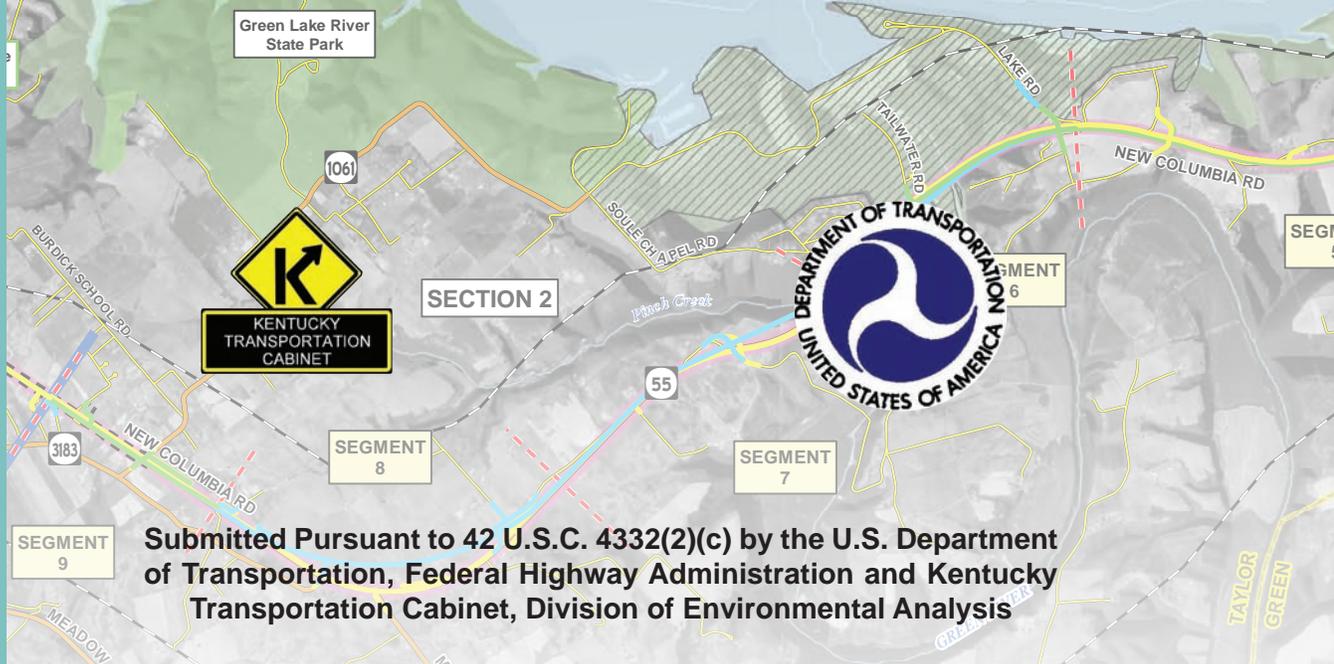


KY 55 Heartland Parkway Reconstruction and Southeast Campbellsville Bypass;

Adair and Taylor Counties, Kentucky

KYTC Item Numbers: 4-142.00, 4-142.10

The proposed highway project involves widening and reconstructing KY 55 in Adair and Taylor counties, and a southeast bypass of Campbellsville in Taylor County, Kentucky. The project corridor begins at the Columbia Bypass and continues northward to US 68. The project corridor is approximately 21 miles in length, including approximately 14 miles of existing KY 55 and 7 miles for the bypass on new alignment.



ENVIRONMENTAL ASSESSMENT

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Submitted Pursuant to 42 U.S.C. 4332(2)(c) by the U.S. Department of Transportation, Federal Highway Administration and Kentucky Transportation Cabinet, Division of Environmental Analysis



**United States Department of Transportation
Federal Highway Administration**



Kentucky Transportation Cabinet

June 2013

**ADMINISTRATIVE ACTION
ENVIRONMENTAL ASSESSMENT**

**KY 55 HEARTLAND PARKWAY RECONSTRUCTION AND
SOUTHEAST CAMPBELLSVILLE BYPASS**

ADAIR AND TAYLOR COUNTIES, KENTUCKY

Item Numbers: 4-142.00, 4-142.10

The proposed highway project involves widening and reconstructing KY 55 in Adair and Taylor counties, and a southeast bypass of Campbellsville in Taylor County, Kentucky. The project corridor begins at the Columbia Bypass and continues northward to US 68. The project corridor is approximately 21 miles in length, including approximately 14 miles of existing KY 55 and 7 miles for the bypass on new alignment.

Submitted Pursuant to 42 U.S.C. 4332(2)(c) by the U.S. Department of Transportation, Federal Highway Administration and Kentucky Transportation Cabinet, Division of Environmental Analysis

Approved For Public Availability



Division Administrator
Federal Highway Administration



Director of Division of Environmental Analysis
Kentucky Transportation Cabinet



Date



Date

Table of Contents

	PAGE
1.0 PURPOSE AND NEED	1
1.1 Project Setting and History	1
1.1.1 Adair and Taylor Counties	1
1.1.2 Project Corridor	2
1.1.3 Major Roads in the Project Area	2
1.1.4 Project History and Current Status	4
1.2 Purpose and Need, Goals	6
1.3 Existing and Projected Traffic	8
1.4 Safety/Crash Analysis.....	9
1.5 Project Termini.....	13
2.0 PROPOSED ALTERNATIVE CONCEPTS	14
2.1 Alternatives Considered.....	14
2.2 Build Alternatives by Section and Segment.....	14
2.2.1 Segment Alternatives	16
2.2.2 Development of Build Alternative Alignments.....	24
2.2.3 Rationale for Recommending the Preferred Alternative	25
3.0 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES	27
3.1 Air Quality	27
3.2 Noise	29
3.3 Aquatic Ecosystems.....	30
3.3.1 Water Quality	30
3.3.2 Streams.....	30
3.3.3 Floodplains.....	33
3.3.4 Wetlands	35
3.3.5 Wild and Scenic Rivers	37
3.3.6 Intergovernmental Coordination.....	37
3.3.7 Avoidance and Minimization	37
3.3.8 Mitigation and Permitting	37
3.4 Terrestrial Ecosystems	38
3.4.1 Terrestrial Environment.....	38
3.4.2 Threatened and Endangered Species	39
3.5 Section 106: Cultural Historical and Archaeological Resources	42
3.5.1 Area of Potential Effects (APE).....	43
3.5.2 Public Involvement—Consulting Parties	43
3.5.3 Cultural Historic Resources	44
3.5.4 Archaeological Resources	48
3.5.5 Cemeteries.....	50
3.6 Section 4(f) and Section 6(f)	52
3.6.1 Section 4(f).....	52
3.6.2 Section 6(f).....	55
3.7 Land Use.....	56
3.7.1 Existing Land Uses	56
3.7.2 Compatibility With Regional and Community Plans.....	59

3.8	Community Impacts	60
3.8.1	Socioeconomic and Demographic Characteristics	60
3.8.2	Communities Served by the Project.....	65
3.8.3	Areas of Community Cohesion	65
3.8.4	Community Resources.....	67
3.9	Relocations and Displacements	69
3.10	Agricultural Impacts	72
3.11	Environmental Justice.....	74
3.12	Pedestrian and Bicycle Facilities	76
3.13	Hazardous Materials	77
3.14	Visual Impacts.....	83
3.15	Construction Impacts	83
3.16	Economic Impacts—Taxes and Revenues.....	83
4.0	MITIGATION MEASURES AND COMMITMENTS	84
5.0	COMMENTS AND COORDINATION	89
5.1	Public Involvement Activities	89
5.2	Interagency Coordination and Consultation	91

LIST OF EXHIBITS

Exhibit 1	Study Area Road Network and Selected Land Uses	Back
Exhibit 2	Traffic Volumes and Noise Receptors	Back
Exhibit 3	Corridor Sections and Segment Alternatives	Back
Exhibit 4	Segment Alternatives 1a through 14 (15 sheets)	Back
Exhibit 5	Battle of Tebbs Bend Historic District	Back
Exhibit 6	Homeplace on Green River	Back

LIST OF FIGURES

Figure 1	Heartland Parkway Corridor	1
Figure 2	Location Map—Taylor and Adair Counties.....	1
Figure 3	Project Area	2
Figure 4	Typical Scenes along KY 55	6
Figure 5	Truck Northbound on KY 55.....	7
Figure 6	Statistically High Crash Sections/Spots—2008–2010	12
Figure 7	Proposed KY 55 Typical Cross Section	16
Figure 8	From KY 55 Looking West toward Columbia Bypass	18
Figure 9	KY 55 Bridge across Green River	20
Figure 10	Green River West of the Dam	31
Figure 11	Floodplains Crossed by Alternatives	34
Figure 12	Karst Potential in Project Area.....	39
Figure 13	Socioeconomic Study Area	61
Figure 14	Preferred Segment Alternative 13Y in the Vicinity of Mobile Homes in RC 5—Original Alignment and Modified (Avoidance) Alignment.....	75
Figure 15	Potential HAZMAT / Contaminated Sites	78
Figure 16	Deed Restricted Area, Segment 5.....	79

Table of Contents (Continued)

LIST OF TABLES	PAGE
Table 1 HIS Base Data Route Information	4
Table 2 Existing and Projected Traffic Volumes, and Levels of Service	8
Table 3 KY 55 and US 68 Crash Analysis, 2009–2011	11
Table 4 Summary of Initial Screening of Alternative Segments	24
Table 5 Build Alternatives by Corridor Section and Segment	25
Table 6 Summary of Potential Environmental Impacts by Build Alternative	26
Table 7 Project Vehicle Miles Traveled (Daily VMT)	28
Table 8 Existing and Predicted Noise Levels (dBA, L _{eq})	29
Table 9 Build Alternatives’ Stream Crossing Impacts—by Stream Types	33
Table 10 Estimated Floodplain Impacts	34
Table 11 Summary of Wetland Characteristics and Potential Impacts	36
Table 12 Estimated Habitat Impacts.....	38
Table 13 Historic Properties and Findings of Effects	46
Table 14 Summary of Results of Phase I Archaeological Investigations	49
Table 15 Cemeteries Identified to Determine Potential Impacts	50
Table 16 Summary of Use of Section 4(f) Properties	54
Table 17 Estimated Direct Land Use Impacts (Acres) by Build Alternatives.....	56
Table 18 Population Trends and Projections	62
Table 19 Comparative Population Characteristics—Block Groups Comprising Socioeconomic Study Area	63
Table 20 2010 Census Race Information—Kentucky, Adair County, Taylor County, and Socioeconomic Study Area	64
Table 21 Median Household Income, Per Capita Income, and Percent Living Below Poverty Level, 2006-2010 ACS 5-Year Estimates	65
Table 22 Summary of Potential Relocations and Displacements	72
Table 23 Estimated Costs of Relocations and Displacements.....	72
Table 24 Potential Farmland Impacts—Farmland Conversion Impact Rating Form AD-1006	73
Table 25 Findings and Recommendations for REC and HREC Sites.....	81
Table 26 Coordination with Resource Agencies and Organizations	91

APPENDICES

Appendix A Rationale for Alternative Selection by Segment.....	Behind Exhibits
Appendix B Technical Report Documentation	CD, inside back cover
Appendix C Resource Agency Coordination	CD, inside back cover
Appendix D Section 106 Consultation	CD, inside back cover

1.0 PURPOSE AND NEED

The proposed highway project involves the widening and reconstruction of KY 55 in Adair and Taylor counties, and a southeast bypass of Campbellsville in Taylor County, Kentucky. The project corridor is approximately 21 miles in length, including approximately 14 miles of existing KY 55 and 7 miles for the bypass. Below are descriptions of the project area, the existing roadway facilities, the project history, the purpose and need for the project, and the process for considering alignment alternatives.

This project is a segment of a larger project defined by the Kentucky Transportation Cabinet (KYTC) as “Heartland Parkway,” which would extend from the Louie B. Nunn Cumberland Parkway in Taylor County to the Martha Layne Collins Blue Grass Parkway in Washington County (see Figure 1, *Heartland Parkway Corridor*).

1.1 Project Setting and History

1.1.1 Adair and Taylor Counties

Adair and Taylor counties are located in south-central Kentucky (see Figure 2, *Location Map*), with the proposed project extending across the county line (see Figure 3, *Project Area*). Adjacent Kentucky counties are: Cumberland, Metcalfe, Green, Larue, Marion, Casey, and Russell. A major waterway and recreational area—the Green River and Green River Reservoir¹/Dam—are within the project area. The build alternatives would include a crossing of the Green River downstream from the dam.

Adair County has a land area of approximately 407 square miles, and Taylor County has a land area of approximately 270 square miles. Both counties are situated within the Pennyrile physiographic region of Kentucky. Much of the Pennyrile is drained by the Green River and its tributaries. Section 3.4.1, herein, describes the geophysical environment of the project area.



Figure 1: Heartland Parkway Corridor

Source: 2005 Heartland Parkway Alternatives Planning Study



Figure 2: Location Map—Taylor and Adair Counties

¹ Green River Reservoir is was created and is operated as a reservoir by the U.S. Army Corps of Engineers and, as a feature of the Kentucky State Parks system, it is known as Green River Lake.

1.1.2 Project Corridor

The project corridor begins at the Columbia Bypass in Adair County, and more-or-less follows existing KY 55 northward into Taylor County. The corridor widens to include several notable historic and natural resource areas, and crosses the Green River. Just south of KY 1625 (Blue Hole Road) the corridor heads northeast on new alignment that bypasses Campbellsville and terminates just north of the US 68/KY 1834 intersection. Several build alternative alignments within the corridor are being evaluated as part of the environmental assessment (EA) process. All build alternatives incorporate existing KY 55 for a major portion (approximately 14 miles) of the project's length, and all cross many state and local roads before terminating at US 68.



Figure 3: Project Area

The Kentucky Tourism, Arts and Heritage Cabinet; the Kentucky Department of Travel; and the Kentucky Tourism Council promote the area's tourist and recreational attractions. In the project area, KY 55 provides access to Green River Lake State Park, and historical sites that include the Battle of Tebbs Bend Historic District and the Isaac Tate Farm/Homeplace on Green River. The U.S. Army Corps of Engineers (USACE) owns the 20,500-acre Green River Wildlife Management Area (WMA) along the Green River Lake shoreline; and manages the lake for wildlife, fisheries, and recreation. These destinations attracted over one million visitors annually.

1.1.3 Major Roads in the Project Area

Data on the existing conditions in the project area were taken from the Kentucky Transportation Cabinet (KYTC) Division of Planning's Highway Information System (HIS) database. Table 1 (p. 4) shows general route information for the two major routes in the project corridor: KY 55 and US 68. Exhibit 1 shows the major roads in the roadway network together with selected land uses along the project corridor.

KY 55 is known as Campbellsville Road in Adair County and New Columbia Road in Taylor County. The road links Columbia and Campbellsville and provides these cities with access to the Louie B. Nunn Cumberland Parkway—the region's main east-west thoroughfare. Between Columbia and Campbellsville, KY 55 is part of the Cumberland Cultural Heritage Highway system—a scenic byway made up of different routes in southern Kentucky.²

From the Columbia Bypass to approximately KY 3180, KY 55 is an undivided road with two 12-foot-wide lanes, and 4- to 10-foot-wide paved or combination shoulders (paved/gravel). Access is by permit only, and there are numerous intersecting state and local roads, as well as driveway entrances to residential, business, and other uses. From approximately 1.0 mile south of KY 1625 (Blue Hole Road) to US 68, KY 55 has been widened to four lanes with shoulders ranging from 10- to 12-foot-wide paved to 2-foot-wide

² Designated by the state as a Kentucky Heritage Highway on July 23, 2001, the 187-mile Cumberland Cultural Heritage Highway is part of the state's scenic byways system. KYTC has oversight responsibility for Kentucky's Scenic Byways and Highways Program. The scenic byways designation does not prohibit KYTC from making transportation-related improvements. (See KYTC guidelines, http://www.tea21.ky.gov/scenic_byways.asp)

curbed. The widened section is a partial-access-controlled facility, i.e., there is 1,200-foot-minimum spacing between access points. (Note: From KY 3183 to US 68, KY 55 is west of the project corridor.) The posted speed limit is 45 or 55 miles per hour (mph) depending on the location.

Through the project corridor, KY 55 is classified in KYTC's Functional Classification System as a Rural Principal Arterial. The section of KY 55 from KY 3183 (west of the corridor) to US 68 is classified as an Urban Principal Arterial. On the state system, KY 55 is classified as a State Primary (Other) road. Through the length of the project, KY 55 is listed on the National Truck Network as a federal designated truck route, for use by trucks with increased dimensions; and is assigned a truck weight classification of "AAA" (a maximum allowable gross weight limit of 80,000 pounds).

US 68 in Taylor County is a major south to north corridor. It is known as Greensburg Road southwest of Campbellsville, East Broadway in the city, and New Lebanon Road northeast of the city. From KY 61 (west of the project corridor) eastward into Campbellsville, US 68 is part of the Cumberland Cultural Heritage Highway system.

US 68 is a two-lane road with 10- to 12-foot-wide driving lanes, shoulders ranging from 2-foot-wide curbed to 10-foot-wide paved or combination, and a posted speed limit ranging from 35 to 55 mph depending on location. For most of its distance US 68 is undivided with no median; however, from approximately KY 210 to KY 3183 in Campbellsville there is a raised, non-mountable median. Through the project area, US 68 is classified in KYTC's Functional Classification System as an Urban Minor Arterial for approximately 0.9 mile, as an Urban Principal Arterial for approximately 2.8 miles (in Campbellsville), and as a Rural Principal Arterial for approximately 1.8 miles. On the state system, US 68 is classified as a State Secondary road for approximately 0.9 mile and as a State Primary (Other) road for the remainder of its distance through the project area. It is listed on the National Truck Network as a state designated truck route for approximately 0.9 mile; and, for the remainder of the distance in the project area, as a federal designated truck route for use by trucks with increased dimensions, and assigned a truck weight classification of "AAA."

Other Local Roads. Throughout the project corridor, 21 U.S. and state roads, and numerous local roads and access drives intersect with KY 55, providing access to locations within and/or surrounding Columbia and Campbellsville, as well as to outlying rural communities, recreational areas, businesses, historic districts/sites, and farmland. Following are the state routes that intersect KY 55 within the project corridor:

Adair County—KY 551 (Knifely Road), KY 530 (Cane Valley Road and Keltner Road), KY 2972 (Cane Valley Mill Road), KY 633 (Farris Road), KY 682 (Cane Valley Road), and KY 1913 (Coburg Lane).

Taylor County—KY 565 (Ebenezer Road), KY 1701 (Milder Creek Road), KY 3183 (Old Columbia Road), KY 1625 (Blue Hole Road), and KY 1061 (Lone Valley Road).

The following U.S. and state routes are within the project corridor heading northeastward from KY 55 on new alignment to bypass Campbellsville. Depending on the alternative considered, the bypass could intersect several or all of these routes: KY 372 (Smith Ridge Road), KY 70 (Elkhorn Road), KY 3518 (Watertown Bypass), KY 658 (Roberts Road), KY 2222, KY 1799 (Reids Chapel Road), KY 3211 (Palestine Road), KY 1834 (Sportsman Lake Road), and US 68 (New Lebanon Road section).

Table 1: HIS Base Data Route Information

Route	Functional Class	Beginning MP	Ending MP	Posted Speed Limit (MPH)	# of Lanes	Lane Width (LF)	Shoulder Width (LF) & Surface	ADT Baseline (Dates)	ADT 2009 Estimate	Composite Adequacy Rating* Percentile
Adair County										
KY 55	Rural Principal Arterial	15.101 (KY 55X)	15,245 (KY 551)	45 & 55	2	12	10 Paved	9,600 (2010)	13,000	74.84
	Rural Principal Arterial	15,2459	21.305 (Taylor Co. Line)	55	2	12	10 Paved	6,800 (2010)	8,000-8,300	74.84
Taylor County										
KY 55	Rural Principal Arterial	0 (Adair Co. Line)	5.483 (KY 1701)	55	2	12	10, 4, & 6 Combination	6,800 (2008)	8,000-8,300	74.84
	Rural Principal Arterial	5.483	6.546 (KY 1061)	55	2	12	10 Paved	7,000 (2009)	7,700	74.84
	Rural Principal Arterial	8.033	9.066 (KY 3183)	55	4	12	12 Paved	9,700 (2010)	15,000	88.77
	Urban Principal Arterial	9.066	10.293 (US 68)	45	4	12	2 Curbed	9,700 (2010)	15,000	88.77
US 68	Urban Minor Arterial	3.975 (KY 323)	4.87 (KY 55/KY 210)	45	2 & 4	12	10 Combination	10,000 (2010)	10,600	99.03 to 99.48
	Urban Principal Arterial	4.87	5.687 (KY 3183)	45 & 35	4	12 & 10	10 Combination & 2 Curbed	15,500 (2009)	20,800	96.48
	Urban Principal Arterial	5.687	5.923 (KY 289)	35	4	10	0 Curbed	22,300 (2011)	29,400	22.49
	Urban Principal Arterial	5.923	6.469 (Ingram Ave.)	35 & 45	4	10	2 Curbed	21,300 (2011)	28,100	22.49
	Urban Principal Arterial	6.469	7.091 (N. Vine St.)	35 & 45	4	10	2 Curbed	15,900 (2010)	20,800	22.49
	Urban Principal Arterial	7.091	7.404 (KY 1799 Airport Rd.)	45	4	10	2 Curbed	11,600 (2009)	(17,100)	60.17
	Urban Principal Arterial	7.404	7.715 (Eastport Rd.)	55	2	12	12 Stabilized	8,600 (2010)	9,600	62.86
	Rural Principal Arterial	7.715	9.53 (KY 1834)	55	2	12	12 Stabilized	8,600 (2010)	9,600	42.94

Source: KYTC Highway Information System (HIS) database.

Abbreviations Key: MP = Mile post MPH = Miles per hour LF = Linear feet ADT = Average daily traffic

* Composite Adequacy Rating is a method developed by KYTC to assess a roadway's condition and prioritize highway improvements. The ratings are calculated by individual functional class and based upon three roadway components (safety, service, and condition) with each component composed of several measures. The rating scores 100 as a perfect, or near perfect, highway. The Composite Adequacy Percentile ranks a particular roadway section compared to other Kentucky roads in the same functional class into a percentile. For example, a road section with a composite adequacy percentile of 75.0 means that 25% of the roads are rated better. Composite adequacy data are from the 9-18-2008 update.

1.1.4 Project History and Current Status

In February 2005, KYTC completed the *Heartland Parkway Alternatives Planning Study* (Item No. 4-132.00). That study analyzed alternative corridors connecting the Louie B. Nunn Cumberland Parkway to the south with the Martha Layne Collins Bluegrass Parkway to the north (see Figure 1). The study findings were guided by the input received at public meetings in 2003 and 2004, and through the work of the Heartland Parkway Task Force. Alternatives studied included a No-Build Alternative, following the existing alignment, and developing a new alignment. The alternative recommended for further study followed the existing alignment and used KY 55, US 68, and KY 555 (north of the current project corridor). According to the study, this option was recommended for the following reasons:

- It had the greatest public support.
- It would provide better regional mobility because the four-lane facility would allow passing throughout its length and would have greater capacity.
- Projected traffic volumes warranted a four-lane facility by the year 2030.

New bypasses were recommended around the communities of Columbia, Campbellsville, and Lebanon. The Columbia Bypass (Item No. 8-159.00) and the Lebanon Bypass (Item No. 4-125.10) are open to traffic. A Campbellsville Bypass was first identified in that city's 1997 *Comprehensive Plan* as being essential to the economic development along the KY 55 corridor in the Campbellsville area. As a task of the study process for that project, an EA was prepared (Commonwealth Technology, Inc., 2000), in which was noted the importance of recovering from the loss of a major area industry in 1997—Fruit of the Loom—and an unemployment rate of 11.1%. The study evaluated two alternative alignments with a corridor that began at US 68 south of the city, headed east across KY 55, and then turned northeast to the east of the city before heading westward to reconnect with US 68 at separate locations northeast of Campbellsville. The project was part of KYTC's recommended *Six-Year Highway Plan*, FY 1999-2004.

In August 2007, a Heartland Parkway Leadership Committee (Leadership Committee) meeting was held with state and local officials and other interested stakeholders to initiate work toward completion of the preliminary engineering and EA for the portion of the Heartland Parkway corridor that included an eastern bypass of Campbellsville (within a corridor similar to that of the 2000 EA), and improvements to the existing KY 55 corridor south to the Columbia Bypass (as identified in the 2005 study). The participants identified issues for consideration during the alternative selection process, problems to be corrected by the project, and needs to be addressed by the project. In October 2007, public meetings followed in Campbellsville and Columbia to present the project to citizens in the area and seek their input. Attendees were afforded the opportunity to provide their suggestions and comments.

Current Status. KYTC has studied several possible combinations of alignments, and has held six public meetings, four Leadership Committee meetings, six Focus Group sessions (two sessions with each of three groups), and two Section 106 consulting parties meetings (see Section 5.1, *Public Involvement Activities*). The alignments have been reduced to four build alternatives that, together with a No-Build Alternative, have been studied in detail and are presented in this EA. Chapter 2, *Proposed Alternative Concepts*, describes the alternatives evaluation process and identifies the recommended preferred alternative—a build alternative that would widen approximately 14 miles of KY 55, from the Columbia Bypass in Adair County to just north of KY 1625 (Blue Hole Road) in Taylor County; and then head northeastward approximately 7 miles on new alignment (the Campbellsville Bypass section) to the project's northern terminus at US 68, a total project distance of approximately 21 miles.

Every two years, the Kentucky General Assembly approves a Six-Year Highway Plan. Per KRS 48.300, KYTC submits the recommended plan to the Kentucky General Assembly, which then reviews, modifies, and approves the plan as part of the biennial budget process. This plan is subject to the availability of state and federal highway dollars.

The approximately 7-mile-long Campbellsville Bypass is the only portion of the 21-mile-long project addressed in this EA that is in the state's FY 2012-2018 *Six-Year Highway Plan*, enacted May 9, 2012. The plan allocates federal monies³ in the amount of \$4.9 million for this section of the project: \$3.8 million for design (D) and \$1.1 million for right-of-way (R) acquisition, as shown:

³ For this project, types of federal funds to be used are Highway Priority Project (HPP) funds, and Federal Statewide Transportation Program Funds (STP).

County	Item No.	Route		Funding	Phase	Year	Amount
Taylor	2006 04- 142.10 Parent No.: 2004 04-142.00	KY555	Priority Section of the Heartland Parkway (Campbellsville Bypass)	HPP STP	D R	2012 2012	\$3.8M \$1.1M

Currently there are no funds allocated for utilities or construction of the bypass; nor is there funding allocated for final design, right-of-way acquisition, utilities, and construction for the portion of the project that extends from the Columbia Bypass northward to the southern terminus of the proposed Campbellsville Bypass.

Because funding for these portions of the overall project is not expected to be available in the foreseeable future, it is considered prudent to identify interim improvements along the KY 55 corridor to address existing safety and capacity issues. Section 2.4, *KY 55 Potential Interim Improvement Options*, discusses the options and identifies proposed locations for their implementation.

1.2 Purpose and Need, Goals

The Heartland Parkway corridor, between the Louie B. Nunn Cumberland and Martha Lane Collins Bluegrass parkways, runs through the heart of west-central Kentucky. The corridor can be characterized as both rural and urban, two-lane and multi-lane, depending on which portion is studied. The *Heartland Parkway Alternatives Planning Study (2005 Planning Study)*⁴ addressing the entire parkway corridor was published by KYTC in 2005.

To create within the corridor a wider, more uniform road that would allow for growth and greater ease of long-distance hauling and transportation, the roadway is under study for major improvements. By widening the two-lane sections to four lanes, and bypassing the constricted urban areas, the roadway could become a major alternative to north-south travelers between and generally parallel to the I-65 and I-75 corridors.

This section of the Heartland Parkway project, from just north of Columbia to northeast of Campbellsville, represents a major portion of that goal. The existing roadway (see Figure 4) is two lanes from the Columbia Bypass to approximately 1.0 mile south of KY 1625 (Blue Hole Road), and four lanes from this point to US 68, which is four lanes through Campbellsville. With narrow, constricted lanes, numerous stoplights, considerable side-road traffic, and pedestrian crossings, the route through



⁴ WMB Inc. Engineers. February 2005.

Campbellsville creates a major constriction to the overall corridor. This study will assess how best to facilitate traffic flow around and between the urban areas.

Previous planning studies have identified capacity deficiencies along the route. The deficiencies contribute to heavy congestion and a related traffic delays, particularly in Campbellsville's central business district; and to high crash rates at several locations. The purpose and need for the KY 55 project are as follows:

Purpose. To complete the Columbia-to-Campbellsville link in the planned Heartland Parkway, which extends between the two parkways, thereby advancing the overall goals of the *Heartland Parkway Alternatives Planning Study* and addressing the local goals identified through local public involvement initiatives. The overall goals from the Planning Study are as follows:

- Improve regional access for economic development, existing industry, truck access, tourism, higher education, and agricultural economy.
- Improve safety.
- Improve highway capacity in certain locations.
- Decrease delays through the communities.
- Improve emergency response times.

The local goals identified through the Columbia-to-Campbellsville local public involvement activities reflect those overall goals and expand upon the tourism element by calling for improved access to tourist attractions in the area, particularly Green River Lake and the state park, which has high summer use; and historic sites such as the Battle of Tebbs Bend Historic District and Homeplace on Green River, a historic farmstead.



Figure 5: Truck Northbound on KY 55

Need. The need for the improvement within the corridor is demonstrated by the following data showing the projected decline in the level of service (LOS) through the corridor by the year 2036, and the current safety issues related to congestion.

- Along KY 55 in the project corridor, year 2010 average daily traffic (ADT) volumes ranged from 6,800 to 9,700 vehicles per day (vpd). By the year 2036 the ADT volumes are projected to range from 13,000 to 22,000 vpd. The LOS for the baseline years was "D," and the LOS without any improvements (No-Build) is projected to fall from LOS "D" to "E" at four locations.
- KYTC vehicle classification data south of Campbellsville (in Taylor County) indicated the percent of medium and heavy trucks (see typical scene, Figure 5) on KY 55 was 12.5% in the baseline years, and the design year (2036) estimate is 13.0%⁵.

Five nearly continuous high crash spots have been identified along US 68 (Main Street) in Campbellsville from approximately Hoskins Avenue to just east of Cherokee Drive. These locations would each be bypassed by the proposed Campbellsville Bypass. Several high crash spots in Taylor County are clustered on KY 55 between Green River Bridge and Lone Valley Road (KY 1061).

5 *Heartland Parkway Traffic Forecast Update, Final Report*. Revised March 7, 2012.

Section 1.3, *Existing and Projected Traffic*, provides detailed traffic volume and LOS data, while Section 1.4, *Safety/Crash Analysis*, presents a discussion of safety-related issues and high crash areas.

1.3 Existing and Projected Traffic

Existing traffic volumes were obtained for the most recent available year (see baseline years in Table 2) and traffic projections were developed for the years 2016 (estimated construction year) and 2036 (design year) to determine how KY 55 and US 68 would function if no improvements beyond normal maintenance were made during that time period (i.e., the No-Build Alternative). An LOS analysis was conducted for the existing and projected scenarios. Table 2 presents the results of the traffic analysis. Exhibit 2 shows the existing and projected No-Build traffic volumes and percent trucks.

Table 2: Existing and Projected Traffic Volumes, and Levels of Service

Traffic Segments (Baseline Year)	From – To	Baseline Year (See Column 1 for dates)			No-Build				Build				
		ADT	LOS	ADT % Trucks	2016		2036		2016		2036		
					ADT	LOS	ADT	LOS	ADT	LOS	ADT/ (DHV)	LOS	ADT % Trucks
US 68													
A (2007)	KY 1834 – KY 3211 (Palestine Rd.)	8,600	D	10.6	9,600	D	11,900	D	10,200	D	14,000	E	N/A
B (2007)	KY 3211 – KY 55/KY 210	12,600	A	7.5	20,800	B	23,600	B	18,500	B	21,000	B	N/A
C (2007)	KY 55 – Green Co. Line	10,000	D	14.3	10,600	D	13,700	E	11,500	D	15,000	E	N/A
KY 55													
D (2010)	US 68 – KY 1625 (Blue Hole Rd.)	9,700	D	12.5	13,100	D	16,000	E	10,000	A	13,000	A	N/A
E (2010)	KY 1625 – KY 1061 (Lone Valley Rd.)	9,700	D	12.5	15,000	E	18,200	E	17,700	A	22,000 (2,200)	B	13.0
F (2009)	KY 1061 – S. of Hall Ln.	7,000	D	12.5	7,700	D	11,000	D	9,300	A	13,500 (1,400)	A	13.0
G (2008)	So. of Hall Ln. – Lake Rd.	6,800	D	12.5	8,000	D	11,300	D	9,600	A	13,600 (1,400)	A	13.0
H (2008)	Lake Rd. – KY 565	6,800	D	12.5	8,300	D	12,800	E	9,900	A	15,500 (1,600)	A	13.0
I (2010)	KY 565 – KY 551 (Knifley Rd.)	6,800	D	12.5	8,100	D	11,500	D	9,400	A	13,400 (1,400)	A	8.2
J (2010)	KY 551 – Columbia Bypass	9,600	D	12.5	13,000	E	16,000	E	16,000	A	19,000 (1,900)	B	8.2
Columbia Bypass (Opened 2009)													
K (2010)	KY 55 – KY 767	3,200	C	15.4	5,000	D	6,500	D	6,000	D	8,500	D	N/A
L (2010)	KY 767 – KY 61	2,800	C	15.4	4,000	C	8,000	D	5,000	D	10,000	D	N/A
M (2010)	KY 61 – Burksville Rd.	3,400	C	14.8	4,600	D	6,000	D	5,600	D	8,000	D	N/A
Campbellsville Bypass													
N (2010)	KY 3211 – KY 70 (Elkhorn Rd.)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	5,000	A	9,000 (900)	A	13.0
O (2010)	KY 70 – KY 55/KY 1625)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	4,800	A	8,500 (900)	A	13.0

Source: Traffic volume and % trucks data are from the “Heartland Parkway Traffic Forecast Update, Final Report.” March 4, 2012. LOS data are from the “Final Report” and Qk4 analysis.

Abbreviations Key: DHV = Design Hour Volume, i.e., peak-hour volume. ADT = Average Daily Traffic. N/A = Not Available

Note: **Tan highlighted rows** represent residual traffic on KY 55 and US 68 through Campbellsville.

As Table 2 shows, in the baseline years, the ADT on KY 55 through the project corridor ranged from 6,800 vpd to 9,700 vpd, with the highest volumes occurring in the vicinity of Columbia in the south (9,600 vpd) and just south of Campbellsville in the north (9,700 vpd). By 2036, without any major construction activity on KY 55 (i.e., the No-Build Alternative), traffic volumes are projected to range from 11,000 vpd to 18,200 vpd, with the highest volumes again occurring in the vicinity of Columbia (16,000) and south of Campbellsville (18,200). These figures indicate an increase of approximately 67% and 88% near Columbia and south of Campbellsville, respectively, and increases averaging approximately 69% on KY 55 throughout the rest of the corridor. With the construction of the Campbellsville Bypass, residual traffic volumes on KY 55 just south of the bypass are forecast to increase to 22,000 vpd, an increase of approximately 125% over current traffic volumes.

Table 2 also shows the existing and projected LOS for the corridor. Level of service is a qualitative measure of expected traffic conflicts, delay, driver discomfort, and congestion. Levels of service are described according to a letter rating system (similar to school grades) ranging from LOS “A” (free flow, minimal or no delays—best conditions) to LOS “F” (stop and go conditions, very long delays—worst conditions). The analysis projects an improvement on KY 55 from the No-Build Alternative’s LOS “D” and “E” in 2016 and 2036, to LOS “A” and “B” in those years with the build alternative, because that alternative would increase roadway capacity by adding a lane in each direction, thereby increasing travel speeds and providing passing opportunities that would decrease the amount of time spent following slower vehicles.

It is anticipated that construction of a bypass around Campbellsville would attract a considerable volume of traffic away from the existing route (KY 55 and US 68) approaching and through the city. Traffic projections support this expectation. Compared with the No-Build Alternative, build alternative traffic volumes on KY 55 from the south terminus of the proposed bypass to US 68 are projected to be almost 24% lower by year 2016 and almost 19% lower by year 2036. On US 68 north through Campbellsville, traffic volumes for those years are also projected to be notably lower than those for the No-Build Alternative—11% lower in both 2016 and 2036. Traffic volumes on a newly constructed Campbellsville Bypass are projected to range from 4,800 vpd to 5,000 vpd by 2016 and 8,500 vpd to 9,000 vpd by 2036, and to provide LOS “A.”

1.4 Safety/Crash Analysis

KY 55 is the major highway connector for the region, providing connections to other major highways and cities. It is also the primary north-south roadway in the two counties, connecting businesses and residents with the county seats and economic activity centers.

Crash Analysis. Crash and traffic data provided by KYTC and the Kentucky State Police were used to identify roadway sections having abnormally high crash rates, thus indicating a possible need for safety improvements. Crash analysis procedures involve assigning reported crashes to roadway locations by mile post. The crashes are normally classified by severity into one of three categories: fatal, injury, or property damage only (PDO). Then, the average crash rate for roadway sections of various lengths is determined. Generally, the analysis includes analyzing the entire roadway length under study, followed by analyzing smaller roadway sections or spots, especially those containing higher concentrations of crashes. Roadway segments are classified as either “spots” (locations 0.3 mile long or shorter) or “sections” (locations 1.0 mile or longer). Roadway section crash rates are normalized for comparison by either hundred-million-vehicle-miles traveled (HMVM) for segments, or millions-of-vehicles (MV) for spots.

Using the average crash rate, the critical crash rate was obtained from the Kentucky Transportation Research Center’s *Analysis of Traffic Crash Data in Kentucky*. The “critical crash rate” is higher than the

average crash rate and reflects the maximum crash rate expected to occur on a roadway section, given the statewide average crash rate for that functional road class, the ADT volume, and the roadway section length. The ratio of these two rates (*i.e.*, the actual crash rate to the critical crash rate) produces a critical crash rate factor (CCRF), or a measure of crash statistical significance for each section or spot location. If the roadway section's actual crash rate exceeds the critical rate (*i.e.*, the CCRF is greater than 1.0), then that section is classified as a high crash location. In other words, that roadway section has more crashes than is statistically probable in the absence of an unsafe condition(s).

For this study, crash data for KY 55 and US 68 in the project area were analyzed for a three-year period, from January 2009 through December 2011 (see Table 3, p. 11). The KYTC crash database for the study period listed 3 fatal crashes, 80 injury crashes, and 402 property-damage-only crashes—486 crashes in all. Of the 3 fatal crashes, 1 occurred at the US 55/KY 1061 (Lone Valley Road) intersection in Taylor County. This “spot” has a CCRF of 1.86. Other 0.1-mile spots where the CCRF exceeds or approaches 1.0 include:

<u>Taylor County</u>	<u>CCRF</u>
• KY 55 between Campground and Tebbs Bend Roads:	1.10
• KY 55 near the Green River Bridge:	1.10
• KY 55 near the intersection of Soule Chapel Road:	1.27
• KY 55 near the intersection of KY 3183:	1.65
• US 68 from N. Hoskins Avenue to just east of S. Columbia Avenue:	2.34
• US 68 from east of S. Columbia Ave. to east of KY 527:	0.90
• US 68 from east of KY 527 to just east of KY 289:	1.40
• US 68 from N. Jackson Street to just west of Durham Street:	0.95
• KY 68 near the intersection with K Y658:	1.50
<u>Adair County</u>	
• KY 55 east of James Kearn Road:	1.11

In all, 115 crashes occurred along the approximately 14-mile stretch of KY 55 from the Columbia Bypass to the proposed southern terminus of the Campbellsville Bypass. An additional 42 crashes occurred along the 1.6-mile section between the proposed southern terminus of the Campbellsville Bypass and the US 68/KY 55 intersection, while 329 crashes occurred along the 4.6-mile section between the US 68/KY 55 intersection and the proposed project terminus at US 68/KY 55 north of the city.

Crash types recorded on US 68 (East Broadway) were:

- | | |
|---------------------------|--------------------|
| • Rear-end crashes: 35.4% | • Sideswipe: 13.1% |
| • Angle collision: 38.7% | • All other: 13.8% |

Nearly 90% of the crashes recorded on US 68 in the city were property-damage-only (no fatal or injury crashes), which is typical for relatively heavily traveled, relatively low-speed urban street. Approximately one third of the crashes were described as “rear end” crashes. Such events are not uncommon along city streets where high traffic volumes contribute to vehicular congestion and where frequent access points generate turning movements that can result in both rear-end crashes and angle collisions. Rear-end crashes and angle collisions together account for more than 74% of the US 68 (East Broadway) crashes.

Environmental Assessment: KY 55 Reconstruction and Southeast Campbellsville Bypass

The most frequently occurring crash type on KY 55 within the high-crash spots was the multi-vehicle, angle crash (34%), followed by single-vehicle run-off-the-road (29.5%), rear-end and side-swipe (13.6% each), and vehicles left-turning into the path of oncoming traffic (5%). All other recorded crash types occurred only once. The statistically high crash sections/spots are indicated on Figure 6.

The proposed Campbellsville Bypass would provide an alternative to using US 68 (East Broadway) to access locations northeast or south of the city (“through-traffic,” some of which is heavy truck and recreational vehicle traffic). These benefits would, in turn, contribute to a solution to safety problems on US 68 by reducing the potential for the chief causes of the recorded crashes: sudden stops (rear-end crashes), vehicles turning in front of another vehicle (angle collisions), and conflicts created by narrow lanes (sideswipes).

Table 3: KY 55 and US 68 Crash Analysis, 2009–2011

Route (County)	From	To	Mile Point		Length (Miles)	ADT ¹	Lanes	Rural / Urban	Crashes			
			Begin	End					Fatal	Injury	PDO ²	Total
KY 55 (Adair)	North End of Columbia Bypass	Adair-Taylor County Line	15.10	21.30	6.20	7,040	2	R	0	6	17	23
KY 55 (Taylor)	Adair-Taylor County Line	Southern End of Proposed Campbellsville Bypass	0.00	8.70	8.70	8,462	2	R	2	18	71	92
KY 55 (Taylor)	South Terminus of Proposed Campbellsville Bypass	Intersection of KY 55 and US 68	8.70	10.30	1.59	10,807	4	U	0	7	35	42
US 68 (Taylor)	Intersection of KY 55 and US 68	North Terminus of Proposed Campbellsville Bypass	4.87	9.48	4.61	17,245	4	U	1	49	279	329
Total									3	80	402	486

Route (County)	From	To	Actual Crash Rate	Functional Class Critical Crash Rate	Critical Crash Rate Factor
KY 55 (Adair)	North End of Columbia Bypass	Adair-Taylor County Line	48.123	265.829	0.181
KY 55 (Taylor)	Adair-Taylor County Line	Southern End of Proposed Campbellsville Bypass	114.122	252.963	0.451
KY 55 (Taylor)	Southern End of Proposed Campbellsville Bypass	Intersection of KY 55 and US 68	223.217	598.451	0.299
US 68 (Taylor)	Intersection of KY 55 and US 68	Northern End of Proposed Campbellsville Bypass	377.931	598.451	0.567

Source: Locations, road characteristics, traffic, and crash data from KYTC; critical crash rate from Kentucky Transportation Research Center’s “Analysis of Traffic Crash Data in Kentucky.”

¹ Average Daily Traffic ² Property Damage Only

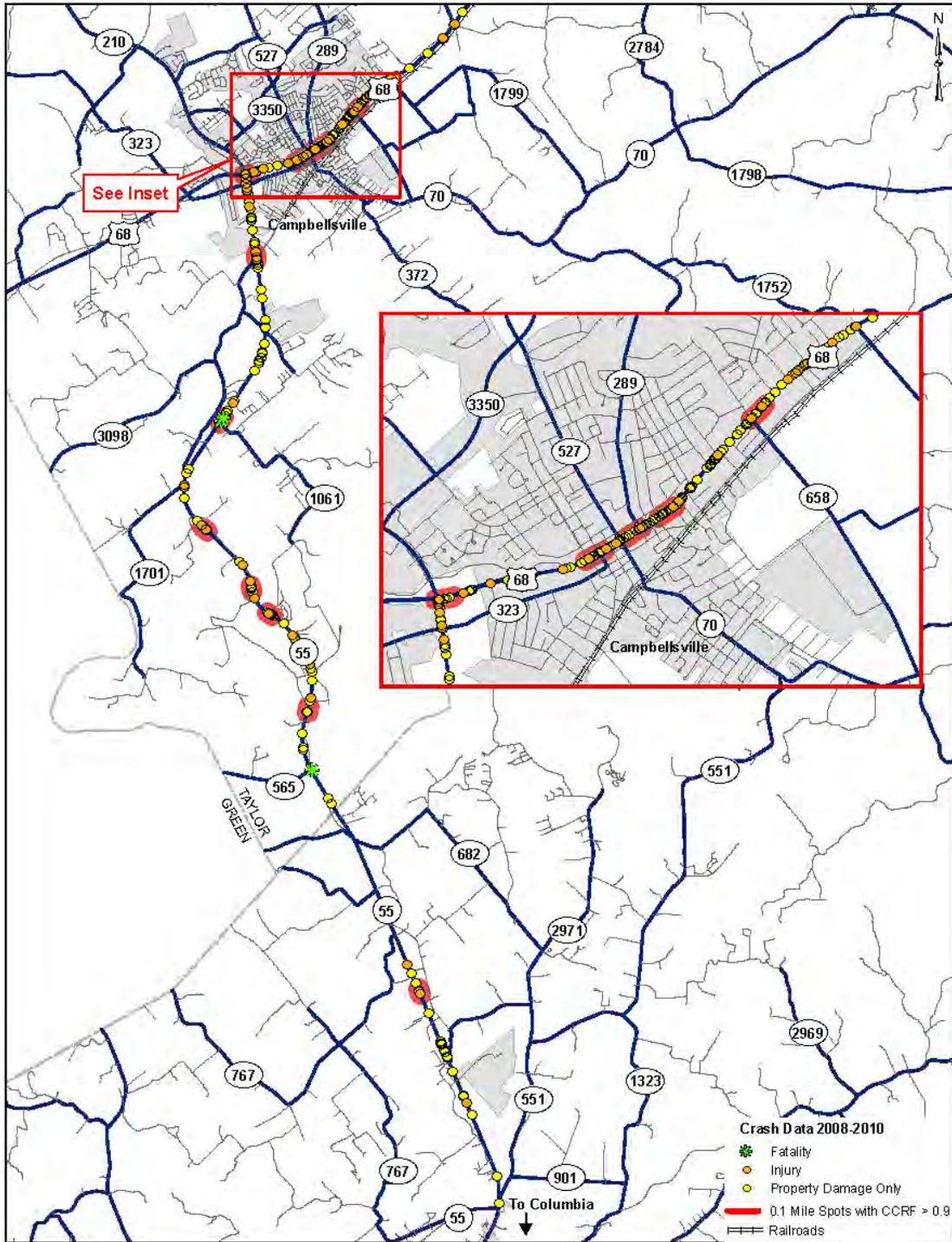


Figure 6: Statistically High Crash Sections/Spots—2008–2010

Other Safety Issues. Lake Road, which intersects KY 55 south of the Green River, provides access to USACE's Big Beech picnic site, the Office and Visitor Center, and State Park Road/Green River Lake State Park. USACE's primary concerns are as follows:

- Stopping sight distance (SSD) on KY 55 at the approach to Lake Road is poor; oncoming traffic is difficult to see due to the steep grade and the location of Lake Drive near the crest of the hill.
- If the project increases the grade on KY 55 to accommodate the proposed relocation of the intersection and widening of KY 55, the grade on Lake Road would also be steeper; therefore, removal of snow and ice from Lake Road for the safety of park and USACE Office visitors and staff would be difficult. USACE does not have a road crew and equipment for winter road maintenance should the grade be made steeper.
- Large recreational vehicles (some of which are 60 to 100 feet in length) headed to/from the state park have difficulty turning from KY 55 onto Lake Drive due to the tight turning radius.

1.5 Project Termini

The proposed project's southern terminus is the Columbia Bypass. The project's proposed northern terminus is at the juncture of KY 1834 and US 68. The termini were selected because they are links in the planned Heartland Highway.

2.0 PROPOSED ALTERNATIVE CONCEPTS

2.1 *Alternatives Considered*

The identification and evaluation of alternatives were the most important and critical steps of this study. Alternatives that could meet the purpose and need for the project were identified and given consideration. Starting from a wide range of alternatives, the number of alternatives was reduced as more detailed information was collected and analyzed. Purpose and need, environmental factors, engineering feasibility, public comment, and cost were evaluated before a preferred alternative was recommended. Alternatives considered in determining whether they met the purpose and need for the project included:

- A No-Build (“Do Nothing”) Alternative
- Rebuild the existing road either in total or at selected locations (“spot” improvements)
- Build a road on new alignment within the same general roadway corridor

No-Build Alternative. The No-Build Alternative is one in which KYTC would take no action to improve the existing roadway. No residential displacements or commercial impacts would occur with the No-Build Alternative. Overall, however, selection of the No-Build Alternative would not meet the stated purpose and need of the proposed project (see Section 1.2, *Purpose and Need, Goals*). The No-Build Alternative would be expected to result in progressively deteriorating conditions for safe, efficient, and economical (time and money) vehicular traffic movement that would, in turn, impede improvement of the socioeconomic environment of Columbia, Campbellsville, Adair County, Taylor County, and the region. Selecting the No-Build Alternative would over time diminish access to the area’s major tourist centers, and fail to provide an adequate transportation network for traffic and economic development. Public safety would continue to be a concern. The increasing volume of passenger vehicles, recreational vehicles, and large trucks could result in elevated crash rates in areas that are already experiencing or approaching high rates. These negative impacts would translate to increased costs to drivers and lessened freight accessibility, which can lead to a lack of competitive and locational advantages and can impact opportunities for employment and economic development.

Rebuild the Existing Road. Improving existing KY 55 was recommended in the 2005 *Alternatives Planning Study* and is the approach that is proposed for most of the roadway in this current study. Alternative alignments associated with this recommendation are described in Section 2.2, *Build Alternatives by Section and Segment*, below.

Build Road on New Alignment. In 2005 the *Heartland Parkway Alternatives Planning Study* examined alternatives on new alignment, west of KY 55, but found them to be unacceptable in terms of impacts, cost, and ability to meet the objectives of the *Planning Study*. Therefore, the alternatives considered during this phase remain within the existing corridor except for the Campbellsville Bypass section. As recommended in the *Alternatives Planning Study*, a bypass of Campbellsville on new alignment is proposed. Alternatives associated with this recommendation are described in Section 2.2.

2.2 *Build Alternatives by Section and Segment*

Because the No-Build Alternative would not meet the project’s purpose and need, build alternatives were developed that would widen and reconstruct an approximately 14-mile section of the existing road and also provide a bypass of Campbellsville on new alignment. The locations of the alternatives took into account several constraints including USACE requirements/recommendations related to the Green River crossing and recreational areas (having potential Section 4(f) use); historical resources with potential Section 106 and Section 4(f) involvement; natural resources such as wetlands, streams, and endangered

species habitat; farmland and residential/commercial impacts; and engineering constraints related to the crossing of Green River and Green River Dam emergency spillway area.

To facilitate preliminary design and environmental analysis within the 21-mile-long corridor, the project corridor was divided into three unique sections:

Section 1 begins on KY 55⁶ at the Columbia Bypass and extends northward to the Adair-Taylor County line, for a distance of 6.2 miles. The project in this section includes a connection to the bypass, and road widening alternatives east of, west of, and centered on KY 55.

Section 2 begins at the county line and continues the widening options along KY 55, over the Green River, to just south of KY 1625 (Blue Hole Road), for a distance of 8.0 miles.

Section 3 leaves KY 55 corridor in the vicinity of KY 1625 to bypass Campbellsville, and travels on new alignment east of Campbellsville to US 68/KY 55 northeast of Campbellsville, for a distance of 6.7 miles.

Each section of the corridor was divided into segments to (1) initially, allow for comparisons of alignments within each segment (see Section 2.2.1); and (2) ultimately, connect segment alignments to form end-to-end build alternatives (i.e., extending the entire length of the project corridor) for evaluation and recommendation of a preferred alternative (see Sections 2.2.2 and 2.3).

In all, there are 15 segments, from 1a in the south end of the corridor to 15 in the north. Each segment contains from two to five alignment options referred to as “segment alternatives.” The naming convention used to identify the segment alternatives relies on the segment number plus one of the following colors that illustrate the alternatives on the exhibits in this EA: Yellow (Y), Green (G), Red (R), Light Blue (LB), and Orange (O).

Various combinations of segment alternatives have produced four end-to-end “build alternatives”—Alternatives A, B, C, and D (recommended as the preferred alternative)—that are evaluated herein. The No-Build Alternative is included in the evaluation process for the purpose of comparing it with the build alternatives.

Figure 7 shows the proposed KY 55 mainline typical cross section. The project is proposed as a four-lane, divided roadway with 12-foot-wide driving lanes, a median (variable width), 12-foot-wide outside shoulders (10-foot paved and 2-foot gravel) and 6-foot-wide inside shoulders (4-foot paved and 2-foot gravel), left-turn lanes where necessary, and a 55 mile-per-hour (mph) design speed. The proposed KY 55 is to be a partial-access-controlled facility (i.e., access locations spaced at least 1,200 feet apart).

There are potentially four or more locations where either a roundabout or a “T” intersection could be considered as an at-grade intersection configuration:

- At the Columbia Bypass intersection
- At the south and north termini of the proposed Campbellsville Bypass
- At KY 70 along the Campbellsville Bypass
- At any location where a traffic signal could be warranted

⁶ Unless otherwise stipulated in the description of alternatives, the term “KY 55” refers to the existing roadway. The proposed reconstructed/new alignment roadway is referred to either by the name of the alternative under discussion (i.e., Alternative 6G, Alternative 2Y, etc.) or as “proposed KY 55.”

Because a roundabout or a “T” intersection would be at the same location and within the general environmental footprint, the environmental impacts would be very similar and the impacts are not, therefore, differentiated within this document. The decision regarding design of a roundabout rather than the “T” intersection would be made in the final design phase of the project.

