CHAPTER III
AFFECTED ENVIRONMENT

A. Land Use, Planning, Public Policy, Socioeconomics

In order to characterize land use, public policy and socioeconomic conditions in Section of Independent Utility (SIU) 2, a series of steps were performed. These steps included: consultation with local, state and federal government officials and the public, windshield surveys, review of planning and economic development documents and examinations of aerial photography and maps. Results of consultation with governmental agencies are included in Appendix E.

1. Existing Land Uses

Community Setting

Land uses along I-70 within SIU 2 primarily consist of agriculture and intermittent, low-density commercial, industrial and residential uses. Most of the commercial and residential areas are clustered near interchanges associated with small towns within the corridor.

The area is rural and is predominantly characterized by large undeveloped areas with dispersed areas of light to moderate density development. The Region of Influence (ROI) for land use and socioeconomics associated with SIU 2 includes lands within the counties of Lafayette, Saline and Cooper, as well as the Cities of Boonville, Sweet Springs, Emma, Concordia and Odessa (See Figure I-2). Interstate 70 is and has historically been a major factor influencing land use and development within the ROI by providing national, statewide, regional and local access and opportunities for economic development.

Most of the lands within SIU 2, adjacent to the I-70 corridor, are privately owned with some public lands associated with roads and recreational areas. Rural lands primarily include private agricultural uses associated with cattle, horse and hay operations and typically have an onsite single-family residence and related structures. Commercial development within SIU 2 adjacent to the I-70 corridor primarily involves highway commercial uses such as gas stations, truck stops, convenience stores, fast-food chain restaurants, motels and various other highway related service and retail operations. Commercial billboards are common along I-70 in SIU 2. Residential development near I-70 is typically low-density single homes on relatively large lots (one to several acres). Developed areas within the ROI are primarily associated with the incorporated cities of Odessa, Concordia, Boonville, Emma and Sweet Springs, but the more developed areas associated with these cities are typically located away from I-70 in the downtown areas of these cities or along the north-south routes that intersect with I-70. Much of the development adjacent to I-70 appears to be more recent than the developments in the downtown areas. In addition, the businesses along I-70 appear to be largely dependent on motorists using I-70, that is, tourists, truck drivers and local residents from more distant locations.

In most of the developed areas within SIU 2, I-70 divides the commercial areas, making interchange bridges important commercial access routes for residents, customers and business operators. Undeveloped areas adjacent to I-70 within SIU 2 primarily include areas where I-70 crosses Davis Creek, the Blackwater River, the Lamine River and several other smaller watercourses.

Lafayette County

Lafayette County is located farthest to the west of the three counties within SIU 2. The cities of Odessa, Emma and Concordia, which are located along the I-70 corridor, are located within the county limits. Based on its 2001 population, Lafayette County is the 32nd largest of the 114 counties in Missouri. (Bureau of Economic Analysis (BEA), 2003a)

Saline County

Saline County is located between Lafayette and Cooper counties within the I-70 corridor. The cities of Emma and Sweet Springs, which are located along the I-70 corridor, are located within the county limits. Based on its 2001 population, Saline County is the 47th largest county in Missouri (BEA, 2003b).

Cooper County

Cooper County is located farthest to the east of the three counties within SIU 2. The City of Boonville, which is located along the I-70 corridor, is located within the county limits. Based on its 2001 population, Cooper County is the 64th largest county in Missouri (BEA, 2003c).

Community Values

SIU 2 is primarily rural in character with small towns and independent farms spread out across the landscape. Individual and property rights are highly valued by many residents. In general, the communities within the SIU 2 place a high value on economic growth, are seeking ways to attract more businesses and increase jobs and consider I-70 vital to the economic well being of their communities.

Travel Patterns

Interstate 70 is the primary east-west transportation route within the three-county area composing the ROI for SIU 2, as well as the primary east-west transportation route in Missouri linking St. Louis and Kansas City. Most residents living within and near SIU 2 use I-70 regularly to travel to and from nearby employment centers and commercial centers, as well as to the major urban centers of St. Louis and Kansas City. In terms of population, the cities of Boonville, Odessa and Concordia are the three largest incorporated communities within the ROI. Boonville (SIU 3) and Odessa (SIU 1) are located outside of the actual SIU 2 study area but are included within the ROI.

SIU 2 receives a large volume of commercial truck traffic associated with the transport of goods and services east and west across the United States. Seasonal recreation travel, primarily during the summer months (June through August), on I-70 is another major component of traffic within SIU 2.

Travel along the I-70 Corridor in SIU 2 is limited to vehicular traffic. The mainline section of I-70 is not intended for pedestrian or bicycle use or crossing. Sidewalks are not currently provided on existing bridges and no established bicycle routes cross I-70 in SIU 2. Existing frontage roads provide a limited shoulder width for pedestrians and cyclists. These frontage roads are discontinuous and are not established bicycle routes in SIU 2.

2. Applicable Local Plans, Policies and Anticipated Future Development

With the exceptions of Lafayette County, the City of Concordia and the City of Boonville, the municipalities with jurisdiction within the ROI have not developed formal plans or zoning to guide development. Development within Cooper and Saline Counties is not regulated, as there are no County Planning Commissions or Comprehensive Plans or any requirements for zoning, building codes or engineering reviews.

Lafayette County Comprehensive Plan Update

The Lafayette County Comprehensive Plan was revised and adopted on November 29, 1999. However, this Plan is currently being updated and is not yet available to the public. It is expected that the Plan will be available in late 2004.

Lafayette County has developed 12 zoning districts to aid in the organized development of county lands. Each of these 12 districts can be lumped into one of four major zoning categories: Agriculture, Residential, Business and Industrial. The majority of lands adjacent to the I-70 corridor within the Lafayette County boundaries are designated District A (Agricultural District). Other zoning districts located adjacent to the I-70 corridor includes District RA (Residential Agriculture), District RE (Rural Estates), District B-2 (General Business District), District M-1 (Light Industrial District) and District M-2 (Heavy Industrial District) (Lafayette County Planning and Zoning). Some of the designated industrial districts (M-1 and M-2) in Lafayette County occur along I-70.

Proposed Comprehensive Plan for Concordia, Missouri

The City's comprehensive plan, as adopted by ordinance on November 17, 2003, provides a systematic framework for the future development of the City in light of anticipated population and economic growth. The City's growth is largely influenced by the physical and economic growth of the Kansas City metropolitan area. The Plan identifies the City as a major regional urban center and seeks to enhance this role through the continued development of its industrial and commercial centers and capitalizing on its location along the I-70 corridor.

The I-70 corridor is identified as one of the "top five" economic development issues and one of the top five land use issues based on a 2001 community survey provided in this Plan. The Plan states that, "it is imperative that the city's plan incorporates future arterial road systems parallel to the I-70 corridor…"

To manage anticipated growth of the City, a future land use map depicting growth areas has been developed. Most of the lands within these growth areas currently feature agricultural uses, which are expected to be replaced with commercial, industrial and residential development. Growth areas are present near the northern and southern industrial areas located in the far northeast and southeast corners of the city, the I-70 vicinity and the western part of the Metro East region. Portions of the areas designated as growth areas would require annexing some

lands that are currently under the jurisdiction of Lafayette County. Specific anticipated development plans that are either directly or indirectly associated with I-70 are:

- A planned seven-acre (3 hectare) retail/commercial district east of Highway 23 and north of Rhineland Acres. The City anticipates that access requirements would need to be coordinated with the Missouri Department of Transportation (MoDOT);
- Additional commercial development on the west side of Highway 23 that would require coordination with MoDOT regarding access onto I-70;
- Use of Highway 23 for regional and local arterial access to existing and future developments off I-70;
- Careful planning of development along Highway 23 in accordance with MoDOT Access Management Principles; and
- Design and construction of Industrial Drive as an arterial road providing access to the industrial area north of I-70 (City of Concordia, 2003).

City of Boonville, Missouri Comprehensive/Strategic Plan

Although I-70 improvements associated with SIU 2 would have an indirect effect on land use and development within the existing city limits of Boonville, the city limits do not currently border the portion of I-70 within SIU 2.

The City of Boonville, Missouri Comprehensive/Strategic Plan, as adopted in November 2003, indicates that the City anticipates and encourages continued physical and economic growth of the city. Already considered a “regional center,” included in the city’s growth plan are annexation of lands to the east, south and west. The I-70 corridor within the current city limits is also named as a planned growth area (City of Boonville, 2003).

Included in Future Land Use discussion (Chapter 5) of the Plan, it is stated that the development of locally improved arterial roads should be favored rather than direct access onto frontage roads due to pressures from developers and property owners.

3. Population Growth

Population

Population statistics for 1990 and 2000 are provided below at the state, county, city and project corridor level. All of the geographic areas shown in this table have experienced population growth from 1990 to 2000, with the cities of Odessa, Emma and Boonville experiencing the largest percentage of growth. Lafayette County and Saline County both experienced growth percentages below that of the State of Missouri, while Cooper County’s population growth rate outpaced that of the state. The City of Sweet Springs experienced minimal growth during the 10-year study period.

Table III-1: Population Trends, 1990-2000*

Location	1990 Population	2000 Population	Percent Change
State of Missouri	5,116,901	5,595,211	9.3%
Lafayette County	31,107	32,960	6.0%
City of Boonville	7,095	8,202	15.6%
SIU 2 Corridor**	23,324	25,517	9.4%
Saline County	23,523	23,756	1.0%
City of Emma	194	243	25.3%
City of Sweet Springs	1,595	1,628	2.1%
SIU 2 Corridor	5,349	5,564	4.0%
Cooper County	14,835	16,670	12.4%
City of Concordia	2,160	2,360	9.3%
City of Odessa	3,695	4,818	30.4%
SIU2 Corridor	4,622	4,821	4.3%

***** U.S. and Missouri population data source: U.S. Bureau of the Census, 2003. County and city population data source: University of Missouri, 2003.
****** Total of census tracts located adjacent to the I-70 corridor

Real Estate and Housing

Table III-2 presents selected housing data from the 2000 Census for the United States, state of Missouri and the three counties within the ROI. It should be noted that, while this data represents the most current data available for these areas, this data is three years old and fluctuates based on local, regional and national economic conditions. As such, these data represent only a snapshot in time, but provide a general understanding of housing characteristics within the ROI. As shown in Table III-2, rent and house values are generally similar within the three counties in the ROI, while rent and house values are lower within the ROI as compared to the state and considerably lower compared to the U.S. However, the median mobile home value is highest in Cooper County out of the five geographic areas assessed. In general, vacancy rates within the ROI are comparable to the state and national rates.

Table III-2: Lafayette, Cooper and Saline County Housing Data

Area	Total Housing Units	Occupied Housing Units	Vacant Housing Units	Percent Occupied	Percent Owner Occupied	Percent Renter Occupied	Average Household Size	Median Home Value**
United States	115,904,641	105,480,101	10,424,540	91.0	66.2	33.8	2.6	$111,900
Missouri	2,442,017	2,194,594	247,423	89.9	70.3	29.7	2.5	$86,900
Cooper County	6,676	5,932	744	88.9	74.2	25.8	2.5	$74,200
SIU2 Corridor*	2,095	1,870	225	89.3	81.5	18.5	2.5	$59,700
Lafayette County	13,707	12,569	1,138	91.7	75.4	24.6	2.5	$74,400
SIU2 Corridor*	10,436	9,637	799	92.3	76.9	23.1	2.6	$75,700
Saline County	10,019	9,015	1,004	90.0	62.2	27.8	2.5	$59,700
SIU2 Corridor*	2,418	2,121	297	87.7	78.1	21.9	2.6	$61,750

Source: U.S. Bureau of the Census 2000 (Summary File 1, Demographic Profile 1)
***** Total of all Census Tracts located adjacent to SIU 2 in the respective county
****** U.S. Bureau of the Census 2000 (Summary File 3, Demographic Profile 3)

Businesses

In order to evaluate the businesses along SIU 2, windshield surveys were conducted over several days to observe and inventory businesses along I-70. Most of the businesses along the SIU 2 portion of the I-70 corridor provide highway-related services such as gas stations/convenience stores, restaurants and motels. Based on the windshield surveys, many of these highway-related businesses are associated with national and regional chains, although there are various other independent businesses. Businesses located along SIU 2 are typically clustered at and near the I-70 entrance- and exit-ramps and many are accessed from I-70 frontage roads. However, community and regional shopping centers along the ROI are generally located away from I-70, except in Odessa. I-70 has been a major factor in shaping the business environment of the ROI. In addition to the direct economic stimulus provided by I-70 to adjacent businesses such as gas stations, convenience stores, motels and restaurants, the presence of I-70 indirectly assists local economies as a major transportation route for the shipment and receipt of goods.

Employment Sectors

As shown in Table III-3, the major industry sectors within the ROI are education, health and social services; wholesale and retail trade; and manufacturing.

Table III-3: Number of Jobs by Industrial Sector, 2000

	Number of Employees		
Industry	**Cooper County**	**Lafayette County**	**Saline County**
Agriculture, Forestry, Fishing, Hunting and Mining	421 (5.7%)	618 (3.9%)	731 (6.4%)
Construction	568 (7.7%)	1,545 (9.7%)	654 (5.8%)
Manufacturing	1,129 (15.2%)	2,448 (15.3%)	2,230 (19.6%)
Wholesale & Retail Trade	1,029 (13.8%)	2,647 (16.6%)	1,511 (13.3%)
Transportation, Warehousing and Utilities	351 (4.7%)	1,045 (6.5%)	593 (5.2%)
Information	131 (1.8%)	398 (2.5%)	200 (1.8%)
Finance, Insurance, Real Estate and Rental and Leasing	398 (5.4%)	818 (5.1%)	361 (3.2%)
Professional, Scientific, Mgmt., Admin. and Waste Mgmt. Services	275 (3.7%)	714 (4.5%)	417 (3.7%)
Educational, Health and Social Services	1,693 (22.8%)	3,161 (19.8%)	2,914 (25.7%)
Arts, Entertainment, Recreation, Accommodation and Food Services	433 (5.8%)	996 (6.2%)	778 (6.9%)
Other Services	390 (5.3%)	812 (5.1%)	432 (3.8%)
Public Administration	605 (8.2%)	775 (4.9%)	530 (4.7%)
Total	7,423	15,977	11,351

Source: U.S. Bureau of the Census 2000b

Unemployment

Unemployment rates for the nation, State of Missouri and Cooper, Lafayette and Saline counties are presented below for 1990 and 1998-2002. In general, all five geographic areas have experienced an upward trend in unemployment rates during the past few years. For the State of Missouri and counties within the study area, however, unemployment levels through 2002 remained below levels experienced in 1990 for the state and the three counties.

Table III-4: Percent Persons Unemployed, 1990 and 1998-2002

Location	1990	1998	1999	2000	2001	2002
U.S.	5.6%	4.5%	4.2%	4.0%	4.7%	5.8%
Missouri	5.8%	4.2%	3.4%	3.4%	4.7%	5.5%
Cooper County	6.5%	3.8%	2.9%	2.9%	4.7%	4.2%
Lafayette County	6.1%	4.0%	3.6%	3.5%	4.5%	5.5%
Saline County	7.5%	3.4%	2.6%	2.8%	5.3%	6.1%

Source: U.S. Department of Labor Bureau of Labor Statistics, 2003.

