CHAPTER III
Affected Environment

This chapter addresses the affected environment in Section of Independent Utility (SIU) 1. The affected environment includes the existing social, economic and environmental characteristics within SIU 1. The affected environment within the 24 miles (39 kilometers) of SIU 1 varies from an urban setting in the western portions near Kansas City to a rural setting in the eastern portions toward Odessa. Given these variances, the characteristics of the affected environment are presented and compared using the five roadway subsections that were defined in Chapter II.

- Subsection 1 – I-470 to MM 19 (East of Woods Chapel Rd.)
- Subsection 2 – MM 19 (East of Woods Chapel Rd.) to MM 22 (East of Adams Dairy Pkwy.)
- Subsection 3 – MM 22 (East of Adams Dairy Pkwy.) to MM 25 (East of Route AA/BB)
- Subsection 4 – MM 25 (East of Route AA/BB) to MM 29 (East of Route H/F)
- Subsection 5 – MM 29 (East of Route H/F) to MM 39 (East of County Rd. 96/Johnson Rd.)

A. Social and Economic Characteristics

This section presents the social and economic characteristics of SIU 1. These characteristics include land use, demographics, income and employment. Data on each of these are shown for the jurisdictions located within SIU 1 including Jackson and Lafayette Counties and the cities of Independence, Blue Springs, Grain Valley, Oak Grove, Bates City and Odessa.

1. Land Use

a. Existing Land Use

This section describes existing land uses, land use planning and zoning in SIU 1, which consists of both urban and rural development patterns. Land uses in Subsections 1, 2 and 3, from I-470 to Grain Valley, primarily consist of suburban residential land uses, commercial and office development at interchanges, along state routes and arterial corridors. Land uses in roadway Subsections 4 and 5 are largely rural with concentrated development located in incorporated areas. Commercial and industrial land uses are located at the I-70 interchanges. In the eastern part of SIU 1, land is less developed and contains more agricultural areas, particularly in Lafayette County.

A field inventory of existing land uses was conducted in 2002 and updated in 2004. This inventory utilized aerial photography and a windshield survey (viewing from a vehicle) to identify specific land uses by property within SIU 1. These existing land uses are shown in Exhibits III-1 through III-5.3. Most developed areas within SIU 1 are located within the incorporated areas.

As shown, land uses within SIU 1 vary in type. Categories of land uses identified in the area include agricultural, single-family and multi-family residential, commercial, industrial, churches, schools, public/semi-public, parks, utilities and transportation uses. Land classified as agricultural/vacant includes land which is vacant, forested or is used for agricultural production.

Park and public lands within or near SIU 1 include several schools, Little Blue Trace Trail and Nature Preserve, Tri-City Ministries Athletic Fields, Burr Oak Woods, Baumgardner Park, Blue Springs County Club, Adams Pointe Golf Club, Gregory O. Grounds Park, Valley Hills Golf Club, Armstrong Park, a city park in Bates City and Dyer Park.

b. Land Use Planning

Comprehensive land use plans are adopted by communities to direct growth and ensure its diversity, efficiency and balance of land uses. Formal land use planning is conducted in the majority of communities within SIU 1. Land use planning or zoning regulations have been adopted and implemented in Jackson County and the cities of Independence, Blue Springs, Grain Valley, Oak Grove and Odessa. The Jackson County portion of SIU 1 is located in incorporated areas and is covered by formal land use plans. Each of these plans addresses the importance of I-70 in their community. Exhibits III-6 through III-10.3 reflect the generalized future land uses adopted by these communities to plan for orderly growth. As shown, these land use plans indicate a preference for commercial and industrial land uses along I-70 and at interchanges. Bates City and the unincorporated portions of Lafayette County within SIU 1 do not have future land use plans and therefore, these areas are blank on the future land use exhibits (Exhibits III-6 through III-10.3).

2. Demographic and Social Characteristics

This section provides an overview of the demographic and social characteristics within SIU 1 including population, age, race, housing, employment and income.

a. Population

The population in SIU 1 was examined at four different levels – county, city, census tract and block group. The block group level most closely represents the demographic characteristics in the area because it includes the I-70 Project Area and the immediately adjacent areas. The SIU 1 Project Area is part of the expanding suburbs of the Kansas City metropolitan area. The majority of SIU 1 has experienced substantial population increases between 1980 and 2000. Increases near and around Blue Springs and Grain Valley have been the most apparent as suburban development has extended farther into the eastern portions of the metropolitan area.

As shown in Table III-1, the population in all jurisdictions within SIU 1 has increased during the past two decades. Blue Springs and Grain Valley have experienced the largest percentage increases due to both overall population growth and annexations. Substantial population growth has also occurred in Bates City and Odessa.

Table III-1: State, County and City Population Trends in the SIU 1 Project Area

Location	1980	1990	2000	% Change 1980-2000
State of Missouri	4,916,766	5,117,073	5,595,211	13.8
Jackson County	626,266	633,232	654,880	4.6
Independence	111,797	112,301	113,288	1.3
Blue Springs	25,936	40,153	48,080	85.4
Oak Grove	4,456	4,967	5,535	24.2
Grain Valley	1,327	1,898	5,160	288.8
Lafayette County	29,925	31,107	32,960	10.1
Bates City	199	197	245	23.1
Odessa	3,088	3,695	4,818	56.0
Source: U.S. Bureau of the Census and Office of Social and Economic Analysis, University of Missouri				

A closer look at the population with SIU 1 can be made by examining smaller areas delineated by the census. Census block groups divide the area into smaller geographic areas, which are shown in Exhibit III-11. The 1990 and 2000 population of census tracts and block groups that encompass SIU 1 are shown in Table III-2. Population increases occurred in the majority of these block groups. These increases were consistent with growth in the larger communities. However, a few areas experienced population decreases.

Table III-2: Population Trends Within the SIU 1 Project Area

County	Census Tract	Block Group	Population 1990	Population 2000	% Change 1990-2000
Jackson County	140.01	1	976	994	1.8
	140.01	2	529	520	-1.8
	140.02	1	1,221	4,433	262.9
	140.03	1	1,866	2,323	24.5
	140.03	2	3,328	3,562	7.0
	141.01	1	3,929	4,722	20.2
	141.01	2	901	924	2.6
	141.07	1	4,299	5,601	30.3
	141.08	1	3,323	3,189	-4.0
	145.01	2	*	1,923	*
	145.02	2	1,513	2,409	59.2
	146.04	3	*	1,132	*
	147.01	2	554	504	-9.0
	148.01	9	717	1,796	150.5
	148.02	1	3,251	3,934	21.0
	149.03	2	1,770	2,251	27.2
	149.04	2	1,715	1,663	-3.0
	149.05	2	985	808	-18.0
SIU 1 Jackson County Subtotal[1]			**30,877**	**39,633**	**28.4**

County	Census Tract	Block Group	Population 1990	Population 2000	% Change 1990-2000
Lafayette County	901	3	1,150	1,405	22.1
	901	4	732	1,009	37.9
	906	1	1,004	1,231	22.6
	906	2	1,282	1,445	12.7
	906	3	1,054	1,296	23.0
	906	5	1,383	2,077	50.2
SIU 1 Lafayette County Subtotal			**6,605**	**8,463**	**28.1**
SIU 1 Total[1]			**37,482**	**48,096**	**28.3**

Source: U.S. Bureau of the Census and Office of Social and Economic Analysis, University of Missouri

* - Block group boundaries were changed in Census 2000. No comparison can be made between 1990 and 2000.
1 - Census Tract 145.01 Block Group 2 and Census Tract 146.04 Block Group 3 were excluded from totals in order to enable comparisons.

b. Age Characteristics

Age characteristics in both Jackson and Lafayette Counties are consistent with the state of Missouri. As shown in Table III-3, the average age is in the mid-30s, the percentage of persons under 17 is just over 25 percent and the percentage of persons over 65 is close to 15 percent in both counties. The median age has increased in the state and counties between 1990 and 2000.

Table III-3: Age Characteristics, 2000

Location	Year	Median Age	Percent 17 and Under	Percent 65 and Older
State of Missouri	1990	33.5	25.6	14.0
	2000	36.1	25.5	13.5
Jackson County	1990	30.5	25.4	13.0
	2000	35.2	25.8	12.5
Lafayette County	1990	35.4	26.4	16.5
	2000	37.9	26.2	15.4

Source: U.S. Bureau of the Census and Office of Social and Economic Analysis, University of Missouri

c. Race and Ethnicity Characteristics

Table III-4 identifies race and ethnicity characteristics of the census block groups within SIU 1. In Jackson County, minority groups represented 32.3 percent of the population in 2000. Minority population in the block groups within the Jackson County portion of SIU 1 was lower. The minority population in Lafayette County was 5.1 percent in 2000. Two block groups located within SIU 1 exceeded this average. Census tract and block group locations are shown on Exhibit III-11.

Table III-4: Race and Ethnicity Characteristics, 2000

Location	White	Black	American Indian	Asian/ Pacific Islander	Other Races	% Minority	% Hispanic (of any race)
Missouri	**4,746,952**	**622,087**	**26,200**	**63,500**	**45,524**	**13.3%**	**2.1%**
Jackson County	**459,002**	**150,202**	**3,334**	**9,572**	**16,240**	**32.3%**	**5.3%**
Tract 140.01 BG 1	977	0	0	0	17	1.7%	0.7%
Tract 140.01 BG 2	4,231	43	0	31	38	6.9%	3.2%
Tract 140.02 BG 1	520	0	0	0	0	0.0%	0.0%
Tract 140.03 BG 1	2,245	0	0	0	78	6.0%	6.0%
Tract 140.03 BG 2	3,476	56	0	0	30	2.4%	0.0%
Tract 141.01 BG 1	4,342	180	43	61	45	9.3%	2.5%
Tract 141.01 BG 2	918	0	0	0	6	0.6%	0.6%
Tract 141.07 BG 1	5,057	193	28	61	44	11.6%	2.8%
Tract 141.08 BG 1	2,876	172	21	42	6	10.2%	0.5%
Tract 145.01 BG 2	1,645	98	36	0	39	13.9%	2.0%
Tract 145.02 BG 2	2,303	0	16	15	26	4.4%	1.4%
Tract 146.04 BG 3	1,100	21	18	0	14	11.5%	4.4%
Tract 147.01 BG 2	442	32	6	24	0	12.3%	0.0%
Tract 148.01 BG 9	1,746	19	0	0	10	4.7%	2.4%
Tract 148.02 BG 1	3,678	142	0	46	28	7.0%	1.2%
Tract 149.03 BG 2	2,240	0	5	0	0	0.5%	0.0%
Tract 149.04 BG 2	1,413	123	0	3	49	15.3%	5.7%
Tract 149.05 BG 2	785	11	12	0	0	2.8%	0.0%
SIU 1 Jackson County Subtotal	**39,994**	**1,090**	**185**	**283**	**430**	**5.0%**	**2.1%**
Lafayette County	**31,431**	**712**	**81**	**76**	**117**	**5.1%**	**1.0%**
Tract 901 BG 3	1,330	24	19	25	43	8.4%	3.1%
Tract 901 BG 4	973	0	2	0	34	3.6%	0.2%
Tract 906 BG 1	1,135	0	0	0	96	7.8%	2.6%
Tract 906 BG 2	1,422	0	0	0	23	1.6%	0.0%
Tract 906 BG 3	1,260	15	0	0	41	3.2%	0.4%
Tract 906 BG 5	1,998	21	0	11	57	4.3%	0.8%
SIU 1 Lafayette County Subtotal	**8,118**	**60**	**21**	**36**	**294**	**5.1%**	**1.2%**
SIU 1 Total	**48,112**	**1,150**	**206**	**319**	**724**	**5.0%**	**1.9%**

Source: U.S. Department of Commerce, Bureau of the Census, Census 2000

BG - Census Block Group

d. Housing Characteristics

Housing characteristics, shown in Table III-5, reflect a stable area with a high rate of occupied dwellings and home ownership. Occupancy rates are over 90 percent in all of the communities located in SIU 1 and the percentage of owner occupied housing units is consistent with or exceeds the state average. Median home values are generally high in the area, particularly in Blue Springs and Grain Valley.

Table III-5: Housing Characteristics of the SIU 1 Project Area, 2000

Location	Total Housing Units	% Occupied	% Owner Occupied	Median Value
State of Missouri	**2,442,017**	**90%**	**63%**	**$89,900**
Jackson County	**288,231**	**92%**	**63%**	**$85,000**
Independence	50,213	94.4%	64.0%	$77,000
Blue Springs	17,733	97.5%	72.4%	$108,300
Oak Grove	2,016	96.4%	65.6%	$83,900
Grain Valley	2,022	95.0%	70.8%	$102,800
Lafayette County	**13,707**	**92%**	**75%**	**$74,400**
Bates City	96	95.8%	67.7%	$75,000
Odessa	2,011	93.8%	62.7%	$85,200
Source: U.S. Bureau of the Census and Office of Social and Economic Analysis, University of Missouri				

e. Employment Characteristics

As shown in Table III-6, within Jackson and Lafayette Counties the manufacturing, trade and professional services sectors employ the greatest number of people. Concentrations of employment generating businesses are located throughout SIU 1, but particularly in Independence and Blue Springs. However, the largest employers within the Kansas City region are located outside of the SIU 1 Project Area.

Table III-6: Employment by Job Type, 2000

Sector	Jackson County Number of Employees	Lafayette County Number of Employees
Forestry, Fishing, Hunting, Ag Support	40	L
Mining	64	L
Construction	22,776	445
Manufacturing	35,091	1,058
Utilities	3,858	D
Wholesale Trade	35,446	346
Retail Trade	40,008	1,631
Finance & Insurance	29,092	255
Services (except Public Administration)	21,161	356
Transportation & Warehousing	7,577	183
Real Estate	6,480	91
Information	29,089	101
Prof., Science & Tech. Services	26,237	134
Healthcare & Social Assistance	46,380	841
Arts, Entertainment, & Rec.	4,687	D
Accommodation & Food Services	27,019	767
Mgt. Of Cos. & Enterprises	5,858	L
Admin, Support, Waste Mgt. & Remedial Svs.	24,182	229

Sector	Jackson County Number of Employees	Lafayette County Number of Employees
Educational Services	7,339	208
Auxillaries (exc corporate, subsid & reg mgt)	1,800	D
Unclassified Establishments	145	15
Total	**374,329**	**6,799**
Source: U.S. Department of Commerce, Bureau of Economic Analysis		

D - Not shown to avoid disclosure of confidential information, but the estimates for this item are included in the total.
L - Less than 10 jobs. Actual estimates for this item are included in the total.

f. Income Characteristics

Personal income is an indicator of the economic condition of an area. Nearly all of the block groups within SIU 1 have income levels higher than the county and state averages. Income characteristics shown in Table III-7 indicate that SIU 1 communities located in Jackson County tend to have higher incomes than the remainder of communities within SIU 1. In particular, block groups in the Blue Springs area far exceed the median household income for Jackson County overall. In Lafayette County, several block groups in SIU 1 are also substantially above the county median household income. The percentage of persons below poverty level in the Jackson County block groups is lower than both state and county levels. In Lafayette County, the percentage of persons below the poverty level was generally greater than in the Jackson County portion of SIU 1. Based on year 2000 data, only two block groups, both in Lafayette County, exhibit poverty levels in excess of the Missouri average of 12 percent: Tract 901 Block Group 3 (16 percent) and Tract 906 Block Group 3 (15 percent). As shown in Table III-4, these block groups comprised 8.4 percent and 3.2 percent minority population, respectively. In both cases, this is below the statewide average of 13.3 percent minority. Census tract and block group locations are shown on Exhibit III-11.

Table III-7: Income Characteristics, 2000

Location	Per Capita Income	Median Household Income	% Persons Below Poverty Level
State of Missouri	**$19,936**	**$37,934**	**12%**
Jackson County	**$20,788**	**$39,277**	**12%**
Tract 140.01 BG 1	$22,461	$41,810	4%
Tract 140.01 BG 2	$19,938	$52,478	5%
Tract 140.02 BG 1	$23,540	$52,321	10%
Tract 140.03 BG 1	$17,642	$42,000	8%
Tract 140.03 BG 2	$18,051	$45,380	11%
Tract 141.01 BG 1	$22,922	$42,308	6%
Tract 141.01 BG 2	$22,356	$45,938	4%
Tract 141.07 BG 1	$23,138	$56,645	3%
Tract 141.08 BG 1	$19,440	$42,622	6%
Tract 145.01 BG 2	$28,557	$45,526	5%
Tract 145.02 BG 2	$20,861	$40,407	9%
Tract 146.04 BG 3	$24,474	$46,949	3%
Tract 147.01 BG 2	$22,289	$34,449	9%
Tract 148.01 BG 9	$33,920	$82,161	1%
Tract 148.02 BG 1	$31,265	$76,195	3%
Tract 149.03 BG 2	$24,228	$61,144	1%
Tract 149.04 BG 2	$33,538	$50,560	8%

Location	Per Capita Income	Median Household Income	% Persons Below Poverty Level
Tract 149.05 BG 2	$18,676	$51,429	4%
SIU 1 Jackson County Average	**$23,739**	**$50,573**	**6%**
Lafayette County	**$18,493**	**$38,235**	**9%**
Tract 901 BG 3	$18,814	$44,563	16%
Tract 901 BG 4	$21,066	$55,000	7%
Tract 906 BG 1	$22,061	$57,014	2%
Tract 906 BG 2	$18,606	$45,799	10%
Tract 906 BG 3	$13,537	$27,949	15%
Tract 906 BG 5	$18,410	$36,328	11%
SIU 1 Lafayette County Average	**$18,749**	**$44,442**	**10%**
SIU 1 Average	**$22,491**	**$49,041**	**7%**
Source: U.S. Bureau of the Census and Office of Social and Economic Analysis, University of Missouri			

3. Community Facilities and Characteristics

a. Churches

There are numerous churches located in the cities of Independence, Blue Springs, Grain Valley, Oak Grove, Bates City and Odessa and in surrounding areas outside the SIU 1 Project Area. The churches located within the SIU 1 Project Area are shown in Exhibit III-1 through Exhibit III-6 and listed below.