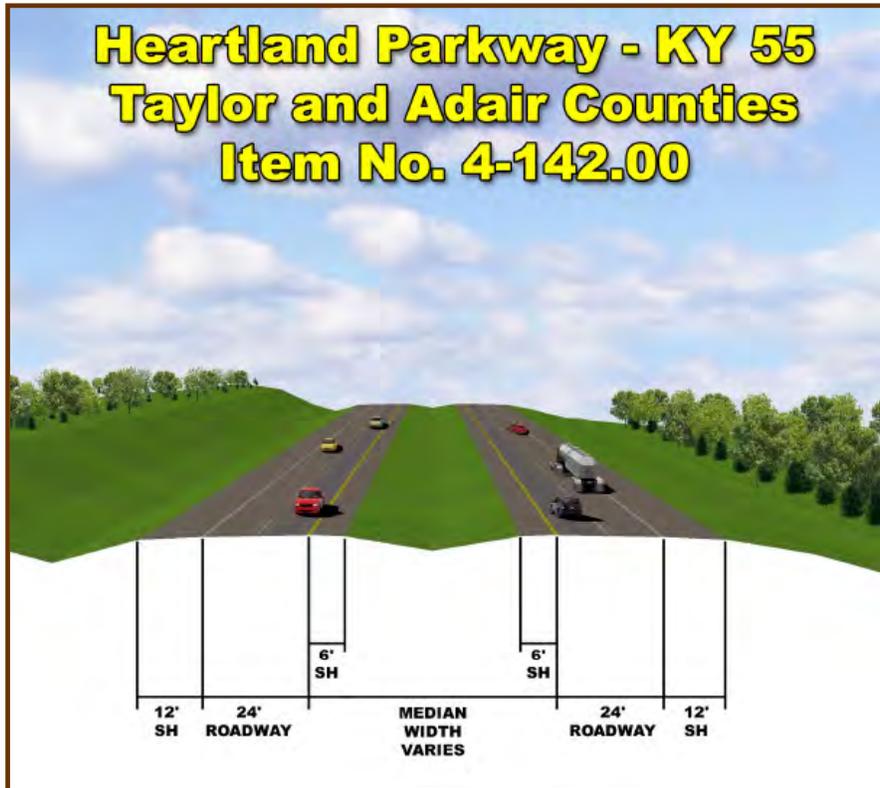


Figure 7: Proposed KY 55 Typical Cross Section

2.2.1 Segment Alternatives

The segment alternatives were presented to the public at a series of meetings. Based upon public input, environmental constraints, and potential environmental impacts, alignments were modified or eliminated, and the revised alignments were then presented at another series of public meetings. To date, six public meetings (three in Campbellsville and three in Columbia), six Focus Group meetings (two in each of the three corridor sections), and two Section 106 consulting parties meetings have been held. Public involvement in project planning and preliminary design will continue throughout the alternatives evaluation/recommendation process.

The proposed KY 55 alternatives have intersections with several state and local roads. With all build alternatives, where the 1,200-foot access spacing requirement would result in loss of direct road (or, in many cases, driveway) access to proposed KY 55, access is proposed wherever feasible via road realignment or relocation, frontage or backage roads, and/or new connectors.

The alternatives considered during the EA process are briefly described, below. Alignments that were considered early-on but eliminated prior to detailed evaluation in this EA are described in the applicable sections below. Table 4, *Summary of Initial Screening of Alternative Segments* (p.24), identifies the

alternatives that were advanced for detailed evaluation or eliminated during the early phase of the project. A partial listing of local features evaluated to assess potential project-related impacts is included in the text boxes that provide locational information for each segment within a section.⁷ Exhibit 3 shows the three corridor sections and segment alternatives within each. Exhibit 4 (Sheets 1a through 15) shows the segment alternatives in greater detail, including environmental constraints encountered by each alternative.

CORRIDOR SECTION 1—

KY 55 from Columbia Bypass to Adair-Taylor County Line

KY 55, which lies in the center of this section of the project corridor, is a mostly straight, two-lane roadway over rolling terrain. At the southern terminus of the project, KY 55 intersects with the Columbia Bypass (see Figure 8) and also intersects with the several state and local roads that are identified, by segment, below.

A mix of agricultural, historic, industrial, commercial, residential, and institutional land uses occurs within this section. In the Adair County portion of the corridor, KY 55 is known as Campbellsville Road.

Section 1 is divided into segments 1a, 1b, 2, 3 and 4 (see sidebar at right), each of which contains two or more segment alternatives.

Segment 1a contains KY 55/Columbia Bypass connection Segment Alternatives 1aY, 1aO, 1aR, 1aG.

Segments 1b through 4 contain the mainline segment alternatives that would widen KY 55 in one of the following ways:

- Alternatives 1bG – 4G add two lanes to the west.
- Alternatives 1bY – 4Y add two lanes to the east.
- Alternative 3R constructs all four lanes along the existing KY 55 centerline. (*NOTE: Segments 1bR and 2R were eliminated early-on due to maintenance of traffic concerns and potential right-of-way impacts that drew public opposition.*)

➤ **Segment 1a**

This segment begins at the KY 55/Columbia Bypass intersection and terminates approximately midway between the north and south Trinity United Methodist Church (UMC) access drives north of the KY 530 (Keltner Road)/KY 55 intersection. The following bypass connection alternatives have been evaluated during the course of this study.

SECTION 1

Segments & Features:

- 1a. Columbia Bypass to north of KY 55/Keltner Road intersection—**
 - Russell Creek & Butler Branch
 - Green River Commerce Park
 - Trinity United Methodist Ch.
 - Butler Farm (NRHP eligible)
 - Champness Butler Farm (NRHP eligible)
 - Cheatham Cemetery
- 1b. North of intersection to just south of Walker Murrell Road—Development Drive*—**
 - Trinity United Methodist Ch.
 - Butler Farm & Cemetery (NRHP eligible)
 - Cox Cemetery
- 2. South of Walker Murrell Road—Development Drive to south of Cane Valley Mill Road (KY 2972)—Cane Valley School Road (KY 530)*—**
 - New Life for the Nations Ch.
 - Cane Valley Apostolic Ch.
 - Spectrum Care Academy Children's Services
 - FS 11 Cemetery (potentially NRHP-eligible)
 - Cundiff House (NRHP eligible)
- 3. South of Cane Valley Mill Road—Cane Valley School Road to Farris Road (KY 633)—**
 - Cane Valley Historic District (NRHP eligible)
 - Cane Valley Baptist Ch. (not in HD)
- 4. Farris Road to county line—**
 - Church of Christ
 - FS 21 Cemetery (T.F. Hare, potentially NRHP eligible)

* West–East intersection with KY 55.

⁷ See Section 3.0, *Affected Environment and Environmental Consequences*, for a comprehensive discussion of the entire project corridor and project-related impacts within the corridor.

Alternative 1aY (at-grade Intersection option) provides a north-south through movement and the bypass would be at a stop condition. This is the existing configuration at the KY 55/Columbia Bypass intersection. Access to proposed KY 55 would also occur at realigned intersections with KY 551 and Shirley Brock Road, and a new connection to KY 530 (Keltner Road). Existing roads crossed by the alternative include, from south to north: KY 551, Scott and Dial Road, Shirley Brock Road, and KY 530. (Note: A roundabout could be considered as an at-grade option to a “T” intersection configuration. Because such an option would be at the same location and within the general environmental footprint evaluated for the proposed “T” intersection, the environmental impacts would be similar.)

Alternative 1aG (fly-over option) realigns KY 55 to the east, where the north-south movement on proposed KY 55 would run continuously along a large-radius curve onto the bypass alignment. The new alignment and existing corridor intersection (the current “T” intersection) would be grade separated to allow for free-flow movement. Local traffic heading to/from Columbia could access proposed KY 55 via a new connector that would intersect KY 551 and existing KY 55. Existing roads crossed by the alternative include, from south to north: KY 901, KY 551, and KY 530 (Keltner Road).



Figure 8: From KY 55 Looking West Toward Columbia Bypass

Alternative 1aR (free flow east) provides an at-grade interchange that continues the two-lane bypass eastward along a large-radius curve, crossing KY 551 farther west than the Green alignment and then intersecting proposed KY 55. Traffic along KY 551 and KY 901 would access the new road via a new connector north of the KY 55/KY 551 intersection. Existing roads crossed by the alternative include, from south to north: KY 551, Scott and Dial Road, Shirley Brock Road, and KY 530 (Keltner Road).

Alternative 1aO (free flow west) provides an at-grade intersection that has a large-radius curve connecting the proposed KY 55 to the bypass for continuous, non-stop movement between the two. KY 55 heading north from Columbia would tie-in to proposed KY 55 using a “T” intersection. Traffic along KY 551 and KY 901 would access the new road via a new connector at the KY 55/KY 551 intersection. Existing roads crossed by the alternative include, from south to north: KY 551, Scott and Dial Road, Shirley Brock Road, and KY 530 (Keltner Road).

Note: Early in the development of alternatives a modified Orange alignment—Orange Dashed—was considered. North-south traffic heading from/to Columbia would be free flowing using a combination of at-grade and grade-separated ramps. Northbound traffic out of Columbia turning south and west onto the bypass would do so at an at-grade “T” intersection. This option was eliminated in the preliminary stage of alternatives’ evaluations due to engineering constraints and lack of public support.

➤ **Segment 1b**

Alternatives 1bG and 1bY continue northward from the bypass connection to just south of the Walker-Murrell Road/Development Drive intersection with KY 55. Alternative 1bG would widen to the west and Alternative 1bY would widen to the east.

➤ **Segment 2**

Alternatives 2G and 2Y continue northward to south of KY 2972 (Cane Valley Mill Road)/KY 530 (Cane Valley Road) intersections with KY 55. Existing roads crossed by the Segment 2 alignments include, from south to north: Walker-Murrell Road, Development Drive, Mary Drive, KY 530 (Cane Valley Road), Keltner Road (KY 530), Marion Smith Road, Bandy Road, Loveless Road, McIntyre Road, and James Karnes Road.

➤ **Segment 3**

Alternatives 3G, 3Y, and 3R continue northward to KY 633 (Farris Road). Existing roads crossed by the Segment 3 alignments include, from south to north: Cane Valley School Road, KY 2972 (Cane Valley Mill Road), Steve Breeding Road, Cane Valley Road, and KY 633 (Farris Road). As noted above, in Section 1 the RED alignment was eliminated in all but Segment 3. It was retained in this segment to provide sufficient alignment options for evaluating potential impacts to Cane Valley, an NRHP-eligible historic district.

➤ **Segment 4**

Alternatives 4G and 4Y continue northwestward to the Taylor-Adair County line. Existing roads crossed by the Segment 4 alignments include, from south to north: KY 682 (Cane Valley Road), KY 1913 (Coburg Lane), Dunworth Road, and Huntington Way.

CORRIDOR SECTION 2—

**KY 55 from
Adair-Taylor County Line to just south of
Campbellsville**

As in Section 1, KY 55 through this section is a two-lane road traversing rolling terrain; however, unlike the previous section, much of the roadway is on a curvilinear rather than straight alignment. There are two perennial streams crossed in Section 2—the Green River (which is an Outstanding Water Resource (OWR) beginning just downstream from the Green River Lake Dam east of the project corridor) and Pinch Creek (north of Green River). USACE recreation areas are within Section 2 north and south of the Green River.

SECTION 2

Segments & Features:

5. **County line to Harley Road–Lake Road* (Green River Lake State Park access)—**
 - *Battle of Tebbs Bend Historic District, including cemetery—(NRHP listed)*
 - *Lemmons Bend Historic District—(NRHP eligible)*
 - *FS 38 Archaeological Site (within Tebbs Bend District)*
 - *FS 28 Archaeological Site (potentially NRHP eligible)*
 - *Tennessee Gas Property*
 - *USACE Wildlife Management Area*
 - *USACE Tailwater Recreation Area*
 - *Lake Road access to Green River Lake State Park*
 - *Faulkner Cemetery*
 - *Sherrod Griffin Grave in Griffin Cemetery (NRHP eligible)*
 - *Asbury United Methodist Ch.*
6. **Harley Road–Lake Road to Soule Chapel Road—**
 - *Battle of Tebbs Bend Historic District—(NRHP listed)*
 - *Green River, Green River Dam and Emergency Spillway*
 - *USACE Tailwater Recreation Area*
 - *Point Pleasant residential community*
 - *Lee Cemetery*
7. **Soule Chapel Road to south of Lyle Road—**
 - *Battle of Tebbs Bend Historic District—(NRHP listed).*
 - *Isaac Tate Farm/Homeplace on Green River (NRHP listed)*
 - *Pinch Creek (perennial stream)*
 - *Cross-Gabled House (NRHP eligible)*
8. **South of Lyle Road to Johnson Road—**
 - *Isaac Tate Farm/Homeplace on Green River (NRHP listed)*
 - *NRHP eligible sites: Caldwell House, Emerald Hill, Smoot House, Burdick School (Ireland Community Center), Robinson-Gaines House, Shively House, Burress/McMayes House*
 - *Burress, Miller, and Rogers cemeteries*
 - *Burdick*
9. **Johnson Road to just south of Garnett Street—**
 - *FS 49 archaeological site (potentially NRHP eligible)*
 - *KY 55/KY 1061 intersection*
 - *Liberty Cemetery*
 - *Churches: Bethel AME, Liberty Cumberland Presbyterian, Green River House of Prayer, and Green River Memorial Baptist*

* West–East intersections with KY 55.

Section 2 contains a mix of agricultural, recreational, historic, commercial, residential, and institutional land uses. Two unincorporated communities are within Section 2: Burdick, north of KY 55 at its intersection with KY 1701 (Milder Creek Road); and Hatcher, on KY 3183 (Old Columbia Road) west of KY 55. The section of KY 55 in the vicinity of Burdick is referred to as the “Burdick Curve” due to the large-radius curve in the alignment. In Section 2, KY 55 has intersections with the several state and local roads, which are identified in the segment descriptions, below.

Section 2 contains five corridor segments (see sidebar, previous page), each containing two or three segment alternatives that widen the existing road as follows:

- Alternatives 5G, 6G, and 9G add two lanes to the west.
- Alternatives 5Y–9Y add two lanes to the east.
- Alternatives 6 LB–9LB shift farther east or west of the other alignments at several locations to flatten curves and/or avoid notable resources.

Reconstructing all four lanes along the existing centerline (Red alignment) was initially considered and eliminated in Section 2 due to the potential for numerous right-of-way impacts, maintenance of traffic concerns, and lack of public support.

➤ Segment 5

Alternatives 5G and 5Y continue northwestward, then turn northeastward and then north to the intersection with Harley Road and Lake Road⁸, which provides access to Green River Lake State Park. The alternatives also cross Coburg Spur Road, Griffin Spring Road, KY 565 (Ebenezer Road), Garrett Road, Gabbert Road, KOA Campground Road, Tebbs Bend Road, Quinn Road, and Westshore Drive. Alternatives 5Y and 5G traverse the NRHP-listed Tebbs Bend Historic District where its historic boundary crosses KY 55. Because Alternative 5Y would widen KY 55 to the east, it would traverse a site within the boundary that was once occupied by a house that served as a Confederate hospital during the Tebbs Bend battle. Alternative 5G widens KY 55 to the west and, therefore, avoids the former hospital site.

Alternative 5LB was studied as a Tebbs Bend Historic District avoidance alternative; however, it was not advanced for detailed evaluation in this EA because a section on new alignment (east of existing KY 55) crossed a contaminated area on Tennessee Gas property (see Section 3.13, *Hazardous Materials*).

➤ Segment 6

Alternatives 6G and 6Y head northwest to Soule Chapel Road. The alternatives cross the Green River at approximately the same location as the existing KY 55 bridge (see Figure 9), then cross Tailwater Road and Spring Meadows Circle (access to the Point Pleasant residential area). It terminates at the proposed KY 55/Soule Chapel Road intersection.

Alternative 6LB initially shares the Alternative 6Y alignment to just north of its crossing of the Green River. North of the river, the alternative shifts westward on new alignment, and then turns eastward, crosses KY 55, and terminates at Soule Chapel Road.



Figure 9: KY 55 Bridge across Green River

⁸ Although the existing KY 55/Lake Road intersection is in Segment 5 of the project corridor, the proposed relocation of the intersection slightly to the north of the existing location would put the intersection in Segment 6.

➤ **Segment 7**

Alternative 7Y swings northeastward, and then curves northwest and terminates south of Lyle Road. The alternative crosses Pinch Creek and then Tebbs Bend Road, Farris Lane, Hall Lane (access to Homeplace on Green River, which occupies a section of the NRHP-listed Isaac Tate Farm), and an unnamed frontage road. Alternative 7G (the west-of-KY 55 alignment) was not advanced for detailed evaluation in this EA due to impacts to the NRHP-listed site.

Alternative 7LB crosses to the east side of KY 55, bridges Pinch Creek, and then travels on new alignment east of Alternative 7Y to Farris Lane, where it joins Alternative 7Y to the segment's terminus south of Lyle Road. The alternative also crosses Farris Lane, Hall Lane, and the unnamed frontage road.

➤ **Segment 8**

Alternative 8Y continues northwestward a short distance before curving (i.e., the Burdick Curve) to the northeast and terminating at the proposed KY 55/Johnson Road intersection. The alternative also crosses Lyle Road, Joe Kerr Road, KY 1701 (Milder Creek Road), and KY 3183 (Old Columbia Road). Alternative 8G was not advanced for detailed evaluation in this EA due to unavoidable impacts to several NRHP-eligible sites east and west of KY 55.

Alternative 8LB heads eastward, crosses Lyle Road, and traverses farmland on new alignment to flatten the radius of the Burdick Curve and avoid the NRHP-eligible sites west of KY 55. However, it does bisect the NRHP-eligible Shively House (Site 94) property east of KY 55. It terminates at the proposed KY 55/Johnson Road intersection. Where the alternative is on new alignment, access roads would connect the existing and new roadways.

➤ **Segment 9**

Alternatives 9G and 9Y head northeast to just south of Garnett Street, approximately 2.0 miles south of the Campbellsville city limits. The alternatives cross KY 1061 (Lone Valley Road), Misty Lane, and Donna Drive.

Alternative 9 LB widens on both sides of the centerline and cross KY 1061 (Lone Valley Road), Misty Lane, and Donna Drive.

**CORRIDOR SECTION 3—
Campbellsville Bypass**

From the northern terminus of Section 2, the project corridor turns eastward from KY 55, and is on new alignment to bypass the city of Campbellsville on the south and east sides and terminate northeast of the city at US 68. The alternatives within the corridor depart from KY 55 at different locations north of Garnett Street. The corridor is primarily through rural, agricultural land; however, at the southern terminus of the section's corridor, the Technology Park (Technology Park) and

SECTION 3

Segments & Features:

10. **South of Garnett Street to east of Stone Quarry Creek—**
 - Heartland Commerce and Technology Park
 - Cemetery on Technology Park site
 - Stone Quarry Creek in WMA
 - Campbellsville Sports Complex
 - Churches: Brethren in Christ, and Jesus Name
11. **East of Stone Quarry Creek to east of Smith Ridge Road (KY 372)—**
 - Hazard Cemetery
 - Stone Quarry Creek tributary
 - Smith Ridge Road
12. **East of Smith Ridge Road to east of Elkhorn Road (KY 70)—**
 - Elkhorn Road (KY 70)
 - NRHP eligible sites: Rice House, and Campbell Farm
 - Robinson Creek-Pitman Creek Baptist Ch.
 - Churches: Meadowview Baptist, Southside Christian
13. **East of Elkhorn Road to north of Reids Chapel Road (KY 1799)—**
 - Campbellsville Airport
 - Cemeteries: Phillips, and Smith
 - Churches: Eastside Baptist, and Ole Gospel Barn & Victory
14. **East of Reids Chapel Road to US 68 north of Campbellsville—**
 - Cemeteries: Garvin, Fisher, and "Tucker" (archaeology site FS-52),
 - US 68

the Campbellsville Sports Complex are under development. Also, USACE's Wildlife Management Area (WMA) is within the Stone Quarry Creek portion of the corridor. There are five corridor segments within Section 3 (see sidebar, above right), each with two or three segment alternative alignments identified by segment number and a color (Yellow, Light Blue, Red, and Orange).

The typical section for the proposed bypass would be the same as that for proposed KY 55, i.e., a four-lane roadway with center median and paved shoulders. It is possible that, due both to funding constraints and traffic demands, the bypass would be built with two lanes initially, and four lanes when traffic warrants. Section 3 considers the following bypass segment alternatives, various combinations of which form the build alternatives in this section:

- Alternatives 10Y–14Y
- Alternatives 14O
- Alternatives 10LB–13LB
- Alternatives 11R–14R

Two alignments initially considered in Section 3 were not advanced for detailed evaluation in this EA: a Green alignment through this section was eliminated primarily due to the number of residential relocations, poor access to the Technology Park, rugged terrain, potential impacts to the WMA, and cost; and because it was seen by the public as being too far from Campbellsville. A far-west Dark Blue alignment, developed for Section 3, only, was eliminated because of the number of potential residential relocations/business displacements, and because public sentiment opposed the alignment as being too close to Campbellsville.

The alternatives in Section 3 are on a new alignment each of which, with some exceptions, differs from the others. In Section 3, the bypass would have intersections with several state and local roads, as identified in the descriptions below.

➤ **Segment 10**

Alternative 10Y crosses Garnett Street and turns eastward from KY 55, then crosses KY 1625 (Blue Hole Road) and then Apartment Road. It continues east, bisecting the Technology Park property (which is under development) and bridging Stone Quarry Creek at the northern tip of the WMA. The bypass (to the east), existing KY 55 (to the north), proposed KY 55 (to the west) and Blue Hole Road (to the south) would intersect as either a 4-way intersection or a roundabout.

Alternative 10LB crosses Garnett Street on shared alignment with Alternative 10Y, and continues along the KY 55 corridor. North of its intersection with KY 1625 (Blue Hole Road) Alternative 10LB would have a 3-way "T" intersection or roundabout with KY 55 and then head east on new alignment. It traverses the southern portion of the 175-acre Campbellsville Sports Complex site and then, for a short distance, crosses the north boundary of the Technology Park, and bridges Stone Quarry Creek north of the Alternative 10Y alignment and the WMA.

Alternative 10R was initially considered but eliminated in this segment early-on because of its impacts due to right-of-way requirements through the WMA at the crossing of Stone Quarry Creek.

➤ **Segment 11**

Alternatives 11Y and 11LB continue a short distance on separate alignments to just east of Barnett Road. From there they more-or-less share an alignment that bridges a Stone Quarry Creek tributary and terminates after crossing KY 372 (Smith Ridge Road). A grade-separated, partial interchange is proposed with Alternative 11LB and an at-grade "T" intersection is proposed with Alternative 11Y.

Alternative 11R begins on shared alignment with Alternative 11Y, and then immediately turns eastward, bridges a tributary to Stone Quarry Creek, and terminates after crossing KY 372 (Smith Ridge Road). This alignment is the southernmost alternative in this segment.

➤ **Segment 12**

Alternative 12Y continues eastward before curving northward, crossing KY 70 (Elkhorn Road), and terminating just north of KY 70.

Alternative 12LB initially shares an alignment with Alternative 12Y, but almost immediately shifts to the northwest, then curves northward, crosses KY 70 (Elkhorn Road), and terminates at its crossing of the Keltner Road/Goodin Lane intersection just north of KY 70. This alternative is the northernmost of the three alternatives in this segment.

Alternative 12R continues northeastward, crosses Reynolds Road, and then bridges an unnamed creek. It then crosses Old Elkhorn Road and KY 70, and heads northward to its terminus.

➤ **Segment 13**

Alternative 13Y continues northeastward, crosses KY 658 (Roberts Road) and curves northwestward, and then crosses Sprat Branch, KY 1799 (Reids Chapel Road), and Catalpha Lane where it terminates. From approximately KY 658 to its terminus it shares an alignment with Alternative 13LB.

Alternative 13LB continues northeastward (to the west of Alternative 13Y), crosses KY 658 (Roberts Road), and shares the Alternative 13Y alignment to Catalpha Lane. Because from this point to the terminus of the project it continues on the same alignment as Alternative 13Y, Alternative 13LB was not carried into Segment 14 for separate evaluation.

Alternative 13R continues northeastward, crossing KY 658 (Roberts Road) and Sprat Branch. As it approaches KY 1799 (Reids Chapel Road), the alignment begins to curve westward, crosses KY 1799, and terminates just beyond that road. This alignment is farther south than Alternative 13Y and Alternative 13LB.

➤ **Segment 14**

Alternative 14Y continues northwestward, bridges Wise Road, intersects KY 1834 (Sportsman Lake Road), and then terminates at US 68.

Alternative 14R continues northwestward, intersects Catalpha Lane, bridges Wise Road, joins the Alternative 14Y alignment north of that road, and continues on the shared alignment with Alternative 14Y to US 68.

Alternative 14O initially shares an alignment with Alternative 14Y before turning north, bridging Wise Road and then terminating at US 68 with either a “T” intersection or a roundabout. (Note: This alignment was developed after the Focus Group and public meetings had been held. The public will have an opportunity to review and comment on the alignment during the period of review of this EA, including at the Public Hearing.)

Table 4: Summary of Initial Screening of Alternative Segments

	Section 1					Section 2					Section 3				
	1a	1b	2	3	4	5	6	7	8	9	10	11	12	13	14
Yellow (Y)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Green (G)	✓	✓	✓	✓	✓	✓	✓	x	x	✓	x	x	x	x	x
Red (R)	✓	x	x	✓	x	x	x	x	x	x	x	✓	✓	✓	✓
Orange (O)	x														✓
O-Dashed	x														
Lt Blue						x	✓	✓	✓	✓	✓	✓	✓	✓	
Dk Blue											x	x	x	x	x

☐ = Not Applicable ✓ = Advanced for detailed analysis x = Not Advanced for detailed analysis

2.2.2 Development of Build Alternative Alignments

Once the segment alternatives within the three sections were selected for detailed analysis in this EA, they were then combined to form three end-to-end build alternatives—referred to as alternatives A, B, and C—that extend from the southern terminus of Section 1, at the Columbia Bypass, to the northern terminus of Section 3 at US 68 in Campbellsville. **The combinations were created so that each segment alternative that was advanced would be included as an element of at least one end-to-end build alternative.** The build alternatives are composed of the following segment alternatives:

- Alternative A.....Segments **1aY–14Y**
- Alternative B.....Segments **1aG–6G, 7Y, 8Y, 9G, 10Y, 11R–14R**
- Alternative C.....Segments **1aR, 1bY, 2Y, 3R, 4Y, 5Y, 6LB–13LB, 14Y**

Continuing analysis of each of the segment alternatives resulted in the re-combination of the segments to create **Alternative D**, which is being identified as the preferred alternative. The following segment alternatives that comprise the preferred alternative provide the best means of avoiding/minimizing environmental impacts and design constraints while meeting purpose and need:

- Columbia Bypass connection.....Segments **1aY** (at-grade option) and **1aG** (flyover option)
- KY 55 wideningSegments **1bG, 2Y, 3G, 4Y, 5G, 6LB, 7Y, 8Y, 9LB**
- Campbellsville BypassSegments **10Y** and **10LB** options (southern bypass termini), **11Y–13Y, 14O** and **14Y** options (northern bypass termini)

The rationale for recommending the combination of segments forming Preferred Alternative D is included in Appendix A. Table 5 lists the build alternatives by corridor section and segment.

Exhibit 3 shows the build alternatives, by corridor segment, from their southern terminus at the Columbia Bypass to US 68 northeast of Campbellsville. Exhibit 4 (Sheets 1a through 15) identifies the environmental constraints encountered by each segment alternative.

There are two options for the Columbia Bypass connection. One will be selected once funding becomes available for that segment. At present no funding beyond the preliminary and environmental documentation stage is available. Prior to a final decision, additional public involvement and environmental analysis of these two options will be conducted. It is anticipated this decision will occur after the publication of the FONSI.

At the two Campbellsville Bypass termini, there currently two options available. These options will be presented at the Public Hearing following this EA. After comments from the Public Hearing are taken into account, an alignment decision at these two locations will be made and documented within the FONSI. The decision about the design of the termini for the Campbellsville Bypass will be made prior to the FONSI because funding is available to advanced this section of the overall project.

Table 5: Build Alternatives by Corridor Section and Segment

Segments	Alternative A	Alternative B	Alternative C	Alternative D Preferred Alternative
Section 1—Columbia Bypass Intersection & KY 55 Widening to the Adair-Taylor County Line				
1a*	1aY	1aG	1aR	1aY (At-grade)
				<i>Or</i>
				1aG (Fly over)
1b	1bY	1bG	1bY	1bG
2	2Y	2G	2Y	2Y
3	3Y	3G	3R	3G
4	4Y	4G	4Y	4Y
Section 2—KY 55 Widening from the County Line to Campbellsville Bypass				
5	5Y	5G	5Y	5G
6	6Y	6G	6LB	6LB
7	7Y	7Y	7LB	7Y
8	8Y	8Y	8LB	8Y
9	9Y	9G	9LB	9LB
Section 3—Campbellsville Bypass on New Alignment				
10	10Y	10Y	10LB	10Y
				<i>Or</i>
				10LB
11	11Y	11R	11LB	11Y
12	12Y	12R	12LB	12Y
13	13Y	13R	13LB	13Y
14	14Y	14R	14Y	14Y
				<i>Or</i>
				14O

2.2.3 Rationale for Recommending the Preferred Alternative

All four build alternatives would equally satisfy the project’s purpose and need. Therefore, other criteria—social and environmental impacts, engineering and design feasibility/constraints, Section 106 and Section 4(f) requirements, project costs, and public and resource agency input—were employed to evaluate the alternatives.

Alternative D is recommended as the preferred alternative based on a number of factors, including environmental impacts, engineering considerations, estimated costs, and connectivity with the adjacent segments. The preferred alternative was created by evaluating alignment options segment-by-segment, and then combining segment alternatives to form an end-to-end alignment that has the least overall environmental impacts.

Table 6 presents a summary matrix comparing the estimated costs and key potential environmental impacts of the proposed Alternatives A through D described throughout Chapter 3.0. Within Appendix A, Tables A1 through A3 compare potential impacts of segment combinations within Sections 1, 2, and 3.

Table 6: Summary of Potential Environmental Impacts by Build Alternative

	Alternative A 1aY-14Y	Alternative B 1aG-6G, 7Y, 8Y, 9G, 10Y,11R-14R	Alternative C 1aO, 1bY, 2Y, 3R, 4Y, 5Y, 6LB-13LB, 14Y	Alternative D* (Recommended Preferred) 1a Y/1aG options, 1bG, 2Y, 3G, 4Y, 5G, 6LB, 7Y, 8Y, 9LB, 10Y/10LB options, 11Y-13Y, 14Y/14Options
DESIGN				
Right-of-Way (total acres)	592	600	588	593
Estimated right-of-way costs	\$49.1	\$45.2	\$51.1	\$44.4 – \$47.2
Estimated utility costs	\$19.9	\$17.5	\$18.2	\$15.8 – \$14.4
Estimated construction costs	\$127.3	\$147.5	\$143.7	\$123.0 – \$134.4
Estimated total costs	\$197.1	\$210.2	\$213.0	\$184.3 – \$196.0
ABILITY TO MEET PURPOSE AND NEED				
Complete link in Heartland Parkway, advancing goals of <i>Alternatives Planning Study</i> and addressing local needs				High
Improve regional access, roadway capacity, and safety				High
POTENTIAL ENVIRONMENTAL IMPACTS (within disturbance limits unless otherwise noted)				
Wetlands (total number affected / total acres)	10 / 0.587	5 / 0.590	13 / 0.584	11 / 0.347 – 0.715
Ponds (total number affected / total acres)	8 / 1.33	7 / 0.57	5 / 0.245	8 – 9 / 1.33 – 1.818
Floodplains (acres)	12.90	13.26	16.81	12.88
Stream crossings (number / linear feet):	56 / 11,370	49 / 9,485	56 / 11,730	57 – 61 / 10,770 – 11,740
Endangered species	Biological Assessment: 2 bat, 8 mussel, and 2 fish species			
Noise—				
Number of sites that approach/exceed NAC standards	7	6	5	4 / 5
Number of sites predicted to have increases of more than 3 dBA compared to No-Build condition	1	3	1	1 / 0
Air—				
In compliance with National and State AAQS?	Yes	Yes	Yes	Yes
Potential for MSAT emissions	Low	Low	Low	Low
Section 106 Resources—				
Cultural Historic Sites: Adverse Effect (AE) and Section 4(f) use	AE / 2 sites: Cane Valley HD, 2.5 ac. total, 1 house Tebbs Bend HD, 2.88 ac. including hospital site	AE / 0 sites	AE / 2 sites: Cane Valley HD, 1.36 ac. total, 1 house Shively House, 11.78 ac.	AE / 0 sites
Archaeology Sites: Research / Phase II recommended if affected.	3 (incl. site within Tebbs Bend)	3	3 (incl. site within Tebbs Bend)	3
Section 4(f): Recreation Area (acres and effects**)—				
USACE Tailwater Recreation Area (TRA)	13.8 <i>NAE, De minimis</i>	8.9 <i>NAE, De minimis</i>	4.9 <i>NAE, De minimis</i> 15.4 <i>NAE, De minimis</i>	4.9 <i>NAE, De minimis</i> 0 / 15.4 <i>NAE, De minimis</i>
Campbellsville Sports Complex	0	0		
Section 4(f): USACE WMA at Stone Quarry Creek (acres, effects)	2.08 <i>NAE, De minimis</i>	2.08 <i>NAE, De minimis</i>	0	0 (10LB) / 2.08 (10Y) <i>NAE, De minimis</i>
Overall Section 4(f) Involvement	Yes	<i>De minimis</i>	Yes	<i>De minimis</i>
Hazardous Materials Sites (excludes utility/ oil drilling equipment / residential USTs/ASTs—further reconnaissance needed)	16	13	12	13 / 16
Potential Relocations/ Displacements:				
Residential	69	49	57	48 – 60
Institutional	1	1	1	0
Commercial	16	13	8	7 – 16
Farmland: Acres to be converted to transportation use	284	328	352	303

* In segments 1a, 10, and 14, two options are recommended for consideration as potential preferred alignments: 1aY and 1aG, 10Y and 10LB, and 14Y and 14O. Therefore, a range of impacts, from least to most, is presented.

** Effects findings by FHWA; await USACE and USFWS responses regarding WMA, and USACE response regarding TRA.

3.0 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

The methods used to examine and evaluate potential impacts are those currently recognized by regulatory agencies and/or prescribed by FHWA and KYTC. Detailed, topic-specific information can be found in the supporting technical reports, which were prepared as separate technical studies and are on file with KYTC. Where applicable, the analyses address direct, indirect, and cumulative impacts, defined as follows:

Direct impacts are changes that happen in the same time and place as the proposed action.

Indirect impacts are those that are caused by the action and are later in time and further removed in distance, but are still reasonably foreseeable. Indirect effects may include growth-inducing effects and other effects related to induced changes in the pattern of land use, population density, or growth rate (see 40 CFR 1508.8).

Cumulative impacts occur when the effects (both direct and indirect) of the action interact with the effects of other actions. The Council on Environmental Quality (CEQ) defines cumulative impacts as those that “result from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions” (40 CFR 1508.7).

3.1 Air Quality

An *Air Quality Analysis* focusing on carbon monoxide (CO), which is the major air pollutant from vehicles, Mobile Source Air Toxics (MSAT), particulate matter, and other priority pollutants was prepared for this project. The report, initially submitted in September 2010, was updated in March 2012 and is available for review from KYTC. Supporting documentation for these analyses is included in Appendix B, except for the analysis of MSATs, which is presented below.

Adair County and Taylor County are currently in attainment for all criteria pollutants (carbon monoxide, ozone, particulate matter, lead, nitrogen dioxide, sulphur dioxide). Based on the Kentucky CO Screening Procedures for NEPA Background Documentation for the determination of existing and future one-hour and eight-hour CO levels, the proposed widening of KY 55 and the construction of the Campbellville Bypass will not have a negative impact on the ambient air quality of Adair County or Taylor County. The proposed project will not have a negative impact on the South Central Kentucky Intrastate Air Quality Control Region when current and predicted carbon monoxide levels are compared to the National Ambient Air Quality Standards (NAAQS).

The proposed project is included in the Statewide Transportation Improvement Program, Fiscal Years 2011-2014 (STIP Appendix C, Item No. 4-142.1, p. 94). Based on the air quality analysis, this project is in compliance with the Kentucky State Implementation Plan for the Attainment and Maintenance of National and State Ambient Air Quality Standards.

Mobile Source Air Toxics (MSATs). The project will serve traffic within same general corridor as existing KY 55. For each alternative in the KY 55 Heartland Parkway project, the amount of Mobile Source Air Toxics (MSAT) emissions would be proportional to the vehicle miles traveled (VMT), assuming that other variables such as fleet mix are the same for each alternative. The VMT estimated for the build alternatives are higher than that for the No-Build Alternative (see Table 7) because the additional capacity associated the reconstruction of KY 55 and the construction of Campbellville Bypass increases the efficiency of the roadway and attracts rerouted trips from elsewhere in the transportation network.

Table 7: Project Vehicle Miles Traveled (Daily VMT)

Facility	Traffic Segment (See Exhibit 2)	2036 No-Build Alternative	2036 Alternative A	2036 Alternative B	2036 Alternative C	2036 Alternative D (Preferred)
US 68/KY 55	Segment A	6,664	7,840	7,840	7,840	7,840
	Segment B	65,844	58,590	58,590	58,590	58,590
US 68/KY 70	Segment C	17,399	19,050	19,050	19,050	19,050
KY 55	Segment D	26,880	21,840	21,840	21,840	21,840
	Segment E	15,288	18,480	18,480	18,480	18,480
	Segment F	11,220	13,770	13,770	13,770	13,770
	Segment G	24,521	29,512	29,512	29,512	29,512
	Segment H	10,752	13,020	13,020	13,020	13,020
	Segment I	63,710	74,236	74,236	74,236	74,236
Columbia Bypass	Segment J	1,600	1,900	1,900	1,900	1,900
	Segment K	7,800	10,200	10,200	10,200	10,200
	Segment L	8,960	11,200	11,200	11,200	11,200
Campbellsville Bypass	Segment M	4,500	6,000	6,000	6,000	6,000
	Segment N	0	38,340	38,340	38,340	38,340
	Segment O	0	24,905	24,905	24,905	24,905
	KY 565	132	216	156	132	156
	KY 551	1,296	1,260	1,332	1,296	1,296
	KY 70	28,543	17,339	16,556	19,076	17,816
	Total VMT	294,986	367,698	366,926	369,386	368,151
	Percent Change		+24.65%	+24.39%	+25.22%	+24.8%

Source of traffic data in the Air Quality Analysis: "Heartland Parkway Traffic Forecast Update, Final Report." March 7, 2012.

This increase in VMT would lead to higher MSAT emissions for the alternatives along the highway corridor, and a corresponding decrease in MSAT emissions along the parallel routes. The emissions increase is offset somewhat by lower MSAT emission rates due to increased speeds. According to USEPA's MOBILE6.2 emissions model, emissions of all of the priority MSATs except for diesel particulate matter decrease as speed increases. The extent to which these speed-related emissions reductions will offset VMT-related emissions increases cannot be reliably projected due to the inherent deficiencies of technical models.

Because the estimated VMT under the build alternatives increases by 24.4% to 25.2% when compared to the No-Build Alternative, it is expected that there would be higher overall MSAT emissions regardless of the alternative chosen. However, emissions will likely be lower than present levels in the design year as a result of USEPA's national control programs that are projected to reduce annual MSAT emissions by 72% between 1999 and 2050. Local conditions may differ from these national projections in terms of fleet mix and turnover, VMT growth rates, and local control measures. However, the magnitude of the USEPA-projected reductions is so great (even after accounting for VMT growth) that MSAT emissions are likely to be lower in the future in nearly all cases.

The additional travel lanes proposed as part of the project alternatives will have the effect of moving some traffic closer to nearby homes, churches, and businesses; therefore, under each alternative there may be localized areas where ambient concentrations of MSATs could be higher under the build alternatives than under the No-Build Alternative. The localized increases in MSAT concentrations would likely be most pronounced along the proposed Campbellsville Bypass, and along KY 55 from KY 551 to KY 565 and from Tebbs Bend Road to KY 1061. However, the magnitude and the duration of the potential increases with the build alternatives compared to the No-Build Alternative cannot be reliably quantified due to the inherent deficiencies of current models.

3.2 Noise

A *Noise Impact Analysis* prepared for this project was developed in accordance with the procedures established for the abatement of highway traffic noise and construction noise as outlined in Part 772 of Title 23 of The Code of Federal Regulations (CFR) and according to the July 13, 2011 KYTC Noise Abatement Policy.

To gain an accurate representation of the overall study corridor with respect to potential noise impacts, 13 sites were chosen to represent typical noise-sensitive receptors along the project area. Sites 1 through 9 were located on KY 55. Sites 10 and 11 were located on KY 70. Site 12 was located on US 68/KY 55 and Site 13 was located on Wise Road just east of its intersection with US 68/KY 55. The sites are listed in Appendix B and shown on Exhibit 2 (by site ID # in the table).

The exterior NAC standard established for residential land uses is 67 dBA L_{eq} and for commercial sites is 72 dBA L_{eq} . Table 8 illustrates existing measured noise levels in the project corridor, and forecasted noise levels for the No-Build option and the Build Alternatives. Noise levels were assumed to approach the NAC if the resultant noise level was within 1 dBA of the NAC standard, and are shown in red text in the table.

The analysis of the noise impacts associated with the No-Build and build alternatives was based upon traffic information provided by the KYTC for the design year (2036). Sites with an anticipated exceedence of the NAC have a bold “Yes” in the table.

Table 8: Existing and Predicted Noise Levels (dBA, L_{eq})

Receptor Site	Corridor Segment	NAC	Existing Measured Noise Levels (dBA L_{eq})	Predicted Noise Levels (dBA L_{eq}) (2036)					Noise impact (approach/exceed criterion, or substantial increase over existing levels)				
				No-Build	Alt. A	Alt. B	Alt. C	Alt. D*** Preferred	No-Build	Alt. A	Alt. B	Alt. C	Alt. D*** Preferred
1	1a	72	63*	63	59	65	63	59(Y) / 65(G)	No	No	No	No	No
2	2	72	70*	70	69	N/A ¹	N/A ¹	69	No	No	N/A ¹	N/A ¹	No
3		67	59	66	65	66	65	66	Yes	No	Yes	No	Yes
4	4	72	66*	69	68	68	68	68	No	No	No	No	No
5	5	67	64	66	66	67	N/A ²	67	Yes	Yes	Yes	N/A ²	Yes
6	6	67	63	69	72	66	58	58	Yes	Yes	Yes	No	No
7	8	72	72*	72**	62	62	62	62	Yes	No	No	No	No
8	10	67	62	66	66	66	63	66(Y) / 63(LB)	Yes	Yes	Yes	No	Yes / No
9		67	67*	67**	63	63	63	63(Y & LB)	Yes	No	No	No	No / No
10	12	67	72	74	67	67	68	67	Yes	Yes	Yes	Yes	Yes
11		67	63	64	65	69	67	65	No	No	Yes	Yes	No
12	14	67	63	65	62	62	62	62(Y)	No	No	No	No	No
13		67	64**	64	64	64	64	64(O)	No	No	No	No	No
Noise Impact Totals: “Yes”									7	4	6	3	4 / 3

* The Field Measured Existing Level at the receptor is primarily the result of ambient noise levels.

** The Field Measured Existing Level is used because the ambient noise is greater than modeled No-Build levels.

*** Preferred Alternative D has two preferred alignment options in corridor segments 1a, 10, and 14. Receptor Site 1 is in Segment 1a, Sites 8 and 9 are in Segment 10, and Sites 12 and 13 are in Segment 14. Two predicted noise levels are shown for these sites—one for each optional alignment (identified by the segment alternative color assigned in Chapter 2.0; Yellow, Green, Light Blue, Orange). Note that, although Sites 12 and 13 are both in Segment 14, their alignment options were far enough apart that they were monitored at different receptor sites; therefore, their results are shown separately.

N/A¹ Site 2 is taken by Alternatives B and C.

N/A² Due to the distance between Site 5 and Alternative C, transportation noise levels cannot be separated from ambient noise levels.

Red text indicates noise levels that approach, meet, or exceed applicable NAC standards (i.e., 67 or 72 dBA L_{eq} , depending on the site’s category).

Noise impacts are expected at up to seven sites with the build alternatives, but only three of four sites with the Preferred Alternative D (depending on which of the optional alignments is selected). The same sites would experience a noise impact with No-Build Alternative. In addition, Preferred Alternative D would result in decreased noise impacts at two sites, as compared to the No-Build Alternative.

Noise Abatement Measures and Summary. KYTC has developed a policy consistent with FHWA guidelines to determine the need, feasibility, and reasonableness of noise abatement measures, including barrier walls, for all major highway projects. The policy gives the most serious consideration to the construction of noise barriers between the shoulder and the right-of-way limits, and dictates reasonableness of when and where barriers should be constructed. Upon review of KYTC's policy, it was determined that constructing barrier walls as a means of noise abatement were not warranted at any receptor location. The proposed build alternatives are designated as partially controlled access facilities. Because noise barriers lose their efficacy if there are openings in the barriers, structural noise barriers cannot be considered for this project. Therefore, noise abatement measures are not considered reasonable at the sites studied and are not recommended for this project.

3.3 Aquatic Ecosystems

An *Ecological Assessment Report (Ecological Report)* was prepared in 2010 as a baseline study for this project, and is on file with the KYTC. A majority of the technical information describing the analyses and impacts is included in Appendix B. The following subsection include information that affected the identification of a preferred alternative.

3.3.1 Water Quality

In all, there were 6 perennial streams, 86 intermittent streams, and 59 ephemeral streams investigated.⁹ Water quality samples were taken from 5 of the 6 perennial streams and 27 of the 86 intermittent streams. The aquatic habitats were surveyed according to guidelines from Kentucky Division of Water's (KDOW) most current guidance. Stream aquatic sampling consisted of a macroinvertebrate, fish, and mussel surveys; water quality analysis; and a surface water characteristics survey. The results of the inventory and analysis are discussed in Appendix B.

No public water suppliers in the project area use groundwater as their source of water; therefore, there are no Wellhead Protection Plans in the project area. The public water supplies in the area use the Green River Reservoir (Taylor and some of Adair counties) or Russell Creek (portions of Adair County) as the water supply source. Since Green River Reservoir and Russell Creek serve as a source for drinking water in the area, Best Management Practices would be employed as needed to protect the local water supply.

3.3.2 Streams

The total linear feet of streams within the disturbance limits of the build alternatives is as follows: 11,370 linear feet (LF) within Alternative A; 9,485 LF within Alternative B; and 11,730 LF within Alternative C. In corridor segments 1a, 10, and 14, Preferred Alternative D has two preferred alignment options; therefore, ranges of stream impacts are provided. For Alternative D, stream impacts would range from 10,770 LF to 11,740 LF, depending on which combination of alignment options is referenced.

⁹ The majority of the streams referenced in this study are unnamed on USGS mapping; therefore, herein they are identified by their stream type—Perennial Stream (PS), Intermittent Stream (IS), or Ephemeral Stream (ES)—followed by the ID numbers assigned in the *Ecological Report*. Where a stream is named, its name appears first, followed by its ID number; e.g., Stone Quarry Creek (IS 51).

Approximately 98% of all streams reported in the *Ecological Report* were considered jurisdictional. USACE has not yet made an official jurisdictional determination. Exhibit 4 (Sheets 1a through 15) shows the locations of streams within the build alternatives' disturbance limits.

Appendix B includes the results of the habitat assessment conducted for the perennial and intermittent streams and identifies the stream crossing and potential impacts to streams as a result of each alternative alignment.

Perennial Streams. A total of 1,420 linear feet of perennial stream was delineated within the Alternative A disturbance limits. The linear feet of impacts by alternative are included in Table 9.

The most notable perennial stream is the Green River (PS 4), which would be bridged by all of the build alternatives in Segment 6. Bridge piers would not be located within the stream.

The Green River flows westward from the central portion of Kentucky draining 12 counties before its confluence with the Ohio River near Evansville, Indiana. Biological diversity is concentrated within the upper 100 miles, which includes eight counties (including Adair and Taylor) and Mammoth Cave National Park.



Figure 10: Green River West of the Dam

Within the project corridor (see Figure 10), the river is approximately 50 feet wide and 1 to 6 feet deep, with a substrate of silt, sand, gravel, and cobble. The stream is partially shaded with a riparian corridor of sycamore, box-elder, and black walnut. Its RBP score of 157 equates to a classification of "Excellent." The alternatives cross the river via a bridge. Special designations and programs associated with the Green River include the following:

- "Outstanding State Resource Water" (OSRW)—From Mile Point (MP) 305 to MP 207, the river is listed in KDOW's Special Use Waters Database as an "Outstanding State Resource Water" for having unique characteristics or habitat for federally threatened or endangered species. In its November 3, 2009, response to a coordination letter sent to KDOW on October 12, 2009 (see Appendix C), KDOW indicated the KY 55 bridge across the river is within this designation.
- Green River Bioreserve—The Nature Conservancy created the Green River Bioreserve in 1998 in an effort to improve the approximate 1,350 square-mile upper watershed, which includes a portion of the project corridor. The upper Green River, its tributaries, and parts of the Mammoth Cave National Park comprise the bioreserve. The Green River is home to 71 of the state's 103 known mussel species. Nearly 60 of these, including the state's only endemic mussel, have been collected from the bioreserve. The area's significance is heightened by the presence of a number of rare mussels, and the Green River is also home to 151 fish species (19% of the U.S. freshwater fish species). A number of rare, threatened or endangered plants and other animals are also native to the bioreserve. (See Section 3.4.3 for discussion of threatened and endangered species within the project area.)
- Green River Dam—The dam, which is located at the river's critical headwaters, is immediately east of the project corridor. By a July 2002 agreement, The Nature Conservancy is working with USACE to alter USACE's operation of the Green River Dam to restore natural flow regimes to benefit wildlife. This effort is the pilot project of the Conservancy's *Sustainable Rivers Project*, a partnership with USACE that has the potential to alter flows of 600 dams across the United

States. The KY 55 project corridor crosses the Green River just west and upstream of the dam, and would not affect the dam structure or operations.

- Conservation Reserve Enhancement Program (CREP)—According to the state Division of Conservation¹⁰ the Green River is the most biologically diverse and rich branch of the Ohio River system. The greatest aquatic diversity occurs within the upper 100-mile section of river, as described above. Data indicates that agricultural runoff contributes high levels of sediment, nutrients, pesticides, and pathogens to the Green River and Mammoth Cave system. On August 29, 2001, the U.S. Department of Agriculture (USDA) and Kentucky agreed to implement CREP, on the above-referenced section of the Green River to restore up to 100,000 acres. This \$110,000,000 program is the largest conservation program in the history of this state. The Nature Conservancy also was a primary contributor, offering permanent easements to landowners in addition to CREP contracts. (CREP is an enhanced version of the USDA Conservation Reserve Program [CRP].)

The “enhancement” is a primarily financial and voluntary land “set aside” program that includes incentive payments for conservation/restoration efforts that, in the Green River CREP region, most often include riparian buffers, native grass planting, hardwood tree planting, and filter strips. In addition, landowners may choose to enter land into a supplemental permanent conservation easement to receive additional incentive payments. CREP contracts may last from 10 to 15 years. Adair County has 305 contracts averaging 24 acres per contract (ca. 7,300+ acres), and Taylor County has 199 contracts, averaging 19 acres per contract (ca. 3,800+ acres). Potential impacts to enrolled properties are identified in Section 3.8.4, *Community Resources*, herein.

Partners of the Green River CREP are the USDA Farm Service Agency, USDA Natural Resources Conservation Service (NRCS), Office of the Governor, Kentucky General Assembly, KSNPC, Kentucky Soil and Water Conservation Commission, Kentucky Division of Conservation, Kentucky Division of Forestry, KDOW, KDFWR, Mammoth Cave National Park, The Nature Conservancy, Kentucky Soil and Water Conservation Districts, and Western Kentucky University (WKU).

Intermittent Streams. Eighty-six “Excellent,” “Average,” and “Poor” quality intermittent streams were identified within the project corridor during field assessments. The linear feet of impacts by alternative are included in Table 9. The majority of the intermittent streams assessed are likely jurisdictional; however, a determination has not yet been made by USACE. Descriptions of each of the three qualities of streams are provided in Appendix B.

Ephemeral Streams. Fifty-nine ephemeral streams are scattered throughout the project corridor, most of which flow into Sprat Branch, Pinch Creek, Butler Branch, or other perennial or intermittent streams. The linear feet of impacts by alternative are included in Table 9. The ephemeral streams range in width from 1 to 5 feet, with bank heights of 3 inches to 3 feet. Most of these streams were dry during the field assessment.

During the development and evaluation of alternatives for this project, careful consideration was given to stream crossings to avoid or minimize their associated impacts. Locations chosen for all stream crossings were evaluated for design feasibility as well as environmental impact. Because the project is on new alignment at several locations in Sections 1 and 2 and for the entire length of the proposed bypass in Section 3, many of the proposed stream crossings are new crossings. Where the project would encounter

¹⁰ www.conservation.ky.gov/programs/crep/. Note that, although the source of Figure 15 is the FFY 2010 CREP annual report provided on the web site, the report notes the map has not been updated since the 2008 report.

county roads at their stream crossings, some existing stream crossing structures may be modified or relocated to accommodate the new construction.

The potential impacts to streams vary with the alternatives considered. Depending upon the build alternative chosen, there may be from 49 to 61 stream crossings. This presents a considerable potential for stream crossing impacts. Alternative D could have the greatest linear feet of impact (11,740 LF) or the second lowest (10,770 LF), depending on which options would be selected at each of the three locations within the corridor where two optional preferred alignments are still under consideration.

Table 9: Build Alternatives’ Stream Crossing Impacts—by Stream Types

Build Alternatives	Stream Types*	Number of Crossings	Total Linear Feet (LF) of Impact*
A	Perennial	4	1,420
	Intermittent	37	8,565
	Ephemeral	15	1,385
Total		56	11,370
B	Perennial	3	1,045
	Intermittent	30	6,725
	Ephemeral	16	1,715
Total		49	9,485
C	Perennial	3	755
	Intermittent	37	9,340
	Ephemeral	16	1,635
Total		56	11,730
D**	Perennial	4	1,420 or 1,500
	Intermittent	35-to-41	7,430-to-8,475
	Ephemeral	15-to-19	1,745-to-1,995
Total		57 to 61	10,770 to 11,740

* Where applicable, totals include jurisdictional and isolated, as identified in the Ecological Report.

** Because Segments 1a, 10, and 14 contain two preferred alternative options each, a range from least-to-most impacts is presented.