4. Ethnicity and Income

Ethnicity

Table III-5 provides race data for the United States, state of Missouri and counties and cities within the SIU 2 ROI for 1990 and 2000. Both the 1990 and 2000 data indicate that in general the percentages of minorities for the geographic areas within the ROI are considerably lower than those for the U.S. and generally lower than those of the state of Missouri, with the exception of the City of Boonville. However, data from most geographical areas indicated a slight increase in the percentage of minority and non-white populations from 1990 to 2000, although generally not as significant an increase as occurred in the U.S. as a whole.

Through the windshield surveys, public involvement activities and other outreach opportunities extended during this project; there was no indication that concentrations of minorities might be present in close proximity to I-70. Possible examples of concentrations of minorities might be residential neighborhoods with high percentages of minorities, commercial areas with businesses catering to a particular minority interest, or churches or community centers specifically associated with minority populations.

Table III-5: Race Distributions in Percent, 1990 and 2000

Location	Year	White	Black	American Indian	Asian or Pacific Islander	Other Race	Hispanic Origin
United States	1990	80.3	12.1	0.8	2.9	3.9	9.0
	2000	75.1	12.3	0.9	3.7	5.5	12.5
Missouri	1990	87.7	10.7	0.4	0.8	0.4	1.2
	2000	84.9	11.2	0.4	1.2	0.8	2.1
Cooper Co.	1990	91.4	7.7	0.4	0.3	0.2	0.7
	2000	89.0	9.0	0.4	0.3	0.3	0.9
SIU 2 Corridor	1990	97.3	2.1	0.4	0	0.1	0.6
	2000	97.6	1.3	0.2	0.1	0.2	0.6
Concordia	1990	99.0	0.4	0.2	0.0	0.4	0.5
	2000	97.9	0.1	0.6	0.2	0.3	0.5
Odessa	1990	97.0	2.6	0.4	0.0	0.0	0.1
	2000	97.0	0.8	0.0	0.1	0.0	0.5
Lafayette Co.	1990	96.4	2.8	0.3	0.2	0.2	0.7
	2000	95.5	2.3	0.3	0.0	0.5	1.2
SIU 2 Corridor	1990	97.1	2.1	0.4	0.2	0.2	0.7
	2000	96.4	1.5	0.3	0.2	0.4	1.1
Boonville	1990	86.9	11.8	0.2	0.8	0.3	0.9
	2000	83.4	14.2	0.3	0.3	0.4	0.5
Saline Co.	1990	93.4	5.8	0.2	0.3	0.4	0.9
	2000	90.0	5.4	0.3	0.6	2.1	4.4
SIU 2 Corridor	1990	98.0	1.4	0.1	0.2	0.3	0.6

Table III-5: Race Distributions in Percent, 1990 and 2000 (Cont'd)

	2000	96.9	1.1	0.2	0.4	0.3	1.0
Emma	1990	99.5	0.0	0.5	0.0	0.0	0.0
	2000	97.9	0.0	0.9	0.0	0.0	1.3
Sweet Springs	1990	98.7	1.0	0.1	0.2	0.0	0.2
	2000	96.9	0.7	0.1	0.7	0.1	0.6

Source: Missouri Census Data Center, 2003 (Summary File 1, Demographic File 1)

Income

Definitions for what constitutes a "low-income" household vary according to the number of persons living in the household; federal, state and local government definitions and thresholds; and income distributions in a given area.

Table III-6 below provides data on income in poverty for the U.S., State of Missouri and the three counties within the ROI. Based on these data, the median household income and per capita income for the three counties in the ROI are generally lower than those for the state and the U.S., with the exception of the median household income in Lafayette County, which is higher than that of the State of Missouri. However, the percentage of people living below the poverty level is lower in Cooper and Lafayette counties compared to Missouri and U.S. However, Saline County has a higher percentage of its population living below poverty level compared to the state and the United States. During windshield surveys of the project area, no concentrations of low-income persons or subsidized housing areas were observed in close proximity to I-70.

Table III-6: Income and Poverty Data, 1999

	Median Household Income	Per Capita Income	Persons Below Poverty	Percent Persons Below Poverty	Households Below Poverty	Percent Households Below Poverty
United States	$41,944	$21,587	33,899,812	12.4%	6,620,945	9.2%
Missouri	$37,934	$19,936	637,891	11.7%	258,419	11.8%
Cooper County	$35,313	$15,648	1,562	10.7%	687	11.6%
SIU 2 Corridor	$32,930	$15,278	575	12.1%	244	13.1%
Lafayette County	$38,235	$18,493	2,816	8.8%	1,262	10.0%
SIU 2 Corridor	$41,000	$18,696	1,983	8.0%	9,641	9.2%
Saline County	$32,743	$16,132	2,889	13.2%	1,155	12.9%
SIU 2 Corridor	$41,115	$16,729	491	9.0%	200	9.5%

Source: U.S. Bureau of the Census 2003.

5. Agriculture

Agriculture is the primary land use within SIU 2. However industrial, commercial and residential development occurs around the interchanges (Figure III-1). Approximately 690,387 acres (279,400 hectares) of land are cultivated in the three-county areas. Farms in Cooper, Lafayette and Saline counties plant the majority of their acreage in corn, soybeans and wheat

(Table III-7). Of the three counties in the study area, Saline County had the state's second highest corn production in 1997 and ranked as the fourth highest soybean producing county in the state in 1998. Corn, soybeans and wheat yields in Saline County averaged 88, 34 and 56 bushels per acre (10, 3 and 5 cubic meters/hectare) in 1997, respectively. Lafayette County corn yields were the highest of the three counties in the 1997. Lafayette County wheat and soybean yields were approximately 60 and 41 bushels per acre (four and one cubic meter/hectare). Cooper County corn, soybean and wheat average yield per acre in 1997 were less than Lafayette and Saline counties at 88, 23 and 56 bushels per acre (eight, three and five cubic meters/hectare) respectively (United States Department of Agriculture (USDA), 1999).

Table III-7: 1997 Crop Statistics by County

CORN	**Cooper**	**Lafayette**	**Saline**
Acres (hectares) Harvested	40,800 (16,512)	86,700 (35,087)	121,400 (49,130)
Production bushels (cubic meter)	3,591,000 (126,547)	10,236,000 (360,717)	14,214,000 (500,901)
Yield bushels/acre (cubic meter/hectare)	88 (8)	118 (10)	117 (10)
Total Value	$8,797,950	$25,078,200	$34,824,300
SOYBEANS			
Acres (hectares) Harvested	62,500 (25,294)	109,300 (44,233)	142,500 (57,670)
Production bushels (cubic meter)	2,116,000 (74,567)	4,477,000 (157,769)	5,690,000 (200,516)
Yield bushes/acre (cubic meter/hectare)	34 (3)	41 (4)	40 (3)
Total Value	$13,521,240	$28,608,030	$36,359,100
WHEAT			
Acres (hectare) Harvested	25,400 (10,279)	19,300 (7,810)	23,400 (9,469)
Production bushels (cubic meter/hectare)	1,420,000 (50,041)	1,154,000 (40,667)	1,457,000 (51,345)
Yield (bushes/acre) (cubic meter/hectare)	56 (5)	60 (1)	62 (5)
Total Value	$4,387,800	$3,565,860	$5,502,130

Source: U.S. Department of Agriculture, 1999.

In addition to row crops, livestock production also comprises a large portion of the agriculture market in the three counties of the study area. Livestock production is generally found in steeper terrain that is less suitable for crop production. In 1997, livestock accounted for 40 percent of all farm products sold in the three counties (USDA, 1999).

Other agriculture production exists in the three counties, including apple orchards. Apple orchards exist primarily in northern Lafayette County near the Missouri River where the terrain is less suited for row crop production. Lafayette County hosts more than 1,850 acres (749 hectares) of apple orchards, which produced 32,707,508 pounds (14,836,125 kilograms) of apples in 1997 (USDA, 1999). Prime farmland is an important resource and was used to evaluate the project alternatives. Prime farmland is defined by the USDA as land that is "best suited to food, feed, forage, fiber and oilseed crops" (7 CFR 658). The 1980 Farmland Protection Policy Act requires that impacts associated with the conversion of farmland be identified and avoided where possible. Approximately ten percent of the three-county area contains prime farmland, which is located primarily on flat uplands and levee-protected bottomlands (Figure III-2).

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Figure III-1: SIU 2 Land Use/Land Cover

Figure III-2a: SIU 2 Prime Farmland

Figure III-2b: SIU 2 Prime Farmland

Figure III-2c: SIU 2 Prime Farmland

In addition to prime farmland, lands enrolled in the Conservation Reserve Program (CRP) or the Wetland Reserve Program (WRP) are also an important resource. The CRP is a voluntary program that offers annual rental payments and cost-share assistance to landowners to set aside lands for the establishment of long-term conservation cover types on eligible lands (USDA, 2003). The CRP program generally commits farmers to a 10 to 15 year contract. The WRP provides landowners financial incentives and technical assistance for converting frequently flooded, marginal agricultural land to its former wetland condition (USDA, 2003). The three-county area contains approximately 2,100 acres (850 hectares) of CRP land and 9,500 acres (3,845 hectares) of land enrolled in the WRP. The combined land areas enrolled in these two programs equal less than one percent of the total area of the three counties.

B. Air Quality

The Clean Air Act was established to protect the public safety, health and welfare from the effects of a variety of air pollutants. National Ambient Air Quality Standards (NAAQS) were established for sulfur dioxide, particulate matter, carbon monoxide, ozone, nitrogen dioxide and lead. Missouri has adopted the federal NAAQS and added hydrogen sulfide and sulfuric acid emission standards. In order to monitor the attainment of the NAAQS, the United States Environmental Protection Agency has designated Air Quality Control Regions (AQCR) across the United States. The AQCRs for SIU 2 include the Southwest Missouri Intrastate AQCR (Lafayette County) and the Northern Missouri Intrastate AQCR (Cooper and Saline Counties). The NAAQS applicable for these areas are listed in Table III-8. Each AQCR in the state is classified as either meeting these NAAQS, exceeding the NAAQS or cannot be classified because of insufficient data.

None of the AQCRs in the project area (Lafayette, Saline, or Cooper) have been classified as exceeding the NAAQS. This project area is in attainment for all transportation NAAQS pollutants. Therefore, the conformity procedure of the 1990 Clean Air Act Amendments do not apply.

Table III-8: National and Missouri Ambient Air Quality Standards

Pollutant	Averaging Time	Concentration
Sulfur Dioxide (SO_2)	Annual Arithmetic Mean Twenty-four Hour Three-Hour Secondary	0.03 ppm 0.14 ppm 0.50 ppm
Particulates (PM-10)	Annual Arithmetic Mean: Primary & Secondary Twenty-four Hour: Primary & Secondary	50 $\mu g/m^3$ 150 $\mu g/m^3$
Particulates (PM-2.5)	Annual Arithmetic Mean: Primary & Secondary Twenty-four Hour: Primary & Secondary	15 $\mu g/m^3$ 65 $\mu g/m^3$
Carbon Monoxide (CO)	One Hour Eight Hour	35 ppm 9 ppm
Ozone (O_3)	One Hour Eight Hour	0.12 ppm 0.08 ppm
Nitrogen Dioxide (NO_2)	Annual Arithmetic Mean	0.053 ppm
Lead (Pb)	Calendar Quarter Arithmetic Mean	1.5 $\mu g/m^3$
Hydrogen Sulfide (H_2S)	One-half Hour One-half Hour	0.05 ppm 0.03 ppm
Sulfuric Acid (H_2SO_4)	Twenty-four Hour One-Hour	10 $\mu g/m^3$ 30 $\mu g/m^3$

Source: 40 CFR 50, July, 2002 Missouri 10 Code of State Regulations 10-6, April 2000

C. Noise

This discussion provides an assessment of existing noise conditions along I-70 in SIU 2. The general subjects of noise, acoustics and sound propagation are defined and explained in Section 1. Details of the noise modeling and characterization are provided in the Noise Analysis Technical Memorandum. This document is available upon request.

The noise levels described in this section are used to characterize the existing affected environment, which is a point in time many years before impacts associated with the Preferred Alternative would be expected to occur. Consequently, these baseline noise levels serve as general background information. The noise impact assessment in Section C of Chapter IV is focused on comparing the conditions in 2030 associated with implementation of the Preferred Alternative versus the conditions in 2030 associated with the No-Build Alternative.

1. Terminology

Noise is a form of vibration that causes pressure variations in media such as air and water. The human ear is sensitive to this pressure and detects it as sound. The intensity of this pressure causes the ear to detect different levels of loudness. The pressure differences are measured in decibels.

The decibel (dB), as measured on a numerical scale, is the unit of measurement for noise. The decibel scale audible to the human ear spans approximately 140 decibels on this scale. Zero corresponds to the lower limit of human audibility while 140 decibels has the ability to cause pain. Table III-9 presents some familiar noise sources with their respective peak noise levels providing reference for some of the noise levels discussed in this report.

The frequency spectrum of highway noise is very broad and can be difficult to relate to human response. Therefore a method used to summarize the contributions of sound from various frequencies and correlate these levels with human response has been developed through the use of frequency weighting networks. The A-weighted curve correlates well with human response to noise. The unit of measurement for A-weighted sound is dBA. The equivalent sound pressure level (L_{eq}) is the equivalent steady-state sound level having the same A-weighted sound energy as that contained in the time-varying sound over the same period of time. The time period widely used for traffic noise is one hour. The abbreviation then becomes $L_{eq}(h)$. All traffic noise levels in this analysis are expressed in dBA $L_{eq}(h)$. L_{eq} (h) is defined in 23 CFR 772 as, "*the equivalent steady-state sound level which, in a one hour period contains the same acoustic energy as the time-varying sound level.*"

Table III-9 Common Indoor and Outdoor Noise Levels

Common Outdoor Noise	Noise Level (dBA)	Common Indoor Noise Levels
	110	Rock Band
Jet Flyover at 1,000 ft.	100	Inside Subway Train (New York)
Gas Lawn Mower at 3 ft. Diesel Truck at 50 ft.	90	Food Blender at 3 ft.
	80	Garbage Disposal at 3 ft.; Shouting at 3 ft.

Table III-9 Common Indoor and Outdoor Noise Levels (Cont'd)

Common Outdoor Noise	Noise Level (dBA)	Common Indoor Noise Levels
Gas Lawn Mower at 100 ft. Commercial Area	70	Vacuum Cleaner at 10 ft., Normal Speech at 3 ft.
	60	Large Business Office
Quiet Urban Daytime	50	Dishwasher Next Room
Quiet Urban Nighttime	40	Small Theater, Lg. Conference Room (Background) Library
Quiet Suburban Nighttime Quiet Rural Nighttime	30	Bedroom at Night, Concert Hall (Background)
	20	Broadcast and Recording Studio
	10	
	0	Threshold of Human Hearing

2. Methodology

The Traffic Noise Model Version 2.1® (TNM) was used to estimate the location of noise contours and the noise levels at specific receptor points for all 14 subsections of SIU 2 (Subsections 10-23). Each subsection was assessed using the traffic volumes; peak hour factors and truck mix appropriate for both the subsection and the year of operation. The affected environment is characterized using available operational data for the year 2000, which for noise impact analysis is reasonably accurate for 2004 conditions and the existing physical configuration of roadway facilities.

