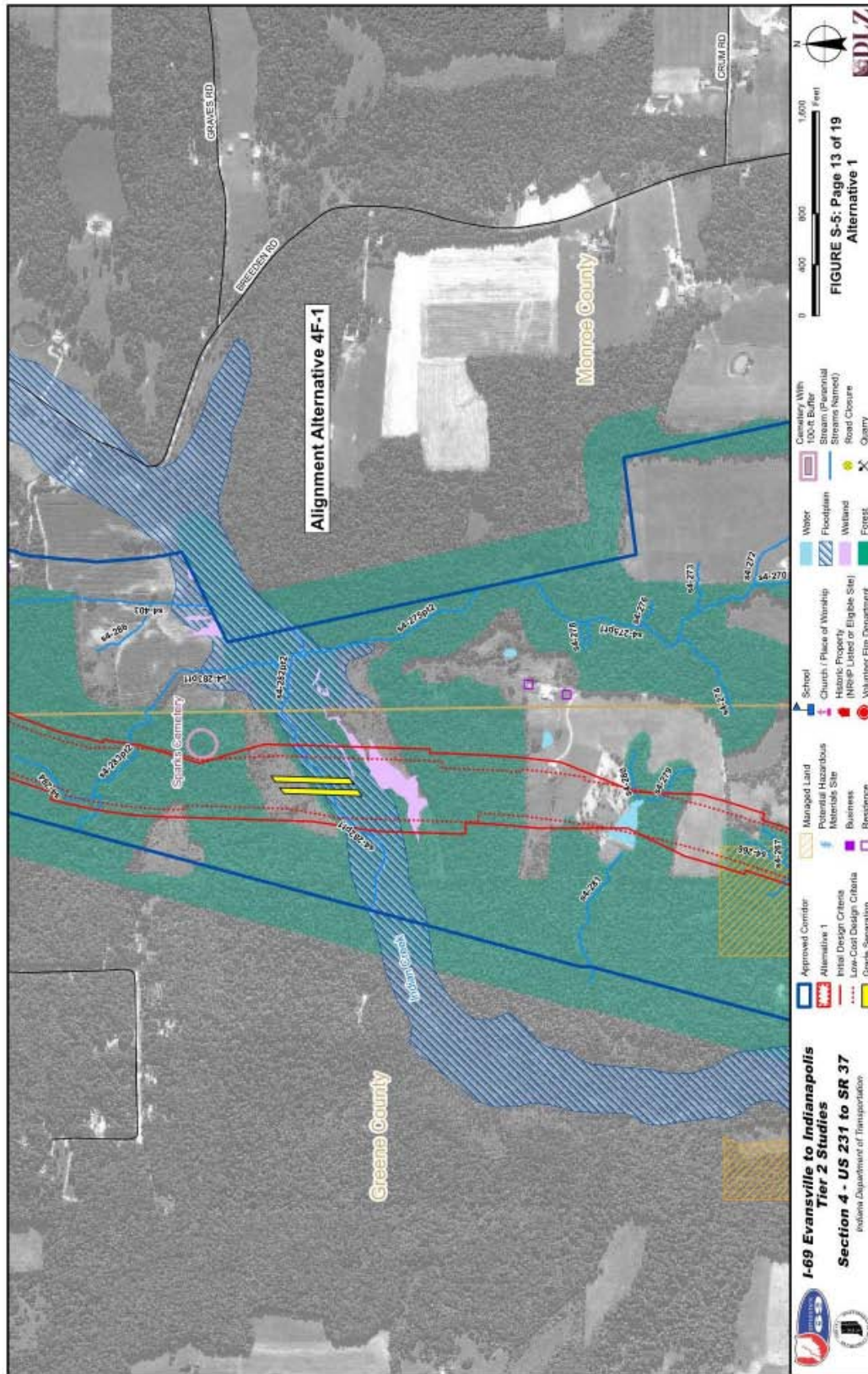
Summary
Section S.15 – Glossary of Key Terms





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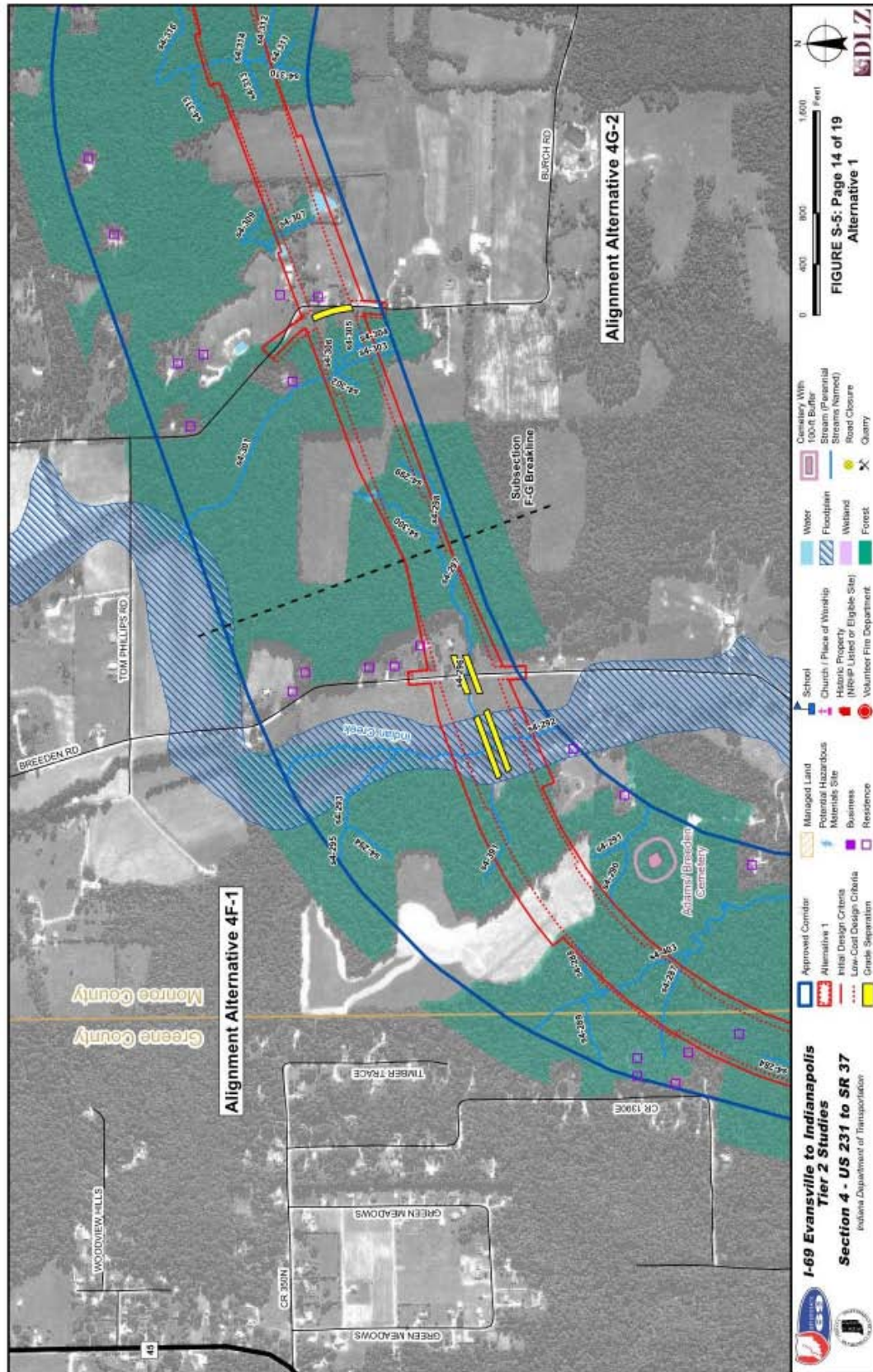


FIGURE S-5: Page 14 of 19
Alternative 1

I-69 Evansville to Indianapolis Tier 2 Studies
Section 4 - US 231 to SR 37
 Indiana Department of Transportation

Legend:

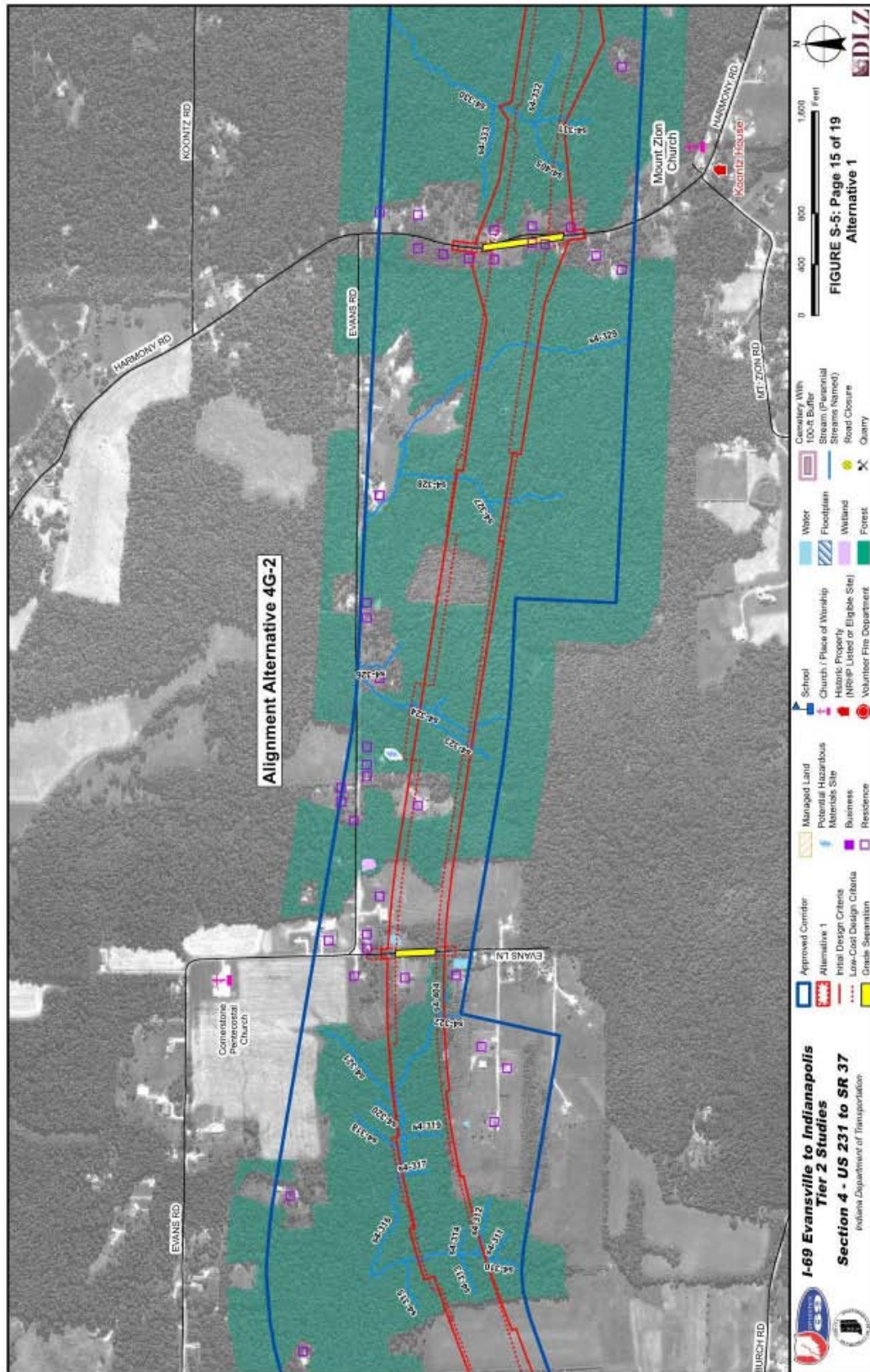
- Approved Corridor Alternative 1
- Initial Design Criteria
- Low-Cost Design Criteria
- Grade Separation
- Managed Land
- Potential Hazardous Materials Site
- Business
- Residence
- School
- Church / Place of Worship
- Historic Property (NRHP Listed or Eligible Site)
- Volunteer Fire Department
- Water
- Floodplain
- Wetland
- Forest
- Cemetary With Soil Burial
- Potential Stream (Named)
- Road Closure
- Quarry

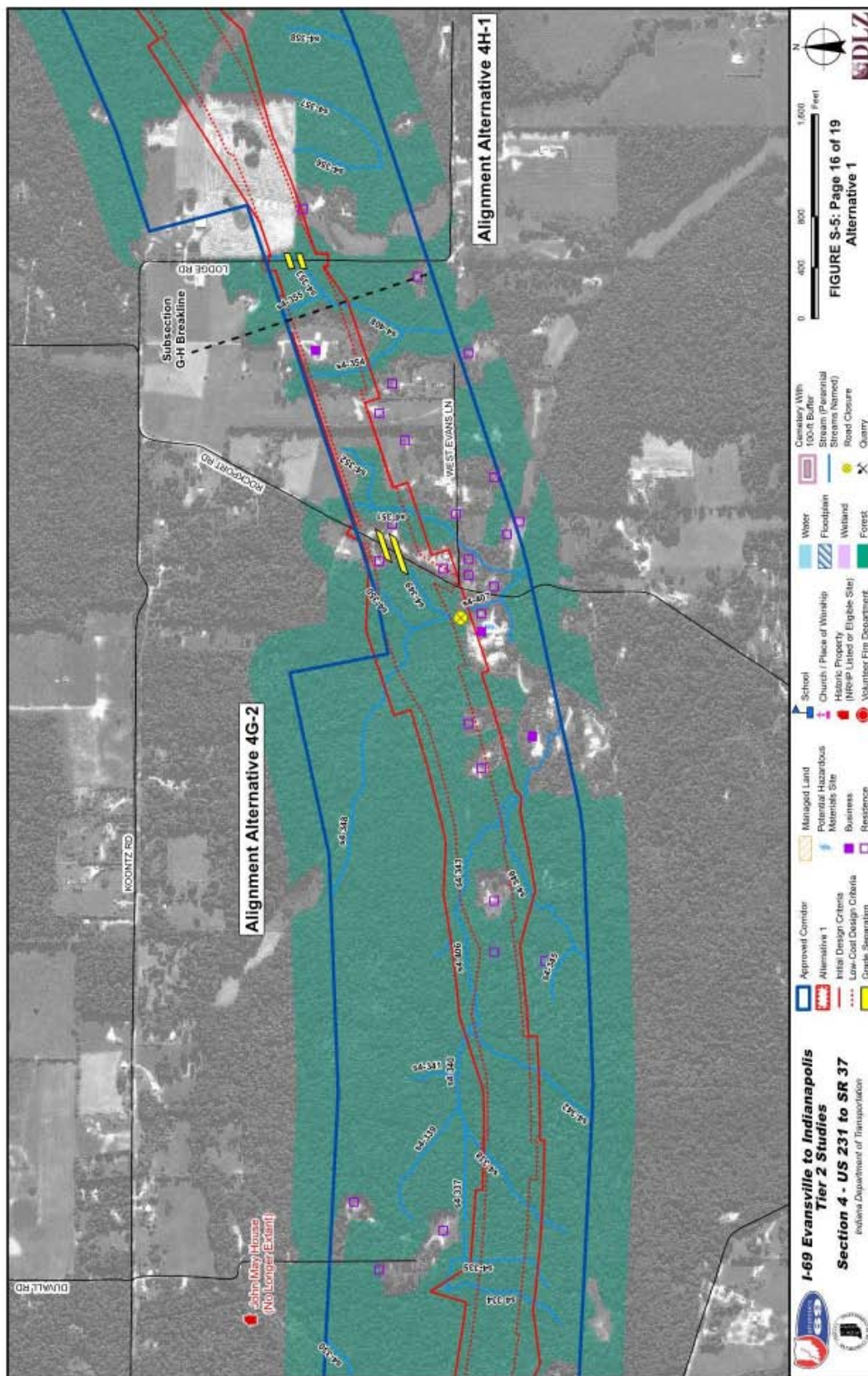
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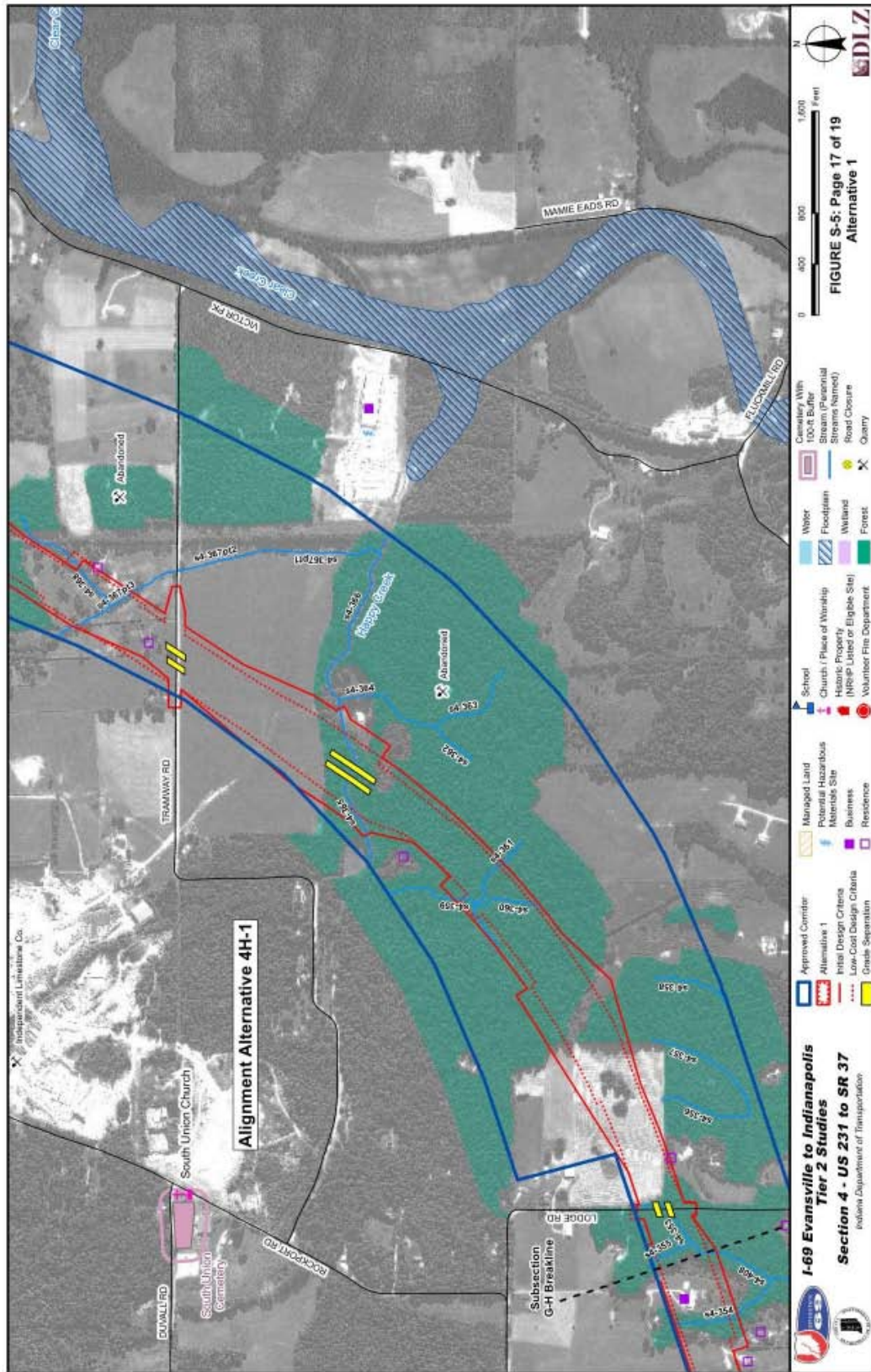


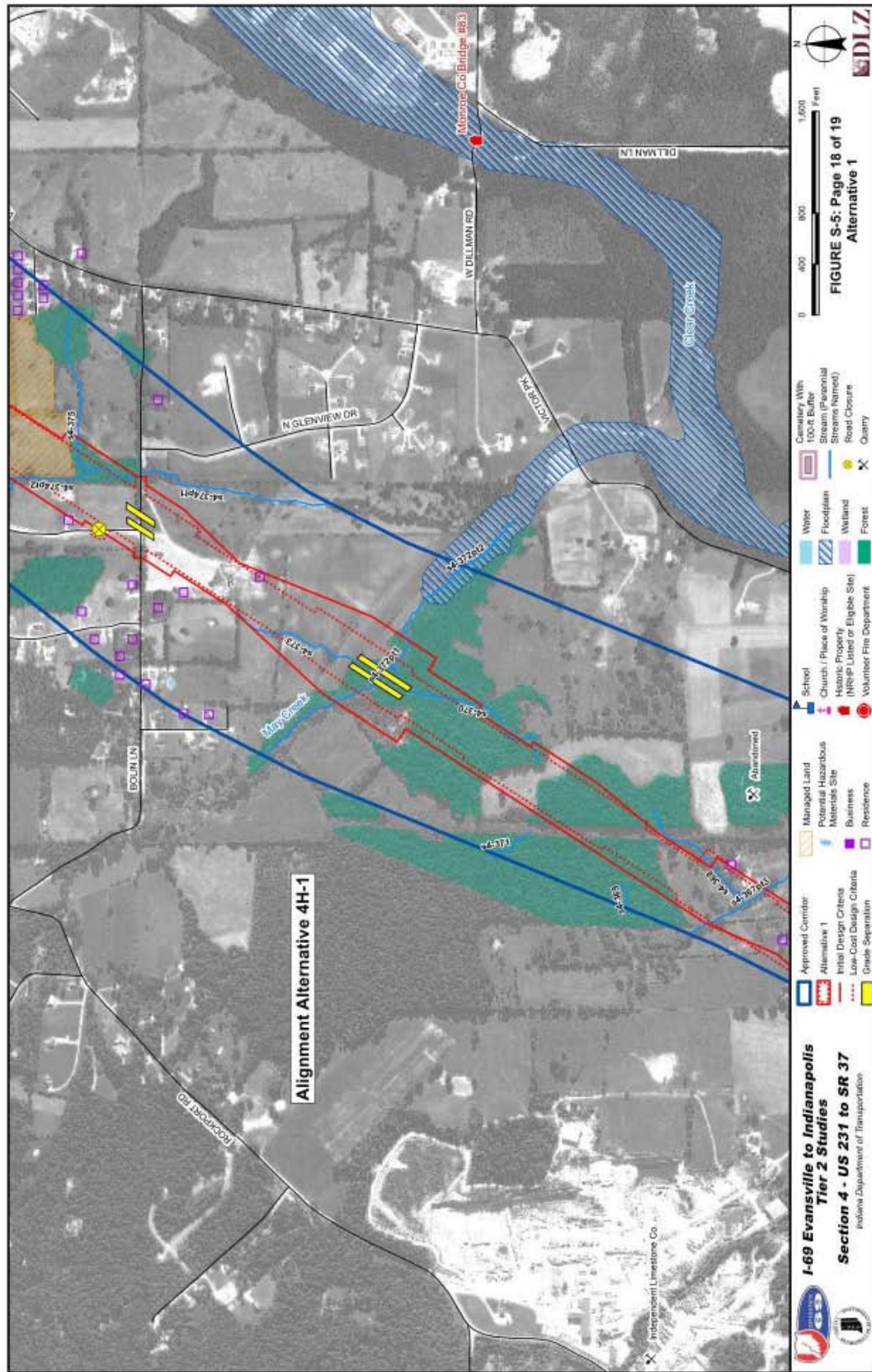




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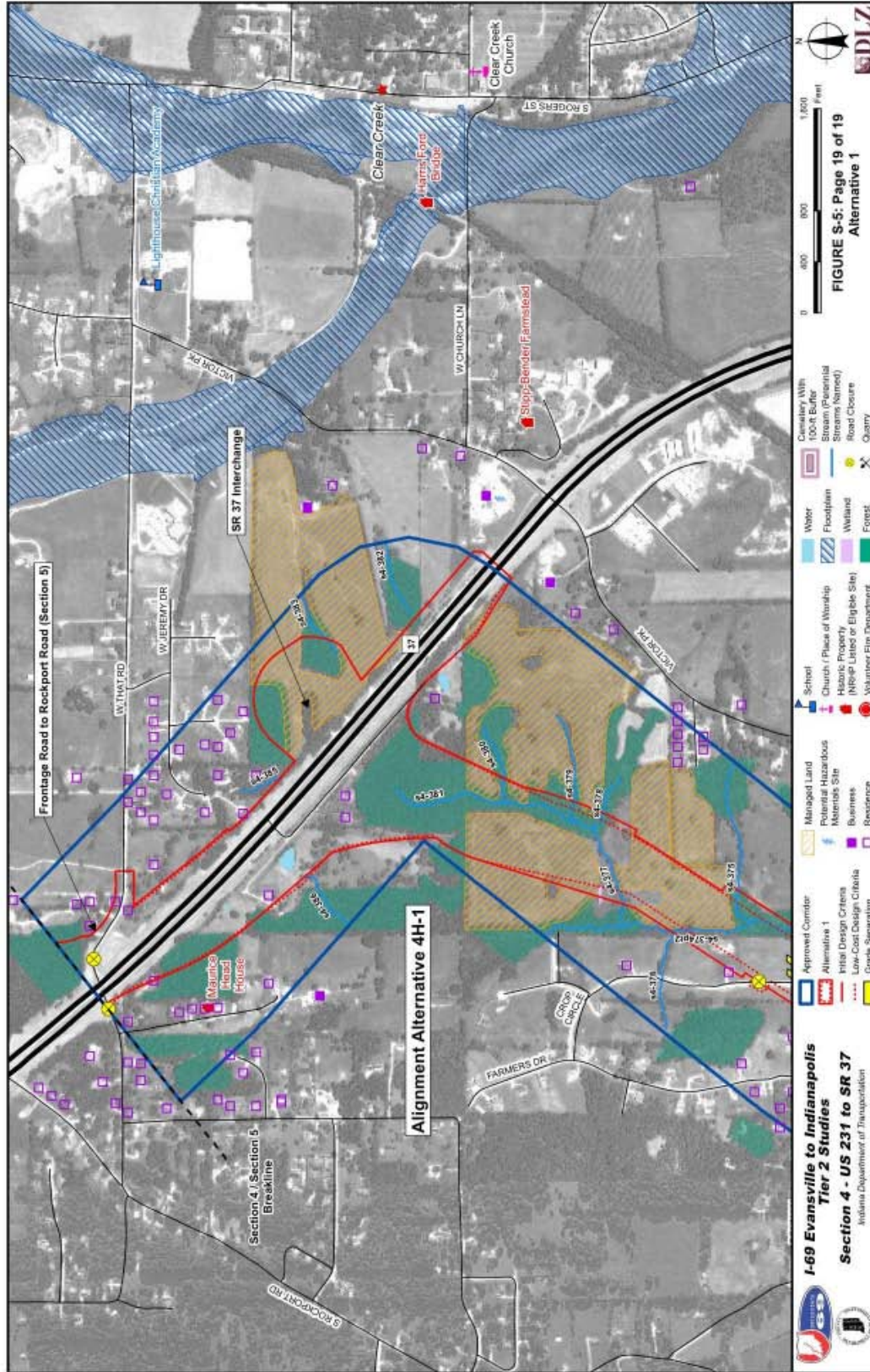


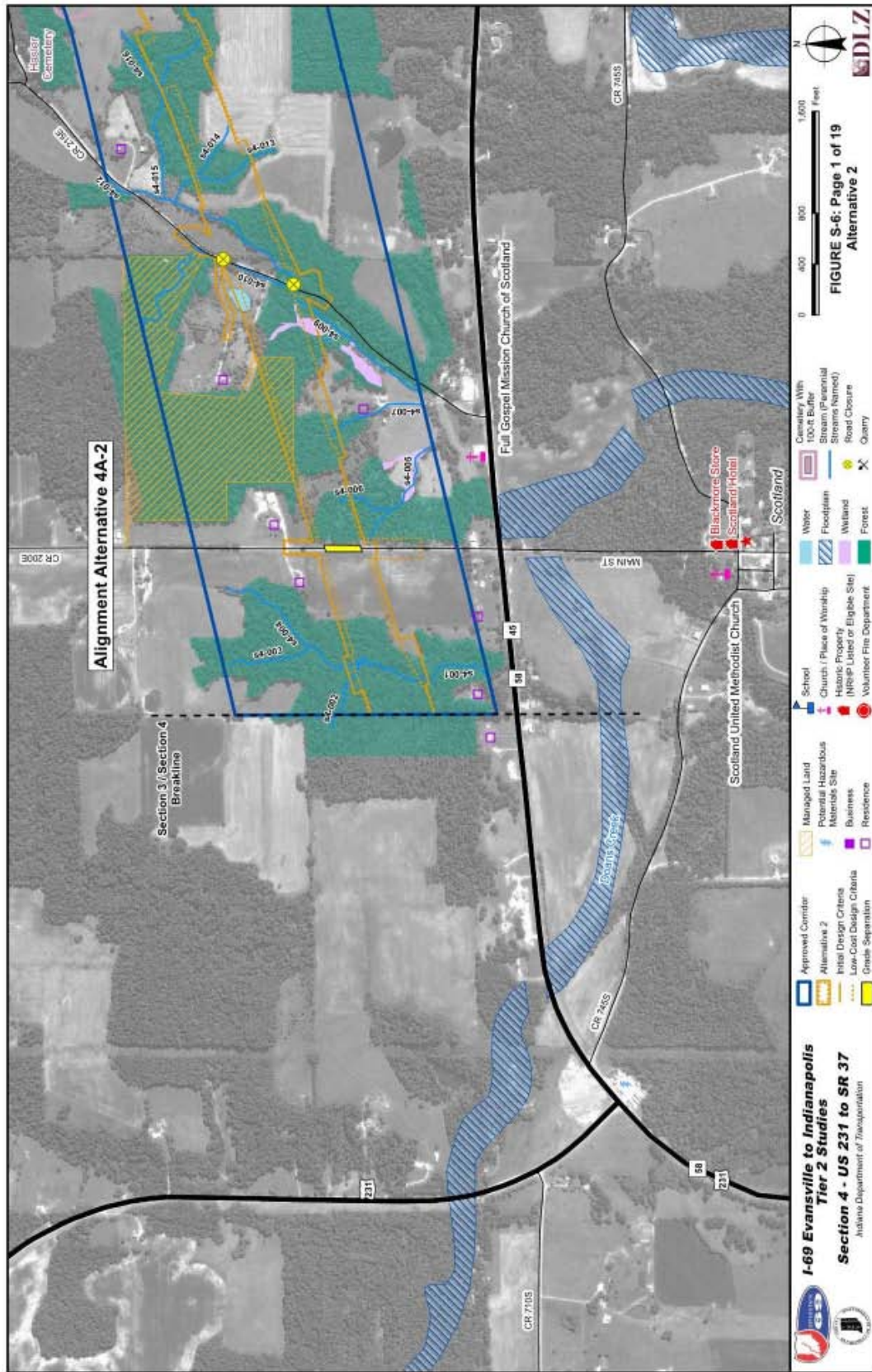




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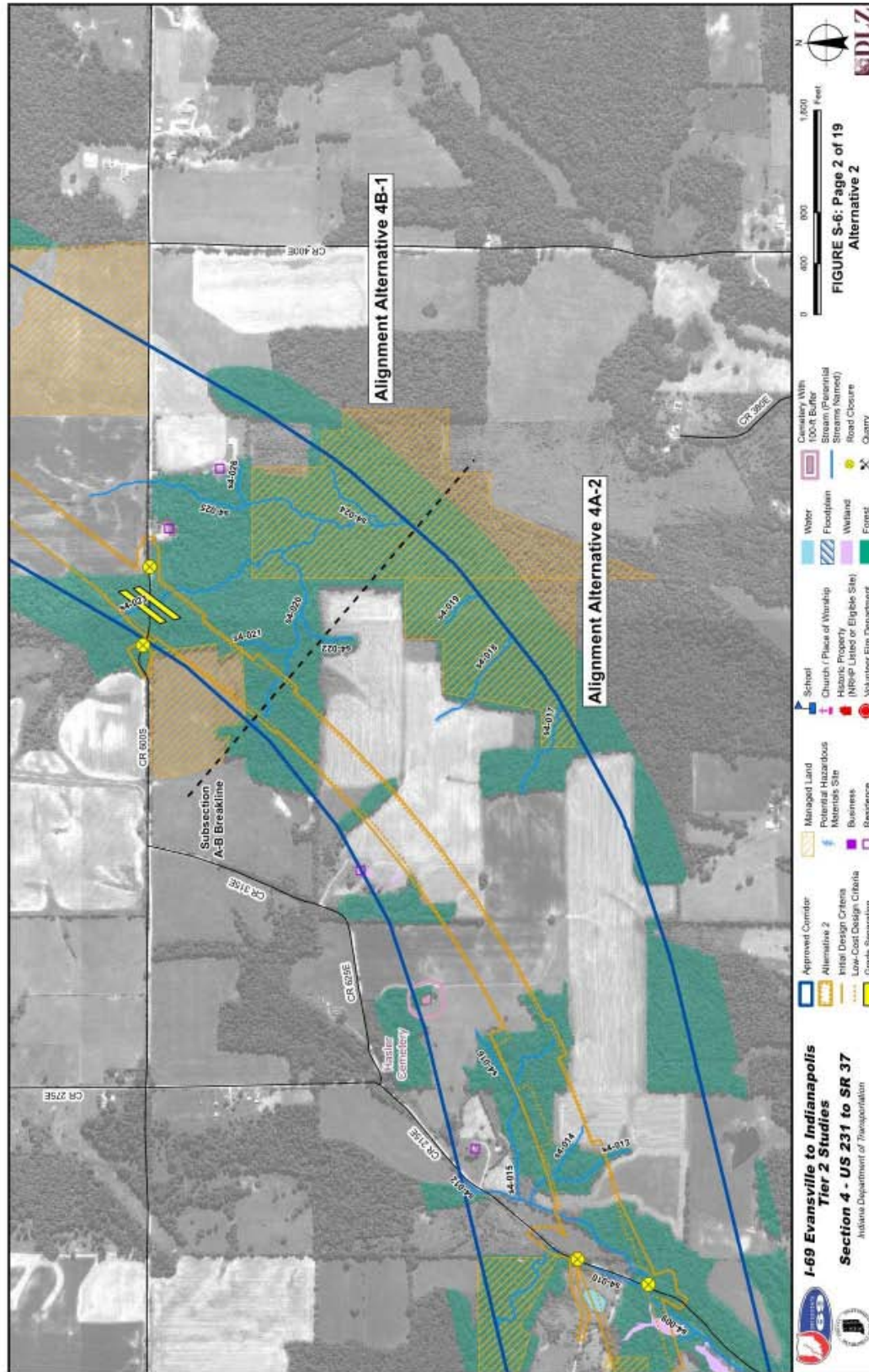






