APPENDIX D

Chapters 3, 4, and 5 of the Draft EIS

Chapter 3: Affected Environment

This chapter describes the existing social, economic, and environmental conditions in the project area, which serve as a baseline for comparing the impacts of the Proposed Action and Alternatives. The project area analyzed in this Draft EIS extends from the connection with the UPRR's mainline near Juab to just south of the intersection of US 89 and US 50 near Salina. The project area is an agricultural valley generally bounded by the Pahvant Range and Valley Mountains to the west and the San Pitch Mountains to the east. Because there are no BLM-designated wilderness areas, areas of environmental concern, forestry resources, or herds of wild horses or burros in the project area, these resources are not discussed in Chapter 3, Affected Environment, or Chapter 4, Environmental Consequences.

Study Area Definition. A resource-specific study area has been defined for each resource in this chapter that establishes the geographic area analyzed in the EIS. The introduction to each resource defines the specific study area for that resource. The area around the alternatives is generally referred to as the project area.

3.1 Rail Operations and Safety

3.1.1 Background

The Board regulations found at 49 CFR 1105.7(e)(2) and 49 CFR 1105.7(e)(7) require the Applicant to analyze transportation systems and safety in relation to the proposed project. This section discusses the current rail operations in the study area, the transportation of hazardous materials, the land transportation network, current trucking operations, and navigable waters. See Section 3.14, Recreation, for information about access to recreation areas and navigation of recreational vessels and Section 3.11, Socioeconomics, for information about emergency vehicle access and response.

The rail operations and safety study area is bounded by I-15 on the west, US 89 and SR 28 on the east, I-70 on the south, and the UPRR load-out facility south of Juab on the north (see Figure 3-1, Land Transportation Network).

3.1.2 Rail Operations

Currently, the only rail operations in the study area are located at the north end of the proposed project. UPRR operates the Sharp Subdivision that connects to the northern terminus of the proposed project. This line parallels I-15 from Provo, 56 miles north of the study area, to just south of Juab, where it connects with the proposed load-out facility. At the proposed load-out facility, the UPRR line turns west, extends for 35 miles, and connects to the Lynndyl Subdivision at Lynndyl. The load-out facility is used by the local trucking

industry to load shipments onto rail for transport out of the valley. The proposed project would add rail capacity from the load-out facility south of Juab to Salina.

From 1896 to 1983, the Denver & Rio Grande Western (D&RGW) Railroad and its predecessor companies (now part of UPRR) provided rail service to Sanpete, Sevier, and Piute Counties. Rail service was provided to these counties over the Marysvale branch of the D&RGW, which ran from the railroad's east-west mainline at Thistle southward through the Sevier Valley for 132 miles to Marysvale (see Figure 3-1, Land Transportation Network). In 1983, the main rail line was buried by a landslide west of Thistle and damaged by a washout at several other locations along the rail line. In 1984, the D&RGW filed for abandonment of the line, which was granted. The former right-of-way has been sold to adjoining landowners and, in many instances, has been converted to farming. Most bridges and drainage structures have been removed.

3.1.3 Transportation of Hazardous Materials

Currently, no hazardous materials are being transported in the rail operations and safety study area.

3.1.4 Land Transportation Network

The study area is served by I-15, which parallels the project on the west side of the Valley Mountains, and I-70, which runs perpendicular to the southern portion of the project at Salina. US 89 and SR 28 serve the east side of the study area near the Sevier River, while US 50 provides highway access to the southern portion of the study area near Salina. See Figure 3-1, Land Transportation Network, for more information about existing roads and railroads in the study area.

3.1.5 Trucking Operations

Trucking is an important support industry for other industries in the study area. See Section 3.11.5, Trucking Industry, for more information on the trucking industry. For Sevier and Sanpete Counties, trucking is the only method for moving large amounts of freight. In Juab County, a rail freight terminal is available in Nephi, about 20 miles north of the proposed project. Currently, highways in the study area carry large volumes of truck traffic daily. Regional roadways currently carry high levels of truck traffic. Coal trucks currently use I-70, I-15, US 89, US 50, and SR 28 with about 1,500 trucks passing through downtown Salina each day at a rate of about one truck per minute. Currently, I-70 carries 750 trucks per day in each direction. Truck traffic runs in one direction on US 89, SR 28, I-15, and US 50 carrying 750 trucks per day (see Section 1.5, Need for Proposed Action). The coal trucks service the SUFCO (Canyon Fuels) mining operation, which is expected to continue at its current rate of production for 25 years.

Several manufacturing and mining companies in the study area use the trucking industry to move supplies into their facilities and move products out.

3.1.6 Navigation

The only navigation in the study area occurs on the Sevier Bridge Reservoir. Sevier River and the Sevier Bridge Reservoir are not considered navigable under Sections 9 and 10 of the Rivers and Harbors Act.

The Sevier Bridge Reservoir is used by ski boats, sailboats, canoes, and rafts. The use of these recreational boats is concentrated primarily in the north end of the reservoir near the dam because the water levels are deeper in this part of the reservoir. The majority of the boat launches are located at the north end of the reservoir (Utah Division of Water Quality 1993). In non-drought years, the water levels support recreational use in the southern part of the reservoir, including a popular sheltered area south of Yuba Narrows that is used for boating (Rasmussen 2005). See Section 3.14, Recreation, for more information about these recreation facilities.

3.1.7 Pipelines

One major pipeline company has facilities in the study area. Questar has a natural gas pipeline parallel to and near US 89 that would be crossed by either of the proposed alternatives. In addition, Questar has some local distribution lines that connect to the natural gas pipeline.

3.1.8 Rail Safety

Operation Standards

All locomotive engineers must be certified to Federal Railroad Administration (FRA) standards before they can operate a locomotive. Engineers also undergo an annual recertification.

Additionally, railroads operate trains according to a system of operating rules developed by each railroad and subsequently submitted to and approved by FRA. Railroad operating supervisors frequently check rail operations to ensure that all speed limits and other safety measures and operating rules are being followed. FRA employs five operations specialists in Salt Lake City whose collective area of influence includes the geography of the proposed project. FRA specialists include expertise in track, operating practices, motive power and equipment, hazardous materials, and signaling (including grade crossing warning devices and train control signals). Additionally, UDOT employs one specialist qualified by FRA in track inspection.

3.1.9 Fire

Over the last 20 years, residences, businesses, and associated infrastructure built adjacent to fire-prone lands has created wildland/urban interface areas. Development in these areas increases the risk of starting fires from industrial or human activities and could threaten public safety, threaten property, or disrupt natural fire regimes by spreading fire from developed areas into wildland areas. The increase in wildland/urban interface areas has led Federal agencies to create a more active hazardous fuel–reduction program (*fuel* refers to built-up dry vegetation) to reduce the number and severity of wildfires. The Fire Management Policy (2000) and the National Fire Plan (2001) have increased awareness of and funding for hazardous fuels management with the intent of actively responding to severe wildland fires and their impacts to communities.

Fire suppression and response is handled according to the 1995 Federal Wildland Fire Management Policy, as amended and updated in 2001, the National Fire Plan, and the Healthy Forests Restoration Act of 2003 and by local agencies such as fire departments and emergency management agencies. Railroad companies and shippers coordinate with local agencies and provide specialized expertise on handling specific equipment such as rail cars.

3.2 Land Use

NEPA regulations require an analysis of the effects of a proposed project on land use and the consistency of the project with existing land use plans. This section addresses land use (Federal, state, and local), zoning, and special land use designations in the study area. The study area for the land use analysis includes the area within 1 mile on either side of the proposed alternatives and includes portions of Juab, Sanpete, and Sevier Counties.

3.2.1 General Land Use Characteristics

Existing land use is defined as the human use of the land resource for various purposes including economic production, natural resource protection, or institutional and private uses (such as schools, churches, public facilities, individual developments, or rights-of-way or easements). The existing land use along the proposed alternatives is primarily rural residential and agricultural. The majority of land in the study area is privately owned with the remainder being either state-owned land or land that is Federally owned and administered by BLM (see Figure 3-2, Land Ownership). The privately owned land includes irrigated and non-irrigated farmland, semi-improved pasture land, open range, a turkey farm, a dairy, and a salt-mining operation.

3.2.2 Agriculture

A large portion of the land in the southern part of the study area is farmland. There are irrigated crops (such as alfalfa, corn, and small grains such as wheat, barley, and oats) west of

Gunnison, and the rest of the farmlands along the study area are non-irrigated. Alfalfa is grown for 5 to 7 years, and then small grain is grown for 1 year to break the disease and insect cycle (Gale 2003). Much of the farmland in the northern part of the study area consists of dryland crops as shown in Table 3.2-1 below.

All the irrigated croplands are privately owned, while most of the grazing lands are under state, Federal, or tribal administration. The main agricultural operation in the basin is cow/calf and beef production. Most of the pasture and rangelands in the region, as well as most of the crops grown, are used to support these activities. Several large dairy operations, including the Brown Dairy north of Redmond just east of the proposed alternatives, also depend on feed and pasture.

The most recent survey (1995) by the Utah Division of Water Resources inventoried the cropland by various categories of land use. The total irrigated cropland area in 1995 in the Sevier Basin, a foreland basin in southwestern Utah, was 354,320 acres. The major crops grown in the Sevier River Basin include alfalfa, 40%; small grains such as wheat, barley, and oats, 13%; pasture and grass/hay, 14%; and idle and fallow, 12% (Utah Division of Water Resources 1999).

Current cropland or farmland in the Central Utah Rail farmland study area is shown in Table 3.2-1 and in Figure 3-10, Prime and State Important Farmland. The table is based on the Utah Division of Water Resources *Water-Related Land Use Data Inventory* map dated 2004.

Table 3.2-1. Cropland or Farmland in the Study Area

Crop or Farmland Type	Acres
Irrigated Crops or Farmland	
Fallow	41.22
Grass hay	122.97
Pasture	1,518.82
Corn	587.47
Grain	603.51
Alfalfa	3,472.44
Total irrigated	**6,346.43**
Non-irrigated Crops or Farmland	
Alfalfa	44.00
Fallow	47.11
Pasture	564.72
Grain/beans/seeds	304.25
Total non-irrigated	**960.08**

Source: Utah Division of Water Resources 1999

Agricultural Land Protection. Juab, Sevier, and Sanpete Counties all have agricultural zones in their ordinances. These ordinances generally allow one residence per 40 acres in order to retain the agricultural and rural nature of the area. However, none of the counties has additional agricultural protection laws (Benson 2004).

3.2.3 Local Land Use and Zoning

The general land use plan for a jurisdiction represents the official position on long-range development and resource management. This position is expressed in goals, policies, plans, and actions regarding the physical, social, and economic environments, both now and in the long term. Zoning allows a jurisdiction to be divided into districts with different regulations for building height, open space, building coverage, building density, and type of future land uses. Zoning should conform to the general land use plan.

3.2.3.1 Juab County

The land use of the study area within Juab County is primarily agriculture and open space. This use is reflected in the county zoning districts in the study area. Most of the study area has one of two zoning designations: GMRF-1 (Grazing, Mining, Recreation, and Forestry District) or A-1 (Agricultural District). The zoning for most of the study area under Juab County's jurisdiction is GMRF-1, and the balance on the north end of the study area is designated A-1 (Greenhalgh 2005).

The primary use of the GMRF-1 District is for grazing, mining, recreation, forestry, and wildlife. Railroads are not a permitted use of the GMRF-1 District (Juab County, no date).

The A-1 District is established to provide areas where the primary use of the land is for agricultural and livestock-raising purposes. Residential development is limited in the A-1 District. Railroad tracks, spurs, switches, and facilities are permitted uses of the A-1 District (Juab County, no date).

3.2.3.2 Sanpete County

The land use of the Sanpete County portion of the study area is primarily agricultural (Utah Governor's Office of Planning and Budget 1997). The zoning for the portion of the county that would be traversed by the proposed project includes agricultural and sensitive land zones (Utah Governor's Office of Planning and Budget 2003). The Agricultural Zone (A) is for lands with agriculture production (food or fiber) or livestock-raising as their primary purpose. The Sensitive Land Zone (SL) is established to protect environmentally sensitive zones and generally covers grazing lands, mountains, and canyons. The portion of this zone that would be traversed by the proposed project includes primarily grazing lands. Railroads are not discussed in the ordinances for either of these zones.

3.2.3.3 Sevier County

As with Juab and Sanpete Counties, the land use in Sevier County is primarily agricultural. Several zoning districts apply to the study area, but all of the zones relate to agriculture: A5-25 (Agriculture), GRF 20 (Grazing Recreation Forestry), and GRF 5 (Grazing Recreation Forestry). A5-25 is for agricultural production (food or fiber production) and livestock. GRF 20 and GRF 5 are established for grazing, forestry, and wildlife purposes and occur in the large tracts of grazing lands, mountains, and canyons in the county. The difference between these zones is the number of buildings allowed per acre (Utah Governor's Office of Planning and Budget 2000). Railroads are not discussed in the zoning ordinances for the agricultural zones in Sevier County.

3.2.3.4 City Planning

Salina and Redmond are near the proposed project. None of the alternatives are within the city limits of either community.

3.2.4 State Land Use (Utah Trust Lands)

Juab, Sanpete, and Sevier Counties contain Utah trust lands held by the State of Utah School and Institutional Trust Lands Administration (SITLA). These lands were originally deeded to the State of Utah to benefit public schools. The lands can be sold or leased. The net revenues from SITLA's trust lands are put in SITLA's permanent fund as required by state law. Some activities that are allowed under leases on the trust lands include natural gas and oil production, mining, grazing, cell phone and telecommunications sites, open spaces, recreation, landfills, and forestry. Railroads are not specifically listed as allowable activities but are considered a commercial and industrial enterprise, which is an allowable activity (SITLA 2001).

3.2.5 Federal Land Use (Bureau of Land Management)

Each BLM field office prepares a Resource Management Plan (RMP) for the land under its jurisdiction. These RMPs provide future direction by establishing guidance, objectives, policies, and management actions for the land under the jurisdiction of the field office. The RMPs discuss the following issues, among others:

- Access and transportation on public lands
- Off-highway vehicle management
- Special management designations
- Balancing multiple uses
- Cultural resources
- Land and realty management
- Rangeland health
- Wild horses and burros
- Areas of critical environmental concern
- Wild and scenic rivers

- Fire management
- Forestry and woodland harvests
- Special-status species management
- Grazing

The proposed project would be within the jurisdictions of the Richfield and Fillmore Field Offices of the BLM. The proposed project has been reviewed for conformance with applicable land use plans described for each field office. Although railroad rights-of way are not specifically mentioned in the land use plans, it is clear that, subject to review and approval, railroad rights-of way are a use that is acceptable and consistent with the principles of multiple use.

Separate site-specific NEPA analysis would be prepared for ancillary facilities proposed on public land (such as access roads or power lines).

3.2.5.1 Richfield Field Office

The Richfield Field Office is currently updating its resource management plan. Until the update is complete, the Field Office lands are managed under the Mountain Valley Management Framework Plan that was approved on July 1, 1982. In the part of the study area managed by the Richfield Field Office, there are no areas of critical environmental concern, wild and scenic rivers, areas with special management designations, or areas dedicated to managing special-status species. The study area is managed as a multiple-use area that includes recreation, grazing, and wildlife uses. The study area is open to off-highway vehicles with no restrictions and includes multiple grazing allotments.

3.2.5.2 Fillmore Field Office

The land use plan for the Fillmore Field Office is the House Range Resource Management Plan that was completed in 1987 (BLM 1987). In the part of the study area managed by the Fillmore Field Office, the BLM lands are designated for multiple use. There are no areas of critical environmental concern or outstanding natural areas, but the Sevier Bridge Reservoir and the surrounding land are considered a Special Resource Management Area. The study area contains some grazing allotments as well as designated crucial mule deer winter range.

3.2.5.3 Prior Existing Rights-of-Way

Prior existing rights-of-way were reviewed by BLM and are included in Appendix D, Prior Existing Rights. Prior existing rights-of-way include power lines, county-maintained roads, ATV routes, range improvements (such as fences, pipelines, and guzzlers), the Sevier Bridge Reservoir, and material sites authorized under BLM right-of-way grant U-3801.

3.2.5.4 Grazing Allotments

The public lands administered by BLM in the study area are rangelands that encompass just over 5 million acres or 75% of the total Sevier Basin area. BLM has a well-established

program to administer private livestock that graze on agency land. Regionally, the land administered by the Richfield Field Office supports about 183 grazing allotments that supply 106,045 AUMs (animal unit month; the amount of forage required to sustain one cow for one month). Nearly all of these allotments are for cattle and horses, although some allotments support sheep and goats. The Fillmore Field Office supports about 170 grazing allotments that supply 273,805 AUMs. These allotments also primarily sustain cattle, horses, and sheep (BLM 2000b).

The study area crosses seven grazing allotments administered by the Richfield Field Office. These seven allotments contain about 11,604 acres of land (Williams 2005; Lichthardt 2006).

The study area crosses three grazing allotments administered by the Fillmore Field Office. These three allotments contain about 9,471 acres of land (Williams 2005; Lichthardt 2006). See Table 3.2-2 below and Figure 3-3, Grazing Allotments, for the location of the 10 grazing allotments currently issued by BLM in the study area.

Table 3.2-2. BLM-Administered Grazing Allotments along the Proposed Alternatives

Allotment	Total Allotment Acreage in Study Area[a]	Livestock Number and Kind	Season of Use	Permitted AUMs[b]	AUMs in the Farmland Study Area[c]
Richfield Field Office					
West Side	532	—	—	405	—
Denmark	2,255	350 cattle	Dec. 1 to Mar. 31	976	15
South Valley	3,593	200 cattle 61 sheep	Nov. 1 to Mar. 30 Dec. 1 to Apr. 31	849	30
Little Valley	970	—	—	798	—
Red Canyon	545	173 cattle	May 1 to Aug. 31	702	3
River	964	38 cattle	Nov. 1 to Jun. 15	34	4
Timber Canyon	2,745	4,360 sheep	May 1 to Jun. 30 Oct. 1 to Oct. 30	654	15
Fillmore Field Office					
Yuba	3,850	126 cattle	Jun. 1 to Feb. 15	539	—
Washboard	4,477	177 cattle	May 16 to Feb. 28	857	—
Chriss Creek	1,144	62 cattle	Jun. 1 to Aug. 15	78	—

[a] Acreage within 0.5 mile of each side of the proposed alternatives.

[b] AUM = animal unit month; the amount of forage required to feed one cow for 1 month. The total AUMs shown are for the entire allotment, not just for the portion of the allotment in the study area.

[c] No AUMs were determined for grazing allotments on state land even though the state land is administered in common with BLM. State land used in common with BLM would also be crossed by the rail line in the West Side, Little Valley, Salt Creek, Yuba, Washboard, Chriss Creek, and Garrett allotments.

Sources: Williams 2005; Lichthardt 2006

In order to continue livestock operations on BLM grazing allotments, the allotments themselves must be maintained as well as livestock access to water sources, vehicle and livestock access to the allotments, safety fencing, and signs for entrances and exits to the grazing allotments. Permittees and private land owners would be consulted to determine how to best address livestock watering and access.

3.3 Biological Resources

3.3.1 Background

This section describes the existing biological resources in the study area. These biological resources include dominant plant communities, fish and wildlife resources, and any threatened, endangered, or sensitive species that could occur in the study area.

These resources were surveyed to ensure that the proposed project would comply with the Endangered Species Act of 1973 (16 U.S.C. 1536) and the Migratory Bird Treaty Act (16 U.S.C. 703–712).

Study Area. The study area for biological resources includes the following:

- The proposed alternatives plus the surrounding area out to a distance of 400 feet from the edge of the rail alignments and associated load-out areas
- Surrounding regional areas as appropriate for different biological resources (see the discussion of each biological resource for a description of the associated study area)

To determine the existing biological resources in the study area, HDR Engineering, Inc. (HDR) obtained data from previously conducted studies such as the *Central Utah Rail Feasibility Study* (Washington Infrastructure Services Inc. and others 2001) (see Appendix K) and from aerial photography, U.S. Geological Survey (USGS) topography maps, vegetation maps, and special-status species maps. HDR also conducted field investigations on multiple dates to investigate existing biological resources.

3.3.2 Plant Communities

Large portions of the study area that once contained native plant communities have been converted to pastures and croplands for agricultural uses (see Figure 3-4, Vegetation). The remaining native plant communities are generally of moderate quality and are neither pristine nor highly degraded. At several locations, the field investigations found plant species, such as big sagebrush (*Artemesia tridentata*), rubber rabbitbrush (*Chrysothamnus nauseosus*), and bluebunch wheatgrass (*Elymus intermedium*), that are important to community health. However, the field investigations also found several species of invasive and non-native plants throughout the study area that dominated areas disturbed by human activity. Figure 3-4 shows

the plant communities in the study area and the surrounding regional area. The following sections describe the existing plant communities that are found in or adjacent to the study area.

3.3.2.1 Agricultural Vegetation

Much of the study area is cropland and pasture agricultural lands. Some pasture lands have remnants of native sagebrush and grassland communities, but introduced forage crops dominate most of these areas. Irrigated croplands include alfalfa, corn, and small grains (wheat, barley, and oats).

3.3.2.2 Sagebrush Community

Sagebrush communities are the main native community type in the valleys and lower foothills of the study area. The sagebrush communities are dominated by arid shrub species such as big sagebrush (*Artemesia tridentata*), rubber rabbitbrush (*Chrysothamnus nauseosus*), low rabbitbrush (*Chrysothamnus viscidiflorus*), broom snakeweed (*Gutierrezia sarothrae*), and some forbs and grasses. Although some areas have desirable native and non-native perennial grasses such as bluebunch wheatgrass (*Elymus intermedium*) and crested wheatgrass (*Agropyron cristatum*), many areas have non-native, invasive and undesirable species such as cheatgrass (*Bromus tectorum*).

3.3.2.3 Grasslands

Most grasslands in the study area are degraded to various degrees by the infestation of species such as cheatgrass (*Bromus tectorum*), Russian thistle (*Salsola iberica*), and tumbling mustard (*Sysimbrium altissimum*). The relatively pristine grasslands are dominated by desirable grasses such as Indian rice grass (*Oryzopsis hymenoides*), needle and thread grass (*Stipa comata*), bluebunch wheatgrass (*Elymus intermedium*), and sheep fescue (*Festuca ovina*). Although not native, crested wheatgrass (*Agropyron cristatum*) is present and desirable.

Additionally, other grasslands in more moist or saline conditions are dominated mainly by inland saltgrass (*Distichlis spicata*). Grasslands are interspersed all along the study area but are most common in the south-central part where the conditions are moist enough to support this vegetation type.

3.3.2.4 Salt Desert Scrub

Salt desert scrub communities are typically dominated by salt-tolerant species such as greasewood (*Sarcobatus vermiculatus*), four-wing saltbush (*Atriplex canescens*), and shadscale (*Atriplex confertifolia*). Invasive and non-native species are common to disturbed areas and include tumbling mustard (*Sysimbrium altissimum*), summer cypress (*Kochia scoparia*), and Russian thistle (*Salsola iberica*). This community type is uncommon in the study area and occurs in smaller patches on saline soils. There is salt desert scrub near the

northern project terminus around Chicken Creek Reservoir, at the Sevier Bridge Reservoir near Yuba Narrows, and along the foothills west of the study area near US 50. The condition of this plant community varies with the degree of grazing that has occurred.

3.3.2.5 Juniper Community

Utah juniper (*Juniperus osteosperma*) is the predominant overstory species in this plant community and is occasionally interspersed with pinyon pine (*Pinus edulis*). Juniper communities are not common in the study area but generally dominate the higher foothills east and west of the study area. Juniper communities are typically intermixed with sagebrush communities. Therefore, many of the species in the juniper community are also found in the arid shrub or sagebrush community.

3.3.2.6 Wet Meadow

Further information on wetland communities in the study area is provided in Section 3.4.5, Wetlands and Waters of the U.S. Vegetation species associated with wet meadows include wiregrass (*Juncus balticus*), inland saltgrass (*Distchlis spicata*), and salt cedar (*Tamarix ramossisima*). Wet meadows are located near the northern terminus and in the southern part of the study area.

3.3.2.7 Emergent Marsh

Marshy areas in the study area are vegetated by species such as alkali bulrush (*Scirpus ameritimus*), cattails (*Typha latifolia*), and common reed (*Phragmites australis*). Most emergent marshes in the study area are associated with the Sevier River floodplain.

3.3.2.8 Lowland Riparian

Riparian communities are rare in the study area and are associated with water bodies such as Chicken Creek Reservoir, Sevier Bridge Reservoir, Redmond Lake, the Sevier River, and some ephemeral washes. Riparian vegetation includes narrowleaf cottonwood (*Populus angustifolia*), Fremont cottonwood (*Populus fremontii*), box elder (*Acer negundo*), Russian olive (*Eleagnus angustifolia*), salt cedar (*Tamarix ramossisima*), rushes (*Scirpus* spp.), and sedges (*Carex* spp.).

3.3.2.9 Invasive and Non-native Plant Species

Various human disturbances in the study area have introduced invasive or non-native plant species. These disturbances include constructing roads and eliminating native vegetation to accommodate agricultural, commercial, industrial, and residential land uses. These invasive and non-native species have the potential to out-compete the native species and dominate the original vegetation communities. Some of these invasive and non-native species are listed in Table 3.3-1.

Table 3.3-1. Invasive and Non-native Plant Species in the Study Area

Common Name	Scientific Name
Cheatgrass	*Bromus tectorum*
Halogeton	*Halogeton glomeratus*
Russian thistle	*Salsola iberica*
Salt cedar	*Tamarix ramossisima*
Common reed	*Phragmites australis*
Curly cup gumweed	G*rindelia squarossa*

3.3.3 Wildlife Resources

The following sections discuss wildlife resources in the study area including wildlife corridors, habitat, and refuges.

3.3.3.1 Wildlife in the Area

The wildlife in the study area is typical of the region. Table 3.3-2 lists some of the more common wildlife species in the study area. The study area also includes various raptors (eagles, hawks, and falcons), miscellaneous songbirds (sparrows, robins, larks, vireos, etc.), and miscellaneous migratory waterfowl (ducks, geese, etc.).

Table 3.3-2. Common Wildlife Species in the Study Area

Common Name	Scientific Name
Mule deer	*Odocoileus hemionus*
Blacktailed jack rabbit	*Lepus californicus*
Desert cottontail	*Sylvilagus audubonii*
Bushytail woodrat	*Neotoma cinerea*
Elk	*Cervus elaphus*
Coyote	*Canis latrans*
Red fox	*Vulpes vulpes*
Badger	*Taxidea taxus*
Raccoon	*Procyon lotor*
Striped skunk	*Mephitis mephitis*
Muskrat	*Ondatra zibethicus*
Beaver	*Castor canadensis*
Meadow vole	*Macrotis pennsylvanicus*
Deer mouse	*Peromyscus maniculatus*
Northern pike	*Esox lucius*
Largemouth bass	*Micropterus salmoides*

Common Name	Scientific Name
Channel catfish	*Ictalurus punctatus*
Black bullhead	*Ictalurus melas*
Yellow perch	*Perca flavescens*
Walleye	*Stizostedion vitreum*
Carp	*Cyprinus carpio*

3.3.3.2 Wildlife Corridors

Migratory Birds

Wetlands associated with Chicken Creek Reservoir, the Sevier River, Sevier Bridge Reservoir, and the Redmond Wildlife Management Area provide important habitat for several migratory bird species including waterfowl. These wetlands are part of the integrated wetland habitats that support critical flyways for migratory waterfowl as part of the greater North American western flyway. In addition, the Sevier Bridge Reservoir and Chicken Creek Reservoir are managed as a Bird Habitat Conservation Area to identify, protect, restore, and enhance wetlands and other important habitats for waterfowl and migratory birds as well as native resident birds. Table 3.3-3 lists some of the species that typically use these wetland areas in the study area for a migratory stopover.

Table 3.3-3. Migratory Birds That Use Wetland Areas in the Study Area

Common Name	Scientific Name
Great blue heron	*Ardea herodias*
Canada goose	*Branta canadensis*
Mallard	*Anas platyrhynchos*
Red-winged blackbird	*Agelaius phoeniceus*
Cinnamon teal	*Anas cyanoptera*
Marsh wren	*Cistothorus palustris*

Big Game

Figure 3-5, Elk and Mule Deer Seasonal Range, shows mule deer and elk seasonal habitats in the regional area. The study area is not located in any areas identified as seasonal habitat for elk. The closest seasonal habitat for elk is one area identified as winter/spring habitat for elk that is east of the study area on the east side of SR 28.

The study area bisects critical and high-value deer winter range for one deer herd in the Valley Mountains and one herd in the San Pitch Mountains.

3.3.3.3 Habitat Fragmentation

The existing habitat in the study area has been fragmented due to previous construction of highway corridors and smaller roads and conversion of land for agricultural, residential, commercial, and industrial uses. These land use changes have disrupted the continuity and function of the original wildlife habitat by affecting the foraging habits, reproductive habits, and migratory movement of many species. For some species, these changes created barriers to movement between mountains and valleys in the region. However, converting land to agricultural purposes does not present a significant migration barrier to many larger transient species such as birds and big game.

Based on the observed condition of the fragmented wildlife habitat in the study area, SEA presumes that wildlife in the study area has experienced reduced species diversity, population densities, and distributions in response to the cumulative long-term effects of these land use changes. Nevertheless, the vegetation communities and aquatic habitats in the study area provide beneficial habitat to a wide variety of wildlife species.

Some of the earliest documented Anglo-European settlement of the area occurred around 1863 (OnlineUtah.com, no date). Since that time, large portions of the study area that once had native plant communities have been converted to pastures and/or croplands for agricultural uses. This conversion of land uses has included the construction of homes, fences, paved and unpaved roads, and irrigation canals, all of which have contributed to the fragmentation of once-contiguous plant communities.

3.3.3.4 Wildlife Mortality

In addition to natural causes of death such as predation and disease, some wildlife is struck and killed by vehicles on existing roads in the area. Currently, no roads exist where the proposed alternatives would be built. Therefore, information on wildlife strikes in the area does not exist. Wildlife mortality from vehicle impacts is most apparent when it involves big-game animals and predators and scavengers then feed on the carcasses.

3.3.3.5 Wildlife Sanctuaries, Refuges, and State Parks

Areas that are legally designated for protecting biological resources include wildlife sanctuaries, refuges, and state parks. These areas are typically managed for the purpose of protecting and enhancing wildlife habitat. Human activities that could harm wildlife habitat are prohibited in these designated areas. The two wildlife protection areas in the study area are Yuba Lake Recreation Area and the Redmond Wildlife Management Area (see Section 3.14, Recreation).

Yuba Lake Recreation Area. The Sevier Bridge Reservoir is also known as Yuba Lake. Yuba Lake Recreation Area is located near the Sevier Bridge Reservoir dam. The park provides

habitat for many wildlife species. Yuba Lake Recreation Area is managed for multiple uses and not specifically as a refuge for any one species of wildlife.

Redmond Wildlife Management Area (WMA). The Redmond WMA is located in Sevier County between Salina and Redmond and is south of and adjacent to Redmond Lake. The Redmond WMA covers 567 acres and is a complex of marshes, wet meadows, and open water (Utah Division of Wildlife Resources 2002). A small portion of the WMA is also set aside for alfalfa production.

A conservation easement for the WMA was established in 1998 for protecting wetlands and preserving habitat for high-priority resident and migratory wildlife species such as waterfowl and shore/wading birds. Examples of the species that use the Redmond WMA are listed above in Table 3.3-3, Migratory Birds That Use Wetland Areas in the Study Area. Special-status wildlife species that might use the Redmond WMA are addressed in Section 3.3.4, Threatened, Endangered, and Sensitive Species.

3.3.4 Threatened, Endangered, and Sensitive Species

USFWS determines whether a Federal action would be likely to adversely affect, harm, or jeopardize the continued existence of any threatened, endangered, or candidate (T&E) species or its habitat (see Appendix B, U.S. Fish and Wildlife Coordination). USFWS designates Federally protected threatened, endangered, and candidate species. The Utah Division of Wildlife Resources also designates state species of concern (SPC) for Utah (see Appendix A, Agency and Public Scoping Summary Report). Table 3.3-4 below lists the special-status species that have the potential to occur in the study area according to coordination letters from these agencies (see Appendix A).

No locations within the study area have been designated by USFWS as critical habitat for any Federally listed species. However, according to correspondence from the Utah Division of Wildlife Resources, the State has designated critical and high-value mule deer winter range in the study area for two separate herds located on the Valley Mountains and the San Pitch Mountains.

HDR performed literature reviews to research the biology and habitat requirements of each of the species listed below in Table 3.3-4. In addition, in the fall of 2004 and the spring and summer of 2005, HDR performed pedestrian (walking) surveys to identify any species habitat that might exist in the study area. If potential habitat was identified for any Federally or state-listed species, a more detailed observation for individuals of those species was conducted by foot in the area that would be affected by the project. As part of mitigation for impacts from this project, surveys for specific species would be conducted prior to construction, if required by the affected land management agency. These surveys would be conducted according to agency-approved protocols.

Field surveys were conducted in the spring and summer of 2005 to determine the presence of any Federally listed or state-listed endangered, threatened, or sensitive plant species in the study area. In addition, surveys were conducted for other Federally listed and state-listed endangered, threatened, or sensitive species (namely raptors, amphibians, small mammals, migratory birds, and mollusks) to determine if any suitable habitat or individuals existed in the study area. As part of mitigation for impacts from this project, and if appropriate, protocol surveys for specific species might be conducted before construction. No aquatic surveys were performed. The results of these literature reviews and field investigations are presented below.

Table 3.3-4. Federal and State-Listed Threatened, Endangered, or Sensitive Species of Concern with Potential to Occur in the Study Area

Common Name	Scientific Name	State Status	Federal Status
Birds			
Bald eagle	*Haliaeetus leucocephalus*	SPC	T
Burrowing owl	*Althene cunicularis*	SPC	—
Ferruginous hawk	*Buteo regalis*	SPC	—
Long-billed curlew	*Numenius americanus*	SPC	—
Northern goshawk	*Accipiter gentiles*	SPC	—
Southwestern willow flycatcher	*Empidonax traillii extimus*	SPC	E
Western yellow-billed cuckoo	*Coccyzus americanus occidentalis*	SPC	C
Mammals			
Kit fox	*Vulpes macrotis*	SPC	—
Utah prairie dog	*Cynomys parvidens*	SPC	T
Fish			
Bonneville cutthroat trout	*Oncorhynchus clarki utah*	CS	—
Least chub	*Lotichthys phlegethontis*	CS	—
Leatherside chub	*Gila copei*	SPC	—
Amphibians			
Columbia spotted frog	*Rana luteiventris*	CS	—
Mollusks			
Toquerville springsnail	*Pyrgulopsis kolobensis*	SPC	—
Plants			
Heliotrope milkvetch	*Astragalus montii*	SPC	T
Last chance townsendia	*Townsendia aprica*	SPC	T
Wright fishhook cactus	*Sclerocactus wrightiae*	SPC	E

Federal Status
- T = Threatened
- E = Endangered
- C = Candidate for Listing

State Status
- SPC = State Species of Concern
- CS = Conservation Species. This designation indicates that these species have a conservation agreement in place. Conservation agreements are voluntary cooperative plans among resource agencies. These agencies include Federal, state, and tribal agencies, typically with the State of Utah being the lead management agency. The purpose of the conservation agreement is to take measures to conserve and protect the species and its habitat so that it will not become Federally listed.

3.3.4.1 Birds

Bald Eagle and Burrowing Owl

During the field surveys, bald eagles and burrowing owls were observed near the study area. The bald eagles were observed perched on rocks near Yuba Narrows at the Sevier Bridge Reservoir. Bald eagles prefer habitat with nesting areas such as large, mature trees or standing dead trees (snags), usually near water (Texas Park and Wildlife 2005). There are very few mature trees or snags near any body of water in the study area that would provide ideal nesting habitat for bald eagles.

The burrowing owls were observed in the study area nesting in various locations in the foothills of the Valley Mountains. Burrowing owls are ground nesters in grasslands and prairie habitats (Center for Biological Diversity 2003).

Ferruginous Hawk

Ferruginous hawks occur in grasslands, agricultural lands, and sagebrush/saltbrush/greasewood shrub lands and along the edges of pinyon-juniper zones. The study area includes grasslands, agricultural lands, sagebrush/saltbrush/greasewood shrub lands, and pinyon-juniper zones.

Long-Billed Curlew

The long-billed curlew nests in meadows and mixed fields that are higher and drier than those inhabited by many other shore birds (UDWR 2005a). The study area includes some meadows and mixed fields near bodies of water that could provide suitable nesting habitat.

Northern Goshawk

The northern goshawk nests in trees in mature mountain forests. Northern goshawks fly through forests and riparian zones to hunt and also perch and watch for prey. Although there are no mature forests in the study area, there are some riparian zones (UDWR 2005b).

Southwestern Willow Flycatcher and Yellow-Billed Cuckoo

The southwestern willow flycatcher and yellow-billed cuckoo have similar habitat requirements. Both species nest in habitat that is classified as dense lowland riparian areas and characterized by a dense subcanopy or shrub layer. The overstory can be developing trees or large gallery-forming trees (willow or cottonwoods) (UDWR 2005c, 2005d). There are some riparian zones with low, dense vegetation in the study area.

3.3.4.2 Mammals

Kit Fox

Kit fox occurs most often in open prairie, plains, and desert habitats (UDWR 2005e). The study area has some open prairie/desert habitat in the foothills of the Valley Mountains, and this habitat might be suitable for kit fox.

Utah Prairie Dog

The Utah prairie dog is similar to other species of prairie dogs in its habitat requirements. Prairie dogs form colonies and spend much of their time underground (UDWR 2005f). The study area has prairies with low-growing shrubs and grasses in the foothills of the Valley Mountains. No prairie dog colonies or mounds were observed during field surveys.

3.3.4.3 Plants

Heliotrope Milkvetch

Heliotrope milkvetch grows in rocky soils derived from the Flagstaff Formation at elevations ranging from 10,600 feet to 10,900 feet. The study area does not have any terrain within this elevational range (UDWR 2005g).

Last Chance Townsendia

Last chance townsendia occurs in clay soils derived from the Mancos Formation (UDWR 2005h). The Mancos Formation was not observed in the study area during field surveys.

Wright Fishhook Cactus

Wright fishhook cactus occurs in clay to fine sandy soils in salt desert scrub and widely scattered pinyon-juniper communities with well-developed biological soil crusts (UDWR 2005i). There are some salt desert scrub and widely scattered pinyon-juniper communities in the study area.

3.3.4.4 Aquatic Animal Species

Bonneville Cutthroat Trout

Correspondence from USFWS stated that Bonneville cutthroat trout are found in Chicken Creek (Maddux 2003). Chicken Creek occurs in the study area.

Columbia Spotted Frog

Correspondence from the Utah Division of Wildlife Resources stated that the Columbia spotted frog exists in several known locations in Juab Valley (D. Hintze 2003). Parts of the study area are in Juab Valley.

Toquerville Springsnail

Correspondence from the Utah Division of Wildlife Resources stated that Toquerville springsnail has historically occurred near the study area (D. Hintze 2003).

Least Chub and Leatherside Chub

Correspondence from USFWS stated that the least chub and leatherside chub are both found in tributaries of the Sevier River (Maddux 2003). Additionally, correspondence from the Utah Division of Wildlife Resources stated that the leatherside chub exists in the Sevier River (Maddux 2003). The Sevier River and some of its tributaries occur in the study area.

3.4 Water Resources

3.4.1 Background

This section describes the existing surface water and groundwater in the study area including streams, lakes, wetlands, floodplains, wells, and public water sources.

Study Areas. The study area for water resources includes the surface water drainage basins, groundwater aquifers, floodplains, and wetland vicinity that contain the proposed alternatives. See Figure 3-6, Water Resources, and Figure 3-7, Floodplains, for a depiction of the study area.

The surface water drainage basins that intersect with the proposed alternatives were included in the study area except for some upland areas near Redmond, Salina, and Aurora. These areas were excluded from the study area due to their elevation.

The portions of groundwater aquifers within 5 miles of the proposed alternatives were included in the study area. Due to distance and elevation, SEA did not evaluate groundwater aquifers that were more than 5 miles from the study area.

The study area for wetlands consists of the area 300 feet on each side of the proposed alternatives and lies entirely within the study areas for surface water and groundwater (see Figure 3-8, Preliminary Wetland Estimation).

3.4.2 Surface Waters and Beneficial Uses

3.4.2.1 Existing Surface Waters

The surface water bodies in the water resources study area include mountain streams that generally do not flow year-round, canals used for agricultural water, Chicken Creek Reservoir, Sevier Bridge Reservoir, the Sevier River, and Redmond Lake. Figure 3-7, Floodplains, shows the approximate location of the larger intermittent mountain streams.

The largest water body in the study area, the Sevier River, generally flows from south to north. The Sevier River Basin is about 170 miles long and encompasses about 16,000 square miles of central and south-central Utah. Hydraulic studies show that the average annual stream flow of the Sevier River near the Piute County–Sevier County border is 137.300 acre-feet. Water is diverted from the river for agricultural purposes and returned to the river, leading to its classification as one of the "most completely consumed rivers in the United States" (Bishop 1997).

The Utah Department of Environmental Quality (UDEQ) classifies surface water bodies in the state according to how the water is used, and each classification has an associated numerical standard. The major water bodies in the study area and their associated beneficial uses are described in Table 3.4-1.

Table 3.4-1. Surface Waters in the Study Area

County	Water Body	Beneficial Uses
Juab County	Chicken Creek Reservoir	2B (secondary contact), 3A (cold-water species of game fish and other aquatic life), 4 (agriculture)
Juab County	Sevier Bridge Reservoir	2B, 3C (species of nongame fish and other aquatic life), 4 (agriculture)
Sanpete County	Sevier River	2B, 3C (species of nongame fish and other aquatic life), 4 (agriculture)
Sevier County	Sevier River	2B, 3C (species of nongame fish and other aquatic life), 4 (agriculture)
Sevier County	Salina Creek	2B, 3C (species of nongame fish and other aquatic life), 4 (agriculture)

Source: Utah Administrative Code R317-2-13, Classification of Waters of the State, as in effect December 1, 2004

The other creeks and canals in the study area are not specifically designated in Utah Administrative Code R317-2-13, and so they are assigned the default beneficial use classifications of 2B, 3C, and 4 (Utah Administrative Code R317-2-13.14).

3.4.2.2 Impaired Waters

Under the Clean Water Act, every state must establish and maintain water quality standards designed to protect, restore, and preserve the quality of waters in the state. When a lake, river,

or stream fails to meet water quality standards, Section 303(d) of the Clean Water Act requires that the state place the water body on a list of "impaired" waters (303(d) list) and prepare an analysis called a total maximum daily load (TMDL) analysis.

The TMDL analysis for the Middle and Lower Sevier River Watershed was submitted by UDEQ on February 9, 2004, and approved by EPA on August 17, 2004.

3.4.2.3 High-Quality Waters

UDEQ regulations state that waters whose existing quality is better than the established standards for their designated uses must be maintained at high quality; that is, the project cannot cause the existing water quality to be degraded. There are no high-quality waters in the study area (Utah Administrative Code R317-2-12, High-Quality Waters, as in effect December 1, 2004).

3.4.2.4 Surface Water Rights

A total of 862 points of diversion, of which 71 are surface water rights, exist within 5 miles of the proposed alternatives. Of these 71 surface water rights, the majority are for agricultural purposes. None of these water rights are for drinking water purposes (see Figure 3-6, Water Resources).

3.4.3 Canals and Irrigation

Settlers in the mid-1800s developed the Sevier River water system by excavating hundreds of miles of irrigation canals and constructing several creeks and reservoirs. In doing so, they transformed much of the desert of south-central Utah into productive farmland (Sevier River Water Users Association 2003).

Diverted canal water is generally used for stock watering and irrigation. Irrigation methods in the water resources study area include flood irrigation, center-pivot sprinklers, and wheel line sprinklers. These irrigation systems are fed through pipes by gravity flow from several (about six) small reservoirs.

In the southern portion of the study area (primarily Sevier County), several canals run along the foothills west of the farmlands. The largest of these canals is the Piute Canal. The canal is about 40 miles long, and its width varies from 2 feet to 12 feet. The canal is filled with irrigation water from the Sevier Bridge Reservoir (Gale 2003). There are a few irrigated crops west of Gunnison, and the rest of the farmlands along the proposed alternatives are non-irrigated. See Figure 3-7, Floodplains, for the locations of the canals.

Currently, the Applicant is proposing to maintain reasonable access to irrigation water for the agricultural parcels in the water resources study area. Further discussion regarding access to waters is in Section 4.4, Impacts to Water Resources.

3.4.4 Floodplains

For the purpose of this analysis, floodplains are defined as areas inundated by stormwater runoff by a 100-year storm. Encroachment (development) into these areas can reduce the flood-carrying capacity of the floodplain and extend the flooding hazard beyond the encroachment area.

In response to escalating taxpayer costs for flood disaster relief, Congress established the National Flood Insurance Program in 1968. This program is administered by the Federal Emergency Management Agency (FEMA). In the 1980s, FEMA performed hydrologic and hydraulic studies to identify and map special flood hazard areas within communities. A special flood hazard area is defined as an area with a 1% chance of being flooded in any given year. Such a flood is known as a 100-year storm event. A result of the FEMA studies is the development of flood insurance rate maps (FIRM) that depict the floodplains for each river and creek analyzed.

Several drainage basins in the floodplain study area convey stormwater runoff; however, not all of these washes, creeks, and rivers have a regulatory floodplain boundary. The information in the following sections was taken from the available flood insurance rate maps produced by FEMA and a review of topographical maps. The floodplains are described below from north to south according to the three counties traversed by the project. The FEMA floodplains are shown in Figure 3-7, Floodplains.

3.4.4.1 Juab County

Chicken Creek Reservoir, Chicken Creek, and the Sevier Bridge Reservoir originate in Juab County; however, no floodplains are defined by FEMA in Juab County near or in the floodplain study area.

3.4.4.2 Sanpete County

The Sevier River floodplain has not been defined by FEMA in Sanpete County.

3.4.4.3 Sevier County

A FEMA-designated floodplain of the Sevier River is located east of the study area. The floodplain is adjacent to the proposed alternatives and extends from a point just north of Redmond Lake southward to the turnout at the southern project terminus. The Denmark Wash runs east-west adjacent to SR 63 and joins the Sevier River. The proposed alternatives run parallel to and west of the Sevier River and crosses the Denmark Wash near SR 63. These FEMA floodplains are zoned A. Zone A floodplains require that the maximum allowable rise in water surface elevation for the 100-year floodplain as a result of development within the floodplain boundary be limited to 1 foot.

3.4.5 Wetlands and Waters of the U.S.

Waters of the U.S. in the study area include springs, wetlands, riparian zones, open water, dry washes, and ephemeral drainages. Figure 3-8, Preliminary Wetland Estimation, shows the types of waters of the U.S. in the study area. These wetlands function by reducing the severity of floods, removing nutrients, retaining particulates, recharging groundwater, and providing hydrologic support for plants and wildlife.

Several ephemeral drainages in the study area have been disturbed or modified by human activities including road construction and agricultural practices. The remaining capacity of an ephemeral drainage to function as waters of the U.S. and provide wildlife habitat depends on the extent of disturbance from pristine conditions.

Wetlands associated with the Sevier River, Chicken Creek Reservoir, Sevier Bridge Reservoir, Redmond Lake, and the Redmond WMA provide important habitat for many species of waterfowl. Detailed information regarding the wetland types and locations in the study area can be found in Appendix E, Waters of the U.S.

Hydrological support for waters of the U.S. in the study area is provided by various sources. These sources include direct precipitation, storm events and snowmelt runoff in ephemeral drainages, the impoundment of surface waters in human-made physical features, shallow groundwater (usually associated with the floodplain of a river), seeps, and artesian springs.

The Natural Resources Conservation Service (NRCS) has completed soil surveys for the project area in Juab and Sanpete Counties, and digital soil data are available for these counties (NRCS 1984). Complete NRCS digital soil data for Sevier County are not yet available. However, analog (hard-copy) data for hydric soils in Sevier County were available (Parslow 2005).

No hydric soils (soils that are sufficiently wet in the upper part to develop anaerobic conditions during the growing season) are known to occur in the study area in Sevier County. Published soil data for Juab and Sanpete Counties (NRCS 1984) indicates that there are small areas of hydric soils in the study area in these counties (see Figure 3-8, Preliminary Wetland Estimation).

The results of the field survey were documented and submitted to USACE in July 2005. USACE concurred with the report findings in October 2006 (see Appendix E, Waters of the U.S.).

The following sections describe waters of the U.S. in the study area that occur in Juab, Sanpete, and Sevier Counties. Table 3.4-2 below summarizes the waters of the U.S. in the study area.

Table 3.4-2. Waters of the U.S. in the Study Area

Type of Waters of the U.S. / Hydric Soil Presence	Juab County	Sanpete County	Sevier County
Wet meadow	Near Chicken Creek	Near Sevier Bridge Reservoir	Redmond Lake and Sevier River floodplain
Emergent marsh	Near Chicken Creek	Near Sevier Bridge Reservoir	Redmond Lake and Sevier River floodplain
Riparian vegetation	Near Chicken Creek	Near Sevier Bridge Reservoir	Redmond Lake and Sevier River floodplain
Ephemeral drainages[a]	8	61	10
Hydric soils present	Yes	Yes	No[b]

[a] This is the number of ephemeral drainages that could be affected by the proposed alternatives.

[b] Digital soil data were not available for Sevier County. Analog data were used to extrapolate soil types in Sevier County.

Source: NRCS 1984

3.4.5.1 Juab County

Waters of the U.S. in the Juab County portion of the study area consist of wet meadows (WM), emergent marsh (EM), riparian vegetation zones (RIP) surrounding open water, and ephemeral drainages (ED). Table 3.4-3 below describes the vegetation associated with these wetland types. The hydrological sources for these wetlands are seeps, springs, impoundment of surface waters, and direct precipitation.

There are wet meadows near the northern project terminus in the vicinity of Chicken Creek. These wet meadows appear to be hydrologically supported by springs and shallow groundwater. Water from these springs ultimately collects in Chicken Creek Reservoir. Near Chicken Creek are two soil series that are on the state hydric soils list: Roshe Springs silt loam and Saltair silt loam. Common characteristics of these two soil types include slopes of 0% to 1%, poor drainage, and supporting wet meadows or salt-tolerant grasses.

Table 3.4-3. Vegetation in the Study Area Associated with Waters of the U.S.

Common Name	Scientific Name	Associated Waters of the U.S.
American bulrush	*Scirpus ameritimus*	EM
Big sagebrush	*Artemesia tridentata*	ED
Box elder	*Acer negundo*	RIP
Broom snakeweed	*Gutierrezia sarothrae*	ED
Cattails	*Typha latifolia*	EM
Cheatgrass	*Bromus tectorum*	ED
Common reed	*Phragmites australis*	EM
Crested wheatgrass	*Agropyron cristatum*	ED
Curly cup gumweed	*Grindelia squarossa*	ED
Curly dock	*Rumex crispus*	ED
Four-wing saltbush	*Atriplex canescense*	ED
Fremont cottonwood	*Populus freemontii*	RIP
Greasewood	*Sarcobatus vermiculatus*	ED
Inland saltgrass	*Distchlis spicata*	WM
Low rabbitbrush	*Chrysothamnus viscidiflorus*	ED
Narrowleaf cottonwood	*Populus angustifolia*	RIP
Rubber rabbitbrush	*Chrysothamnus nauseosus*	ED
Rushes	*Scirpus* spp.	EM
Russian olive	*Eleagnus angustifolia*	WM/RIP
Russian thistle	*Salsola iberica*	ED
Salt cedar	*Tamarix ramossisima*	WM/EM/RIP
Sedges	*Carex* spp.	WM/EM
Shadscale	*Atriplex confertifolia*	ED
Wiregrass	*Juncus balticus*	WM

WM = wet meadow
EM = emergent marsh
RIP = riparian
ED = ephemeral drainage

The wet meadows around Chicken Creek are used for grazing domestic livestock and for wildlife habitat. The open water that collects at Chicken Creek provides hydrology for riparian vegetation and emergent marsh vegetation. These areas of emergent marsh and open water provide habitat for migratory waterfowl.

Proceeding south, the remaining waters of the U.S. in Juab County are ephemeral drainages. These ephemeral drainages convey water during storm events and spring snowmelt. Additionally, they provide migration corridors, escape cover, and food sources for a variety

of wildlife species. The vegetation usually associated with these drainages varies depending on the local soil characteristics. The drainages are typically vegetated with either an arid shrub community (sagebrush) or a salt desert scrub community (chenopods) depending on soil salinity and available moisture.

3.4.5.2 Sanpete County

Waters of the U.S. in the Sanpete County portion of the study area consist of ephemeral drainages to the north, riparian areas associated with the Sevier Bridge Reservoir, and additional ephemeral drainages to the south. The hydrological sources for these wetlands are impoundments of surface waters, storm events, snowmelt runoff, and accumulation of shallow groundwater associated with river floodplains. There is only one hydric soil type within the study area: a xerofluvent (excessively drained to poorly drained soil) associated with the floodplain of the Sevier River (see Figure 3-7, Floodplains).

The ephemeral drainages at the northern Sanpete County border are similar in character and nature to those in the study area in Juab County. The vegetation present varies depending on soil salinity and available moisture.

The riparian areas in the study area in Sanpete County are associated with the Sevier Bridge Reservoir. The proposed alternatives cross the Sevier Bridge Reservoir at a geologic feature called Yuba Narrows. At this location, both riparian and emergent marsh vegetation are present. The open water and associated vegetation communities provide habitat for many species of wildlife including migratory waterfowl.

The remainder of the waters of the U.S. from Yuba Narrows south to the Sevier County border are ephemeral drainages. These ephemeral drainages convey storm event precipitation and snowmelt from the Valley Mountains. Wildlife habitat associated with these drainages varies with the type and density of vegetation present. These drainages are typically vegetated with a combination of arid and salt desert shrub communities. Some of these ephemeral drainages have been cleared of native vegetation and are currently used for agriculture. In these drainages, the vegetation present varies depending on individual management practices. Consequently, the value of these drainages for wildlife habitat as well as the number of species that inhabit them are variable as well.

3.4.5.3 Sevier County

Waters of the U.S. in the Sevier County portion of the study area consist of ephemeral drainages, wet meadows, emergent marsh, and open water. The hydrological sources for these wetlands are surface waters, impoundment of surface waters, and shallow groundwater associated with river floodplains. The ephemeral drainages are similar in size, function, and vegetation to those in Juab and Sanpete Counties. The wet meadows, emergent marsh, and open water in the Sevier County portion of the study area are associated with Redmond Lake, the Sevier River, and the Sevier River floodplain.

Vegetation in the wet meadows is similar to that found near Chicken Creek with one exception—the additional hydrology in Sevier County allows the vegetation to be much more lush than that in Juab County. The hydrological source for these wetlands is shallow groundwater associated with the Sevier River floodplain. Due to the low gradient and sinuosity through this reach of the river, the vegetation cover in these wet meadows is considerably greater than at the northern project terminus. With the greater amount of vegetative cover and more available water, the quality of wildlife habitat is considerably better.

The study area crosses the Redmond WMA, a 567-acre complex of marshes, open water, and wet meadows managed by the Utah Division of Wildlife Resources. The Redmond WMA is discussed further in Section 3.3, Biological Resources.

3.4.6 Groundwater and Wells

3.4.6.1 Groundwater

The Sevier River cuts across the Little Valley faults and travels near the Wasatch faults near the Sanpete County–Juab County border (at the Sevier Bridge Reservoir) and discharges to the dry basin of Sevier Lake. Two groundwater basins underlie the study area: the Central Sevier Valley groundwater basin and the Southern Juab Valley groundwater basin. The Central Sevier Valley groundwater basin extends along the Sevier River from the Sevier Bridge Reservoir in the north to the Piute Reservoir in the south. The Southern Juab Valley groundwater basin is bounded by the San Pitch Mountains on the east and the West Hills and South Hills on the west. This part of the valley is about 16 miles long and 2 miles to 6 miles wide.

Within the larger Central Sevier Valley groundwater basin are five groundwater aquifers separated by mostly-impermeable underground geologic formations. These groundwater aquifers are supplied by water from rivers and irrigation canals, percolation from precipitation and irrigation, and groundwater inflow. The proposed project would cross four of the five groundwater aquifers in the Central Sevier Valley groundwater basin: the Aurora-Redmond aquifer, the Redmond-Gunnison aquifer, the Gunnison–Sevier Bridge aquifer, and the Southern Juab Valley aquifer (Utah Division of Water Resources 1999).

Groundwater in the Juab Valley is typically shallow in depth and is encountered under both static and artesian conditions. Numerous springs and seeps from artesian pressures were noted near Chicken Creek Reservoir in the southern portion of the Juab Valley where clays and silts are interbedded with coarser alluvial materials. The proposed project would cross one of the two groundwater aquifers in the Juab Valley: the Southern Juab Valley aquifer. The project would not cross the smaller Mills Valley aquifer. Figure 3-6, Water Resources, shows the groundwater aquifers that would be affected by the proposed project.

Groundwater in the Sevier Valley is typically shallow and is encountered mostly under static conditions. There are several flowing wells in the northern part of the valley near the Sevier Bridge Reservoir.

Aurora-Redmond Aquifer

This groundwater aquifer is located in the southern part of the study area near the project's southern terminus. This aquifer is 9 miles long and about 3 miles wide with a maximum depth of about 660 feet east of Aurora. This aquifer contains three distinct layers of clay deposited by the Sevier River and its tributaries. Recharge comes from precipitation, seepage from the Sevier River and canals, and infiltration of irrigation water. Most of the groundwater in the Aurora-Redmond aquifer is suitable for all types of uses. Well withdrawals are for municipal and industrial, domestic, and stock-watering purposes (Utah Division of Water Resources 1999).

Redmond-Gunnison Aquifer

Beginning near the Sevier County–Sanpete County border, the Redmond-Gunnison groundwater aquifer has an arm that stretches to the north toward the Gunnison–Sevier Bridge aquifer. Near the proposed project, the groundwater-bearing soils range in depth from about 120 feet west of Centerfield to 320 feet west of Gunnison. Groundwater in this part of the aquifer nearest the project is of acceptable quality for most uses. Irrigation is the primary use. Of the 4,500 acre-feet of groundwater withdrawn in 1999, 4,200 acre-feet were used for irrigation with the balance used for municipal and industrial purposes (Utah Division of Water Resources 1999).

Gunnison–Sevier Bridge Aquifer

This groundwater aquifer extends from midway between Gunnison and Fayette to the Sevier Bridge Reservoir dam. It is 18 miles long and about 3 miles wide. The thickness of water-bearing soils varies. The aquifer is about 500 feet deep near Fayette and 320 feet deep near Gunnison. Near Yuba Narrows, the aquifer is confined to a thin soil layer. Because of the poor groundwater quality, irrigation is the only suitable use for groundwater from the Gunnison–Sevier Bridge aquifer (Utah Division of Water Resources 1999).