3.3.3 Floodplains

The Federal Emergency Management Agency (FEMA) Q3 Digital Flood Data was reviewed for the project area. (FEMA insurance rate mapping is not available for this area.) Construction activities in a floodplain are regulated by FEMA. In addition, if filling in a floodplain is necessary, then a KDOW Construction in a Floodplain Permit would be required. All build alternatives would cross the Green River via a bridge in the immediate vicinity of the existing KY 55 bridge and with slight variations in their alignments; therefore, impacts to the floodplain differ according to the alignment considered. The river extends from west to east across the project corridor; therefore, its floodplain cannot be avoided. Alternatives A, B, and Preferred Alternative D are more or less on a shared alignment through this area and would require an approximately 185-foot extension of an existing culvert that carries Pinch Creek (PS 3) under existing KY 55. Alternative C would cross Pinch Creek via a bridge, the piers of which could be located in the creek’s floodplain. These alternatives’ potential acres of impacts to the floodplains of Green River and Pinch Creek are shown on Table 10, below. Figure 11 shows the floodplain areas in relation to the alternatives.

Table 10: Estimated Floodplain Impacts

Floodplain	Build Alternatives—Acres of Floodplain Impact							
	Alternative A		Alternative B		Alternative C		Alternative D (Preferred)	
	Segment	Acres	Segment	Acres	Segment	Acres	Segment	Acres
Green River (PS 4)	6Y	9.74	6G	10.10	6LB	9.72	6LB	9.72
Pinch Creek (PS 3)	7Y	3.16	7Y	3.16	7LB	7.09	7Y	3.16
Total		12.90		13.26		16.81		12.88

Source: Floodplain acreage was derived from Q3 Digital Flood Data, 1996, developed and distributed by FEMA.

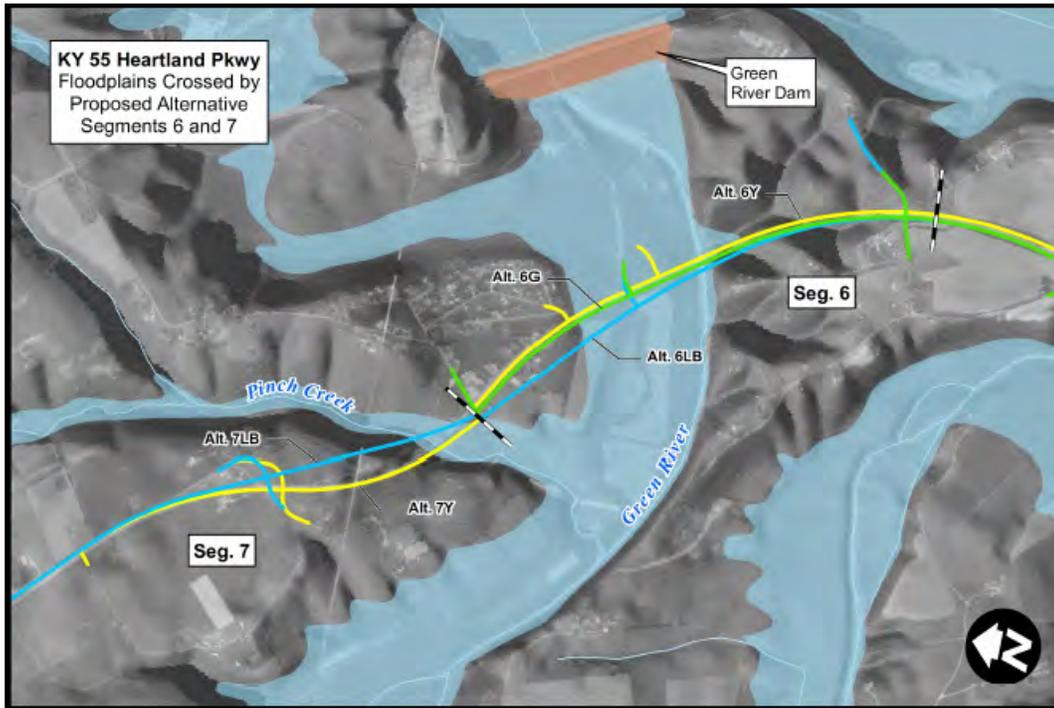


Figure 11: Floodplains Crossed by Alternatives

Through analysis of the floodplain and the river crossing, the opening of the proposed bridge across the Green River (with any alternative) would be sized so that 100-year floodway elevations would not be substantially affected. The Green River bridge and the culvert extension at Pinch Creek proposed with Preferred Alternative D would be designed to "pass" the 100-year flood volume with adequate clearance under the bridge and through the culverts; therefore, the KY 55 crossings are not expected to increase flooding or the potential for interruption or termination of emergency service or emergency evacuation routes. As a result, there would be no significant impacts to the natural and beneficial value of the Green River or Pinch Creek floodplains. There would be no change in flood risk due to the placement of the bridge over the Green River with any of the alternatives or the culvert with Preferred Alternative D.

It should be noted that:

- Due to steep terrain, a new access road proposed with Alternative B would be parallel to the east side of KY 55 and extend from Tailwater Road north to Spring Meadows Circle in the Point Pleasant residential area and would likely require construction on fill. The construction would encroach upon the dam's emergency spillway area. USACE has expressed concern that this

access road could create a barrier that could alter water flow and impair the emergency spillway's ability to function properly. Preliminary design indicates Alternative A could be constructed without changing the existing roadway elevation and, thus, would not impact the spillway area. Preferred Alternative D and Alternative C appear to have no impact in this regard, as most new construction would occur west of KY 55, away from the dam and emergency spillway; and the road would not exceed the existing grade. USACE has stated that its engineers would be involved in the design approval process. (See Appendix C for coordination with USACE.) The alignment of Alternative B in this area was not recommended due to potential impacts to the floodway and to residents of Point Pleasant.

- Alternative C's alignment in this area was not recommended as preferred primarily due to the substantial cost of constructing twin bridges (two lanes northbound and two lanes southbound) across Pinch Creek. However, during final design, should it be decided that bridging Pinch Creek would be preferred, piers would be placed within the floodplain according to structural design requirements and with consideration for minimizing impacts to drainage within the floodplain.

3.3.4 Wetlands

This project has been developed in conformity with Executive Order 11990 and USDOT Order 5660.1A. The *Ecological Report* prepared for this project (October 2010) is available for review from the KYTC. Local county soil survey and National Wetlands Inventory (NWI) maps were used to determine potential wetland areas within the project corridor, and field reconnaissance was conducted using the 1987 USACE *Wetland Delineation Manual*. Table 11 identifies the potential acres of impacts to wetlands within the proposed disturbance limits of each build alternative. The report's descriptions of the wetlands potentially affected by the project are summarized in Appendix B, and the wetland sites are located on Exhibit 4.

Of the 27 wetlands, 17 would potentially be affected by one or more alternatives and all but two of the 17 are considered jurisdictional. Potential wetland impacts differ in number of wetlands affected, but are almost identical in the total acres of impact, as follows: Alternative A, 10 wetlands and a total impact of 0.587 acre; Alternative B, 5 wetlands and a total impact of 0.590 acre; Alternative C, 13 wetlands and a total impact of 0.585 acre; and Preferred Alternative D, 11 wetlands and total impacts ranging from 0.347 acre to 0.715 acre depending on the combinations of segment alternatives and alternative options considered. Of the potential 0.715-acre impact, 0.140 acre is considered an isolated wetland. The exact determination of impacts to jurisdictional wetlands will be made by KYTC after final design.

Table 11: Summary of Wetland Characteristics and Potential Impacts

Corridor Segment	Wetland ID*	Total Acres	Status**	Cowardin Class***	Quality	Associate d With	Functions	Impact (acres within disturbance limits)			
								Alt. A	Alt. B	Alt. C	Alt. D
4	23	0.04	J	PEM1C	Low	ES 49	Storage, nutrient removal	0.001	0	0.001	0.001
Sub-total								0.001	0	0.001	0.001
6	18	0.03	Iso	PEM1C	Low	n/a	Limited, water quality improv't	0	0.030	0	0
6	19	0.12	J	PFO1	Low	IS 58	Storage, nutrient removal, biological diversity	0.004	0.080	0.120	0.120
6	20	0.21	J	PFO1	Moderate	IS 58	Storage, nutrient removal, biological diversity	0	0	0.002	0.002
6	21	0.67	J	PFO1	Moderate	IS 58	Storage, nutrient removal, biological diversity	0	0	0.040	0.04
6	22	0.08	J	PFO1	Low	SC	Storage, nutrient removal	0.030	0	0	0
Sub-total								0.034	0.110	0.162	0.162
8	15	0.07	J	PEM1C	Low	SC	Limited, water quality improv't	0	0	0.010	0
Sub-total								0	0	0.010	0
10	13	0.14	Iso	PEM1C	Low	n/a	Limited, water quality improv't	0.140	0.140	0	0.140 or 0
10	14	0.009	J	PEM1C	Low	SC	Limited, water quality improv't	0	0	0.002	0 or 0.002
Sub-total								0.140	0.140	0.002	0.140 or 0.002
11	9	0.06	J	PEM1C	Low	SC	Water quality improv't, storage	0.060	0	0.060	0.060
11	10	0.20	J	PEM1C	Low	IS 38, 39	Water quality improv't, storage	0.020	0	0.020	0.020
Sub-total								0.080	0	0.080	0.080
13	4	0.004	J	PEM1C	Low	IS 19	Limited, water quality improv't	0.004	0	0.004	0.004
13	5	0.02	J	PEM1C	Low	IS 20	Limited, water quality improv't	0.020	0	0.017	0.020
13	6	0.008	J	PEM1C	Low	IS 20	Limited, water quality improv't	0.008	0	0.008	0.008
Sub-total								0.032	0	0.029	0.032
14	1	0.32	J	PEM1Fh/ PUBHh	Low	Pond 4	Water quality improv't, storage	0.300	0.310	0.300	0.300 or 0
14	3	0.03	J	PEM1C	Low	IS 15	Water quality improv't, storage, biological diversity	0	0.030	0	0 or 0
14	2012-501	0.07	J	PEM1Fh	Low	IS 1 and Pond 4	Limited water quality improv't, storage	0	0	0	0 or 0.07
Sub-total								0.300	0.340	0.300	0.300 or 0.07
Total Acres, Isolated								0.140	0.170	0.000	0 – 0.140
Total Acres Potentially Jurisdictional								0.447	0.420	0.584	0.275 – 0.577
Total Acres of Wetland Impacts								0.587	0.590	0.584	0.347 – 0.715

* The wetlands are identified by these numbers in the Ecological Report and on Exhibit 4.

** USACE will make the final jurisdictional determinations during permitting.

*** Cowardin et al. Classifications is used by the USFWS. The following types are found in the right-of-way of the alternatives:

PEM1C = Palustrine, emergent, persistent, seasonally flooded

PFO1 = Palustrine, forested, broad-leaved deciduous

PEM1Fh = Palustrine, emergent, persistent, semi-permanently flooded, diked/impounded

PUBHh = Palustrine, unconsolidated bottom, permanently flooded, diked/impounded

Abbreviations: J=Jurisdictional, Iso=Isolated, ES=Ephemeral Stream, IS = Intermittent Stream

SC = Surface connection to a jurisdictional stream, n/a = not applicable (isolated stream, not connected to waters of the U.S.)

3.3.5 Wild and Scenic Rivers

No wild and/or scenic rivers designated by state or federal agencies are located in the project corridor.

3.3.6 Intergovernmental Coordination

Intergovernmental coordination has been initiated to identify potential water quality and aquatic habitat impacts and to obtain recommend avoidance, minimization, and mitigation options. The coordination is included in Appendix C. Agencies that were sent coordination, and their responses if provided, are listed below.

- **U.S. Fish and Wildlife Service (USFWS).** No response has been received to date.
- **Kentucky State Nature Preserves Commission (KSNPC).** Response focused on the Green River Bioreserve, and the presence of sensitive aquatic organisms and habitat
- **Kentucky Department of Fish and Wildlife Resources (KDFWR).** Response recommending erosion control measures be implemented.
- **Kentucky Division of Water (KDOW).** Response noted the Green River is an OSRW where KY 55 crosses the river, and that habitat exists for several federally listed species.
- **United States Army Corps of Engineers (USACE).** In addition to coordination letters, three meetings have been held with the USACE at the Green River Lake offices. The USACE noted that mitigation measures beyond standard BMPs for erosion control and handling of hazardous materials spills would probably be required, and additional site specific mitigation will be determined during the permitting and BA phases.
- **Natural Resources Conservation Service (NRCS).** Response addressed hydric soils and highly erodible soils in both counties.
- **The Nature Conservancy.** Response stated the organization's major concern was the potential for sedimentation to affect the Green River.

3.3.7 Avoidance and Minimization

Efforts to avoid and minimize impacts to aquatic ecosystems have been made during the development of the preliminary alternatives and will be continued throughout the development of a build alternative, should one be selected. The Green River and Stone Quarry Creek would be bridged by the recommended Preferred Alternative D, and bridge piers would not be located within the streams. The potential minimization and mitigation options identified by the agencies noted above will be provided to the engineering design team to consider during the final design if a build alternative is selected.

3.3.8 Mitigation and Permitting

Water quality impacts from erosion and sedimentation during construction would be controlled in accordance with KYTC's *Standard Specifications for Road and Bridge Construction (Standard Specifications)* and through the use of Best Management Practices. Mitigation measures proposed for impacts during construction are addressed in Chapter 4.0, *Mitigation Measures*. The following permits could be required:

- **USACE Section 404 Individual Permit.** Section 404 of the Clean Water Act requires a permit before dredged or fill material may be discharged into "waters of the United States" (*i.e.*, jurisdictional waters, waterways, and wetlands). Under Section 404, USACE is the agency responsible for administering permit decisions, conducting or verifying jurisdictional determinations, and enforcing Section 404 provisions.

- **401 Water Quality Certification.** The Section 401 Water Quality Certification is a state’s review of applications for Section 404 USACE’s permits for compliance with state water quality standards. If a Section 404 Permit(s) is required, a Section 401 Water Quality Certification from the KDOW would also be required.
- **Kentucky Pollutant Discharge Elimination System (KPDES) Individual Permits.** Since all project alternatives will cross the Green River (an OSRW), a KPDES Individual Stormwater Permit would be required from KDOW for that crossing. For the remainder of the project, it is anticipated a KPDES General Stormwater Permit will be required.
- **No-rise Certification and Floodplain Construction Permit.** Construction activities in floodplains are regulated by FEMA and, potentially, KDOW permits. Should a build alternative be selected, appropriate regulatory agencies will be consulted regarding potential floodplain impacts, and a floodway analysis will be performed to determine the need for a No-rise Certification and floodplain plan. If required, a floodplain plan would be developed in coordination with FEMA. If filling in a floodplain is necessary, then a KDOW Floodplain Construction Permit would also be required.

All necessary permits will be applied for and obtained prior to the construction of this project, and the terms and conditions of these permits will be adhered to during the construction and maintenance of this facility.

3.4 Terrestrial Ecosystems

Appendix B includes a summary of terrestrial ecosystems, including floral and faunal surveys, presented in the *Ecological Assessment Report* prepared for this project.

3.4.1 Terrestrial Environment

Terrestrial sampling of the project corridor consisted of (1) a delineation of habitat types within a 400-foot-right-of-way corridor; and (2) a floral survey and faunal surveys (all vegetation plus bird, amphibian, reptile, and mammal species). In addition, a cave assessment was conducted. The results of the surveys are summarized in this section and presented in full in the *Ecological Report*.

Habitat types identified within the project corridor are Upland Woods, Open Field (including urban land), and Wetlands. Many of these habitats are very disturbed, having been logged, grazed, or cultivated. The approximate total acres¹¹ of these habitat types within the disturbance limits of each alternative are presented in Table 12, as follows:

Table 12: Estimated Habitat Impacts

Floodplain	Build Alternatives—Acres of Floodplain Impact			
	Alternative A	Alternative B	Alternative C	Alternative D (Preferred)
Upland Woods	87 acres (14.7%)	82 acres (13.7%)	94 acres (15.9%)	88 acres (14.8%)
Open Field	502 acres (84.9%)	516 acres (86.0%)	492 acres (83.6%)	500 acres (84.8%)
Wetlands	0.59 acre (0.09%)	0.59 acre (0.09%)	0.59 acre (0.09%)	0.50 acre (0.08%)
Total	592	600	588	593

¹¹ The totals exclude water features (ponds and streams), which occur across all habitat types within the disturbance limits of the build alternatives: Alternative A, 1.7 acres; Alternative B, 1.46 acres; Alternative C, 2.34 acres; and Alternative D, approximately 1.7 acres.

Cave Assessment. The project corridor is underlain by interbedded limestones, sandstones, and shales, and karst topography appears common throughout the corridor. Many streams originate at seeps or terminate as stream sinks. No rock shelters or caves were identified during the field surveys.

A consultation letter was sent to the Center for Cave and Karst Studies (CCKS) at WKU on October 12, 2009, regarding any known protected cave or karst features within the vicinity of the project. The CCKS responded (via telephone) on October 28, 2009, that they were unaware of any other large cave systems not previously identified by KSNPC. In addition, they recommended reviewing a karst areas map (see Figure 12) to identify areas of potential karst systems in the project area.

3.4.2 Threatened and Endangered Species

Early coordination with USFWS, KDFWR, and KSNPC was initiated to determine whether federal and/or state protected species potentially occur within the project area. Additional research included contacting the Kentucky Division of Forestry (KDOF) in Campbellsville regarding important woodland features, and the CCKS regarding the presence of caves within the corridor. Coordination correspondence is provided in Appendix B.

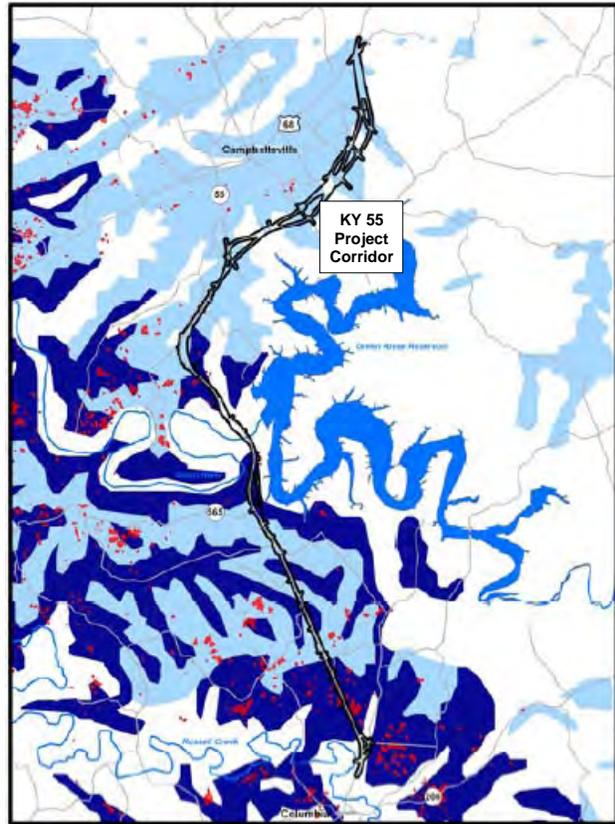


Figure 12: Karst Potential in Project Area

The following subsections provide information about the federal-listed species identified through agency coordination and field observation during the habitat communities (floral and faunal) surveys. Their potential for occurrence in the project area, and potential impacts that could result from the project are also noted, and mitigation is discussed in the *Mitigation and Permitting* section. The listing designations in the section below are abbreviated as follows: FE/FT (Federal Endangered/Federal Threatened), SE/ST (State Endangered)/State Threatened), FSC (Federal Species of Concern), and SSC (State Species of Concern).

Coordination conducted with KDOF identified a champion American chestnut tree located south of the corridor's southern boundary. The importance of this specimen is summarized in the "PLANTS" section.

MAMMALS

- **Indiana bat (*Myotis sodalis*)—FE, SE:** The upland woods habitat represents potential foraging habitat and marginal summer roosting habitat for the species. Indiana bat winter habitat (limestone caves with pools, rock shelters, and mine portals) are not present in the project corridor. However, the broader project area is located in the vicinity of two Priority 3/Priority 4 Indiana bat hibernacula recorded by USFWS. Priority 3 hibernacula have current or observed historic populations of 50 to 1,000 bats, while Priority 4 hibernacula have less than 50 bats. Both of the hibernacula are classified as "Known Swarming Habitat," and "Sensitive." The first habitat

circle is north and west of the project area and encloses most of the northern half of the project corridor. The second habitat circle is around the southern terminus of the project and encloses the southern half of the project corridor. No Indiana bats were observed during the mammalian survey.

- **Gray bat (*Myotis grisescens*)—FE, ST:** The preferred roosting habitat for this species includes limestone caves. Summer foraging habitat includes forested areas along banks of streams and lakes near cave entrances. According to KSNPC, gray bats have been documented in three caves within two miles of the project, including the following: Saltpeter Cave, Jones Cave, and Bull Run Cave. These caves are outside the project corridor and will not be impacted by any of the proposed alternatives. No caves were observed within the corridor; therefore, no potential winter hibernacula for the gray bat is present. However, the upland woods habitat represents potential foraging habitat for this species. Four gray bats were observed roosting in a road culvert north of Columbia near Cane Valley Road, and one gray bat was observed in a road culvert near Elkhorn Road southeast of Campbellville. Both sites are within the disturbance limits of all of the build alternatives.

Potential impact: While the gray bats' use of the two culverts would be disrupted during construction, it is anticipated that the disturbance would be temporary since culverts would be in place at the same locations following construction. The proposed project may have some minor impacts to Indiana bats due to the loss of summer maternity habitat trees. Tree removal from upland woods could also have minor impacts to foraging for both species.

MUSSELS

- Fanshell (*Cyprogenia stegaria*)—FE, SE
- Northern riffleshell (*Epioblasma torulosa rangiana*)—FE, SE
- Snuffbox (*Epioblasma triquetra*)—FSC, SE
- Clubshell (*Pleurobeme clava*)—FE, SE
- Rough pigtoe (*Pleurobeme plenum*)—FE, SE
- Rabbitsfoot (*Quadrula cylindrical cylindrical*)—FSC, ST
- Purple lilliput (*Toxolasma lividus*)—FSC, SE
- Kentucky creekshell (*Villosa ortmanni*)—FSC, ST
- Pocketbook (*Lampsilis ovata*)—SE

Potential for occurrence: KSNPC has records for eight federally protected mussel species and one state-listed mussel species in the Green River and Russell Creek. Previous studies indicate the Green River within the project area provides very little habitat; however, it is assumed Russell Creek provides habitat for these species

Potential impact: The support piers and footings for the new bridge over the Green River would be outside the bed and bank of the river; therefore, direct impacts are not anticipated. Russell Creek is outside the disturbance limits and will not be impacted by the project; therefore, direct impacts are not anticipated.

FISH

- Spotted darter (*Etheostoma maculatum*)—FSC, ST
- Longhead darter (*Percina macrocephala*)—FSC, ST

Potential for occurrence: KSNPC has records for the spotted darter in the Green River and Meadow Creek, a tributary of Green River downstream of the dam; and for the longhead darter in Green River and Russell Creek. The sections of these streams within the project area are assumed to provide habitat for these species.

Potential impacts: As noted above, the project would have no direct impacts to the Green River and Russell Creek.

PLANTS

- **Spreading false foxglove (*Aureolaria patula*)—SSC**
- **Butternut (*Juglans cinerea*)—SSC**
- **American chestnut (*Castanea dentata*)—Kentucky Champion Specimen:** While this species is not state or federally protected, KDOF identified a champion American chestnut tree located approximately one-half mile south of the project corridor's southern boundary (see Exhibit 1). The tree is significant because it is the largest American chestnut in Kentucky, and it is "the main contributor of pollen for use by Kentucky Chapter of the American Chestnut Foundation." (See email correspondence dated January 22, 2009, in Appendix B.)

Potential for occurrence: No individuals of the spreading false foxglove were observed during the field survey; however, KSNPC identified a population near the project area along steep bluffs beside the Green River. Although the butternut was not identified from the early coordination with resource agencies, several individuals were observed during the field survey and are documented on the moist alluvial terrace near Stone Quarry Creek, within the section of Alternative C and Preferred Alternative D) that would bridge the creek. This area, located adjacent to the Green River WMA, is surrounded by steep slopes and is less disturbed than other upland woods habitats throughout the project area. Butternuts were not observed in any other area. The trees observed were generally young (less than 6 inches diameter at breast height [dbh]). The champion American chestnut tree is outside the project corridor.

Potential impacts: At the Green River crossing, all build alternatives are in close proximity and no significant differences in impacts to the spreading false foxglove would be expected to occur.

It is assumed that some butternuts or butternut habitat is present in the disturbance limits of the build alternatives in Segment 10 of the corridor. Impacts will likely be lower with Alternatives A, B, and Preferred Alternative D, which use a bridge to span the steep stream valley. Alternatives C and D will use fill to cross a less steep section upstream. According to the KSNPC Rare Plants database, timber removal around butternut populations could be detrimental.

Mitigation. The only protected species observed during field surveys were the gray bats. Agency comments to date regarding protected species have included the following (see Appendix B for the referenced correspondence):

- KDFWR recommended, in its letter of November 12, 2009, that removal suitable roost trees for Indiana bats be completed between October 15 and March 31 to avoid impacting the bats' summer roosting.
- KSNPC noted in correspondence dated September 3, 2009, that surveys should be conducted for several protected bat species if suitable habitat will be disturbed. The agency also identified the October 15 through March 31 timeframe for removal of suitable Indiana bat roost trees due to construction; and noted that, to avoid impacts to bats, bottomland forests and riparian corridors, especially near caves, should not be disturbed.

- KDOW noted in its November 3, 2009, letter of response to a request for consultation that habitat exists for several federally protected species, and stated that “steps to address maintenance of water quality and aquatic habitat integrity ...will be necessary.”

Mitigation measures for threatened or endangered species include minimization of impact to prime habitat areas, minimization of riparian tree clearing, use of proper equipment staging and fueling areas, and enhanced erosion control measures. Although USFWS did not provide comments during early coordination, the agency will likely request that a BA be performed prior to construction to determine potential impacts to the federally protected species with habitat occurring in the project area. The BA, which would be prepared in consultation with USFWS, would identify potential direct, indirect, and cumulative impacts to these species, as well as mitigation measures, should they be required.

3.5 Section 106: Cultural Historical and Archaeological Resources

Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended, and 36 CFR Part 800 (Protection of Historic Properties, Revised 11 January 2001) require the Federal Government to take into account the effect of its proposed actions on historic and archaeological properties or resources before making project decisions. Historic and archaeological sites listed in or eligible for listing in the NRHP are afforded protection under Federal regulations. In accordance with the procedures contained in 36 CFR Part 800, cultural resource assessments, including background research and field surveys, were performed for the proposed project to locate above- and below-ground historic and archaeological resource properties, sites, and structures that may be affected by the proposed project. Results of the assessments were presented in the following reports, which are on file with KYTC:

- *Cultural Historic Eligibility Report (Eligibility Report)*, which identified resources located within the area of potential effects (APE), evaluated their historical significance, identified properties that are listed in the NRHP, and provided a preliminary evaluation regarding which other properties within the APE could be determined eligible for listing in the NRHP.
- *Determination of Effects Report (DOE Report)*, which provided a preliminary evaluation of the proposed alternatives' potential effects (i.e., No Effect, No Adverse Effect, or Adverse Effect) on the identified listed or eligible resources.
- *Cultural Historic Resource Assessment Report (Assessment Report)*, which updated the eligibility and effects reports to identify FHWA's final eligibility determinations and effects findings based upon consultation with the Kentucky State Historic Preservation Officer (SHPO) and input from consulting parties following their reviews and comments on the boundaries of the APE, *Eligibility Report*, and the *DOE Report*.
- *An Archaeological Overview (Overview) and Management Summary*

Within Appendix B of this EA, is a discussion of the APEs (cultural historic and archaeological) identified for the project; a more detailed discussion of the Section 106 consulting party process and activities related to this project; more detailed description of the resources that are listed or eligible for listing in the NRHP, and potential project impacts and mitigation; and more detailed research conducted to date to identify the potential for NRHP-listed or -eligible archaeological sites being located within the project corridor. Exhibits 4 through 6 show the location of NRHP-listed and -eligible cultural historic resources in relation to proposed build alternatives. To protect the integrity of archaeological sites, information regarding their locations is limited and the sites are not shown on maps herein.

3.5.1 Area of Potential Effects (APE)

The APE is the “geographic area within which an undertaking may directly or indirectly cause changes in the character or use of historic properties, if such properties exist” (36 CFR 800.16(d)). The boundary of the cultural historic APE for this project is shown on Exhibit 1. Per 36 CFR 800.16(d) and through consultation with the SHPO, the boundary of the archaeological APE has been defined as the right-of-way for the preferred alternative.

3.5.2 Public Involvement—Consulting Parties

A key element of the Section 106 process is the involvement of “consulting parties” who have an interest in the historic resource issues associated with the project. Participation in the consulting party process for this project was solicited in a variety of ways, including:

- Letters of invitation.
- Newspaper notice announcing the first set of Public Meetings, in October 2007.
- Information provided at meetings with the Leadership Committee (September 2007), Focus Groups (February 2008 and June 2009), and the public (October 2007 and March 2009).

There are 7 by-right consulting parties (FHWA, KYTC, the SHPO, the cities of Columbia and Campbellsville, and the counties of Adair and Taylor) and 17 by-invitation consulting parties.

The following provides a chronological listing of Section 106-related activities and consultation with the consulting parties, including the SHPO and Native American tribes.¹² Unless otherwise noted, coordination correspondence and related Section 106 documentation are provided in Appendix C (C1, *Consulting Party Consultation* and C2, *Agency Coordination*), by date provided below.

- **September 24, 2007.** A project “kick-off” Leadership Committee meeting.
- **October 4 and 9, 2007.** Public meetings were held in Campbellsville and Columbia, respectively.
- **February 8 and 15, 2008.** Three Focus Groups were established to identify issues along the project corridor and within the project area.
- **March 17 and 24, 2009.** The second set of public meetings was held.
- **June 17 and 19, 2009.** The three Focus Groups met to discuss the current status of the project.
- **November 10 and 17, 2009.** The third set of public meetings was held in Columbia and Campbellsville, respectively.
- **November 19, 2009.** KYTC, the SHPO, a consulting party representing the Tebbs Bend Battlefield Association, and project consultants visited historic properties and prehistoric sites in the project area in Taylor County. Locations visited included the Battle of Tebbs Bend Historic District (NRHP listed), Lemmons Bend, and Homeplace on Green River (within the NRHP-listed Isaac Tate Farm).
- **April 26, 2010.** FHWA sent to the SHPO a letter concurring with the (draft) *Eligibility Report*.
- **June 2, 2010.** The SHPO provided FHWA with comments on the draft *Eligibility Report*.

¹² The meetings with stakeholders and the general public included solicitations for consulting parties and, in some cases, input from participants regarding historic resources in the project area. More information about these meetings is presented in Appendix B, and Section 5.1, *Public Involvement Activities*.

- **July 12, 2010.** KYTC historians met with a consulting party to visit the site of the Burress cemetery. Information about the cemetery is included the description of the Burress House (Site 95) in the *Assessment Report*.
- **August 23, 2010.** A consulting parties meeting was held on to describe the Section 106 process, present information on the APE and those properties deemed eligible for the NRHP, and solicit information regarding any other properties to be considered for eligibility.
- **January 6, 2011.** FHWA sent the SHPO its concurrence with KYTC's findings in the *Summary of Interactions with Consulting Parties*.
- **February 10, 2011.** In a letter to FHWA, the SHPO acknowledged receipt of the *Summary of Interactions with Consulting Parties*; and also requested additional information about Site 45 in Cane Valley Historic District.
- **March 10, 2011.** Representatives of KYTC, project consultants, and the SHPO met in Frankfort to review the recommendations in the draft *DOE Report*. It was decided that, before FHWA issues its effects determinations, a consulting parties meeting would be held to obtain input on the draft report's recommendations.
- **April 13, 2011.** A consulting parties meeting was held to review and discuss the proposed effects determinations for each of the eligible historic sites (see the meeting minutes in Appendix D1).
- **September 1, 2011.** SHPO concurred with the effects findings in a letter to FHWA. The SHPO noted "the de minimis rule applies to these situations." (See Section 3.6.1, herein, for further discussion of the *de minimis* rule.)
- **December 21, 2011.** The *Assessment Report* was submitted to KYTC for distribution to FHWA and the SHPO.
- **March 1, 2012.** The SHPO provided concurrence on the *Assessment Report*, including all determinations of eligibility and effects to historic resources by the project alternatives.

3.5.3 Cultural Historic Resources

An assessment of cultural historic resources that was conducted for this project included a review of Kentucky Heritage Council files for historic places in Adair and Taylor counties, and a literature search on the project vicinity, which was coordinated with the consulting parties, as described above. Following the literature research, on-site reconnaissance was conducted in the project area, including a field review that was coordinated with and attended by representatives of KYTC, the Kentucky Heritage Council, the Tebbs Bend Battlefield Association, and representatives of the project consultants (see itinerary and minutes dated November 19, 2007, in Appendix D2).

The *Eligibility Report* identified two sites within the APE that are listed in the NRHP—The Battle of Tebbs Bend Historic District (Site 79) and Isaac Tate Farm/Homeplace on Green River (Site 82); and 48 individual sites identified as potentially eligible for listing in the NRHP, including 31 sites that would potentially be contributing elements to the NRHP-eligible Cane Valley Historic District. The SHPO has concurred with the eligibility determinations.

The listed and eligible sites are identified on Exhibits 1 and 4, by site number. Exhibits 5 and 6 show the Battle of Tebbs Bend Historic District and Isaac Tate Farm/Homeplace sites, respectively, in relation to the alternative alignments. Table 13 identifies the listed and eligible sites, the applicable eligibility criteria, and determinations of effects associated with each alternative.

Indirect and cumulative impacts. Indirect impacts occur as a result of changes in land use induced by construction of the proposed project. Impacts of these types are likely to result in a loss of the historic settings associated with the eligible properties. It is not anticipated that new development induced by the project would occur that would affect NRHP-listed or -eligible historic sites. Cumulative impacts occur as a result of past, current, and future projects that alter land uses. Currently, land use plans along the project corridor are primarily focused on the Technology Park and the Campbellsville Sports Complex, both of which are in Segment 10 of the corridor. They are not in the vicinity of any of the listed or eligible sites and are being advanced independent of this proposed highway project.

Mitigation. Section 106 requires consultation with consulting parties, including the SHPO, regarding the identification of mitigate adverse effects, if any. As Table 13 shows, build Alternatives A and C would have adverse effects to sites that are NRHP-listed or -eligible. **Preferred Alternative D would not have adverse effects to any listed or eligible sites.** Therefore, no mitigation would be required with the selection of Preferred Alternative D. Should an alternative be selected that has an adverse effect to a historic site, mitigation would be identified through coordination with consulting parties, including the SHPO, prior to the completion of the NEPA process.

Table 13: Historic Properties and Findings of Effects

Site ID	Resource	NRHP Status	NRHP Criteria	Effects Determinations *			
				Alternative A	Alternative B	Alternative C	Alternative D (Preferred)
Adair County							
1	Butler Farm: Assoc. with early settler John Butler (1769-1839). 1798 land grant of 200 ac., 130 ac. remaining; 2 dwellings, outbuildings, cemetery, spring.	Eligible (E)	A, C	1aY No Effect (bdry to CL: 600', house to CL: 2,800')	1aG No Effect (bdry to CL: 600') (house to CL: 2,800')	1aR No Effect (bdry to CL: 600') (house to CL: 2,800')	1aY ** No Effect (bdry to CL: 600', house to CL: 2,800') 1aG No Effect (bdry to CL: 600') (house to CL: 2,800')
				1bY No Effect (bdry to CL: 600') (house to CL: 2,800')	1bG No Effect (bdry to CL: 600') (house to CL: 2,800')	N/A	1bG No Effect (bdry to CL: 600') (house to CL: 2,800')
2	Nathan Champness Butler Farm: Agricultural complex owned by grandson of J. Butler (above); in agricultural use 140+ yrs. Log & frame house, outbuildings, spring.	E	A, C	1aY No Effect (bdry to CL: 900'); (house to CL: 2,100')	1aG No Adverse Effect (acquires 1.34 ac. from 100 ac. site) <i>de minimis</i>	1aR No Effect (bdry to CL: 900'); (house to CL: 2,100')	1aY No Effect (bdry to CL: 600', house to CL: 2,800') 1aG No Effect (bdry to CL: 600') (house to CL: 2,800')
16	Cundiff House: Example of Craftsman cottage.	E	C	2Y No Effect (bdry to CL: 1,000')	2G No Effect (bdry to CL: 1,000')	N/A	2Y No Effect (bdry to CL: 1,000')
23-55	Cane Valley Historic District: Rural agricultural community (1850-1960); 31 sites individually eligible contributing elements; 2 sites (36 and 45) not eligible/contributing.	E	A (District & potentially, some dwellings) B (potentially, Sites 31, 32)	3Y Adverse Effect (acquires total 2.50 ac. & 1 residence [4 contributing elements affected], in 105-ac. district; requires temp. easements)	3G No Adverse Effect (acquires total 0.16 ac. from <u>no</u> contributing elements in 105-ac. district) <i>de minimis</i>	3R Adverse Effect (acquires total 1.36 ac. and 1 residence [3 contributing elements affected] in 105-ac. district; requires temporary easement)	3G No Adverse Effect (acquires total 0.16 ac. from <u>no</u> contributing elements in 105-ac. district) <i>de minimis</i>
Taylor County							
76	Sherrod Griffin Grave (in Griffin Cemetery).	E	C	5Y No Effect (bdry to CL: 2,500')	5G No Effect (bdry to CL: 2,500')	5Y No Effect (bdry to CL: 2,500')	5G No Effect (bdry to CL: 2,500')
79	Battle of Tebbs Bend District: Period of significance, July 4, 1863: Union troops defeated Confederate Gen. J.H. Morgan's cavalry. Area's natural features were significant factors in battle location/outcome. Derives its significance from the battle. Contributing elements: The battlefield; Sublett House (used as Union hospital), corncrib, smokehouse; a spring; a river ford; and the site of the Atkinson-Griffin House (used as Confederate hospital; relocated to Green River Lake State Park property).	Listed	A	5Y Adverse Effect (acquires total 2.88 ac., including former Confederate hospital site, in 927-ac. district; requires temporary easement)	5G No Adverse Effect (acquires 3.35 ac. [from <u>no</u> contributing elements], in 927-ac. district; requires temporary easement) <i>de minimis</i>	N/A	5G No Adverse Effect (acquires 3.35 ac. [from <u>no</u> contributing elements], in 927-ac. district; requires temporary easement) <i>de minimis</i>
				6Y No Effect (bdry to CL:300'-1,800')	6G No Effect (bdry to CL:300'-1,800')	6LB No Effect (bdry to CL:200'-1,800')	6LB No Effect (bdry to CL:200'-1,800')
				7Y No Adverse Effect (acquires total 0.19 ac. from <u>no</u> contributing elements in 927-ac. district) <i>de minimis</i>	7Y No Adverse Effect (acquires total 0.19 ac. from <u>no</u> contributing elements in 927-ac. district) <i>de minimis</i>	7LB No Effect (bdry to CL: 300')	7Y No Adverse Effect (acquires total 0.19 ac. from <u>no</u> contributing elements in 927-ac. district) <i>de minimis</i>
80	Lemmons Bend District—Expansion of Battle of Tebbs Bend District: Played significant role in Battle of Tebbs Bend.	E	A	5Y No Effect (bdry to CL: 900')	5G No Effect (bdry to CL: 800')	N/A	N/A
				6Y No Effect (bdry to CL:1,200'-1.5 mi.)	6G No Effect (bdry to CL:1,200'-1.5 mi.)	6LB No Effect (bdry to CL:1,200'-1.5 mi.)	6LB No Effect (bdry to CL:1,200'-1.5 mi.)
				7Y No Effect (bdry to CL:1.5 mi.)	7Y No Effect (bdry to CL:1.5 mi.)	7LB No Effect (bdry to CL:1.5 mi.)	7Y No Effect (bdry to CL:1.5 mi.)
81	Cross-Gabled House: 2002 survey concluded eligible as representation of T-plan house in Taylor County; retains several original features.	E	C	7Y No Effect (200' from CL)	7Y No Effect (200' from CL)	7LB No Effect (500' from CL)	7Y No Effect (200' from CL)

Table 13: Historic Properties and Findings of Effects (Continued)

Site ID	Resource	NRHP Status	NRHP Criteria	Effects Determinations *			
				Alternative A	Alternative B	Alternative C	Alternative D (Preferred)
Taylor County							
82	Isaac Tate Farm / Homeplace on Green River: Family farm 1801–2001; remains mostly intact. Exemplifies changing family farm in KY from settlement to present.	Listed	A	7Y No Adverse Effect (acquires 5.29 ac. in 392-ac. site) <i>de minimis</i>	7Y No Adverse Effect (acquires 5.29 ac. in 392-ac. site) <i>de minimis</i>	7LB No Adverse Effect (acquires 2.56 ac. in 392-ac. site; requires temporary easement) <i>de minimis</i>	7Y No Adverse Effect (acquires 5.29 ac. in 392-ac. site) <i>de minimis</i>
				8Y No Adverse Effect (acquires 0.97 ac. in approx. 392-ac. site) <i>de minimis</i>	8Y No Adverse Effect (acquires 0.97 ac. in approx. 392-ac. site) <i>de minimis</i>	8LB No Adverse Effect (acquires 0.49 ac. in approx. 392-ac. site) <i>de minimis</i>	8Y No Adverse Effect (acquires 0.97 ac. in approx. 392-ac. site) <i>de minimis</i>
85	James C. Caldwell House: Association with wealthy farmer in area 1855–1871; intact example of one of the few structures of its type, 1850 – 1860. [Nomination to NRHP pending review by Kentucky SHPO.]	E	B, C	8Y No Effect (bdry to CL: 35') (house to CL: 900')	8Y No Effect (bdry to CL: 35') (house to CL: 900')	8LB No Effect (bdry to CL: 35') (house to CL: 900')	8Y No Effect (bdry to CL: 35') (house to CL: 900')
88	T.G. Buchanan House (Emerald Hill): Associated with Civil War in Taylor County and locally significant farmer, Buchanan. [Nomination to NRHP pending review by Kentucky SHPO.]	E	A, B, C	8Y No Effect (bdry to CL: 50') (house to CL: 900') (requires temporary easement)	8Y No Effect (bdry to CL: 50') (house to CL: 900') (requires temporary easement)	8LB No Effect (bdry to CL: 600') (house to CL: 1,200')	8Y No Effect (bdry to CL: 50') (house to CL: 900') (requires temporary easement)
89	Smoot House: Only intact example of American Foursquare in Burdick.	E	C	8Y No Effect (bdry to CL: 80') (requires temporary easement)	8Y No Effect (bdry to CL: 80') (requires temporary easement)	8LB No Effect (bdry to CL: 600')	8Y No Effect (bdry to CL: 80') (requires temporary easement)
90	Burdick School: Associated with community of Ireland (later called Burdick); on site since 1853 and only surviving public feature of Burdick. School closed in 1956; purchased by local families for use as Ireland Community Center (present use). A well is located within historic boundary.	E	A	8Y No Effect (bdry to CL: 70') (proposed retaining wall requires temporary easement)	8Y No Effect (bdry to CL: 70') (proposed retaining wall requires temporary easement)	8LB No Effect (bdry to CL: 600')	8Y No Effect (bdry to CL: 70') (proposed retaining wall requires temporary easement)
92	Robinson/Gaines House: Associated with a Burdick merchant from 1885–1904; intact example of one of few structures of its type, 1850–1860. [Nomination to NRHP pending review by Kentucky SHPO.]	E	B, C	8Y No Effect (bdry to CL: 120')	8Y No Effect (bdry to CL: 120')	8LB No Effect (bdry to CL: 570')	8Y No Effect (bdry to CL: 120')
94	Alexander Shively House: Associated with noted local surgeon from ca. 1870–1906; founder of academy that is now Campbellsville University.	E	B	8Y No Adverse Effect (acquires 3.74 ac. from 32.2-ac. site) <i>de minimis</i>	8Y No Adverse Effect (acquires 3.74 ac. from 32.2-ac. site) <i>de minimis</i>	8LB Adverse Effect (visual impact and acquires 11.78 ac. from 32.2-ac. site)	8Y No Adverse Effect (acquires 3.74 ac. from 32.2-ac. site) <i>de minimis</i>
95	Burress/McMayes House: Associated with early 19 th C settlement of Taylor County.	E	A	8Y No Effect (bdry to CL: 600')	8Y No Effect (bdry to CL: 600')	8LB No Effect (bdry to CL: 600')	8Y No Effect (bdry to CL: 600')
127	W.J. Rice House: 1999 survey indicated house is intact example of early 20 th C central-passage dwelling.	E	C	12Y No Effect (bdry to CL: 1,200')	12R No Effect (bdry to CL: 1,600')	12LB No Effect (bdry to CL: 600')	12Y No Effect (bdry to CL: 1,200')
132	Campbell Farm: Associated with J. Campbell and settlement of Campbellsville.	E	A	12Y No Effect (bdry to CL: 1.4 mi.)	12R No Effect (bdry to CL: 1.6 mi.)	12LB No Effect (bdry to CL: 1.3 mi.)	12Y No Effect (bdry to CL: 1.4 mi.)

* "bdry to CL" = The approximate distance from the historic boundary to the centerline of the alternative. Where the historic boundary and the historic structure within the boundary are in close proximity, only the boundary-to-CL distance is noted. Where the distance from boundary to CL differs markedly from the distance from structure to CL, both distances are given.

** In Segment 1, both Segment Alternative 1aY and Segment Alternative 1aG are considered "preferred," and will be presented as optional alignments of Preferred Alternative D for consideration and comment at the Public Hearing.

3.5.4 Archaeological Resources

An archaeological overview for the project was prepared and presented in a report—*An Archaeological Overview of the Proposed Heartland Parkway Improvements to Approximately 22 Miles of KY 55 in Adair and Taylor Counties, Kentucky* (August 13, 2010, AMEC Earth & Environmental, Inc.) The *Overview* report is on file with KYTC.

Field investigations for the Phase I Archaeological Survey of the project right-of-way was completed in July 2012, and a *Management Summary (Summary)* was submitted to KYTC on August 16, 2012. Concurrent with the *Overview* and Phase I survey, geophysical surveys (remote sensing) of five cemeteries were conducted to better define their boundaries. The *Summary* outlines the archaeological investigations' results and provides recommendations for the archaeological sites documented in the investigation corridor. (A detailed report is being prepared and will be submitted to KYTC prior to the completion of the NEPA process.) Preliminary assessments of the sites' NRHP eligibility were made in the *Summary*.

Overview. The *Overview* was prepared in part to address concerns about potential impacts to several early recorded prehistoric mound sites as well as the NRHP-listed Civil War Battle of Tebbs Bend Historic District. The background research performed during the preparation of the *Overview* included a review of Kentucky Office of State Archaeology (OSA) archaeological site files and reports, and a review of historic maps to identify potential historic sites.

In both Adair and Taylor counties 84 sites were identified, 30 sites are within a 1.25-mile buffer of the project corridor. One site—Site 15AD54 (in Segment 1a)—is listed in the NRHP, 20 are considered potentially eligible for listing, 46 are considered not eligible, and 13 are in the “unknown” category. The listed site is east of the rights-of-way of all current alternative alignments; therefore, impacts due to the project are not anticipated.

The *Overview* identified two prehistoric archaeological sites evaluated by previous investigators and potentially affected by the project—Site 15AD3 and Site 15TA3, both of which were identified as prehistoric open habitation with mounds. Both sites were reported to be adjacent to the existing KY 55 roadway.

Management Summary—Phase I Investigation. Of 71 sites investigated, 10 were identified as potentially containing archaeological features or deposits or to pose other concerns, and were considered potentially NRHP eligible, pending Phase II investigation should a build alternative be selected that would impact the sites.

Regarding Site 15AD3 and Site 15TA3, referenced above, both were investigated during the 2012 survey. No evidence for Site 15AD3 was found and it was considered likely the site was incorrectly mapped. The portion of Site 15TA3 that is in the project area was considered not eligible for NRHP listing, and no further archaeological investigations were recommended. Table 14 summarizes the results of the Phase I investigations.

Table 14: Summary of Results of Phase I Archaeological Investigations

Description	Potential Impacts, by Alternative	Recommendation	Comment
Site FS 11 —Unnamed historic 19 th C cemetery	None	Phase II, if not avoided	
Site FS 21 —Hare Cemetery, historic 19 th /20 th C	None	Phase II if not avoided	
Site FS 28 —Prehistoric open habitation site; Late Archaic and Early Woodland components	Alternatives A, B, C, and Preferred D	Phase II if not avoided	
Site FS 38 —Multi-component site with prehistoric open habitation (Late Archaic, Middle Archaic, Late Woodland/ Mississippian).	Alternatives A, B, C, and Preferred D	Phase II if not avoided	Access road proposed immediately north of the former hospital site would be within the boundary of FS 38.
Also, 19 th /20 th C historic house/farmstead, and Confederate field hospital for within NRHP-listed Battle of Tebbs Bend Historic District	Alternatives A and C	Phase II if not avoided	Not recommended as preferred due to impact within NRHP boundary
Site FS 49 —18 th /19 th C historic house/farmstead	Alternatives A, B, C, and Preferred D	Additional archival research; possible Phase II if research shows it is warranted.	
Site 52 —Unnamed historic grave site associated with African Americans	None	Phase II if not avoided	Identified as “Tucker Cemetery– Negro” on data sheet accompanying a USGS map. (See Table 15 in Section 3.5.5, <i>Cemeteries</i> .) Outside project right-of-way.
Site FS 59 —Multi-component site with prehistoric habitation and historic house/farmstead, and reported but unconfirmed historic African American “slave” cemetery”	None	Additional archival research and geophysical survey; possible Phase II if research shows it is warranted.	This cemetery was assessed during the cultural historic surveys conducted for this project and considered potentially eligible for listing in the NRHP. (See Section 3.5.5, <i>Cemeteries</i>)
Sites FS 63, 64, 65 —Historic 19 th /20 th C Cheatham, Lee, and Fisher cemeteries, respectively	None	Phase II if not avoided	These cemeteries were assessed during the cultural historic surveys conducted for this project and determined Not Eligible for listing in the NRHP. (See Section 3.5.5, <i>Cemeteries</i>)

If a build alternative is selected, formal testing will be conducted to determine National Register eligibility and mitigation for impacts to eligible sites. Where impacts to NRHP-listed or eligible sites could not be avoided, a Memorandum of Agreement (MOA) will be prepared, in consultation with the SHPO and consulting parties, that will include measures to mitigate impacts; commitments to complete Phase II and other archaeological investigations, as needed; and stipulations regarding how potential impact, including inadvertent discoveries such as graves, are to be handled.

If any concentrations of archaeological artifacts are discovered during construction activities, work must cease and the project engineer must be notified immediately. Coordination with the SHPO will be conducted to determine the potential eligibility of such sites and whether Phase II testing should be completed. If human remains, associated burial items, sacred items, or items of cultural patrimony are discovered, construction in those areas must cease and FHWA will notify and consult with the SHPO, identified Native American tribes, and other parties deemed appropriate by FHWA to determine a specific protocol for treatment, handling and reburial of the remains.

3.5.5 Cemeteries

Numerous small cemeteries are located within the cultural historic APE and are discussed in the *Assessment Report*. The Griffin Cemetery (Site 76) is eligible for listing in the NRHP. In addition, a Confederate cemetery is within the historic boundary of the Battle of Tebbs Bend Historic District (Site 79), which is listed in the NRHP; and the Butler Cemetery is within the historic boundary of the NRHP-eligible Butler Farm (Site 1). None of the other cemeteries observed within the APE have been determined eligible for listing in the NRHP. The Phase I archaeological survey conducted during the summer of 2012 located two additional cemeteries within the project corridor—archaeological sites FS 11 (unnamed) and FS 21 (Hare Cemetery), which were included in the *Management Summary* together with several cemeteries already identified during the cultural historic survey (Unnamed Cemetery [FS 52, also referred to as Tucker Cemetery], and Cheatham, Lee, and Fisher cemeteries).

During the course of the Section 106 consultation, several consulting parties helped locate and provided information about local cemeteries, including some not within the APE. Field visits were conducted to verify their locations, but eligibility determinations were not made for those found to be outside the APE. Table 15 contains information about cemeteries identified during the course of this study. The information is the result of research, the input of consulting parties, archaeological surveys, and field visits to verify cemetery locations and identify potential effects of the project. Where the potential for impacts existed, alignments would be shifted or other measures would be taken to avoid impacts to the cemeteries. As a result, at several locations the alignments of build alternatives were shifted to avoid impacts to cemeteries; and at one location (Cheatham Cemetery), where a shift of the alignment (Segment Alternative 1aG, one of the two options under consideration with Preferred Alternative D) was not feasible, a retaining wall along the cemetery boundary would be constructed if that alignment were to be selected.

These measures resulted in avoidance of impacts to all of the cemeteries identified during the course of this study. The locations of the cemeteries are shown on Exhibit 1.

Table 15: Cemeteries Identified to Determine Potential Impacts

Site ID (Exhibit 1)	Cemetery (Site ID in AR*)	County	Corridor Segment	Comments <i>(Segment Alternatives comprising Preferred Alternative D are in bold type.)</i>
1	Cheatham (Site 162)	Adair	1a	Geophysical investigations ¹ conducted to provide a “maximum approximate boundary” for use in identifying potential impacts. Not NRHP-eligible. Preferred Alternative D (Green option) and Alternative B: Retaining walls proposed to avoid impacts. Relocation would also be an option. Preferred Alternative D (Yellow option): Alignment shifted to avoid impacts. Alternative C: No impact.
2	Butler (Site 1)	Adair	1b	Within NRHP-eligible Site 1 historic boundary. All Alternatives: No impact.
3	Cox (Site 11)	Adair	1b	All Alternatives: No impact.
4	Cemetery (Unnamed)	Adair	2	Phase 1 archaeological survey (Site FS-11) ² identified site. Boundaries as yet unknown. Engravings on headstones unreadable; presumed to be 19 th century. If the site is affected by the project, Phase II investigations would be conducted to evaluate NRHP eligibility. All Alternatives: No impact.
5	T. F. Hare	Adair	4	Phase 1 archaeological survey (Site FS-21) ² identified site. Although the cemetery is adjacent to the right-of-way, it would be avoided by all build alternatives. All Alternatives: No Impact.

