



**MID-STATES  
CORRIDOR**

# APPENDIX L – STREAM IMPACT ANALYSIS

## Mid-States Corridor Tier 1 Environmental Impact Statement

Prepared for

Indiana Department of Transportation

Mid-States Corridor Regional Development Authority

December 2, 2021 [Revised February 3, 2023]

Prepared by

Mid-States Corridor Project Consultant





# TABLE OF CONTENTS

Stream Impacts Map & Detailed Analysis..... 3

    Introduction..... 3

    Resource Analysis ..... 4

        Alternative B (Northwest Family)..... 5

        Alternative C (Northwest Family)..... 8

        Alternative M (Northeast Family)..... 8

        Alternative O (Northeast Family) ..... 9

        Alternative P (North Central Family) ..... 9

        Alternative R..... 10

    Local Improvements ..... 10

    Summary..... 10

## **Tables**

Table 1. Alternative new Alignment Working ROW Area and Distance ..... 4

Table 2. Stream Impacts by Alternative, Variation, and Section ..... 6

Table 3: Stream Impacts by Local Improvement ..... 11

## **Figures**

Figure 1. Stream Impacts Map Series Index..... 12

Figure 2. Stream Impacts Map Series ..... 13 - 39



# STREAM IMPACTS MAP & DETAILED ANALYSIS

## Introduction

The following substantive changes have been made to this section since the Draft Environmental Impact Statement (DEIS) was published:

- During the Screening of Alternatives, preliminary Alternative R was evaluated before being removed from further consideration. Alternative R consists of upgrading US 231 from I-64 to I-69. Many comments on the DEIS requested further consideration of an upgrade of US 231 in addition to the five alternatives presented in the DEIS. In response to these comments, this FEIS further evaluates the costs, impacts and benefits of Alternative R. See Section 2.5.1 for details about Alternative R.
- Multiple comments were received from local officials in Loogootee and Martin County about the alignment of Alternative P in Martin County, in particular in the vicinity of Loogootee. The DEIS showed Alternative P with an alignment west of Loogootee. Portions of this alignment are in Daviess County. These comments requested modifications to Alternative P to bring it through or to the east of Loogootee.

In response to these comments, three additional variations of Alternative P have been added in Martin County. All variations of Alternative P are within Section of Independent Utility (SIU) 4. See Section 2.7 for a discussion of Tier 2 sections for all alternatives. Alternative P with these variations has been designated as Refined Preferred Alternative P (RPA P). It is evaluated separately from any alternative considered in the DEIS. A single variation of RPA P will be selected in Tier 2 studies for SIU 4. See Section 2.5.2 for details about the variations of RPA P near Loogootee.

This chapter has been updated to reflect the new information associated with the development of RPA P and Alternative R.

The purpose of this section is to provide additional data, graphics, and analyses regarding the potential stream impacts by the project alternatives. Discussion and tables in Section 3.19 provide an overview of the type of impacts that may occur and the range of stream impacts with comparisons between alternatives. Tables in this appendix present impacts of the sections, variations, local improvements and facility types within each alternative. Because the freeway facility type has been removed from consideration, this analysis will limit discussion to Super-2 and expressway. Because existing US 231 in Section 1 and SR 37 in Section 3 will not include the potential for new alignment and an upgrade to a freeway has been removed, they are excluded from discussion in the analysis.

Impact discussion regarding the consideration of streams on the Indiana impaired streams list and the presence of approved Total Maximum Daily Load (TMDL) watersheds are in **Appendix R - Section 303(d)**



*List.* This appendix will be limited to further detail of impacts by type of waterway (perennial, intermittent, ephemeral, canals and ditches, and unclassified streams).

## Resource Analysis

Alternatives B, C, M, and O have one centerline with two working alignments to reflect two possible facility types: Super-2 or expressway. Alternative P has east and west Loogootee variations, each with the two possible facility types. RPA P increased the alignment variations associated with Loogootee and provided one western, two eastern, and one through variant. The inclusion of these variants causes the widest range of impacts. Alternative R is an upgrade of existing US 231, and generally follows the existing centerline. **Table 1** shows the comparison of length and area of these alignments, centerlines, and variations for the DEIS alternatives. Expressway facilities generally require more right-of-way (ROW) than Super-2 facilities, and thus will have more impacts for the same centerline location.

**Table 2** presents the detailed breakdown of stream impacts by alternatives, sections, and stream types for Alternatives B, C, M, O, and P. **Table 2a** presents the detailed breakdown of stream impacts by variations and stream types for the RPA P and Alternative R. In Section 2, the western variation (Alternative B) has more classified stream type impacts than the eastern variation (Alternatives C, M, O, and P). The majority of Section 2 impacts come from the Patoka River Valley, which crosses perpendicular to all alternatives. The shortest alignments, the Northwestern Family, have the least total impacts to streams. Section 3 traverses mostly agricultural land. The Northeastern Family has the longest alignments and the most stream impacts. They traverse multiple river valleys and watersheds in complex topography. Alternative R is an upgraded facility with no new alignment and has the least new crossings of or impacts to streams. The length of the new alignment working centerline of an alternative and impacts to classified streams (perennial, intermittent, and ditches) is strongly correlated ( $r = 0.8$ ). A single set of maps has been prepared and attached to the end of this appendix to present the classified and unclassified streams for each alternative.

**TABLE 1. ALTERNATIVE NEW ALIGNMENT WORKING ROW AREA AND DISTANCE**



Alternatives*			Section 2		Section 3		Total Alternative	
Name	Facility	Map ID	ROW (Acres)	Centerline (Miles)	ROW (Acres)	Centerline (Miles)	Total ROW (Acres)	Centerline (Miles)
B	Expressway	B2	1,152	23	1,096	10	2,248	33
	Super-2	B3	915	23	1,027	10	1,941	33
C	Expressway	C2	1,243	23	889	17	2,132	40
	Super-2	C3	897	23	731	17	1,628	40
M	Expressway	M2	1,242	23	3,210	57	4,453	80
	Super-2	M3	897	23	2,794	57	3,691	80
O	Expressway	O2	1,222	23	2,121	59	3,343	82
	Super-2	O3	941	23	1,834	60	2,775	82
P	Expressway	P2e	1,243	23	1,599	31	2,842	54
	Super-2	P3e	897	23	1,299	31	2,196	54
	Expressway	P2w	1,243	23	1,516	31	2,759	54
	Super-2	P3w	897	23	1,209	31	2,105	54

\*Area and distance are only for new alignment and do not include local improvements to existing facilities.

## Alternative B (Northwest Family)

Alternative B is unique in that it has almost no overlap with any other alternative in Sections 2 or 3 as it is the only alignment with an alignment west of Huntingburg and Jasper. Negligible overlap is present where the alternatives separate from US 231 at the southern start of Section 2. As a result, the comparison of stream impacts of Alternative B does not need to consider areas of common alignment. Although the shortest alternative, Alternative B has the most stream impacts in the Northwestern Family (Alternatives B and C). Its classified stream impacts composition in the total alternative is approximately 17 percent perennial steams, 40 percent intermittent streams, and 43 percent ditches. Unclassified streams comprise 54 percent of the total stream impacts. The expressway facility variation is 16 percent larger than the Super-2 facility and has 16 percent more total stream impacts.

Alternative B Section 2 and 3 new alignment ROWs have very similar acreage, but Section 2 contains 70 percent of the alternative length. This parity in acreage is influenced by the large footprint for determining the intersection with I-69 in Tier 2. Alternative B Section 2 traverses the Patoka River Valley and its associated streams and tributaries. The location of Section 2 as well as the longer length result in more stream crossings than Section 3. Please refer to **Table 2**. Section 3, north of the East Fork White River, is mainly agricultural land but does include crossings of Mud Creek, Camp Creek, Aikman Creek, and Veale Creek. A majority of the impacts to classified streams (perennial, intermittent, and canals) occur in Section 2 and are related to the Patoka River and its associated drainages such as Short Creek, Ell Creek, Crooked Creek, Altar Creek, and Little Flat Creek. Unclassified stream impacts are very similar between Sections 2 and 3 for both facility types.



**TABLE 2. STREAM IMPACTS BY ALTERNATIVE, VARIATION, AND SECTION**

*[Due to independent rounding for subtotals and totals, the totals may differ by 100]*

Alternative	B		C		M		O		P			
Variation	B2	B3	C2	C3	M2	M3	O2	O3	P2e	P3e	P2w	P3w
<b>Perennial Streams and Rivers (Linear Feet of Impact)</b>												
<b>Section 2</b>	9,100	7,900	5,800	5,200	5,800	5,200	5,400	4,800	5,900	5,900	5,200	5,200
<b>Section 3</b>	4,100	3,700	4,700	3,500	26,800	24,300	9,500	8,700	18,200	15,500	15,000	11,400
<b>Total</b>	<b>13,200</b>	<b>11,600</b>	<b>10,500</b>	<b>8,600</b>	<b>32,600</b>	<b>29,400</b>	<b>14,800</b>	<b>13,500</b>	<b>24,000</b>	<b>21,300</b>	<b>20,100</b>	<b>16,500</b>
<b>Intermittent Streams (Linear Feet of Impact)</b>												
<b>Section 2</b>	24,400	20,000	21,000	15,700	21,000	15,700	22,300	18,300	21,100	21,100	15,700	15,700
<b>Section 3</b>	6,200	6,200	5,800	5,000	20,900	18,100	29,800	27,500	15,400	14,900	12,800	11,800
<b>Total</b>	<b>30,700</b>	<b>26,200</b>	<b>26,900</b>	<b>20,800</b>	<b>41,900</b>	<b>33,800</b>	<b>52,100</b>	<b>45,700</b>	<b>36,600</b>	<b>36,000</b>	<b>28,600</b>	<b>27,600</b>
<b>Canals and Ditches (Linear Feet of Impact)</b>												
<b>Section 2</b>	21,800	17,300	22,200	18,100	22,200	18,100	22,300	18,500	22,200	22,200	18,100	18,100
<b>Section 3</b>	11,200	11,000	5,100	4,600	15,300	16,000	8,900	8,300	5,200	3,900	5,500	4,700
<b>Total</b>	<b>33,100</b>	<b>28,300</b>	<b>27,400</b>	<b>22,700</b>	<b>37,600</b>	<b>34,200</b>	<b>31,300</b>	<b>26,900</b>	<b>27,300</b>	<b>26,100</b>	<b>23,700</b>	<b>22,900</b>
<b>Classified Streams Subtotal (Perennial, Intermittent, and Canal Streams) (Linear Feet of Impact)</b>												
<b>Section 2</b>	55,300	45,100	49,100	39,000	49,100	39,000	50,000	41,600	49,100	49,100	39,000	39,000
<b>Section 3</b>	21,700	21,100	15,700	13,000	63,100	58,400	48,200	44,500	38,800	34,300	33,300	27,900
<b>Total</b>	<b>76,900</b>	<b>66,100</b>	<b>64,800</b>	<b>52,100</b>	<b>112,200</b>	<b>97,400</b>	<b>98,200</b>	<b>86,100</b>	<b>87,900</b>	<b>83,400</b>	<b>72,300</b>	<b>66,900</b>
<b>Unclassified Drainages (Linear Feet of Impact)</b>												
<b>Section 2</b>	50,400	40,600	56,400	43,200	56,300	43,200	56,700	45,600	56,400	56,300	43,200	43,200
<b>Section 3</b>	41,600	38,300	30,900	25,000	111,100	97,700	54,800	50,200	63,600	58,100	53,300	48,300
<b>Total</b>	<b>92,000</b>	<b>78,900</b>	<b>87,300</b>	<b>68,200</b>	<b>167,400</b>	<b>140,900</b>	<b>111,500</b>	<b>95,900</b>	<b>120,000</b>	<b>114,400</b>	<b>96,600</b>	<b>91,600</b>
<b>Grand Total of All Streams and Drainages (Linear Feet of Impact)</b>												
<b>Section 2</b>	105,700	85,700	105,600	82,300	105,500	82,300	106,800	87,300	105,500	105,500	82,300	82,300
<b>Section 3</b>	63,100	59,300	46,600	38,000	174,200	156,100	103,000	94,800	102,400	92,400	86,600	76,200
<b>Total</b>	<b>168,900</b>	<b>145,000</b>	<b>152,100</b>	<b>120,300</b>	<b>279,600</b>	<b>238,300</b>	<b>209,700</b>	<b>182,000</b>	<b>207,900</b>	<b>197,900</b>	<b>168,900</b>	<b>158,500</b>



**TABLE 2A. STREAM IMPACTS BY ALTERNATIVE AND VARIATION FOR RPA P AND R**

Alternative	R	RPA P – Super 2				RPA P - Expressway		
Variation	Super 2	P1	P2	P3	P4	P1	P3	P4
<b>Perennial Streams and Rivers (Linear Feet of Impact)</b>	9,100	16,500	16,200	16,500	20,100	21,300	22,000	26,400
<b>Intermittent Streams (Linear Feet of Impact)</b>	10,700	27,600	26,600	27,400	27,900	36,000	35,400	36,600
<b>Canals and Ditches (Linear Feet of Impact)</b>	19,100	22,900	22,700	23,100	23,600	26,100	26,600	27,100
<b>Classified Streams Subtotal (Perennial, Intermittent, and Canal Streams) (Linear Feet of Impact)</b>	38,900	66,900	65,500	67,000	71,500	83,400	84,000	90,100
<b>Unclassified Drainages (Linear Feet of Impact)</b>	44,200	91,600	85,300	86,200	96,200	114,400	108,900	120,100
<b>Grand Total of All Streams and Drainages (Linear Feet of Impact)</b>	83,100	158,500	150,800	153,300	167,700	197,900	192,900	210,200



## Alternative C (Northwest Family)

Alternative C has an alignment east of Jasper and Huntingburg. It has the smallest impact to streams for the expressway variation. It has the least impact to perennial streams of any alternative. It has roughly 2 to 2.5 miles less classified stream impacts than Alternative B. Although Alternative B is 40 percent shorter overall length, Alternative C has a smaller ROW than Alternative B due to a much smaller footprint area at the I-69 connection.

The composition of Alternative C classified stream impacts composition is approximately 16 percent perennial streams, 41 percent intermittent streams, and 43 percent ditches. Unclassified streams comprise 57 percent of the total stream impacts. The expressway facility variation is roughly 30 percent larger than the Super-2 facility and has 26 percent more total stream impacts.

Alternative C shares its alignment in Section 2 with Alternatives M and P and most of the length of Alternative O. Section 2 new alignments are 35 percent longer, 25 to 40 percent more area, and have twice as many classified stream impacts overall as Section 3. Section 2 traverses the Patoka River Valley and other bottomland. Section 2 and 3 have similar perennial stream impacts, but Section 2 intermittent stream impacts are 2.5 to 3 times larger than Section 3 while ditch impacts are 1.8 to 2.2 times larger than Section 3. Alternative C new alignment crosses the following creeks and rivers: Short's Creek, Hunley Creek, Straight Creek, Patoka River, East Fork Mill Creek, East Fork White River, Slate Creek, Sugar Creek, West Fork Sugar Creek, Aikman Creek, and Veale Creek.

## Alternative M (Northeast Family)

Alternative M has the largest impact of any alternative. While Alternative O is a longer new alignment by 2 miles, Alternative M has 1,000 acres more ROW impact. Alternative M has roughly 2 to 2.5 miles more classified stream impacts than Alternative O, and 11 to 13 miles more total impacts than Alternative O when unclassified drainages are included. Alternative M classified streams composition is 30 percent perennial streams, 36 percent intermittent streams, and 34 percent ditches. Unclassified streams comprise 60 percent of the total stream impacts. Alternative M parallels the East Fork White River in much of Section 3 and crosses numerous tributaries of the East Fork White River. It has the most impact for all stream types except intermittent streams, where Alternative O is larger. The terminus of Alternative M at SR 37, Bedford, has notable impacts to Salt Creek. These impacts would likely be reduced in Tier 2. The expressway facility variation has 20 percent more area than the Super-2 facility and has 17 percent more total stream impacts.

Alternative M shares Section 2 with Alternatives C and P and most the length of Alternative O. While Northwestern Family had a much longer Section 2 than Section 3, the opposite is true for the Northeastern Family. Section 3's new alignment of Alternative M is 34 miles longer, 3,000 acres more area, and has 1.5 to 2 times as many classified stream impacts overall as Section 2. Section 3 new alignment shares 13 miles (15 percent) of its length with Alternative P from the East Fork White River to near Loogootee, where it turns east parallel to the East Fork of the White River and County Road 450. Section 2 classified stream composition is 12 percent perennial streams, 42 percent intermittent streams, and 46 percent ditches. Section 3 classified stream composition is 43 percent perennial streams, 32 percent intermittent streams, and 25 percent ditches. Section 3 has more than 4.5 times the perennial stream impacts as Section 2. Alternative M new alignment crosses the following creeks and rivers: Short's Creek, Hunley Creek, Straight Creek, Patoka River, East Fork Mill Creek, East Fork White





River, Slate Creek, Haw Creek, Friends Creek, Boggs Creek, Buzzard Run, Poss Creek, Opossum Creek, Sulphur Creek, Indian Creek, and Salt Creek.

## Alternative O (Northeast Family)

Alternative O has the lowest total stream impacts in the Northeastern Family (Alternatives M and O). Alternative O classified streams composition is 15 percent perennial streams, 53 percent intermittent streams, and 32 percent ditches. The streams in Alternative O have half the amount of the perennial type compared to Alternative M, but substantially more of the intermittent type. Alternative O has the most intermittent stream impacts of any alternative across families. The shift to a higher percentage of intermittent streams is likely correlated with the karst geology along the alternative. Alternative O crosses the Lost River, which is a sensitive feature connecting to underground hydrology. Unclassified streams comprise 53 percent of the total stream impacts. The expressway facility variation is 20 percent more area than the Super-2 facility and has 15 percent more total stream impacts.

Alternative O new alignment shares 19 miles of its 23-mile Section 2 with Alternatives C, M, and P. It has four miles of unique alignment from Dubois County Road N 400 to its crossing with State Road 56. The classified stream impacts of this unique segment consist of seven crossings of all intermittent streams. Section 3's new alignment is 36 to 37 miles longer and 900 acres more area than Section 2. Section 3 crosses rough terrain and karst topography, which gives it very different characteristics than Section 2. Section 2 classified stream composition is 11 percent perennial streams, 44 percent intermittent streams, and 45 percent ditches. Section 3 classified stream composition is 20 percent perennial streams, 62 percent intermittent streams, and 19 percent ditches. There are abundant sinking streams, disappearing streams and sinkholes in Section 3, which lends to the intermittent nature of the streams and lack of ditches for drainage. Although the overall percentage of perennial stream impacts in Alternative O is comparatively low (15 percent), Section 3 has twice the number of impacts of Section 2. Intermittent stream impacts are 33 to 50 percent higher in Section 3. Section 2 has substantially more ditches than Section 3. Much of the ditch impacts in Alternative O occur in the local improvements to existing roadways, contributing 41 to 54 percent of impacts in Section 2 and 28 to 31 percent of impacts in Section 3. Alternative O new alignment crosses the following creeks and rivers: Short's Creek, Hunley Creek, Straight Creek, Patoka River, Davies Creek, French Lick Creek, Upper Sulphur Creek, Lick Creek, and the Lost River.