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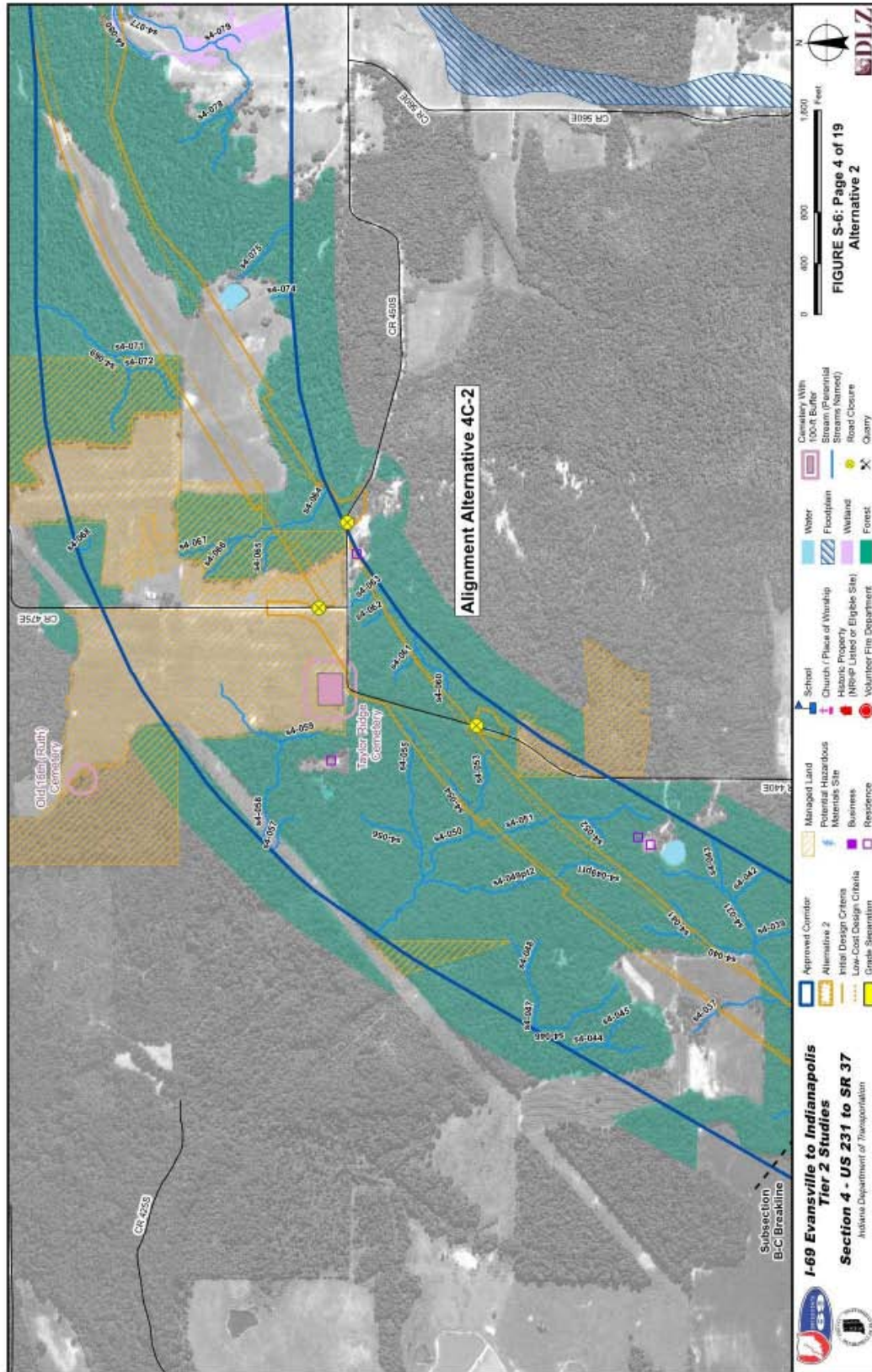
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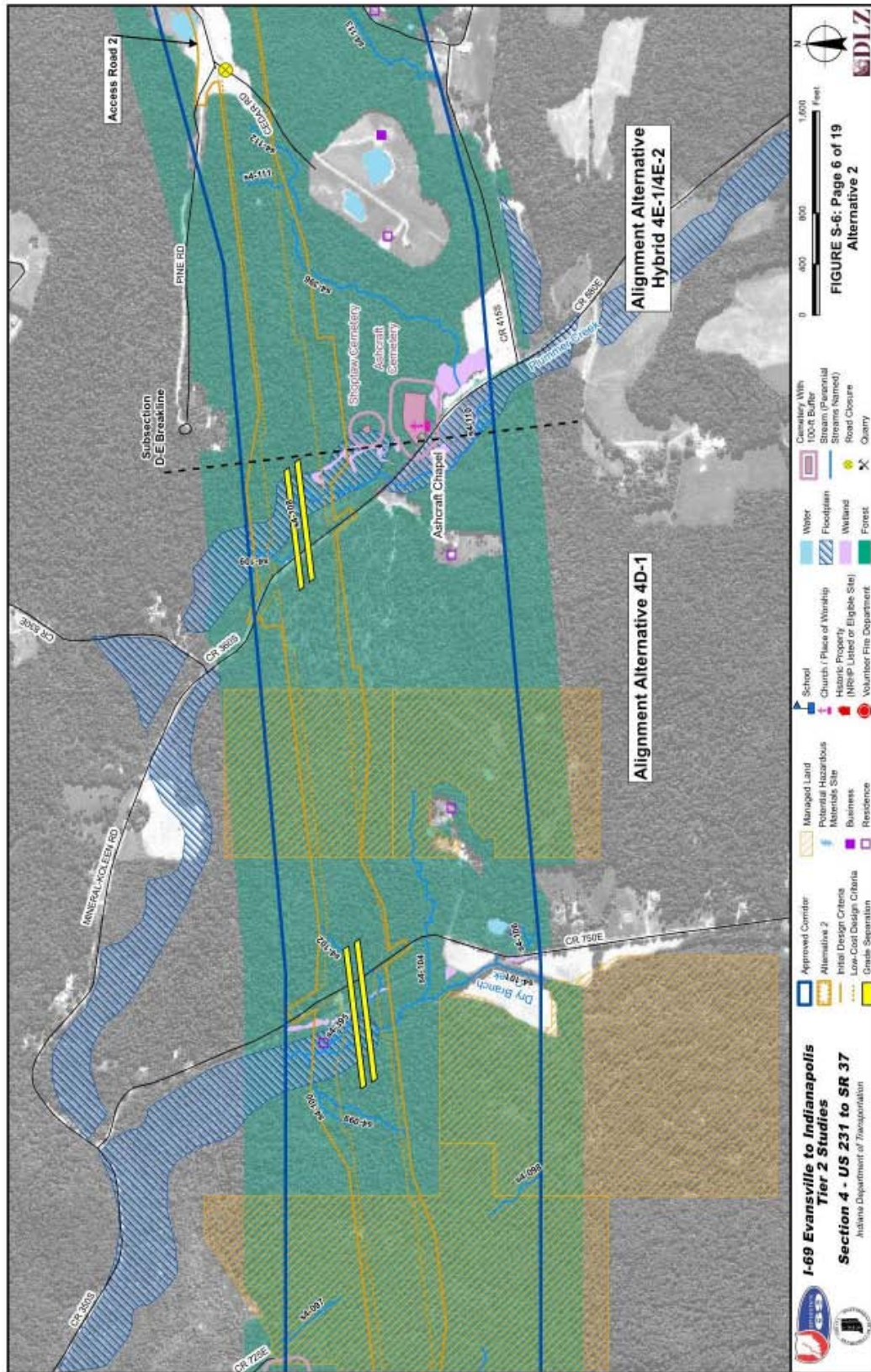
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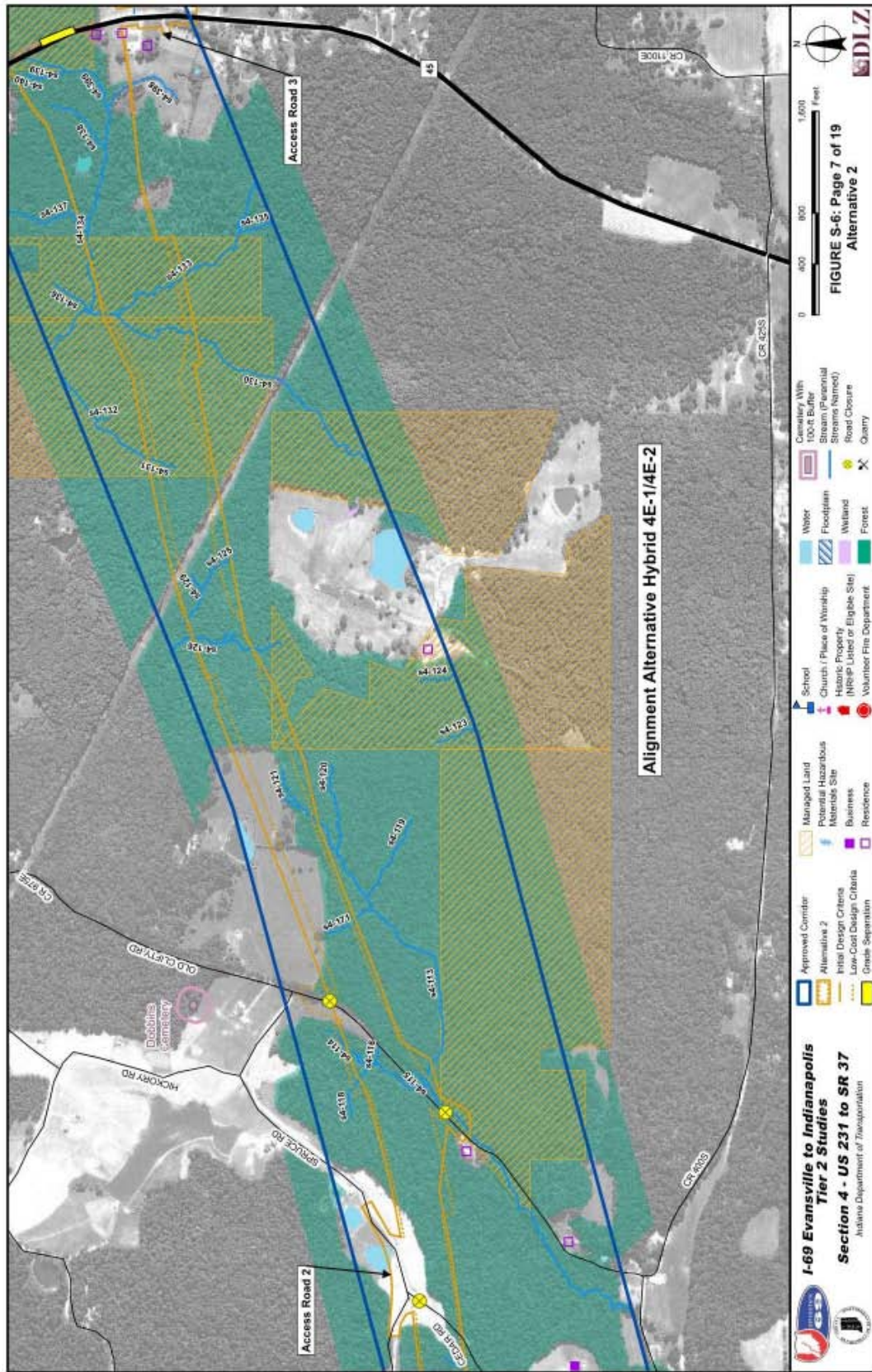




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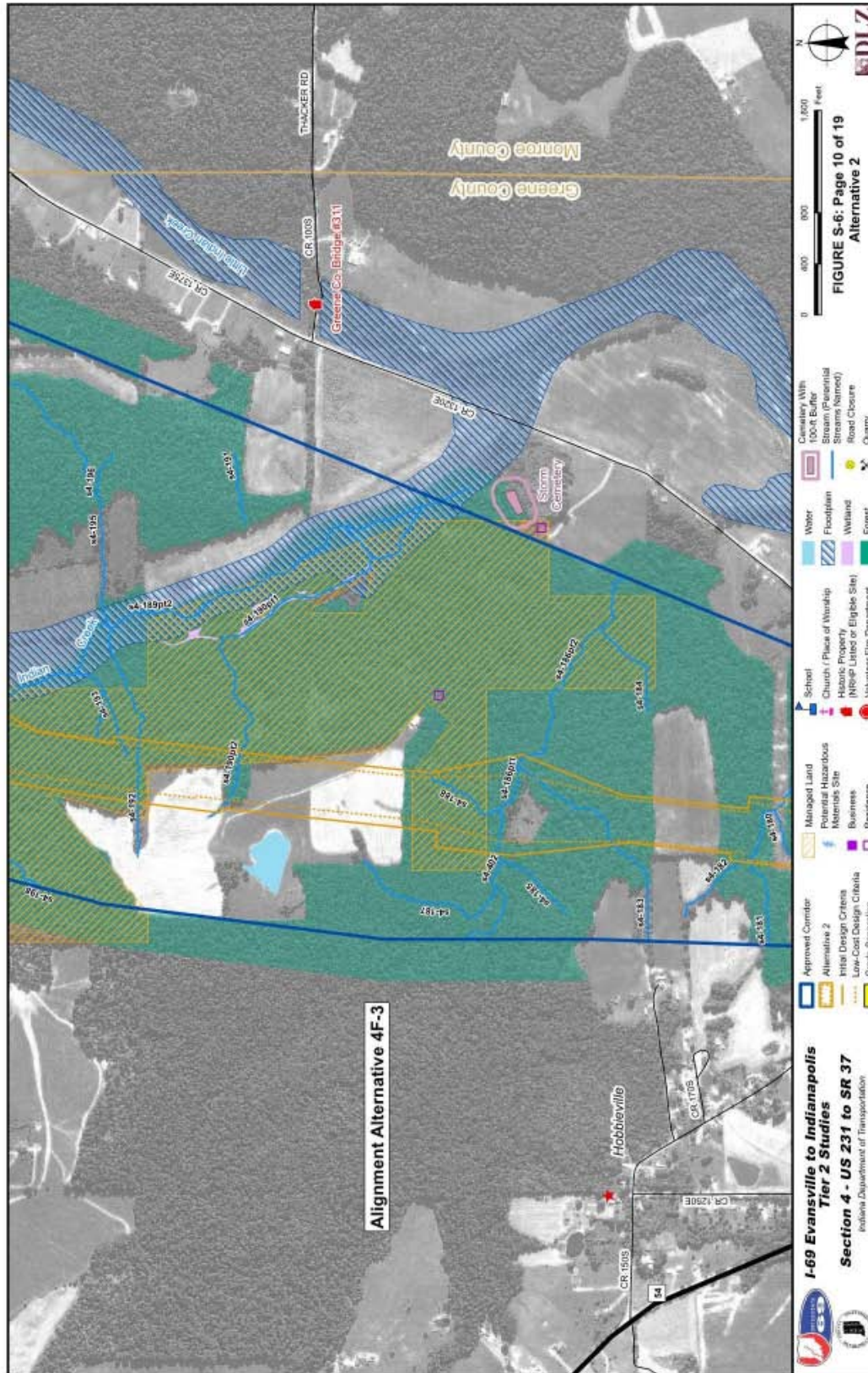


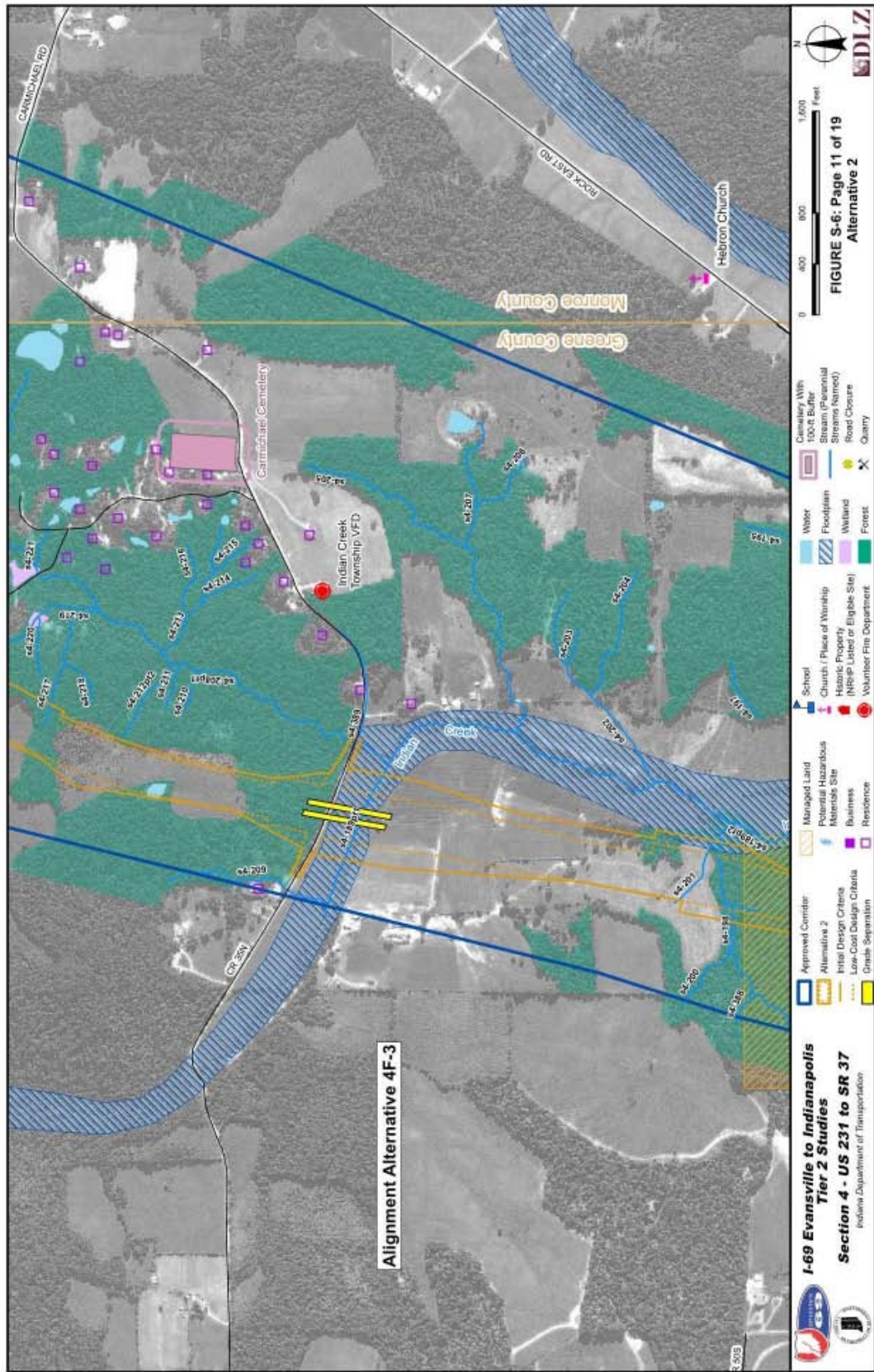




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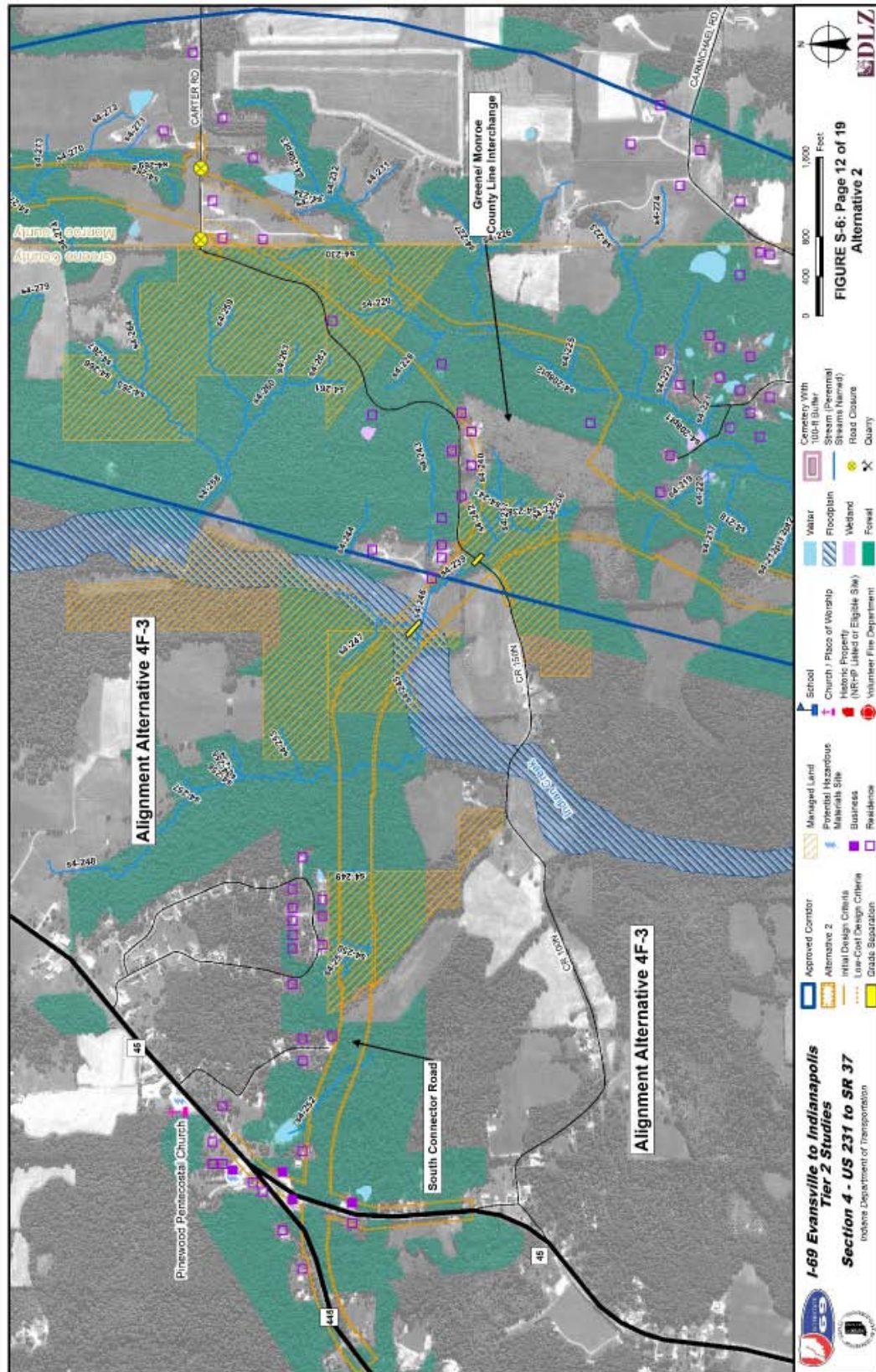


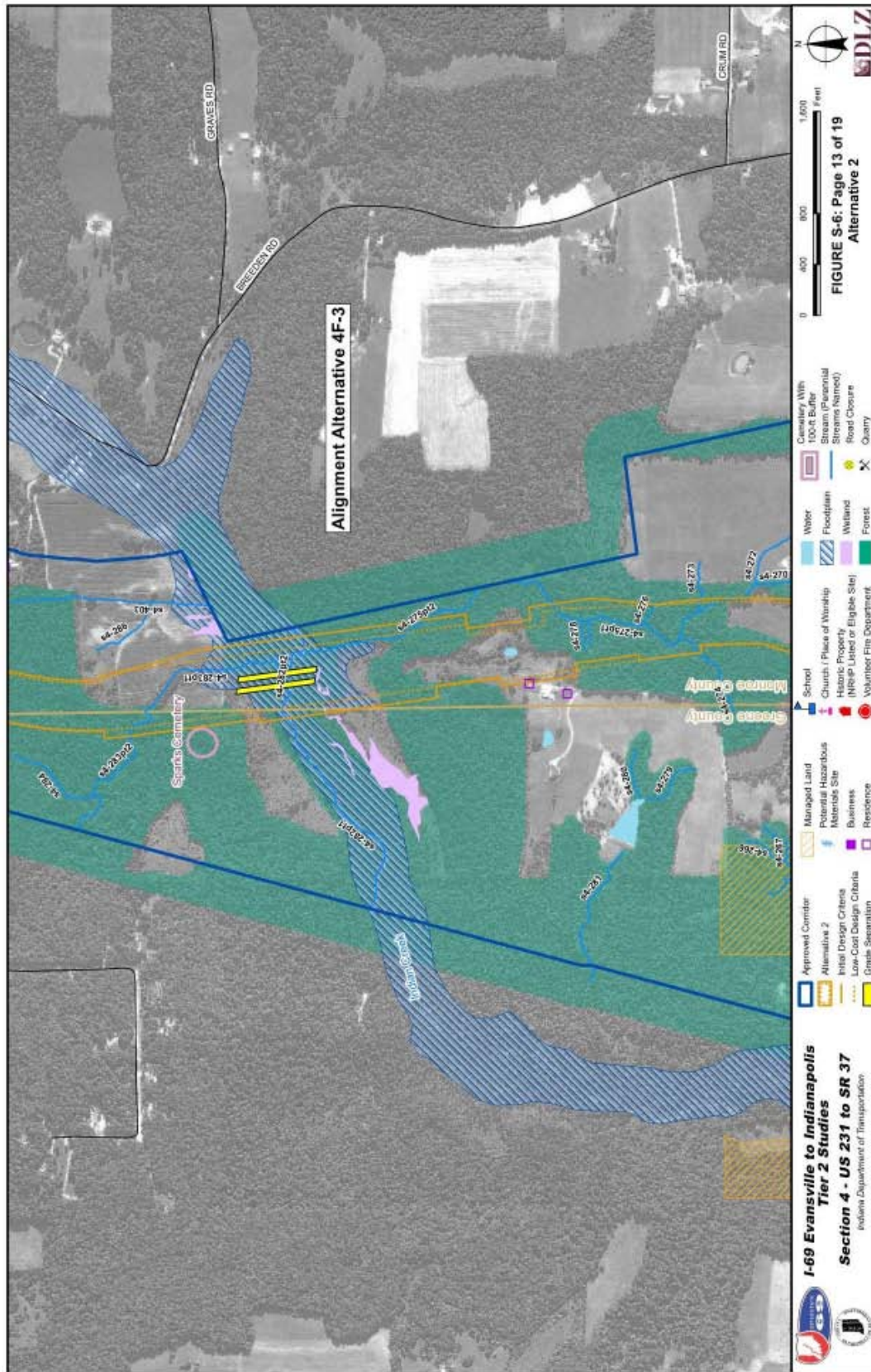




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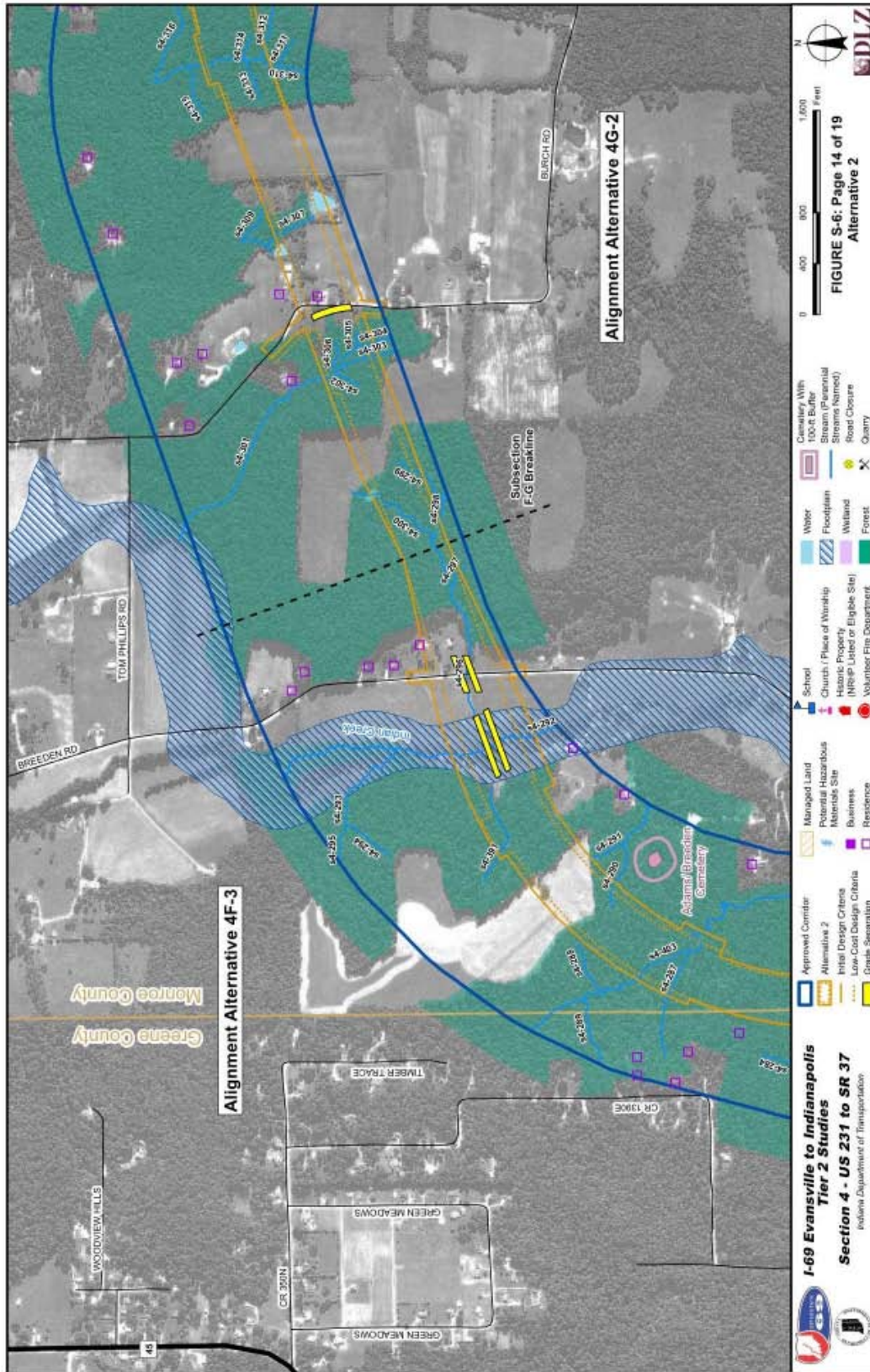