Southern Juab Valley Aquifer

The Southern Juab Valley groundwater aquifer is bounded by the San Pitch Mountains on the east and the West Hills and South Hills on the west. This part of the valley is about 16 miles long. Chicken Creek and Pigeon Creek are the primary streams that supply water to the aquifer. Groundwater is discharged from springs and is ultimately stored in Chicken Creek Reservoir near the project's northern terminus. Groundwater entering this reservoir is high in calcium and sulfate. Much of the water in Chicken Creek is used for irrigation in the Mills

area about 4 miles south of Chicken Creek Reservoir (Utah Division of Water Resources 1999). There is a high concentration of springs and possibly flowing wells near the project's northern terminus, which indicates shallow groundwater or artesian conditions.

3.4.6.2 Wells

Figure 3-6, Water Resources, and Table 3.4-4 show the location and density of public water sources in the study area.

Table 3.4-4. Public Water Sources within 5 Miles of the Proposed Alternatives

Utah Division of Drinking Water System Source Number	System Owner	Source Name	Source Type
12001-01	Levan	Levan well	Well GW
12001-04	Levan	Tunnel Spring	Spring GW
12001-06	Levan	500 East well	Well GW
12006-01	State of Utah	Blue Springs	Spring GW
20002-01	Fayette	Well	Well GW
20004-04	Gunnison	New well (1991)	Well GW
21002-01	Aurora	Broadhead Spring	Spring GW
21002-02	Aurora	Denmark Spring	Spring GW
21002-03	Aurora	Cemetery well	Well GW
21002-04	Aurora	Standby well	Well GW
21002-05	Aurora	White bally	Spring GW
21012-01	Redmond	Redmond Lake	Spring GW
21012-02	Redmond	1987 well	Well GW
21012-03	Redmond	1976 well	Well GW
21012-04	Redmond	1998 well	Well GW
21012-05	Redmond	Cemetery well	Well GW
21014-02	Salina	Salina well	Well GW
20074-01	BLM	2006 well	Well GW[a]
20074-06844	BLM	Golden Ranch	Well GW

[a] BLM well is currently not public, but is anticipated to be public by CURP construction.

GW = groundwater

Source: Jensen 2004

3.4.6.3 Drinking Water Source Protection Zones

The Utah Division of Drinking Water requires owners of systems that supply water to the public for domestic (drinking water) purposes to submit a Drinking Water Source Protection (DWSP) plan as required by the Drinking Water Source Protection Rule (Utah Administrative Code R309-600). The Division of Drinking Water generally defines public systems as those that serve more than 25 people.

There are 18 groundwater wells and springs with DWSP zones in the study area as shown in Figure 3-6, Water Resources. The others are either not in use, are planned for use in the future, or are not approved by the Division of Drinking Water. There are no surface water sources for drinking water in the study area.

The Utah Division of Drinking Water requires the DWSP plan to identify four distinct DWSP zones for each well:

- Zone 1 is the area within a 100-foot radius from the wellhead.
- Zone 2 is the area within a 250-day groundwater time of travel to the wellhead.
- Zone 3 is the area within a 3-year groundwater time of travel to the wellhead.
- Zone 4 is the area within a 15-year groundwater time of travel to the wellhead.

In general, certain types of development are not allowed within a designated DWSP zone unless the developer can show that the withdrawal point is isolated from the development by a confining layer, or that the development would not be a source of contamination. Construction is not generally allowed within Zone 1, but railroad construction within Zones 2, 3, and 4 would not typically be a major water quality concern and would be allowable (Martin 2005). In addition to the Division of Drinking Water, the Central Utah Public Health Department has jurisdiction over public drinking water. However, this department does not place any additional requirements on public drinking water other than the requirements of the Division of Drinking Water (Costa 2005).

3.4.6.4 Groundwater Rights

The Utah Division of Water Rights classifies groundwater wells according to their use: domestic (drinking water), irrigation, stock watering, municipal, or recreational. The municipal classification indicates that the well is owned by a city or county for a variety of uses, including drinking water or agriculture. The Division of Water Rights tracks groundwater rights according to an inventoried water right number. Each water right number represents one or more groundwater wells. The approximate locations of the wells that water rights owners may draw from are shown in Figure 3-6, Water Resources.

3.5 Geology and Soils

3.5.1 Background

This section discusses the existing topography, geology, and soils along the proposed project where new construction would occur. For minerals and mining, the study area is Juab, Sanpete, and Sevier Counties with most of the analysis focusing on the southeast portion of Juab County near Levan to the northwest portion of Sevier County to just south of Aurora. For the remaining topics in Section 3.5, the study area is the Juab and Sevier Valleys.

The topography of the terrain along the project area is relatively flat and would require cuts and fill of 20 feet to 30 feet to construct the project. Ground elevations in the Juab Valley range from about 5,075 feet on the north end to about 5,200 feet near the Sevier Bridge Reservoir. The ground surface elevations of the alternatives vary depending on their positions within the Sevier Valley.

South of the Sanpete County–Sevier County border, two alternatives are under evaluation. Alternative C (the western alternative) is situated within the somewhat hilly and dissected alluvial fan deposits below the Valley Mountains. Ground elevations along Alternative C range from about 5,400 feet near the county border to about 5,150 feet at the southern end of the project. The Proposed Action (the eastern alternative) is located within the relatively flat portion of the valley where ground elevations range from about 5,150 feet to 5,200 feet.

3.5.2 Topography

The topography of the terrain in the study area is relatively flat and would require cuts and fills of 20 feet to 30 feet to construct the project. Ground elevations in the Juab Valley range from about 5,075 feet on the north end to about 5,200 feet near the Sevier Bridge Reservoir. The ground surface elevations of the alternatives vary depending on their positions within the Sevier Valley.

South of the Sanpete County–Sevier County border, two alternatives are under evaluation. Alternative C (the western alternative) is situated within the somewhat hilly and dissected alluvial fan deposits below the Valley Mountains. Ground elevations along Alternative C range from about 5,400 feet near the county border to about 5,150 feet at the southern end of the project. The Proposed Action (the eastern alternative) is located within the relatively flat portion of the valley where ground elevations range from about 5,150 feet to 5,200 feet.

The elevation of the study area ranges from 5,020 feet to 5,325 feet. This elevation places the study area in the Foothill Vegetation Community that falls within the 5,000-foot to 6,500-foot zone (Wullstein 2004).

3.5.3 Geologic Setting

The Sevier Valley portion of the study area lies within the Sanpete–Sevier Valley and Gunnison Plateau–Valley Mountains physiographic units, and the Juab Valley portion of the study area lies within in the Pahvant Range–Canyon Range subsection (Stokes 1986). The Sanpete–Sevier Valley section consists of a narrow depression formed by two rivers: the Sevier and the San Pitch. The streams join near the town of Gunnison, and the Sevier River continues to flow northward between the Valley Mountains and the Gunnison Plateau. The Gunnison Plateau–Valley Mountains section consists of two distinct ranges: the Valley Mountains and the Gunnison Plateau, which is also referred to as the San Pitch Mountains at the north end of this range. Exposed bedrock in the Gunnison Plateau is Jurassic to Tertiary in age, and in the Valley Mountains, predominantly Tertiary. The formations are sedimentary, consisting variably of conglomerate, sandstone, mudstone, and limestone. The valleys that separate the ranges contain predominately Quaternary alluvium and valley fill.

Central Utah has undergone a complex history of faulting and folding, which includes thrust faulting (Late Cretaceous) related to the Sevier Orogeny, regional folding (latest Cretaceous–early Tertiary) related to the Laramide Orogeny, normal faulting (beginning about 20 million years ago), and salt diapirism related to movement of soft sediments in the Arapien Shale. The present-day landforms of plateaus (ranges) and valleys began to form about 20 million years ago with formation of the Basin and Range and development of normal faults (L. Hintze 1980). In general, the plateaus are uplifted blocks relative to the valleys, which are down-dropped.

The project is located in the Intermountain Seismic Belt. This belt is a zone of active earthquakes with displacement related to movements on faults (Bishop 1997). For more information, see Section 3.5.3.4, Seismicity.

The study area is situated in a transitional zone between the Colorado Plateau and the Basin and Range physiographic provinces. The zone of transitional physio-tectonic characteristics includes the High Plateaus and consists of high-elevation tablelands separated by generally narrowing north-trending structural valleys (Hecker 1993).

3.5.3.1 Juab Valley

The Juab Valley is a structural trough formed between the Wasatch fault and San Pitch Mountains on the east and east-dipping bedrock on the West Hills on the west (Anderson and others 1994). The region has undergone various episodes of deformation including compression, extension, and uplift. The present-day valley is largely a result of extension of the local bedrock. The material in the valley is primarily alluvial fan and floodplain deposits. The southern part of the valley was not totally inundated by Lake Bonneville, which reached a maximum water surface elevation of about 5,090 feet.

Chicken Creek delivers runoff into Chicken Creek Reservoir near the southern end of the valley. The reservoir is bounded by a county road to the north and the Union Pacific Railroad to the west. The spillway elevation of Chicken Creek Reservoir is 5,050 feet.

Groundwater in the Juab Valley is typically shallow in depth and is encountered under both static and artesian conditions. Numerous springs and seeps from artesian pressures were noted near Chicken Creek Reservoir in the southern part of the Juab Valley, where clays and silts are interbedded with coarser alluvial materials.

3.5.3.2 Sevier Valley

The Sevier Valley is similar to the Juab Valley but is a separate valley formed primarily by the uplift of the adjacent mountain ranges. In the vicinity of the project, the ranges include the Valley Mountains and Pahvant Range on the west and the Gunnison Plateau (San Pitch Mountains), Wasatch Plateau, and Sevier Plateau on the east (Stokes 1986). The valley is bounded on the east by the Sevier fault along the Sevier Plateau and the Fayette segment of the Wasatch fault along the Gunnison Plateau and on the west by the Elsinore fault along the Pahvant Range and an east-dipping monocline along the Valley Mountains.

The Sevier River is a meandering stream that that runs through the center of the valley and flows from south to north. The Sevier Bridge Reservoir is a topographic low spot within the valley that collects runoff from the Sevier River and the numerous drainages from the adjacent mountains and hills. The spillway elevation of the Sevier Bridge Reservoir is 5,014 feet.

The upland soils at the base of the Valley Mountains were deposited as broad alluvial fans that have coalesced to form an extensive system of aprons. The rock debris in these aprons is Tertiary-Quaternary in age, and subsequent erosion has cut the older alluvium to form pediments that are capped with sand and gravel.

Groundwater in the Sevier Valley is typically shallow in depth and is encountered mostly under static conditions. Numerous flowing wells are present in the northern part of the valley near the Sevier Bridge Reservoir.

3.5.3.3 Subsurface Soil Conditions

The subsurface materials in the Juab and Sevier Valleys are primarily unconsolidated granular soils of Quaternary age that were deposited from the Sevier River that fed Lake Bonneville during the Holocene epoch and from runoff of the adjacent mountains and hillsides. These alluvial deposits consist primarily of sand and gravel with occasional layers of clay, silt, and sand with some zones of gravel. The sediments deposited in such alluvial and deltaic environments are generally loose in nature. The alluvial fan material generally becomes progressively finer toward the center of the valleys. Available well logs show that the thickness of the alluvium in the Juab and Sevier Valleys ranges from 130 feet to 380 feet.

3.5.3.4 Seismicity

The proposed project is located in the Intermountain Seismic Belt, which is dominated by the Wasatch fault zone. This fault zone trends in a north-south direction across the study area and the entire state. The zone is considered active and consists of a series of smaller related and independent faults that generally align parallel to the trend of the fault system.

Past activity demonstrates that the Wasatch fault zone and related fault segments can generate moderate to large earthquakes of Richter magnitudes ranging from 6.5 to 7.25 with a recurrence interval of 250 to 280 years. The Nephi, Levan, and Fayette segments are the most active parts of the Wasatch fault near the study area. See Figure 3-17, Geologic Map, for the mapped locations of these faults and other features near the proposed project. There is abundant evidence that earthquake events associated with the Wasatch fault zone have produced surface ruptures during the Holocene epoch (Hecker 1993).

The seismicity map from Stover and others (1986) is presented in Figure 3-17 for the central Utah region. This map, which displays the approximate epicenter location, modified Mercalli intensity, and the year of the earthquake event, shows that there has been some significant seismic activity in the region, most notably the 1901 event with an intensity of IX.

Other faults that could affect the project include the Elsinore fault and the Sevier fault. These faults are considered capable of producing earthquakes with magnitudes ranging from 6.0 to 6.5. Table 3.5-1 presents a summary of the known faults in the study area.

Table 3.5-1. Known Faults in the Study Area

Fault	Location	Type of Fault	Approx. Distance to Proposed Alternatives	Last Movement
Wasatch fault – Nephi segment	Juab Valley	Normal fault	< 5 miles	300 to 500 years
Wasatch fault – Levan segment	Juab Valley	Normal fault	< 5 miles	1,000 years
Wasatch fault – Fayette segment	Juab Valley	Normal fault	< 5 miles	10,000 to 15,000 years
Elsinore fault	Sevier Valley	Normal fault	< 1 mile	Quatemary
Sevier fault – Northern portion	Sevier Valley	Front fault	< 2 miles	Late Quatemary

3.5.4 Geologic Hazards

Several potential geologic hazards are associated with the seismicity of the region, which is dominated by the Wasatch fault zone. These hazards include ground shaking, liquefaction, and tectonic subsidence. Surface fault ruptures and earthquake-induced seiches (waves from oscillation of a water surface) are less significant geologic hazards. Landslides also present a geologic hazard that can be directly or indirectly related to seismic activity.

3.5.4.1 Ground Shaking

The Wasatch fault zone is active and capable of producing damaging seismic waves generated during an earthquake. The bridges, walls, and embankments for the project would have to be designed to withstand the anticipated ground shaking and earthquake accelerations associated with movement along the Wasatch fault zone and other nearby active faults. For an earthquake event with a 10% probability of being exceeded in 50 years, a maximum ground acceleration of about 0.25 g (0.25 times the acceleration of gravity) can be expected. For an earthquake event with a 10% probability of being exceeded in 250 years, a maximum ground acceleration of 0.6 g can be expected (AREMA 2004).

3.5.4.2 Liquefaction Potential

Liquefaction is defined as the sudden loss of strength and stiffness in a saturated, cohesionless soil during strong earthquake shaking. During liquefaction, the water pressure in the pores of the soil matrix rises to the point where the material transforms from a solid state to a liquid state. The phenomenon of liquefaction can be manifested in the form of subsidence, sand boils, lateral spreading, and loss of bearing support for structures.

The liquefaction potential maps created by USGS define areas where liquefaction has a certain probability of occurring. Based on SEA's review of these maps, most of the study area is situated in areas with a very low potential for liquefaction. Two areas in the project area with a moderate potential for liquefaction were noted: near Chicken Creek Reservoir and between the Sevier Bridge Reservoir and Gunnison. No sites in the study area have a high potential for liquefaction.

3.5.4.3 Tectonic Subsidence

A major earthquake along the Wasatch fault zone could cause some degree of tectonic subsidence. Although ground subsidence is recognized as a potential hazard, incorporating measures in the design of future facilities to mitigate this risk is not practical.

3.5.4.4 Fault Rupture

Several traces of known faults have been mapped near the study area (Hecker 1993). However, due to the thickness of the overburden soils and the lack of surface indications of underlying faults, no segments of the Wasatch fault zone or other faults are presently believed to underlie or traverse the study area.

3.5.4.5 Seiches

Earthquake-induced seiches (oscillation of water from seismic shaking) could occur along the central part of the proposed project that is closest to the Sevier Bridge Reservoir. SEA

considers the risk of this hazard to the project to be minor since the project alignment in this area would be at a significantly higher elevation than the spillway elevation of the reservoir.

3.5.4.6 Landslide Potential

The term *landslide* is defined as gravity-induced downward and outward movement composed of slope-forming materials or natural rock and soil and combinations of the two. Landslides can range in size from tiny popouts on soil slopes to massive earth movements (Jahns 1982).

Review of the landslides mapping indicates that there is no landslide activity in the study area and very little landslide activity in the adjacent uplands and mountains.

3.5.5 Farmland Soils

3.5.5.1 Prime Farmland

The Farmland Protection Policy Act of 1981 requires that Federal projects minimize conversion of prime farmland to nonagricultural uses and that such projects consider state and local farmland protection policies to the extent practical. Specially classified farmlands receive close scrutiny under this Act. Figure 3-10, Prime and State Important Farmland, shows prime farmland, as designated by NRCS, in the study area.

Based on information from NRCS and as shown in Table 3.5-2, the study area contains 1,055 acres of prime farmland. This farmland is primarily in dryland wheat. A representative from NRCS stated that farmland existed in the study area that was considered prime *when farmed*. However, due to drought conditions and crop rotation, certain farmlands are not being currently farmed and irrigated and so are not included as prime farmland (Parslow 2004).

Table 3.5-2. Prime and State Important Farmland within 0.5 Mile of the Proposed Alternatives

Farmland Designation	Farmland (acres)			
	Sevier County	Juab County	Sanpete County	Total
Prime	202	201[a]	652[a]	1,055
Unique	0	0	0	0
State important	0	23	1,056	1,079
Total	**202**	**224**	**1,708**	**2,134**

[a] Prime if irrigated

Source: Parslow 2004

3.5.5.2 Unique Farmland

Unique farmland is defined as land other than prime farmland used for the production of specific high-value food and fiber crops. Based on information from NRCS (Parslow 2004) and as shown in Table 3.5-2 above, Prime and State Important Farmland within 0.5 Mile of the Proposed Alternatives, the study area contains 0 acres of unique farmland.

3.5.5.3 Farmland of State Importance

State important farmland is classified by NRCS as farmland of lesser quality than prime farmland but having the soil, water supply, and other characteristics that, with good management, yield productive crops (Utah Agricultural Experiment Station 1983). Based on consultation with NRCS (Parslow 2004) and as shown in Table 3.5-2 above, Prime and State Important Farmland within 0.5 Mile of the Proposed Alternatives, the study area contains 1,079 acres of state important farmland. This farmland is primarily in pasture and alfalfa. Figure 3-10, Prime and State Important Farmland, shows state important farmland in the study area as designated by NRCS.

3.5.6 Paleontological Resources

The bedrock formations exposed at the surface within the vicinity of the project that have a likelihood for fossils include the Tertiary North Horn, Colton, Flagstaff, Green River, Crazy Hollow, Moroni, and Dipping Vat Formations. When fossils have been reported within these formations, they most commonly include plant and invertebrate fossils.

Paleontological resources are integrally associated with the Tertiary-Quaternary alluvial deposits in which they are located. Sedimentary formations are formed through depositional processes that lead to characteristic traits and varying potential for certain types of fossils. More than half of the sedimentary formations (23 of 40) in the BLM Richfield Field Office jurisdiction are known to contain vertebrate or trace vertebrate fossils. However, some formations have a higher potential than others to contain significant numbers of vertebrate fossils. Several complete fossil skeletons have been scientifically excavated from several specific localities in the BLM Richfield and Fillmore Field Office jurisdictions.

Under policy dictated by the BLM Manual and Handbook H-8270-1 (July 1998), formations are ranked according to their paleontological potential.

- **Condition 1** applies to areas that are known to contain fossil localities. Evaluation and special consideration of the known resources are necessary.
- **Condition 2** applies to areas that have exposures of geologic rock known to have produced fossils elsewhere.
- **Condition 3** applies to areas that are unlikely to produce fossils based on surface geology.

Although these guidelines apply mostly to vertebrate fossils on lands under the direction of BLM, they are equally designed to help protect rare plant and invertebrate fossils on state lands.

The Utah Geological Survey (UGS) and SITLA were contacted regarding the potential for the study area to contain sensitive paleontological resources. UGS reviewed available geologic maps to determine whether the proposed alternatives could encounter exposures of the Tertiary Dipping Vat and Green River Formations, formations that have yielded significant fossils in past excavations. UGS responded that the proposed alternatives are situated entirely in Quaternary alluvium, alluvial fan deposits, and terrace deposits and did not intersect any materials mapped as Tertiary age. Based on the geologic maps of the project area and a review of available paleontological inventories, Condition 2 is considered appropriate for this project, and site-specific inventories are not necessary.

In addition, on August 4, 2006, SITLA conducted a surface inspection for paleontological resources on lands within the project area that were identified as having the potential for containing fossil remains under Condition 2. The survey was conducted on Utah trust lands on the Golden Ranch Formation within the right-of-way for the proposed alternatives; this formation is known to yield plant fossils of the Eocene age. These lands are identified as the E½ E½ of section 32, T.16S., R.1W. SLB&M. The inspection revealed that the proposed alternatives would pass through areas that are covered with undifferentiated Quaternary alluvium and colluvium. No fossil remains were found, and no paleontological restrictions are recommended for the development of the proposed project (Stokes 2006).

3.5.7 Minerals and Mining

The National Energy Policy Act of 2005 (Public Law 109-58) seeks to provide reliable, affordable energy to our nation's consumers and to lessen the impact on Americans of volatile energy prices and uncertain supplies. Access to coal reserves by the proposed alternatives would reduce fuel waste by shortening the transport routes and would help maintain supplies of diverse and traditional forms of energy within the U.S. (domestic oil, gas, and coal). The National Energy Policy Act promotes such improvements in the productive and efficient use of energy (Demille 2007).

Oil and gas leases have been issued on BLM-administered land within the BLM Richfield and Fillmore Field Office jurisdictions. Oil and gas leases have also been issued within the right-of-way for the proposed project; however, the presence of a lease does not necessarily mean that oil and gas drilling will occur. No active or approved oil and gas activities such as drilling within the project right-of-way are recorded with BLM (Jackson 2006).

No mining claims for locatable or leasable minerals nor authorized mining law operations exist within the project right-of-way.

Vast amounts of sand and gravel aggregate are exposed at the base of the Wasatch and Gunnison Plateaus and the Valley Mountains (Witkind and others 1987). The majority of the aggregate was formed from carbonate rocks such as limestone and dolomite. Numerous gravel pits and quarries are noted on the USGS quadrangles and geologic maps that describe the study area. The sand and gravel are generally crudely sorted and contain oversized material that requires the sand or gravel to be crushed and screened before its use in concrete production and highway construction. The particle size of these materials ranges from fine sand to cobbles and boulders.

Other mineral resources are present in the Sevier Valley. These include gypsum, bentonite, and salt. Figure 3-9, Mines, shows the mining operations in the area. These mining operations are discussed in the following sections.

3.5.7.1 Canyon Fuel Company

Canyon Fuel Company is a coal company that owns and operates the SUFCO Mine in Sevier County. The SUFCO Mine, Utah's largest producer of coal, is located in the northeast portion of Sevier County outside the area shown in Figure 3-9, Mines. The distance from the mine to the coal-loading facility is about 30 miles. Table 3.5-3 shows the level of coal production at the SUFCO Mine in tons from 2001 through 2004 as reported by the Utah Geological Survey (2006). Canyon Fuel Company would haul about 38,000 carloads per year of SUFCO coal if the proposed project is constructed (Washington Infrastructure Services, Inc. and others 2001).

Table 3.5-3. SUFCO Mine Coal Production (2001–2004)

Year	Production (tons)
2001	7,001,000
2002	7,600,000
2003	7,126,000
2004	7,568,000

Source: Utah Geological Survey 2006

3.5.7.2 Redmond Minerals Incorporated

Redmond Minerals is primarily a salt-mining company but is also a producer of bentonite and fuller's earth. Redmond Minerals has about 85 employees and owns Utah's only underground salt mine (Washington Infrastructure Services Inc. and others 2001). Within the study area, Redmond Minerals owns the underground salt mine (the Sanpete County Mine), which is located near Redmond, and one bentonite mine (the Clay Mine) located on the Sanpete County–Sevier County border. In addition to the salt mine, Redmond Minerals has a salt-bagging plant, which is located along the Sevier River west of US 89 in Sanpete County. Redmond Minerals produces about 400,000 tons of salt per year.

A small portion of that salt is ground, screened, and packaged to be sold under the company's table salt brand, RealSalt. The rest of the salt mined is sold to de-ice roads or as salt blocks for livestock. The Feasibility Study suggests that as much as 2,200 to 3,000 carloads of salt per year could be hauled if the proposed project is constructed (Washington Infrastructure Services Inc. and others 2001).

3.5.7.3 Western Clay Company

Western Clay Company operates the Redmond Mine, a bentonite mine, which is located in Aurora and the Sevier Plant which is located just east of Aurora near the southern terminus of the proposed project. Bentonite is used for waterproofing in civil engineering applications, as a pet-waste absorbent, as an additive in oil and gas-drilling fluids, and as a binder in foundry molds (Bon and Krahulec 2004). According to the Feasibility Study, Western Clay Company could haul between 1,000 and 1,400 carloads per year from its mine and plant if the proposed project is constructed (Washington Infrastructure Services Inc. and others 2001).

3.5.7.4 U.S. Gypsum Company

U.S. Gypsum Company is a subsidiary of USG Corporation that operates the Jumbo-Jensen Mine near Sigurd just outside the southern boundary of the study area. The Jumbo-Jensen Mine is a surface gypsum mine with about nine employees (U.S. Department of Labor, Mine Safety and Health Administration 1999). There are many uses for gypsum including agriculture applications for fertilizer and erosion control, cements and plasters for art, metal casting, manufacture of wallboard and floor underlayment, and as polymer, chemical, and food additives. HDR was unable to determine how much gypsum is produced at the Jumbo-Jensen mine, but the Feasibility Study suggests that the mine could haul between 600 and 900 carloads per year if the proposed project is constructed (Washington Infrastructure Services Inc. and others 2001).

3.5.7.5 Georgia-Pacific Corporation

The Georgia-Pacific Corporation operates the Sigurd mine and plant in Sigurd. The mine and plant are gypsum facilities that are located just south of the study area. In June 2002, Georgia-Pacific closed the 65,000-ton plaster plant located at Sigurd (Georgia-Pacific Corporation 2002). Georgia-Pacific resumed mining operations in November 2005, and the Sigurd plant is also currently operating.

3.5.7.6 Aggregate Mining

Two aggregate companies have been located within the study area: G.W. Johansen Construction Company, Inc. and Hales Sand and Gravel, Inc. Both companies operate sand and gravel facilities. Hales Sand and Gravel operates a pit located just south of Redmond. The Johansen sand and gravel mine is located along the proposed project just north of the Sanpete County–Sevier County border. As stated in the Feasibility Study, Hales Sand and Gravel could haul between 130 and 190 carloads of asphalt products and cement per year if the proposed project is constructed (Washington Infrastructure Services Inc. and others 2001).

3.6 Vibration

Vibration is a function of the activities occurring within an area. Land use along the proposed alternatives in Sevier and Sanpete Counties is primarily cultivated agriculture with scattered mining operations, grazing, and open space. Vibrations with very low frequencies and intensities are produced by trucks and cars along roadways and by farming activities. Vibration associated with mining is a function of the mining method. Although gravel mines produce high levels of noise from earth-moving equipment and sorting machinery, they do not produce significant levels of vibration. Salt-mining activities include the use of earth-moving equipment and occasional blasting. The blasting produces locally intense vibration of short duration.

3.7 Hazardous Materials and Waste Sites

3.7.1 Background

Board regulations require the Applicant to discuss transport of hazardous materials (49 CFR 1105.7(e)(7)(ii)) and to identify the location of any “known hazardous waste sites or sites where there have been known hazardous materials spills on the right-of-way” (49 CFR 1105.7(e)(7)(iii)). This section discusses the occurrence of known and potential hazardous waste sites in and near the study area. The hazardous waste study area includes all sites within 1 mile of the proposed alternatives.

3.7.2 Potentially Hazardous Waste Sites

SEA identified potentially hazardous waste sites by reviewing the Utah Division of Environmental Response and Remediation (DERR) interactive map viewer on February 21, 2006 (DERR 2006). SEA reviewed DERR's interactive map viewer to determine sites close to the proposed alternatives that are listed in the following categories:

- Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS), a database of Superfund sites
- National Priorities List (NPL), a list of priority CERCLIS sites
- Brownfield sites[1]
- Voluntary Cleanup Program (VCP)
- Leaking underground storage tanks (LUST), either open (under investigation) or closed (no additional remedial actions are required or ever took place)
- Underground storage tanks (UST), either active (currently regulated by UDEQ) or out of use

HDR also conducted a field survey on October 5, 2004, to help identify other potentially hazardous sites that were not identified in the DERR databases. In addition, HDR reviewed a summary of all spill incidents that were reported to DERR between 1988 and 2003 to evaluate the potential for construction workers to encounter contamination from a large spill or other event involving hazardous materials. As a supplement to the DERR incident summary, HDR queried the National Response Center spills database for incidents in the study area (NRC 2005).

HDR identified seven potentially hazardous waste sites in the study area. Table 3.7-1 below lists the sites from north to south, and the sites are shown in Figure 3-11, Potential Hazardous Waste Sites. A total of 26 underground storage tanks (USTs) are listed for the seven sites. Of these 26 USTs, 18 have been removed, six are currently in use, and two have been closed in place. A total of three leaking underground storage tanks (LUSTs) have been identified at two of the sites. During the October 2004 field survey, HDR personnel identified a junk yard near the crossing of US 50 and Alternative C. HDR did not find any spill incidents in the DERR and National Response Center databases.

[1] In general, the term "brownfield site" means real property, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant.

Table 3.7-1. Potentially Hazardous Waste Sites within 1 Mile of the Proposed Alternatives

Site ID	Type	Notes
2000654	UST (gasoline)	Tank 1 was removed in 1992.
2000114	UST (diesel)	Tank 1 was removed in 1993.
2000366	UST (diesel)	Tank 1 was removed in 1990.
	LUST (diesel)	LUST (DERR ID: FYL) was closed in 1995.
2000117	UST (gas/diesel)	Tank 1 (compartmented) is currently in use.
	UST (diesel)	Tank 2 is currently in use.
	UST (used oil)	Tank 8 was removed in 1991.
	UST (diesel)	Tank 9 was removed in 1991.
	UST (gasoline)	Tank 10 was removed in 1991.
	UST (diesel)	Tank 11 was removed in 1996.
2000595	UST (used oil)	Tank 1 was closed in place in 1991.
2000223	UST (gasoline)	Tank 1 was removed in 1997.
	UST (gasoline)	Tank 2 was removed in 1997.
	UST (new oil)	Tank 3 was removed in 1991.
	UST (new oil)	Tank 4 was removed in 1991.
	UST (new oil)	Tank 5 was removed in 1991.
	UST (new oil)	Tank 6 was removed in 1991.
	UST (gasoline)	Tank 8 was removed in 1997.
	UST (gasoline)	Tank 9 is currently in use.
	UST (diesel)	Tank 10 is currently in use.
	UST (gasoline)	Tank 11 is currently in use.
	UST (diesel)	Tank 12 is currently in use.
	LUST (new oil)	LUST (DERR ID: GTP) was closed in 1993.
	LUST (gasoline)	LUST (DERR ID: JZI) was listed in 1997.
2000018	UST (diesel)	Tank 1 was removed in 1992.
	UST (diesel)	Tank 2 was removed in 1992.
	UST (diesel)	Tank 3 was removed in 1992.
	UST (gasoline)	Tank 4 was removed in 1992.
	UST (used oil)	Tank 5 was closed in place in 1991.

Source: DERR 2006

Removed or closed USTs typically indicate a site that has been remediated or that did not require remediation when the UST was removed or closed in place. Because these sites are not listed as LUST occurrences, there is a low probability of environmental degradation. However, contamination (if any) could have been left in place if it did not pose a threat to human health or the environment. Direct impacts to these sites could require DERR to re-examine the status of the site.

Typical contaminants of concern associated with the fuel and used oil USTs are petroleum-based hydrocarbons, also known as BTEX (benzene, toluene, ethylbenzene, and xylene). However, nothing in the DERR databases indicated that the sites listed above in Table 3.7-1, Potentially Hazardous Waste Sites within 1 Mile of the Proposed Alternatives, ever leaked contaminants into the surrounding soils or groundwater.

3.8 Air Quality

3.8.1 Background

The Board's regulations, found at 49 CFR 1105.7(e)(5), set thresholds for analyzing the anticipated effects of a proposed rail project on air emissions. The Board analyzes air impacts for projects that would involve an increase of at least eight trains per day, an increase in rail traffic of at least 100% (measured in gross ton-miles annually), or an increase in rail yard activity of at least 100% (measured by carload activity). The proposed project involves operations on a new rail alignment and anticipates up to two trains per day, so it would not meet the Board's threshold requirement of eight trains per day which would require an analysis of air quality impacts.

USEPA regulations specify the maximum acceptable ambient concentration level for six types of air pollutants. As defined by the Clean Air Act, there are two types of National Ambient Air Quality Standards (NAAQS): primary standards that establish limits to protect public health, and secondary standards that set limits to protect public welfare. USEPA's Office of Air Quality Planning and Standards has set NAAQS for six primary, or "criteria," pollutants: ozone (O_3), nitrogen dioxide (NO_2), carbon monoxide (CO), sulfur dioxide (SO_2), respirable particulate matter (PM), and lead (Pb). UDEQ has adopted these same standards for Utah. The primary and secondary standards are summarized in Table 3.8-1 below.

Table 3.8-1. National Ambient Air Quality Standards (NAAQS)

Pollutant	National (USEPA) Standard[a] Primary	Secondary
Lead (Pb)		
Quarterly average	1.5 µg/m^3	1.5 µg/m^3
Particulate Matter (PM_{10})		
Annual arithmetic mean	50 µg/m^3	50 µg/m^3
24-hour average	150 µg/m^3	150 µg/m^3
Particulate Matter ($PM_{2.5}$)		
Annual arithmetic mean	15 µg/m^3	15 µg/m^3
24-hour average	65 µg/m^3	65 µg/m^3
Sulfur Dioxide (SO_2)		
Annual average	0.03 ppm	(no standard)
24-hour average	0.14 ppm	(no standard)
3-hour average	(no standard)	0.50 ppm
1-hour average	(no standard)	(no standard)
Carbon Monoxide (CO)		
8-hour average	9 ppm	(no standard)
1-hour average	35 ppm	(no standard)
Ozone (O_3)		
8-hour average	0.08 ppm	0.08 ppm
1-hour average[b]	0.12 ppm	0.12 ppm
Nitrogen Dioxide (NO_2)		
Annual average	0.05 ppm	0.05 ppm

Annual standards are never to be exceeded. Short-term standards are not to be exceeded more than 1 day per calendar year unless noted otherwise.

ppm = parts per million

PM_{10} = particulate matter 10 microns in diameter or less

$PM_{2.5}$ = particulate matter 2.5 microns in diameter or less

µg/m^3 = micrograms per cubic meter

[a] Primary standards are set to protect public health. Secondary standards are based on other factors (for example, protection of crops and materials, avoidance of nuisance conditions).

[b] Standard is not to be exceeded more than 1 day per calendar year.

Source: USEPA 2003

3.8.2 Existing Air Quality

The Clean Air Act Amendments of 1990 require that all areas with recorded violations of the NAAQS be designated as non-attainment areas. A State Implementation Plan must be developed for non-attainment areas that identifies control strategies for bringing the region back into conformance with the NAAQS. The proposed project would be constructed in Sevier, Sanpete, and Juab Counties, which are in attainment for all of the criteria pollutants.

Since the air quality study area is in air quality attainment, no air pollution control district has been established that defines the air basin. Nearly the entire right-of-way for the proposed project is undeveloped terrain, and there is little data available on existing air quality. The nearest air quality monitoring station is in Provo, about 100 miles north of the study area. Monitoring data from this distant location would not reflect the air quality in the study area. The nearest Class I area is Capitol Reef National Park, about 50 miles southeast of Salina, the southern terminus of the project.

The majority of the study area is in areas that are undeveloped or that are used for agricultural purposes such as growing row crops or cattle grazing. The expected air pollutants associated with the study area are wind-blown dust and particulates from exposed agricultural soil and vehicle emissions (primarily CO) from traffic on existing roads. Vehicle emissions would be slightly higher near established communities such as Salina than in undeveloped areas.

3.9 Noise

3.9.1 Background

Under the proposed project, the rail line would carry one round trip (two movements which equals one full load and one empty back-haul) per day, which is below the Board's threshold for environmental noise analysis. This threshold is an increase in train traffic of at least eight trains per day or an increase in rail traffic of at least 100% measured in gross ton-miles annually. Consequently, no noise analyses are required for this project according to the Board's thresholds for noise impact assessment. However, because of public interest in the project, SEA performed a noise analysis.

For this analysis, the noise study area is the land adjacent to the proposed alternatives that could be affected by an increase in noise from the project. To give a general context for the noise environment in the study area, a regional overview is provided. This section also describes the general characteristics of noise, provides a regulatory overview of noise standards, lists the sensitive noise receptors in the study area, and summarizes monitored noise levels.

3.9.2 Characteristics of Noise

Noise is defined as unwanted sound. The decibel (dB) is the accepted standard unit for measuring noise. Since human hearing is not equally sensitive to all sound frequencies, only certain frequencies can be considered when measuring noise in decibels. The A-weighted decibel scale corresponds to the sensitivity range for human hearing; noise levels for this scale are measured in dBA. A noise level change of 3 dBA is barely perceptible to humans, but a 5-dBA change is noticeable. A 10-dBA change in noise is perceived as a doubling of noise loudness, while a 20-dBA change is considered a dramatic change. Table 3.9-1 shows noise levels associated with everyday sources.

Table 3.9-1. Weighted Sound Levels and Human Response

Examples of Sound Sources	dBA[a]	Response Criterion
	0	Threshold of hearing
	10	Just audible
Broadcasting studio background	20	
Soft whisper at 15 feet	30	Very quiet
In living room, bedroom, or library	40	
	50	Quiet
Air conditioner at 20 feet; light auto traffic at 50 feet	60	
Freeway traffic at 50 feet	70	Intrusive; telephone use difficult
Passenger train at 100 feet; freight train at 50 feet; helicopter at 500 feet	80	Annoying
Heavy truck at 50 feet; pneumatic drill at 50 feet	90	Hearing damage after 8 hours
Shout at 0.5 foot; inside New York subway station	100	Very annoying
Riveting machine; jet takeoff at 2,000 feet	110	
Jet takeoff at 200 feet; auto horn at 3 feet; inside discotheque	120	Threshold of feeling and pain
	130	Painfully loud
Carrier deck jet operation	140	Limit of amplified speech

[a] Typical A-weighted sound levels taken with a sound-level meter and expressed as decibels weighted on the "A" scale (dBA), which approximates the frequency response of the human ear.

Source: CEQ, Executive Office of the President 1970

3.9.3 Regulatory Overview

Equivalent Sound Level. Federal regulatory agencies often use the equivalent sound level (L_{eq}) scale to evaluate noise impacts (USEPA, 40 CFR 201 to 211). With this scale, noise is defined as a constant sound with the same sound energy as a more realistic, fluctuating sound. When reporting sound levels, it is crucial to identify the time period under consideration. For example, $L_{eq}(24)$ is the equivalent sound level for a 24-hour period. Unless otherwise noted, all sound levels provided in this report use $L_{eq}(1)$, the hourly equivalent noise level.

Day-Night Average Sound Level. Average noise exposure over a 24-hour period is often presented as a day-night average sound level (L_{dn}). L_{dn} values are calculated from hourly L_{eq} values, with the L_{eq} values for the nighttime period (10 PM to 7 AM) artificially increased by 10 dBA to reflect the greater disturbance caused by noises at night.

The Federal Noise Control Act of 1972 (40 CFR 201 to 211) recognized that major transportation noise sources associated with commerce should be regulated the same way in every state. Different regulations, particularly in the case of railroads, could interfere with interstate commerce. USEPA and the Federal Railroad Administration developed noise regulations (49 CFR 210) in response to the Noise Control Act that establish noise level limits for individual pieces of railroad equipment. However, these regulations do not address the effects of multiple or cumulative noise events.

Other transportation agencies, such as the Federal Highway Administration, the Federal Transit Administration, and the Federal Aviation Administration, have developed noise assessment and mitigation policies that take multiple noise events into account. These policies, typically based on L_{dn} noise metrics, were developed in response to public concerns over increased noise due to increased transportation activity.

The Board's noise regulations address the effects of multiple noise events in a similar fashion to the policies developed by other transportation agencies. Railroad noise mitigation includes noise barriers, sound insulation for buildings, directional horns or quiet zones, and changes in land use planning.

3.9.4 Definition of Railroad Noise

The principal types of noise that SEA considered in evaluating rail line segments are horn noise and wayside train noise.

- **Horn noise** occurs near grade crossings and warns motorists and pedestrians of approaching trains.
- **Wayside train noise** refers to all train-related operational noise adjacent to the right-of-way, excluding warning horn noise. Wayside train noise results from steel train wheels contacting steel rails and from locomotive exhaust and engine noise. The amount of noise created by the locomotive depends on the throttle setting.

3.9.5 Existing Noise Conditions

The majority of the study area is undeveloped open space with a very small number of residential and recreational land uses (such as campgrounds) interspersed throughout the study area. The principal sources of background noise in the project area are occasional vehicle traffic on ranch roads, aircraft overflights, and wind.

To determine existing noise levels, SEA monitored the noise level at four locations in the study area that the team felt represented existing noise conditions (see Figure 3-12, Noise Monitoring Locations). The associated noise levels at each monitoring location are provided in Table 3.9-2.

Table 3.9-2. Ambient Noise Monitoring Data

Monitoring Location	Location	Monitored L_{eq} (dBA)
1	Along SR 28 near the Juab County–Sanpete County border, near Painted Rocks Campground	36.6
2	Near Sevier River south of the Sevier Bridge Reservoir	41.4
3	Just south of the Juab County–Sanpete County border near Redmond	45.8
4	Near southern project terminus east of the Sevier River	48.3

3.10 Energy Resources

3.10.1 Background

The NEPA regulations (40 CFR 1502.16) require an examination of the energy requirements of a proposed project and the project's potential to conserve energy. This section describes the existing energy demands of transportation (truck traffic) in the study area that would be affected by the proposed project. This section also describes the existing energy resources in the study area. The energy resources study area is the proposed alternatives plus the surrounding area out to a distance of 500 feet on either side of the alternatives.

3.10.2 Existing Energy Use

The proposed project would convert truck traffic hauling coal to and from the SUFCO mine to rail traffic. To evaluate changes in energy use, this section analyzes existing truck traffic and projected future truck traffic.

About 750 trucks per day pass through Salina, Centerfield, Gunnison, and Levan. Each truck travels 163 miles round trip from the coal mine northeast of Salina to the Sharp load-out facility just south of Levan (see Figure 3-13, Energy).

Fuel consumption varies with vehicle type. Most trucks that haul coal through the study area are heavy single-unit trucks[2] with an average fuel efficiency of 6.0 mpg (miles per gallon) (EIA 2004). This fuel efficiency is projected to increase to 6.5 mpg by 2025, an increase of 8%. Currently, coal trucks traveling from Salina to the Sharp load-out facility use about 20,375 gallons of diesel fuel per day. This equals 2,832 million Btu (British thermal units) of energy consumed each day by coal truck traffic.

Table 3.10-1 shows the current truck vehicle-miles traveled (VMT), fuel consumption, and energy consumption in the study area.

Table 3.10-1. Existing Average Daily Energy Consumption in 2003

Coal Truck Traffic (trips per day)	Coal Truck Traffic (VMT)	Fuel Consumption (gallons)	Energy Consumption (million Btu)
1,500	122,250	20,375	2,832

1 gallon diesel fuel = 139,000 Btu. Heavy single-unit trucks are assumed to achieve diesel fuel efficiency of 6.0 miles per gallon.

Source: EIA 2004

3.10.3 Other Energy Resources

Other energy resources in the study area include transmission lines. These are shown in Figure 3-13, Energy. The transmission lines are owned by PacifiCorp and administered by Rocky Mountain Power. The lines shown from west of Levan to Aurora include two 345-kilovolt lines and one 46-kilovolt line. The line from Scipio to Aurora is a 46-kilovolt line, and the lines from Aurora to the east are two 345-kilovolt lines.

[2] As defined by the Energy Information Administration, a single-unit truck is "a motor vehicle consisting primarily of a single motorized device with more than two axles or more than four tires." In comparison, a combination truck "consists of a power unit (a truck tractor) and one or more trailing units (a semi-trailer or trailer)" (EIA 2004).

3.11 Socioeconomics

3.11.1 Background

NEPA regulations (40 CFR 1508.14) require an analysis of the socioeconomic effects of a proposed project when the "economic or social and natural or physical environmental effects [of the project] are interrelated." In addition, the courts have ruled that socioeconomic issues are closely linked to quality of life and should be studied under NEPA. For this EIS, SEA analyzed socioeconomic issues including employment, income, commerce, and tax base.

The socioeconomic study area includes parts of the three counties (Juab, Sanpete, and Sevier) that would be affected by the proposed project. When possible, SEA evaluated the portions of the study area that are immediately adjacent to the proposed project.

3.11.2 Population and Demographics

3.11.2.1 Juab County

Juab County is the northernmost county in the socioeconomic study area. The county has five main communities—Nephi, Levan, Eureka, Mona, and Rocky Ridge—with most of the population residing in Nephi (4,962 people out of 8,713). Of these five communities, Levan is the closest to the proposed project and has a population of 782. About 10% of Juab County residents live in rural areas of the county (Utah Department of Workforce Services 2004a).

Population growth in the county has historically outpaced employment growth. Juab County is the sixth-fastest-growing county in Utah in terms of population and grew at an average rate of 3.5% per year between 1990 and 2000. Many Juab County residents commute outside the county for work. In contrast, some people who work along the Wasatch Front (Utah and Salt Lake Counties) are building homes in Juab County. New residential building permits averaged 55 per year from 1998 to 2002 with 39 of those for homes in Nephi. The value of residential building permits in Juab County was about $6.3 million in 2003 (Utah Department of Workforce Services 2004a).

3.11.2.2 Sanpete County

The majority of the proposed rail line would run through Sanpete County. Within the county, the communities of Fayette, Gunnison, and Centerfield are the closest to the proposed project. In 2003, the total population of Sanpete County was 23,391. Fayette, Gunnison, and Centerfield had populations of 206, 2,484, and 1,068, respectively. The rural population in Sanpete County is about 15% of the total population (Utah Department of Workforce Services 2004b).

Sanpete County grew at an average rate of 3.4% per year between 1990 and 2000. The county averaged 190 new residential building permits per year from 1999 to 2003; however, the

number has been declining since 2000. Residential building permits in 2003 were valued at nearly $14 million. The location of new homes being built has been concentrated in areas outside the county's major townships (Utah Department of Workforce Services 2004b).

3.11.2.3 Sevier County

Sevier County is the southernmost county in the study area. Within the county, the closest communities to the proposed project are Aurora, Redmond, and Salina. In 2003, the population of Sevier County was 19,318 with the rural population about 19% of the total population. The populations of Aurora, Redman, and Salina were 939, 778, and 2,378, respectively (Utah Department of Workforce Services 2004c).

Over the past decade, Sevier County has had an average annual growth rate of about 2.0%, which is below the average annual growth rate for Utah overall (2.3%). Salina, near the proposed project, added about 450 residents and averaged 130 new residential building permits per year from 1999 to 2003 (Utah Department of Workforce Services 2004c).

3.11.3 Employment

3.11.3.1 Juab County

In 2003, government employment had the largest share of total employment in Juab County (23%). The manufacturing; trade, transportation, and utilities; and leisure and hospitality industries also provided a large percentage of employment in the county. Table 3.11-1 below shows job distribution by industry for nonfarm jobs in 2003 (Utah Department of Workforce Services 2004a). Table 3.11-2 below shows the size of the labor force and the distribution of jobs for all industries including farm jobs in 2000.

Table 3.11-1. Job Distribution by Industry for Nonfarm Jobs in 2003

Industry	Percent of Total Employment		
	Juab County	Sanpete County	Sevier County
Construction	8%	5%	5%
Education/Health/Social Services	6%	8%	10%
Financial Activities	2%	3%	2%
Government	23%	39%	23%
Information	0%	2%	1%
Leisure/Hospitality	15%	7%	11%
Manufacturing	14%	12%	7%
Mining	2%	0%	5%
Other Services	3%	2%	2%
Professional/Business Services	6%	4%	4%
Trade/Transportation/Utilities	16%	15%	29%

Source: Utah Department of Workforce Services 2004a, 2004b, 2004c

Table 3.11-2. Job Distribution by Industry for Farm and Nonfarm Jobs in 2000

Industry	Percent of Total Employment		
	Juab County	Sanpete County	Sevier County
Labor Force (16 years and older)	3,547	9,274	8,053
Agriculture, Forestry, Fishing, and Hunting	3.8%	6.9%	4.8%
Arts and Entertainment	11.7%	5.8%	9.4%
Construction	11.3%	9.6%	9.0%
Education and Social Services	17.4%	24.9%	21.2%
Finance, Insurance, and Real Estate Rental and Leasing	3.0%	3.8%	3.3%
Information	2.0%	2.0%	2.1%
Manufacturing	17.5%	13.3%	6.6%
Mining	0.9%	3.3%	3.4%
Other Services	2.8%	4.4%	4.7%
Professional Services	4.6%	3.6%	2.9%
Public Administration	4.5%	5.9%	6.9%
Retail Trade	11.7%	11.1%	14.3%
Transportation and Utilities	5.2%	3.7%	8.0%
Wholesale Trade	3.5%	1.7%	3.3%

Source: U.S. Census Bureau 2000

Most of the employers in Juab County are small businesses. Forty percent of all employers in the county have three or fewer employees. The Juab School District is the largest employer in Juab County, followed by Central Valley Medical Center and Nephi Rubber Products.

During 2003, Juab County had a substantial loss in construction employment (119 jobs or 37%). The education, health, and social services industry and the leisure and hospitality industry had job losses of 48 jobs (8%) and 42 jobs (13%), respectively. In 2002, the unemployment rate in the county increased to an all-time high of 7.8% and decreased only slightly in 2003 to 7.3%.

3.11.3.2 Sanpete County

In Sanpete County, government employment makes up the greatest percentage of nonfarm jobs with 39%. The trade, transportation, and utilities industry has the next-highest percentage of employment with 15%, and the manufacturing industry accounts for 12%. Table 3.11-1 above shows job distribution by industry for nonfarm jobs in 2003, and Table 3.11-2 above shows the distribution of jobs for all industries including farm jobs in 2000.

Sanpete County has more large businesses than Juab County. Major employers in Sanpete County include the State of Utah, Moroni Feed, and Snow College. The county's school districts, North Sanpete School District and South Sanpete School District, also employ a large number of people. Gunnison Valley Hospital is a large employer in Sanpete County near the proposed project (Utah Department of Workforce Services 2004b). Gunnison, which is located near the proposed project, relies heavily on the agriculture industry but also houses a state correctional facility.

Unlike employment in Juab County, employment in Sanpete County is increasing overall. However, some of the job growth in the county was offset by a loss of employment in the construction and manufacturing industries. The unemployment rate for Sanpete County reached 7.1% in 2002 and remained at that level in 2003.

3.11.3.3 Sevier County

In Sevier County, the trade, transportation, and utilities industry has the largest share of employment with 29%. The large percentage of jobs in this industry is due to trucking associated with the coal mines in Sevier County. Other major industries in Sevier County include government (23%), leisure and hospitality (11%), and education, health, and social services (10%). Table 3.11-1 above shows job distribution by industry for nonfarm jobs in 2003, and Table 3.11-2 above shows the distribution of jobs for all industries including farm jobs in 2000. The largest employers in the county are the Sevier County School District, Canyon Fuels, US Gypsum Company, Richfield Care Center, and Barney Trucking.

Although agriculture is still an important industry in the county, other sources of economic activity are being developed. Mining has contributed significantly to the county's economy (see Section 3.5.6, Paleontological Resources).

3.11.3.4 Employment Growth in the Study Area

Employment in the study area is projected to continue to increase by an average of 1.93% per year between 2005 and 2030 (see Table 3.11-3).

Table 3.11-3. Projected Total Employment in the Study Area (2005–2030)

County	2000	2005	2010	2015	2020	2030	AARC[a] 2005–2030
Juab County	3,547	4,131	4,777	5,450	6,043	6,859	2.22%
Sanpete County	9,274	11,049	12,087	13,175	14,050	14,983	1.61%
Sevier County	8,053	10,647	11,652	12,686	13,531	14,428	1.96%

[a] AARC = average annual rate of change

Sources: U.S. Census Bureau 2000; Utah Governor's Office of Planning and Budget 2002

3.11.4 Income

3.11.4.1 Juab County

The median household income reported by the 2000 U.S. census for Juab County was $38,139. In comparison, the median household income for Utah overall was $45,726 (U.S. Census Bureau 2000). In 2001, the total personal income for Juab County was $134.3 million. The county's per-capita income was $15,849, which ranked fifth lowest among Utah's 29 counties. This per-capita income was 65.9% of the state average ($24,033) (Utah Department of Workforce Services 2003).

3.11.4.2 Sanpete County

The median household income reported by the 2000 U.S. census for Sanpete County was $33,042 (U.S. Census Bureau 2000). In 2001, the total personal income for Sanpete County was $349.7 million. The county's per-capita income was $15,077, which ranked second lowest among Utah's 29 counties. This per-capita income was 62.7% of the state average (Utah Department of Workforce Services 2003).

3.11.4.3 Sevier County

The median household income reported by the 2000 U.S. census for Sevier County was $35,822 (U.S. Census Bureau 2000). In 2001, the total personal income for Sevier County was $351.8 million. The county's per-capita income was $18,505, which was 77.0% of the state average (Utah Department of Workforce Services 2003).

3.11.5 Trucking Industry

Most of the large trucking companies in the study area are located in Sevier County. Major employers in the trucking industry include Barney Trucking, Robinson Transport, Gurney

Trucking, and DP Curtis Trucking. Barney Trucking and Robinson Transport are the main freight carriers for the SUFCO mine. In December 2004, Barney Trucking employed 225 people and had 200 drivers at the company's Salina location. In December 2004, Robinson Transport employed 140 people and had 110 drivers. See Section 0,

Trucking Operations, for more information on the trucking operations in the study area.

3.11.6 Agriculture

Agriculture has historically played an important role in all the counties in the study area. The 2002 Census of Agriculture (U.S. Census Bureau 2002) found that Juab County had 236 farms and 122 people who operated a farm as their principal occupation. Both of these numbers increased during the 10-year census period (1992 to 2002). Sanpete County had 759 active farms with an average size of 471 acres. The number of farm operators in Sanpete County increased during the census period and accounted for nearly 400 jobs in the county. In Sevier County, there were about 300 farm operators and 568 farms.

3.11.6.1 Juab County

In Juab County, the value of agricultural products sold continues to increase, but the amount of land in farms and the average size of farms continue to decrease. In 2002, the market value of agricultural products produced in Juab County was about $22.0 million. Farms averaged 1,146 acres and accounted for 270,350 acres of land in the county.

3.11.6.2 Sanpete County

The economy of Sanpete County has always relied heavily on agriculture. The county is one of the United States' top producers of turkeys and is a Utah leader in sheep production. Sanpete County is also home to a large fish hatchery. Sanpete County ranks as one of Utah's top producers of barley, oats, and alfalfa and is also a producer of cattle, calves, and milk cows. In 2002, the market value of agricultural products produced in Sanpete County was about $93.7 million.

3.11.6.3 Sevier County

Sevier County's historic economic activity has been dominated by agriculture. Cattle, sheep, turkeys, and dairy products are the main outputs of the county's agricultural production. In 2002, the market value of agricultural products produced in Sevier County was over $52.3 million.

3.11.7 Tax Base

Sales tax revenues and property tax revenues are the major sources of funds for all three counties in the study area.

3.11.7.1 Juab County

In 2003, the total gross taxable sales for Juab County were about $99.2 million, down about 5% from 2002 gross taxable sales when taxable sales were at a 5-year high of about $104.5 million. The majority of gross taxable sales comes from retail trade sales. The total assessed property value for the county in 2001 was about $391.2 million.

3.11.7.2 Sanpete County

The assessed property value in Sanpete County was about $671.8 million in 2001. Gross taxable sales in Sanpete County were over $162 million in 2003, which was a 2.5% increase over 2002 and a 5-year high for the county. About 60% of gross taxable sales for Sanpete County come from retail trade sales.

3.11.7.3 Sevier County

The assessed property value in Sevier County for 2001 was about $658.2 million. Gross taxable sales for 2001 for Sevier County were almost $230 million in 2002 (2003 gross taxable sales were not available).

3.11.8 Community Facilities

There are very few community facilities in the study area along or near the proposed project. The only community facilities within 4 miles of the proposed alternatives are in Salina. These facilities include churches, schools, law enforcement facilities, post offices, and a medical facility (see Table 3.11-4 below).

Table 3.11-4. Community Facilities within 4 Miles of the Proposed Alternatives

Facility	Name	Address	City
Church	First Baptist Church	165 South 400 East	Salina
Church	Church of Jesus Christ of Latter-day Saints	87 South 100 East	Salina
Church	Church of Jesus Christ of Latter-day Saints	98 West 400 North	Salina
Church	Church of Jesus Christ of Latter-day Saints	355 West 400 North	Salina
School	Salina Elementary School	210 West 300 North	Salina
School	North Sevier Middle School	135 North 100 West	Salina
School	North Sevier High School	350 West 400 North	Salina
Senior center	Salina Senior Citizens Center	330 W. Main Street	Salina
Law enforcement	Salina Police Department	90 W. Main Street	Salina
Library	Salina City Library	90 W. Main Street	Salina
U.S. post office	Post Office – Salina	35 North 100 East	Salina
U.S. post office	Post Office – Redmond	19 South 100 West	Redmond

3.11.9 Emergency Response

Emergency response to areas near the proposed project is currently being provided by facilities and services in Levan, Gunnison, Salina, Nephi, Manti, and Sigurd. Emergency responders for the study area include fire departments (Salina, Gunnison, and Nephi), ambulance services (Juab and Sevier Counties, Levan, and Gunnison), the Utah Highway Patrol, and police and sheriff's departments (Gunnison, Salina, Juab, and Sanpete and Sevier Counties).

Emergency responders travel to emergencies using SR 28, US 89, and rural roads. All ambulance and law enforcement agencies in the study area are located east of the proposed project. With the exception of the Sigurd Fire Department, which is located south of the southern terminus of the project, all fire departments in the study area are located east and northeast of the proposed project.

3.12 Cultural Resources

3.12.1 Introduction

This section summarizes the Board's process for identifying, evaluating, and assessing historic properties[3] located within the project's area of potential effect (APE)[4] pursuant to Federal laws and regulations. For purpose of this project, the APE consists of a corridor predominantly 160 feet wide with some portions that are 900 feet wide. SEA is overseeing the completion of environmental and historic reviews required to comply with its legislative requirements for historic properties that are eligible for or listed on the National Register of Historic Places (National Register).[5]

3.12.2 Legislative Requirements

The National Historic Preservation Act (NHPA) of 1966, as amended, is the principal Federal law governing the consideration of historic properties. Section 106 of the NHPA requires the Board to consider impacts to National Register eligible or listed historic properties prior to approving a major Federal action or undertaking, while the Section 106 regulations (36 CFR part 800) outline the specific steps the Board must follow to identify, assess, and mitigate any impacts to significant cultural resources as a result of such actions. NEPA and the regulations of the President's Council on Environmental Quality (CEQ) implementing NEPA (see 40 CFR 1500–1508) also require Federal agencies to assess the direct and indirect impacts of a major Federal action on the affected human environment including National Register eligible or listed cultural resources.