Tri-Cities Ministry Baptist Church (Subsection 1, Exhibit III-1)
Located southwest of the I-70/Little Blue Parkway interchange in Independence.

Blue Springs Assembly of God (Subsection 2, Exhibit III-2)
Located south of I-70 between Woods Chapel Road and Route 7 in Blue Springs.

Harvest Baptist Church (Subsection 2, Exhibit III-2)
Located north of I-70 between Woods Chapel Road and Route 7 in Blue Springs.

St. John LaLande Catholic Church (Subsection 2, Exhibit III-2)
Located southwest of the I-70/Route 7 interchange in Blue Springs.

Timothy Lutheran Church (Subsection 2, Exhibit III-2)
Located southeast of the I-70/Route 7 interchange in Blue Springs.

St. Mary's Manor (Subsection 2, Exhibit III-2)
Located south of I-70 between Route and Adams Dairy Parkway in Blue Springs.

North Spring United Methodist (Subsection 2, Exhibit III-2)
Located north of I-70 between Route 7 and Adams Dairy Parkway in Blue Springs.

Grain Valley Christian Church (Subsection 3, Exhibit III-3)
Located north of I-70 between Adams Dairy Parkway and Route AA/BB in Grain Valley.

First Baptist Church (Subsection 3, Exhibit III-3)
Located southwest of the I-70/Route AA/BB interchange in Grain Valley.

Grain Valley Assembly of God (Subsection 3, Exhibit III-3)
Located northeast of the I-70/Route AA/BB interchange in Grain Valley.

New Life Assembly of God (Subsection 4, Exhibit III-4)
Located south of I-70 and one mile west of the Route H/F interchange in Oak Grove.

Church of Christ (Subsection 4, Exhibit III-4)
Located southwest of the I-70/Route H/F interchange in Oak Grove.

Kingdom Hall of Jehovah's Witness (Subsection 5, Exhibit III-5.1)
Located south of I-70 between Route H/F and Route D/Z near Bates City.

Church of Jesus Christ of Latter Day Saints (Subsection 5, Exhibit III-5.3)
Located northwest of the I-70/Route 131 interchange in Odessa.

Calvary Baptist Church (Subsection 5, Exhibit III-5.3)
Located northeast of the I-70/Route 131 interchange in Odessa.

b. Schools

There are four school districts that serve the SIU 1 Project Area: Blue Springs R-IV and Grain Valley R-V school districts in Jackson County, Odessa R-VII school district in Lafayette County and Oak Grove R-VI school district which is in both Jackson and Lafayette Counties. There are no schools located within the SIU 1 Project Area in Lafayette County. The following schools are located within the SIU 1 Project Area in Jackson County:

Blue River Community College (Subsection 2, Exhibit III-2)
Located north of I-70 between Woods Chapel Road and Route 7 in Blue Springs.

Matthews Elementary School (Subsection 3, Exhibit III-3)
Located northeast of the I-70/Route AA/BB interchange in Grain Valley.

c. Cemeteries

There are no cemeteries located within the Jackson County portion of SIU 1. There is one cemetery within SIU 1 in Lafayette County:

Bates City Cemetery (Subsection 5, Exhibit III-5.1)
Located south of I-70 and east of Route D/Z near Bates City.

d. Emergency Services

(1) Police

Police protection for the cities of Independence, Blue Springs, Grain Valley, Oak Grove and Odessa is provided by the respective city's police department. Police protection for portions of SIU 1 located outside of the municipal boundaries are provided by the Jackson County Sheriff's Department in Lee's Summit and the Lafayette County Sheriff's Department in Lexington. The Missouri State Highway Patrol responds to incidents that take place along I-70.

The following police station is located within the SIU 1 Project Area:

Grain Valley Police Station (Subsection 3, Exhibit III-3)
Located southeast of the I-70/Route AA/BB interchange in Grain Valley.

(2) Fire Protection

Fire protection for the Jackson County portion of SIU 1 is provided by the Central Fire District. Fire protection for the Lafayette County portion of SIU 1 is provided by the Odessa Fire District. The Sni-Valley Fire District provides protection for areas located in both Jackson and Lafayette Counties.

The following fire protection district offices/stations are located within the SIU 1 Project Area:

The Central Jackson Fire Protection District Office (Subsection 1, Exhibit III-1)
Located southeast of the I-70/Woods Chapel Road interchange in Blue Springs.

The Central Jackson Fire Protection District Station #3 (Subsection 2, Exhibit III-2)
Located northwest of the I-70/Adams Dairy Parkway interchange in Blue Springs.

The Sni-Valley Fire Protection District #2 (Subsection 5, Exhibit III-5.1)
Located south of I-70 and east of Route Z in Bates City.

(3) Hospitals

Areas in and around SIU 1 are provided health care and affiliated services by the following hospitals: Independence Regional Health Center in Independence, St. Mary's Hospital in Blue Springs and Lafayette Regional Hospital in Lexington. The following hospitals are located within the SIU 1 Project Area:

St. Mary's Hospital (Subsection 2, Exhibit III-2)
Located south of I-70 between Route 7 and Adams Dairy Parkway in Blue Springs.

e. Public/Semi-Public

The following public/semi-public facilities (excluding parks) are located within SIU 1 in Jackson County:

MoDOT Park and Ride (Subsection 1, Exhibit III-1)
Located in the northwest quadrant of the I-70/Woods Chapel Road interchange.

Missouri Department of Conservation Kansas City Regulatory Office (Subsection 1, Exhibit III-1)
Located northeast of the I-70/Woods Chapel Road interchange.

MoDOT Park and Ride (Subsection 2, Exhibit III-2)
Located in the northwest quadrant of the I-70/Route 7 interchange.

MoDOT Park and Ride (Subsection 3, Exhibit III-3)
Located in the northwest quadrant of the I-70/Route AA/BB interchange.

Grain Valley Post Office (Subsection 3, Exhibit III-3)
Located southwest of the I-70/Route AA/BB interchange in Grain Valley.

Grain Valley City Hall (Subsection 3, Exhibit III-3)
Located southeast of the I-70/Route AA/BB interchange in Grain Valley.

Grain Valley Center (Subsection 3, Exhibit III-3)
Located southeast of the I-70/Route AA/BB interchange in Grain Valley.

Water Treatment Plant Pumping Station (Subsection 3, Exhibit III-3)
Located north of I-70 and east of Route BB in Grain Valley.

MoDOT Park and Ride (Subsection 4, Exhibit III-4)
Located in the southwest quadrant of the I-70/Route H/F interchange in Oak Grove.

The following public/semi-public facilities (excluding parks) are located within SIU 1 in Lafayette County:

Bates City Hall (Subsection 5, Exhibit III-5.1)
Located south of I-70 and west of Route Z in Bates City.

Truck Rest Area (Subsection 5, Exhibit III-5.2)
A former weigh station that has been converted to a truck rest area without facilities is located on both sides of I-70 at Burton Road.

MoDOT Maintenance Yard (Subsection 5, Exhibit III-5.3)
Located north of I-70 and west of Route 131 in Odessa.

MoDOT Park and Ride (Subsection 5, Exhibit III-5.3)
Located south of I-70 and east of Route 131 in Odessa.

VFW Post 5675 (Subsection 5, Exhibit III-5.3)
Located south of I-70 and east of County Road 96/Johnson Road in Odessa.

B. Natural Environment

The following discussion addresses the natural environment of the SIU 1 Project Area and includes: air quality, noise, parklands, conservation and wildlife refuges, prime farmland, water resources, physiography and topography, terrestrial and aquatic communities, historic and archaeological resources, hazardous waste sites, visual resources and wild and scenic rivers.

1. Air Quality

The federal Clean Air Act Amendments (CAAA) of 1970 required the adoption of air quality standards. These were established in order to protect public health, safety and welfare from known or anticipated effects of sulfur dioxide, particulate matter, carbon monoxide, nitrogen dioxide, ozone and lead. In addition to these pollutants, the state of Missouri has established additional criteria for hydrogen sulfide. The Missouri and National Ambient Air Quality Standards (NAAQS) for these pollutants are listed in Table III-8.

The CAAA of 1977 required all states to submit to the Environmental Protection Agency (EPA) a list identifying those air quality control regions or portions thereof, which meet or exceed the NAAQS or cannot be classified because of insufficient data. Portions of air quality control regions which are shown by monitored data or air quality modeling to exceed the NAAQS for any criteria pollutant are designated “non-attainment” areas for that pollutant.

The 1990 CAAA established procedures for determining the conformity of state implementation plans with the requirements of the federal regulations. These procedures are published in 40 CFR Parts 51 and 93.

The Lafayette County portion of SIU 1 falls within the Southwestern Intrastate Air Quality Control Region (AQCR #139), and the Jackson County portion of SIU 1 falls within the Metropolitan Kansas City Interstate AQCR (AQCR #94). The Southwestern Intrastate Air Quality Control Region has a designation of better than national standards for total suspended particulates and sulfur dioxide, unclassifiable/attainment for carbon monoxide, cannot be classified or better than national standards for nitrogen dioxide, and no designation for lead. The Metropolitan Kansas City Interstate Air Quality Control Region has a designation of better than national standards for total suspended particulates and sulfur dioxide, unclassifiable/ attainment for carbon monoxide, cannot be classified or better than national standards for nitrogen dioxide, and no designation for lead. The Missouri State Implementation Plan (SIP) does not contain any transportation control measures for these AQCRs.

a. 2002 Kansas City Maintenance Plan for Control of Ozone

The Environmental Protection Agency approved the current Kansas City Ozone Maintenance Plan on June 23, 1992. This is a periodic revision to the plan that is required by the Clean Air Act after a non-attainment area has been redesignated to an attainment area. This subsequent plan includes an updated emissions inventory, emission growth projections, emission control measures, contingency measures and provides for continued operation of the monitoring network to demonstrate how the area will maintain the ozone standard for the next 10 years. The plan relies on an attainment level of emissions of volatile organic compounds and nitrogen

oxides to maintain the ozone standard through a combination of control measures, which includes both stationary and mobile source controls. The plan shows that the 1999 emissions when projected to 2012 will not increase. The Missouri Air Conservation Commission adopted this plan of action on July 25, 2002.

Under the plan, the state agreed to continue monitoring ambient air quality, to periodically update the emissions inventory to ensure it is consistent with the budget and to implement certain contingency measures if the standard is violated. The Kansas City plan was approved by EPA on January 13, 2004. Mobile source control measures approved in the plan include the federal motor vehicle emissions control program and reductions in the volatility of gasoline. In addition, the plan relies upon lower volatility gasoline to control fuel volatility (KAR 28-19-719, Fuel volatility).

b. Eight-hour Ozone Standard

On April 15, 2004, EPA announced designations under the new eight-hour ozone NAAQS. That action designated several counties in the Kansas City area as unclassifiable. The counties in the Kansas City area included in the designation were Johnson, Linn, Miami and Wyandotte Counties in Kansas and Cass, Clay, Jackson and Platte Counties in Missouri. The "unclassifiable" designation means that EPA believes the area cannot be classified as meeting or not meeting the standard on the basis of available information.

As of February, 2005, based on data from all of 2004, the EPA proposes to redesignate the above counties to attainment, and the 1-hour ozone standard will be revoked on June 15, 2005.

The Environmental Protection Agency's rule for implementing the eight-hour ozone standard calls for communities that were maintenance areas for the 1-hour ozone standard and are attainment areas for the eight-hour ozone standard to put in place a plan to maintain the eight-hour ozone standard for a ten-year period, no later than three years after designation. Thus both Kansas and Missouri are required to develop a plan to maintain the eight -hour ozone standard in the Kansas City area.

Based upon regulatory requirements in 40 CFR part 50 and the eight-hour ozone air quality data for the 2002 through 2004 time period, EPA is proposing to redesignate Johnson, Linn, Miami and Wyandotte Counties in Kansas and Cass, Clay, Jackson and Platte Counties in Missouri to attainment for the eight-hour ozone standard. If this occurs, no transportation conformity will be required. If something causes the area to be designated as a non-attainment area, conformity requirements will be determined and incorporated into the State Implementation Plan, and any requirements will need to be considered as the project proceeds.

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

Pollutant	Averaging Time	Concentration
Sulfur Dioxide (SO_2)	Annual Arithmetic Mean: Primary Twenty-Four Hour(1): Primary Three Hour(1): Secondary	80 µg/m^3 (0.03 ppm) 365 µg/m^3 (0.14 ppm) 1,300 µg/m^3 (0.50 ppm)
Particulate (PM-10)	Annual Arithmetic Mean: Primary and Secondary Twenty-Four Hour(2): Primary and Secondary	50 µg/m^3 150 µg/m^3

Pollutant	Averaging Time	Concentration
Particulate (PM-2.5)	Annual Arithmetic Mean: Primary and Secondary Twenty-Four Hour(2): Primary and Secondary	15 µg/m^3 65 µg/m^3
Carbon Monoxide (CO)	One Hour(1): Primary Eight Hour(1): Primary	40 mg/m^3 (35 ppm) 10 mg/m^3 (9 ppm)
Ozone	Eight Hour(1): Primary and Secondary	157 µg/m^3 (0.08 ppm)
Nitrogen Dioxide (NO_2)	Annual Arithmetic Mean: Primary and Secondary	100 µg/m^3 (0.053 ppm)
Lead (Pb)	Calendar Quarter Arithmetic Mean: Primary and Secondary	1.5 µg/m^3
Hydrogen Sulfide (H_2S)	One-half Hour(3) One-half Hour(4)	70 µg/m^3 (0.05 ppm)(8) 42 µg/m^3 (0.03 ppm)(8)
Sulfuric Acid (H_2SO_4)	Twenty-Four Hour(5) One Hour(6)	10 µg/m^3(8) 30 µg/m^3(8)
Source: MDNR Division 10 – Air Conservation Commission.		

(1) - Not to be exceeded more than once per year.
(2) - Statistically estimated number of days with exceedances is not to be more than 1 per year.
(3) - Not to be exceeded more than twice per year.
(4) - Not to be exceeded more than twice in any consecutive days.
(5) - Not to be exceeded more than once in any 90 consecutive days.
(6) - Not to be exceeded more than once in any two consecutive days.
(7) - Not more than one expected exceedance per year, on a 3-year average.
(8) - Missouri Air Quality Standards.
ppm - Parts of pollutant per million parts of air (by volume) at 25°C.
µg/m^3 - Micrograms of pollutant per cubic meter of air.

2. Noise

This section provides a general assessment of the ambient noise characteristics of the SIU 1 Project Area. The assessment includes a summary of Federal Highway Administration (FHWA) noise criteria, a screening for sensitive noise receptors and an investigation of the ambient noise conditions.

a. Noise Criteria and Guidelines

Noise is defined as “unwanted sound.” Sounds are described as noise if they interfere with an activity or disturb the person hearing them. Sound is measured in a logarithmic unit called a decibel. The human ear is more sensitive to middle and high frequency sounds than it is to low frequency sounds, so sound levels are weighted to more closely reflect human perceptions. These “A-weighted” sounds are measured using the decibel unit dBA. Noise that is transmitted through the air is referred to as “airborne noise.”

Sound levels fluctuate with time depending on the sources of the sound audible at a specific location. In addition, the degree of annoyance associated with certain sounds varies by time of day, depending on other ambient sounds affecting the listener and the activities of the listener. The time-varying fluctuations in sound levels at a fixed location can be quite complex, so they are typically reported using statistical or mathematical descriptors that are a function of sound intensity and time. A commonly used descriptor of the equivalent noise level is L_{eq}, which represents the equivalent of a steady, unvarying level over a defined period of time containing the same level of sound energy as the time varying noise environment.

b. FHWA Noise Abatement Criteria (NAC)

The Federal Aid Highway Act of 1970 established the requirements contained in 23 CFR Part 772 that traffic noise control be a part of the planning and design of all federally aided highway projects (Table III-9).