The TNM calculated noise levels for each receptor for the year 2000. Based on the land use type and the resulting noise levels, a smaller set of points was selected for detailed analysis and discussion. Points with predicted noise levels below threshold impact criteria were not evaluated or discussed in detail, but have been retained for the record in the Noise Analysis Technical Memorandum. The year 2000 results are presented in the following discussion. The results for 2030 are presented in Section C of Chapter IV.

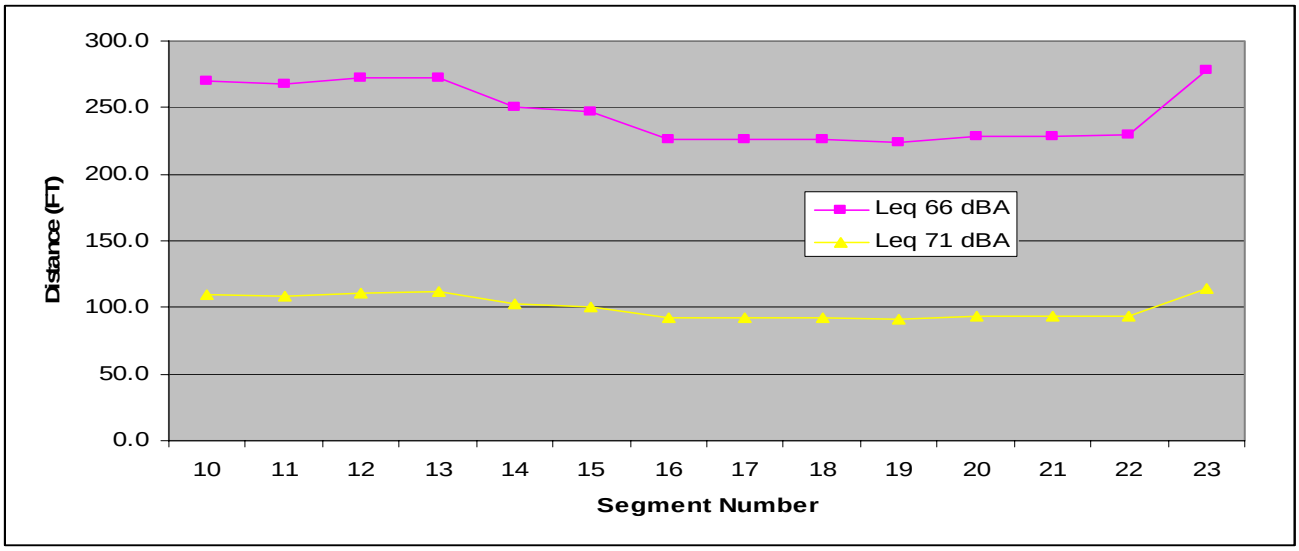
The Federal Highway Administration (FHWA) and MoDOT specify two evaluation criteria applicable to the evaluation of the significance of highway noise levels: 67 dBA L_{eq} (h) and 72 dBA L_{eq} (h). A 67 dBA L_{eq} criterion has been established for schools, libraries, residences, churches, playgrounds and recreational areas. A 72 dBA L_{eq} criterion has been established for commercial and industrial land uses. Any predicted noise level that "approaches or exceeds" the applicable noise abatement criteria (NAC) is considered an impact. MoDOT policy defines "approach" as one dBA below the appropriate NAC, or 66 dBA for residential structures. Because these levels are not to be approached or exceeded, the criteria are applied as 1 dBA

below the maximum allowable level, or L_{eq} 66 and 71 dBA, respectively (hereafter L_{eq} 66 and L_{eq} 71 dBA). The noise analysis was conducted according to the guidelines described in the Environmental Methodologies *Technical Memorandum* (MoDOT, 2003).

3. Existing Noise Levels

The current sound environment of the I-70 study corridor is dominated by traffic on I-70. Since I-70 is the predominant roadway within the study corridor with the highest traffic volumes and truck mix percentages, those areas adjacent to I-70 have the highest ambient noise levels. Based on Activity Category B of the FHWA regulation (including residences, churches, schools, libraries, hospitals, nursing homes, motels and hotels), 45 percent of the residences along I-70 in the SIU 2 corridor currently experience noise levels that approach or exceed the NAC. An hourly L_{eq} sound level of 66 dBA was used in making this determination. Figure III-3 presents a graph of the distance from the edge of the near lane to the existing L_{eq} 66 and 71 dBA noise contours for each of the 14 affected highway subsections or segments.

Figure III-3: Baseline 2000 Noise Contours for I-70 SIU 2



As shown, the existing L_{eq} 66 dBA contour extends 225 to 275 feet (69 to 84 meters) from the edge of the near lane of I-70 to the north or south of the existing alignment. The existing 2003 L_{eq} 71 dBA contour extends 90 to 115 feet (27 to 35 meters) to the north and south of I-70. None of the receptors identified as part of this project presently occur within the existing 71 dBA contour.

Based on the existing noise levels, 32 of the 71 residential receptors occur within the 66-dBA contour. Of the eight businesses within the 66-dBA contour, four are hotels, two of which are currently exposed to noise levels of 69 dBA. Additionally, one campground also occurs within the L_{eq} 66 dBA contour.

D. Visual Quality/Aesthetics

The following discussion describes the visual resources of the project area, those physical features that make up the visible landscape, including man-made features, land, water and vegetation and the area's existing aesthetic character. Figure III-4 presents photographs that characterize the visual setting within the study corridor including the existing I-70 facilities and the visual quality of the roadway.

1. Visual Resources

Section of Independent Utility 2 is located within the Western Glaciated Plains Natural Division of Missouri (Thom and Wilson, 1996). This area is characterized by a relatively flat landscape (loess-dominated topography) and has the driest climate in the state. Viewsheds are generally undisturbed by hills or valleys with the result that broad vistas are available from numerous vantage points (Figure III-4). The overall visual characteristics of the study corridor can be described as a mosaic of grassland and prairie habitat types modified by historic land clearing, agriculture and dispersed development. Large fields of corn, soybeans and pasture are visible from most of the corridor. These open space lands, used for crop production and grazing, play a key role in defining the visual context of the corridor.

Man-made visual resources (buildings or other structures) within the study corridor include development associated with the communities of Higginsville, Aullville, Concordia, Emma, Sweet Springs, Marshall, Blackwater and Boonville; sparse residential development outside of these cities; highway commercial and industrial development of relatively low density; railroads; signage (including numerous billboards); and utility structures such as communication towers and power transmission lines. Existing roadways (e.g., state highways, county roads and urban streets) are additional components of the man-made features comprising the primary public vantage points.

Most of the communities in the study area have a small-town character, characterized by low-density single-family homes and dispersed commercial development. The communities generally include large areas of open space and agricultural land adjacent to their borders containing dispersed farmstead clusters, including a house, barns and related outbuildings arranged closely together in the domestic space of the properties.

Notable natural visual resources within SIU 2 consist of geological resources along the Lamine and Blackwater rivers and several water resources including intermittent and perennial streams (Davis Creek and the Blackwater River), the Lamine River (Figure III-4 H), numerous small stock ponds and wetlands (Figure III-4 G) and the Maple Leaf Conservation Area. Along the streams within the study corridor, natural riparian vegetation exists with some forested areas extending into the adjacent uplands.

2. Existing I-70 Facilities

The existing I-70 corridor through SIU 2 is a 4-lane facility, two lanes in each direction, with a 40-foot wide average center median. There are a number of highway bridge overpasses and interchanges with varying design components and few enhancements (special design features or landscaping) occur throughout SIU 2.

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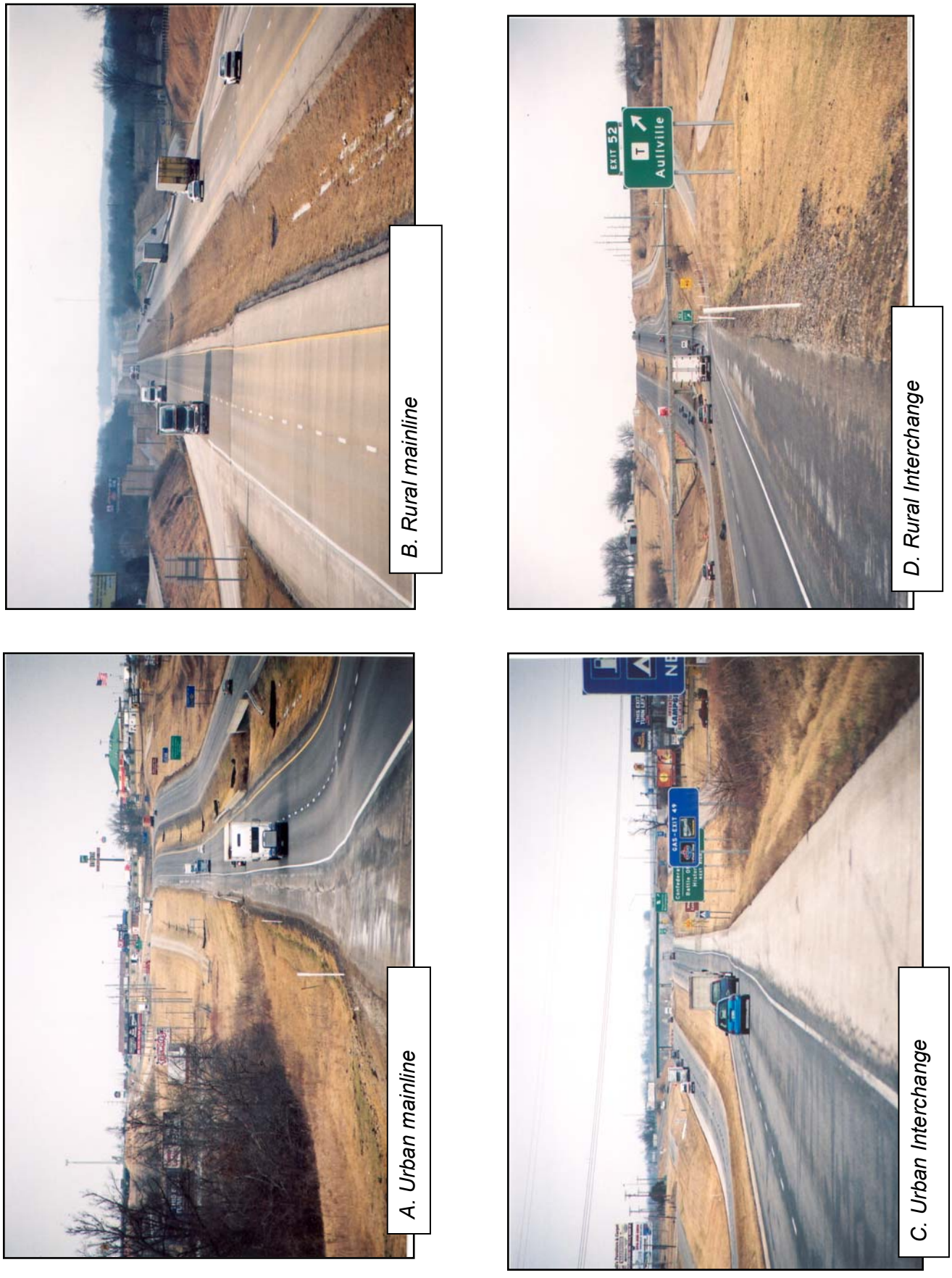


Figure III-4: Representative Photographs of the Visual Setting in the SIU 2 Corridor

Figure III-4: Representative Photographs of the Visual Setting in the SIU 2 Corridor (Cont'd)

F. Rural View of Road

H. Lamine River Bridge

E. Urban View of Road

G. Wetland Crossing

Figure III-4: Representative Photographs of the Visual Setting in the SIU 2 Corridor (Cont'd)

I. Existing outer road alignment.

J. View I-70 from an elevated location

K. Rural Landscape

L. Urban Landscape

3. Visual Quality Rating

The First Tier Study for the I-70 corridor included a visual quality rating analysis. To determine a visual quality rating, the different visually distinct areas of the corridor were defined and separated into visual assessment units within which there are consistent visual characteristics and a uniform visual experience. The units have direct relationships to physiography and land use, the boundaries of which occur where there is a change in visual character as determined by topography and landscape components. By examining each of the units and studying aerial photography, the quality of the visual environment was rated using the attributes of vividness, intactness and unity as defined in the First Tier Environmental Impact Statement (EIS).

- Vividness – the relative strength of the seen image;
- Intactness – the visual integrity of the natural or man-made landscape and its freedom from encroaching elements; and
- Unity – the overall visual harmony of a composition and the degree to which the various elements combine in a coherent way.

The identified visual assessment units for the corridor and the relative existing visual quality rating of each are presented in Table III-10. Generally, for SIU 2, the visual quality rating can be categorized as moderate with high quality at the various river and stream valleys.

Table III-10: Visual Quality Ratings for Visual Assessment Units

Visual Assessment Units	Visual Quality Rating
Agricultural Land	Moderate
River and Stream Valleys	High
Forested Areas	High
Large Towns and Cities	Moderate to Low
Small Towns	Moderate to High

4. Views of the I-70 Corridor

Viewer groups within the study corridor include those groups with a view from the road (i.e., tourist, local and commuter traffic) and those groups with a view of the road (i.e., residents, recreational, schools, commercial and industrial). The quality of the views from the road, as defined above, can be generally characterized as moderate and the relative concentration of viewers would be considered relatively low due primarily to traffic volumes and land use density in the study area compared to other areas in Missouri.

E. Water Resources

Rivers, creeks, branches, tributaries, ponds, lakes and other water resources are located throughout SIU 2. The Lamine and Blackwater Rivers are the largest rivers within SIU 2. Maple Leaf Lake in Lafayette County is the largest surface water body in SIU 2. This lake is a 140-acre (57 hectare) fishing lake, owned and managed by the Missouri Department of Conservation. Numerous other creeks and tributaries cross SIU 2, but none are as numerous as Davis Creek and its associated tributaries. Interstate 70 in SIU 2 crosses 18 tributaries to Davis Creek.

1. Surface Water

The project area is located within the Lamine, Lower Missouri-Moreau and Blackwater watersheds. The largest segment of the project area is located within the Blackwater Watershed, which extends along the SIU 2 corridor from Odessa to two miles (3.2 kilometers) east of U.S. 65. Land use in the 1,518 square mile (3,932 square kilometers) basin is approximately 80 percent agricultural (row crop and pasture) and 20 percent forest. Soils in the portion of the basin intercepted by the I-70 corridor consist of a four-to eight-foot (1.2 to 2.4-meter)-thick layer of loess overlying bedrock. A few small springs exist in the basin, none of which are located in the vicinity of the project area. Almost all water movement in this basin is by surface water flow.

Interstate 70 extends through the Lamine Watershed from east of U.S. 65 to Highway 135. Land use in the 1,112 square-mile (2,880 square kilometer) basin is approximately 65 percent agricultural and 35 percent forest. Soils in the Lamine River basin consist of four to eight feet (1-2 to 2.4-meter) of loess overlying bedrock. The bedrock underlying this basin is generally impermeable and ground water flow is limited; consequently water movement in the basin is due almost exclusively to surface water flow.