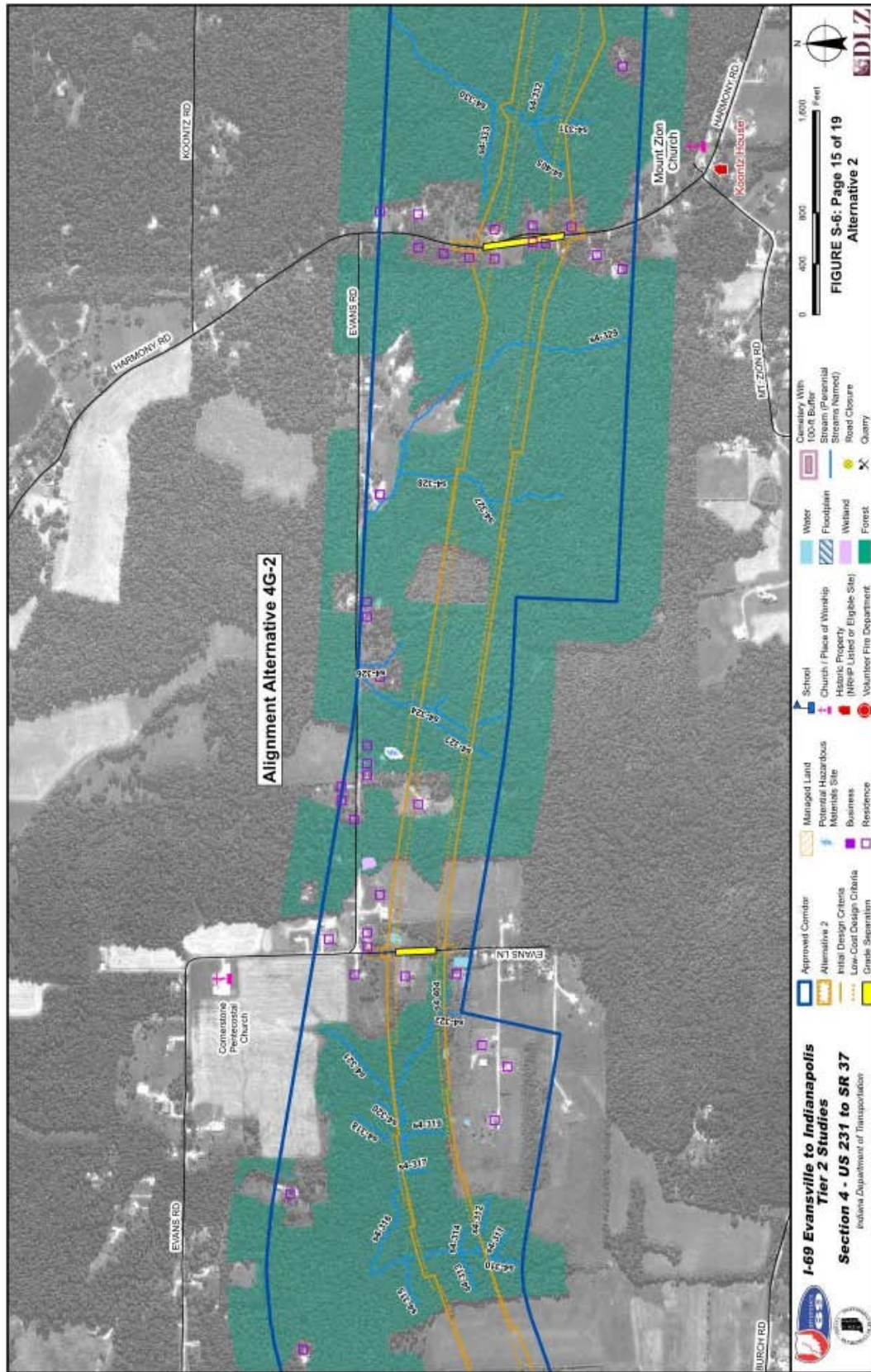




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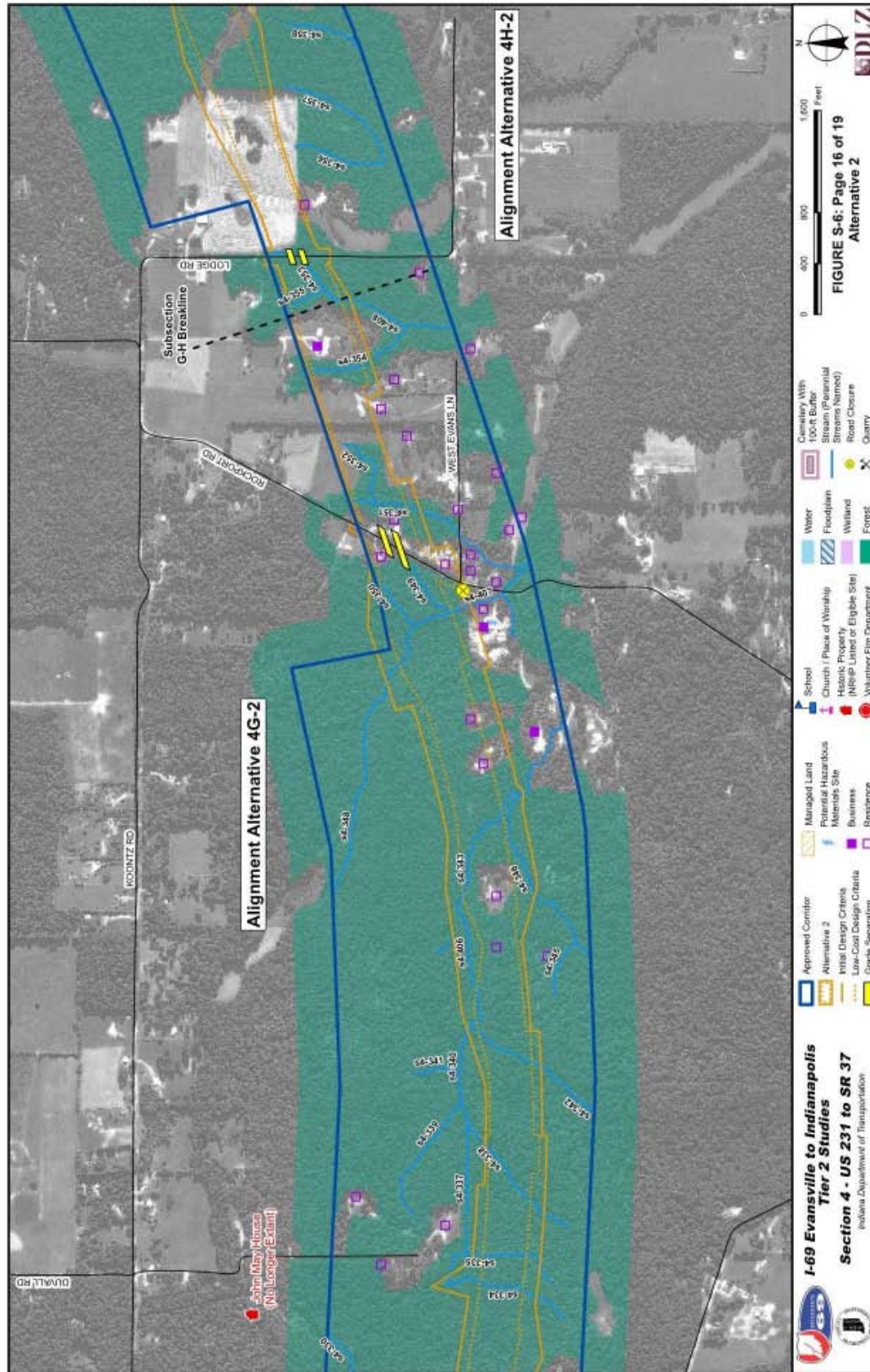


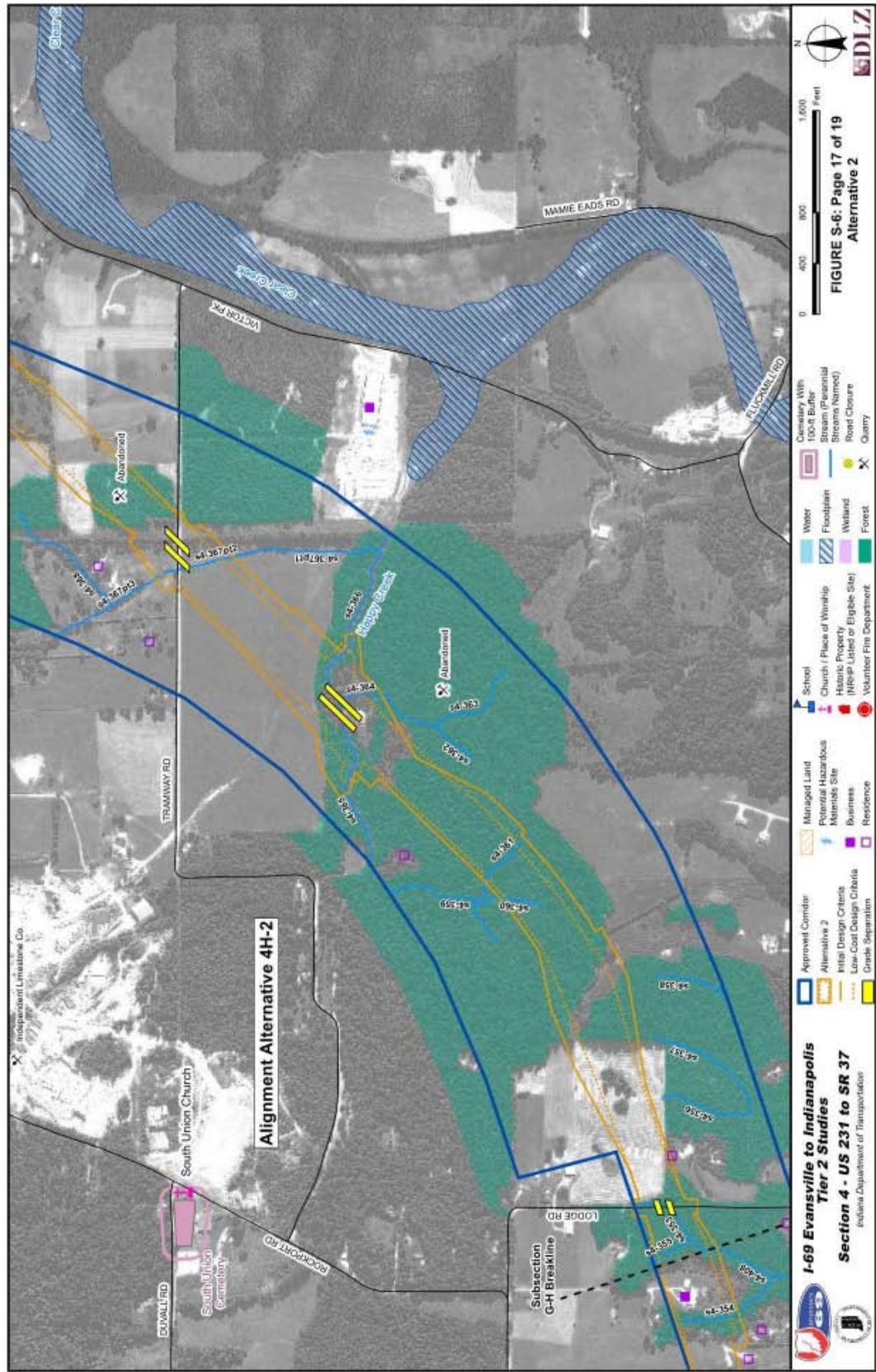




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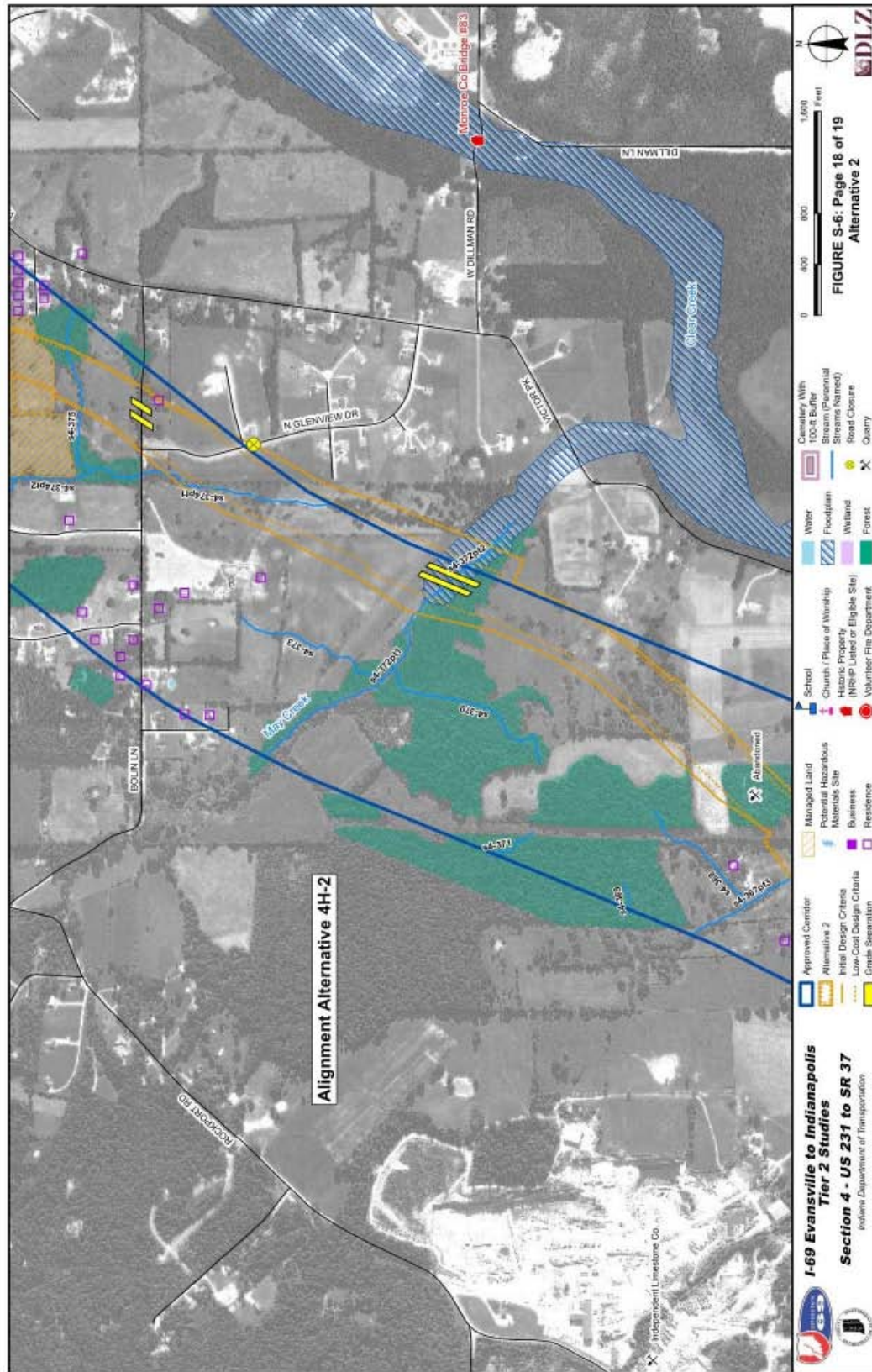


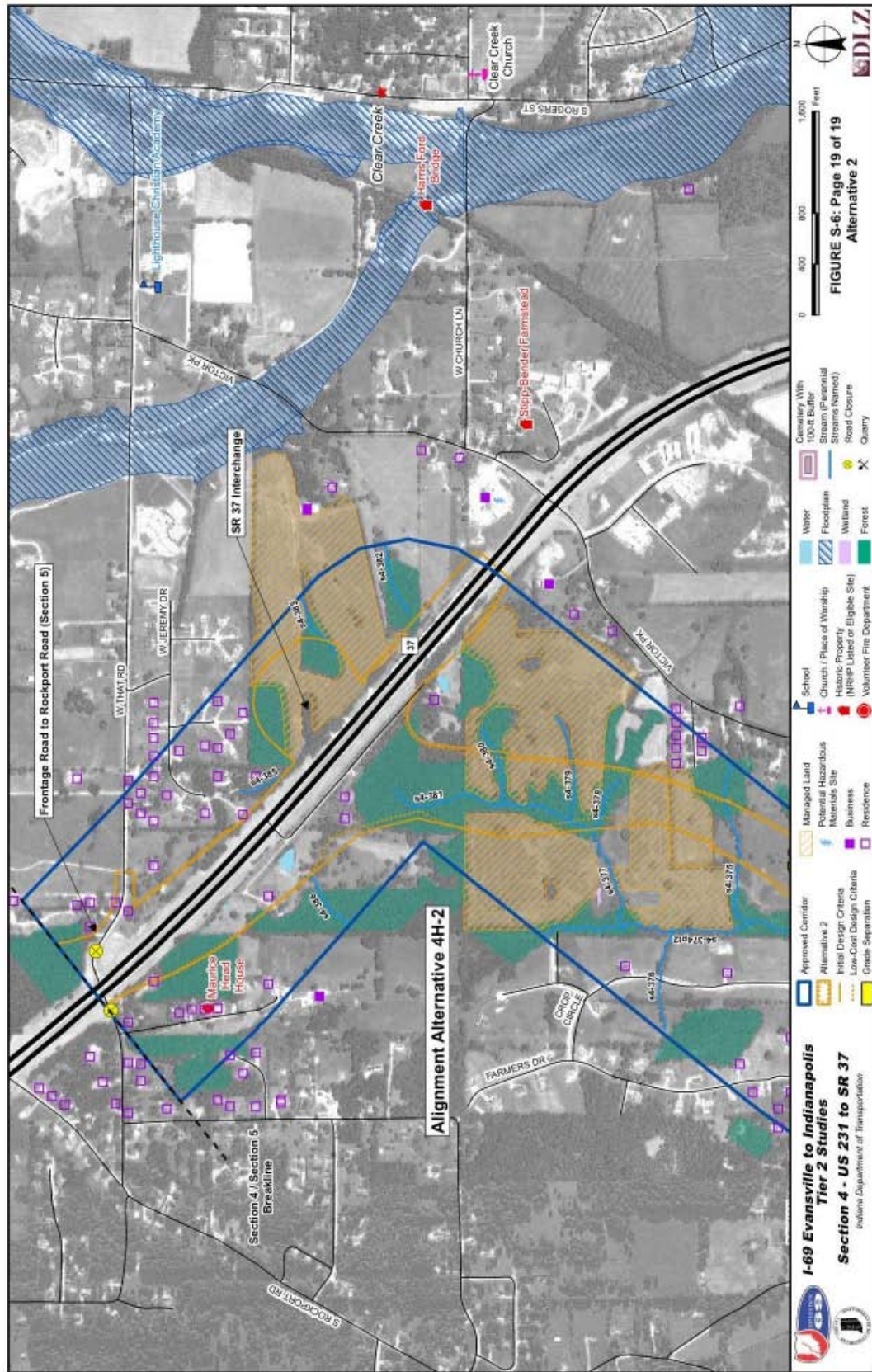




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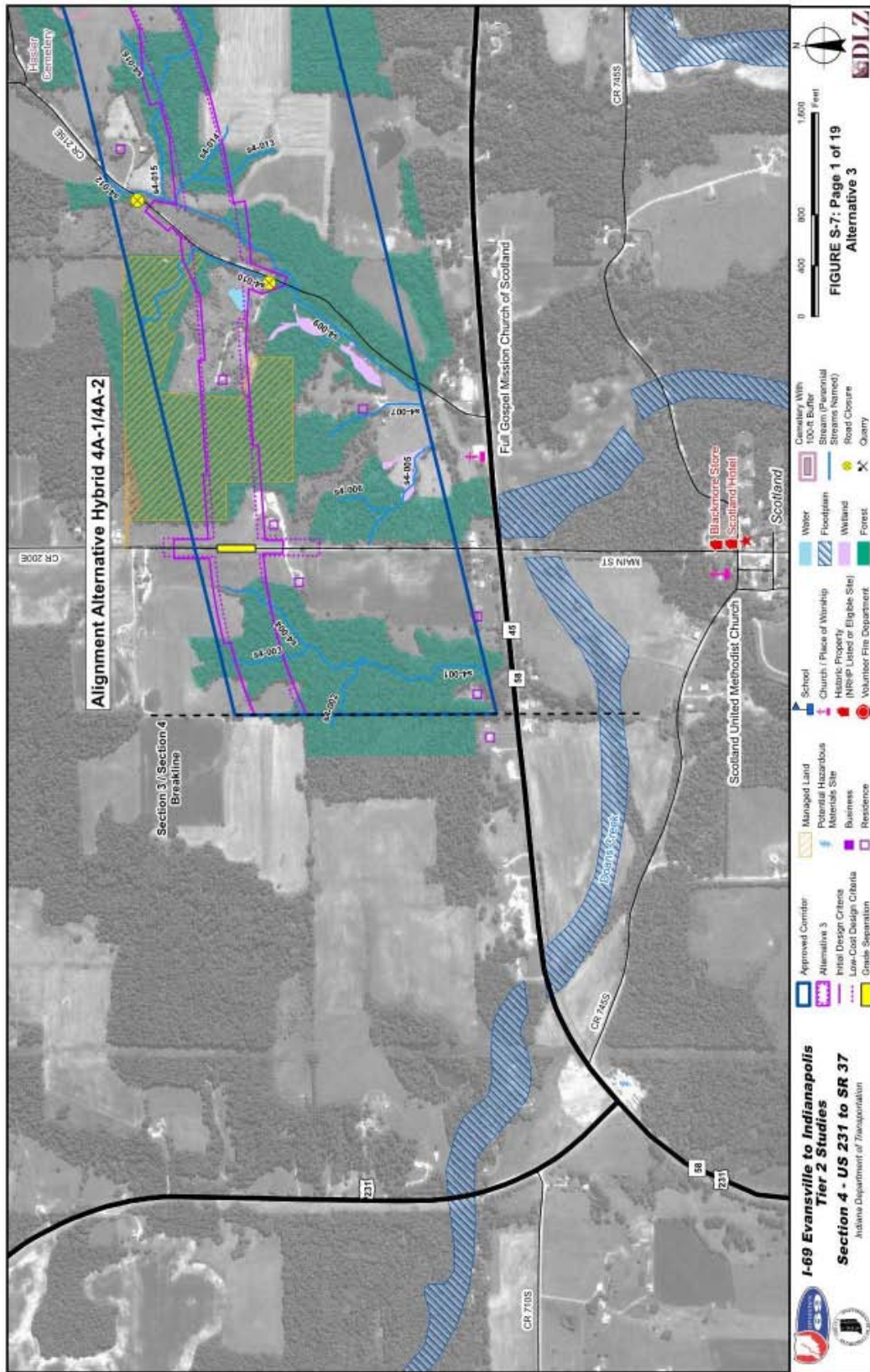


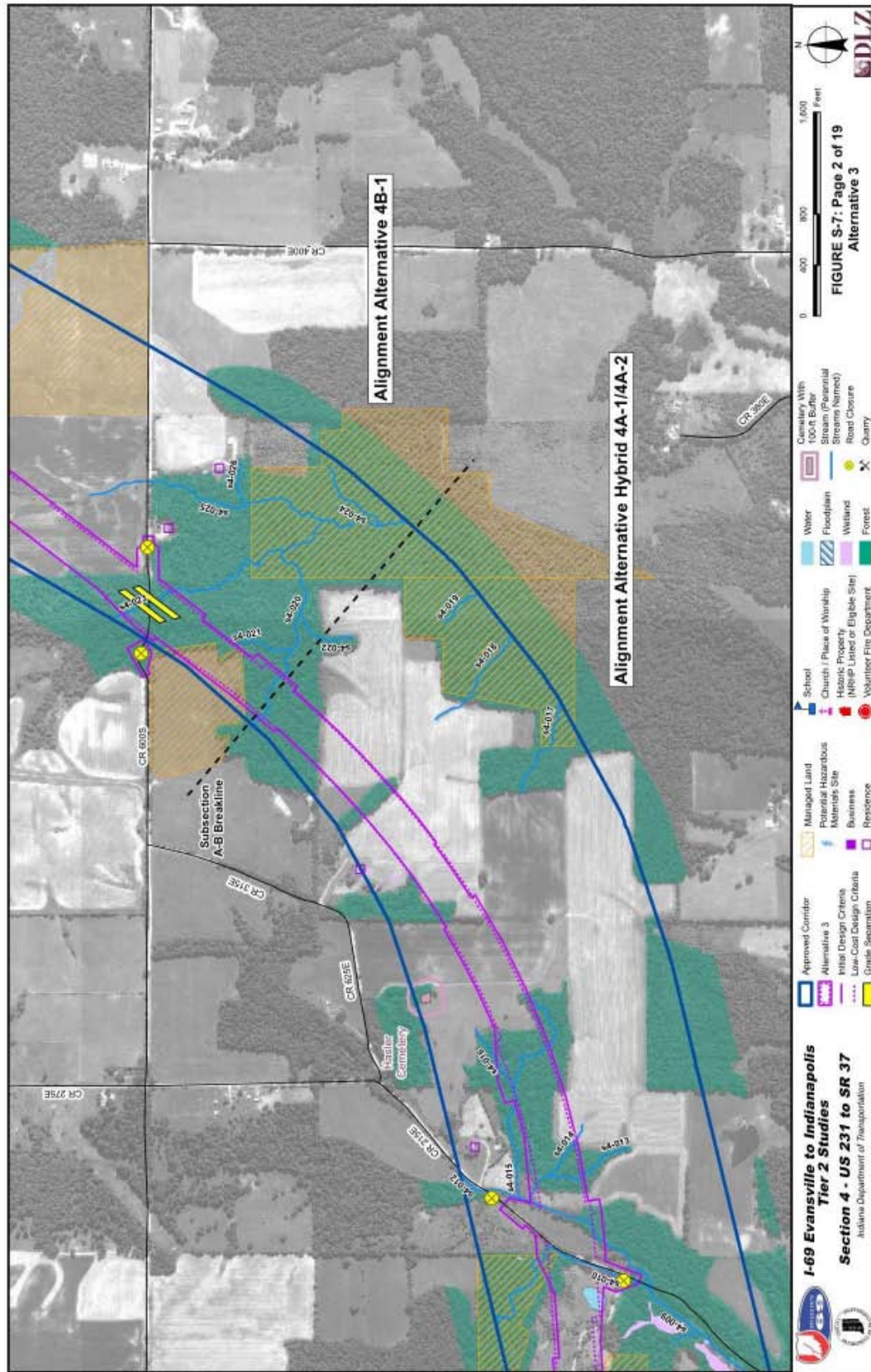




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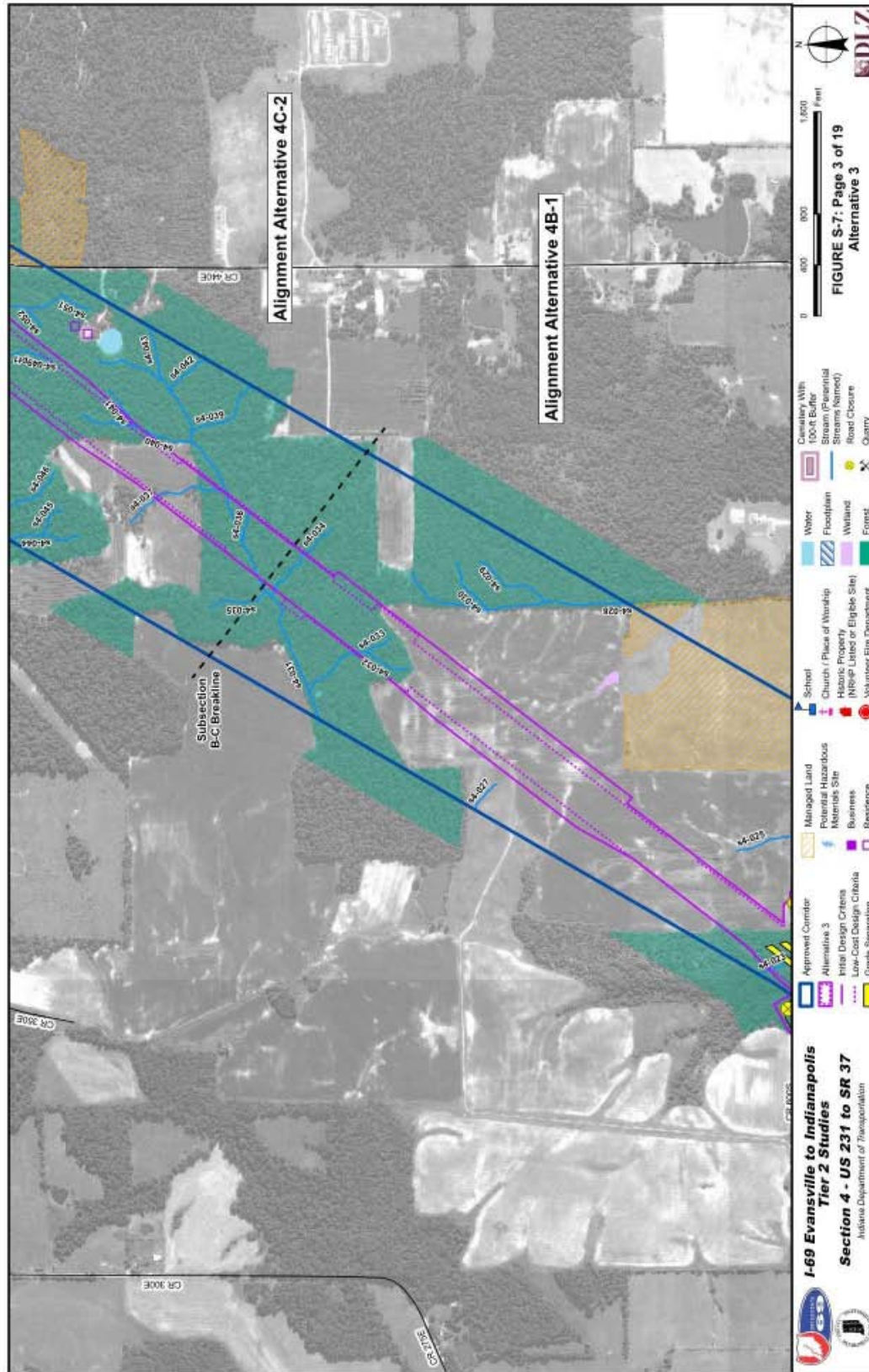


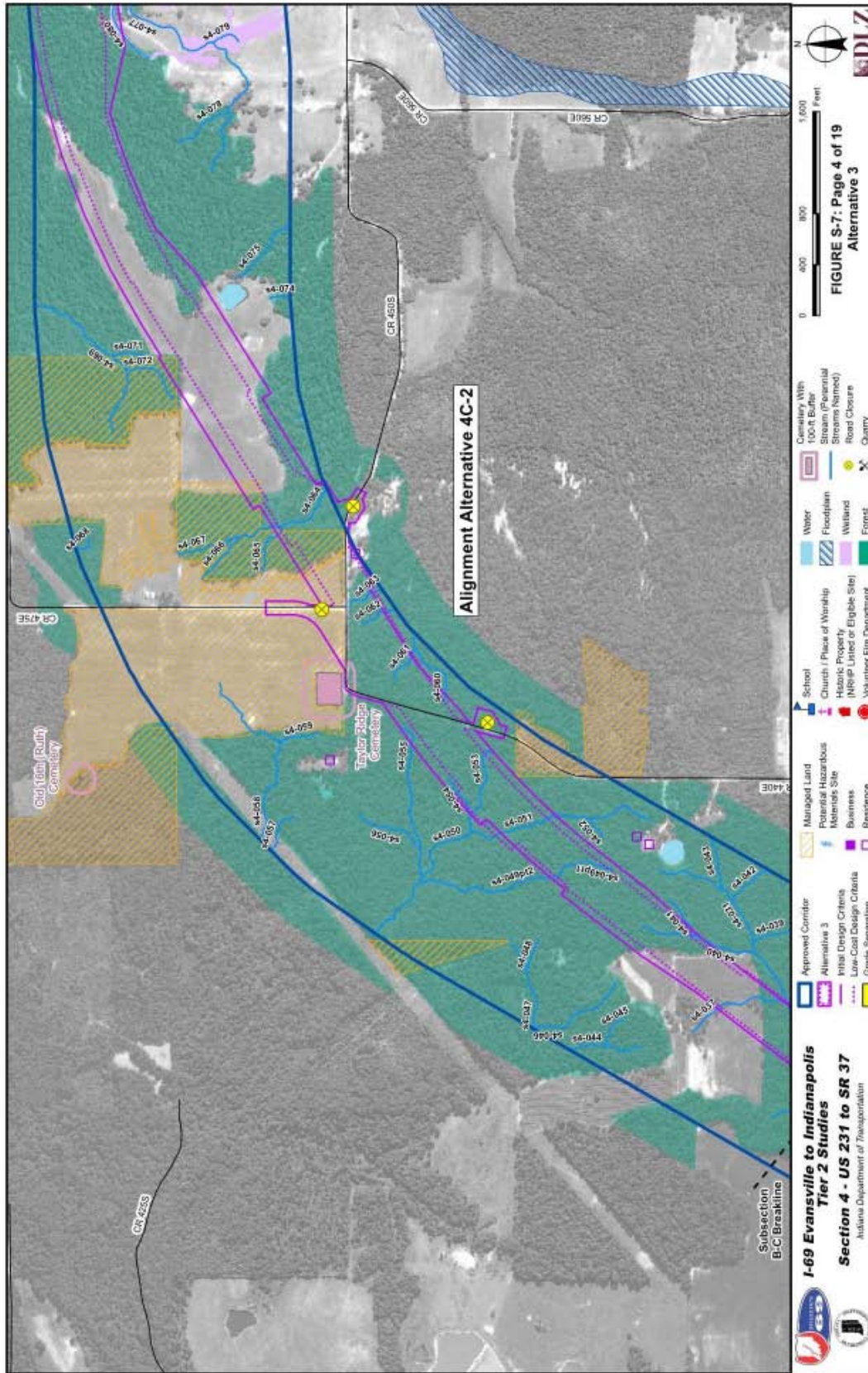




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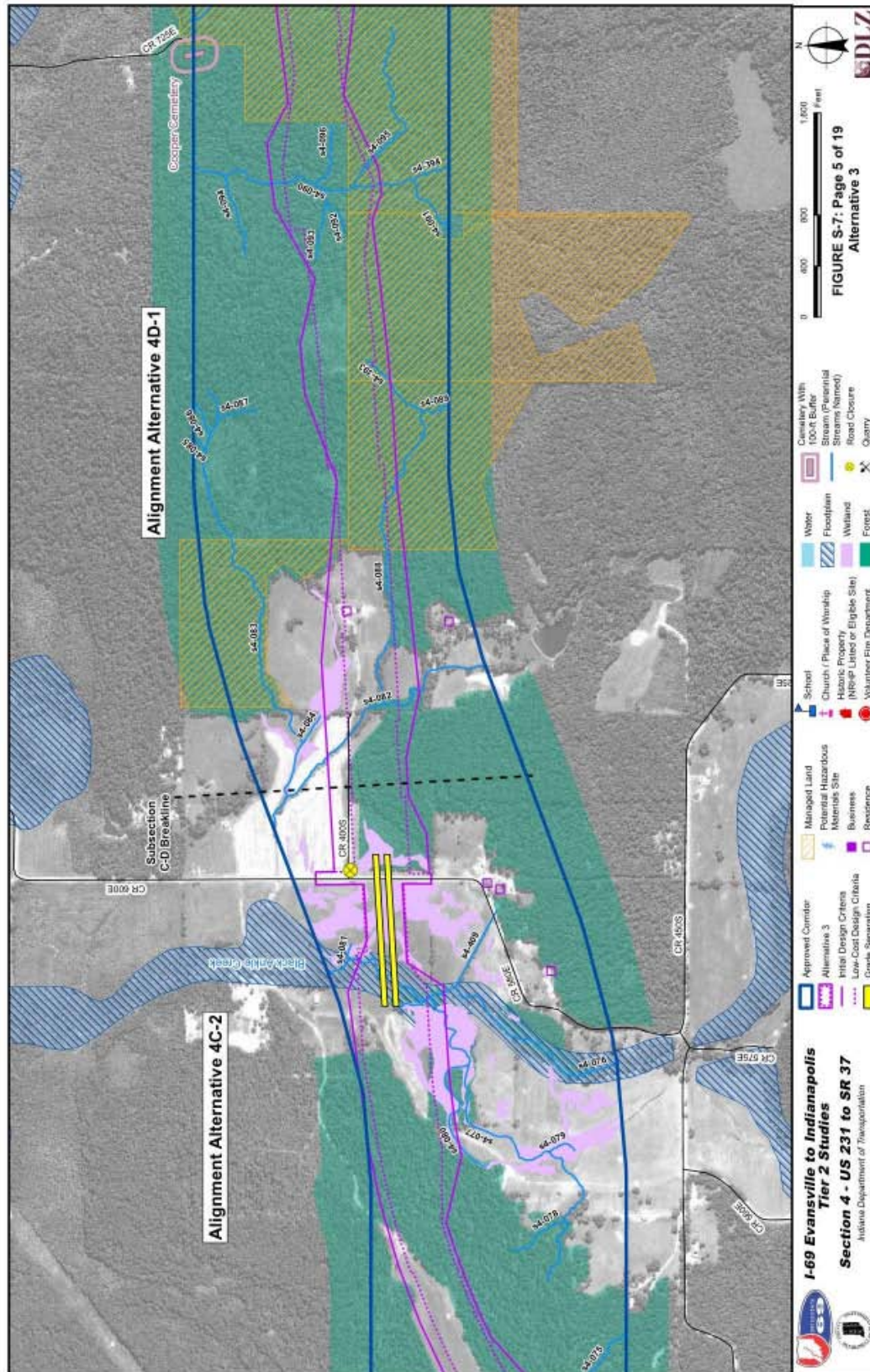