Table III-9: NAC for Applicable Land Use Activity Categories

Activity Category	Abatement Criteria [$L_{eq}(h)$]*	Description of Activity Category
A	57 exterior	Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of these qualities are essential if the areas are to continue to serve their intended purpose.
B	67 exterior	Picnic areas, recreation areas, playgrounds, active sports areas, parks, residences, motels, hotels, schools, churches, libraries and hospitals.
C	72 exterior	Developed lands, properties, or activities not included in Categories A or B.
D	--	Undeveloped lands.
E	52 interior	Residences, motels, hotels, public meeting rooms, schools, churches, libraries, hospitals and auditoriums.
Source: CFR, Title 23 Part 772, Revised October 1997.		

* - Hourly A-weighted noise levels in decibels (dBA).

$L_{eq}(h)$ - the equivalent steady state sound level which in a 1-hour period of time contains the same acoustic energy as the time varying sound level during the same period.

Noise impacts, as defined by MoDOT and approved by the FHWA, occur when the predicted noise levels approach or exceed the NAC (i.e., 66 dBA), or when the predicted traffic noise levels substantially exceed the existing noise levels (i.e., an increase of 15 dBA $L_{eq}(h)$ or more above existing noise levels).

c. Methodology

The noise analysis was performed in accordance with FHWA policy and regulations and MoDOT's policy statement on Traffic Noise Analysis and Abatement Guidelines. Noise modeling was performed for the Build Alternatives using FHWA's Traffic Noise Model® 2.1 (TNM) analysis and recent traffic data. A total of 28 sensitive receptors representing 273 dwelling units along the SIU 1 Project Area were identified in the analysis.

d. Existing Noise Levels

Existing noise levels were calculated using the TNM for the year 2000 and were supplemented with existing noise monitoring data. Noise monitoring was conducted at five locations adjacent to the proposed SIU 1 Project Area. The details of the monitoring are provided in the Table III-10.

Table III-10: Noise Monitoring Details

Receptor	Monitored Leq	Time of Day	Location
W2	71	9:55 – 10:20 a.m.	150' from the center of the westbound lanes
E5	67	2:22 – 2:42 p.m.	163' from the center of the eastbound lanes
W5	67	7:51 – 8:15 a.m.	200' from the westbound exit ramp, 250' from the center of the westbound lanes
W8	63	1:27 – 1:48 p.m.	400' from the center of the westbound lanes
E14	70	12:43 – 1:09 p.m.	165' from the center of the eastbound lanes

The monitoring was conducted to validate that the modeling produces a realistic prediction of noise levels. Since the noise model provides similar results to the monitoring, the model is a good tool for reliably predicting the future noise levels of the Build Alternatives.

A summary of the existing noise levels is presented in Table III-11. The lowest existing noise levels for SIU 1 are represented by a value of 62 dBA Leq(h). In contrast, the highest existing level is estimated at 73 dBA Leq(h). However, existing noise levels for much of the area range from 64 dBA Leq(h) to 70 dBA Leq(h). In total, 16 noise receptors presently are exposed to noise levels that approach or exceed the NAC (Table III-11).

Table III-11: Existing Noise Levels at Sensitive Receptors

Receptor Number	Land Use	Number of Dwelling Units Represented	NAC Category	NAC Level	Noise Levels (Leq) (Design Hour)	
					Existing Monitoring 2000	Existing Modeling 2000
Subsection 1 – *I-470 to Mile Marker 19*						
E1	Residential	2	B	67		70
E2	Residential	24	B	67		72
E3	Residential	30	B	67		72
E4	Residential	12	B	67		73
W1	Hotel	18	B	67		71
Subsection 2 – *Mile Marker 19 to Mile Marker 22*						
W2	Hotel / Residential	9	B	67	71	72
W3	Residential	15	B	67		72
W4	Residential	10	B	67		71
Subsection 3 – *Mile Marker 22 to Mile Marker 25*						
E5	Residential	20	B	67	67	71
E6	Residential	16	B	67		71
W5	Hotel / Residential	13	B	67	67	66
Subsection 4 – *Mile Marker 25 to Mile Marker 29*						
E7	Residential	2	B	67		64
W14	Residential	36	B	67		63
Subsection 5 – *Mile Marker 29 to Mile Marker 39*						
E8	Residential	4	B	67		62
E9	Residential	2	B	67		63

Receptor Number	Land Use	Number of Dwelling Units Represented	NAC Category	NAC Level	Noise Levels (Leq) (Design Hour)	
					Existing Monitoring 2000	Existing Modeling 2000
E10	Residential	2	B	67		66
E11	Residential	6	B	67		66
E12	Residential	5	B	67		64
E13	Residential	4	B	67		65
E14	Residential	3	B	67	70	67
W6	Residential	2	B	67		68
W7	Residential	10	B	67		62
W8	Residential	18	B	67	63	62
W9	Residential	1	B	67		68
W10	Residential	1	B	67		67
W11	Residential	1	B	67		67
W12	Campground	5	B	67		63
W13	Residential	2	B	67		64

3. Parklands, Recreation Areas and Wildlife Refuges

This section identifies parklands, i.e., public parks, recreation lands and wildlife and waterfowl refuges within the SIU 1 Project Area. All existing parklands located within SIU 1 have been inventoried and are shown on the existing land use maps (Exhibit III-1 through Exhibit III-6).

a. Legal and Regulatory Requirements

The United States Department of Transportation (USDOT) Act of 1966, Section 4(f) as amended (49 USC 303), prohibits the acquisition and conversion of public park, recreation land or wildlife refuge (and historic sites) for any federally funded transportation project, unless a determination is made that:

- there is no feasible or prudent alternative to use of the land; and
- the proposed action includes all possible planning to minimize harm to the land resulting from its use for the transportation project.

The meaning of "use" in this context is the acquisition of land or property for construction of a permanent transportation facility, or if land is not acquired, the substantial impairment of the intended use of a public park or recreation area (“constructive use”). For any alternative under which the direct use or constructive use of parkland is required, a Section 4(f) evaluation must be conducted to document that there is no feasible or prudent alternative to using the parkland.

The second major federal regulation regarding parklands is Section 6(f)(3) of the Land and Water Conservation Fund (LWCF) Act of 1965. Section 6(f)(3) stipulates that any land or facility planned, developed, or improved with LWCF funds cannot be converted to uses other than parks, recreation, or open space unless land of at least equal fair market value and reasonably equivalent usefulness is provided. Anytime a transportation project would cause such a conversion, regardless of funding sources, such replacement land must be provided.

b. Parks and Recreation Areas

The following parks and recreation areas are located in or adjacent to the SIU 1 Project Area and are listed as they appear from west to east:

Little Blue Trace Nature Preserve (Subsection 1, Exhibit III-1)
The Little Blue Trace Nature Preserve consists of 1,856 acres (751 hectares). It borders the Little Blue River extending from Longview Lake downstream (north) to Blue Mills Road. It also borders the East Fork of the Little Blue River extending from Blue Springs Lake downstream (north) to the confluence with the Little Blue River. Amenities in the park include 4 shelters, 30 picnic tables, 3 soccer fields and a softball field, all of which are located to the north of existing I-70. The Little Blue Trace bicycle trail is also located within the Nature Preserve. According to Jackson County Parks and Recreation officials there are currently no plans for additional facilities adjacent to I-70 aside from the future extension of the Little Blue Trace Trail to the south under I-70. The Nature Preserve currently crosses I-70 at two locations within SIU 1 as shown on Exhibit III-1. The Little Blue Trace Nature Preserve is a public facility maintained by the Jackson County Parks and Recreation Department. Land and Water Conservation Funds were used to acquire land for this facility. The entire facility is a 4(f) and 6(f) resource.

Tri-City Ministries Athletic Fields (Subsection 1, Exhibit III-1)
The Tri-City Ministries athletic fields are located southeast of the I-70/Little Blue Parkway interchange in Independence. Tri-City Ministries owns and maintains four baseball fields and one soccer field at this location. Tri-City Ministries is a private entity, therefore section 4(f) and 6(f) are not applicable to this facility.

Baumgardner Park (Subsection 2, Exhibit III-2)
Baumgardner Park is located south of I-70 between Woods Chapel Road and Route 7 in Blue Springs. The park consists of 12 acres (4.9 hectares) and is owned and maintained by the city of Blue Springs. Amenities in the park include the Centennial Pool-Plex (i.e., indoor and outdoor pools), picnic shelters, four tennis courts, one ball field, two sand-volleyball courts, horseshoe pits and a playground. The entire facility is a 4(f) and 6(f) resource.

Blue Springs Country Club (Subsection 2, Exhibit III-2)
Blue Springs Country Club is located northeast of the I-70/Route 7 interchange in Blue Springs. The club is private and consists of an 18-hole golf course, clubhouse and practice range. Since Blue Springs Country Club is privately owned, section 4(f) and 6(f) are not applicable to this facility.

Adams Pointe Golf Club (Subsection 2 and 3, Exhibit III-2 and III-3)
Adams Pointe Golf Club is located southeast of the I-70/Adams Dairy Parkway interchange in Blue Springs. The club is open to the public and consists of an 18-hole golf course, clubhouse and practice range. The club is owned and operated by Evergreen Alliance Golf Limited in Irving, Texas. Since Adams Pointe Golf Club is privately owned, section 4(f) and 6(f) are not applicable to this facility.

Gregory O. Grounds Park (Subsection 2 and 3, Exhibit III-2 and III-3)
Gregory O. Grounds Park is owned by the city of Blue Springs and consists of a newly constructed 54-acre (22-hectare) lake with 79 acres (32 hectares) of surrounding parkland that is currently undeveloped. The dam for the lake is built and the lake is now full; however, the Missouri Department of Natural Resources (MDNR) has indicated that they are currently monitoring a dam safety issue because the dam has inadequate spillway capacity and the property owner used a portion of the I-70 North Outer Road embankment in the construction of the dam. The City of Blue Springs is currently working with the MDNR to correct the situation.

Construction on the remainder of the park has yet to begin. The City of Blue Springs is building the park and their parks and recreation department will manage the park upon completion of the construction. Construction of park amenities is scheduled for completion in the summer of 2005. Primary uses of this park will likely include hiking, jogging and cycling, fishing, use of picnic shelters and other general recreational uses. The entire facility is a 4(f) resource. Since LWCFs have not been used at this facility, section 6(f) is not applicable to this facility.

Valley Hills Golf Club (Subsection 3, Exhibit III-3)
Valley Hills Golf Club is a public golf course located south of I-70 between Adams Dairy Parkway and Route AA/BB in Grain Valley. Since Valley Hills Golf Club is privately owned, section 4(f) and 6(f) are not applicable to this facility.

Armstrong Park (Subsection 3, Exhibit III-3)
Armstrong Park is located southeast of the I-70/Route AA/BB interchange in Grain Valley. The park consists of 10 acres (4 hectares) and is owned and maintained by the City of Grain Valley. Amenities in the park include three shelter houses with grills and picnic tables, a gazebo, restrooms, two playground areas, sand volleyball courts, two lighted baseball fields and an asphalt walking trail. The entire facility is a 4(f) and 6(f) resource.

Bates City Park (Subsection 5, Exhibit III-5.1)
Bates City Park is a public facility located at 107 East Mitchell Street in Bates City, approximately 1/3 of a mile south of I-70. The park is owned and maintained by Bates City and consists of approximately 0.75 acres (0.3 hectares). Park amenities include playground equipment. The entire facility is a 4(f) resource. Since LWCFs have not been used at this facility, section 6(f) is not applicable to this facility.

Dyer Park (Subsection 5, Exhibit III-5.3)
Dyer Park is a public facility located southeast of the I-70/Route 131 interchange in Odessa. The park consists of 31 acres (12.5 hectares) and is owned and maintained by the City of Odessa. Amenities in the park include a 13-acre fishing lake, picnic shelters, a walking trail, baseball fields, tennis courts, an outdoor pool, basketball courts, sand volleyball courts, a playground and a rodeo arena. The entire facility is a 4(f) resource. Since LWCFs have not been used at this facility, section 6(f) is not applicable to this facility.

c. State Parks

No Missouri State Parks were identified within the SIU 1 Project Area.

d. Pedestrian and Bicycle Facilities

There are existing and planned "signed" or "designated" pedestrian and bicycle facilities located within SIU 1. The SIU 1 Project Area is located in an area that is also encompassed by the MetroGreen regional greenway plan developed by MARC.
Information about pedestrian and bicycle facilities has been gathered through local agencies as well as field reconnaissance and includes the following facilities:

Little Blue Trace Bicycle Trail (Subsection 1, Exhibit III-1)
The Little Blue Trace Trail is a public facility associated with and located completely within the Little Blue Trace Nature Preserve. Land and Water Conservation Funds were used to acquire land for the Nature Preserve where the Trail is located. The 10-mile (16.1-kilometer) gravel-covered hiking and bicycle trail extends from the north end of the nature preserve south towards I-70 along the bank of the Little Blue River. The trail currently ends prior to the existing I-70 right of way but will likely be expanded in the next few years to cross underneath I-70 along the Little Blue River and south to Old Route 40. The Little Blue Trace Trail is owned and maintained by the Jackson County Parks & Recreation Department. The extension of the trail is being developed in coordination with the City of Independence. The entire facility is a 4(f) and 6(f) resource.

Woods Chapel Road and Route 7 Bicycle Trails (Planned)

Woods Chapel Road Bicycle Trail (Planned)
This trail is planned to be constructed parallel to Woods Chapel Road from Duncan Road to Old Route 40. The trail would cross over I-70 at the Woods Chapel Road interchange.

Route 7 Bicycle Trail (Planned)
This trail is planned to be constructed parallel to Route 7 from Pink Hill Road to Liggett Road. The trail would cross under I-70 at the Route 7 interchange.

Coordination with the City of Blue Springs Parks and Recreation Department indicated that while these are "planned facilities" and that they have been incorporated into MARC's Metrogreen plan, the actual plans are not definitive. Officials indicated that the City would prefer to construct Class I trails, which would include a completely separated right-of-way designed to be shared with pedestrians. However, officials also indicated that it is possible that the trails may end up being Class II trails, which would only include striping and signage along the shoulder of the roadway. While the general location of the trails is known (generally parallel to each respective roadway) the exact location of the planned trails has not been determined and the land for the improvements has not be acquired by the City of Blue Springs. Since land has not yet been acquired and LWCFs have not been used, section 4(f) and 6(f) are not applicable to this facility.

Adams Dairy Parkway Bicycle Trail (Subsection 2, Exhibit III-2)
This paved bicycle trail is maintained by the City of Blue Springs Parks and Recreation Department and runs north-south along the western side of Adams Dairy Parkway. The public trail runs through the existing MoDOT right of way at the Adams Dairy Parkway interchange and crosses under the I-70 mainline and under the on/off ramps on the western side of the

interchange. An agreement (Job No. J4I0921) was signed between MoDOT and City of Blue Springs that outlines development of the Adams Dairy Parkway Trail and a temporary easement for the use of right of way. The entire facility is a 4(f) resource. Since LWCFs have not been used at this facility, section 6(f) is not applicable to this facility.

Sidewalks
Currently there are no sidewalks on existing bridges or overpasses within the SIU 1 Project Area. However, the existing roadway shoulder area might be used by pedestrians.

e. Conservation and Wildlife Areas

Burr Oak Woods Conservation Area (Subsection 1 and 2, Exhibit III-1 and III-2)
Burr Oak Woods Conservation Area is a 1,071-acre (433 hectare) tract of land located north of I-70 and west of Route 7 that is owned and maintained by the Missouri Department of Conservation. The area is approximately 75 percent forested with the remaining acreage consisting primarily of early successional fields, grasslands, prairies and cropland. Primary uses of this conservation area include hiking on the three miles of trails, orienteering, bird watching, visiting the nature center and fishing. The Nature Center includes a 154-seat auditorium, a 3,000-gallon aquarium and serves as the focal point of nature interpretation and conservation education. Special events and programs are scheduled throughout the year. The small portion of the Burr Oak Woods Conservation Area that is near the proposed improvements is not a 4(f) resource. Since LWCFs have not been used at this facility, section 6(f) is not applicable to this facility.

4. Prime Farmland and Conservation Reserve Program

The agricultural lands within SIU 1 that may be affected by the proposed action are regulated by the Farmland Protection Policy Act (FPPA). The purpose of the FPPA is to minimize the extent to which federal programs contribute to the unnecessary and irreversible conversion of farmland to non-agricultural uses. The FPPA ensures to the maximum extent practicable, that federal programs are administered in a manner that is compatible with state, unit of local government and private programs to protect farmland.

a. Prime Farmland Definition

Prime farmland is an important resource and was considered during the evaluation of alternatives. Prime farmland soils have the best combination of physical and chemical characteristics for producing food, feed, fiber, forage, oilseed and other agricultural crops with minimum inputs of fuel, fertilizer, pesticides and labor and without intolerable soil erosion. Soils of statewide importance include all soils with few to severe limitations to agricultural production; land capability classes I to IV, as designated by the Natural Resources Conservation Service (NRCS). Hydric soils, prime farmland and soils of statewide importance within the SIU 1 Project Area are listed in Table III-12.