The eastern four-mile (6.4 kilometer) subsection of SIU 2 extends through the Lower Missouri-Moreau Watershed from Highway 135 to Route 5. Compared to the Blackwater and Lamine Watershed, the Lower Missouri-Moreau Watershed makes up only a small fraction of the total project area. The entire basin encompasses 578 square miles (1,497 square kilometers) and consists of agricultural (60 percent) and forested land (40 percent). Groundwater movement is limited in this basin and surface streams conduct almost all water movement.

Water quality concerns in all three basins are primarily related to the agricultural nature of the watersheds (Table III-11). The primary sources of aquatic habitat degradation in the three watersheds are caused by high rates of soil erosion and water quality problems resulting from turbidity, fertilizer and animal wastes. During low flow conditions, the concentration of animal waste in streams contributes to problems such as low dissolved oxygen, elevated ammonia levels and nuisance algal growth. The area has limited groundwater resources and many of the local water supplies come from surface waters that may be susceptible to contamination from agricultural runoff.

There are no streams within the SIU 2 project area that are designated as cold-water fisheries or outstanding national or state water resources. The Missouri Department of Natural Resources (MDNR) classifies major streams in Missouri as either "Class P" or "Class C" streams. Class P streams maintain permanent flow even in drought periods [Code of State Regulations (CSR), 2001]. Class C streams are characterized as those streams that may cease flow in dry periods, but maintain permanent pools, which support aquatic life. Only five classified streams are located within the project area. The Lamine and Blackwater Rivers and Davis and Chouteau Creeks are listed as Class P streams. Dry Creek is the only Class C stream in the project area. In addition to the classified streams, the SIU 2 portion of I-70 crosses 107 intermittent streams including Mulkey, Long Branch, Copper's and Harper's Creek.

Table III-11: Classified Water Bodies on the SIU 2 Corridor

Crossings	Water body	Class	Miles (kilometers)	Location	County	Use Designation
2	Davis Creek	P	25.0 (40)	Mouth to Section 2, T28N R18W	Lafayette	LWW, AQL
1	Blackwater River	P	76.0 (122)	Mouth to Section 12, T48N R23W	Saline, Cooper	IRR, LWW, AQL, WBC, BTG, DWS

Table III-11: Classified Water Bodies on the SIU 2 Corridor (Cont'd)

Crossings	Water body	Class	Miles (kilometers)	Location	County	Use Designation
1	Dry Creek	C	3.0 (4.8)	Mouth to Section 11, T48N R21W	Saline	LWW, AQL
1	Lamine River	P	54.0 (87)	Mouth to Section 12, T45N R19W	Cooper	IRR, LWW, AQL, WBC, BTG
1	Chouteau Creek	P*	(N/A)	Mouth to Section 6, T48N R18W	Cooper	Unknown

Source: Department of Natural Resources *Water Quality Standards, 10 CSR 20-7, 10/31/01, pgs 17-114.*
*During normal flow periods, some rivers back water into tributaries, which are not otherwise classified. These permanent backwater areas are considered to have the same classification as the water body into which the tributary flows (10 CSR 20-7).

IRR – Irrigation
LWW – Livestock & Wildlife Watering
AQL – Protection of Warm Water Aquatic Life and Human Health – Fish Consumption
WBC – Whole Body Contact Recreation
BTG – Boating and Canoeing
DWS – Drinking Water Supply

Under Section 303(d) of the Clean Water Act, the State of Missouri is required to list water bodies for which existing water pollution controls are not stringent enough to meet water quality standards. Davis Creek is the only stream that crosses the project area that is listed on the Missouri 303(d) list. A two-mile (3.2-kilometer) stretch of Davis Creek near Odessa does not meet the water quality standards for dissolved oxygen. However, the affected area of the creek is several miles upstream of the area where I-70 crosses Davis Creek and the non-attainment zone does not extend into the project area.

The MDNR also evaluates the degree to which a classified stream supports a designated stream use. The following categories are used to rate streams: fully supported, partially supported, not supported and not assessed. All five of the classified streams that cross I-70 in the project area are designated for aquatic life support and have been listed as only partially supporting this use. Impairments for this use include sedimentation/siltation, agricultural practices and habitat alterations.

2. Ground Water

The project area is located in the West-Central Missouri groundwater province. Groundwater resources within this province are extremely limited. Groundwater in the deep aquifer zones (Mississippian, Ordovician, Cambrian formations) in the West-Central Missouri province are highly mineralized (>1,000 mg/L total dissolved solids) and unsuited for most water uses. Water that is considered to be suitable for drinking in Missouri must contain less than 1,000 milligrams per liter of total dissolved solids and less than 250 mg/L each of sulfate and chloride.

Near surface bedrock units in the project area consist primarily of the Pennsylvanian age formations comprised of the Cherokee Group, the Marmaton Group and the Pleasanton Group. Mississippian age formations are located near the surface in the eastern portion of the SIU2 corridor, but the groundwater in these formations is generally too mineralized to be usable as a water source. Limited quantities of ground water exist within the sandstone units of the Cherokee Group. By drilling into these sandstone units, it is possible to obtain small quantities (one to three gallons [3.8 to 11.4 liters] per minute) of marginal quality water. Wells drilled into the Marmaton Group generally have lower yields than the Cherokee Group. Wells within the

Pleasanton group may yield 10 to 15 gallons (38 to 57 liters) per minute in localized areas. As a result of the limited ground water resources in the area, most public water supplies in the region are derived from surface water resources such as the Missouri River.

According to the *Groundwater Resources of Missouri* (MDNR, 1997), the potential for groundwater contamination in the West-Central Missouri groundwater province is low to moderate. The underlying bedrock in the province is relatively impermeable and prevents contamination from surface waters of these bedrock aquifers. The greatest potential for contamination is the improper construction and maintenance of groundwater wells resulting in the localized contamination of individual wells.

3. Floodplains

Floodplains are one of the major resources within the study area. The Federal Emergency Management Agency (FEMA) maintains Federal Insurance Rate Maps that delineate the extent of floodplains. These maps were reviewed to determine the 100-year floodplain boundaries of the streams, creeks, rivers and branches within the study area. The FEMA and FHWA guidelines 23 CFR 650 have identified the base (100-year) flood as the flood having a one-percent probability of being equaled or exceeded in any given year. The base floodplain is the area of 100-year flood hazard within a county or community. The regulatory floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 100-year flood discharge can be conveyed without increasing the base flood elevation more than a specified amount. The Federal Emergency Management Agency has mandated that projects can cause no rise in the regulatory floodway, and a one-foot cumulative rise for all projects in the base (100-year) floodplain. For projects that involve the state of Missouri, the State Emergency Management Agency (SEMA) issues floodplain development permits.

All FEMA designated floodplains in the study area are un-numbered A zones and are determined by approximate methods. Regulatory floodways, as defined by FEMA, are that part of the floodplain which would have to remain undisturbed if all of the rest of the floodplain were filled with water in order to limit the increase in the 100-year floodwater elevation to less than 1 foot (0.3 meters). Figure III-5 shows the 100-year floodplains in SIU 2. No regulatory floodways occur within the SIU 2 study area.

At the present time flood prone properties may be purchased by SEMA with FEMA funding through the Hazard Mitigation Grant Program and Section 404 of the Stafford Act and Flood Mitigation Assistance Program with state and local governmental agency funding matching funds. These Flood Buyout Properties are owned by local jurisdictions, the cities and counties. Deed restrictions prohibit development on these properties that include the placement of fill for road construction or bridge abutments and piers. County and local communities were contacted concerning SEMA and FEMA Flood Buyout Properties in SIU 2. Correspondences with these groups indicated that no such properties exist along the SIU 2 corridor.

Floodplains are dynamic over time and periodic inundation causes changes in topography, vegetation and soils, all of which affect channels and surrounding lands. Streams, creeks and rivers are constantly creating and abandoning meanders that cause changes in the extent of floodplains.

W:\MoDOT\Maps\Figure_III_5_Floodplain_Impact.mxd

IMPROVE i70

2
Route 131
to
Route 5

Cities
Interstate
Route
U.S. Highway
River
County Boundary
100-Year Floodplain
Reservoirs

Note: Floodplains and Rivers are only displayed within a 5-mile buffer North and South of I-70.

0 2.5 5 10 Miles

1:250,000

SIU 2
100-Year Floodplains

FIGURE
III-5

Historically, agriculture has dominated the land use in this part of Missouri. The soils found within floodplains are very fertile and the flat topography of floodplains facilitates access and the use of agricultural equipment.

Along SIU 2, I-70 crosses the 100-year floodplains of more than 30 creeks, rivers, branches and tributaries to creeks and rivers. The combined width of these crossings totals almost 10 percent of SIU 2 (over 5.5 miles (8.85 kilometers) of the 60-mile (100 kilometers) corridor. Floodplains associated with Davis Creek and its tributaries compose the majority of these crossings [18 crossings totaling more than 2.5 miles (4.0 kilometers)]. Other key floodplains include those associated with the Lamine River, Choteau Creek, Martin Branch, Blackwater River, Long Branch, Coppers Branch, Harpers Branch and Mulkey Creek. The Blackwater and Lamine floodplains drain much of the eastern half of SIU 2. The Davis Creek floodplain drains much of the western half of SIU 2.

4. Wetlands

Section 404 of the Clean Water Act regulates discharges of fill or dredge material into “waters of the United States,” which includes jurisdictional wetlands and other special aquatic sites. In order to comply with the Clean Water Act, it is necessary to locate and identify potential wetland impacts along the project corridor. According to the 1987 Corps of Engineers Wetlands Delineation Manual, all three criteria specified in the manual must be present for an area to be determined a jurisdictional wetland. The three criteria are as follows:

1. **Hydric soils:** soils that form under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic (lack of oxygen) conditions.

2. **Hydrophytic vegetation:** vegetation capable of growing, reproducing and/or persisting in anaerobic soil conditions.

3. **Hydrology:** hydrologic characteristics of areas that are periodically inundated or have soils saturated to the surface at some time during the growing season

National Wetland Inventory (NWI) maps, United States Geological Survey (USGS) Topographic Maps and Natural Resources Conservation Service (NRCS) soil surveys, were used to identify potential locations of wetlands within the project corridor. The classification system used by the National Wetland Inventory (the Cowardin System) requires that only one of the preceding elements be present in order to be considered as a wetland (Cowardin et al, 1979). As a result of the different requirements, NWI listed wetlands may not be considered jurisdictional wetlands by the U.S. Army Corps of Engineers due to the absence of the remaining one or two criteria (typically hydric soils or hydrology). For example, the NWI will map water bodies such as rivers, lakes and ponds as wetlands. These water bodies do not typically meet all three criteria required for a jurisdictional wetland.

The largest wetland complexes in the study area are located along the floodplains of Blackwater River, Lamine River, Davis Creek and Chouteau Creek. Additional wetland complexes are located along Lick Branch and Martin Branch at the point where these streams cross I-70 and a few isolated emergent wetlands are scattered throughout the project area.

National Wetland Inventory (NWI) maps were initially evaluated to determine general impacts to potential wetlands along the entire SIU 2 corridor (Figure III-6). A more detailed delineation of

wetlands was conducted to determine the location and jurisdictional boundaries of wetlands along the preferred alternative.

The NWI wetland types identified along the SIU 2 corridor are predominantly comprised of palustrine forested and palustrine-emergent wetland types, with a few areas of palustrine scrub shrub. Forested wetlands contain woody vegetation greater than 20 feet in height. Characteristic species include sycamore, cottonwood, silver maple and box elder. Scrub-shrub wetlands contain woody vegetation less than 20 feet in height. Characteristic species include silver maple, buttonbush and dogwoods. Emergent wetlands are comprised of erect, rooted herbaceous vegetation that is present throughout the growing season during most years. Characteristic species in emergent wetlands include various sedge species and broadleaf species such as smartweeds and arrowheads. Within the project corridor, all three wetland types occur primarily along the major stream channels.

F. Geology and Soils

Cooper, Lafayette and Saline Counties are located in the Osage Plains Sub province of the Central Lowlands Physiographic Province. The Osage Plains is characterized by a surface topography that is generally flat-lying plains with some broad, rolling hills in its central part.

1. Geology

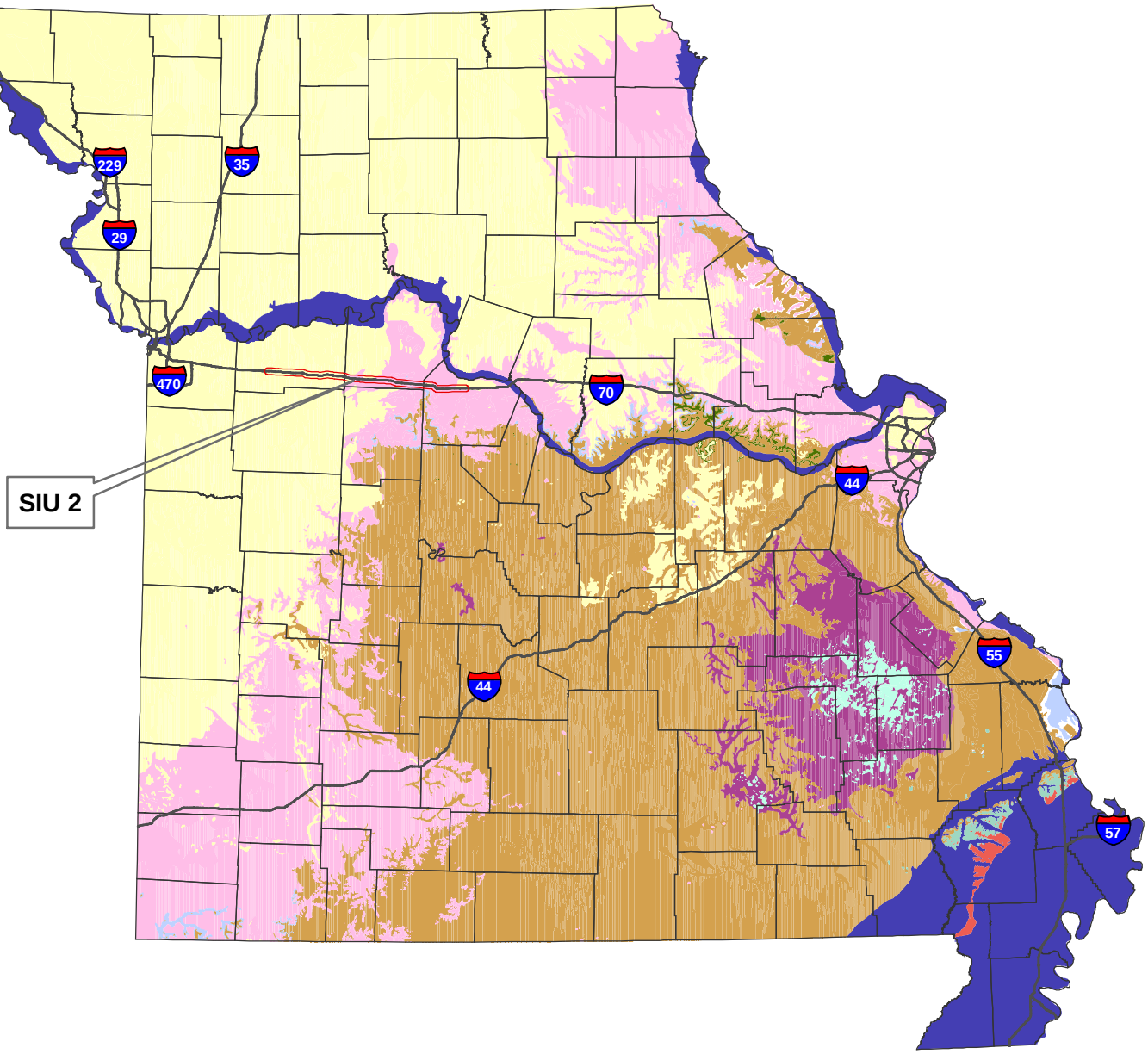
The geology along SIU 2 is underlain by Mississippian and Pennsylvanian age formations as shown on the geologic map (Figure III-7). Older layers of Mississippian, Ordovician and Cambrian formations underlie the Mississippian and Pennsylvanian strata throughout the project area. These formations are not described in detail, as they are isolated from the surface by lower permeable layers of shale and limestone. In Cooper and Saline Counties, the rocks consist of Mississippian formations and Pennsylvanian formations occur in Lafayette County. The Mississippian beds are primarily limestone and the Pennsylvanian formation contains alternating beds of limestone, shale and coal (Unklesbay and Vineyard, 1992). The layered formations of the area gently dip westward as part of the domal structure governing most of the state. This region has little structural features. The area of Mississippian formations has primarily low relief, without high hills or deep valleys but with broad, relatively level prairies. Warm seas with abundant marine life once covered this area, creating an abundance of thick fossil-bearing limestone. The topography of the area underlain by Pennsylvanian formations consists of low, rolling plains with shallow valleys and is characterized by interbedded limestones and shales.

