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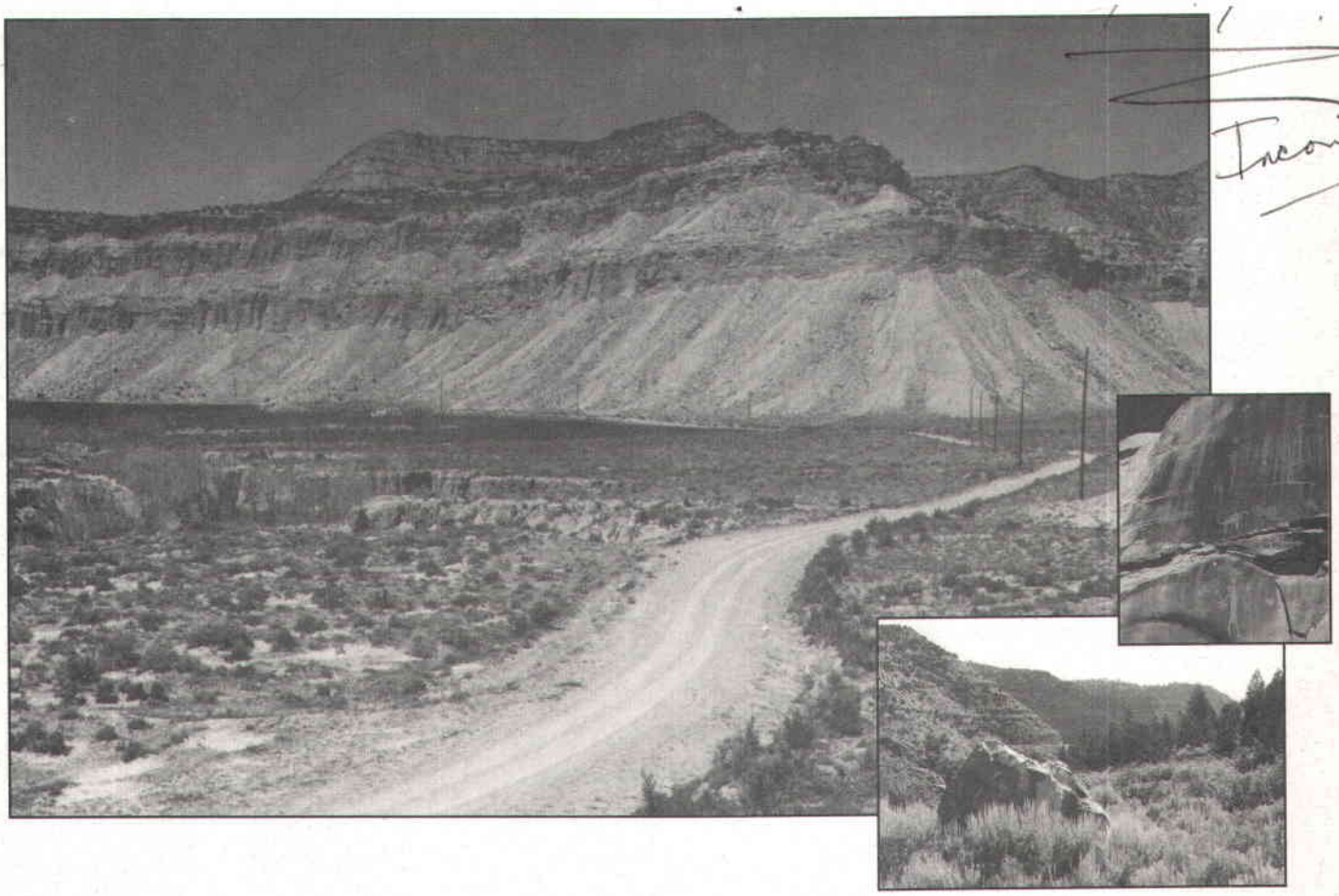

Incoming

QUITCHUPAH CREEK ROAD

Draft Environmental Impact Statement

U.S. Department of Agriculture
Forest Service
Fishlake National Forest

U.S. Department of Interior
Bureau of Land Management
Richfield Field Office

This is a DEIS conducted through the NEPA process on the Fishlake National Forest and on Richfield BLM Public Lands

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Department of Agriculture
Forest Service
Fishlake National Forest
115 East 900 North
Richfield, Utah 84701
(435) 896-9233

Department of the Interior
Bureau of Land Management
Richfield Field Office
150 East 900 North
Richfield, Utah 84701
(435) 896-1500

File Code: 1950
Date: December 3, 2001

Dear Interested Party:

Enclosed for your review and comment is the Draft Environmental Impact Statement (DEIS) for the proposed Quitchupah Creek Road in Emery and Sevier Counties, Utah. This document is written in response to a right-of-way application submitted by Sevier County Special Services District to the U.S. Forest Service (USFS) Fishlake National Forest and the U.S. Bureau of Land Management (BLM) Richfield Field Office. The proposed route for the road also crosses state and private lands. The BLM and FS responsible officials have not identified a preferred alternative.