Table 15: Cemeteries Identified to Determine Potential Impacts (Continued)

Site ID (Exhibit 1)	Cemetery (Site ID in AR*)	County	Corridor Segment	Comments <i>(Segment Alternatives comprising Preferred Alternative D are in bold type.)</i>
6	Griffin (Site 76)	Taylor	5	NRHP eligible, based on investigation in response to query at consulting parties meeting August 23, 2010. All Alternatives: No impact.
7	Faulkner (Site 78)	Taylor	5	All Alternatives: No impact.
8	Tebbs Bend (Site 79)	Taylor	5	Confederate cemetery is within Site 79 historic boundary. All Alternatives: No impact.
9	Lee (Site 163)	Taylor	6	Geophysical investigations ¹ conducted to provide a “maximum approximate boundary” for use in identifying potential impacts. All Alternatives: No impact.
10	Miller (Site 86)	Taylor	8	All Alternatives: No impact.
11	Burress (Site 95)	Taylor	8	Thought to be associated with Burress/McMayes House (Site 95). A field visit found cemetery to be <u>outside site’s historic boundary and the project’s cultural historic APE</u> ; therefore, an eligibility determination was not made. Related information was provided by consulting parties. ³ All Alternatives: No impact.
12	Rogers	Taylor	8	A map was provided by a consulting party. ³ The cemetery is located <u>outside the cultural historic APE</u> ; therefore, an eligibility determination was not made. All Alternatives: No impact.
13	Liberty (Site 98)	Taylor	9	All Alternatives: No impact.
14	Cemetery (Unnamed)	Taylor	10	Located on Taylor County Technology Park property. All Alternatives: No impact.
15	Hazard (Site 166)	Taylor	11	A map and data sheet were provided by a consulting party. ⁴ Segments 11Y and 11R: No impact.
16	Robinson Creek- Pitman Creek Baptist Church	Taylor	12	Conflicting location information led to a field visit that identified the site as being east of Keltner Road. The site is not within disturbance limits of any alternatives, and there was no conclusive evidence of a cemetery on the site. Should the site be in the project’s archaeological APE, further study will be conducted to determine NRHP eligibility and potential impacts of preferred alternative.
17	Roberts (Site 134)	Taylor	12	All Alternatives: No impact.
18	Philips (Site 147)	Taylor	13	All Alternatives: No impact.
19	Smith (Site 165)	Taylor	13	Data sheets and photos were provided by a consulting party. ³ Preferred Alternative D and Alternative A: Alignment shifted to avoid impact. Alternative C: Within right-of-way Alternative B: No impact.
20	Garvin	Taylor	14	At the August 23 meeting, a consulting party indicated the cemetery was associated with Site 156 (NE). A field visit located the cemetery off site and <u>outside the cultural historic APE</u> ; therefore, an eligibility determination was not made. All Alternatives: No impact.
21	Fisher (Site 164)	Taylor	14	Geophysical investigations ¹ conducted to provide a “maximum approximate boundary” for use in identifying potential impacts. Alternative B: Alignment shifted to avoid impact. Preferred Alternative D (options Yellow and Orange) and Alternatives A and C: No impact.
22	Tucker Cemetery (Site 167)	Taylor	14	A USGS map and a data sheet noting “Tucker Cemetery – Negro” were provided by a consulting party. ⁴ A site visit located the cemetery. Phase 1 archaeological survey also identified site (Site FS-52) ² . Potentially NRHP-eligible. Phase II needed if affected by the preferred alternative. All Alternatives: No impact.

* Unless otherwise noted in the references below, the sources of the information are the Cultural Historic Resource Assessment Report (AR), county inventories, and information provided by consulting parties.

¹ Geophysical Investigations at Cheatham, Fisher and Lee Cemeteries, Adair and Taylor Counties, Kentucky. August 2010. AMEC Earth & Environmental.

² Archaeological Phase I Survey Progress Report and Initial Recommendations. June 12, 2012. AMEC Earth & Environmental.

³ See Draft Summary of Interactions with Consulting Parties (Summary), Attachment 3, in Appendix D2.

⁴ See Draft Summary, Attachment 4, in Appendix D2.

3.6 Section 4(f) and Section 6(f)

3.6.1 Section 4(f)

Section 4(f) of the 1966 USDOT Act, codified as 23 CFR 774, provides protection for a significant publicly owned park, recreation area, and wildlife or waterfowl refuge; and for a significant historic site that is on or eligible for inclusion in the NRHP, and archaeological sites on or eligible for the NRHP and important for “preservation in place.”

The law states that such properties cannot be used unless there is no prudent and feasible alternative. However, if it is determined that the project would have a minimal (*de minimis*¹³) impact that would result in a No Adverse Effects finding, the Section 4(f) process is complete.

The KY 55 project corridor includes NRHP-listed and -eligible cultural historic sites (see Section 3.6.1.1), publicly owned recreation areas (see Section 3.6.1.2), and a wildlife management area (see Section 3.6.1.3). Table 16 identifies the alternatives having Adverse Effects or No Adverse Effects findings, and the protected properties to which the effects findings apply.

In summary, build Alternative B and Preferred Alternative D would have a *de minimis* impact to Section 4(f) protected properties. Alternatives A and C would have an adverse effect to and use of Section (4) properties.

3.6.1.1 Cultural Historic Sites

As discussed in Section 3.6, Alternative A (Segment Alternatives 3Y and 5Y), and Alternative C (Segment Alternatives 3R and 8LB) have been determined to have an adverse effect on NRHP-listed and -eligible sites due to use of land within the historic boundaries. Because avoidance or minimization alternatives for these alignments are available, Segment Alternatives 3Y, 5Y, 3R, and 8LB were not recommended as elements of Preferred Alternative D. In a letter dated September 1, 2011 (Appendix D2), the SHPO concurred with the effects findings and noted the *de minimis* rule applies to the sites having a No Adverse Effects finding (see Table 16).

3.6.1.2 Publicly Owned Park and Recreation Areas

All of the alternative alignments would encroach on USACE’s TRA property south of the Green River at the KY 55/Lake Road intersection, near the Big Beech picnic site; and north of the Green River at the KY 55/Tailwater Road intersection. One of the two recommended options of Preferred Alternative D in corridor Segment 10 (i.e., option 10LB) would traverse the site of the Campbellsville Sports Complex. Coordination with agencies having jurisdiction over these properties is described below, and summarized in Table 16.

Tailwater Recreation Area (TRA)—Coordination is ongoing with USACE regarding potential effects to USACE recreation area property (described below and shown on Exhibit 4, Sheet 6), which, if adversely affected by the project, would result in the need for a Section 4(f) Evaluation(s). Coordination has included meetings on January 6, 2010, August 10, 2011, and February 7, 2013; and correspondence identified below. Coordination correspondence and the meetings’ minutes are included in Appendix C.

- Big Beech picnic site is along Lake Road less than one-half mile east of the KY 55/Lake Road Intersection. The site has a small parking area and three picnic tables. As noted in Section 1.4,

13 *De minimis* impacts related to historic sites are defined as the determination of either "no adverse effect" or "no historic properties affected" in compliance with Section 106 of the National Historic Preservation Act (NHPA). *De minimis* impacts related to public recreational areas or wildlife management are those that will not adversely affect the features, attributes, or activities qualifying the property for protection areas under Section 4(f). (23 CFR 774.17)

Safety/Crash Analysis, Lake Road also provides access to USACE's Office and Visitor Center and to State Park Road/Green River Lake State Park. At the January 6, 2010, meeting, USACE noted safety issues related to (1) the steep grade of Lake Drive, and (2) the tight turning radius onto Lake Drive from KY 55 that creates hazards for the large/oversized vehicles. USACE officials stated the importance of resolving the safety issues even if such encroachment would require relocation of the picnic area.

In November 2012, KYTC submitted a letter to USACE requesting concurrence with a finding of No Adverse Effects to the recreation area. In a letter of reply dated November 28, 2012, USACE requested additional information regarding several issues including proposed design features along KY 55 in the vicinity of the Lake Road intersection and KY 55/Tailwater Road intersection. At the February 2013 meeting attended by USACE, FHWA, and KYTC staff and consultants, KYTC noted that safety issues associated with the KY 55/Lake Road intersection could be addressed while avoiding use of the picnic area. Regarding other design issues raised by USACE, it was agreed that coordination among the agencies would continue to resolve USACE's concerns identified in the November 2012 letter.

- KY 55/Green River Crossing and KY 55/Tailwater Road Intersection are within the TRA. The intersection is immediately north of the crossing of the Green River (in Segment 6). USACE officials at the January 2010 meeting noted the realignment of the intersection would not affect the walking trails, camping areas, fishing area, or other recreational uses of the portion of the TRA east of KY 55. USACE officials pointed out at the February 2013 meeting that there are no current or planned recreational uses/facilities in the section of the TRA along the river west of the KY 55 crossing.

In its November 2012 letter and at the February 2013 meeting, USACE officials asked for information about the proposed intersection design so the agency could (1) review how the proposed new KY 55/Tailwater Road intersection would affect access to the dam by large maintenance/repair vehicles; and (2) assess the potential for adverse effects to the dam, emergency spillway, and Green River. KYTC explained that the current effort is preliminary design and environmental documentation; and that final design would not begin until the conclusion this first phase of the process. KYTC also noted that, with the exception of the Campbellville Bypass, funding beyond the first phase of the project is not expected to be available in the foreseeable future. Regarding the alternatives in this segment:

- Preferred Alternative D would widen to the west, away from the existing pavement of KY 55. Tailwater Road would be extended a short distance westward, across existing KY 55, to intersect proposed KY 55. With this alternative, the estimated right-of-way requirements have been minimized to reduce encroachment onto USACE property.
- Alternative B also would widen to the west, but incorporate existing KY 55, and would not significantly differ from that of the existing condition; however, an access road extending from Tailwater Road to Spring Meadows Circle would be needed to provide access to the Point Pleasant residential area.
- Alternative A would widen to the east of KY 55, incorporating the existing road. The proposed KY 55/Tailwater Road intersection would be shifted to the south.

With Preferred Alternative D, the estimated right-of-way requirements have been minimized to the extent possible in the preliminary design and encroachment onto USACE property for right-of-way is not anticipated to have an adverse effect on the recreational uses of the properties. Toward obtaining USACE's concurrence with a finding of No Adverse Effects to these properties, KYTC commits to

continuing coordination with USACE to resolve the concerns identified in the agency’s letter of November 28, 2012. USACE concurrence with a finding of No Adverse Effects and resulting application of the *de minimis* rule are anticipated following the period of public comment on this EA.

City of Campbellsville Sports Complex—The site of the Campbellsville Sports Complex, which is currently under construction by the City on 175 acres north of the Technology Park, would be traversed by Preferred Alternative D’s option 10LB. The alternative will be located in the southern portion of the property, which has not yet been developed, acquire 15.4 acres for right-of-way, and provide access to the property. Because access to the new road is considered an asset, and is shown on the City’s Master Plan for the complex, the City has stated its support for the alternative, and concurrence with a finding of No Adverse Effects to the recreational uses planned for the property was provided in a letter dated November 9, 2012 (see correspondence in Appendix C).

3.6.1.3 Publicly Owned Wildlife and Waterfowl Refuges

Stone Quarry Creek WMA—During the January 2010, August 2011, and February 2013 coordination meetings with USACE, potential impacts to USACE’s Green River WMA in the vicinity of Stone Quarry Creek (Segment 10 of the project corridor) were discussed. Within the WMA, Stone Quarry Creek would be crossed by Preferred Alternative D’s option 10Y (see Exhibit 4, Sheet 10). The alternative would cross the northernmost tip of the WMA via a bridge that would span most if not all of the area within the WMA. USACE and KDFWR representatives have stated that, because the area would be crossed via a bridge with the preferred alternative’s option 10Y and would not be traversed at all by the preferred alternative’s option 10LB, neither of the preferred alternative options would have an adverse effect to the wildlife management goals and objectives of the WMA. At the February 2013 meeting with KYTC and FHWA, representatives of USACE noted that, while the bridging of the creek with the Preferred Alternative D’s option 10Y would likely have no adverse effect to the WMA, option 10LB (the other preferred option) would avoid the WMA entirely and, would therefore have no use of the property, per Section 4(f).

With Preferred Alternative D – 10Y option, the estimated right-of-way requirements have been minimized to the extent possible in the preliminary design and encroachment onto the WMA for right-of-way is not anticipated to have an adverse effect on wildlife management objectives. USACE and KDFWR concurrences with a finding of No Adverse Effects and resulting application of the *de minimis* rule are anticipated following the period of public comment on this EA. As noted above, coordination will continue with USACE to resolve the agency’s concerns regarding potential impacts and design issues identified in the agency’s letter of November 28, 2012 (see Appendix C).

Table 16: Summary of Use of Section 4(f) Properties

Properties	Alternative A	Alternative B	Alternative C	Alternative D (Preferred Alternative)	
CULTURAL HISTORIC PROPERTIES (The SHPO has concurred with the effects findings.)					
Champhess Butler Farm (Site 2, 100 acres) Section 4(f) Use	Segment 1aY No Effect	Segment 1aG (Approx. 1.4 ac) No Adverse Effect	Segment 1aY No Effect	Segment 1aG (Approx. 1.4 ac) No Adverse Effect	Segment 1aY No Effect
	No use	<i>de minimis</i>	No use	<i>de minimis</i>	No use
Cane Valley Historic District (Sites 23-55, 105 acres) Section 4(f) Use	Segment 3Y (1 residence & total of 2.50 ac. from 4 contributing elements) Adverse Effect	Segment 3G (Approx 0.16 ac) No Adverse Effect	Segment 3R (1 residence & total of 1.36 ac. from 3 contributing elements) Adverse Effect	Segment 3G (Approx 0.16 ac) No Adverse Effect	
	Yes	<i>de minimis</i>	Yes	<i>de minimis</i>	

Table 16: Summary of Use of Section 4(f) Properties (Continued)

Properties	Alternative A	Alternative B	Alternative C	Alternative D (Preferred Alternative)
CULTURAL HISTORIC PROPERTIES (The SHPO has concurred with the effects findings.)				
Battle of Tebbs Bend Historic District (Site 79, 927 acres)	Segment 5Y (2.88 ac. including Confederate hospital site & land along KY 55/ Tebbs Bend Road) Adverse Effect	Segment 5G (Approx 3.35 ac) No Adverse Effect	Segment 5Y (2.88 ac. including Confederate hospital site & land along KY 55/ Tebbs Bend Road) Adverse Effect	Segment 5G (Approx 3.35 ac, inc. temporary easement) No Adverse Effect
	Segment 6Y No Effect	Segment 6LB No Effect	Segment 6LB No Effect	Segment 6LB No Effect
Section 4(f) Use	Segment 7Y (Approx 0.19 ac) No Adverse Effect	Segment 7Y (Approx 0.19 ac) No Adverse Effect	Segment 7LB No Effect	Segment 7Y (Approx 0.19 ac) No Adverse Effect
	5Y—Yes 6Y—No use 7Y— <i>de minimis</i>	5G— <i>de minimis</i> 6Y—No use 7Y— <i>de minimis</i> (Approx 3.54 ac, total)	5Y—Yes 6Y—No use 7LB—No use	5G— <i>de minimis</i> 6LB—No use 7Y— <i>de minimis</i> (Approx 3.54 ac, total)
Isaac Tate Farm (Site 82, 392 acres)	Segments 7Y & 8Y (Approx. 6.26 ac) No Adverse Effect	Segments 7Y & 8Y (Approx. 6.26 ac) No Adverse Effect	Segments 7LB & 8LB (Approx. 3.05 ac) No Adverse Effect	Segments 7Y & 8Y (Approx. 6.26 ac) No Adverse Effect
	<i>de minimis</i>	<i>de minimis</i>	<i>de minimis</i>	<i>de minimis</i>
Section 4(f) Use	Segments 8Y (Approx 3.47 ac) No Adverse Effect	Segments 8Y (Approx 3.47 ac) No Adverse Effect	Segment 8LB (11.78 ac & Visual) Adverse Effect	Segments 8Y (Approx 3.74 ac) No Adverse Effect
	<i>de minimis</i>	<i>de minimis</i>	Yes	<i>de minimis</i>
Sites 1, 16, 76, 80, 81, 85–92, 95, 127, & 132	All Segments No Effect	All Segments No Effect	All Segments No Effect	All Segments No Effect
	No use	No use	No use	No use
PUBLIC PARKS/ RECREATIONAL AREAS				
USACE Recreational Areas**: Tailwater RA	Segment 6Y (Approx 13.8 ac) No Adverse Effect*	Segment 6G (Approx 8.9 ac) No Adverse Effect*	Segment 6LB (Approx. 4.9 ac) No Adverse Effect*	Segment 6LB (Approx. 4.9 ac) No Adverse Effect*
	Segment 6Y	Segment 6G	Segment 6LB	Segment 6LB
Section 4(f) Use	<i>de minimis</i> *	<i>de minimis</i> *	<i>de minimis</i> *	<i>de minimis</i> *
USACE Wildlife Management Area at Stone Quarry Creek	Segment 10Y (Approx 2.08 ac) No Adverse Effect*	Segment 10Y (Approx 2.08 ac) No Adverse Effect*	Segment 10LB No Effect	Segment 10Y (Approx 2.08 ac) No Adverse Effect*
	Segment 10Y	Segment 10Y	Segment 10LB	Segment 10LB
Section 4(f) Use	<i>de minimis</i> *	<i>de minimis</i> *	No use	<i>de minimis</i> * No use
Campbellville Sports Complex	Segment 10Y (0 ac) No Effect	Segment 10Y (0 ac) No Effect	Segment 10LB (Approx. 15.4 ac) No Adverse Effect	Segments 10Y or 10LB (0 ac or approx.15.4 ac) No Adverse Effect
	Segment 10Y	Segment 10Y	Segment 10LB	Segments 10Y or 10LB
Section 4(f) Use	No use	No use	<i>de minimis</i> *	<i>de minimis</i> *
Overall Section 4(f) Involvement	Yes	<i>de minimis</i> *	Yes	<i>de minimis</i> *

* Anticipated effects findings; pending USACE concurrence, which awaits close of EA public comment period.

** There will be no Section 4(f) use of the Big Beech picnic site, which is outside the project's right-of-way. Acres of proposed right-of-way for the relocated KY 55/Lake Road intersection, which leads to the picnic area, are included in the acreage shown for the TRA.

3.6.2 Section 6(f)

Federal Land and Water Conservation Act (LWCA) funds are often used to purchase or improve lands that are used for parks, conservation, recreation, or similar purposes. Under Section 6(f) of the act, any

federal project that would convert any part of a property improved with LWCA funds to another use must be approved by the Secretary of the Interior. To be approved, the project must demonstrate that equivalent land or facilities have been replaced elsewhere adjacent to the impacted property. This program is administered by the U.S. Department of the Interior, National Park Service.

No properties purchase or improved with LWCA funds would be affected by any alternatives associated with this project.

3.7 Land Use

3.7.1 Existing Land Uses

Both Adair and Taylor counties' land uses are predominantly agricultural and rural residential. The county seats (Columbia and Campbellville, respectively) are the economic activity centers in each county. KY 55 links these two cities, and a mix of developed and agricultural/open land uses occurs along the roadway corridor. Along KY 55 just south of Campbellville, infrastructure is in place and development is underway in the 202-acre Heartland Commerce and Technology Park, while in Columbia approximately one mile north of the bypass, infrastructure is in place in the 311-acre Green River Commerce Park. Small communities such as Burdick, Coburg, and Cane Valley are also accessed via KY 55. The project corridor crosses the Green River and numerous streams, and includes natural, scenic, and sensitive resources such as the Green River Lake State Park; Green River Bioreserve; Green River WMA; and two NRHP-listed sites—the Battle of Tebbs Bend Historic District and the Isaac Tate Farm (which includes Homeplace on Green River). The following paragraphs identify land uses in the project area. Table 17 summarizes the estimated land use areas within the disturbance limits of each build alternative. The project would convert these land uses to highway use. Exhibit 1 shows selected land uses.

Table 17: Estimated Direct Land Use Impacts (Acres) by Build Alternatives

Land Uses	Total Acres Potentially Within Right-of-Way			
	Alternative A	Alternative B	Alternative C	Alternative D <i>Preferred</i>
Developed (Residential / Commercial / Institutional / Roads / Other)	219	188	140	197
Agricultural / Open Fields (Undeveloped)	284	328	352	303
Upland Woods	87	82	94	90
Wetlands, Ponds, Streams	2	2	3	3
Total Acres	592	600	588	593

Agricultural Areas. Agriculture, including livestock and poultry, is the predominant land use in Adair and Taylor counties. According to the 2007 Census of Agriculture (the latest census available), there are 1,424 farms in Adair County, comprising 187,981 acres (approximately 73% of the county's area); and 941 farms in Taylor County, comprising 118,712 acres (approximately 70% of the county's area). The 2007 census reported that the average farm size in Adair County was 132 acres (up from 122 acres reported in the in 2002 census), and the average farm size in Taylor County was 126 acres (up from 117 in the 2002 census). Section 3.10, *Agricultural Impacts*, contains a discussion of potential effects of the project on farmland.

Purchase of Agricultural Conservation Easement (PACE). Under Kentucky's Farmland Preservation Program, the PACE Corporation has been authorized to purchase agricultural conservation easements. These easements are to ensure that lands currently in agricultural use will not be converted to other uses. In the project area the most current state Department of Agriculture website list (October 2008) shows

seven PACE program farms in Taylor County and none in Adair County. Four of the conservation easements have been purchased for farms along the Green River, within the Battle of Tebbs Bend Historic District boundary in Taylor County. The remaining three properties are northwest of the project area. None would be impacted by any alignment of the project.

Agricultural Districts—The project corridor includes all of state-recognized Agricultural District 109-10 and portions districts 109-6 and 109-12. Kentucky's *Agricultural District Law*, passed in 1982, permits a landowner or group of landowners owning at least 250 contiguous acres in agricultural production to petition their local conservation district to form an agricultural district for the purpose of protecting/enhancing the agricultural land. With the exception of District 109-6, the districts' boundaries are shown on Exhibit 1. Further information is provided in Section 3.10.

Isaac Tate Farm and Homeplace on Green River—The Isaac Tate Farm (Site 82) is an approximately 392-acre site is listed in the NRHP under Criterion A in the context of "Agriculture in Taylor County, Kentucky." The Homeplace on Green River, which is within the historic boundary, is a community resource that is open to the public and discussed under the "Institutional" category, below.

Residential Uses. The project area contains a broad mix of residential uses, including single-family houses and mobile homes along roadways and in subdivision settings; some multi-family residential dwellings; and rural residential housing in agricultural areas. Single-family residences predominate, and most are one-story structures of brick, frame, vinyl, or stone construction, often with a garage and/or additional outbuildings—particularly where a residence is part of a farmstead. Subdivisions in the project corridor include Happy Hills on KY 372 (Smith Ridge Road, Segment 11), Rustic Haven on KY 70 (Elkhorn Road, Segment 13), and Arista on Wise Road (Segment 14).

Along several area roads there are clusters of residences that are otherwise isolated due to the rural nature of their location. Residents in such clusters often rely upon and derive a sense of security and community from each other; therefore, these clusters could be considered loosely-defined neighborhoods. Section 3.8.3, *Areas of Community Cohesion*, identifies the residential clusters and potential impacts to each. Section 3.9, *Relocations and Displacements*, includes a discussion of potential residential relocation impacts associated with the project.

Commercial and Industrial Enterprises. Most of the commercial and industrial activity is located in or near Columbia and Campbellville. In the project corridor commercial and industrial uses do occur along KY 55, US 68, KY 70, and at a few scattered locations along other state and local roads. Along KY 55 just south of Campbellville, land is being cleared and infrastructure installed for the 202-acre Technology Park; while similar activity is occurring within the 311-acre Green River Commerce Park about one mile north of the Columbia Bypass. The largest employer in the two-county area is Amazon.com, Inc., which employs approximately 1,100 people in its distribution facility in Campbellville, west of the project corridor. Section 3.9 includes a discussion of the potential for commercial displacements.

Institutional Uses. In the context of this document, an institution is an established organization dedicated to public service or culture, such as churches, schools, hospitals, government or social service agencies, museums, libraries, etc. Section 3.8.4, *Community Resources*, identifies potential impact to institutions.

- Schools—Two public and one private school are within the project corridor: Campbellville Middle School on Roberts Road, Taylor County Middle School on US 68 (East Broadway), and Kentucky Christian School (preschool through grade 5) on New Columbia Road (KY 55).
- Churches—Within the project corridor, there are 22 churches, as follows: Trinity United Methodist Church, Cane Valley Apostolic Church, Cane Valley Christian Church, Cane Valley Baptist Church, Church of Christ, Asbury United Methodist Church, Bethel A.M.E. Church, Liberty Cumberland Presbyterian Church, South Side Christian Church, Church of Christ Spurlington

Road, Eastside Baptist Church, Ole Gospel Barn and Victory, East Campbellville Church of God, First Cumberland Presbyterian Church, Green River Memorial Baptist Church, Green River House of Prayer, International Gospel Lighthouse, Meadowview Baptist Church, New Covenant Church, Calvary Seventh-Day Adventists, Jesus Name Church, and New Life for the Nations Inc.

- Health Care/Emergency Services—The area’s primary health care and emergency medical facilities are located in Campbellsville and Columbia, outside the project corridor. Spectrum Care Academy Children’s Services—a psychiatric residential treatment facility—is located on five acres adjacent to KY 55 north of Columbia, in Segment 2 of the project corridor. The facility provides services to girls between the ages of 13 and 17. Facilities include four houses, a gymnasium, and outdoor recreation areas for volleyball and picnics. Facility officials are proposing to construct two additional residential units on the campus.
- Ireland Community Center (Burdick School)—The community center, located on KY 55 in Burdick, was a school building until 1956, when the Taylor County School System stopped using the structure. Members of the neighborhood bought the building to use as a community center. The site is eligible for listing in the NRHP (Historic Site 90).
- Isaac Tate Farm and Homeplace on Green River—As noted in the “Agricultural” category, above, Homeplace (Site 82) is listed in the NRHP and is open to the public. It is a community resource that lists on its website “Potential Activities” that include: living history exhibits, museum, agricultural demonstrations, American chestnut and agricultural research, maintain/exhibit Heritage Breeds of poultry and livestock, future farms of America projects, farmer’s market, school field trips, joint projects with Tebbs Bend, conservation projects, animal exhibits, and farm leases for crop production.

The Nature Conservancy aided Taylor County in the purchase of the land, after which the County donated a permanent conservation easement on the land to the Conservancy. The easement protects the agricultural, open-space and ecological features, a cave, and a Civil War campsite. Homeplace “Partners” are: The Nature Conservancy, U.K. Cooperative Extension, Tebbs Bend/Green River Nature Area, Tebbs Bend Battlefield Association, USDA Natural Resources and Conservation Service, Heartland Waterways Tourism Corridor, Southern and Eastern KY Tourism Development Association, Adair, Green and Taylor County Fiscal Courts, Kentucky Department of Agriculture, West Kentucky Corporation, Team Taylor County, Farmer’s Market of Taylor County, Taylor County Conservation District, Kentucky Department of Fish and Wildlife Resources, Taylor County FFA, Kentucky Chapter of the American Chestnut Foundation.

Recreational Areas. The following recreational areas are within the Socioeconomic Study Area. Section 3.6.1, *Section 4(f)*, identifies potential impacts to recreational areas as a result of the project.

- Green River Lake State Park—The state park is located just east of the project corridor. The Kentucky Department of Parks operates the park on land leased from USACE. Opened in 1969, the park contains 1,331 acres along the western shore of Green River Lake (see below). The park offers a 157-site campground plus 72 tent sites and 50 overflow sites, a grocery, and other facilities. Activities and other facilities at the park include fishing, a marina and boat launch ramp, swimming, multi-use trails, picnicking, miniature golf, and a gift shop. The state park is a major tourist and economic asset for the region. No right-of-way would be acquired from the park.
- Green River Lake and Green River WMA—These areas are administered by USACE in cooperation with several federal and state agencies and local governments. The 8,200-acre lake is in both Taylor and Adair counties and is managed for multiple uses, including flood protection and outdoor activities associated with large bodies of water—boating, fishing, swimming, etc. The

annual economic benefit generated from recreational visitors to Green River Lake is more than \$30.7 million. The WMA surrounds much of Green River Lake and contains approximately 20,500 acres. USACE owns the WMA and licenses it to the KDFWR for wildlife management purposes. Hunting, fishing, wildlife viewing, hiking, educational programs, and photography are among the activities available at various locations within the Green River WMA. The only section of the WMA traversed by the project is at Stone Quarry Creek, which is bridged by Preferred Alternative D–option 10Y. Hunting is permitted in that area.

- Tailwater Recreation Area—USACE’s TRA lies east of KY 55 goes under KY 55 along the river for approximately 0.5 mile. Access to the area north of the river is Tailwater Road, which provides access to the parking area, a picnic shelter, restrooms and boat launch ramp to the Green River below the dam. The recreational facilities would not be within the right-of-way of the project. There are no recreational facilities or uses on TRA property west of KY 55. All alternatives in Segment 6 bridge TRA property. (See Section 6.3.2.1, Section 4(f), for more details.)
- Campbellsville Sports Complex—The City of Campbellsville has purchase 175 acres north of the Technology Park and development is underway on a sports complex that will feature baseball and softball fields and other activity areas, and provide approximately 30–35 acres for use as the Taylor County Fairgrounds. Preferred Alternative D–option 10LB traverses the property.

Special Areas—Green River Conservation Reserve Enhancement Program (CREP). The U.S. Department of Agriculture (USDA) and Kentucky implements CREP on a 100-mile section of the Green River between Green River Reservoir and Mammoth Cave National Park to restore up to 100,000 acres. The “enhancement” is a primarily financial and voluntary land “set aside” program that includes incentive payments for conservation/restoration efforts. Landowners may choose to enter land into a supplemental permanent conservation easement to receive additional incentive payments. CREP contracts may last from 10 to 15 years. According to the Kentucky Green River CREP Annual Program Accomplishment Report (CEP-68R), FFY 2009, the total CREP acreages are as follows: Adair 7,447.9 and Taylor 3,856.7. Section 3.3.2, herein, provides additional information about this program.

3.7.2 Compatibility With Regional and Community Plans

Green River Dam. By a July 2002 agreement, The Nature Conservancy is working with USACE to alter USACE’s operation of the Green River Dam to restore natural flow regimes to benefit wildlife. This effort is the pilot project of the Conservancy’s *Sustainable Rivers Project*, a partnership with USACE that has the potential to alter flows of 600 dams across the U.S. The KY 55 project corridor crosses the Green River just west of the dam, and would not affect the dam structure or operations or this pilot project.

Lake Cumberland Area Development District (LCADD). LCADD serves the counties of Adair, Casey, Clinton, Cumberland, Green, McCreary, Pulaski, Russell, Taylor, and Wayne. This quasi-governmental agency works with the local government evaluates regional projects for possible inclusion in KYTC’s Six-Year Highway Plan. LCADD prepared the following plans relevant to the proposed project:

Comprehensive Economic Development Strategy (CEDS)—The Fiscal Year 2008 plan identifies the following Heartland Parkway priorities on the LCADD “Unplanned Projects List 2007 (High Only)”:

- Construct a southern bypass of Campbellsville
- Upgrade the US 68/KY 55 corridor from the Campbellsville Bypass to the Marion County line
- Upgrade the KY 55 corridor from the Adair County line to the Campbellsville Bypass
- Upgrade the KY 55 corridor from the Columbia Bypass to the Taylor County line
- Reconstruct KY 55 from US 127 to the Louie B. Nunn/Cumberland Parkway

City of Campbellsville, Taylor County. The city of Campbellsville has a Zoning Commission that has jurisdiction over subdivision regulations, building and housing codes within the city limits. The Campbellsville-Taylor County Economic Development Authority (EDA), also known as “Team Taylor County,” is the economic development authority in Campbellsville-Taylor County. A key focus of the EDA is the development of the 202-acre Technology Park on KY 55 in Campbellsville (see Exhibit 1). The site has been cleared and infrastructure improvements (an access road and water and sewer lines) are planned or under construction. One of the two options for the southern terminus of the Campbellsville Bypass portion of Preferred Alternative D would bisect the park. Coordination with Team Taylor is ongoing and will be considered before a final alignment is selected.

City of Columbia, Adair County. The city of Columbia has a zoning ordinance (updated in March 2007) and subdivision regulations (updated in May 2007). The transportation component (Chapter 7) of the *City of Columbia Comprehensive Plan*¹⁴ listed several local/regional projects that were on the state's Six Year Plan (FY 2006-2010), including the since-completed western section of the Columbia bypass. The *Plan* included, as “important to mention,” the construction of the Heartland Parkway primarily along existing roadway corridors from the Louie B. Nunn Cumberland Parkway to the Martha Layne Collins Bluegrass Parkway. “This new corridor will provide for the continuous flow of traffic, reduce truck traffic on existing routes, and will only require minimal maintenance of traffic during construction.”

3.8 Community Impacts

3.8.1 Socioeconomic and Demographic Characteristics

The following sections summarize the trends and status of the socioeconomic and demographic characteristics for the Commonwealth of Kentucky, Adair County, Taylor County, and the proposed project's corridor, as recorded in the U.S. Census years 2000 and 2010 and American Community Survey (ACS) estimates¹⁵ (see Figure 13). The relevant census block group boundaries have changed between the 2000 and 2010 Census, primarily in the Columbia area, and several tracts and block groups have been renumbered, as noted in parentheses, below. The proposed project traverses the following census tracts (CT) and block groups (BG)¹⁶ within the tracts, which are collectively referred to in this subsection as the “Socioeconomic Study Area.”

¹⁴ The Comprehensive Plan and Small Area Plan component were prepared by Kriss Lowry & Associates, Inc. The Comprehensive Plan was approved in November 2006 and updated in February 2007.

¹⁵ The American Community Survey (ACS) is an annual survey that provides data that gives communities the current information needed to plan investments and services. Information from the survey generates data that help determine how more than \$400 billion in federal and state funds are distributed each year.

¹⁶ A block group can be identified using its tract number followed by a decimal followed by the block number, as follows: BG 9201.2, BG 9704.02.1, etc.

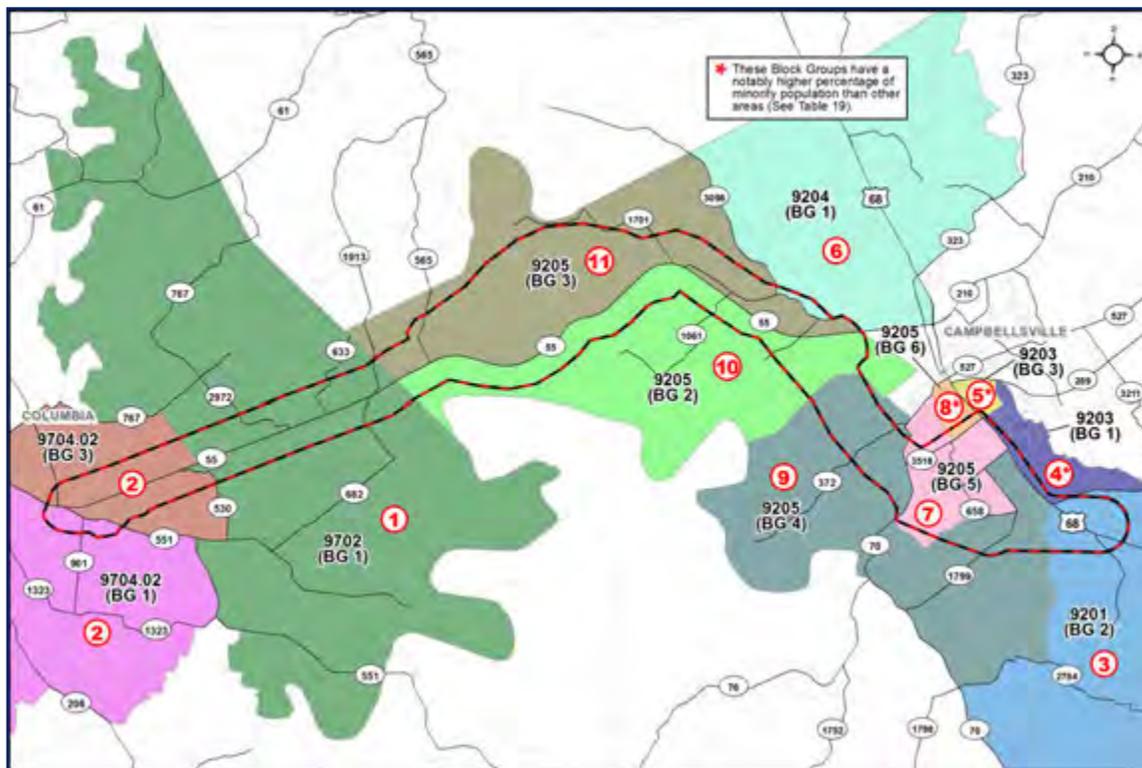


Figure 13: Socioeconomic Study Area—Census Block Groups (2010 Census)

Population Trends and Projections¹⁷. Table 18 presents population data reported by the U.S. Census Bureau for Kentucky, Adair County, and Taylor County. It also shows state and county population projections for the years 2020 and 2030. Table 19 shows comparative population characteristics, by block group, in the Socioeconomic Study Area. Population projections were calculated by the Kentucky State Data Center, at the University of Louisville. Population projections below the county level are not available.

Census data show that all three jurisdictions experienced an increase in population between 1990 and 2000 and again between 2000 and 2010. Kentucky State Data Center projections indicate that the population in each jurisdiction will continue to grow, although the rate of increase will generally decline.

¹⁷ Because boundaries have changed and renumbering has occurred for some census tracts and block groups, the 2010 information is not totally comparable to 2000 and earlier census years.

Table 18: Population Trends and Projections

	YEAR					
	1980	1990	2000	2010	2020	2030
Kentucky	3,660,777	3,686,891	4,041,769	4,339,367	4,672,754	4,951,178
Number Change	--	26,114	356,473	297,598	333,387	278,424
% Change	--	0.7	9.7	7.4	7.7	6.0
Adair County	15,233	15,360	17,244	18,656	20,052	21,095
Number Change	--	127	1,884	1,412	1,396	1,043
% Change	--	0.8	12.2	8.2	7.5	5.2
Taylor County	21,178	21,146	22,927	24,512	26,079	27,280
Number Change	--	-32	1,781	1,585	1,567	1,201
% Change	--	-0.2	8.4	6.9	6.4	4.6
Socioeconomic Study Area	not available	14,666	16,031	16,081	not available	not available
Number Change	available	--	1,365	50	available	available
% Change	--	--	9.3	0.3	--	--

Sources: U.S. Bureau of the Census, 1970, 1980, 1990, 2000 and 2010. University of Louisville, Urban Studies Institute, Kentucky State Data Center (<http://ksdc.louisville.edu/kpr/pro/projections.htm>). Years 2020 and 2030 projections were released May 5, 2011, by the Kentucky State Data Center. Population projections below the county level are generally not available.

Table 19: Comparative Population Characteristics—Block Groups Comprising Socioeconomic Study Area

Adair County	9702 1		9704.02 2	
	BG1		BG1	BG1 + BG3 ¹
	2000	2010	2000	2010
Population	1,508	1,722	2,114	2,810
% Change	35.0	14.2	17.4	33.0
Age (%)				
0-17	22.9	24.2	28.0	24.0
18-64	65.6	61.0	60.8	61.3
65+	11.5	14.9	11.2	14.7
Race ² (%)				
White	99.0	95.0	98.5	97.0
Other	1.0	5.0	1.5	3.0

Red numbers correspond with Figure 14.

Taylor County	9201 3		9203 4				9204 6		9205 7		9205 8		9205 9		9205 10		9205 11	
	BG2		BG1		BG3		BG1		BG5		BG6		BG4		BG2		BG3	
	2000	2010	2000	2010	2000	2010	2000	2010	2000	2010	2000	2010	2000	2010	2000	2010	2000	2010
Population	1,620	1,842	847	873	925	944	3,394	2,735	891	974	653	818	1,434	1,467	975	1,236	693	660
% Change	16.0	13.7	-10.1	3.1	-12.5	2.0	34.4	-19.4	-8.2	9.3	-25.5	25.3	2.6	2.3	25.6	26.8	14.4	-4.8
Age (%)																		
0-17	31.0	25.6	19.5	22.6	29.6	21.4	27.5	24.1	32.3	20.0	15.2	19.8	28.1	22.0	25.7	24.4	25.7	22.3
18-64	60.9	62.2	67.9	58.4	59.3	57.8	59.4	61.6	52.3	56.5	53.0	64.3	63.0	61.2	64.9	60.0	64.9	62.7
65+	8.1	12.2	12.5	19.0	11.1	20.8	13.1	14.3	15.4	23.5	31.9	15.9	8.9	16.8	9.3	15.6	9.3	15.0
Race ¹ (%)																		
White	100.0	97.7	98.2	90.0	95.7	86.8	96.2	93.7	90.4	94.1	63.4	65.4	100.0	95.4	93.7	93.4	93.7	95.5
Other	0.0	2.3	1.8	10.0	4.3	13.2	3.8	6.3	9.6	5.9	36.6	34.6	0.0	4.6	6.3	6.6	6.3	4.5

Source: U.S. Bureau of the Census, 2000 and 2010. University of Louisville, Urban Studies Institute, Kentucky State Data Center.

¹ Since the 2000 Census, the boundary of year 2000 BG1 was redrawn to exclude the area north of KY 551. That area is included in what is now BG3 (a portion of which was formerly BG2). While the year 2010 BG1 and BG3, taken together, approximate the area that was BG 1 in the year 2000 for purposes of comparison, the comparison cannot be exact.

² The 2010 information is not totally comparable to 2000 and earlier census years, as boundaries have changed for some census tracts and block groups. Additionally, some census tracts and block groups have been renumbered for the 2010 Census, and are indicated as such in parenthesis. This table presents the 2000 and 2010 Census race data for those who choose “white alone” as their race. Table 20 presents detailed race data from the 2010 Census.

Racial Characteristics. Historically, the racial composition of Adair and Taylor counties and the block groups in the Socioeconomic Study Area has been predominantly white. The 2010 Census records show the counties and the Socioeconomic Study Area block groups have a notably higher percentage of population in the “White, Alone” category than does the state (87.8%) (see Table 20).

With the exception of the “Black or African American Alone” category, minority populations in the two counties and Socioeconomic Study Area block groups make up less than 0.1% in each category. Taylor County and the Socioeconomic Study Area block groups within that county have a higher percentage of Black or African American population (4.9% and 2.5%, respectively) than Adair County or the Socioeconomic Study Area block groups within that county (2.7% and 0.4%, respectively). The 228 Black or African American residents in Taylor County’s BG 9205.6 represent the largest minority population residing in any of the Socioeconomic Study Area block groups—27.9% of the total population of the block group and 1.4% of the total population of all Socioeconomic Study Area block groups . While 1.4% seems small, it should be noted that all minorities in the “One Race” category make up 5.8% of the total population of the Socioeconomic Study Area block groups; therefore, the minority population of BG 9205.6 represents 25.9% of the minorities in the Socioeconomic Study Area.

Table 20: 2010 Census Race Information—Kentucky, Adair County, Taylor County, and Socioeconomic Study Area

Geographic Area	Total Population	One Race							Population of Two or More Races	Hispanic or Latino Origin
		Population of One Race	White Alone	Black or African American Alone	American Indian & Alaska Native Alone	Asian Alone	Native Hawaiian & Other Pacific Islander Alone	Some Other Race Alone		
Kentucky										
Total	4,339,367	4,264,159	3,809,537	337,520	10,120	48,930	2,501	55,551	75,208	132,836
%	100	98.3	87.8	7.8	0.2	1.1	0.05	1.3	1.7	3.1
Adair County										
Total	18,656	18,449	17,696	503	36	45	5	164	207	319
%	100	98.9	94.9	2.7	0.2	0.2	0.02	0.9	1.1	1.7
Taylor County										
Total	24,512	24,112	22,539	1,216	31	129	10	187	400	433
%	100	98.4	92.0	4.9	0.1	0.5	0.04	0.8	1.6	1.8
Socioec. Study Area (Census Block Groups containing the proposed project)										
Adair Co										
9702.1	1,722	1,712	1,635	41	5	0	0	31	10	45
9704.02.1	1,926	1,904	1,867	19	6	3	2	7	22	24
9704.02.3	884	873	810	33	5	1	1	23	11	27
Taylor Co										
9201.2	1,842	1,823	1,800	14	5	2	0	2	19	35
9203.1	873	848	785	50	1	1	0	11	25	24
9203.3	944	917	820	82	2	2	0	11	27	18
9204.1	2,735	2,688	2,562	95	5	12	0	14	47	29
9205.2	1,236	1,227	1,154	61	0	4	0	8	9	17
9205.3	660	655	630	17	0	1	1	6	5	10
9205.4	1,467	1,457	1,399	35	0	9	0	14	10	21
9205.5	974	958	917	38	1	1	0	1	16	9
9205.6	818	783	535	228	0	0	0	20	35	27
Total	16,081	15,845	14,914	713	30	36	4	148	236	286
%	100	98.5	92.7	4.4	0.2	0.2	0.02	0.9	1.5	1.8

Source: U.S. Bureau of the Census, 2010.

Average Income and Percent of Residents Living below the Poverty Level. A summary of the 2006-2010 ACS 5-year estimated per capita and household income data are presented in Table 21 for Kentucky, Adair County, and Taylor County. The median household income of the state is \$41,576, which is more than Adair County (\$29,834) and Taylor County (\$35,378).

Adair County and Taylor County had higher percentages of their total populations living below the poverty level than the state (21.3% and 22.8%, respectively, versus the 17.7% state rate). Taylor County had the highest percentage of its youths in poverty while Adair County had the highest percentage of elderly living below the poverty level.

Taken as a whole, it is possible the proposed project could affect low-income people because the two counties have high percentages of low-income individuals. However, because low-income individuals characterize the area, the proposed project would not likely have a disproportionately high impact on this population.

Table 21: Median Household Income, Per Capita Income, and Percent Living Below Poverty Level, 2006-2010 ACS 5-Year Estimates

	Kentucky	Adair County	Taylor County	Socioeconomic Study Area
Median Household Income				
Total	\$41,576	\$29,834	\$35,378	n/a
Per Capita Income				
Total	\$22,515	\$15,790	\$18,014	n/a
Percent Living Below Poverty Level				
Total Population	4,339,367	18,656	24,512	--
% of Total Population Living Below Poverty Level	768,067 17.7%	3,974 21.3%	5,589 22.8%	n/a
Of Total Living Below Poverty Level, % Who Are Children (Ages 0-17)	24.3	22.4	35.0	n/a
Of Total Living Below Poverty Level, % Who Are Elderly (Ages 65+)	12.7	29.0	13.5	n/a

Source: U.S. Bureau of the Census, 2006-2010 ACS 5-Year Estimates. Data are not available (n/a) for the Study Area

3.8.2 Communities Served by the Project

The communities that will be served by the project include the cities of Columbia in Adair County and Campbellsville in Taylor County, and several smaller, unincorporated communities along and near KY 55 including: Cane Valley, Coburg, Burdick, and Romine, of which Cane Valley is the largest. In addition, the proposed project would also serve many other residents of rural Adair and Taylor counties by improving the transportation network in the region, providing access to regional centers of employment, education, health care, shopping, recreation, and other services.

3.8.3 Areas of Community Cohesion

The proposed project corridor is situated primarily along KY 55 primarily within unincorporated areas of Adair and Taylor counties. Residences, including several farmsteads, are interspersed with commercial/ industrial and institutional facilities along KY 55. In addition, there are rural neighborhoods along other existing roads in the project corridor as well as small clusters of rural residences that could be considered to have loosely-defined community cohesion. Although some of these areas would experience some

residential relocations, new access will be provided or existing access retained for the remaining residents. Where the project heads away from KY 55 on new alignment, east of Campbellville, some neighborhoods or rural residential clusters would be divided by the proposed new roadway; therefore, the project could negatively affect community cohesion that could be present in these areas. Locations along KY 55 or on new alignment where community cohesion could be affected as a result of the project are identified below and shown on Exhibit 1 by the identification RC#:

- **RC-1, Point Pleasant (formerly Romine).** Alternatives A and B could require the relocation of two or three houses on the east side of KY 55 in the residential community of Point Pleasant and three or four residences on the west side of KY 55. Alternative C, and Preferred Alternative D avoids Point Pleasant and all but one house on the west side of KY 55 in that vicinity. Residences in Romine that are not along the proposed KY 55 right-of-way would not be directly impacted by the project.
- **RC-2, Blue Hole Road.** Alternatives A and B and Preferred Alternative D could require the relocation of five of the six single-family residences and one of four 4-unit apartment buildings in a cluster along Blue Hole Road just east of its intersection with KY 55, where the project heads east from KY 55 on new alignment.
- **RC-3, Roberts Road.** Alternative A, Preferred Alternative D and Alternative C could require the relocation of three of five residences in close proximity along Roberts Road. The rural nature and distance to other residences of the area suggest the possibility that a sense of community exists among the residents of these five residences.
- **RC-4, Old Elkhorn Road.** Alternative B could require the relocation of two residences at the Old Elkhorn Road/Elkhorn Spur intersection. Alternative A and Preferred Alternative D could relocate three residences farther east of the intersection. All of the potential relocatees are in the easternmost portion of the cluster. The residences are among approximately 16 in a residential area along Old Elkhorn Road and Caudill Road south of Elkhorn Road. The eastern portion of this area would be affected by either alternative; however, the area would not be divided by the proposed KY 55 roadway and access to that new road would be provided in the immediate vicinity.
- **RC-5, Reids Chapel Road.** Ten mobile homes, seven houses, and two churches (Ole Gospel Barn and Victory and Eastside Baptist) are along an approximately half-mile section of Reids Chapel Road between Franklin Road and Catalpha Drive. Three houses are in the right-of-way of Alternative A, B, and Preferred Alternative D. All other residences along the road in the vicinity of the project are on more widely scattered locations. Residents along the half-mile road section could experience some interdependence that could be adversely affected by the residential relocations. See Figure 14, below, which shows how the alignment of Preferred Alternative D has been modified to minimize and avoid impacts to this community.
- **Subdivisions** in the project corridor include Happy Hills on KY 372 (Smith Ridge Road, in Segment 11), Rustic Haven on KY 70 (Elkhorn Road, in Segment 13), and Arista on Wise Road (in Segment 14). No residential relocations would occur in these subdivisions; however, some right-of-way could be required on a vacant parcel at the entrance to Rustic Haven. In addition to residential clusters and subdivisions, the unincorporated communities of Cane Valley, Coburg, and Burdick extend into the project corridor, along KY 55. No relocations would occur within Cane Valley with the selection of Preferred Alternative D. As with the rural neighborhoods and residential clusters, new access will be provided or existing access retained, and the communities

would not be divided by the proposed new roadway. Therefore, the project is not anticipated to negatively affect community cohesion in these areas.

3.8.4 Community Resources

The following sections address key public services located in the project corridor and, therefore, having the potential to be affected by the proposed project.

Educational Facilities. Two public and one private school are within the project corridor: Campbellville Middle School on Roberts Road, Taylor County Middle School on US 68 (East Broadway), and Kentucky Christian School (preschool through grade 5) on New Columbia Road (KY 55). None would be impacted by the project. Overall, an improved roadway network would be expected to benefit the school systems by improving motoring safety, local access, and access to educational opportunities/destinations within the region.

Churches. Of the 24 churches within the project corridor, the following seven could be impacted by one or more alternatives as a result of right-of-way acquisition.

Trinity United Methodist Church—Alternatives A and C would acquire church buildings, thereby displacing the church. Community leaders and other members of the public have expressed the wish that the church not be displaced. Preferred Alternative D—option 1aG and Alternative B avoid displacing the church building although they would require realigning the entrance.

New Life for the Nations, Inc.— Alternative B would acquire buildings on the property and the parking area for right-of-way, which would result in displacement of the church. Preferred Alternative D and Alternative A would avoid displacing the church.

Church of Christ—All alternatives in Segment 4 would acquire right-of-way from church property along proposed KY 55 for the mainline and for a new frontage road that would provide access to parcels owned by the church, but none would displace the church building.

Asbury United Methodist Church—All alternatives in Segment 5 would acquire right-of-way from church property for the mainline and a frontage access road, but none would displace the church building.

Jesus Name Church—Preferred Alternative D—option 10LB and Alternative C would acquire some right-of-way from church property along proposed KY 55 and at the KY 1625 (Blue Hole Road)/ proposed KY 55 intersection, but displacement of the church building is not anticipated.

Eastside Baptist Church—Alternative C would acquire right-of-way to provide an access drive that would extend to the relocated section of KY 1799 (Reids Chapel Road), but would not displace the church building.

Ole Gospel Barn and Victory—Alternative C would acquire right-of-way along Reids Chapel Road for an access drive and the relocation of Reids Chapel Road, but would not displace the church building.

Other Institutions. In addition to potential impacts to churches, four other institutions within the project corridor could be affected by the project. Three of the four sites are either listed or eligible for listing in the NRHP, discussed in detail in Section 3.5.3, *Cultural Historic Resources*:

Ireland Community Center (Burdick School) is an NRHP-eligible site (Site 90) in Segment 8 of the project corridor. Preferred Alternative D and Alternatives A and B would potentially require a temporary easement. A retaining wall at the property boundary along KY1701 (Milder Creek Road) and KY 55 is proposed to avoid impacts to the property. The Kentucky SHPO has concurred with a No Effects finding.

Isaac Tate Farm (includes Homeplace on Green River) is an NRHP-listed site (Site 82) in both Segments 7 and 8 of the project corridor. Alternative A, B, C and Preferred Alternative D would acquire land from the site for right-of-way. The SHPO has concurred with No Adverse Effects findings in each case and with the resulting application of the *de minimis* rule.

Spectrum Care Academy Children's Services is located in Segment 2 of the project corridor. With all segment alternatives, the access control requirement and right-of-way acquisition would relocate the access drive and potentially affect parking areas. The KY 55 project would not impact the planned new residential structures at their currently proposed locations.

Park and Recreational Facilities. The project area includes a state park, USACE recreation areas, and a sports complex being developed by the City of Campbellsville. Section 3.7.1, *Existing Land Uses*, provides additional discussion about these facilities. Section 3.6.1, *Section 4(f)*, includes details of the coordination with the City of Campbellsville, and ongoing coordination regarding USACE concerns about impacts to its recreational areas, the Green River crossing, and the Green River Dam.

Green River Lake State Park—The state park is east of the project corridor. No right-of-way would be acquired from the park and no Section 4(f) use of the park's land or recreational facilities would occur.