## Alternative P (North Central Family)

Alternative P has two variations in the alternative with an eastern and western variation of Loogootee. The P expressway variation has the second highest impact and is comparable to Alternative O, with only Alternative M being higher. More impacts are associated with the eastern variation of Loogootee compared to the western variation. RPA P established four variations of the original western variation. These variations incorporated portions of the eastern variation, added a new eastern variation closer to Loogootee, and added a through-town variation.

The alternative occurs at the transition between the gentle topography dominated by agricultural land use in Section 2 into more rugged terrain in Section 3 dominated by forest. Section 3 mostly parallels the county line of Martin and Daviess counties. Although Alternative P has the widest range of impacts due to variations, it traverses the same general area and thus has a similar composition of classified stream impacts. Classified stream impacts are comprised of, on average, 26 percent perennial streams, 41 percent intermittent streams, and 32 percent ditches. Unclassified streams comprise 58 percent of the



total stream impacts. All variations of Alternative P share Section 2 centerlines with Alternatives C, M, and most of Alternative O. All Alternative P variations share the same alignment in Section 2.

The east variation of Loogootee has roughly one mile more classified stream impacts than the west variation and roughly a total (classified and unclassified) of two miles more than the west variation. The east variation follows more closely the East Fork of the White River and thus is in closer vicinity of its streams, tributaries, and drainages. The east variation impacts West Boggs Creek while the west variation does not. The Alternative P expressway variation is 30 percent larger than the Super-2 and has 25 percent more stream impacts. Alternative P new alignment crosses the following creeks and rivers: Short's Creek, Hunley Creek, Straight Creek, Patoka River, East Fork Mill Creek, East Fork White River, Slate Creek, Haw Creek, Friends Creek, West Boggs Creek, North Fork Prairie Creek, and First Creek. The additional variation for RPA P creates a slightly wider range of impacts but aligns with the description of impacts for Alternative P.

## Alternative R

Alternative R overall has the least stream impacts, as well as the fewest stream impacts in each category. It does not result in impacts to any new streams not already impacted by US 231. Nearly all impacts are due to widening of existing bridges,

## Local Improvements

**Table 3** shows the potential stream impacts by individual local improvement. Local improvements may be included in more than one Alternative design, as indicated in the table. Impacts of note include the following. Local Improvement 2 (Alternatives B, C, M, O, P, and RPA P) adds eight miles of classified stream impacts and nine miles of unclassified streams to the alternatives, for a total of 17.5 additional miles. Local Improvement 3 (Alternatives B, C, M, O, P, and RPA P) adds 13.5 miles of classified stream impacts to each alternative, 12 miles of which are ditches. Local Improvement 5 (Alternatives C, M, O, P, and RPA P) adds 7.5 miles of classified stream impacts, of which six miles are ditches. Local Improvement 6 adds six miles of classified stream impacts, four miles of which are perennial streams. Alternative R represents an upgrade of existing US 231 and does not have any corresponding local improvements.

## Summary

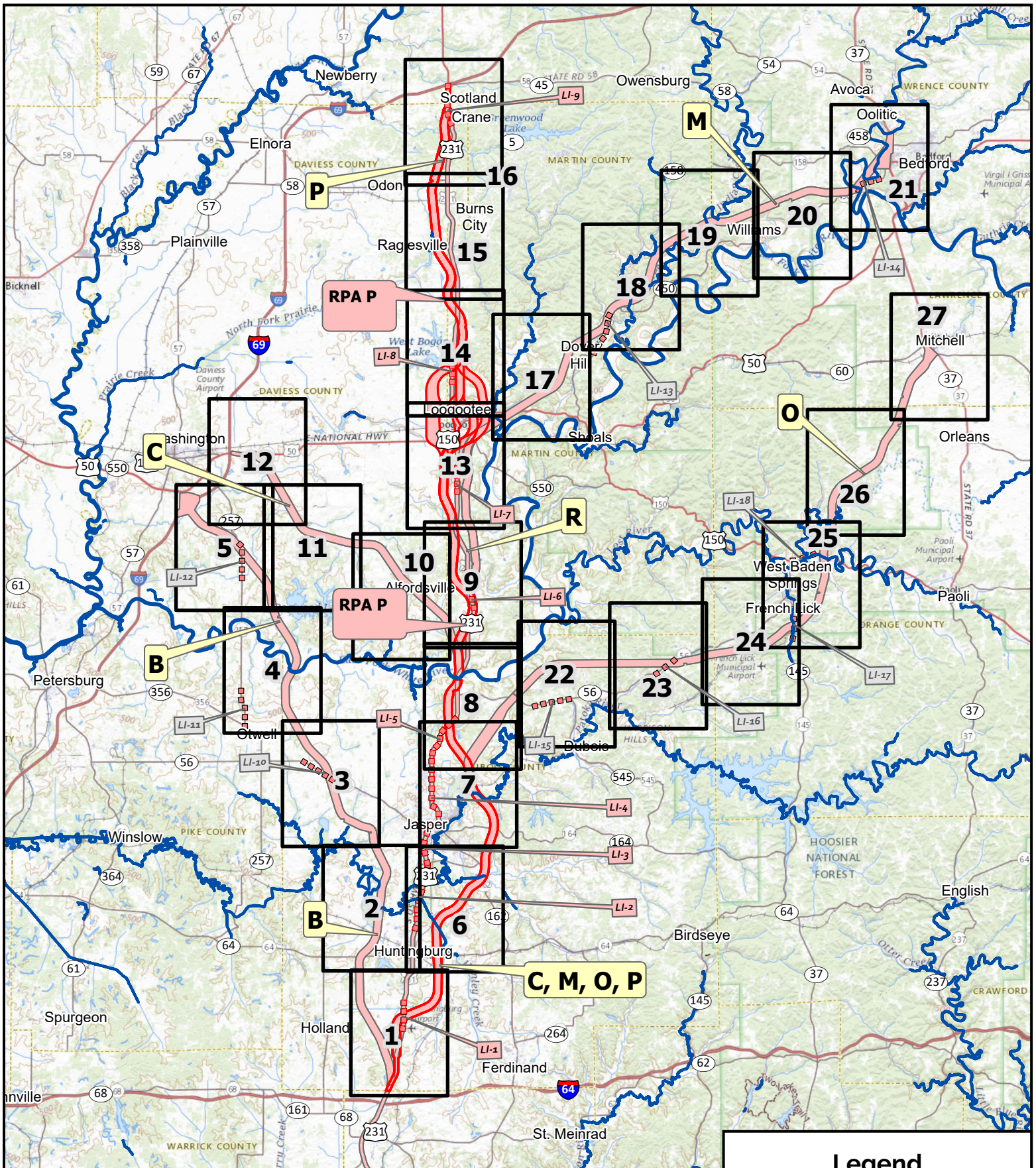
In summary, the impacts by alternative family are generally in the order of Northeastern Family, North Central Family, and Northwestern Family (greatest to least impact, respectively). Alternative C Super-2 variation has the least impacts to classified streams (9 miles). Alternative M expressway has the highest impact to streams (21 miles). Although the type of stream impacted is largely influenced by the topography, land use, and natural region, the total amount is strongly correlated to the amount of new alignment working ROW area ( $r = 0.94$ ). Local Improvement 2 adds substantial stream impacts to all the Alternatives. Local Improvement 6 adds four miles of perennial stream impacts to Alternatives M and P. Other notable local improvement impacts include Local Improvement 3 and Local Improvement 5, however; the majority of the associated impacts are ditches. Alternative R is an upgrade of existing US 231 and does not include any new alignment resulting in nearly all impacts associated with widening of existing crossings.



**TABLE 3: STREAM IMPACTS BY LOCAL IMPROVEMENT**

Local Improvements*				Stream Impacts (Linear Feet)					
LI-#	Existing Road	Alternatives	Section	Perennial	Intermittent	Canal/ Ditch	Classified Subtotal	Unclassified	Grand Total
LI-1	US 231	B, C, M, O, P, RPA P	2	2,200	900	10,800	13,900	4,300	18,200
LI-2	US 231	B, C, M, O, P, RPA P	2	9,100	20,300	12,300	41,600	51,100	92,800
LI-3	US 231	B, C, M, O, P, RPA P	2	3,200	5,100	62,900	71,300	12,100	83,400
LI-4	US 231	C, M, O, P, RPA P	2	0	0	0	0	300	300
LI-5	US 231	C, M, O, P, RPA P	2	2,700	3,500	33,600	39,800	25,600	65,400
LI-6	US 231	M, P, RPA P	3	19,700	5,200	5,300	30,300	20,300	50,600
LI-7	US 231	M, P, RPA P	3	3,500	0	8,200	11,800	6,000	17,800
LI-8	US 231	P, RPA P	3	0	4,000	0	4,000	3,200	7,300
LI-9	US 231	P, RPA P	3	0	1,000	0	1,000	10,800	11,800
LI-10	SR 56	B	2	0	1,000	200	1,200	1,400	2,500
LI-11	SR 257	B	2	500	1,600	1,000	3,100	2,000	5,100
LI-12	SR 257	B	3	500	0	11,000	11,500	200	11,700
LI-13	SR 450	M	3	1,300	0	4,800	6,100	2,100	8,200
LI-14	SR 450	M	3	700	0	0	700	2,000	2,700
LI-15	SR 56	O	3	0	2,000	0	2,000	4,800	6,700
LI-16	SR 56	O	3	1,500	500	5,700	7,800	2,400	10,100
LI-17	SR 145	O	3	2,600	0	3,700	6,300	1,100	7,300
LI-18	US 150	O	3	1,100	0	4,100	5,200	3,100	8,200

\* Local Improvements are associated with the alternatives.



## FEIS Appendix L Stream Impact Map Series Index









**MID-STATES  
CORRIDOR**

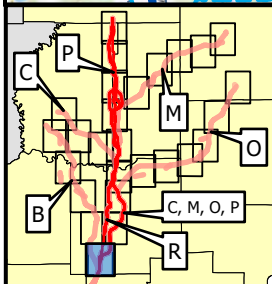
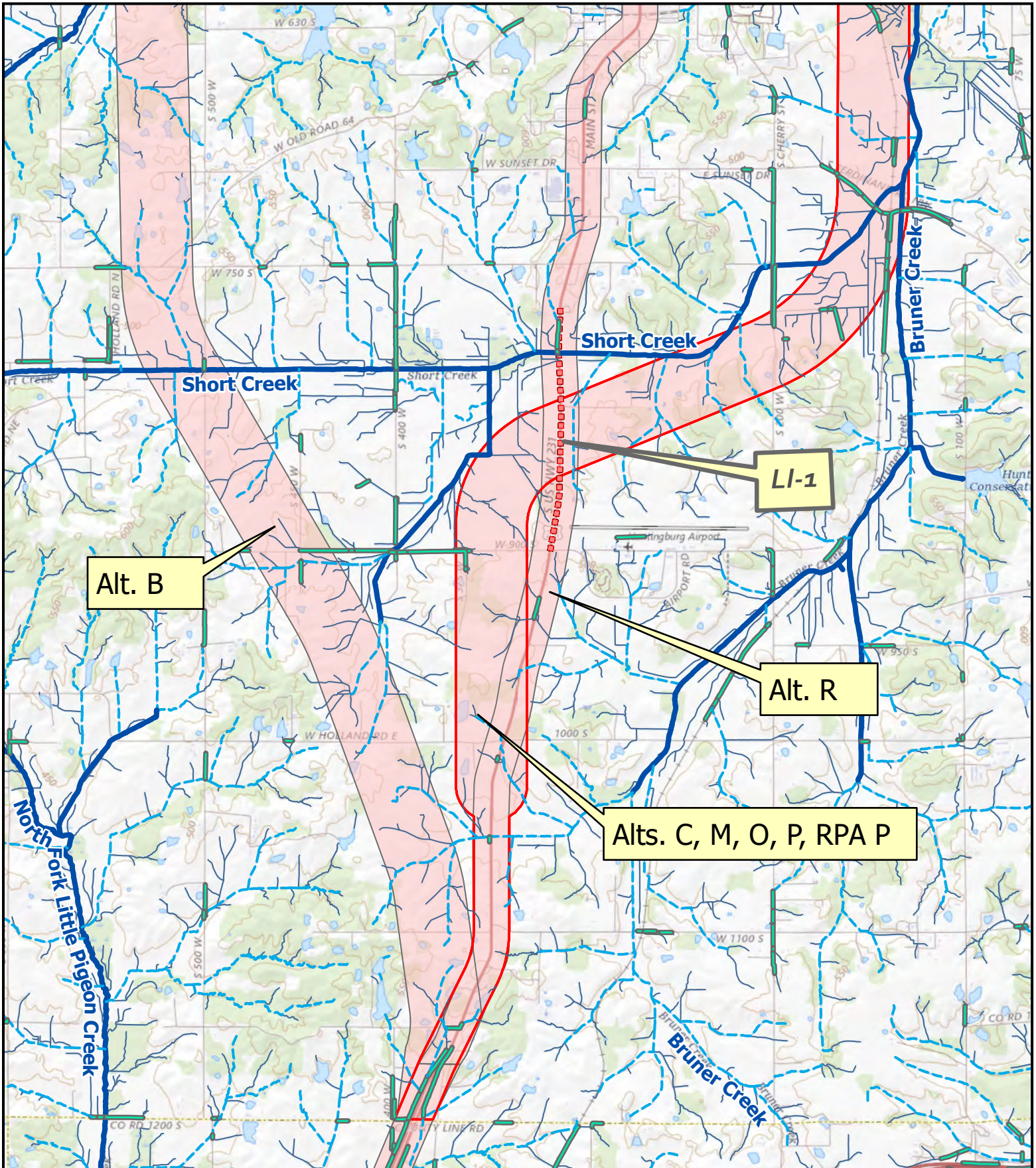
0 5 10 Miles



2/13/2023

### Legend

-  Stream Series Pages
-  Rivers
-  Alternative Corridors
-  Studied Alternatives
-  Refined Preferred Alternative P
-  Local Improvements



**MID-STATES  
CORRIDOR**

**FEIS Appendix L  
Stream Impact Map Series**

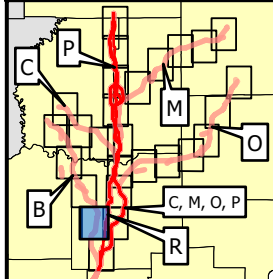
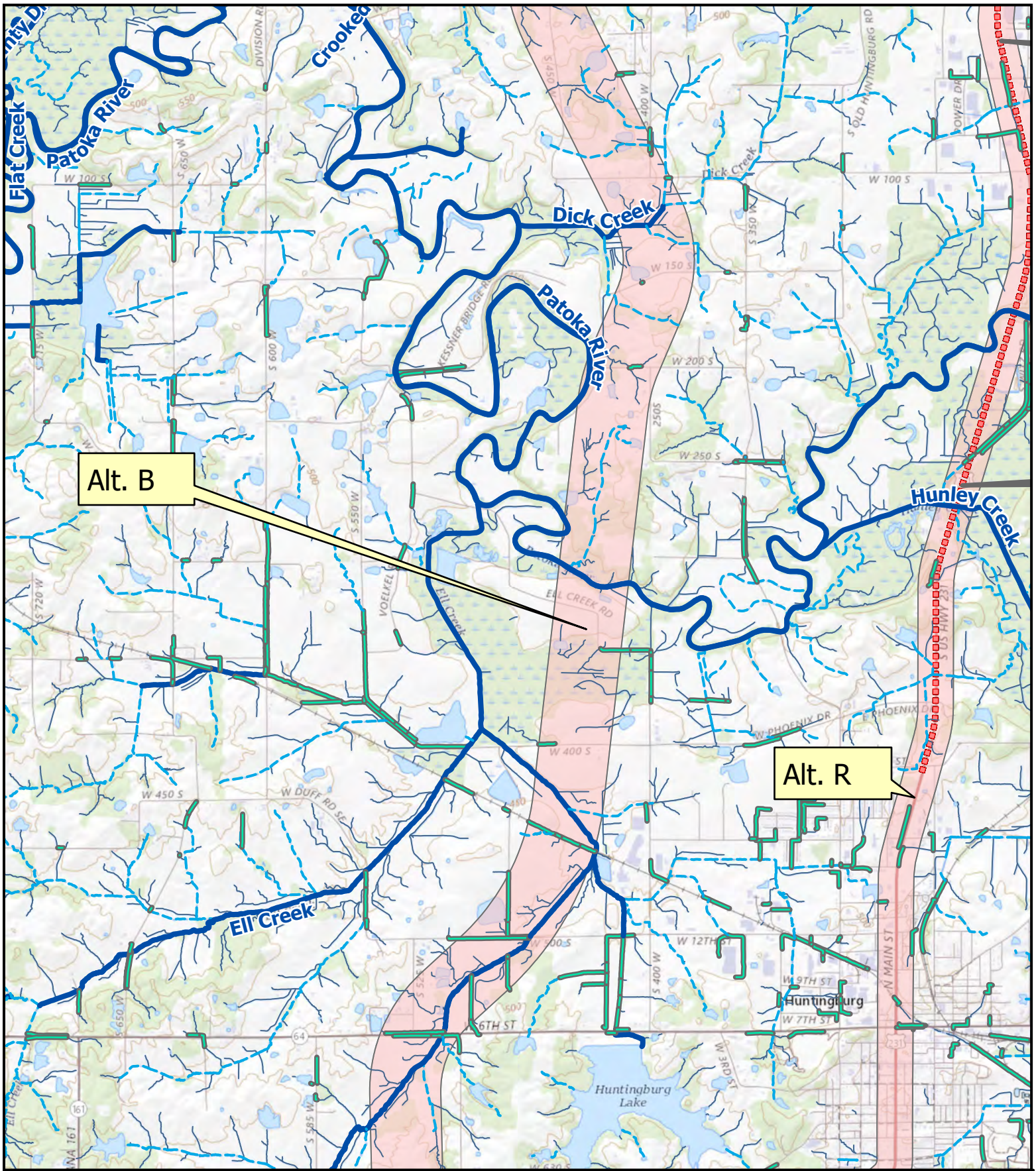
0 0.5 1 Miles