In addition to being required by the NHPA and NEPA, the consideration of historic properties for Federal actions that could affect such properties is required by a number of Federal laws, regulations, Executive Orders, and Utah state laws including the American Indian Religious Freedom Act of 1978; the Archaeological and Historic Data Preservation Act of 1974; the Native American Graves Protection and Repatriation Act (NAGPRA); the Archaeological

[3] A historic property is defined as any prehistoric or historic district, site building, structure, or object included or eligible for inclusion in the National Register of Historic Places maintained by the Secretary of the Interior. The term includes artifacts, records, and remains that are related to and located within such properties. It includes properties of traditional religious and cultural importance to an Indian tribe or Native Hawaiian organization that meet the National Register criteria [36 CFR Part 800.16(l)(1)].

[4] The area of potential effect (APE) is the "geographic area or areas within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties, if any such properties exit. The area of potential effect is influenced by the scale and nature of an undertaking and may be different for different kinds of effects caused by an undertaking" [36 CFR Part 800.16(d)].

[5] The National Register was established under Section 101 of the NHPA to serve as the nation's formal list of significant cultural resources.

Resources Protection Act (ARPA); and Utah Administrative Code 9-9-401 to 9-9-405. Both NAGPRA and ARPA apply to Federal lands only.

3.12.3 Chronology and Background of Historic Preservation Review Process

In spring of 2003, SEA contacted the Utah State Historic Preservation Office (SHPO), the Bureau of Land Management (BLM), the Bureau of Indian Affairs (BIA), and five Federally recognized tribes (the Paiute Indian Tribe of Utah, the Ute Indian Tribe, the Goshute Indian Tribe, the Skull Valley Band of Goshute Indians, and the Hopi Tribe) by letter to request their initial comments on the proposed project (see Appendix J, Agency and Tribal Consultation). Comments that were received in response to the letters generally acknowledged the potential for significant cultural resources in the project area and requested additional information once resource identification surveys were completed (see Appendix F, Cultural Resource Comments). In an April 13, 2003, letter, the Hopi Tribe stated that the project area contained Hopi ancestral sites and traditional cultural properties.

On May 20, 2003, SEA held a site visit to which the above Federally recognized tribes were invited to attend. Representatives from the Hopi Tribe and Navajo Nation attended the site visit. The Navajo Nation attended the site visit on its own initiative and stated that it had potential ancestral connections to the project area. Tribal representatives from the Paiute Indian Tribe of Utah attended the agency scoping meeting the following day.

SEA conducted archaeological background research and field studies beginning in January 2004. SEA began its investigations with a literature search of existing cultural resources records on file at the SHPO (see Appendix G, Cultural Report). The records reviewed included completed archaeological site forms, field inventory reports, and other archival materials encompassing the APE and a buffer zone to account for potential shifts in the proposed alternatives. The results of the Class I existing data review were included in a report completed by SEA in 2004 (MOAC 2004).

From April to July 2005, SEA completed an intensive pedestrian (walking) survey of the project APE that identified both previously recorded and newly identified cultural resources. The results of the survey were provided in the cultural resources report, *Cultural Resources Inventory of the Central Utah Railroad Project in Sevier, SanPete and Juab Counties, Utah* (MOAC 2006). The report includes a summary of field methods, inventory results, a historic and prehistoric context for the project area, and survey forms completed for each of the sites identified (see Appendix G). Copies of the report were provided to BLM, BIA, SHPO, and the Advisory Council on Historic Preservation (ACHP).

In May 2006, SEA sent letters to the SHPO, the six Federally recognized tribes originally identified in 2005, and six additional Federally recognized tribes: the Southern Ute Tribe of Colorado, the Ute Mountain Ute of Colorado, the White Mesa Ute, the San Juan Southern Paiute of Arizona, the Kaibab Paiute Tribe of Arizona, and the Moapa Band of Paiute Indians of Nevada. The letters summarized the results of the cultural resource studies conducted by

SEA and requested input regarding the National Register eligibility of the identified sites. Letters sent to the tribes were specific in requesting information regarding properties of traditional and cultural significance to the tribes including the potential of the project area to contain burial items.

In its letter to the SHPO, SEA requested the names of potential Section 106 consulting parties that should be invited to participate in the Section 106 process. In response, the SHPO provided the names of recommended consulting parties. Based on the SHPO's recommendations, letters were also sent to a number of organizations including local museums and statewide archaeological societies requesting their participation in the Section 106 review process for the project.[6] No responses have been received from the potential consulting parties recommended by the SHPO. Also, in its letter to SEA, the SHPO requested additional information regarding SEA's preliminary National Register eligibility determinations for some of the identified sites. This requested information was provided to the SHPO in July 2006 in a letter report. In addition, some of the archaeological site forms were updated to reflect the SHPO's National Register eligibility recommendations. Copies of the updated site forms were provided to the SHPO and ACHP.

SEA has received letters from the Hopi Tribe, the Paiute Indian Tribe of Utah (the Koosharem Band and Kanosh Band each responded), and the Kaibab Band of Paiute Indians stating their interest in acting as Section 106 consulting parties throughout the Section 106 and NEPA processes. All three tribes were subsequently provided with a copy of the cultural resources report for their review and comment. The Hopi Tribe responded to SEA's request for input regarding the National Register eligibility determinations of the identified sites and agreed with SEA's preliminary National Register eligibility assessments.

In a letter dated May 30, 2006, SEA notified ACHP that the proposed project will likely adversely affect historic properties within the APE. As part of its next steps, SEA will be developing a Memorandum of Agreement (MOA) in consultation with the SHPO, Federally recognized tribes, the Applicant, and other Section 106 consulting parties, as appropriate. The agreement document would stipulate steps to resolve anticipated adverse effects to historic properties and outline the means and schedule to implement any agreed-on mitigation measures. Additional information regarding proposed measures to mitigate adverse effects to historic properties is included in Section 4.12, Impacts to Cultural Resources.

[6] Letters were sent to the following organizations requesting their participation as Section 106 consulting parties: Western Mining and Railroad Museum, Ramsey Historical Museum, Fremont Indian Park and Museum, Great Basin Museum, Utah Historical Trails Consortium, Utah Statewide Archaeological Society, and Utah Professional Archaeological Association. To date, none of these organizations have indicated their interest in participating as Section 106 consulting parties.

3.12.4 Prehistoric Context

3.12.4.1 Paleoindian Period

The Paleoindian period in the continental United States extends from the end of the Pleistocene Epoch (about 11,000 BC) to the early Holocene Epoch (7500 BC). In Utah, three Paleoindian complexes are recognized: Clovis (about 11,500–11,000 BC), Folsom (about 11,000–10,000 BC), and Plano (about 10,000–7500 BC). Despite minor differences in tool kits and tool-manufacturing technology, the three complexes share a variety of traits including big-game hunting, low population densities, and wide spatial distributions. Chronologically, Paleoindians were contemporaries with extinct megafauna, and evidence outside the study area shows the early human dependency on megafauna such as mammoths and giant sloths (Spangler 1995).

Utah Clovis sites were generally surface sites commonly interpreted as temporary camps. Diagnostic cultural materials attributed to the Clovis complex have been found in sand dunes along the Sevier River, including a lithic (artifact) scatter containing a Clovis projectile point (Copeland and Fike 1988). In western Utah, the Hell'n Moriah Clovis site, a single component retooling station, yielded seven Clovis fluted projectile points, flaked tools, and lithic debitage (waste materials produced during the manufacture of stone tools) (Davis and others 1994). More recently, an early Paleoindian lithic procurement locality was investigated from an obsidian source in the Mineral Mountains (Montgomery and others 2001).

The distribution of Folsom sites in Utah is very similar to that of the Clovis period distribution (Schroedl 1991). The Plano tradition, which incorporates several early Holocene Paleoindian complexes, dates from 8300 BC to about 7800 BC.

3.12.4.2 Archaic Period

The material culture of the Archaic period includes projectile points smaller than those found at Paleoindian sites, an increased frequency of ground stone implements, perishables (baskets, sandals, split-twig figurines), and pit structure architecture (Horn and others 1994). The warmer, drier environment following the Paleoindian period resulted in a change from the big-game subsistence pattern of the Paleoindian to a small-game hunting, seed-gathering, and nut-gathering subsistence pattern (Cordell 1984). Tipps (1988) believes that Archaic peoples "followed an annual round in response to changing resource availability, living in small, kin-related groups throughout most of the year."

Toward the end of the Archaic period, the hunter-gatherer tradition was gradually incorporated into supplemental agricultural subsistence (BLM 1982). Evidence of agriculture exists in southern and southeastern Utah, dated to early Anasazi cultures around 1000 BC (BLM 1982). Archaic sites are common in the area and are managed by the BLM Richfield or Fillmore Field Offices. A few places in the area that were inhospitable to later Formative occupation seemed to favor earlier Archaic use.

3.12.4.3 Formative Period

Sometime between AD 1 and AD 400, the Formative cultures emerged on the northern Colorado Plateau and in portions of the Great Basin. Maize, ceramics, and the bow and arrow were adopted in different spatiotemporal patterns (Madsen and Simms 1998, 260). Formative cultures led a more sedentary life than did their Archaic predecessors. Consequently, Formative cultures resulted in more-permanent settlements and the associated collection of cultural resources in a given area. By AD 700, a ceramic tradition is well-presented at hundreds of sites attributed to the Fremont complex in central Utah.

Evidence of the Anasazi is limited to areas east of Capitol Reef National Park, and it does not extend much farther north than the Henry Mountains area. Archaeological evidence of the Fremont people is generally found north of the Puebloan areas throughout much of central and eastern Utah. Archaeological evidence from north of the Henry Mountains area contains evidence of the Fremont and Puebloan cultures.

3.12.4.4 Late Prehistoric/Protohistoric Period

Following the disappearance of the Fremont from the archaeological record, a largely nomadic hunting and gathering economic strategy resumed. Numic-speaking Southern Paiute and Ute groups were present throughout much of Utah upon the arrival of Europeans. These cultures relied on late Archaic hunting-gathering traditions rather than the agriculturally augmented Formative subsistence patterns. Although the name Paiute was originally applied only to the Southern Paiute, it was extended to additional groups as the exploration of the Great Basin proceeded. Linguistic evidence suggests that a wavelike spread of Numic peoples advanced to the north and east across the Great Basin from a southeastern California homeland in or near the Owens Valley roughly 1,000 years ago (Bettinger and Baumhoff 1982).

Numic occupation in the study area is evidenced by Desert Side-notched projectile points, Southern Paiute Utility Ware ceramics, and distinct perishables. In the vicinity of the study area, several radiocarbon dates have been obtained from Late Prehistoric occupations in Clear Creek Canyon. The North Cedars Cave contained numerous brownware sherds, or pieces of ceramic (in mixed deposits) and yielded dates of AD 1400s and 1600s (Janetski and others 2000).

3.12.5 Historic Context

Occupying the study area at the time of European-American arrival were the Pah Vent (or Pahvant) Utes. According to Steward (1938, 227), the traditional territory of the Pah Vent Utes stretched from “the deserts surrounding Sevier Lake west of the Wasatch Mountains nearly to the Nevada border.” Known villages were located near the modern communities of Kanosh, Deseret, Black Rock, Holden, Lynndyl, and Scipio. The first documented Europeans in Utah arrived in 1776–1777, led by the Spanish Catholic Fathers Dominguez and Escalante.

Trappers, explorers, and emigrants passing through to the Pacific coast followed them. Between the early 1830s and the late 1840s, users of what is now known as the Old Spanish Trail navigated numerous routes, many of which cross parts of the BLM Richfield and Fillmore Field Office jurisdictions (NPS 2005). European settlement of the study area ranged from 1848 in Sanpete County to the 1880s in Wayne County and was predominantly accomplished by Mormon pioneers. There were about 500 Pah Vent Utes when the Mormons arrived in the 1860s to build Cove Fort (Van Cott 1997). Mormon pioneers noted the presence of Indian corn cultivation along a nearby creek bed, which indicated that these Utes practiced maize horticulture to some extent.

A gold and silver boom in the Tushar Mountains in the 1890s and early 20th century spawned several small towns in Piute County. When the mines were no longer productive, the population boom reversed itself. Later, lead, zinc, alunite, and uranium were mined. Over the years, ranching has been continued as a use of public lands.

3.12.6 Historic Properties Identified

A total of 55 historic and prehistoric properties were identified within the APE for the project encompassing both Alternatives B and C (see Appendix G). All cultural resources identified within the APE were evaluated for eligibility for listing on the National Register in consultation with the SHPO and Federally recognized tribes as previously noted. SEA has subsequently determined that 36 properties meet the National Register eligibility criteria. Table 3.12-1 below summarizes the results of the cultural resources inventory survey completed for the project (MOAC 2005). For a detailed review of the cultural resources identified in the project area, see the cultural resources report, *Cultural Resources Inventory of the Central Utah Railroad Project in Sevier, SanPete and Juab Counties, Utah* (MOAC 2005), attached as Appendix G.

Criteria for evaluating the significance of resources for listing on the National Register are outlined in 36 CFR 800.10, National Register Criteria, and in handbooks that describe the National Register evaluation process. Four criteria are used to evaluate the significance of properties—Criterion A through Criterion D. Under all the criteria, the quality of significance is considered present in sites that possess integrity of location, design, setting, materials, workmanship, feeling, and association. However, quality of significance also serves to differentiate the criteria.[7]

[7] Criterion A: The quality of significance is present in sites that are associated with events that have made a significant contribution to the broad patterns of our history. Criterion B: The quality of significance is present in sites that are associated with the lives of persons significant in our past. Criterion C: The quality of significance is present in sites that embody the distinctive characteristics of a type, period, or method of construction, or 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: The quality of significance is present in sites that have yielded, or may be likely to yield, information important in prehistory or history.

Table 3.12-1. Historic Properties Identified within the Project Area

Site Number	Site Age/Type	Description	NRHP Eligibility and Criterion	Site Location	Comments
42Sv2342 Addendum	Historic – Rocky Ford Canal	15.6-mile earthen canal	Eligible – A	Crosses Alternatives B and C	Previously recorded in 1994, built in 1872, still in use; located on private land.
42Sv2343 Addendum	Historic – Vermillion Canal	24.2-mile earthen canal	Eligible – A	Crosses Alternatives B and C	Previously recorded in 1994, built around 1878; located on private land.
42Sv2344 Addendum	Historic – Piute Canal segment	36-mile earthen canal	Eligible – A	Crosses Alternative C	Previously recorded, built around 1910.
42Sv2502 Addendum	Historic – Former Denver & Rio Grande Western Railroad	Rail bed only as tracks removed 1987–1988	Eligible – A	Crosses Alternatives B and C	Previously recorded; located on private land.
42Sv2737	Prehistoric – LIthic scatter	Small, low-density lithic scatter on a slope	Not Eligible	Within APE of load-out facility area	Lithic material testing location; located on private land.
42Sv2738	Historic – Farmstead	Consists of 2 single-room structures, roads, fences, 2 corrals	Eligible – D	Within APE of Alternative B	Historic artifacts scattered throughout the site; located on private and state land.
42Sv2739	Prehistoric – Lithic scatter	Small, dispersed lithic scatter in plowed field	Eligible – D	Within APE of Alternative B	Artifacts include lithic debitage, 2 cores, 1 mano; located on private land.
42Sv2740	Historic – Corral	Large corral with numerous enclosures	Not Eligible	Within APE of Alternative B	Much of the structure disassembled; located on private land.
42Sv2741	Historic – Hay derrick	Partially collapsed, 11.75 feet tall	Not Eligible	Within APE of Alternative B	No associated artifacts.
42Sv2742	Historic – Hay derrick	Intact, 22.8 feet tall	Eligible – C	Within APE of Alternative B	No associated artifacts.
42Sv2743	Historic – Corral	Large corral and fence	Not Eligible	Within APE of Alternative B	Also includes collapsed wood shelter; located on private land.
42Sv2744	Historic – Little ditch	2- to 3-foot-wide earthen ditch	Not Eligible	Within APE of Alternative B	Merges with Rocky Ford Canal; located on private land.
42Sv2746	Prehistoric – Lithic scatter	Low-density scatter on a small ridge	Not Eligible	Within APE of Alternatives B and C	Artifacts include debitage and hammerstone; located on private land.
42Sv2747	Historic – Farmstead	Collapsed wood and brick structure with associated features	Eligible – D	Within APE of Alternatives B and C	Artifacts include a plow that could date to mid-1800s; located on private land.
42Sv2748	Historic – Farm equipment	Concentration of abandoned farm equipment	Not Eligible	Within APE of Alternative C	Equipment could date to early 1900s; located on private land.
42Sv2749	Prehistoric – LIthic scatter	Low-density scatter on a gentle slope	Not Eligible	Within APE of Alternative C	Artifacts include 12 pieces of debitage; located on state land.
42Sv2750	Prehistoric – Lithic scatter	Small scatter on Sevier Valley floor	Not Eligible	Within APE of Alternative C	Artifacts include 3 bifaces/ fragments; located on state land.
42Sv2751	Prehistoric – Lithic scatter	Low-density scatter on a low ridge	Not Eligible	Within APE of Alternative C	Artifacts include debitage and several bifaces; located on BLM land.

Site Number	Site Age/Type	Description	NRHP Eligibility and Criterion	Site Location	Comments
42Sv2752	Historic – Trash scatter	Historic trash dump	Not Eligible	Within APE of Alternative C	Artifacts date to early 1900s; located on BLM land.
42Sp18 Addendum	Prehistoric – Temporary camp	High-density lithic scatter	Eligible – D	Within APE of Alternative B	Originally recorded in 1975, re-recorded as 42SP211 in 1989; located on state and private land.
42Sp19 Addendum	Prehistoric – Temporary camp	High-density dispersed scatter on a ridge	Eligible – D	Within APE of Alternative B	Originally recorded in 1975. Material testing and processing area; located on state and private land.
42Sp213 Addendum	Prehistoric – Temporary camp	Large, dispersed lithic scatter	Eligible – D	Within APE of Alternative B	Originally recorded in 1989. Archaic and Formative period artifacts found on site. Heavily looted; located on state and private land.
42Sp570	Prehistoric – Lithic scatter	Medium-density scatter on a low ridge	Eligible – D	Within APE of Alternative B	Artifacts include debitage, 7 bifaces, 2 cores; located on private land.
42Sp571	Prehistoric – Lithic scatter	Small scatter on low ridge	Eligible – D	Within APE of Alternative B	Site shows signs of core-reduction activities; located on private land.
42Sp572	Historic – Piute Canal segment	Historic earthen dam	Eligible – A and D	Within APE of Alternatives B and C	36 miles long. Extension of Sevier River Canal; state, BLM, and private land; note different portions previously recorded under 42Sv2344; located on state, BLM, and private land.
42Sp573	Prehistoric – Lithic scatter	Small scatter on gentle, south-facing slope	Eligible – D	Within APE of Alternatives B and C	Apparent material testing area; located on private land.
42Sp575	Historic – Trash scatter	Large dispersed trash scatter	Not Eligible	Within APE of Alternatives B and C	Appears to represent multiple dumping episodes; located on private land.
42Sp579	Historic – Trash scatter	Small. dispersed scatter adjacent to a road	Not Eligible	Within APE of Alternatives B and C	Artifacts date to early to mid-1900s; located on state land.
42Sp580	Historic – Trash scatter	Low-density can scatter	Not Eligible	Within APE of Alternatives B and C	Appears to date to post-1920; located on state and private land.
42Sp581	Prehistoric – Lithic scatter	Small scatter on an east/southeast-facing slope	Not Eligible	Within APE of Alternatives B and C	Artifacts include lithic debitage, a core, and a biface fragment; located on private land.
42Sp582	Historic – Powerline poles	Series of collapsed or dismantled poles	Not Eligible	Within APE of Alternatives B and C	Probably provided power to small towns in Sevier Valley; located on state and private land.
42Sp583	Historic – Trash scatter	Small, isolated scatter	Not Eligible	Within APE of Alternatives B and C	Artifacts could date to 1930–1950; located on private land.
42Sp584	Prehistoric – Lithic scatter	Large, dispersed scatter	Eligible – D	Within APE of Alternative B	Artifacts suggest Archaic or Fremont cultural affiliation; located on state land.

Site Number	Site Age/Type	Description	NRHP Eligibility and Criterion	Site Location	Comments
42Sp585	Prehistoric – Temporary camp	Large, dispersed scatter on top and slopes of a low ridge	Eligible – D	Within APE of Alternative B	Contains 2 artifact concentrations and 3 fire-related features; located on state land.
42Sp586	Prehistoric – Temporary camp	Small camp on slopes of a small ridge	Eligible – D	Within APE of Alternative B	Site contains a hearth feature; located on state land.
42Sp587	Prehistoric – Temporary camp	High-density scatter on small ridge	Eligible – D	Within Alternative B	Presence of 2 Elko Series projectile points suggests Archaic or Fremont affiliation; located on state land.
42Sp588	Prehistoric – Lithic scatter	Medium-sized dispersed scatter on eastern slope of a ridge	Eligible – D	Within Alternative B	Fire-cracked rock scattered throughout the site; located on state land.
42Sp589	Prehistoric – Temporary camp	Dispersed scatter on a knoll	Eligible – D	Within Alternative B	Presence of Rose Spring Series projectile point suggests Late Prehistoric affiliation; located on state land.
42Sp590	Prehistoric – Temporary camp	On eastern slope of a low knoll	Eligible – D	Within Alternative B	Site contains lithic scatter, 2 cores, groundstone and biface fragments, and a hearth feature; located on state land.
42Sp591	Prehistoric – Temporary camp	Large scatter on ridge top and slopes	Eligible – D	Within Alternative B	Site contains numerous tools, debitage, and 2 hearth features; located on state land.
42Sp592	Prehistoric – Lithic scatter	High-density scatter on top and slopes of a knoll	Eligible – D	Within Alternative B	Site contains numerous cores, bifaces, and an Archaic projectile point; located on state and private land.
42Sp593	Prehistoric – Lithic scatter	Small scatter on eastern slope of a low knoll	Eligible – D	Within Alternative B	Site exhibits potential for additional buried materials; located on private land.
42Sp594	Prehistoric – Habitation AREA	Large, dispersed lithic scatter with tools and 2 rock alignments	Eligible – D	Within Alternative B	Presence of Rose Spring Series projectile point suggests Late Prehistoric affiliation; located on state land.
42Sp595	Prehistoric – Camp; and Historic – Trash site	Artifact scatter on top and slopes of a low ridge	Eligible – D	Within Alternative B	Very large lithic scatter with numerous tools, possible features; located on state land.
42Sp596	Prehistoric – Lithic scatter	Moderately dense scatter on a knoll	Eligible – D	Within Alternative B	Artifacts include lithic debitage, 7 tools; located on state land.
42Sp597	Prehistoric – Lithic scatter; Historic – Trash site	Dual-component dispersed site	Eligible – D	Within Alternative B	Artifacts include debitage and tools; located on BLM land.
42Sp598	Prehistoric – Lithic scatter	Sparse scatter on westward ridge slope	Eligible – D	Within Alternative B	Site contains debitage, tools, and 2 hearth features; located on BLM land.
42Sp603	Prehistoric – Lithic scatter	Low-density scatter on low ridge	Not Eligible	Within Alternative C	Consists of 2 loci, no diagnostics; located on BLM land.

Site Number	Site Age/Type	Description	NRHP Eligibility and Criterion	Site Location	Comments
42Sp604	Prehistoric – Lithic scatter	Medium-density scatter on a very low ridge	Eligible – C	Within Alternative C	Artifacts include debitage and bifacial tools; located on BLM land.
42JB1041 Addendum	Historic – Union Pacific Railroad	Two tracks and remains of 2 stockyard buildings	Eligible – A, D	Within Alternative B	Referred to as Track 106, Station 133, crossing #806-789T; located on private land.
42JB1396	Prehistoric – Lithic scatter	Large, dispersed scatter in pasture	Eligible – D	Within Alternative B	Artifacts include debitage, bifaces; small point fragment.
42JB1397	Prehistoric – Lithic scatter	High-density scatter in a pasture	Eligible – D	Within Alternative B	Artifacts include debitage, 5 bifaces; 1 core.
42JB1398	Prehistoric – Lithic scatter	Small scatter in a pasture	Not eligible	Within Alternative B	Artifacts include debitage and portable slab metate.
42JB1399	Prehistoric – Lithic scatter	Low-density scatter on relatively flat terrain	Eligible – D	Within Alternative B	Artifacts include debitage, 3 tools, fire-cracked rock, and a Rose Spring series projectile point.
42JB1400	Prehistoric – Lithic scatter	Large dispersed scatter on a knoll	Eligible – D	Within Alternative B	Artifacts include debitage, tools, fire-cracked rock. Elko and Pinto Series projectile points suggest Archaic affiliation.

3.13 Environmental Justice

3.13.1 Background

Environmental justice addresses equity in all Federally funded programs and activities in compliance with Title VI of the 1964 Civil Rights Act and Executive Order 12898, Federal Actions To Address Environmental Justice in Minority and Low-Income Populations. The Board has not issued rules or guidance that specifically address environmental justice. For this EIS, guidance from other Federal agencies including the U.S. Department of Transportation (USDOT), the Council on Environmental Quality, and the Federal Highway Administration has been used.

Environmental justice guidelines for public outreach do not require that more public outreach be conducted for low-income and minority populations than for other populations. Rather, these guidelines require that the public outreach process be designed with attention given to some of the particular obstacles that environmental justice communities might face. Multilingual advertisements and presentation materials, diverse means of outreach and publicity, and careful selection of public hearing times and locations are all elements of such an approach.

SEA took steps to ensure that public outreach was conducted so that minority and low-income communities were informed about the proposed project and were able to voice any concerns and requests regarding the environmental review process. These procedures are summarized in Section 1.8.1, Public Participation.

Definitions. *Environmental justice* is a term used to describe the fair and equitable treatment of minority[8] and low-income[9] people with regard to all Federally funded projects. Fair treatment means that no minority or low-income population should be forced to bear a disproportionately high share of negative environmental effects. Fair treatment also includes meaningful involvement and opportunities for minority and low-income people to participate in the decision-making process.

Study Area. The proposed project would travel through portions of Juab, Sanpete, and Sevier Counties. The social study area includes the actual alternatives, land adjacent to the alternatives, and any populations in these counties that might be affected by the proposed project. The proposed alternatives would not enter any city limits (one or more alternatives would pass within 1,100 feet of the Salina city limits and within 2,900 feet of the Redmond city limits). However, Salina and Redmond city data were included for the purpose of examining existing conditions regarding the truck traffic currently affecting these communities. This section provides a summary of the environmental justice communities in the social study area.

Census Block Data. For this analysis, the 2000 U.S. census data were used as a starting point to gain a general understanding of the minority and low-income populations in the social study area. Additional sources of information were used to supplement census data because census block groups are relatively large (the entire project crosses through only four census blocks), census information was likely collected in 1998 and 1999, and the proposed project would be primarily located in non-populated areas. Additional sources of information included public meetings, community coordination, local school data, housing authority information, and discussions with local agency officials. See the *CURP DEIS Agency and Public Scoping Summary Report* for details about the project's public involvement efforts (HDR 2004).

Figure 3-14, Environmental Justice, shows the location of the census block groups in the study area.

[8] FHWA and USDOT define a minority as a person belonging to one of the following five groups: Black, Hispanic, Asian, American Indian or Alaskan Native, or Native Hawaiian or other Pacific Islander (USDOT 1998).

[9] FHWA and USDOT define a low-income person as having a household or median income below the poverty thresholds defined by the U.S. Department of Health and Human Services. For 1999 (the year that census data were collected), the poverty threshold was $16,700 per year for a family of four and $8,240 per year for a single person (USDOT 1998).

3.13.2 Minority Populations

Table 3.13-1 presents information on the racial and ethnic populations, as well as low-income populations, in the study area using 2000 U.S. census data for the state, counties, cities, and census tracts. The study area is predominantly made up of Caucasian, non-Hispanic persons. All the areas that were evaluated have percentages of racial minorities and ethnic or Hispanic persons that are lower than the percentages for Utah overall.

Table 3.13-1. Minority and Low-Income Populations in Utah and the Study Area

Area	Total Population	Caucasian	Racial Minorities	Ethnic Minorities	Persons below Poverty Level
State					
Utah	2,233,169	89.2%	10.8%	9.0%	9.4%
County					
Juab County	8,489	96.6%	3.4%	2.6%	10.4%
Sanpete County	23,376	92.4%	7.6%	6.6%	15.9%
Sevier County	18,961	95.6%	4.4%	2.6%	10.8%
City/Town					
Salina	2,393	96.7%	1.5%	2.8%	13.8%
Redmond	788	98.2%	0.2%	1.9%	12.3%
Census Tract					
102 (Juab County)	3,383	96.0%	4.0%	2.9%	11.2%
9723 (Sanpete County)	4,139	89.8%	10.3%	7.6%	14.9%
9725 (Sanpete County)	4,144	89.5%	10.5%	2.8%	11.3%
9751 (Sevier County)	4,562	97.4%	2.6%	2.1%	10.5%

Source: U.S. Census Bureau 2000, Summary File 3

Minority Students. To verify the information indicated by the census data, SEA obtained information about minority students in the Sevier County School District. Three schools in this district draw students from the study area (see Table 3.13-2).

Table 3.13-2. Minority and Low-Income Students in Utah and the Study Area

School (Area)	Racial Minority Students	Ethnic Minority Students	Students Eligible for Free or Reduced-Price Lunch
Utah (state average)	1.07%	10.44%	34.24%
North Sevier High (Salina)	0.91%	1.52%	30.30%
North Sevier Middle (Salina)	1.19%	0.40%	39.29%
Salina Elementary School (Salina)	1.75%	2.62%	46.07%
Three-school average	**1.28%**	**1.51%**	**38.55%**

Source: National Center for Education Statistics 2005

Two of the schools have percentages of racial minorities that are slightly higher than the Utah state average (North Sevier Middle and Salina Elementary School have three and seven racial minority students, respectively). All three schools have percentages of ethnic minorities that are lower than the Utah state average.

Summary of Minority Populations. There are few minority populations present in the study area. However, all the areas that were evaluated have percentages of racial minorities and ethnic or Hispanic persons that are lower than the percentages for Utah overall.

3.13.3 Low-Income Populations

Table 3.13-1 above, Minority and Low-Income Populations in Utah and the Study Area, presents information on low-income populations in the study area according to the 2000 U.S. census data for state, county, city, and census tracts. All the areas that were evaluated have greater percentages of households below the poverty level than for Utah overall.

Low-Income Students. To verify the information indicated by the census data, SEA obtained information about low-income students in the Sevier County School District. Three schools in this district draw students from the study area. Students are eligible for reduced-price lunch when their parents' income is 185% or less of the U.S. Department of Health and Human Services poverty guidelines, and they are eligible for free lunch when their parents' income is 130% or less of these guidelines.

Two of the schools have percentages of students eligible for free or reduced-price lunch that are higher than the percentage for Utah overall. This is consistent with census data that indicated higher percentages of persons under poverty level in the study area than for Utah overall.

Low-Income Housing. To further define low-income communities in the study area, SEA examined several resources including data from the U.S. Department of Housing and Urban Development. This agency reports that there are no low-income housing developments or subsidized apartments in the study area (HUD 2006).

Summary of Low-Income Populations. The study area contains low-income populations. These populations are primarily located within the city limits in portions of Juab, Sanpete, and Sevier Counties.

3.13.4 Vulnerable Age Groups

Although children (age 18 and under) and senior citizens (age 65 and over) are not specifically defined as environmental justice populations in Title VI and Executive Order 12898, they are considered vulnerable age groups. According to the census data, all of the counties and cities (Salina, Redmond, and Aurora) in the study area have percentages of senior citizens that are higher than the percentage for Utah overall, and there is one senior citizen center in the study area in Salina (see Figure 3-14, Environmental Justice).

3.14 Recreation

3.14.1 Background

This section discusses recreation resources along the proposed alternatives. The study area for recreation resources includes any recreation areas and recreation access points within 500 feet of the proposed alternatives (see Figure 3-15, Recreation). Recreation activities in the study area include off-highway vehicle (OHV) use, camping, fishing, hiking, horseback riding, hunting, and boating. On BLM-administered land, camping, backpacking, sightseeing, and OHV use are the most common recreational uses (BLM 1987).

3.14.2 Recreation Resources

3.14.2.1 BLM Recreation

Although there is BLM-administered land west of the proposed alternatives through most of the study area, only a small portion of the proposed alternatives actually passes through BLM-administered land. BLM lands are designated multiple use, with recreation being one of several designated multiple uses. Recreation uses include hiking, camping, and OHV use.

Two BLM field offices oversee the BLM-administered lands in the study area. The Richfield Field Office has not designated any Special Recreation Management Areas, but the Fillmore Field Office has designated the Sevier Bridge Reservoir as a Special Recreation Management Area (BLM 1987).

3.14.2.2 Paiute ATV Trail System

The Paiute all-terrain vehicle (ATV) trail system is located in Sevier, Piute, Beaver, and Millard Counties. Its network of trails crosses mountain ranges, canyons, and deserts and links the local communities with public lands and national forests. The Paiute trail system receives approximately 70,000 visitors a year and is a major recreational attraction and investment for the local communities (Utah.com 2005). This trail is primarily south of Salina, but the northern part of the trail is near the project's southern terminus.

3.14.2.3 Chicken Creek Reservoir

Chicken Creek Reservoir is located near the northern terminus of the study area and is a popular spot for bird watching. The proposed project would be about 0.5 mile north of Chicken Creek Reservoir (see Figure 3-15, Recreation).

3.14.2.4 Yuba Lake Recreation Area and Sevier Bridge Reservoir

The Sevier Bridge Reservoir is located between the Valley Mountains and the San Pitch Mountains between Gunnison and I-15. The Sevier Bridge Reservoir is privately owned by multiple irrigation companies and is primarily used for irrigation. The primary use of the

water is for irrigation with recreational use of the reservoir as a secondary use (Utah Division of Water Quality 1993).

The Sevier Bridge Reservoir is also known as Yuba Lake. Yuba Lake Recreation Area is located near the Sevier Bridge Reservoir dam, and the recreation area and lake are popular recreation sites for outdoor enthusiasts. About 150,000 visitors use the Sevier Bridge Reservoir area every year (BLM 2004). Due to dam repair and low water levels during the past 8 years, visitation had dropped. Visitation began to increase between 2002 and 2004 with 2004 having 138,233 visitors (Finger 2006).

Activities include boating, camping, OHV use, fishing, and waterfowl hunting (during the designated hunting season). The recreation area has many public-use beaches, boat ramps, and campgrounds including Oasis Campground, Eagle View Campground, and Painted Rocks Campground (Utah Division of Parks and Recreation 2005). Oasis Campground is located northwest of Scipio. Eagle View and Painted Rocks Campgrounds are located on the east side of the Sevier Bridge Reservoir near Fayette along SR 28.

The reservoir is accessible from many points on SR 28 north of Gunnison as well as from the old US 91 north of Scipio. Northern accesses to the reservoir are preferred because the south end of the reservoir is often shallow or dry.

The study area parallels the Sevier Bridge Reservoir on the east side for about 2 miles, then crosses the reservoir at a point called Yuba Narrows and parallels the reservoir on the west side for about 3 miles. The proposed project would cross the access road to Painted Rocks Campground about 200 yards east of the campground entrance.

For more information on existing noise levels near the Sevier Bridge Reservoir, see Section 3.9, Noise.

3.14.2.5 Sevier River

The Sevier Bridge Reservoir is an impoundment of the Sevier River. On the north side of the reservoir, the Sevier River is west of the proposed alternatives, but south of the reservoir the Sevier River is east of the proposed alternatives. The river is used for fishing and recreation. Several private and public hunting areas are located along the river, including the Sanpete Fish and Game Club hunting area.

3.14.2.6 Redmond Lake

Redmond Lake is located just south of Red Knolls about 0.25 mile southwest of Redmond near the southern terminus of the proposed project. The lake is used for irrigation, fishing, and boating, although the shallow, muddy water does not support extensive recreation. The Redmond WMA is located south of Redmond Lake. The management area is 567 acres of marshes, open water, and wet meadows. The management area allows bird watching and

waterfowl hunting and is accessed by foot only (Utah Division of Wildlife Resources, no date; Utah Division of Parks and Recreation 2001).

3.15 Aesthetics

3.15.1 Visual Resources

The scenic quality of an area depends on its visual resources—the physical features that make up the visible landscape including land, water, vegetation, and human-made features such as buildings, roadways, railways, and structures.

The study area for the visual resources analysis includes the proposed alternatives and the viewshed of the alternatives. The viewshed is defined as all areas from which physical changes associated with the proposed alternatives could be seen. The viewshed is influenced by existing topography, vegetation, and structures. Within the study area, viewer groups consist of residents of the towns of Fayette, Gunnison, Centerfield, Redmond, and Salina and people engaging in farming and recreation activities on public or private lands.

3.15.2 Conformance with BLM Visual Resource Management Program

Because parts of the proposed project would cross BLM-administered land, the visual quality assessment is based on BLM's Visual Resource Management (VRM) program. According to the current revision of the Richfield Resource Management Plan (BLM 2005), BLM has two VRM class designations for the visual study area: primarily Class IV with some Class III. The objective of Class III is to partially retain the existing character of the landscape, while the objective of Class IV is to allow major modifications to the character of the landscape (see Figure 3-16, Visual Resource Management).

3.15.3 Visual Characteristics

The landscape was inventoried for existing foreground, middle ground, and background views. Several critical views, called key observation points (KOPs), were selected to represent different types of views. Eleven KOPs in the study area were chosen to represent the visual resources of the area as shown in Figure 3-16, Visual Resource Management, and discussed in detail in Appendix I, Visual Resource Management.

The proposed project would extend northward from the Salina area up the Sevier River Valley to the southern reaches of the Juab Valley near Levan. The Sevier Valley is generally a broad, flat-to-rolling area that is divided by the Sevier River and its flanking alluvial terraces. The valley is generally bounded by the Pahvant Range and Valley Mountains to the west and the San Pitch Mountains to the east. A large portion of the valley floor supports farms that rely on an irrigation system composed of an extensive canal and ditch network.

Foreground and middle ground views in the study area largely consist of pasturelands and irrigated crops, while background views are largely dominated by the Pahvant Range, Valley Mountains, and San Pitch Mountains. Existing roadways, rail lines, utility rights-of-way (power lines), canals, and recreational infrastructure (campground and parking lots) contribute to the visual character of the study area.

3.15.4 Wild and Scenic Rivers

The Wild and Scenic Rivers Act of 1968 is designed to preserve free-flowing rivers with special values in their natural condition for the use and enjoyment of the public. The Act states that "in all planning for the use and development of water and related land resources, consideration shall be given by all Federal agencies involved to potential national wild, scenic, and recreational river areas…" (Wild and Scenic Rivers Act, Section 5(d)(1)).

As part of the current revision of the Richfield Resource Management Plan, the BLM Richfield Field Office performed a preliminary review of eligible rivers and streams and documented the findings in the *Wild and Scenic River Preliminary Eligibility and Tentative Classification Report* (BLM 2005). As described in the report, there are no potentially eligible wild, scenic, or recreational river segments in the study area.

The current Fillmore Field Office Resource Management Plan does not address wild and scenic river considerations (BLM 1987).

This page is intentionally blank.