Glaciers covered the majority of northern Missouri. The Missouri River marks the approximate southern extent of the ice sheets. The southern limit of glaciations in Missouri roughly parallels I-70. At one stage, the ice temporarily extended slightly into parts of Saline, Cooper and Moniteau counties. As a result of glaciations, the soils north of the project area are primarily derived from glacial till overlain by wind blown loess. The till consists mostly of clay with some rock and gravel. To the south of the glaciated line, a four- to eight-foot (1.2- to 2.4-meter)-thick layer of loess directly overlies the bedrock. Alluvial soils are also present where the project crosses over streams and rivers.

Figure III-6a: SIU 2 National Wetland Inventory

Figure III-6b: SIU 2 National Wetland Inventory

Figure III-6c: SIU 2 National Wetland Inventory



I-70 SIU 2 1-Mile Corridor
Missouri Counties
Interstate

Cambrian
Cretaceous
Devonian
Mississippian
Ordivician
Ordovician
Pennsylvanian
Permian
Precambrian Y
Quaternary
Silurian
Tertiary

0 30 60 Miles

1:3,200,000

2
Route 131 to Route 5

Generalized Geologic Map of Missouri

FIGURE III-7

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There are major karst areas in the Mississippian and Ordovician age formations in many parts of Missouri. Karst features and caves exist in the Mississippian formations in Cooper County. These include: Eldred Well, Cave Creek Cave, Onyx Pit, Cave Spring Cave and Dual opening Cave (Ref: I-70 First Tier Draft EIS). However, these features are not present in SIU 2.

The geology is characterized by layered sedimentary rock with younger formations overlying older layers in a horizontal pattern. Generally, older formations are found in the low-lying valleys while younger formations form the tops of hills. A brief description (oldest to youngest) of the near surface bedrock in the project area is described in Table III-12.

Table III-12: Near Surface Bedrock Along the I-70 Corridor SIU 2

System	Series	Group or Formation	Lithology
Quaternary	Pleistocene	Undifferentiated glacial drift and alluvium	Clay, silt and gravel glacially derived. Some loess near the river valley.
Pennsylvanian	Missourian	Pleasanton Group	Thick clastic shale with basal siltstone or very fine sandstone. There are two thick channel sandstones in the upper half of group.
	Desmoinesian	Marmaton Group	Fewer sandstone bodies than Pleasanton Group with more limestones and thick shale sequences.
		Cherokee Group and Krebs Subgroup	Thin sandstone and siltstone with intervening shales. The shales locally have coal seams. Thin limestone beds occur at widely scattered intervals.
Mississippian	Osagean	Burlington-Keokuk Formation	Medium- to course-grained crystalline; medium-to-thick bedded limestone.

Source: Thompson, T., 1995 and Unklesbay, A. G. and Vineyard, J. D., 1992

The oldest near surface bedrock in the project area is Mississippian age formations in the Burlington-Keokuk Limestone Group of the Osagean Series. Burlington-Keokuk Limestone is a coarsely-crystalline limestone with scattered layers of chert nodules. The association occurs along the project corridor in Cooper and Saline counties.

The remaining bedrock layers in the project area are of Pennsylvanian age. The Cherokee Group of the Desmoinesian Series overlies Burlington-Keokuk Limestone. The Cherokee Group contains most of the mineable coal beds in Missouri and is predominately shale, with minor carbonate and sandstone.
Overlying the Cherokee Group is the Marmaton Group also belonging to the Desmoinesian Series. The Marmaton Group consists of a succession of horizontal layers of shale, sandstone, limestone, clay and coal. It contains more limestone units than the underlying Cherokee Group (Thompson, 1995).

The Missourian Series overlies the Desmoinesian Series and is separated by an unconformity at the base of the Pleasonton, indicated by the absence of typical Desmoinesian fossils. The Pleasonton Group of the Missourian Series overlies the Marmaton Group. The Pleasanton Group consists almost entirely of shale with the exception of three layers of sandstone. The

Warrensburg Sandstone, a subgroup of the Pleasanton Group, is an old channel that is aligned north to south in an area that corresponds roughly to Route 13. This channel sandstone is 2 to 3 miles (3.2 to 4.8 kilometers) wide and up to 150 feet (46 meters) thick.

Except for a few areas of exposed bedrock along the Lamine and Blackwater rivers, the project area is covered by Pleistocene Series undifferentiated glacial drift, loess and alluvium. Quaternary-age clastic sediments consisting of clays, silt and gravel are present in southern Saline and Cooper counties. These sediments are relatively thin over much of the area. There is a buried alluvial valley in Saline County that trends northwest southeast. It is either a preglacial channel or the result of ice damming of the Missouri River during glaciation (Miller and Vandike, 1997).

Mineral and geologic resources of the project area consist of coal beds, barite-containing lead deposits and potential oil and gas production. There are more than forty separate coal beds in Missouri. Most of the coal production has come from five major fields including central and north-central Lafayette County (the Lexington Field). The most important coals are in the Desmoinesian Series and are ranked as "high volatile bituminous". In the central district including a small portion of Cooper County there are many small deposits of barite, pyrite, galena and sphalerite. These deposits are too small to be important sources.

2. Soils

Soils in the project area can be classified into three general groups based upon the parent material from which they are formed. The three parent materials in the project area are loess (material deposited by the wind), alluvium (material deposited by water) and residuum (material from weathered rock). Agricultural values derived from site soils are discussed in Section A.

Loess is a result of material that was deposited after continental glaciers retreated or during interglacial periods. The soil consists of clay and silt particles that were picked up by the wind from river bottomlands and deposited on adjacent uplands.

Alluvium is a mixture of sand, silt and clay that has been deposited by water. Clay deposits are usually in old backwater areas and abandoned channels. Silt and sand are usually along the edge of a natural channel.

The weathering of bedrock forms residuum. The composition of the original bedrock contributes to the final soil composition. In Cooper County residuum is derived from cherty limestone and sandstone whereas in Lafayette and Saline Counties parent material included shale, limestone and sandstone.

Soil Associations

The general soil map (Figure III-8) of Missouri shows the following soil associations in the project area:

The dominant soil association in the project area is the Marshall-Higginsville Association located in Lafayette County (Table III-13). Except for a small area along Davis Creek, this association is located along the entire project corridor from Odessa to the Lafayette/Saline County line. The soils are generally gently sloping to strongly sloping, loamy, well drained and somewhat poorly

drained soils on uplands. The soils were formed in silty loess that is approximately eight feet thick in the project area.

Table III-13 Soil Associations Within SIU 2

County	Soil Association
Saline	Macksburg-Arispe Association Dockery-Colo Association Weller-Winfield-Goss Association
Lafayette	Marshall-Higginsville Association Blackoar-Otter-Nodaway Association Winsfield-Sample Association
Cooper	Dockery-Speed-Moniteau Association Menfro Association Arisburg Association Coss-Wrengart-Bluelick Association

The Blackoar-Otter-Nodaway Association and the Winsfield-Sample Association are both located along Davis Creek. The Blackoar-Otter-Nodaway Association is nearly level, loamy, poorly drained and moderately drained soils on bottomlands. These soils in the project area were formed from alluvial materials deposited by Davis Creek. The Winsfield-Sample Association is gently sloping to steep, loamy, moderately well drained and somewhat poorly drained soils on uplands. Winsfield soils are formed in loess and occupy ridges and hillsides. Simple soils formed from shale residuum and are located on hillsides throughout the association.

The Macksburg-Arispe Association is located in deep, very gently sloping to strongly sloping, somewhat poorly drained loess soils on uplands. The association is distributed next to the Weller-Winfield-Goss Association throughout the entire project area in Saline County.

The Weller-Winfield-Goss Association is deep, gently sloping to steep, moderately well drained and well-drained soils formed in loess or residuum on uplands.

The Dockery-Colo Association is deep, nearly level, somewhat poorly drained and poorly drained soils formed in alluvium on floodplains along the Blackwater River.

Soils in the Dockery-Speed-Moniteau Association are very deep, nearly level and very gently sloping, somewhat poorly drained and poorly drained soils that formed in the alluvium of the Lamine River.

The largest soil association in Cooper County is the Menfro Association. The Menfro Association soils are very deep, gently sloping to steep, well-drained soils that formed in thick loess on uplands.

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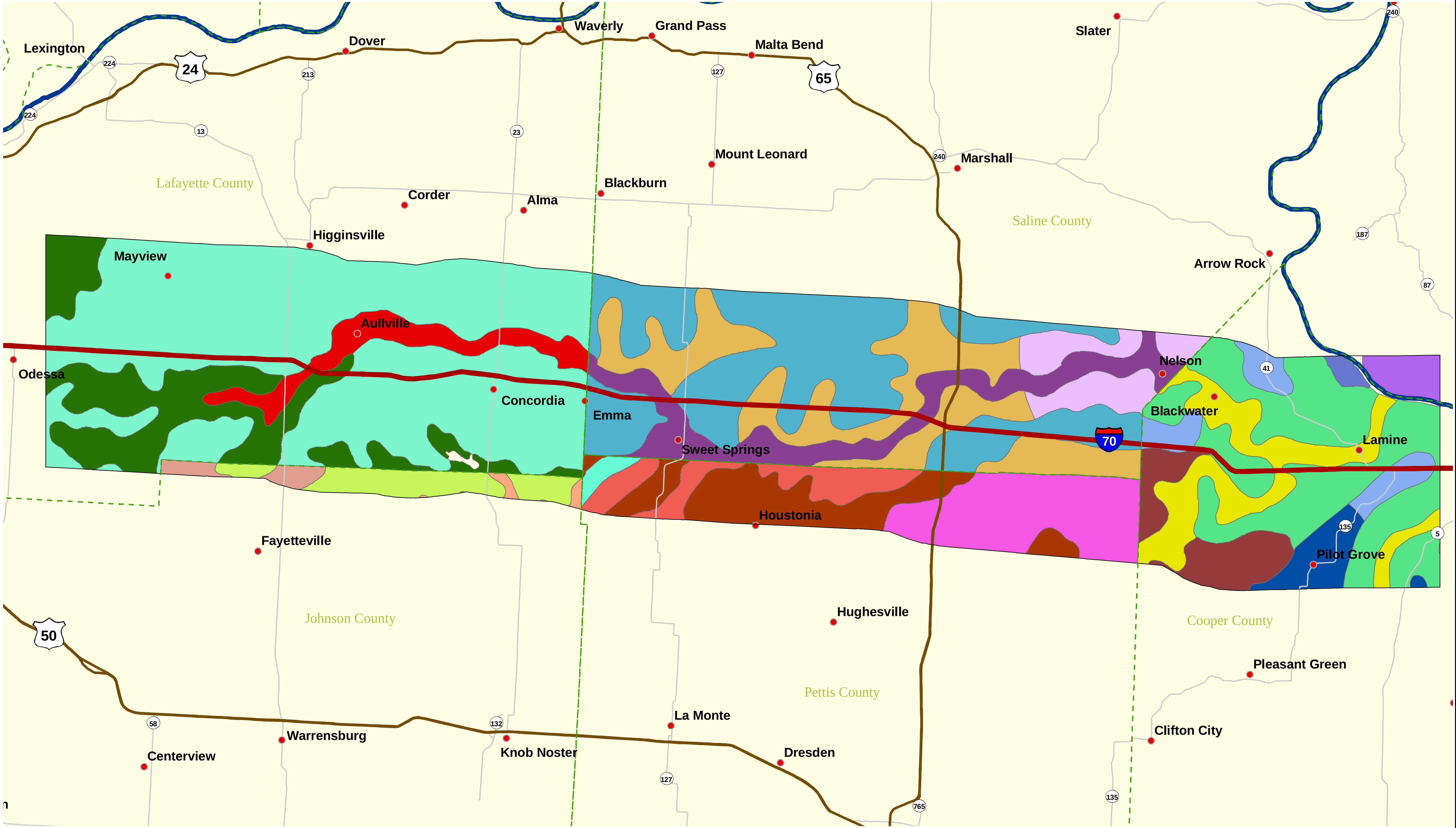

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MoDOT

IMPROVE I-70

2

Route 131
to
Route 5

Cities
Interstate
Route
U.S. Highway
County Boundary

SIU 2 Soils

- Arisburg
- Arispe-Macksburg-Greenton
- Blackoar-Otter-Nodaway
- Bluelick-Goss-Pembroke
- Clafork-Leslie-Crestmeade
- Dockery-Colo
- Dockery-Speed-Moniteau
- Dockery-Tanglenook-Lamine
- Goss-Wrengart-Bluelick
- Haynie-Waldron-Leta
- Knox-Menfro-Sibley
- Leta-Haynie-Hodge
- Macksburg-Arispe
- Macksburg-Sampsel
- Marshall-Higginsville
- Menfro
- Pershing-Greenton-Dockery
- Sampsel-Snead-Polo
- Weller-Winfield-Goss
- Winfield-Sampsel
- Zook-Dockery-Blackoar

Note: Soils are only displayed within a 5-mile buffer of I-70.

0 2.5 5 10 Miles

1:250,000

SIU 2
General Soils

FIGURE
III-8

The Arisburg Association is located on uplands and is composed of deep, very gently sloping to moderately sloping, somewhat poorly drained soils that formed in loess. The only location of this association in the project area is located at the intersection of I-70 with Route 135.

The Coss-Wrengart-Bluelick Association is located in upland areas and is composed of very deep, gently sloping to very steep, moderately well drained to well-drained soils that formed in loess and cherty limestone residuum or in cherty limestone residuum. The only location of this association in the project area is located at the intersection of I-70 with Highway Z.