Floodplain soils may be inundated for prolonged periods throughout the year. Hydric soils are saturated, flooded, or ponded during the growing season and develop anaerobic conditions favorable to the growth and regeneration of hydrophytic (wetland) vegetation. Bremer, Colo, Haynie, Wabash and Zook soil units are hydric. Soils occur in the SIU 1 Project Area that are

predominately non-hydric with hydric inclusions. These types of soils are typically included in hydric soils lists. For the purposes of this study, inclusional hydric soils are not listed in the table.

Table III-12: Prime, Hydric and Statewide Important Soils in the SIU 1 Project Area

Prime Soils*	Hydric Soils	Statewide Important (SI)	Prime and Hydric Soils	Hydric and SI	Prime, Hydric and SI
Bremer	Bremer	Bremer	Bremer	Bremer	Bremer
Colo	Colo	Colo	Colo	Colo	Colo
Gilliam	Haynie	Gilliam	Haynie	Haynie	Haynie
Haynie	Wabash	Haynie	Wabash	Wabash	Wabash
Kennebec	Zook	Kennebec	Zook	Zook	Zook
Leta		Knox (5-9%)			
Napier		Knox (5-14%)			
Parkville		Knox (14-20%)			
Sibley (2-5%)		Leta			
Sibley (5-9%)		Napier			
Wabash		Oska			
Wiota		Parkville			
Zook		Sibley (2-5%)			
		Sibley (5-9%)			
		Wabash			
		Wiota			
		Zook			

* - All prime farmland soils are also classified as Statewide Important soils in the SIU 1 Project Area.

b. Extent of Prime Farmland

In 1997 Missouri had a total of 14,310,200 acres (5,791,132 hectares) of prime farmland. Jackson County had a total of 141,000 acres (57,061 hectares) and Lafayette County had a total of 157,015 acres (63,542 hectares) of prime farmland. The extent of prime farmland and farmland of statewide importance within SIU 1 is illustrated in Exhibit III-12.

c. Conservation Reserve Program

The Conservation Reserve Program (CRP) is a voluntary program for agricultural landowners. Through CRP, landowners can receive annual rental payments and cost-share assistance to establish long-term, resource-conserving covers on eligible farmland. The program is administered by the Commodity Credit Corporation through the Farm Service Agency. Program support is provided by NRCS, the Cooperative State Research and Education Extension Service, state forestry agencies and local Soil and Water Conservation Districts.

Currently, one parcel of land within the SIU 1 Project Area is enrolled in the CRP program. This parcel of land is in Subsection 4, north of I-70 along the Jackson/Lafayette County boundary (Exhibit IV-10).

5. Water Resources and Water Quality

a. Lakes, Rivers and Streams

The SIU 1 Project Area is located in the Lower Missouri-Crooked Watershed. Surface water hydrology in SIU 1 is typical of northwest Missouri and the central United States. Rivers, streams and drainages form a dendritic drainage pattern. Streams and tributaries are affected by high rates of sediment deposition and are typically cloudy during and immediately after stormwater events. All of the streams in SIU 1 eventually flow into the Missouri River, which is located to the north of I-70.

The Missouri River provides a seemingly unlimited supply of water to this region. The Missouri River has irrigation, livestock and wildlife watering, aquatic life and drinking water supply and industrial use designations. Water quality is generally dependent on land use conditions in several upstream states to the north and west. Suspended sediment concentrations are high due to agricultural practices and channelization. Historic water quality problems in this area include intermittent low dissolved oxygen concentrations, high fecal Coliform bacteria concentrations and agricultural chemical levels that are a concern to drinking water suppliers.

The Missouri Department of Natural Resources regulates surface water and groundwater quality within Missouri per 10 CSR 20-7, which is the Code of State Regulations governing water quality for the state of Missouri. Stream water quality reflects the land uses within its watershed. Due to both urban and rural land uses within the SIU 1 Project Area, water quality is influenced by point sources such as wastewater treatment plant discharges, and non-point sources such as agricultural runoff or atmospheric deposition. The Missouri Department of Natural Resources is also in the process of developing Total Maximum Daily Load (TMDL) for all waters on the EPA's approved 2002 Missouri 303(d) list. The TMDL is a mathematical calculation of the amount of a specific pollutant that a waterbody can absorb while still meeting water quality standards. An approved TMDL document will include an implementation plan to identify how the load will be reduced to a level that will protect water quality. Table III-13 lists the streams in SIU 1 that are on the EPA's approved 2002 Missouri 303(d) list. The Missouri Department of Natural Resources modified the list as of May 2004.

Table III-13: EPA Approved 2002 Missouri 303(d) List of Waterbodies

Waterbody ID	Waterbody	TMDL Approved	Size	Unit	Pollutant	Source	Downstream County	Upstream County	Priority
912	Davis Creek	2003	2	Miles	Nutrients, Low DO*	Odessa SE Waste Water Treatment Plant	Lafayette		H
3413	Horseshoe Creek		3.1	Miles	BOD, NH3N	2 Oak Grove Lagoons	Jackson	Lafayette	H
423	Little Blue River		22	Miles	Mercury	Atmospheric Deposition	Jackson		M

Waterbody ID	Waterbody	TMDL Approved	Size	Unit	Pollutant	Source	Downstream County	Upstream County	Priority
400	West Fork Sni-A-Bar Creek		2	Miles	BOD, VSS	Lake Lotawana Lagoon	Jackson		H
Source: MDNR, 2004									

* - Waterbody where the TDML is written and approved for the listed pollutant
H - High
M - Medium

Several lakes are located within the SIU 1 Project Area including Blue Springs Reservoir, Lake Jacomo and Odessa Lake. Both Blue Springs Reservoir and Lake Jacomo are classified as lakes that are waters of the state including both public and private lakes. They have usage designations including livestock and wildlife watering, aquatic life, whole body contact recreation, boating and canoeing. Odessa Lake is classified as a lake or reservoir used primarily for public drinking water supply. Its usage designations include livestock and wildlife watering, aquatic life, boating and canoeing and drinking water supply. None of the lakes identified in the SIU 1 Project Area have been listed on the 2002 Missouri 303(d) list.

Several classified streams are located within SIU 1. Table III-13 lists the waterbody classifications and use designations for major lakes and tributaries. Exhibit III-13 shows the location of the lakes and streams. Each stream is briefly described below.

Little Blue River – The Little Blue River crosses the SIU 1 Project Area south to north approximately 0.6 miles (1 kilometer) east of I-470 in Independence. The Little Blue River is classified as a stream with permanent flow. It has usage designations including livestock and wildlife watering, aquatic life and boating and canoeing. Erosion from agricultural fields and urban run off are water quality considerations in the Little Blue Basin. The Little Blue River has a “metropolitan no-discharge” classification for the entire river. Pollutants include mercury, due to atmospheric deposition, and chlordane, due to urban runoff. Generally, urban and suburban developments can and do affect water quality by sedimentation, channelization or alteration of the stream, erosion from construction sites and both fertilizer and pesticide use in agriculture and residential areas.

East Fork of the Little Blue River – The East Fork of the Little Blue River crosses the SIU 1 Project Area south to north in Independence approximately 1.5 miles (2.5 kilometers) east of I-470. It is a major tributary to the Little Blue River. Several large reservoirs, including Lake Jacomo and Blue Springs Reservoir are within its drainage area. The East Fork of the Little Blue River is classified as a stream with permanent flow. It has usage designations including livestock and wildlife watering and aquatic life. Pollutants include volatile suspended solids.

Burr Oak Creek – A tributary to Burr Oak Creek crosses the SIU 1 Project Area north to south in Blue Springs approximately 4.3 miles (7 kilometers) east of I-470. It is classified as a stream that may cease flow in dry periods but maintains permanent pools that support aquatic life. No

discrete pollutants are indicated within this stream. Burr Oak Creek is a major tributary to the Little Blue River.

Sni-A-Bar Creek – Sni-A-Bar Creek crosses the SIU 1 Project Area south to north in Grain Valley approximately 0.8 miles (1.3 kilometers) east of the I-70/Grain Valley interchange. It is classified as a stream with permanent flow. It has usage designations including livestock and wildlife watering, aquatic life and boating and canoeing. Pollutants include biochemical oxygen demand due to lagoons and volatile suspended solids.

Horseshoe Creek – Horseshoe Creek crosses the SIU 1 Project Area south to north near Oak Grove approximately 0.16 miles (0.25 kilometers) east of the Jackson and Lafayette County line. It is classified as a stream that may cease flow in dry periods but maintains permanent pools that support aquatic life. It has usage designations including livestock and wildlife watering and aquatic life. Pollutants include Biological Oxygen Demand and ammonia due to lagoons.

Little Horseshoe Creek – Little Horseshoe Creek crosses the SIU 1 Project Area south to north near Oak Grove approximately 0.3 miles (0.5 kilometers) east of the Jackson and Lafayette County Line. It is classified as a stream that may cease flow in dry periods but maintains permanent pools that support aquatic life. It has usage designations including livestock and wildlife watering and aquatic life. No discrete pollutants are indicated within this stream. It is a major tributary to Horseshoe Creek.

East Fork of Sni-A-Bar Creek – The East Fork of Sni-A-Bar Creek crosses the SIU 1 Project Area south to north approximately midway between Bates City and Odessa. It is classified as a stream with permanent flow. It has usage designations including livestock and wildlife watering and aquatic life. No discrete pollutants are indicated within this stream.

Owl Creek – Owl Creek crosses the SIU 1 Project Area south to north in Odessa. It is classified as a stream that may cease flow in dry periods but maintains permanent pools that support aquatic life. It has usage designations including livestock and wildlife watering and aquatic life. Pollutants include biochemical oxygen demand and volatile suspended solids. The Odessa City Lake discharges into Owl creek south of I-70.

Davis Creek – Three tributaries to Davis Creek cross the SIU 1 Project Area north to south approximately 1 mile (1.6 kilometers) east of Odessa. The creek is classified as a stream that may cease flow in dry periods but maintains permanent pools that support aquatic life. It has usage designations including livestock and wildlife watering and aquatic life. Pollutants include nutrients and biological oxygen demand due to the Odessa southeast wastewater treatment plant. Davis Creek is a major tributary to the Blackwater River.

Blue Branch – The Blue Branch is a named surface tributary in the SIU 1 Project Area that is not included in the MDNR stream classification and use designations. Blue Branch is a perennial stream located west of Sni-A-Bar Creek and south of I-70 near the eastern corporate limits of Blue Springs. Blue Branch merges with Sni-A-Bar Creek south of I-70.

Table III-14: Waterbody Classifications and Use Designations

Waterbody	Class	Use Designations								
		IRR	LWW	AQL	CLF	CDF	WBC	BTG	DWS	IND
Blue Springs Lake	L3		X	X			X	X		
Jacomo Lake	L3		X	X			X	X		
Odessa Lake	L1		X	X				X	X	
Little Blue River	P		X	X				X		
East Fork Little Blue River	P		X	X						
Burr Oak Creek	C		X	X						
Sni-A-Bar Creek	P		X	X				X		
Horseshoe Creek	C		X	X						
Little Horseshoe Creek	C		X	X						
East Fork Sni-A-Bar Creek	P		X	X						
Owl Creek	C		X	X						
Davis Creek	C		X	X						
Source: MDNR, 2001										

L1 - Lakes or Reservoirs used primarily for public drinking water supply
L3 - Other lakes which are waters of the state including both public and private lakes
P - Streams that maintain permanent flow even in drought conditions
C - Streams that may cease flow in dry periods but maintain permanent pools which support aquatic life
IRR - Irrigation
LWW - Livestock & Wildlife Watering
AQL - Protection of Warm Water Aquatic Life and Human Health-Fish Consumption
CLF - Cool Water Fishery
CDF - Cold Water Fishery
WBC - Whole Body Contact Recreation
BTG - Boating and Canoeing
DWS - Drinking Water Supply
IND - Industrial

Other unnamed intermittent and ephemeral tributaries are located throughout the SIU 1 Project Area. Additional surface water features include small ponds and lakes. These small man-made features were excavated as amenities and for the purpose of livestock watering.

b. Groundwater

The SIU 1 Project Area lies within the Osage – Salt Plains of the Central Lowland physiographic region of northwest Missouri. The bedrock underlying the area consists of cyclic deposits of limestone and shale. Water from the consolidated rock formations is highly mineralized and generally unsuitable for human use, such that other sources of water are used for water supplies. Wells in the alluvium along the smaller streams produce small amounts of water.

The principal source of present and future groundwater supplies is from the Missouri River. The Missouri River alluvium provides a productive source of groundwater to Kansas City and Independence as well as other non-municipal water users in the SIU 1 Project Area. Generally, water from the Missouri River alluvium is a calcium-bicarbonate type with variable

concentrations of total dissolved solids, sulfate and chloride and other inorganic compounds. The vertical conductivity of soils in the SIU 1 Project Area range from 0.007 to 0.499 feet per hour (0.002 to 0.152 meters per hour) with most of the soils in the range of between 0.075 to 0.141 feet per hour (0.023 and 0.043 meters per hour), according to 1992 data from the United States Geological Survey (USGS). The water table generally is between 5 to 25 feet (1.5 to 7.6 meters) below the surface of the floodplain and well yields are between 500 and 1,500 gallons per minute (1892.7 and 5678.1 liters per minute) and average about 1,000 gallons per minute (3785.4 liters per minute) according to 1984 data from the Soil Conservation Service (SCS).

c. Floodplains

As part of the National Flood Insurance Program (NFIP), many communities and counties have performed flood insurance studies to identify flood hazards for floodplain management and flood insurance purposes. The administration of the NFIP, performed by the Federal Emergency Management Agency (FEMA), entails detailed studies of flood-prone streams and rivers for the determination of flood boundaries and flood hazards.

The Federal Emergency Management Agency and the FHWA guidelines in 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.

The state of Missouri is a participant in the NFIP. Any state-owned development associated with this project located within a special flood hazard area as identified by FEMA must meet the requirements of the State of Missouri Executive Order 97-09. For projects that involve the state of Missouri, the State Emergency Management Agency (SEMA) issues floodplain development permits. In the case of projects proposed within regulatory floodways, a “no-rise” certificate, if applicable, should be obtained prior to issuance of a permit.

The Federal Emergency Management Agency maintains flood insurance rate maps that show the extent of the 100-year floodplains. The floodplain assessment for this document included a thorough review of NFIP maps to determine the base floodplain areas and regulated floodways within the SIU 1 Project Area as shown on Exhibit III-13. The Federal Emergency Management Agency has mapped 100-year floodplains for the major rivers and perennial streams in the SIU 1 Project Area.

In Jackson County, maps developed by FEMA show that the majority of flood prone streams have determined base flood elevations. Existing Interstate 70 in Jackson County crosses the 100-year floodplains of the Little Blue River, the East Fork of the Little Blue River, Blue Branch Creek Tributary Number 2, Sni-A-Bar Creek, and Sni-A-Bar Creek Tributary Number 3. An existing connector road included within the SIU Project Area in Jackson County crosses the 100-year floodplain of the Swiney Branch. Regulatory floodways within the SIU 1 Project Area

are present on Blue Branch Creek Tributary Number 2, Sni-A-Bar Creek, Swiney Branch and Sni-A-Bar Creek Tributary Number 3a.

In Lafayette County, maps developed by FEMA show that flood prone streams have been designated as Zone A. No base flood elevations or regulatory floodways have been determined for the flood prone streams within SIU 1. Existing I-70 in Lafayette County crosses Horseshoe Creek, Little Horseshoe Creek, an unnamed tributary to Little Horseshoe Creek, East Fork of Sni-A-Bar Creek, Owl Creek and three unnamed tributaries to Davis Creek.

Floodplain Managers/Administrators from communities located within SIU 1 and participating in the NFIP were contacted. They all indicated that no FEMA or SEMA buyout properties are located within the SIU 1 Project Area.

6. Wetlands and Waters of the United States

a. Regulatory Overview

Executive Order 11990, dated May 24, 1977, requires federal agencies to avoid undertaking or providing assistance for new construction located in wetlands unless there are no practicable alternatives, and all practicable measures to minimize harm to wetlands have been implemented.

The United States Army Corps of Engineers (USACE) has authority to administer a permit program to regulate the discharge of dredged or fill material into waters of the United States and obstructions to navigation under Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act. These federal statutes prohibit the discharge of dredge material or placement of fill into waters and the obstruction of navigation without a Department of the Army permit. In accordance with these laws, the USACE will review and evaluate project plans and issue permits as defined by 33 CFR Parts 320-321 and the Rivers and Harbors Act. The United States Army Corps of Engineers, Kansas City District has jurisdiction over the water resources in the area in which the SIU 1 Project Area is located. United States Army Corps of Engineers permits are issued contingent on water quality certification issued under Section 401 of the Clean Water Act by MDNR. In accordance with a Memorandum of Agreement dated January 1994 with USACE, NRCS has regulatory authority over the delineation of farmed wetlands.