This DEIS analyzes potential impacts associated with the upgrade of 9.2 miles of an existing road/trail along Quitchupah Creek connecting the Acord Lakes Road in Convulsion Canyon, Sevier County with State Route 10 in Emery County. The Quitchupah Creek Road would provide a shorter coal hauling route for the SUFCO Mine, reducing time and fuel required to deliver coal to markets east of the mine. In addition, this would create an alternate access to the mine for safe conduct of traffic and rescue units in the event of a mine emergency and provide a shorter access route between the Acord Lakes recreation area and Emery County.

The Sevier County Special Services District would charge a toll to the SUFCO Mine for coal hauling to recover costs of constructing this road. This public road would become part of the state collector system.

The DEIS analyzes four alternatives: no action, the proposed action, and two other build alternatives. Alternative A, the no action, would require the SUFCO Mine to continue transporting coal on the existing route of Acord Lakes Road, Interstate 70 and State Route 10. Alternative B, the proposed action, would build a paved road over an existing two-track road and county-maintained gravel road alongside Quitchupah Creek, connecting the Acord Lakes Road with SR-10. Alternative C would follow a similar route to Alternative B but incorporate fencing and underpasses to prevent livestock and wildlife from entering the road and allow for livestock movement between the BLM livestock grazing allotments. Alternative C also includes an alternate junction with SR-10 to avoid rebuilding a bridge and an uphill passing lane on SR-10. Alternative D, the Water Hollow route, is a longer route designed to minimize impacts to archeological sites, Native American religious concerns, and private interests along Quitchupah Creek.

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Date 12030 For additional information

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Appendix B of the DEIS is bound separately from the DEIS and will not be mailed with the DEIS, but is available upon request. Appendix B has detailed figures, engineering plans, and maps of the three routes to help the reader interested in engineering details further understand the project. Please contact the persons listed below for a copy of Appendix B.

The DEIS comment period will officially begin with a publication of notice of availability in the Federal Register. We anticipate that this availability publication will occur December 14, 2001. A 45-day comment period is required. However, in recognition that this document is being sent during a very busy time of year, additional review time will be given. Comments on this document will be accepted through February 15, 2002 and must be submitted in writing either to:

Linda L. Jackson
Public Affairs Officer
Fishlake National Forest
115 East 900 North
Richfield, Utah 84701

Kay Erickson
Realty Specialist
Bureau of Land Management
Richfield Field Office
150 East 900 North
Richfield, Utah 84701

Your interest in the management of public lands is appreciated. If you have any questions, need further information, or would like to be briefed on the project, please contact Linda Jackson, USFS Project Leader at (435) 896-9233 or Kay Erickson, BLM Co-Project Leader at (435) 896-1500.

Sincerely,

/s/ Mary C. Erickson

MARY C. ERICKSON
Forest Supervisor
Fishlake National Forest

/s/ Jerry Meredith

JERRY MEREDITH
Acting Field Manager
Richfield Field Office, BLM

Enclosure:
(1) DEIS Quitchupah Creek Road

QUITCHUPAH CREEK ROAD PROJECT
DRAFT
ENVIRONMENTAL IMPACT STATEMENT

Responsible Agencies:

U.S.D.A. FOREST SERVICE (Lead Agency)
Fishlake National Forest

U.S.D.I. BUREAU OF LAND MANAGEMENT
Richfield Field Office

Responsible Officials:

Mary C. Erickson
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State: Utah

County: Sevier, Emery

ABSTRACT:

This Draft Environmental Impact Statement (DEIS) is written in response to a right-of-way application submitted by the Sevier County Special Services District (SSD) to the USFS and the BLM for the construction of the Quitchupah Creek Road, a public road to be utilized primarily as a coal hauling route for the SUFCO Mine. The Quitchupah Creek Road DEIS analyzes one Federal action that requires decisions by the responsible officials of the USDA-FS and the USDI-BLM. The Federal action is to consider granting the right-of-way. The alternatives considered in this analysis include No Action and three route variations, one with design features for livestock and wildlife. The responsible officials for the BLM and FS have not identified a preferred alternative.