Big Beech Picnic Site—Located along Lake Road just east of the KY 55/Lake Road intersection, this small picnic site has three picnic tables and a parking area for 4 to 6 vehicles. None of the alternatives in this segment encroach upon the picnic site. However, USACE has stated the importance of safety improvements in the area, and noted that the picnic area could be relocated if encroachment were necessary to accomplish safety-related road improvements.

Green River—KY 55 currently crosses the Green River west of the Green River dam and lake, and all alternatives in Segment 6 cross the river at approximately the same location. The crossing is within a section of the river classified by KDOW as an "Outstanding State Resource Water." Therefore, KYTC commits to implementing enhanced mitigation measures that will be determined during permit coordination with USACE and KDOW and the development of the BA with USFWS.

Green River Tailwater Recreation Area (TRA)—This area provides for a variety of recreational activities. All of the alternatives in Segment 6 of the project corridor would traverse and some portions of the TRA. USACE has expressed a preference for the alignment of Preferred Alternative D (the same as Alternative C) because the proposed KY 55/Tailwater Road intersection would remain in approximately the same location.

Campbellsville Sports Complex—Site work is underway on the City's 175-acre sports complex and fairgrounds facility north of the Technology Park. The property will be traversed by Preferred Alternative D – option 10LB. Coordination has occurred with the City, which supports the project and has concurred with a finding of No Adverse Effects to the recreational uses of the property.

Wildlife Management Area. The Green River WMA contains approximately 20,500 acres along the shoreline of Green River Lake. A portion of the WMA within Segment 10 of the project corridor would be traversed by the alternatives. Preferred Alternative D—option 10Y and Alternatives A and C would traverse the western tip of a section of the WMA, and Preferred Alternative D option—10LB and Alternative B) is northwest of and would not traverse the WMA. Coordination with USACE included the February 2013 meeting with KYTC and FHWA. Representatives of USACE noted that the bridging of the creek with the Preferred Segment Alternative 10Y option would likely have no adverse effect to the WMA. The 10LB option avoids the WMA entirely and, thus, would be preferred.

Special areas: Green River Conservation Reserve Enhancement Program (CREP). According to the Kentucky Green River CREP Annual Program Accomplishment Report (CEP-68R), FFY 2010 (the most recent report), the total CREP acreage in Adair and Taylor counties for fiscal years 2002 through 2010 are as follows: Adair 7,447.9 and Taylor 3,856.7. Consultation with USDA indicated that in Taylor County there is the potential for impacting properties enrolled in the CREP program.

Shopping and Business Districts. Within the project corridor the businesses and industries are generally located along the existing KY 55 and US 68. While the greatest concentrations of each occur near Columbia and Campbellville, there are businesses/industries distributed along the entire length of both highways, as well as some small businesses on scattered sites along local roadways. There is no area between the two cities that could be recognized as a business or shopping district. Potential business displacements are discussed in Section 3.9.

3.9 Relocations and Displacements

Information regarding potential residential relocations and business and institutional displacements was gathered during field visits; reviews of preliminary design plans; and discussions with local officials, stakeholders, and members of the public at the series of project-related public and Focus Group meetings. Described below are the potential residential, commercial, and institutional relocations/displacements¹⁸, associated with this project. Table 22 summarizes the potential relocations/displacements and estimated number of residents to be relocated and Table 23 summarizes the estimated costs by build alternative.

Residential Relocations. The build alternatives could require 48 to 68 residential relocations (including one apartment building with four units), depending on which alternative is considered. The apartment building would be within the right-of-way of Preferred Alternative D—option 10Y, and of Alternatives A and B. The remaining housing units appear to be single-family residences, and include several mobile homes. Ancillary building displacements (i.e., barns, sheds, farm buildings, detached garages, etc.) are likely with the selection of any build alternative. A comparative tally of these structures is not available.

Commercial/Industrial Displacements. From 7 to 16 business displacements and 1 institutional displacement could occur, depending upon the build alternative considered.

Institutional or Non-profit Organizations Displacements. No displacement of governmental or not-for-profit institutions is anticipated with the selection of a proposed build alternative. Two churches could be displaced: Alternatives A and C would displace Trinity United Methodist Church (UMC); and Alternative B would displace New Life for the Nations.

Uniform Act. To minimize the unavoidable effects of right-of-way acquisition and displacement of people, KYTC offers a Relocation Assistance Program in accordance with the *Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970* (Public Law 91-646), as amended in 1987. Housing and relocation resources would be available to all residential and business relocatees without regard to race, creed, color, national origin, or economic status, as required by Title VI of the *Civil Rights Act of 1964*. In accordance with *Environmental Justice Executive Order 12898*, an analysis was conducted to identify any geographic areas containing disproportionately high concentrations of minority, low-income, or elderly households. It was concluded that none of the proposed build alternatives would have a

¹⁸ The potential number of individuals who might be relocated was calculated based on 2010 Census “persons-per-household” data: 2.42 persons in Adair County multiplied by (x) potential number of relocations (i.e., housing units), and 2.52 persons in Taylor County x potential number of relocations.

disproportionately high and adverse effect on minority or low-income populations (see Section 3.11, *Environmental Justice*).

KYTC provides advance notification of impending right-of-way acquisition. Before acquiring right-of-way, all properties would be appraised on the basis of their fair market value. Owners of property to be acquired would be offered and paid fair market value for their property rights. No person lawfully occupying real property would be required to relocate without written notice of the intended vacation date; and no residential property occupant would be required to relocate until decent, safe, and sanitary replacement housing would be made available. "Made available" means the relocatee has either obtained (and has the right of possession of) replacement housing on his/her own; or the KYTC has offered the relocatee decent, safe, and sanitary housing within his/her financial means and available for immediate occupancy. KYTC has several options available to locate replacement housing, including:

- Repositioning dwellings on their existing property so they are outside the right-of-way limits.
- New house construction by the existing landowners.
- Relocating individuals into housing for sale on the real estate market, locally, regionally, or elsewhere.
- Advertisements in local media requesting to purchase housing meeting specific requirements.

In some situations, the demand for new housing generated by right-of-way acquisition could encourage new local ventures in real estate development to meet the housing requirements. If, however, decent, safe, and sanitary replacement housing cannot be found by these or other means, or if there is no housing within the displacee's financial means, then Housing of Last Resort may be considered.

Under the Relocation Assistance Program, when right-of-way is acquired, at least one relocation specialist is assigned to the roadway project to execute the relocation assistance and payments program. The relocation specialist contacts each person/family to be relocated to ascertain individual needs and desires. The specialist also provides information, answers questions, and provides assistance in finding replacement property. Relocation services and payments would be provided without regard to race, color, religion, sex, national origin, or economic status. All tenants and owner-occupant displacees would receive an explanation regarding all options available to them, such as: varying methods of claiming moving expenses reimbursement; replacement housing rental, either private or publicly subsidized; replacement housing purchase; or moving owner-occupied housing to another location. Financial assistance would be available to the eligible relocatee for the following:

- Reimburse the relocatee for the actual reasonable costs of moving from homes, businesses, and farm operations acquired for a highway project;
- Make up the difference, if any, between the amount paid for the acquired dwelling and the cost of a comparable decent, safe, and sanitary dwelling available on the private market;
- Provide expenses reimbursement, such as legal fees and other eligible closing costs incurred in buying a replacement dwelling;
- Make payment for eligible increased interest costs resulting from having to acquire a higher interest rate mortgage.

A displaced tenant may be eligible to receive a payment to rent a replacement dwelling or room, or use as a down payment, including closing costs, on the purchase of a replacement dwelling. A brochure entitled "Your Benefits as a Highway Displacee under the Relocation Assistance Program" describes in detail the state assistance available, and would be made available to interested person(s).

Current Housing Market. A review of the local housing market reveals a limited supply of comparable housing available at any one time. For example, on REALTOR.com, as of September 2012, there were 65 single-family residences listed on the market in the Columbia and Campbellville areas.¹⁹ The listed values of these are as follows:

Under \$49,999 = 1	\$200,000 – \$499,999 = 18
\$50,000 – \$99,999 = 16	\$500,000 – \$1 million = 1
\$100,000 – \$199,999 = 29	\$1 million+ = 0

In comparison, the estimated values of the residences that might be relocated range from approximately \$30,000 to \$250,000. It is anticipated that there would be more relocations than available, comparable residences at any given time; consequently, it is unlikely all the residences could be relocated at the same time. However, over the course of a year or more for relocations, it is possible that sufficient comparable housing would become available when the right-of-way is acquired for this proposed project. Accordingly, it is likely the relocations would be accomplished using normal relocation procedures, and the need for Last Resort Housing²⁰ should not be anticipated. This program would be used if comparable replacement housing would not be available, or unavailable within the displacee's financial means, and the replacement payment exceeds the state legal limitation. Regarding business displacements, the 327-acre Green River Commerce Park in Columbia, and Campbellville's 202-acre Technology Park; vacant commercial sites; and undeveloped land in the project area would likely accommodate the requirements of some, though probably not all, businesses that would be displaced. One institutional displacement could occur (Trinity UMC or New Life for Nations, depending on the build alternative considered), and it is anticipated relocation in the project area would be possible.

Relocation schedule. KYTC has included the approximately 7-mile-long Campbellville Bypass portion of the KY 55 Heartland Parkway project in its 2012-2018 *Six-Year Highway Plan*. Design and right-of-way acquisition have been funded for this portion of the project, only. While funding for utilities and construction in this section is anticipated to follow, funding for the remaining approximately 14 miles of the project (i.e., Columbia Bypass to the southern terminus of the proposed Campbellville Bypass) is not anticipated in the foreseeable future.

¹⁹ Residential listings for these cities incorporate almost all of the properties in both counties listed on REALTOR.com. Every effort is made to relocate residents in the vicinity of the residence from which they are moving. Therefore, available housing in the adjacent counties was not researched for this report.

²⁰ "Last resort housing" is a program used when comparable replacement housing is not available or when it is unavailable within the displacee's financial means, and the replacement payment exceeds the state legal limitation. The purpose of the program is to allow broad latitudes in methods of implementation by the state so that decent, safe, and sanitary replacement housing can be provided. This program is used, as the name implies, only as a "last resort," when there is no adequate opportunity for relocation within the area.

Table 22: Summary of Potential Relocations and Displacements

Alternative	County	Residences	Institutional	Businesses
A	Adair	10	0	7
	Taylor	59	1	9
	Total	68	1	16
B	Adair	12	1	5
	Taylor	37	0	10
	Total	49	1	15
C	Adair	10	1	6
	Taylor	46	0	2
	Total	55	1	8
D (Preferred)	Adair	8 to 10	0	4 to 7
	Taylor	40 to 50	0	3 to 9
	Total	48 to 60	0	7 to 16

Table 23: Estimated Costs of Relocations and Displacements

Build Alternative	Estimated Costs*			
	Residential Relocation**	Institutional Displacement	Business Displacement	Total
Alternative A	\$1,717,000	\$20,000	\$320,000	\$2,057,000
Alternative B	\$1,146,000	\$20,000	\$300,000	\$1,466,000
Alternative C	\$1,396,000	\$20,000	\$160,000	\$1,576,000
Alternative D (Preferred)	\$1,200,000 to \$1,421,000	\$0	\$140,000 to \$320,000	\$1,340,000 to \$1,741,000

* Estimates = relocation assistance costs, only. Property acquisition costs are not included.

** The Residential Relocation estimates include rental units observed within the corridor of Alternatives A and C. Although no apparent rental units were observed within the Alternative B corridor, to account for the likelihood that there are some renters therein, for relocation cost estimating purposes, it is assumed that 10% of the residences are renter-occupied.

3.10 Agricultural Impacts

Formal consultation with the U.S. Department of Agriculture’s (USDA) Adair County and Taylor County offices of the Natural Resources Conservation Service (NRCS) for compliance with the *Farmland Protection Policy Act of 1981* was completed (see January 27, 2010 correspondence, Appendix C). In accordance with state and federal regulations concerning farmland protection, the Farmland Conversion Impact Rating Form AD-1006 was used to evaluate this project's effect on farmland. The evaluation results (Part VII, Form AD-1006) for Adair and Taylor counties are included in Table 24. On the rating form for Taylor County, Alternatives A, B, and C each received total points of 154, while in Adair County these alternatives received 126, 132, and 126, respectively. USDA recommends in 7 CFR 658.4(c)(3) that “sites receiving scores totaling 160 or more be given increasingly higher levels of consideration for protection.” Since this project received scores of less than 160 points in both counties, the project's impact on farmland would not be adverse and the protection of this farmland should not override the need for the project. This conclusion applies to Alternative D, even though it was identified after the coordination with NRCS, because Alternative D includes elements of the other build alternatives, except

for Segment 14O, which is in proximity to 14Y and would be expected to have the same impacts and result in the same overall rating.

The proposed build alternatives would acquire for right-of-way approximately 284 to 345 acres of agricultural land—approximately 0.09% of the total agricultural land in Taylor and Adair counties. Depending on which alternative is considered, from approximately 152 to 203 acres are prime and unique farmland, and approximately 189 to 216 acres are statewide or local important farmland. The farmland in the project area is primarily used for livestock grazing (dairy cows, beef cattle, sheep) and corn, soybean, and tobacco cultivation.

Table 24: Potential Farmland Impacts—Farmland Conversion Impact Rating Form AD-1006

	Alternative A	Alternative B	Alternative C
Total Right-of-Way (ROW) to be converted to transportation use:			
Adair	176.9	182.3	173.4
Taylor	406.9	407.8	403.9
Total	583.8	590.1	577.3
Adair County—Total Acres to be converted to transportation use:			
Prime and Unique Farmland	21.9	20.4	19.5
Statewide and Local Important Farmland	55.6	58.3	51.1
Total	77.5	78.7	70.7
Taylor County—Total Acres to be converted to transportation use:			
Prime and Unique Farmland	151.0	182.9	132.0
Statewide and Local Important Farmland	158.4	130.6	164.7
Total	309.4	313.5	296.7
Total Farmland Rating Points from Form AD-1006, Part VII*			
Adair	126	132	126
Taylor	154	154	154

Source: NRCS Farmland Conversion Impact Rating form AD-1006.

* Alternative D, the Preferred Alternative, is a composite of selected segments from Alternatives A, B, and C. It was identified during the alternatives evaluation process based in part on input from agencies, such as NRCS's form AD-1006. Although Alternative D was not evaluated as a stand-alone alternative by NRCS, with one exception (14 Orange), segments that comprise Alternative D were evaluated as features of one or more of the other build alternatives. Segment Alternative 14O is within the same section of the corridor and shares a portion of its alignment with Segment 14Y, which was evaluated by NRCS.

The rural nature of much of the project area makes some farmland impacts unavoidable with any build alternative, particularly where the alternative is on new alignment, such as in the area of the proposed Campbellville Bypass. Reconstructing the existing road will require additional right-of-way that also could result in farmland impacts. Some farm residence relocations and farm building acquisitions would be required. Any build alternative is likely to split some farms, which may affect farm operations. In the event this occurs, a relocation assistance specialist would be assigned to deal specifically with those farms affected to help resolve problems resulting from splitting farms. Loss of farmland for right-of-way, creation of an uneconomic remnant, and other impacts will be addressed during the right-of-way acquisition phase should a build alternative be selected for construction.

Purchase of Agricultural Conservation Easement (PACE). The project would not impact any of the seven PACE program farms in Taylor County. None are recorded in Adair County. Four of the

conservation easements are within the Battle of Tebbs Bend's NRHP boundary—an area avoided by all alternative roadway alignments. The remaining three properties are northwest of the project area.

Agricultural Districts. All three of the Agricultural Districts in the project corridor (see Exhibit 1) would be directly impacted by the project, as follows:

District 109-10 is along the east side of KY 55, in corridor Segment 5. All of the build alternatives follow KY 55 in this area, and would traverse portions of the western edge of the district.

District 109-06 borders the west side of KY 55 within the boundary of Isaac Tate Farm / Homeplace on Green River, in corridor segments 7 and 8. All of the build alternatives follow the alignment of KY 55 through this area and, therefore, would directly impact the district by acquiring right-of-way along its eastern edge.

District 109-12 is between KY 70 (Elkhorn Road) and KY 1799 (Reids Chapel Road), in corridor Segment 13. The build alternatives are on new alignment in this area, and all traverse the district. Preferred Alternative D and Alternatives A and C cross the western part of the district and would have similar impacts. Alternative B traverses the eastern part of the district.

Where land that is enrolled in an Agricultural District is converted to nonfarm use as a result of this project, as would be the case in the above districts, measures to mitigate impacts will be addressed through coordination with the Kentucky Natural Resources and Environmental Protection Cabinet, Division of Conservation.

3.11 Environmental Justice

Environmental Justice Policy. Title VI of the 1964 Civil Rights Act requires each Federal agency to ensure that “no person, on the ground of race color or national origin, be excluded from participating in, denied the benefits of, or subjected to discrimination” under any program or activity receiving Federal Aid. Title VI implications on the transportation planning process were further refined on February 11, 1994, in Executive Order 12898 titled *Federal Actions to Address Environmental Justice in Minority Populations and Low Income Populations*. The President's Executive Order requires each Federal department and agency to “identify and address disproportionately high and adverse human health or environmental effects of their policies, programs and activities on minority populations or low income populations.” On April 15, 1997, USDOT published DOT Order 5680-1 as a component of the June 29, 1995, FHWA Environmental Justice Strategy. The Order, which appeared in the *Federal Register, Volume 62, Number 72*, describes the process USDOT implemented to incorporate Environmental Justice principles into existing programs, policies, and activities. On June 14, 2012, FHWA issued the *FHWA Actions to Address Environmental Justice in Minority Populations and Low-Income Populations* directive, which establishes policies and procedures for FHWA to use in complying with Executive Order 12898.

Environmental Justice Direct Impact Analysis. Efforts made to identify areas of low-income and minority populations within the Socioeconomic Study Area (see Section 3.8.1, subsections *Racial Characteristics* and *Average Income and Percent of Residents Living Below the Poverty Level*) included a review of U.S. Census data, project mapping, contact with local governmental officials and community leaders, field observations, and discussions with property owners and residents during public meetings.

Low-Income Residents—As noted in Section 3.8.1, profiles of poverty levels are available for the state and counties as American Community Survey (ACS) five-year estimates by the U.S. Census from 2006 to 2010. Adair County and Taylor County had higher percentages of their total populations living below the poverty level than the state (21.3% and 22.8%, respectively, versus the 17.7% state rate). It is probable that the project would affect some low-income people because the two counties have a high number of low-income individuals.

Along the east side of Reids Chapel Road in Segment 13 of the project corridor, there are seven mobile homes on land surrounding the Ole Gospel Barn and Victory church. They are within the RC-5 residential cluster discussed in Section 3.8.3, *Areas of Community Cohesion*. Field observations indicated the mobile homes' residents would likely be low income based on the appearances of the mobile homes, which were at least 20 years old and in need of minor repairs/upkeep. Segment Alternative 13Y is the alignment recommended as Preferred Alternative D in this area. Early in the development of alternatives within the project corridor, that segment's alignment could have required the relocation of two to three of the mobile homes and right-of-way from a portion of the parking area in front of the church adjacent to the mobile homes. To reduce impact to the mobile home residents and the church, the alignment has been shifted: it now avoids the mobile homes and the church property. Figure 14 shows the original alignment and the modified alignment that avoids impacts to the mobile home residents and the church.



Figure 14: Segment Alternative 13Y of Preferred Alternative D in the Vicinity of Mobile Homes in RC 5—Original Alignment and Modified (Avoidance) Alignment

Minority Residents—The 2010 Census does provide data regarding racial characteristics at the block group level; therefore, this type of data is available for the Socioeconomic Study Area. Overall, minorities make up from 5% to 8% of the populations in the two counties and Socioeconomic Study Area block groups (see Table 20 in Section 3.8.1). Whereas Taylor County block group 9205.6 (see Figure 13, in Section 3.8.1) contains the largest minority population among the Socioeconomic Study Area block groups (approximately 35%), none of the alternatives would impact residents in this block group, which is located in southeast Campbellsville. The alternatives are well to the west of the residential areas within the block group. The census data analysis, consultations with local officials, and field surveys confirm there are no pockets of minorities within the project corridor that would be affected by the project.

The only area within the project corridor where field observation indicated low-income residents were located, is within residential cluster RC-5 (i.e., a group of mobile homes along Reids Chapel Road in Segment 13 of the Bypass), the alignment of Preferred Alternative D has been shifted to avoid relocations that would have occurred with an earlier iteration of that alternative, as shown in Figure 14.

Conclusions and Future Steps. Of the 48 to 60 residential relocations, except for area “RC-5,” there are other no known pockets of minority or low-income people, nor is there a known disproportionate high number of such individuals throughout the corridor. Regarding minorities, the overall average percent of the population in Adair and Taylor counties, and the 12 block groups that make up the study area, is 93% “white alone.” There is no evidence that the potential relocatees would contain more than 7% minority people. Regarding low income people, the average percent of people living at or below the poverty line in the two counties is 22%. Likewise, there is no evidence that more than 22% of the potential relocatees are low-income people. Regarding the business displacement, of 6 to 17 businesses potentially displaced by the Preferred Alternative D, none appear to be owned or run by minorities or low income people, or positioned to provide a service to such populations. Therefore, based on the analysis for this Environmental Assessment, there does not appear to be a disproportionate impact to environmental justice populations.

Regarding effects to environmental justice people, the benefits of improved mobility, transportation connectivity, and improved safety, would be made available to all resident populations, including environmental justice populations, and would likely outweigh any adverse effect cause by right-of-way acquisition or other impacts.

Based on this research, in accordance with *Environmental Justice Executive Order 12898*, and FHWA’s June 2012 directive, the project would not likely have a disproportionately high and adverse effect on minority or low-income populations.

However, because site-specific data has not been obtained on the minority or income status of the 48 to 60 potential residential relocations and 7 to 16 business displacements for Preferred Alternative D, the final determination regarding a disproportionate high and adverse impact cannot be made until further data is collected and analyzed. The Project Team will not select an alternative until a Public Hearing is held, all comments from the Public Hearing process are taken into consideration, and additional research is conducted to make a final determination regarding the potential for a high and disproportionate impact to environmental justice populations. The additional research will be conducted before a FONSI is prepared and will include distribution of a survey tool in KYTC’s Environmental Justice Analysis Guidance, dated June 27, 2011. This survey will be sent to all potential relocatees, and the research will be supplemented, as necessary, with interviews of property owners and residents. Determinations of disproportionate impacts will be made by using the above-referenced percentages of minorities (7%) and low-income (22%) as thresholds. Should adverse effects to environmental justice populations be identify, minimization and mitigation commitments will be provided in the FONSI with the goal of obtaining an overall determination of no disproportionately high and adverse impact to environmental justice populations.

3.12 Pedestrian and Bicycle Facilities

No pedestrian facilities are in place along the project corridor. The 232-mile long Central Heartland Bike Tour route lies west of the project corridor from Columbia to north of the Adair-Green County line, but it does use KY 55 in two locations in Taylor County. Although the proposed project does not provide dedicated bike lanes or paths along its length, the wide roadway and planned 12-foot-wide outside shoulders (10 feet of which to be paved) would provide a safer place for bicyclists compared to the existing conditions.

3.13 Hazardous Materials

A primary concern when developing a new facility or improving an existing roadway is the potential for disturbing hazardous materials sites. It is essential to identify hazardous materials site locations early in the development of a project. Discovering a hazardous materials site during right-of-way acquisition or construction would have a detrimental impact on the project. The project could be delayed or even halted until a lengthy, detailed, and expensive site evaluation is completed. If identified early in the process, mitigation measures to either eliminate or minimize hazardous materials site impacts can be addressed.

Phase I Environmental Site Assessment (ESA). A Phase I ESA was prepared for this project and is on file with KYTC. Coordination with the Kentucky Division of Waste Management Underground Storage Tanks and Division for Air Quality branches was conducted in April 2010. Correspondence provided by the agencies related to several sites studied is included in Appendix C, *Agency Coordination*, “1993–2009 HAZMAT Documentation.”

A one-mile-radius (minimum search radius) driving survey of the project site was conducted on April 14, 2010. REC and HREC sites were identified for properties located in the approximate corridor of the proposed reconstruction and widening of KY 55. In addition, interviews were conducted with regulatory agencies and local residents; internet Web sites, local records and historic resources were reviewed; and a regulatory agency database report was obtained²¹ and reviewed.

The Phase I investigation identified 23 sites that were within or near the project disturbance limits and were reported or potential hazardous materials site locations (see Figure 15). The evaluation of build alternative alignments identified 16 of these sites as potentially affecting one or more of the build alternatives. Either 13 or 16 sites would potentially affect Preferred Alternative D; the number would depend upon whether Segment Alternative 1aG or 1aY would be selected

²¹ EDR DataMap™ Area Study. April 16, 2010. Environmental Data Resources, Inc. (EDR), Milford, Connecticut.

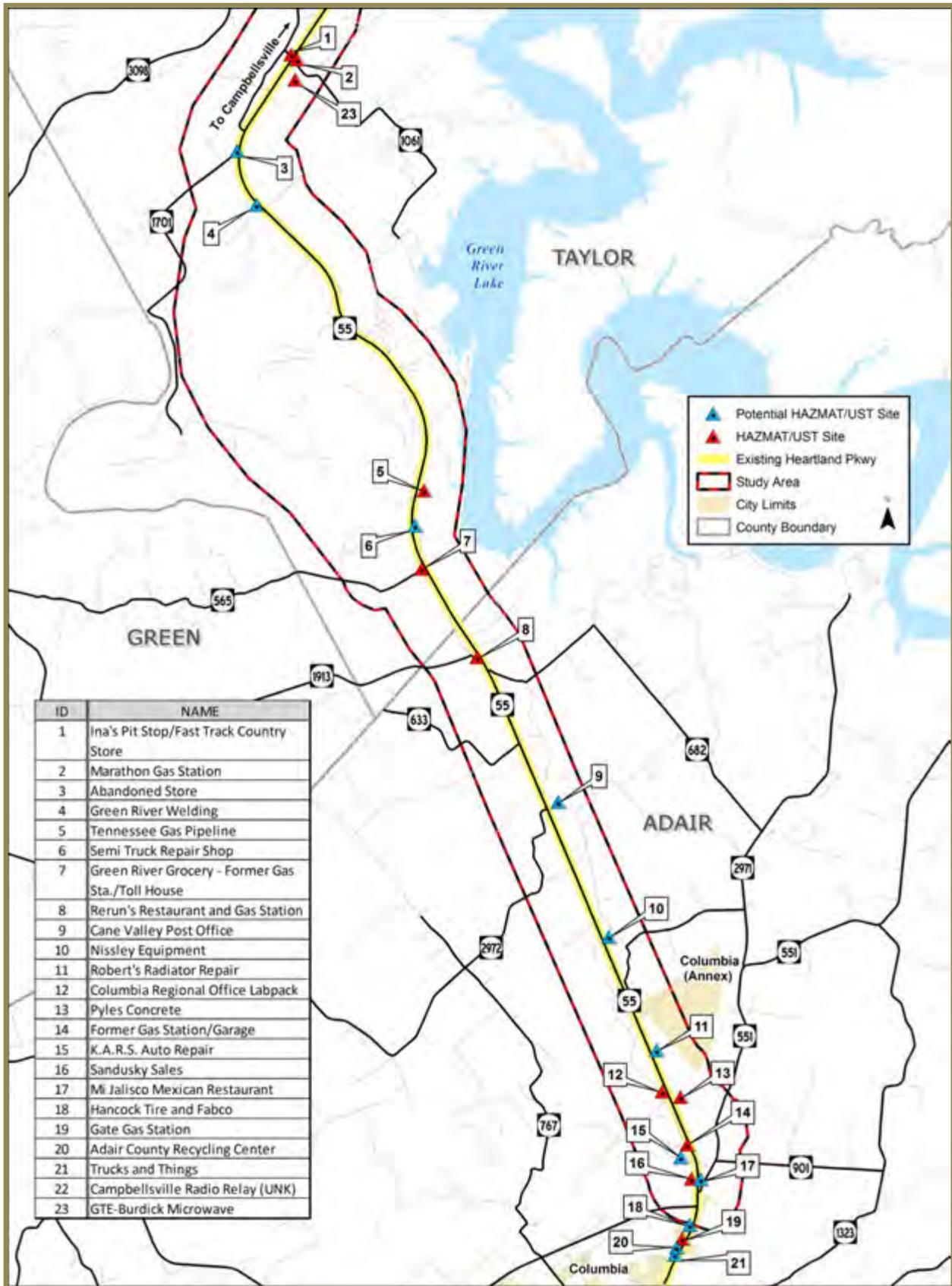


Figure 15: Potential HAZMAT / Contaminated Sites

Table 25 lists the 23 sites and identifies those sites that could affect the project, the potential contaminants at those sites, and recommendations for investigations on sites where right-of-way or an easement is required. In addition, a number of suspect sites were observed at multiple locations in the project area but are not included in the mapping or Table 25, Further reconnaissance would be required to identify all such sites. Contaminants potentially located at such sites include the following:

- Polychlorinated biphenyls (PCBs). Potential evidence of use, storage, or disposal of PCB-containing transformers, lifts, and other equipment was observed during site reconnaissance at several locations along the project corridor. Tennessee Gas Pipeline (which is included on the exhibit and in the table) is a known PADS site, which indicates that the facility contains or stores PCBs or equipment containing PCBs. Certain portions of the facility property have been deed restricted against future residential use (see Figure 16), and a notice has been filed with the Taylor County deed records that will notify future owners of residual PCBs that may remain in the soil. Segment Alternative 5LB, shown in Figure 16, was considered early in the process. However, because the alternative traversed the Tennessee Gas property in the area later found to have PCB-contaminated soils that would require substantial remediation costs, Segment Alternative 5LB was eliminated from further evaluation.
- Petroleum containing equipment was observed on several sites. During construction, soil staining or groundwater contamination may be encountered. If encountered, contaminated soil and groundwater should be remediated.
- Fertilizer, insecticide, and herbicide use was not observed during the site reconnaissance; however, some commercial properties within the project area may store or sell these products. Since a portion of the project area is agricultural land, the proposed project may have historic and current uses of fertilizers, insecticides, and herbicides.
- Asbestos-containing materials (ACMs) were not observed during site reconnaissance; however, the average age of structures in the project area indicates that ACM may be located in structures that may be acquired. If structures are to be removed, then sampling prior to removal is required. A Notification of Asbestos Abatement Activities DEP 7036 should be submitted to the Kentucky Division for Air Quality prior to removal of structures.
- Lead-based paint may be encountered in structures that may be acquired. If encountered, no abatement is anticipated.



Figure 16: Deed-Restricted Area, Segment 5
Aerial view of deed-restricted area (boundary in red) and location of Segment Alternative 5LB crossing the potential PCB-contaminated site.

- Universal waste may be encountered on several sites during construction. If encountered, universal waste should be disposed of properly.
- Demolition debris piles were observed on several sites throughout the project area. Although stained vegetation and soils were not observed during site reconnaissance, discovery of stained vegetation and soils surrounding demolition debris is possible. If encountered, demolition debris should be disposed of properly.
- Chlorofluorocarbons, refrigerants, and coolants are used in air conditioning units that were observed throughout the project area. Discovery of additional chlorofluorocarbons, refrigerants, or coolants is possible, particularly in residential, commercial, and industrial structures.
- Aboveground/underground storage tanks (ASTs and USTs) could be in use in residences throughout the area to store heating fuel oil. The presence of these types of tank systems would only be determined by a visual inspection of the structures on a case-by-case basis.

Hazardous materials manufacture, use, storage, treatment, transportation, and disposal are regulated by the *Resource Conservation and Recovery Act of 1976 (RCRA)*, as amended by the hazardous and solid waste amendments of 1984. The *Comprehensive Environmental Response, Compensation and Liability Act (CERCLA)*, as amended, is responsible for regulating the control, cleanup, and liability designation for abandoned, uncontrolled, or inactive waste sites. *CERCLA* is also designed to handle hazardous materials discharges and emergencies. The 1986 Amendments of *CERCLA*, also known as the *Superfund Amendments and Reauthorization Act of 1986 (SARA)*, were designed to provide protection against liability for both private and public "Innocent Landowners." This defense was provided for those parties who acquire property without prior knowledge of the presence of hazardous materials, and who made a good faith effort to identify any hazardous materials located on the site prior to purchase. Other federal laws with relevance to the generation, control, disposal, or detection of hazardous materials include NEPA, the *Clean Water Act*, the *Safe Drinking Water Act*, the *Toxic Substances Control Act (TSCA)*, the *Clean Air Act*, and the *Occupational Safety and Health Act (OSHA)*.

During right-of-way acquisition and/or construction, if a site suspected of containing hazardous materials is discovered, then activities at that site will cease and further investigations must be performed before construction can proceed. Such materials/conditions could include hazardous building materials, soil discoloration, odors, or oily sheen on water.

Mitigation. Should a build alternative be selected that affects a given site, Phase II ESA will be completed prior to right-of-way acquisition, unless KYTC is unable to obtain site access. In those cases, the work would be completed as early as possible following the securing of the legal right to enter the property. The proposed project would not be advertised for construction until all clearances are obtained.

During right-of-way acquisition and/or construction, if a site suspected of containing hazardous materials is discovered, then activities at that site will cease and further investigations must be performed before construction can proceed.

Structures identified for acquisition should be inspected for ASTs and USTs. Confirmed tanks will be removed prior to demolition, and handled and disposed of consistent with existing local, state, and federal regulations. Structures identified for acquisition should be inspected for ACMs by an accredited inspector. Confirmed ACMs will be removed prior to demolition, and handled and disposed of consistent with existing local, state, and federal regulations.

Table 25: Findings and Recommendations for REC and HREC Sites

Site ID (Figure 15)	Site Name or Description	Facility Type/History	Issue(s)	Area of Concern	Recommendation (if Area of Concern is acquired)	Build Alternatives Potentially Impacting Site			
						Alt. A	Alt. B	Alt. C	Alt. D
1	Ina's Pit Stop/Fast Track Country Store Lone Valley Rd.	Fuel station; UST RCRA-NonGen; FINDS	Potential soil and groundwater contamination (tanks supposedly replaced); monitoring wells present	Near tanks, monitoring wells	Phase II ESA	Yes	Yes	Yes	Yes
2	Marathon Gas Station Lone Valley Rd.	Fuel station; USTs	Potential soil and groundwater contamination	Entire property	Phase II ESA	Yes	Yes	Yes	Yes
3	Abandoned Store Corner, Columbia Rd and KY 1701	Potential USTs	Potential soil and groundwater contamination	Entire property	Phase II ESA	Yes	Yes	No	Yes
4	Green River Welding New Columbia Rd. (KY 55)	Welding shop; potential SHWS	Potential soil and groundwater contamination	Entire property	Phase II ESA	Yes	Yes	No	Yes
5	Tennessee Gas Pipeline New Columbia Rd.	Natural gas site with equipment; RCRA-CESQG; FINDS; SHWS	Known PCB contamination	Residential deed restrictions (see Figure14); avoid known locations of PCB contamination (sloped area, Tributary A, cove area)	Phase II ESA	Yes (avoids restricted areas)	Yes (avoids restricted areas)	Yes (avoids restricted areas)	Yes (avoids restricted areas)
6	Semi Truck Repair Shop Corner, Garret Rd. and New Columbia Rd. (KY 55)	Truck repair; potential SHWS	Potential soil and groundwater contamination	Entire property	Phase II ESA	Yes	Yes	No	Yes
7	Green River Grocery – Former Gas Station/Toll House Ebenezer Rd./New Columbia Rd. (KY 55)	Former fuel station/grocery; USTs (tanks supposedly removed prior to 1988, but no FNA/closure record)	Potential petroleum tanks (tanks supposedly removed) and soils/groundwater contamination	Frontage property, tank location	Phase II ESA	Yes	Yes	No	Yes
8	Reruns Restaurant Campbellsville Rd. (KY 55)	Fuel station; USTs	Potential soil and groundwater contamination	Road frontage property, tank location	Phase II ESA	Yes	Yes	Yes	Yes
9	Cane Valley Post Office Corner, Old Cane Valley Rd. and Old Cane Valley School Rd.	Fuel station; potential USTs	Potential soil and groundwater contamination (tanks supposedly removed)	Entire property	Phase II ESA	No	No	No	No
10	Nissley Equipment Campbellsville Rd. (KY 55)	Agricultural and construction equipment sales; potential SHWS	Potential soil and groundwater contamination	Entire property	Phase II ESA	Yes	Yes	Yes	Yes
11	Robert's Radiator Repair Campbellsville Rd. (KY 55)	Radiator repair/junkyard; potential SHWS		Entire property	Phase II ESA	Yes	Yes	Yes	Yes
12	Columbia Regional Office Labpack Campbellsville Rd. (KY 55)	Laboratory services; SHWS	Potential soils and groundwater contamination	Entire property	Phase II ESA	Yes	Yes	Yes	Yes

Table 25: Findings and Recommendations for REC and HREC Sites (Continued)

Site ID (Figure 15)	Site Name or Description	Facility Type/History	Issue(s)	Area of Concern	Recommendation (if Area of Concern is acquired)	Build Alternative Segments Potentially Impacting Site			
						Alt. A	Alt. B	Alt. C	Alt. D
13	Pyles Concrete Campbellsville Rd. (KY 55)	Concrete company; NPDES	Potential soil, groundwater, and surface water contamination	Entire property	Phase II ESA	Yes	Yes	Yes	Yes
14	Former Gas Station/Garage Campbellsville Rd. (KY 55)	Former fuel station (tanks supposedly removed prior to 1988); potential USTs	Potential soils and groundwater contamination	Entire property	Phase II ESA	Yes	No	Yes	1aY option Yes 1aG option No
15	K.A.R.S. Auto Repair Campbellsville Rd. (KY 55)	Automobile repair/storage; potential SHWS	Potential soils and groundwater contamination	Entire property	Phase II ESA	No	No	No	No
16	Sandusky Sales Campbellsville Rd.(KY 55)	Steel company/sales; FINDS; SHWS	Potential soil and groundwater contamination	Entire property	Phase II ESA	Yes	No	Yes	1aY option Yes 1aG option No
17	Mi Jalisco Mexican Restaurant Campbellsville Rd. (KY 55)	Restaurant; potential USTs	Potential soil and groundwater contamination	Entire property	Phase II ESA	Yes	No	Yes	1aY option Yes 1aG option No
18	Hancock Tire and Fabco Campbellsville Rd. (KY 55)	Automobile tire shop and metal fabrication shop; potential SHWS	Potential soils and groundwater contamination	Entire property	Phase II ESA	Yes	Yes	Yes	1aY & 1aG options Yes
19	Gate Gas Station Campbellsville Rd. (KY 55)	Fuel station; USTs	Potential soils and groundwater contamination	Tank location	Phase II ESA	No	No	No	No
20	Adair Co. Recycling Center Campbellsville Rd. (KY 55)	Household recycling center	No known issues	Where hazardous materials (if any) may be stored	Phase II ESA	No	No	No	No
21	Trucks and Things Campbellsville Rd. (KY 55)	Auto repair and sales; potential SHWS	Potential soils and groundwater contamination	Entire property	Phase II ESA	No	No	No	No
22	Campbellsville Radio Relay KY 55 (exact location unknown)	Potential UST	No known issues	Entire property (if found)	Phase II ESA (if found)	UNK	UNK	UNK	UNK
23	GTE-Burdick Microwave Lakeway Dr.	Potential UST	No known issues	Entire property	Phase II ESA	No	No	No	No
Total "Yes"	(Total excludes sites not mapped or location unknown.)					16	13	12	13 or 16

Abbreviations Key:

- REC Recognized Environmental Conditions
- HREC Historical Recognized Environmental Conditions
- SHWS State Hazardous Waste Site
- UST Underground Storage Tank
- NPDES National Pollutant Discharge Elimination System
- RCRA Resource Conservation and Recovery Act
- CESQG Conditionally Exempt Small Quantity Generators
- FINDS Facility Index System/Facility Registry System
- NonGEN Non Generators; do not presently generate hazardous waste

3.14 Visual Impacts

“Aesthetics” refer to the visual qualities and scenic nature of an area. Studies show there can be individual and regional preferences over what qualifies as “scenic.” The project corridor encompasses both rural and urban environments and presents viewsheds typical of both.

View of the Road. Where the project widens along existing KY 55, there are land uses typically associated with both urban and rural areas, including residences, businesses and industries, as well as rolling fields or pastures, crops, forested areas, and the Green River. While roadway construction would remove some structures (primarily commercial, agricultural, and residential) and replace some open ground, trees, and other vegetation, there are no unique aesthetic features or viewsheds potentially impacted by the proposed project. The crossing of the Green River should not result in a notable change in the viewshed of the area in which the bridge would be located because the design of the new bridge would incorporate or be adjacent to the existing bridge’s current alignment.

Where the project is on new alignment, the viewshed is typical of farming areas and presents a natural landscape that is pleasantly pastoral. While roadway construction would replace open ground, trees, and other vegetation, with one exception there are no unique aesthetic features or viewsheds potentially affected by the proposed project.

View from the Road. Where new roadway construction would replace open ground, trees, and other vegetation, the aesthetic appeal would be reduced for motorists along the corridor. Where the project would widen KY 55, the build alternatives would have minimal impacts on the visual character of the corridor, and should enhance driving pleasure by providing a safe, efficient, and economical route. Regardless of which build alternative is selected, the visual effects would be similar. The only visual impact of the No-build Alternative would be that associated with increased traffic and congestion on the existing roadway network.

3.15 Construction Impacts

The proposed project is anticipated to produce a beneficial, short-term economic impact by stimulating the local economy in terms of construction-related jobs, sales, income, government revenue and expenditures, and other variables. Furthermore, it could be expected to produce a beneficial long-term impact by providing the necessary infrastructure to encourage and sustain development and growth.

Highway construction activities would have temporary air, water quality, noise, traffic flow, and associated impacts within the project area. Steps that will be taken to minimize these temporary impacts are addressed Section 4.0, Mitigation.

3.16 Economic Impacts—Taxes and Revenues

Considering both positive and negative revenue impacts of the proposed project, the following issues were identified: tax revenue and a short-term construction income surge. Overall, the direct revenue impacts of this proposed project would be negligible.

The overall *beneficial* socioeconomic impacts of implementing a proposed build alternative would be expected to be substantial. Any of the proposed build alternatives would provide improved access to the region’s tourist industry attractions and business/industrial developments. Throughout the local area, a build alternative would increase overall travel speed, reduce travel time, and thereby improve the economy of travel by lowering operating costs. Accessibility, response time, and safety for law enforcement, fire protection, EMS, and school buses would be improved. Long-term economic benefits associated with regional accessibility could offset revenues lost.

4.0 MITIGATION MEASURES AND COMMITMENTS

Chapter 3.0 of this EA identifies the impacts for the proposed build alternatives and, where applicable, mitigation measures that could be expected to result from the proposed project. The following summarizes these impacts and the committed mitigation measures associated with them. The section of this report wherein a subject is discussed is indicated in brackets [0.0] following each category heading.

Public Water Sources [3.3.1.3] — Best Management Practices will be employed as needed to protect the local water supply.

Streams and Stream Crossings [3.3.2] — Through intergovernmental coordination, KSNPC, KDFWR, KDOW, USACE, and The Nature Conservancy have identified potential impacts and recommended avoidance, minimization, and mitigation options, which are summarized below (see also Section 3.3.7, *Intergovernmental Coordination*, and coordination correspondence in Appendix C).

- KSNPC, in a letter dated September 3, 2009, recommended preparation of a written erosion control plan that includes "...stringent erosion control methods... placed in a staggered manner to provide several stages of control. All erosion control measures should be monitored periodically to ensure that they are functioning as planned."
- Coordination with KDFWR resulted in a letter dated November 12, 2009, in which the agency also recommended erosion control measures during construction "to minimize siltation into nearby waterways."
- In its letter of November 3, 2009, KDOW noted that the Green River is an OSRW where all proposed build alternatives in Segment 6 would cross the river, and that habitat exists for several federally listed species (see discussion in Section 3.4.3): as a result "...steps to address maintenance of water quality and aquatic habitat integrity (401 KAR 10:031 Section 8(2)2)...will need to be addressed through an individual stormwater permit." The agency noted other waters in the project area are designated as warmwater aquatic habitat and will require protection.
- The Nature Conservancy, in a February 3, 2010 telephone conversation, requested proper erosion control measures be installed to protect the Green River Biosphere
- Coordination is ongoing with USACE regarding the potential impacts as the project crosses the Green River (all alternatives in Segment 6) and Stone Quarry Creek (Preferred Alternative D—option 10Y in Segment 10). Because Preferred Alternative D—option 10Y would bridge Stone Quarry Creek in the WMA, that option would not be expected to impact the stream. KYTC commits to continuing coordination with USACE to address the agency's concerns detailed in its letter of November 28, 2012 (see Appendix C) regarding the stream crossings and other design issues in these corridor segments.

If a build alternative is selected, stream impacts will be minimized to the maximum extent possible during final design and each of the recommendation identified by the above-referenced agencies will be considered. Water quality impacts from erosion and sedimentation during construction will be controlled in accordance with KYTC's *Standard Specifications* and through the use of Best Management Practices.

Mitigation for unavoidable stream impacts will be required through the permitting process under Sections 404 and 401 of the Clean Water Act as administered by the USACE and KDOW, respectively. A USACE Individual 404 Permit and KDOW 401 Water Quality Certification would be required with any build alternative selected. USACE would make jurisdictional determinations that would take into account all aquatic resources (including streams and ditches) subject to Section 404 jurisdiction during the permitting

phase of the project. In addition, an Individual KPDES permit would be required for the crossing of the Green River. A General KPDES permit would be required for the remainder of the project.

The project corridor crosses the Green River in a section of the river classified by KDOW as an “Outstanding State Resource Water.” Therefore, KYTC commits to implementing enhanced mitigation measures that will be determined during permit coordination with USACE and KDOW and the development of the BA with USFWS. (As noted in Section 1.1.4, *Project History and Current Status*, funding for this section of the project corridor is not anticipated to be available in the foreseeable future.)

If excess fill deposition sites located outside of the project corridor are needed, these areas would be surveyed for potential “waters of the United States.” Fill sites (if needed) that would impact a jurisdictional stream would require USACE 404 and KDOW 401 permitting. If this permitting is to be the responsibility of the contractor, the contractor will be made aware of such obligations.

Floodplains [3.3.3] — Construction activities in floodplains are regulated by FEMA and, potentially KDOW. Potential impacts to the floodplains will be reviewed by the appropriate regulatory authorities to gain their concurrence with the determination that there will be no substantial impacts; and a floodway analysis will be performed to determine the need for a No-rise certification and floodplain plan, the development of which would be coordinated with FEMA. In addition, if there will be filling in a floodplain, then a KDOW Construction in a Floodplain Permit would also be required.

Wetlands and Ponds [3.3.4 and 3.3.5] — Of the 27 wetlands, 17 would potentially be affected by one or more alternatives and all but two of the 17 are considered jurisdictional. Efforts to minimize wetland impacts will be made during final design. USACE would make jurisdictional determinations that take into account aquatic resources (including wetlands) subject to Section 404 jurisdiction during the permitting phase of the project. The preliminary estimate of the acres of impacts by build alternatives A, B, C, and D are 0.587, 0.590, 0.584, and 0.347–0.715 acres, respectively. Wetland impacts will be minimized to the maximum extent possible during final design, should a build alternative be selected. Because avoidance of all impacts to jurisdictional wetlands is likely not possible with any build alternative evaluated, mitigation for unavoidable impacts will be required through the permitting process under Sections 404 and 401 of the Clean Water Act as administered by USACE and KDOW, respectively. Mitigation is not typically required for open water (pond) impacts; however, mitigation requirements will be determined by the USACE and KDOW during the permitting process.

- If it is determined during final design that the total amount of jurisdictional wetland within the disturbance limits of the selected alternative would be greater than 0.5 acre, an Individual USACE 404 permit would be required. Alternative C and Preferred Alternative D (with either options 10Y and 14Y or options 10LB and 14Y) could have total impacts slightly greater than 0.5 acre.
- Wetland disturbance acreages falling between 0.1 and 0.5 acre would potentially qualify for a Nationwide permit per review by USACE. Alternatives A and B, and Preferred Alternative D (with options 10LB and 14O or options 10Y and 14O) would have impacts between 0.1 and 0.5 acre.
- If a Section 404 Permit(s) is required, a Section 401 Water Quality Certification from the KDOW would also be required. As noted above, it is anticipated recommended Preferred Alternative D or (if selected) Alternative C would require a Section 404 Permit; therefore, Section 401 certification would be required.

Prior to construction (i.e., after final design) KYTC, Division of Environmental Analysis will make an exact determination of impacts to jurisdictional wetlands. Detailed permit coordination—which will identify specific mitigation measures—will occur with USACE during the final design phase of the project should a build alternative be selected. For the loss of emergent wetlands and ponds, such mitigation could include

creation of small, shallow, seasonally flooded ponds to minimize the loss of these habitats. Ideally, the mitigation would take place on-site if locations with available right-of-way are suitable. If suitable locations are not found onsite, off-site mitigation would be required.

Threatened and Endangered Species [3.4.3] — Suitable habitats for two federally listed endangered bat species, eight federally listed endangered or special concern mussel species, and two federally listed special concern fish species were identified in the project area. Agency comments to date regarding protected species have included the following (see Appendix C for the referenced correspondence):

- KDFWR recommended, in its letter of November 12, 2009, that removal of suitable roost trees for Indiana bats be completed between October 15 and March 31 to avoid impacting the bats' summer roosting.
- KSNPC noted in correspondence dated September 3, 2009, that surveys should be conducted for several protected bat species if suitable habitat will be disturbed. The agency also identified the October 15 through March 31 timeframe for removal of suitable Indiana bat roost trees due to construction; and noted that, to avoid impacts to bats, bottomland forests and riparian corridors, especially near caves, should not be disturbed.
- KDOW noted in its November 3, 2009, letter of response to a request for consultation that habitat exists for several federally protected species and "steps to address maintenance of water quality and aquatic habitat integrity...will be necessary."

Mitigation measures for threatened or endangered species include minimization of impact to prime habitat areas, minimization of riparian tree clearing, use of proper equipment staging and fueling areas, and enhanced erosion control measures. Prior to construction, a BA will be prepared to determine potential impacts to the federally protected species with habitat occurring in the project area. The BA, which would be prepared in consultation with USFWS, would identify potential direct, indirect, and cumulative impacts to these species, as well as mitigation measures, should they be required. KYTC commits to implementing enhanced mitigation measures at the Green River crossing because of its designation as an OSRW (see **Streams and Stream Crossings [3.3.2]**, above).

Cultural Historic Resources [3.5.3] — As Table 13 shows, the following segment alternatives have received findings of Adverse Effects, concurred in by the SHPO: Segment Alternatives 3Y (Alternative A) and 3R (Alternative C) would acquire a residence and land (2.5 acres and 1.36 acres, respectively) from the NRHP-eligible Cane Valley Historic District; Segment Alternative 5Y (Alternative A) would acquire a contributing element (the former hospital site) and 2.88 acres from the NRHP-listed Battle of Tebbs Bend Historic District (Site 79); and Segment Alternative 8LB (Alternative C) would acquire 11.78 acres of land from within the historic boundaries of the NRHP-eligible Shively House (Site 94) and have an adverse visual impact on elements that contribute to the NRHP eligibility.

Alternative D, the recommended preferred alternative, does not include those segments, and would not have an adverse effect due to visual or other impacts to any listed or eligible sites along its entire length. Therefore, no mitigation will be required. If a different alternative is selected that includes a finding of Adverse Effects to a listed or eligible historic resource, mitigation would be developed through consultation with the consulting parties, including the SHPO, and is documented in an MOA.

Archaeological Resources [3.5.4] — If a build alternative is selected, it will be subject to a full, intensive inventory of archaeological sites and, where appropriate, formal testing will be conducted to determine NRHP eligibility and mitigation for impacts to eligible sites. If any archaeological sites potentially impacted by the project are determined to be eligible for listing in the NRHP, an MOA will be prepared that will

stipulate the conduct of phased archaeological investigations and document mitigation measures. The MOA will have stipulations that include procedures that must be followed if any concentrations of archaeological artifacts are discovered during construction activities. Such stipulations would include:

- Work must cease and the project engineer must be notified immediately.
- Coordination with the Kentucky SHPO will be made to determine the potential eligibility of such sites and whether Phase II testing should be completed.
- If human remains, associated burial items, sacred items, or items of cultural patrimony are discovered, construction in those areas must cease and FHWA will notify and consult with the SHPO, identified Native American tribes, and other parties deemed appropriate by FHWA to determine a specific protocol for treatment, handling and reburial of the remains.

Agricultural Districts [3.7.1] — The project corridor includes all of state-recognized Agricultural District 109-10 and portions of Districts 109-6 and 109-12. Where land that is enrolled in an Agricultural District is converted to nonfarm use as a result of this project, as would be the case in the above districts, measures to mitigate impacts will be addressed through coordination with the Kentucky Natural Resources and Environmental Protection Cabinet, Division of Conservation.

Relocations/Displacements [3.9] — All build alternatives would result in the acquisition of residences for right-of-way, as follows: Alternative A, 69; Alternative B, 49; Alternative C, 57; and Alternative D, 48 to 60. Business displacements could also occur, as follows: Alternative A, 16; Alternative B, 13; Alternative C, 8; and Alternative D, 7 to 16.

If a build alternative is selected KYTC will implement a program in accordance with the *Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (Public Law 91-646)*, as amended in 1987. Relocation resources will be available to all residential relocatees and business/institutional displacement without discrimination. A review of the local housing market reveals a limited supply of comparable housing available at any one time. It is anticipated that there could be more relocations than available, affordable residences at any given time; consequently, it is unlikely all the residences could be relocated at the same time. However, over the course of a year or more for relocations, it is possible that sufficient comparable housing would become available when the right-of-way is acquired for this proposed project. Accordingly, it is likely the relocations for this project would be accomplished using normal relocation procedures, and the need for Last Resort Housing should not be anticipated. This program would be used if comparable replacement housing would not be available, or would be unavailable within the displacee's financial means, and the replacement payment exceeds the state legal limitation.