2/13/2023

**Legend**

- NHD Streams
  - Perennial Streams
  - - - Intermittent Streams
  - Canals/Ditches
  - NHD Unclassified Drainages
- Rivers and Streams
- Local Improvements
- Refined Preferred Alternative P
- Alternative Corridors

Page# 1



**MID-STATES  
CORRIDOR**

**FEIS Appendix L  
Stream Impact Map Series**

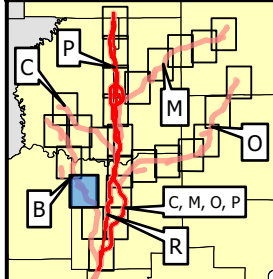
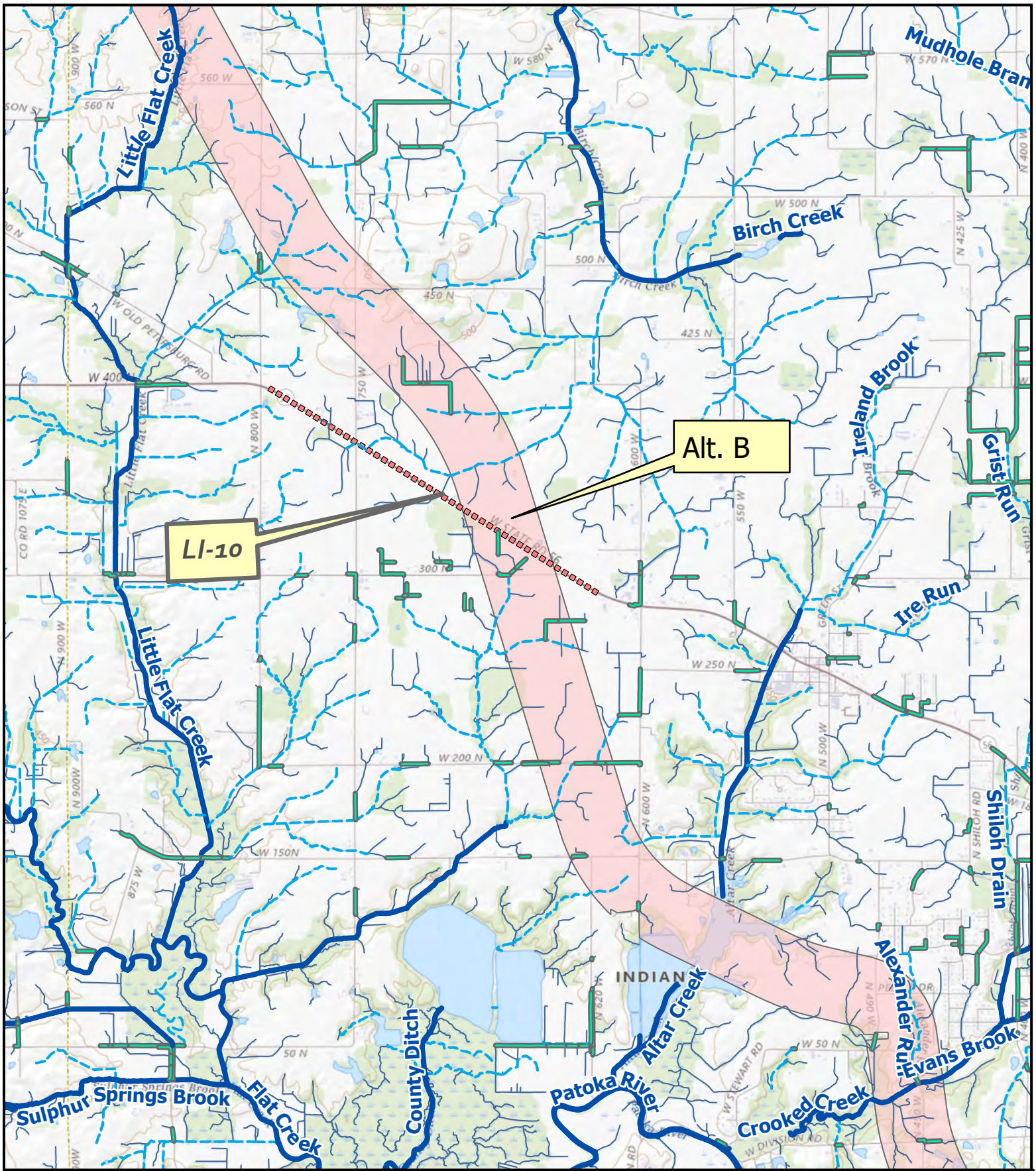
0 0.5 1 Miles

2/13/2023

**Legend**

- NHD Streams
  - Perennial Streams
  - - - Intermittent Streams
  - Canals/Ditches
  - NHD Unclassified Drainages
- Rivers and Streams
- Local Improvements
- Refined Preferred Alternative P
- Alternative Corridors

Page# 2



**MID-STATES  
CORRIDOR**

**FEIS Appendix L  
Stream Impact Map Series**

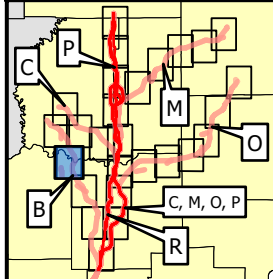
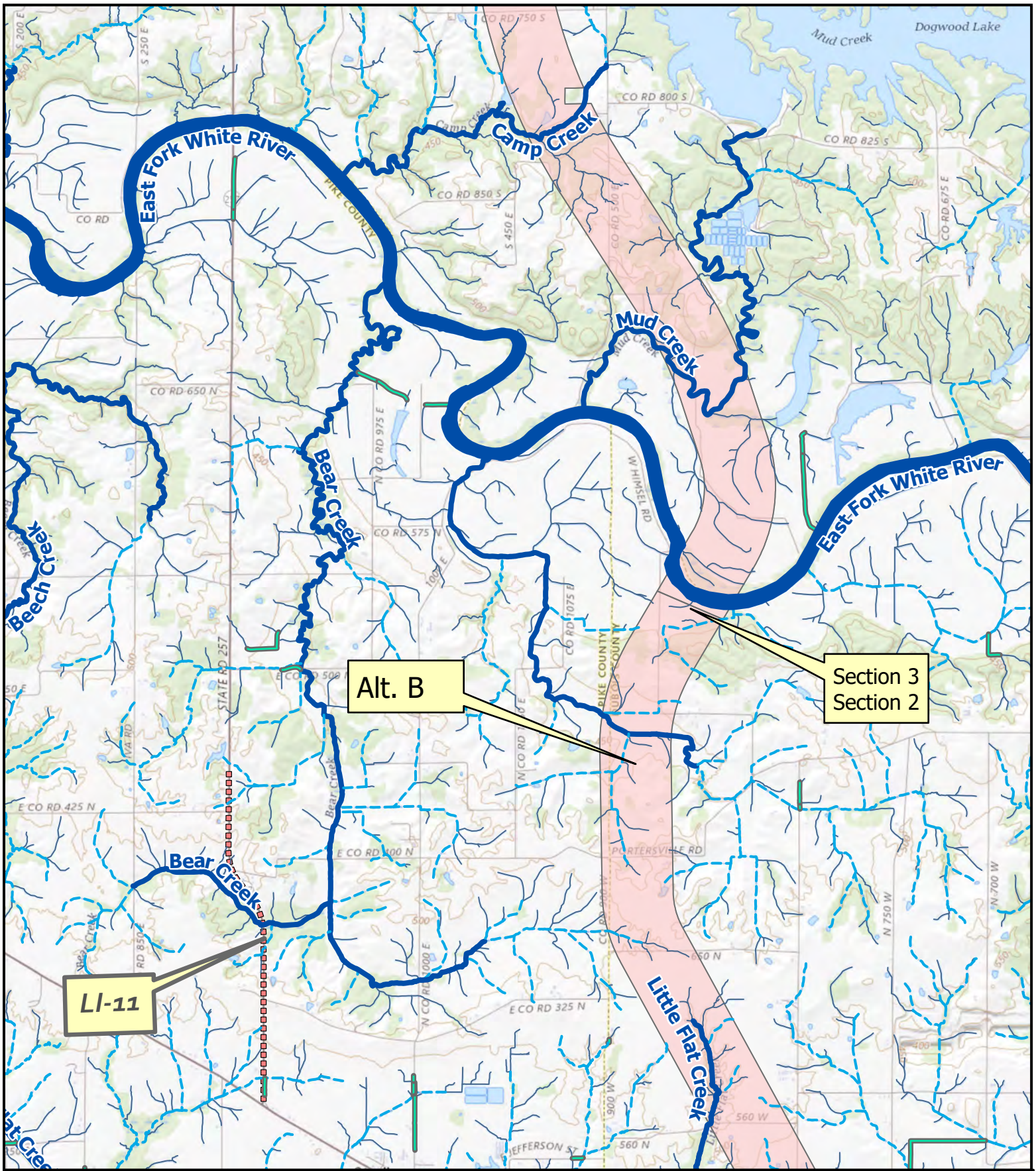
0 0.5 1 Miles

2/13/2023

**Legend**

- NHD Streams
  - Perennial Streams
  - Intermittent Streams
  - Canals/Ditches
  - NHD Unclassified Drainages
- Local Improvements
- Refined Preferred Alternative P
- Alternative Corridors
- Rivers and Streams

Page# 3



**MID-STATES  
CORRIDOR**

**FEIS Appendix L  
Stream Impact Map Series**

0 0.5 1 Miles

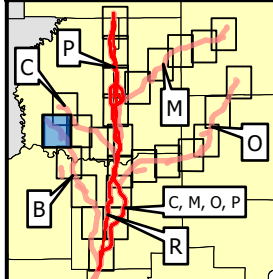
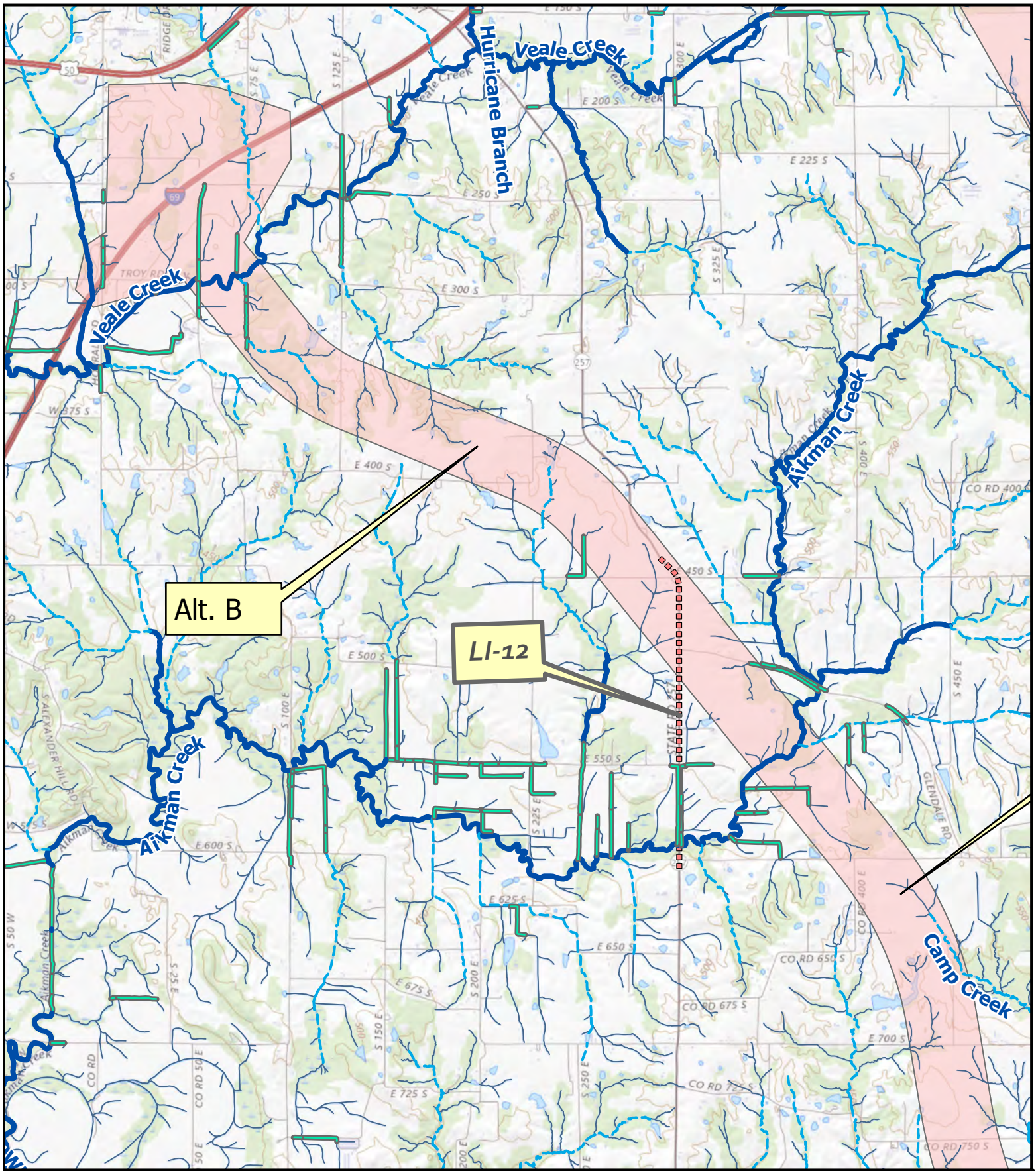
2/13/2023

**Legend**

- NHD Streams
- Perennial Streams
- Intermittent Streams
- Canals/Ditches
- NHD Unclassified Drainages
- Rivers and Streams
- Local Improvements
- Refined Preferred Alternative P
- Alternative Corridors

Page# 4





**MID-STATES  
CORRIDOR**

**FEIS Appendix L  
Stream Impact Map Series**

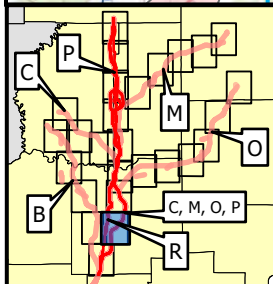
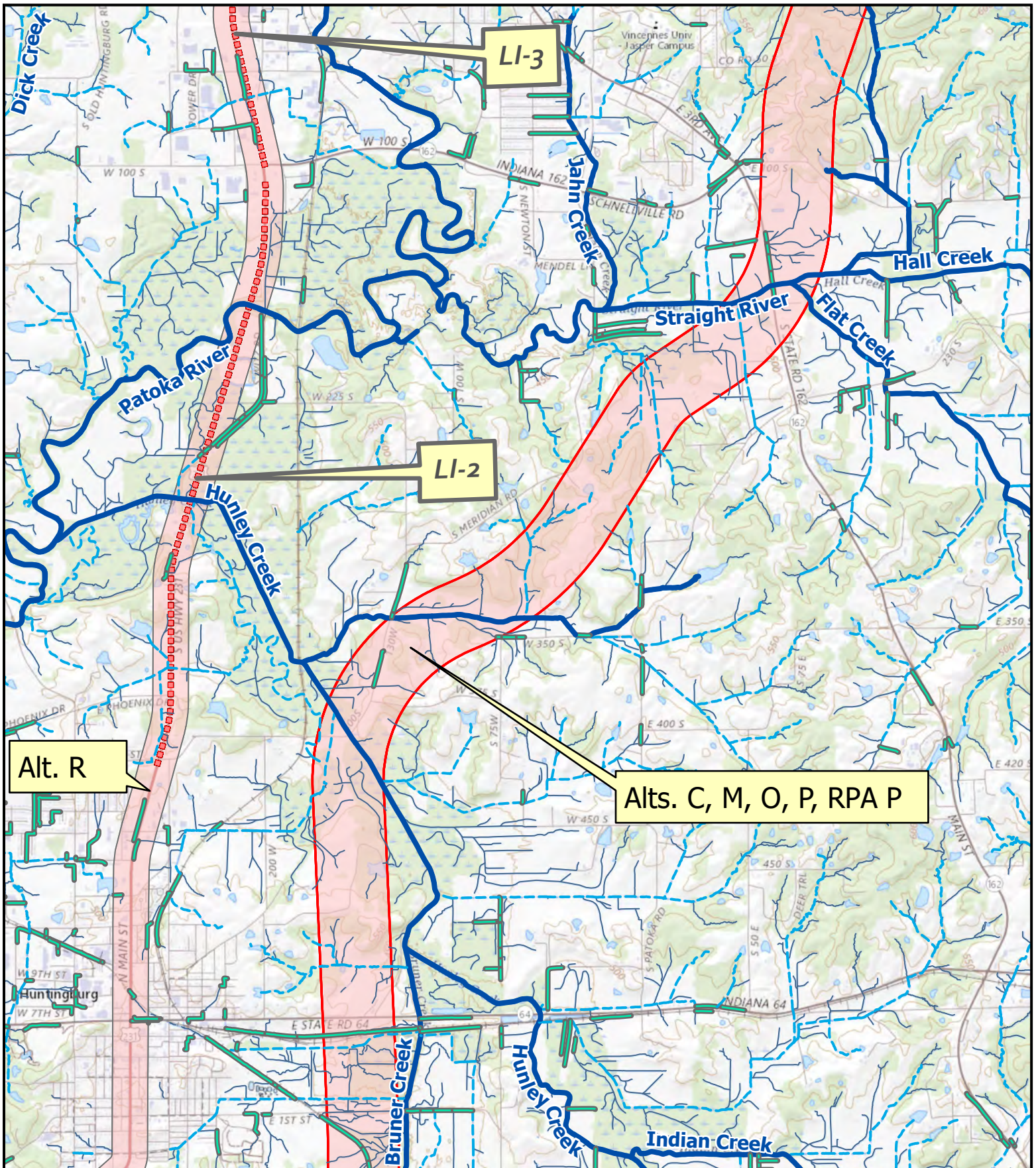
0 0.5 1 Miles

2/13/2023

**Legend**

- NHD Streams
  - Perennial Streams
  - - - Intermittent Streams
  - Canals/Ditches
  - - - NHD Unclassified Drainages
- Rivers and Streams
- - - Local Improvements
- Refined Preferred Alternative P
- Alternative Corridors