Other regulatory permits such as USCG Section 9 Bridge Permit, MDNR stormwater permit, and FEMA/SEMA floodplain development permit (and if in a floodway a “no-rise” certificate) are also required.

In response to these regulatory mandates, a thorough water resources inventory (streams, wetlands and ponds) was conducted as part of the natural resource investigation within the SIU 1 Project Area. Potential jurisdictional waters were identified during the alternative development stage in conjunction with natural resource constraints mapping. Detailed field delineations of water resources were performed within limits of the Reasonable Alternatives as described in Chapter II.

The Environmental Methodologies Technical Memorandum "I-70 Second Tier Environmental Studies Kansas City to St. Louis, Missouri," dated January 2003 (available upon request) outlined the methodology used to identify streams and locations of jurisdictional wetlands and ponds. Rivers, streams, wetlands and ponds occurring within the SIU 1 Project Area were identified utilizing a variety of existing data sources including:

- National Wetlands Inventory (NWI) maps;
- USGS 7.5 minute topographic quadrangle maps;
- aerial photography (dated November 2000);
- Jackson and Lafayette County soil surveys;
- Jackson and Lafayette County NRCS hydric soils lists; and
- FEMA Flood Insurance Rate Maps.

Flood Security Act (FSA) wetland inventory maps were not available for the SIU 1 Project Area. Windshield surveys were performed on each side of the I-70 centerline with a review of available mapping for use in the evaluation of the north/south mainline alternatives. Rivers and streams were initially identified on USGS maps, and wetlands were initially identified using NWI maps. Subsequent field reconnaissance was conducted to confirm mapped resources and identify additional resources. Subsequent to the selection of the preferred alternative and the development of limits of construction, a detailed field delineation of wetlands and other waters was conducted using the USACE 1987 Wetland Delineation Manual. The delineation effort was performed in May and June 2004 by study team personnel.

b. Rivers and Streams

The field determination of streams as jurisdictional resources was based upon the presence of an ordinary high water mark (OHWM) and bed and bank, and the presence of documented surface water connections to navigable waters of the United States. According to 33 CFR 328.3, the term "ordinary high water mark" means: "the line on the shore established by the fluctuations of water and indicated by physical characteristics such as a clear, natural line impressed on the bank, shelving, changes in the character of the soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas." In general, the OHWM for a stream is usually determined through an examination of the recent physical evidence of surface flow in the stream channel. Watercourses that contain bed and bank, and exhibit an OHWM, are classified as waters of the United States and regulated by the USACE.

Field investigations resulted in the identification of 40 jurisdictional stream crossings (Note: An individual stream crossing may include both the north and south sides of I-70). Streams were typically small with widths ranging from 2 to 40 feet (0.6 to 12.2 meters) at the OHWM. Substrate and in-stream cover were found to be variable depending on the overall stream gradient, bank stability and degree of riparian zone development. An inventory of the stream crossings located in the SIU 1 Project Area is presented in Table III-15.

Table III-15: Stream Inventory

Stream Crossing Number	Mile Marker	Name/Location	Crossing Type	OHWM Width (ft)
Subsection 1 - *I-470 to Mile Marker 19*				
1	16	Little Blue River	Bridge	35
2	17	E. Fork Little Blue River	Culvert	30
3	18	Unnamed stream west of Woods Chapel Rd. flowing south	Culvert	6
4	18	Unnamed stream south of I-70, crossing Woods Chapel Rd., flowing west	Culvert	6
Subsection 2 - *Mile Marker 19 to Mile Marker 22*				
None	-	-	-	-
Subsection 3 - *Mile Marker 22 to Mile Marker 25*				
5	22	Unnamed stream flowing south from newly constructed Lake at Gregory O. Grounds Park	Culvert	5
6	22	Unnamed stream crossing I-70 flowing south, approximately 1600’ west of MM 23	Culvert	4.5
29	23	Unnamed stream to the south of I-70 flowing south, immediately east of MM 23	Culvert	4
7	24	Unnamed stream to the south of I-70 flowing west (area of proposed access road)	Culvert	9
8	24	Unnamed stream to the south of I-70 flowing north crossing Yenni Ave. Same stream as above entry	Culvert	8
30	24	Unnamed stream to the north of I-70 flowing north, approximately halfway between MM24 and MM25	Culvert	6
9	24	Swiney Branch to the north of I-70 flowing east	Culvert	15
Subsection 4 - *Mile Marker 25 to Mile Marker 29*				
10	25	Sni-A-Bar Creek	Bridge	30
11	25	Unnamed stream approximately 2200' west of MM26, flowing north	Culvert	9
12	26	Unnamed stream north of I-70 flowing northeast	Culvert	3
13	26	Unnamed stream crossing I-70 flowing north	Culvert	27.5
14	27	Unnamed stream crossing I-70 flowing north, approximately 650' east of MM27	Culvert	20
15	27	Unnamed stream crossing I-70 flowing north, approximately 2100' east of above entry	Culvert	10
16	27	Unnamed stream crossing I-70 approximately 800' west of MM28, flowing north	Culvert	5
17	27	Unnamed stream crossing proposed access road approximately 1800' due north of MM28	Culvert	3
18	28	Unnamed stream crossing I-70 to the northwest of Wal-Mart store, flowing northeast	Culvert	22.5
19	28	Unnamed stream crossing I-70 to the northeast of Wal-Mart store, flowing north	Culvert	25
31	28	Unnamed stream crossing I-70 flowing north, approximately 700’ west of MM29	Culvert	3
Subsection 5 - *Mile Marker 29 to Mile Marker 39*				
32	29	Unnamed stream crossing I-70 flowing north, approximately 700’ east of MM29	Culvert	3
20	29	Horseshoe Creek	Bridge	40

Stream Crossing Number	Mile Marker	Name/Location	Crossing Type	OHWM Width (ft)
21	29	Little Horseshoe Creek, flowing north	Bridge	30
33	30	Unnamed stream crossing I-70 flowing south, approximately 1,000' east of MM30	Culvert	2.5
22	30	Little Horseshoe Creek, flowing south	Culvert	8
23	30	Unnamed stream flowing south approximately 1400' west of MM31	Culvert	5
24	32	Unnamed stream north of I-70 flowing east-northeast	Culvert	3
25	33	East Fork Sni-A-Bar Creek	Bridge	25
34	34	Unnamed stream crossing I-70 flowing north, at MM34	Culvert	2
26	34	Unnamed stream approximately halfway between MM34 and 35, flowing south	Culvert	4
35	34	Unnamed stream crossing I-70 flowing southwest from Pond 34-3, approximately 1,500' west of MM35	Culvert/ Relocation	4
40	35	Unnamed stream flowing north from Wetland 35-1	Culvert/ Relocation	4
36	35	Unnamed stream crossing I-70 flowing north, approximately 1,500' west of MM36	Culvert	4
37	35	Unnamed stream north of I-70 flowing northeast, approximately 750' west of MM36	Culvert/ Relocation	2
38[1]	35	Unnamed stream south of I-70 flowing east from Pond 35-1, approximately 750' west of MM36	Culvert/ Relocation	3 (estimated)
27	36	Unnamed stream approximately 200' east of MM36, flowing north	Culvert	10
39	36	Unnamed stream crossing I-70 flowing north from Wetland 36-2, approximately 2,000' east of MM36	Culvert	6
28	36	Owl Creek	Culvert	8

1 – Access to property was not granted, therefore the OHWM width is estimated.

Photographs and pertinent information about each stream and the adjacent riparian area are presented on stream data forms in the *I-70 SIU 1 Draft Waters of the U.S. and Wetland Determinations Summary Report* (available upon request).

c. Wetlands

The United States Army Corps of Engineers and the EPA jointly define wetlands as "those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions." Wetlands generally include swamps, marshes, bogs and similar areas.

The wetlands within SIU 1 were delineated in accordance with the USACE 1987 Wetland Delineation Manual. The results of the detailed wetland delineations are presented in a separate *I-70 SIU 1 Draft Waters of the U.S. and Wetland Determinations Summary Report* (available upon request). Potential wetland areas are considered jurisdictional wetlands if they meet all three wetland criteria: hydrophytic vegetation, hydric soils and wetland hydrology (USACE 1987). In addition, wetlands must be hydraulically connected or adjacent to jurisdictional waters in order to be classified as jurisdictional wetlands (US Supreme Court

ruling, Solid Waste Agency of Northern Cook County). Typically, this includes wetlands located within the floodplain of a jurisdictional river or stream.

The wetlands within SIU 1 consist of palustrine wetlands. Palustrine wetlands are further divided based on hydrology, landscape position and vegetation (USFWS, 1979). Palustrine wetlands are classified according to dominant vegetation as palustrine emergent wetlands, palustrine scrub-shrub and palustrine forested wetlands. All three of these palustrine types are present within SIU 1.

Wetland communities represent transitional areas between aquatic and terrestrial habitats. Wetlands generally occur within a variety of landscapes including forest, pasture, cropland, old field and urban/suburban settings. As a result, wetlands reflect aspects of both aquatic and terrestrial communities. Wetland habitats are generally highly productive and maintain relatively diverse floral and faunal assemblages. While wetlands have long been recognized as providing habitat for fish and wildlife, these areas are also recognized as performing a variety of functions that are valuable to society at large. Wetland functions include groundwater recharge, flood storage, sediment retention, erosion control, nutrient removal and retention, maintenance of plant and animal communities and enhancement of water quality. While wetland communities are, in part, determined by the composition of plant communities and certain soil characteristics, hydrology is recognized as the driving force behind wetland development. Within SIU 1, it is apparent that the predominant determinants of hydrological characterization are position within the landscape and groundwater discharge. The wetlands located within SIU 1 are summarized in Table III-16, shown on Exhibit IV-1 through Exhibit IV-17 and described in more detail in the *I-70 SIU 1 Draft Waters of the U.S. and Wetland Determinations Summary Report* (available upon request).

Table III-16: Wetland Descriptions

Wetland Number	Location	NWI/ NRCS	Wetland Type	Wetland Area within existing right of way	
				acres	ha
Subsection 1 - *I-470 to Mile Marker 19*					
15-1	South of I-70 adjacent to I-470 northbound to I-70 eastbound ramp. Approximately 1000' west of MM 16	PF01A	PFO	0.041	0.017
16-2	North of I-70 between I-70 westbound and entrance ramp to I-70 westbound from Little Blue Parkway	-	PEM	0.298	0.121
16-3	South of I-70 eastbound exit ramp to Little Blue Parkway	PEMCx	PEM	0.538	0.218
16-4	South of I-70 eastbound between I-70 eastbound and I-70 eastbound exit ramp to Little Blue Parkway	-	PEM	0.166	0.067
			Total for Subsection 1	**1.043**	**0.422**
Subsection 2 - *Mile Marker 19 to Mile Marker 22*					
None		**-**	**-**	0.00	0.00
			Total for Subsection 2	**0.00**	**0.00**

Wetland Number	Location	NWI/ NRCS	Wetland Type	Wetland Area within existing right of way	
				acres	ha
Subsection 3 - *Mile Marker 22 to Mile Marker 25*					
24-1	South of I-70 between US 40 and Yenni Ave in location of proposed access road	PF01A	PFO	0.0	0.0
24-5	North of I-70 along the west side of South Seymour Road	PF01Ch PEMCh PEMAh	PFO	0.761	0.308
24-8	South of I-70 to the east of San Kar Drive in area of proposed frontage road	PSS1A PSS1C	PSS	0.0	0.0
24-10	North of I-70 to the east of proposed north-south cul-de-sac, approximately 1000' east of Route AA/BB	-	PSS	0.0	0.0
			Total for Subsection 3	**0.761**	**0.308**
Subsection 4 - *Mile Marker 25 to Mile Marker 29*					
25-6	South of I-70 directly east of Sni-A-Bar Creek	PEMCx PF01A	PEM, PFO	1.243	0.503
25-7	South of I-70 to the east of 25-6, west of unnamed stream.	-	PEM	0.084	0.034
25-8	North of I-70, east of Sni-A-Bar Creek	-	PEM, PFO	1.700	0.688
25-9	North of I-70, west of Sni-A-Bar Creek	PF01A	PFO	1.167	0.472
25-10	South of I-70, west of Sni-A-Bar Creek	PF01A	PFO	0.599	0.242
			Total for Subsection 4	**4.793**	**1.940**
Subsection 5 - *Mile Marker 29 to Mile Marker 39*					
29-3	Pond north of I-70, approximately 600' west-northwest of MM30	PUBGh PSS1Ch	PUB, PFO	0.0	0.0
30-3	Pond associated with trailer park north of I-70	PUBGh	PUB, PEM	0.024	0.010
32-2	North of I-70, north of Foster College Road, approximately 2000' east of MM32	-	PFO	0.01	0.004
33-1	North of I-70, immediately east of East Fork Sni-A-Bar Creek	PSS1A	PFO, PSS	0.0	0.0
34-2	North of I-70, north of frontage road, approximately 1000' west of Hwy. WW	-	PEM	0.027	0.011
35-2	North of I-70, north of frontage road, approximately 2,000' east of MM35	-	PUB, PEM	0.0	0.0
35-3	North of I-70, north of frontage road, approximately 1,900 east of MM35	-	PEM, PFO	0.01	0.004
36-2	South of I-70, south of frontage road, approximately 350' west of Action Avenue	PEM / SS1Ch	PEM	0.001	0.0004
37-1	North of I-70, north of frontage road, immediately west of County Road 71	-	PEM	0.218	0.088
38-2	Farmed wetland north of I-70, north of frontage road, approximately 150' northwest of 38-1	PUBGh	FW	0.0	0.0
			Total for Subsection 5	**0.290**	**0.1174**

Wetlands Reserve Program

The Wetlands Reserve Program (WRP) is a voluntary program that provides technical and financial assistance to eligible landowners to address wetland, wildlife habitat, soil, water, and related natural resource concerns on private lands in an environmentally beneficial and cost-effective manner. The program provides an opportunity for landowners to receive financial incentives to enhance wetlands in exchange for retiring marginal land from agriculture. The Wetlands Reserve Program is reauthorized in the Farm Security and Rural Investment Act of

the 2002 Farm Bill. The Natural Resource Conservation Service administers the WRP program and the Commodity Credit Corporation provides funding.

At the time this report was completed, there were no parcels of land within SIU 1 enrolled in the WRP program.

d. Ponds

Excavated ponds and impoundments with open water are located throughout SIU 1. In general these areas were created primarily for recreation or livestock water purposes and are generally classified as palustrine, unconsolidated bottom (PUB). The majority of ponds and impoundments in SIU 1 are not connected to jurisdictional waters (isolated); therefore, they do not meet jurisdictional criteria. These were designated non-jurisdictional ponds in accordance with US Supreme Court ruling, Solid Waste Agency of Northern Cook County.

Many potential PUB ponds or upland ponds are located in a variety of positions within the landscape. Thus, these features exhibit a wide range of characteristics (i.e., extent and composition of vegetation, water depth and clarity, etc.). Pond age and current use (i.e., recreation, livestock watering, etc.) often determine the extent and composition of vegetation. Ponds that have been recently constructed typically have steep banks and no established shoreline vegetative communities. Ponds used frequently for livestock are usually characterized by degraded banks and littoral zones with a limited vegetative fringe.

Established PUB ponds generally contain more extensive emergent vegetative zones and support a more diverse floral assemblage. Some impoundments within SIU 1 appeared abandoned and were characterized by limited open water, large and diverse communities of emergent vegetation and aquatic macrophytes, and bank communities of herb, shrub and tree species. In cases such as this, the vegetative portion of the pond is considered a wetland, separated from the open water portion, and is considered jurisdictional if the pond is connected to jurisdictional water. Fringe vegetation around PUB ponds typically includes cattails, sedges and willows. The ponds within SIU 1 are summarized in Table III-17, shown on Exhibit IV-1 through Exhibit IV-17 and described in more detail in the *I-70 SIU 1 Draft Waters of the U.S. and Wetland Determinations Summary Report* (available upon request).