G. Biological Resources

1. Natural Habitats

Existing I-70 along SIU 2 crosses a great diversity of biological resources. From agricultural fields, river bottoms and forested lands to urban developed areas around the interchanges, SIU 2 offers a diversity of habitats.

a. Terrestrial Communities

"The Natural Divisions of Missouri" (Thom and Wilson 1996) was used to characterize the terrestrial communities for the project area. The two natural divisions located in the project area are the Glaciated Plains Division-Western Section, located in Lafayette and Saline Counties and the Ozark Border Division-Missouri River Section located in Cooper County and the southeast corner of Saline County.

The Glaciated Plains Division-Western Section is characterized by loess-dominated topography and soils and the driest climate in the state. Prairie communities were the dominant presettlement vegetation on both uplands and bottomlands. Characteristic plants of the Glaciated Plains Division include the interrupted fern (*Osmunda claytoniana*), snow trillium (*Trillium nivale*), choke cherry (*Prunus virginiana*), meadow sweet (*Spriea alba*), bluejoint grass (*Calamagrostis canadensis*) and pussy toes (*Antennaria neglecta*). Characteristic animals include the plains leopard frog, (*Rana blairi*), plains garter snake (*Thamnophis radix*), rose-breasted grosbeak (*Pheucticus ludovicianus*), horned lark (*Eremophila alpestris*), Franklin's ground squirrel (*Spermophilus franklinii*) and badger (*Taxidea taxus*).

The Ozark Border Division-Missouri River Section is characterized by a highly dissected topography with isolated rolling hills and gently sloping ridgetops and valley bottoms. Soils are primarily derived from loess. Presettlement vegetation was predominantly deciduous forest with lesser areas of marsh, prairie and glades. According to Thom and Wilson (1996), several plants are generally restricted to this division including clubmoss (*Lycopodium lucidulum*), white trillium (*Trillium flexipes*), Forbes's saxifrage (*Saxifraga pensylvanica* var. *forbesii*) and hay-scented fern (*Dennstaedtia punctilobula*). Typical animals include woodchuck (*Marmota monax monax*), eastern gray squirrel (*Sciurus carolinensis carolinensis*), eastern chipmunk (*Tamias striatus griseus*), gray fox (*Urocyon cinereoargenteus*), Northern redbelly snake, (*Storeria occipitomaculata occipitomaculata*) and broadhead skink (*Eumeces laticeps*).

The natural vegetation communities in the project's three-county area have been significantly altered since presettlement times. The remaining forest communities typically consist of

deciduous hardwoods such as oaks, hickories and maples. The amount and quality of forests within the project area has been significantly reduced by logging, agricultural practices and other development. The remaining forested areas are generally limited to stream and river valleys. Prairies in the three-county area have also been significantly altered by agricultural practices and development and with a few exceptions only small remnants remain in undisturbed areas such as along railroad right of way, cemeteries and some pasture lands.

Correspondence with the Missouri Department of Conservation (MDC) was initiated in order to determine significant or unique natural features that were located within one mile of the SIU 2 corridor to the project. The MDC Natural Heritage Database indicated that three natural features/unique species were located within one mile of the project corridor; however, none of these areas were within the proposed right of way. A complete list of these features is included with the MDC letter in Appendix E.

b. Aquatic Communities

The distribution of aquatic species, particularly fish, can be divided into four faunal groups in Missouri: Ozark, Lowland, Prairie and Big-river. SIU 2 is located entirely in the Prairie Faunal Region. Major streams of the Prairie Region historically meandered across broad flat valleys creating ox-bow lakes and sloughs as their channels shifted. Most of the streams in this area have now been channelized and straightened and are of a uniform depth. Streambeds are composed of silt, sand and gravel and waters are usually turbid. Small fish that are not widespread, but are characteristic of the Prairie Region include common shiner, ghost shiner, brassy minnow, plains killifish and trout perch. Common small fish of the region include golden shiner, big mouth shiner, creek chub, red shiner, redfin shiner and sand shiner. Non-game fish common to the region include gizzard shad, carp, river carpsucker and white sucker. Common game fish include flathead and channel catfish, bluegill, largemouth bass and white crappie (Pflieger, 1991).

2. Threatened and Endangered Species

No state or federally listed threatened or endangered species are known to occur within the project area. However, the U.S. Fish and Wildlife Service (USFWS) indicated that running buffalo clover *(Trifolium stoloniferum)* and Indiana bats *(Myotis sodalis)* could occur in SIU 2 (Scott, 2004). Although a wetland delineation was conducted throughout SIU 2 and no running buffalo clover plants were identified, no surveys for threatened and endangered species were conducted as part of this project.

Running buffalo clover is a native clover of Missouri and was thought to have been extirpated from the state until 1989, when it was rediscovered growing on an unattended dirt pile in St. Louis. A natural site was discovered in Madison County in 1994 and a second followed in Maries County in 1998. It is a perennial that grows from 4 to 20 inches tall, blooming generally from mid-May through June. Its appearance is very similar to other clovers found in the state.

Recent sites where running buffalo clover had been found are in or adjacent to disturbed areas as well as in riverine settings, along the first wooded terrace or bench above the river. It has been thought that disturbance, such as that provided by the herds of buffalo in Missouri, were instrumental in the species propagation and distribution. Running buffalo clover does not appear to compete well with other species of clover. Currently mowing and grazing can provide that disturbance which appears to be necessary for the plant’s distribution.

Indiana bats (Myotis sodalis) may be found throughout the state. The wintering range is generally south of the Missouri River and the summer range occurs throughout the state. Caves are used for the hibernaculum during the winter, while trees are preferred for females and their young in the summer months. According to the MDC, there are fewer than 30 caves or mines, which are known to have sizable Indiana bat colonies during winter hibernation. The bats have very specific habitat requirements for their winter hibernation sites.

The Indiana bats are known to inhabit Rocheport (also known as Boone) and Lewis and Clark Caves during the winter months. Both caves are located outside of SIU2 in the Overton Bottoms area of the Missouri River and are approximately 20 miles east of SIU 2. The Indiana bats come into the cave shortly after the gray bats have left, generally in October and stay until March. According to a recent MDC census, approximately 200 Indiana bats are present over the winter months. However, not all the bats will leave the cave's vicinity during the summer months. Some of the Indiana bats will stay near the cave and continue foraging nearby. No other important hibernaculums are known in the I-70 corridor.

The females and their young spend the summer months in maternity colonies in both riparian and upland woodlands where suitable roost trees are present. Suitable roosting habitat is primarily dead or dying trees >9-inches diameter at breast height (dbh) that have exfoliating bark. Indiana bats also use live shagbark and shellbark hickories (*Carya ovata and C. laciniosa*, respectively) that have a dbh >9-inches, or live white oak (*Quercus alba*) with a dbh >20-inches. Female maternity colonies prefer to roost under the sloughing bark. According to the USFWS, summering Indiana bats could occur along I-70 where suitable roosting habitat occurs.

According to the Missouri Department of Conservation, the ghost shiner (*Notropis buchanani*), a species of Conservation Concern (ranked S2), is known to occur in the Blackwater and Lamine Rivers near I-70 (Gardner, 2002). Correspondence with the Missouri Department of Conservation indicated that the ghost shiner is considered a common inhabitant of low-gradient sections of large prairie creeks with permanent flows and that the shiner is likely to occur in suitable habitats throughout both the Blackwater and Lamine River's systems. Pflieger (1991) indicates that the ghost shiner is a characteristic species of low-gradient sections of large creeks and rivers having permanent flow and moderately clear water. It prefers habitat in quiet waters and inhabits larger pools and protected backwaters without noticeable current. Spawning occurs over sluggish rifles composed of sand or fine gravel.

H. Cultural Resources

1. Interstate 70 History

As early as 1938 consideration was given by the federal government to an interstate highway network. A report resulting from the Federal Highway Act of that year recommended construction of a 26,000-miles (41,843 kilometers) inter-regional system consisting of two- or four-lane highways, some with controlled access. The plan remained dormant until the Federal Highway Act of 1944 authorized the designation of select existing highways as part of an interstate system. The act called for improvement of these designated roads, but made no provision for increased federal funding. Lack of money and lack of uniform design standards slowed progress on the project over the following years. Although funding increased with the Federal Highway Act of 1952, only 6,000 miles (9,656 kilometers) of highway had been completed by 1953.

In an address prepared for a governor's conference in 1954, President Dwight Eisenhower declared that the highway system then in place was totally inadequate, causing needless death and injury, creating delay in the transportation of goods, and placing the nation at risk in the event of major disaster or war. He called for federal and state cooperation in the creation of a modern interstate network, paid for by a revamped system of financing that would avoid debt.

The Federal Highway Act of 1956 substantially enacted Eisenhower's proposal and initiated the current interstate highway system. The act instituted construction on a network 39,000 miles (63,730 kilometers) in extent and authorized $25 billion for the project, to be spent over the period 1957 to 1969. Existing toll roads meeting system standards could be integrated into the interstate system. Inherent in the terms of the act was the idea that the interstate system should evolve and improve over time and that initial construction would be altered or replaced in the future as need arose. The original act permitted two-lane interstate segments with at-grade intersections in low traffic rural areas, but called for the adoption of minimum standards aimed at the eventual elimination of these segments. Legislation passed in 1966 ultimately did require all interstates to be at least four lanes and have no at-grade intersections. According to the 1956 act, interstates were to be constructed according to standards accommodating traffic forecasted for 1975. Subsequent legislation amended this requirement so that highway design would tolerate traffic estimates for a maximum of 20 years.

The 1956 act started a public works project that was the most expensive and wide-scale in United States history, surpassing any program undertaken during the New Deal era, with approximately 75 percent of the new interstate system constructed on new right of way. Initial construction of the interstate system was greeted with wide-ranging support. It was not until the 1960s that significant opposition to the program mounted, with criticisms centering on the displacement of residents and the destruction of urban neighborhoods caused by highway construction.

When finished, I-70 extended from Baltimore, Maryland, through the Alleghenies of Pennsylvania, and across the Ohio River at Wheeling, West Virginia. From there it passed through Indianapolis, St. Louis and Kansas City, toward its original western terminus at Denver. In 1957 it was decided to extend I-70 west from Denver to a junction of I-15 in south central Utah.

As one of the interstates built in the immediate aftermath of the Federal Highway Act of 1956, I-70 was designated by federal legislation in 1990 as part of the Dwight D. Eisenhower System of Interstate and Defense Highways. In February 1994, this system was named by the American Society of Civil Engineers as one of the "Seven Wonders of the United States", along with other notable engineering accomplishments including the Golden Gate Bridge, the Panama Canal and Hoover Dam.

a. Missouri Interstate 70 Memorandum of Understanding (MOU)

Missouri is sometimes credited as the first state to initiate interstate highway construction, breaking ground on a 2.6 miles (4.2 kilometers) section of Interstate 70 in St. Charles County, after the state signed the first contracts under the new interstate program on August 2, 1956. Beginning in 1956, construction of I-70 across Missouri took nine years to complete. Work on the last sections, in Jackson and Lafayette counties, was completed in August of 1965. Extending 251 miles (403.9 kilometers), the Missouri section of I-70 was designed to meet the 20-year tolerance standard established by federal legislation.

During the First Tier Study, discussions began with the Historic Preservation Program (HPP) office, which houses the Missouri State Historic Preservation Office (SHPO), within MDNR, and FHWA. These discussions were regarding the potential historic significance of I-70 in view of the National Historic Preservation Act of 1966 and its possible eligibility for the National Register of Historic Places. The interstate system is approaching the 50-year-old threshold for consideration of eligibility, and as a result, the national interstate system is currently being studied by a national task force including representatives of the National Conference of State Historic Preservation Officers, the FHWA, select state Departments of Transportation, the Advisory Council on Historic Preservation, the National Register and other interested parties. The discussions within Missouri led to the development of a memorandum of understanding (MOU) that outlines a course of action to be followed with regard to I-70. The agreed action is the following:

1. A formal assessment of the eligibility of the section of Interstate 70 addressed in the the First Tier EIS and in the Second Tier environmental documents will be prepared by the Federal Highway Administration at such time that the interstate has reached 50 years of age, or the national task force has reached an opinion regarding the eligibility of the interstate system.

2. In the interim, the FHWA and MoDOT will proceed in good faith to gather documentation on the history and development of this important interstate highway (Interstate 70) in Missouri.

3. Should Interstate 70 or any part thereof be determined eligible at a later date, the FHWA and MoDOT shall enter into consultation with the Missouri SHPO and the Advisory Council on Historic Preservation pursuant to 36 CFR 800.

The MOU has been signed by the FHWA, MoDOT and MDNR. It is included in Appendix H of this document.

2. Cultural Resource Investigations

An investigation of historic, archaeological and architectural properties (including bridges) present in SIU 2 was conducted by the Center for Archaeological Research (CAR) at Southwest Missouri State University. The investigation followed MoDOT/SHPO approved protocol for cultural resource surveys and documentation. The technical reports are summarized in this section and in Section H of Chapter IV. The approved protocol and technical report are available upon request.

The investigation included a search of the Archaeological Survey of Missouri and State Historic Preservation Office, Missouri Department of Natural Resource files for information on known sites and their significance. As part of the background investigations, efforts were made to identify all current National Register of Historic Places (NRHP) properties within 500 feet (152 meters) of the area of potential effects (APE). This documentation included potential historic districts and landscapes. Along the mainline, between the interchanges, the APE extended 250 feet (76 meters) from the current right of way on the side selected for widening. Around the interchanges, the APE consisted of the farthest extent of any potential reconstruction with a 100-foot (30-meter) buffer outside that limit. Documentation standards were specified by survey methodologies supplied by MoDOT.

Section 4(f) of the Department of Transportation Act of 1966 states that special effort should be made to preserve "historic sites of national, state or local significance among other resources unless there is no prudent or feasible alternative to using that land and that if they cannot be avoided, all possible planning to minimize harm is undertaken." Section 4(f) historic properties would include those determined by the State Historic Preservation Officer to be on, or eligible for the NRHP and affected by the project.

a. Architectural Resources Survey Methodology

The basic protocol used for architectural resources other than bridges was as follows:

- Properties built after 1970 were not documented unless they were of high design or had unique architecture; if so, they were photographed.
- Properties dating between 1945 and 1970 were all photographed. If the property was of high design or had unique architecture, it was then documented with a one-page Missouri State Historic Preservation Office Architectural/Historic Inventory Survey Form.
- Properties with any buildings or other resources built before 1945 (and qualifying younger ones) were documented with photographs and a one-page Missouri State Historic Preservation Office Architectural/Historic Inventory Survey Form was completed. All forms and photographs were submitted with an accompanying report to MoDOT under a separate cover.

For bridges, the protocol was as follows:

- Identify all bridge resources in the APE. Bridge resources are defined as highway, railroad and pedestrian bridges, viaducts and culverts. This definition excludes metal, plastic and concrete pipes and most concrete bridges and culverts under 20 feet in roadway length.
- Photograph all bridge resources built prior to 1961.
- Provide a one-page State Historic Preservation Office/Historic Bridge Inventory Form for those resources that appear in the "included list" of Clayton Fraser's 1996 draft Missouri Historic Bridge Inventory and for resources not evaluated by Fraser.