Page# 5



**MID-STATES  
CORRIDOR**

**FEIS Appendix L  
Stream Impact Map Series**

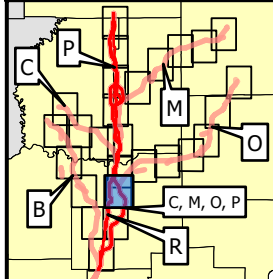
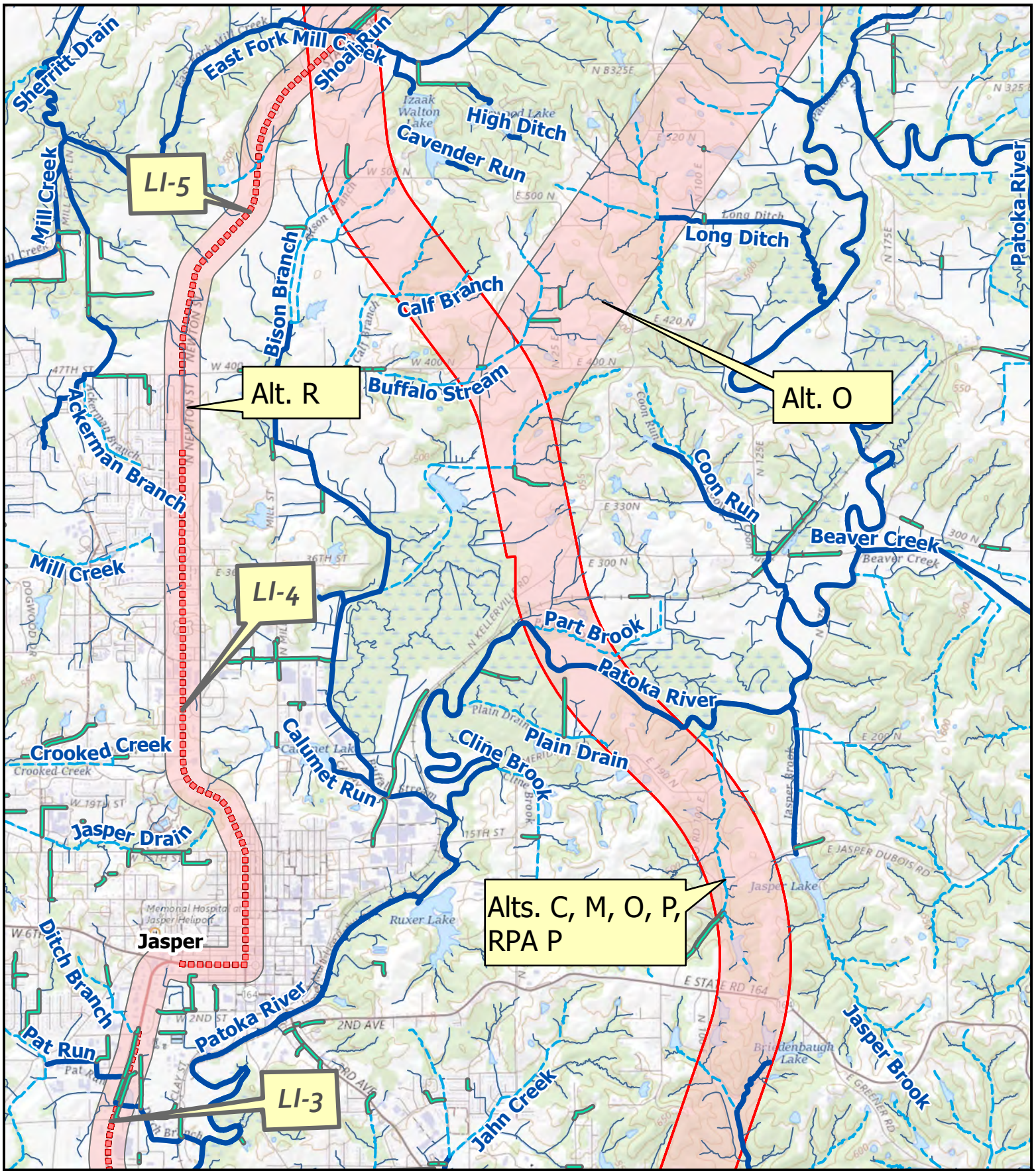
0 0.5 1 Miles


2/13/2023


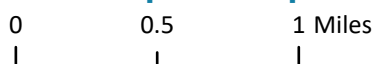
**Legend**

- NHD Streams
  - Perennial Streams
  - - - Intermittent Streams
  - Canals/Ditches
  - NHD Unclassified Drainages
- Rivers and Streams
- Local Improvements
- Refined Preferred Alternative P
- Alternative Corridors

Page# 6












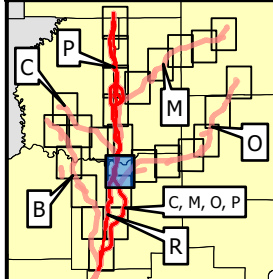
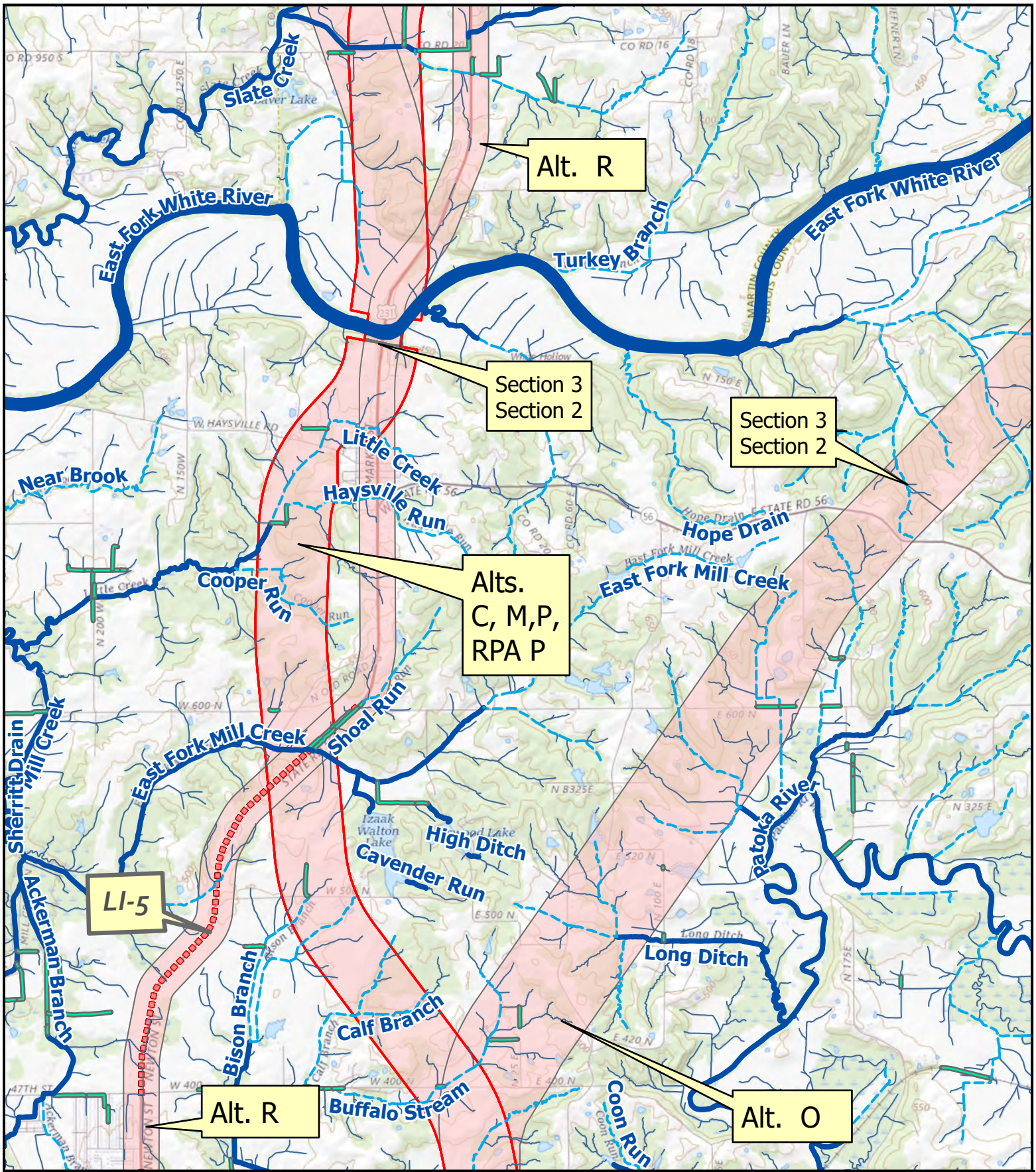

**MID-STATES CORRIDOR**  
**FEIS Appendix L**  
**Stream Impact Map Series**

2/13/2023 Page# 7

**Legend**

 NHD Streams	 Rivers and Streams
 Perennial Streams	 Local Improvements
 Intermittent Streams	 Refined Preferred Alternative P
 Canals/Ditches	 Alternative Corridors
 NHD Unclassified Drainages	



**MID-STATES  
CORRIDOR**

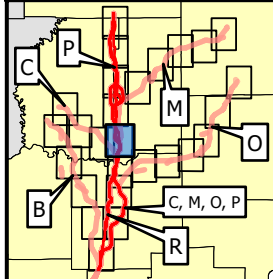
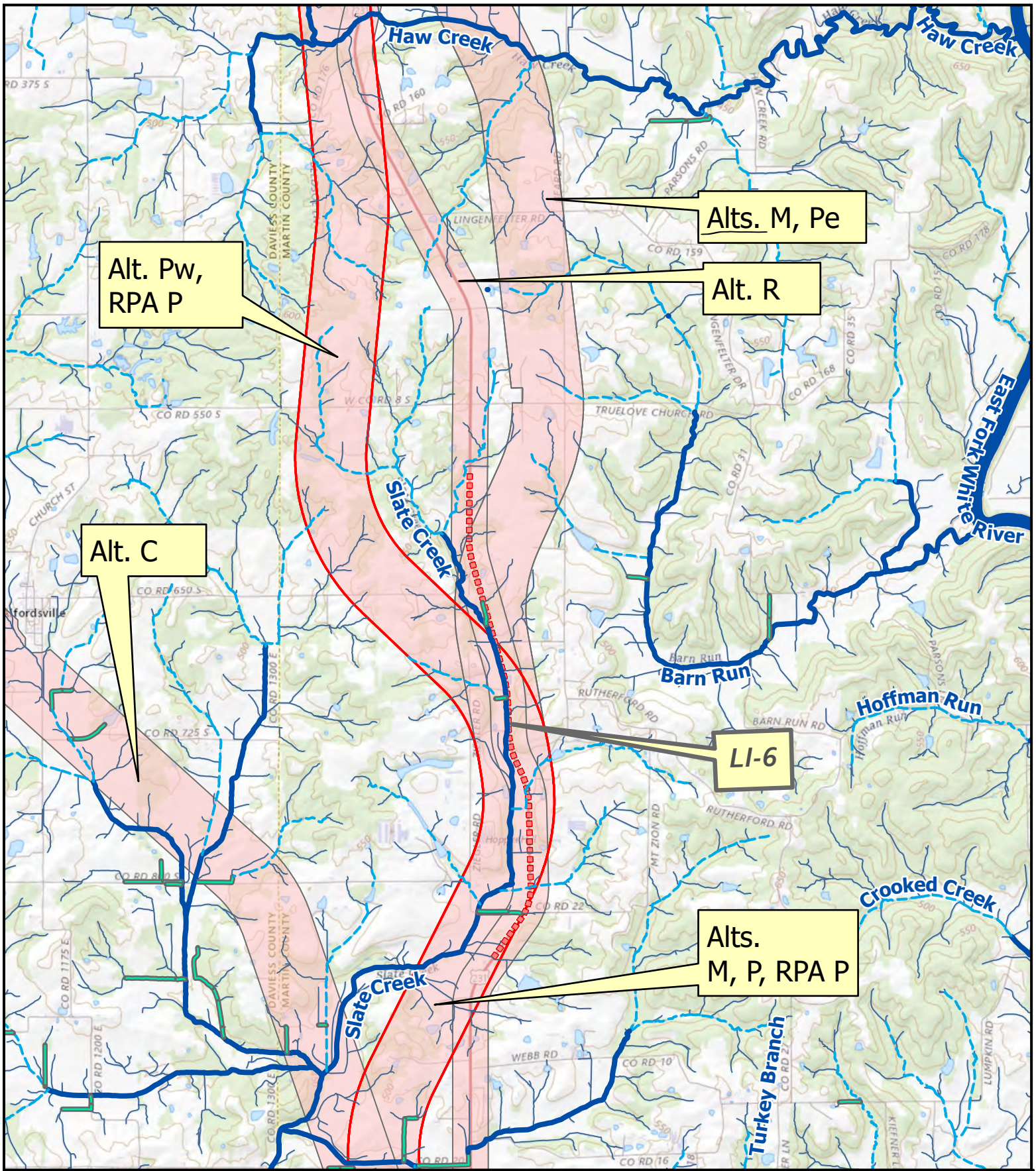
**FEIS Appendix L  
Stream Impact Map Series**

0 0.5 1 Miles

2/13/2023

**Legend**

- NHD Streams
- Perennial Streams
- Intermittent Streams
- Canals/Ditches
- NHD Unclassified Drainages
- Rivers and Streams
- Local Improvements
- Refined Preferred Alternative P
- Alternative Corridors



**MID-STATES  
CORRIDOR**

**FEIS Appendix L  
Stream Impact Map Series**

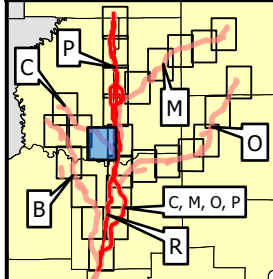
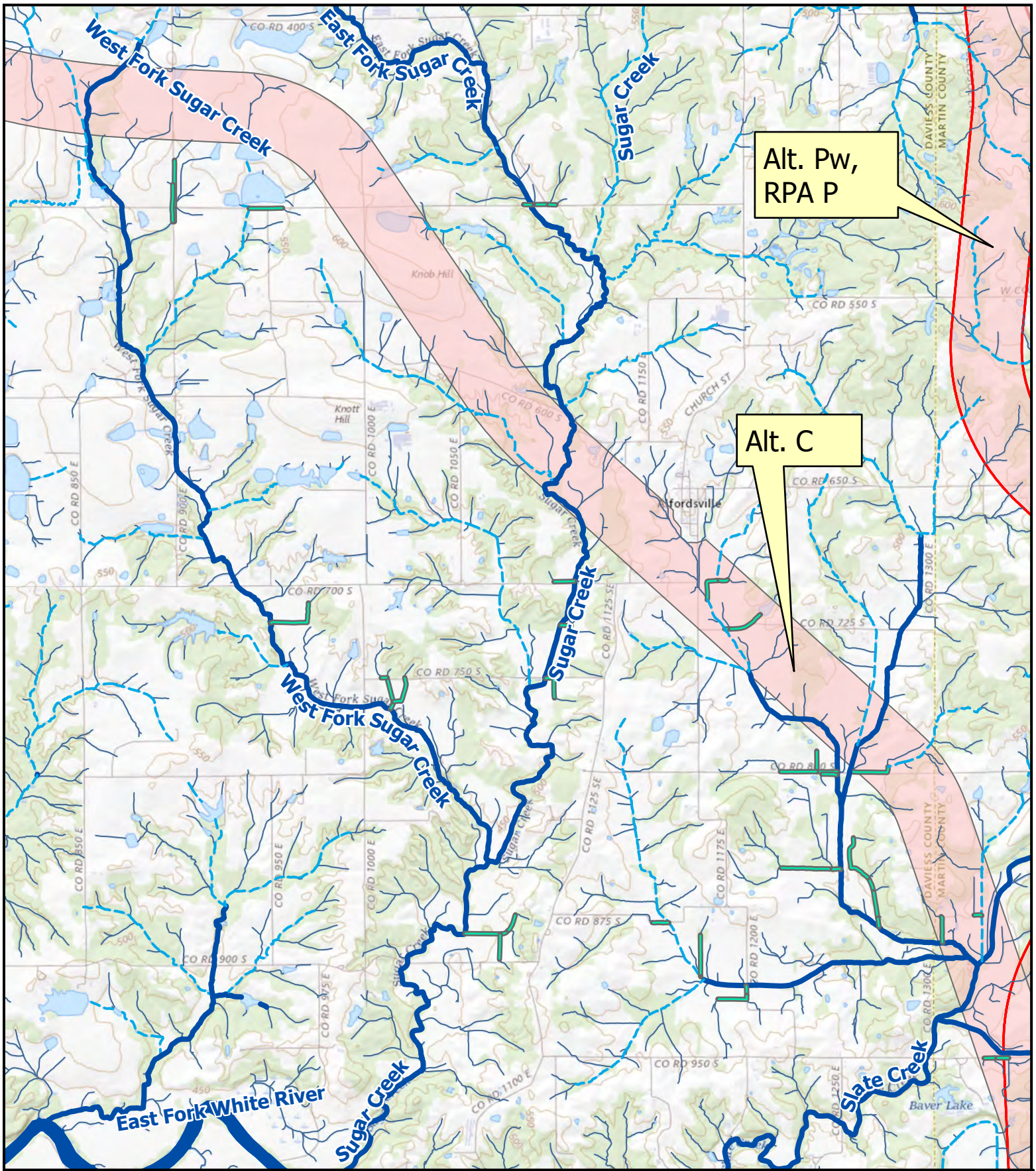
0 0.5 1 Miles

2/13/2023

**Legend**

- NHD Streams
- Perennial Streams
- - - Intermittent Streams
- Canals/Ditches
- NHD Unclassified Drainages
- Rivers and Streams
- Local Improvements
- Refined Preferred Alternative P
- Alternative Corridors