Table III-17: Pond Descriptions

Pond Number	Location	NWI/ NRCS	Pond Type	Pond Area within existing right of way	
				acres	ha
Subsection 1 - *I-470 to Mile Marker 19*					
None		-	-	0.00	0.00
			Total for Subsection 1	**0.00**	**0.00**
Subsection 2 - *Mile Marker 19 to Mile Marker 22*					
None		-	-	0.00	0.00
			Total for Subsection 2	**0.00**	**0.00**
Subsection 3 - *Mile Marker 22 to Mile Marker 25*					
24-6	North of I-70 to the east of proposed north-south cul-de-sac, approximately 1000' east of Route AA/BB	PUBFh	PUB	0.00	0.00
			Total for Subsection 3	**0.00**	**0.00**

Pond Number	Location	NWI/ NRCS	Pond Type	Pond Area within existing right of way	
				acres	ha
Subsection 4 - *Mile Marker 25 to Mile Marker 29*					
25-4	Partially backfilled pond south of I-70, west of Old US Hwy. 40, and north of RR tracks	PUBGh	PUB	0.00	0.00
25-5	Pond south of I-70, west of Old US Hwy. 40, and north of RR tracks. Approximately 600' directly southwest of MM26	PUBGh	PUB	0.00	0.00
26-1	Pond north of I-70, approximately 350' northeast of MM26	-	PUB	0.00	0.00
26-2	Pond south of I-70, approximately 600' southeast of MM26	PUBFh	PUB	0.00	0.00
26-5	Pond north of I-70, approximately 1600' west of MM27	-	PUB	0.00	0.00
Total for Subsection 4				**0.00**	**0.00**
Subsection 5 - *Mile Marker 29 to Mile Marker 39*					
29-3	Pond north of I-70, approximately 600' west-northwest of MM30	PUBGh PSS1Ch	PUB PFO	0.00	0.00
30-3	Pond associated with trailer park north of I-70	PUBGh	PUB PEM	0.00	0.00
30-4	Pond north of I-70 between trailer parks, approximately 1000' east of MM31	PUBGh	PUB	0.00	0.00
31-1	Pond north of I-70, approximately 400' east of Route D/Z	PUBGh PEMCh	PUB	0.00	0.00
31-2	Pond south of I-70, south of Old Hwy. 40, approximately 1000' west-southwest of MM32	PUBGh	PUB	0.00	0.00
33-3	Pond north of I-70, north of frontage road, approximately 1500' east of East Fork Sni-A-Bar Creek	PUBGh	PUB	0.00	0.00
34-3	Pond north of I-70, east of Hwy. WW	PUBGh	PUB	0.00	0.00
35-1	Pond south of I-70, south of frontage road, approximately 1200' south-southwest of MM36	PUBGh	PUB	0.00	0.00
35-2	North of I-70, north of frontage road, approximately 2,000' east of MM35	-	PUB, PEM	0.00	0.00
36-4	Pond south of I-70, south of frontage road, approximately 800' southeast of MM36	PUBGh	PUB	0.00	0.00
38-1	Pond north of I-70, north of frontage road, approximately 1500' east of County Road 96/Johnson Road	PUBGh	PUB	0.00	0.00
38-4	Pond north of I-70, north of frontage road, approximately 750' west of MM39	PUBGh	PUB	0.00	0.00
38-5	Pond south of I-70, south of frontage road, approximately 500' east of County Road 96/Johnson Road	PUBFh	PUB	0.00	0.00
39-4	Pond north of I-70, immediately north of MM39	PUBGh	PUB	0.00	0.00
Total for Subsection 5				**0.00**	**0.00**

7. Physiography and Topography

a. Physiography

The SIU 1 Project Area is located on the approximate border between the Dissected Till Plains Section and Osage Plains Section of the Central Lowland Physiographic Province (Fenneman, 1946). Both the Dissected Till Plains and the Osage Plains are characterized by rolling plains of low relief. Surficial soils in upland areas of the Dissected Till Plains are derived from loess or glacial till while surficial soils within the Osage Plains are generally derived from residuum. The border between the two sections is generally marked by the Missouri River, which was generally the southern limit of the continental ice sheets. The vast amounts of water released from the edge of the melting ice sheets carved out the present river valley. During the Kansan glaciation,

the continental ice sheets pushed south of the Missouri River and stopped just a few miles south of the SIU 1 Project Area. However, there is little evidence of glaciation in Jackson County since most glacial debris, where present, is covered by a mantle of loess. The uplands areas in SIU 1 are divided by two small drainage areas, the Blue River and Sni-A-Bar Creek. The topography of the drainage area floodplains is relatively flat with surficial soils comprised of alluvium. Specific soils within SIU 1 are described in the following section.

b. Geology

Surficial Soils

The geology within SIU 1 consists of unconsolidated sediments composed of loess, glacial till, and/or residuum overlying Pennsylvanian Age limestone and shales in the uplands areas with alluvium in the floodplains of the Little Blue River and Sni-A-Bar Creek. In the Missouri River Valley, loess, consisting of windblown silt and clay size particles composed primarily of quartz, feldspar and kaolin may be present up to a thickness of 100 feet (30.5 meters). However, the thickness of the loess decreases substantially to a thickness of a few feet or less in SIU 1. In some areas the loess may be underlain by Kansan glacial till where the predominantly clay till has not been eroded. The loess is normally described as low plastic silty clay to clayey silt. Residual soils may be present below the till or loess where it has not been removed by the Kansan glaciation. These residual clay and silty clay soils transition into the layers of bedrock that underlie the entire uplands area. The residual soils are normally described as highly plastic or medium to highly plastic clays. The alluvium in the Little Blue River and Sni-A-Bar Creek valleys consists primarily of silty clay and clay overlying a thin layer of sand and gravel.

A description of the soils found in the portions of Jackson County and Lafayette County in the SIU 1 Project Area are summarized below by soil association (Soil Conservation Service, 1977, 1984). Soil associations are groupings of one to several major dominant soil types used to describe soil occurrences on the natural landscape.

The Soil Survey of Jackson County, Missouri indicates three soil associations in the western portion of SIU 1. Jackson County soil associations include the Higginsville-Sibley-Sharpsburg Association, the Kennebec-Colo-Bremer Association and the Snead-Menfro-Oska Association. The locations of the soil associations are shown on Exhibit III-14. There are two soil associations located in the eastern portion of SIU 1 in Lafayette County. These soil associations are the Winfield-Sampsel Association and the Marshall-Higginsville Association. A brief description of each of the soil associations is provided below.

Higginsville-Sibley-Sharpsburg Association

On the tops of the uplands in east central Jackson County is the Higginsville-Sibley-Sharpsburg Association. These are the predominant soils within the SIU 1 Project Area in Jackson County, Missouri. These soils are deep, gently sloping to moderately sloping, somewhat poorly drained to well drained soils formed in loess on ridgetops and upland side slopes on broad divides between major drainage ways. The Higginsville, Sibley and Sharpsburg soils are generally considered to have severe limitations for road construction due to frost action and low strength.

Snead-Menfro-Oska Association

The Snead-Menfro-Oska Association soils are found on strongly dissected upland bluffs adjacent to the floodplains of intermediate and small streams such as the Little Blue River.

These soils make up a limited portion of the SIU 1 Project Area in Jackson County, Missouri. These soils are moderately deep to deep, gently to steeply sloping, well drained to moderately well drained soils that formed in loess or from residuum overlying shale and limestone. Snead soils are generally considered to have severe limitations for road construction due to low strength, slope and shrink-swell concerns. Menfro soils are generally considered to have severe limitations for road construction due to frost action and low strength. Oska soils are generally considered to have severe limitations for road construction due to low strength and shrink-swell.

Kennebec-Colo-Bremer Association
Soils in the Little Blue River and Sni-A-Bar Creek floodplain include the Kennebec-Colo-Bremer Association. These soils make up a limited portion of the SIU 1 Project Area in Jackson County, Missouri. These soils are deep, nearly level, moderately well drained to poorly drained soils that formed in alluvium on the Little Blue River and Sni-A-Bar Creek floodplains and terraces. Kennebec, Colo and Bremer soils are generally considered to have severe limitations for road construction due to flooding, frost action and low strength.

Winfield-Sampsel Association
The Winfield-Sampsel Association is a gently sloping to steep, loamy, moderately well drained to somewhat poorly drained soil. These soils constitute approximately one-half of the soils in SIU 1 in Lafayette County. Winfield soils were formed in loess and are loamy, moderately permeable and moderately well drained. Sampsel soils are mainly formed in shale residuum and are loamy, slowly permeable and somewhat poorly drained. Winfield soils are considered fair for road construction because of a moderate shrink-swell potential. Sampsel soils are considered fair for road construction because they tend to be somewhat poorly drained.

Marshall-Higginsville Association
The Marshall-Higginsville Association is a loess-derived, loamy, well-drained to somewhat poorly drained soil found on gently sloping broad ridgetops, sloping to strongly sloping hillsides and level to nearly level bottom lands adjacent to small streams. These soils generally make up the remainder of soils within the SIU 1 Project Area. The Marshall soils are silty, moderately permeable and well drained while Higginsville soils are silty, slowly permeable and somewhat poorly drained. Marshall soils are considered fair for road construction due to medium to high compressibility. Higginsville soils are considered fair for road construction because of the moderate shrink-swell potential and since they tend to be poorly drained.

Bedrock
The bedrock within the SIU 1 Project Area consists of alternating layers of limestone and shale of the Pennsylvanian Age Kansas City, Pleasanton, Marmaton and Cherokee Groups. Most of the bedrock within SIU 1 is from the Kansas City or Marmaton Groups. These bedrock units were deposited in a shallow marine environment approximately 300 million years ago. They are basically flat lying with a slight dip to the west forming broad north-south ridges.

There are no large-scale faults within SIU 1. However, a limited potential exists for bridge and overpass structures within SIU 1 to be affected by seismic activity related to the New Madrid seismic zone. A strong earthquake (Richter intensity of 6.0-6.9, Mercalli intensity of V) would not be expected to produce significant damage. A major earthquake (Richter intensity of 7.0-7.9, Mercalli intensity of VI) would be expected to produce slight damage to a low percentage of bridges (two percent). A great earthquake (Richter intensity of 8.0-8.9, Mercalli

intensity of VII) would be expected to produce slight damage to approximately five percent of bridges with severe damage to approximately two percent of bridges. An earthquake of this magnitude may also produce some fissures or cracks in the ground surface.

With the potential exception of seismic activity related to the New Madrid seismic zone, the bedrock units within SIU 1 appear to be relatively stable. However, it is noted that some of the shale units are expansive which may lead to slope stability problems where the exposed shale slopes are steep or where an expansive shale underlies limestone blocks.

Economically important mineral deposits in the region include limestone, which is quarried, or mined for use in the production of concrete aggregate, cement manufacturing and agricultural lime. Coal was produced for a time from the Lexington Coal Field in central and northern Lafayette County using underground longwall mining methods. The coal field has been exhausted and long since abandoned. Neither limestone quarries nor coal mines are located within the SIU 1 Project Area.

Caves and other karst features such as springs and losing streams are common in southern Missouri where there are thicker sequences of soluble limestone and dolomite. However, these geologic conditions suitable for formation of karst features are not found in Jackson and Lafayette counties. There are no known caves, springs or other karst features within SIU 1.

8. Terrestrial and Aquatic Communities

a. Terrestrial and Aquatic Communities

- **Flora**
  The SIU 1 Project Area is located within the Glaciated Plains Natural Division of Missouri. The original vegetation of this area was predominantly prairie. Extensive forests existed historically and in most cases, still do exist along drainages. In rural areas of SIU 1, rowcrop agriculture and grazing operations dominate the area. Remnant prairies, glades and wetlands are also found in Jackson and Lafayette counties (Currier and Smith, 1988) (Gremaud, 1987).

  Upland forests in SIU 1 occur on ridgetops and sideslopes. Upland forests overstory species include white oak (*Quercus alba*), black oak (*Quercus velutina*), shingle oak (*Quercus imbricaria*), burr oak (*Quercus macrocarpa*), shagbark hickory (*Carya ovata*), black cherry (*Prunus serotina*) and hackberry (*Celtis occidentalis*). Understory species include redbud (*Cercis canadensis*), amur honeysuckle (*Lonicera Mackii*), coral berry *(Symphoricarpos orbiculatus*), currant (*Ribes missouriense*) and generally sparse herbaceous stratum.

  Bottomland hardwood wetlands occur primarily along the floodplains of the major rivers and streams within SIU 1. Overstory dominants include cottonwood (*Populus deltoides*), sycamore (*Plantanus occidentalis*), silver maple (*Acer saccharinum*), box elder (*Acer negundo*), green ash (*Fraxinus pennsylvanica*) and American elm (*Ulmus americana*). Understory and herbaceous species include American elm, box elder, elderberry (*Sambucus canadensis*), rice cutgrass (*Leersia oryzoides*), bulrush

(*Scirpus atrovirens*), flatsedge (*Cyperus sp.*) and cattail (*Typha sp.)* in open places. In the alluvial valley of the Blue River, American elm and pin oak (Quercus palustris) dominate the forested wetlands.

Bottomland forests occur along incised streams and tributaries. Bottomland forests along the terraces of these waterways flood for a brief duration during and after heavy rainfall events. Despite occasional short-term flooding, these forests are typically not jurisdictional wetlands except for scattered depressions in the floodplain. Species in these riparian forests include cottonwood, American elm, honey locust, shagbark hickory, hackberry, Osage orange (*Maclura pomifera*) and black walnut (*Juglans nigra*). Understory species include the above species as well as American bladdernut (*Staphylea trifoliata*) and elderberry. Herbaceous species include wild rye (*Elymus virginicus*), poison ivy (*Toxicodendron radicans*) and Virginian creeper (*Parthenoscissus quinquefolia*).

Limestone glades also occur within Jackson County. Glades are areas of thin soils and large amounts of exposed bedrock. Glades are typically dominated by herbaceous species that endure extreme environmental conditions. The Missouri Department of Conservation Natural Features Inventory for Jackson County did not identify any glades within the SIU 1 Project Area (Currier and Smith, 1988). Remnant prairies are also noted throughout Jackson and Lafayette counties. However, no prairie sites have been identified within the SIU 1 Project Area (Currier and Smith 1988) (Gremaud, 1987). Wetland types were described in Section 6 of this Chapter.

- **Fauna**
  Terrestrial and aquatic wildlife species and their habitats are found in the SIU 1 Project Area on agricultural land, pastures, bottomland, upland forests, rivers, streams and wetlands.

  - **Terrestrial Fauna**
    The SIU 1 Project Area consists of various habitat and land uses. Upland forests, wetlands, old fields, agricultural land and pastures are habitats and travel corridors for common wildlife species. White-tailed deer (*Odocoileus virginianus*), coyote (*Canis latrans*), racoon (*Procyon lotor*), red fox (*Vulpes vulpes*), Virginia opossum (*Didelphis virginiana*), striped skunk (*Mephitis mephitis*), eastern cottontail rabbit (*Sylvilagus floridanus*), fox squirrel (*Sciurus nigra*) and gray squirrel (*Sciurus carolinensis*) are common. Beavers (*Castor canadensis*) are widely distributed in rivers, streams and tributaries throughout SIU 1. The Missouri Fish and Wildlife Information System (MFWIS) lists 40 species of mammals in Jackson County and 31 species of mammals in Lafayette County. Although black bears (*Ursus americanus americanus*) are included in the list for Jackson County, it is unlikely that any black bears live within SIU 1 based on the detailed summary report from the MFWIS.

    The Missouri Fish and Wildlife Information System lists nearly 250 bird species for Jackson and Lafayette counties. Common upland game bird species include wild turkey (*Meleagris gallopavo*), mourning dove (*Zenaida macrocoura carolinensis*) and northern bobwhite (*Colinus virginianus virginianus*). Waterfowl and shore birds use rivers, ponds and shallow emergent wetlands in the SIU 1

Project Area. Species listed for Jackson and Lafayette counties include mallard (*Anas platyrhynchos platyrhynchos*), and wood duck (*Aix sponsa*), Canada goose (*Branta canadensis*) and lesser snow goose (*Chen Caerulescens*). Other species include canvasback (*Athya valisineria*), American black duck (*Anas rubripes*), ring-neck duck (*Athya collaris*), ruddy duck (*Oxyura jamacaicensis rubida*) and northern pintail (*Anas acuta*). Mergansers, scaups, teals, herons and grebes have also been documented. Shore birds such as American avocet (*Recurviostra americana*), upland sandpiper (*Bartramia longicauda*), caspian tern (*Sterna capsia*), interior least tern (*Sterna antillarum athatlassos*), willet (*Catoptrophorus semipalmatus*) and lesser yellowlegs (*Tringa flavipes*) have been documented in Jackson and Lafayette counties.

Raptors in the SIU 1 Project Area include red-tailed hawk (*Buteo jamaicensis borealis*), American *kestrel (Falco sparverius sparverius*), northern harrier (*Circus cyaneus*), Coopers hawk (*Accipiter Cooperii*) and wintering bald eagles (*Haliaeetus leucocephalus alascensis*) along the Missouri River. Numerous species of owls and the turkey vulture (*Cathartes aura septentrionalis*) are also found in SIU 1.