Environmental Justice [3.11] — The Project Team will not select an alternative until additional research is conducted to make a final determination regarding the potential for a high and disproportionate impact to environmental justice populations. The additional research will be conducted before a FONSI is prepared and will include distribution of the survey tool in KYTC's Environmental Justice Analysis Guidance, dated June 27, 2011. This survey will be sent to all potential relocatees, and the research will be supplemented, as necessary, with interviews of property owners and residents. Should adverse effects to environmental justice populations be identified, minimization and mitigation commitments will be provided in the FONSI with the goal of obtaining an overall determination of no disproportionately high and adverse impact to environmental justice populations

Hazardous Materials [3.14] — The build alternatives could traverse several sites that have the potential to contain hazardous materials. The Preferred Alternative D is estimated to impact either 13 or 16 sites,

depending on which alignment option (i.e., 1aG or 1aY) is selected. In addition, there is further potential to impact sites scattered throughout the project area but not mapped during this study. These sites include pole-mounted electrical transformers; and area residential/ agricultural properties containing ASTs/USTs, pesticides, herbicides, and other pollutants. Mitigation measures would include the following:

- Should a build alternative be selected that impacts a given site, a Phase II hazardous materials investigation would be completed prior to right-of-way acquisition, unless KYTC is unable to obtain site access. In those cases, the work would be completed as early as possible following the securing of the legal right to enter the property. The project would not be advertised for construction until all clearances are obtained.
- Structures identified for acquisition should be inspected for ASTs and USTs. Confirmed tanks will be removed prior to demolition, and handled and disposed of consistent with existing local, state, and federal regulations.
- Structures identified for acquisition should be inspected for ACM by an accredited inspector. Confirmed ACM will be removed prior to demolition, and handled and disposed of consistent with existing local, state, and federal regulations.
- During right-of-way acquisition and/or construction, if a site suspected of containing hazardous materials is discovered, then activities at that site will cease and further investigations must be performed before construction can proceed.

Construction [3.15] — Highway construction activities would have minimal and temporary air and water quality, noise, traffic flow, and associated impacts within the project area. Impacts will be addressed by implementing the KYTC's *Standard Specifications*, as directed by the KYTC project manager, and through the use of Best Management Practices.

5.0 COMMENTS AND COORDINATION

FHWA and KYTC have provided opportunities for public involvement and resource agency coordination in the development of this EA. Opportunities for public involvement have included establishing a Leadership Committee and three Focus Groups, identifying consulting parties to the Section 106 process, and seeking input from the general public. Resource agency coordination has included meetings, field trips, and correspondence. Activities associated with public and resource agency involvement are summarized below.

A **Public Hearing** will be held soon after the approval of this EA to obtain input on the recommendations in this document; and mitigation measures and continued coordination will also be needed before a final conclusion can be reached regarding the selection of an alternative. The environmental documentation process will not conclude and a road alignment or the No-Build option will not be selected until a Public Hearing has been held and all comments have been given consideration.

5.1 *Public Involvement Activities*

Leadership Committee Meetings. Civic and elected officials for local, state, federal governments representing Adair and Taylor counties were invited to participate on the Leadership Committee for the project. One or more of the meetings were attended by representatives of the cities of Lebanon, Columbia, and Campbellsville; Heartland Parkway Foundation; Lake Cumberland and Lincoln Trail Area Development Districts; Team Taylor County; Adair, Marion, and Taylor counties' Fiscal Courts; state and Federal government elected officials or their representatives; representatives of KYTC; and project consultants. The four meetings that have been held, to date: September 24, 2007, February 3, 2009, October 14, 2009, and November 1, 2011.

Focus Group Meetings. Three Focus Groups were established to provide information about the project and solicit input from each group's members regarding sensitive issues in their portions of the project area. Each group focuses on a specific section of the project corridor, as follows:

- Focus Group 1—from the Columbia Bypass north to the Adair-Taylor County line. Membership includes local residents and representatives of Lindsey Wilson College, the area Chamber of Commerce, and the development and farming communities.
- Focus Group 2—from the county line through the Battle of Tebbs Bend Historic District and Green River crossing areas to the beginning of the proposed Campbellsville Bypass near the Technology Park. Membership includes local residents and business owners, and representatives of USACE, Home Place on Green River, Green River Lake State Park, The Nature Conservancy, and Tebbs Bend Battlefield Association.
- Focus Group 3—the Campbellsville Bypass. Membership includes local residents and business owners; former and current local elected officials; and representatives of local agencies, Campbellsville University; economic development and tourism interests, USACE, Campbellsville's Technology Park, and the Campbellsville airport.

Two meetings with each of the three Focus Groups have been held to date: February 2008 and June 2009.

Public Meetings. Three public meetings have been held at each of two locations—one location at each end of the 21-mile-long project corridor—to encourage attendance, and to provide adequate meeting space and access to project staff.

October 2007. A total of approximately 360 people signed in as attendees at the meetings (289 in Campbellsville and 71 in Columbia). Both meetings followed the same “open house” format: Aerial photographs showing the preliminary alternatives were displayed for review, and project staff members were on hand to help identify properties, explain alternative alignments, and answer questions from the public. Midway through the open house, a presentation was given to describe the project.

March 2009. 123 visitors signed in at the March 17 meeting and 316 signed in at the March 24 meeting. The meetings followed an “open house” format, with a formal presentation given mid-way through the meeting to explain the status of the environmental tasks and alternatives evaluation process since the previous meeting. Meeting handouts included a questionnaire requesting input regarding preferences of alternatives presented at the meeting. A total of 211 questionnaires and one email comment were submitted.

November 2009. On November 10 and 17, an “open house” format was combined with a formal presentation discussing the project background, current activities, and anticipated future tasks and schedules. These were the final public meetings to be held before the Public Hearing and completion of the environmental studies. A total of 101 visitors signed in at the November 10 meeting in Columbia, and 260 signed in at the November 17 in Campbellsville. There were 99 questionnaires/email comments returned.

Consulting Party Consultation. Consulting parties consultation is described in detail in Section 3.5.2, *Public Involvement—Consulting Parties*. Appendix C contains documentation related to Section 106 issues, including minutes of consulting parties meetings and correspondence to/from consulting parties.

5.2 Interagency Coordination and Consultation

Coordination has occurred with the resource agencies and organizations identified in Table 26. Letters, meeting minutes, and other project-related documentation received from responding agencies are provided in Appendix C (except Section 106 related) and Appendix D (Section 106 related).

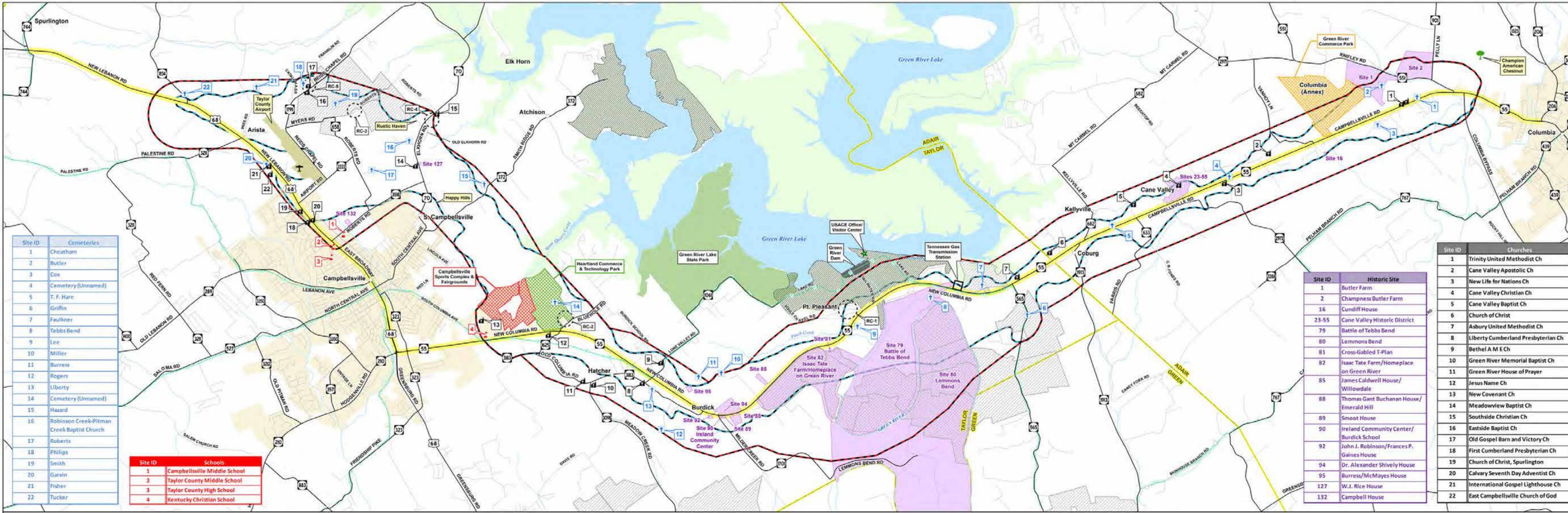
Table 26: Coordination with Resource Agencies and Organizations

Agency / Organization	Coordination Date	Coordination Type	Document	Appendix
Resource Agencies				
USACE— Green River Office Green River Office & Louisville District	May 19, 2008	Coordination Mtg	Minutes	C
	January 1, 2010	Coordination Mtg (with KDFWR)	Minutes	
August 10, 2011	Coordination Mtg	Minutes		
November 28, 2012	USACE regarding design issues	Letter		
February 7, 2013	Coordination Mtg	Minutes		
USDA—Natural Resources Conservation Service Taylor County	January 30, 2009	Response to request re: CREP enrollments	Email	C
	January 27, 2010	NRCS completed AD-1006	Email	
	February 4, 2010	NRCS soils maps, report	Email	
	November 29, 2010	ORA request re: CREP enrollments	Letter, shape files via email	
	November 30, 2010	USDA denies ORA request	Letter	
	February 3, 2011	NRCS revised AD 1006 (in response to 12-23-2010 request for additional coordination)	Email	
Adair County	February 9, 2009	Response to request re: CREP enrollments	Email	C
	January 27, 2010	NRCS completed AD-1006	Letter, maps	
	January 29, 2010	NRCS soils maps, report	Email	
USDOJ—Fish and Wildlife Service	N/A	No response to Dec. 1, 2009 letter re: federally protected species Species list for counties obtained from USFWS website	Data referenced in "Ecological Assessment Report" (Nov. 2010)	On file: KYTC-DEA*
USEPA—Region 4 and Washington, DC	May 19, 2008	Coordination Mtg	Minutes	C
KY Dept. for Environmental Protection— Division of Water	May 19, 2008	Coordination Mtg	Minutes	C
	November 3, 2009	Response to request re: Special Aquatic Resources	Letter	
KY Dept. for Natural Resources— Division of Conservation	May 19, 2008	Coordination Mtg	Minutes	C
	February 3, 2009	Response to request re: Ag Districts & PACE Easements	Email	
Division of Forestry	January 22, 2009	Response to request re: champion tree	Email	C
	November 2, 2009	Response to request re: forests	Letter	

Table 33: Coordination with Resource Agencies and Organizations (*Continued*)

Agency / Organization	Coordination Date	Coordination Type	Document	Appendix
Resource Agencies				
KY Dept. of Fish and Wildlife Resources	November 12, 2009	Response to request re: threatened/endangered species	Letter	C
	January 1, 2010	Coordination Mtg (with USACE)	Minutes	
KY Dept. for Libraries and Archives	Various, 2010 & 2011	Historical research	Referenced in "Cultural Historic Resource Assessment Report" (Nov. 2011) "Cultural Historic Eligibility Report" (Feb. 2010)	On file: KYTC-DEA*
KY Dept. for Local Government	February 17, 2009	Response to request re: LWCF	Email	C
KY Geological Survey	Various, 2010	Website research: KY Geologic Map Information Service (interactive map viewer, 2009)	Data in "Ecological Assessment Report" (Nov. 2010)	On file KYTC-DEA*
KY Heritage Council, State Historic Preservation Officer	November 19, 2007	Tour of Historic Sites	Minutes	D
	August 23, 2010	Consulting Parties Mtg 1	Minutes	
March 10, 2011	Coordination Mtg	Minutes		
April 13, 2011	Consulting Parties Mtg 2	Minutes		
Other		Coordination letters/submittals of reports, etc. (numerous)	Correspondence	
KY State Nature Preserves Commission	September 3, 2009	Response to request for Natural Heritage Program Database data re: threatened, endangered, special concern species	Letter	C
Other				
The Nature Conservancy	February 1, 2010	Telephone response to request re: Green River Bioreserve	Summary of response in "Ecological Assessment Report" (Nov. 2010)	On file KYTC-DEA*
University of Kentucky: Office of State Archaeology	Various, 2010	Archaeological research	Referenced in "An Archaeological Overview" (Aug. 2010)	On file KYTC-DEA*
Western Kentucky University: Center for Cave and Karst Studies	October 28, 2009	Telephone response to request re: cave/karst features in project area	Summary of response in "Ecological Assessment Report" (Nov. 2010)	On file KYTC-DEA*
Campbellsville University: Dr. Richard Kessler (Biologist)	February 3, 2010	Telephone response to request re: terrestrial/aquatic resources, sampling reports in project area	Summary of response in "Ecological Assessment Report" (Nov. 2010)	On file KYTC-DEA*

* These reports were prepared as baseline studies for use in this EA. As noted, the reports are on file with the KYTC, Division of Environmental Analysis in Frankfort, Kentucky.

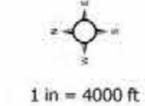


Site ID	Cemeteries
1	Cheatham
2	Butler
3	Cox
4	Cemetery (Unnamed)
5	T. F. Hare
6	Griffin
7	Faulkner
8	Tebbs Bend
9	Lee
10	Miller
11	Burress
12	Rogers
13	Liberty
14	Cemetery (Unnamed)
15	Hazard
16	Robinson Creek-Pitman Creek Baptist Church
17	Roberts
18	Philips
19	Smith
20	Garvin
21	Fisher
22	Tucker

Site ID	Schools
1	Campbellville Middle School
2	Taylor County Middle School
3	Taylor County High School
4	Kentucky Christian School

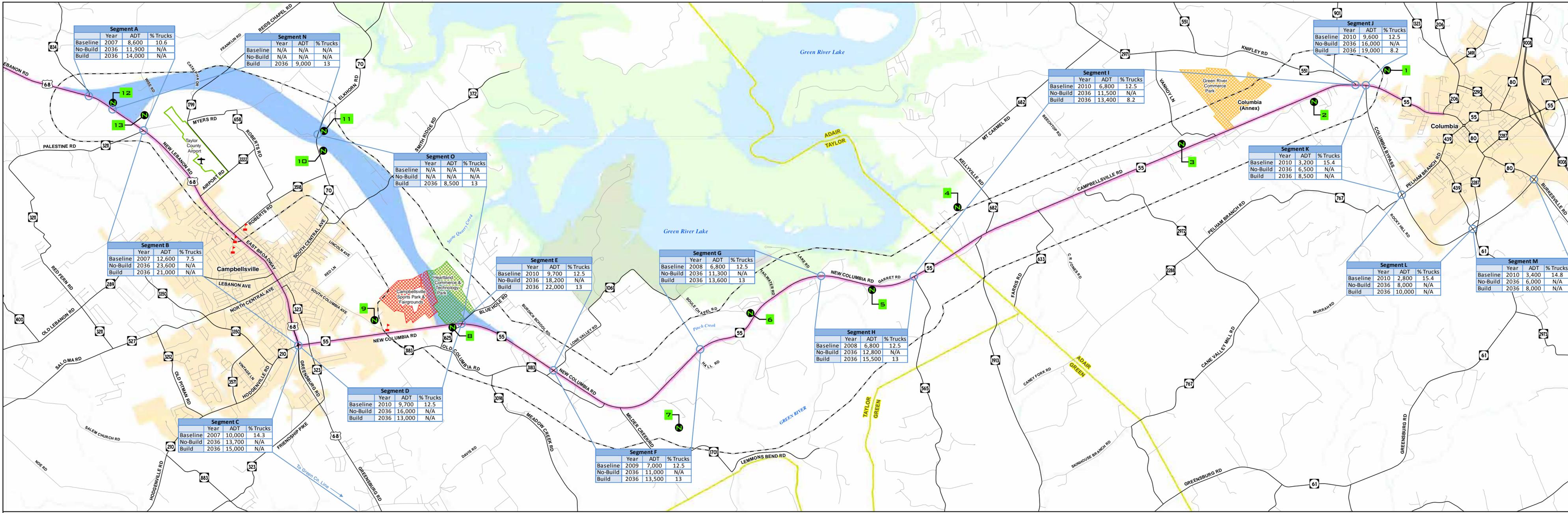
Site ID	Historic Site
1	Butler Farm
2	Champness Butler Farm
16	Cundiff House
23-55	Cane Valley Historic District
79	Battle of Tebbs Bend
80	Lemmons Bend
81	Cross-Gabled T-Plan
82	Isaac Tate Farm/Homeplace on Green River
85	James Caldwell House/Willowdale
88	Thomas Gant Buchanan House/Emerald Hill
89	Smoot House
90	Ireland Community Center/Burdick School
92	John J. Robinson/Frances P. Gaines House
94	Dr. Alexander Shively House
95	Burress/McMays House
127	W.J. Rice House
132	Campbell House

Site ID	Churches
1	Trinity United Methodist Ch
2	Cane Valley Apostolic Ch
3	New Life for Nations Ch
4	Cane Valley Christian Ch
5	Cane Valley Baptist Ch
6	Church of Christ
7	Asbury United Methodist Ch
8	Liberty Cumberland Presbyterian Ch
9	Bethel A M E Ch
10	Green River Memorial Baptist Ch
11	Green River House of Prayer
12	Jesus Name Ch
13	New Covenant Ch
14	Meadowview Baptist Ch
15	Southside Christian Ch
16	Eastside Baptist Ch
17	Old Gospel Barn and Victory Ch
18	First Cumberland Presbyterian Ch
19	Church of Christ, Spurlington
20	Calvary Seventh Day Adventist Ch
21	International Gospel Lighthouse Ch
22	East Campbellville Church of God



- School
- Church
- Cemetery
- Airport
- Populated Place
- Residential Cluster
- Bike Trail
- Existing Heartland Pkwy
- City Limits
- Historic Site
- Agricultural District
- Green River Lake State Park
- USACE Green River Lake WMA
- USACE Recreation Area
- Study Area
- Area of Potential Effect





Segment A			
Year	ADT	% Trucks	
Baseline	2007	8,600	10.6
No-Build	2036	11,900	N/A
Build	2036	14,000	N/A

Segment N			
Year	ADT	% Trucks	
Baseline	N/A	N/A	N/A
No-Build	N/A	N/A	N/A
Build	2036	9,000	13

Segment J			
Year	ADT	% Trucks	
Baseline	2010	9,600	12.5
No-Build	2036	16,000	N/A
Build	2036	19,000	8.2

Segment I			
Year	ADT	% Trucks	
Baseline	2010	6,800	12.5
No-Build	2036	11,500	N/A
Build	2036	13,400	8.2

Segment K			
Year	ADT	% Trucks	
Baseline	2010	3,200	15.4
No-Build	2036	6,500	N/A
Build	2036	8,500	N/A

Segment L			
Year	ADT	% Trucks	
Baseline	2010	2,800	15.4
No-Build	2036	8,000	N/A
Build	2036	10,000	N/A

Segment M			
Year	ADT	% Trucks	
Baseline	2010	3,400	14.8
No-Build	2036	6,000	N/A
Build	2036	8,000	N/A

Segment B			
Year	ADT	% Trucks	
Baseline	2007	12,600	7.5
No-Build	2036	23,600	N/A
Build	2036	21,000	N/A

Segment O			
Year	ADT	% Trucks	
Baseline	N/A	N/A	N/A
No-Build	N/A	N/A	N/A
Build	2036	8,500	13

Segment E			
Year	ADT	% Trucks	
Baseline	2010	9,700	12.5
No-Build	2036	18,200	N/A
Build	2036	22,000	13

Segment G			
Year	ADT	% Trucks	
Baseline	2008	6,800	12.5
No-Build	2036	11,300	N/A
Build	2036	13,600	13

Segment H			
Year	ADT	% Trucks	
Baseline	2008	6,800	12.5
No-Build	2036	12,800	N/A
Build	2036	15,500	13

Segment D			
Year	ADT	% Trucks	
Baseline	2010	9,700	12.5
No-Build	2036	16,000	N/A
Build	2036	13,000	N/A

Segment F			
Year	ADT	% Trucks	
Baseline	2009	7,000	12.5
No-Build	2036	11,000	N/A
Build	2036	13,500	13

Segment C			
Year	ADT	% Trucks	
Baseline	2007	10,000	14.3
No-Build	2036	13,700	N/A
Build	2036	15,000	N/A



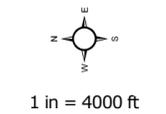
1 in = 4000 ft

Source Citation
Topographic data, including cultural, utilities and imagery and less historic, aquatic and terrestrial courtesy of the Kentucky Division of Geographic Information (KY DGI). Qk4 makes no claim to the accuracy of that data shown on this map.

- Segment From/To Points
- Noise Receptor
- Campbellsville Bypass (Illustrative Concept)
- School
- Airport
- Study Area
- Existing Heartland Pkwy
- Green River Lake State Park
- USACE Green River Lake WMA

Note: For more detailed traffic information, see Table 2, Existing and Projected Traffic Volumes, and Levels of Service. Source: "Heartland Parkway Traffic Forecast Update" March 4, 2012.

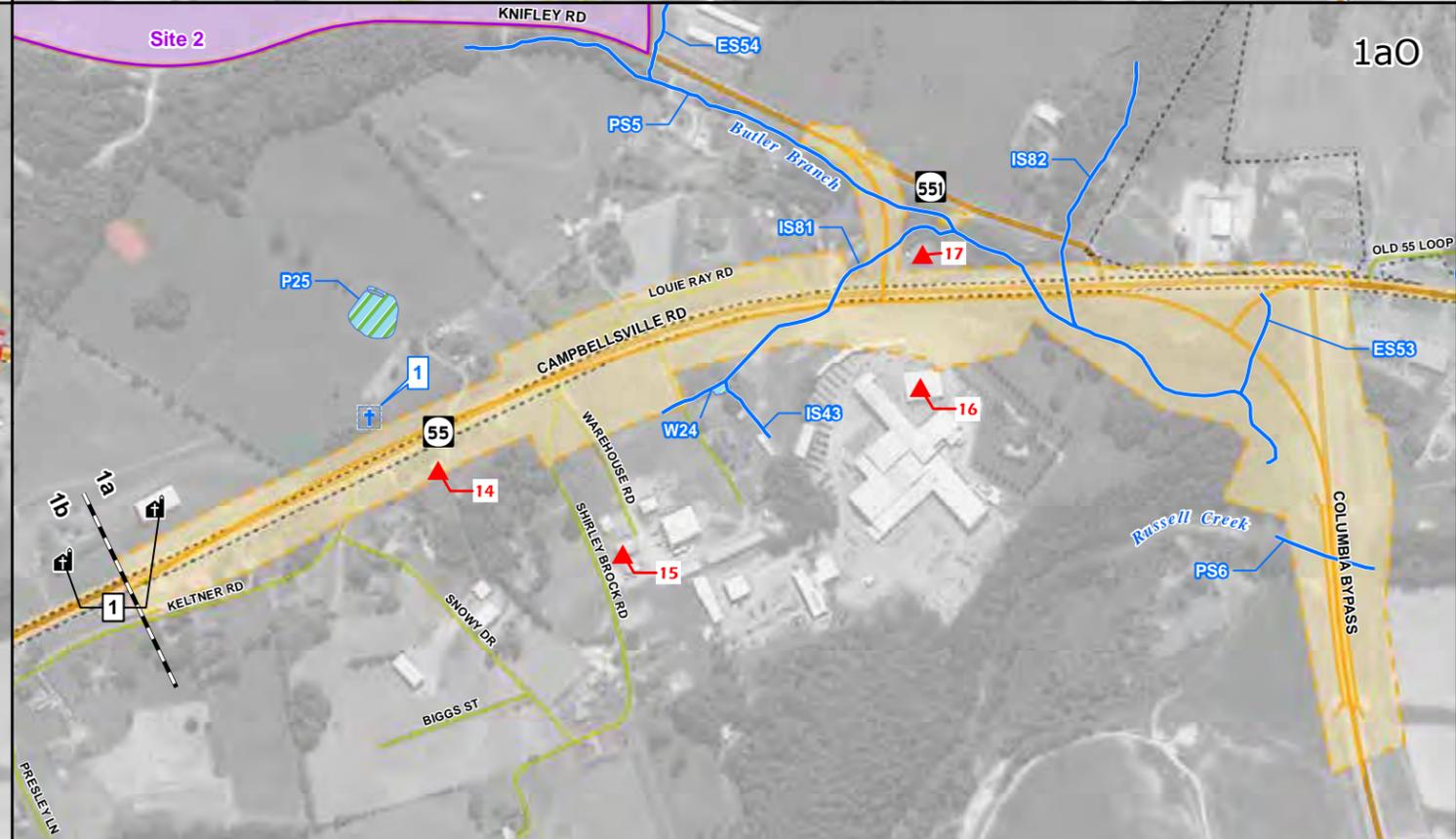
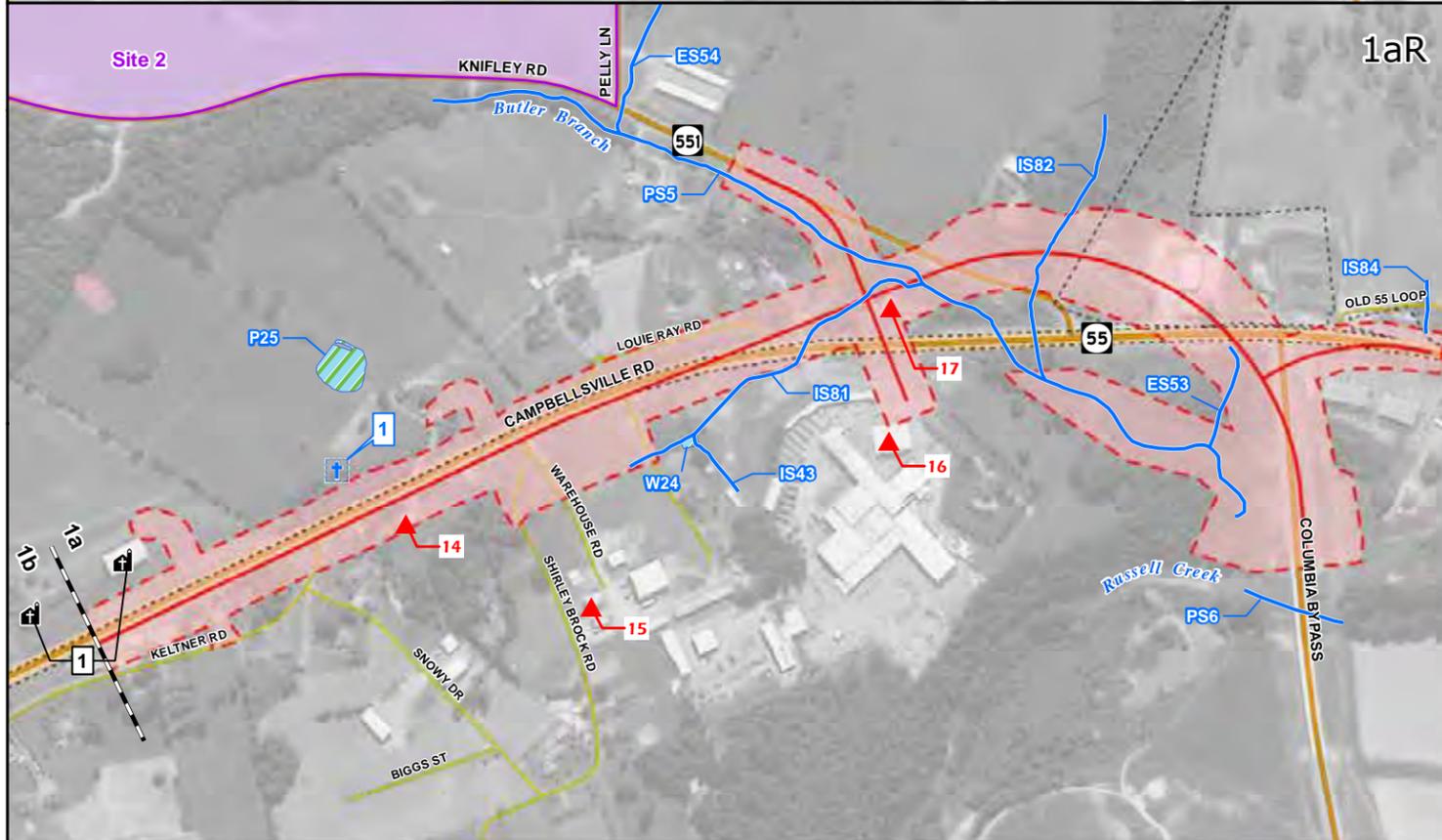
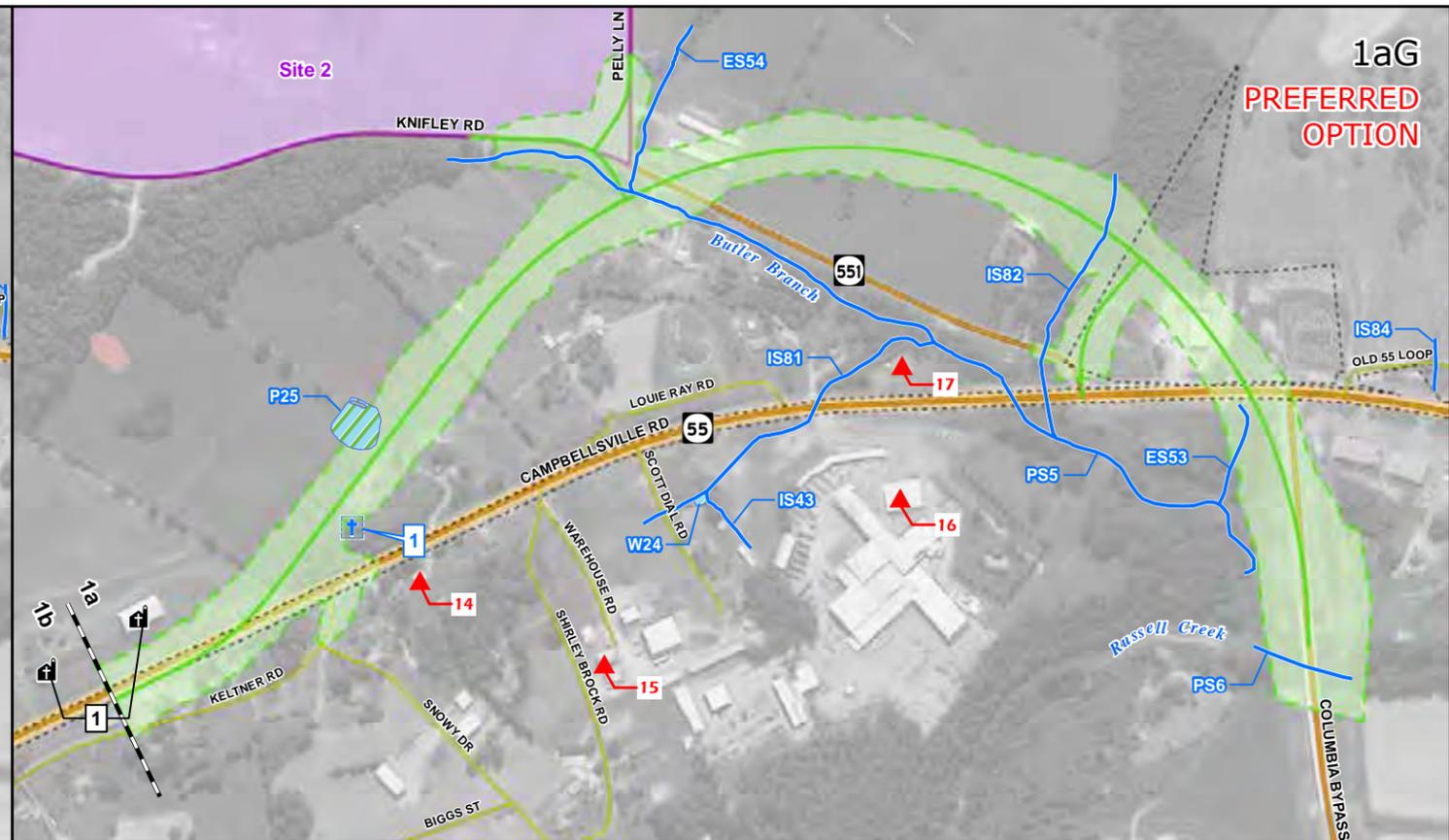
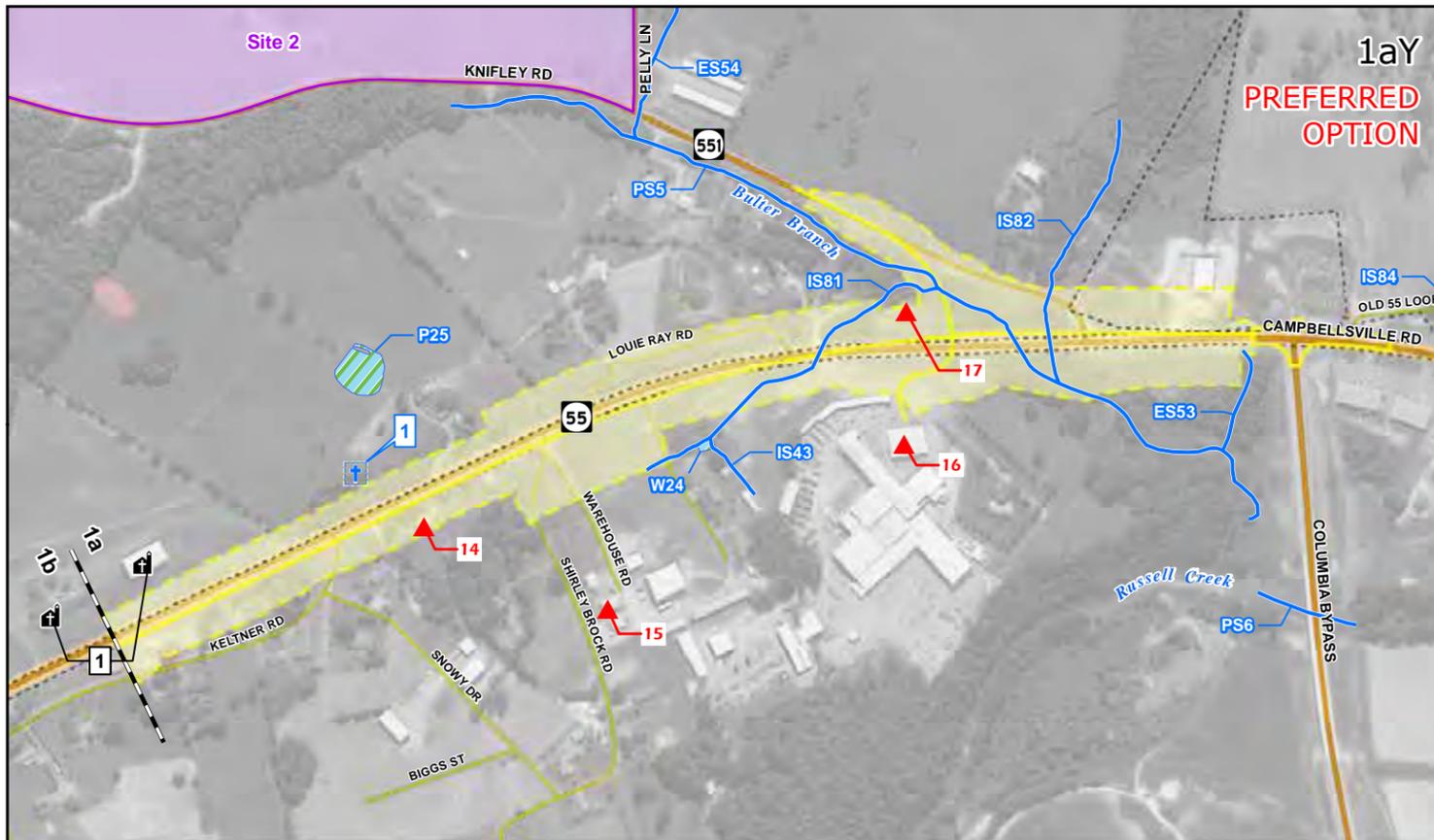




- | | | |
|---|---|--|
| — YELLOW OPTION | Airport | — Existing Heartland Pkwy |
| — RED OPTION | Airfield | Green River Lake State Park |
| — GREEN OPTION | --- Segment Line | USACE Green River Lake WMA |
| — LT BLUE OPTION | --- Section Line | USACE Recreation Area |
| — ORANGE OPTION | Study Area | |

Note: This map is intended as a general locator for sections, segments, and proposed alternatives. For more detail, see individual segment maps. (Exhibit 4, Sheets 1-14)





Source Citation
Topographic data, including cultural, utilities and imagery and less historic, aquatic and terrestrial courtesy of the Kentucky Division of Geographic Information (KY DGI). Qk4 makes no claim to the accuracy of that data shown on this map.

1 in = 650 ft

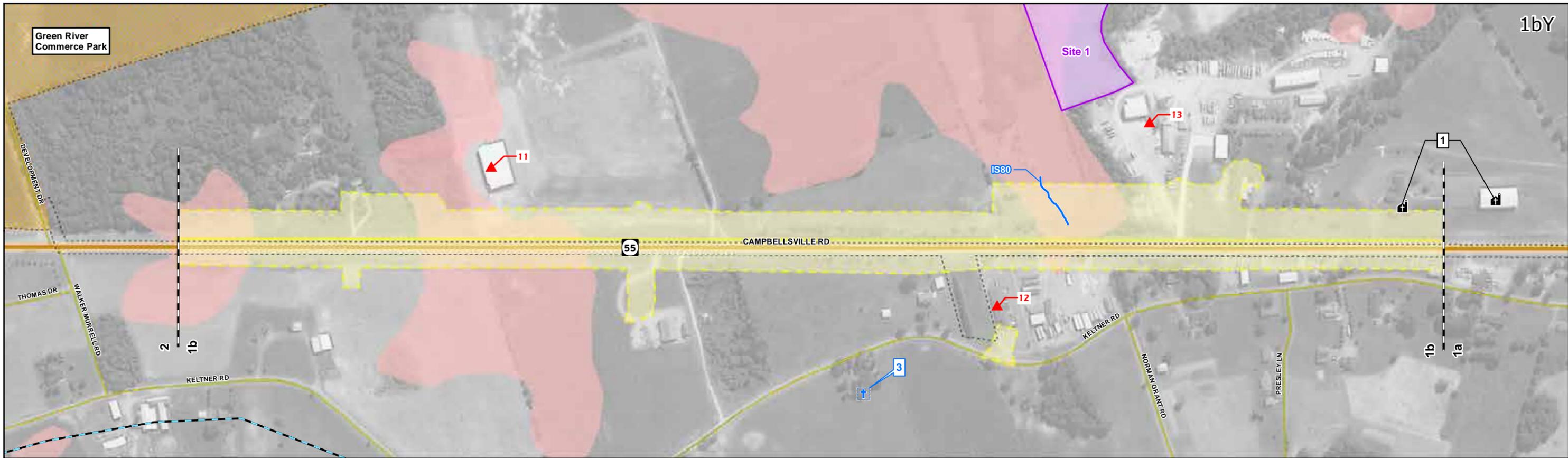
1a-YELLOW	Cemetery*	Existing Heartland Pkwy
1a-GREEN	Church*	Stream**
1a-RED	HAZMAT Site*	Pond/Wetland**
1a-ORANGE	Historic Site*	Sinkhole
	Segment Line	City of Columbia

*Note: For Cemetery, Church, or Historic Site details, see Exhibit 1, Study Area Road Network and Selected Land Uses. For HAZMAT details, see Figure 16.

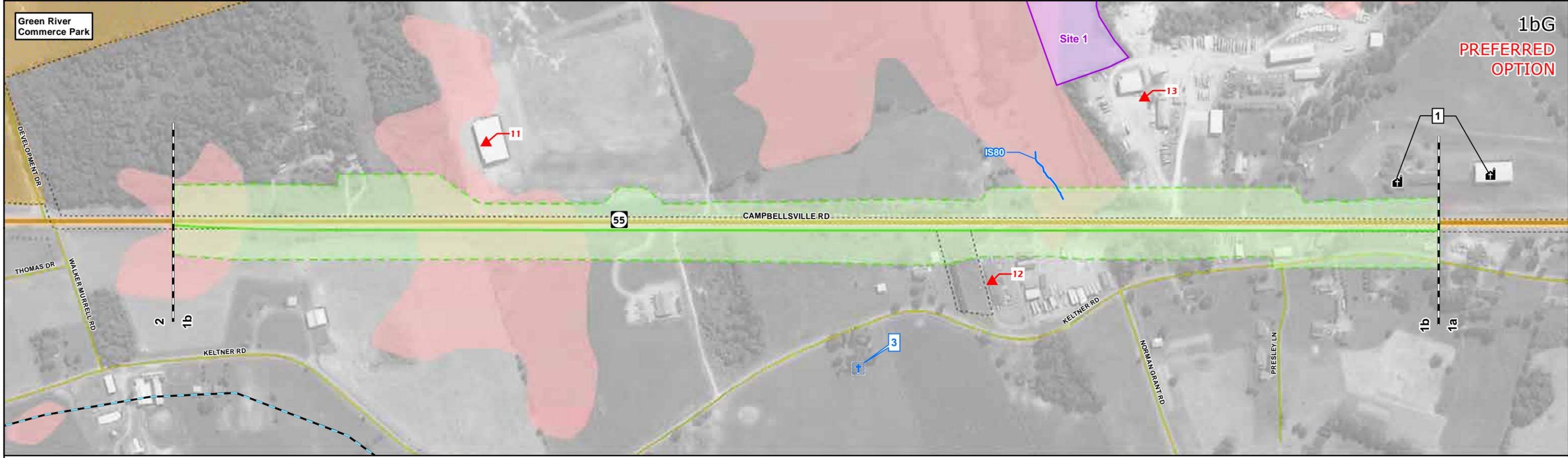
**Stream/Pond/Wetland Abbreviations:
PS = Perennial Stream, IS = Intermittent Stream, ES = Ephemeral Stream, P = Pond, W = Wetland

REFERENCE MAP

Exhibit 4 Sheet 1a
SEGMENT 1a ALTERNATIVES and ENVIRONMENTAL CONSTRAINTS
KY 55 - Heartland Parkway
Adair and Taylor Counties, Kentucky
KYTC Item No. 4-142.00 and .10



PREFERRED OPTION



1 in = 400 ft

- 1b-YELLOW
- 1b-GREEN
- Cemetery*
- Church*
- HAZMAT Site*
- Historic Site*
- Sinkhole
- Segment Line
- Stream**
- Existing Heartland Pkwy
- Area of Potential Effect
- City of Columbia (Annex)
- Commerce Park

*Note: For Cemetery, Church, or Historic Site details, see Exhibit 1, Study Area Road Network and Selected Land Uses. For HAZMAT details, see Figure 16.

**Stream/Pond/Wetland Abbreviations:
 PS = Perennial Stream, IS = Intermittent Stream,
 ES = Ephemeral Stream, P = Pond, W = Wetland



REFERENCE MAP

Exhibit 4 Sheet 1b
SEGMENT 1b ALTERNATIVES and ENVIRONMENTAL CONSTRAINTS
 KY 55 - Heartland Parkway
 Adair and Taylor Counties, Kentucky
 KYTC Item No. 4-142.00 and .10

Source Citation
 Topographic data, including cultural, utilities and imagery and less historic, aquatic and terrestrial courtesy of the Kentucky Division of Geographic Information (KY DGI) OK4 makes no claim to the accuracy of that data shown on this map.



1 in = 700 ft

- 2-YELLOW
- 2-GREEN
- Cemetery*
- Church*
- HAZMAT Site*
- Historic Site*
- Segment Line
- Stream**
- Pond/Wetland**
- Existing Heartland Pkwy
- Sinkhole
- Area of Potential Effect
- City of Columbia (Annex)
- Commerce Park

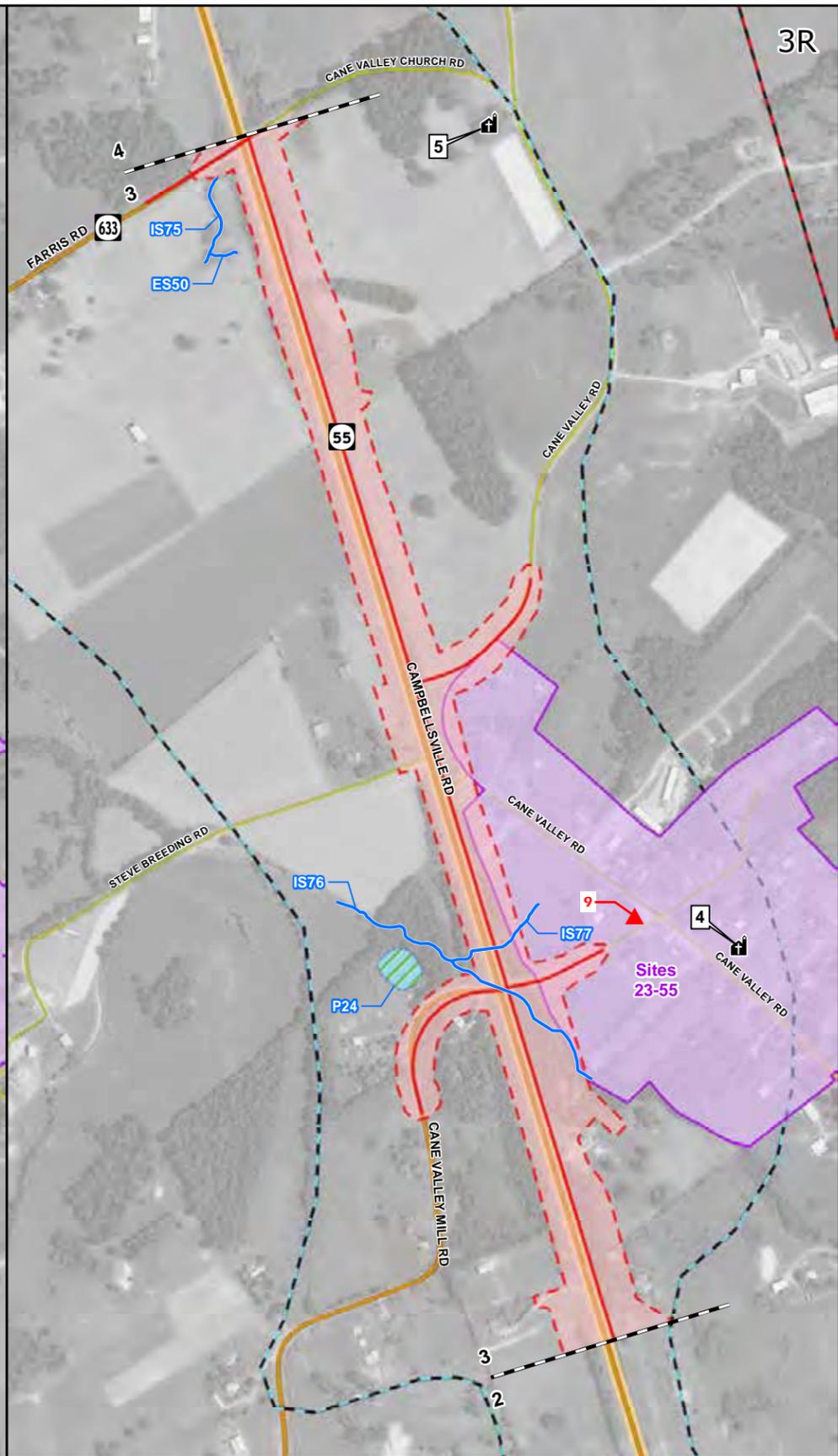
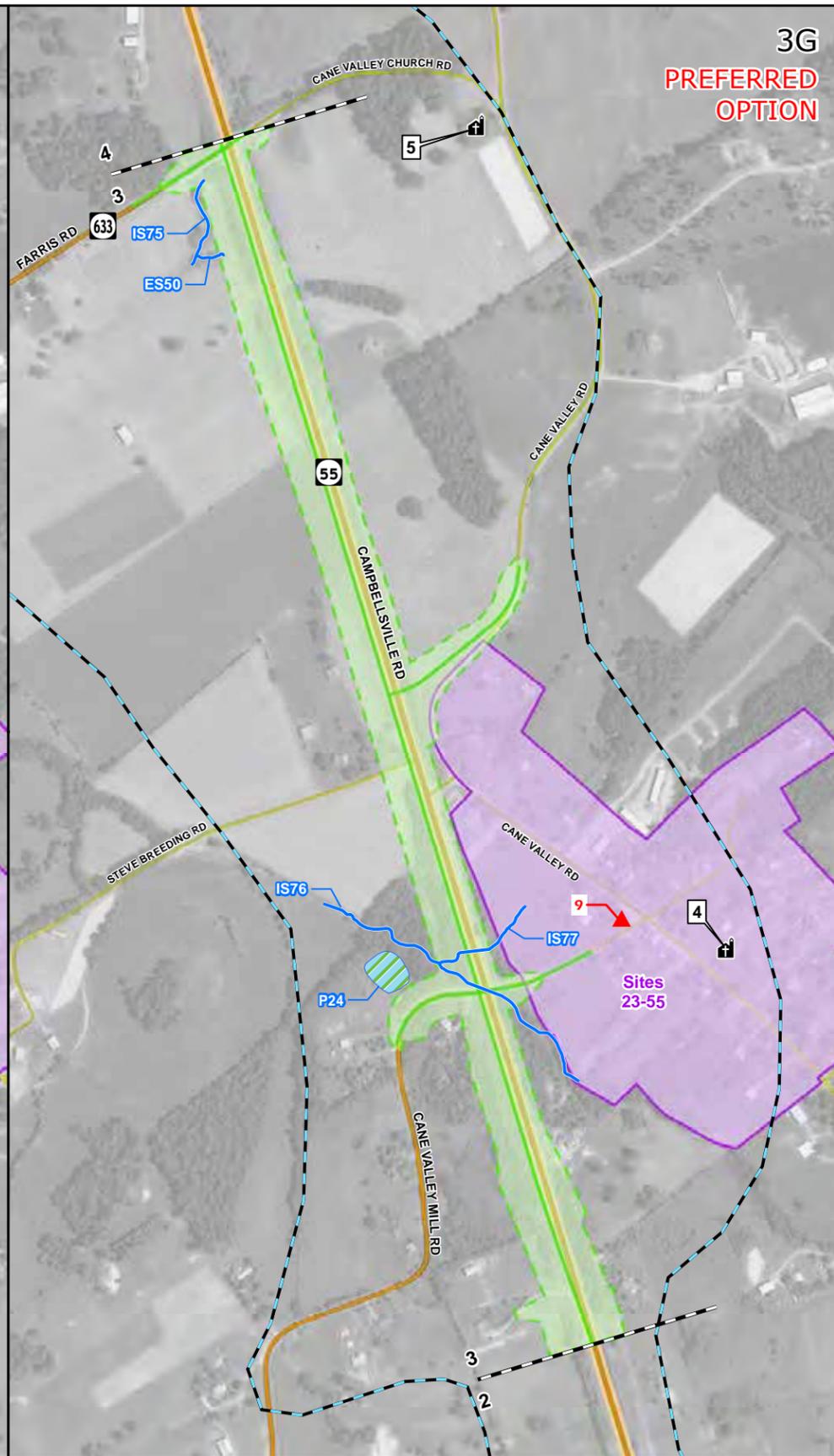
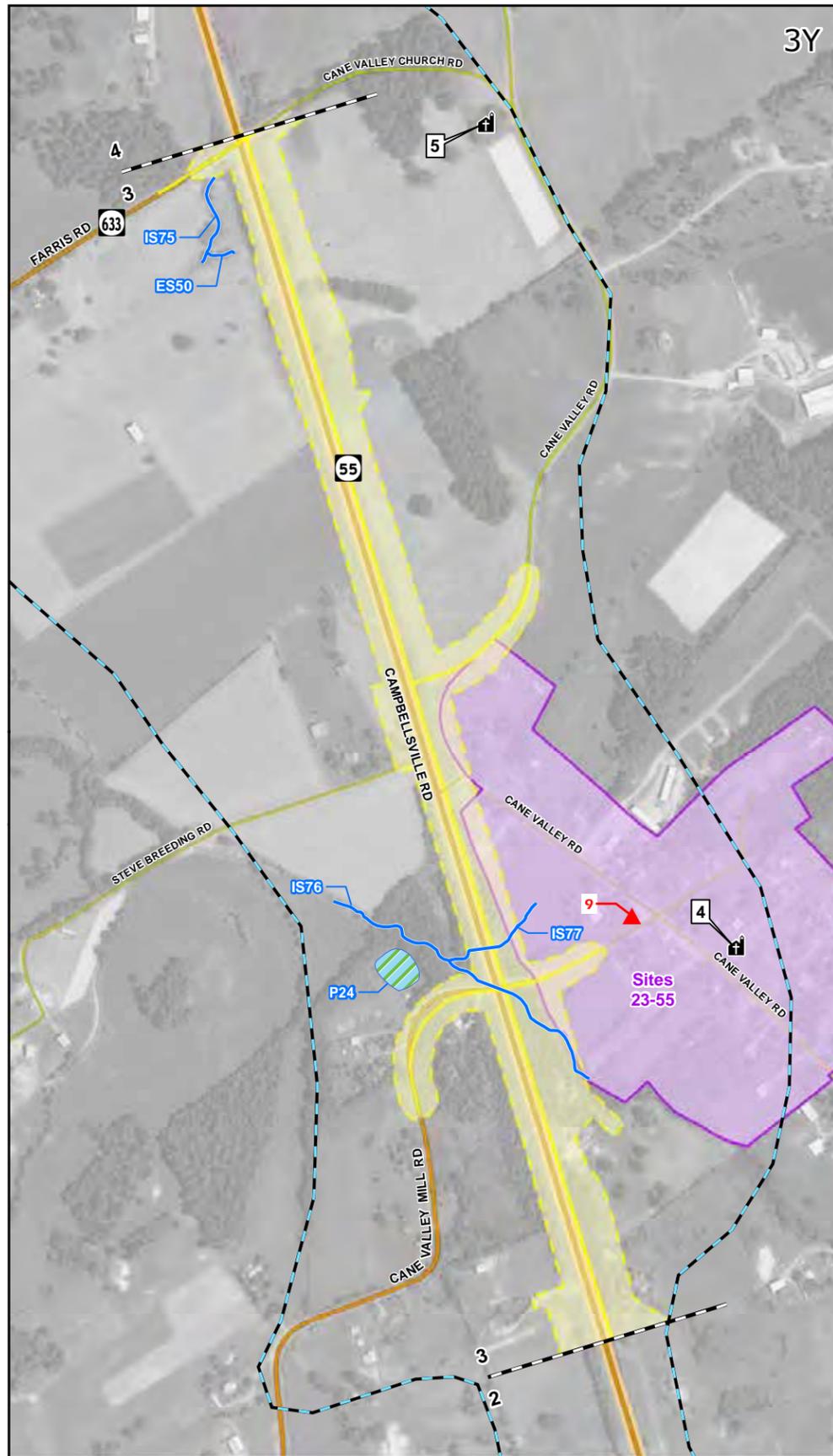
*Note: For Cemetery, Church, or Historic Site details, see Exhibit 1, Study Area Road Network and Selected Land Uses. For HAZMAT details, see Figure 16.