Page# 9



**MID-STATES  
CORRIDOR**

**FEIS Appendix L  
Stream Impact Map Series**

0 0.5 1 Miles

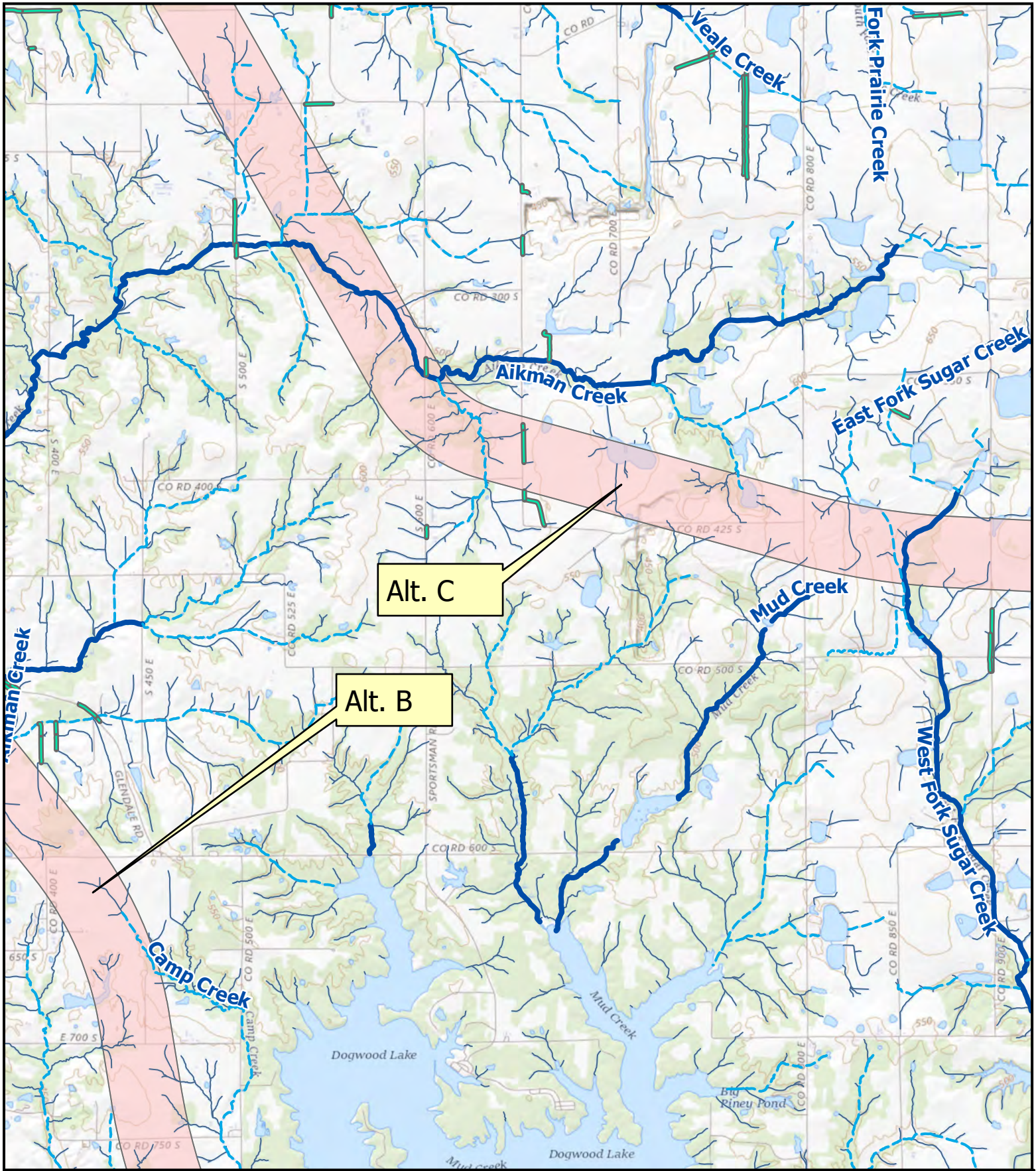
2/13/2023

- NHD Streams
- Perennial Streams
- - - Intermittent Streams
- Canals/Ditches
- NHD Unclassified Drainages

**Legend**

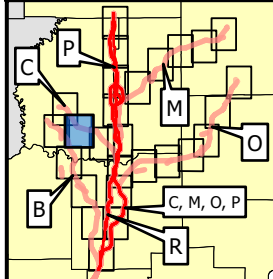
- Rivers and Streams
- Local Improvements
- Refined Preferred Alternative P
- Alternative Corridors

Page# 10



Alt. C

Alt. B



**MID-STATES CORRIDOR**

**FEIS Appendix L  
Stream Impact Map Series**

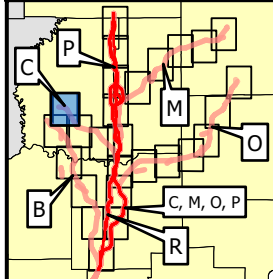
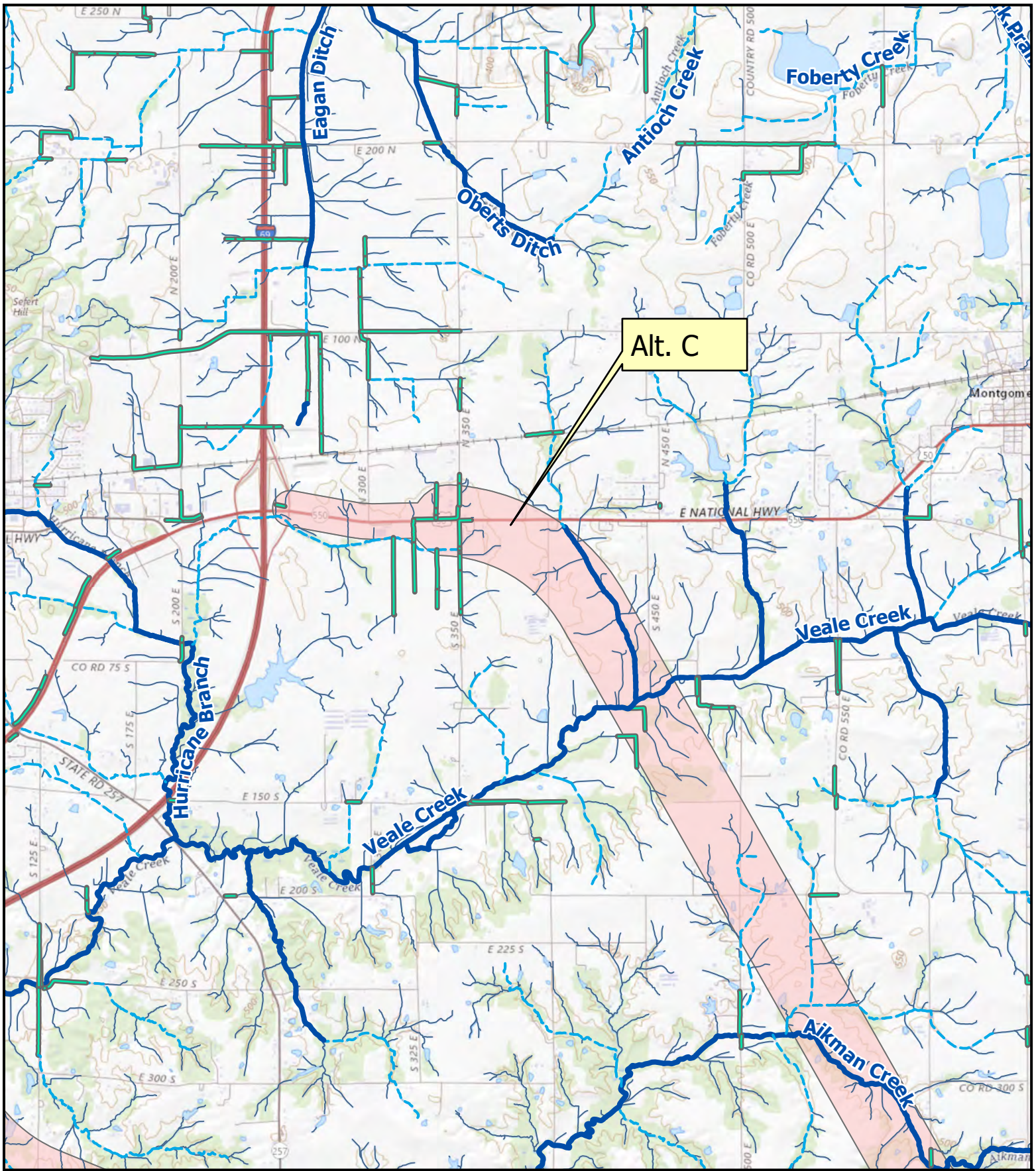
0 0.5 1 Miles

2/13/2023

**Legend**

NHD Streams	Rivers and Streams
Perennial Streams	Local Improvements
Intermittent Streams	Refined Preferred Alternative P
Canals/Ditches	Alternative Corridors
NHD Unclassified Drainages	

Page# 11



**MID-STATES  
CORRIDOR**

**FEIS Appendix L  
Stream Impact Map Series**

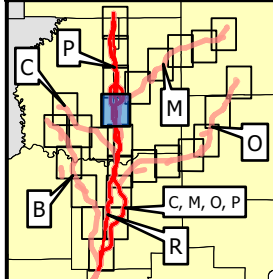
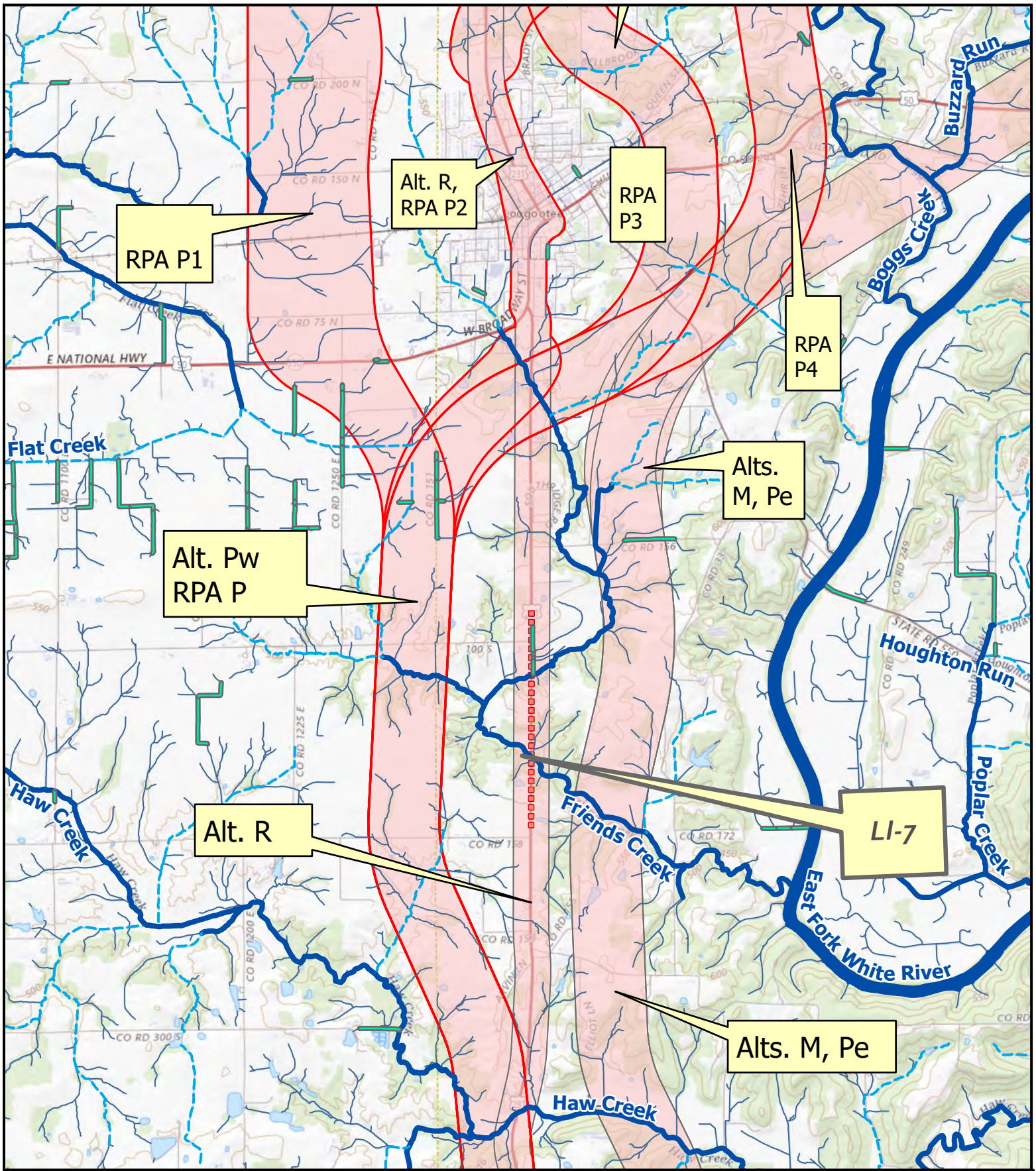
0 0.5 1 Miles

2/13/2023

**Legend**

- NHD Streams
  - Perennial Streams
  - - - Intermittent Streams
  - Canals/Ditches
  - - - NHD Unclassified Drainages
- Rivers and Streams
- - - Local Improvements
- Refined Preferred Alternative P
- Alternative Corridors





**MID-STATES  
CORRIDOR**

**FEIS Appendix L  
Stream Impact Map Series**

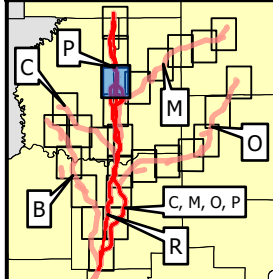
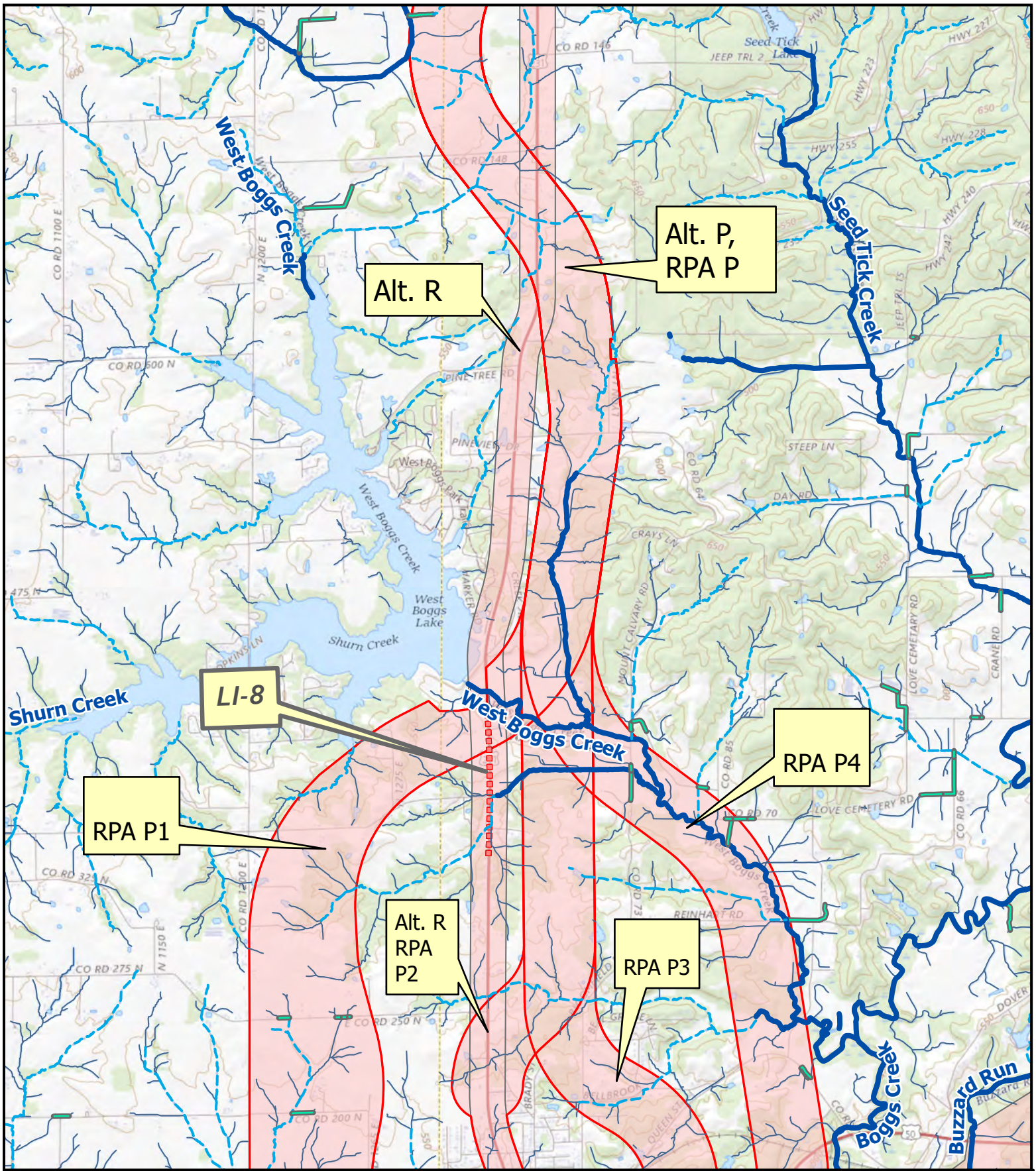
0 0.5 1 Miles

2/13/2023

**Legend**

- NHD Streams
  - Perennial Streams
  - - - Intermittent Streams
  - Canals/Ditches
  - NHD Unclassified Drainages
- Rivers and Streams
- Local Improvements
- Refined Preferred Alternative P
- Alternative Corridors

Page# 13



**MID-STATES  
CORRIDOR**

**FEIS Appendix L  
Stream Impact Map Series**

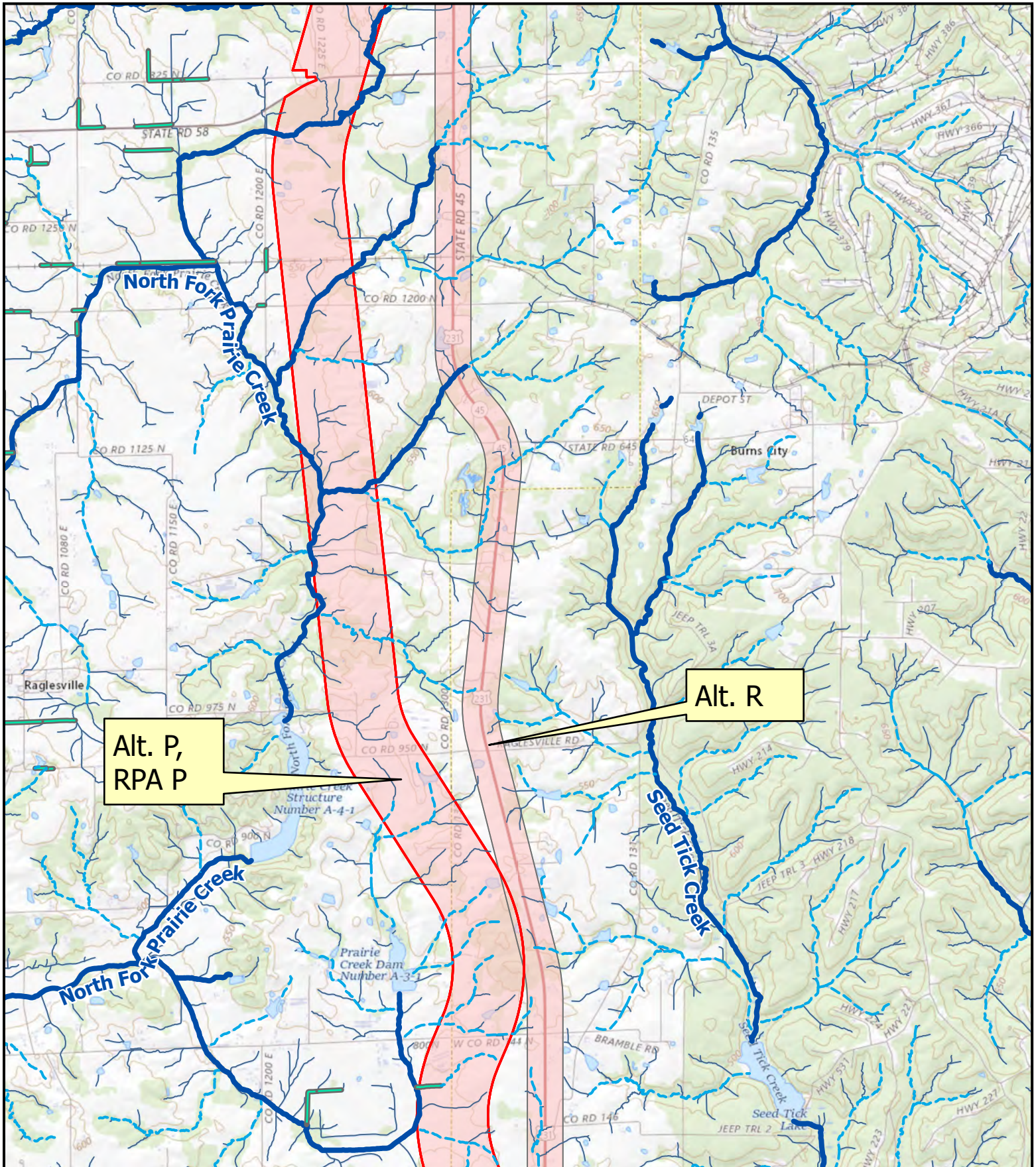
0 0.5 1 Miles

2/13/2023

**Legend**

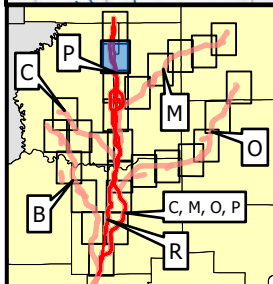
- NHD Streams
  - Perennial Streams
  - - - Intermittent Streams
  - Canals/Ditches
  - - - NHD Unclassified Drainages
- Rivers and Streams
- - - Local Improvements
- Refined Preferred Alternative P
- Alternative Corridors