Resident songbirds and neotropical migrants occur in Jackson and Lafayette counties including warblers (23 species), sparrows (18 species), vireos (6 species), flycatchers (7 species), tanagers (2 species), orioles (2 species) and purple martins (*Progne subis*). In the summer, common nesting and migrant species include Whip-poor-will (*Caprimulgus vociferus*), great-crested flycatcher (*Myiarchus crinitus*), eastern wood-pewee (*Contopus virens*), Carolina wren (*Thryothorus ludovicianus*), wood thrush (*Hylocichla mustelina*), blue-gray gnatcatcher (*Polioptila caerulea*), yellow-throated vireos (*Vireo flavifrons*), and red-eyed vireos (*Vireo olivaceus*) and summer tanagers (*Piranga rubra*). In riparian forests common species include warbling vireo (*Vireo gilvus*), northern parula (*Parula americana*), Louisiana waterthrush (*Seiurus motacilla*) and Cerulean warbler (*Dendroica cerulea*). During spring (May) and fall (September) migration more than 20 warblers species can be seen. Tennessee warblers (*Vermivora peregrina*) and Nashville warblers (*Vermivora ruficapilla*) are common. Less common migrant warblers include green warblers (*Dendroica virens*), black-burnian warblers (*Dendroica fusca*), bay-breasted warblers (*Dencroica castanea*) and mourning warblers (*Oporornis philadelphia*); (Zimmerman and Patti, 1988).

- **Aquatic Fauna**

  The Blue River, Little Blue River, Sni-A-Bar Creek, perennial streams, intermittent tributaries and ponds are the major sources of aquatic fauna in the SIU 1 Project Area. There are no commercial harvests in these rivers and tributaries. In the Blue River, 31 species have been sampled (Jeffries et. al. 1993). Channel catfish (*Ictalurus punctatus*), common carp (*Cyprinus carpio*), largemouth bass *(Micropterus salmoides*) and green sunfish (*Lepomis cyanellus*) are common species in the Blue and Little Blue River. Other species found in the mainstem of the Blue and Little Blue Rivers include shortnose gar (*Lepisosteus platostomus*), black bullhead (*Ameiurus melas*), yellow bullhead (*Ameiurus natalis*), flathead catfish (*Pylodictis olivaris*), white crappie (*Pomoxis annularis*),

black crappie (*Pomoxis nigromaculatus*), bluegill (*Lepomis macrochrius)*, white sucker *(Catasiomus commersoni)* and gizzard shad *(Dorasomo cepedianum)*. Ponds located in the SIU 1 Project Area are commonly stocked with bluegill, largemouth bass and channel catfish.

b. Threatened and Endangered Species

The Endangered Species Act of 1973 (16 USC 1531-1543) provides for the protection of threatened and endangered species, and the conservation of designated critical habitat. The potential occurrence of federal and state listed species in the vicinity of the SIU 1 Project Area was determined through literature review and agency consultation with MoDOT.

The Missouri Natural Heritage Database was consulted to determine if state and/or federal threatened and endangered species were known to occur in the SIU 1 Project Area and throughout Jackson and Lafayette Counties. Table III-18 presents the threatened and endangered species listed in the Missouri Natural Heritage Database (MNHD) for Jackson and Lafayette Counties.

Table III-18: Missouri Natural Heritage Database Information for SIU 1

Common Name	Scientific Name	State Rank	State Status	Global Rank	Federal Status	MNHD Listing	
						Jackson County	Lafayette County
PLANTS							
Forbs/Herbs							
Auriculate false foxglove	*Agalinus auriculata*	S2		G3		x	
Beardtongue	*Penstemon cobaea var. cobaea*	S1		G4T?		x	
Oval ladies' tresses	*Spiranthes ovalis var. erostellata*	S2		G5T?		x	
Flat-topped white aster	*Aster pubentior*	S1		G?			x
Bergia	*Bergia texana*	S2		G5			x
Cut-leaved water parsnip	*Berula erecta*	S1		G4G5			x
Marsh marigold	*Caltha palustris*	S1		G5			x
Willow herb	*Epilobium leptophyllum*	S1		G5			x
Spotted joe-pye weed	*Eupatorium maculatum*	S1		G5			x
Trees							
Rock elm	*Ulmus thomasii*	S2		G5		x	
ANIMALS							
Birds							
Great blue heron	*Ardea herodias*	S5		G5		x	x
Little blue heron	*Egretta caerulea*	S2		G5		x	
Peregrine falcon	*Falco peregrinus*	S1	E	G4		x	
Black-crowned night heron	*Nycticorax nycticorax*	S2		G5		x	
Pied-billed grebe	*Podilymbus podiceps*	S2		G5		x	x

Common Name	Scientific Name	State Rank	State Status	Global Rank	Federal Status	MNHD Listing	
						Jackson County	Lafayette County
Barn owl	*Tyto alba*	S2	E	G5		x	
Henslow's sparrow	*Ammodramus henslowi*	S2		G4			x
American bittern	*Botaurus lentiginosus*	S1	E	G4			
Insects							
Regal fritillary (butterfly)	*Speyeria idalia*	S3		G3			x

State Rank

S1- Critically imperiled in the state because of extreme rarity or because of some factor(s) making it especially vulnerable to extirpation from the state. (typically 5 or fewer occurrences or very few remaining individuals)

S2- Imperiled in the state because of rarity or because of some factor(s) making it very vulnerable to extirpation from the state. (6 to 20 occurrences or few remaining individuals or acres)

S3- Rare and uncommon in the state. (21 to 100 occurrences)

S5- Demonstrably widespread, abundant, and secure in the state, and essentially ineradicable under present conditions.

State Status

E- Endangered (Rule 3CSR10-4.111 of the *Wildlife Code of Missouri* and certain state statutes apply to state *Code* listed species. The state status "endangered" is determined by the Department of Conservation under constitutional authority.)

Global Rank

G3- Either very rare and local throughout its range or found locally (even abundantly at some of its locations) in a restricted range (e.g., a single western state, a physiographic region in the East) or because of other factors making it vulnerable to extinction throughout its range. (21 to 100 occurrences)

G4- Widespread, abundant, and apparently secure globally, though it may be quite rare in parts of its range, especially at the periphery. Thus, the element is of long-term concern. (usually more than 100 occurrences)

G5- Demonstrably widespread, abundant, and secure globally, though it may be quite rare in parts of its range, especially at the periphery.

T- Taxonomic subdivision: rank applies to a subspecies or variety.

?- Inexact: denotes inexact numeric rank.

G#G#-Numeric range rank: A range between two of the numeric ranks. Denotes range of uncertainty about the exact rarity of the element.

The Missouri Department of Transportation queried the Missouri Natural Heritage Database and determined that no federal or state listed species are known to occur within or in the vicinity (i.e., within one mile of the proposed right of way) of the SIU 1 Project Area (Wren [MoDOT], personal communication). The peregrine falcon (*Falco peregrinus*) and barn owl (*Tyto alba*) are the only state-endangered species known to occur in Jackson County. Habitat preferences for the peregrine falcon and barn owl include residential areas, cropland, pasture and rangeland, all of which are abundant in areas surrounding the SIU 1 Project Area. The American bittern (*Botaurus lentiginosus*) is the only known state-endangered species known to occur in Lafayette County. Habitat preferences for the American bittern include marshes, wet meadows and sloughs with emergent vegetation and permanent water 8-13 inches deep. Development of land for residential and commercial purposes in the area surrounding the SIU 1 Project Area has likely decreased this preferred habitat; however, ponds with emergent vegetation are abundant throughout rural Jackson and Lafayette Counties. These three state-endangered species are not imperiled globally.

Indiana Bats (*Myotis sodalis*) may be found throughout the state. The wintering range is generally south of the Missouri River and the summer range generally north. According to the MDC, there are fewer than 30 caves or mines that are known to have sizable Indiana Bat colonies. The bats have very specific habitat requirements for their winter hibernation sites.

The Indiana Bats are known to inhabit Rocheport (Boone) Cave, located in SIU 3, during the winter months. 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. Not all the bats will leave the cave vicinity during the summer instead some of them will stay and continue foraging near the cave.

The females and their young spend the summer months in maternity colonies in both riparian and upland woodlands where suitable roost trees are present. The preferred roost trees have exfoliating, loose or platy bark or scars from fire or lightning strikes or other damage that allow the bats entry in a hollow or cavity in the tree. The tree could also be dead or declining vigor and the bark is in the process of sloughing off. Female maternity colonies prefer to roost under the sloughing bark.

There are likely additional areas within the I-70 corridor that provide seasonal habitat to the Indiana Bat. The Missouri Department of Transportation recognizes the importance of minimizing the effects of habitat loss, especially with respect to habitats that could be used by threatened and endangered species. The Indiana Bat does prefer woodlands with a variety of species and age classes.

The United States Fish and Wildlife Service previously used a guidance that focused on not cutting suitable roost trees during the breeding season (April 1 through September 30) to avoid negative impacts on the species. The United States Fish and Wildlife Service now advocates reviewing projects on a case by case basis focusing on the following criteria: the projects proximity to known hibernacula; maternity, male roosts and/or important foraging areas; the composition of the woodland; the land use of the area after the project is complete; and consideration of the magnitude, scope, frequency and duration of the proposed action with regard to the importance of the area to the Indiana Bat.

To address USFWS and MDC concerns, MoDOT will review the Natural Heritage Database periodically during the project development process to identify any new locations of Indiana Bat activity and monitor all other developments relative to threatened and endangered species in or near SIU 1 Project Area. The Missouri Department of Transportation will conduct field investigations in woodlands where large groups of trees will be cleared to determine the relative suitability of the woodland habitat for the bats. These field reviews for suitable habitat would be done at least one year prior to the clearing and construction activity. As appropriate, MoDOT would then review the affected woodland habitat with USFWS to determine the need for and the protocol to be used in any sampling activity that would appear to be warranted. The Missouri Department of Transportation will continue consultation with the USFWS to avoid or minimize potential impacts to threatened and endangered species.

9. Cultural Resources

a. Cultural Resources Methodology

Introduction

One of the objectives of the Second Tier Study was to produce an overview of previously recorded cultural resources within the proposed I-70 construction corridor and to identify any previously unknown cultural resources, including architectural properties, cemeteries, bridges, archaeological sites and cultural landscapes within the preferred alignment. The significance of these resources was then evaluated according to National Register Historic Places (NRHP) criteria. 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.

Adverse effects to NRHP listed or eligible properties by the proposed interstate improvements were also evaluated according to criteria set forth in 36CFR800.5 (a)(1).

Previous Investigations

Initially, an archival review of previous cultural resource investigations near the proposed interstate improvements was performed. Information from the broad First Tier EIS cultural resource study was utilized, but a more specific and thorough review was conducted for SIU 1. The investigation included a search of the Archaeological Survey of Missouri, Missouri State Historic Preservation Office (SHPO) and the MDNR files for information on known sites and their significance. A study area one-half mile wide, consisting of one-quarter of a mile either side of the interstate or any alternatives, was used. Existing archaeological and architectural surveys, projects and sites were reviewed and summarized, MoDOT's Historical Bridge Coordinator was contacted in order to obtain bridge data, and a more thorough and specific historic archival search was conducted. Appropriate historic maps and atlases were also obtained. This information provided a context for evaluating archaeological sites and historic properties identified during the surveys.

As part of the background investigations, a search for properties currently listed on the NRHP within 500 feet (152 meters) of the area of potential effects (APE) was conducted. This documentation included buildings, structures, potential historic districts and landscapes.

Architectural and Bridge Surveys

An architectural survey was completed to identify and document all architectural resources (i.e., buildings, structures, objects, bridges and districts/landscapes) within the proposed APE. The architectural APE included the proposed construction area and an additional buffer area; the exact widths of the construction corridors were varied. In general, rural sections of the interstate consisted of the existing roadway plus approximately 150 feet (46 meters) to one side or the other, and a buffer of 100 feet (30 meters) beyond the construction limits. At rural locations where the construction corridor included both sides of the interstate, the APE consisted of 75 feet (23 meters) and an additional 100-foot (30-meter) buffer on both sides of the existing interstate. If only a new frontage road was required, the APE consisted of a 50-foot (15-meter) construction corridor plus an additional 100-feet (30-meter) buffer. Urban areas had an APE approximately 100 feet (30 meters) wide for the construction corridor and an additional buffer of 50 feet (15 kilometers), and those locations requiring widening on both sides of the interstate had a corridor of 50 feet (15 meters), and a buffer of 50 feet (15 meters), on both sides. Any new alternates assumed an APE of 500 feet (152 meters), for the construction corridor plus a buffer of 100 feet (30 meters) to either side. Interchanges typically covered an area of one-half square mile (1.3 square kilometers), plus a surrounding 100-foot (30-meter) buffer. For interchanges covering greater distances, only the construction corridor and a buffer of 100 feet (30 meters) was surveyed. If the APE did not extend beyond the existing I-70 right of way, no cultural resource investigations were performed in that area.

A one-page Architectural/Historic Inventory Survey Form was completed for each property having at least one building within the APE and at least one building that dated prior to 1945, even if the building was outside the APE. At least two color photographs were taken of all buildings dating prior to 1945 showing opposing angles, when possible, and character defining features were detailed. The locations of all buildings were clearly marked on aerial maps and on the appropriate USGS 7.5 minute series quadrangle maps. Sketch maps were drawn for all properties having more than three buildings. Properties were documented on all forms and photographs with the following designation: the appropriate SIU number in Arabic numerals, the two-letter county abbreviation, and a consecutive property number from west to east (e.g., 1JA004: SIU 1, Jackson County, 4th architectural property recorded). Buildings that dated between 1946 and 1970 were only mapped and photographed. Buildings that post-date 1970 were surveyed but not documented unless they were of high style, unique architecture, or of exceptional importance at the national, state, or local level necessary to fulfill the NRHP criteria.

For potential historic districts and landscapes, all contributing elements within the APE were documented on survey forms. The potential boundaries were delineated, but for districts that extended beyond the APE, the boundaries were only generally defined. Buildings outside the APE, but contributing to the district/landscape, were not documented on survey forms but were briefly mentioned in the report text. Non-contributing properties within the APE were also described in the report, along with an explanation of why they were not contributing. Buildings in districts dating between 1945 and 1970 were not documented on survey forms unless they were of high style, unique architecture, or of exceptional importance at the national, state, or local level necessary to fulfill the NRHP criteria. At least one photograph was made of these buildings and their locations noted on aerial maps.

Subdivisions and commercial strips were treated as single properties. In subdivisions dating prior to 1945, only buildings typical of the complex were recorded on survey forms. Photographs were taken showing appropriate streetscapes and various architectural styles used

in the subdivision. When available, a floor plan of each typical house style and a plat map of the subdivision was provided. If a plat was not available, the subdivision boundaries were shown on aerial maps. The locations of streetscapes and houses photographed were also shown on the maps. Subdivisions and commercial strips dating between 1945 and 1970 were briefly described in the report, mapped in a similar way to those dating before 1945, and representative photographs were taken. Subdivisions and commercial strips dating after 1970 were mapped but not photographed. Additionally, if substantial fencing dating prior to 1945, such as masonry fences and ornate gateways, were encountered then the entire property was documented with a survey form. While cemeteries were documented primarily during the archaeological survey, any cemeteries surrounded by substantial fencing were recorded during the architectural survey. Mobile home parks and similar contemporary complexes were photographed showing streetscapes and representative examples of mobile homes. Survey forms were completed only when the mobile home represented a classic type used over 50 years ago. Finally, all billboards over 50 years old were photographed, however, only those with unique characteristics were documented on a survey form.

The historic bridge survey identified and documented all bridges within the APE. Bridge resources were defined as highway, railroad and pedestrian bridges, viaducts and culverts and excluded metal, plastic and concrete pipes, and most concrete bridges and culverts under 20 feet in roadway length. All bridge resources built prior to 1961 were photographed. The one page SHPO/Historic Bridge Inventory Form was completed only for those bridges in the "Included List" of Fraser's 1996 Missouri Historic Bridge Inventory. All bridge resources were numbered with official state and off-system bridge number according to their listing in the MoDOT Bridge and Maintenance Division Databases. The information was compiled in tables for the SIU. The locations of all bridge resources were identified on aerial maps and only those constructed before 1961 were identified on USGS quadrangles.

A separate report, *Interstate 70, SIU 1: Historical and Architectural Survey* (available upon request), was prepared for SIU 1 describing the overall study, appropriate historical contexts, results of the architectural survey, and recommendations on each resource's eligibility and effects of proposed construction on eligible resources. The report also included appropriate maps, figures and photographs of buildings and structures. The Architectural/Historic Inventory Survey Forms along with corresponding maps and photographs were included as an appendix to the report.

Geomorphological Study

A geomorphological study was performed where the proposed construction corridor extended across the bottoms of major waterways. The main goal of these investigations was 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.

Archaeological Survey

An intensive archaeological survey was performed once the RPA was identified. The APE surveyed consisted of a 164-foot (50-meter) wide area adjacent to the existing right of way (or frontage road right of way) where lane expansion was to take place. At interchanges, all new right of way was surveyed. The survey identified all prehistoric and historic archaeological sites within the APE. Transects, typically spaced 33- to 49-feet (10- to 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 33- to 49-feet (10- to 15-meters) intervals to a depth of 12- to 20-inches (30- to 50-cm). 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. Even where shovel probing was used, recent disturbances that afforded some ground visibility were examined wherever present. These included cattle paths, dirt roadbeds and road cuts (e.g., along the edges of the I-70 right of way), locations where placement of hay bales killed the underlying vegetation, gully and stream bank cuts, cattle-trodden feeding locations, etc.; in essence, any place that afforded some surface visibility.