Figure 3-1. Land Transportation Network

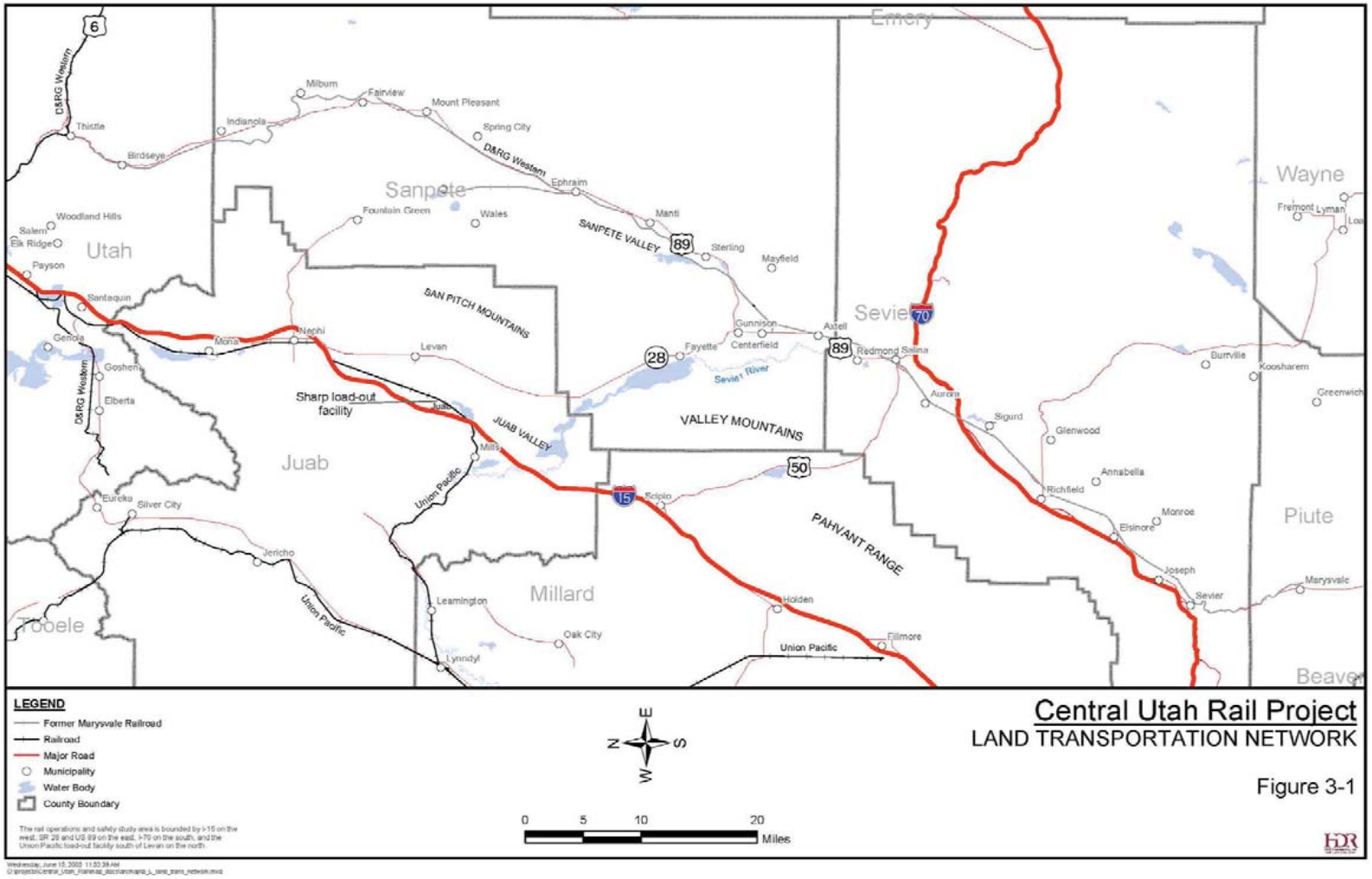


Figure 3-2. Land Ownership

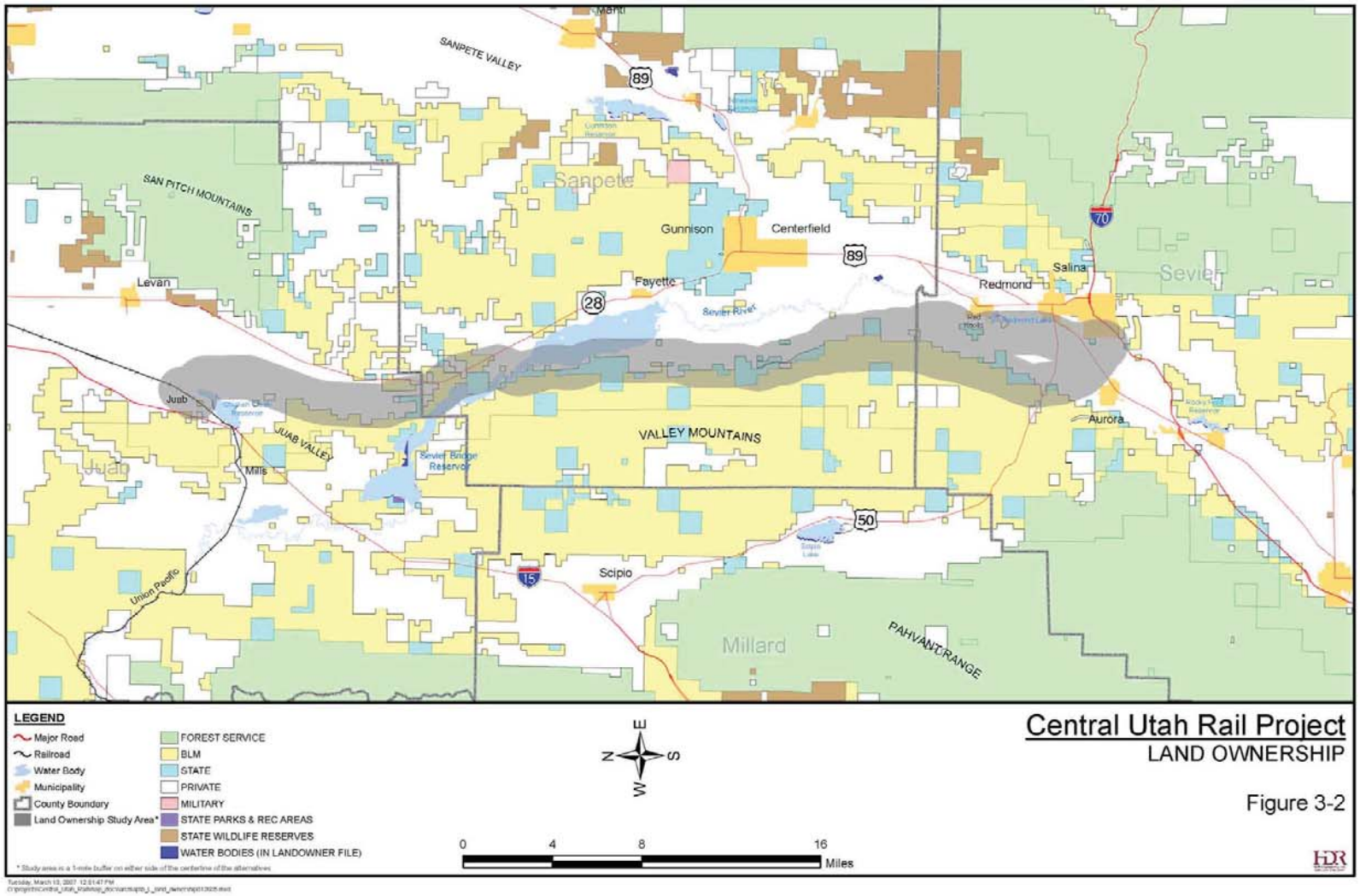


Figure 3-3. Grazing Allotments

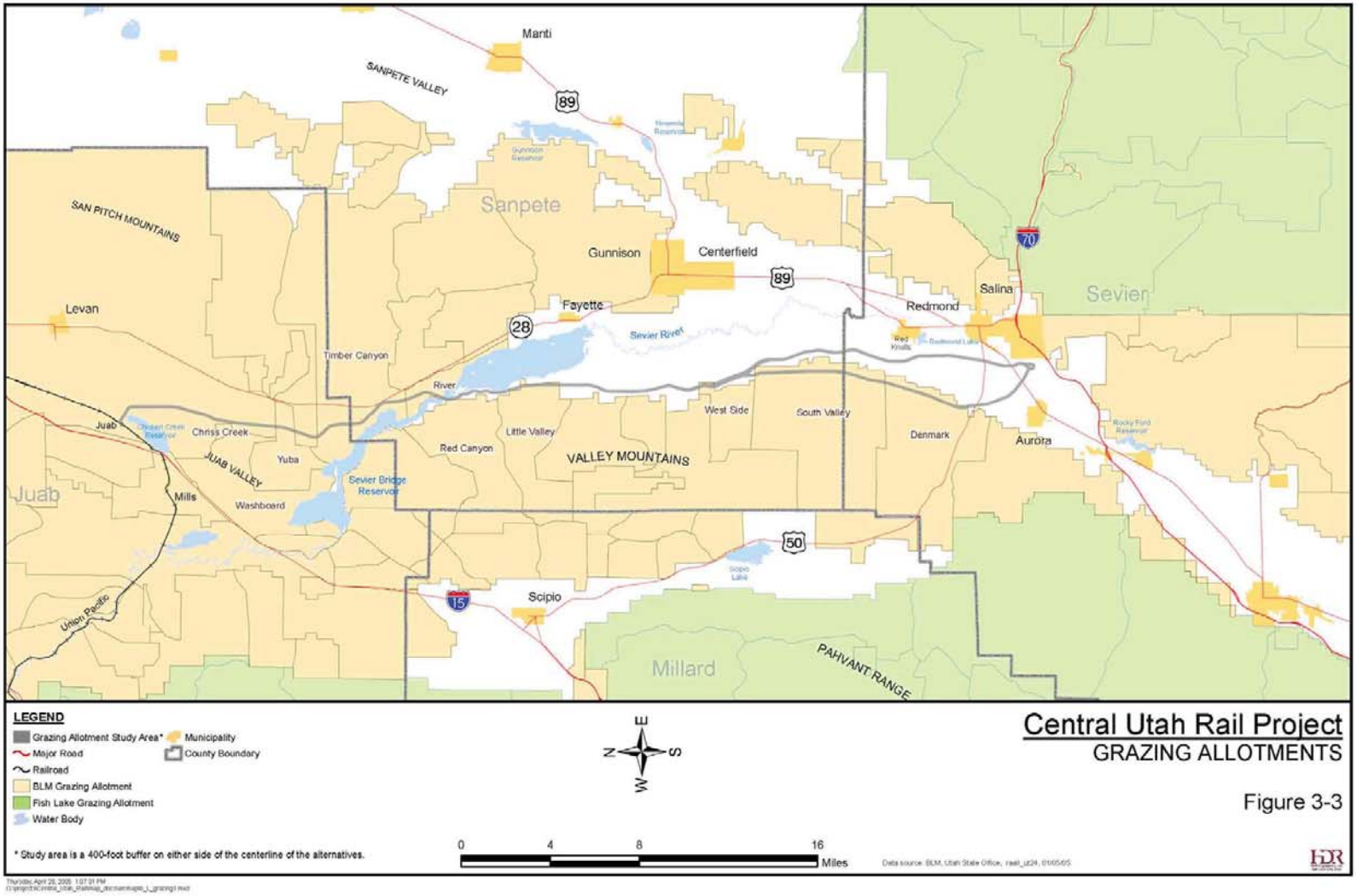


Figure 3-4. Vegetation

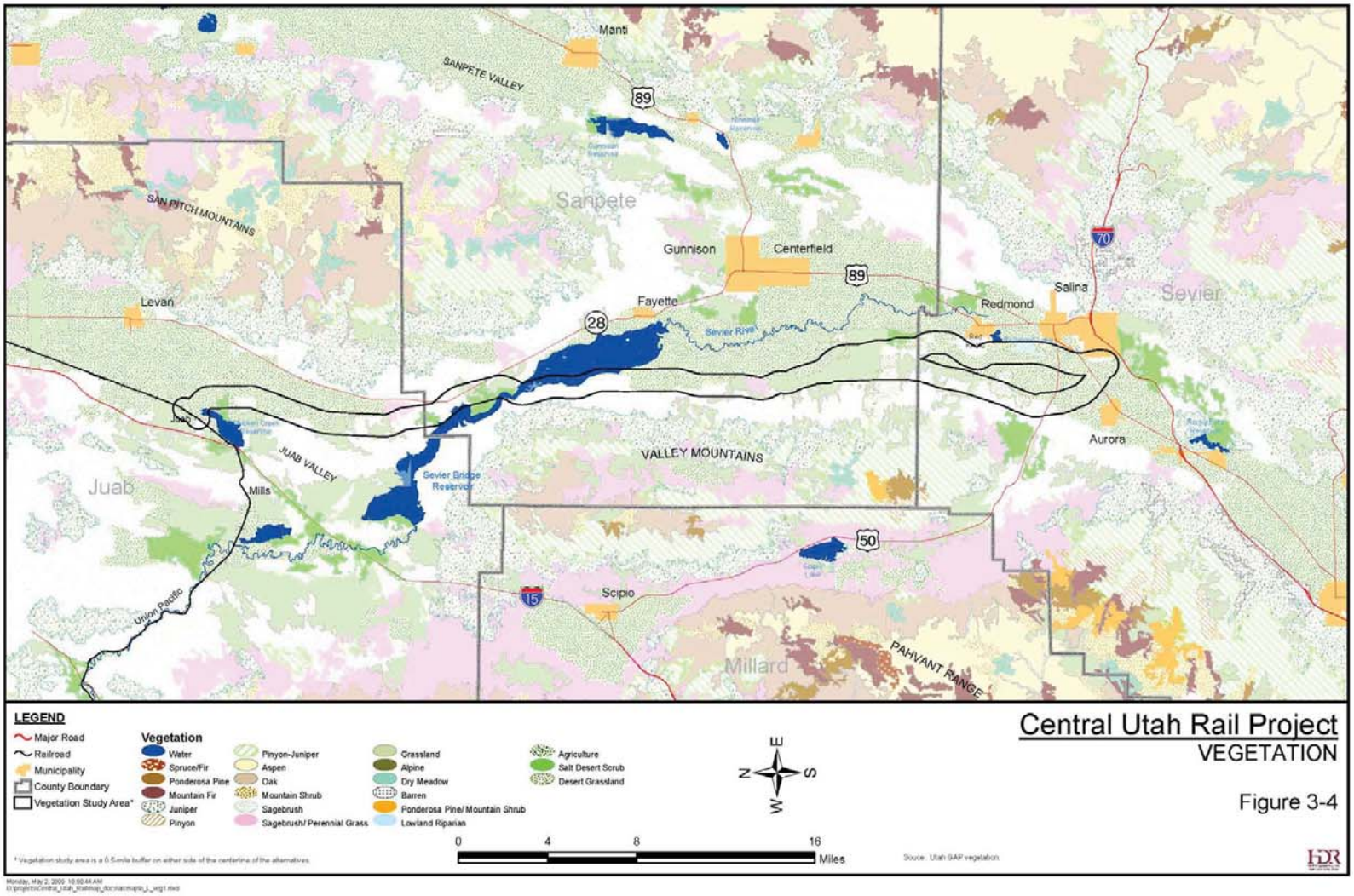


Figure 3-5. Elk and Mule Deer Seasonal Range

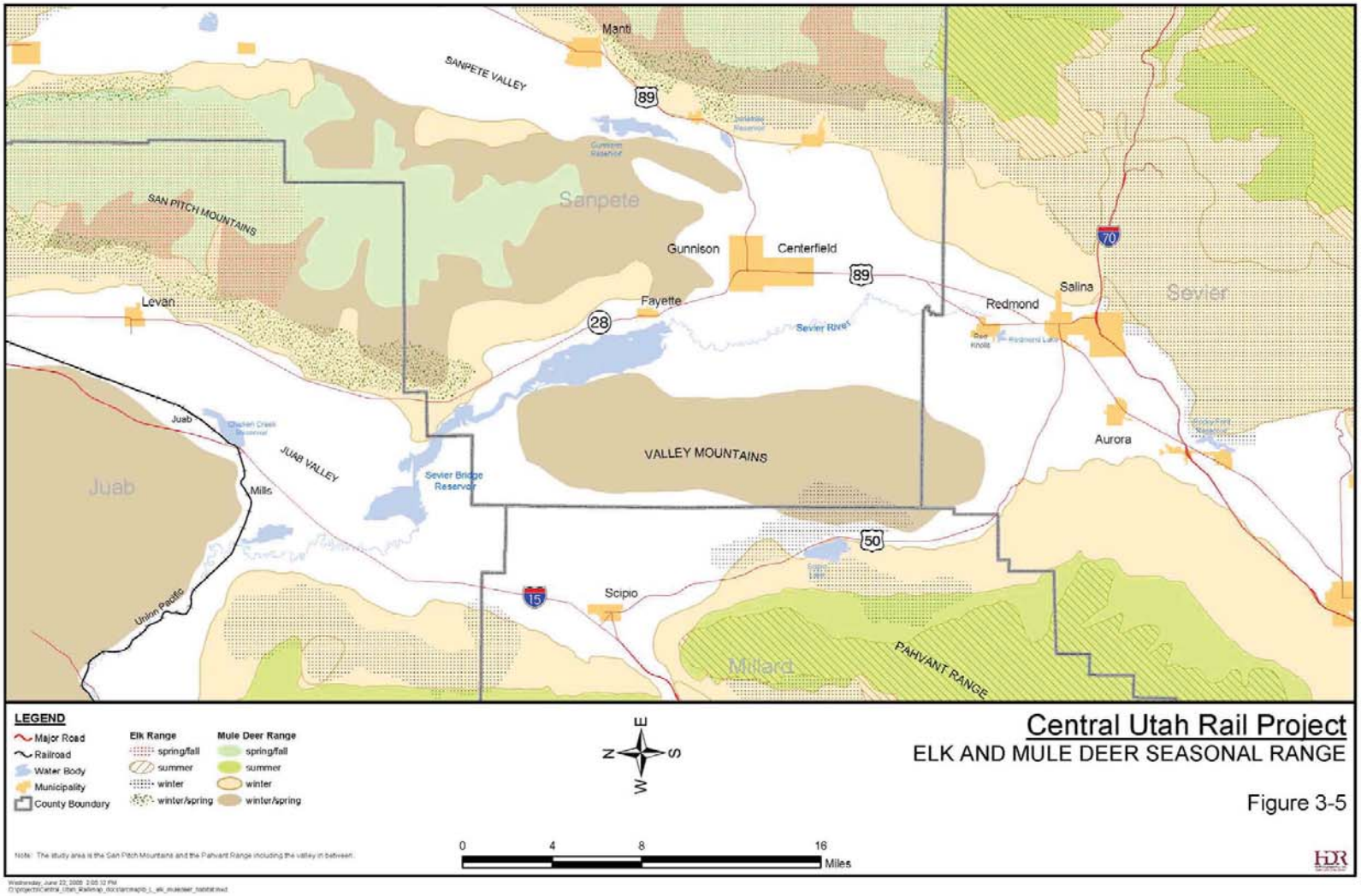


Figure 3-6. Water Resources

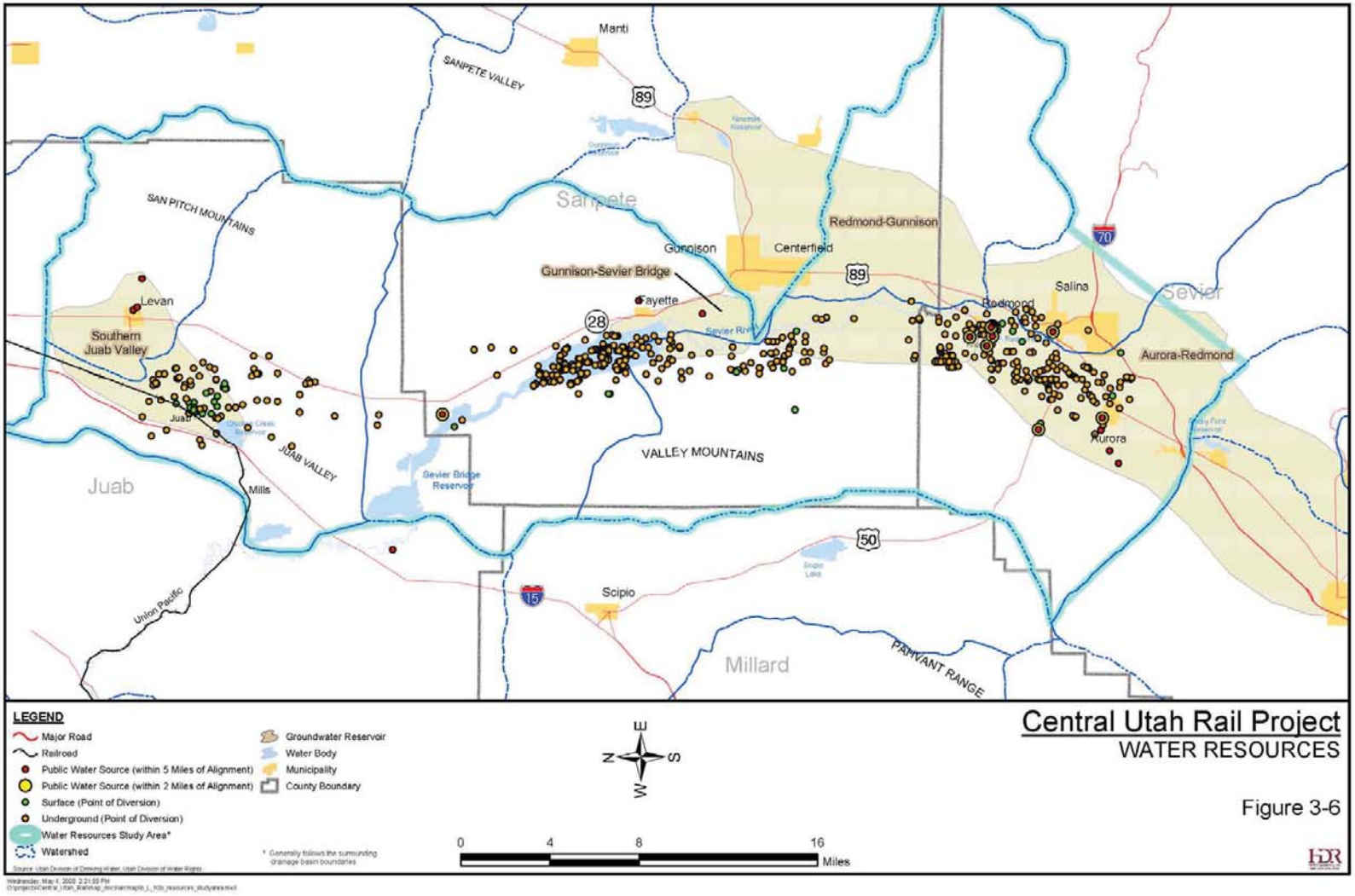


Figure 3-7. Floodplains

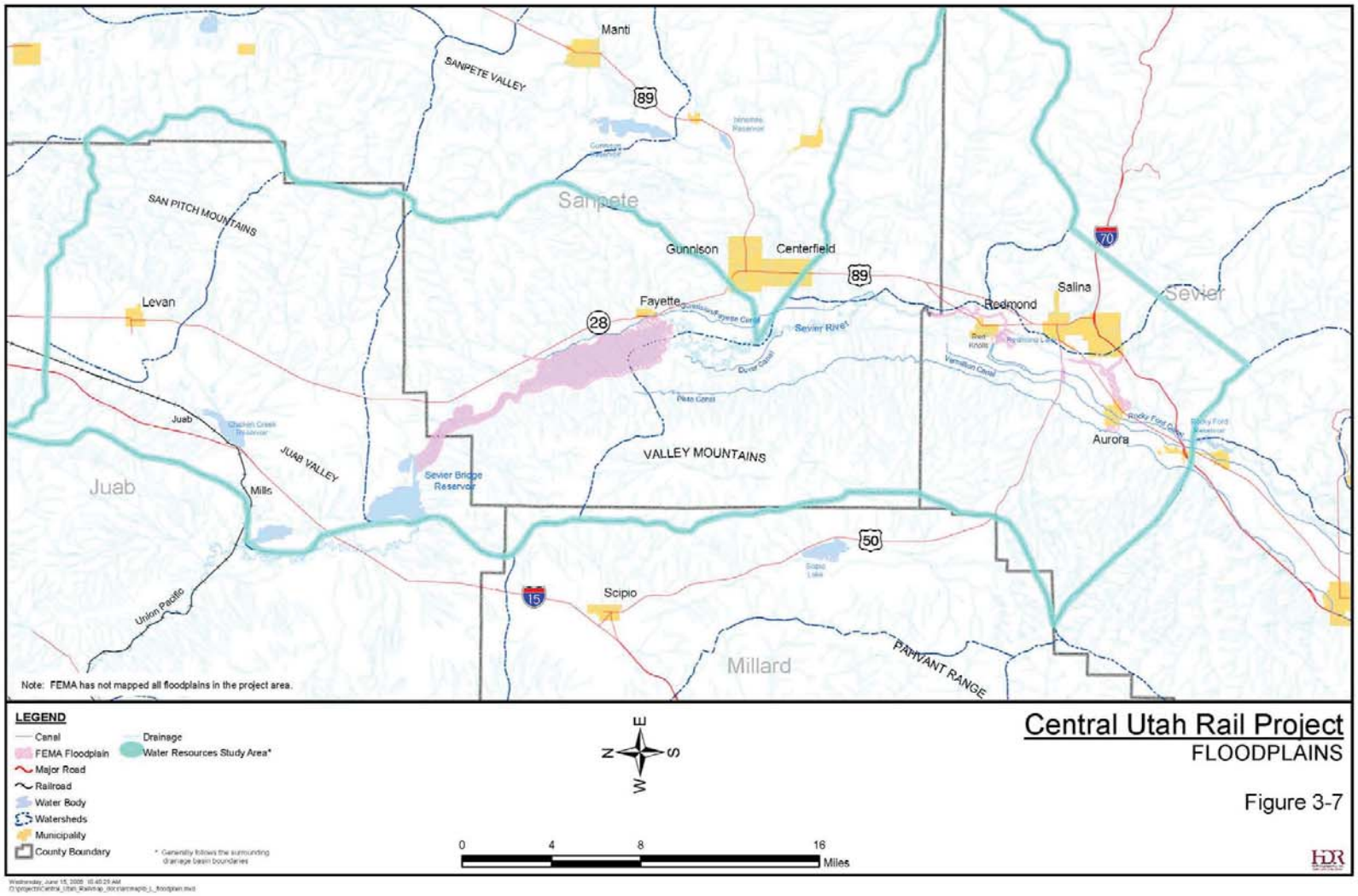


Figure 3-8. Preliminary Wetland Estimation

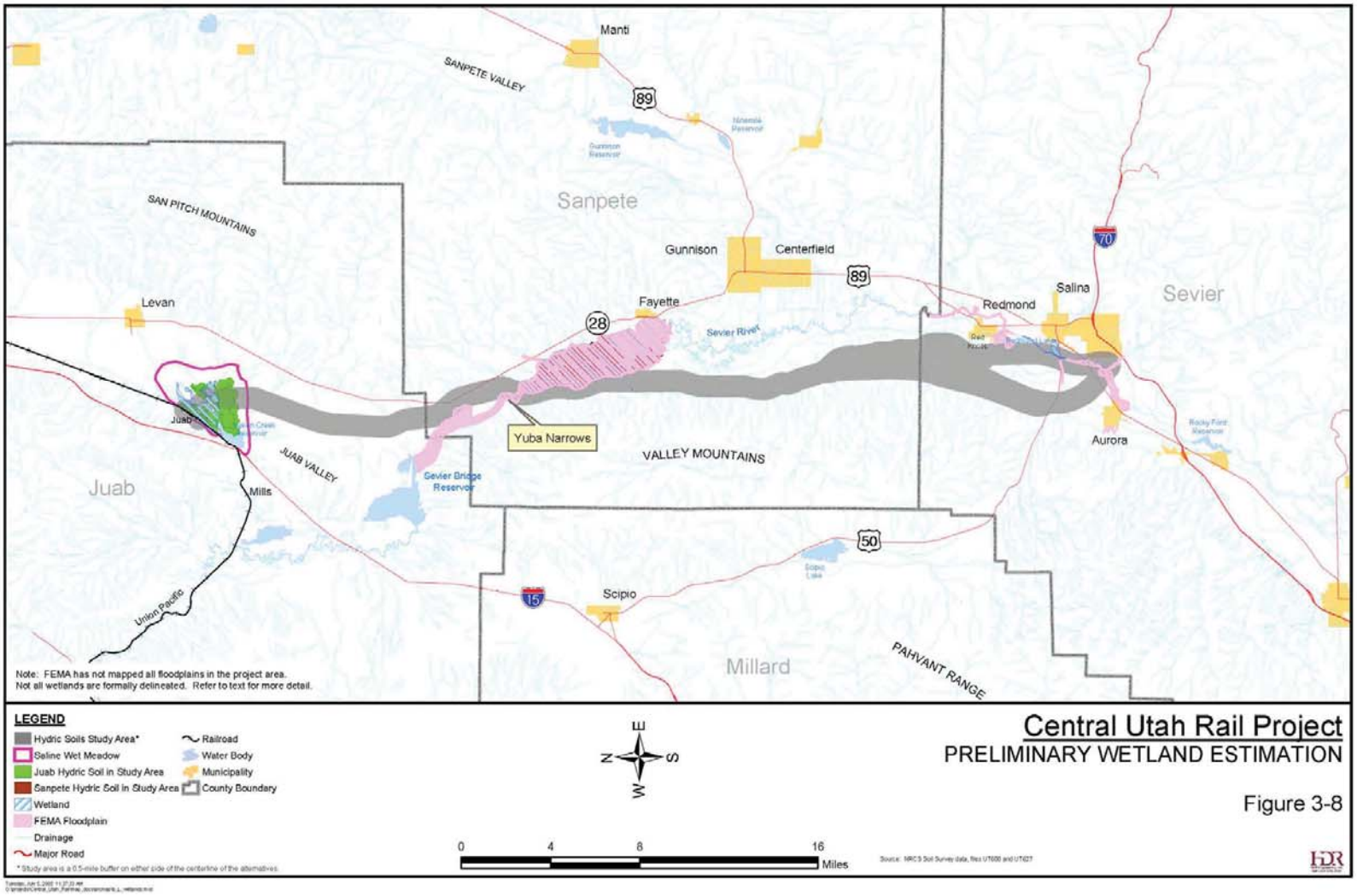


Figure 3-9. Mines

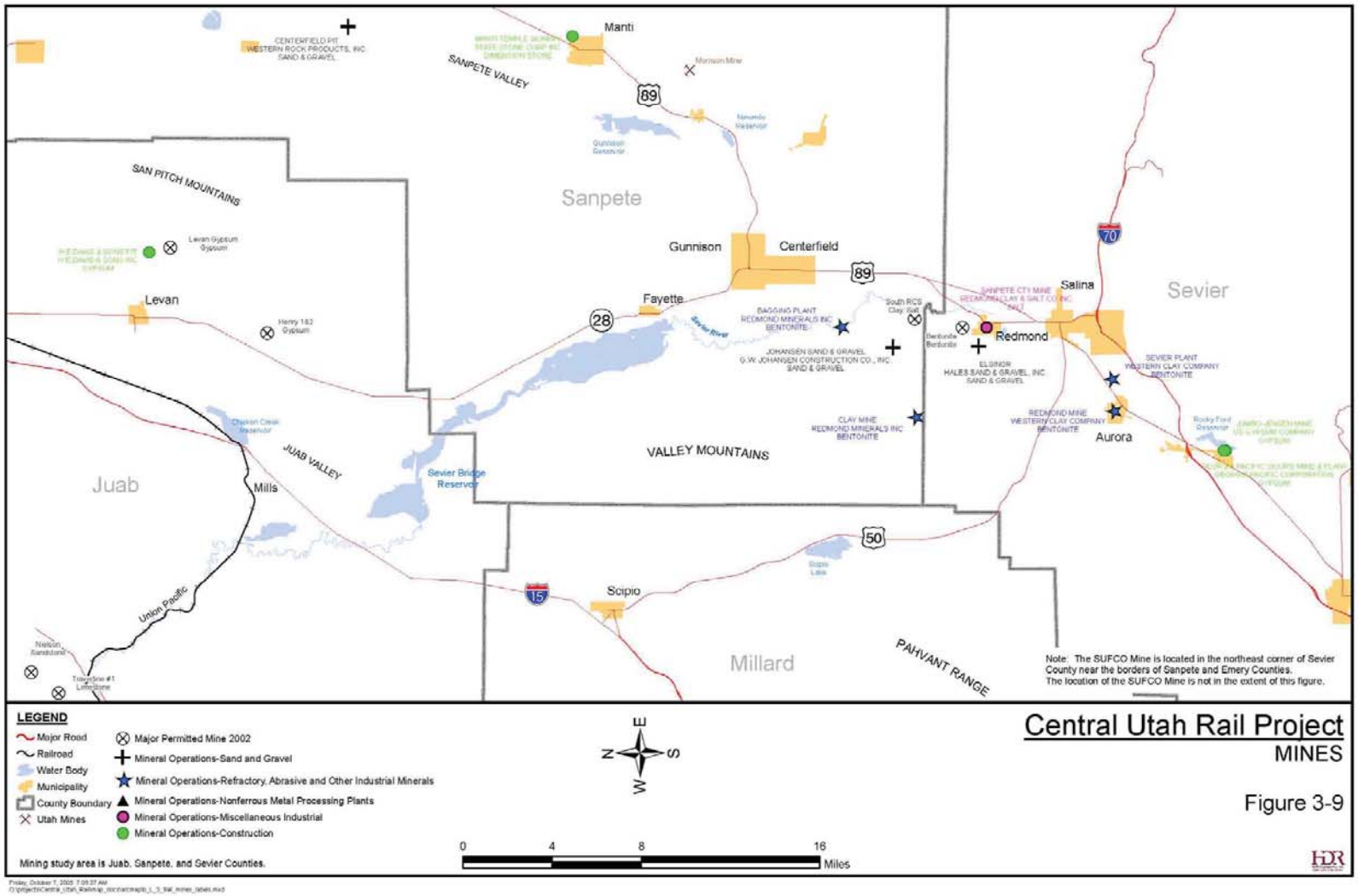


Figure 3-10. Prime and State Important Farmland

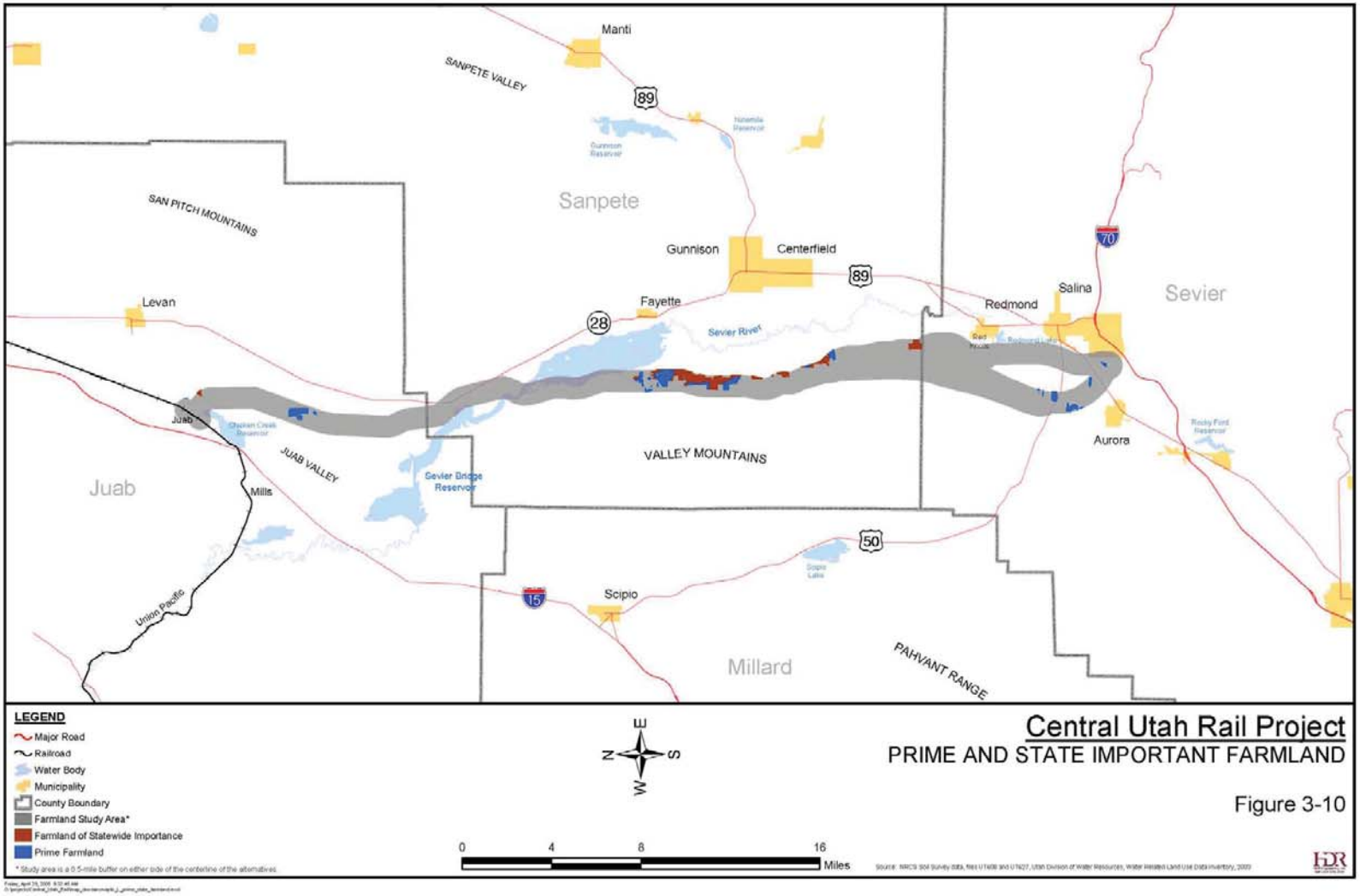


Figure 3-11. Potential Hazardous Waste Sites

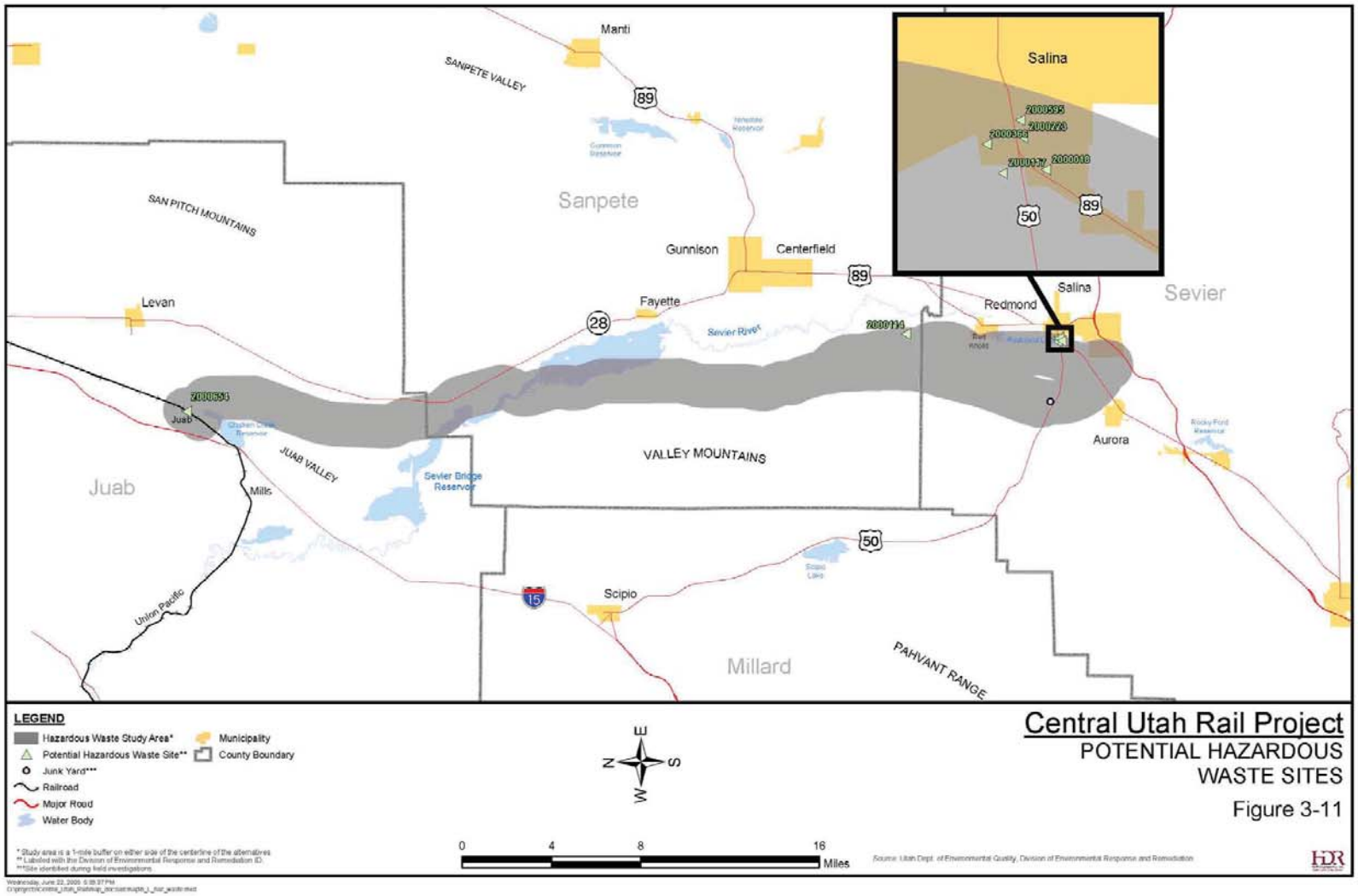


Figure 3-12. Noise Monitoring Locations

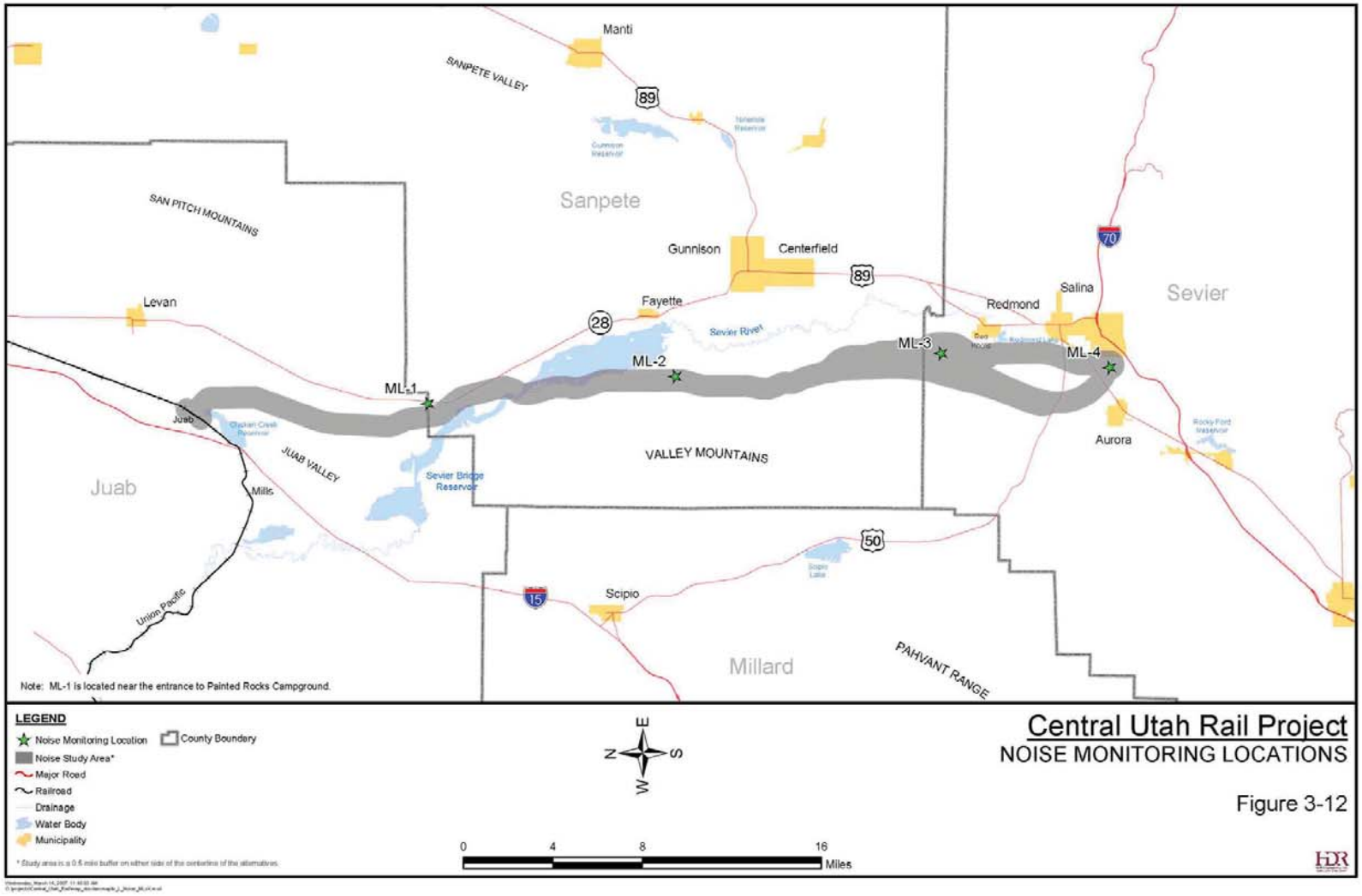


Figure 3-13. Energy

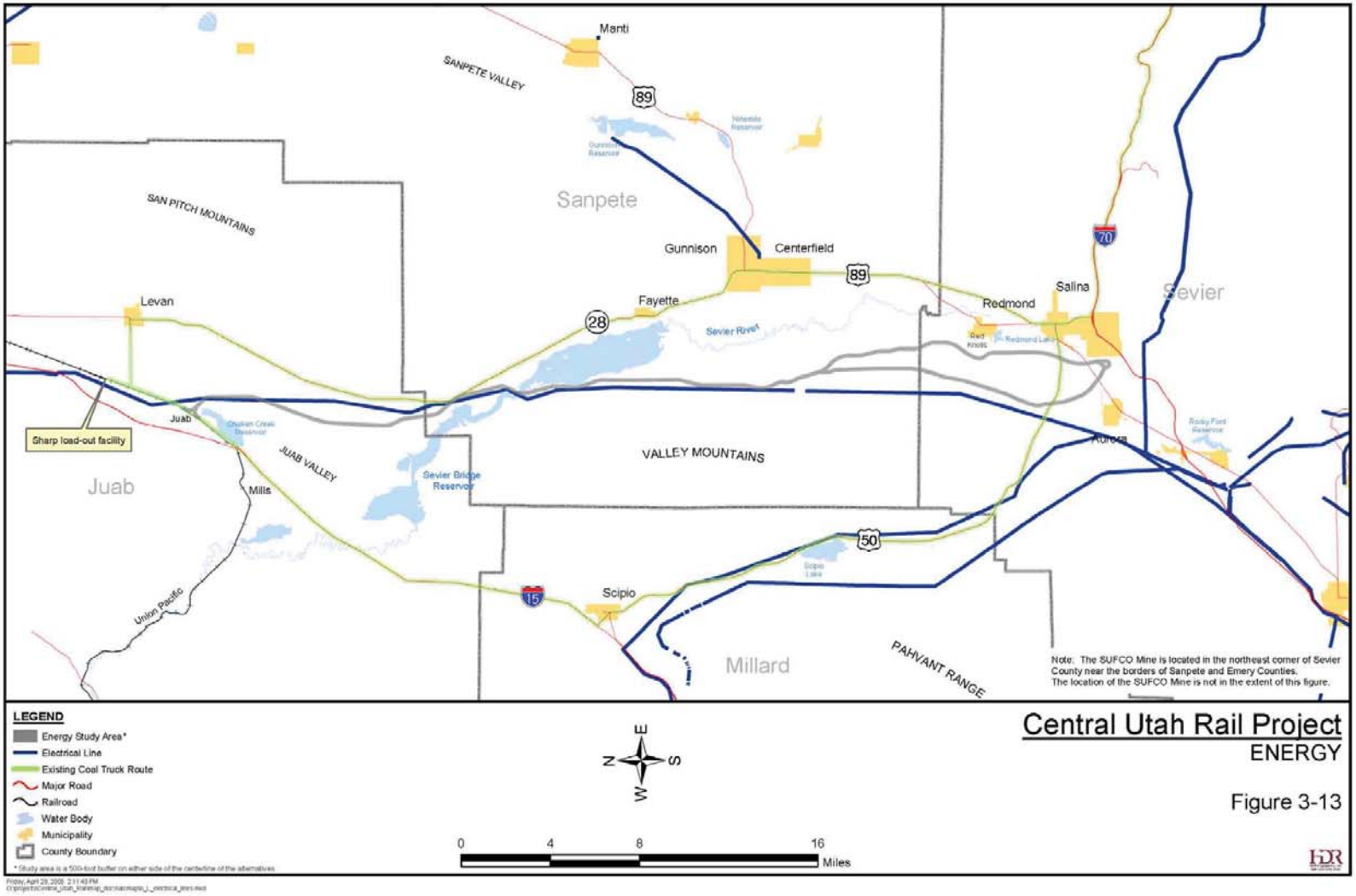


Figure 3-14. Environmental Justice

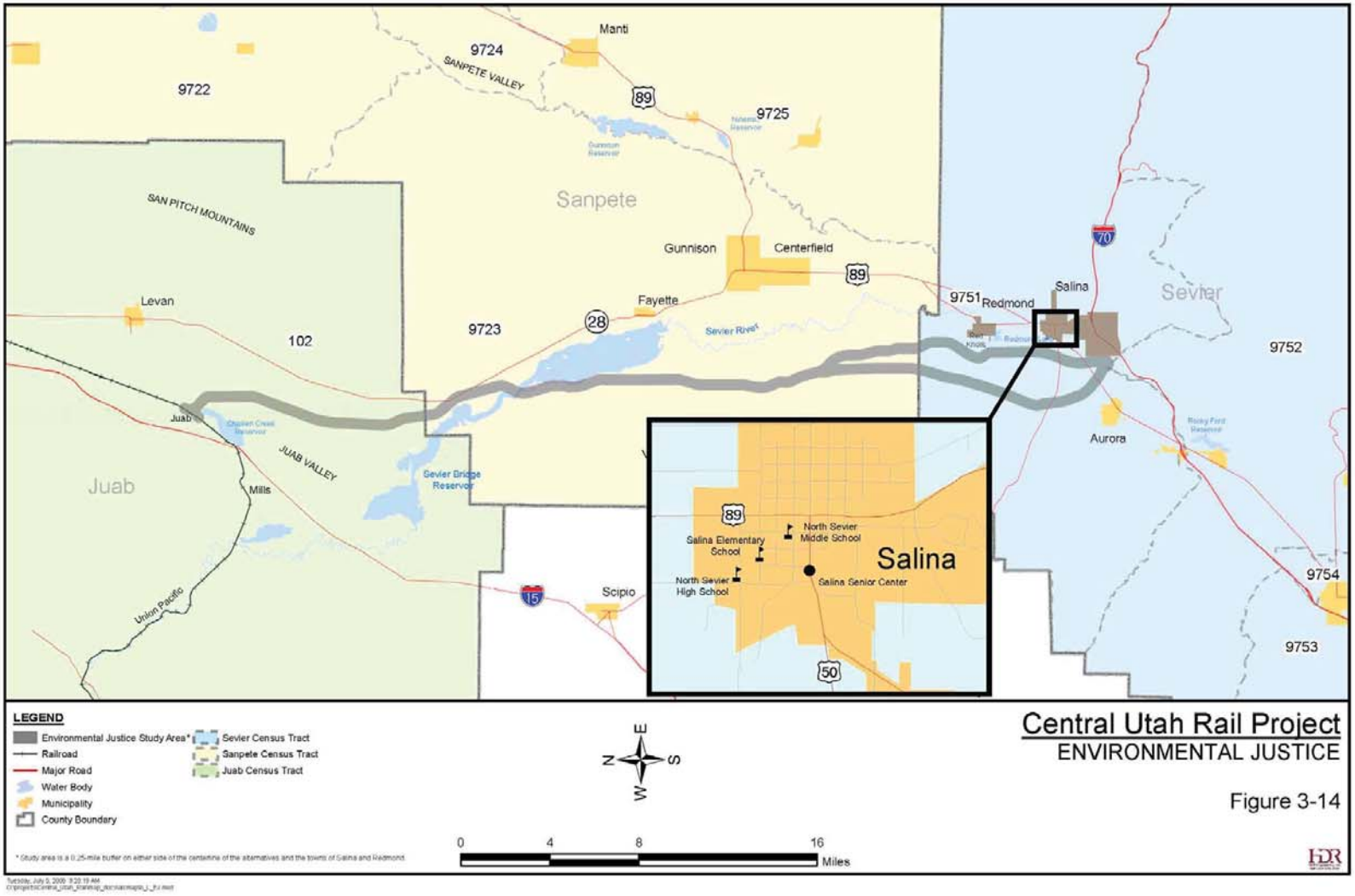


Figure 3-15. Recreation

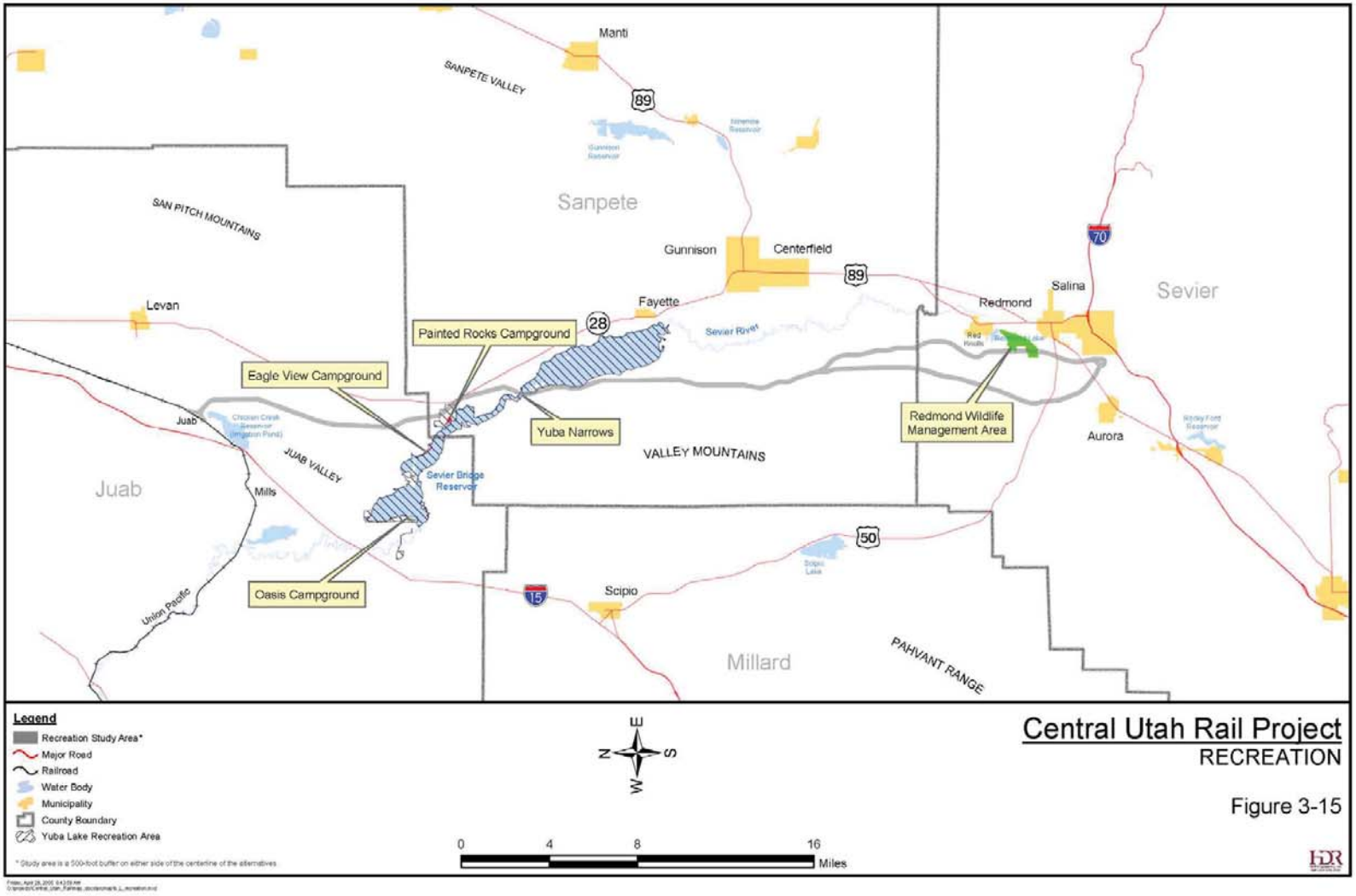


Figure 3-16. Visual Resource Management

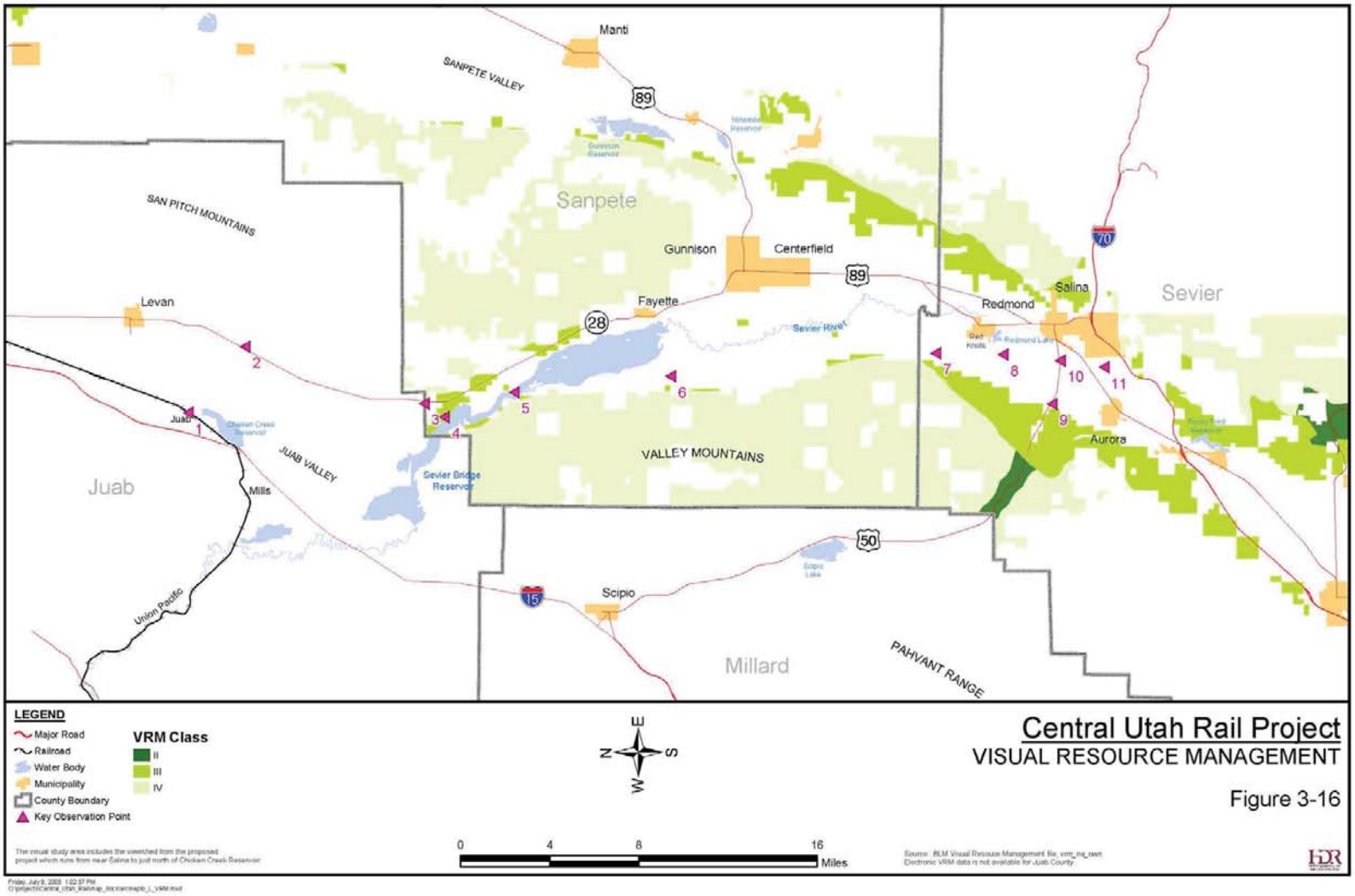
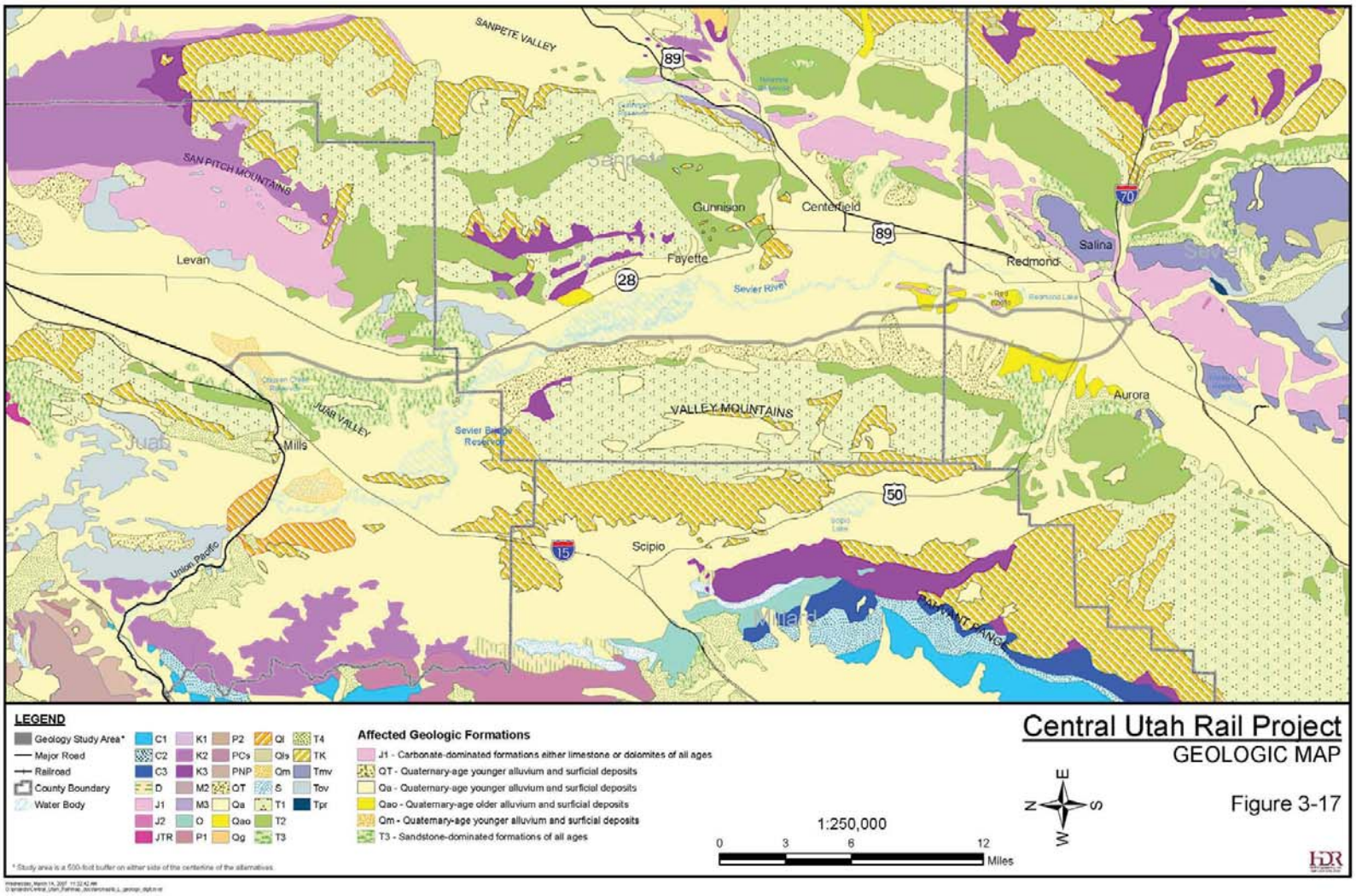


Figure 3-17. Geologic Map



This page is intentionally blank.

Chapter 4: Environmental Consequences

This chapter discusses the environmental consequences associated with the Build Alternatives and the No-Action Alternative.

- **Build Alternatives.** The Build Alternatives include the Proposed Action (Alternative B) and one other alternative (Alternative C) that would involve construction of a new rail line that would connect the UPRR mainline to shippers within portions of Juab, Sanpete, and Sevier Counties. Each alternative would run from the UPRR mainline within portions of Juab, Sanpete, and Sevier Counties beginning near Juab, about 16 miles south of Nephi to the industrial area located about 0.5 mile southwest of Salina.
- **No-Action Alternative.** Under the No-Action Alternative (Alternative A), no new rail line construction would take place. Central Utah shippers would continue to transport commodities by surface roads within portions of Juab, Sanpete, and Sevier Counties.

Chapter 4 is arranged in sections that discuss the environmental consequences for each alternative within each environmental resource area.

4.1 Impacts on Rail Operations and Safety

4.1.1 Methodology

SEA ordinarily analyzes impacts associated with rail operations and rail operations safety when a Proposed Action would create an increase of eight trains per day or more. Because there are currently no rail operations in the study area, SEA analyzed rail operations and rail operations safety issues associated with Alternative B and Alternative C. SEA anticipates that both of these alternatives will involve two trains per day on average.

SEA analyzed the expected operations of Alternatives B and C in the context of the existing operational and safety conditions described in Section 3.1, Rail Operations and Safety. The Central Utah Rail Feasibility Study (Feasibility Study) stated that the volume of coal transported through the study area would not materially change from current conditions under Alternatives B and C (see Appendix K, Central Utah Rail Feasibility Study, Washington Infrastructure Services, Inc. and others 2001). Based on the analysis in the Feasibility Study and SEA's review of market conditions and regional coal production, SEA does not expect that rail operations on the UPRR Sharp Subdivision would significantly change in volume or frequency if the proposed rail line is constructed. The volume of coal shipped by Canyon Fuels is expected to remain stable and the other potential shippers in the area are limited or speculative at this time (Washington Infrastructure Services, Inc. and others 2001). Since the

volume of coal moved on the UPRR mainline is not anticipated to materially change, SEA did not analyze rail operations and safety effects on the existing UPRR rail line between Provo and Lynndyl, Utah.

Because of the small number of trains expected with the Proposed Action (two per day on average), and because rail line use did not exceed thresholds, SEA evaluated the proposed rail operations and rail operation safety using a qualitative rather than quantitative approach.

Traffic Delay. SEA evaluated the consequences of the proposed alternatives on delay at grade crossings. SEA reviewed the existing traffic delay associated with the existing rail lines that would be used under the proposed alternatives. SEA also conducted field surveys within the project area and consulted with UDOT to discuss and identify any transportation delay at grade crossings in the project area.

SEA conducted its grade crossing analysis in accordance with Federal Highway Administration guidelines. These guidelines take into account the frequency of trains at grade crossings, volume of traffic, and other factors to determine the impacts of an increase in rail traffic.

Traffic Safety. SEA used traffic crash data from the Utah Department of Public Safety supplemented with detailed accident information provided by the Crash Data Section of UDOT to assess the current traffic safety conditions on the roads in the study area. SEA also used information from recent USDOT studies of truck crashes and fatalities to frame the analytic effort because of the significant number of large trucks carrying coal on the highway network between Salina and Levan.

Rail Lines. In the absence of rail operations in the study area, SEA used estimating methodologies based on hypothetical rail operations identified in the Feasibility Study. Applicants identified several parameters including 133-pound rails, no train-control signal systems, and 49 mph as the maximum operating speed. Consequently, SEA assumed FRA Track Class 4.

Trucking Operations. The analysis for estimating impacts to trucking operations was adapted from the Feasibility Study. The economic analysis presented in that study used an economic impact model called Regional Economic Models Incorporated (REMI). See Section 4.11, Socioeconomic Impacts, for more detail on the model and analysis.

Navigation. SEA contacted USACE to determine if navigable waters as defined under Sections 9 and 10 of the Rivers and Harbors Act were present in the study area. No navigable waters were present; therefore, no additional analysis was performed with regard to navigation.

Rail Accidents. There are no data available on past rail accidents in the study area. In the absence of these data, SEA examined the likelihood of rail operations resulting in a rail accident using the estimated frequency of derailment based on safety statistics derived in a 1994 unpublished project for the Association of American Railroads (Saricks and Kvitek

1994). SEA uses these statistics to provide a reasonable estimate of the results of anticipated operations on new line constructions.

Grade Crossings. SEA evaluated the consequences of the proposed alternatives on safety conditions at grade crossings. SEA reviewed the existing safety conditions associated with the existing rail lines that would be used under the proposed alternatives. SEA also conducted field surveys within the project area and consulted with UDOT to discuss and identify any safety concerns at grade crossings in the project area.

SEA conducted its grade crossings analysis in accordance with the Federal Highway Administration's guidelines. These guidelines take into account the frequency of trains at grade crossings, volume of traffic, existing safety devices at grade crossings, and other factors to determine the safety impacts of an increase in rail traffic.

Pipeline Crossings. SEA considered the impacts of rail operations on pipeline safety by examining the likelihood of the construction or operation of the proposed alternatives causing a rupture in a natural gas pipeline in the study area and the consequences of such as rupture. SEA used data available from the National Pipeline Mapping System (PHMSA 2006) to gather information on the location of pipelines in the study area.

Valid Existing Rights To Use Public Land. SEA used available data and worked cooperatively with state and local government entities, BLM, private landowners, and companies to identify the expected consequences of the proposed alternatives on the current valid existing rights on the public land within the project area. Valid existing rights are those rights to use the public land which predate the final decision on the proposed project and arise from a permit, lease, right-of-way, or claim. Valid existing rights include rights to use public land for roads, pipelines, buried and overhead power lines, telephone lines, canals, irrigation ditches, state- and county-maintained roads, and other facilities that are held by BLM, other government entities, or private individuals or companies. Any potential conflicts with existing rights are addressed in the particular resource section in this chapter or are reduced or eliminated with mitigation. Future coordination between agencies would continue to address potential conflicts during construction of the proposed rail line and continued maintenance activities. See Appendix D, Prior Existing Rights, for a list of existing rights-of-way within the project area.

Transportation of Hazardous Materials. Risk is a function of both the frequency of accidents and their potential consequences. Risk analysis considers not only how severe an accident could be, but also how likely it is that any specific consequence of the accident would occur. To assess the overall potential risk associated with transporting hazardous materials, SEA considered the existing risk in the project area as well as the additional risk, if any, that would be introduced by operation of the proposed rail line.

4.1.2 Impacts on the Regional Transportation System

4.1.2.1 Impacts on Traffic Delay

Alternative A (No-Action Alternative)

Under the No-Action Alternative, no new construction or changes in rail operations would occur, so there would be no impacts to traffic delay from the No-Action Alternative.

Alternative B (Proposed Action)

Access and ancillary road construction, operation, and maintenance would be in compliance with the terms and conditions of the subject grant and the AASHTO safety standards.

Using methodology explained in Section 4.1.1, Methodology, Table 4.1-1 shows the number of trains and the expected average delay at highway/rail at-grade crossings for Alternative B. SEA's traffic delay analysis showed that the level of service would not decrease at any grade crossing as a result of Alternative B. The average delay per vehicle for the new grade crossings for Alternative B would range from 1 to 4 seconds. There would be no delay at US 89 because a grade-separated crossing is proposed.

Table 4.1-1. Expected Average Delay at Crossings under Alternative B

Crossing	Assumed AADT	Assumed Trains per Day	Estimated Blocked Crossing Time per Day (minutes)	Estimated Crossing Delay per Stopped Vehicle per Day (minutes)	Estimated Number of Vehicles Delayed per Day	Estimated Average Daily Delay per Vehicle (seconds)
Major Crossings						
SR 24	5,000	2	8.5	6.0	59	4
US 50	5,000	2	8.5	6.0	59	4
SR 78	3,000	2	8.5	5.1	35	4
All Other Crossings						
Public (9)	200	2	3.7	1.9	1	1
Private (43)	10	2	3.7	1.9	0	1

AADT = annual average daily traffic

Alternative C

Access and ancillary road construction, operation, and maintenance would be in compliance with the terms and conditions of the subject grant and the AASHTO safety standards.

Table 4.1-2 below shows the number of trains and the expected delay at highway/rail at-grade crossings for Alternative C. SEA's traffic delay analysis showed that the level of service would not decrease at any grade crossing as a result of Alternative C. The average delay per

vehicle for the new grade crossings for Alternative C would range from 1 to 4 seconds. There would be no delay at US 89 because a grade-separated crossing is proposed.

Table 4.1-2. Expected Average Delay at Crossings under Alternative C

Crossing	Assumed AADT	Assumed Trains per Day	Estimated Blocked Crossing Time per Day (minutes)	Estimated Crossing Delay per Stopped Vehicle per Day (minutes)	Estimated Number of Vehicles Delayed per Day	Estimated Average Daily Delay per Vehicle (seconds)
Major Crossings						
SR 24	5,000	2	8.5	6.0	59	4
US 50	5,000	2	8.5	6.0	59	4
SR 78	3,000	2	8.5	5.1	35	4
All Other Crossings						
Public (9)	200	2	3.7	1.9	1	1
Private (37)	10	2	3.7	1.9	0	1

AADT = annual average daily traffic

4.1.2.2 Impacts on Traffic Safety

Alternative A (No-Action Alternative)

Under the No-Action Alternative, no new construction or changes in rail operations would occur; therefore, there would be no impacts to traffic safety from the No-Action Alternative.

Alternative B (Proposed Action)

SEA noted that operations under either Alternative B or Alternative C would likely sharply reduce the number of trucks carrying coal on SR 28 and US 89 between Salina and Levan. Nationally, large trucks account for 3% of vehicles involved in all vehicle accidents and 8% of vehicles involved in fatalities. Large trucks are also associated with 12% of the total traffic fatality count (USDOT 1998, 1). If the driver of a passenger vehicle is involved in a collision with a large truck, the probability of injury to the driver of the passenger vehicle is increased by nine times (1,000%) on average compared to passenger-vehicle-to-passenger-vehicle collisions (USDOT Bureau of Transportation Statistics 1998, 20).

SEA reviewed UDOT's vehicle safety report (Utah Department of Public Safety 2004) and specific safety data for incidents on the highways where coal is being moved in trucks for the 3-year period from 2002 to 2004. Statewide, large trucks were involved in 3.5% of the "property damage only" crashes and 2.4% of the "vehicles involved in injury" crashes. On US 89 in Sevier County, large trucks were involved in 35% of the total accidents. Table 4.1-3 below shows a summary of all accidents in Juab, Sanpete, and Sevier Counties. Based on

national accident statistics and UDOT vehicle safety reports, SEA concluded that Alternative B would have negligible impacts on safety.

Table 4.1-3. Summary of All Accidents

	ADT	Total Accidents	Accidents Involving Large Trucks	
			Number	Percent of Total
Juab County				
US 28	2,660	50	7	14%
SR 78	950	2	0	0%
Total	**—**	**52**	**7**	**13%**
Sanpete County				
US 28	2,660	36	2	6%
US 89	8,050	42	2	5%
Total	**—**	**78**	**4**	**5%**
Sevier County				
US 50	1,950	6	0	0%
US 89	8,050	23	8	35%
Total	**—**	**29**	**8**	**28%**

ADT = average daily traffic

Alternative C

The impacts on traffic accidents from Alternative C would be very similar to those from Alternative B. The train operations would be similar, and the results of the train operations would be similar with respect to the potential beneficial impact on highway safety from reducing the number of large trucks carrying coal on highways in the study area. Alternative C requires fewer rail/highway at-grade crossings; see Section 4.1.3.2, Impacts on Grade Crossing Safety.

4.1.2.3 Impacts on Rail Lines

Alternative A (No-Action Alternative)

Under the No-Action Alternative, UPRR would continue to operate as the only rail carrier providing service to and from the present Levan/Sharp load-out facility. There would be no change in rail operations compared to the conditions described in Section 3.1, Rail Operations and Safety.

Alternative B (Proposed Action)

Under Alternative B, the Applicant would construct a new rail line consisting of about 43 miles of new single-track railroad line between Juab (Levan/Sharp load-out facility) and Salina. The Applicant plans to operate one round trip (two movements which equals one full load and one empty back-haul) per day. If additional demand supports the operation of more trains, an additional round trip once per week may be required.

Typically, there would be two trains of about 100 cars each per day on the proposed line—one trip from Juab to Salina and the return trip from Salina to Juab. The train from Juab to Salina would consist of two or three locomotives and empty coal hoppers received from UPRR at Juab. At Salina, the train would operate around the SUFCO loading loop, and the hoppers would be filled with coal. The train from Salina to Juab would consist of the same locomotives and loaded coal hoppers. At Juab, the loaded cars would be placed on one of the interchange tracks for further movement by UPRR on UPRR trains. Any service to customers other than SUFCO would be provided by the same crew and locomotives or by another crew with the same locomotives.

Alternative C

Under Alternative C, the Applicant would construct a new rail line. Train operations would occur with the same frequency and at the same times of day as for Alternative B.

Alternative C would require fewer crossings of the Piute Canal and associated irrigation facilities since it would be west of and upslope from the canal. It would also cross fewer agricultural lands on the west side of the Sevier Valley.

4.1.2.4 Impacts on Trucking Operations

Alternative A (No-Action Alternative)

Under the No-Action Alternative, the proposed rail line would not be constructed. Consequently, the local trucking industry would continue to transport commodities (including coal from the SUFCO mines) from Sanpete and Sevier Counties at current levels.