Page# 14



Alt. P,  
RPA P

Alt. R



**MID-STATES  
CORRIDOR**

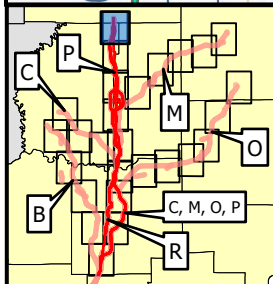
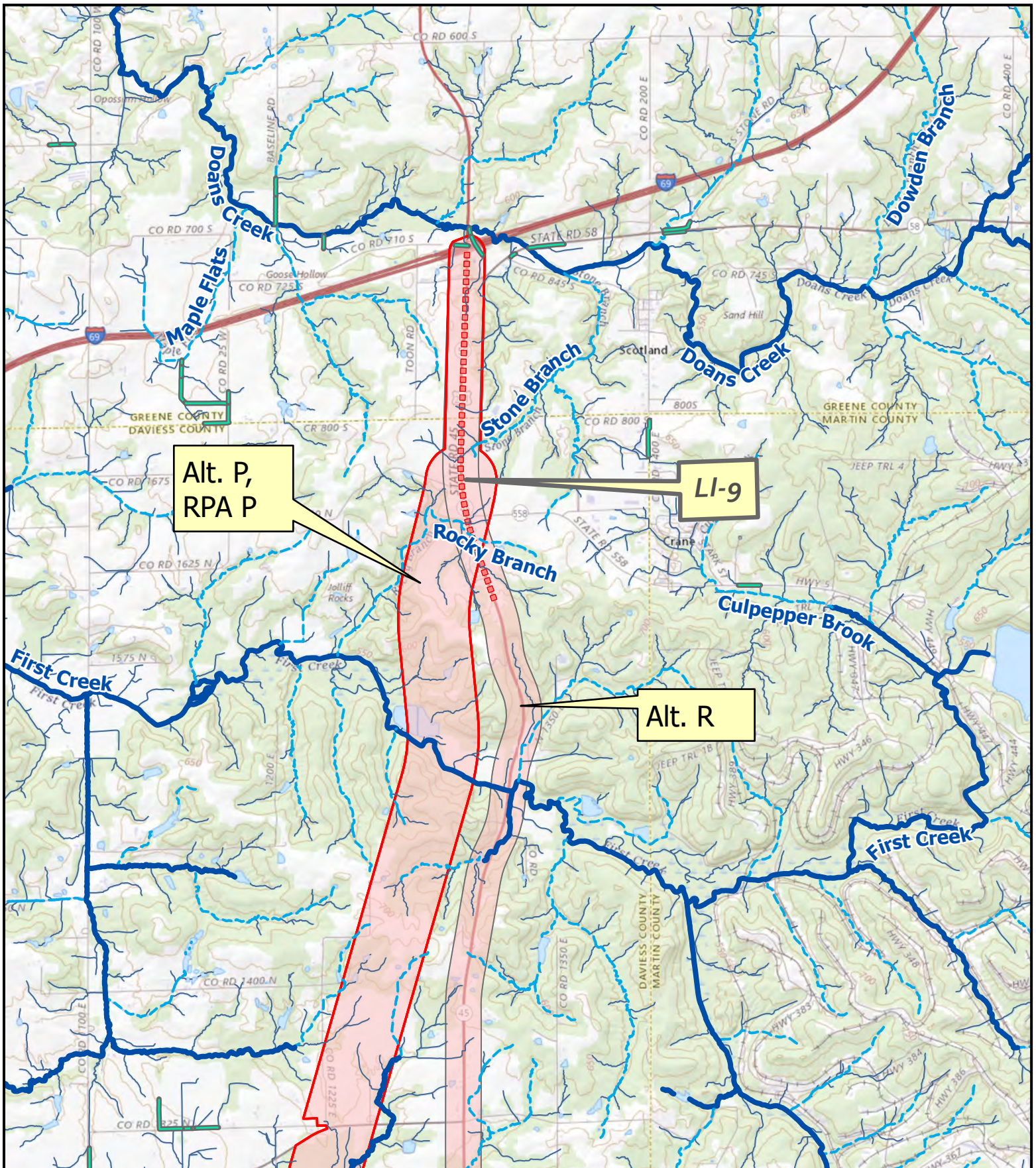
**FEIS Appendix L  
Stream Impact Map Series**

0 0.5 1 Miles

2/13/2023

**Legend**

- NHD Streams
  - Perennial Streams
  - - - Intermittent Streams
  - Canals/Ditches
  - NHD Unclassified Drainages
- Rivers and Streams
- Local Improvements
- Refined Preferred Alternative P
- Alternative Corridors



**MID-STATES  
CORRIDOR**

**FEIS Appendix L  
Stream Impact Map Series**

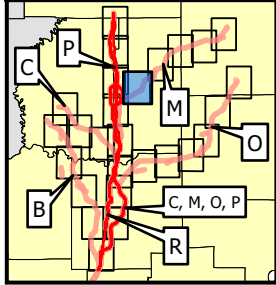
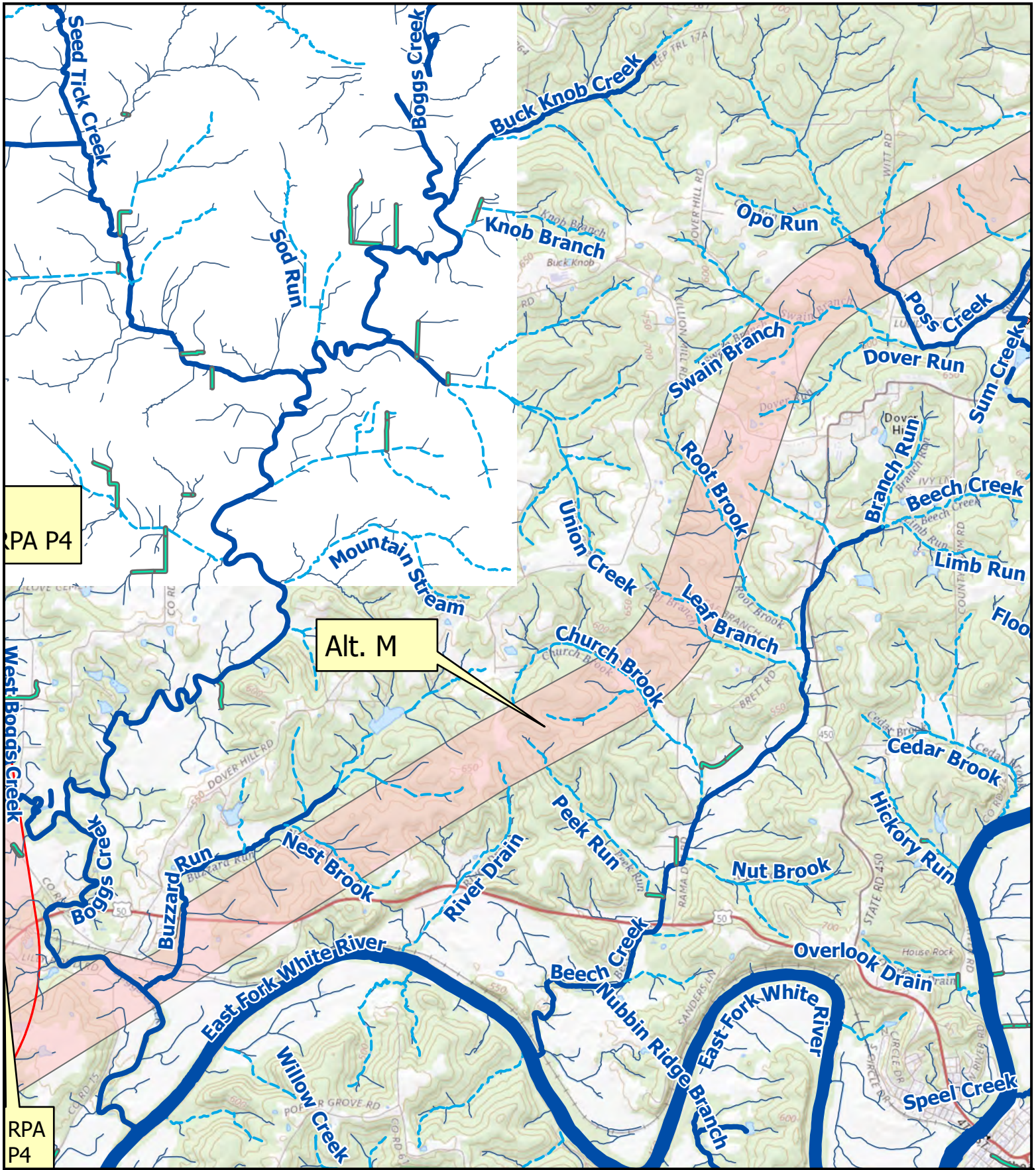
0 0.5 1 Miles

2/13/2023

**Legend**

- NHD Streams
  - Perennial Streams
  - - - Intermittent Streams
  - Canals/Ditches
  - NHD Unclassified Drainages
- Rivers and Streams
- Local Improvements
- Refined Preferred Alternative P
- Alternative Corridors

Page# 16



**MID-STATES  
CORRIDOR**

**FEIS Appendix L  
Stream Impact Map Series**

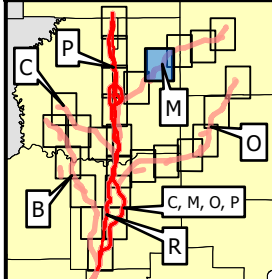
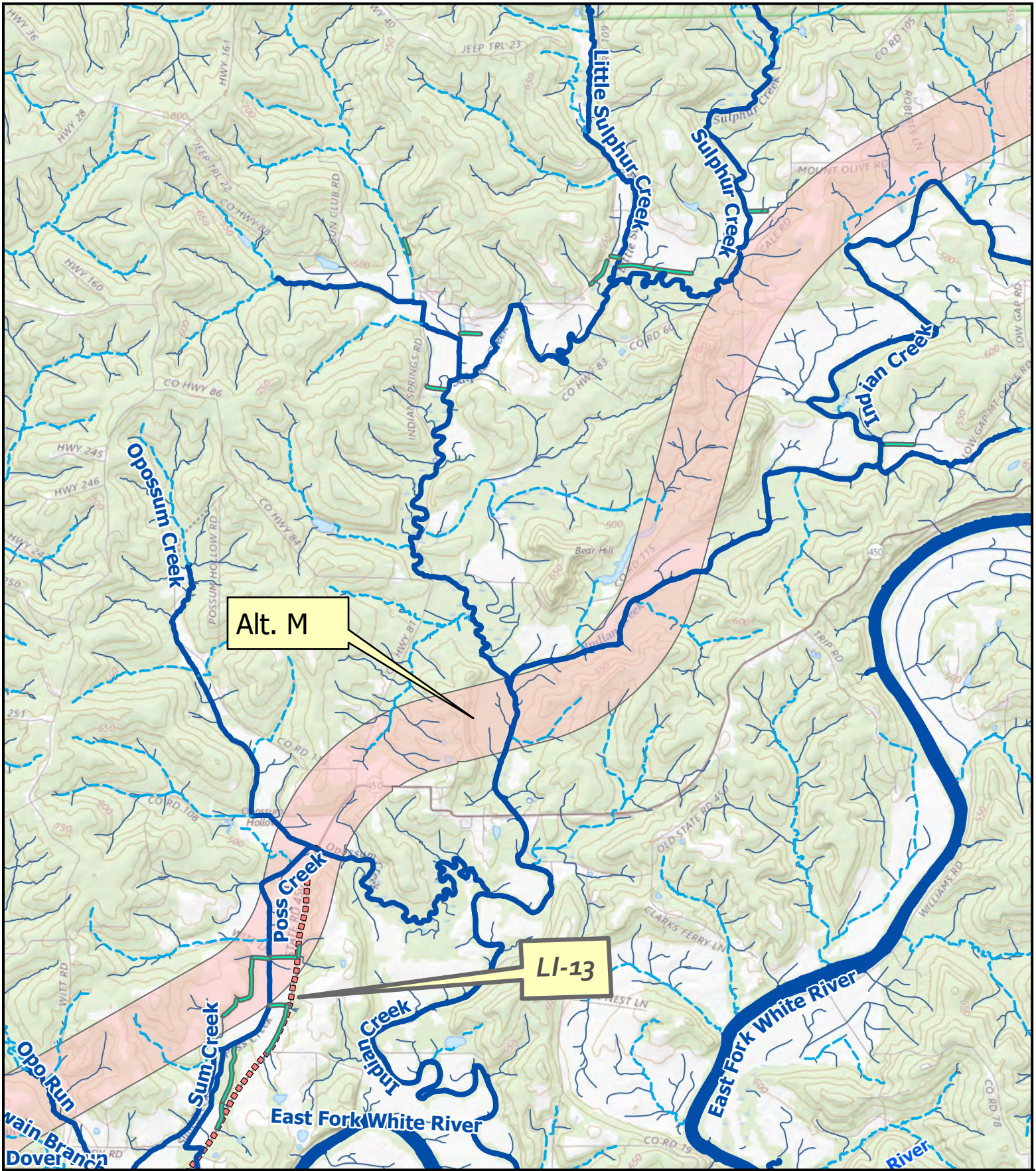
0 0.5 1 Miles

2/13/2023

**Legend**

- NHD Streams
- Perennial Streams
- Intermittent Streams
- Canals/Ditches
- NHD Unclassified Drainages
- Rivers and Streams
- Local Improvements
- Refined Preferred Alternative P
- Alternative Corridors

Page# 17



**MID-STATES  
CORRIDOR**

**FEIS Appendix L  
Stream Impact Map Series**

0 0.5 1 Miles

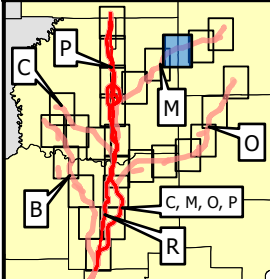
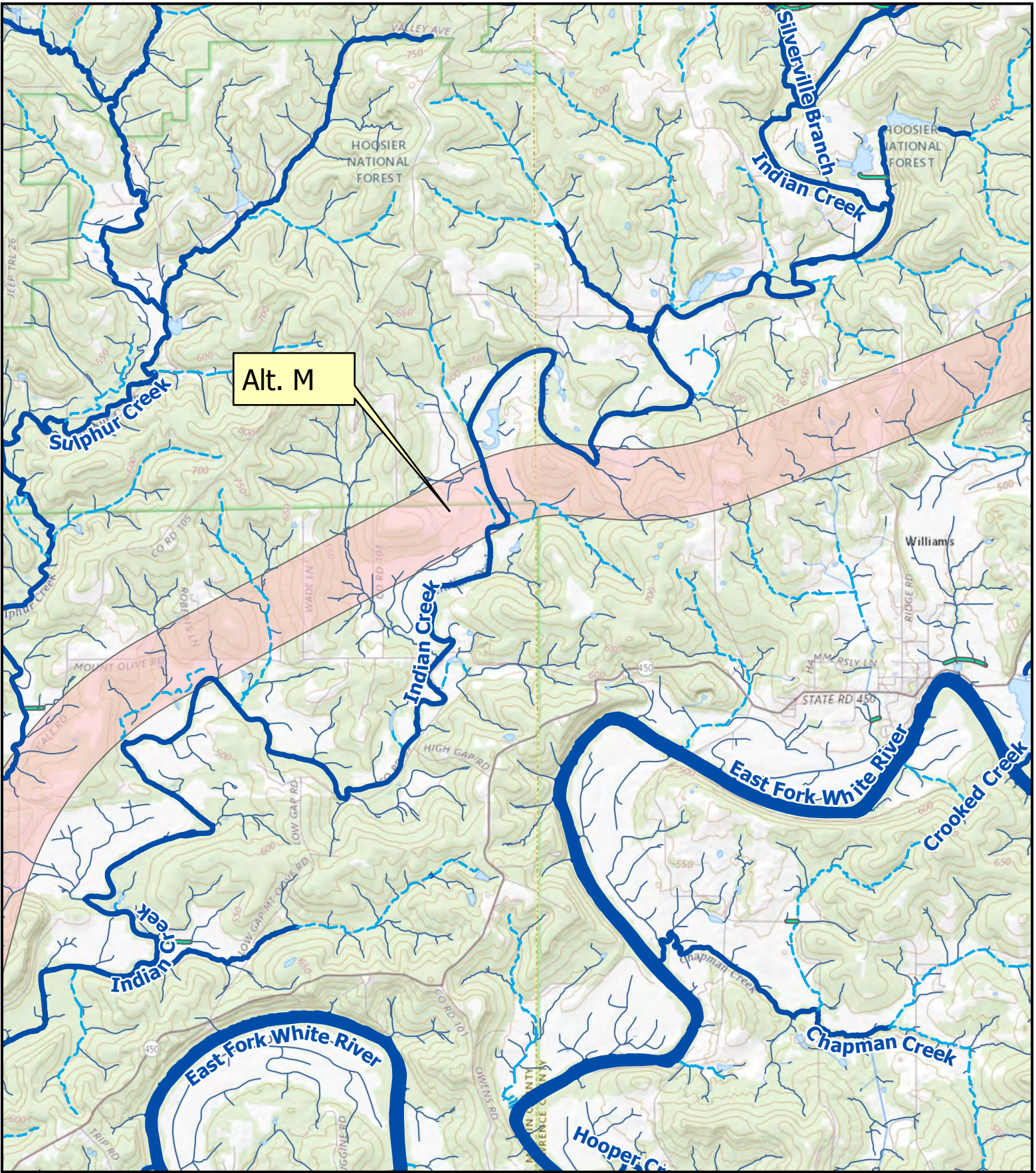
2/13/2023