Some parts of the APE were not surveyed due to denial of access or severe disturbance. The APE contained about 37 miles (59 kilometers) of potential survey transects. Of this distance, access was denied by landowners for about 6 percent, 29 percent was too disturbed for survey, 16 percent was surveyed with the pedestrian method and 49 percent was shovel tested.

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 site's 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 NRHP eligibility was determined for each site, as well as the amount of impact, if any, the project would have on them.

A separate report, *Interstate 70, SIU 1: Phase I Archaeological Survey*, was prepared for SIU 1 describing the results of the survey in conjunction with recommendations for the further management of the identified sites. A table was constructed listing all archaeological sites with a description of these resources, their potential eligibility, and the amount of impact, if any, the project would have on that resource.

b. Cultural Resource Investigations

The investigation of historic, archaeological and architectural properties (including bridges) present in SIU 1 was conducted by the Center for Archaeological Research (CAR) at Southwest Missouri State University. The investigation followed MoDOT approved protocol for cultural resource surveys and documentation. The findings of the *Interstate 70, SIU 1: Historical and Architectural Survey* and the *Interstate 70, SIU 1: Phase I Archaeological Survey* are summarized in this section. The approved protocol and the Historical and Architectural Survey are available upon request.

(1) Architecture

The architectural survey for SIU 1 documented 185 architectural resources and 27 bridge resources. Of the architectural resources, 47 date prior to 1945 and were formally inventoried; the remaining 138 date between 1946 and 1970 and were only mapped and photographed. Twenty-one of the bridge resources date to 1961 or later; these were mapped on aerial photographs. The six pre-1961 bridge resources were photographed and mapped, but none are

on Fraser's (1996) list of included resources and none of the bridges are recommended eligible for the NRHP.

Although no listed NRHP properties occur within the APE for SIU 1, two resources within SIU 1 were recommended eligible for the NRHP. However, since the time that the field survey was conducted, the Grain Valley School (1JA57) has been demolished by its current owner, the Owner-Operator Independent Drivers Association (OOIDA). Therefore, it is no longer eligible for listing on the NRHP and the Rice House (1JA107) is the only known resource within SIU 1 potentially eligible for the NRHP.

Grain Valley School (1JA57)
The Grain Valley School building was in the twentieth-century Renaissance Revival style. It was of brick construction with some stone detailing. Six schools were consolidated in 1906 forming Grain Valley District 3, and the first Grain Valley High School opened in 1907. The original school building was destroyed by fire in November 1925. The current building replaced the original and was completed and dedicated in the fall of 1926. The property consisted of five structures: the main school building (1JA57.1), an elementary school building constructed in 1953 (1JA57.2), a brick and metal classroom building constructed in 1960 (1JA57.3), a gymnasium building constructed in 1964 (1JA57.4) and a shop and home economics building constructed in 1969 (1JA57.5).

The main school building (1JA57.1) was recommended eligible for the NRHP under Criterion A, Education, and Criterion C, Architecture with the period of significance being 1926-1954. The elementary school building (1JA57.2) was a contributing building since it was built during the period of significance and related to the use of the area as an educational campus. The NRHP boundary would be the compound footprint of 1JA57.1 and 1JA57.2

As previously stated, since the time that the field survey was conducted, the Grain Valley School was demolished by its current owner, OOIDA. Therefore, it is no longer eligible for listing on the NRHP.

Rice House (1JA107) (Subsection 4, Exhibit IV-9)
This is a Craftsman bungalow built ca. 1920-1930 and is a good example of a gable-fronted bungalow. While there have been a number of changes to this residence, these alterations do not significantly detract from the overall character and it has enough of its original fabric and detail to retain its historic integrity. In addition to the house (1JA107.1), there is a frame two-bay garage (1JA107.2) and a frame shed (1JA107.3), both of which likely predate 1954.

The house (1JA107.1) is recommended eligible for the NRHP under Criterion C, Architecture with the period of significance being 1920-1930. The garage (1JA107.2) and the shed (1JA107.3) would be considered contributing resources. The National Register of Historic Places boundary would be the parcel boundary.

(2) Archaeology

Two archaeological sites, both historic, were defined during the archaeological survey. Site AS1JA1 is the previously recorded site 23JA368, which originally contained a light scatter of historic artifacts. However, the site area is now covered by a parking lot. Site AS1LF2 consists

of a concrete foundation, possibly for a barn. No prehistoric remains were found during the survey. Only two artifacts were found during the survey, a cut nail and a bolt located at site AS1LF2. None of the sites are recommended eligible for the NRHP.

c. 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-mile (41,843 km) 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 km) of highway had been completed by 1953. In an address prepared for a governors 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 km) 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.

d. Missouri Interstate 70 Memorandum of Understanding

Missouri is sometimes credited as the first state to initiate interstate highway construction, breaking ground on a 2.6 mile (4.2 km) 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 km), the Missouri section of I-70 was designed to meet the 20-year design life standard established by federal legislation.

During the First Tier Study, discussions began with the Historic Preservation Program (HPP) office, which houses the Missouri SHPO, within the MDNR and the 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 NRHP. 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 (ACHP), the NRHP 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:

- A formal assessment of the eligibility of the section of I-70 addressed in the First Tier EIS and in the Second Tier environmental documents will be prepared by the FHWA 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.
- 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 (I-70) in Missouri.
- Should I-70 or any part thereof be determined eligible at a later date, FHWA and MoDOT shall enter into consultation with the Missouri SHPO and the ACHP pursuant to 36 CFR 800.

The MOU has been signed by the FHWA, MoDOT, and MDNR. A copy of the MOU is included in Appendix E of this EA.

e. Programmatic Agreement

A Programmatic Agreement (PA) that encompasses all 7 SIUs of the Improve I-70 Project was signed by FHWA, SHPO and MoDOT on May 19, 2005. The PA outlines how cultural resources

will be addressed and states that the project will be administered in accordance with 36 CFR 800 with additional stipulations. A copy of the PA is included in Appendix E.

f. Section 4(f)

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) properties would include those listed on or eligible for the NRHP and adversely affected by the project.

g. Native American Consultation

The Federal Highway Administration has contacted nine indigenous tribes that would have an interest in the I-70 corridor. The tribes contacted include: Iowa Tribe of Kansas and Nebraska, Sac and Fox Tribe of the Mississippi in Iowa, Sac and Fox Nation of Oklahoma, Sac and Fox Nation of Missouri in Kansas and Nebraska, Peoria Tribe of Indians of Oklahoma, Otoe-Missouri Tribe of Oklahoma, Osage Nation of Oklahoma, Omaha Tribe of Nebraska and Iowa Tribe of Oklahoma. One response was received and it was from the Sac and Fox NAGPRA Confederacy. Appendix E contains an example of the letters sent to the tribes and a copy of the response received.

10. Hazardous Waste Sites

A database search of potential hazardous waste sites was performed to evaluate the likelihood of soil and/or groundwater contamination within the SIU 1 Project Area. The purpose of the evaluation was to identify sites that may require remediation that would result in additional costs and time for completion of the selected alternative. The scope of this evaluation was limited to a database search for recorded site information followed by a "windshield" survey of selected potential hazardous waste sites. An electronic database was used that queried federal and state agency databases. This evaluation did not include a complete site assessment per ASTM Standard E 1527-00, nor does it constitute a hazardous waste remedial investigation.

a. Survey Methodology

There is no single comprehensive source of information available that identifies all known or potential sources of environmental contamination within the SIU 1 Project Area. Therefore, to identify and evaluate sites that may potentially contain hazardous materials, petroleum products, or other sources of contamination, a federal and state government database search was conducted by Environmental Data Resources, Inc. dated August 7, 2002. The following databases were searched for recorded sites within the SIU 1 Project Area:

Federal Databases

NPL	National Priority List, also known as the "Superfund" list of uncontrolled or abandoned hazardous waste sites that have become contaminated
Proposed NPL	Contains sites proposed for listing as NPL Sites
Delisted NPL	Deletions from National Priority List

NPL Liens	Federal Superfund Liens
CERCLIS	Comprehensive Environmental Response, Compensation, and Liability Information System
CERCLIS/NFRAP	No Further Remedial Action Planned
CONSENT	Superfund (CERCLA) Consent Decrees
CORRACTS	Corrective Action Report
RCRIS-TSD	RCRA Treatment Storage and Disposal facilities
RCRIS-LQG	Information on RCRA sites that generate, treat, store, or dispose of large quantities of hazardous waste
RCRIS-SQG	Information on RCRA sites that generate, treat, store, or dispose of small quantities of hazardous waste
FINDS	Facility Index System includes facility information and references to additional databases
ROD	Records of Decision
MLTS	Material Licensing Tracking System
MINES	Master Index of Mines
RAATS	RCRA Administrative Action Tracking System
TRIS	Toxic Chemical Release Inventory System
ERNS	Emergency Response Notification System contains information on releases of oil and hazardous substances
FINDS	Facility Index System includes facility information and references to additional databases
TSCA	Manufacturers and importers of chemical substances under the purview of the Toxic Substances Control Act
HMIRS	Hazardous Materials Incident Report System is a list of spill incidents
FTTS	Database that tracks certain administrative cases and pesticide enforcement actions
PADS	Polychlorinated biphenyl (PCB) Database identifying generators, transporters, commercial storage and/ or brokers and disposers of PCBs

State Databases

LUST	Leaking Underground Storage Tank incidents
UST	Inventory of registered Underground Storage Tanks
VCP	Voluntary Clean-up (remediation) Program sites
AST	List of sites with above ground petroleum storage tanks
MORRC	List of certified hazardous waste resource recovery facilities
SPILLS	List of spills in the Environmental Response Tracking Database
SHWS	State Hazardous Waste Sites records: This list is the state equivalent of CERCLIS; however, it may identify priority clean-up sites
SWL/LF	List of Landfills

Field reconnaissance was conducted in addition to this government database search. The field reconnaissance was limited to a “windshield” survey for potential sites of concern that may not have been listed in the database report, plus verification of selected site locations judged to have moderate to high potential for environmental contamination. Properties were not accessed and no interviews were conducted with owners or operators during the field reconnaissance.

To supplement and update the Environmental Data Resources, Inc. report dated August 7, 2002 the USEPA’s online NPL and CERCLIS databases were searched on March 24, 2005 to identify any recent additions to the NPL or CERCLIS databases.

b. Potential Sites

The results of the database search were prioritized as to the likelihood of soil and/or groundwater contamination present on or in the SIU 1 Project Area. The priority assigned was either "None-to-Low", "Low-to-Moderate", or "Moderate-to-High,” in accordance with the following definitions:

- "**None-to-Low**" – After a review of available database information, there is no indication that the proposed project would impact the site. It is possible that potential contaminants could have been generated or handled on the site, however, all information indicates potential impact to a proposed alternative would be minimal. These sites include Resource Conservation and Recovery Act (RCRA) small quantity generators or underground storage tank sites for which releases of hazardous constituents have not been documented.
- "**Low-to-Moderate**" – These sites include any former or current operations identified as large quantity hazardous waste generators. Also included in the category are locations where releases of hazardous materials or petroleum products have been reported, but no remediation has been completed. These sites include leaking underground storage tank sites that have been listed in the database as closed following completion of remediation.
- "**Moderate-to-High**" – A review of available information indicates that known soil and/or groundwater contamination is present and that the site is either undergoing remediation or continued groundwater monitoring. Additional sites may include unmappable sites with underground storage tanks listed in the database search. Further assessment would be required if a “Moderate-to-High” priority site is affected by the RPA to determine the actual presence and/ or levels of contamination, the contaminated medium and the need for mitigation/ remediation. Actual physical assessment would not begin until the final RPA is defined.

A total of five sites were identified during the government database search as having a “Moderate-to-High” potential for contamination. These sites primarily consist of service stations and RCRA small quantity generators. These sites include:

- BP Amoco Service Station, 1922 Woods Chapel Road, Blue Springs, MO;
- BP Amoco Service Station, I-70 and Missouri Route 7, Blue Springs, MO;
- Phillips Petroleum Company Service Station, 1202 N. Missouri Route 7, Blue Springs, MO;

- New Trail Travel Center (former), 1103 N. Buckner-Tarsney Road, Grain Valley, MO; and
- BP Amoco Service Station, 202 East 40 Highway, Oak Grove, MO.

The potential impact of the various alternatives on these sites is discussed in Chapter IV. The other sites ranked as "Low-to-Moderate" and “None-to-Low” are not likely to have an impact upon the selection of one alternative over another. Therefore, no further consideration will be given to sites ranked as "Low-to-Moderate" and “None-to-Low” in this EA.

11. Visual Quality

This section describes the visual characteristics and aesthetic resources within the SIU 1 Project Area, the defining factors, the rating system of visual quality and the potential viewers affected by the project.

a. Existing SIU 1 Visual Environment

The SIU 1 Project Area is located in the Western Glaciated Plains, consisting of gentle to moderate slopes with rolling hills. In general the western portion of SIU 1 is urban in nature including the large cities of Independence, Blue Springs and Grain Valley while the remainder of SIU 1 is a mixture of agricultural land and the smaller cities of Oak Grove, Bates City and Odessa.

Natural visual resources within SIU 1 include several water resources including intermittent and perennial streams (e.g. Burr Oak Branch, Blue Branch Creek, Sni-A-Bar, Horseshoe Creek, Owl Creek, etc.), the Little Blue River and Little Blue Trace, numerous small stock ponds, lakes and wetlands. The visual characterization of the vegetation within SIU 1 can be described as a mosaic of forest and grassland habitat types modified by historic land clearing, agriculture and development. The majority of undeveloped land within SIU 1 is currently used for agricultural purposes that include row-crop fields, pasture and hayfields. Along streams within SIU 1 some natural riparian vegetation exists with some forested areas extending into the adjacent uplands.

There are numerous man-made visual resources within SIU 1 including commercial and industrial buildings, existing roadways and interchanges, billboards, utility structures, transmission lines and communication towers. The majority of the man-made resources are concentrated within the cities located along I-70 in SIU 1.

b. Visual Quality Rating

The First Tier EIS for the I-70 corridor developed a visual quality rating procedure (based on the FHWA publication Visual Impact Assessment for Highway Projects) that can be used at a more detailed level during this Second Tier Study. To determine a visual quality rating, SIU 1 can be divided into separate visual assessment areas where there are consistent visual characteristics and a uniform visual experience. The boundaries of these areas occur where there is a change in visual character and the strongest determinations of these visual boundaries are *topography* and *landscape components*.

- **Topography** – Topography influences many natural systems such as drainage, vegetation, geology, aspect, etc. These natural systems often have distinct and variable characteristics with visual consequences.
- **Landscape Components** – Landscape components are distinct elements in the visual environment. Natural land-cover elements such as trees, water, rocks and open areas; developed land uses such as roads, bridges and buildings; and identifiable patterns such as power line corridors and agricultural crops, constitute landscape components.

The visual assessment units were determined and evaluated by analyzing the topography, studying the major landscape components and examining aerial photographs of SIU 1. The quality of the visual environment can be collectively assessed using the attributes of *vividness*, *intactness* and *unity*.

- **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.
- **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 SIU 1 and the relative existing visual quality rating of each are presented in Table III-20.

Table III-19: 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

c. Viewers

There are two distinct groups of viewers within SIU 1 that need to be considered: viewers who are users of the project facility (views *from* the road), and viewers who can observe the roadway from an adjacent vantage point (views *of* the road).

Individuals who have the potential for undesirable views *of* the road are referred to as “Sensitive Visual Receptors.” The relative concentration of sensitive visual receptors is high in the populated areas of towns and cities, and low in the rural areas of SIU 1. This information is presented in Table III-21.

Table III-20: Views and Visual Receptors

Visual Environment	Quality of View from the Road	Relative Concentration of Sensitive Visual Receptors
Agricultural Land	Moderate	Low
River and Stream Valleys	High	Low
Forested Areas	High	Low
Large Towns and Cities	Moderate to Low	High
Small Towns	Moderate to High	High

12. Wild and Scenic Rivers

Wild and scenic rivers are protected under the Wild and Scenic Rivers Act (WSRA), codified under 16 U.S.C. 1271, et seq. The intent of the WSRA is to preserve the free-flowing state of rivers that are listed in the National Wild and Scenic Rivers System or under study for inclusion in the System because of their outstanding scenic, recreational, geologic, fish and wildlife, historic, cultural, or other similar values.

The only river in Missouri included in the National Wild and Scenic Rivers System, is the Eleven Point River, which is located in the south-central portion of Missouri. The SIU 1 Project Area is not located in an area where an impact to the Eleven Point River would occur, and no further consideration will be given to wild and scenic rivers in this EA.