**Stream/Pond/Wetland Abbreviations:
 PS = Perennial Stream, IS = Intermittent Stream,
 ES = Ephemeral Stream, P = Pond, W = Wetland



REFERENCE MAP

Exhibit 4 Sheet 2
SEGMENT 2 ALTERNATIVES and ENVIRONMENTAL CONSTRAINTS
 KY 55 - Heartland Parkway
 Adair and Taylor Counties, Kentucky
 KYTC Item No. 4-142.00 and .10



1 in = 650 ft

- 3-YELLOW
- 3-GREEN
- 3-RED
- Historic Site*
- Segment Line
- Church*
- Pond/Wetland**
- Existing Heartland Pkwy
- Area of Potential Effect
- Stream**
- HAZMAT Site*

Source Citation
Topographic data, including cultural, utilities and imagery and less historic, aquatic and terrestrial courtesy of the Kentucky Division of Geographic Information (KY DGI). Q44 makes no claim to the accuracy of that data shown on this map.

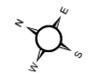
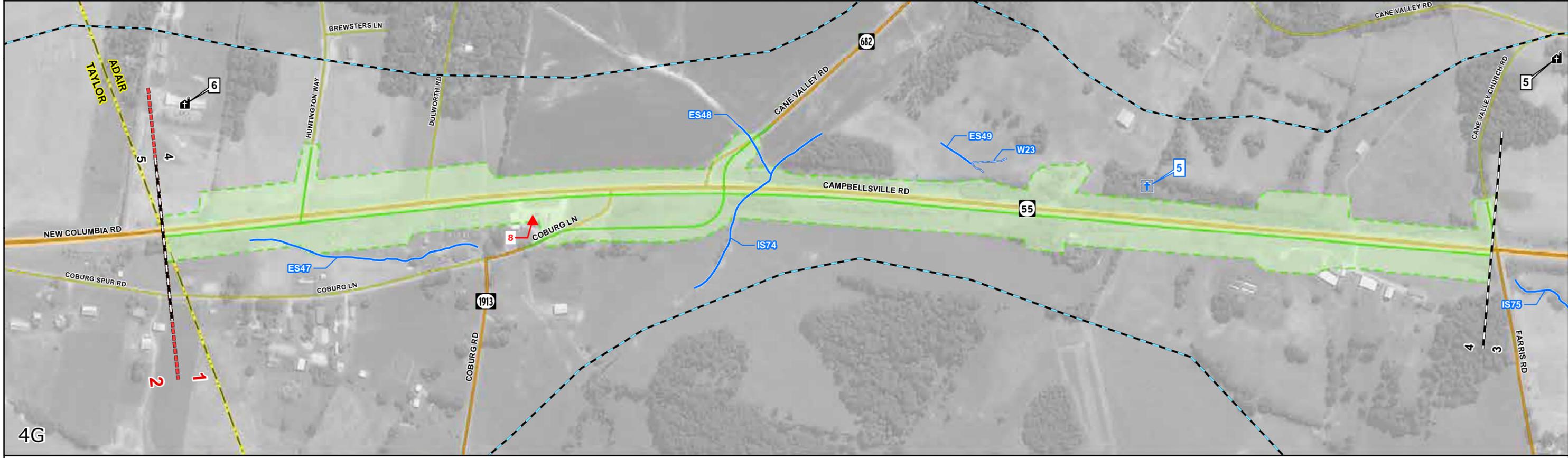
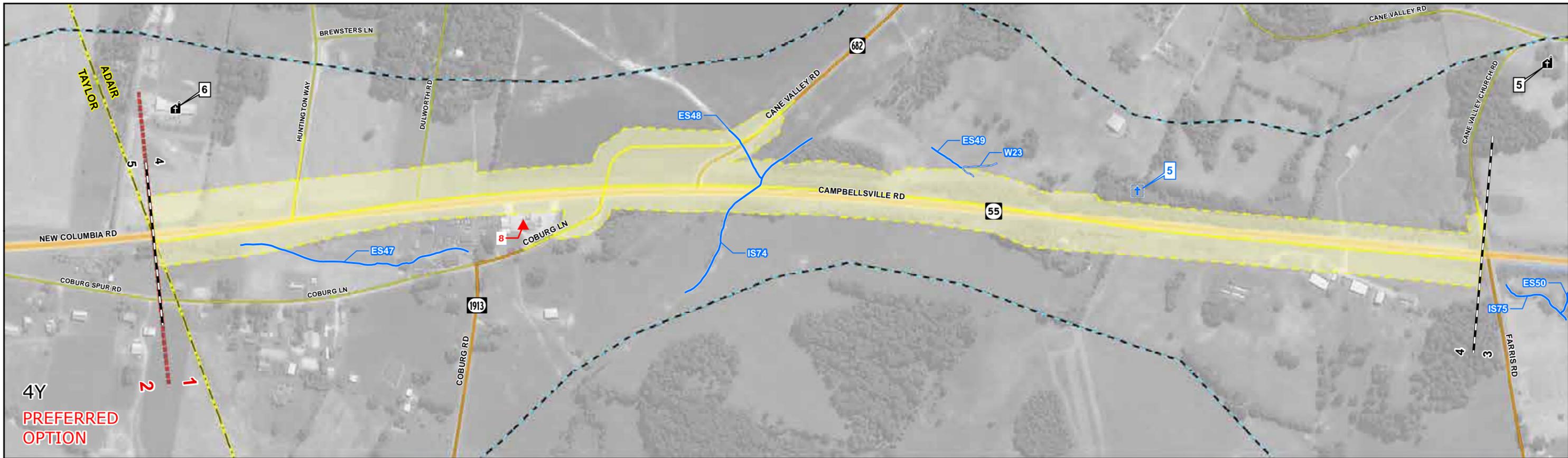
*Note: For Cemetery, Church, or Historic Site details, see Exhibit 1, Study Area Road Network and Selected Land Uses. For HAZMAT details, see Figure 16.

**Stream/Pond/Wetland Abbreviations:
PS = Perennial Stream, IS = Intermittent Stream, ES = Ephemeral Stream, P = Pond, W = Wetland



REFERENCE MAP

Exhibit 4 Sheet 3
SEGMENT 3 ALTERNATIVES and ENVIRONMENTAL CONSTRAINTS
KY 55 - Heartland Parkway
Adair and Taylor Counties, Kentucky
KYTC Item No. 4-142.00 and .10



1 in = 500 ft

- 4-YELLOW
- 4-GREEN
- Cemetery*
- Church*
- HAZMAT Site*
- Segment Line
- Section Line
- Existing Heartland Pkwy
- Stream**
- Pond/Wetland**
- Area of Potential Effect
- County Boundary

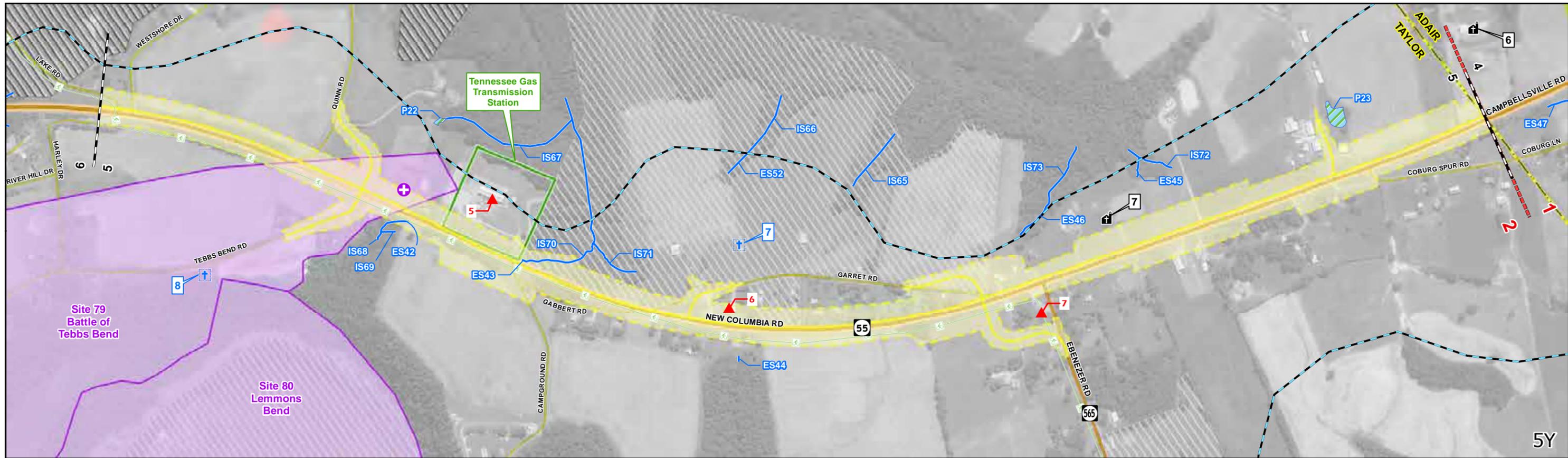
*Note: For Cemetery, Church, or Historic Site details, see Exhibit 1, Study Area Road Network and Selected Land Uses. For HAZMAT details, see Figure 16.

**Stream/Pond/Wetland Abbreviations:
 PS = Perennial Stream, IS = Intermittent Stream,
 ES = Ephemeral Stream, P = Pond, W = Wetland



Exhibit 4 Sheet 4
SEGMENT 4 ALTERNATIVES and ENVIRONMENTAL CONSTRAINTS
 KY 55 - Heartland Parkway
 Adair and Taylor Counties, Kentucky
 KYTC Item No. 4-142.00 and .10

Source Citation
 Topographic data, including cultural, utilities and imagery and less historic, aquatic and terrestrial courtesy of the Kentucky Division of Geographic Information (KY DCI). QK4 makes no claim to the accuracy of that data shown on this map.



Source Citation
Topographic data, including cultural, utilities and imagery and less historic, aquatic and terrestrial courtesy of the Kentucky Division of Geographic Information (KY DCI). QK4 makes no claim to the accuracy of that data shown on this map.

1 in = 700 ft

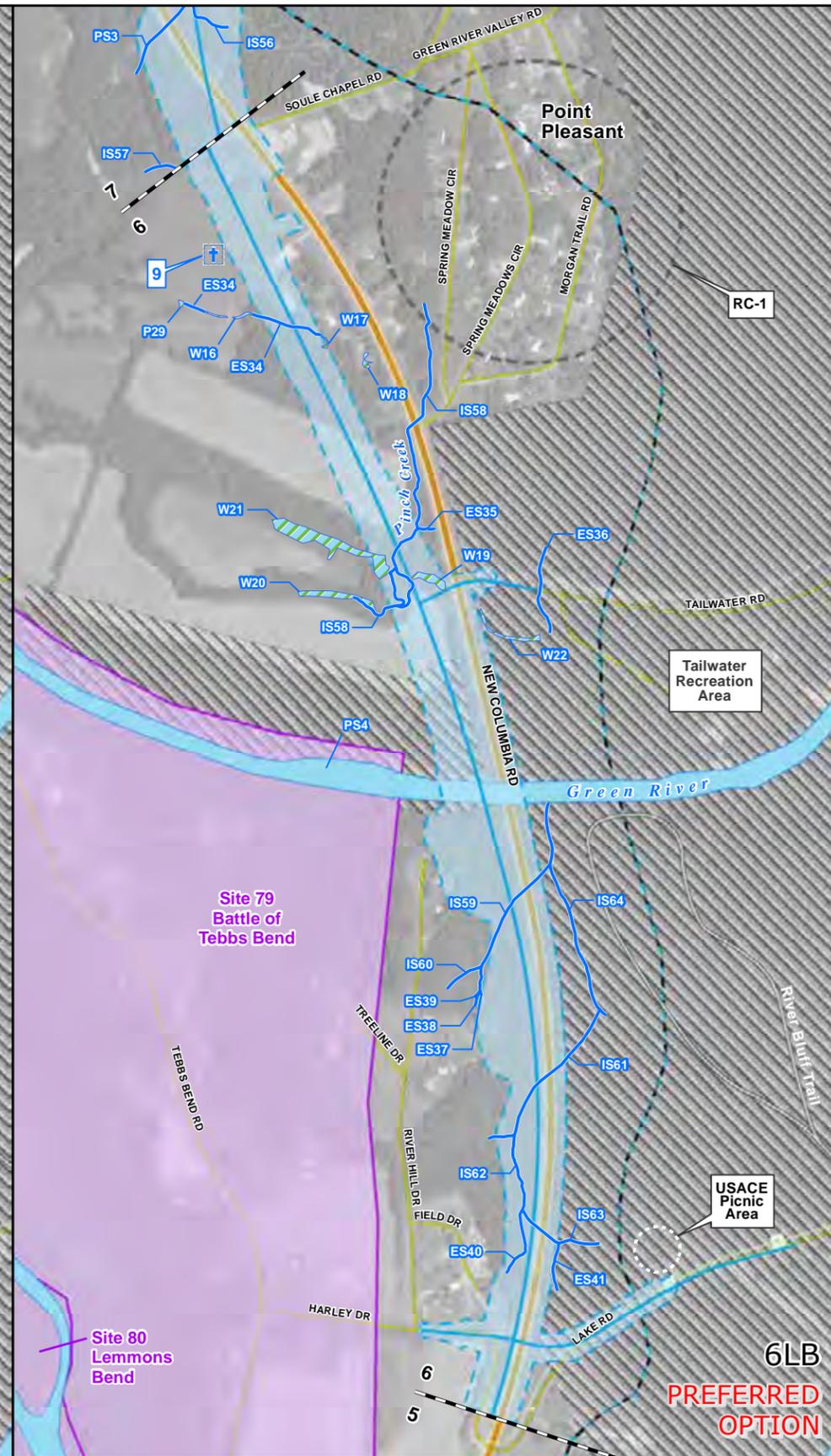
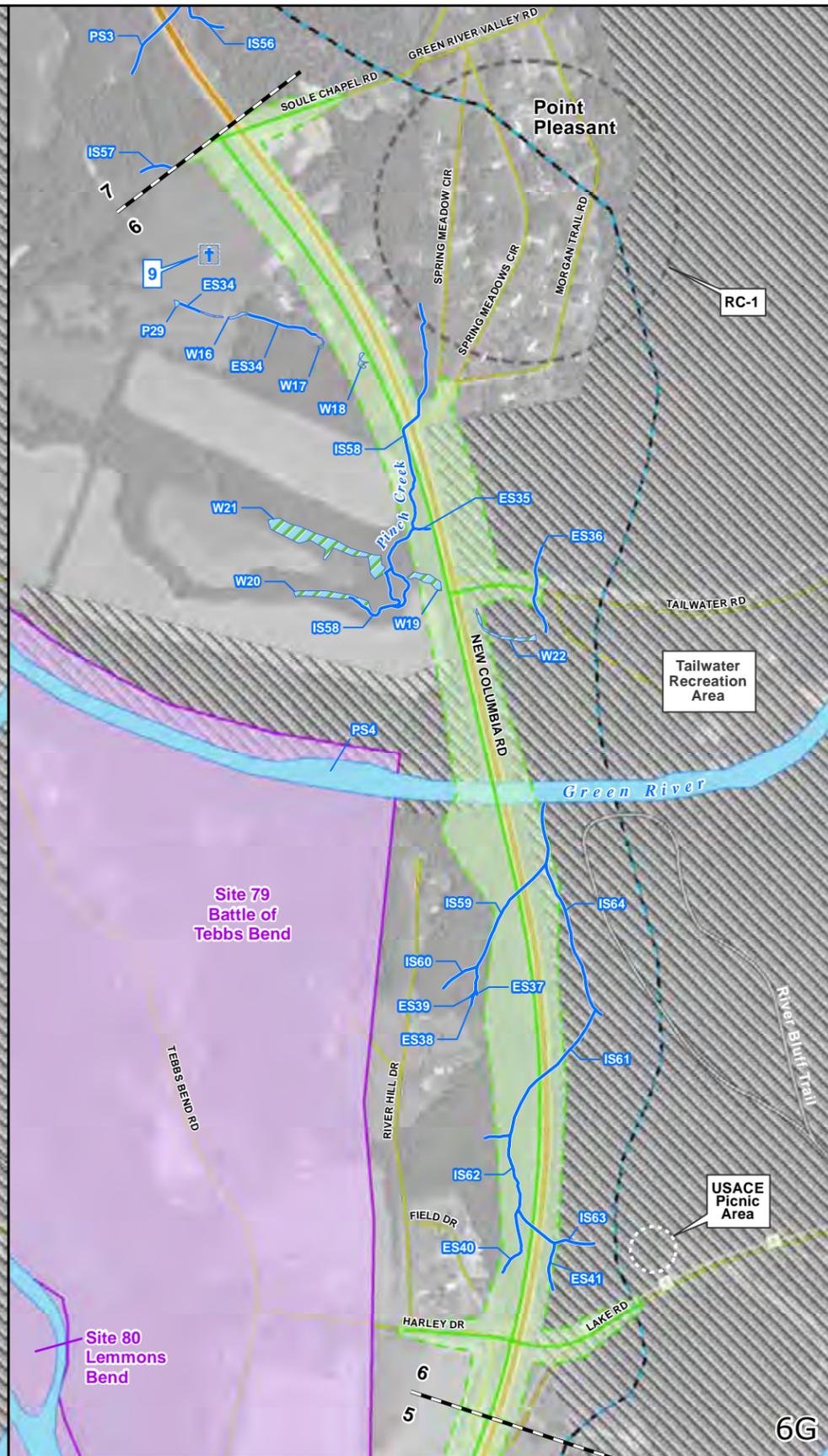
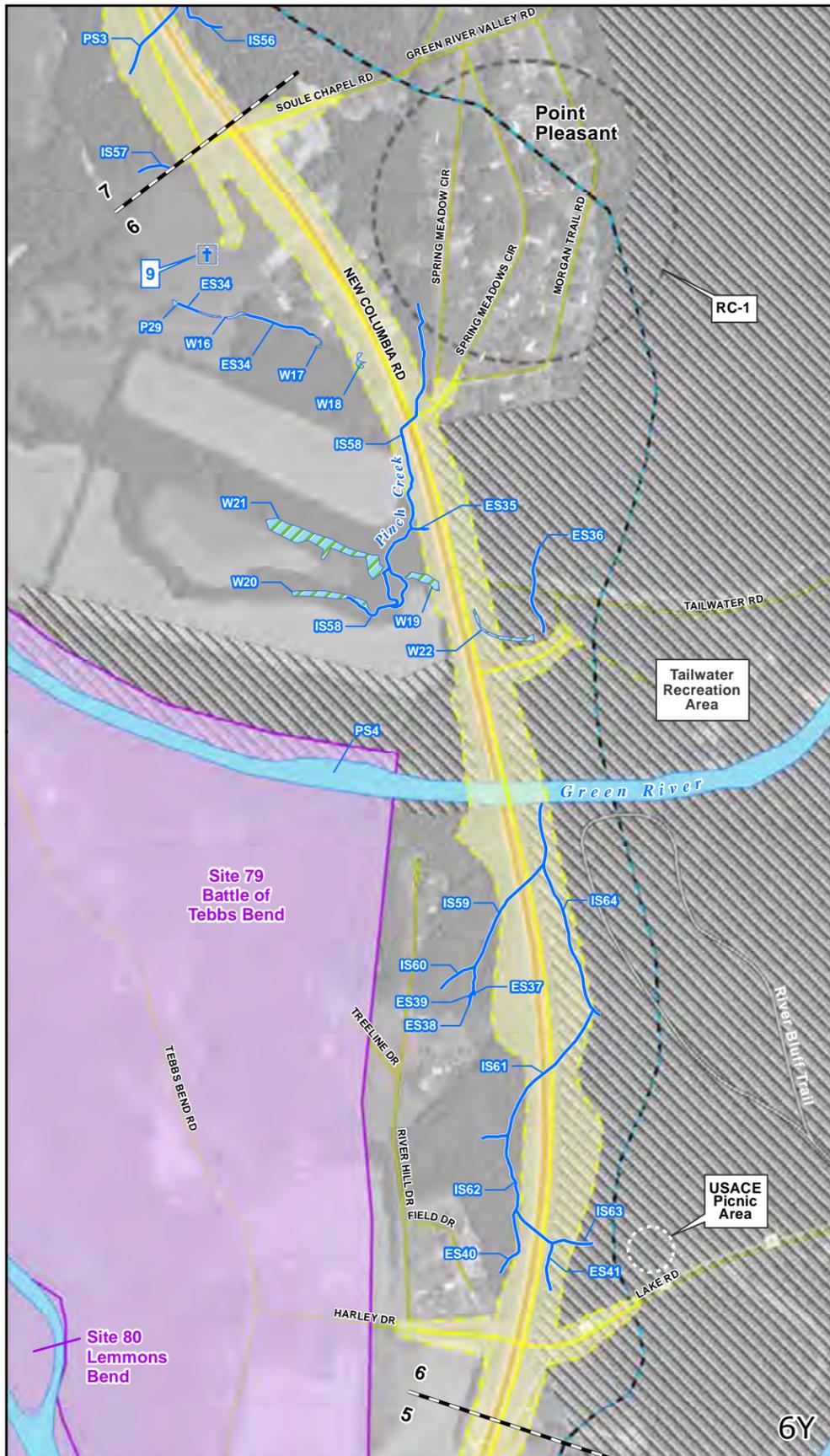
5-YELLOW	Historic Site*	Pond/Wetland**	Area of Potential Effect
5-GREEN	Section Line	Existing Heartland Pkwy	County Boundary
Cemetery*	Segment Line	Agricultural District	Atkinson-Griffin House/ Confederate Hospital Site
Church*	Bike Trail	USACE Recreation Area	
HAZMAT Site*	Stream**	Sinkhole	

***Note:** For Cemetery, Church, or Historic Site details, see Exhibit 1, Study Area Road Network and Selected Land Uses. For HAZMAT details, see Figure 16.

****Stream/Pond/Wetland Abbreviations:**
PS = Perennial Stream, IS = Intermittent Stream, ES = Ephemeral Stream, P = Pond, W = Wetland

REFERENCE MAP

Exhibit 4 Sheet 5
SEGMENT 5 ALTERNATIVES and ENVIRONMENTAL CONSTRAINTS
KY 55 - Heartland Parkway
Adair and Taylor Counties, Kentucky
KYTC Item No. 4-142.00 and .10



Source Citation
Topographic data, including cultural, utilities and imagery and less historic, aquatic and terrestrial courtesy of the Kentucky Division of Geographic Information (KY D31). QK4 makes no claim to the accuracy of that data shown on this map.

1 in = 700 ft

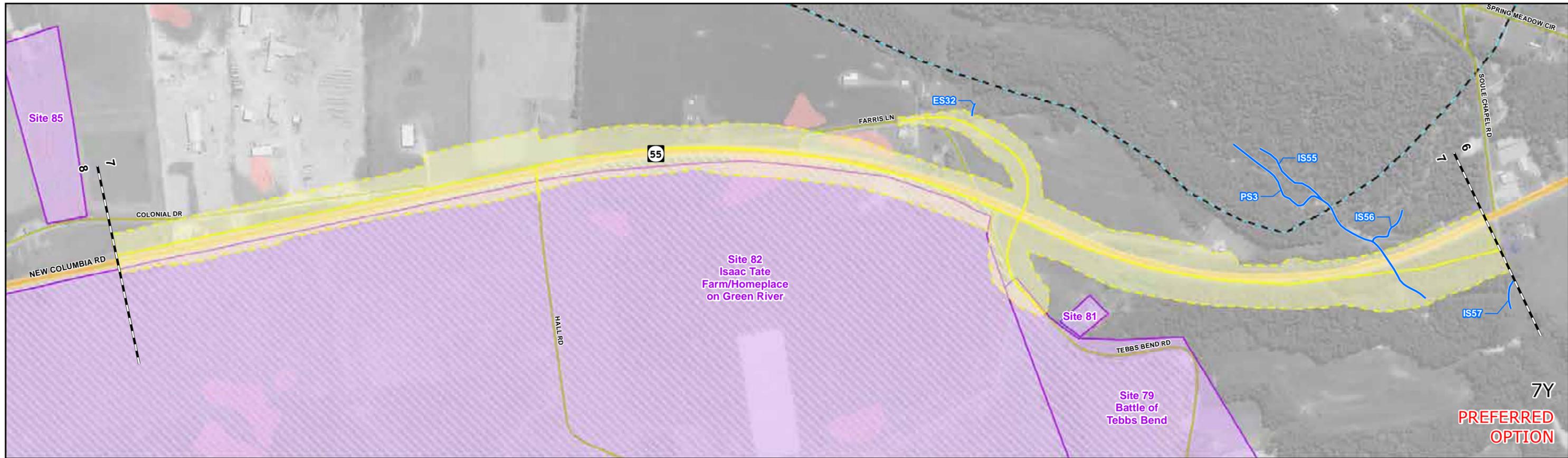
	6-YELLOW		Segment Line		Existing Heartland Pkwy
	6-GREEN		Bike Trail		Residential Cluster
	6-LT BLUE		Stream**		USACE Recreation Area
	Cemetery*		Pond/Wetland**		Area of Potential Effect
	Historic Site*				

***Note:** For Cemetery, Church, or Historic Site details, see Exhibit 1, Study Area Road Network and Selected Land Uses. For HAZMAT details, see Figure 16.

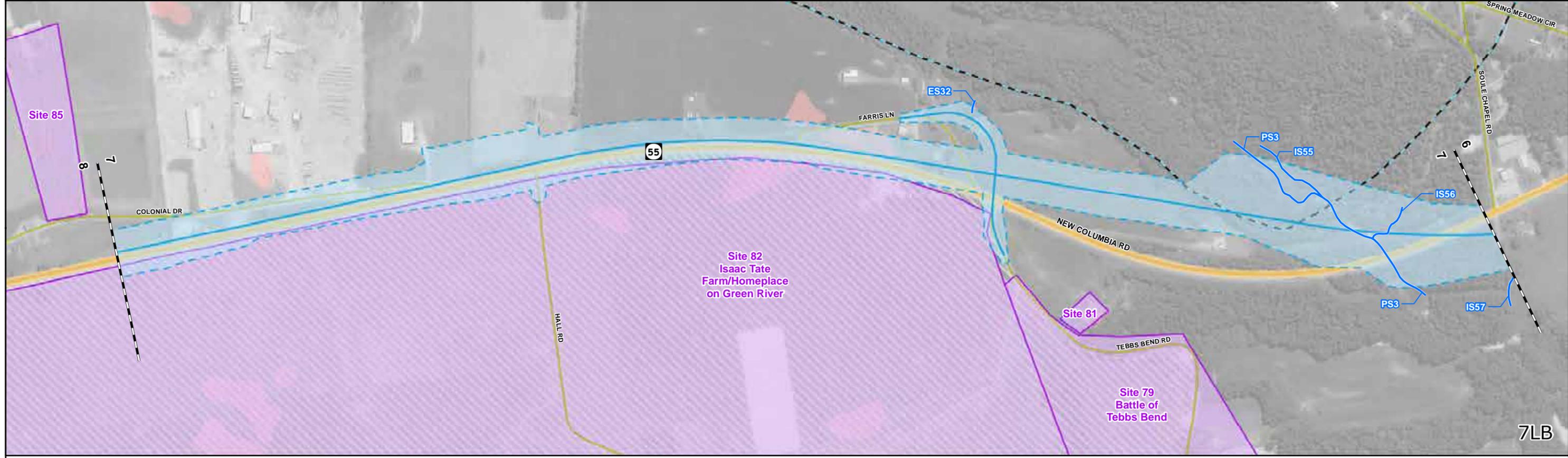
****Stream/Pond/Wetland Abbreviations:**
PS = Perennial Stream, IS = Intermittent Stream, ES = Ephemeral Stream, P = Pond, W = Wetland

REFERENCE MAP

Exhibit 4 Sheet 6
SEGMENT 6 ALTERNATIVES and ENVIRONMENTAL CONSTRAINTS
KY 55 - Heartland Parkway
Adair and Taylor Counties, Kentucky
KYTC Item No. 4-142.00 and .10



7Y
**PREFERRED
 OPTION**



7LB



1 in = 500 ft

- 7-YELLOW
- 7-LT BLUE
- Historic Site*
- Segment Line
- Existing Heartland Pkwy
- Area of Potential Effect
- Agricultural District
- Stream**
- Sinkhole

*Note: For Cemetery, Church, or Historic Site details, see Exhibit 1, Study Area Road Network and Selected Land Uses. For HAZMAT details, see Figure 16.

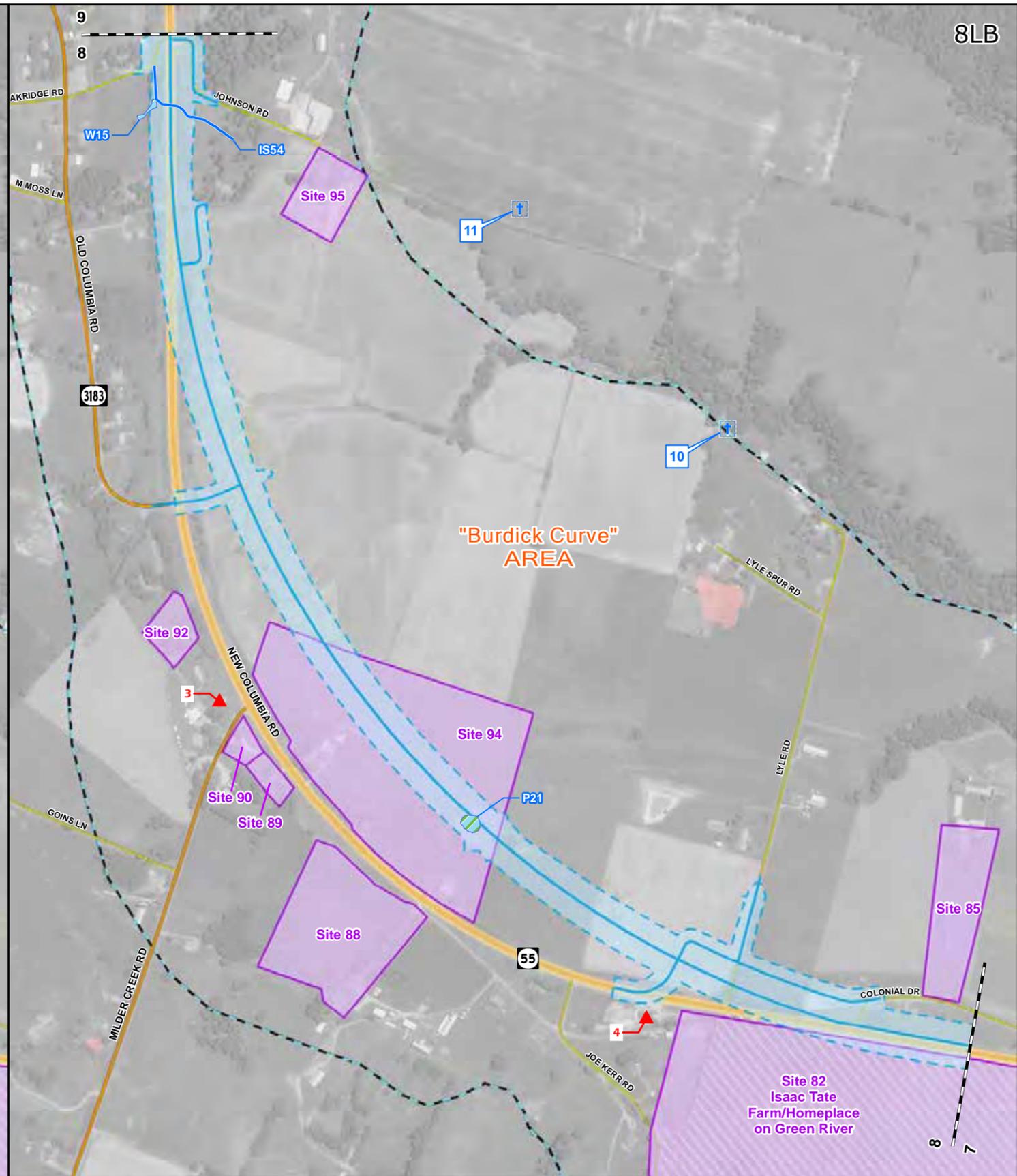
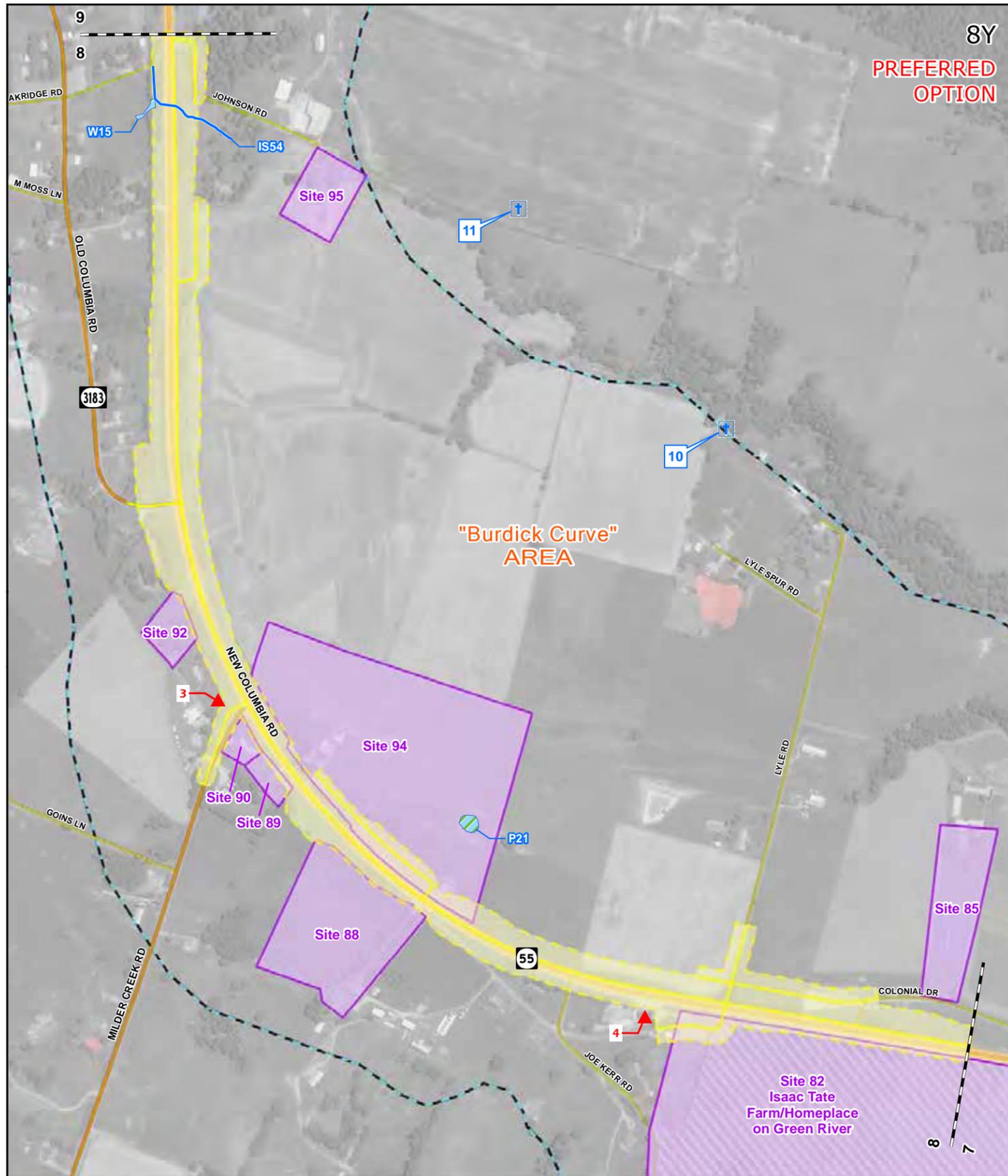
**Stream/Pond/Wetland Abbreviations:
 PS = Perennial Stream, IS = Intermittent Stream,
 ES = Ephemeral Stream, P = Pond, W = Wetland



REFERENCE MAP

Exhibit 4 Sheet 7
**SEGMENT 7 ALTERNATIVES and
 ENVIRONMENTAL CONSTRAINTS**
 KY 55 - Heartland Parkway
 Adair and Taylor Counties, Kentucky
 KYTC Item No. 4-142.00 and .10

Source Citation
 Topographic data, including cultural, utilities and imagery and less historic, aquatic and terrestrial courtesy of the Kentucky Division of Geographic Information (KY DGI). OK4 makes no claim to the accuracy of that data shown on this map.



8Y
PREFERRED
OPTION

8LB

"Burdick Curve"
AREA

"Burdick Curve"
AREA



1 in = 700 ft

- | | | |
|--------------|----------------|--------------------------|
| 8-YELLOW | Historic Site* | Existing Heartland Pkwy |
| 8-LT BLUE | Segment Line | Area of Potential Effect |
| Cemetery* | Stream** | Agricultural District |
| HAZMAT Site* | Pond/Wetland** | Sinkhole |

Source Citation
Topographic data, including cultural, utilities and imagery and less historic, aquatic and terrestrial courtesy of the Kentucky Division of Geographic Information (KY DCI). QK4 makes no claim to the accuracy of that data shown on this map.

*Note: For Cemetery, Church, or Historic Site details, see Exhibit 1, Study Area Road Network and Selected Land Uses. For HAZMAT details, see Figure 16.

**Stream/Pond/Wetland Abbreviations:
PS = Perennial Stream, IS = Intermittent Stream, ES = Ephemeral Stream, P = Pond, W = Wetland



Exhibit 4 Sheet 8
SEGMENT 8 ALTERNATIVES and ENVIRONMENTAL CONSTRAINTS
KY 55 - Heartland Parkway
Adair and Taylor Counties, Kentucky
KYTC Item No. 4-142.00 and .10



Source Citation
Topographic data, including cultural, utilities and imagery and less historic, aquatic and terrestrial courtesy of the Kentucky Division of Geographic Information (KY DCI). Q4 makes no claim to the accuracy of that data shown on this map.

1 in = 500 ft

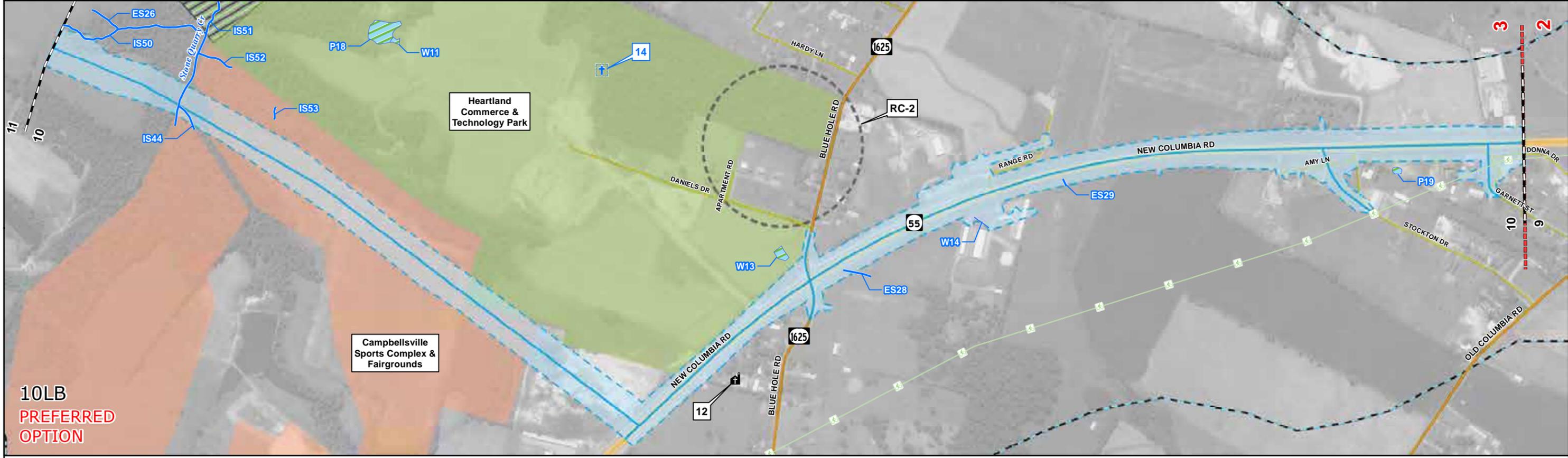
9-YELLOW	HAZMAT Site*	Stream**
9-GREEN	Segment Line	Pond/Wetland**
9-LT BLUE	Section Line	Existing Heartland Pkwy
Cemetery*	Bike Trail	Area of Potential Effect
Church*		

***Note:** For Cemetery, Church, or Historic Site details, see Exhibit 1, Study Area Road Network and Selected Land Uses. For HAZMAT details, see Figure 16.

****Stream/Pond/Wetland Abbreviations:**
PS = Perennial Stream, IS = Intermittent Stream, ES = Ephemeral Stream, P = Pond, W = Wetland

Exhibit 4 Sheet 9
SEGMENT 9 ALTERNATIVES and ENVIRONMENTAL CONSTRAINTS
KY 55 - Heartland Parkway
Adair and Taylor Counties, Kentucky
KYTC Item No. 4-142.00 and .10

REFERENCE MAP



1 in = 700 ft

- 10-YELLOW
- 10-LT BLUE
- Cemetery*
- Church*
- Segment Line
- Section Line
- Bike Trail
- Stream**
- Pond/Wetland**
- Existing Heartland Pkwy
- Area of Potential Effect
- Residential Cluster
- Sports Complex Site
- Technology Park Site
- Green River Lake WMA

*Note: For Cemetery, Church, or Historic Site details, see Exhibit 1, Study Area Road Network and Selected Land Uses. For HAZMAT details, see Figure 16.

**Stream/Pond/Wetland Abbreviations:
 PS = Perennial Stream, IS = Intermittent Stream,
 ES = Ephemeral Stream, P = Pond, W = Wetland

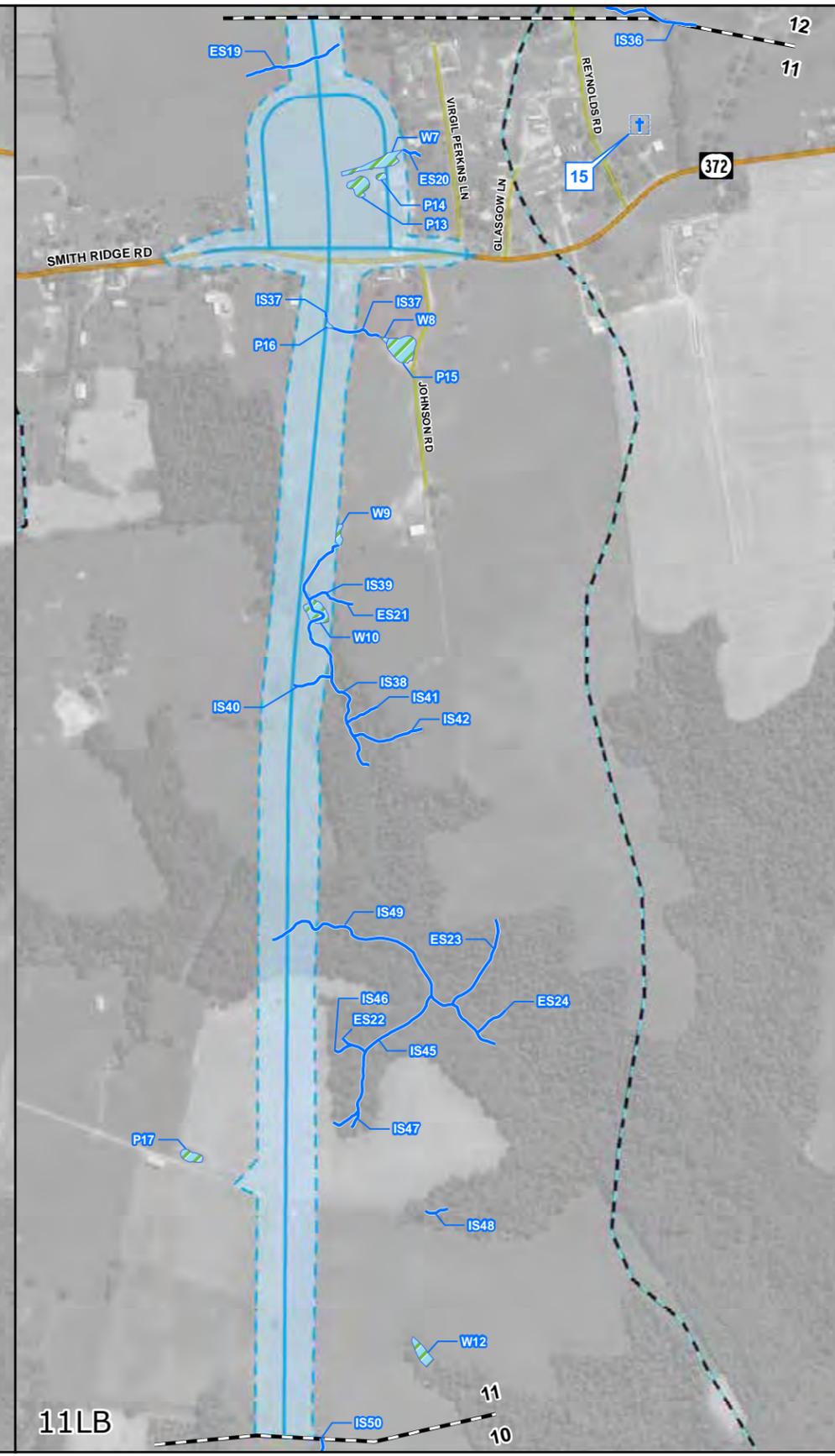
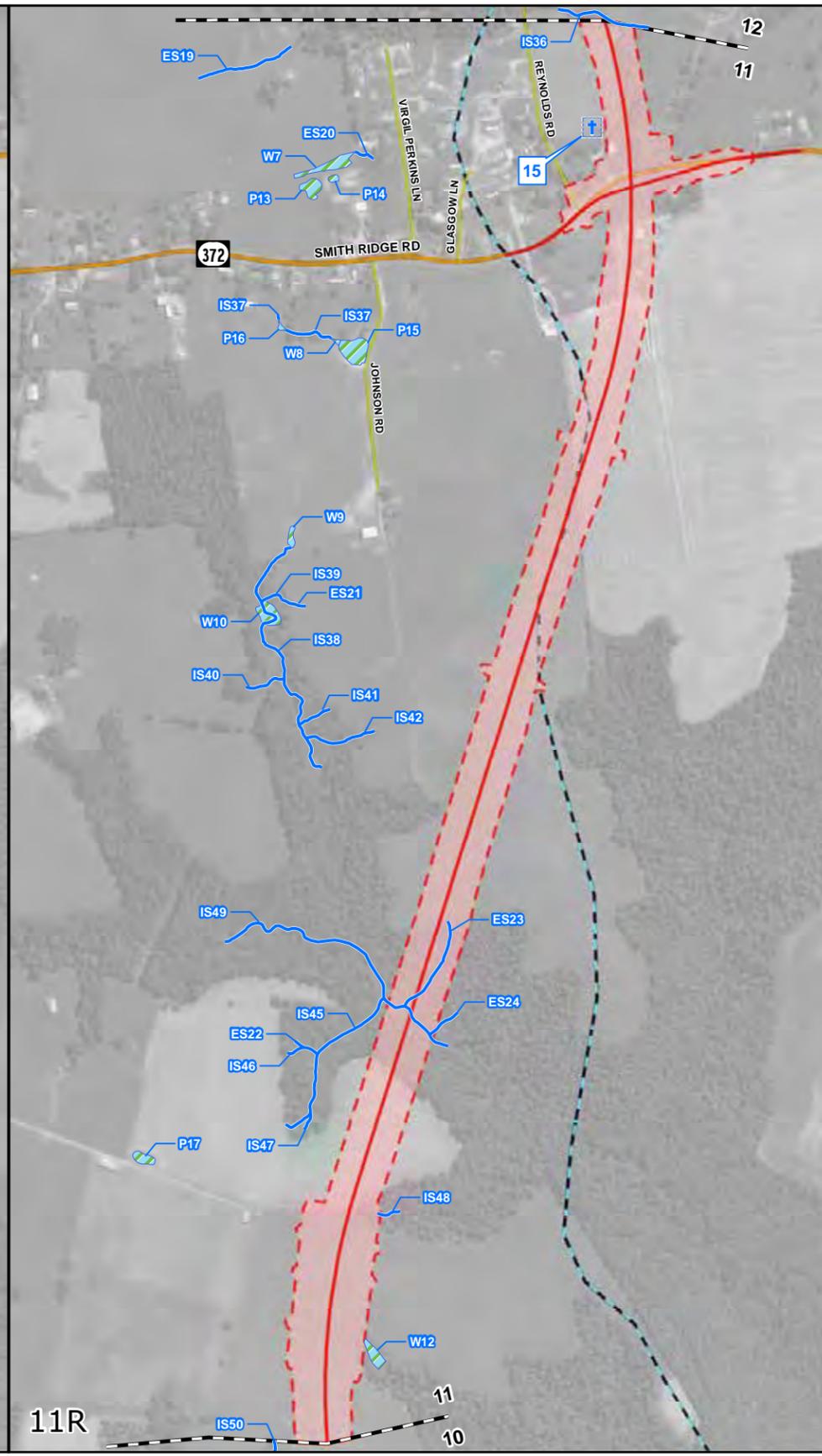
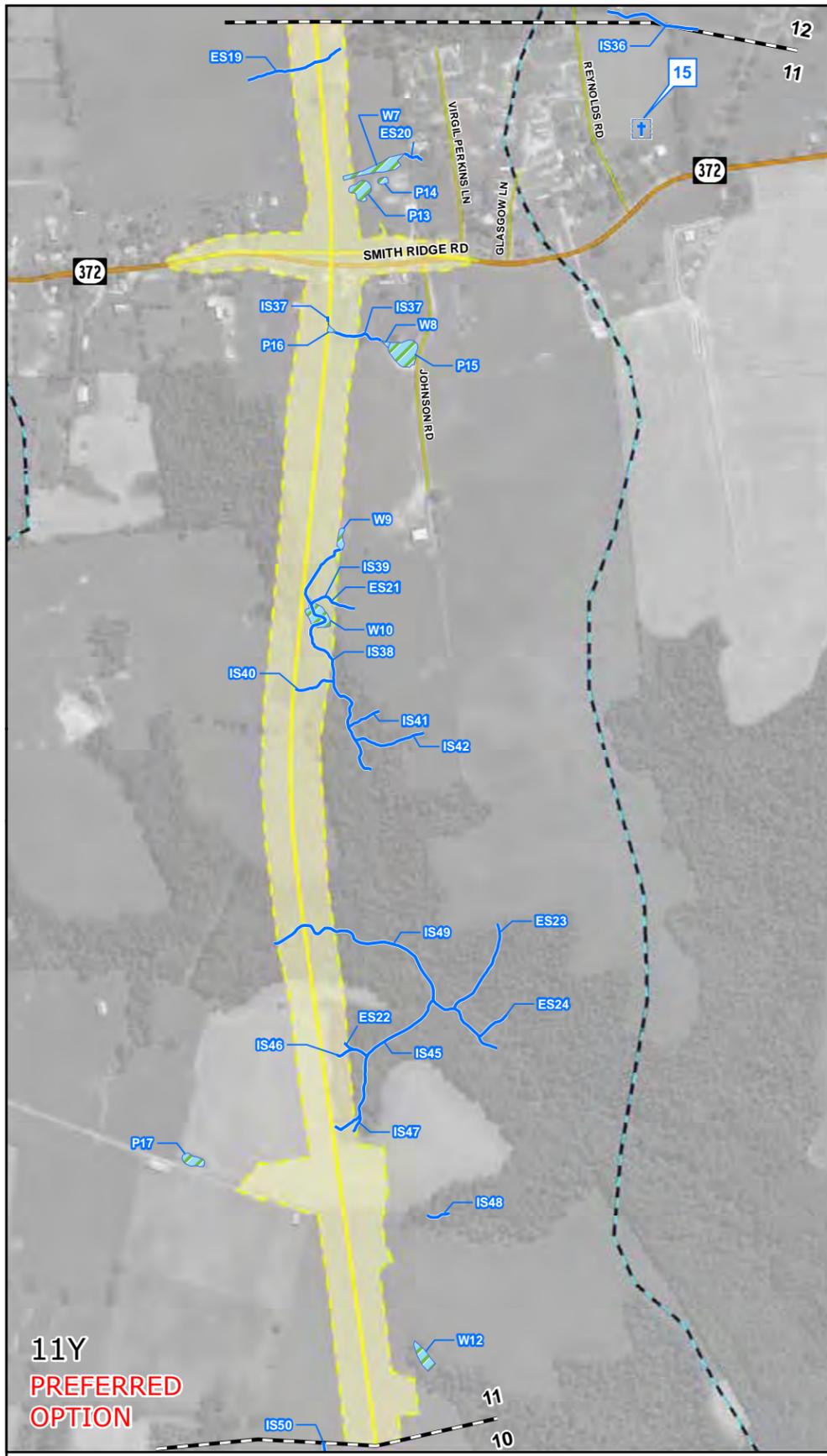


REFERENCE MAP

Exhibit 4 Sheet 10
SEGMENT 10 ALTERNATIVES and ENVIRONMENTAL CONSTRAINTS
 KY 55 - Heartland Parkway
 Adair and Taylor Counties, Kentucky
 KYTC Item No. 4-142.00 and .10

10Y
**PREFERRED
 OPTION**

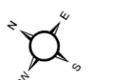
10LB
**PREFERRED
 OPTION**



11Y
PREFERRED
OPTION

11R

11LB



1 in = 750 ft

- 11-YELLOW
- 11-RED
- 11-LT BLUE

- Cemetery*
- Segment Line
- Stream**

- Pond/Wetland**
- Existing Heartland Pkwy
- Area of Potential Effect

*Note: For Cemetery, Church, or Historic Site details, see Exhibit 1, Study Area Road Network and Selected Land Uses. For HAZMAT details, see Figure 16.