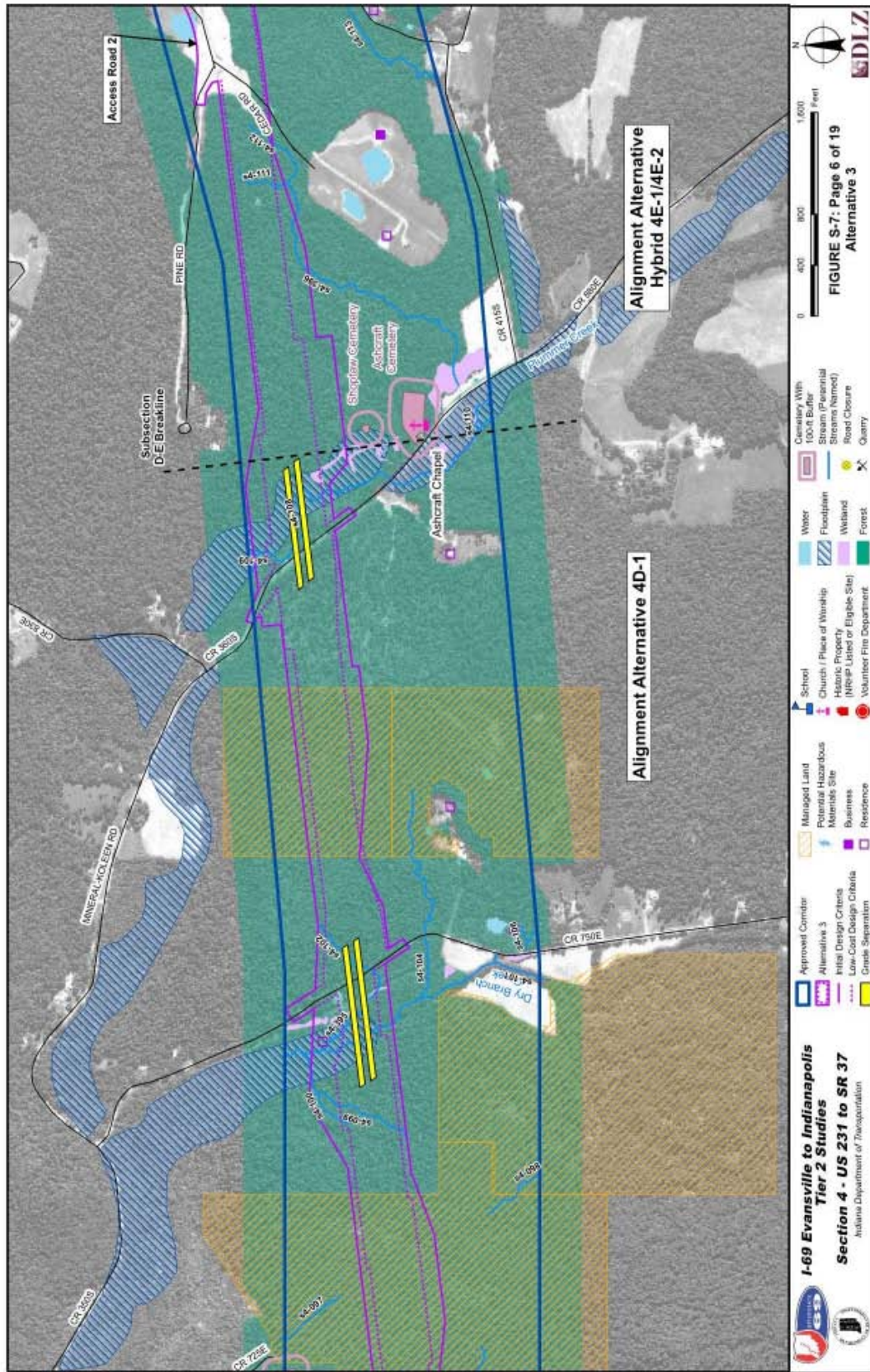




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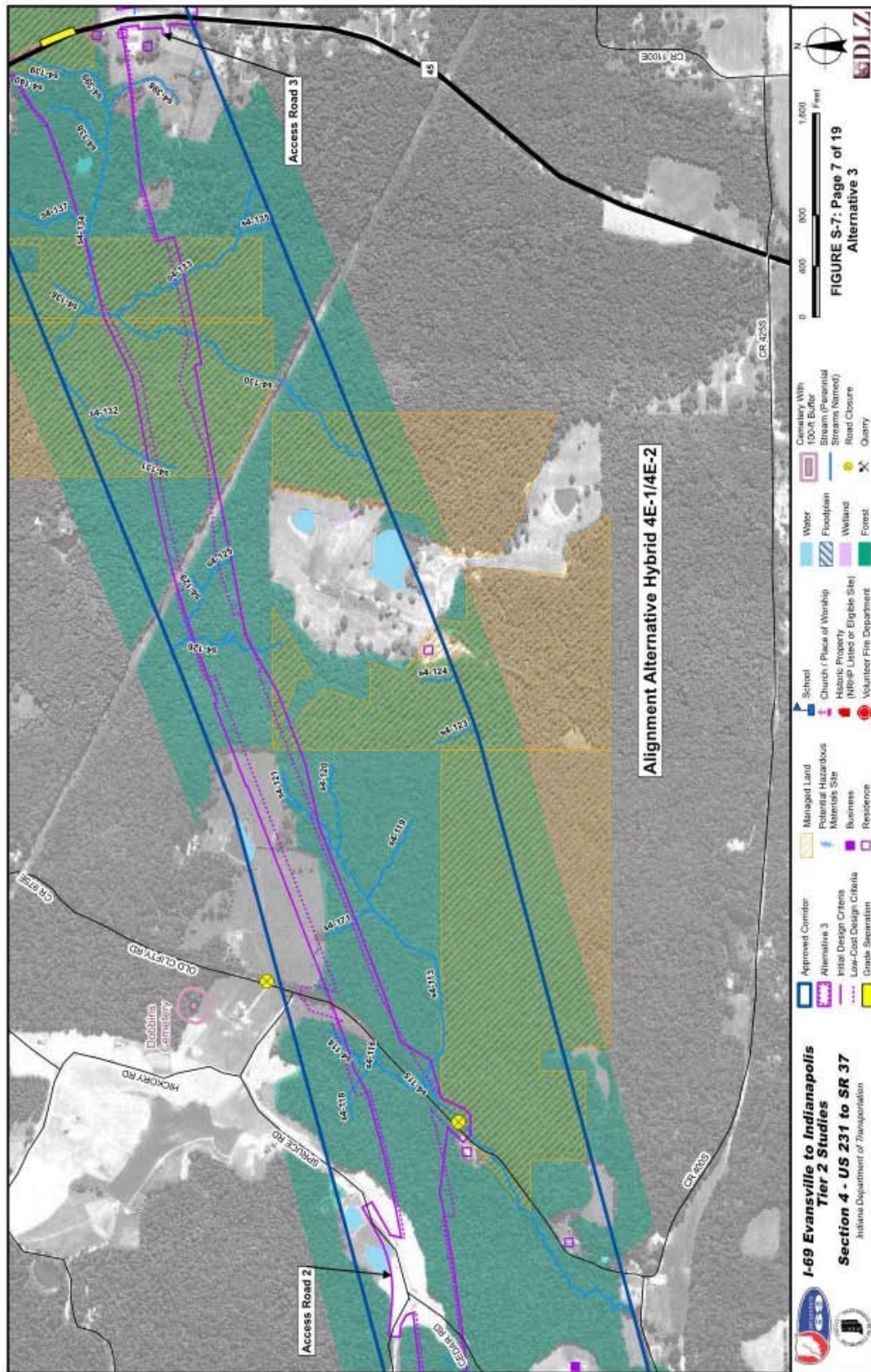






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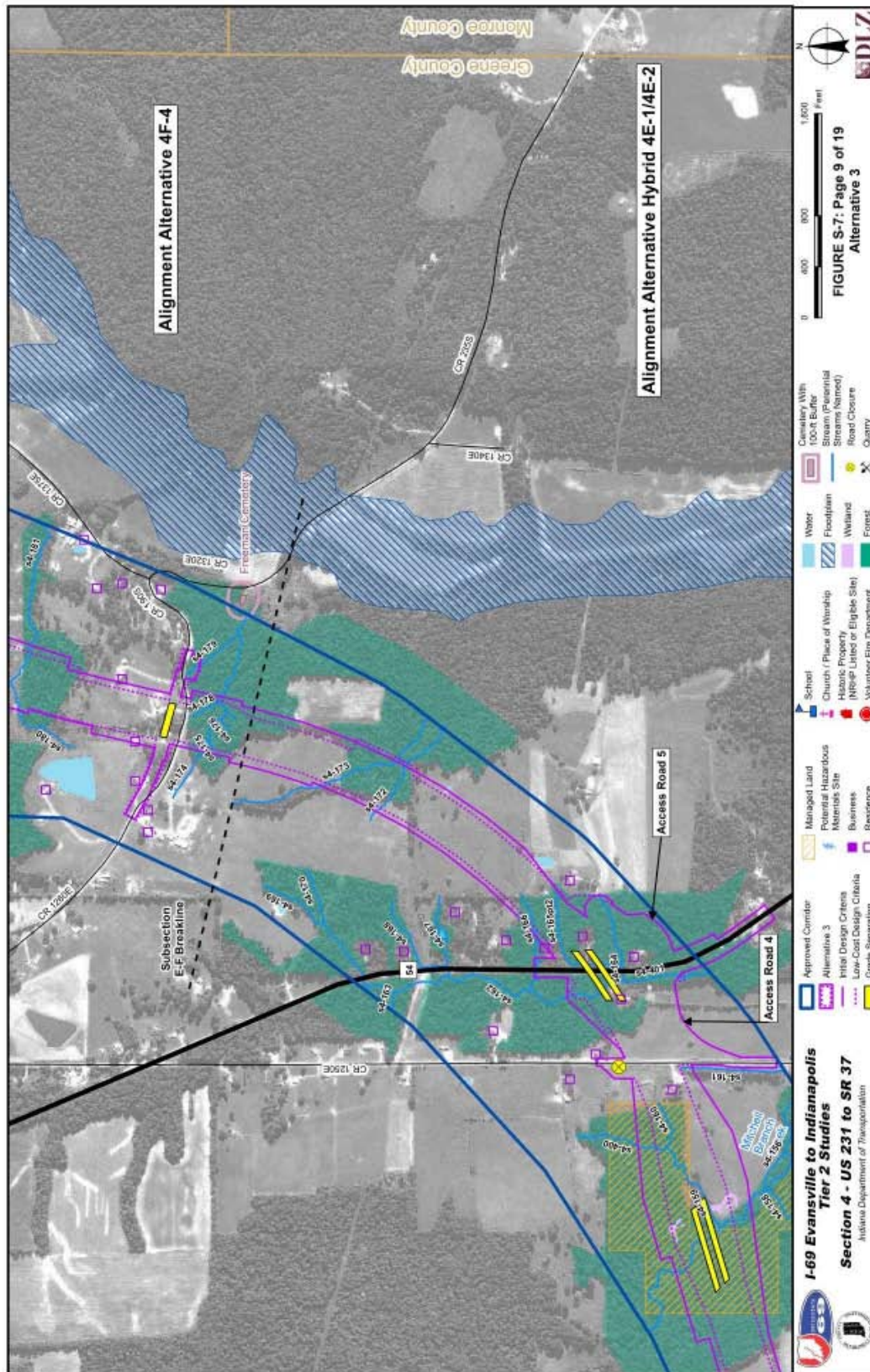
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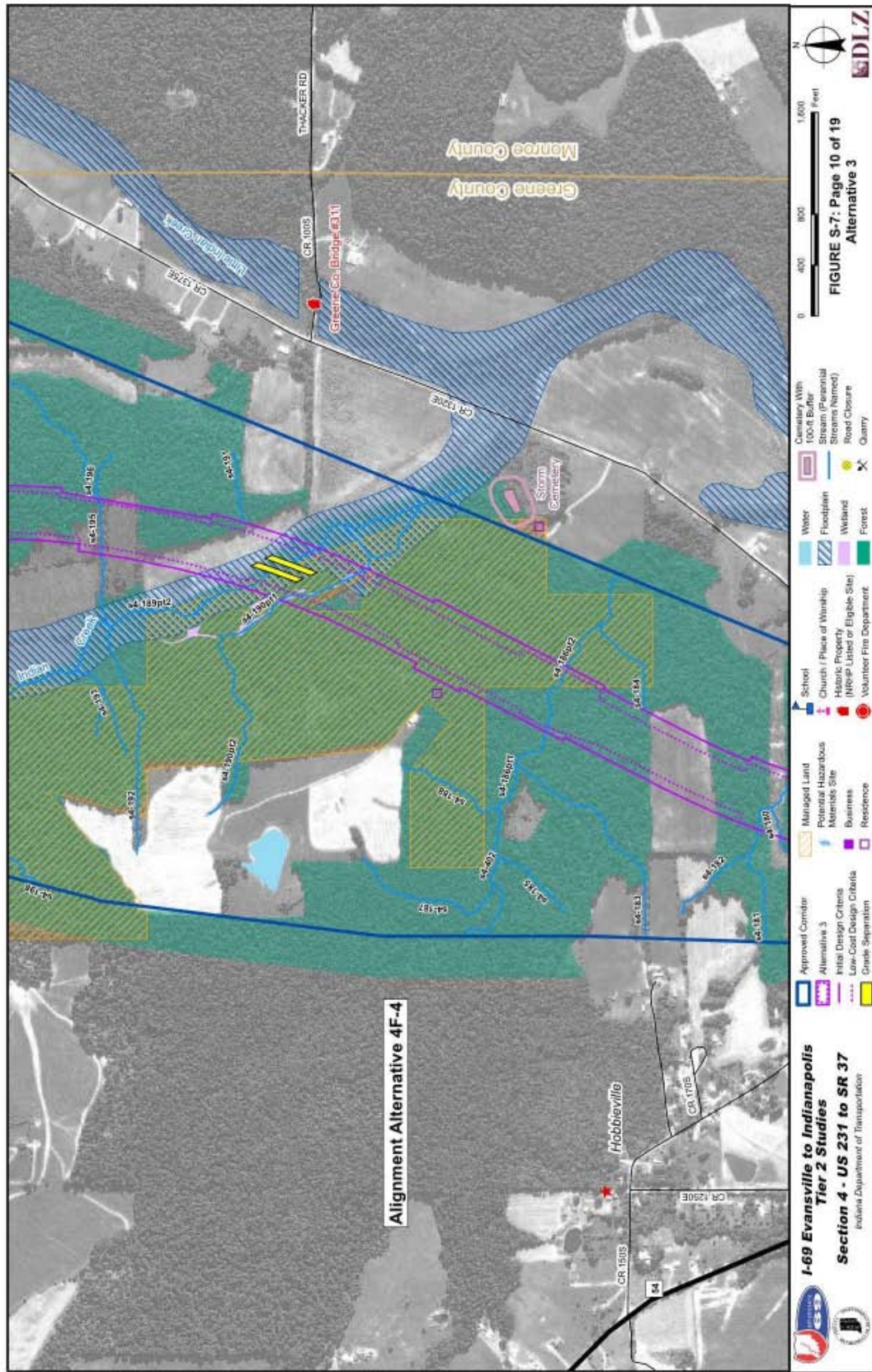


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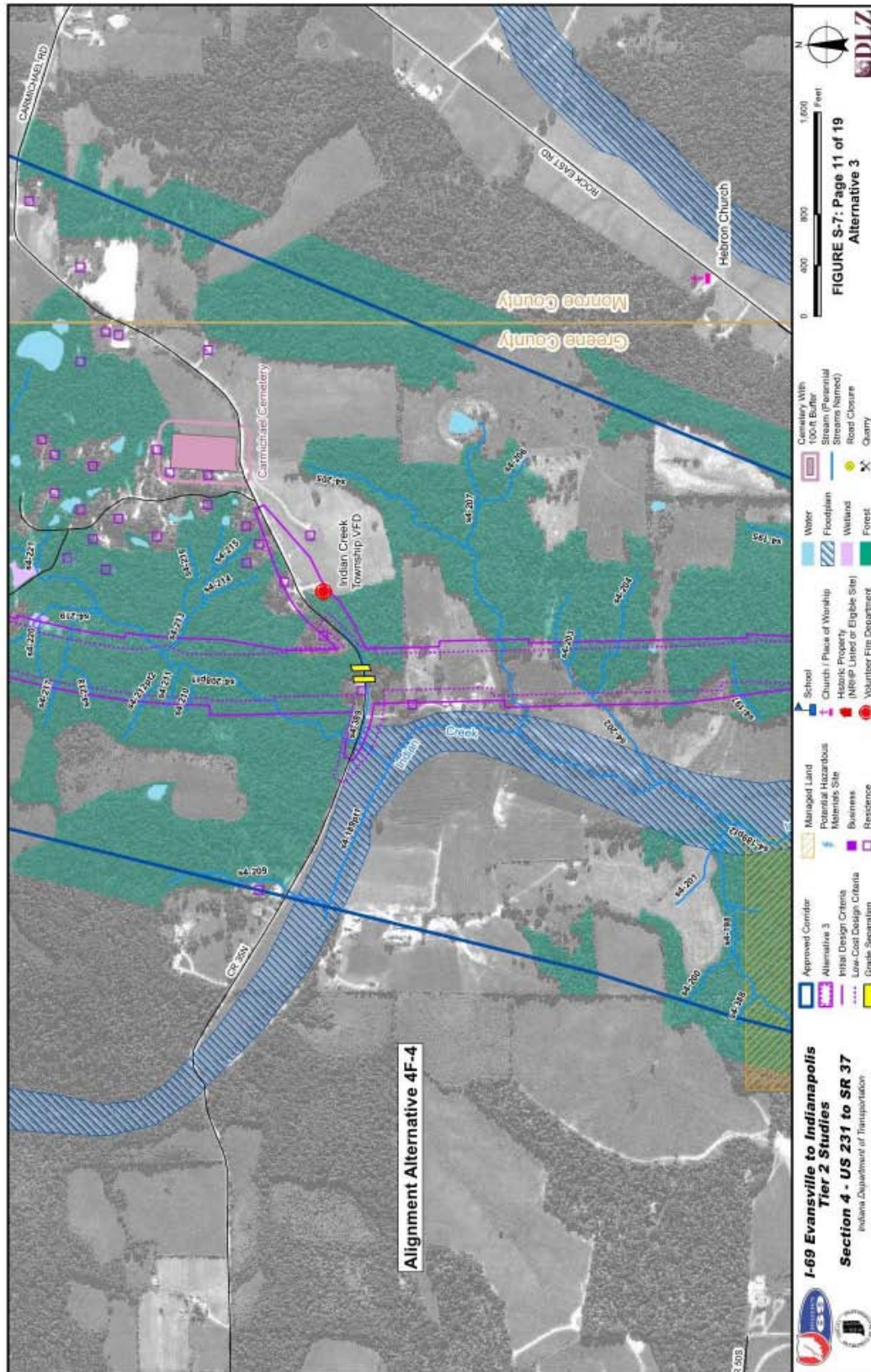
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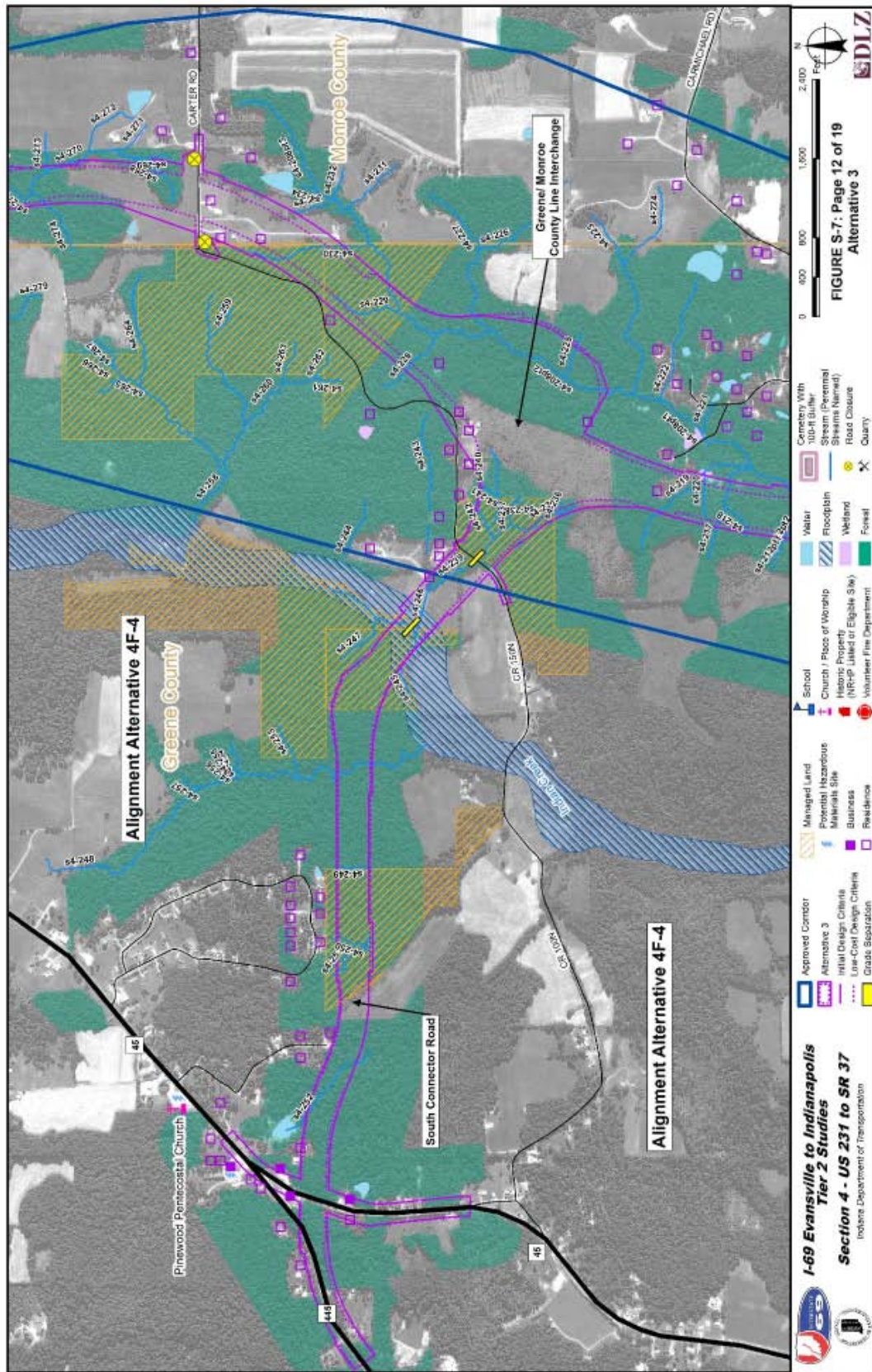




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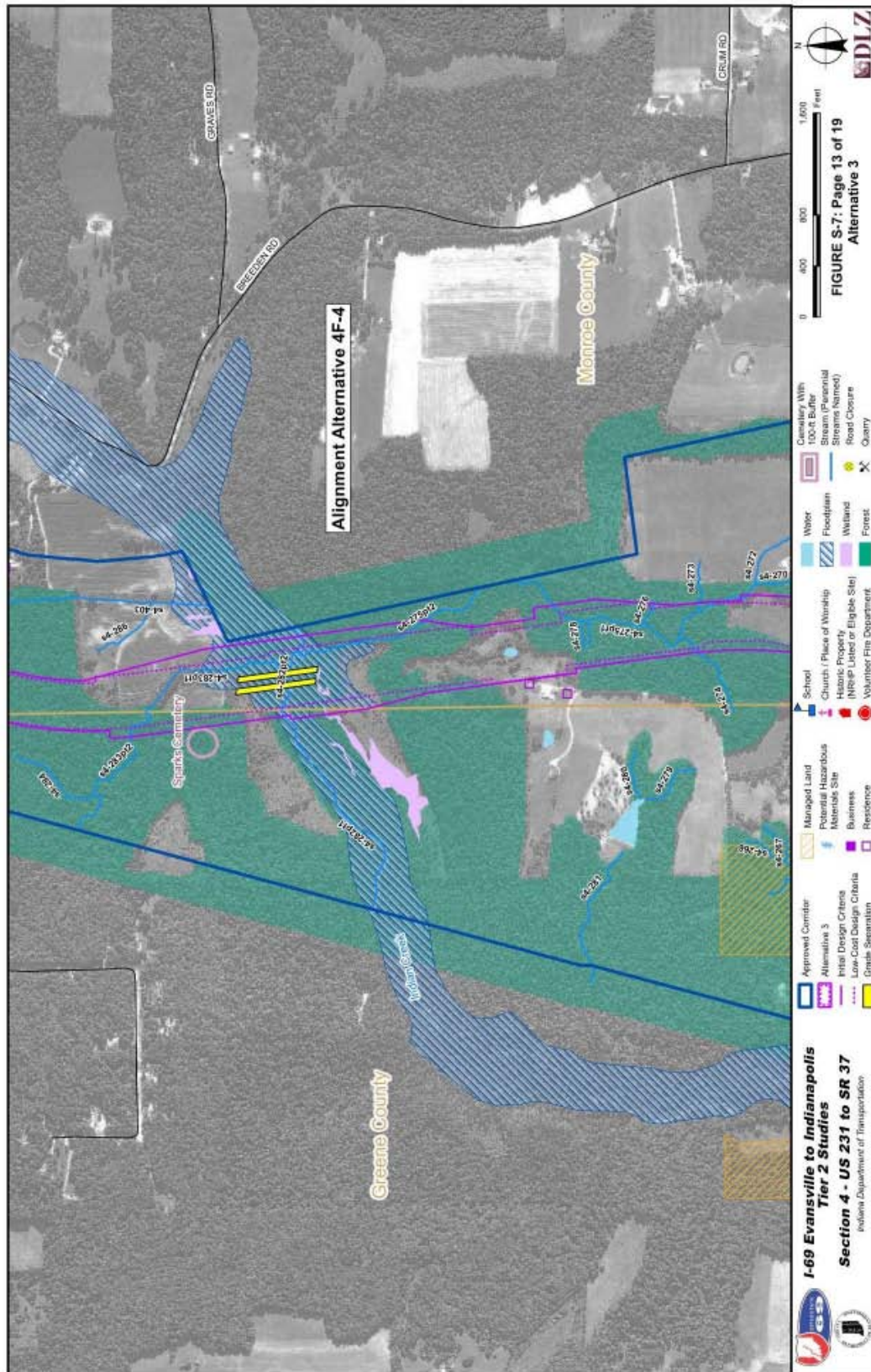


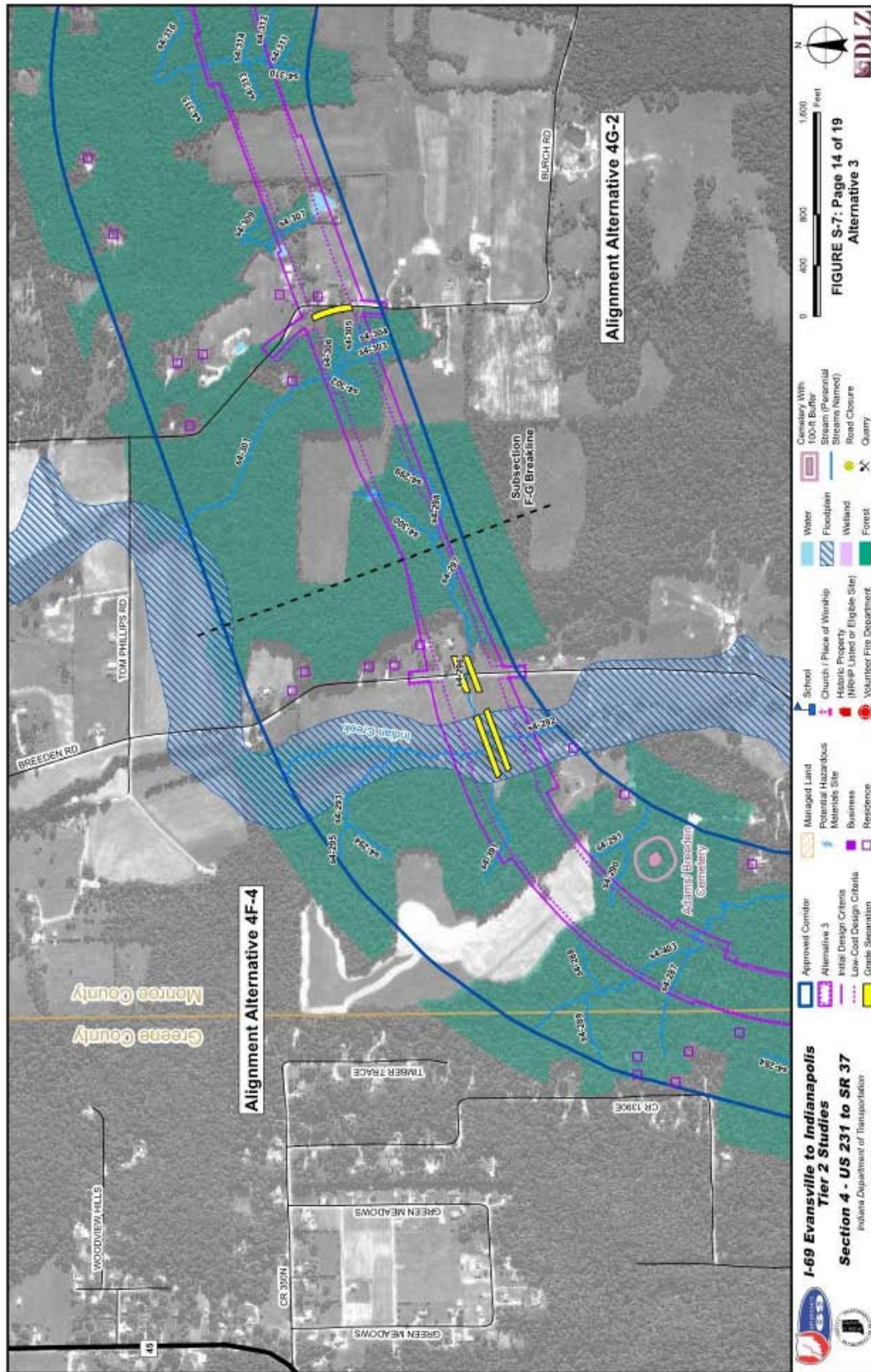




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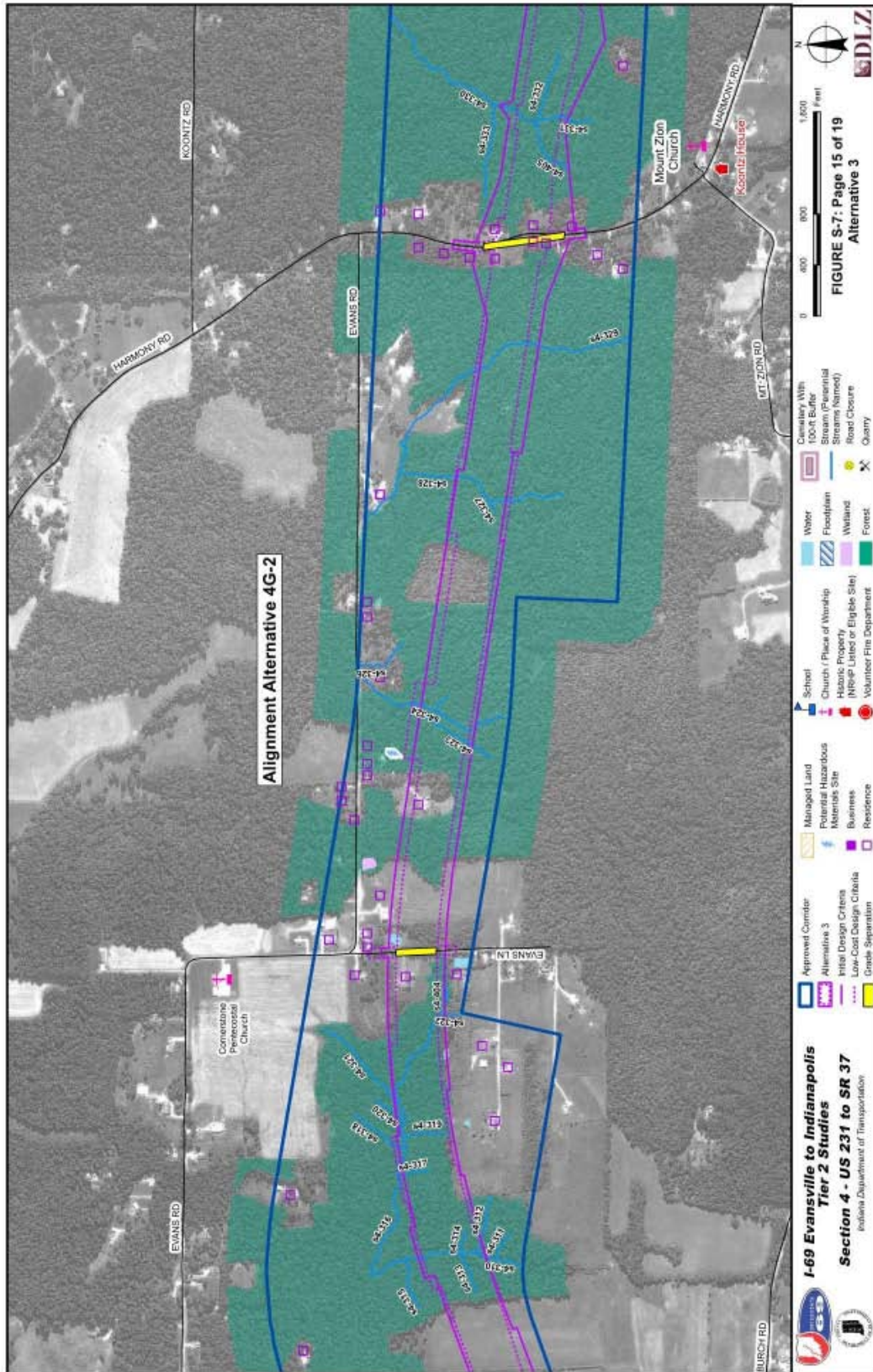