All photographed architectural resources were identified with a unique number. Properties built after 1970 were not documented unless they were of high design or had unique architecture: if so, they were photographed and assigned a property number. For architectural resources other than bridge resources, the number was assigned based on the property location west to east in the SIU; the numbers are sequential throughout the SIU regardless of county. Prefixes were added to the base number for the SIU number and a county abbreviation; for example, the westernmost property in Saline County in SIU 2 would be designated 2SA1. For bridge resources, the state or other previously applied numbers were used.

Site plans were prepared for all inventoried properties having three or more buildings and sometimes for other properties. The site plans consist of cropped and labeled high-resolution aerial photographs. In SIU 2, 277 properties were inventoried, 90 of which dated prior to 1945. Although former U.S. 40 in SIU 2 was not given a property number it was evaluated and recommended as not eligible for the NRHP.

The locations of all inventoried buildings were researched on historic plat maps. The property owners on each map were recorded as to whether the map indicated a building in the

approximate location, though not all plat maps showed buildings. All numbered resources were mapped on high-resolution air photographs. All inventoried buildings were mapped on USGS 7.5' quadrangle maps, as were any bridges more than 50 years old. Cultural resource in the vicintiy of I-70 are described in Table III-14 and the locations of these resources are shown in Figure III-9.

Evaluation of Eligibility for the National Register of Historic Places

Properties are considered significant if they meet the criteria for eligibility to the NRHP, maintained by the U.S. Department of the Interior. Eligibility criteria are summarized as follows:

- Criterion A—Resources associated with events that have made a significant contribution to broad patterns of our history.
- Criterion B—Resources associated with the lives of persons significant in our past.
- Criterion C—Resources that embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction.
- Criterion D—Resources that have yielded, or may be likely to yield, information important in prehistory or history.

Although no listed NRHP properties occur within the APE for SIU 2, four resources within SIU 2 were recommended eligible for the National Register of Historic Places (NRHP). The SHPO has reviewed these four sites and has concurred that they are eligible for listing on the NRHP. In addition SHPO has determined that the Schmitt Garage (2CP239) is also eligible for listing on the NRHP. One other object, the Higginsville Hand Sign, is undergoing SHPO review for potential eligibility.

Marth/Fischer Barn (2LF66)

This gambrel-roofed barn has a ridge hood, an elaborate descending hay loft door, glass ball lightning rods and a steel vent cupola. According to the owner, Mrs. Roland Fischer, a local carpenter built it in 1936 and 1937 with help from neighbors. Mrs. Fischer's father (Otto Marth) originally owned the property and she was present during construction. This is an excellent example of a gambrel-roofed cattle barn with a good deal of characteristic detailing. It has the highest level of physical integrity of any such barn in the survey area. The barn is considered eligible for listing on the NRHP under Criterion C with Architecture as the area of significance; the period of significance is 1936-1937.

Burrow House, 109 South Main Street, Concordia, Missouri (2LF113)

This bungalow presents a fine use of typical Craftsman style detailing. Examples of this detailing include: angle brackets, porch posts that combine wood and textured block, an asymmetrical composition, an arched porch beam, exposed rafter ends and a bay window. This circa 1930 house has not been substantially altered on the exterior and is in excellent condition. It is considered eligible for listing on the NRHP under Criterion C with Architecture as the area of significance; the period of significance is 1930.

Hall/Simmons House (2SA191)

This small Craftsman open-gable bungalow still retains its original detailing including angle brackets, shaped rafter ends, window and doorframes and a porch with brick and wood columns. An unobtrusive addition has been constructed on the rear of this house. According to the current owner, it was built in the late 1930s. It is considered eligible for listing on the NRHP under Criterion C with architecture as the area of significance. The period of significance is 1935-1940, which spans the probable era of construction. The house is on a 15-acre (6-hectare) parcel with a small portable building and an unused highway development building that postdates 1945. The recommended NRHP boundary is the footprint of the house.

Younger/Swift House (2SA208)

This property consists of three buildings. The house (2SA208.1) is a brick Craftsman bungalow. The other two buildings are a brick garage (2SA208.2) and service station (2SA208.3). All the buildings show similar brick masonry work. Except for the addition of a deck on the rear and wheelchair ramp on the front, the house has all but complete integrity. It is a good example of a brick bungalow with a full front porch contained within the gable roof. The garage is partly overgrown and partly boarded up and its wood parts are weathered. The gas station has its canopy area partially enclosed by recently constructed metal; however, its detail appears to be mostly present. Both of these buildings retain a high level of integrity.

The buildings on the property date to the early years of highway development in Marshall Junction, where U.S. 40 and U.S. 65 intersected, in the 1920s and 1930s. Jerome Younger owned the property in 1930 and he operated a store in the area that is no longer present (Orr 1967:230). The property is considered eligible for listing on the NRHP under Criterion A with Transportation as the area of significance and Criterion C, Architecture. The period of significance is 1930 to 1945. The buildings are currently on an oddly shaped 5-acre (2-hectare) parcel (an angular hour-glass shape), a small portion of the 225 acres (91-hectares) owned by Younger in 1930. Therefore, the recommended NRHP boundary is the area immediately around the buildings**.**

Schmitt Garage (2CP239)

This is an example of a rock highway development building (2CP239.1) located along what was once U.S. 40. According to the owner, Gloria Schmitt, it also served as a Greyhound bus station prior to the construction of I-70. According to the date in the façade, the garage was built in 1935 by J. H. Cassell who owned the property in 1930. The facade is suggestive of the Mission Style in the parapet. It is also an example of the rock-over-frame building technique. Unfortunately, the rock has fallen over the service bay and is badly cracked in other places. The wood details are substantially deteriorated. Several windows in the rear are entirely devoid of glass, causing deterioration of the structure and the interior. A recent metal convenience store (2CP239.2) is located immediately to the west.

Despite its condition, SHPO determined 2CP239.1 to be eligible for the National Register under Criterion A, Transportation, and Criterion C, Architecture. The period of significance would be 1935 to 1954, the date of construction until 50 years ago. The NRHP boundary would be the footprint of the building.

Higginsville Hand Sign (2LF277)

The sign is made from 1/4-inch steel plate cut into the shape of a pointing hand. It is mounted on angle iron posts that are set into concrete. The sign is approximately 15 feet long by 15 feet

tall. The word “Downtown” is painted on the pointing finger. On the hand, the sign reads, “5 Minutes, Higginsville, Gas Food Shopping.” A two-foot by four-foot paper sign, that reads, “The Hub of Lafayette Co.” is pasted onto the metal hand

This is one of three signs used by the Higginsville Chamber of Commerce to attract visitors to the town. An identical sign is located south of I-70 and east of Highway 13 along the south outer road, visible to eastbound motorists on I-70. The north-side sign is visible to westbound traffic. Both signs were originally adjacent to U.S. 40, which currently serves as the south outer road. A similar sign is located on Highway 13 north of Higginsville, although it only says “Welcome to Higginsville.” The signs along U.S. 40 replaced earlier wooden signs in about 1940. The wooden signs were in the shape of an ear of corn and proclaimed Higginsville to be the “Seed Corn Capital of the World.” This sign north of I-70 would have been moved in the early 1960s when I-70 was built, however, the one south of I-70 is in its original location.

Table III-14: Architectural Resources Eligible for the NRHP

Resource	Name	Significance Criteria	Area of Significance	Period of Significance	NRHP Boundary
2LF66	Marth/Fischer Barn	C	Architecture	1936-1937	Footprint of barn
2LF113	Burrow House	C	Architecture	1930	Lot boundary
2SA191	Hall/Simmons House	C	Architecture	1935-1940	Footprint of house
2SA208	Younger/Swift House	A, C	Transportation, architecture	1930-1945	Footprint of buildings
2CP239	Schmitt Garage	A, C	Transportation, architecture	1935-1954	Footprint of building

b. Archaeological Resources Survey Methodology

The archaeological resources survey methodology started with the archival searches conducted during the First Tier EIS process. During the First Tier EIS, the Historic Preservation Program of the Missouri Department of Natural Resources in Jefferson City provided a list of National Register properties. Properties within the study area were identified and the National Register nomination forms for each property were examined. These forms are on file at the MDNR Historic Preservation Program.

Basic information on each property was obtained such as its name, location, why the site was significant and its period of significance. This information was then summarized in a table and the locations of the properties placed on the appropriate USGS quadrangles. Within the counties crossed by SIU 2 there were two in Lafayette County, six in Saline County and 30 in Cooper County. The greater number of properties within Cooper County does not reflect a greater number of significant cultural resources in that area. It is more likely due instead to the proximity of the University of Missouri in Columbia. Researchers from that institution were more likely to document resources in the surrounding region. For example, over half of the properties identified in Boone County are within the city of limits of Columbia. Although 38 NRHP properties were identified in Lafayette, Saline and Cooper counties, only one prehistoric NRHP site (the Imhoff site) is located near I-70 in SIU 2. The Imhoff site is a Middle Woodland Period (200 BC - AD 300) site that includes a burial mound and an associated village.

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MoDOT IMPROVE I70

2
Route 131
to
Route 5

- Cities
- Interstate
- Route
- U.S. Highway
- County Boundary
- Reservoirs
- SIU 2 Architectural Resources

0 2.5 5 10 Miles

1:250,000

SIU 2
Cultural Resources

FIGURE
III-9

Upon completion of the NRHP search, a geomorphological study of the lowlands along major waterways was conducted to identify locations likely to have buried cultural remains. Places having little or no chance for buried resources were also identified. Information obtained from this study was then used to guide future archaeological investigations.

The archaeological survey was performed once a preferred alignment was chosen. The Area of Potential Effect (APE) surveyed consisted of a 164-foot (50-meter) wide area adjacent to the existing right of way (or outer road right of way) where lane expansion would take place. The survey identified all prehistoric and historic archaeological sites within the APE. Transects, typically spaced 10 - 15 meters apart, were walked within the APE and the ground was examined for cultural remains in areas with at least 30 percent surface visibility. When surface visibility was less than 30 percent, shovel tests were placed along the transects at 10-15 meter intervals to a depth of 30-50 centimeters. The shovel tests were not screened, but were carefully examined for cultural remains. Information from the geomorphological study was used to identify places likely to have deeply buried sites and deeper bucket auger tests were performed at those locations.

When a site was identified, a sample of artifacts large enough to determine temporal affiliation and site use was collected. At least one shovel test was excavated at all sites in order to determine soil integrity, which aided in assessing the present condition of each site. Site boundaries were determined, even if these extended beyond the construction corridor. The sites location was then placed on the appropriate USGS quadrangle and aerial map. A sketch map showing landmarks, ground cover, artifact concentrations, or exposed features was also drawn. The potential National Register eligibility was determined for each site, as well as the amount of impact, if any, the project would have on each site.

A separate Phase I archaeological survey report for SIU 2 has been prepared by the Center for Archaeological Research (CAR). The Phase I report describes the results of the survey in conjunction with recommendations for the further management of the identified sites.

During the Phase I survey, the CAR identified 88 archaeological sites, nine of which were previously identified. Of the 88 sites, the CAR recommended 14 as eligible for Phase II testing. Twelve of the 88 could not be evaluated due to denial of property access. Sites recommended as eligible for Phase II testing included 10 prehistoric sites, three historic sites and one multi-component, pre-historic-historic site. A summary of the CAR report is provided below.

Prehistoric Resources

Various peoples have occupied the study corridor over the past 11,000 years representing prehistoric and historic periods. The prehistoric period includes Paleo-Indian, Archaic, Woodland, Mississippian, and Historic Native American cultural traditions (Table III-15**)**. Although not well dated, many prehistoric sites are located in the SIU 2 corridor.

Table III- 15: Prehistoric Periods in Missouri

Period	Years Before Present	Years B.C./A.D.
Historic Indian	250-120	A.D. 1700-1830
Mississippian	1000-250	A.D. 1000-1700
Woodland	2600-1000	600 B.C. – A.D. 1000
Archaic	9500-2600	7500 B.C.-600 B.C.
Paleo-Indian	11,250-9500	9250 B.C.-7500 B.C.

Source: Adapted from Lopinot et al. (2004)

Evidence of Paleo-Indian occupation of Missouri can be traced to the early Clovis culture. Finds of Clovis points are uncommon. As of 1974, five had been found in Cooper County (Chapman, 1975). Middle Paleo-Indian occupation existed in the form of small bands of nomadic hunter-gatherers utilizing large territories in pursuit of food and resources. Middle Paleo-Indian cultures utilized a greater diversity of projectiles than the earlier Clovis cultures. Later Paleo-Indian sites are more frequent and are determined primarily by the presence of the Dalton point, a concave-stemmed lanceolate projectile point/knife that typically exhibits basal thinning and grinding. One site in the project area was determined to have Paleo-Indian artifacts (AS2SA51).

Archaic cultures were nomadic and semi-nomadic hunter-gatherers. The period is characterized by increasing regional populations and greater exploitation of local resources. Sites representing the Sedalia phase, known for Sedalia points, are common in Lafayette, Saline, and Cooper counties (O'Brien and Wood, 1998). Three sites with Archaic components were located in the project area (AS2CP12, AS2CP24, and AS2SA51).

Woodland culture sites reflect increasing sedentism, with evidence of cultivation and semi-permanent to permanent occupations. Mound burials were common and often located on bluffs near flood plain settlements. Several Woodland sites that are in the region of, but not impacted by, SIU 2 are included on the NRHP such as the Fisher-Gabbbert site in Saline County, the Imhoff site and the Mellor village and mounds in Cooper County. Three sites containing Woodland components were located in the project area (AS2CP21, AS2SA38, and AS2SA51).

The Mississippi Period is marked by substantial population agglomeration and political unification into chiefdom-level societies. Large manifestations of Mississippian cultural artifacts are uncommon in the area of SIU 2. This could be due to a potential large unoccupied buffer zone between the groups in the St. Louis and Kansas City areas, or it could be that the local Late Woodland-type population continued to live in the region and did not adopt the Mississippian culture. No Mississippian sites were discovered within the SIU 2 project area.

Historic Resources

In Missouri the prehistoric and historic eras overlap. The historic period represents the time period from European "discovery" to modern times. The historic period includes Protohistory, Contact and Colonialism, European-American Settlement and Agricultural Expansion, Industrialization and Urbanization, and Economic Renewal and Suburbanization (Table III-16).

Table III-16: Historic Periods in Missouri

Period	Years A.D.
Economic Renewal and Suburbanization	1930-present
Industrialization and Urbanization	1865-1930
European-American Settlement and Agricultural Expansion	1803-1865
Contact and Colonialism	1673-1803
Protohistory	1550-1673

Source: Lopinot et al. (2004)

The Protohistory period represents a time of significant demographic, economic, and political change for indigenous societies in the Missouri River valley. Even though the Spanish explorations into the interior of the continent during the mid 1500's did not lead to permanent settlements, their influence on the Native American populations of the entire region was formidable. The effects of the explorers included the introduction of horses and disease

epidemics. Later French and British influence included the introduction of guns and the development of the fur trade in central Missouri.

During the period of Contact and Colonialism the entire mid-continent was claimed by Spain and France. The first Spanish land grants were given primarily to the French, often for mining (Gerlach, 1976). One land grant was given in the SIU 2 corridor. It was to Pierre Chouteau, Sr., a well known trader based in St. Louis. The final return of the Louisiana Territory to the French came in the Treaty of San Ildefonso in 1800, after the Spanish opened Missouri to American settlement in 1797 (Foley, 1989).