Alternative B (Proposed Action)

Alternative B is projected to cause the loss of 108 jobs in the local trucking industry (Washington Infrastructure Services, Inc. and others 2001). The jobs would be lost because the length of coal-haul routes would be reduced. Coal would still need to be trucked from the mines to the project's southern terminus in Salina and possibly to the proposed power plant outside Sigurd. This job loss would primarily impact Barney Trucking and Robinson Transport, the main freight carriers for the SUFCO mine, both of which are located in Sevier County.

In December 2004, Barney Trucking employed 225 people, including 200 drivers, at the company's Salina location. Robinson Transport employed 140 people, 110 of which were drivers. Assuming that these two companies account for all of the 108 lost trucking jobs, the result is a reduction of 30% of current positions between the two companies. The response of these companies to such an impact is unknown at this time. SEA anticipates that the terminated trucking employees would be able to find jobs in areas that are expected to experience growth as a result of the project (see Section 4.11.3, Impacts to Employment and Income).

Alternative C

The impacts to the trucking industry from Alternative C would be the same as those from Alternative B.

4.1.2.5 Impacts on Navigation

Alternative A (No-Action Alternative)

There are no navigable waters in the study area, so there would be no impact to navigable waters from the No-Action Alternative.

Alternative B (Proposed Action)

There are no navigable waters in the study area, so there would be no impact to navigable waters from Alternative B.

Alternative C

There are no navigable waters in the study area, so there would be no impact to navigable waters from Alternative C.

4.1.3 Impacts on Rail Safety

4.1.3.1 Impacts on Rail Accidents

Alternative A (No-Action Alternative)

Under the No-Action Alternative, no new construction or changes in rail operations would occur, so there would be no impacts to rail safety from the No-Action Alternative.

Alternative B (Proposed Action)

In the absence of past data on rail accidents in the area, SEA examined the likelihood of rail operations resulting in a rail accident using the estimated frequency of derailment based on safety statistics derived in a 1994 unpublished project for the Association of American Railroads (Saricks and Kvitek 1994). SEA believes that these statistics provide a reasonable

estimate of the potential results of future operations on new rail line constructions. Table 4.1-4 shows train accident rates by track class and railroad class.

The proposed line would be Class 4 track (60 mph maximum freight train speed), but the absence of a fixed wayside train control signal system would limit train speed to 49 mph. For the accident calculation, SEA used the accident rate for Class 4 operations even though the maximum speed would be 49 mph. SEA determined that the probability of an accident occurring that included cars derailing was 30.6% in any given year, or approximately one accident every 3 years (Saricks and Kvitek 1994). See Section 4.1.1, Methodology, for more information.

Overall, SEA concluded that this project would cause negligible direct or indirect impacts on rail operations safety. SEA arrived at this conclusion by analyzing several facts including the distances traveled daily by the trains on the new line, the appropriate speeds for operation under proven methods with clear and unambiguous operating rules, and the strong regulatory environment in which the railroads operate.

Table 4.1-4. Regular Train Accident Rates by Track Class and Railroad Class

Accidents According to FRA RAIRS[a]	Accident Type	Class I Railroads – FRA Track Class				Non-Class I Railroads	Percent with Cars Derailed[b]
		2	3	4	5 and 6		
Accidents per billion car-miles traveled	Derailments	71.0	25.0	5.5	3.3	79.8	98%
	Collisions	0.8	0.3	0.2	0.0	0.4	53%
	Other	1.0	0.7	0.3	0.4	0.9	17%
Accidents per million train-miles traveled	Derailments	1.29	0.48	0.12	0.06	0.9	94%
	Collisions	0.27	0.10	0.03	0.02	0.17	54%
	Other	0.60	0.49	0.23	0.14	0.61	15%

[a] FRA's Railroad Accident and Incident Reporting System (RAIRS) categorizes accidents as being a function of either car-miles (mechanical failure of track and car components) or train-miles (accidents caused by human factors, grade crossing collisions, or collisions with obstructions).

[b] Percent of the total number of accidents on both Class I and non-Class I railroads that involved the derailment of at least one rail car.

Source: AREMA 2002

Alternative C

The impacts on rail accidents from Alternative C would be very similar to those from Alternative B. The train operations and subsequent results would be similar with respect to rail operation safety. Alternative C requires fewer rail/highway at-grade crossings; see Section 4.1.3.2, Impacts on Grade Crossing Safety.

4.1.3.2 Impacts on Grade Crossing Safety

Alternative A (No-Action Alternative)

Because no new construction or changes in rail operations would occur, no safety impacts are expected to result from the No-Action Alternative. The annual accident frequency rate for the existing conditions on the UPRR Sharp Subdivision would not change.

Alternative B (Proposed Action)

SEA recognized that all of the highway/rail at-grade crossings proposed as part of Alternative B would be new crossings. SEA used the USDOT accident prediction equations to estimate the likelihood of an accident occurring at each new crossing. Accident history is an important part of the accident prediction equations. Consequently, SEA used the Web Accident Prediction System to review the FRA 10-year collision history for the 32 public at-grade crossings in the FRA database for the three counties (Juab, Sanpete, and Sevier) where the proposed project would be constructed.

The FRA 10-year collision history showed that there have been eight accidents in the past 10 years: three accidents in 2004, one accident in 2002, two accidents in 1999, and one accident in 1998. Four of the accidents occurred at two crossings, and five of the accidents occurred in Nephi, a city with 15 crossings in 3 miles of rail line. Alternative B would have nine public at-grade crossings. SEA concludes that the estimates shown in Table 4.1-5 fairly predict the impacts to at-grade crossing safety that would result from Alternative B. According to these estimates, Alternative B would result in approximately one at-grade accident per year for a total of 10 accidents in 10 years.

Table 4.1-5. Estimated Accidents at Grade Crossings

Crossing Name	Estimated Years between Accidents	Estimated Accidents per Year
Crossings Proposed with Gates and Flashers		
SR 24	17	0.058
US 50	17	0.058
Crossing Proposed with Only Flashers		
SR 78	9	0.110
Crossings Proposed with Passive Devices		
Public (9)	58	0.017
Private (43)	75	0.013
All Crossings		
All roads crossed by the project	1	0.954

Source: AREMA 2002

Alternative C

The impacts on grade crossing safety from Alternative C would be the same as those from Alternative B.

4.1.3.3 Impacts on Pipeline Crossings

Alternative A (No-Action Alternative)

Under the No-Action Alternative, the proposed rail line would not be built, so there would be no excavation and therefore no impacts to existing pipelines.

Alternative B (Proposed Action)

According to the National Pipeline Mapping System, two major pipeline companies have facilities in the three-county study area: Kern River Gas Transmission Company and Questar Gas and Pipeline Company. SEA contacted both pipeline companies. The Kern River Gas representative said that none of the Kern River Gas facilities would be affected by Alternative B because they are west of I-15 (Donnelly 2006). The Questar representative identified a natural gas pipeline and local distribution lines near US 89 that would be crossed by either Alternative B or Alternative C (Peay 2005). Short-term disruption of the natural gas pipeline and distribution lines could occur but would be minimized by coordinating with Questar.

SEA used data from the Pipeline and Hazardous Material Safety Administration's Office of Pipeline Safety (USDOT 1998) to estimate the potential hazard from the proposed rail line crossing the Questar gas transmission and distribution lines. SEA has previously reviewed data concerning pipeline safety with respect to new rail line construction and operation and concluded that excavation during construction is the only likely cause of a pipeline accident (Surface Transportation Board 2002). Based on the response from Questar, SEA considered the possibility of accidents from the gas transmission line and from the distribution lines separately. SEA calculated the annual accident occurrence rate as 3.4×10^{-7} for a transmission line accident and 2.9×10^{-8} for a distribution line accident, or virtually no likelihood of pipeline accidents.

Alternative C

The impacts on pipeline crossings from Alternative C would be the same as those from Alternative B.

4.1.3.4 Impacts on Transportation of Hazardous Materials

Alternative A (No-Action Alternative)

Under the No-Action Alternative, the proposed rail line would not be built, so the existing risk levels for transporting hazardous materials would not change.

Alternative B (Proposed Action)

No hazardous materials would be transported over the proposed rail line (Washington Infrastructure Services, Inc. and others 2001). Therefore SEA determined that there is virtually no risk of a hazardous material release as a result of constructing or operating Alternative B. The Applicant expects to ship petroleum products, but in a volume less than 1% of the total volume of goods shipped, or less than 400 carloads per year. Since rail is a safer mode of transportation than trucks for hazardous materials and petroleum products, SEA believes that any shift from trucks to rail would have a slightly positive but unquantifiable effect on overall safety.

Based on this analysis, SEA has determined that the overall risk associated with Alternative B would be very low.

Alternative C

Under Alternative C, the risks associated with transporting hazardous materials would be the same as those under Alternative B.

4.1.3.5 Mitigation Measures for Impacts to Rail Safety

SEA has determined through its analysis and consultation with UDOT that the Proposed Action and Alternatives would have a negligible effect on rail operations. Mitigation is discussed in Section 6.3.1, Rail Operations and Safety, and Section 6.4.1, Rail Operations.

4.2 Land Use Impacts

4.2.1 Methodology

SEA considered the expected land use impacts from the construction and operation of the proposed rail line. The land use study area includes the right-of-way of 0.5 mile in each direction from the centerline of the proposed alternatives. SEA analyzed the proposed alternatives for compatibility with local land uses and agency land use plans. SEA also analyzed the expected effects on prime farmlands and grazing allotments. The acquisition and use of the right-of-way could affect local land use if the alternatives change the area's current development trends or alter local land use policies.

4.2.2 Impacts to Agriculture

The Applicant used the best available information to review the expected effects of the proposed alternatives on farmland, including farmland designated as prime, unique, and state important. The proposed rail line would directly impact farmland. Some farmland is within the proposed right-of-way and would be directly taken out of production. The project would also cause indirect and secondary impacts, which typically occur when farmland is taken out of production because the remaining parcels are too small to farm or because access to parcels is eliminated. Acquiring farmland for rail line construction is considered a farm displacement only if the amount of farmland remaining is not enough to farm.

To determine the indirect impacts, parcels were identified as being farmed either by visual review of 2004 National Agriculture Imagery Program aerial photography or by information obtained from NRCS and the Utah Division of Water Resources. Indirect impacts are those on farmland outside the right-of-way that is rendered non-farmable because of such impacts as the creation of remnants (parts of fields that are too small to farm economically) and disruption of access. There is no specific guidance regarding the size at which a farmland remnant becomes too small to farm economically. However, according to the Utah Farmland Assessment Act (FAA),[1] 5 acres is the size at which farmland can qualify for the FAA.

Each farmed parcel was then noted as being impacted as a strip, split, or total take. Remaining acreages near or under 5 acres were calculated. BLM or another appropriate government agency, in consultation with the property owner, would consider on a case-by-case basis whether farmland could remain farmable. Farmland with less than 5 acres remaining was considered non-farmable and an indirect impact for this analysis. See Table 4.2-1 below for land use impacts in the study area.

[1] The Utah Farmland Assessment Act allows qualifying agricultural property to be assessed and taxed based upon its productive capability instead of the prevailing market value. This unique method of assessment is vital to agriculture operations in close proximity to expanding urban areas, where taxing agricultural property at market value can make farming operations economically prohibitive.

Table 4.2-1. Land Use Impacts within the Right-of-Way of the Proposed Alternatives

		Juab County		Sanpete County		Sevier County	
	Land Administration/ Land Use	Alt. B (acres)	Alt. C (acres)	Alt. B (acres)	Alt. C (acres)	Alt. B (acres)	Alt. C (acres)
Private	Agricultural	126.39	126.39	1.23	1.14	37.52	115.72
	Commercial/ industrial	—	—	—	—	—	0.29
	Idle	—	—	7.65	7.16	8.33	12.66
	Water/Reservoirs/ Riparian	—	—	—	—	6.00	—
	Residential	—	—	—	—	—	—
	No data	12.78	12.78	29.21	11.33	12.10	26.96
	Subtotal	*138.17*	*138.17*	*38.09*	*19.63*	*63.95*	*155.63*
State	Agricultural	—	—	1.13	1.13	1.29	—
	Commercial/ industrial	—	—	—	—	—	—
	Idle	—	—	4.74	4.74	—	—
	Water/Reservoirs/ Riparian	—	—	3.33	3.33	—	—
	Residential	—	—	—	—	—	—
	No data	6.67	6.67	62.16	70.71	2.43	14.34
	Subtotal	*6.67*	*6.67*	*71.36*	*79.91*	*3.72*	*14.34*
BLM	Agricultural	—	—	—	—	—	—
	Commercial/ industrial	—	—	—	—	—	—
	Idle	—	—	—	—	—	—
	Water/Reservoirs/ Riparian	—	—	—	—	—	—
	Residential	—	—	—	—	—	—
	No data	—	—	20.43	42.85	—	20.61
	Subtotal	—	—	*20.43*	*42.85*	—	*20.61*
	Total	**145.84**	**145.84**	**129.88**	**142.39**	**67.67**	**190.58**

Source: HDR Engineering, Inc. 2006a

4.2.2.1 Alternative A (No-Action Alternative)

Under the No-Action Alternative, the Central Utah Rail project would not be built. However, some agricultural land would likely be converted to residential, commercial, industrial, and recreational uses. The amount of agricultural land that might be converted to these other uses is not known at this time.

4.2.2.2 Alternative B (Proposed Action)

Alternative B would involve construction of a new rail line that would connect the UPRR mainline to shippers within portions of Juab, Sanpete, and Sevier Counties. The alternative would run from the UPRR mainline near Juab to the Salina area. The impacts to farmland in the farmland study area are shown in Table 4.2-2. Because the exact locations of sidings, temporary access roads, and maintenance yards within the right-of-way are not yet known, numbers for impacts to the specific types of land uses within the right-of-way may slightly change. Under Alternative B, there would be impacts to about 43 acres of irrigated farmland and about 9 acres of non-irrigated farmland. About 36 acres of farmland would be indirectly impacted by Alternative B.

Table 4.2-2. Direct Impacts to Crops or Farmland

Crop or Farmland Type	Alternative B (acres)	Alternative C (acres)
Irrigated Crops or Farmland		
Grass hay	0.80	9.54
Grain	2.62	3.69
Corn	4.13	5.24
Pasture	19.33	33.74
Alfalfa	16.18	69.32
Total irrigated	**43.06**	**121.53**
Non-irrigated Crops or Farmland		
Alfalfa	1.72	1.72
Grain/beans/seeds	3.20	3.20
Pasture	4.00	4.00
Total non-irrigated	**8.92**	**8.92**

4.2.2.3 Alternative C

Alternative C would cross fewer agricultural parcels than Alternative B. However, because the rail line would need to be placed on a 75-foot-tall berm through the agricultural land between the foothills and the loading facility north of I-70 near Salina's industrial park, it would impact more farmland acreage. The impacts to farmland in the farmland study area are shown above in Table 4.2-2, Direct Impacts to Crops or Farmland. Because the exact

locations of sidings, temporary access roads, and maintenance yards within the right-of-way are not yet known, the numbers for impacts to the specific types of land uses within the right-of-way may change slightly. Under Alternative C, there would be impacts to about 122 acres of irrigated farmland and about 9 acres of non-irrigated farmland. About 13 acres of farmland would be indirectly impacted by Alternative C.

4.2.2.4 Mitigation Measures for Impacts to Agriculture

Mitigation measures for impacts to agriculture are discussed in Section 6.3.2.1, Mitigation Measures for Impacts to Agriculture, and Section 6.4.2.3, Agriculture.

4.2.3 Impacts to Local Land Use and Zoning

4.2.3.1 Alternative A (No-Action Alternative)

Under the No-Action Alternative, the proposed rail line would not be constructed. There would be no changes to local land use or zoning as a result of railroad construction. Other locally constructed projects might require land use or zoning changes, but these projects would be independent of the proposed rail construction.

4.2.3.2 Alternative B (Proposed Action)

Juab County

Within Juab County, 146 acres of land would be impacted, including 139 acres of private land, 7 acres of state land, and 0 acres of BLM-administered public lands. See Figure 4-1, Impacts to Land Ownership, and Figure 4-2, Land Use Impacts. The acres of land impacted are shown in Table 4.2-3. Right-of-way acquisition for Alternative B is not expected to change the area's current development trends or alter local land use policies.

Table 4.2-3. Land Ownership within the Right-of-Way of the Proposed Alternatives

	Juab County		Sanpete County		Sevier County	
Ownership	Alt. B (acres)	Alt. C (acres)	Alt. B (acres)	Alt. C (acres)	Alt. B (acres)	Alt. C (acres)
Fillmore BLM	0	0	NA	NA	NA	NA
Richfield BLM	NA	NA	21	30	0	21
State	7	7	70	65	4	14
Private	139	139	71	53	64	137
Total	**146**	**146**	**162**	**148**	**68**	**172**

NA = data not available

As noted in Section 3.2.3.1, Juab County, the areas zoned GMRF-1 (Grazing, Mining, Recreation and Forestry District) and A-1 (Agricultural District) comprise most of the county. The GMRF-1 District does not permit railroads, so a change in zoning would be required for these lands. No change in zoning would be required for lands in the A-1 District because railroad tracks, spurs, switches, and facilities are permitted uses of the A-1 District (Juab County, no date). The wye and associated tracks would be located in the A-1 District. The rest of the tracks in Juab County would be in the GMRF-1 District.

Sanpete County

Within Sanpete County, 162 acres of land would be impacted, including 71 acres of private land, 70 acres of state land, and 21 acres of Richfield BLM-administered public lands. The land uses and land ownership impacted are shown above in Table 4.2-3, Land Ownership within the Right-of-Way of the Proposed Alternatives. Use of BLM land for power lines, sidings, maintenance facilities, or temporary and/or permanent access roads would be authorized by the BLM Richfield Field Office in compliance with applicable land use polices and permitting regulations.

Alternative B would cross lands that are zoned A (Agricultural) and SL (Sensitive Lands). Lands zoned A occur primarily south of the Sevier Bridge Reservoir about 3 miles north of the Sanpete County–Sevier County border. The remaining land impacts are in the SL zone, which includes grazing lands, mountains, and canyons.

Sevier County

Within Sevier County, 68 acres of land would be impacted, including 64 acres of private land, 4 acres of state land, and 0 acres of BLM-administered lands would be affected. The land uses and land ownership impacted are shown in above in Table 4.2-3, Land Ownership within the Right-of-Way of the Proposed Alternatives.

As with Juab and Sanpete Counties, the land use in Sevier County is primarily agricultural with A5-25 (Agriculture), GRF 20 (Grazing Recreation Forestry), and GRF 5 (Grazing Recreation Forestry) zoning districts present. Alternative B would primarily cross lands zoned A5-25 and would terminate with a loop in an area designated by the community of Salina as a future industrial park. Railroads are not discussed as permitted or restricted uses within the A5-25 zone but would generally not affect the land uses or zoning in the area.

4.2.3.3 Alternative C

Juab County

In Juab County, the impacts from Alternative C would be the same as those from Alternative B because the alternatives share the same alignment in Juab County.

Sanpete County

Within Sanpete County, 148 acres of land would be impacted, including 53 acres of private land, 65 acres of state land, and 30 acres of Richfield BLM-administered public lands. The land uses and land ownership impacted are shown above in Table 4.2-3, Land Ownership within the Right-of-Way of the Proposed Alternatives. The land use and zoning impacts would be the same as those from Alternative B. Use of BLM land outside the right-of-way for power lines, sidings, maintenance facilities, or temporary and/or permanent access roads would be authorized by the BLM Richfield Field Office in compliance with applicable land use polices and permitting regulations.

Sevier County

Within Sevier County, 172 acres of land would be impacted, including 137 acres of private land, 14 acres of state land, and 21 acres of Richfield BLM-administered public lands. The land uses and land ownership impacted are shown above in Table 4.2-3, Land Ownership within the Right-of-Way of the Proposed Alternatives. Use of BLM land outside the right-of-way for power lines, sidings, maintenance facilities, or temporary and/or permanent access roads would be authorized by the BLM Richfield Field Office in compliance with applicable land use polices and permitting regulations.

As with Juab and Sanpete Counties, the land use in Sevier County is primarily agricultural, with A5-25 (Agriculture), GRF 20 (Grazing Recreation Forestry), and GRF 5 (Grazing Recreation Forestry) zoning districts present. Alternative C would primarily cross lands zoned GRF 20 and GRF 5 north of US 50. The lands in this area are primarily used for grazing rather than irrigated agricultural lands. South of US 50, Alternative C would cross lands zoned A5-25. These lands are primarily used for irrigated agriculture. Alternative C would terminate with a loop in an area that has been designated by the community of Salina as a future industrial park. Railroads are not discussed as permitted or restricted uses within these zones but would generally not affect the land uses or zoning in the area.

4.2.3.4 Mitigation Measures for Impacts to Local Land Use and Zoning

No mitigation is proposed for local land use and zoning.

4.2.4 Impacts to State Land Use (Utah Trust Lands)

4.2.4.1 Alternative A (No-Action Alternative)

Under the No-Action Alternative, the proposed rail line would not be constructed. No land would be leased from SITLA. Other locally constructed projects might require lease or purchase of SITLA lands, but these projects would be independent of the proposed rail construction. At this time, no additional projects are anticipated.

4.2.4.2 Alternative B (Proposed Action)

Under Alternative B, 81.75 acres of land would be leased from SITLA for construction and operation of the rail line. By state law, the trust lands can be used for commercial and industrial enterprises, so the railroad would be a compatible land use on SITLA lands.

4.2.4.3 Alternative C

Under Alternative C, 100.92 acres of land would be leased from SITLA for construction and operation of the rail line. The railroad would be a compatible land use on SITLA lands.

4.2.4.4 Mitigation Measures for Impacts to State Land Use

SEA has determined through its analysis and consultation with SITLA that the Proposed Action and Alternatives would have a negligible effect on state lands.

4.2.5 Impacts to Federal Land Use (Bureau of Land Management)

4.2.5.1 Alternative A (No-Action Alternative)

Under the No-Action Alternative, the proposed rail line would not be constructed. A right-of-way grant would not be obtained from BLM. Other locally constructed projects might require a right-of-way grant from BLM, but these projects would be independent of the proposed rail construction. Currently, construction of the Quitchupah Creek Road project would require a right-of-way grant.

4.2.5.2 Alternative B (Proposed Action)

Alternative B would not conflict with any existing land use regulations or policies in any BLM Management Framework Plan or Resource Management Plan or substantially change or alter the way the affected public lands are managed. Alternative B would not result in a change of resource uses, levels of use, areas of production, protection of resources, resource condition goals, resource condition objectives, management constraints, or management practices. Therefore, the Proposed Action is considered to be in conformance with the existing plans for the Richfield and Fillmore Field Offices.

Based on GIS (geographic information system) information provided by BLM and an overlay of the proposed project area, a right-of-way grant for about 20.43 acres of land would be obtained from BLM (Richfield Field Office) for the construction and operation of Alternative B. Most of the area that would be crossed by Alternative B is managed for multiple uses including recreation, grazing, and wildlife. The Sevier Bridge Reservoir is the only area within the right-of-way for Alternative B that is not managed for multiple uses. It is designated as a Special Resource Management Area. No other areas of critical environmental concern, wild and scenic rivers, areas with special management designations, or areas dedicated to special-status species management would be affected.

Construction and operation of the railroad would be compatible uses under BLM's multiple-use directive. Construction and operation of the railroad near the Sevier Bridge Reservoir would not affect the recreational land use around the reservoir. For more information on recreation impacts, see Section 4.14, Impacts to Recreation.

There are no withdrawals or designations presently existing on the described public lands that would preclude the issue of a right-of-way grant for Alternative B. The proposed right-of-way would be issued subject to the existing valid, prior rights-of-way as described in Appendix D, Prior Existing Rights.

Fences would be placed along the railroad right-of-way in cooperation with BLM guidance; these fences would limit recreation, grazing, and wildlife use along the rail right-of-way. For specific impacts to these resources, see Section 4.14, Impacts to Recreation, Section 4.2.6, Impacts to Grazing Allotments, and Section 4.3, Impacts on Biological Resources.

4.2.5.3 Alternative C

Based on GIS information provided by BLM and an overlay of the proposed project area, a right-of-way grant for about 63.46 acres of land would be necessary from BLM (Richfield Field Office) for the construction and operation of Alternative C. Alternative C would be compatible with the multiple-use directive on BLM lands and would have the same impacts as Alternative B.

There are no withdrawals or designations presently existing on the described public lands that would preclude the issue of a right-of-way grant for Alternative C. The proposed right-of-way would be issued subject to the existing valid, prior rights-of-way as described in Section 3.2.5.3, Prior Existing Rights-of-Way.

4.2.5.4 Mitigation Measures for Impacts to Federal Land Use

Mitigation measures for access to public land and recreation routes are discussed in Section 6.3.2.2, Mitigation Measures for Impacts to Federal Land Use, and Section 6.4.2, Land Use.

4.2.6 Impacts to Grazing Allotments

The proposed rail line would cause direct impacts to 10 grazing allotments administered by BLM as shown in Figure 4-3, Impacts to Grazing Allotments. Table 4.2-4 below provides an overview of the direct impacts to grazing allotments on public, state, and private lands within 0.5 mile of the centerline for each of the proposed alternatives. Each alternative is summarized by grazing allotment, acres impacted, and animal unit month (AUM) affected. An AUM is the amount of forage required to feed one cow for 1 month. The loss of each AUM would reduce the area available to graze cattle, which would cause an economic impact.

Indirect impacts typically result when transportation improvements bisect a grazing allotment and the remaining parcel is too small to graze. Other indirect impacts are usually short-term and include dust from construction activities, which could displace cattle from parts of an allotment during construction.

Table 4.2-4. Grazing Allotments Affected by the Proposed Alternatives

Grazing Allotment	Total Allotment Acreage in Study Area[a]	Acres Impacted		Permitted AUMs[b]	AUMs in Farmland Study Area[c]	AUMs Impacted	
		Alt. B	Alt. C			Alt. B	Alt. C
Richfield Field Office							
West Side	532	4.30	4.30	405	—	—	—
Denmark	2,255	0.00	20.92	976	15	0.00	0.14
South Valley	3,593	0.41	38.60	849	30	0.00	0.32
Little Valley	970	11.64	11.64	798	—	—	—
Red Canyon	545	0.00	0.00	702	3	0.00	0.00
River	964	13.90	13.90	34	4	0.06	0.06
Timber Canyon	2,745	31.48	31.48	654	15	0.17	0.17
Fillmore Field Office							
Yuba	543	12.0	12.0	539	—	2.0	2.0
Washboard	272	12.6	12.6	857	—	2.0	2.0
Chriss Creek	78	0.00	0.00	78	—	—	—
Total	**12,497**	**86.33**	**145.44**	**5,892**	**67**	**4.23**	**4.69**

[a] Acreage within 0.5 mile of each side of the proposed alternatives.

[b] AUM = animal unit month; the amount of forage required to feed one cow for 1 month. The total AUMs shown are for the entire allotment, not just for the portion of the allotment in the study area.

[c] No AUMs were determined for grazing allotments on state land even though the state land is administered in common with BLM. State land used in common with BLM would also be crossed by the rail line in the West Side, Little Valley, Yuba, Washboard, and Chriss Creek allotments.

Sources: Williams 2005; Lichthardt 2006

4.2.6.1 Alternative A (No-Action Alternative)

Under the No-Action Alternative, there would be no direct or indirect impacts to grazing allotments that are actively being used, and the land would continue to be grazed.

4.2.6.2 Alternative B (Proposed Action)

Under Alternative B, 7 grazing allotments would be directly impacted for a total reduction of about 98.92 grazing acres and a reduction of about 4.23 AUMs.

The land affected by the proposed rail line would be removed from the associated grazing allotments. Due to the small amount of forage that would be lost, the grazing permits would not likely be adjusted. Grazing allotments located on SITLA lands would require an easement

to be obtained for the proposed rail line in coordination with proper state trust land procedures.

The indirect impacts would be short-term and would typically last less than 1 year for any particular section of the rail line. The following indirect impacts could occur:

- Dust on forage adjacent to the right-of-way could reduce the palatability of the forage.
- The frequency of fires could increase, which would alter the composition of forage.
- The operation of heavy equipment during construction could displace livestock.

4.2.6.3 Alternative C

Under Alternative C, 8 grazing allotments would be directly affected for a total reduction of about 158.03 grazing acres and a reduction of about 4.69 AUMs. Under Alternative C, the proposed rail line would separate a well on private land used as a water supply from the allotment.

The land affected by the proposed rail line would be removed from the associated grazing allotments. Due to the small amount of forage that would be lost, the grazing permits would not likely be adjusted. Grazing allotments located on SITLA lands would require an easement to be obtained for the proposed rail line in coordination with proper state trust land procedures.

The indirect impacts would be short-term and would typically last less than 1 year for any particular section of the rail line. The following indirect impacts could occur:

- Dust on forage adjacent to the right-of-way could reduce the palatability of the forage.
- The operation of heavy equipment during construction could displace livestock.

4.2.6.4 Mitigation Measures for Impacts to Grazing Allotments

Mitigation measures for the 10 grazing allotments that lie within the right-of-way of the proposed alternatives are discussed in Section 6.4.2.4, Grazing Allotments.

4.3 Impacts on Biological Resources

4.3.1 Methodology

SEA, in coordination with USFWS, evaluated the expected effects of the project alternatives on plant communities, wildlife resources, and threatened, endangered, and sensitive species in the study area. SEA evaluated these effects by interpreting data collected from published reports, feasibility studies, regulatory agency documents, guidance manuals, discussions with resource personnel, aerial photographs, USGS topographic maps, and fall, spring, and summer pedestrian (walking) survey field inspections and by analyzing data in GIS. The study area for each biological resource was defined in the appropriate subsection of Section 3.3, Biological Resources. Other than pedestrian observational surveys, no specific survey protocols were identified as necessary to determine the potential for impacts to species listed in this section.

In order to calculate the acreage of impacts from the project, SEA performed GIS calculations using resource data and right-of-way boundaries for each proposed alternative. Areas investigated with the GIS calculations include wildlife sanctuaries, refuges, state parks, wetlands, and vegetation communities.

SEA consulted with state and federal officials regarding the potential presence of any threatened, endangered, or sensitive species in the project area. The characteristics (preferred habitat and behavior) of the species identified by these agencies were further researched to determine the probability of the species occurring within the project area and to determine the species with potential to be affected by project construction and operation.

4.3.2 Plant Communities

SEA evaluated the effects of the proposed alternatives on existing plant communities in the study area. The evaluation included construction-related impacts as well as impacts related to operation and maintenance of the proposed rail line.

Construction of the proposed alternatives would require clearing all existing vegetation within the project right-of-way. This right-of-way varies from 50 feet wide to 550 feet wide depending on the location of grade-separated crossings, construction staging areas, and necessary construction specific to each alternative. Some areas of natural vegetation would be permanently lost due to construction of the rail line bed.

Table 4.3-1 below lists the direct impacts to plant communities from each of the alternatives. For a more detailed description of each plant community type in the study area, see Section 3.3.2, Plant Communities.

Table 4.3-1. Plant Community Impacts

Vegetation Community	Direct Impacts (acres)		
	Alt. A	Alt. B[a]	Alt. C[a]
Agricultural vegetation	0	194	278
Sagebrush community	0	98	100
Grasslands	0	53	94
Salt desert scrub	0	27	25
Juniper community	0	0	0
Lowland riparian	0	3	0
Subtotal	*0*	*375*	*497*
Emergent marsh[b]	0	71	71
Wet meadow[b]	0	92	92
Total	**0**	**538**	**660**

[a] Areas of direct impacts for the proposed alternatives were calculated using the right-of-way boundaries for each alternative.

[b] For more information, see Section 4.4.7, Impacts to Wetlands and Waters of the U.S.

4.3.2.1 Alternative A (No-Action Alternative)

Construction Impacts

Under the No-Action Alternative, the proposed rail line would not be built, so there would be no construction-related impacts to plant communities.

Operation and Maintenance Impacts

Under the No-Action Alternative, the proposed rail line would not be built, so there would be no impacts to plant communities related to operation and maintenance of the rail line.

4.3.2.2 Alternative B (Proposed Action)

Construction Impacts

Construction impacts from Alternative B include removal of 194 acres of agricultural vegetation, 98 acres of sagebrush communities, 53 acres of grasslands, 27 acres of salt desert scrub, and 3 acres of lowland riparian vegetation communities. Impacts to wetland communities such as wet meadow and emergent marsh are described in Section 4.4, Impacts to Water Resources. Impacts to plant communities assume that all existing vegetation within the right-of-way for Alternative B would be cleared. For most of the right-of-way, this would be a short-term impact because cleared areas outside the rail line right-of-way would be reseeded.

Construction of a permanent rail line for Alternative B would cause minor fragmentation of some plant communities and would reduce the biological function of those communities by a small amount. Alternative B would consist of a long, thin, linear feature (the rail line) that would cause low impacts to any one type of plant community.

Whenever existing plant communities are disturbed, invasive and non-native plant species could be introduced. Some of the commonly found invasive and non-native plant species in the study area include cheatgrass (*Bromus tectorum*), halogeton (*Halogeton glomeratus*), Russian thistle (*Salsola iberica*), salt cedar (*Tamarix ramossisima*), common reed (*Phragmites australis*), and curly cup gumweed (*Grindelia squarossa*). Construction impacts could introduce some of these invasive and non-native plant species. However, following best management practices (BMPs) would help prevent the introduction of these species (see Section 6.3.3, Biological Resources).

Operation and Maintenance Impacts

During the operation of Alternative B, accidents or equipment failure could release petroleum products from the train engines and associated machinery into the adjacent plant communities. The trains would haul primarily coal, which is not considered to be a hazardous material. In the unlikely event of a coal or petroleum spill, the area would be cleaned up to prevent irreparable harm to the environment.

Maintenance procedures for parts of the Alternative B right-of-way could include periodic application of herbicides to control unwanted vegetation. Control of excess vegetation within the right-of-way also reduces the potential for fires (see Section 4.3.5, Accidental Fires). Herbicides could affect the surrounding plant communities if they are improperly applied. All herbicides would be used in accordance with regulatory requirements.

Maintenance procedures would also include occasional mowing if vegetation becomes a problem within the right-of-way. Operation and maintenance activities would have minor impacts on the surrounding plant communities. In many areas where weedy species are common, the application of herbicides would control weeds, resulting in improved vegetation immediately adjacent to the rail line.

4.3.2.3 Alternative C

Construction Impacts

Construction impacts from Alternative C would include the removal of 278 acres of agricultural vegetation, 100 acres of sagebrush communities, 94 acres of grasslands, and 25 acres of salt desert scrub vegetation communities. Impacts to wetland communities such as wet meadow and emergent marsh are described in Section 4.4, Impacts to Water Resources. Impacts to plant communities assume that all existing vegetation within the right-of-way for

Alternative C would be cleared. For most of the right-of-way, this would be a short-term impact because cleared areas outside the rail line right-of-way would be reseeded.

Under Alternative C, minor fragmentation of plant communities and the potential for introducing invasive and non-native species would be the same as under Alternative B.

Operation and Maintenance Impacts

Under Alternative C, the operation and maintenance impacts on plant communities would be the same as those from Alternative B.

4.3.3 Wildlife Resources

Various wildlife resources are found within the project area (see Table 3.3-2, Common Wildlife Species in the Study Area). SEA evaluated the effects of the proposed alternatives on wildlife resources. The evaluation included construction-related impacts as well as impacts related to operation and maintenance of the proposed rail line.

Wildlife habitat in the project study area has already been somewhat fragmented due to the previous construction of highway rights-of-way and smaller roads and the conversion of land for agricultural, residential, commercial, and industrial uses. SEA expects that the impacts from constructing and operating a rail line with anticipated traffic of one round trip (two movements which equals one full load and one empty back-haul) per day would not contribute significantly to habitat fragmentation and the alteration of wildlife behavior in the project area.

4.3.3.1 Wildlife in the Area

Alternative A (No-Action Alternative)

Construction Impacts

Under the No-Action Alternative, the proposed rail line would not be built, so there would be no construction-related impacts to wildlife in the area.

Operation and Maintenance Impacts

Under the No-Action Alternative, the proposed rail line would not be built, so there would be no impacts to wildlife in the area related to operation and maintenance of the rail line.

Alternative B (Proposed Action)

Construction Impacts

Under Alternative B, construction impacts to wildlife in the area are anticipated to be minor and short-term. The right-of-way varies from 50 feet wide to 150 feet wide depending on

local conditions. Construction activities would temporarily displace several species of wildlife during construction, but they would likely return after construction.

Operation and Maintenance Impacts

During operation of Alternative B, accidents or equipment failure could release petroleum products from the train engines and associated machinery into the adjacent wildlife habitat. The trains would haul coal (no other specific commodities have been determined), which is not considered to be a hazardous material. In the unlikely event of a coal or petroleum spill, the area would be cleaned up to prevent irreparable harm to the environment.

Maintenance procedures for parts of the Alternative B right-of-way could include periodic application of herbicides to control unwanted vegetation. Herbicides could affect the surrounding wildlife habitat if they are improperly applied. All herbicides would be used in accordance with regulatory requirements.

Maintenance procedures would also include occasional mowing if vegetation becomes a problem within the right-of-way. Occasional mowing could kill or injure small rodents and reptiles using the right-of-way. Operation and maintenance activities would have minor impacts on the surrounding wildlife habitat.

Alternative C

Construction Impacts

Under Alternative C, the construction impacts to wildlife in the area would be the same as those from Alternative B.

Operation and Maintenance Impacts

Under Alternative C, the operation and maintenance impacts to wildlife in the area would be the same as those from Alternative B.

4.3.3.2 Wildlife Corridors

As described in Section 3.3.3.2, Wildlife Corridors, there are important corridors for wildlife and migratory birds in the study area. The Utah Division of Wildlife Resources (UDWR) has stated that the proposed alternatives would bisect critical and high-value winter range for two separate deer herds in the Valley Mountains and the San Pitch Mountains (see Figure 4-4, Impacts to Elk and Mule Deer Seasonal Range).

Alternative A (No-Action Alternative)

Construction Impacts

Under the No-Action Alternative, the proposed rail line would not be built, so there would be no construction-related impacts to wildlife corridors.

Operation and Maintenance Impacts

Under the No-Action Alternative, the proposed rail line would not be built, so there would be no impacts to wildlife corridors related to operation and maintenance of the rail line.

Alternative B (Proposed Action)

Construction Impacts

Construction of Alternative B would result in a relatively small amount of habitat loss within wildlife corridors for migratory birds and big-game mammals. However, because of the timing of the construction of the rail line and the temporary nature of construction, SEA does not anticipate that these construction activities would be a substantial barrier to wildlife movement. Construction of Alternative B would not compromise the biological function of these wildlife corridors.

Operation and Maintenance Impacts

Under Alternative B, rail operations would conflict with the winter movements of two separate deer herds in the Valley Mountains and the San Pitch Mountains. The result of the conflict would be deer-train collisions. Deer-train collisions are expected and would result in deer mortality. However, existing coal-hauling trucks along SR 28 are currently a major source of deer mortality. According to records of road kills from 2001 to 2005 provided by UDWR, on average 15 deer are killed per month along the entire 38.8-mile length of SR 28 (Sakaguchi 2005). Given these data, the removal of many large trucks from SR 28 and the construction of the proposed rail line could result in a net decrease in deer mortality within the wildlife corridors in the study area.

Similarly, any collisions between migratory birds and trains might be offset by fewer collisions with trucks along SR 28. Therefore, the net effect of the project might be to decrease the net number of wildlife collisions within the wildlife corridors in the study area.

Alternative C

Construction Impacts

Under Alternative C, construction impacts to wildlife corridors would be the same as those from Alternative B.

Operation and Maintenance Impacts

Under Alternative C, the operation and maintenance impacts to wildlife corridors would be the same as those from Alternative B.

4.3.3.3 Wildlife Sanctuaries, Refuges, and State Parks

Alternative A (No-Action Alternative)

Construction Impacts

Under the No-Action Alternative, the proposed rail line would not be built, so there would be no construction-related impacts to wildlife refuges.

Operation and Maintenance Impacts

Under the No-Action Alternative, the proposed rail line would not be built, so there would be no impacts to wildlife refuges related to operation and maintenance of the rail line.

Alternative B (Proposed Action)

Construction Impacts

Under Alternative B, construction impacts would occur to both Yuba Lake Recreation Area and the Redmond WMA. Alternative B would impact 10.8 acres of wildlife habitat associated with Yuba Lake Recreation Area. These impacts would consist of 8.9 acres of sagebrush community and 1.9 acres of agricultural lands. Yuba Lake Recreation Area is mostly surrounded by sagebrush communities. Waterfowl species typically do not use sagebrush communities adjacent to water bodies. Although some wildlife habitat associated with these vegetation communities would be lost, the function of Yuba Lake Recreation Area as a wildlife refuge and migratory stop-over for waterfowl would not be affected by the loss of such a small amount of upland acreage. Alternative B would cross the Sevier Bridge Reservoir on a bridge located at Yuba Narrows. Locating the bridge at this location would allow spanning the lake without placing any dredge, fill, or bridge structures into the Sevier Bridge Reservoir.

Additionally, Alternative B would impact 4.3 acres of wildlife habitat in the Redmond WMA. These impacts would consist of 2.9 acres of agricultural lands and 1.4 acres of riparian habitat. Although construction of Alternative B would result in only a small amount of direct

habitat loss, UDWR stated that construction of Alternative B could disrupt the flow of water from west of Redmond WMA that is crucial to the maintenance and health of the wetland habitat in the area. In addition, Sevier Bridge Reservoir and Chicken Creek Reservoir Bird Habitat Conservation Areas may be similarly affected through potential impacts to the health of wetland habitat.

Although the construction of the proposed project could affect the Redmond WMA, proper BMPs and other mitigation measures would be implemented (see Section 6.3.3, Biological Resources) so that these impacts would not significantly diminish the functions of either the Yuba Lake Recreation Area or the Redmond WMA.

Operation and Maintenance Impacts

Under Alternative B, the impacts from the operation and maintenance of Alternative B on wildlife refuges would be the same as those described for Alternative B in Section 4.3.2, Plant Communities, and Section 4.3.3, Wildlife Resources. Since the flow of water would be maintained to wildlife habitat in Redmond WMA, the operation and maintenance impacts from Alternative B would be minor.

Alternative C

Construction Impacts

Under Alternative C, construction impacts to Yuba Lake Recreation Area would be the same as those from Alternative B. There would be no construction-related impacts to Redmond WMA from Alternative C.

Operation and Maintenance Impacts

Under Alternative C, the operation and maintenance impacts to Yuba Lake Recreation Area would be the same as those as those from Alternative B. There would be no operation or maintenance impacts to Redmond WMA from Alternative C.

4.3.4 Threatened, Endangered, and Sensitive Species

USFWS has determined that the proposed project would have no effect on threatened, endangered, or sensitive species (see Appendix B, U.S. Fish and Wildlife Coordination). Table 4.3-2 below lists the threatened, endangered, and sensitive species that could occur in the study area and therefore could potentially be negatively affected by the proposed alternatives. This table also addresses the state status, the federal status, and the potential for negative impacts from the proposed alternatives for 17 species of concern. USFWS has designated critical habitat for two federally listed species in the table: one bird species, the southwestern willow flycatcher (*Empidonax traillii extimus*), and one plant species, the heliotrope milkvetch (*Astragalus montii*). However, the areas designated as critical habitat for

each of these species are outside the project right-of-way. Also, BLM has stated that no threatened, endangered, or sensitive species are present on BLM-administered land in the project right-of-way (Greenwood 2005). As part of mitigation for the impacts from this project, surveys for specific species would be conducted prior to construction, if required by the affected land management agency. These surveys would be conducted according to agency-approved protocols.

Table 4.3-2. Federal and State Listed Threatened, Endangered, and Sensitive Species of Concern and Their Potential To Be Affected by the Proposed Alternatives

Common Name	Scientific Name	State Status	Federal Status	Potential for Negative Impacts from the Proposed Alternatives
Birds				
Bald eagle	*Haliaeetus leucocephalus*	SPC	T	Potential for negative impacts is low for both Alternative B and Alternative C. Bald eagles are winter migrants in the project corridor. There is little if any suitable nesting habitat present.
Burrowing owl	*Althene cunicularis*	SPC	—	Potential for negative impacts is low for both Alternative B and Alternative C. Burrowing owls were observed in multiple locations in the foothills of the Valley Mountains during field surveys. Burrowing owls are ground nesters in grasslands and prairie habitats. Burrowing owl dens were not identified within the right-of-way corridor for either alternative.
Ferruginous hawk	*Buteo regalis*	SPC	—	The potential for negative impacts is low for both Alternative B and Alternative C. Ferruginous hawks occur in grasslands, agricultural lands, and sagebrush, saltbrush, and greasewood shrub lands and along the edges of pinyon-juniper zones. The study area includes these habitat types; however, ferruginous hawks are encountered so rarely that the probability of occurrence in the project corridor is low.
Long-billed curlew	*Numenius americanus*	SPC	—	Potential for negative impacts is medium for Alternative B (which impacts 4.3 acres of the Redmond WMA) and low for Alternative C. Alternative C would not impact the Redmond WMA. Additionally, it would be spatially separated from the Redmond WMA. Long-billed curlew habitat requirements include short-stature grasslands with a bare ground component, shade, and abundant prey base, all of which are found in and immediately adjacent to the Redmond WMA.
Northern goshawk	*Accipiter gentiles*	SPC	—	No potential for negative impacts for either Alternative B or Alternative C. Northern goshawks prefer nesting in mature mountain forests and riparian-zone habitats. No mature mountain forests are within the project corridor.

Common Name	Scientific Name	State Status	Federal Status	Potential for Negative Impacts from the Proposed Alternatives
Southwestern willow flycatcher	*Empidonax traillii extimus*	SPC	E	Potential for negative impacts is low for Alternative B and Alternative C. Southwestern willow flycatchers prefer enclosed riparian canopy. Inadequate riparian habitats are present in the project area to sustain this species. The project area is outside the known distribution of this species.
Western yellow-billed cuckoo	*Coccyzus americanus occidentalis*	SPC	C	Potential for negative impacts is low to none for Alternative B and Alternative C. Western yellow-billed cuckoos require a fairly enclosed riparian canopy habitat. There are inadequate amounts of riparian canopy in the project corridor to support this species. There are no historical accounts of western yellow-billed cuckoo in the project corridor.
Mammals				
Kit fox	*Vulpes macrotis*	SPC	—	Potential for negative impacts is very low to none for Alternative B and Alternative C. Kit foxes prefer open prairie, plains, and desert habitat. The project corridor is too urbanized to support this species.
Utah prairie dog	*Cynomys parvidens*	SPC	T	Potential for negative impacts is very low to none for Alternative B and Alternative C. The project area is outside the known distribution of this species. No prairie dog colonies or mounds were observed during field surveys.
Fish				
Bonneville cutthroat trout	*Oncorhynchus clarki utah*	CS	—	No potential for negative impacts for either Alternative B or Alternative C. Bonneville cutthroat trout occurs in Chicken Creek Reservoir. No impacts to this reservoir are anticipated from the proposed project.
Least chub	*Lotichthys phlegethontis*	CS	—	Potential for negative impacts to the least chub is low to none for Alternative B and Alternative C. Least chub occurs in the Sevier River and its tributaries. Alternative B and Alternative C both cross the Sevier Bridge Reservoir at Yuba Narrows. This area would be spanned. No bridge structures or fill material would be placed in the Sevier River.
Leatherside chub	*Gila copei*	SPC	—	Potential for negative impacts to the leatherside chub is low to none for Alternative B and Alternative C. Leatherside chub occurs in the Sevier River and its tributaries. Alternative B and Alternative C both cross the Sevier Bridge Reservoir at Yuba Narrows. This area would be spanned. No bridge structures or fill material would be placed in the Sevier River.

Common Name	Scientific Name	State Status	Federal Status	Potential for Negative Impacts from the Proposed Alternatives
Amphibians				
Columbia spotted frog	*Rana luteiventris*	CS	—	No potential for negative impacts for either Alternative B or Alternative C. Columbia spotted frog exists in known locations in Juab Valley, but none were identified in the project corridor during field surveys. The Columbia spotted frog prefers isolated springs, and no impacts to springs are anticipated with this project.
Mollusks				
Toquerville springsnail	*Pyrgulopsis kolobensis*	SPC	—	No potential for negative impacts for either Alternative B or Alternative C. No impacts to springs are anticipated from the proposed project. Toquerville springsnail is associated with springs.
Plants				
Heliotrope milkvetch	*Astragalus montii*	SPC	T	No potential for negative impacts for either Alternative B or Alternative C. Heliotrope milkvetch habitat is at high elevation (10,600–10,900 feet), which is outside the elevation range for the proposed project.
Last chance townsendia	*Townsendia aprica*	SPC	T	No potential for negative impacts for either Alternative B or Alternative C. Last chance townsendia is found only in soils derived from the Mancos Formation. No Mancos Formation is found within project corridor.
Wright fishhook cactus	*Sclerocactus wrightiae*	SPC	E	No potential for negative impacts for either Alternative B or Alternative C. Wright fishhook cactus has never been documented to occur within the project corridor. The project corridor is outside the known distribution of this species.

Federal Status

T = Threatened

E = Endangered

C = Candidate for Listing

State Status

SPC = State Species of Concern

CS = Conservation Species. This designation indicates that the species has a conservation agreement in place. Conservation agreements are voluntary cooperative plans among resource agencies. The purpose of a conservation agreement is to take measures to conserve and protect the species and its habitat so that it will not become federally listed.

Source: UDWR 2006

4.3.4.1 Alternative A (No-Action Alternative)

Construction Impacts

Under the No-Action Alternative, the proposed rail line would not be built, so there would be no construction-related impacts to threatened, endangered, or sensitive species.

Operation and Maintenance Impacts

Under the No-Action Alternative, the proposed rail line would not be built, so there would be no impacts to threatened, endangered, or sensitive species related to operation and maintenance of the rail line.

4.3.4.2 Alternative B (Proposed Action)

Construction Impacts

As described above in Table 4.3-2, Federal and State Listed Threatened, Endangered, and Sensitive Species of Concern and Their Potential To Be Affected by the Proposed Alternatives, no impacts are anticipated to most threatened, endangered, or sensitive species. Construction of Alternative B could affect three special-status species: long-billed curlew, least chub, and leatherside chub.

Suitable habitat for the long-billed curlew occurs within the Redmond WMA. Construction of Alternative B would impact up to 4.3 acres in the Redmond WMA. However, there are no known documented occurrences of long-billed curlew nesting within the area affected by Alternative B.

The least chub and the leatherside chub both occur in the Sevier River. Alternative B crosses the Sevier Bridge Reservoir at Yuba Narrows and again farther south in Sevier County. Placing the bridge at this location would allow spanning the lake without placing any bridge structures, dredge, or fill material into the lake. The potential for negative impacts to the least chub and the leatherside chub is low to none for Alternative B. Additional mitigation measures to avoid or minimize any impacts to these fish are described in Section 6.3.3, Biological Resources.

Burrowing owls have been observed by HDR biologists near the project right-of-way west of Alternative B in the foothills of the Valley Mountains. Burrowing owl dens were not identified within the right-of-way for Alternative B. The potential for negative impacts to burrowing owls is low for this alternative.

Operation and Maintenance Impacts

During operation of Alternative B, accidents or equipment failure could release petroleum products from the train engines and associated machinery into the adjacent habitat for the long-billed curlew, least chub, and leatherside chub. The trains would haul primarily coal,

which is not considered to be a hazardous material. In the unlikely event of a coal or petroleum spill, the area would be cleaned up to prevent irreparable harm to the environment.

Collisions between long-billed curlews and trains might occur infrequently, but operational and maintenance activities for Alternative B would not likely affect the long-term viability of any threatened, endangered, or sensitive species.

4.3.4.3 Alternative C

Construction Impacts

As described above in Table 4.3-2, Federal and State Listed Threatened, Endangered, and Sensitive Species of Concern and Their Potential To Be Affected by the Proposed Alternatives, no impacts are anticipated to most threatened, endangered, or sensitive species. Construction impacts under Alternative C would be the same for the least chub, leatherside chub, and burrowing owl as those from Alternative B. However, Alternative C would not impact Redmond WMA and associated long-billed curlew habitat. Therefore, construction impacts for this species would be less under Alternative C than under Alternative B.

Operation and Maintenance Impacts

Under Alternative C, the operation and maintenance impacts to threatened, endangered, and sensitive species would be similar to those from Alternative B. Alternative C does not travel through Redmond WMA; therefore, impacts to long-billed curlew would be less than those from Alternative B. Collisions between sensitive bird species and trains might occur infrequently, but operational and maintenance activities for Alternative C would not likely affect the long-term viability of any threatened, endangered, or sensitive species.

4.3.5 Accidental Fires

Operation and maintenance of the rail line could infrequently ignite a wildfire. Fires that remove the healthy native vegetation can increase the potential for invasion of noxious weeds. If fire occurs frequently, the native vegetation might never recover due to competition with invasive species. Some of the plant communities that would be bisected by the rail line are grasslands and desert grasslands. During dry periods, the danger of igniting a fire in these plant communities would be increased with the presence of the rail line (see Figure 4-5, Vegetation Impacts).

4.3.5.1 Alternative A (No-Action Alternative)

Construction Impacts

Under the No-Action Alternative, the proposed rail line would not be built, so there would be no construction-related impacts to biological resources resulting from accidental fires.

Operation and Maintenance Impacts

Under the No-Action Alternative, the proposed rail line would not be built, so there would be no operation and maintenance–related impacts to biological resources resulting from accidental fires.

4.3.5.2 Alternative B (Proposed Action)

Construction Impacts

Under Alternative B, the number of accidental fires caused by the construction of the proposed rail line is expected to be minor.

Operation and Maintenance Impacts

Operation of a rail line can cause accidental fires. Accidental fires resulting from Alternative B that are not confined to the right-of-way could alter existing plant communities, including areas that provide habitat for threatened, endangered, and sensitive species or other wildlife. Accidental fires could also affect big-game migratory corridors or adjacent wildlife refuge habitat. Additionally, fires have the potential to convert healthy native vegetative communities to monocultures of undesirable noxious weeds.

4.3.5.3 Alternative C

Construction Impacts

Under Alternative C, the construction-related impacts to biological resources resulting from accidental fires would be the same as those from Alternative B.

Operation and Maintenance Impacts

Under Alternative C, the operation and maintenance–related impacts to biological resources resulting from accidental fires would be the same as those from Alternative B.

4.3.6 Mitigation Measures for Impacts to Biological Resources

Mitigation measures for impacts to biological resources are discussed in Section 6.3.3, Biological Resources, and Section 6.4.3, Biological Resources.

4.4 Impacts to Water Resources

This section describes the expected direct and indirect impacts of the proposed alternatives on surface water and groundwater in the Sevier River watershed and study area (see Figure 4-7, Impacts to Water Resources). It includes discussion of permitting requirements as well as impacts to streams, lakes, wetlands, floodplains, wells, and public water sources.

4.4.1 Methodology

Surface Water Impacts. SEA assessed surface water impacts for each of the alternatives by evaluating the number of rivers and ephemeral drainages that would be crossed by each alternative. Of particular concern are waters currently listed on the State of Utah 303(d) list of impaired waters; these waters fail to meet water quality standards due to the presence of one or more pollutants. To determine whether construction of the proposed rail line would affect the amount of these pollutants in surface waters, SEA compared the amount of existing ground that has been disturbed by construction to the amount of ground that would be disturbed by construction of the proposed rail line. Disturbed ground is considered to contribute more pollutants to nearby surface waters than undisturbed ground.

The closer an alternative is to a drainage, the greater are the expected impacts (release of sediment or pollutants) to the drainage. If the source of pollution is farther away from surface waters, pollutants are more likely to be filtered out of runoff through settlement of suspended sediments, reactions from sunlight, and nutrient uptake by plants before the runoff reaches the water body. These processes would treat runoff from both construction impacts and impacts from railroad operation.

Areas that would be built up to support the rail line (filled areas) are more likely to degrade water quality than areas that are undisturbed because there is a greater potential for sediment and pollutants from disturbed areas to wash into surface waters. The side slopes of filled areas are typically vegetated. A raised area causes more negative impacts to water quality than undisturbed ground, which can treat runoff through processes such as infiltration of runoff into soil, nutrient uptake of soluble pollutants by plants, or sheetflowing of runoff through vegetation to remove particulates. In addition, the side slopes of filled areas erode more easily than undisturbed ground, particularly undisturbed ground with a flatter slope. When water flows along a steeper slope, it has a higher velocity and can potentially cause more erosion and mobilize more sediments.

Canals and Irrigation. Impacts to canals and irrigation were determined by reviewing topographic maps, evaluating current farming practices, and assessing the proposed alternatives to determine whether they would affect access to canals or irrigation facilities.

Floodplains. Impacts to floodplains were determined by calculating the amount of land that would be disturbed in areas that have a regulatory floodplain as defined by FEMA (see Section 3.4.4, Floodplains). These regulatory floodplains are shown in Figure 3-7, Floodplains, and the impacts were calculated for each alternative using GIS.

Wetlands and Waters of the U.S. SEA evaluated the effects of the alternatives on wetlands and other jurisdictional waters of the U.S. using the study area wetland data described in Section 3.4.5, Wetlands and Waters of the U.S. SEA used GIS to determine the acreage of wetlands that would be located within the right-of-way for each proposed alternative. To determine the expected impacts to ephemeral drainages, SEA counted the number of drainage crossings for each alternative.

Groundwater. Impacts to groundwater were determined by calculating the acreage of disturbance to groundwater recharge areas and the proximity of the proposed alternatives to drinking water wells. The extent of disturbance was calculated using GIS.

4.4.2 Permitting

Table 4.4-1 below lists the permits that would be needed to construct the proposed project in addition to regulations that must be followed during construction and operation of the railroad. The major permits are described in more detail after the table.