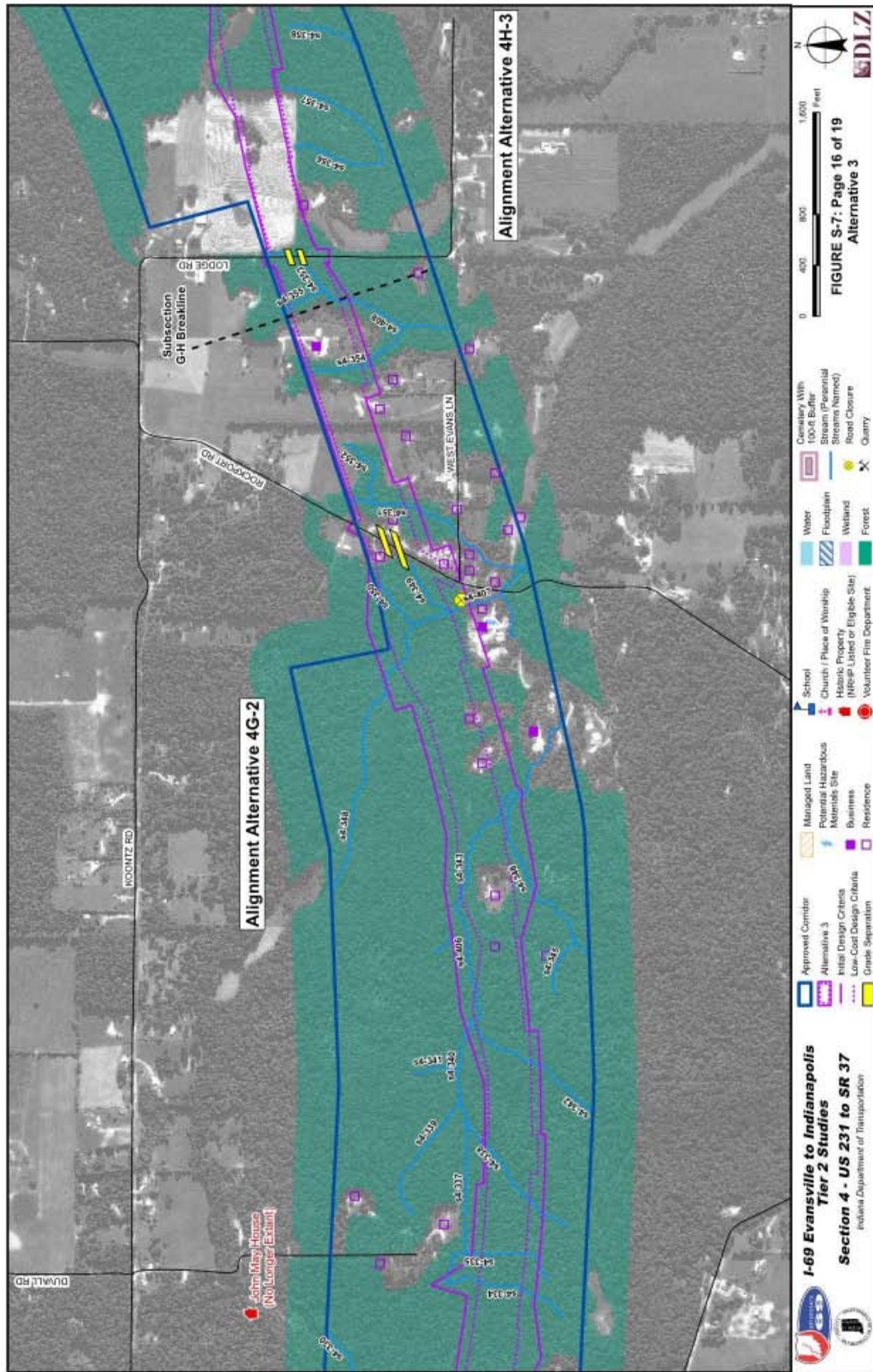




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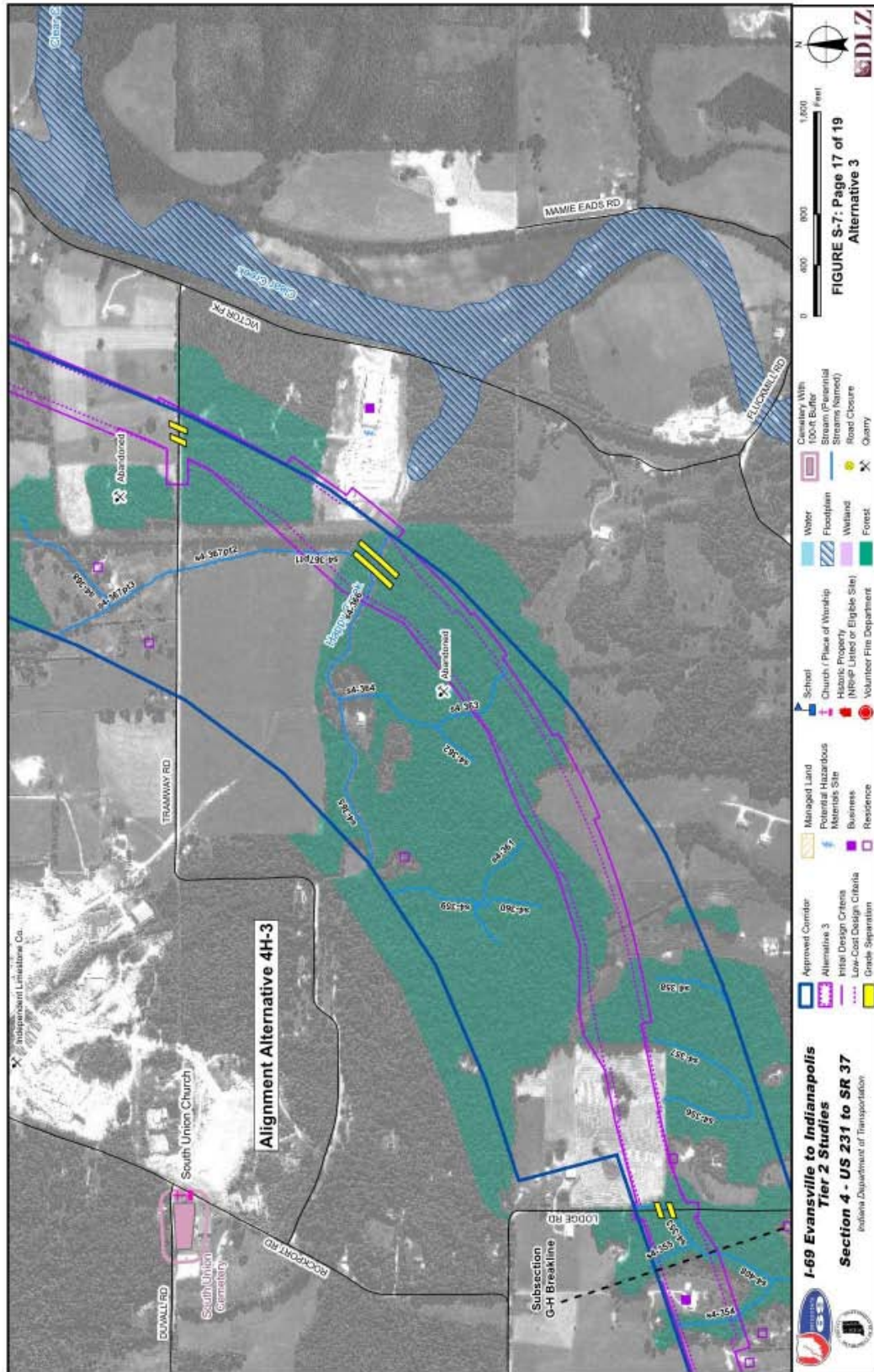


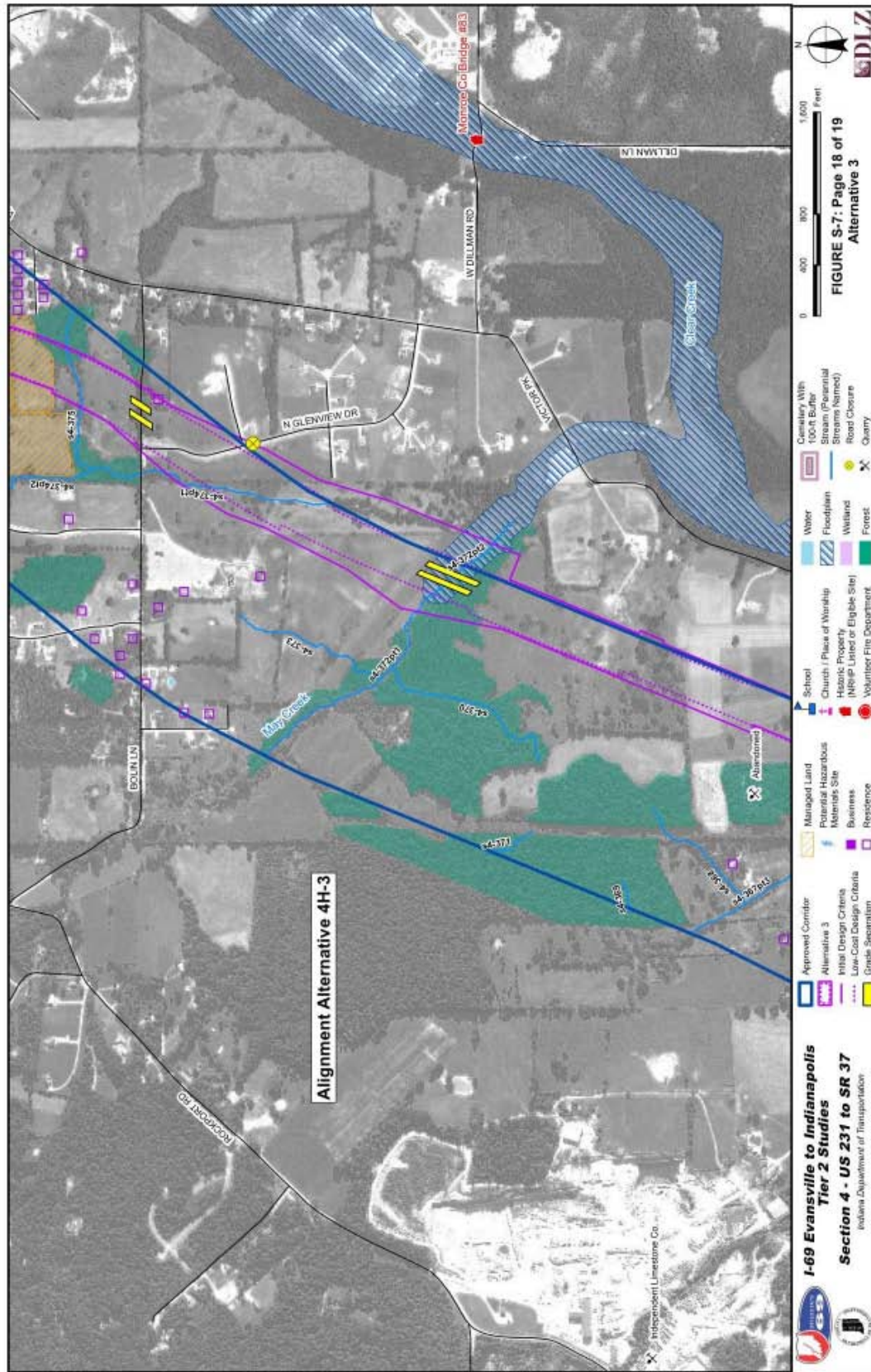




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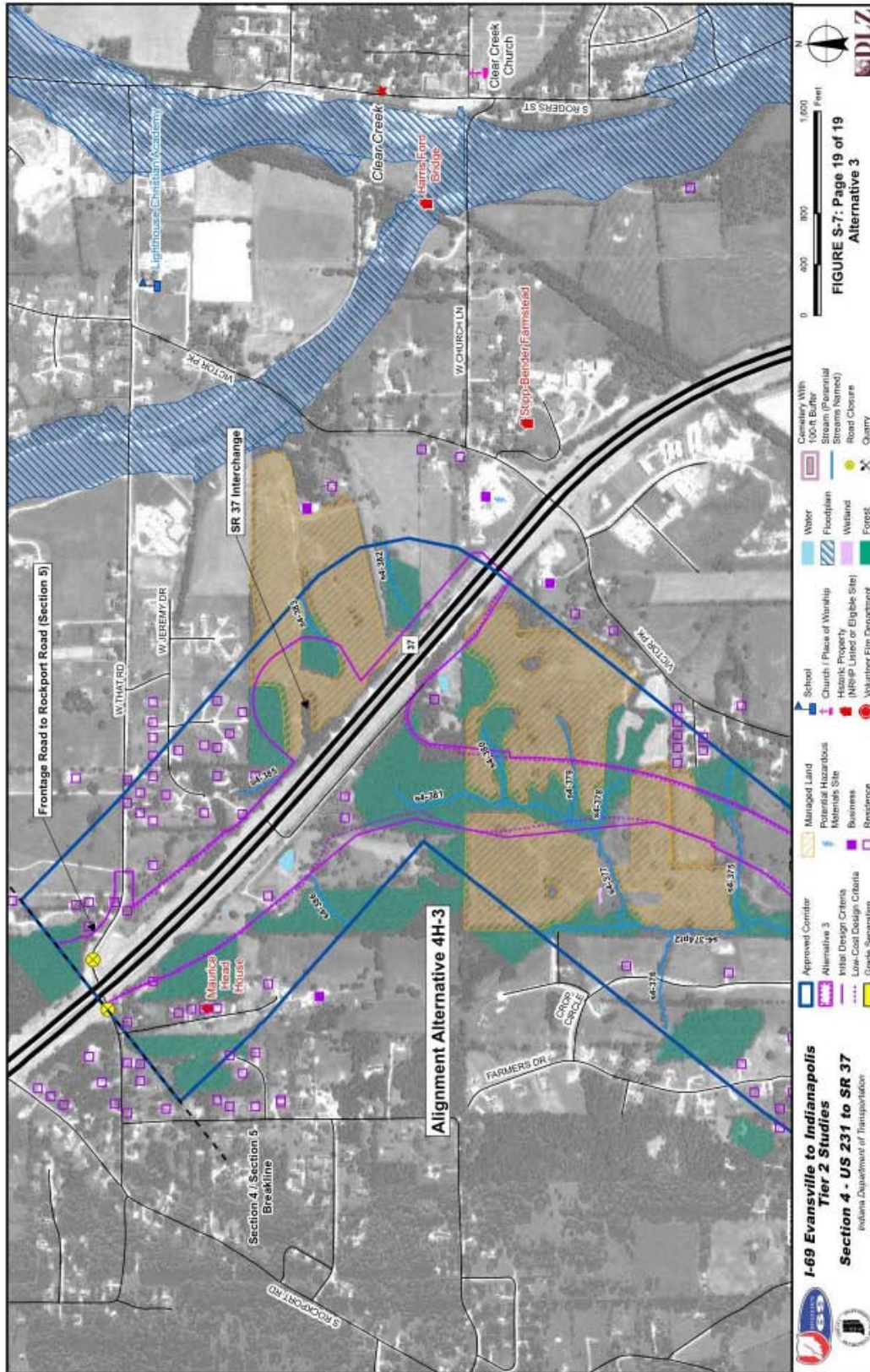


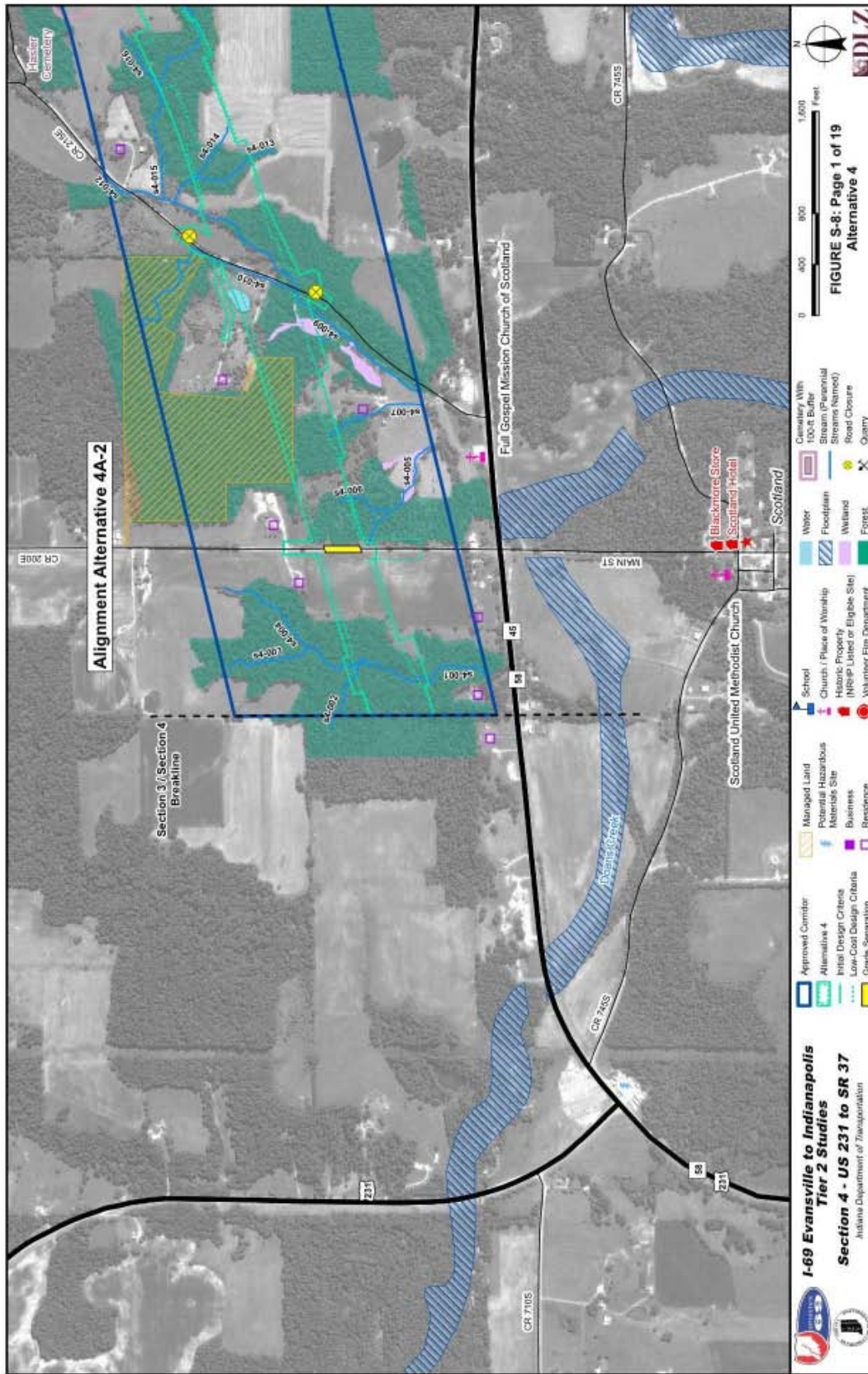




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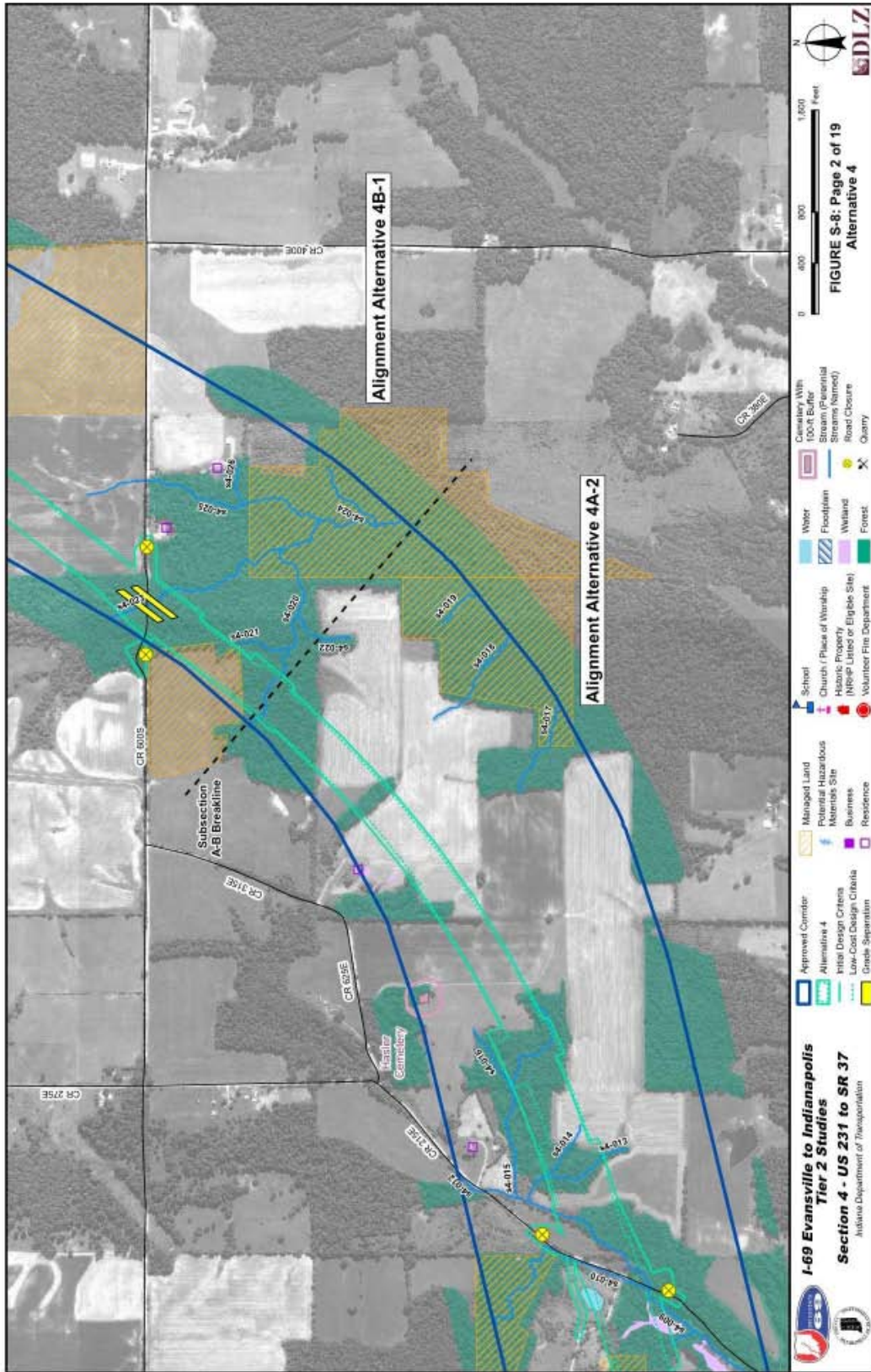


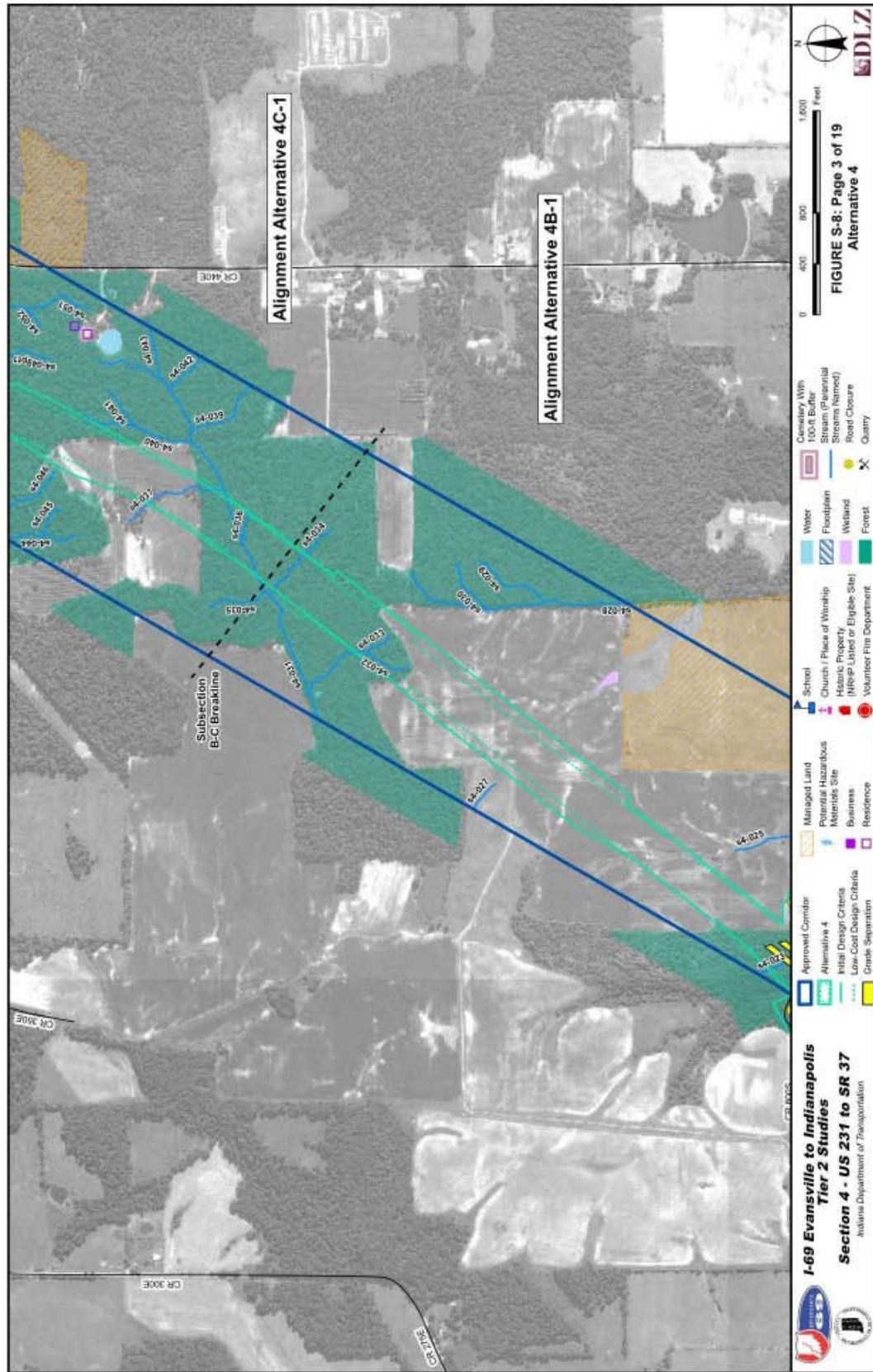




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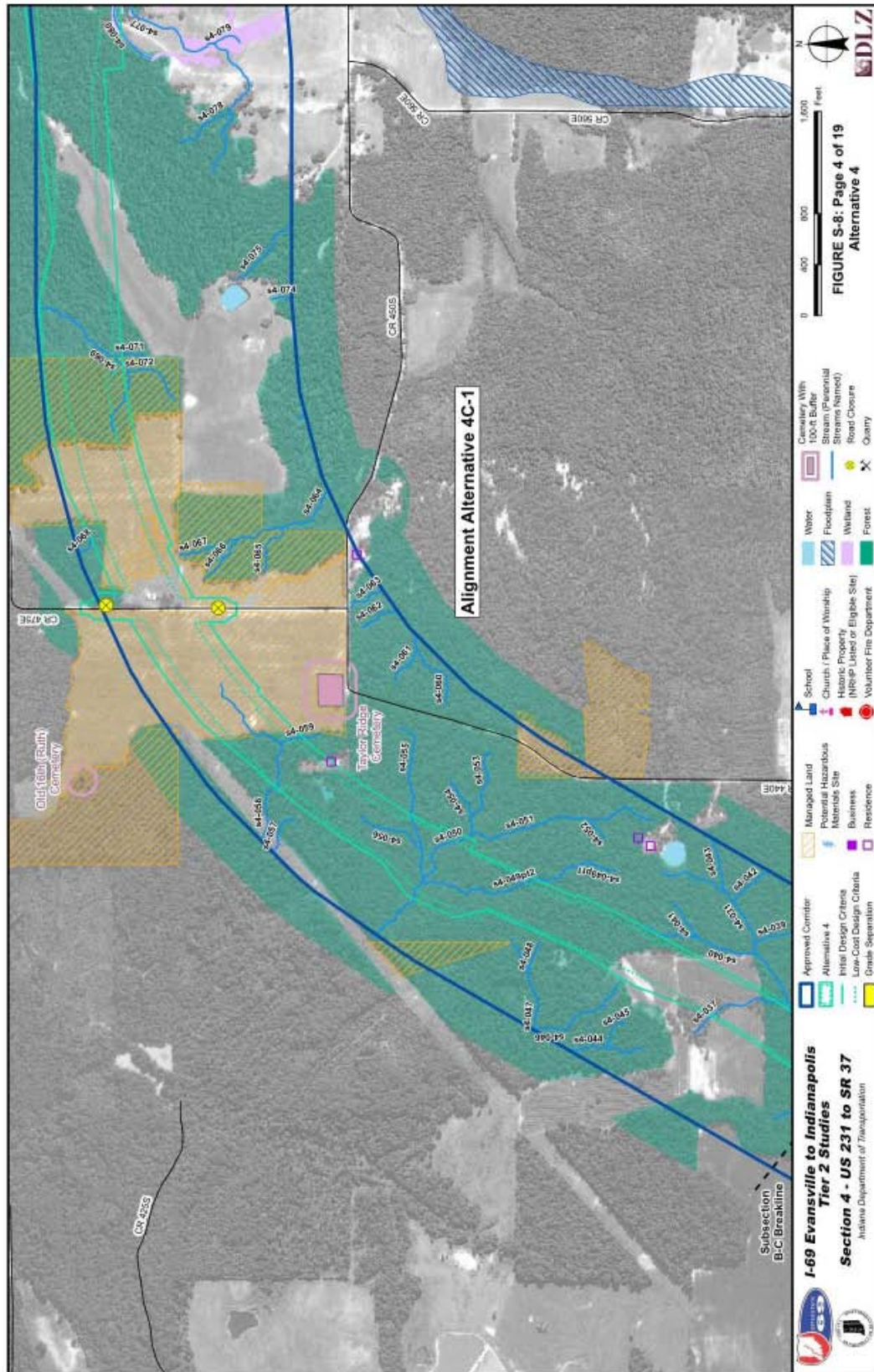