**Stream/Pond/Wetland Abbreviations:
PS = Perennial Stream, IS = Intermittent Stream, ES = Ephemeral Stream, P = Pond, W = Wetland

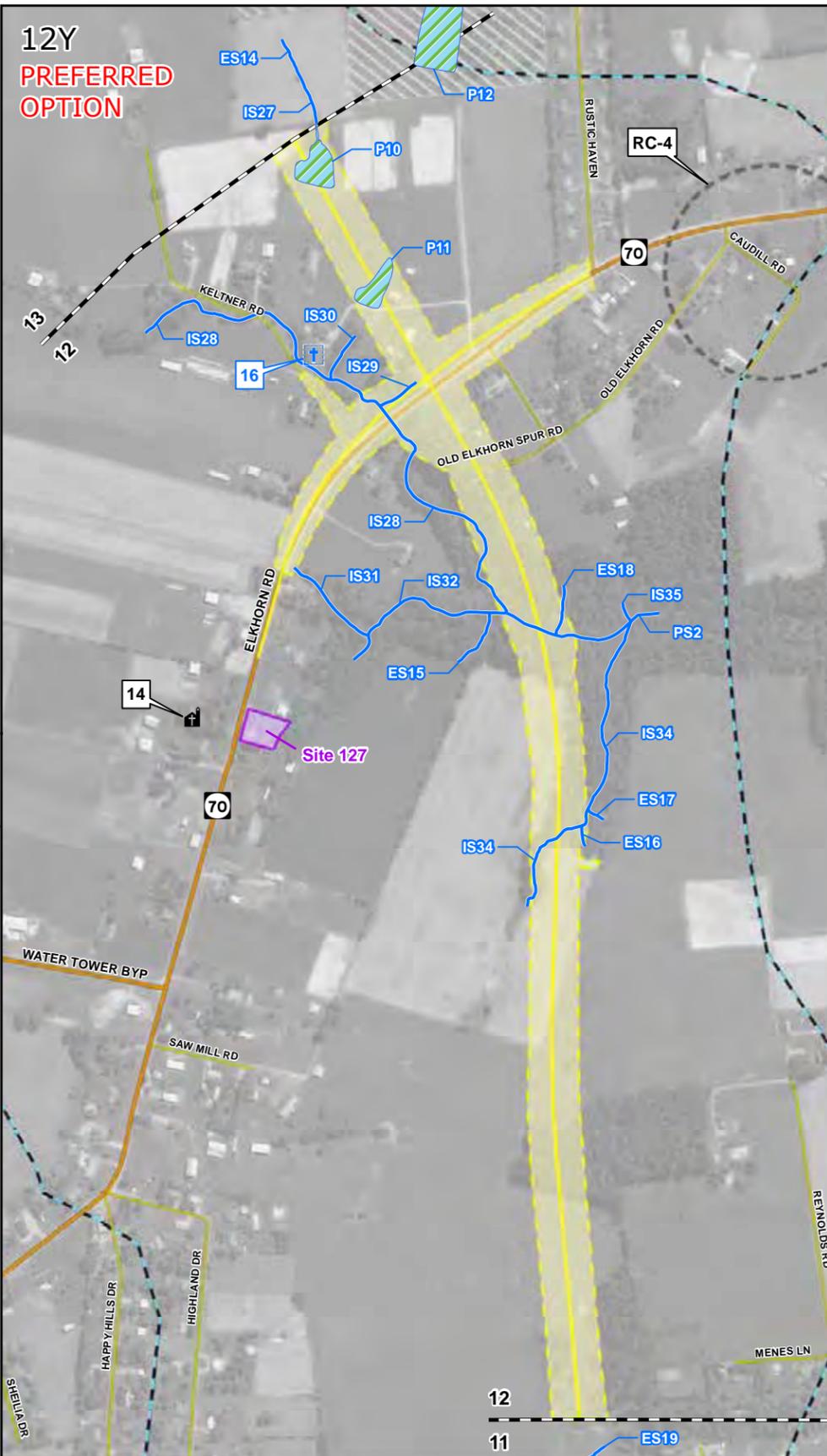


REFERENCE MAP

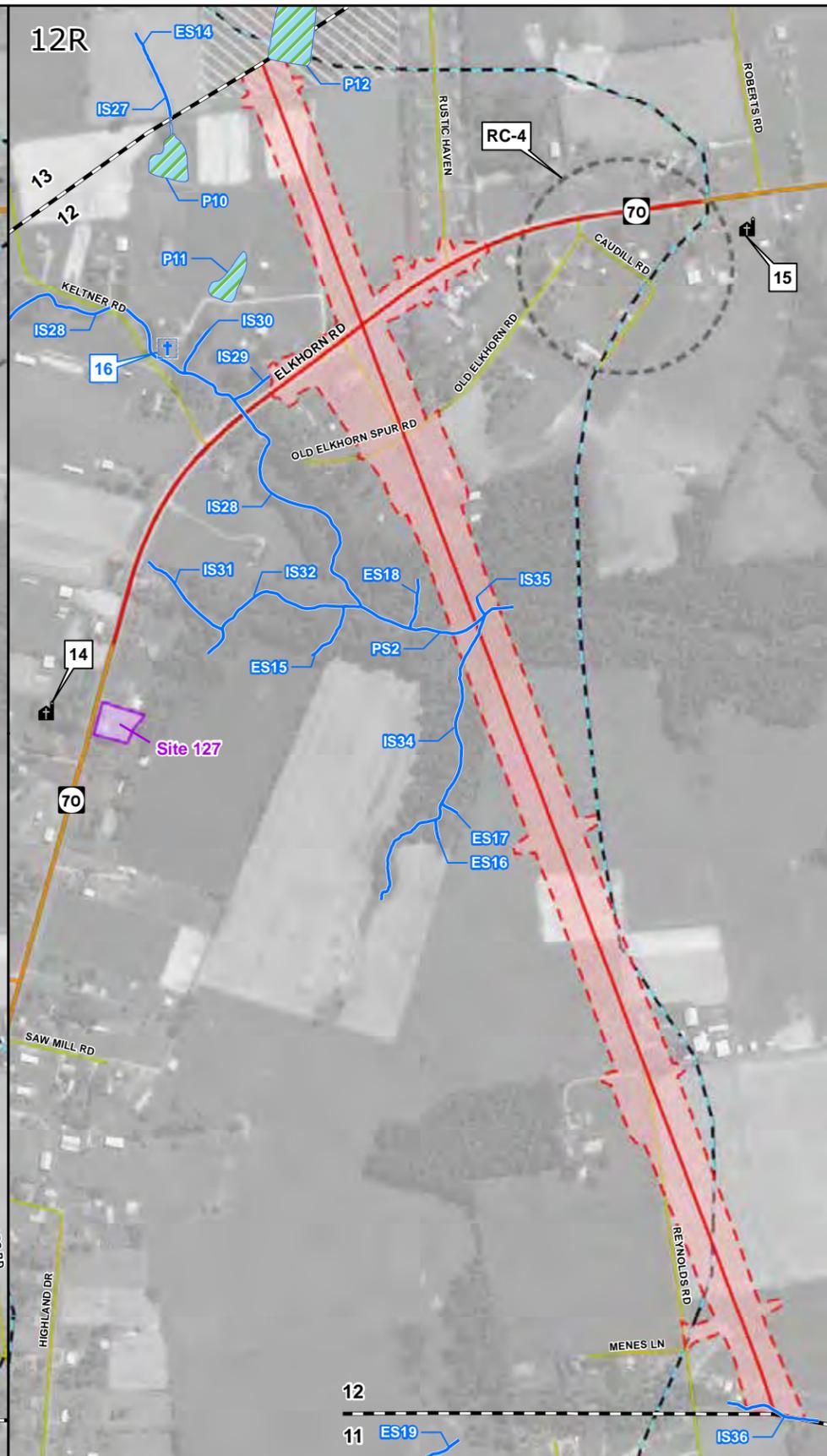
Exhibit 4 Sheet 11
SEGMENT 11 ALTERNATIVES and
ENVIRONMENTAL CONSTRAINTS
KY 55 - Heartland Parkway
Adair and Taylor Counties, Kentucky
KYTC Item No. 4-142.00 and .10

Source Citation
Topographic data, including cultural, utilities and imagery and less historic, aquatic and terrestrial courtesy of the Kentucky Division of Geographic Information (KY DCI). QK4 makes no claim to the accuracy of that data shown on this map.

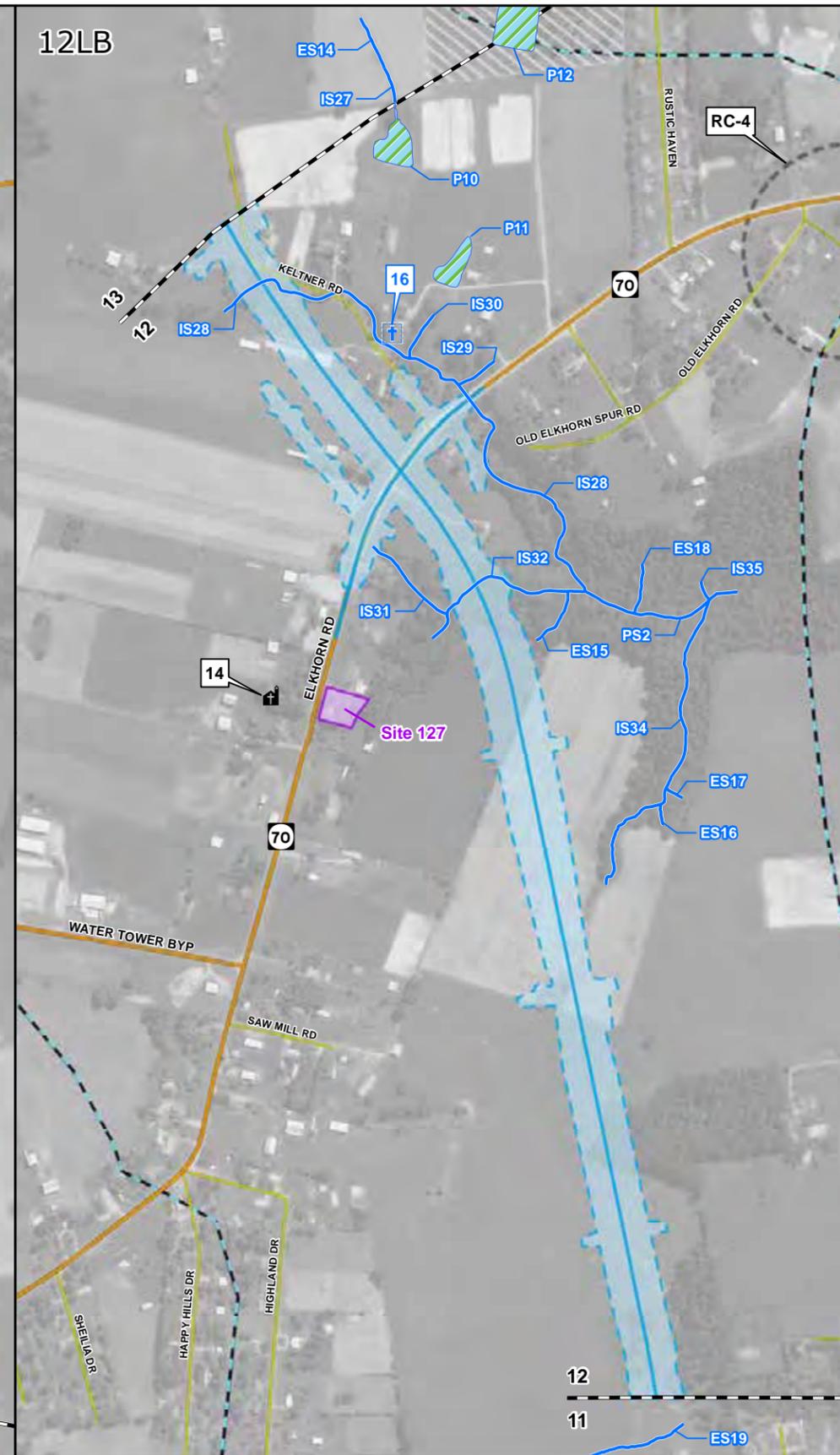
12Y
PREFERRED
OPTION



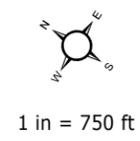
12R



12LB



Kentucky
Source Citation
Topographic data, including cultural, utilities and imagery and less historic, aquatic and terrestrial courtesy of the Kentucky Division of Geographic Information (KY DCI). OK4 makes no claim to the accuracy of that data shown on this map.



- 12-YELLOW
- 12-RED
- 12-LT BLUE
- Historic Site*
- Segment Line
- Stream**
- Cemetery*
- Church*
- Existing Heartland Pkwy
- Area of Potential Effect
- Residential Cluster
- Agricultural District
- Pond/Wetland**

*Note: For Cemetery, Church, or Historic Site details, see Exhibit 1, Study Area Road Network and Selected Land Uses. For HAZMAT details, see Figure 16.
**Stream/Pond/Wetland Abbreviations:
PS = Perennial Stream, IS = Intermittent Stream, ES = Ephemeral Stream, P = Pond, W = Wetland

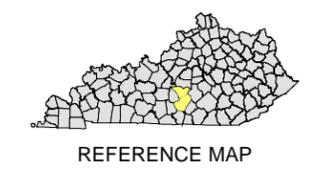
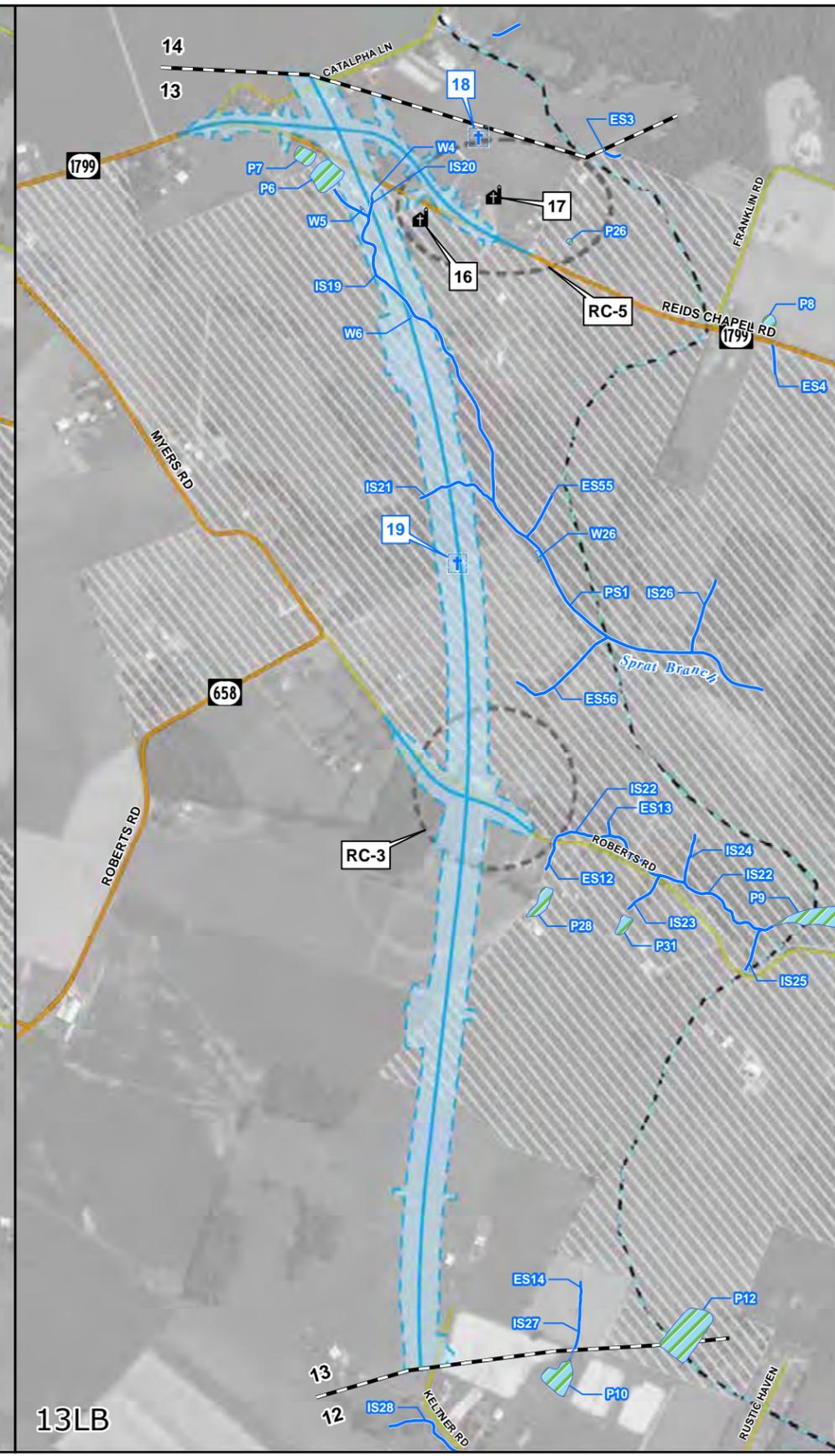
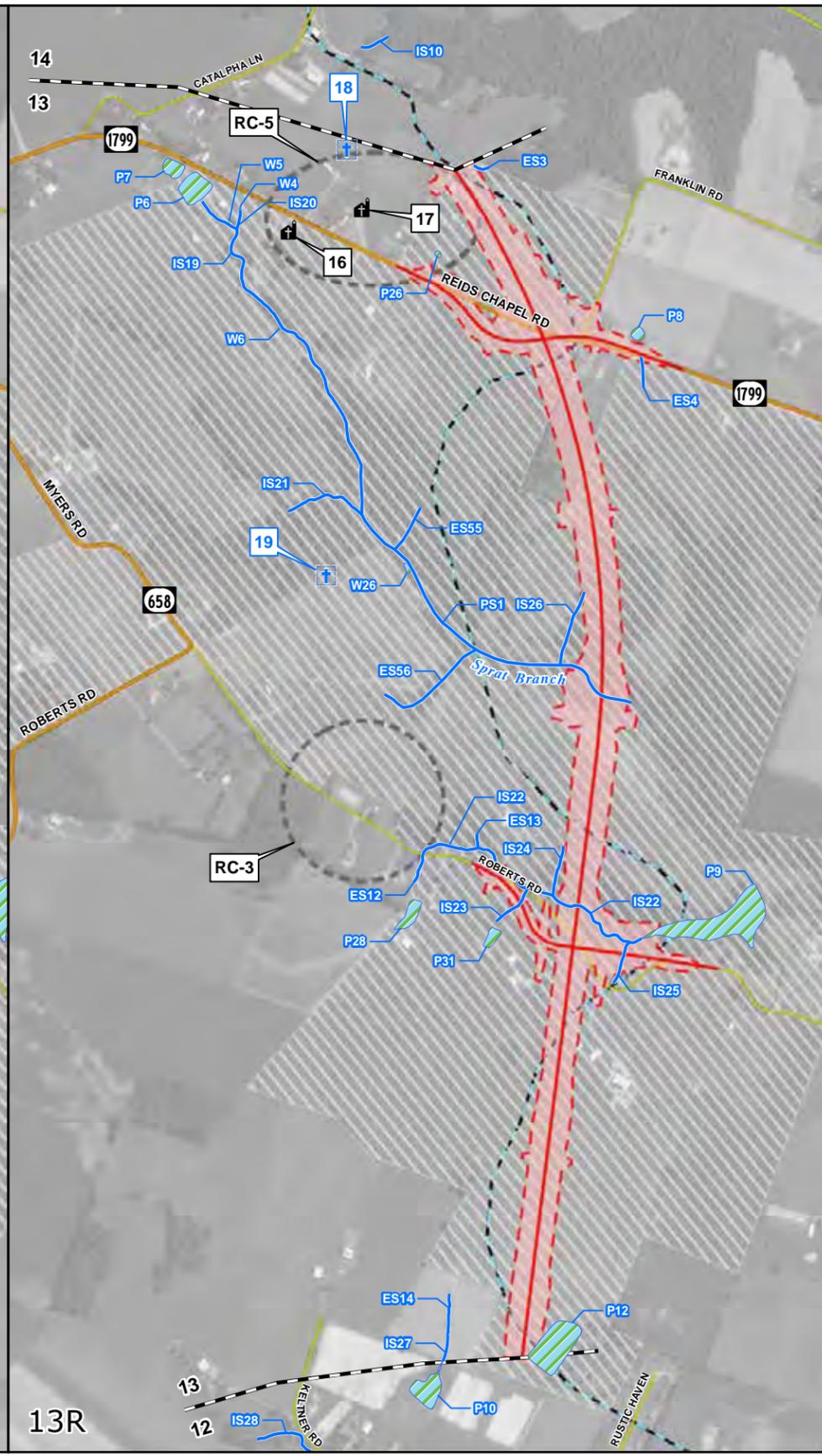
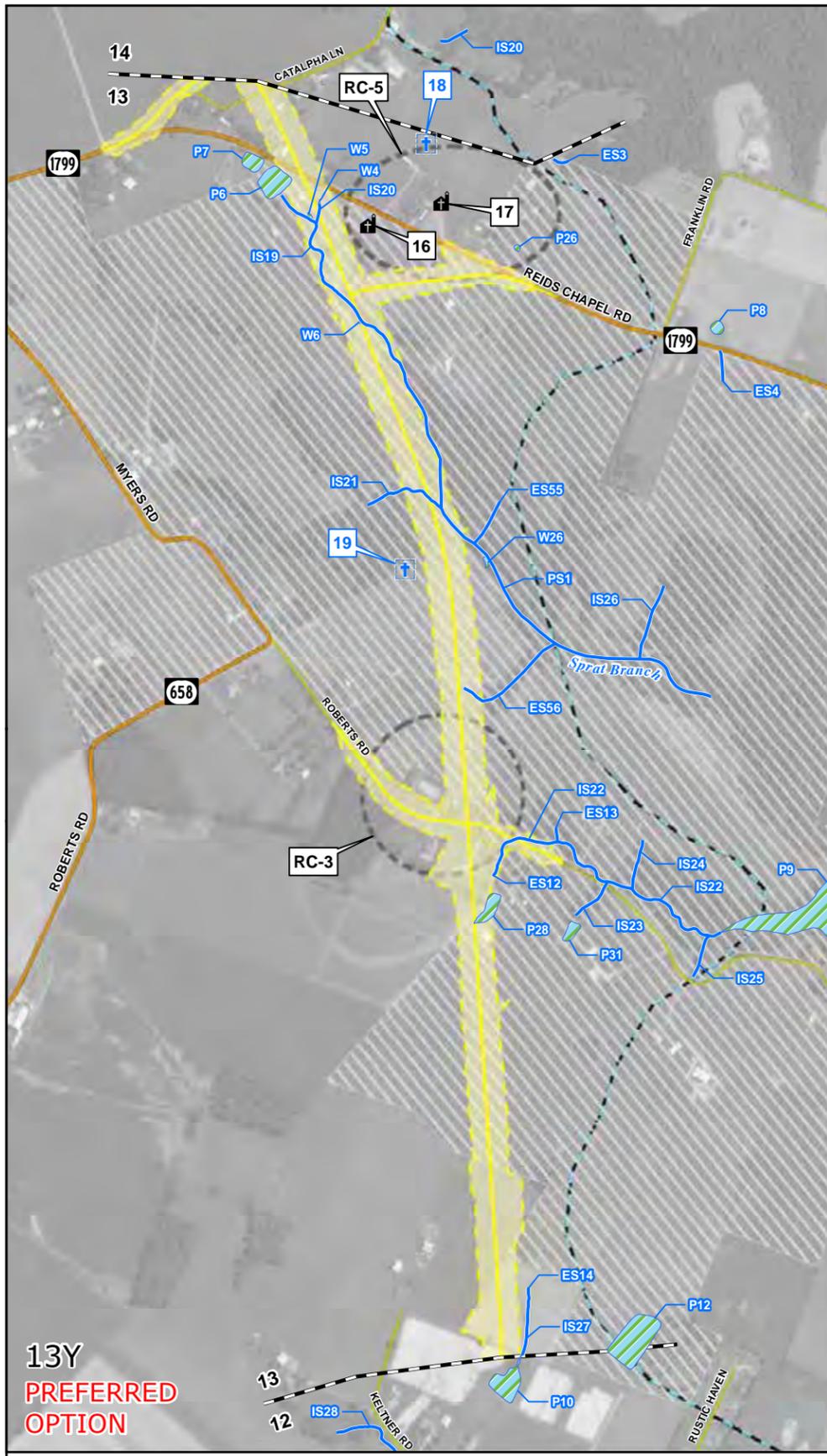


Exhibit 4 Sheet 12
SEGMENT 12 ALTERNATIVES and ENVIRONMENTAL CONSTRAINTS
KY 55 - Heartland Parkway
Adair and Taylor Counties, Kentucky
KYTC Item No. 4-142.00 and .10



13Y
PREFERRED
OPTION

13R

13LB



1 in = 1,000 ft

- 13-YELLOW
- 13-RED
- 13-LT BLUE
- Cemetery*

- Church*
- Segment Line
- Stream**
- Pond/Wetland**

- Existing Heartland Pkwy
- Area of Potential Effect
- Agricultural District
- Residential Cluster

*Note: For Cemetery, Church, or Historic Site details, see Exhibit 1, Study Area Road Network and Selected Land Uses. For HAZMAT details, see Figure 16.

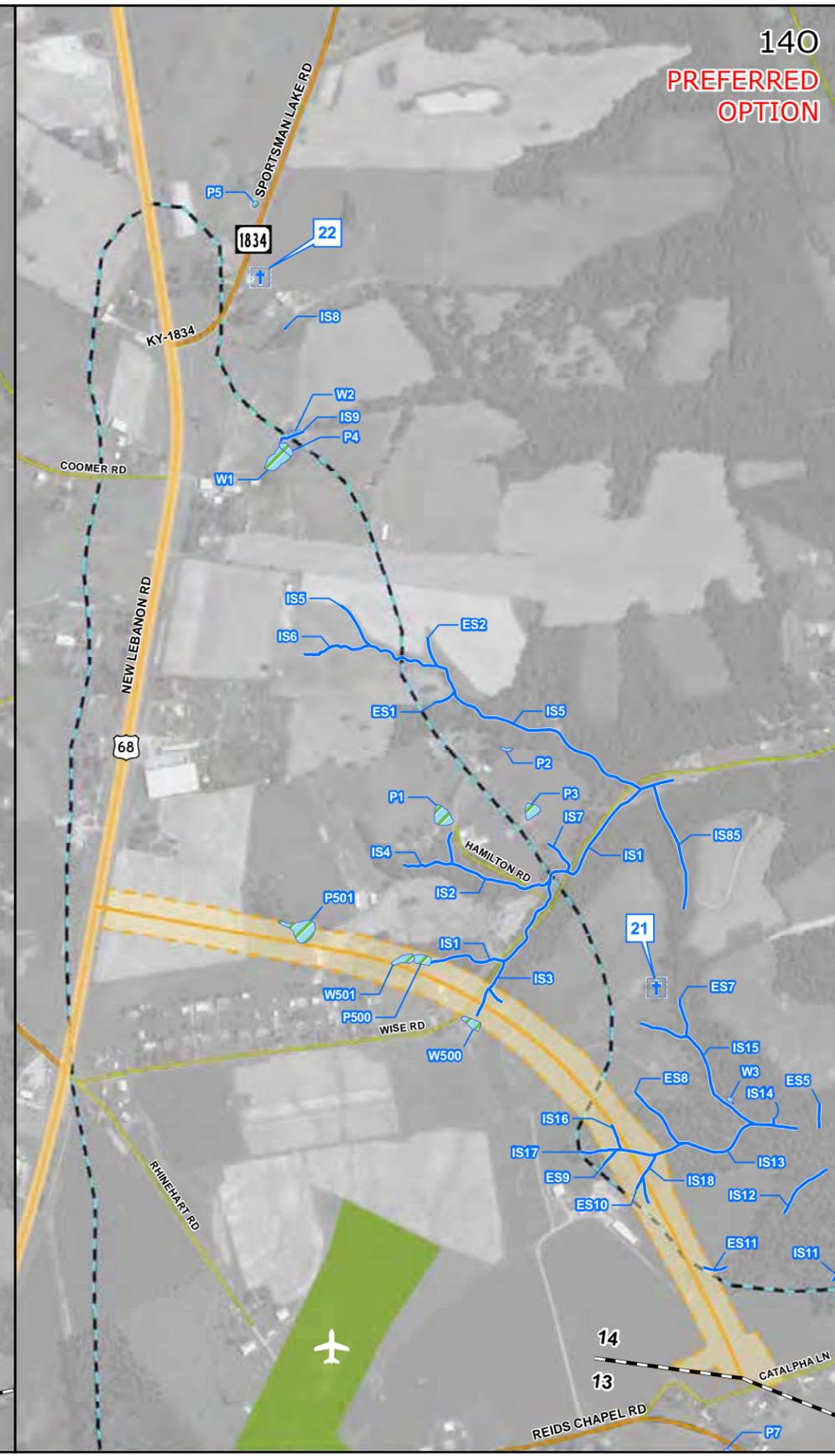
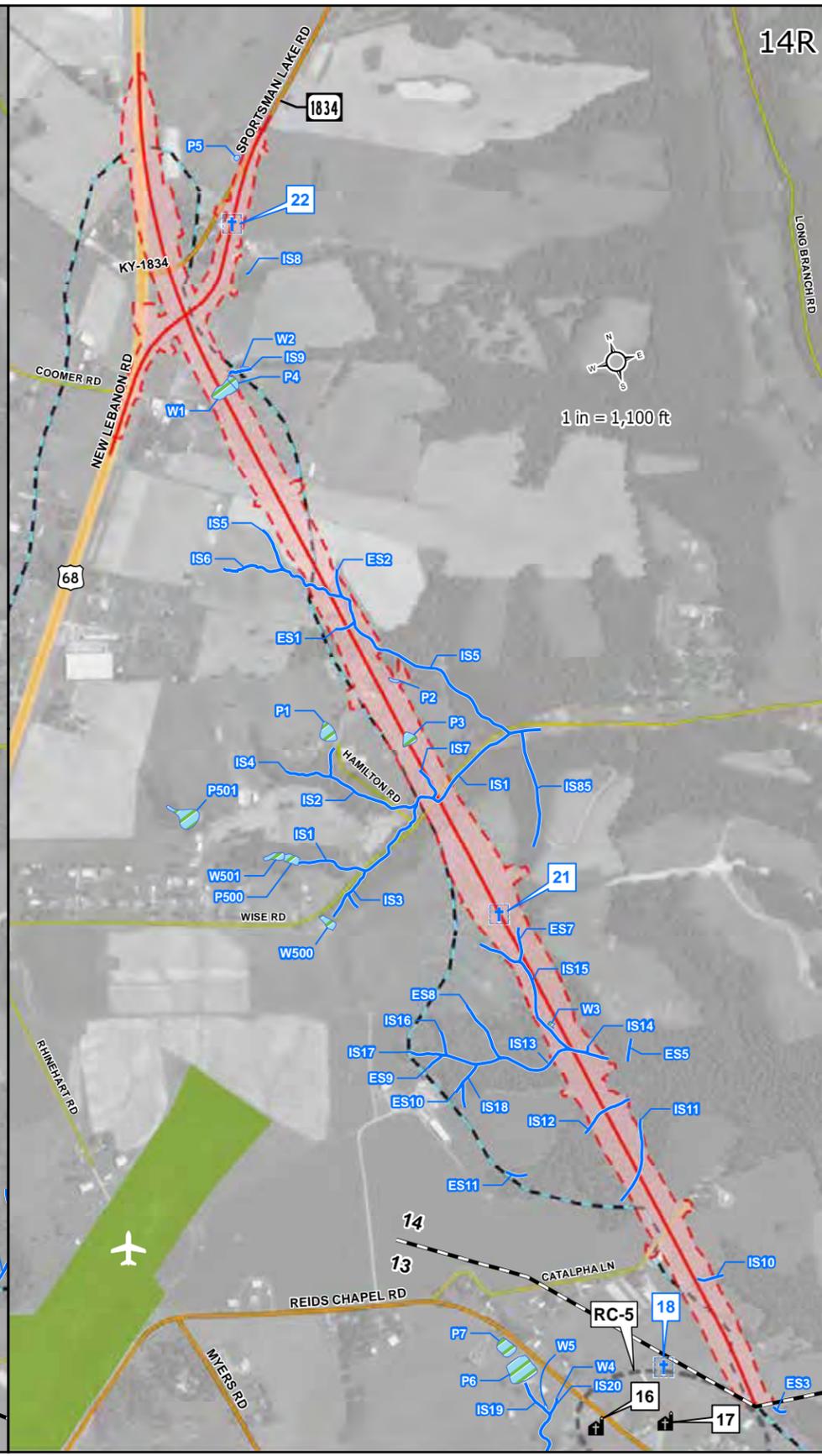
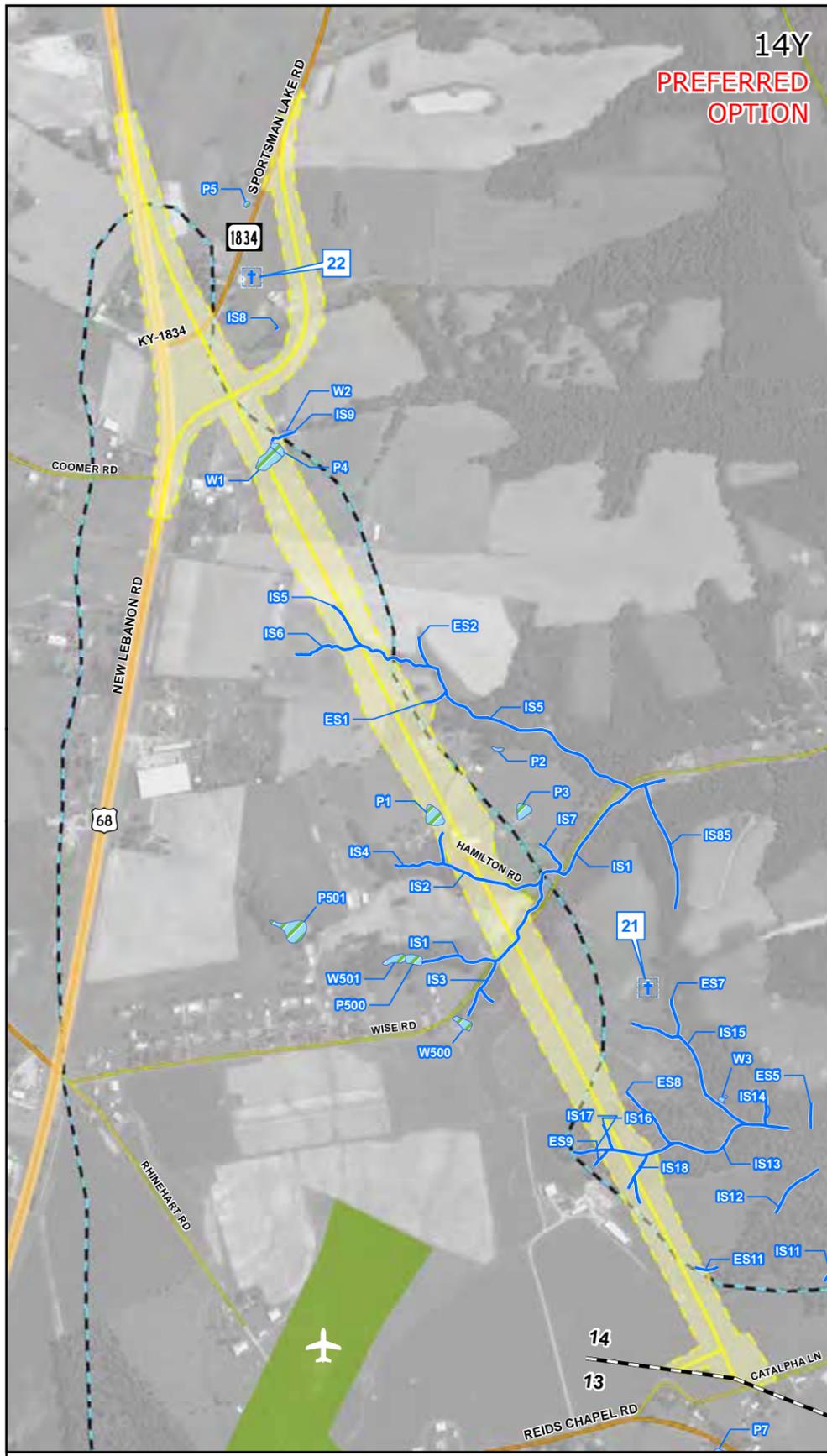
**Stream/Pond/Wetland Abbreviations:
PS = Perennial Stream, IS = Intermittent Stream,
ES = Ephemeral Stream, P = Pond, W = Wetland



REFERENCE MAP

Exhibit 4 Sheet 13
SEGMENT 13 ALTERNATIVES and
ENVIRONMENTAL CONSTRAINTS
KY 55 - Heartland Parkway
Adair and Taylor Counties, Kentucky
KYTC Item No. 4-142.00 and .10

Source Citation
Topographic data, including cultural, utilities and imagery and less historic, aquatic and terrestrial courtesy of the Kentucky Division of Geographic Information (KY DGI). OK4 makes no claim to the accuracy of that data shown on this map.



1 in = 1,000 ft

- 14-YELLOW
- 14-RED
- 14-ORANGE
- Cemetery*
- Church*
- Segment Line
- Stream**
- Pond/Wetland**
- Existing Heartland Pkwy
- Area of Potential Effect
- Taylor County Airport
- Residential Cluster

*Note: For Cemetery, Church, or Historic Site details, see Exhibit 1, Study Area Road Network and Selected Land Uses. For HAZMAT details, see Figure 16.

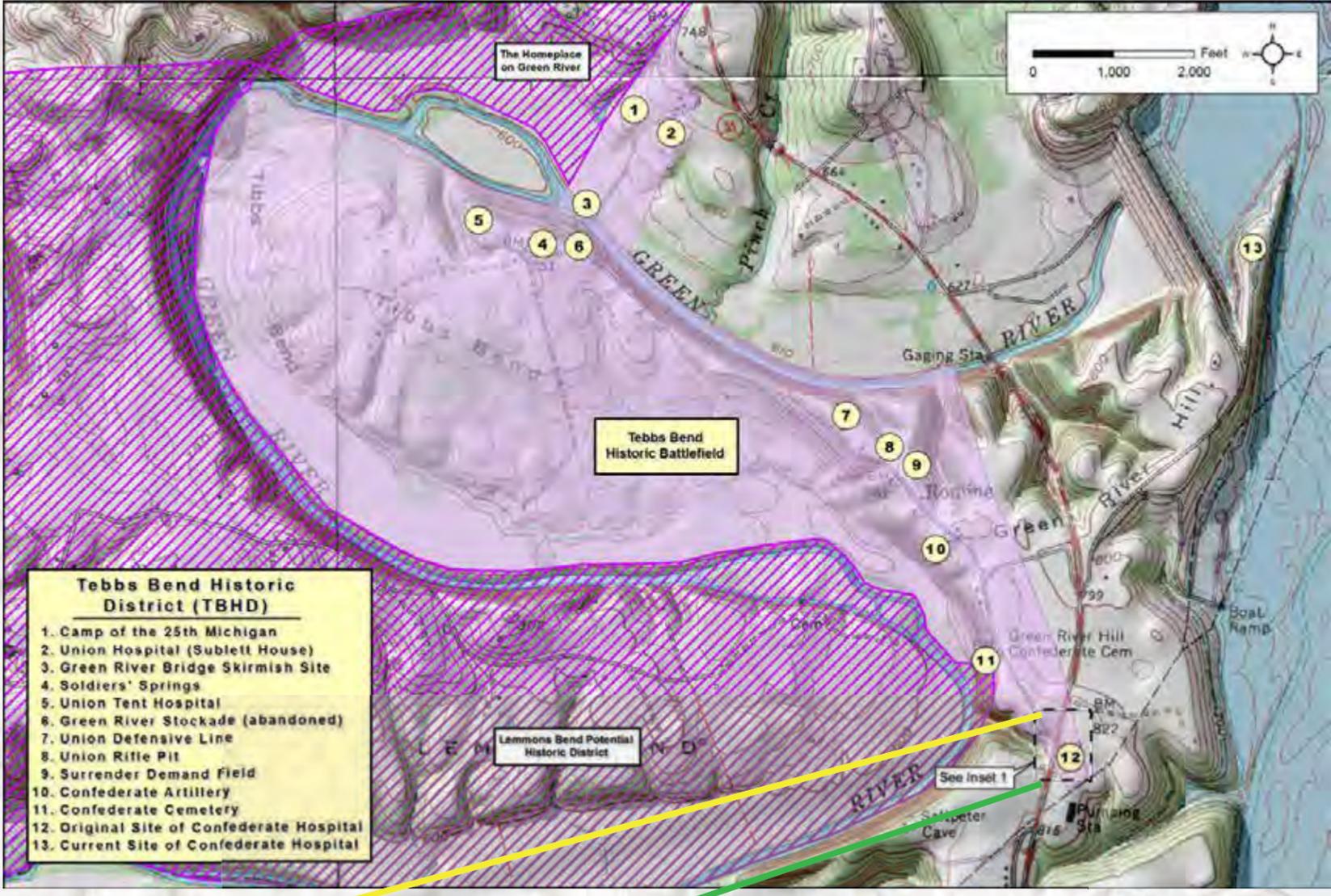
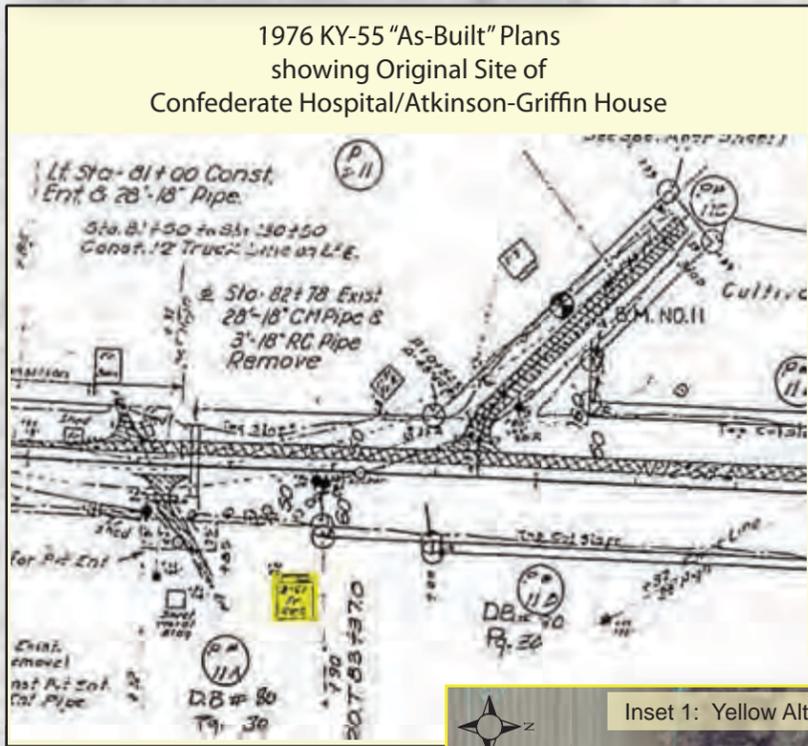
**Stream/Pond/Wetland Abbreviations:
 PS = Perennial Stream, IS = Intermittent Stream,
 ES = Ephemeral Stream, P = Pond, W = Wetland



REFERENCE MAP

Exhibit 4 Sheet 14
SEGMENT 14 ALTERNATIVES and ENVIRONMENTAL CONSTRAINTS
 KY 55 - Heartland Parkway
 Adair and Taylor Counties, Kentucky
 KYTC Item No. 4-142.00 and .10

Source Citation
 Topographic data, including cultural, utilities and imagery and less historic, aquatic and terrestrial courtesy of the Kentucky Division of Geographic Information (KY DGI). Q44 makes no claim to the accuracy of that data shown on this map.



Acreages

TBHD.....	927 acres
Existing KY-55 Right-of-Way within TBHD.....	2.62 acres
Proposed KY-55 Right-of-Way within TBHD	
Yellow Alternative	2.88 acres
Green Alternative.....	3.35 acres

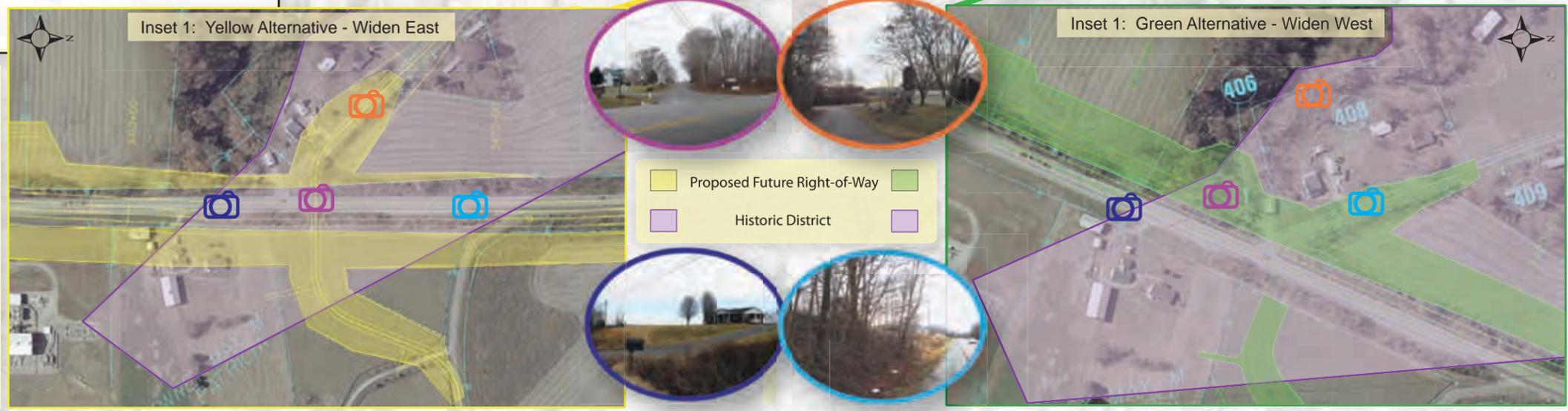


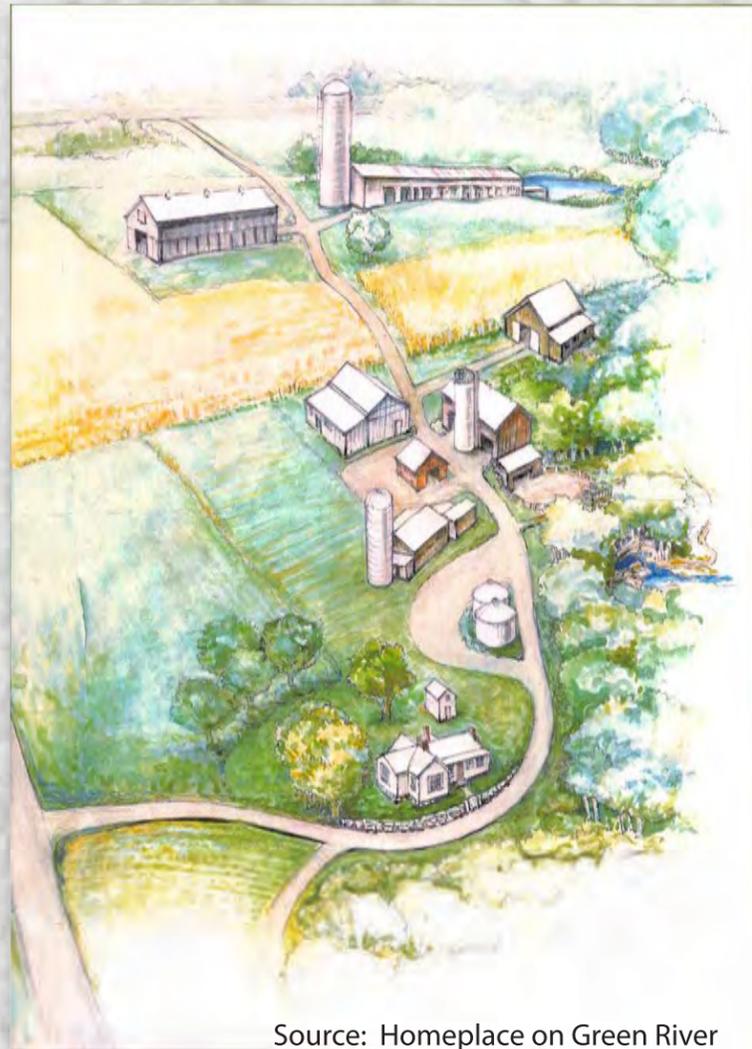
Exhibit 5
TEBBS BEND HISTORIC DISTRICT
AND PROPOSED BUILD ALTERNATIVES
GREEN AND YELLOW - SECTION 5
KY 55 - Hearthland Parkway
Adair and Taylor Counties, Kentucky
KYTC Item No. 4-142.00 and .10



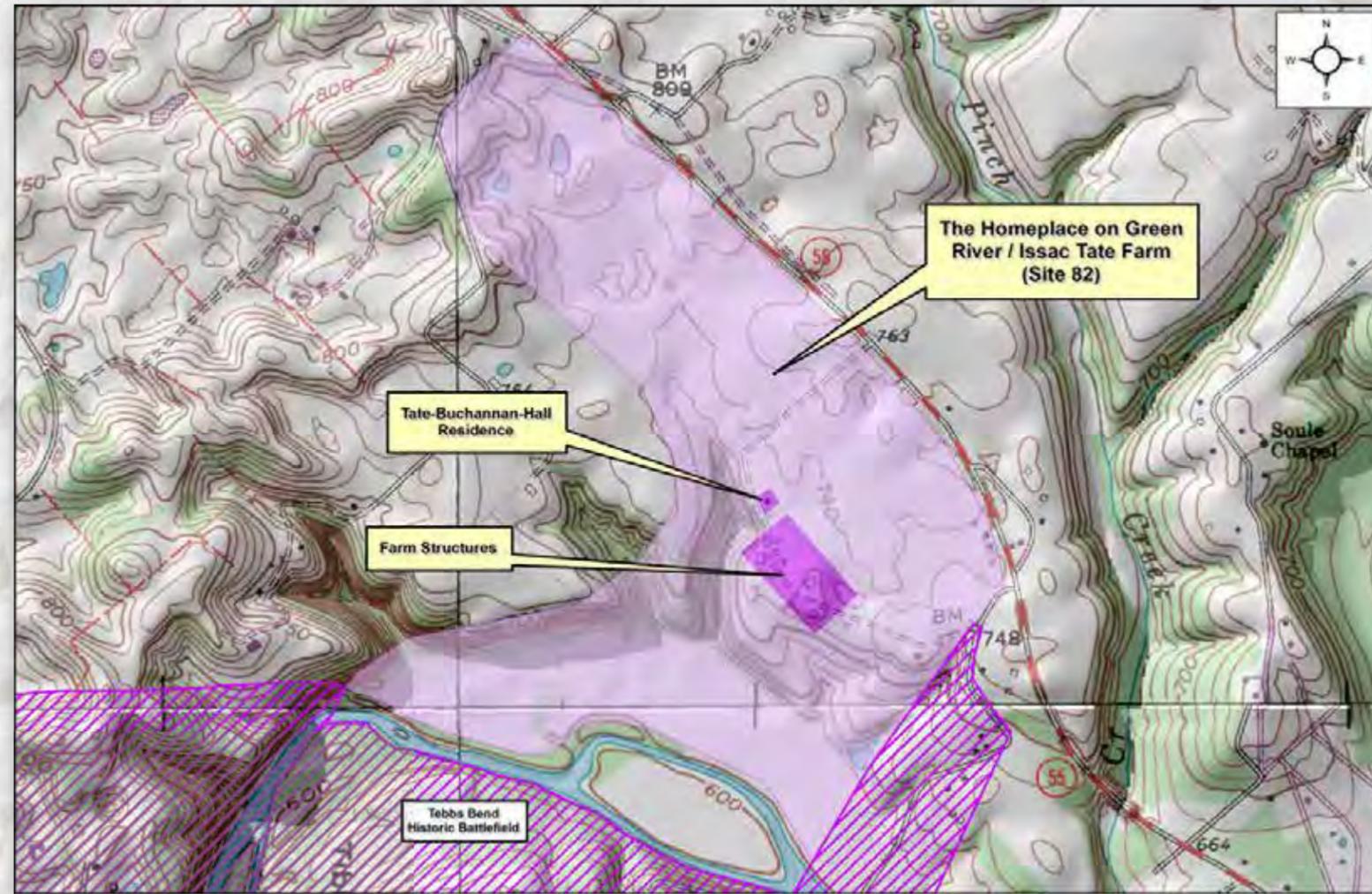
Light Blue Alternative



Yellow Alternative



Source: Homeplace on Green River



Acres

Homeplace392 acres

Proposed KY-55 Right-of-Way within Homeplace

Yellow Alternative5.29 acres

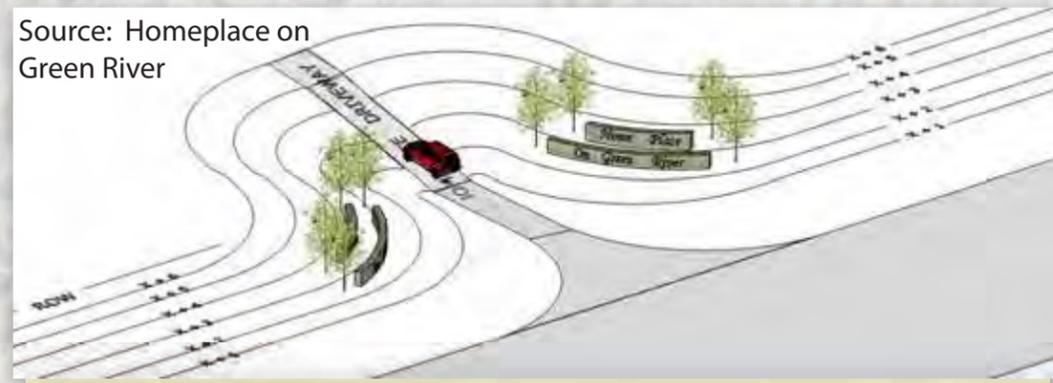
Light Blue Alternative... ..2.56 acres



Pennsylvania-style Bank Barn



Tate-Buchannan-Hall Residence



Proposed Gateway entrance to The Homeplace on Green River / Isaac Tate Farm



View of Farm Structures looking West



Residence and Grain Bends

Exhibit 6
 THE HOMEPLACE ON GREEN RIVER/
 ISAAC TATE FARM
 PROPOSED BUILD ALTERNATIVES
 LIGHT BLUE AND YELLOW - SECTIONS 7 & 8
 KY 55 - Hearthland Parkway
 Adair and Taylor Counties, Kentucky
 KYTC Item No. 4-142.00 and .10