Reviewers should provide the Forest Service with their comments during the review period of the draft environmental impact statement. This will enable the Forest Service to analyze and respond to the comments at one time and to use information acquired in the preparation of the final environmental impact statement, thus avoiding undue delay in the decisionmaking process. Reviewers have an obligation to structure their participation in the National Environmental Policy Act process so that it is meaningful and alerts the agency to the reviewers' position and contentions. Vermont Yankee Nuclear Power Plant Corp. v. NRDC, 435 U.S.519, 553 (1978). Environmental objections that could have been raised at the draft stage may be waived if not raised until after completion of the final environmental impact statement. City of Angoon v. Hodel (E.D. Wis. 1980). Comments on the draft environmental impact statement should be specific and should address the adequacy of the statement and the merits of the alternatives discussed (40 CFR 1503.3).

Comments must be received by FEB 15 2002

November, 2001

QUITCHUPAH CREEK ROAD PROJECT DEIS

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LIST OF ACRONYMS & ABBREVIATIONS

AADT	Average Annual Daily Traffic
ADT	Average Daily Traffic
AASHTO	American Association of State Highway and Transportation Officials
AERC	Archaeological Environmental Research Corporation
AIRS	Aerometric Information Resource System
AMSL	Above Mean Sea Level
ATV	All-Terrain Vehicle
AUM	Animal Unit Month
BA	Biological Assessment
BE	Biological Evaluation
BCI	Biotic Condition Index
BLM	Bureau of Land Management
BMP	Best Management Practices
BYU	Brigham Young University
CEQ	Council of Environmental Quality
CFR	Code of Federal Regulations
cfs	Cubic Feet Per Second
CO	Carbon Monoxide
Corps	U. S. Army Corps of Engineers
CTQ_a	Actual Community Tolerance Quotient
CTQ_p	Predicted Community Tolerance Quotient
D_{50}	Median Particle Size Diameter
dB	Decibel
dBA	Decibel-A weighted
EA	Environmental Assessment
EIS	Environmental Impact Statement
EPA	Environmental Protection Agency
ESA	Endangered Species Act
FHWA	Federal Highway Administration
gpm	Gallons Per Minute
g/m^2	Grams per Square Meter
IDT	Interdisciplinary Team
I-70	Interstate 70
JBR	JBR Environmental Consultants, Inc.
JW	Jurisdictional Wetland
K	Erodibility Factor
KOP	Key Observation Point
L_{50}	Noise Levels as a Function of Exceeding 50 dBA 50 Percent of the Time
L_{eq}	Equivalent Sound Level
L_n	Statistical Probability Measure
LDS	Church of Jesus Christ of Latter-Day Saints
LRMP	Land and Resource Management Plan
mm	Millimeters
mmtpy	Million Tons per Year
MSHA	Mining Safety and Health Administration

NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NO_x	Oxides of Nitrogen
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
ORV	Off-Road Vehicle
OSHA	Occupational Safety and Health Administration
PEL	Permissible Exposure Level
PLS	Pure Live Seed
PM	Particulate Matter
PM_{10}	Particulate Matter Less Than 10 Microns
PSD	Prevention of Significant Deterioration
RARE	Roadless Area Review and Evaluation
RMP	Resource Management Plan
RNA	Research Natural Area
SCT	Savage Coal Terminal
SEUOHV	Southeastern Utah Off-Highway Vehicle Club
SHPO	State Historic Preservation Office
SIC	Standard Industrial Classification
SITLA	State Institutional Trust Lands Administration
SLBM	Salt Lake Base Meridian
SO_2	Sulfur Dioxide
SR-10	State Route 10
SSD	Special Services District
SUFCO	Southern Utah Fuel Company
SWPPP	Storm Water Pollution Prevention Plan
TDS	Total Dissolved Solids
TES	Threatened, Endangered, and Sensitive
tpy	Tons Per Year
UDOT	Utah Department of Transportation
UDWR	Utah Division of Wildlife Resources
UGS	Utah Geological Survey
UOSH	Utah Occupational Safety and Health Division
UPDES	Utah Pollutant Discharge Elimination System
UP&L	Utah Power and Light
USFS	United States Forest Service
USFWS	United States Fish and Wildlife Service
US GSA	United States General Services Administration
UWC	Utah Wilderness Coalition
VOC	Volatile Organic Compounds
VQO	Visual Quality Objective
WEG	Wind Erodibility Group
WIU	Wilderness Inventory Units
WSA	Wilderness Study Area
yd^3	Cubic Yards

INTRODUCTION

This Environmental Impact Statement (EIS) considers a single proposed federal action, with alternatives, and is a joint document between the United States Forest Service (USFS), Fishlake National Forest and the Bureau of Land Management (BLM), Richfield Field Office. This National Environmental Policy Act (NEPA) analysis will consider the potential environmental consequences associated with implementing the proposed action and alternatives, as described below.

The Sevier County Special Services District (SSD) has submitted a right-of-way application to the USFS and the BLM for the construction of the Quitchupah Creek Road, a public road. The Quitchupah Creek Road would be generally located between the Acord Lakes Road and the junction with State Route 10 (SR-10). Lands along the route are administered by the USFS, the BLM, Utah State School and Institutional Trust Lands Administration (SITLA) in Richfield, and private interests.