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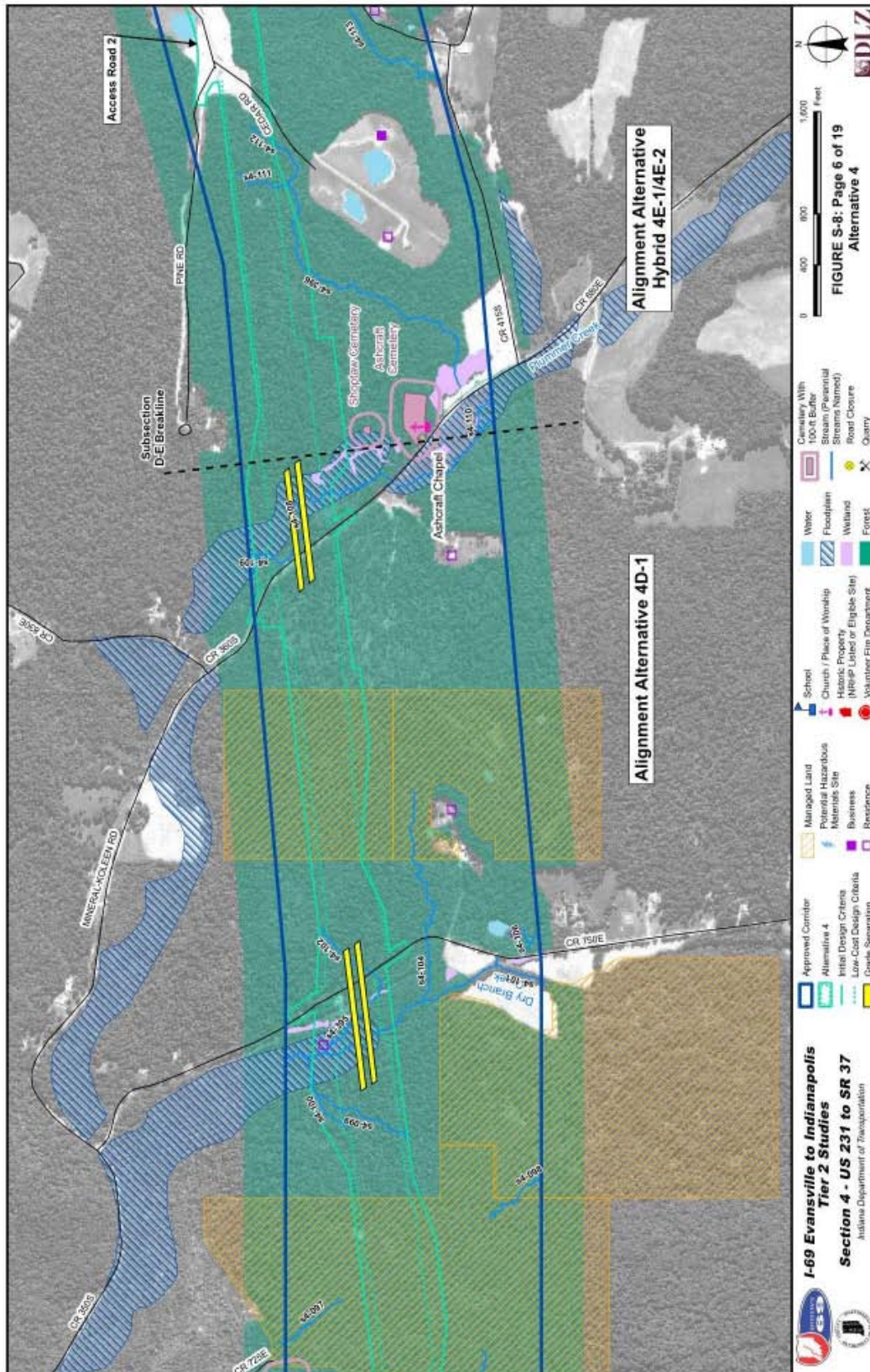
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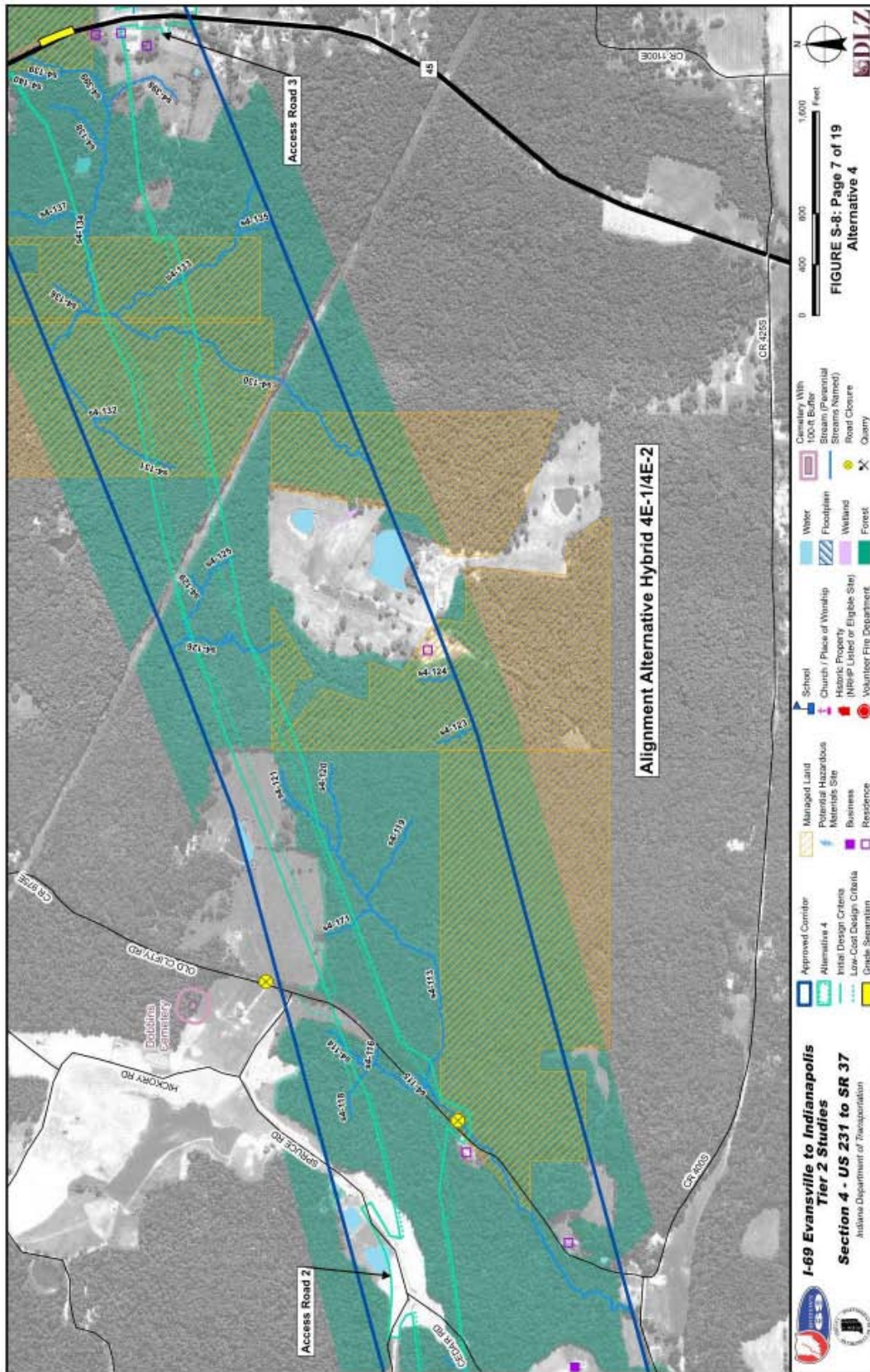


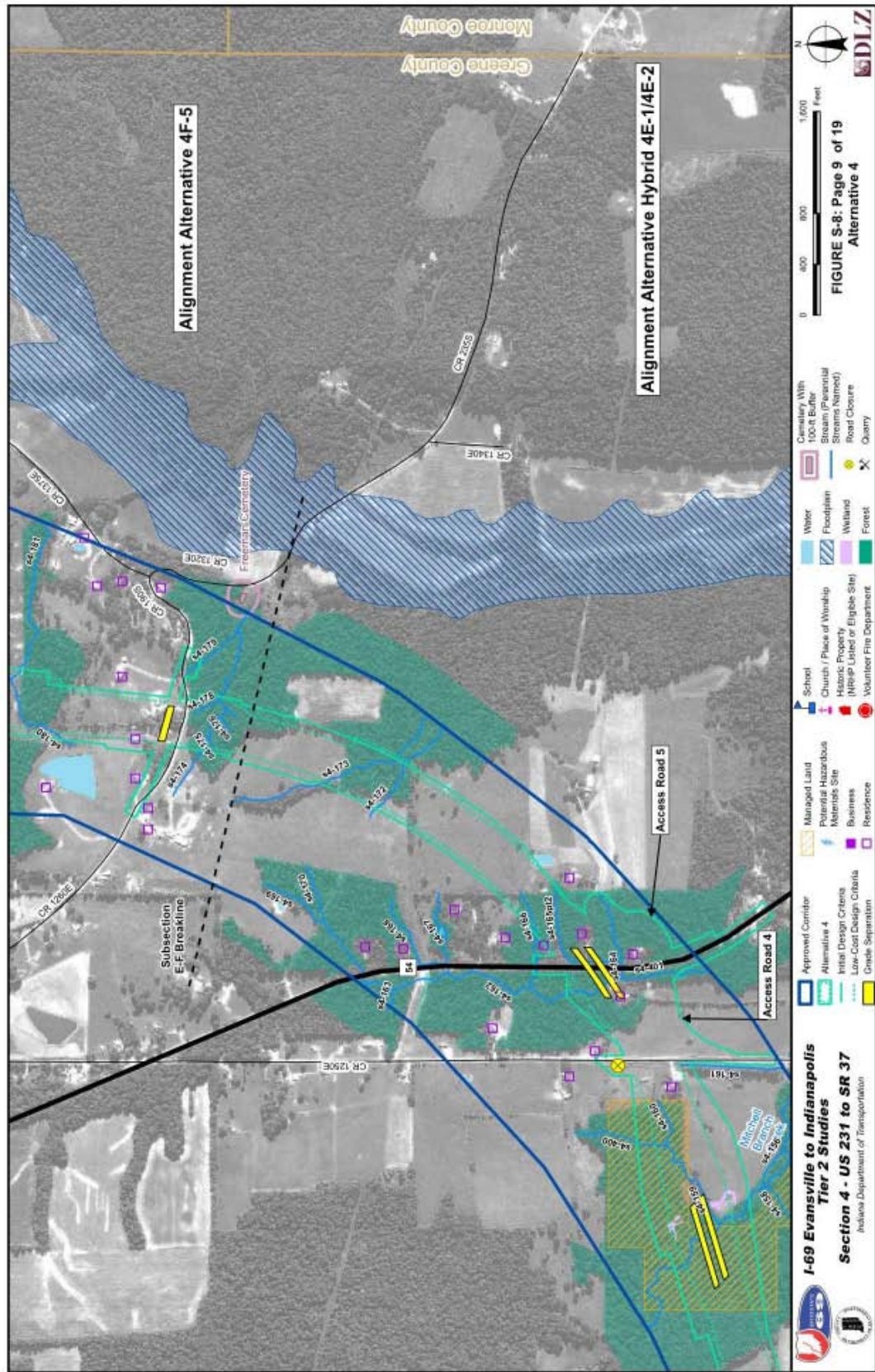


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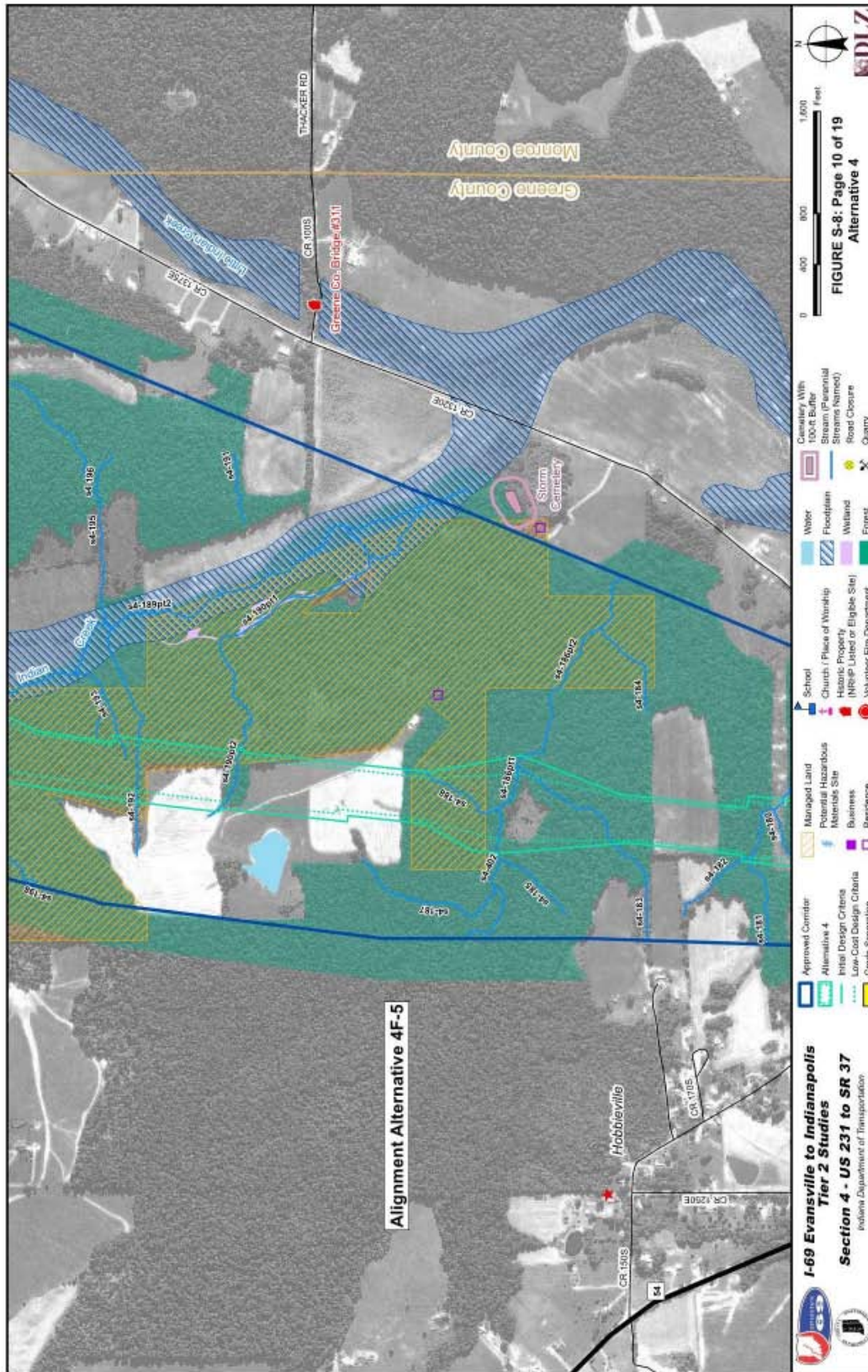


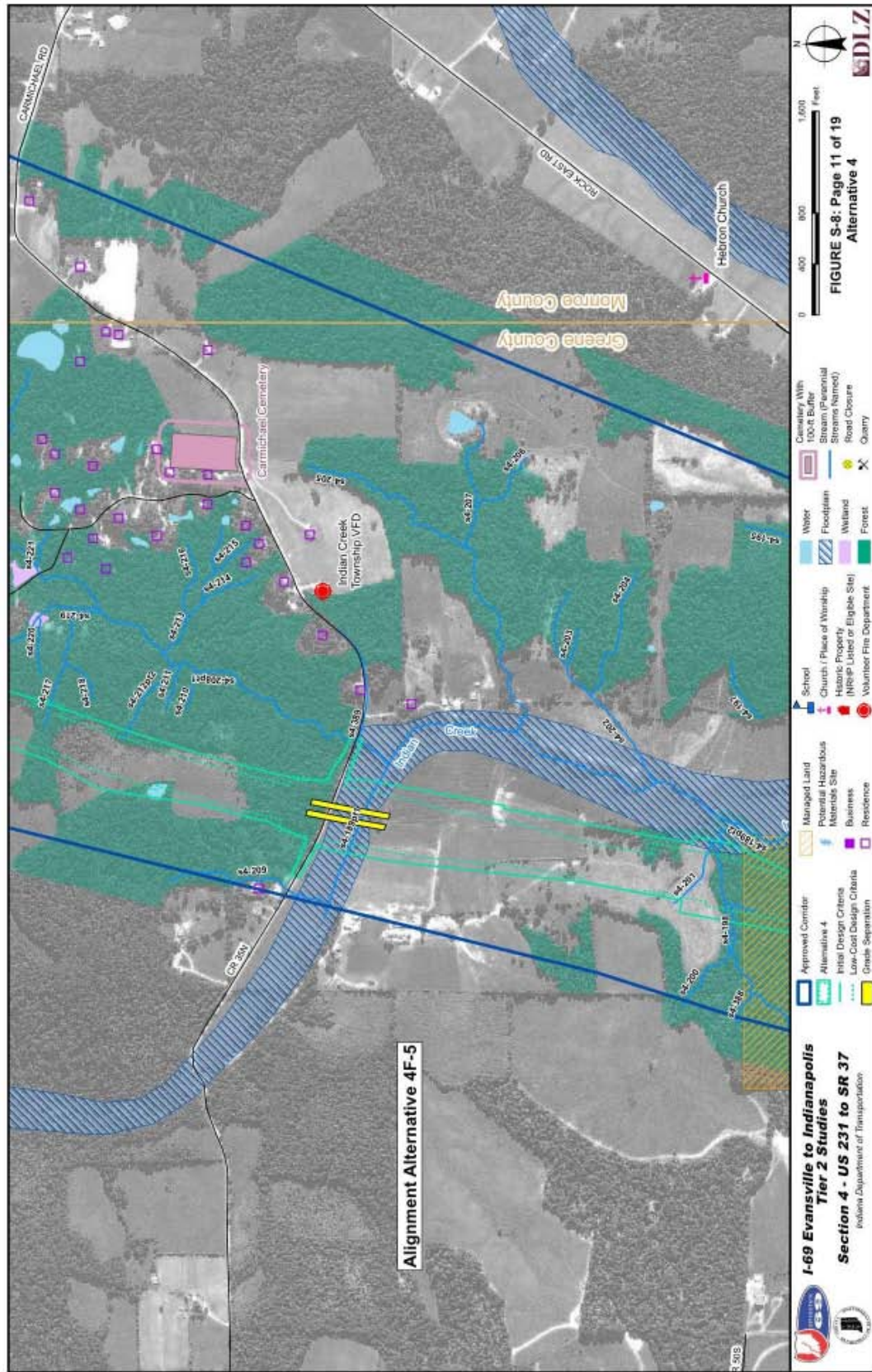




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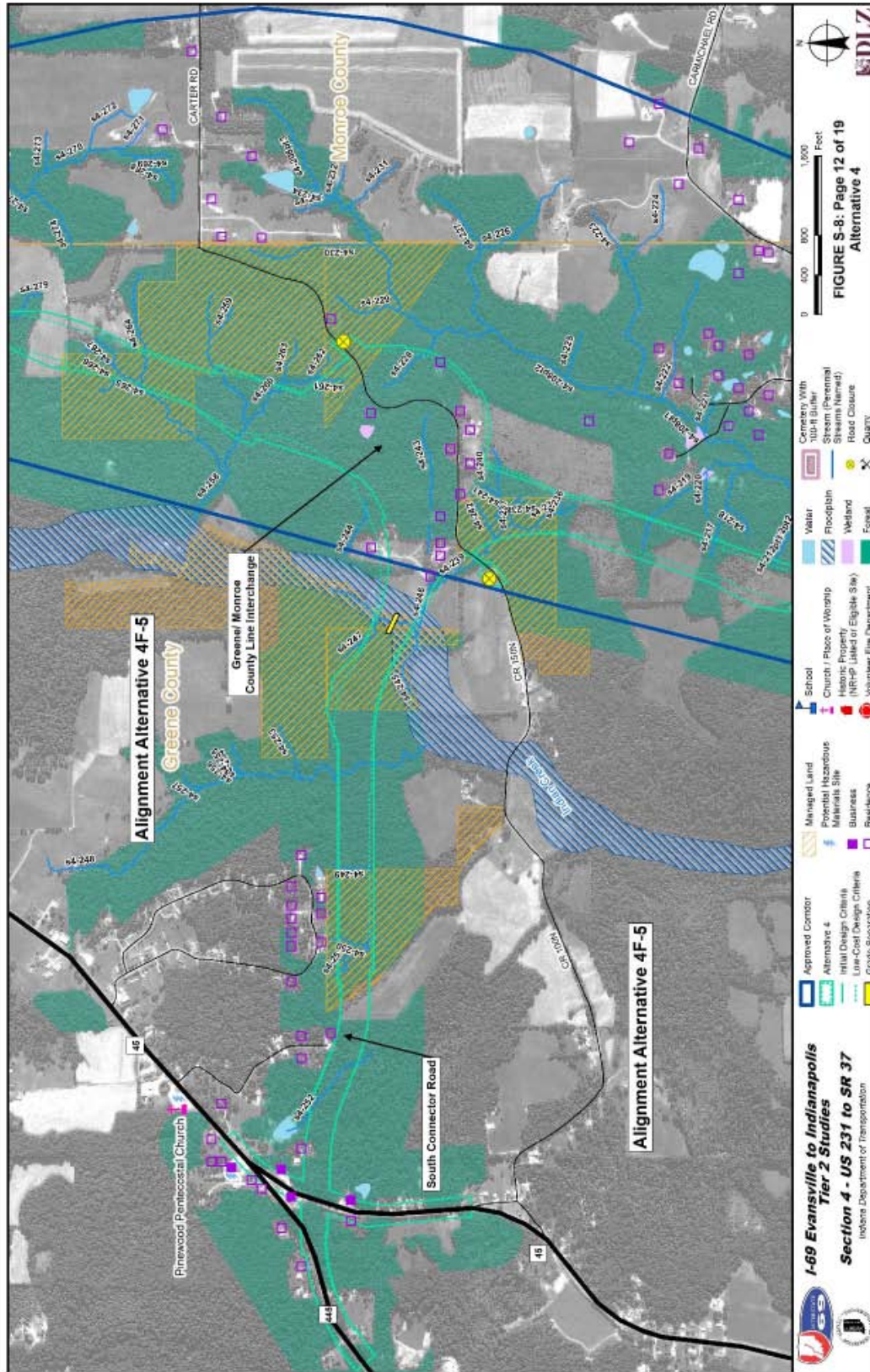


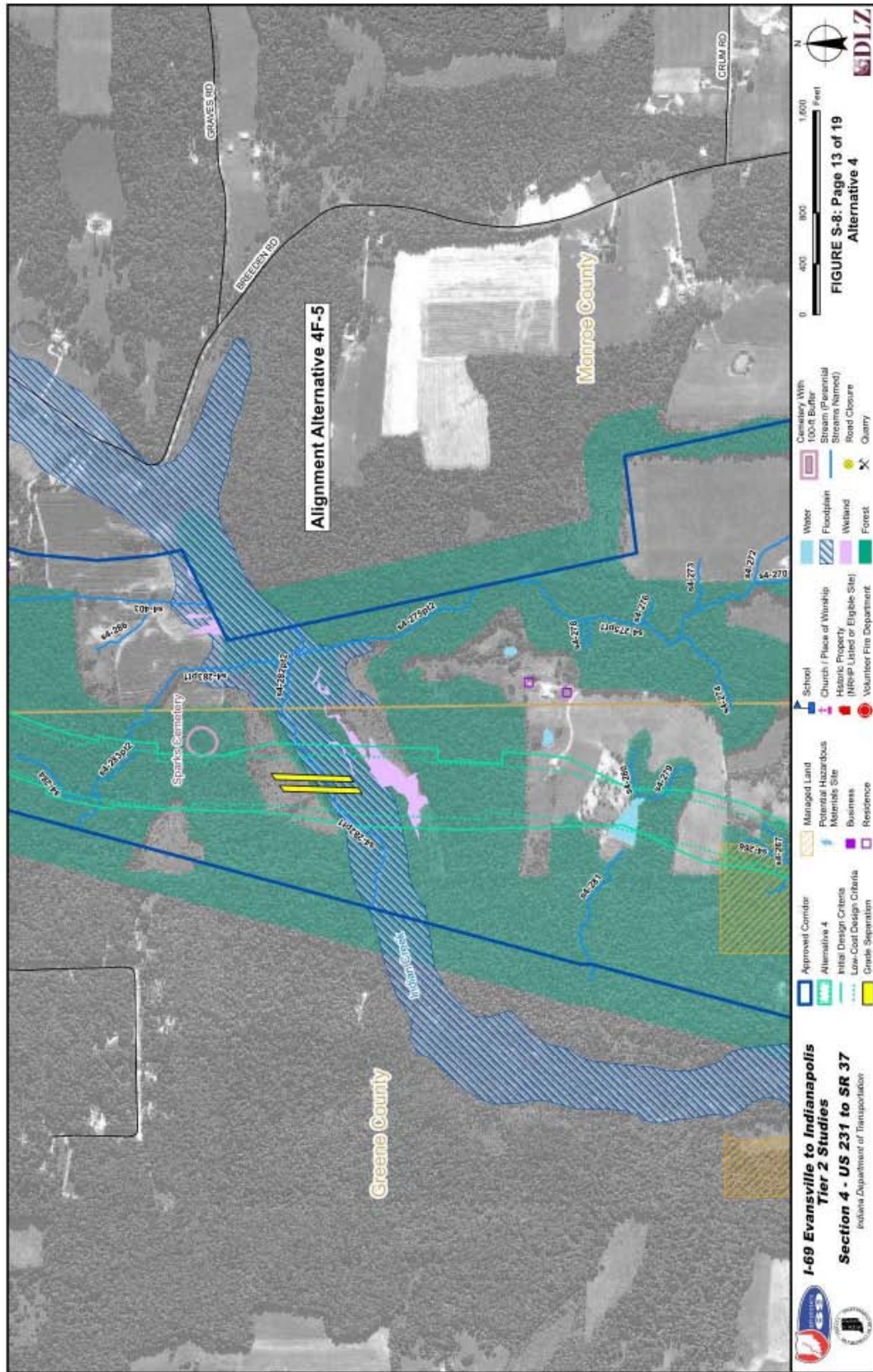




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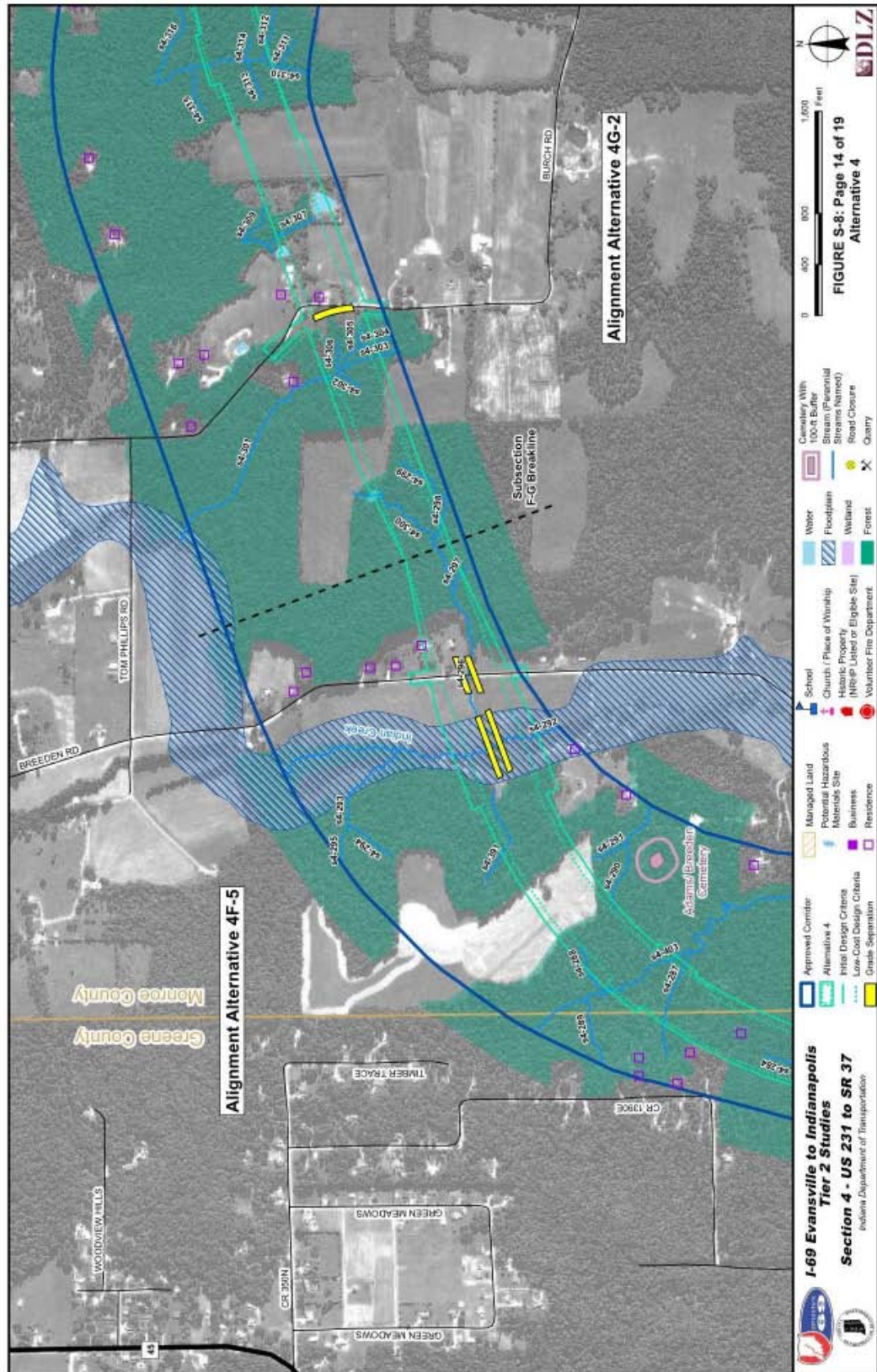


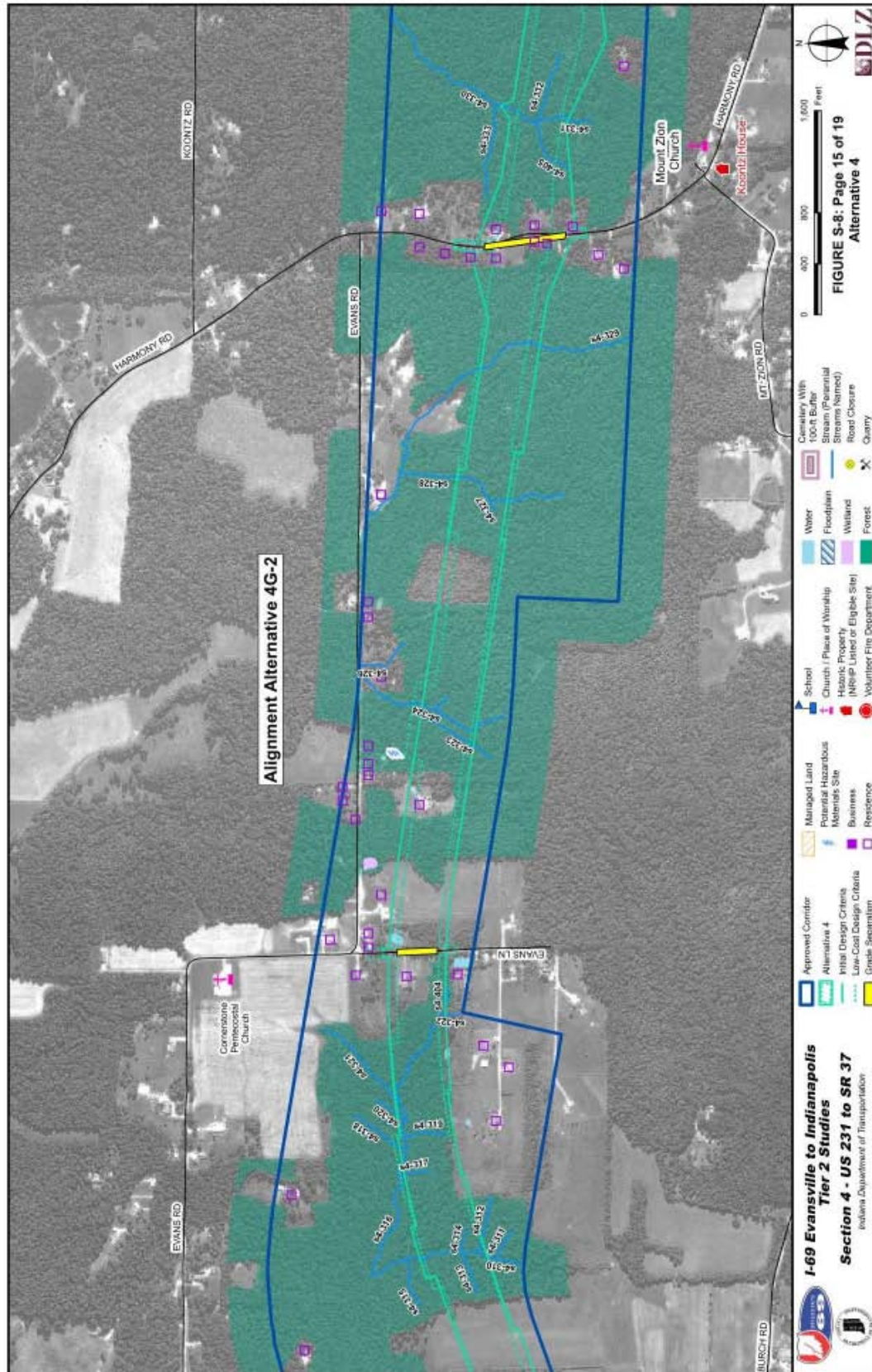




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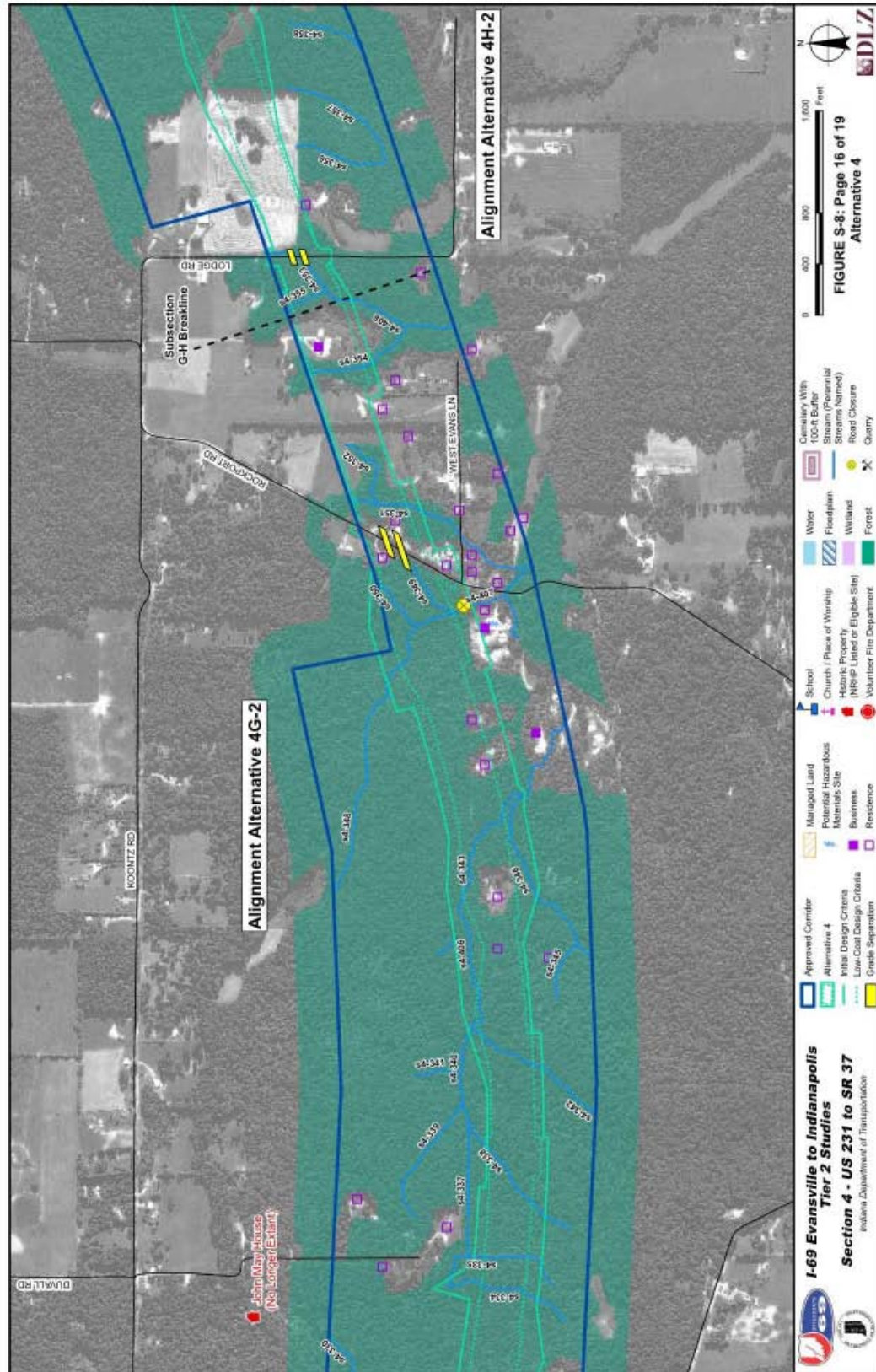