Table 4.4-1. Water Quality Permits and Regulations To Be Considered during Construction and Operation of the Railroad

Regulation	Regulatory Agency and Requirement
CWA Section 401 State Water Quality Certification	USEPA requires UDEQ to certify that the project would not cause Utah water quality standards to be exceeded.
CWA Section 402 (UAC R317-8) NPDES Permit (UPDES in Utah) (Limits discharges)	USEPA delegated authority for the National Pollutant Discharge Elimination System (NPDES) program in Utah to UDEQ. Industrial projects that discharge stormwater to surface water, construction projects that disturb more than 1 acre of land, and construction dewatering projects must obtain a Utah Pollutant Discharge Elimination System (UPDES) permit.
CWA Section 404 Waters and Wetlands	USEPA delegated authority for the Waters and Wetlands program to USACE. Stream alteration permits are administered by the Utah Division of Water Rights. All waters of the United States, such as streams, rivers, lakes, etc., including wetlands, are protected under the guidelines of the Clean Water Act, including the requirements for appropriate and practicable mitigation.
CWA Section 303(d) Impaired Waters (Limits discharges)	USEPA requires the Utah Division of Water Quality to identify water bodies that do not meet state water quality standards and therefore do not support their designated beneficial use. The Division submits a 303(d) list of these impaired waters to USEPA biannually. The Division conducts a total maximum daily load (TMDL) analysis on the impaired waters to determine the maximum contaminant load that the water body can accept and still meet the standards. The Division then assigns point-source dischargers (UPDES permit holders) a numerical limit for discharge of particular pollutants based on the TMDL analysis.
UAC R317-2-7.2 Narrative Water Quality Standards (Limits discharges)	This regulation states that it is unlawful to discharge into surface waters substances that could cause undesirable effects on human health or aquatic life.
UAC R317-2-14 Beneficial Uses (In-stream standard)	Numeric standards for water quality are based on the water body's beneficial use, such as drinking water, supporting game fish, or swimming. Projects cannot cause water quality standards to be exceeded. If a standard is already being exceeded, a TMDL limit may be applied to the project.
UAC R317-2-3 High-Quality Waters (In-stream standard)	UDEQ regulations state that waters whose existing quality is better than the established standards for the designated uses would be maintained at high quality; that is, a project cannot cause the existing water quality to be degraded.
UAC R309-600 and 605 Drinking Water Source Protection (Regulates activities near drinking water sources)	Owners of public water systems are responsible for protecting sources of drinking water and for submitting a Drinking Water Source Protection (DWSP) Plan to the Utah Division of Drinking Water. DWSP Plans must identify DWSP zones around each drinking water source (such as a lake, river, spring, or groundwater well), existing sources of contamination, and the types of new construction projects that are restricted within each zone.
UAC R317-6 Classified Aquifers (Aquifer standards; limits discharges to groundwater)	The Utah Water Quality Board classifies aquifers according to quality and use (such as ecologically important, irreplaceable, drinking water quality, and saline). The Utah Division of Water Quality publishes numerical standards for each class. Any person can petition the Board to classify an aquifer. In addition, the Division requires groundwater permits for activities that discharge pollutants to groundwater. The Central Utah Rail project is unlikely to require a groundwater permit because the impacts are likely to be considered *de minimis* (that is, too minor to require action) based on discussion with the Utah Division of Water Quality.

CWA = Clean Water Act; UAC = Utah Administrative Code

4.4.3 Regulatory Programs

The regulatory programs of several federal, state, and local agencies address water resources in the project study area. Impacts to waters of the U.S., including perennial streams, intermittent streams, and wetlands, require permits from USACE. Section 404 of the Clean Water Act requires a permit for the discharge of dredge or fill material into waters of the U.S. The USACE Section 404 permit process requires a comprehensive analysis of the steps taken to avoid and minimize wetland impacts. The USACE Section 404 permit would require mitigation to compensate for unavoidable impacts on jurisdictional wetlands.

Section 401 of the Clean Water Act requires certification from UDEQ that the project would not violate state water quality standards. According to Section 402 of the Clean Water Act, and because the project would disturb more than 1 acre, the Applicant would be required to obtain a Utah Pollutant Discharge Elimination System permit for construction-related stormwater runoff discharges.

Executive Order 11988, Floodplain Management, established federal policy "to avoid to the extent possible the long- and short-term adverse impacts associated with the occupancy and modification of floodplains and to avoid direct or indirect support of floodplain development wherever there is a practicable alternative." To the extent practicable, a proposed action should not "significantly" encroach on the 100-year floodplain. What constitutes a "significant" encroachment is determined on a case-by-case basis, considering adjacent development. FEMA has set a 1-foot increase in the 100-year flood elevation as the upper limit of allowable impact.

Executive Order 11990, Protection of Wetlands, established federal policy to "avoid to the extent possible the long- and short-term adverse impacts associated with the destruction or modification of wetlands and to avoid direct or indirect support of new construction in wetlands wherever there is a practicable alternative."

4.4.4 Impacts to Surface Waters

4.4.4.1 Alternative A (No-Action Alternative)

Under the No-Action Alternative, the rail line would not be built. Existing sources of pollution, such as highways and areas disturbed by construction, would continue to contribute pollutants to surface waters.

4.4.4.2 Alternative B (Proposed Action)

Alternative B would cross the Sevier River at two locations and would cross a total of 85 ephemeral drainages (see Table 4.4-2 below). Under Alternative B, the southern portion of the alternative would be placed on fill (that is, raised above the existing ground); however, this fill would not disproportionately impact wetlands. Alternative B would widen

substantially at the northernmost end, which is the connection to the Union Pacific mainline and switch yard. At this point, Alternatives B and C are on the same alignment. In this area, as well as the southern terminus loop ramp, there would be more ground disturbed during construction and therefore more potential for surface water impacts.

Table 4.4-2. Approximate Impacts to Wetlands and Ephemeral Drainages

Alternative	Wetland Impacts (acres)			Crossings of Ephemeral Drainages
	Emergent Marsh	Wet Meadow	Total	
Alternative A	0.0	0.0	0.0	0
Alternative B	71.1	92.4	163.5	85
Alternative C	70.6	92.4	163.0	109

Table 4.4-3 shows the acres of ground that would be disturbed by each alternative. Construction of Alternative B would disturb 335.48 acres of ground.

Table 4.4-3. Area Disturbed by the Proposed Alternatives

Alternative	Disturbed Area (acres)
Alternative A	0.00
Alternative B	335.48
Alternative C	464.17

Source: HDR Engineering, Inc. 2006b

Common Railroad Pollutants

In addition to sedimentation, railroad pollutants can also affect surface waters. The following list presents the conventional pollutants from railroad operations as published in the *Federal Register* (Volume 58, No. 222, November 19, 1993, page 61335):

- Biological oxygen demand (BOD5)
- Chemical oxygen demand (COD)
- Nitrate + nitrate nitrogen
- Total Kjeldahl nitrogen
- Oil and grease
- pH
- Total phosphorus
- Total suspended solids (TSS)

Of these pollutants, only phosphorus is mentioned in the 303(d) list as a pollutant whose standard is not being met in the study area (see Section 3.4.2.2, Impaired Waters). The

impaired water for which phosphorus is a problem is the Sevier River between the Sevier Bridge Reservoir dam and the confluence with Salina Creek.

4.4.4.3 Alternative C

Alternative C would cross the Sevier River at two locations and would cross a total of 109 ephemeral drainages.

Construction of Alternative C would disturb 464.17 acres of ground. The increase in disturbed area over Alternative B is due primarily to the design of the southern end of the Alternative C alignment. This part of the alignment would require a filled berm up to 75 feet high and a maximum of 550 feet wide as the rail line approaches the southern terminus. The area of the Alternative C alignment with the berm would have the steepest and longest slopes.

4.4.5 Impacts to Canals and Irrigation

4.4.5.1 Alternative A (No-Action Alternative)

Under the No-Action Alternative, the proposed rail line would not be built, so the No-Action Alternative would have no impact to canals and irrigation.

4.4.5.2 Alternative B (Proposed Action)

Alternative B would use farmland in the northern portion of its alignment north of where Alternatives B and C diverge. Alternative B lies east of the Piute, Vermillion, and Rocky Ford irrigation canals and would cut off some farms' access to these canals. During the scoping phase of the project, farmers suggested that sleeves (pipe culverts) could be placed beneath the rail line so that irrigation lines could still tie into the canals. The Applicant will coordinate the locations of the sleeves with the farmers, as described in Section 6.3.4, Water Resources. In the southern portion of its alignment, Alternative B would use less farmland than Alternative C. Table 4.4-7, Impacts to Groundwater Recharge Areas, on page 4-47 shows impacts to groundwater recharge areas, which is also the amount of land taken for each alternative.

4.4.5.3 Alternative C

Alternative C would not use any irrigated farmland in the northern portion of its alignment north of where Alternatives B and C diverge. Alternative C lies west of the Piute, Vermillion, and Rocky Ford irrigation canals in an area that is not typically irrigated for farming. During the scoping phase of the project, farmers initially stated a preference for Alternative C because it would not cut off access to these canals. However, as Alternative C was developed, SEA determined that a filled berm up to 75 feet high and a maximum of 550 feet wide would be required as the rail line approaches the southern terminus. This berm would require a substantial amount of additional farmland toward the southern end of this alternative. Table

4.4-7, Impacts to Groundwater Recharge Areas, on page 4-47 shows impacts to groundwater recharge areas, which is also the amount of land taken for each alternative.

4.4.6 Impacts to Floodplains

4.4.6.1 Alternative A (No-Action Alternative)

Under the No-Action Alternative, the proposed rail line would not be built, so the No-Action Alternative would have no impact to floodplains.

4.4.6.2 Alternative B (Proposed Action)

Alternative B would disturb 15.96 acres of Zone A floodplain (see Table 4.4-4 and Figure 4-6, Wetland/Drainage Impacts). Development within Zone A floodplains is allowed provided it does not cause a rise in the surface water elevation of 1 foot or more. Compared to the overall size of the floodplain, the impact of disturbing up to 20 acres of floodplain should not cause an increase in water surface elevation of more than 1 foot. The culverts and bridges along the rail line would be designed in accordance with FEMA regulations. These minimum FEMA regulations are to be administered by the county floodplain administrators for their respective counties as listed in Table 4.4-5.

Table 4.4-4. Impacts to Floodplains

Alternative	Floodplain Impacts (acres)	Zone
Alternative A	0.00	A
Alternative B	15.96	A
Alternative C	18.13	A

Impacts do not include Juab County because there is no Flood Insurance Rate Map for Juab County.

Source: HDR Engineering, Inc. 2006c

Table 4.4-5. County Floodplain Administrators

County	Floodplain Administrator	Telephone
Juab County	Glen Greenhalgh, City of Nephi	(435) 623-0822
Sanpete County	Dale Nichols	(435) 835-2113
Sevier County	Don Brown, County Attorney	(435) 896-9262

Source: Crofts 2006

4.4.6.3 Alternative C

Alternative C would disturb 18.13 acres of floodplain. Compared to the overall size of the floodplain, the impact of disturbing up to 20 acres of floodplain should not cause an increase in water surface elevation of more than 1 foot. The culverts and bridges along the rail line would be designed in accordance with FEMA regulations. These minimum FEMA regulations are to be administered by the county floodplain administrators for their respective counties, as listed above in Table 4.4-5, County Floodplain Administrators.

4.4.7 Impacts to Wetlands and Waters of the U.S.

Jurisdictional waters of the U.S. in the study area are described in Section 3.4.5, Wetlands and Waters of the U.S., and include springs, wetlands, riparian zones, open water, and ephemeral drainages. As discussed in Section 4.4.2, Permitting, all waters of the U.S. are protected under the guidelines of the Clean Water Act. Figure 4-6, Wetland/Drainage Impacts, shows the locations of wetlands relative to the proposed alternatives. Direct impacts to wetland areas (about 163 acres) and ephemeral washes (85 acres for Alternative B and 109 acres for Alternative C) are provided in Table 4.4-2, Approximate Impacts to Wetlands and Ephemeral Drainages, on page 4-41.

4.4.7.1 Alternative A (No-Action Alternative)

Under the No-Action Alternative, there would be no construction impacts to wetlands or ephemeral drainages. There would be no long-term operation or maintenance impacts to wetlands, ephemeral drainages, or other jurisdictional waters of the U.S.

4.4.7.2 Alternative B (Proposed Action)

Construction Impacts

According to Table 4.4-2, Approximate Impacts to Wetlands and Ephemeral Drainages, on page 4-41, Alternative B would directly impact 71.1 acres of emergent marsh and 92.4 acres of wet meadow for a total of 163.5 acres of direct wetland impacts. Most of the wet meadow impacts would occur near the northern terminus for Alternative B northeast of Chicken Creek Reservoir. Impacts to emergent marsh would occur mainly near Yuba Narrows and the northern terminus. The placement of fill in these areas would cause a permanent loss of wetland functions. Hydrologic modifications and stormwater runoff from Alternative B could indirectly affect wetlands by altering the functions and composition of wetlands that are located near the construction footprint.

Alternative B would cross 85 ephemeral drainages. As described in Section 3.4.5, Wetlands and Waters of the U.S., several of these ephemeral drainages have been disturbed or modified by human activities. Based on the characterization of ephemeral drainages in the study area, the character and quality of the drainages do not differ substantially among the different

locations for Alternative B crossings. No notable or unique ephemeral drainages were identified. Placement of fill and other materials to construct crossings would constitute minor impacts to ephemeral drainages.

Alternative B may impact a small amount of riparian vegetation (about 3 acres) near Chicken Creek Reservoir, Sevier Bridge Reservoir, Redmond Lake, and the Sevier River floodplain, but it would not impact any open water areas.

Operation and Maintenance Impacts

During the operation of Alternative B, accidents or equipment failure could result in a release of petroleum from the engine into adjacent wetlands. Stormwater discharges could contain low concentrations of typical railway pollutants that would indirectly affect wetlands located along the receiving waterways and drainages. Adjacent wetland areas are located primarily near Chicken Creek Reservoir, Yuba Narrows, and Redmond Lake. Railroad maintenance could include repairs to the tracks, associated structures, and bridges as well as cleaning out ditches, drainages, and culverts. These activities would be of short duration and relatively infrequent and, if they were located in wetlands, would be performed in accordance with any permit requirements.

4.4.7.3 Alternative C

Construction Impacts

According to Table 4.4-2, Approximate Impacts to Wetlands and Ephemeral Drainages, on page 4-41, Alternative C would directly impact 70.6 acres of emergent marsh and 92.4 acres of wet meadow for a total of 163.0 acres of direct wetland impacts. The general locations of impacts and indirect impacts from Alternative C would be the same as those from Alternative B.

Alternative C would cross 109 ephemeral drainages. Based on the characterization of ephemeral drainages in the study area, the character and quality of the drainages do not differ substantially among the different locations for Alternative C crossings. Placement of fill and other materials to construct crossings would constitute minor impacts to ephemeral drainages.

Alternative C would not impact any identified areas of lowland riparian vegetation.

Operation and Maintenance Impacts

The long-term impacts from Alternative C would be the same as those from Alternative B.

4.4.8 Impacts to Groundwater

The Utah Division of Drinking Water, which issues groundwater permits, considers the impacts to groundwater from a railroad to be *de minimis* (too minor to require action) and

does not require a permit for this project (Herbert 2006). Nevertheless, there would be a small impact to groundwater quality because developing undisturbed soil could cause a slight deterioration of the groundwater recharge area compared to the No-Action Alternative. Figure 4-6, Wetland/Drainage Impacts, shows the groundwater reservoirs that would be affected by the various alternatives.

None of the alternatives would displace the 18 drinking water wells in the study area. In addition, none of the alternatives would be located in DWSP Zone 1, which is the area within 100 feet of a wellhead (see Section 3.4.6.3, Drinking Water Source Protection Zones). All 18 drinking water wells in the study area are located in or near DWSP Zones 2, 3, or 4.

Consequently, SEA does not expect any of the alternatives to substantially affect drinking water for any of the 18 drinking water wells. The Utah Division of Drinking Water encourages building as far as possible from drinking water wells, preferably outside of Zone 4. Table 4.4-6 shows that there are eight wells for Alternative B and six wells for Alternative C that are within 2 miles of the alternatives and 15 wells for Alternatives B and C that are within 5 miles of the alternatives.

Table 4.4-6. Drinking Water Wells within 2 Miles and 5 Miles of the Proposed Alternatives

Alternative	Wells within 2 Miles	Wells within 5 Miles
Alternative A	0	0
Alternative B	8	15
Alternative C	6	15

Source: HDR Engineering, Inc. 2006d

4.4.8.1 Alternative A (No-Action Alternative)

Under the No-Action Alternative, the proposed rail line would not be built, so there would not be any impacts to groundwater recharge areas or to the 18 drinking water wells in the study area.

4.4.8.2 Alternative B (Proposed Action)

Alternative B would disturb 173.93 acres of groundwater recharge area (see Table 4.4-7 below). The Utah Division of Water Quality generally does not consider railroad construction in a groundwater recharge area to be a significant concern. There are seven drinking water wells within 2 miles of Alternative B and 14 wells within 5 miles of the alternative. The Utah Division of Drinking Water encourages building as far as possible from drinking water wells.

4.4.8.3 Alternative C

Alternative C would disturb 259.11 acres of groundwater recharge area (see Table 4.4-7). The Utah Division of Water Quality generally does not consider railroad construction in a groundwater recharge area to be a significant concern. There are five drinking water wells within 2 miles of Alternative C and 14 wells within 5 miles of the alternative. The Utah Division of Drinking Water encourages building as far as possible from drinking water wells.

Table 4.4-7. Impacts to Groundwater Recharge Areas

	Groundwater Recharge Area (acres)				
Alternative	Aurora-Redmond Reservoir	Redmond-Gunnison Reservoir	Gunnison-Sevier Bridge Reservoir[a]	Southern Juab Valley Reservoir	Total (acres)
Alternative A	0.00	0.00	0.00	0.00	0.00
Alternative B	46.65	39.61	0.00	87.67	173.93
Alternative C	171.44	0.00	0.00	87.67	259.11

[a] The northern portion of the groundwater recharge area is unmapped since its location is unclear. Little is known about the extent, thickness, or characteristics of the groundwater reservoir in the lower subbasin as it is typically covered by water stored in Sevier Bridge Reservoir (UDWR 1999).

Source: HDR Engineering, Inc. 2006e

4.4.9 Mitigation Measures for Impacts to Water Resources

Mitigation measures for impacts to water resources are discussed in Section 6.3.4, Water Resources, and Section 6.4.4, Water Resources and Wetlands.

4.5 Impacts to Topography, Geology, and Soils

4.5.1 Methodology

SEA assessed whether the construction and operation of the proposed rail line would substantially affect the local topography, geology, and soils. This evaluation included a review of topographic and geologic maps, relevant published geology, water resources reports logs, soil borings, preliminary design information, and experience in similar settings and construction.

An NRCS-CPA-106 Farmland Impact Rating Form was used to evaluate the impacts of each proposed alternative on prime and state important farmland. The main criteria used for this rating are total farmland acreage to be converted (both directly and indirectly), percentage of total acreage in the county or city, degree of nonurban land use, level of on-farm investments, availability of state or local programs to protect farmland, impacted farm size compared to the average, and amount of nonfarmable land that is created.

If the right-of-way receives a total rating of less than 160 points, it is given a minimal level of consideration for protection and no additional sites need to be evaluated. If the right-of-way receives a total rating of 160 points or more, it receives higher levels of consideration for protection and additional alternatives must be evaluated. Both Alternative B and Alternative C had ratings under 160 points as described in Section 4.5.5, Impacts to Prime Farmland. These are the guidelines and criteria for assessing impact ratings under 7 CFR 658.4 and 658.5. Impacts on prime farmland from the proposed alternatives are described below.

4.5.2 Topographic Impacts

4.5.2.1 Alternative A (No-Action Alternative)

The No-Action Alternative does not involve new construction, so it would not result in any topographic changes.

4.5.2.2 Alternative B (Proposed Action)

Alternative B would result in mostly minor changes to the existing topography along the right-of-way of the proposed rail line due to the flat rail grades and relatively flat existing ground. Due to the flat natural topography, most of the length of the rail line would be at or near the natural grade, and only small changes would be needed to fill in depressions or excavate the higher ground. These changes would raise or lower the existing topography by about 3 feet to 5 feet and would include compacted embankment fill and a subballast/ballast section under the ties and track. The fills for embankments would be taken from the extensive sand and gravel deposits along the right-of-way. The proposed project would require about 1,286,000 cubic yards of borrow. Materials would come from sites along the right-of-way within 0.5 mile to 1 mile of the alternative (Washington Group 2006). This material would be an excellent source of fill that could be placed and compacted in embankments with slopes as steep as 2:1. The foundation conditions are generally well suited to support the fills, and no foundation improvement with stone columns, wick drains, or staged construction would be needed.

Culverts would be provided so that existing drainages can safely pass storm runoff.

The greatest topographic increases would occur at the grade separations over existing roadways and water crossings where approach embankments would be constructed. The maximum height of these embankments would be about 25 feet. In addition, excavations into higher ground would be required which may have a maximum height of about 25 feet.

4.5.2.3 Alternative C

The topographic impacts from Alternative C would be the same as those from Alternative B, except in Sevier County where a berm with a maximum height of 75 feet and a maximum

width of 550 feet would be required as the rail line approaches the southern terminus. About 12,518,000 cubic yards of borrow material would be required for Alternative C.

4.5.3 Geologic Impacts

4.5.3.1 Alternative A (No-Action Alternative)

The No-Action Alternative does not involve new construction, so it would not result in any impacts to geologic conditions.

4.5.3.2 Alternative B (Proposed Action)

As discussed in Section 3.5, Geology and Soils, the primary geologic hazards that could affect the region are ground motions caused by earthquake shaking and soil liquefaction. Rail line construction or traffic is not anticipated to affect seismicity, landslides, or the frequency or intensity of earthquakes. The actual inclinations of the cut-and-fill slopes have not been determined at this time, but will be selected based on the observed subsurface conditions and the configuration of the cut or fill. The earthen cuts and fills required to construct the new rail line would not adversely affect the geologic conditions or the stability of the ground or cause an increase in seismic activity. The configuration of the cuts and fills will be selected to provide long-term stability, erosion resistance, and minimal maintenance. Alternative B would not involve actions that would adversely affect the existing geologic conditions or increase the potential for the occurrence of geologic hazards in the area within and outside of the right-of-way.

For this alternative, water would be required to compact the new fill and to control dust. This water would be taken from the Sevier Bridge Reservoir and not from groundwater wells. Therefore, this alternative would not cause subsidence due to extracting groundwater, and no impacts to groundwater conditions would occur.

4.5.3.3 Alternative C

The impacts to geologic conditions from Alternative C would be the same as those from Alternative B.

4.5.4 Soil Impacts

4.5.4.1 Alternative A (No-Action Alternative)

The No-Action Alternative does not involve new construction, so it would not affect soils.

4.5.4.2 Alternative B (Proposed Action)

The surficial soils within the study area and those that would be exposed from grading operations are generally granular in nature and were deposited in alluvial and deltaic

environments. SEA anticipates a minor increase in erosion to these soils during grading operations and construction of Alternative B. Disturbance of surface soils is an unavoidable aspect of the construction process.

The naturally flat topography and the use of standard erosion-control practices would reduce the amount of erosion that occurs. These erosion-control practices include limiting the amount of disturbed areas, replanting vegetation as soon as practical after construction, and spraying the disturbed areas with water to reduce the amount of windblown dust. Haul and access roads might require additional treatment such as a surface layer of crushed rock to provide a stable surface for traffic and to protect against erosion.

4.5.4.3 Alternative C

The impacts to soils under Alternative C would be greater than those from Alternative B due to construction of the 75-foot-tall berm at the southern terminus of the rail line.

4.5.5 Impacts to Prime Farmland

4.5.5.1 Alternative A (No-Action Alternative)

Under the No-Action Alternative, the Central Utah Rail project would not be built. However, the study area would experience continued residential, commercial, industrial, and recreational development. The No-Action Alternative would not cause any indirect impacts to prime farmland, although continued development in the study area would likely convert some prime farmland to urban uses near Salina.

4.5.5.2 Alternative B (Proposed Action)

Under Alternative B, 12.1 acres of prime farmland would be impacted. The impacts to prime farmland in the farmland study area are shown in Table 4.5-1 below and Figure 4-8, Impacts to Prime and State Important Farmland.

Using the NRCS-CPA-106 rating form, the Alternative B right-of-way is rated 114 points (see Appendix H, Farmlands), which is under the 160-point threshold that requires the implementation of special mitigation measures and the consideration of other alternatives.

There would be no indirect impacts to prime farmland under this alternative.

4.5.5.3 Alternative C

Under Alternative C, 19.99 acres of prime farmland would be impacted. The impacts to prime farmland in the farmland study area are shown in Table 4.5-1 below.

Using the NRCS-CPA-106 rating form, the Alternative C right-of-way is rated 124 points (see Appendix H, Farmlands), which is under the 160-point threshold that requires the implementation of special mitigation measures and the consideration of other alternatives.

At the southern end of Alternative C near US 50, about 2.7 acres of prime farmland would be indirectly impacted.

Table 4.5-1. Direct and Indirect Impacts on Prime and State Important Farmland

Type of Farmland	Alternative A (acres)	Alternative B (acres)	Alternative C (acres)
Prime Farmland			
Direct impacts	0.0	12.1	19.99
Indirect impacts[a]	0.0	0.0	2.70
State Important Farmland			
Direct impacts	0.0	3.1	3.06
Indirect impacts[a]	0.0	0.0	0.00
Total	**0.0**	**15.2**	**25.75**

[a] This number includes farmland outside the right-of-way that would no longer be farmable due to small parcel size, lack of access, or other reasons.

4.5.6 Impacts to Unique Farmland

According to NRCS, there is no unique farmland in the study area (Parslow 2004).

4.5.7 Impacts to Farmland of State Importance

4.5.7.1 Alternative A (No-Action Alternative)

Under the No-Action Alternative, the Central Utah Rail project would not be built. However, the study area would experience continued residential, commercial, industrial, and recreational development. The No-Action Alternative would not cause any direct impacts to state important farmland, although continued development in the study area would likely convert some state important farmland to urban uses near Salina.

4.5.7.2 Alternative B (Proposed Action)

Under Alternative B, 3.1 acres of state important farmland would be impacted. The impacts to state important farmland in the farmland study area are shown in Table 4.5-1 above, Direct and Indirect Impacts on Prime and State Important Farmland.

Using the NRCS-CPA-106 rating form, the Alternative B right-of-way is rated 114 points (see Appendix H, Farmlands), which is under the 160-point threshold that requires the implementation of special mitigation measures and the consideration of other alternatives.

There would be no indirect impacts to state important farmland under this alternative.

4.5.7.3 Alternative C

Under Alternative C, 3.06 acres of state important farmland would be impacted. The impacts to state important farmland in the farmland study area are shown in Table 4.5-1 above, Direct and Indirect Impacts on Prime and State Important Farmland.

Using the NRCS-CPA-106 rating form, the Alternative C right-of-way is rated 124 points (see Appendix H, Farmlands), which is under the 160-point threshold that requires the implementation of special mitigation measures and the consideration of other alternatives.

There would be no indirect impacts to state important farmland under this alternative.

4.5.8 Impacts to Paleontological Resources

4.5.8.1 Methodology

Geologic mapping in coordination with SITLA and the Utah Geological Survey was reviewed to determine the presence of Tertiary formations that might contain fossils.

4.5.8.2 Impact Analysis

Alternative A (No-Action Alternative)

Under the No-Action Alternative, no new rail line construction would take place, so there would be no effects to any paleontological resources.

Alternative B (Proposed Action)

Paleontological resources found on public lands are recognized by BLM as a fragile and nonrenewable scientific record of the history of life on earth, and so represent an important and critical component of America's natural heritage. These resources are afforded protection under 43 CFR 3802 and 3809, and penalties possible for the collection of vertebrate fossils are under 43 CFR 8365.1-5.

Based on the geologic mapping and paleontological occurrences within the area, the project is rated as Condition 2 in accordance with BLM policy, and impacts to fossils are considered unlikely. Based on that conclusion, fossils should be adequately protected by mitigation measures to protect any significant fossils discovered during the construction of the railroad. Therefore, Alternative B is not likely to cause impacts to paleontological resources. Fossils could be present in the Tertiary and Quaternary unconsolidated deposits, but specific discoveries or known locations of paleontological resources from these deposits within the project area are not reported.

Alternative C

Paleontological resources found on public lands are recognized by BLM as a fragile and nonrenewable scientific record of the history of life on earth, and so represent an important and critical component of America's natural heritage. These resources are afforded protection under 43 CFR 3802 and 3809, and penalties possible for the collection of vertebrate fossils are under 43 CFR 8365.1–5.

Based on the geologic mapping and paleontological occurrences, the project is rated as Condition 2 in accordance with BLM policy, and impacts to fossils are considered unlikely. Condition 2 includes areas with exposure of geological units or settings that are likely to contain fossils. The presence of geologic units from which fossils have been recovered elsewhere will require an assessment of these same units if they occur in the area of consideration. Based on that conclusion, fossils should be adequately protected with mitigation measures to protect any significant fossils discovered during the construction of the railroad. Therefore, Alternative C is not likely to cause impacts to paleontological resources. Fossils could be present in the Tertiary and Quaternary unconsolidated deposits, but specific discoveries or known locations of paleontological resources from these deposits within the project area are not reported.

4.5.8.3 Mitigation Measures for Impacts to Paleontological Resources

Mitigation measures for impacts to paleontological resources are discussed in Section 6.3.12, and Section 6.4.10.

4.5.9 Impacts to Minerals and Mining

4.5.9.1 Alternative A (No-Action Alternative)

Under the No-Action Alternative, the proposed rail right-of-way would not be constructed. Consequently, mining operations would continue to operate at current levels and transport their commodities out of Sanpete and Sevier Counties by truck. Mining companies would continue to have similar expenses related to truck transport. However, as discussed in Section 4.10, Impacts to Energy Resources, using trucks to ship coal is more expensive and less energy-efficient than using the rail line (see Section 4.10, Impacts to Energy Resources, and Section 4.11, Socioeconomic Impacts, for further discussion).

4.5.9.2 Alternative B (Proposed Action)

Alternative B would have a minor effect on oil and gas leasing on BLM-administered land. Although oil and gas leases have been issued along the project right-of-way, there are no approved oil and gas activities such as drilling. Proposed activities under an oil and gas lease would be subject to the existing rights of the rail right-of-way, if it is constructed.

There are no other mineral leases, mineral material disposals, mining material disposals, or mining claims within the proposed right-of-way. Future mineral leases, future mineral material disposals, or proposed operations under the mining laws would similarly be subject to the existing rights of the rail right-of-way.

Construction of the rail line under Alternative B would require about 1,286,000 cubic yards of borrow material. In addition, construction could require materials in addition to the fill material that will be produced from construction of the rail line. These materials could include additional fill material, subgrade gravel, and railroad ballast. These materials could come from sources outside the railroad right-of-way on private, state, and/or federal land. Those sources will be permitted in accordance with applicable laws and regulations at the time the individual sources are located for use on the project.

Alternative B would have beneficial impacts on mining companies in the Sevier Valley. SUFCO would need to ship 38,000 carloads annually to provide the economic foundation to proceed with the Proposed Action. Marketing studies show that, without increased production, SUFCO would be shipping 42,410 to 44,175 carloads annually (Washington Infrastructure Services, Inc. and others 2001). The new rail right-of-way would provide a more cost-effective method of transporting mining commodities out of the area. Mining facilities would benefit from the lower operating costs associated with rail transport.

The SUFCO mine would be the primary benefactor of the proposed rail construction due to decreased operating costs related to coal transport and the resulting increased competitiveness with other regional coal producers. SEA predicts that the SUFCO mine would ship 38,000 carloads of coal per year with destinations primarily including utilities in Utah and Nevada. This is about 90% of the total 41,925-carload minimum projected shipping volume and about 87% of the total 43,475-carload maximum projected shipping volume of the Central Utah Rail (Washington Infrastructure Services, Inc. and others 2001).

Other potential users of the Central Utah Rail include Redmond Minerals, Western Clay, US Gypsum Company, Georgia-Pacific Gypsum, Johansen Sand and Gravel, and Hales Sand and Gravel. Mining companies with a lower potential of using the Central Utah Rail include B&H Stone, Consol Energy (Emery Mine), and the proposed power plant near Sigurd.

The right-of-way design could limit the shipping potential for US Gypsum and other businesses in the Sigurd area (Georgia-Pacific Gypsum). In order for US Gypsum to use the rail, they would have to truck their product (gypsum wallboard) to the industrial park at the southern terminus of the rail right-of-way before loading their product onto rail cars. The incremental cost associated with trucking and product handling would likely offset the rail shipping advantage to nearby destinations such as Salt Lake City (the ultimate destination for the majority of US Gypsum product) (Washington Infrastructure Services, Inc. and others 2001).

During a market analysis screening interview performed the week of May 7, 2001, B&H Stone stated that they would like to find a market for their lacustrine limestone that is produced as a byproduct of the quarrying process. However, the delivered value of this lime is about $3.50 per ton due to its relatively low quality. After removing the cost of loading, the remaining value would not cover transportation costs (Washington Infrastructure Services, Inc. and others 2001).

After being idle for a decade, the Emery Mine was reopened by Consol in August 2004 and produced 256,000 tons before year-end. Consol has short-term contracts to keep the mine in service for the indefinite future, and operators plan to produce 1.2 million tons in both 2005 and 2006 (Vanden Berg 2005).

4.5.9.3 Alternative C

Under Alternative C, shippers within portions of Juab, Sanpete, and Sevier Counties would be able to load their cargo only at the southern terminus of the proposed project near Salina. Although Alternative C would have a different alignment than Alternative B, the alternatives would have the same southern terminus, where loading would occur.

Construction of the rail line under Alternative C would require about 12,518,000 cubic yards of borrow material. In addition, construction could require materials in addition to the fill material that will be produced from construction of the rail line. These materials could include additional fill material, sub-grade gravel, and railroad ballast. These materials could come from sources outside the railroad right-of-way on private, state, and/or federal land. Those sources will be permitted in accordance with applicable laws and regulations when the individual sources are located for use on the project.

4.5.10 Mitigation Measures for Impacts to Topography, Geology, and Soils

Mitigation measures for impacts to topography, geology, and soils are discussed in Section 6.3.5, Topography, Geology, and Soils, and Section 6.4.5, Topography, Geology, and Soils.

4.6 Vibration Impacts

4.6.1 Methodology

SEA assessed whether vibrations generated by the construction and operation of the proposed rail line would substantially affect buildings and water wells. This evaluation included a visual examination of aerial photographs, a review of geologic information and literature on train-induced vibration levels, a review of preliminary design information, and SEA's prior experience in similar settings and construction.

Buildings. The analysis of vibration impacts on buildings used the most conservative published criterion for the upper limit of ground vibration that can cause damage to buildings.

This criterion is the DIN 4150 standard for historic and ancient buildings from the Deutsches Institut für Normung (German Institute for Standards).

Under this criterion, a ground vibration level of more than 0.08 ips (inches per second) is considered capable of causing damage to buildings. A loaded freight train traveling at the design speed for the proposed alternatives (49 mph) can be expected to produce this level of vibration at a distance of about 52 feet from the track centerline, based on data collected by the Federal Transit Administration (1998). An allowance was made for sediments along the alternative (such as saturated silty or clayey sediments) that could conduct vibration beyond this distance. A final screening distance of 104 feet, twice the projected minimum, was used to identify expected impacts.

Water Wells. According to a study on the effects of coal mine blasting on domestic water wells (Daniel B. Stephens & Associates, Inc. 2002), a ground vibration level of 0.125 ips at the surface adjacent to a water well has no measurable effect on the integrity of the well or the water quality. A loaded freight train traveling at the design speed for the proposed alternatives (49 mph) can be expected to produce this level of vibration at a distance of about 36 feet from the track centerline, based on data collected by the Federal Transit Administration (2006). Although geologic conditions along the right-of-way are expected to be similar to those in the blasting study, a screening distance of 72 feet, twice the projected minimum, was used to provide a larger buffer zone for identifying expected impacts.

4.6.2 Building Impacts

4.6.2.1 Alternative A (No-Action Alternative)

Under the No-Action Alternative, the Central Utah Rail project would not be built, so there would be no vibration impacts to buildings from construction or operation of the rail line.

4.6.2.2 Alternative B (Proposed Action)

An examination of aerial photographs did not identify any buildings within 104 feet of the track centerline for Alternative B, so no vibration impacts to buildings are expected from this alternative.

4.6.2.3 Alternative C

An examination of aerial photographs did not identify any buildings within 104 feet of the track centerline for Alternative C, so no vibration impacts to buildings are expected from this alternative.

4.6.3 Water Well Impacts

4.6.3.1 Alternative A (No-Action Alternative)

Under the No-Action Alternative, the Central Utah Rail project would not be built, so there would be no vibration impacts to water wells from construction or operation of the rail line.

4.6.3.2 Alternative B (Proposed Action)

An examination of aerial photographs did not identify any water wells within 72 feet of the track centerline for Alternative B, so no vibration impacts to water wells are expected from this alternative. A water well is currently permitted for future installation at the Painted Rocks Campground. When the well is installed or the proposed project is constructed (whichever occurs first), site-specific mitigation measures will be implemented to ensure that the well is not affected.

4.6.3.3 Alternative C

An examination of aerial photographs did not identify any water wells within 72 feet of the track centerline for Alternative C, so no vibration impacts to water wells are expected from this alternative.

4.6.4 Mitigation Measures for Vibration Impacts

SEA has determined through its analysis that the Proposed Action and Alternatives would have a negligible vibration effect on buildings and water wells because construction would be outside of the zone of vibration effect for buildings and water wells. Therefore, no mitigation measures are proposed.

4.7 Impacts to Hazardous Materials

4.7.1 Methodology

SEA identified potentially hazardous waste sites by reviewing the Utah Division of Environmental Response and Remediation (DERR) interactive map viewer. In addition, HDR conducted field surveys to help identify other potentially hazardous sites that were not identified in the DERR databases. As described in Section 3.7.2, Potentially Hazardous Waste Sites, HDR reviewed spill incidents reported to DERR between 1988 and 2003 and queried the National Response Center spills database. Searches of the DERR and National Response Center databases found no spill locations in the study area.

SEA evaluated the expected effects of construction and operation of the proposed rail line on hazardous waste sites based on the following considerations:

- Hazardous waste site type (Brownfield, LUST, UST, etc.), characteristics, and status (active, out of use, closed, etc.)
- Characteristics of surrounding topography, surface water, and apparent direction of groundwater flow
- Sensitive human and ecological receptors (schools, hospitals, wetlands, lakes, and streams)

SEA considers the effects of construction activities at hazardous waste sites to be significant if one or both of the following conditions would occur:

- The construction activities would create a potential threat to human health or the environment by disturbing sites that contain hazardous materials.
- The construction activities have the potential to disturb sites where other parties had contained the contaminants in place to reduce the possibility of threats to human health or the environment (for example, contaminants were covered with a clay, soil, or asphalt cap).

4.7.2 Alternative A (No-Action Alternative)

Under the No-Action Alternative, no construction activities would take place. Therefore, existing hazardous waste sites would not be disturbed.

4.7.3 Alternative B (Proposed Action)

Of the 26 USTs at the seven potentially hazardous waste sites in the study area, 18 have been removed, six are currently in use, and two have been closed in place. A total of three leaking underground storage tanks (LUSTs) are located at two of the sites (see Figure 4-9, Impacts to Potential Hazardous Waste Sites).

Removal or closure of a UST typically indicates that the site has been remediated or did not require remediation when the UST was removed or closed in place. However, contamination (if any) could have been left in place if it did not pose a threat to human health or the environment. For that reason, the proximity of the sites to proposed construction and operation areas should still be considered.

The following paragraphs group the seven potentially hazardous waste sites in the study area by general location and discuss site-specific considerations.

Near Levan. The northernmost UST (Site 2000654), which was removed in 1992, was used to store gasoline. The site is located near the northern project limits about 0.3 mile northeast of the proposed wye connection with the UPRR mainline and on the opposite side of the tracks. Of the seven potentially hazardous waste sites, this former UST location is the closest to the proposed construction activity. The potential of environmental risk is reduced because the UST has been removed and no LUST occurrence is listed for the site. The surface water and assumed groundwater gradients are such that, if any leaking and contamination occurred when the UST was removed, the contamination could migrate toward the proposed wye connection area. As discussed in Section 3.7, Hazardous Materials and Waste Sites, appropriate measures will be put in place to protect workers and the environment from undocumented hazards.

Near Redmond. The second UST (Site 2000114) was used to store diesel fuel and was removed in 1993. The site is located in Sanpete County about 0.7 mile north of the Sanpete County–Sevier County border and about 0.7 mile east of Alternative B. Surface water drainage in the vicinity of the proposed rail line near Site 2000114 is generally from west to east. Any contamination from the former UST site would migrate away from the proposed rail line.

In Salina. Five potentially hazardous waste sites are located close to one another in western Salina. The distances from the sites to Alternative B are between 0.7 mile and 1 mile. A total of 24 USTs have been or are located at the five sites. Of these, 16 have been removed, six are currently in use, and two have been closed in place. Materials stored in the USTs include gasoline, diesel, used oil, and new oil. A total of three LUSTs are located at two of the sites. The proposed construction activity would not disturb the UST or LUST sites. Surface water from the general area of the UST and LUST sites naturally drains toward Salina Creek or the Sevier River, and it is assumed that groundwater follows this same pattern. If any contamination migrates from the sites, it would likely be intercepted by these waterways. Alternative B is located on the opposite side (the west side) of the Sevier River; therefore, the environmental risk from the properties in Salina during construction is low.

As described above, no potentially hazardous waste sites would be directly affected by construction or operation activities associated with Alternative B. SEA determined that neither the USTs nor the LUSTs pose an environmental risk to construction activities. The topography and drainage characteristics of the sites currently in use are such that any

contamination would migrate away from Alternative B and/or would be intercepted before reaching the alignment.

Based on the available information, SEA does not anticipate that significant adverse impacts to human health or the environment are likely to result from disturbances to hazardous materials spill sites and hazardous waste sites during construction or operation activities associated with Alternative B.

4.7.4 Alternative C

Near Levan. Of the seven potentially hazardous waste sites in the study area, only one is located within 1 mile of Alternative C. Site 2000654 near Levan is located near the northern project limits where Alternatives B and C share a common alignment. The impacts associated with this site would be the same as those from Alternative B.

Near Salina. In the southern portion of the study area, Alternative C is located west of Alternative B and is also at a higher elevation. The potentially hazardous waste sites near Redmond and in Salina are located more than 1 mile east of Alternative C, and the topography and drainage are such that any contamination migrating from the sites would not reach Alternative C.

In addition to the seven potentially hazardous waste sites mentioned above, a junk yard is also located within the study area. The junk yard, which was identified by HDR during field reconnaissance, is located near Alternative C at US 50. Based on aerial photography, it appears that most of the junk yard is located west of Alternative C. SEA did not determine whether hazardous materials are present at the junk yard, but the construction contractor should use the mitigation measures identified in Section 3.7, Hazardous Materials and Waste Sites, in the vicinity of the junk yard.

Based the available information, SEA does not anticipate that significant adverse impacts to human health or the environment are likely to result from disturbances to hazardous materials spill sites and hazardous waste sites during construction or operation activities associated with Alternative C.

4.7.5 Mitigation Measures for Impacts to Hazardous Materials

Mitigation measures for impacts to hazardous materials are discussed in Section 6.3.7, Hazardous Materials, and Section 6.4.6, Hazardous Materials.

4.8 Air Quality Impacts

4.8.1 Methodology

A qualitative air quality impact assessment was conducted for this project that considered the following factors:

- SEA's air quality impact thresholds (an increase of at least eight trains per day, an increase in rail traffic of at least 100% as measured in gross ton-miles annually, or an increase in rail yard activity of at least 100% as measured by carload activity),
- The existing regional air quality status (that is, attainment or non-attainment status),
- The Applicant's Proposed Action (one to two loaded trains per day), which does not meet SEA's impact threshold for detailed air quality modeling and analysis,
- No appreciable increased production at the SUFCO mine if the proposed new rail line is completed,
- No change in customer base for coal from the SUFCO mine if the proposed new rail line is completed,
- No change in coal distribution for the SUFCO mine as a result of the proposed new rail line, and
- The undeveloped nature of the right-of-way, including the lack of substantial air emission sources in the project area.

The qualitative analysis consisted of determining the reduction in vehicle-miles traveled under the Proposed Action and comparing that with the addition of one to two trains per day in the study area.

4.8.2 Alternative A (No-Action Alternative)

Under the No-Action Alternative, no new rail construction or rail operations would occur. Therefore, there would be no truck-to-rail diversion and no change in vehicle-related air emissions. However, due to the greater pollutant emissions associated with truck operations, pollutant emissions associated with the No-Action Alternative would be greater than those from Alternatives B and C.

4.8.3 Alternative B (Proposed Action)

The study area is rural and undeveloped. The air quality in the study area is good, and the region is in attainment for all criteria pollutants. Existing sources of emissions in the study area include automobiles, trucks, and farm equipment. Vehicle traffic in the study area is responsible for tailpipe emissions including nitrogen oxides, carbon monoxide, and sulfur dioxide. The primary pollutant produced by locomotives and farm equipment is nitrogen

dioxides from diesel fuel. Farming and ranching activities and vehicles using unpaved roads are sources of fugitive dust.

4.8.3.1 Construction Impacts

Fugitive dust would be released during construction (for example, during grading) of the alignment which could be a short-term, minor inconvenience to people near the alignment. Because construction of the alignment would occur over several years, fugitive dust emissions would vary depending on what portion of the alignment was being constructed. Due to the undeveloped nature of the study area and lack of emission sources in the region, fugitive dust emissions are not expected to exceed the NAAQS.

4.8.3.2 Impacts from Railroad Operation

Under Alternative B, a change in vehicle-related air emissions would occur due to the truck-to-rail diversion of traffic. Under existing operations, about 750 coal trucks make a round trip (two movements which equals one full load and one empty back-haul) of 163 miles per day from the SUFCO mine to Salina and back (122,250 vehicle-miles traveled per day). The same quantity of coal will continue to be shipped to existing customers in Nevada and Utah and, therefore, would not result in any additional air emissions to any new areas within the United States (K. May 2006).

Under Alternative B, coal would be hauled by truck from the SUFCO mine to the proposed loading facility north of I-70 near Salina's industrial park. Each day about 1,500 truck trips (750 round trips) would be made, and the round-trip distance for each truck would be 66 miles (49,500 vehicle-miles traveled per day). From there, between 100 and 110 rail cars would be used to transport the coal about 43 miles (86 miles round-trip) to the UPRR mainline. Under Alternative B, truck-related vehicle-miles traveled would be reduced by 247%, which would greatly reduce pollutant emissions associated with truck traffic. Although there would be pollutant emissions associated with locomotives, in total they would be less than those from truck traffic, with the resulting impact of a minor improvement in air quality in the study area.

4.8.4 Alternative C

The air quality impacts from Alternative C would be the same as those from Alternative B.

4.8.5 Mitigation Measures for Impacts to Air Quality

Mitigation measures for impacts to air quality are discussed in Section 6.3.8, Air Quality, and Section 6.4.7, Air Quality.

4.9 Noise Impacts

4.9.1 Methodology

A qualitative, screening-level noise impact assessment was conducted for this project that took into consideration the following factors:

- SEA's threshold for conducting an environmental noise analysis is an increase in train traffic of at least eight trains per day or an increase in rail traffic of at least 100% measured in gross ton-miles annually.
- SEA's threshold for noise impacts is an increase in the day-night noise levels (L_{dn}) to greater than 65 dBA or an increase in existing noise levels by 3 dBA L_{dn}.
- The Applicant's Proposed Action (one to two loaded trains per day) does not meet SEA's impact threshold for detailed modeling and analysis.
- The project right-of-way is mostly undeveloped and contains few sensitive noise receptors near the right-of-way.

The assessment included measuring noise levels in the right-of-way to determine the impact of two trains per day on sensitive noise receptors in the project area.

4.9.2 Alternative A (No-Action Alternative)

Under the No-Action Alternative, the Central Utah Rail project would not be built. No change in noise levels is anticipated under the No-Action Alternative.

4.9.3 Alternative B (Proposed Action)

The project area is rural and mostly undeveloped with low existing noise levels. Automobile and truck traffic on SR 28, farm machinery, and natural noise sources such as wind are the primary sources of noise in the project area. As noted in Section 3.9, Noise, existing noise levels range from about 37 dBA to 48 dBA. SEA considers residences, schools, libraries, parks, hospitals, retirement homes, and nursing homes as sensitive to noise and therefore considers these buildings to be sensitive noise receptors. There are 150 residences within 1 mile of Alternative B.

The nearest sensitive noise receptor to Alternative B is Yuba Lake Recreation Area. The Painted Rocks Campground is about 0.5 mile southwest of Alternative B. Isolated farmsteads are located throughout the right-of-way.

Wayside noise includes the noise generated by a passing train. Locomotive engine noise, rail noise, and rail car noise contribute to wayside noise. Additionally, as a safety measure, trains are required to sound a warning horn when approaching a public grade crossing. Horn noise is substantially louder and more intrusive than wayside noise and is designed to warn motorists and pedestrians of an approaching train. Horn soundings are required from

0.25 mile prior to a crossing until the locomotive passes through the crossing. There are about nine public at-grade crossings along Alternative B that would likely be subject to this requirement. In addition, there are a number of private, unpaved crossings in the study area. In general, warning horns are not sounded at these private crossings.

Sensitive noise receptors along Alternative B could be exposed to one or both types of noise. Because horn noise is significantly louder than wayside noise, it extends farther from the rail line and affects a greater number of noise receptors. Because of the relatively low background noise levels in the project area, the residences would likely hear train warning signals sounded at the public crossings.

Under the Applicant's proposal, one round trip (two movements which equals one full load and one empty back-haul) per day would pass through study area. Wayside and warning horn noise associated with two trains per day in the study area would not increase day-night noise levels (L_{dn}) to greater than 65 dBA or increase existing noise levels by 3 dBA L_{dn}. The nearest sensitive noise receptor to Alternative B is Yuba Lake Recreation Area. The park contains campground facilities within about 0.5 mile of Alternative B. One to two trains per day passing through the Yuba Lake Recreation Area could create a short-term disturbance to recreational campers but would not exceed the Board's noise thresholds.

4.9.4 Alternative C

The noise impacts from Alternative C would be the same as those from Alternative B.

4.9.5 Mitigation Measures for Noise Impacts

Mitigation measures for noise impacts are discussed in Section 6.3.9, Noise, and Section 6.4.8, Noise.

4.10 Impacts to Energy Resources

4.10.1 Methodology

SEA evaluated the impacts to energy resources including energy use and other energy resources. The discussion of energy use includes a quantitative analysis of changes in energy consumption due to the proposed truck-to-rail diversion (see Section 4.10.2, Impacts on Energy Consumption) and a qualitative evaluation of energy use associated with grade crossing delay and idling vehicles (see Section 4.10.3, Impacts on Other Energy Resources). Items addressed in Section 4.10.3 include energy distribution (including transmission lines), transportation of energy resources, and transportation of recyclable commodities. Impacts to pipelines are addressed in Section 4.1.3.3, Impacts on Pipeline Crossings.

4.10.2 Impacts on Energy Consumption

4.10.2.1 Alternative A (No-Action Alternative)

Under the No-Action Alternative, no new rail construction or rail operations would occur, so there would be no energy savings from diverting traffic from truck to rail and no increase in energy consumption from vehicles waiting at grade crossings. Overall, the energy requirements of the No-Action Alternative would be greater than those of Alternatives B and C.

4.10.2.2 Alternative B (Proposed Action)

Truck-to-Rail Diversion

Alternative B would cause a change in energy consumption because truck traffic would be diverted to rail. As stated in Section 3.10.2, Existing Energy Use, the average daily energy consumption of SUFCO coal truck traffic is 2,832 million Btu. This energy consumption value was based on 750 coal trucks and a round-trip haul route of 163 miles. This route includes about 60 miles from the SUFCO mine to Salina and back and a loop of about 103 miles starting in Salina and traveling through Centerfield, Gunnison, Levan, Nephi, and Scipio before returning to Salina.

Under Alternative B, coal would be hauled by truck from the SUFCO mine to the proposed loading facility north of I-70 near Salina's industrial park. Each day about 1,500 truck trips (750 round trips) would be made, and the round-trip distance for each truck would be 66 miles. Between 100 and 110 rail cars would then be used to transport the coal about 43 miles (86 miles round-trip) to the UPRR mainline.

Table 4.10-1 below shows the typical daily energy consumption associated with transporting coal by truck and rail under either Alternative B or Alternative C. The daily truck and rail energy consumption would total about 1,301 million Btu, or about 46% of the existing average daily energy consumption (which consists of truck traffic only). SEA anticipates that no more than one additional round trip (two movements which equals one full load and one empty back-haul) per week would be used to ship other miscellaneous products by rail.

The additional train would consume up to about 154 million Btu and would bring the total anticipated daily energy consumption to 1,455 million Btu, or 51% of the existing average daily energy consumption. Diverting coal shipping from truck to rail would improve the efficiency of coal transportation in support of the National Energy Policy Act of 2005 (Public Law 109-58).

Table 4.10-1. Typical Daily Energy Consumption under the Proposed Alternatives

Haul Type	Coal Truck/ Rail Car Traffic (trips per day)	Coal Traffic (vehicle/rail car-miles traveled)	Fuel Consumption and/or Energy Intensity Rates	Energy Consumption (million Btu)
Truck	1,500	49,500	6.0 miles/gallon[a] 139,000 Btu/gallon[b]	1,147
Rail	220	9,460	16,250 Btu/car-mile[c]	154
Total	**—**	**—**	**—**	**1,301**

[a] Heavy single-unit trucks are assumed to achieve diesel fuel efficiency of 6.0 miles per gallon (EIA 2004).

[b] 1 gallon diesel fuel = 139,000 Btu (EIA 2004).

[c] 1 car-mile requires 16,250 Btu (derived from AREMA 2002).

Grade Crossing Delay

Grade crossing delays are addressed in Section 4.1.3.2, Impacts on Grade Crossing Safety. Based on the anticipated train volume of one round trip (two movements which equals one full load and one empty back-haul) per day and the low volume of traffic on roads in the study area, the additional energy consumption from vehicle delays at grade crossings is considered to be insignificant.

4.10.2.3 Alternative C

Truck-to-Rail Diversion

Under Alternative C, the impacts from diverting truck traffic to rail would be similar to those under Alternative B. The southern portions of the Alternative B and C alignments differ, but the overall proposed rail length (43 miles) and the corresponding energy consumption would be approximately equal. The truck trips described in Section 4.10.2.2 for Alternative B would also be required for Alternative C, and the typical daily energy consumption would be 1,301 million Btu (see Table 4.10-1 above, Typical Daily Energy Consumption under the Proposed Alternatives). About once each week, daily energy consumption would increase by up to 154 million Btu due to a shipment of miscellaneous commodities, which would bring the daily total to 1,455 million Btu.

Grade Crossing Delay

Under Alternative C, the impacts to energy consumption from grade crossing delays would be the same as those from Alternative B.

4.10.3 Impacts on Other Energy Resources

4.10.3.1 Alternative A (No-Action Alternative)

Under the No-Action Alternative, the proposed rail line would not be built, so there would be no impacts on other energy resources. There would be no impacts to transmission lines, no change in the transportation of energy resources, and no change in the transportation of recyclable commodities under this alternative.

4.10.3.2 Alternative B (Proposed Action)

Energy Distribution

A high-voltage transmission line runs generally north-to-south from a point west of Levan to Aurora and near Alternative B (see Figure 4-10, Energy Impacts). The proposed rail line would cross the transmission line corridor at one location about 3 miles north of Yuba Narrows. Six segments of the proposed rail line, including the crossing location, would be located within 500 feet of the transmission lines. The length of these segments totals about 7.1 miles.

SEA does not anticipate any interruption of electricity transmission during construction of the proposed rail line. However, special safety precautions would be required, particularly with regard to large equipment such as cranes.

The proximity of the proposed rail to the transmission lines is not a safety concern under normal operating conditions. However, in the unlikely event of a derailment, the transmission line could be affected. In such an event, a derailed car could damage a pylon and disrupt electricity transmission. Other than the single crossing location, the closest the proposed rail would come to the transmission lines is about 130 feet. Given this distance and the low probability of derailment, SEA expects the effects of Alternative B on transmission lines to be negligible.

Transportation of Energy Resources

Alternative B would result in the truck-to-rail diversion of coal, an energy resource. The origin and destination of this energy resource would be the same, and no adverse impacts to the transportation of energy resources would occur. SEA anticipates that the proposed rail line would be used to transport other commercial supplies or products that would require one additional round trip (two movements which equals one full load and one empty back-haul) per week. Based on available information (see Section 3.5.7, Minerals and Mining), less than 5% of these commodities would be energy resources.

Transportation of Recyclable Commodities

SEA does not anticipate that Alternative B would change the transportation of recyclable commodities. The proposed rail line would be used primarily for transporting coal.

4.10.3.3 Alternative C

Energy Distribution

As noted in Section 4.10.3.2, Alternative B (Proposed Action), a high-voltage transmission line runs generally north-to-south from a point west of Levan to Aurora. The proposed rail line crossing and the six segments of the transmission line within the study area are all located along the alignment that is common to both Alternatives B and C. Therefore, the impacts to transmission lines would be the same as those from Alternative B.

Transportation of Energy Resources

Under Alternative C, the impacts to transportation of energy resources would be the same as those from Alternative B.

Transportation of Recyclable Commodities

Under Alternative C, the impacts to transportation of recyclable commodities would be the same as those from Alternative B.

4.10.4 Mitigation Measures for Impacts to Energy Resources

SEA has determined through its analysis that the Proposed Action and Alternatives would have a negligible effect on energy resources. Therefore, no mitigation measures are proposed.

4.11 Socioeconomic Impacts

4.11.1 Methodology

Socioeconomic impacts were based on the assumption that the volume of coal produced by the mine and subsequently shipped by train or truck would remain stable for at least 25 years (the life of the mine reserves). The SUFCO mine is currently operating at capacity and coal production is driven primarily by mine infrastructure, not by client demand or coal transportation mode (K. May 2006). The Central Utah Rail Feasibility Study (Washington Infrastructure Services, Inc. and others 2001) states that SUFCO would need to ship 38,000 carloads annually to provide the economic foundation to proceed with proposed project. Marketing studies show that, without increased production, SUFCO would be shipping 42,410 to 44,175 carloads annually (Washington Infrastructure Services Inc. and others 2001). Therefore, available information does not suggest that any appreciable increased

production is planned, nor is there a foreseeable need for increased production, if the proposed new rail line is completed (*Federal Register* 2004).

The methodology for determining the impacts to employment, income, and population described in this section was adapted from the Central Utah Rail Feasibility Study. The economic analysis presented in that study used an economic impact model called Regional Economic Models Incorporated (REMI). The analysis included a complete history of the growth in jobs and population in Sanpete and Sevier Counties between 1969 and 1998.[2] Through the use of the REMI model, the Applicant determined that Sanpete and Sevier Counties are the only counties that would experience statistically significant impacts from the railroad (Washington Infrastructure Services, Inc. and others 2001). The REMI model is widely considered acceptable for this analysis for estimating population and economic impacts. Note that, for this analysis, REMI provided only low and high economic scenarios that bracket the range of expected possible outcomes. REMI did not assign probabilities to either end of the range, so the analysis did not indicate whether the low scenario or the high scenario is more likely to occur. For the purpose of this section, the midpoint between the low and high scenarios is considered to be the most likely outcome.

Impacts to agriculture were calculated using statistics from the 2002 Census of Agriculture (NASS 2002). The Census of Agriculture contains statistics on acres of farmland, farm size, employment, market value of output from farms, and employment by county. These statistics were used to create ratios for market value of output per acre of farmland and for employment per acre. The ratios were applied to the acres of affected agricultural land to generate estimates of the impacts of the proposed rail line on agricultural production.

Two sets of impacts to the tax bases of the counties were calculated. The first is impacts to the sales tax base; the second is impacts to the property tax base. Impacts to the sales tax base were calculated using ratios of sales tax collections for the State of Utah to total personal income in the state. The ratios were applied to the changes in personal income from the analysis in the Central Utah Rail Feasibility Study (Washington Infrastructure Services, Inc. and others 2001).