- NHD Streams
- Perennial Streams
- - - Intermittent Streams
- Canals/Ditches
- NHD Unclassified Drainages

**Legend**

- Rivers and Streams
- - - Local Improvements
- Refined Preferred Alternative P
- Alternative Corridors

Page# 18



**MID-STATES  
CORRIDOR**

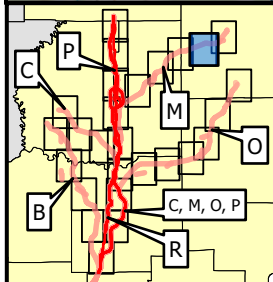
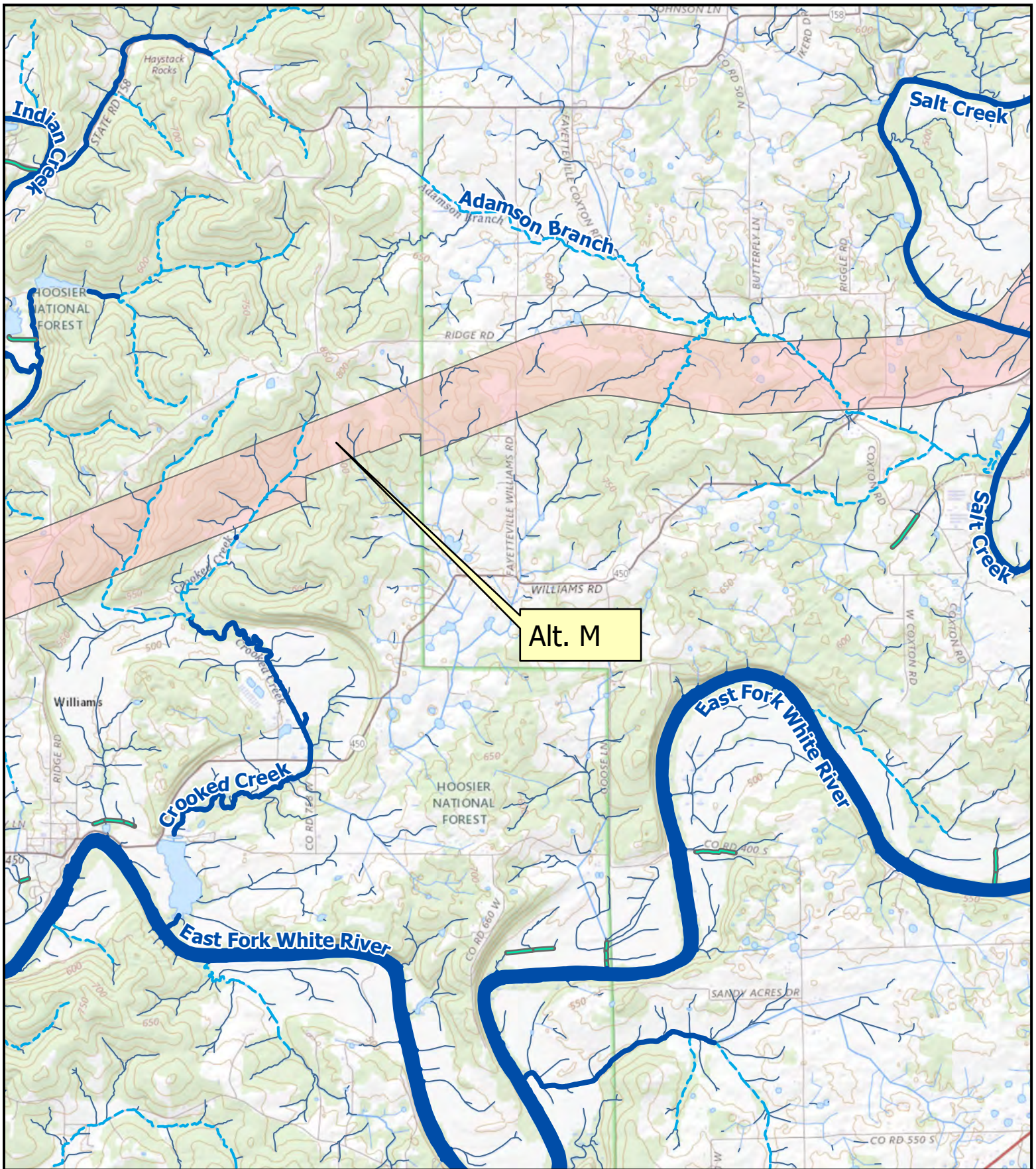
**FEIS Appendix L  
Stream Impact Map Series**

0 0.5 1 Miles

2/13/2023

**Legend**

- NHD Streams
  - Perennial Streams
  - - - Intermittent Streams
  - Canals/Ditches
  - NHD Unclassified Drainages
- Rivers and Streams
- Local Improvements
- Refined Preferred Alternative P
- Alternative Corridors



**MID-STATES  
CORRIDOR**

**FEIS Appendix L  
Stream Impact Map Series**

0 0.5 1 Miles

2/13/2023

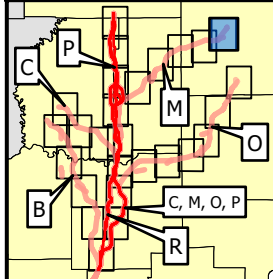
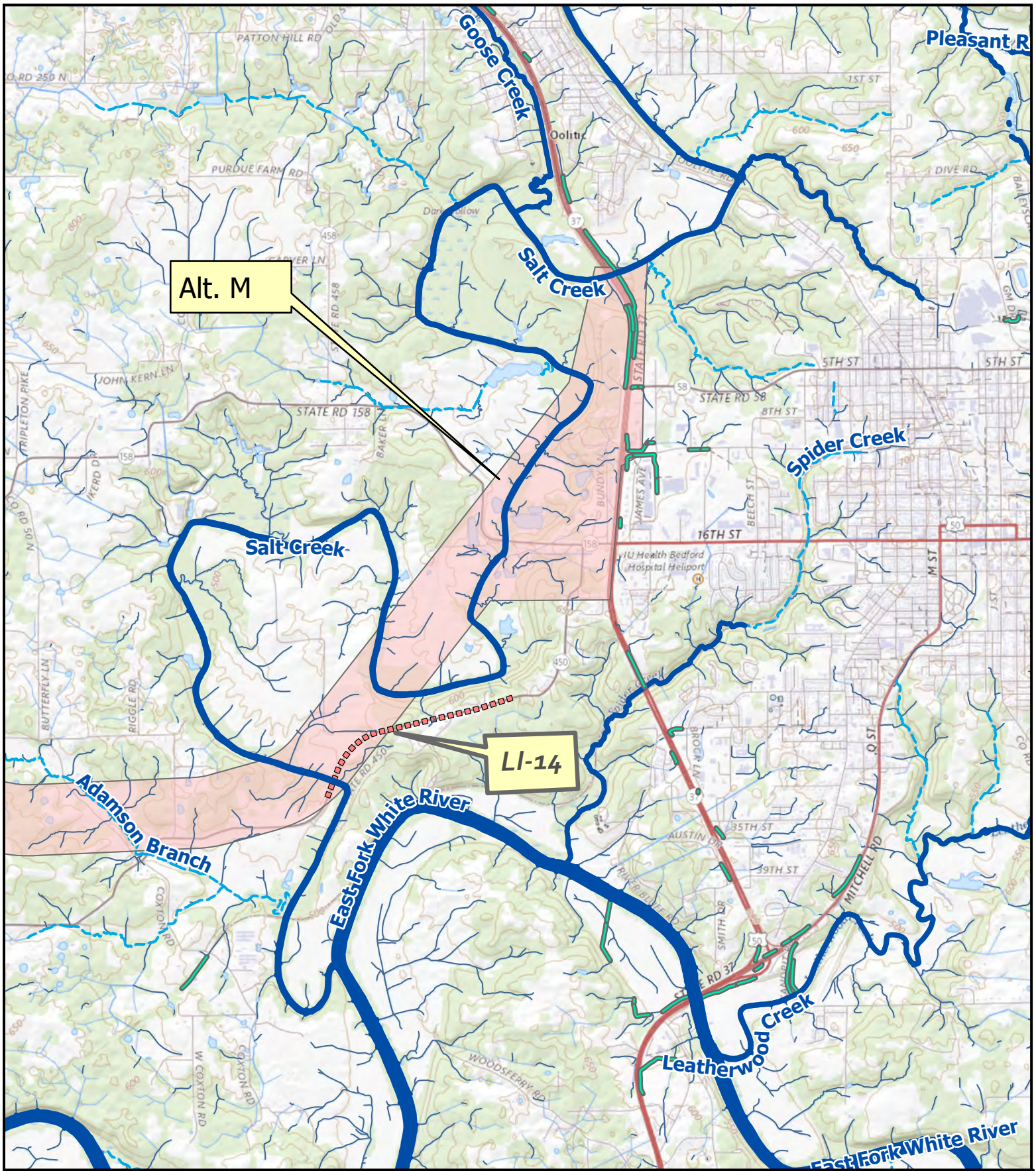
- NHD Streams
- Perennial Streams
- - - Intermittent Streams
- Canals/Ditches
- NHD Unclassified Drainages

**Legend**

- Rivers and Streams
- Local Improvements
- Refined Preferred Alternative P
- Alternative Corridors

Page# 20





**MID-STATES  
CORRIDOR**

**FEIS Appendix L  
Stream Impact Map Series**

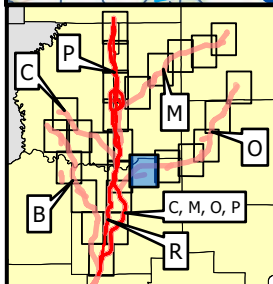
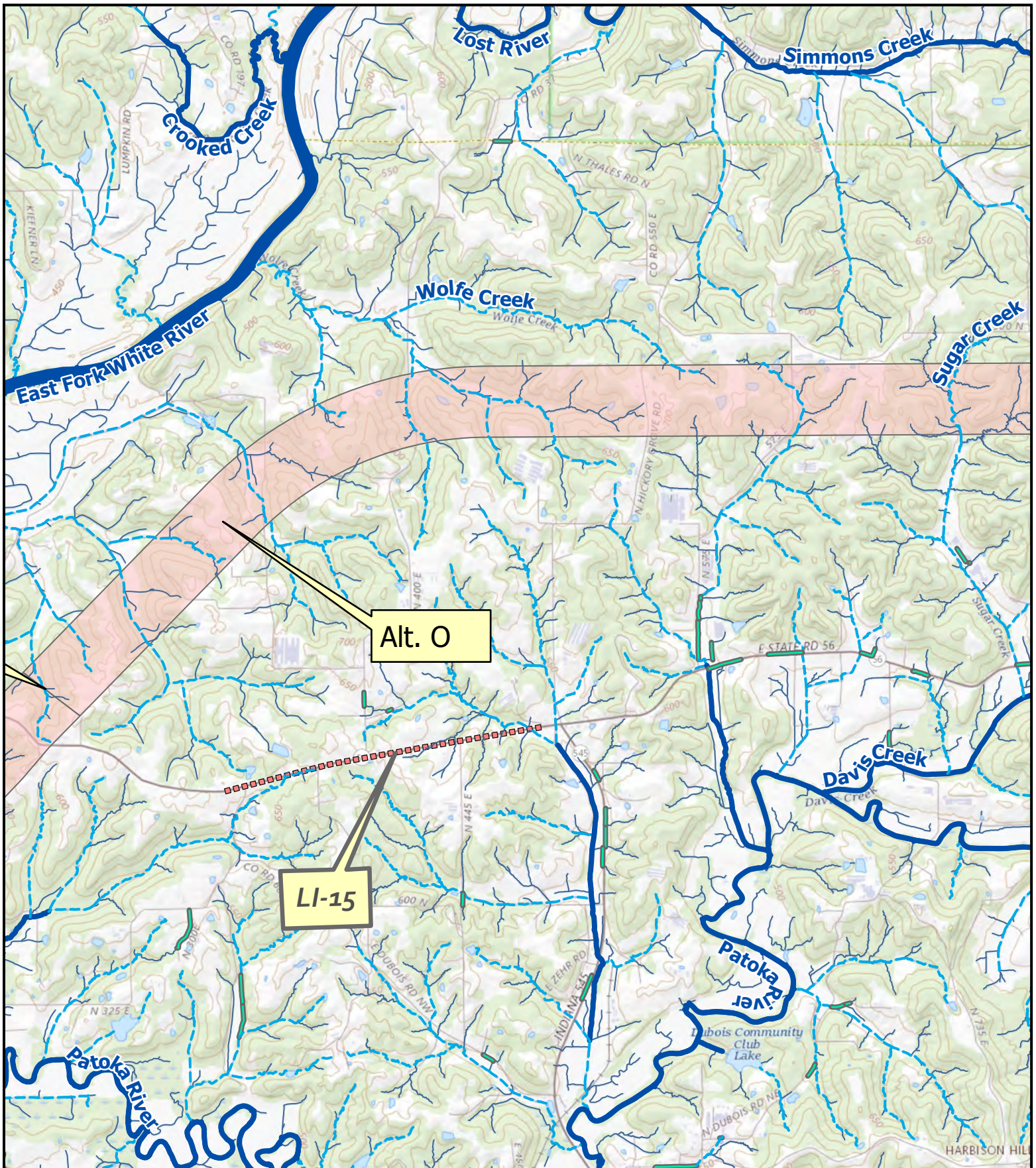
0 0.5 1 Miles

2/13/2023

**Legend**

- NHD Streams
- Perennial Streams
- Intermittent Streams
- Canals/Ditches
- NHD Unclassified Drainages
- Rivers and Streams
- Local Improvements
- Refined Preferred Alternative P
- Alternative Corridors

Page# 21



**MID-STATES  
CORRIDOR**

**FEIS Appendix L  
Stream Impact Map Series**

0 0.5 1 Miles

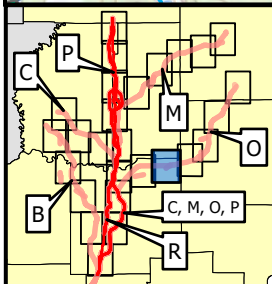
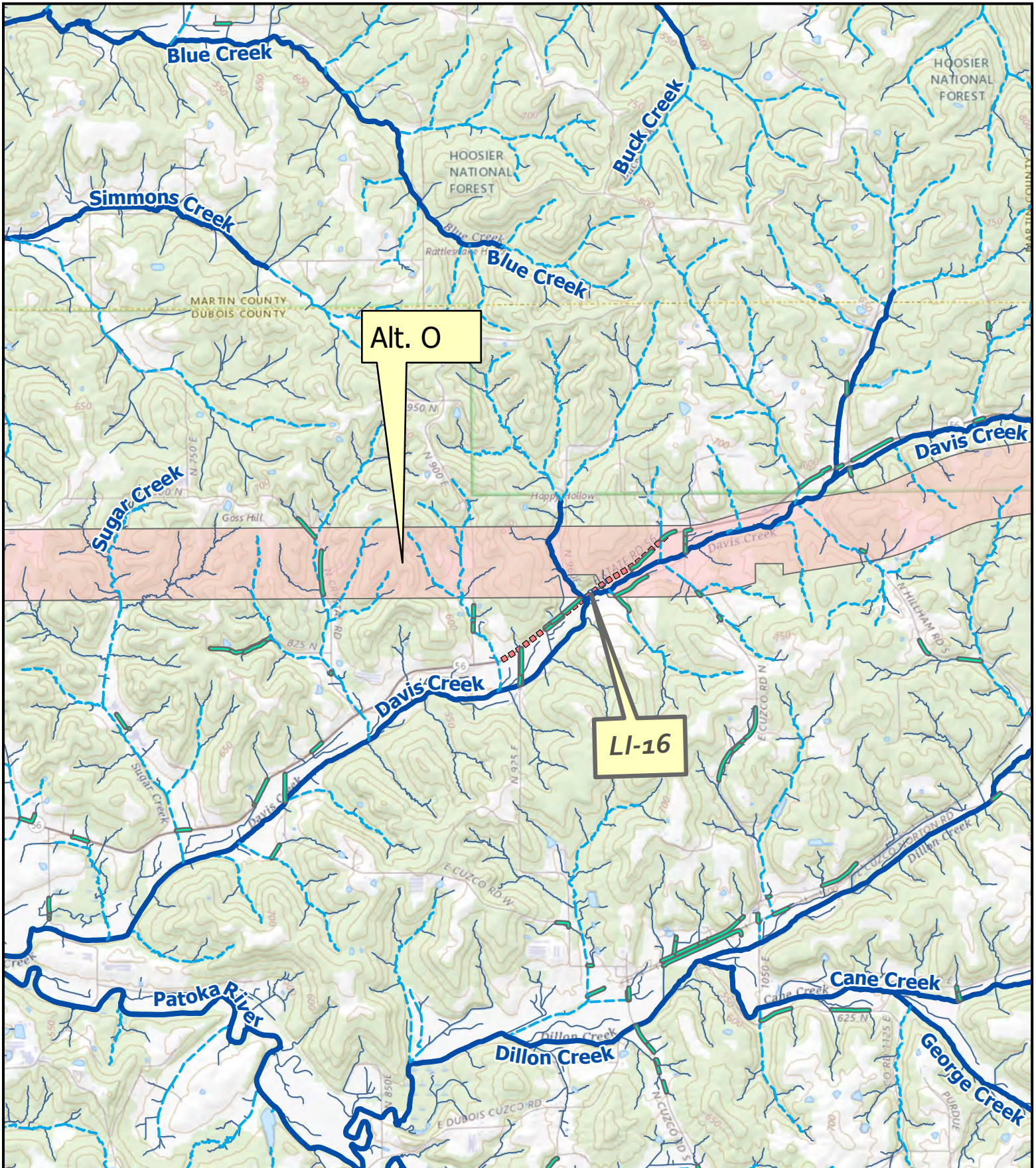
2/13/2023