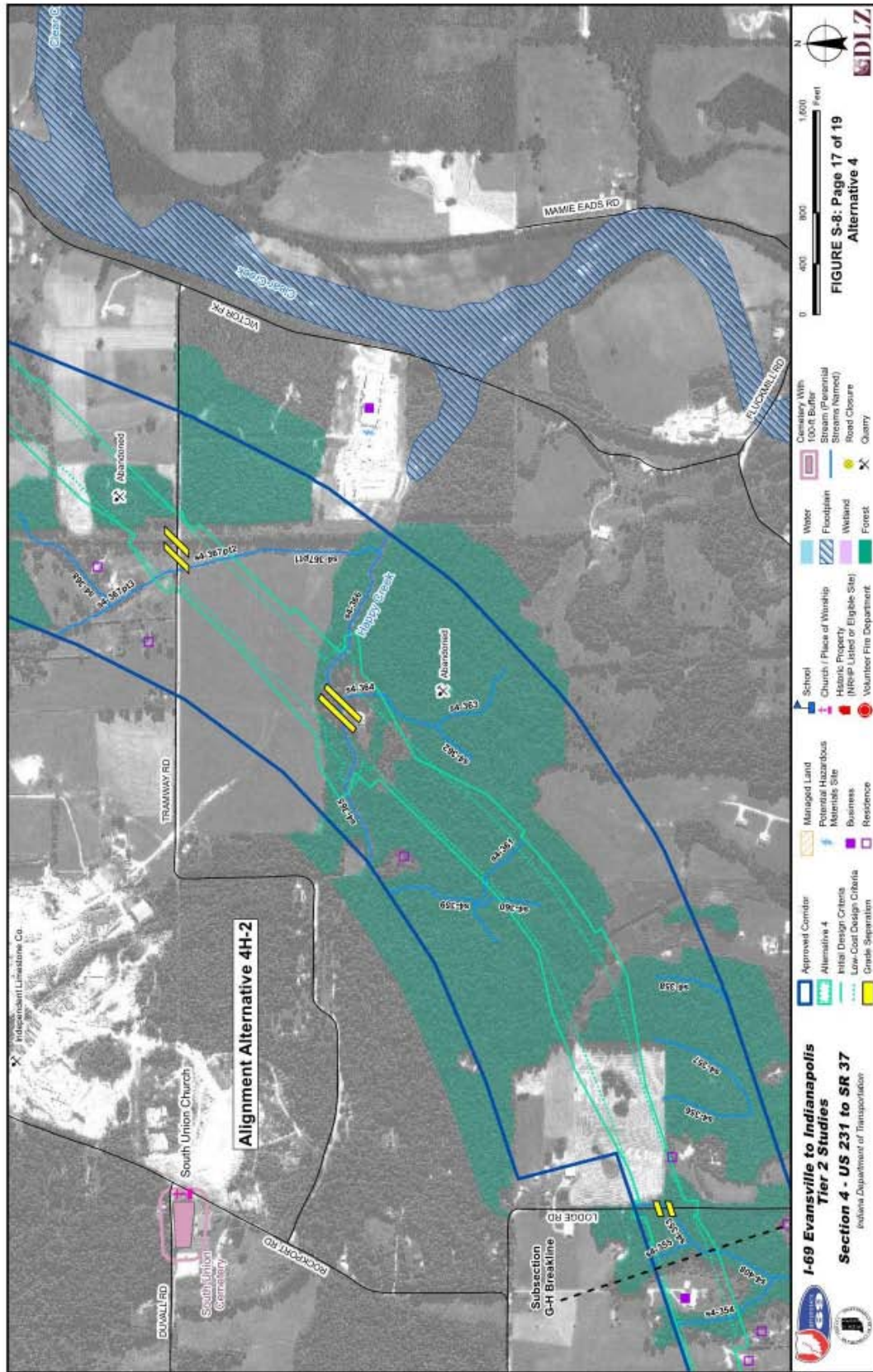




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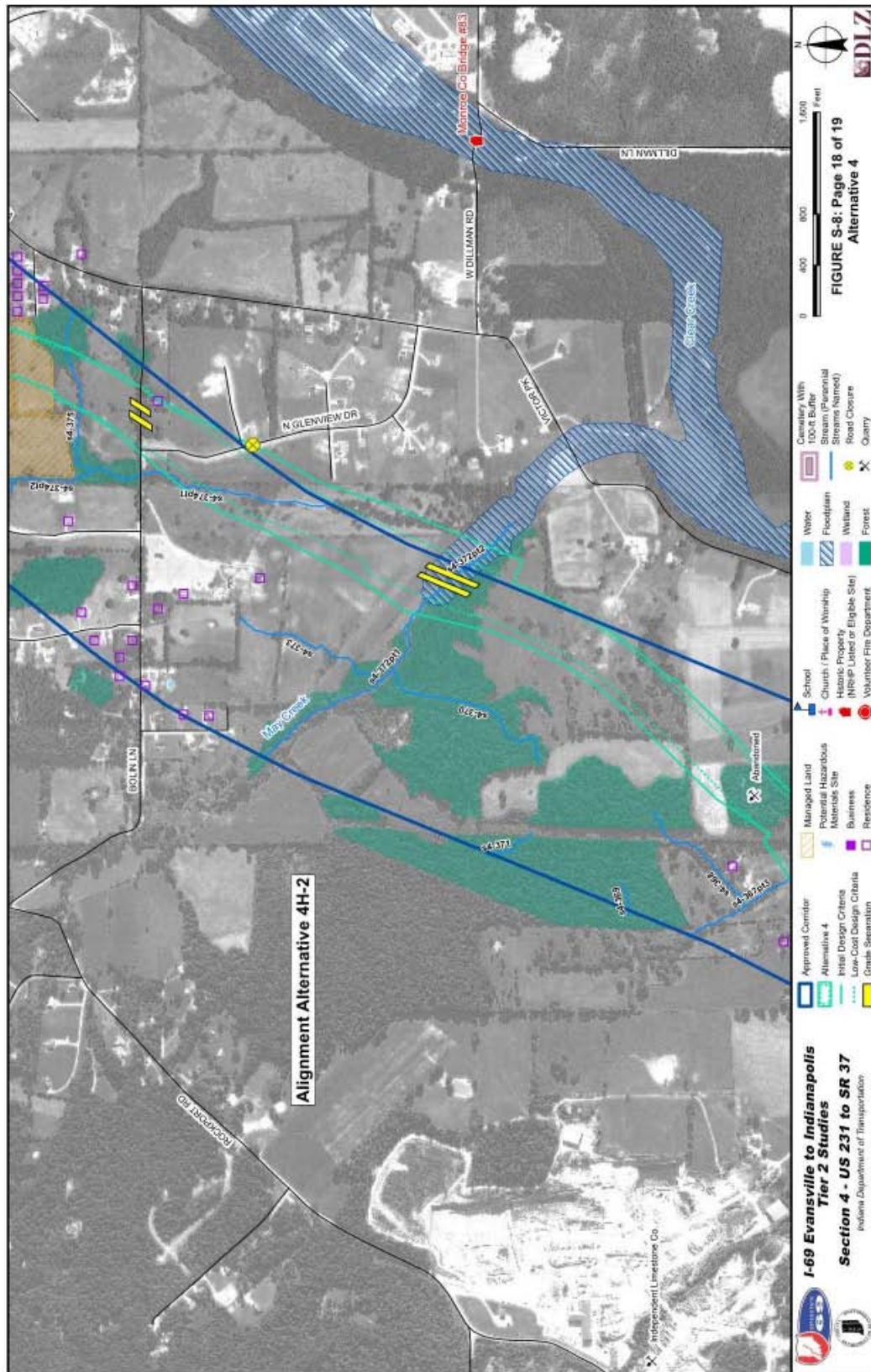


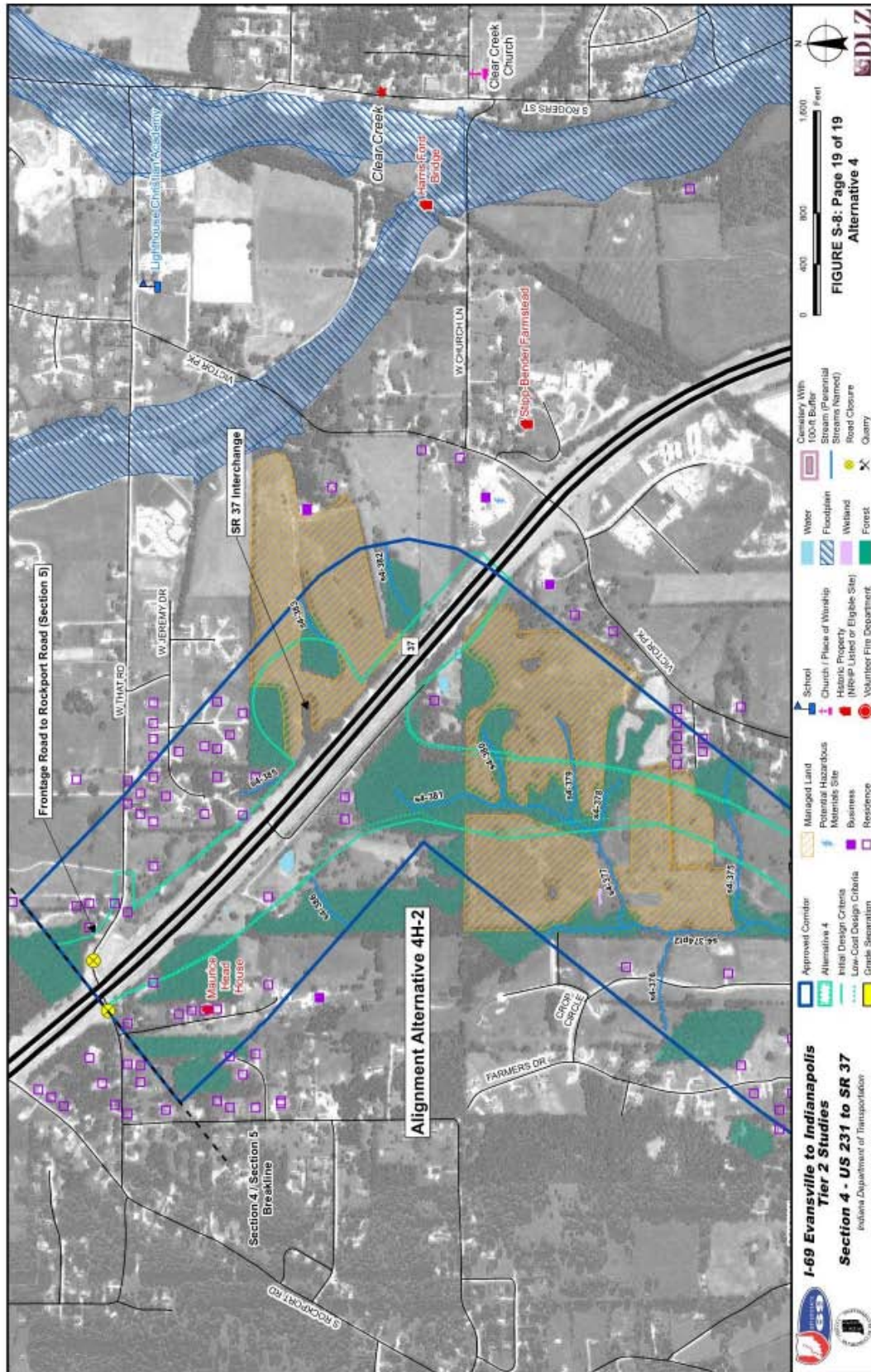




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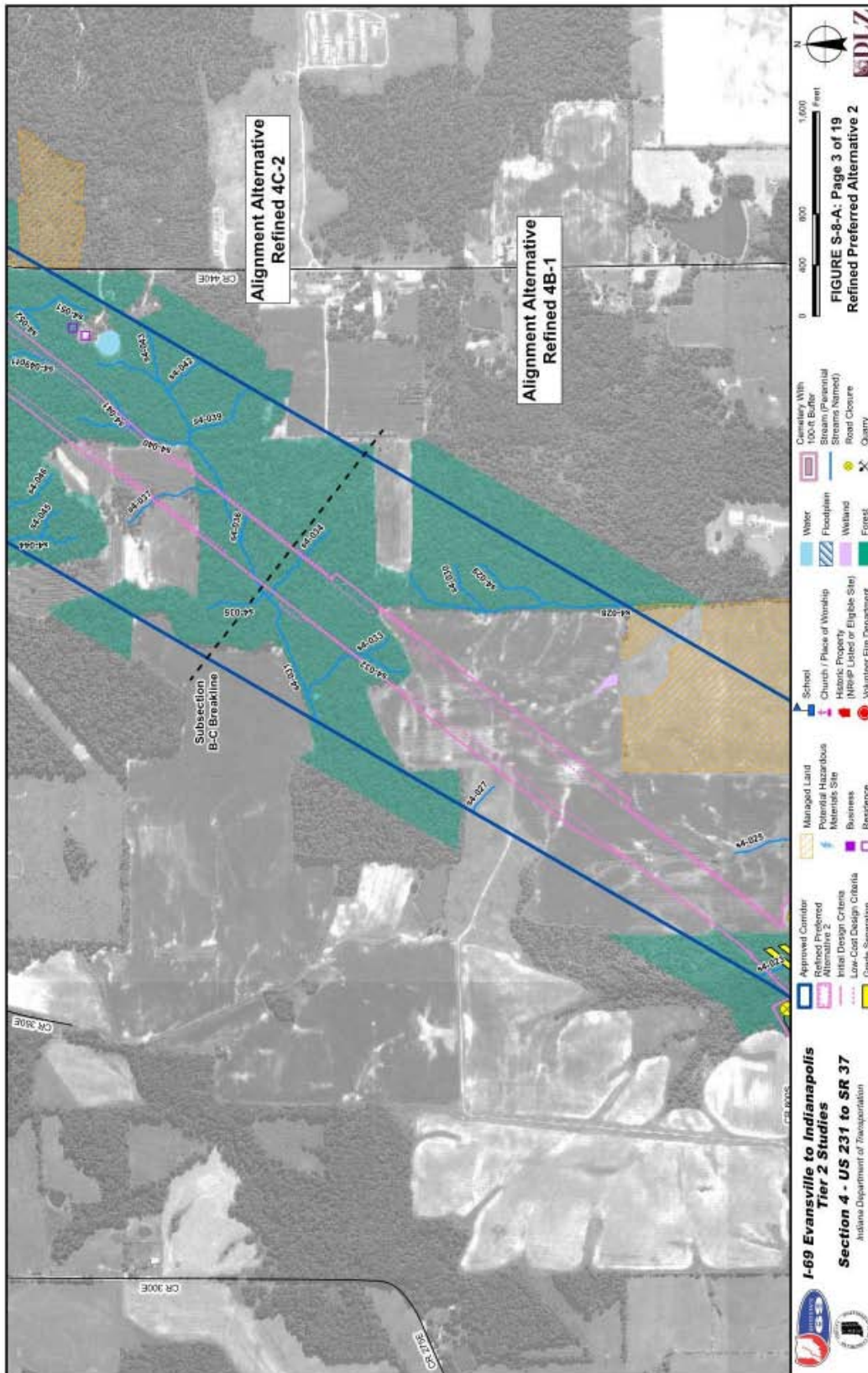


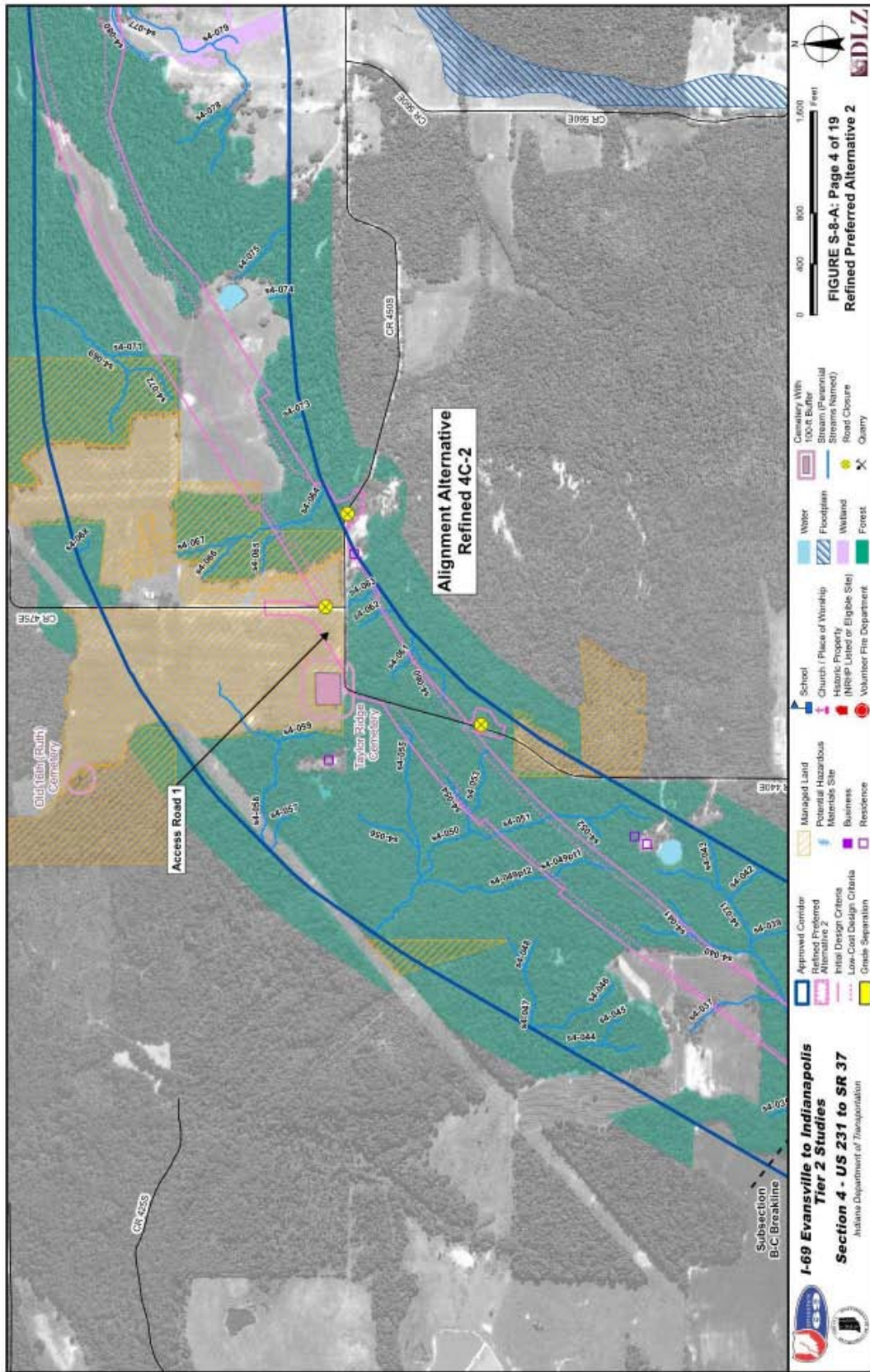




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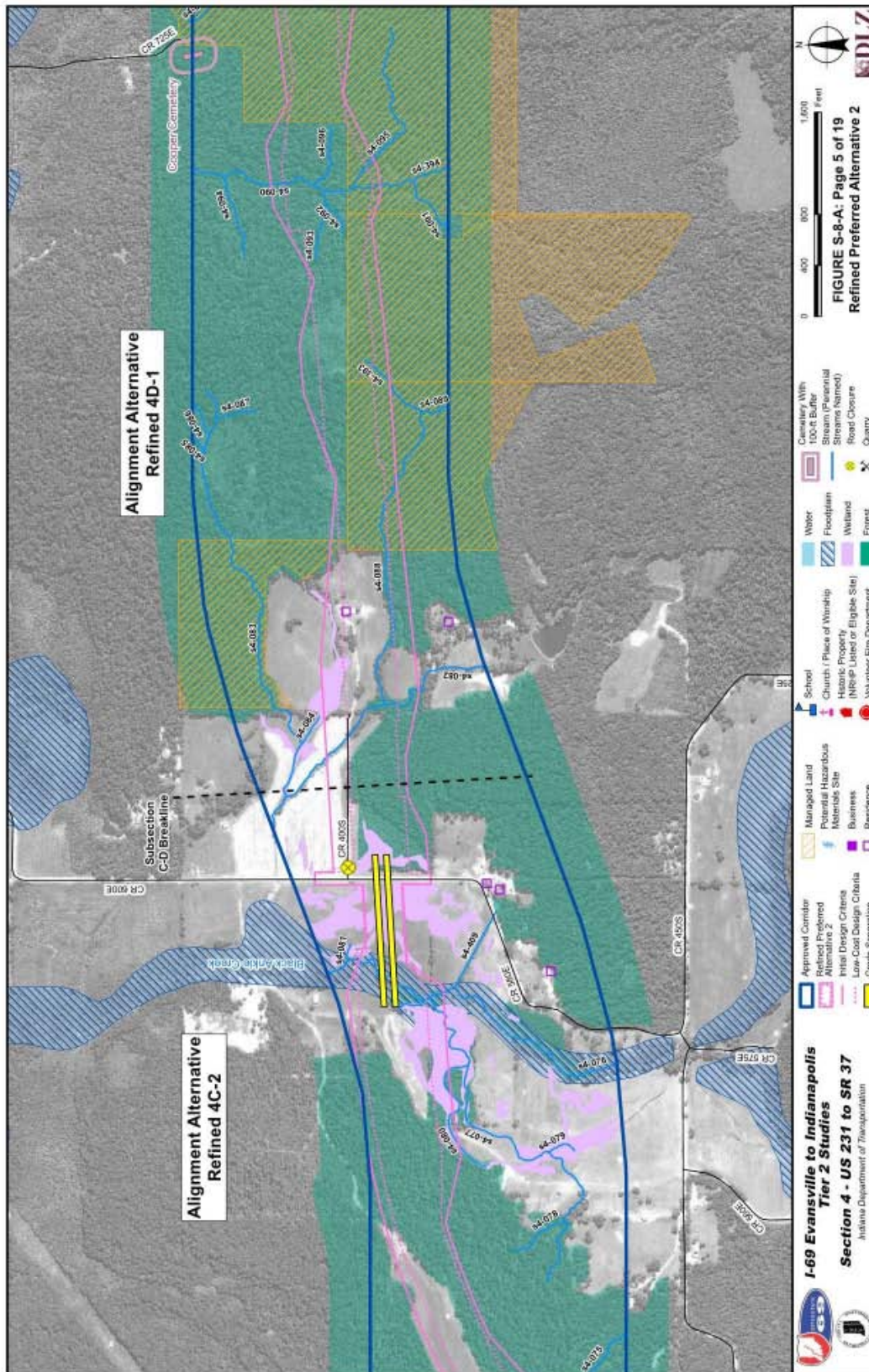


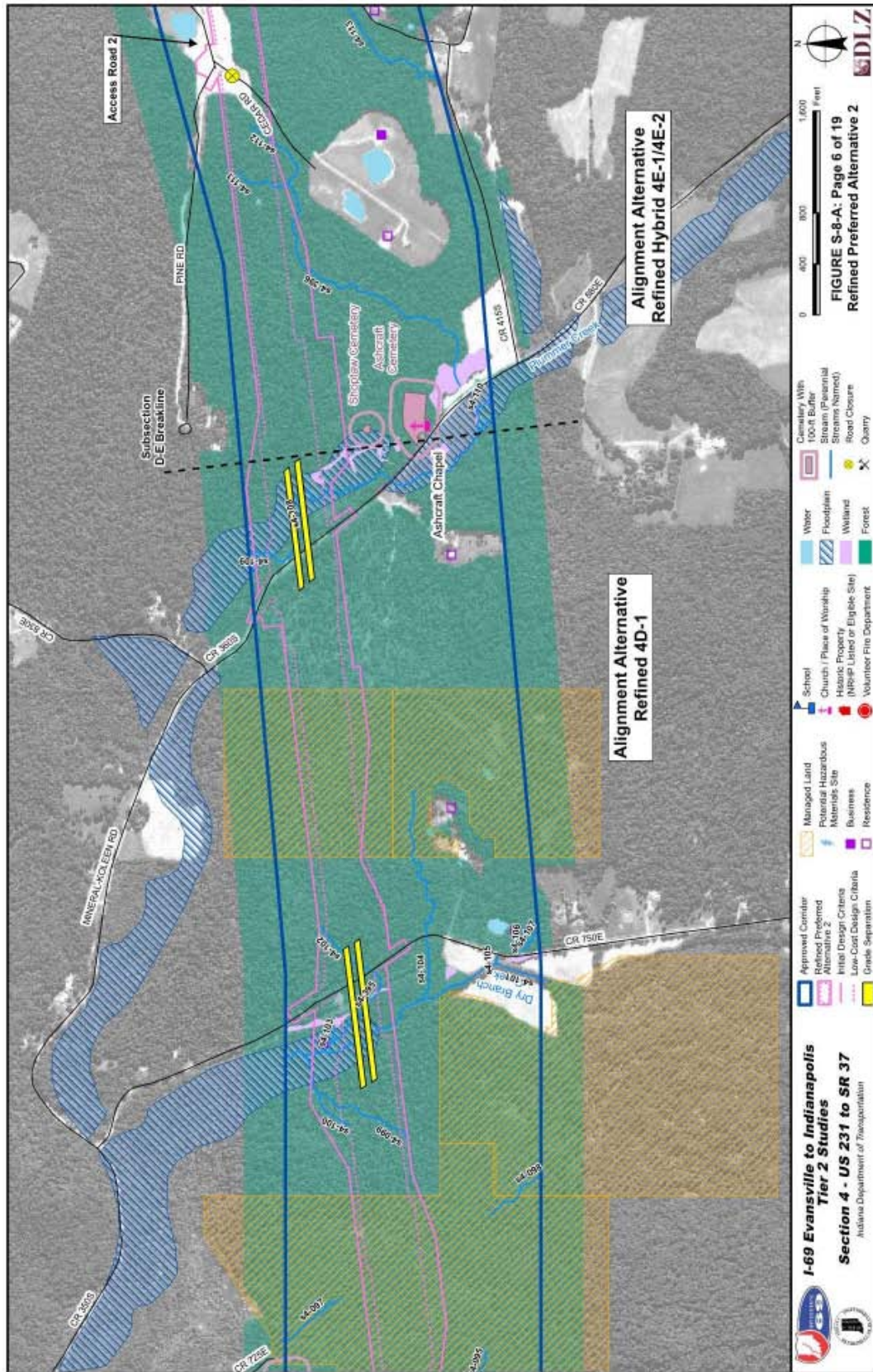




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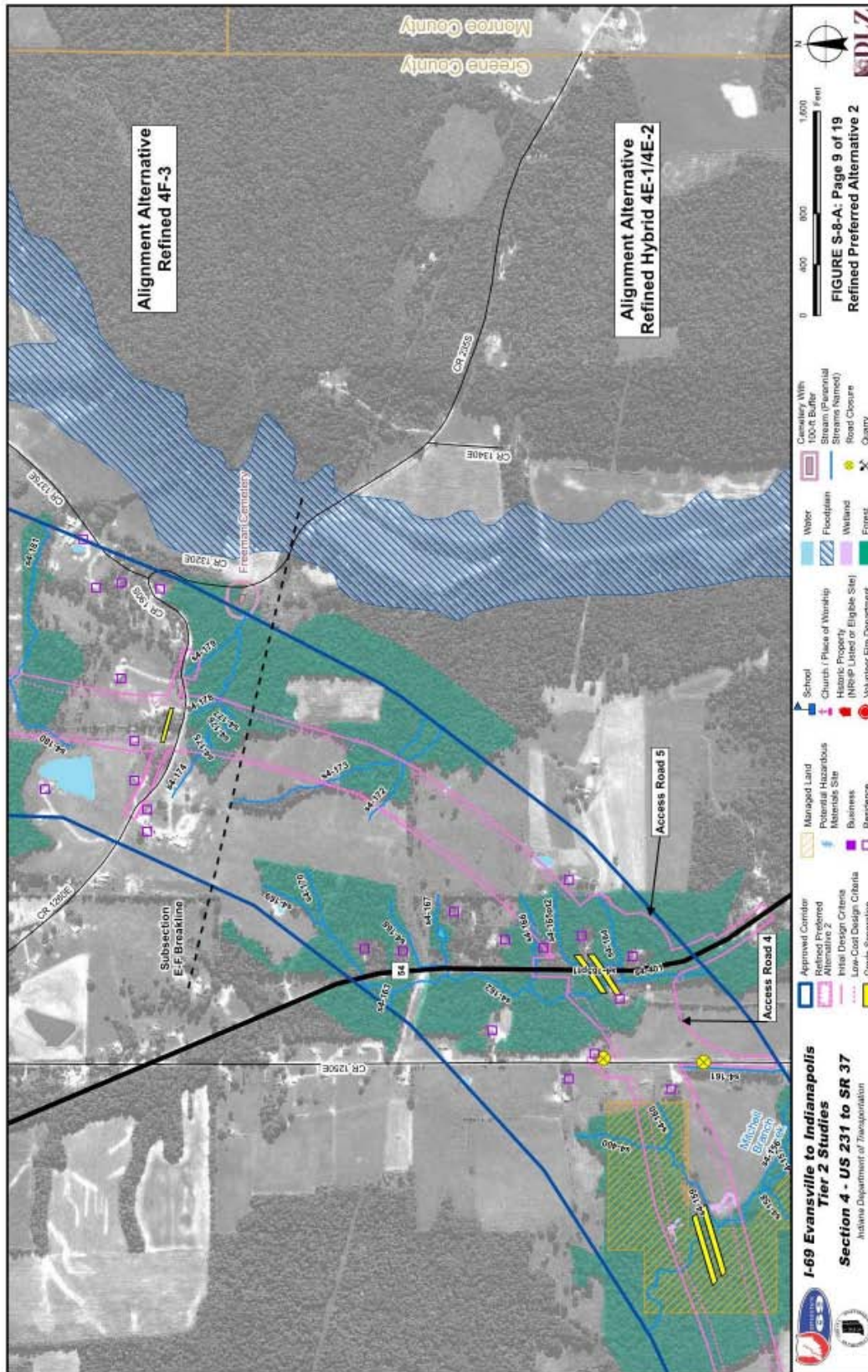