Impacts to the property tax base were calculated using approximated assessable values of land obtained from county assessors in the counties and from assessed values of land by type from the Farmland Assessment Act. The values were multiplied by the number of acres, and the property tax rates were applied to get impacts to the tax rolls. Land for which no data are available was left out of the analysis because tax classifications were not available. Since specific affected lots had not been determined at the time of the analysis, the methodology assumes that the rail right-of-way will be routed to avoid land with structures; therefore, the analysis includes only impacts to the property tax rolls for land without structures.

[2] Sanpete and Sevier Counties were the only counties that SEA believes will experience measurable impacts from the project. It is likely that Juab County and other surrounding counties would receive a regional benefit as well, but that impact is not quantified here.

The impacts to emergency response were determined by calculating the increase in emergency response times caused by the alternatives. Increases in emergency response times would be due to emergency responders waiting at crossings for trains to pass.

Emergency response delays were determined by assuming that one round trip (two movements which equals one full load and one empty back-haul) per day, traveling at about 49 mph, would use the proposed rail line. With a normal train length of about 1.3 miles, this amount of train traffic would cause about 3 minutes 12 seconds of delay per day at any given point along the right-of-way.

4.11.2 Impacts to Population and Demographics

4.11.2.1 Alternative A (No-Action Alternative)

Under the No-Action Alternative, the proposed rail line would not be built, so the existing population and demographic trends described in Section 3.11.2, Population and Demographics, would continue. As a result, no change in the population and demographic composition of the study area due to the development of the rail line would occur.

4.11.2.2 Alternative B (Proposed Action)

Based on the potential for increased economic development under Alternative B (see Section 4.11.3, Impacts to Employment and Income), this alternative would likely cause a small increase in the population of Sanpete and Sevier Counties over the No-Action Alternative. This increase is estimated to be 60 to 65 people over the next 20 years and is an increase of less than 1%, based on the 2003 population estimates in Section 3.11.2, Population and Demographics. (Because REMI included only Sanpete and Sevier Counties, the population in Juab County is not included in this number.) This expected increase in population would primarily be due to an increase in the manual labor pool required for economic development in these two counties and would likely result from in-migration from surrounding areas.

4.11.2.3 Alternative C

Under Alternative C, the impacts to population and demographics would be the same as those from Alternative B.

4.11.3 Impacts to Employment and Income

4.11.3.1 Alternative A (No-Action Alternative)

Under the No-Action Alternative, the proposed rail line would not be built, so the existing employment and income trends described in Section 3.11.3, Employment, and Section 3.11.4, Income, would continue. As a result, no change in employment and income due to the development of the rail line would occur.

4.11.3.2 Alternative B (Proposed Action)

Under Alternative B, construction and operation of the rail line would affect multiple sectors of the local economies, namely the lumber; stone, clay, and glass; petroleum products; mining; construction; and railroad sectors (based on REMI calculations in the Central Utah Rail Feasibility Study, Washington Infrastructure Services, Inc. and others 2001). The impacts would be both positive and negative and would be experienced at different times as discussed below.

The lumber; stone, clay, and glass; and petroleum products sectors of the local economies would be the primary users of the rail. Over time, these sectors would benefit from lower transportation costs, which would increase profit margins for the firms in these sectors and free up internal resources to expand business, hire more employees, and increase their output.

The construction sector would benefit from the railroad by providing services during construction. In particular, construction of the rail line would add 77 jobs in the construction sector of the local economy. Those jobs would contribute $24,430 (Utah Department of Workforce Services 2004) in wage and salary earnings (about $1.9 million in total income contributions) annually for both years of construction.[3] However, the jobs would add only a short-term boost to the local economies because the jobs would contribute dollars until the construction phase of the project is complete.

Once the railroad is operational, about 108 jobs would be lost from the trucking industry as SUFCO and other companies reduce the length of trucking routes and switch to using the rail line. According to the Utah Department of Workforce Services, average wages for the trucking industry in central Utah are $29,480 (Utah Department of Workforce Services 2004), which translates to a loss of about $3.1 million in wages in the study area.

The loss in trucking jobs would be partially offset by 19 railroad jobs that would be added when the railroad is operational. (Railroad jobs were assumed to be those from rail conductors and operations.) The average wage of the railroad jobs would be $61,010 (Utah Department of Workforce Services 2004), resulting in a total of about $1.2 million in wages, which is 39% of the lost wages from trucking jobs. For example, employment in stone, clay, and glass sector would be helped by continuing demand for ballast for the railroad after construction; an estimated $30,000 to $60,000 of ballast would be purchased annually over the following 20 years.

Coal production would not increase; therefore, no new jobs at the SUFCO mine would result from rail operation. The sectors that would benefit from construction of the railroad, namely the lumber; stone, clay, and glass; petroleum products; mining; and railroad sectors, would continue to produce benefits for the local economy in the long term. For example, although

[3] Wages and salaries are one component of total personal income. Wages and salaries are often referred to as a contribution to personal income.

the local economy would lose some income from truck wage earnings, construction of the railroad would more than offset that loss with higher employment and income, which would be spent in the economy on goods and services. This new indirect demand caused by higher profits and new employment would spur additional rounds of spending and drive increased economic development benefits in the local economies.

These economic benefits have been estimated using REMI and reported in the Central Utah Rail Feasibility Study (Washington Infrastructure Services, Inc. and others 2001). The results are shown in Table 4.11-1. The study established high and low projections of economic impacts from 2004 to 2025. The midpoint of the projections demonstrates that the proposed rail line would contribute 328 net new jobs to the economy over the life of the analysis. These 328 jobs would add about $23 million through total personal income.[4]

Table 4.11-1. Total Annual Increases to Employment and Income under the Proposed Alternatives from the REMI Low and High Scenarios (2004–2025)

	Low Scenario		High Scenario	
Alternative	**Employment**	**Total Personal Income[a]**	**Employment**	**Total Personal Income[a]**
Alternative A	No change	No change	No change	No change
Alternative B	+ 238 jobs	+ $6.4 million	+ 419 jobs	+ $39.6 million
Alternative C	+ 238 jobs	+ $6.4 million	+ 419 jobs	+ $39.6 million

[a] Total personal income measures income received by individuals from all sources including wages and salaries, interest, dividends, rent, workers' compensation, proprietors' earnings, and transfer payments.

Source: Washington Infrastructure Services, Inc. and others 2001, REMI calculations

4.11.3.3 Alternative C

Under Alternative C, the impacts to employment and income would be the same as those from Alternative B.

4.11.4 Impacts to the Trucking Industry

4.11.4.1 Alternative A (No-Action Alternative)

Under the No-Action Alternative, the proposed rail line would not be built. Consequently, the local trucking industry would continue to transport commodities (including coal from the SUFCO mines) within portions of Juab, Sanpete, and Sevier Counties at current levels.

[4] Total personal income is the sum of income received by individuals from all sources including wages and salaries, interest, dividends, rent, workers' compensation, proprietors' earnings, and transfer payments.

4.11.4.2 Alternative B (Proposed Action)

Alternative B is projected to cause the loss of 108 jobs in the local trucking industry (Washington Infrastructure Services, Inc. and others 2001). The jobs would be lost because the length of coal-haul routes would be reduced. Coal would still need to be trucked from the SUFCO mine to the rail line's southern terminus in Salina and possibly to the proposed power plant outside Sigurd. This job loss would primarily affect Barney Trucking and Robinson Transport, the main freight carriers for the SUFCO mine, both of which are located in Sevier County.

In December 2004, Barney Trucking employed 225 people, including 200 drivers, at the company's Salina location. Robinson Transport employed 140 people, 110 of which were drivers. Assuming that these two companies account for all of the 108 lost trucking jobs, the result is a reduction of 30% of the current positions between the two companies. The response of these companies to such an impact is unknown at this time. SEA anticipates that the terminated trucking employees would be able to find jobs in areas that are expected to experience growth as a result of the project (see Section 4.11.3, Impacts to Employment and Income).

Additionally, Alternative B would likely reduce the amount of daily truck traffic in central Utah. Most roadways in use by trucks are an asphalt cement concrete that is designed to carry the projected traffic load for 10 to 20 years. The service life of existing road surfaces would be extended, which would decrease the need for roadway repairs in the near term. UDOT estimates the cost to repair a 1-mile stretch of 4-inch-deep, two-lane highway at $325,000 (Hawks 2001). Reduction in necessary road repairs would create significant cost savings for UDOT and the public.

4.11.4.3 Alternative C

The impacts to the trucking industry from Alternative C would be the same as those from Alternative B.

4.11.5 Impacts to Agriculture

4.11.5.1 Alternative A (No-Action Alternative)

Under the No-Action Alternative, the proposed rail line would not be built. Present conditions and trends in the agricultural economy of the three counties would continue.

4.11.5.2 Alternative B (Proposed Action)

As shown in Table 4.11-2 below, Alternative B would remove about 165 acres from agricultural use in the three counties. This is less than one-tenth of a percent of the total land in farms in each of the three counties (see Section 3.11.6, Agriculture). Affected grazing allotments located on SITLA lands would devalue funds given to Utah schools and other

beneficiaries of trust lands. However, the resulting impacts on the market value of output from farms in the three counties would be negligible (less than one-tenth of a percent of the total farm output). Additionally, the ratio of agricultural land to farm operators is large in each of the counties.[5] Given the high land-to-operator ratios, removing such small amounts of land from agricultural use would likely have no impact on farm employment.

Table 4.11-2. Impacts to Agricultural Production

	Land Removed from Agricultural Use (acres)		Impacts to the Market Value of Agricultural Products		Impacts to Employment in Farms (employees)	
County	**Alt. B**	**Alt. C**	**Alt. B**	**Alt. C**	**Alt. B**	**Alt. C**
Juab	126.39	126.39	$5,700	$5,700	0	0
Sanpete	1.23	1.14	$300	$300	0	0
Sevier	37.52	115.72	$11,900	$36,700	0	0
Total	**165.14**	**243.25**	**$17,900**	**$42,700**	**0**	**0**

4.11.5.3 Alternative C

Alternative C would remove about 243 acres from agricultural use in the three counties. This is less than one-tenth of a percent of the total land in farms in each of the three counties (see Section 3.11.6, Agriculture). The resulting impacts on the market value of output from farms and employment in farms in the three counties would be the same as those from Alternative B.

4.11.6 Impacts to the Tax Base

4.11.6.1 Alternative A (No-Action Alternative)

Under the No-Action Alternative, the proposed rail line would not be built. As a result, no change in the tax base due to the development of the rail line would occur.

4.11.6.2 Alternative B (Proposed Action)

Sales Tax Base

Table 4.11-3 below shows the average annual and net cumulative impacts to the sales tax base over the period 2004 to 2025 for each proposed alternative. Since the analysis here is based on calculations from REMI in the Central Utah Rail Feasibility Study (Washington Infrastructure Services, Inc. and others 2001), it includes only impacts to the tax base of Sanpete and Sevier Counties. Depending on the extent of the positive impacts, the gross sales tax base in the two counties could increase by 0.05% to 0.2% over 2002 levels annually.

[5] The ratio of agricultural land to farm operators in Juab, Sanpete, and Sevier Counties is 2,216 acres, 893 acres, and 549 acres per farm operator in each county, respectively.

Table 4.11-3. Impacts to the Sales Tax Base

	Low Scenario		High Scenario	
Alternative	**Average Annual**	**Net Cumulative**	**Average Annual**	**Net Cumulative**
Alternative A	No change	No change	No change	No change
Alternative B	$182,900	$3,657,700	$1,131,600	$22,631,938
Alternative C	$182,900	$3,657,700	$1,131,600	$22,631,938

There is no foreseeable change in coal production at the SUFCO plant. Additionally, the proposed project would not change the current distribution of coal to customers, the customer base, or the market base for SUFCO. Therefore, the impacts to the sales tax base shown in Table 4.11-3 above would not be a result of increased production or a change in market base by the SUFCO mine (K. May 2006).

Property Tax Base

As shown in Table 4.11-2 above, Impacts to Agricultural Production, Alternative B would remove about 165 acres of privately owned land from the tax base of the study area. (Neither state nor federally owned lands appear on the assessed property tax rolls.) Of the private land that would be affected by Alternative B, the majority of the land in each county is agricultural with some riparian and idle lands in Sanpete and Sevier Counties.

In the analysis, agricultural land is assumed to be greenbelt agricultural land.[6] All land is assumed to be of the highest productive value possible in each county (Irrigable Class II).[7] Conversations with county assessors in Sanpete and Sevier Counties provided possible values for idle land and riparian land (in Sevier County only) (Nash 2005).

The analysis assumes that the rail line would be publicly owned and the land would be removed from the property tax rolls. Table 4.11-4 below summarizes the impacts from each proposed alternative. The result would be a loss to the property tax base of less than 0.1% per county for Alternative B. The impact is small because the property tax base includes lands with higher-valued uses (commercial and residential) and also land with structures.

If the ownership of the rail line were private, then the land and rail line would be centrally assessed by the Utah Property Tax Division. The assessment process for the rail line would follow current processes used by the State Assessor's office for centrally assessed utilities. The rail company would report the value of all property (land, tangible assets, etc.) to the State Assessor's office. The State Assessor's office would then share the total property value

[6] Utah has two designations for agricultural land: greenbelt (FAA) or non-greenbelt (non-FAA) land. Greenbelt land is land that meets the classifications and specifications to make it assessable under the Utah Farmland Assessment Act (FAA). The FAA authorizes qualifying agricultural land to be assessed according to its productive capability rather than the true market value.

[7] Classifications used by the Utah State Tax Commission, Property Tax Division, under the guidelines of the Utah Farmland Assessment Act. Most current FAA taxable values per acre are available on the Property Tax Division Web site at propertytax.utah.gov/faa/faa.html.

with each county in which the rail operates, and the counties would apply their corresponding property tax rates to the share of the total property value applied to their county. The process does not allow each county to identify separate property values for tangible assets and land. At the time of this analysis, ownership of the rail line had not been determined.

Table 4.11-4. Impacts to the Property Tax Base under Public Ownership

County	Alternative A	Alternative B	Alternative C
Juab	No impact	$55,000	$55,000
Sanpete	No impact	$7,900	$7,300
Sevier	No impact	$46,200	$96,000

4.11.6.3 Alternative C

Sales Tax Base

Table 4.11-3 above, Impacts to the Sales Tax Base, shows the average annual and net cumulative impacts to the sales tax base over the period 2004 to 2025 for each proposed alternative. Since the analysis here is based on calculations from REMI in the Central Utah Rail Feasibility Study (Washington Infrastructure Services, Inc. and others 2001), it includes only impacts to the tax base of Sanpete and Sevier Counties. Depending on the extent of the positive impacts, the gross sales tax base in the two counties could increase by 0.05% to 0.2% over 2002 levels annually.

There is no foreseeable change in coal production at the SUFCO plant. Additionally, the proposed project would not change the current distribution of coal to customers, the customer base, or the market base for SUFCO. Therefore, the impacts to the sales tax base shown in Table 4.11-3 above would not be a result of increased production or a change in market base by the SUFCO mine (K. May 2006).

Property Tax Base

As shown in Table 4.11-2 above, Impacts to Agricultural Production, Alternative C would remove about 243 acres of privately owned land from the tax base of the study area. (Neither state nor federally owned lands appear on the assessed property tax rolls.) Of the private land that would be affected by Alternative C, the majority of the land in each county is agricultural with some commercial and idle lands in Sanpete and Sevier Counties.

In the analysis agricultural land is assumed to be greenbelt agricultural land.[8] All land is assumed to be of the highest productive value possible in each county (Irrigable Class II).[9]

[8] See footnote 6 on page 75.

[9] See footnote 7 on page 75.

Conversations with county assessors in Sanpete and Sevier Counties provided possible values for idle land and riparian land (in Sevier County only) (Nash 2005).

The analysis assumes that the rail line would be publicly owned and the land would be removed from the property tax rolls. Table 4.11-4 above, Impacts to the Property Tax Base under Public Ownership, summarizes the impacts from each proposed alternative. The result would be a loss to the property tax base of less than 0.1% per county for Alternative C. The impact is small because the property tax base includes lands with higher-valued uses (commercial and residential) and also lands with structures.

If the ownership of the rail line were private, then the land and rail line would be centrally assessed by the Utah Property Tax Division. The assessment process for the rail line would follow current processes used by the State Assessor's office for centrally assessed utilities. The rail company would report the value of all property (land, tangible assets, etc.) to the State Assessor's office. The State Assessor's office would then share the total property value with each county in which the rail operates, and the counties would apply their corresponding property tax rates to the share of the total property value applied to their county. The process does not allow each county to identify separate property values for tangible assets and land. At the time of this analysis, ownership of the rail line had not been determined.

4.11.7 Impacts to Community Facilities

4.11.7.1 Alternative A (No-Action Alternative)

As stated in Section 3.11.8, Community Facilities, there are very few community facilities near the proposed rail line. Under the No-Action Alternative, the proposed rail line would not be built, so there would be no impacts to existing public services and community facilities from development of the rail line. Current trends in the demand for services and facilities would continue.

4.11.7.2 Alternative B (Proposed Action)

Alternative B would contribute to the economic development and population growth of the three counties over 20 years. The majority of the identified public services and community facilities (those within 4 miles of the alternative) are in Salina. Increased population and economic development would increase the demand for community facilities and services provided by those facilities including education, law enforcement, churches, and post offices. Growth in the demand for services and facilities can be expected to follow the trend of the economic impacts from the project. An initial spike in the demand for services and facilities would occur with the construction phase of the project and then decline, followed by gradual growth in demand as economic development and population increase over time.

4.11.7.3 Alternative C

Under Alternative C, the impacts to public services and community facilities would be the same as those from Alternative B.

4.11.8 Impacts to Emergency Response

4.11.8.1 Alternative A (No-Action Alternative)

The No-Action Alternative would not affect any existing emergency response routes in the study area, so emergency response times would remain unchanged.

4.11.8.2 Alternative B (Proposed Action)

Alternative B would not cause significant impacts to existing emergency response times in the study area. The major roadways used by emergency responders are US 89, which would be spanned by a grade-separated crossing; SR 28, which would not be crossed by the proposed rail line; SR 50, which would have an at-grade crossing with automatic crossing gates; and SR 24, which would also have an at-grade crossing with automatic crossing gates. Although the project would require nine new at-grade public road/rail crossings and 43 new at-grade private (farm) road/rail crossings, the likelihood of an emergency responder being delayed by the amount of train traffic described in Section 4.1.1, Methodology, is small, especially since the study area is mainly rural.

During the scoping phase of the project, Yuba Lake Recreation Area personnel stated concerns about the possible impacts to emergency response times for the Painted Rocks Campground at Yuba Lake Recreation Area (Rasmussen 2005). Alternative B would cross the access road to Painted Rocks Campground about 200 yards east of the campground entrance. This at-grade crossing would have a sign but would not have lights or crossing arms.

After SEA calculated the frequency of train crossings at the campground and the duration of the delay, SEA contacted park personnel and informed them that trains would cross the campground access twice per day for 1.5 minutes per crossing. Park personnel stated that emergency responders respond to one to two emergency calls per year, and that these emergencies are unlikely to occur during the short, infrequent delays expected to be caused by the project. For these reasons, park personnel felt that the project would not cause a major impact to emergency response times at Painted Rocks Campground (Evans 2006).

The type of crossing (at-grade or grade-separated) and the level of safety controls at each crossing were determined by the USDOT Accident Prediction Equation (Washington Group 2004). This equation takes into account several factors including type of traffic control, highway traffic volume, and train traffic volume. However, the equation does not consider emergency responder traffic. SEA further coordinated with the involved counties' emergency management departments and determined that these local agencies were unable to quantify

the frequency of emergency response situations on the roadways proposed to be crossed by the railroad. These agencies also stated that the severity of a delay in emergency response due to delay at a rail crossing would vary based on the severity of the emergency that required the response (Barney 2006; Harwood 2006; Hight 2006).

4.11.8.3 Alternative C

For the northern two-thirds of the alignment (including the access road to Painted Rocks Campground) and the area west of the southern third of the alignment, the impacts from Alternative C would be the same as those from Alternative B.

South of the point where the proposed alternatives split and east of the Alternative C alignment, the impacts to emergency response would be less than those from Alternative B. Because all emergency responders are based in locations east of the alternatives and Alternative C is farther west than Alternative B (that is, farther from the base locations of the emergency responders), there is a slightly larger area east of Alternative C that can be accessed by emergency responders without having to cross the proposed rail right-of-way.

4.11.9 Mitigation Measures for Socioeconomic Impacts

Mitigation measures for socioeconomics are discussed in Section 6.3.11, Socioeconomics, and Section 6.4.9, Socioeconomics.

4.12 Impacts to Cultural Resources

4.12.1 Methodology

SEA has determined that the proposed project could have adverse effects on 36 historic properties that are eligible for or listed in the National Register of Historic Places (National Register). Nineteen additional properties have been identified in the project area but have been determined to be ineligible for listing in the National Register (see Table 3.12-1, Historic Properties Identified within the Project Area; Table 4.12-1 below, Archaeological Sites within the APE of Alternative B; and Table 4.12-2 below, Archaeological Sites within the APE of Alternative C).

The area of potential effect (APE) [10] for each Build Alternative (Alternative B and Alternative C) generally consists of a corridor that is 160 feet wide. The APE for some sections within each alternative near the loading loop and near the existing rail line was expanded to 900 feet to ensure the widest consideration of historic properties in these larger impact areas.

[10] Adverse effects are those actions that have the potential to directly or indirectly alter the historic integrity of a historic property that qualifies the property for inclusion in the National Register of Historic Places.

The historic properties identified in the project area consist of prehistoric and historic archaeological sites and some sites that include both prehistoric and historic components (multi-component sites).

No traditional cultural properties have been identified within the APE for either Alternative B or Alternative C. So far, SEA has consulted with 12 federally recognized tribes to determine the potential location of traditional cultural properties within the project area and will continue to seek tribal input to identify any properties of traditional religious and cultural significance to tribes.

In 2006, SEA analyzed a wider area outside the APE for direct impacts to determine the potential for indirect, cumulative, and visual impacts to historic properties.[11] The result of this assessment indicated that no such impacts would likely occur from construction of either Alternative B or Alternative C. The consideration of the potential cumulative, indirect, and visual impacts of the proposed project was completed by SEA in consultation with the SHPO, BLM, other Section 106 consulting parties, and UDOT (see Section 5.2.5, Cultural Resources, for a summary of the cumulative impacts to cultural resources).

4.12.2 Resolving Adverse Effects

Proposed measures to avoid, minimize, or mitigate adverse effects to historic properties located within the project area will be determined in consultation with the SHPO, federally recognized tribes, the Applicant, and other consulting parties according to 36 CFR 800.6(a). Measures to mitigate adverse effects will be set forth in an agreement document (either a Memorandum of Agreement or a Programmatic Agreement) in consultation with the appropriate Section 106 parties. SEA has discussed potential options for resolving adverse effects with the SHPO including avoidance, data recovery, and educational outreach initiatives. SEA anticipates that any agreement document that will be developed will include a treatment plan that will address tribal concerns and the disposition of materials that will result from any data recovery efforts.

An assessment of the sites that would be affected within each alternative's APE is presented below. SEA has also assessed the expected impacts of Alternative A (No-Action Alternative).

4.12.2.1 Alternative A (No-Action Alternative)

Under the No-Action Alternative, no construction of the proposed rail line would take place, so no adverse effects to historic properties are anticipated.

[11] Note that the Class I data review conducted by SEA included a 0.5-mile buffer zone along each side of the original proposed alternative in order to obtain a representation of along both the proposed corridor and surrounding areas (see Appendix G, Cultural Report).

4.12.2.2 Alternative B (Proposed Action)

In total, SEA has identified 27 prehistoric archaeological sites, 16 historic archaeological sites, and two multi-component sites (with both historic and prehistoric resources) within the APE of Alternative B. The prehistoric sites identified within the APE consist of lithic scatters, temporary camps, and one possible permanent habitation site. The historic sites include irrigation canals, railroad lines, a farmstead, corrals, and hay derricks (see Table 4.12-1 below).

Based on the results of SEA's cultural resource studies, consultations with federally recognized tribes, the SHPO, BLM, and other consulting parties, SEA has determined that 33 of the archaeological sites identified within the APE of Alternative B are National Register eligible properties that would be adversely affected by the construction of Alternative B (see Table 4.12-1). The potentially affected prehistoric sites include 15 lithic scatters, eight temporary camps, and one possible habitation site. Seven potentially affected historic sites include the Union Pacific Railroad tracks and buildings; a hay derrick; a farmstead; segments of the Piute Canal, Rocky Ford Canal, and Vermillion Canal; and remnants of the Denver and Rio Grande Railroad. The two multi-component sites are a prehistoric temporary camp/historic trash scatter and a prehistoric lithic scatter/historic trash site (see Table 4.12-1).

The significant sites located within the APE for Alternative B could also be subjected to adverse effects from clearing vegetation, mechanized grading, vibration, and any future data-recovery efforts that might be conducted. With the construction of Alternative B, archaeological sites could also be affected though increased access to the area and the resulting potential for vandalism, littering, collecting of surface artifacts, and subsurface looting.

SEA intends to continue working with the SHPO, federally recognized tribes, the BLM, and other consulting parties to determine appropriate measures to avoid, minimize, or mitigate adverse effects to historic properties identified within the APE of Alternative B if the proposed project is constructed within this corridor.

Table 4.12-1. Archaeological Sites within the APE of Alternative B

Smithsonian Site No.	Site Age	Site Type	NRHP Eligibility	Recommendation
42Jb1041	Historic	Union Pacific Railroad line	Eligible (A, D)	Resolve Adverse Effects
42Jb1396	Prehistoric	Lithic scatter	Eligible (D)	Resolve Adverse Effects
42Jb1397	Prehistoric	Lithic scatter	Eligible (D)	Resolve Adverse Effects
42Jb1398	Prehistoric	Lithic scatter	Not Eligible	No Action Required
42Jb1399	Prehistoric	Lithic scatter	Eligible (D)	Resolve Adverse Effects
42Jb1400	Prehistoric	Lithic scatter	Eligible (D)	Resolve Adverse Effects
42Sp18 Addendum	Prehistoric	Temporary camp	Eligible (D)	Resolve Adverse Effects
42Sp19 Addendum	Prehistoric	Temporary camp	Eligible (D)	Resolve Adverse Effects
42Sp213 Addendum	Prehistoric	Lithic scatter	Eligible (D)	Resolve Adverse Effects
42Sp570	Prehistoric	Lithic scatter	Eligible (D)	Resolve Adverse Effects
42Sp571	Prehistoric	Lithic scatter	Eligible (D)	Resolve Adverse Effects
42Sp572	Historic	Piute Canal	Eligible (A)	Resolve Adverse Effects
42Sp573	Prehistoric	Lithic scatter	Eligible (D)	Resolve Adverse Effects
42Sp575	Historic	Trash scatter	Not Eligible	No Action Required
42Sp579	Historic	Trash scatter	Not Eligible	No Action Required
42Sp580	Historic	Can scatter	Not Eligible	No Action Required
42Sp581	Prehistoric	Lithic scatter	Not Eligible	No Action Required
42Sp582	Historic	Powerline poles	Not Eligible	No Action Required
42Sp583	Historic	Trash scatter	Not Eligible	No Action Required
42Sp584	Prehistoric	Lithic scatter	Eligible (D)	Resolve Adverse Effects
42Sp585	Prehistoric	Temporary camp	Eligible (D)	Resolve Adverse Effects
42Sp586	Prehistoric	Temporary camp	Eligible (D)	Resolve Adverse Effects
42Sp587	Prehistoric	Temporary camp	Eligible (D)	Resolve Adverse Effects
42Sp588	Prehistoric	Lithic scatter	Eligible (D)	Resolve Adverse Effects

Smithsonian Site No.	Site Age	Site Type	NRHP Eligibility	Recommendation
42Sp589	Prehistoric	Temporary camp	Eligible (D)	Resolve Adverse Effects
42Sp590	Prehistoric	temporary camp	Eligible (D)	Resolve Adverse Effects
42Sp591	Prehistoric	Temporary camp	Eligible (D)	Resolve Adverse Effects
42Sp592	Prehistoric	Lithic scatter	Eligible (D)	Resolve Adverse Effects
42Sp593	Prehistoric	Lithic scatter	Eligible (D)	Resolve Adverse Effects
42Sp594	Prehistoric	Possible habitation site	Eligible (D)	Resolve Adverse Effects
42Sp595	Prehistoric/Historic	Prehistoric temporary camp/historic artifact scatter	Eligible (D)	Resolve Adverse Effects
42Sp596	Prehistoric	Lithic SCATTER	Eligible (D)	Resolve Adverse Effects
42Sp597	Prehistoric/Historic	Lithic scatter/ trash scatter	Eligible (D)	Resolve Adverse Effects
42Sp598	Prehistoric	Lithic scatter	Eligible (D)	Resolve Adverse Effects
42Sv2342	Historic	Rocky Ford Canal	Eligible (D)	Resolve Adverse Effects
42Sv2343	Historic	Vermillion Canal	Eligible (A)	Resolve Adverse Effects
42Sv2502 Addendum	Historic	Denver and Rio Grande Railroad	Eligible (A)	Resolve Adverse Effects
42Sv2737	Prehistoric	Lithic scatter	Not Eligible	No Action Required
42Sv2738	Historic	Farmstead	Eligible (D)	Resolve Adverse Effects
42Sv2739	Prehistoric	Lithic scatter	Eligible (D)	Resolve Adverse Effects
42Sv2740	Historic	Corral	Not Eligible	No Action Required
42Sv2741	Historic	Hay derrick	Not Eligible	No Action Required
42Sv2742	Historic	Hay derrick	Eligible (C)	Resolve Adverse Effects
42Sv2743	Historic	Corral	Not Eligible	No Action Required
42Sv2744	Historic	Little ditch	Not Eligible	No Action Required

4.12.2.3 Alternative C

A total of 13 National Register eligible historic properties would be adversely affected by the construction of Alternative C. Seventeen other archaeological sites identified within the APE for Alternative C were determined ineligible for listing in the National Register. The significant sites identified within the APE for Alternative C consist of five prehistoric sites (all lithic scatters) and seven historic sites (two remnants of the Piute Canal, the Vermillion Canal, the Rocky Ford Canal, the Denver and Rio Grande Railroad, a farmstead, and a hay derrick). These sites would be subject to a combination of direct physical impacts and effects associated with clearing vegetation, mechanized grading, vibration, and soil excavation. Because the project would result in improved access to nearby archaeological sites, other impacts could include increased potential for vandalism, littering, collecting of surface artifacts, and subsurface looting.

Table 4.12-2 lists the sites located within the APE for Alternative C including significant sites where adverse effects will need to be resolved through future discussions with the Section 106 consulting parties.

Table 4.12-2. Archaeological Sites within the APE of Alternative C

Smithsonian No.	Site Age	Site Type	NRHP Eligibility	Recommendation
42Sp570	Prehistoric	Lithic scatter	Eligible (D)	Resolve Adverse Effects
42Sp571	Prehistoric	Lithic scatter	Eligible (D)	Resolve Adverse Effects
42Sp572[a]	Historic	Piute Canal	Eligible (A)	Resolve Adverse Effects
42Sp573	Prehistoric	Lithic scatter	Eligible (D)	Resolve Adverse Effects
42Sp575	Historic	Trash scatter	Not Eligible	No Action Required
42Sp579	Historic	Trash scatter	Not Eligible	No Action Required
42Sp580	Historic	Can scatter	Not Eligible	No Action Required
42Sp581	Prehistoric	Lithic scatter	Not Eligible	No Action Required
42Sp582	Historic	Powerline poles	Not Eligible	No Action Required
42Sp603	Prehistoric	Lithic scatter	Not Eligible	No Action Required
42Sp604	Prehistoric	Lithic scatter	Eligible (D)	Resolve Adverse Effects
42Sv2342	Historic	Rocky Ford Canal	Eligible (A)	Resolve Adverse Effects
42Sv2343	Historic	Vermillion Canal	Eligible (A)	Resolve Adverse Effects
42Sv2344[a]	Historic	Piute Canal	Eligible (A)	Resolve Adverse Effects
42Sv2502	Historic	Denver and Rio	Eligible (A)	Resolve Adverse

Smithsonian No.	Site Age	Site Type	NRHP Eligibility	Recommendation
Addendum		Grande Railroad		Effects
42Sv2737	Prehistoric	Lithic scatter	Not Eligible	No Action Required
42Sv2738	Historic	Farmstead	Eligible (D)	Resolve Adverse Effects
42Sv2739	Prehistoric	Lithic scatter	Eligible (D)	Resolve Adverse Effects
42Sv2740	Historic	Corral	Not Eligible	No Action Required
42Sv2741	Historic	Hay derrick	Not Eligible	No Action Required
42Sv2742	Historic	Hay derrick	Eligible (C)	Resolve Adverse Effects
42Sv2743	Historic	Corral	Not Eligible	No Action Required
42Sv2744	Historic	Little ditch	Not Eligible	No Action Required
42Sv2746	Prehistoric	Lithic scatter	Not Eligible	No Action Required
42Sv2747	Historic	Farmstead	Eligible (D)	Resolve Adverse Effects
42Sv2748	Historic	Farm equipment concentration	Not Eligible	No Action Required
42Sv2749	Prehistoric	Lithic scatter	Not Eligible	No Action Required
42Sv2750	Prehistoric	Lithic scatter	Not Eligible	No Action Required
42Sv2751	Prehistoric	Lithic scatter	Not Eligible	No Action Required
42Sv5752	Historic	Trash scatter	Not Eligible	No Action Required

[a] Note that the different segments of the Piute Canal have different site numbers.

4.12.3 Mitigation Measures for Impacts to Cultural Properties

SEA has determined that the proposed project would have adverse effects to cultural resources within the project's APE. The construction of Alternative B would adversely affect 33 National Register eligible or listed sites, while construction of Alternative C would adversely affect 13 significant archaeological sites. SEA will continue to consult with the SHPO, federally recognized tribes, BLM, and other Section 106 consulting parties to develop appropriate measures to resolve adverse effects to historic properties.

Potential mitigation measures for impacts to cultural resources are further discussed in Section 6.3.12, Cultural Resources, and Section 6.4.10, Cultural Resources.

4.13 Impacts to Environmental Justice Communities

4.13.1 Methodology

SEA followed a five-step process to evaluate the expected impacts of the proposed alternatives on environmental justice communities. The five-step process draws on the general approach previously used by SEA as well as the USEPA Region VI Environmental Justice methodology (USEPA 1996).

1. SEA analyzed the expected effects of the proposed alternatives on environmental justice populations.
2. SEA determined whether any environmental justice populations are located in the study area. The presence or absence of environmental justice populations was analyzed for each census tract in the study area. An environmental justice population is defined as one that meets any of the following criteria:
    - Over one-half of the census tract residents are minorities.
    - Over one-half of the census tract households are low-income households.
    - The percentage of minorities in the census tract is more than 10 percentage points higher than the percentage of minorities in Juab, Sanpete, and Sevier Counties.
    - The percentage of low-income households in the census tract is more than 10 percentage points higher than the percentage of low-income households in the involved counties.
3. SEA assessed whether any expected effects to environmental justice populations could be high and adverse. To make this determination, SEA considered whether effects would be significant as defined by NEPA (CEQ 1997).
4. SEA analyzed the spatial distribution of potential environmental justice populations (that is, minority and low-income populations) relative to the proposed alternatives. SEA mapped available economic and demographic information in order to identify areas of potential impact.
5. SEA determined whether any potentially high and adverse effects would be disproportionately borne by environmental justice populations.

SEA identified minority and low-income populations using data from the 2000 U.S. census. Low-income households include all households below the Department of Health and Human Services poverty threshold for a family of four. In 1999 (the year that census data were collected), this value was $16,700 per year for a family of four and $8,240 per year for a single person. According to the 2000 U.S. census data, there are minority and low-income populations in the study area (see Table 3.13-1, Minority and Low-Income Populations in Utah and the Study Area). However, none of these populations meet the criteria for environmental justice populations listed above.

As a result of this five-step process, SEA determined that there are no environmental justice populations in the study area according to the criteria listed above.

4.13.2 Alternative A (No-Action Alternative)

According to Table 3.13-1, Minority and Low-Income Populations in Utah and the Study Area, none of the minority or low-income populations in the study area meet the criteria for environmental justice populations listed in Section 4.13.1, Methodology. Therefore, the No-Action Alternative would not cause any impacts to environmental justice populations.

4.13.3 Alternative B (Proposed Action)

According to Table 3.13-1, Minority and Low-Income Populations in Utah and the Study Area, none of the minority or low-income populations in the study area meet the criteria for environmental justice populations listed in Section 4.13.1, Methodology. Therefore, Alternative B would not cause any disproportionately high or adverse effects to environmental justice populations. This alternative would be built in an undeveloped, rural area. No residential relocations would be required as a result of Alternative B.

Although there are vulnerable age groups[12] in the study area, no persons would be displaced or relocated. Access to services or transportation would not be denied to any group. Therefore, the project would not impact vulnerable age groups.

4.13.4 Alternative C

According to Table 3.13-1, Minority and Low-Income Populations in Utah and the Study Area, none of the minority or low-income populations in the study area meet the criteria for environmental justice populations listed in Section 4.13.1, Methodology. Therefore, Alternative C would not cause any impacts to environmental justice populations. This alternative would be built in an undeveloped, rural area. No residential relocations would be required as a result of Alternative C.

Although there are vulnerable age groups in the study area, no persons would be displace or relocated. Access to services or transportation would not be denied to any group. Therefore, the project would not impact vulnerable age groups.

4.13.5 Mitigation Measures for Impacts to Environmental Justice Populations

SEA has determined through its analysis that no environmental justice populations are present and that the Proposed Action and Alternatives would have a negligible effect on environmental justice populations. No mitigation measures are proposed.

[12] Vulnerable age groups would include children (age 18 and under) and senior citizens (age 65 and over). These populations are not specifically defined as environmental justice populations in Title VI and Executive Order 12898.

4.14 Impacts to Recreation

Section 3.14, Recreation, presents existing and anticipated recreation opportunities in the project study area. This section describes the expected impacts of construction and operation of the proposed rail line on recreation including access roads, general recreation uses and specific recreation sites, off-highway vehicle (OHV)–based recreation, and Special Recreational Management Areas. Appropriate measures to avoid, minimize, or mitigate the expected impacts on recreation resources are also proposed. Other impacts that could affect recreation resources such as noise and visual impacts are discussed in their respective sections.

4.14.1 Methodology

SEA considered the expected effects of the proposed alternatives on recreation in the study area. Impacts to recreation can occur when construction of a proposed action results in:

- The loss of recreation lands or suitability of lands for recreation
- The disturbance of recreation opportunities or access to these opportunities
- The introduction of noise

4.14.2 Alternative A (No-Action Alternative)

Under the No-Action Alternative, no new rail line construction would take place. Central Utah shippers would continue to transport commodities by surface roads throughout Sanpete and Sevier Counties. No impacts to recreation would occur as a result of the No-Action Alternative.

4.14.3 Alternative B (Proposed Action)

Alternative B would involve construction of a new rail line that would connect the UPRR mainline to shippers throughout the Sevier Valley and central Utah. Alternative B would run from the UPRR mainline near Juab, about 16 miles south of Nephi, to the industrial park about 0.5 mile southwest of Salina.

4.14.3.1 BLM Recreation Land

The dominant recreation activities in the study area are hunting in the fall and ATV use year-round as conditions permit. Other activities include hiking and camping. About 9,747 acres of BLM-administered land in the study area are open for these recreational uses (Bonar 2006). Alternative B would impact about 20.43 acres of this recreation-designated BLM land, or 0.02%. Impacts to the Painted Rocks Campground would occur during the construction phase of the rail line. However, given the small percentage of acreage impacted and the specific acreage impacted (a linear right-of-way about 75 feet wide and about 3 miles long), SEA does not consider the long-term impacts to recreation from Alternative B to be significant.

Alternative B would not impact any specially designated areas such as the Sevier Bridge Reservoir, wilderness areas, or areas of critical environmental concern.

4.14.3.2 Paiute ATV Trail System

Alternative B would cross the Paiute ATV trail system (Fishlake National Forest 2006). The crossing would be at-grade and would directly affect about 62 linear feet of the trail (see Figure 4-11, Recreation Impacts). ATV users would have to wait at the crossing for trains to pass. SEA anticipates that one round trip (two movements which equals one full load and one empty back-haul) per day would use the proposed rail line, resulting in about 3 minutes 12 seconds of wait time per day (two trains at 1 minute 36 seconds each). This wait time is considered relatively short and would not cause major disruptions to trail users. Appropriate railroad crossing signs would be used to alert ATV users to watch for approaching trains.

4.14.3.3 Chicken Creek Reservoir

Alternative B would not cause any recreation impacts to Chicken Creek Reservoir.

4.14.3.4 Yuba Lake Recreation Area and Sevier Bridge Reservoir

Alternative B would impact about 11 acres of Yuba Lake Recreation Area near Painted Rocks Campground as shown in Figure 4-11, Recreation Impacts.

4.14.3.5 Painted Rocks Campground

Painted Rocks Campground is adjacent to the Sevier Bridge Reservoir, and the campground is accessed from SR 28 by a 1-mile-long dirt road. Alternative B would cross this dirt access road about 200 yards from the main entrance. No campground or picnic facilities would be directly impacted, and the short duration of delay at the crossing (less than 2 minutes per train) would not cause a major impact. Appropriate railroad crossing signs would be used to alert recreationists to watch for approaching trains. Noise impacts would be minor and are discussed in Section 4.9, Noise Impacts.

4.14.3.6 Yuba Narrows

Under Alternative B, the rail alignment would cross the Sevier Bridge Reservoir on a 300-foot-long bridge approximately midway between the dam and the Sevier River inlet. The bridge would have a 14-foot clearance to allow boats on the Sevier Bridge Reservoir to pass underneath it (the average height of a speedboat is 12.5 feet). The bridge may hinder use of some sailboats depending on mast height. Boating activities might be disrupted during construction of the bridge, but impacts would be minor.

4.14.3.7 Sevier River

Alternative B would not cause any recreation impacts to the Sevier River. The noise analysis conducted for this project found that noise levels would not increase significantly and access to fishing and hunting would not be impaired (see Section 4.9, Noise Impacts).

4.14.3.8 Redmond Lake

Alternative B would not cause any recreation impacts to Redmond Lake or the Redmond WMA.

4.14.4 Alternative C

4.14.4.1 BLM Recreation Land

About 9,747 acres of BLM-administered land in the study area are open for recreational uses (Bonar 2006). Alternative C would impact about 63.46 acres of this recreation-designated BLM land, or 0.06%. Given the small percentage of acreage impacted and the specific acreage impacted (a linear right-of-way about 75 feet wide and about 9 miles long), SEA does not consider the impacts to recreation from Alternative C to be significant. Alternative C would not impact any specially designated areas such as wilderness areas or areas of critical environmental concern.

4.14.4.2 Paiute ATV Trail System

Under Alternative C, in order to accommodate the rail line, a filled berm up to 75 feet high and a maximum of 550 feet wide would be required as the rail line approaches the southern terminus. This berm would cut off a loop of 1,570 linear feet of the Paiute ATV trail. Because of the difficulty of altering the existing trail to cross the raised berm, this portion of the Paiute ATV trail would need to be abandoned or relocated to avoid the berm.

4.14.4.3 Chicken Creek Reservoir

Alternative C would not cause any recreation impacts to Chicken Creek Reservoir.

4.14.4.4 Yuba Lake Recreation Area and Sevier Bridge Reservoir

The impacts to Yuba Lake Recreation Area and the Sevier Bridge Reservoir under Alternative C would be the same as those from Alternative B because the alternatives are on the same alignment in this location.

4.14.4.5 Painted Rocks Campground

The impacts to Painted Rocks Campground under Alternative C would be the same as those from Alternative B.

4.14.4.6 Yuba Narrows

The impacts to Yuba Narrows under Alternative C would be the same as those from Alternative B.

4.14.4.7 Sevier River

The impacts to the Sevier River under Alternative C would be the same as those from Alternative B.

4.14.4.8 Redmond Lake

Alternative C would not cause any recreational impacts to Redmond Lake or the Redmond WMA.

4.14.5 Mitigation Measures for Recreation Impacts

Mitigation measures for impacts to recreation are discussed in Section 6.3.14, Recreation, and Section 6.4.11, Recreation.

4.15 Impacts on Aesthetics

Impacts on visual quality are based on the BLM class objectives described in Section 3.15, Aesthetics. This section identifies expected impacts from the proposed new rail line construction and operation on any areas determined to be of high visual quality as well as impacts on any waterways designated or considered for designation as wild and scenic. Changes in the visual environment can be generally classified as either short-term, construction-related impacts or long-term impacts from permanently altering the landscape. This section also identifies mitigation measures to avoid, minimize, or reduce adverse visual impacts.

4.15.1 Methodology

SEA reviewed the expected effects of the proposed alternatives on the landscape and the visual context of the project area. Effects on visual resources are often difficult to characterize due to the subjective nature of scenic value and differing perceptions of visual quality. SEA considers adverse effects to result from the intrusion of aesthetic elements that are out of character with the current visual setting.

Impacts were determined using the BLM Visual Resource Management (VRM) Program. BLM's VRM system provides a way to identify and evaluate scenic values to determine the appropriate levels of management. It also provides a way to analyze visual impacts and apply visual design techniques to ensure that surface-disturbing activities are in harmony with their surroundings. Visual impacts were assessed from 11 KOPs in the study area as described in

Appendix I, Visual Resource Management, and shown in Figure 4-12, Impacts to Visual Resource Management.

4.15.2 Visual Characteristics

4.15.2.1 Alternative A (No-Action Alternative)

Construction-Related Visual Impacts

Under the No-Action Alternative, no new rail line construction would take place. Central Utah shippers would continue to transport commodities by surface roads in Sanpete and Sevier Counties. Because no rail line would be built, no large topographic changes or soil disturbances from construction-related cuts, fills, or tunnel and bridge construction would occur. The physical and visual character of the project area would remain unchanged by rail line construction.

Long-Term Visual Impacts

Under the No-Action Alternative, the Central Utah Rail project would not be built. However, the study area would experience continued residential, commercial, industrial, and recreational development that could affect visual resources. The exact nature of the potential effects to visual resources from future development is not known at this time.

4.15.2.2 Alternative B (Proposed Action)

Construction-Related Visual Impacts

Alternative B would involve construction of a new rail line that would connect the UPRR mainline to shippers in Sanpete and Sevier Counties. The alternative would run from the UPRR mainline near Juab, about 16 miles south of Nephi, to the industrial park about 0.5 mile southwest of Salina. Under Alternative B, short-term construction-related impacts in the study area would include construction vehicle activity and accompanying staging areas, stockpiling of excavated material, and construction-related dust.

During construction, the work zone would be cleared of vegetation. The exposed bare ground would likely contrast visually with the surrounding agricultural and residential areas that the viewer is used to seeing. Visual quality from sensitive viewer locations would be temporarily reduced during construction. Until the construction is completed and the right-of-way is revegetated, the construction area would stand out.

Construction-related visual impacts from the rail line itself would likely be greatest where construction would require the largest cut slopes. Mitigation for large cut slopes is addressed in Section 6.4.12, Aesthetics. Additionally, where Alternative B is farther from large viewer groups, its construction-related visual impacts would be apparent to fewer people, while in locations where Alternative B is closer to viewer groups, construction-related visual impacts

would be more obvious. Construction-related visual impacts would likely be greatest in locations where Alternative B is closer to U.S. highways and I-15, near the Painted Rocks Campground, at the Sevier Bridge Reservoir, at the Redmond WMA, and in the town of Salina.

Long-Term Visual Impacts

The long-term visual impacts from Alternative B would result from a new rail line including cut-and-fill slopes, bridges, loss of agricultural land and other vegetation, and drainage structures. The long-term visual impacts of Alternative B were assessed from 11 KOPs as described in Appendix I, Visual Resource Management. The railroad tracks would not be under continuous use; there would be one round trip (two movements which equals one full load and one empty back-haul) per day expected. For this reason, the users are not likely to have a high sensitivity to the tracks because the tracks themselves are not very visible by most viewers. In addition, any maintenance buildings or storage yards would follow federal, state, and local policies and regulations to maintain the integrity of visual resources in the project area.

4.15.2.3 Alternative C

Construction-Related Visual Impacts

Construction-related visual impacts from Alternative C would be the same as those from Alternative B.

Long-Term Visual Impacts

Alternative C would result in similar long-term visual impacts as Alternative B. However, Alternative C would not involve any crossings of the Piute Canal and associated irrigation facilities since the entire alternative would be west of and upslope from the canal. The visual impacts from Alternative C would be greater in the southernmost 2.5 miles of the study area since the rail line would be placed on a 75-foot-tall berm through the agricultural land between the foothills and the loading facility north of I-70. There would be fewer visual impacts from canal/irrigation crossing structures, but more disturbance of agricultural land that would be highly visible to users of the highway and residents of the study area. The long-term visual impacts of Alternative C were assessed from 11 KOPs as described in Appendix I, Visual Resource Management.

4.15.3 User Groups

There are two basic user groups associated with the rail line: those using the rail line (who have views from the rail line) and those looking at the rail line (who have views of the railroad tracks). No passengers would use the rail line since the purpose of the rail line is commercial and industrial rather than recreational. The other user group, which is difficult to

quantify, includes local residents and agricultural landowners as well as commercial and industrial owners. There are also scattered recreational users such those using the Sanpete Fish and Game Club and boaters at the Sevier Bridge Reservoir.

These groups experience a visual sensitivity that depends on the number and type of viewers and the frequency and duration of views. Visual sensitivity is also modified by viewer activity, awareness, and visual expectations in relation to the number of viewers and viewing duration. The visual sensitivity is generally higher for the group viewing the new transportation right-of-way than for the group that uses the rail right-of-way (U.S. Forest Service 1995; FHWA 1983). Residential and agricultural viewers typically have extended viewing periods and are concerned about changes in their views. Viewers using recreation areas are also concerned about the changes in their views.

The railroad tracks would not be under continual use, because only one round trip (two movements which equals one full load and one empty back-haul) per day is expected. Therefore, users are not likely to have a high sensitivity to the tracks because the tracks themselves are not very visible by most viewers.

4.15.4 Wild and Scenic Rivers

Since there are no potentially eligible wild, scenic, or recreational river segments in the study area (BLM 2005), the proposed new rail line construction and operation would not impact wild and scenic rivers.

4.15.5 Mitigation Measures for Impacts on Aesthetics

Mitigation measures to visually harmonize the rail line with existing structures and other landscape elements in the project area and other impacts to aesthetics are discussed in Section 6.4.12, Aesthetics.

This page is intentionally blank.