The later historical periods have been broken down into two themes that are pertinent to potential archaeology along the SIU 2 corridor. These are early settlement, particularly if ethnicity can be established, and agriculture.

After the purchase of the Louisiana Territory in 1803, Missouri underwent an intense period of settlement by European Americans. Many of the earliest settlers in the SIU 2 area were of English, Scottish, and Irish descent looking for cheaper land. However, other immigrants included slaveholders seeking a new territory without antislavery restrictions. This portion eventually became known as “Little Dixie” due to the concentration of Slave Plantations, though the majority were not in the interior uplands but in the Missouri River valley.

From the 1830’s through the 1940’s German-speaking people dominated the foreign immigration into Lafayette, Saline, and Cooper counties (Lopinot et al. 2004). The greatest number settled within or near the towns of Concordia and Emma. The possible remains of St. John’s church and school (AS2LF9) were found within the SIU 2 Corridor. The church was a German Evangelical church organized in 1847.

Two additional sites that may represent pre-Civil War occupation were located in the SIU2 Corridor. One is an artifact scatter (AS2SA10) that dates to the early-middle nineteenth century, which appears to be the possible location of a residence. The other is the possible location of another historic residence, which, due to a lack of nails and window glass, could have been a pegged log dwelling.

During the Civil War the population of the area was disrupted, but the post-war era saw a development of railroads, and wagon roads that re-invigorated agricultural production in the area. The population of all three counties peaked around 1900, and began to decrease with the advent of mechanized farming and the increase in land prices (AS2SA37).

The possible location of the Ridge Prairie School (AS2SA32) was located in the SIU 2 corridor just east of Highway J. The school dates to the turn of the century and represents a unique component of the rural historic agricultural landscape that could have included churches, country stores, and other services, along with many family farms.

The trend of increasing farm size and decreasing rural population has continued through the period of urbanization and industrialization. The decrease in population represents the loss of family farms, and the movement of people to cities and towns for factory and service jobs.

I. Hazardous Materials and Waste Management

A search of various databases supplemented by a windshield survey and review of aerial photography was used to identify known or suspected hazardous waste sites that would have the potential to be impacted by the project. The database search included the following sources:

1. NPL	National Priorities List, a list of high priority Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) sites
2. Proposed NPL	Proposed NPL
3. Delisted NPL	Site that have been removed from the NPL for any reason
4. ROD	Record of Decision, CERCLA (aka Superfund) site final decision document to determine the remedial action
5. NPL Liens	Liens placed on property resulting from remedial actions
6. CERCLIS	CERCLA Information System
7. CERC-NFRAP	CERCLA "No Further Remedial Action Planned"
8. CORRACTS	Corrective Action Report
9. RCRIS	Resource Conservation and Recovery Act Information System. This search included a search of treatment, storage and disposal facilities and large and small quantity generators
10. ERNS	Emergency Response Notification System record and stores information reported on releases of oil and hazardous substances (also known at the National Response Center)
11. MO RRC	Certified Hazardous Waste Resource Recovery Facilities in Missouri (MDNR Missouri Hazardous Waste Treatment, Storage and Disposal Facilities)
12. SHWS	MDNR Registry of Confirmed Abandoned or Uncontrolled Hazardous Waste Disposal Sites
13. MO SWF/LF	Solid Waste Facility List in Missouri
14. LUST	Leaking Underground Storage Tanks
15. UST	MDNR Underground Storage Tanks
16. PSTIF	Missouri Petroleum Storage Tank Insurance Fund
17. CONSENT	Superfund (CERCLA) Consent Decrees
18. FINDS	Facility Index System, this database links to the other federal databases
19. HMIS	Hazardous Materials Information Reporting System
20. MLTS	Material Licensing Tracking System
21. MINES	Mines Master Index File
22. PADS	PCB Activity Database System
23. DOD	Department of Defense
24. RAATS	RCRA Administrative Action Tracking System
25. TRIS	Toxic Chemical Release Inventory System
26. TSCA	Toxic Substance Control Act
27. SSTS	Section 7 Tracking Systems

28. FTTS	Tracks administrative cases and pesticide enforcement actions and compliance activities related to FIFRA, TSCA and EPCRA over the previous five years
29. AST	Aboveground petroleum storage
30. SPILLS	Environmental Response Tracking database

Numerous facilities or sites listed in the various database files are located in the project area. Environmental Data Resources, Inc (EDR) conducted a database search and the results are hereby included by reference (EDR, 2003). The information presented here is based on the results of that database search, windshield survey and review of aerial photography. The majority of these sites are located near interchanges. The sites largely comprise service stations and convenience stores located in the project area that would be impacted during interchange construction. These locations are potentially hazardous due to the underground storage tanks (UST) present. In addition, five automobile and truck repair facilities would be potentially impacted in SIU 2. Other potentially hazardous sites include equipment and automobile sales locations, Micro Tool and Dye, Mid Missouri Thermal King, a KOA printing press, a former Minuteman II missile site and two abandoned USTs. The potentially impacted sites are presented in Table III-15, which includes the location of the hazardous site and alternative that would cause a potential impact. In addition to known sites, farms in the SIU may have aboveground or underground storage tanks as well as areas of pesticide or herbicide contamination. Farms and residences in Missouri are exempt from Missouri Underground Storage Tank Law and Regulations.

Table III-17: Hazardous Waste Sites Potentially Impacted by the Preferred Alternative and Interchange Alternatives*

Mainline Improvements	
Bri-Ley Sales	
Raney Auto Sales and Service	
Klienschmidts	
Mirco Tool and Dye	
M&S Livestock Equipment	
Trader's Corner Used Farm Equipment	
Unknown Truck Service Facility	
Bill's Garage	
I-70/Route H Interchange	
Former Minuteman II missile site	**Alternative A**
I-70/Route 13 Interchange - Higginsville	
Pilot Travel Center	Alternative A and B
Iron Horse	Alternative A and B
I-70/Route 23 Interchange - Concordia	
Travel Center	Alternative A
Break Time	Alternative A and B
Texaco	Alternative A and B
Conoco	Alternative A and B
Mike's Auto Repair	Alternative A and B
I-70/Route 127 Interchange	
Gas Station	Alternative A and B
Convenient Store	Alternative A and B
I-70/Route YY Interchange	
Betty's Motel/Restaurant and Gas Station	Alternative A
Amoco	Alternative A
Truck Repair	Alternative A
TSI (former Kerr McGee site)	Alternative A

Table III-17: Hazardous Waste Sites Potentially Impacted by the Preferred Alternative and Interchange Alternatives* (Cont'd)

I-70/U.S. 65 Interchange	
No impacts to potential hazardous waste sites from Alternative A or B	
I-70/Route J Interchange	
Stuckey's	Alternative A
Abandoned Gas Station	Alternative A
I-70/Route 135/41 Interchange	
All Star Gas	Alternative A and B
Mid Missouri Thermal King	Alternative A
Williams Sales and Service	Alternative A and B
KOA Press	Alternative A and B
Conoco Gas Station	Alternative A
Chase Repair	Alternative B
First Amendment Video (potential UST)	Alternative A and B
Texaco Gas Station (UST)	Alternative A and B

*Exact locations are shown in Appendix A. These include partial takes in addition to displacements.

J. Public Utilities and Services

The following discussion provides affected environment information for the primary public services and utilities serving I-70 within SIU 2.

1. Electricity and Gas

Kansas City Power and Light and Missouri Public Service are the two largest electric utilities in the project corridor. Other electric providers include small rural cooperatives and the City of Higginsville. Electric transmission lines owned by various electrical companies parallel and/or cross over I-70 throughout the entire length of the corridor.

The City of Higginsville Electric Department has been in continuous operation since 1894. The system is community owned and operated and currently serves more than 2,300 customers in and around the city limits of Higginsville.

Near the eastern terminus of SIU 2 at mile marker 97, Panhandle Eastern Pipe Line Company operates three 16-inch natural gas transmission lines. There are three valve settings on the north side of I-70 at this location.

2. Telecommunications

Telecommunications utility corridors exist along both the north and south sides of I-70 and in some places in the median. These underground phone and fiber optic cables are typically located near the edge of the existing right of way, although some fiber optic cables within SIU 2 was located in the median. Other telecommunications facilities in the corridor include several cellular towers. These towers are distributed across the project area on either side of I-70.

3. Water

As a result of limited groundwater resources in the project area the major public water systems rely on surface water as a source of drinking water. The greatest users of water in the project area are the two largest cities in the corridor. Concordia and Higginsville use artificial lakes to supply potable water to their customers. The City of Emma purchases surface water for use as a potable water source. Smaller communities such as Sweet Springs and Aullville rely on groundwater as a source of drinking water. Excluding a portion of Cooper County and Saline County, drinking water in the rural areas of the project area is supplied by County Water Supply Districts. The proposed right of way also crosses through Lafayette County Public Water Supply District #1 and #2, Saline County PWSD #1 and #3 and Cooper County PWSD #2 and #3. All of the water supply sources for these PWSDs are located outside of the project corridor. At some of the undeveloped interchanges in SIU 2, water remains a constraint for development. For example, at the U.S. 65 interchange, the Marshall Wake District is currently extending a six-inch water line to serve this area. At the I-70/Route 127 interchange, the City of Sweet Springs is planning to construct a water line to the future hospital site. Outside of the more developed interchanges, water lines with sufficient capacity to support future commercial development are not common.

4. Sanitary Sewage Facilities

Each of the three major communities located along the corridor provides sanitary sewer facilities within the city limits. Higginsville contains four sewage treatment facilities, two located northwest and southeast of the city and two near the I-70/Route 13 interchange. The Sweet Springs sewage facility is located west of the city, south of existing I-70. The major inlet pipes for the facility are located to the south of the sewage treatment pond. The City of Concordia has a single sewage treatment facility located to the southeast of the city.

5. Emergency Response and Fire Protection

Emergency services are dependent upon the transportation infrastructure to provide an efficient means to respond to emergency calls. Emergency services in the SIU 2 corridor are primarily based around the cities in the corridor. The cities of Higginsville, Concordia and Sweet Springs police, fire and ambulance services use I-70 for emergency response calls. The City of Higginsville has nine police officers and 22 all-volunteer fire-fighters. The department has four pumper trucks, a tanker, a brush truck and a rescue vehicle. The fire department covers approximately 75 square miles (97 hectares) around the city of Higginsville. The City also has an emergency medical service with seven full-time paramedics and nine part-time emergency medical technicians and medics.

The City of Concordia has six full-time police officers and an additional reserve force. The Concordia Fire Protection District serves approximately 100 square miles (120.7 kilometers) and comprises 31 volunteer fire fighters and six emergency medical technician ambulance personnel. The district has six fire trucks and two ambulances.

The City of Sweet Springs has three full-time police officers. The fire department has 25 all-volunteer firefighters. Emergency medical service is handled by a separate ambulance service with two full-time and ten part-time employees.

Other fire protection districts that respond to emergencies along the SIU 2 corridor include the City of Odessa, the City of Mayview, the City of Marshall and the Cooper County Fire Protection

District. The City of Odessa and Cooper County also have ambulance services that may respond to emergencies along I-70. The Missouri State Highway Patrol and the County Sheriff Departments may also respond to calls along the SIU 2 I-70 corridor.

K. Public Lands

Publicly managed parks, recreation areas and other lands are scattered throughout the SIU 2 corridor and serve as important resources for conservation or regional natural heritage and for recreational opportunities. These areas range from city parks to state fishing lakes and wildlife management areas. The major state agency managing land within the SIU 2 corridor is the Missouri Department of Conservation. Public lands are identified on the plates in Appendix A.

Section 4(f) of the Federal Aid Highway Act of 1968 requires the consideration of publicly owned lands when evaluating alternatives for transportation projects. Further, recreation areas where Land and Water Conservation Fund (LWCF) Act monies have been used are protected under Section 6(f) of the Act. The following discussion identifies the potential Section 4(f) and Section 6(f) resources located within the SIU 2 Study Corridor and clarifies whether these resources meet the underlying requirements of these regulations.

1. Potential 6(f) and 4(f) Resources

Based on an evaluation of public lands within SIU 2, the following resources have been identified:

- Harriman Hill Access Conservation Area on the Lamine River: 4(f);
- Maple Leaf Lake Conservation Area: 4(f);
- Historic Sites: 4(f) and;
- Archaeological sites worthy of preservation in place: 4(f)

Based on previously collected data from the First Tier EIS for I-70, there are 32 Section 6(f) resources in Lafayette, Saline and Cooper counties including four in Lafayette County, 21 in Saline County and seven in Cooper County. A full listing of these resources is presented in Table III-16.

Table III-18 SIU 2 Section 6(f) Locations by County

Cooper County	
Missouri River Access	Boonville Swimming Pool Development
Boonville Lions Park	Boonville School Tennis Court Dev.
Blackwater Bridge Access Development	Bunceton City Park Development.
Boonville Park Acquisition	
Lafayette County	
Concordia Shelter House Dev. 2 Sites	Lexington Municipal Swimming Pool
Higginsville Tennis Court Development	Confederate Memorial Development
Saline County	
Saline County Lake Site	Arrow Rock-Planning & Road Construction
Blind Pony Lake 1	Miami Community Center Park
Blind Pony Lake 2	Marshall Tennis Court Development

Table III-18 SIU 2 Section 6(f) Locations by County

Arrow Rock State Park No. 1	Marshall Swimming Pool Renovation
Van Meter Site Park No. 1	Malta Bend Community Tennis/Basketball court
Marshall Indian Foothill Park Development	Slater Park Donation
Slater City Park Addition	Marshall Swimming Pool Renovation
Arrow Rock Acquisition	Blackburn Donation Development
Marshall Indian Foothills Park Development	Marshall Indian Foothills Golf course
Sweet Springs Swimming Pool Complex	Van Meter State Park
Slater Park Ball field	Indian Foothills Park

In addition to the 6(f) resources, other public lands include conservation areas as discussed below.

a. Harriman Hill Access Conservation Area

The Harriman Hill Conservation Area occupies 37 acres (15 hectares) of publicly owned land managed by the Missouri Department of Conservation near mile marker 92. The Harriman Hill Conservation Area provides public access to the Lamine River for fishing, camping, boating and other recreation activities. The Harriman Hill Conservation Area is located north of I-70 between mile markers 92 and 93. A gravel road provides access to the area from Route M. The boat ramp area was developed with Land and Water Conservation Funds. As a result, the boat ramp area is subject to Section 6(f). No other federal programs such as the Pittman-Robertson Wildlife Funds or Dingell Johnson Sport Fish Funds were utilized at the Harriman Hill Conservation Area.

b. Maple Leaf Lake Conservation Area

The Maple Leaf Lake Conservation Area is located approximately nine miles (14 kilometers) east of Odessa, Missouri, immediately south of I-70 between mile markers 46 and 47 and just east of Route H. Access to the 826-acre (334 hectares) Conservation Area is available via the I-70 frontage road from the Route H interchange at mile marker 45. No federal aid such as the Pittman-Robertson Wildlife Funds or Dingell Johnson Sport Fish Funds was utilized for the Maple Leaf Lake Conservation Area.

c. Other Public Lands

One additional resource within SIU 2 is the abandoned former Minuteman II missile site located in the northwest quadrant of the Route H interchange. Property ownership records indicate that this site is privately owned and the signs and fencing located at the site appear to be remnants of former government ownership.

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