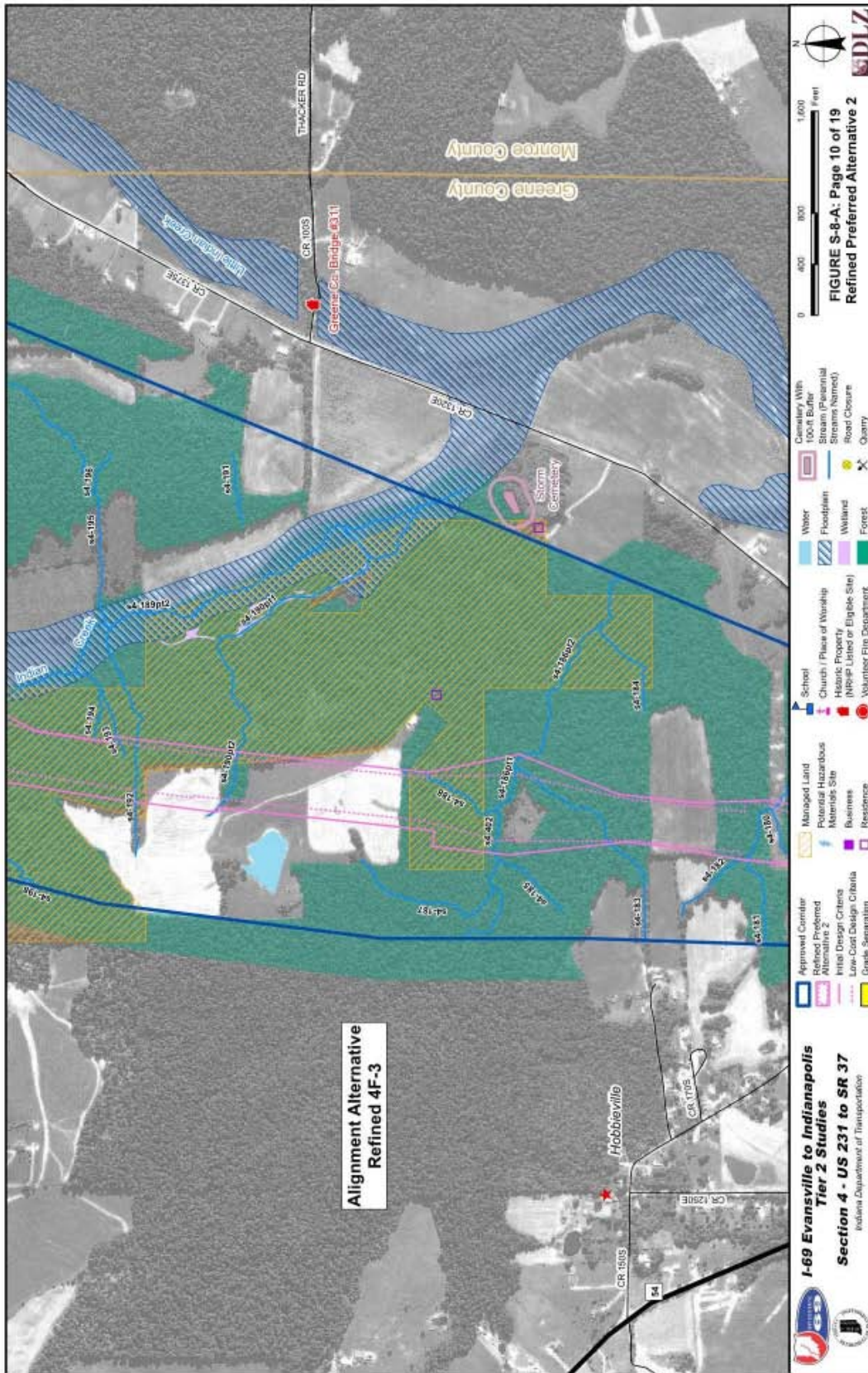




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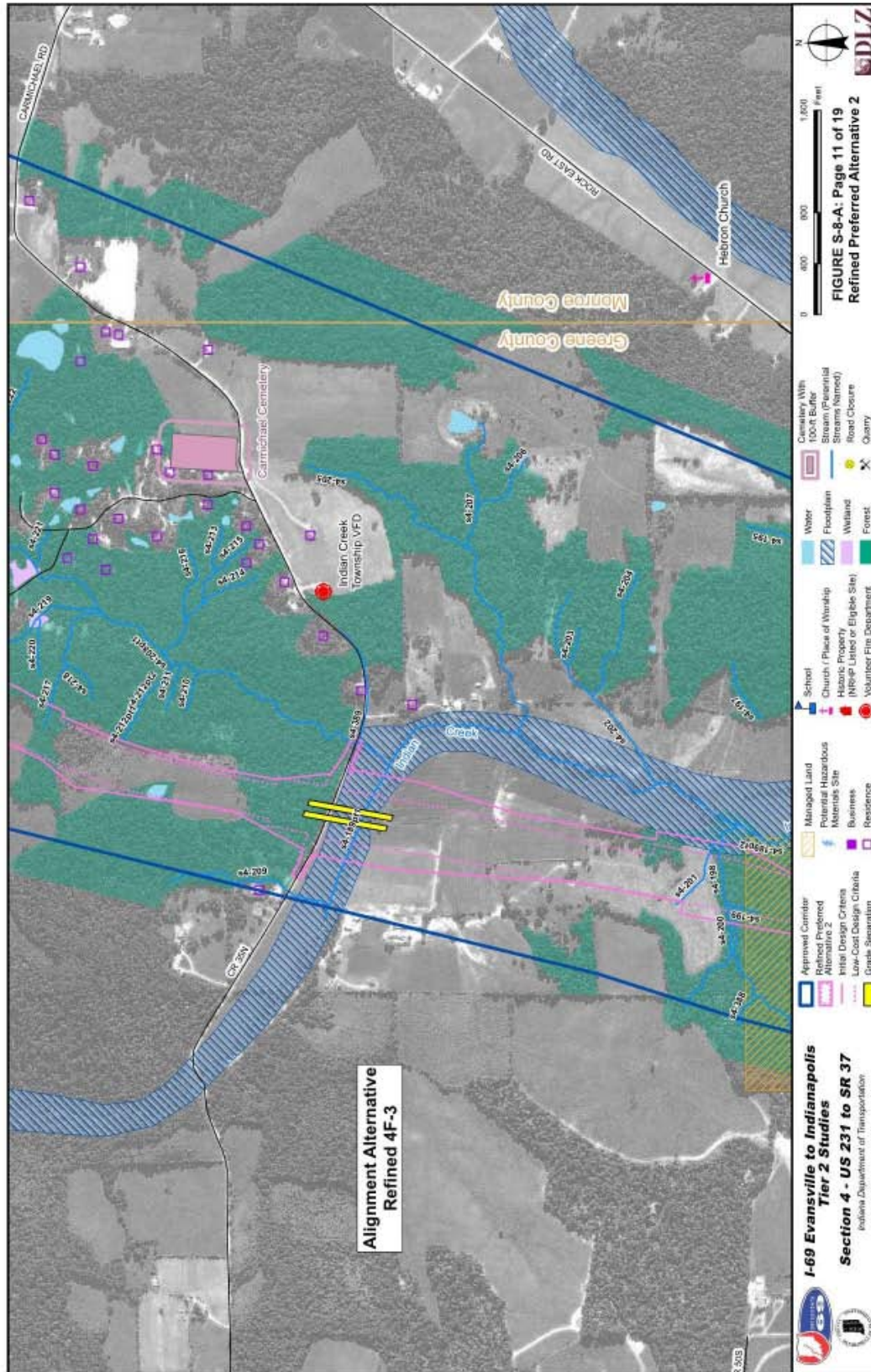


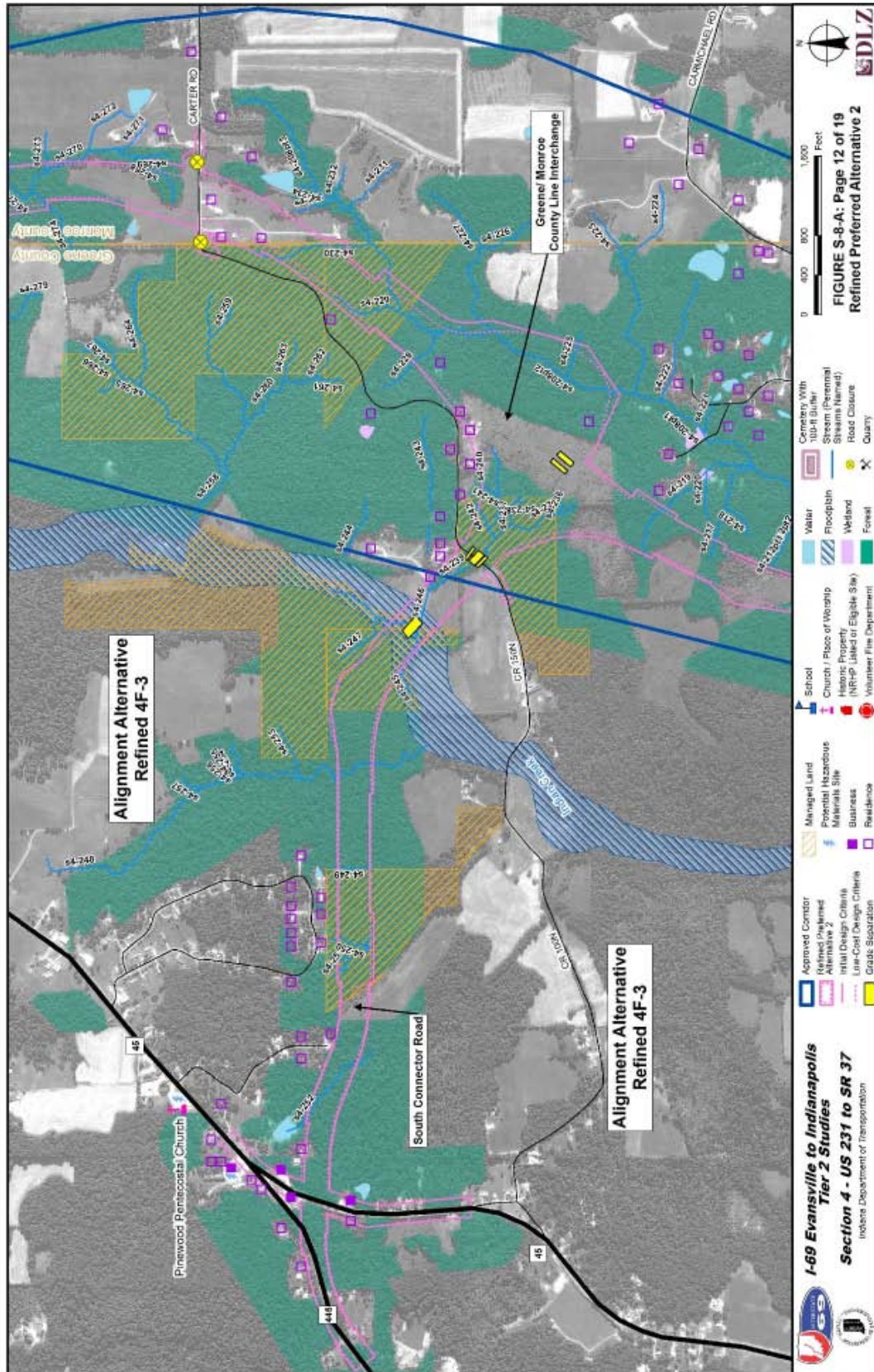




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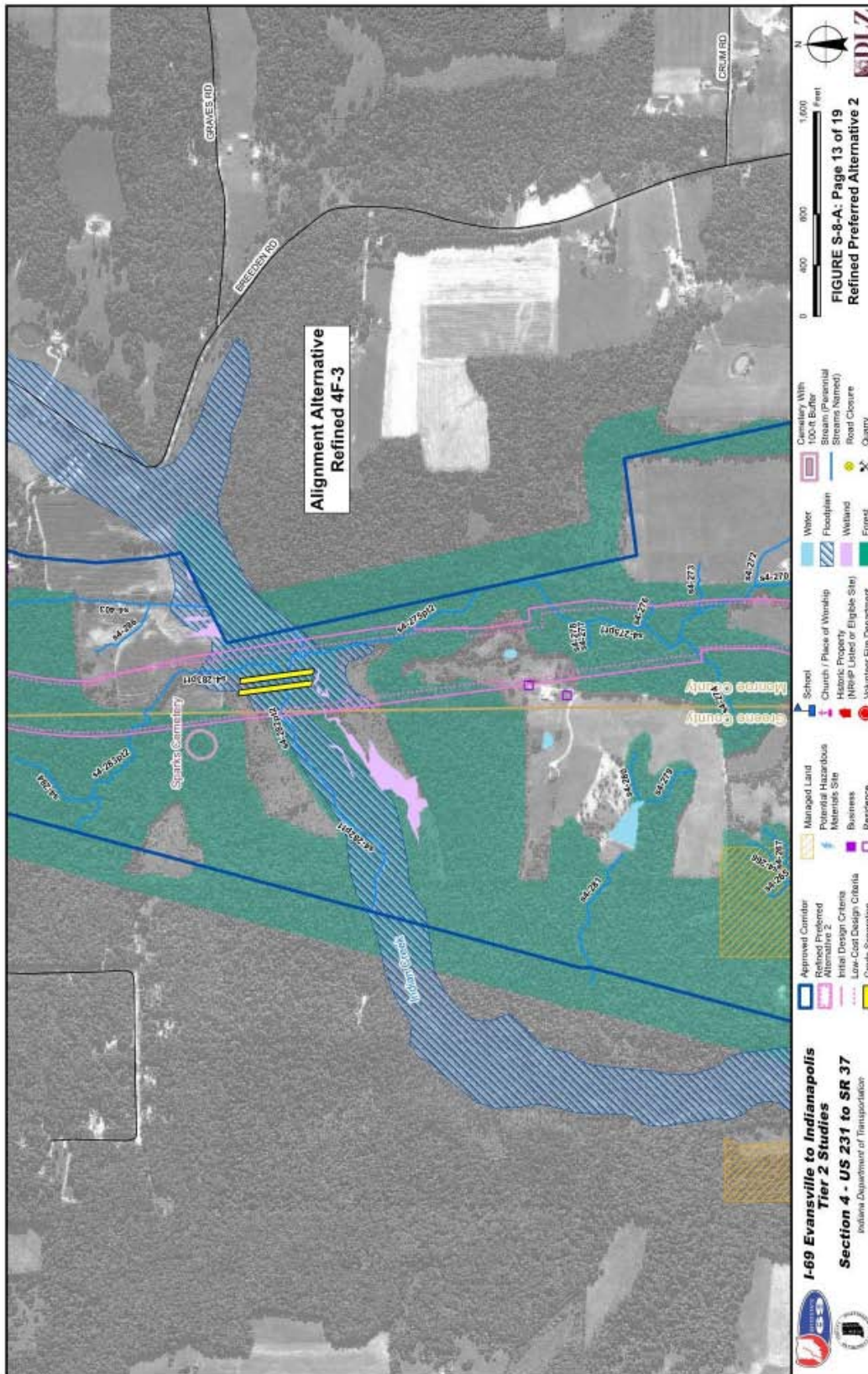


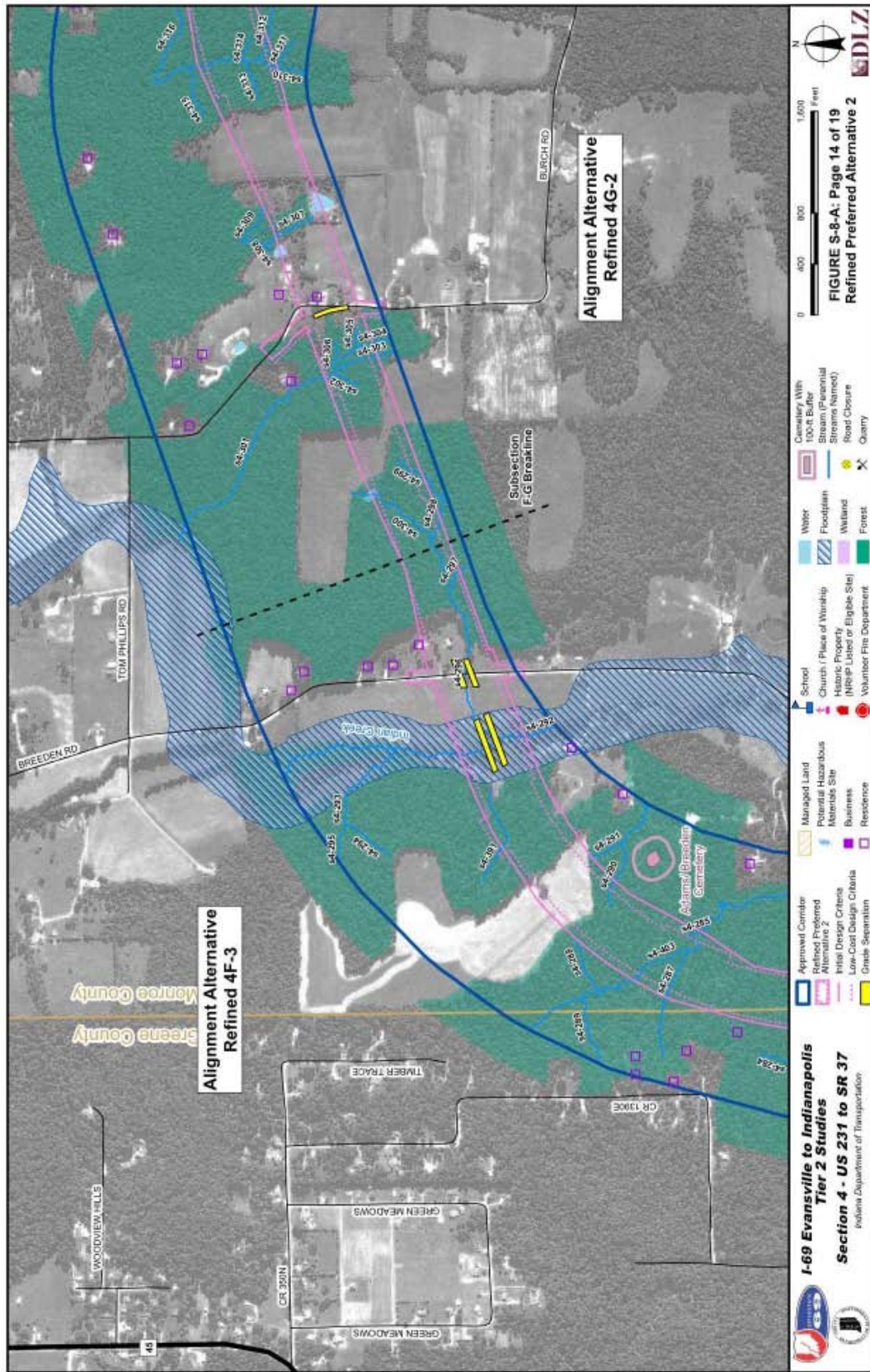




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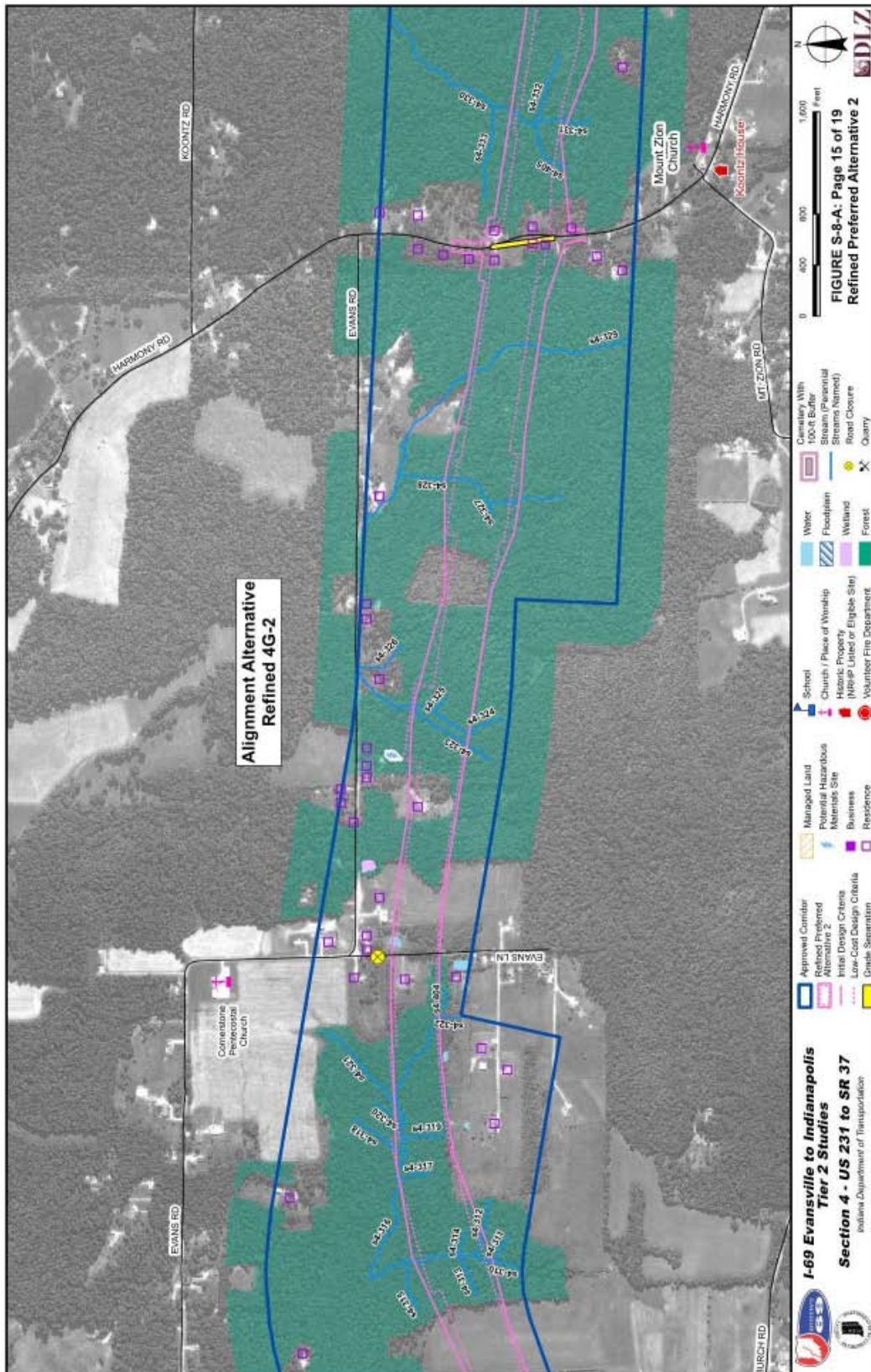


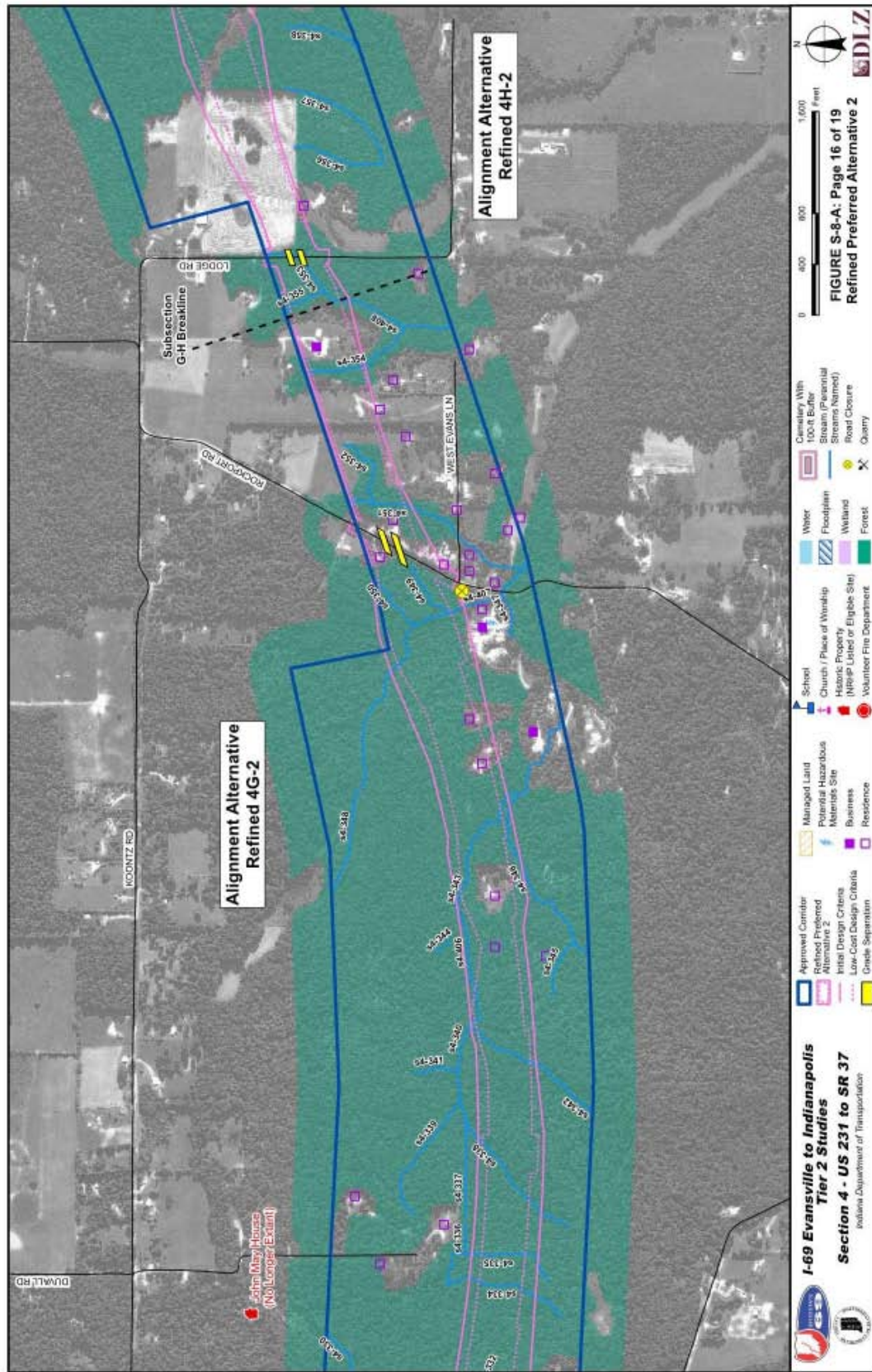




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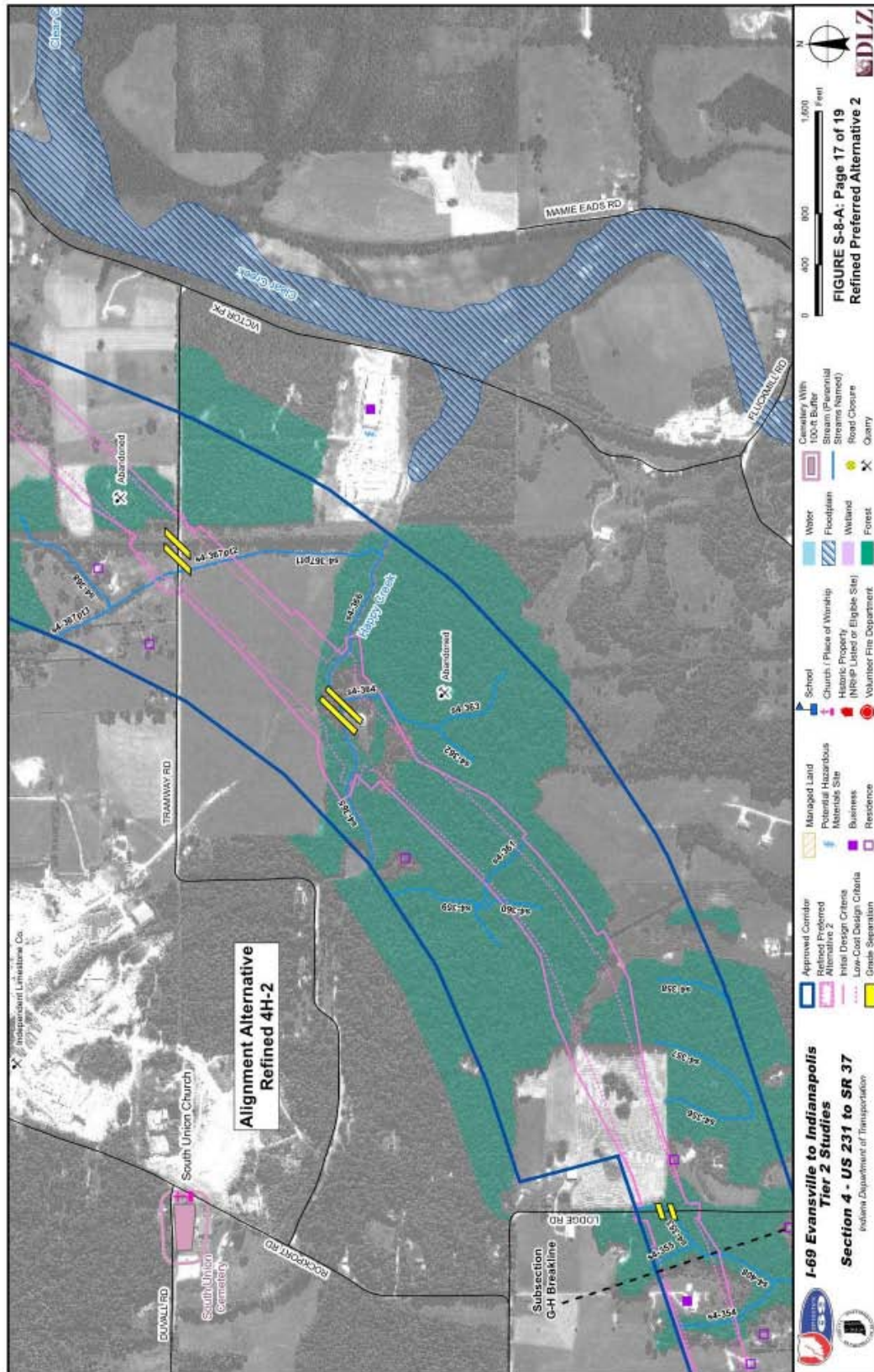


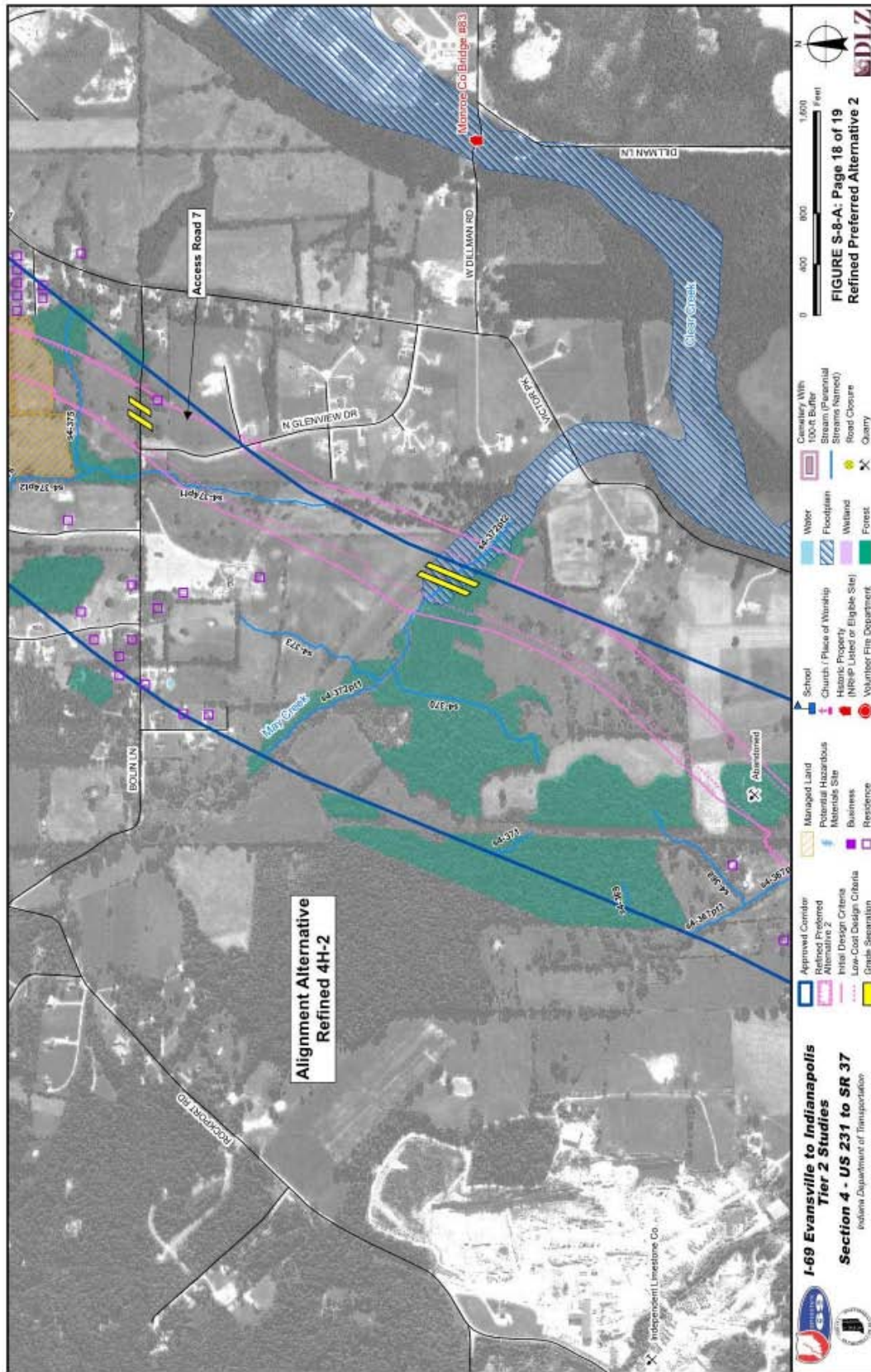




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