Figure 4-1. Impacts to Land Ownership

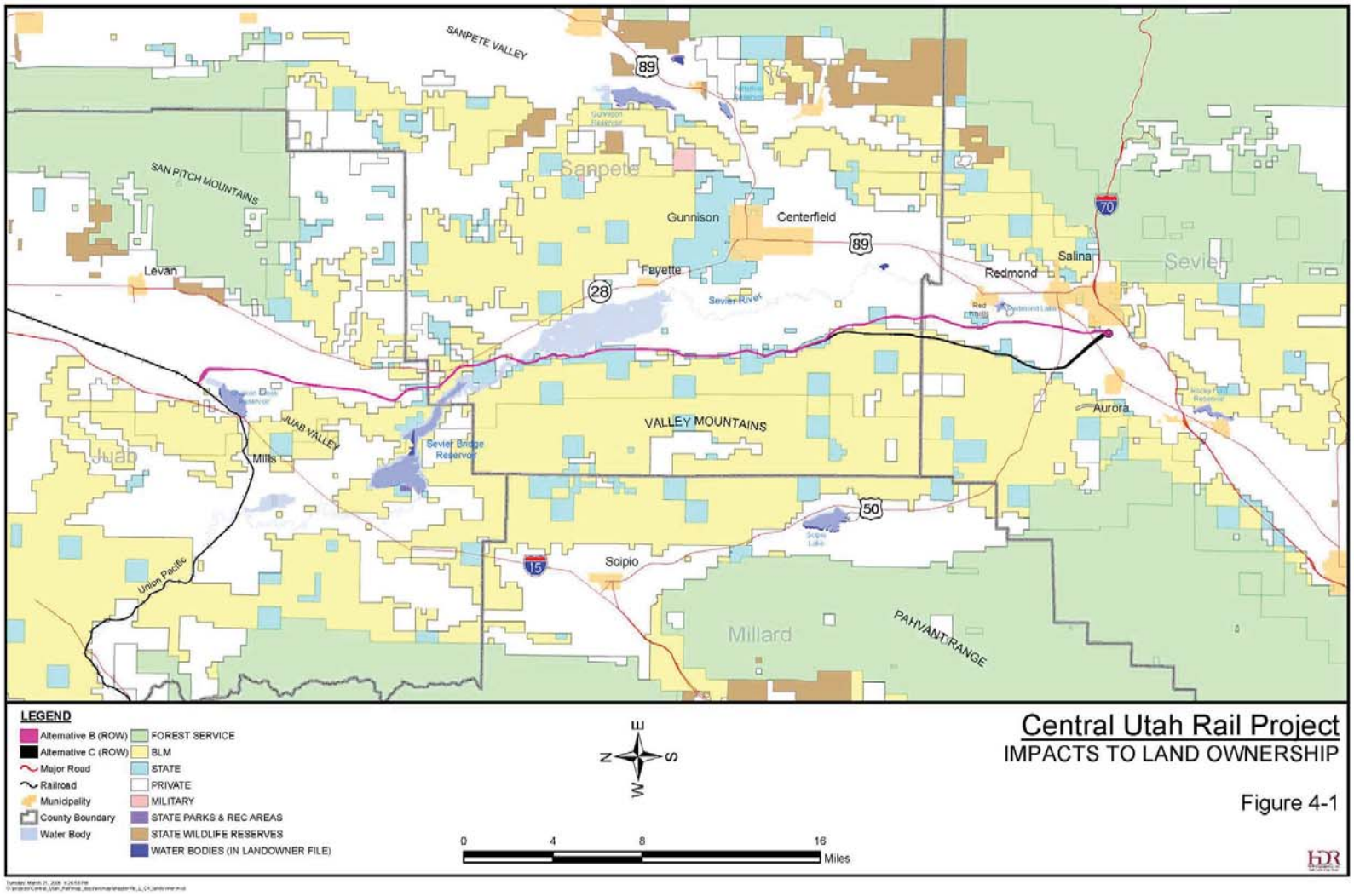


Figure 4-2. Land Use Impacts

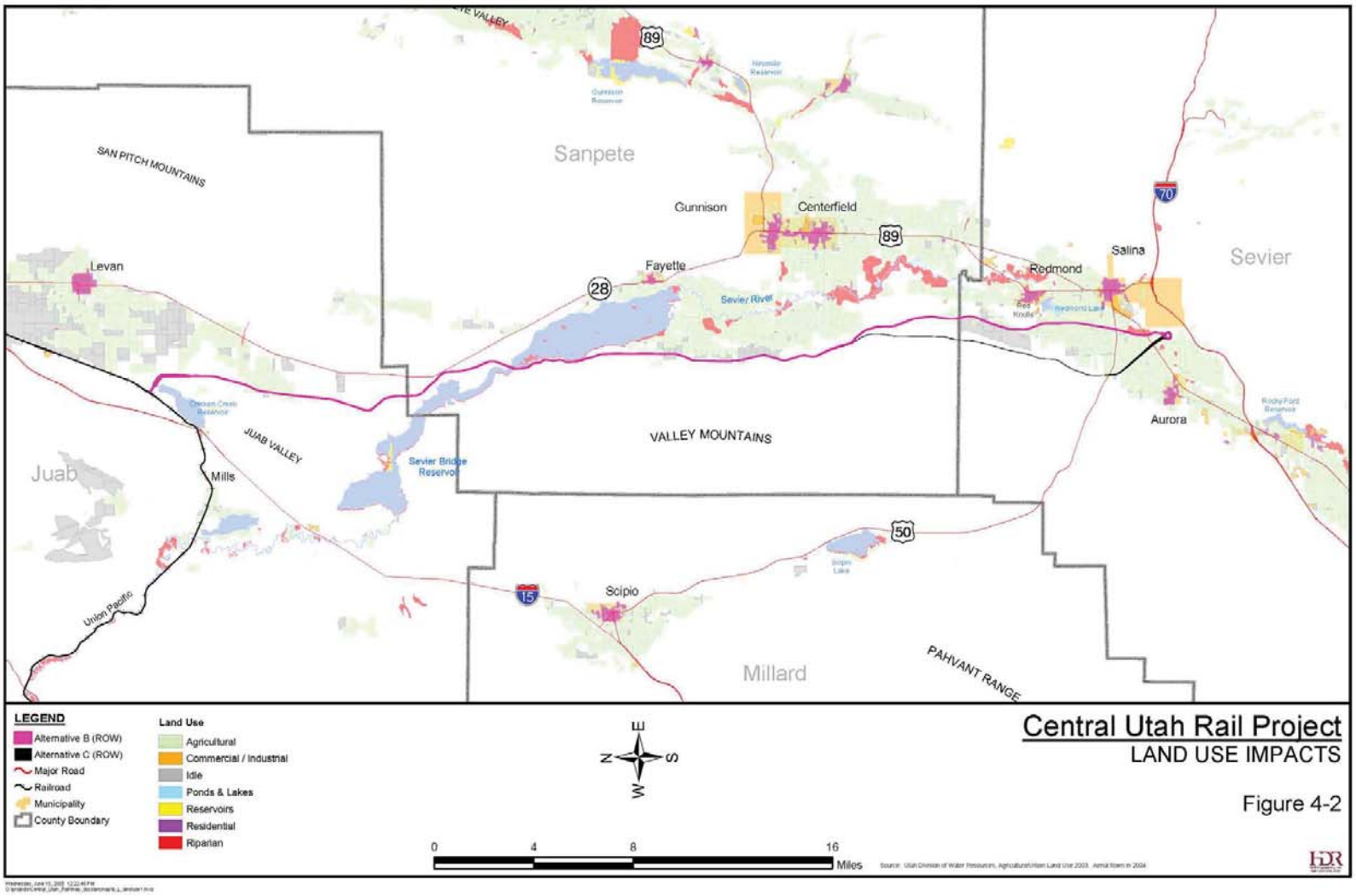


Figure 4-3. Impacts to Grazing Allotments

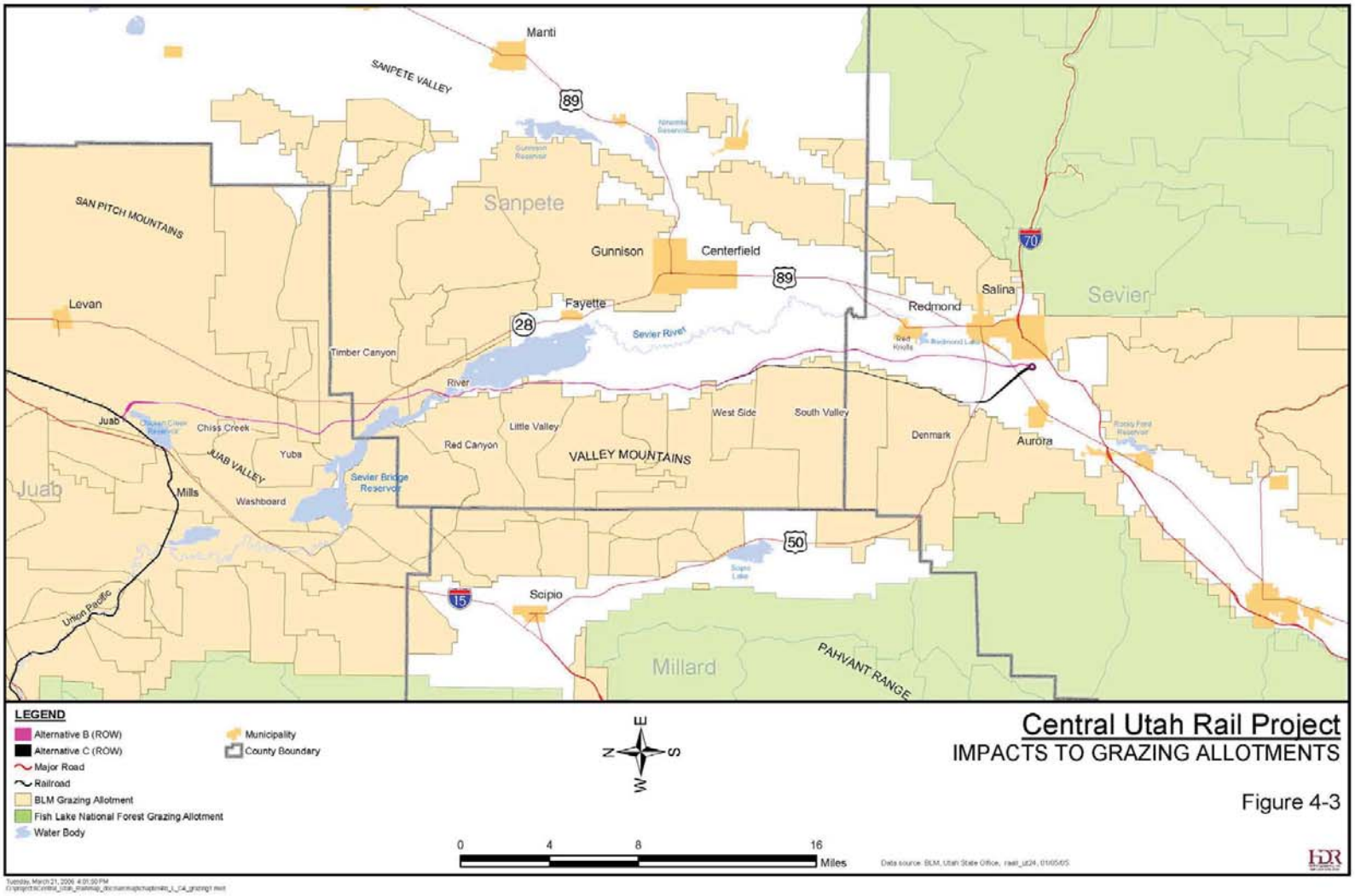


Figure 4-4. Impacts to Elk and Mule Deer Seasonal Range

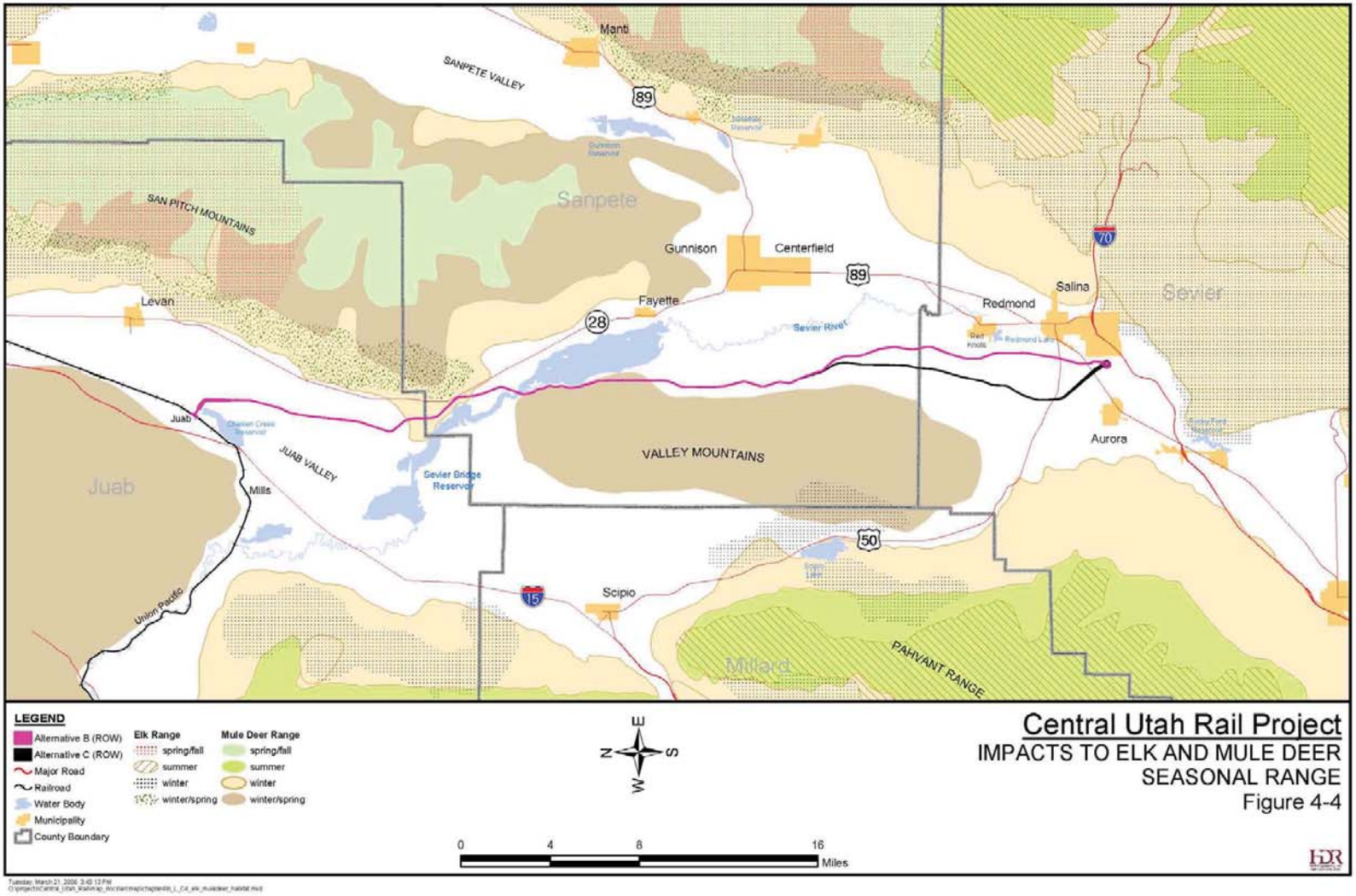


Figure 4-5. Vegetation Impacts

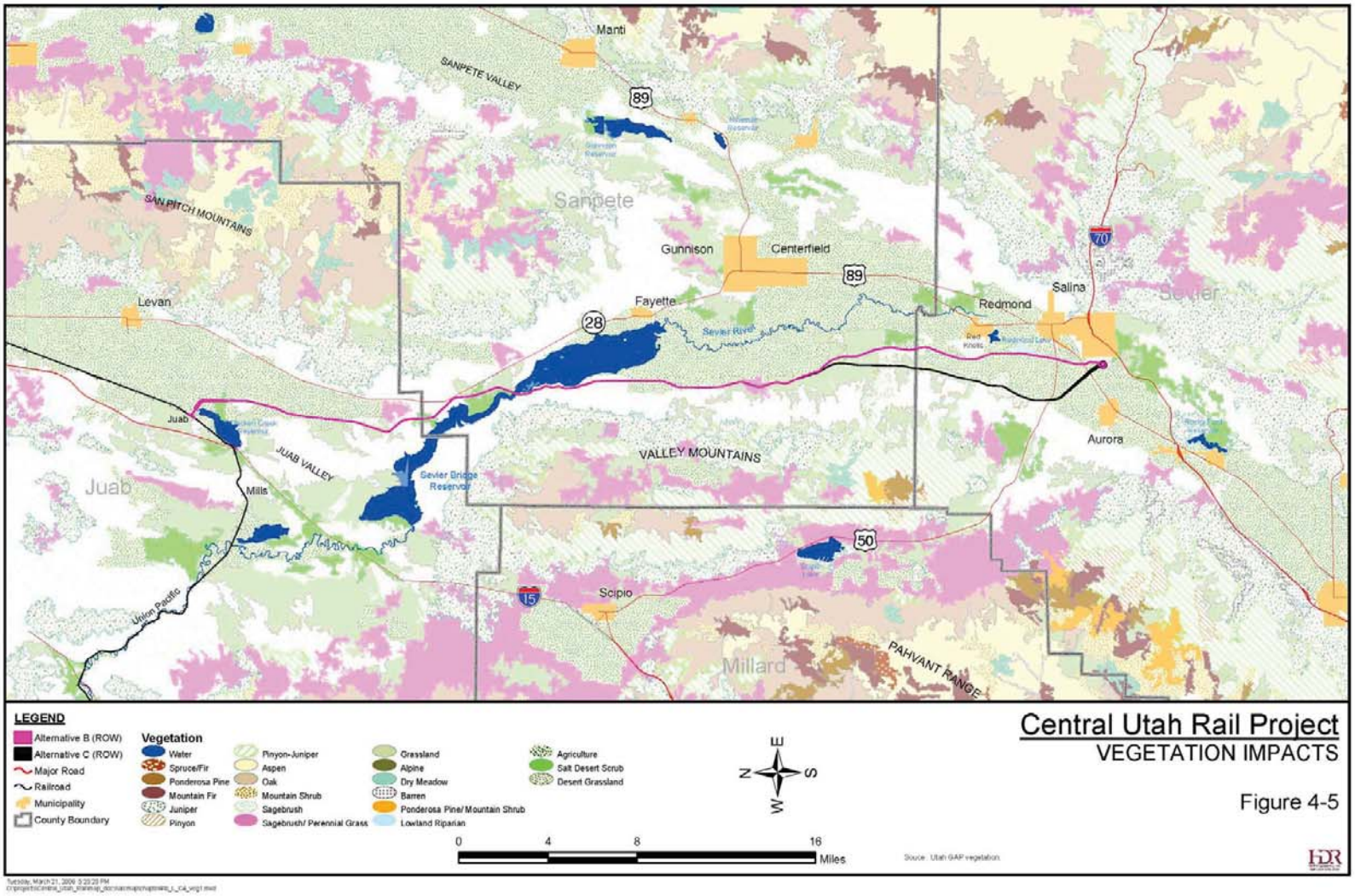


Figure 4-6. Wetland/Drainage Impacts

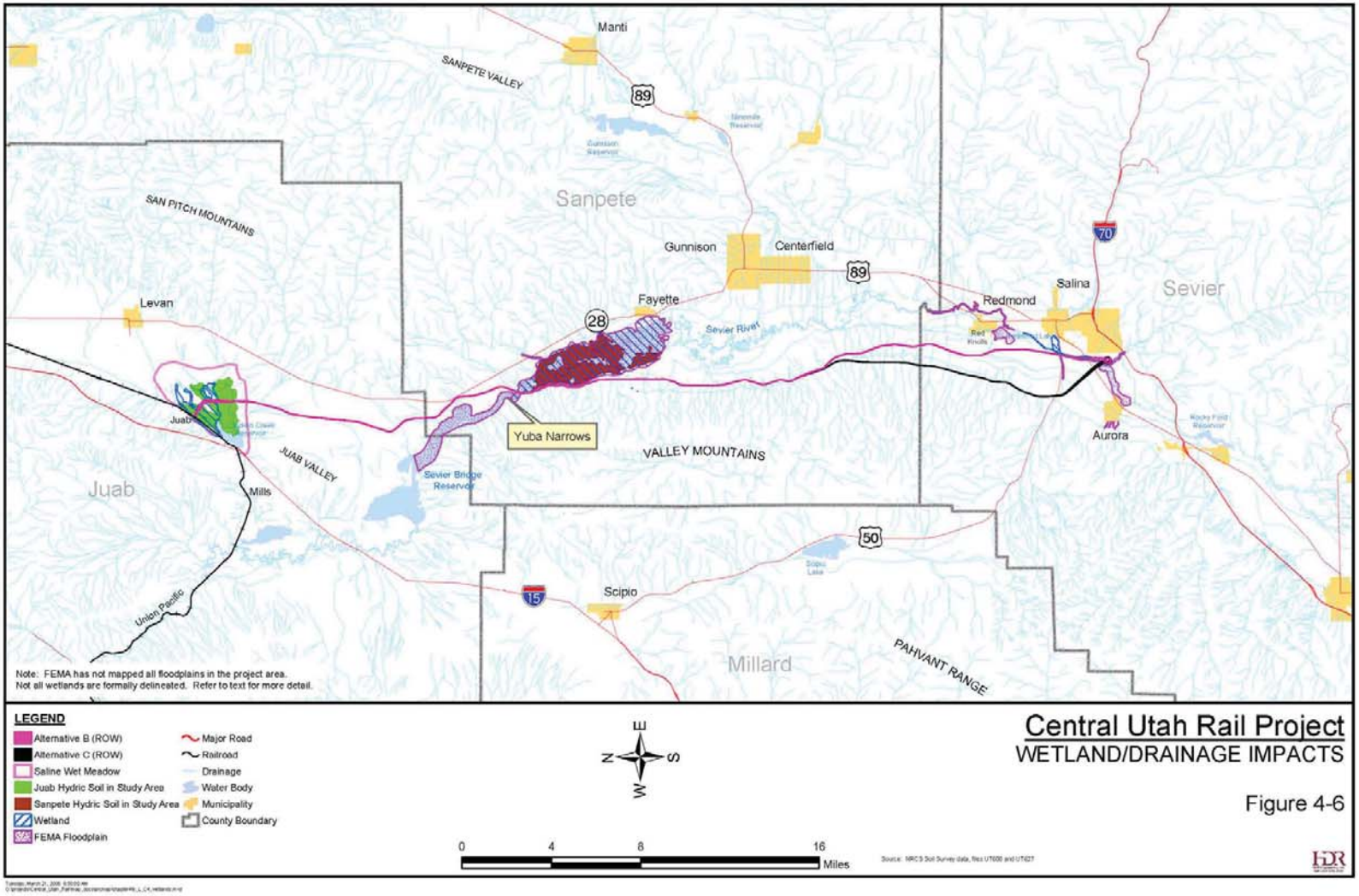


Figure 4-7. Impacts to Water Resources

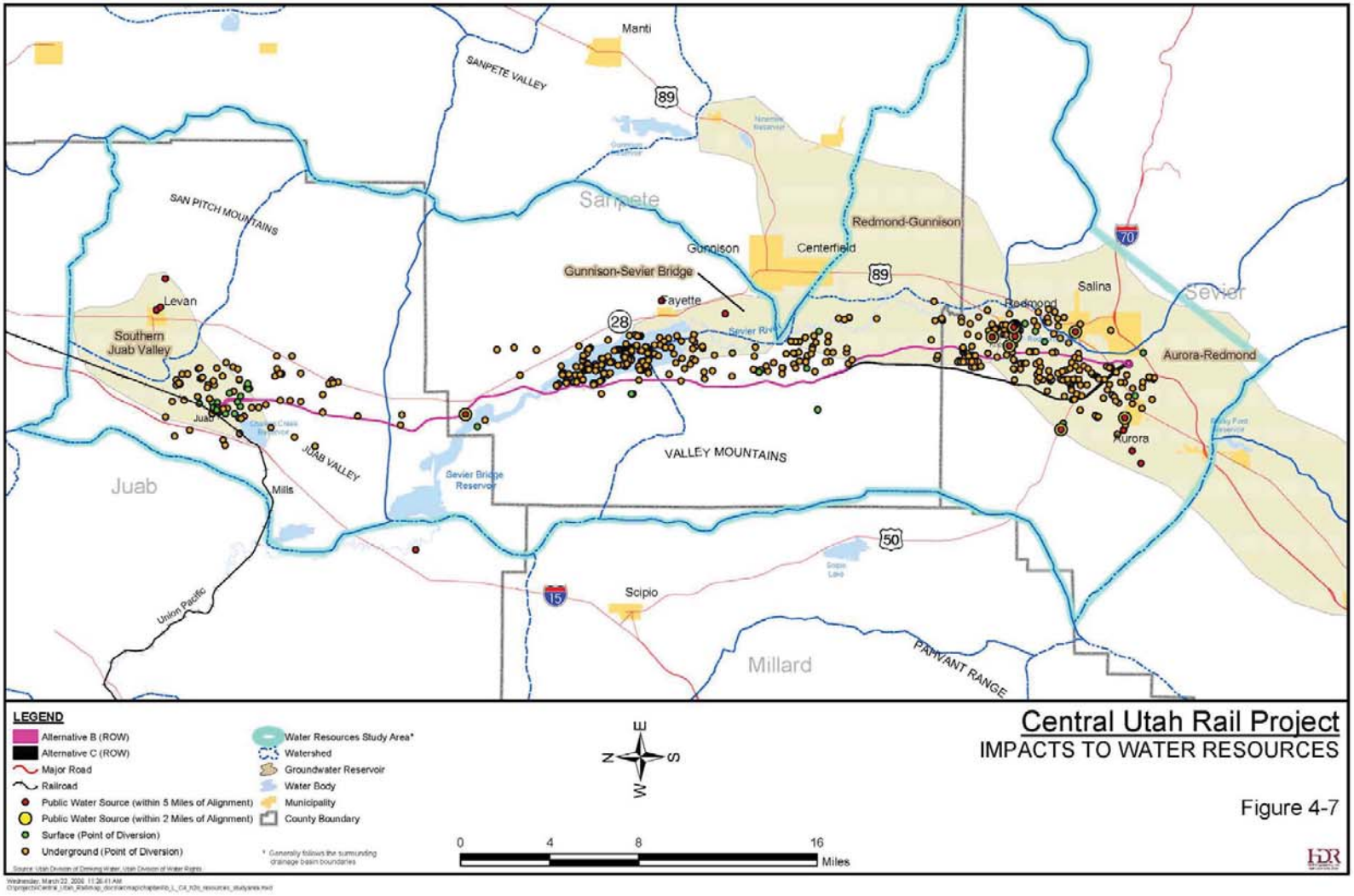


Figure 4-8. Impacts to Prime and State Important Farmland

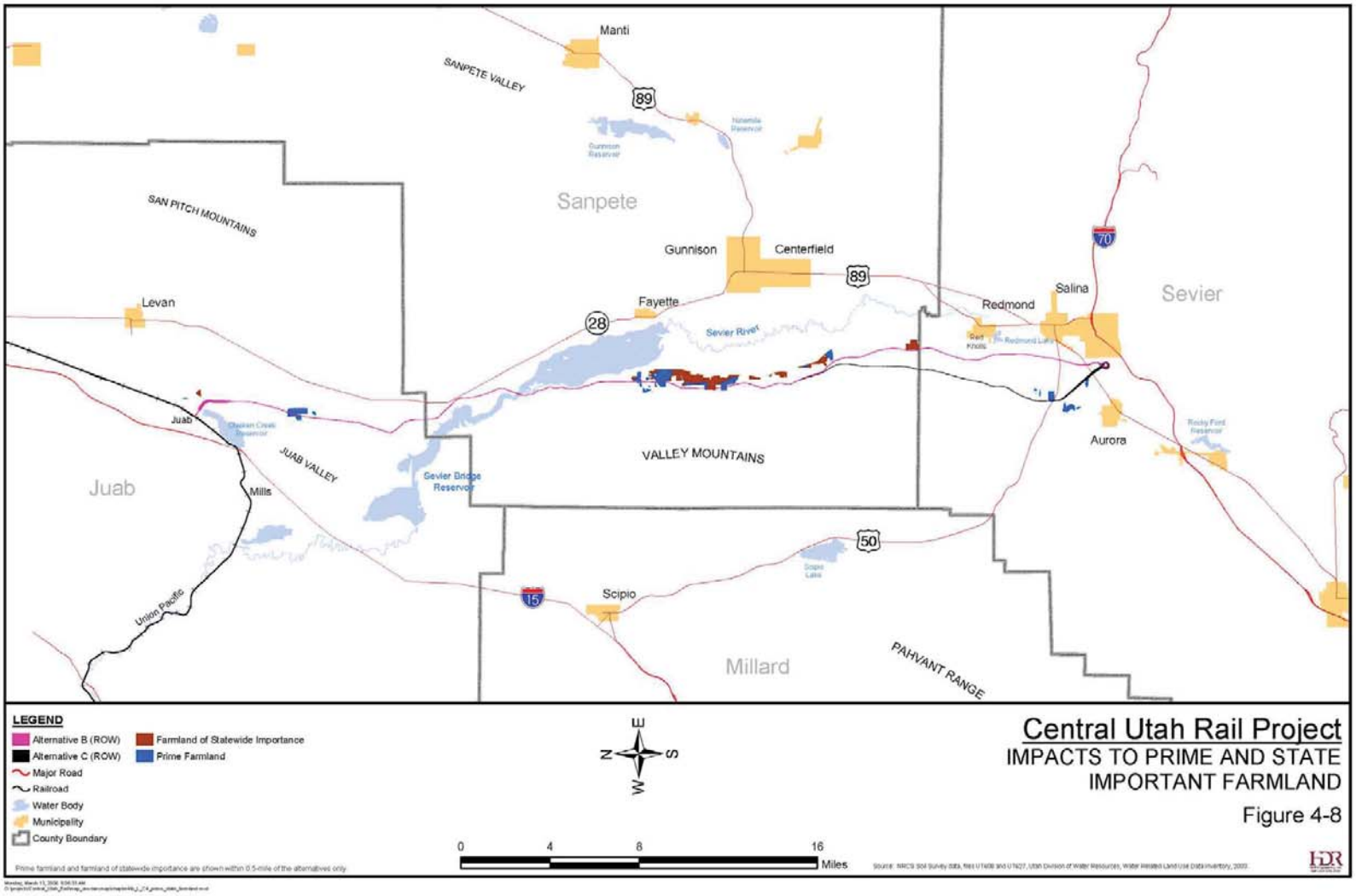


Figure 4-9. Impacts to Potential Hazardous Waste Sites

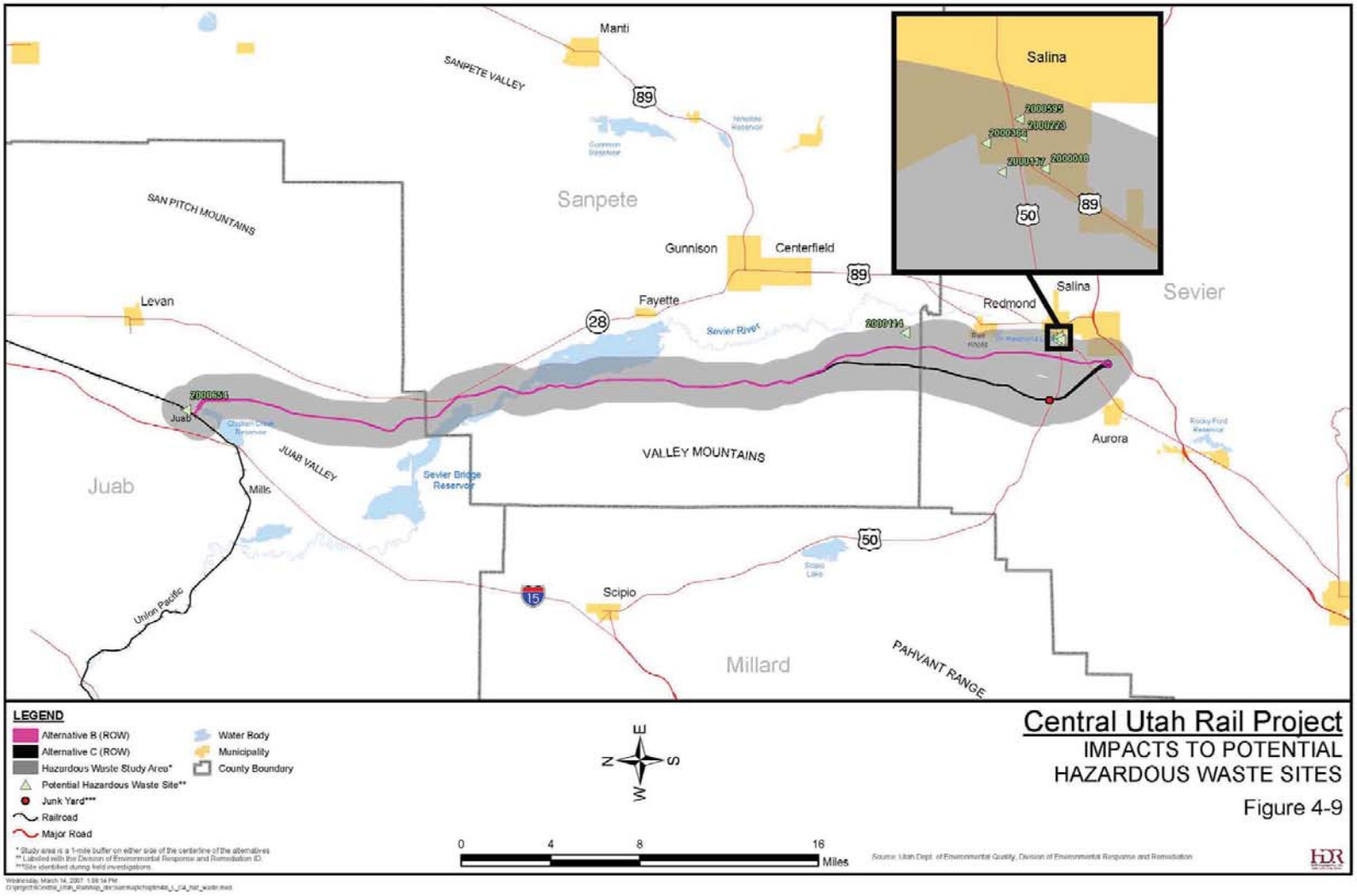


Figure 4-10. Energy Impacts

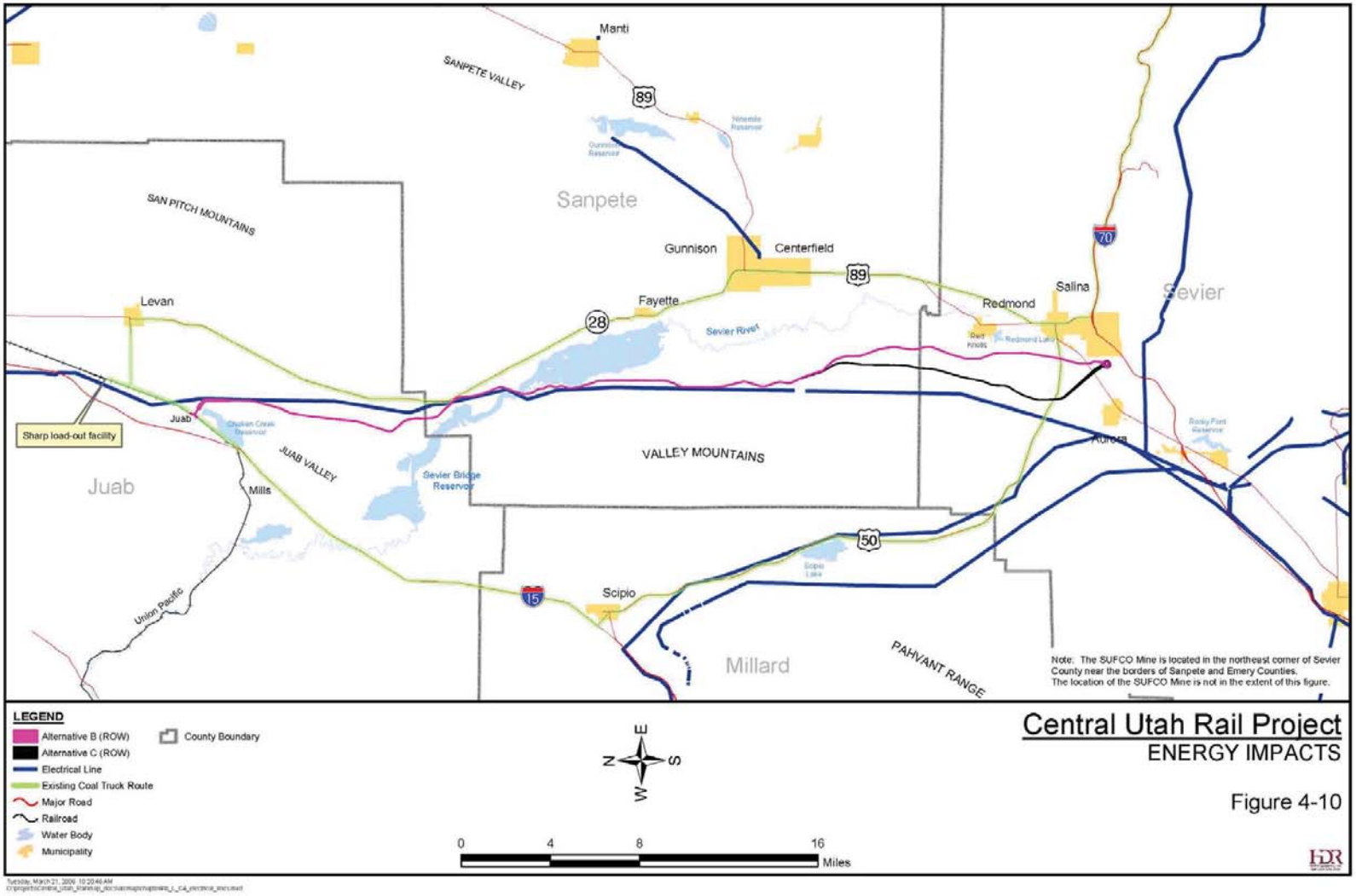


Figure 4-11. Recreation Impacts

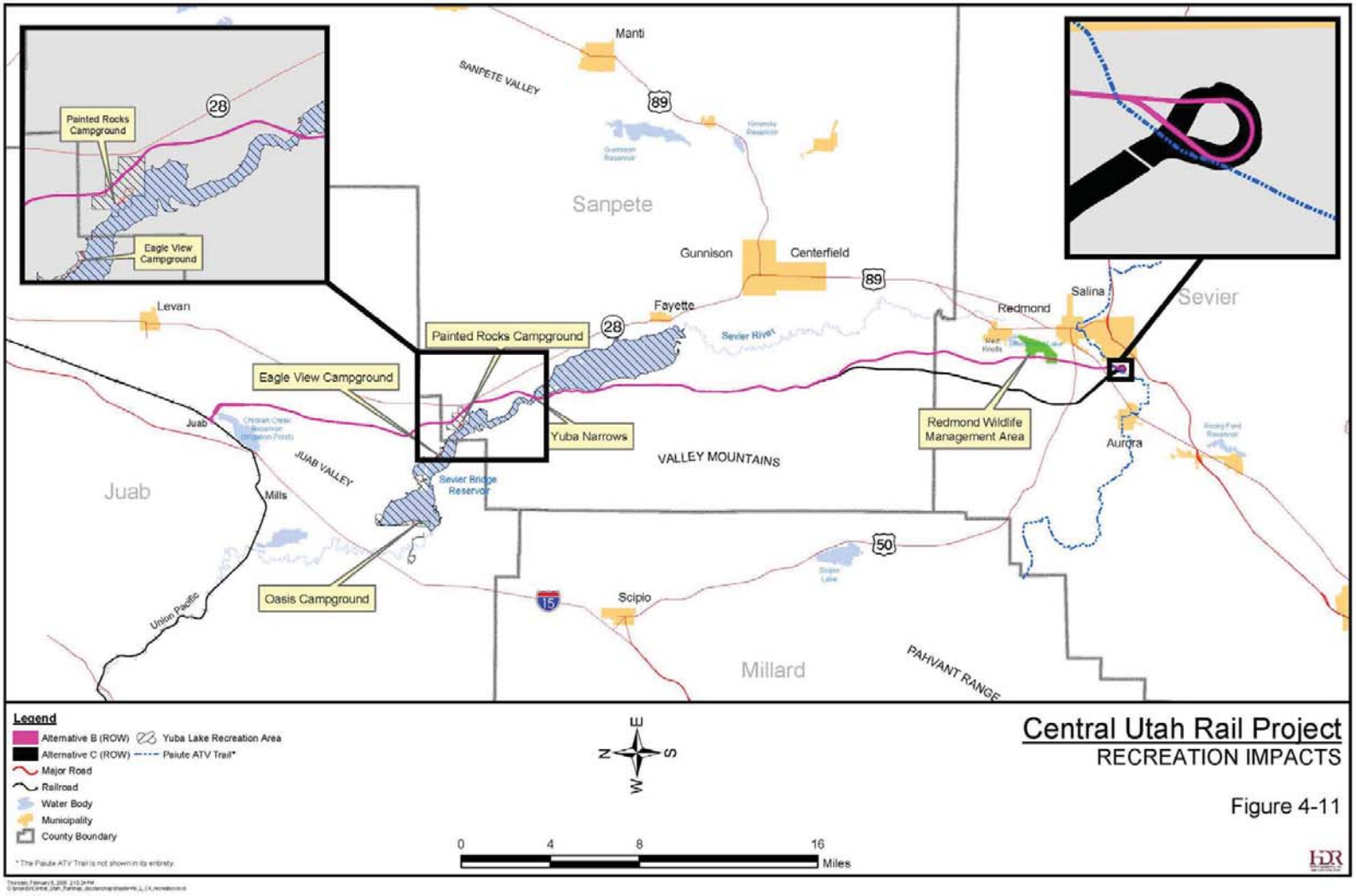
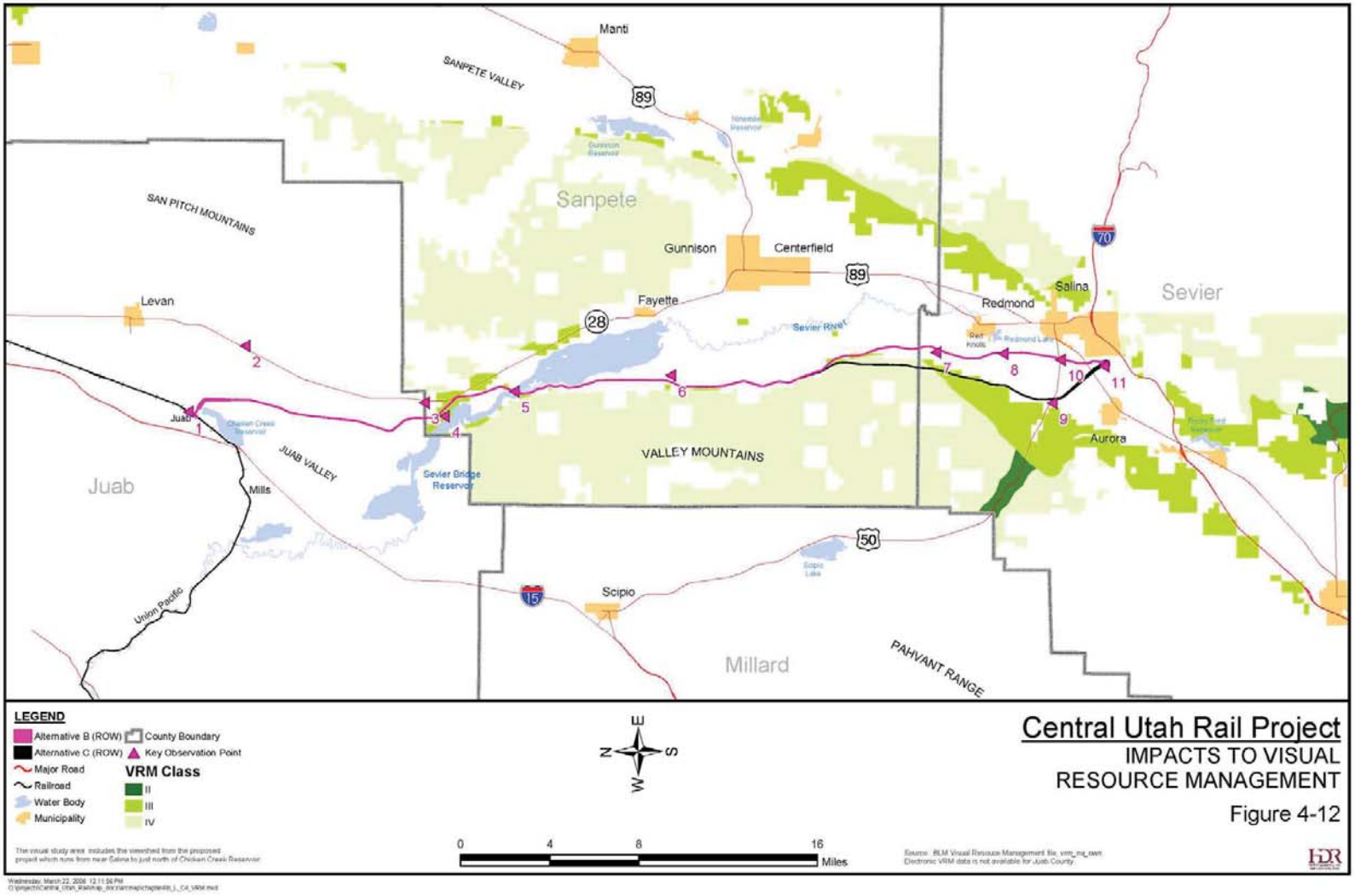


Figure 4-12. Impacts to Visual Resource Management



This page is intentionally blank.

Chapter 5: Cumulative Impacts

5.1 Methodology

The CEQ regulations that implement the procedural provisions of NEPA define cumulative effects as "the impact on the environment which results from the incremental consequences of an action when added to other past, present, and reasonably foreseeable future actions, regardless of what agency or person undertakes such other actions" (40 CFR 1508.7). To assist Federal agencies in assessing cumulative impacts under NEPA, CEQ developed a handbook entitled *Considering Cumulative Effects under the National Environmental Policy Act*. SEA followed these guidelines in its evaluation of whether planned and reasonably foreseeable projects in the area in combination with potential impacts of operations or construction activities of the Proposed Action and Alternatives would cumulatively result in significant adverse environmental impacts.

Available information obtained in consultation with the Applicant, the Utah Department of Workforce Services, and the Utah Governor's Office of Planning and Budget (2003) suggests that the following planned or reasonably foreseeable projects would take place in the same general geographical region as the Proposed Action and Alternatives. The project would occur within Sanpete, Sevier, and Juab Counties, Utah, and would connect to the Union Pacific Railroad (UPRR) about 16 miles south of Nephi, near Juab (see Figure 5-1, Planned Projects in the Central Utah Rail Project Region):

- **Quitchupah Creek Road.** Sevier County has proposed to upgrade the Quitchupah Creek Road located 25 miles from the Central Utah Rail Proposed Action and Alternatives. The road will be used as an additional, shorter haul road for trucks entering Emery County from Canyon Fuels' SUFCO mine. The mine would be the primary user of the upgraded road. The road would also provide access to the Accord Lakes area and a shorter route for those in the Emery area traveling west toward Salina and I-15 (Fishlake National Forest and Bureau of Land Management 2006).
- **Nevco Energy Company Power Plant.** Nevco Energy Company is proposing to build a 270-megawatt circulating fluidized bed coal-fired power plant near Sigurd, Utah, which is in the Sevier Valley. The Nevco Energy power plant would be located 8 miles from the Proposed Action and Alternatives.

The cumulative impacts vary depending on the environmental resource category under consideration. SEA analyzed the cumulative impacts for those situations in which the geographic region for planned or reasonably foreseeable project impacts overlapped with the Proposed Action and Alternatives. The project area is located within high-elevation tablelands separated by generally narrowing north-trending structural valleys within the Juab and Sevier Valleys (Hecker 1993). Although the two projects mentioned above are planned to

occur in the same general geographic region as the Proposed Action and Alternatives, the projects are separated from the Proposed Action by a distance of 25 miles and 8 miles, respectively. In addition, the diverse topography of the project area separates these projects from the Proposed Action and Alternatives as seen in Figure 5-1, Planned Projects in the Central Utah Rail Project Region. Therefore, the projects do not share the same impact area for most resources considered in this EIS.

5.2 Impact Analysis

The production of coal at the SUFCO plant is currently at capacity, and there is no foreseen change in capacity. Coal production is driven primarily by mine infrastructure, not by client demand or coal transportation mode (K. May 2006). In addition, the rail project would not change the current distribution of coal to customers, change the customer base, or change the market base for SUFCO (K. May 2006). The volume of coal produced by the mine and subsequently shipped by train or truck should remain stable for at least 25 years (the life of the mine reserves).

SUFCO would need to ship 38,000 carloads annually to provide the economic foundation to proceed with the Proposed Action. Marketing studies show that, without increased production, SUFCO would be shipping 42,410 to 44,175 carloads annually (Washington Infrastructure Services Inc. and others 2001). Therefore, available information does not suggest that any appreciable increased production is planned, nor is there foreseeable need for increased production, if the proposed new rail line is completed.

SEA identified the combined interaction of the Proposed Action and Alternatives and the other planned or reasonable foreseeable projects described in Section 5.1, Methodology. SEA then identified the potential cumulative impacts on water resources, specifically water quality; air quality; energy; socioeconomics; and cultural resources.

SEA has determined that the proposed construction of about 43 miles of new rail line and the operation of two trains per day, on average, under the Proposed Action and Alternatives would not result in any notable cumulative impacts in the project area. The Central Utah Rail project impact area for the above resources does not overlap with either the impact area for the Quitchupah Creek Road project or the impact area for Nevco Energy Company's proposed power plant project. Because of this lack of overlap, coupled with the undeveloped nature of and lack of development in the project area, SEA does not expect that the Proposed Action and Alternatives combined with other past, present, and reasonably foreseeable projects would cause cumulative impacts for the other resource areas addressed in this EIS (see Figure 5-1, Planned Projects in the Central Utah Rail Project Region).

5.2.1 Water Resources

Several types of past, present, and ongoing land uses such as livestock grazing, mining, and recreation occur within the Sevier River watershed in the vicinity of the Central Utah Rail project impact area. These uses, along with related activities, may have contributed to upland watershed conditions and erosion.

SEA determined that since the Quitchupah Creek Road project impact area is located in a different drainage basin from the Central Utah Rail project impact area, the cumulative effects on surface waters, canals and irrigation, floodplains, wetlands, and groundwater from these two combined projects would be negligible.

SEA also determined that because the Nevco Energy power plant near Sigurd is within the same watershed as the Proposed Action and Alternatives, there is the potential for cumulative impacts to water quality. However, the impacts would be negligible.

Construction and operation of both the Proposed Action and Alternatives and the proposed Nevco Energy power plant would both disturb undeveloped ground. Since there is more runoff from impervious surfaces than from undeveloped ground, some decrease in water quality would occur if this land is developed. Any land disturbances associated with the construction and operation of either project would need to be mitigated in accordance with all local, state, and Federal development requirements. The use of BMPs would reduce impacts; therefore, the development of either project would not contribute significantly to the degradation of water quality.

Since the actual project impact areas don't overlap and are located roughly 5 miles apart, there is little or no potential for cumulative impacts to surface waters, canals and irrigation, floodplains, wetlands, or groundwater.

5.2.2 Climate and Air Quality

All planned and foreseeable projects with emission sources must be considered for authorization under the State Implementation Plan to ensure that cumulative emissions do not cause Sevier County to violate the NAAQS or prevent the county from attaining these standards. The Central Utah Rail project area is in an attainment area for all priority pollutants, and no NAAQS would be exceeded by the Proposed Action or Alternatives. Because the proposed rail line is in an attainment area, would handle only one or two trains a day, and would reduce emissions in the Sevier Valley from reduced truck traffic, a comprehensive air quality analysis was not required.

The Quitchupah Creek Road project is also in an attainment area for all NAAQS pollutants, and no NAAQS would be exceeded by the Proposed Action and Alternatives.

Nevco completed an application (Notice of Intent) and the Utah Division of Air Quality (2004) approved a permit for the 270-megawatt coal-fired plant. An extensive air quality

study was completed as part of the application. In their response to comments received from the Sevier Power Company (N2529-001), the Utah Division of Air Quality stated that "the proposed construction of the new power plant would not cause an exceedance of the NAAQS for PM_{10}; nor would it significantly contribute to any model predicted exceedances of the NAAQS in the Sevier Valley." If SUFCO were to provide coal to meet the needs of the Nevco power plant, it would need to reduce shipments to current customers. Nevco's coal needs would not be met by increased production from the SUFCO mine.

Windblown emissions would be reduced for all projects through the use of covered rail cars and enclosed or covered trucks used for coal transport. Construction activities are typically regulated under the rules for reducing fugitive dust as expressed in Utah Administrative Code R307-205. Any air quality disturbances associated with the construction of any of the projects discussed in this chapter would need to be mitigated in accordance with all local, state, and Federal development requirements.

Because neither the Proposed Action and Alternatives nor the Quitchupah Creek Road project would exceed the NAAQS, and given the distance between all three projects, the Proposed Action and Alternatives would not have a significant cumulative adverse impact on air quality.

In addition, the rail project would not change the customer base for the SUFCO mine. Coal that is currently shipped within Utah and to Nevada by truck would continue to be delivered to these same customers by rail. Therefore, the rail project would not result in additional air quality impacts to other locales throughout the United States (K. May 2006).

5.2.3 Energy

Energy is evaluated primarily in the form of vehicle fuel consumption. Both the Proposed Action and Alternatives and the Quitchupah Creek Road project would reduce overall energy consumption by providing more efficient transportation of coal. As stated in Section 4.10, Impacts to Energy Resources, the total anticipated daily energy consumption resulting from the Proposed Action and Alternatives would be 51% of the existing average daily energy consumption (which consists of truck traffic only).

The proposed Quitchupah Creek Road project would reduce the round-trip coal transport from the SUFCO mine by about 50 miles and would therefore reduce fuel waste, resulting in a fuel savings of about 11 gallons per trip.

The cumulative impacts of the Proposed Action and Alternatives and the Quitchupah Creek Road would be a reduction in overall energy consumption.

5.2.4 Socioeconomics

5.2.4.1 Population

Due to an increase in the labor pool required for economic development in the geographic area, the Proposed Action and Alternatives, the Quitchupah Creek Road project, and the proposed Nevco Energy power plant could cumulatively lead to a small increase in population, likely resulting from in-migration from surrounding areas.

5.2.4.2 Employment, Income, and Tax Base

Information obtained in consultation with the Applicant suggests that the economic feasibility of the Proposed Action and Alternatives is based on coal shipments from the SUFCO mine. Based on representation by SUFCO, the volume of coal produced by the mine and subsequently shipped by train or truck should remain stable for at least 25 years. Available information does not suggest that any appreciable increased production at SUFCO mine is likely if the Proposed Action or Alternatives are implemented. Although production at the SUFCO mine is unlikely to increase, the area does have large coal reserves. Therefore, other mines near the proposed rail line could have an incentive to seek permits to open and begin production. The Utah Division of Oil, Gas, and Mining has advised SEA that they have received a few inquiries about other mines possibly starting up in the area, but there are no pending applications (SCOAG 2002).

Non-coal businesses could also use the proposed rail line. The proposed line could provide existing and future non-coal businesses that would benefit from using rail transportation with new marketing opportunities, which currently appear to be constrained by the trucking cost to reach a rail loading point. The amount of coal and non-coal products shipped in the study area could increase, assuming that the proposed new rail line is approved and becomes operational. However, the extent of the potential for increased coal production and the likelihood of new or existing non-coal businesses using the line is not reasonably foreseeable at this time.

SEA expects similar results from the projected coal transportation cost savings resulting from both the Proposed Action and Alternatives and the Quitchupah Creek Road project. Although there may be some initial increased profitability for the SUFCO mine, the competitive nature of the market should ensure that the added profit margin would be reduced to prevailing levels. Therefore, it's reasonable to assume that the combined effects of the Proposed Action and Alternatives and the Quitchupah Creek Road project would not cumulatively impact the productivity or profitability of mining in the region. However, the fact that both projects would allow SUFCO to remain competitive in a competitive coal market would have positive cumulative impacts on Sevier County. The long-term stability of the SUFCO mine would ensure that one-quarter of the Sevier County payroll would continue and one-fifth of workers would remain employed (Nash 2006).

Other positive cumulative impacts to employment and income would result from the combined projects. The construction sector would benefit from the construction of all three projects by providing services during construction. However, the jobs would add only a short-term boost to the local economies because the jobs would contribute dollars only until the construction phase of a project is complete. Once the railroad is operational, SEA expects that about 108 jobs would be lost from the trucking industry as SUFCO and other companies reduce the length of trucking routes and switch to using the rail line. According to the Utah Department of Workforce Services, average wages for the trucking industry in central Utah are $29,480 (Utah Department of Workforce Services 2004), which translates to a loss of about $3.1 million in wages in the study area.

The loss in trucking jobs from the implementation of the rail line would likely be partially offset by 19 railroad jobs that would be added when the railroad is operational. (Railroad jobs were assumed to be those from rail conductors and operations.) The average wage of the railroad jobs would be $61,010 (Utah Department of Workforce Services 2004), resulting in a total of about $1.2 million in wages, which is 39% of the lost wages from trucking jobs. In addition, 85 new jobs are projected to be created from the Nevco Energy power plant, resulting in about $5.5 million in direct payroll. The operations and payroll would likely further stimulate indirect and induced jobs, creating additional economic development benefits. See Section 3.11, Socioeconomics, and Section 4.11, Socioeconomic Impacts, for further explanation of methodology of used for analysis.

The sectors that would benefit from construction of the Proposed Action and Alternatives, the Quitchupah Creek Road project, and the Nevco Energy power plant include the lumber; stone, clay, and glass; petroleum products; mining; and railroad sectors. These sectors would continue to produce benefits for the local economy in the long term. For example, although the local economy would lose some income from truck wage earnings as described above, SEA expects construction of the projects to offset that loss with higher employment and income, which would be spent in the economy on goods and services. This new indirect demand caused by higher profits and new employment would spur additional rounds of spending and drive increased economic development benefits in the local economies.

5.2.4.3 Agriculture

The resulting impacts on the market value of output from farms in the Central Utah Rail project area would be negligible. Construction of the proposed rail line could lead to changes in zoning. However, the ratio of agricultural land to farm operators is large enough that removing such small amounts of land from agricultural use would likely have no impact on farm employment. Similarly, the loss of agricultural lands resulting from the Quitchupah Creek Road project would be an insignificant economic impact to the livestock industry in the Quitchupah Creek study area. Information obtained in consultation with the Applicant suggests that about 35 acres of marginal farmland would be impacted by the project and likely converted to industrial use. However, given the distance from the rail line (see Figure

5-1, Planned Projects in the Central Utah Rail Project Region), it is reasonable to assume that the Proposed Action and Alternatives would not contribute significant cumulative impacts to agriculture or farm employment.

5.2.4.4 Community Facilities and Emergency Response

The Central Utah Rail project, when combined with the Quitchupah Creek Road project and the Nevco Energy power plant project, would not contribute to cumulative impacts to community facilities and emergency response times.

5.2.4.5 Summary

Overall, the cumulative effects of the combined projects would have positive effects on local socioeconomic conditions.

5.2.5 Cultural Resources

SEA has determined that no indirect, visual, or cumulative impacts would result from the Proposed Action and Alternatives (Seddon 2007).

In 2006 and 2007, as a result of discussions with the Utah SHPO and the Advisory Council on Historic Preservation (ACHP), SEA completed an assessment of the potential indirect, visual, or cumulative impacts that could result from construction of the proposed project and alternatives. This assessment was completed by SEA in consultation with the SHPO, BLM, Federally recognized tribes, and UDOT.

In 2007, SEA identified nine historic properties that are listed on or eligible for the National Register located outside the APE for direct impacts but within a 0.5-mile-wide buffer zone analyzed by SEA in its 2003 study of the project area (MOAC 2004, 2005). The nine sites include two prehistoric lithic scatters, one prehistoric lithic scatter/camp, one prehistoric lithic and ceramic scatter, three historic canals (the Rocky Ford, Vermillion, and Piute Canals), and two historic bridges (the Lost Creek Bridge and the Denmark Bridge).

In follow-up discussions with the SHPO and BLM, SEA determined that the archaeological sites listed above would not be subject to indirect, visual, or cumulative impacts because the characteristics that make them eligible for the National Register under Criterion D would be affected by direct impacts only (Seddon 2007). In addition, SEA determined, based on a site inspection completed by BLM Archaeologist Craig Harmon, that the historic Denmark Bridge would not be subject to indirect, visual, or cumulative impacts because it is not in actual visual view of any of the construction alternatives.

Finally, consultations with UDOT indicated that the remaining bridge (the Lost Creek Bridge) had been recently replaced and is therefore no longer eligible for listing in the National Register. SEA also determined that, although the historic canals (the Vermillion, Rocky Ford, and Piute Canals) are National Register properties, they would not be subject to

adverse indirect, visual, or cumulative impacts due to the high degree of degradation of the canals from years of improvements and modifications (Harmon 2007).

5.2.6 Aesthetics

In 2004, Montgomery Archaeological Consultants, Inc. (MOAC) conducted a Class I existing data review of the Central Utah Rail project that examined the area 0.5 mile in either direction of the centerline of the proposed alternatives. This data review included record searches conducted at the Utah SHPO and a literature review of the area's prehistory and history. The record searches identified 63 archaeological sites. Nine of these sites have been recommended as eligible for the NRHP. These nine sites include two prehistoric lithic scatters, one prehistoric lithic scatter/camp, one prehistoric lithic and ceramic scatter, three historic canals, and two historic bridges. See Table 5.2-1.

Table 5.2-1. Class I NRHP-Eligible (Recommended) Sites

Site Number	Site Type or Name
42Sp84	Lithic scatter
42Sp200	Lithic/ceramic scatter
42Sp212	Lithic scatter/camp
42Sp213	Lithic scatter
42Sv2342	Historic Rocky Ford Canal
42Sv2343	Historic Vermillion Canal
42Sv2344	Historic Piute Canal
Lost Creek Bridge	Historic bridge
SR 260 Denmark Bridge	Historic bridge

Source: Kinnear-Ferris and others 2004

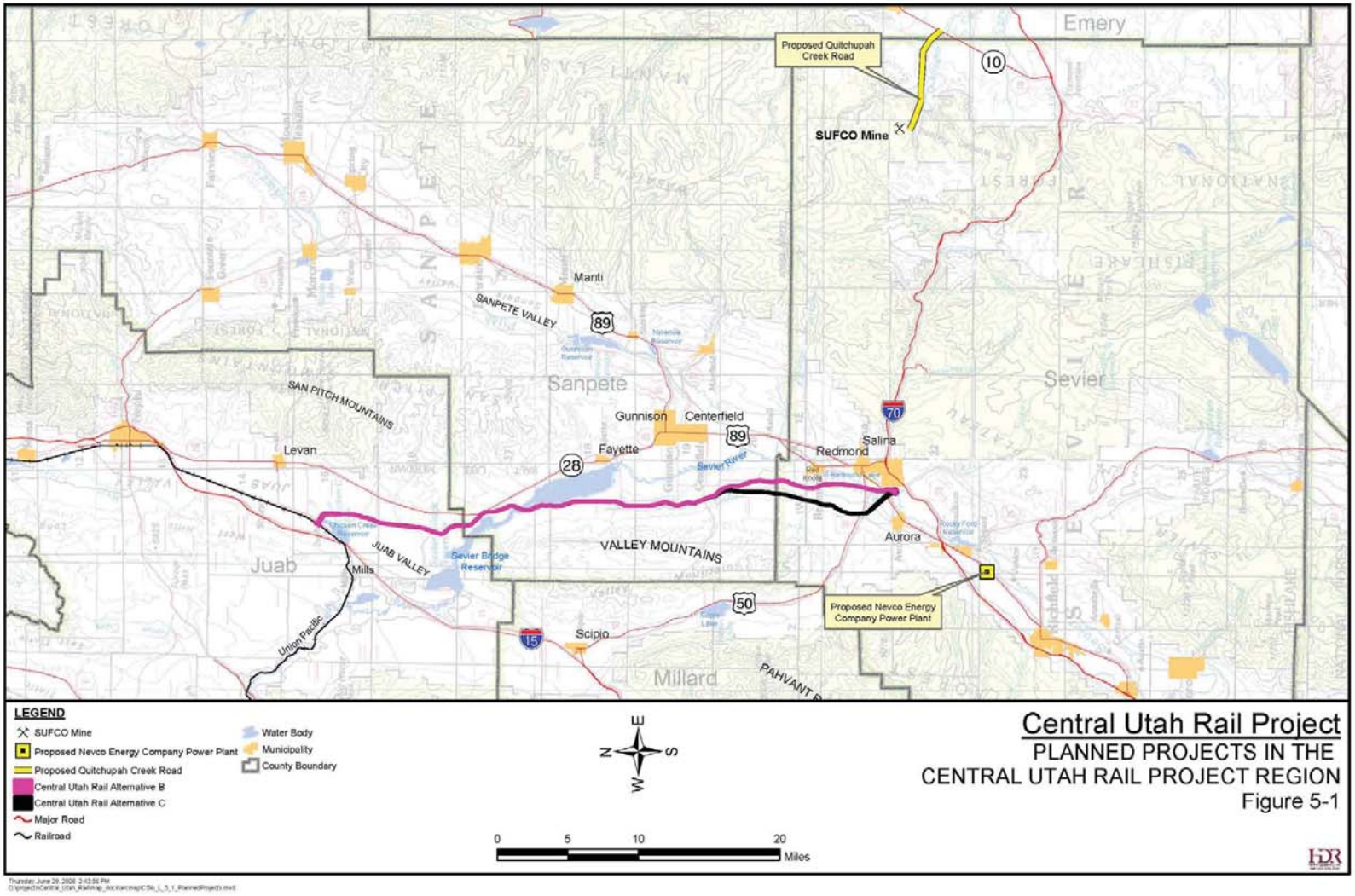
SEA has worked in coordination with the SHPO to determine that the characteristics that make these sites eligible under Criterion D would not be affected by the Proposed Action and Alternatives (SHPO 2007). Any future cumulative impacts to aesthetics and visual resources would be mitigated through cooperative efforts to create appropriate mitigation.

5.2.7 Conclusion

Neither the Quitchupah Creek Road project nor the proposed Nevco Energy power plant share the same geographical impact area with the Proposed Action and Alternatives. Therefore, the Central Utah Rail project would not contribute cumulative impacts to most resource areas discussed in Chapters 3 and 4 of this EIS. Because there would be no change in production for the SUFCO mine or any change in its client base, impacts would not occur beyond the current geographical impact area for the project. For those resources that do have a less-defined geographic boundary or for projects that would be constructed at the same time, SEA finds that the Central Utah Rail project, when combined with other past, present, and reasonable foreseeable projects, would not contribute to any notable cumulative impacts.

This page is intentionally blank.

Figure 5-1. Planned Projects in the Central Utah Rail Project Region



This page is intentionally blank.