- NHD Streams
- Perennial Streams
- - - Intermittent Streams
- Canals/Ditches
- NHD Unclassified Drainages

**Legend**

- Rivers and Streams
- - - Local Improvements
- Refined Preferred Alternative P
- Alternative Corridors

Page# 22



**MID-STATES  
CORRIDOR**

**FEIS Appendix L  
Stream Impact Map Series**

0 0.5 1 Miles

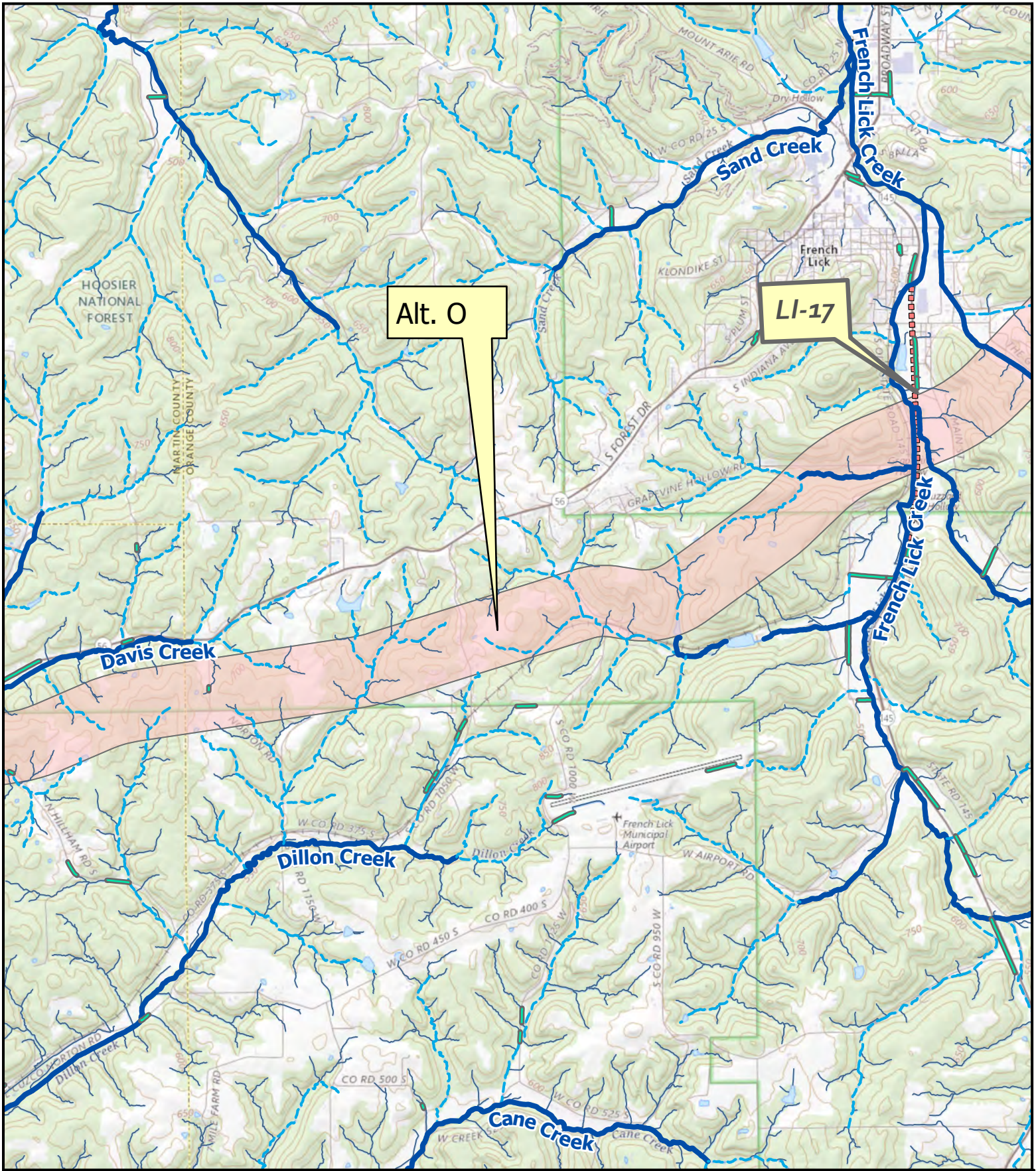
2/13/2023

- NHD Streams
- Perennial Streams
- - - Intermittent Streams
- Canals/Ditches
- NHD Unclassified Drainages

**Legend**

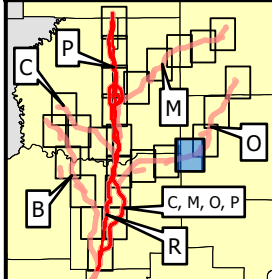
- Rivers and Streams
- Local Improvements
- Refined Preferred Alternative P
- Alternative Corridors

Page# 23



Alt. O

LI-17



**MID-STATES  
CORRIDOR**

**FEIS Appendix L  
Stream Impact Map Series**

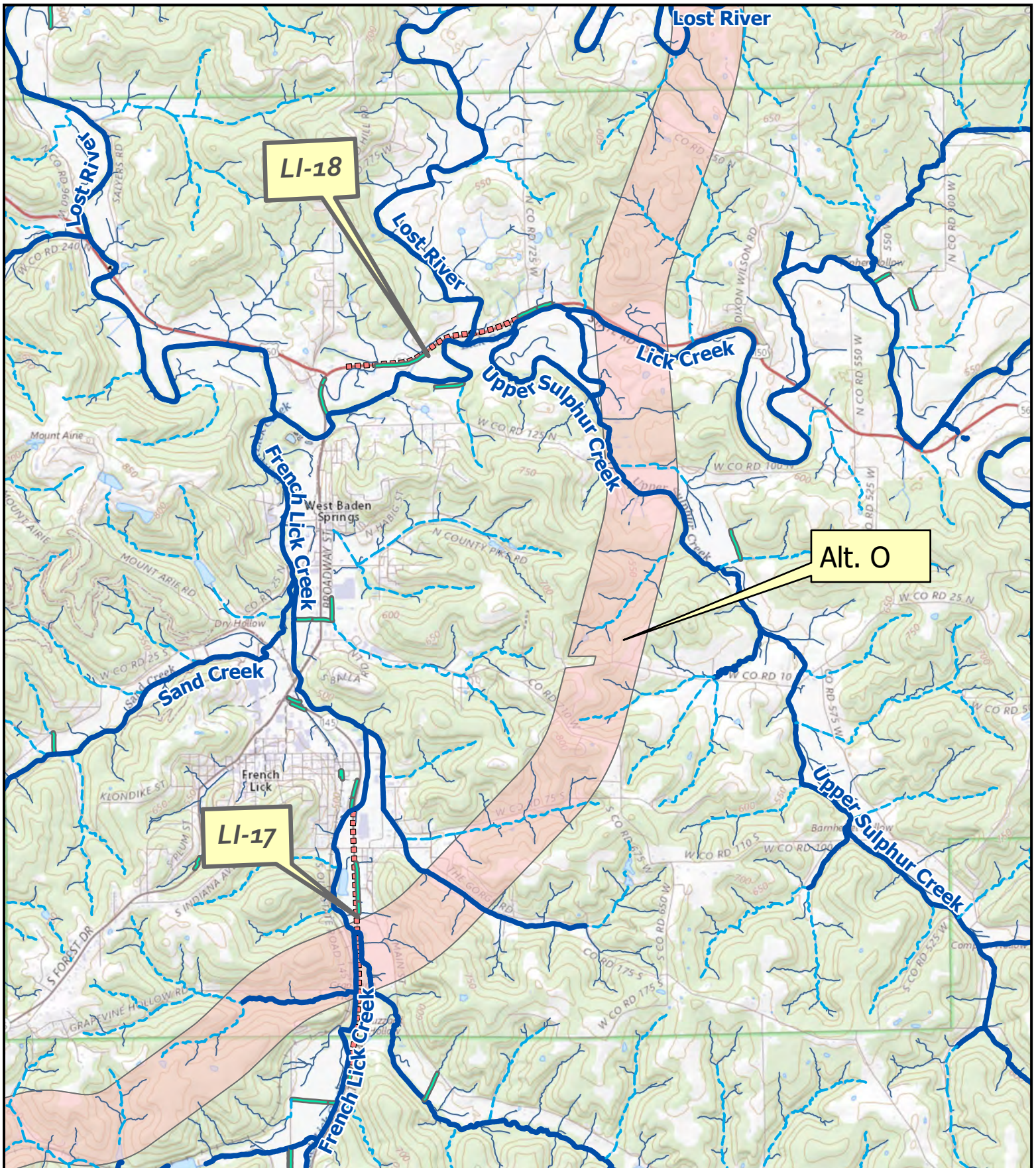
0 0.5 1 Miles

2/13/2023

**Legend**

- NHD Streams
- Perennial Streams
- - - Intermittent Streams
- Canals/Ditches
- NHD Unclassified Drainages
- Rivers and Streams
- Local Improvements
- Refined Preferred Alternative P
- Alternative Corridors

Page# 24



**MID-STATES  
CORRIDOR**

**FEIS Appendix L  
Stream Impact Map Series**

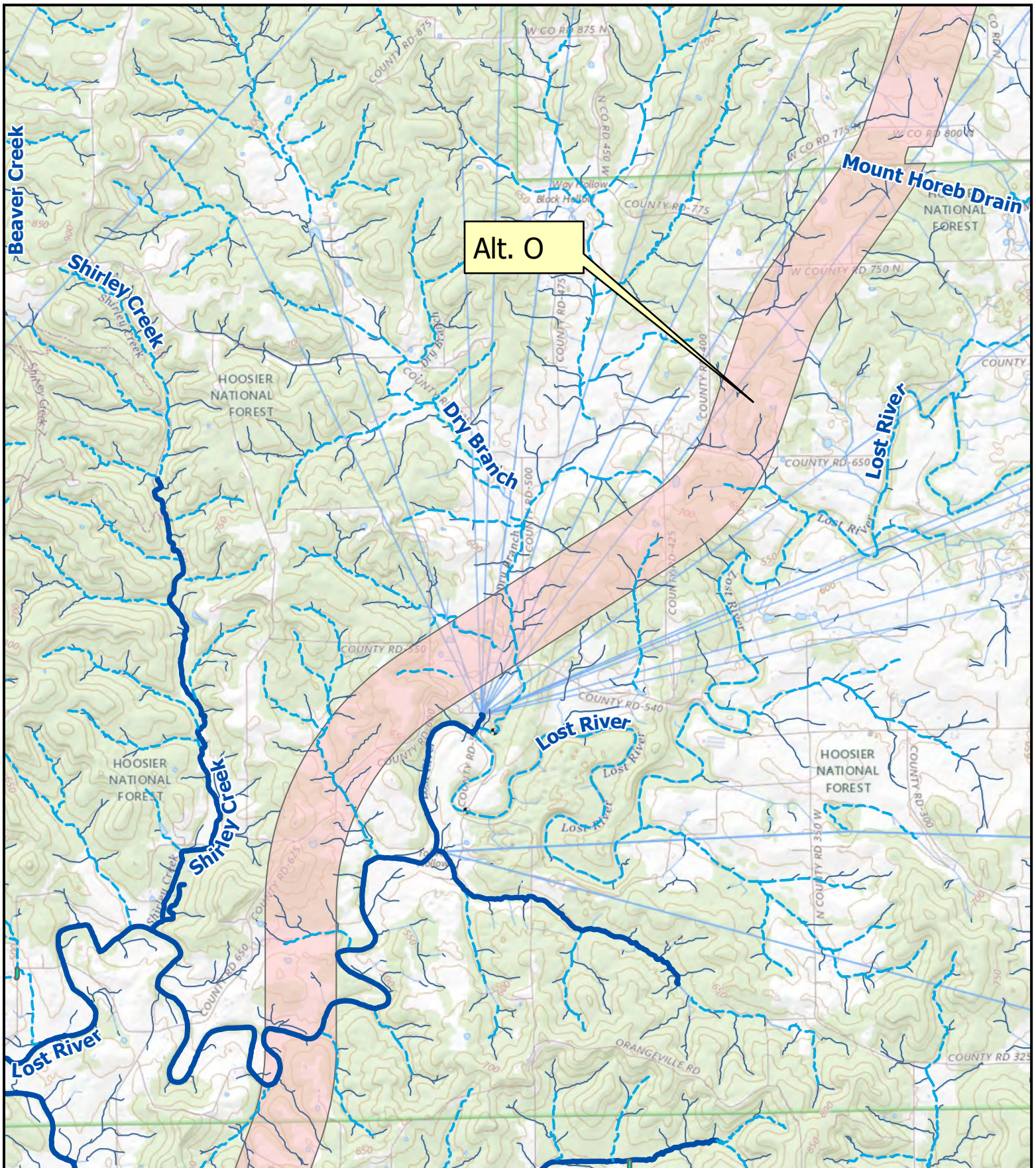
0 0.5 1 Miles

2/13/2023

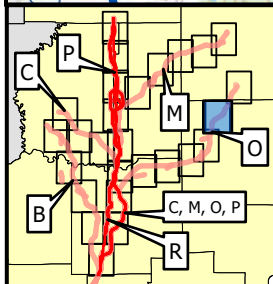
**Legend**

- NHD Streams
  - Perennial Streams
  - - - Intermittent Streams
  - Canals/Ditches
  - NHD Unclassified Drainages
- Rivers and Streams
- Local Improvements
- Refined Preferred Alternative P
- Alternative Corridors

Page# 25



Alt. O



**MID-STATES  
CORRIDOR**

**FEIS Appendix L  
Stream Impact Map Series**

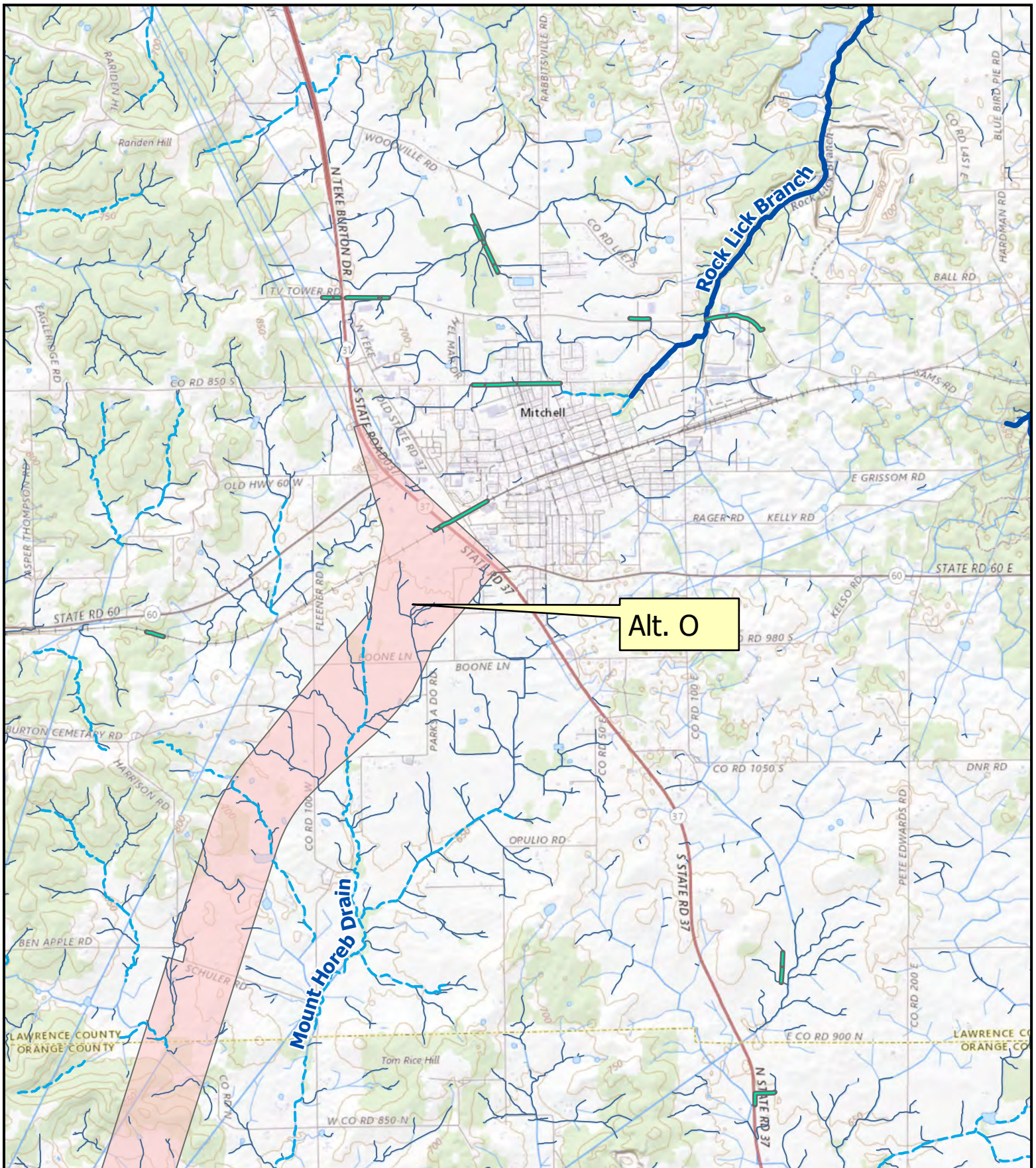
0 0.5 1 Miles

2/13/2023

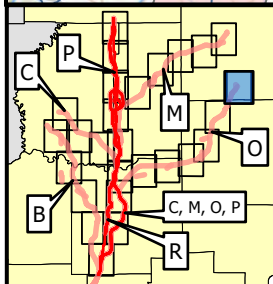
**Legend**

Page# 26

- NHD Streams
  - Perennial Streams
  - - - Intermittent Streams
  - Canals/Ditches
  - NHD Unclassified Drainages
- Rivers and Streams
- Local Improvements
- Refined Preferred Alternative P
- Alternative Corridors



Alt. O



**MID-STATES  
CORRIDOR**

**FEIS Appendix L  
Stream Impact Map Series**

0 0.5 1 Miles



2/13/2023

- NHD Streams
- Perennial Streams
- - - Intermittent Streams
- Canals/Ditches
- NHD Unclassified Drainages

**Legend**

- Rivers and Streams
- Local Improvements
- Refined Preferred Alternative P
- Alternative Corridors

Page# 27