This EIS addresses the need for federal decisions approving a right-of-way application, or an alternative, which would cross Federal lands. The Forest Supervisor for the Fishlake National Forest and the Field Manager for the Richfield BLM Field Office are joint responsible officials for the EIS. They will make their respective decisions regarding the proposed actions after considering the comments, responses, and environmental consequences discussed in the EIS. The rationale for each agency decision will be documented in separate Record of Decisions.

PURPOSE AND NEED

The purpose of the federal action is to consider granting a right-of-way to Sevier County SSD to construct a public road. Southern Utah Fuel Company (SUFCO) Mine would then be a toll user of this road to facilitate coal hauling to Hunter Power Plant and Savage Loadout at Wellington, Utah. The SSD would also be required to obtain right-of-ways from SITLA and the private landowners along the route.

The primary purpose of the road is to provide another coal hauling route for the SUFCO Mine. The use of this road by the SUFCO Mine for coal hauling would reduce the trip to Wellington and Hunter Power Plant by 50 miles (round-trip); thus, reducing time and fuel required to deliver the coal. The secondary purpose is to provide an alternate access to the mine for safe conduct of traffic and rescue units in the event of a mine emergency. The road would also provide public access from SR-10 to the Acord Lakes Road. After coal mining and hauling have ceased, the road would still be maintained by Sevier County SSD for public use as a rural collector road in the state collector system. (Fig. 1-1).

SUMMARY OF PROPOSED ROAD

Sevier County SSD has proposed the upgrade of 9.2 miles of an existing road/trail along Quitchupah Creek in 2002, which connects the Acord Lakes Road in Convulsion Canyon, Sevier County with

SR-10 in Emery County. The land ownership in this corridor is a combination of private, USFS, BLM, and State of Utah.

The finished road would be a 28-foot wide paved surface, with an operational right-of-way of 66 feet. Three pull-outs for parking off the road shoulder would be provided at the Link Canyon channel crossing, North Fork, and at East Springs Creek Canyon, respectively. The construction corridor would vary from 50 feet to 60 feet on the flatter ground (eastern end) to an average 100 feet for the remainder of the road. The road would be designed for a speed of 40 miles per hour, and constructed according to the standards of the American Association of State Highway and Transportation Officials and the Utah Department of Transportation 1992 Standard Specifications for Road and Bridge Construction.

No facilities would be built in association with this alignment. The total maximum disturbance within the road corridor would be 88.4 acres. Once reclamation is complete, the net loss of vegetation would be 45 acres of paved roadbed.

The proposed action would conform to the overall guidance of the Fishlake Land and Resource Management Plan (LRMP) and Final EIS, and the BLM San Rafael Resource Management Plan and Final EIS. This EIS tiers to the decisions of both Land Use Plans, which are available for review at the USFS and BLM offices, both located in Richfield, Utah. No plan amendments would be required either for the USFS Fishlake Plan or the BLM San Rafael Plan for the proposed action.

ISSUES RAISED DURING SCOPING

The agencies initiated public scoping for the Quitchupah Creek Road Project on January 15, 1999, with the intent of preparing an Environmental Assessment (EA). Informal meetings were held in Emery County, including a field meeting March 30, 1999. Other meetings, including the Quitchupah Grazing Association Meeting on January 27, 1999, and the Emery County Public Lands Council Meeting, June 8, 1999, were attended by agency and consultant representatives. Due to the level of public concern for the proposed project, and the issues identified during the scoping process, the USFS and the BLM determined that the proposed project warranted preparation of an EIS. A Notice of Intent for the Quitchupah Creek Road EIS was published in the Federal Register on July 1, 1999. The legal notice, Request for Comments, was published in the *Richfield Reaper* July 14, 1999; the *Emery County Progress* July 13, 1999; and the *Salt Lake Tribune* and *Deseret News* July 15, 1999.

A total of 35 comment letters or forms have been received as a result of the EIS scoping effort. Approximately 25 comments, previously received during scoping for the EA in January and February 1999, were incorporated into the EIS scoping process for a total of 60 comments.

Issues carried forward in analysis include:

Geology - A mapped landslide feature was noted within a portion of the road corridor.

Air Quality - Some air quality impacts may result from the continued operation of the SUFCO Mine and construction and operation of the road.

Noise - High speed transportation would increase the noise level in Quitchupah Creek and in the town of Emery.

Water Quality - Water quality of the stream may be impacted due to disturbance of erosive soils introducing sediments into the creek.

Soil - The presence of erodible soils and soils unsuitable as material for roadbed may impact the integrity of the roadbed and could contribute sediments and increased salts into the creek.

Wetlands - Wetlands associated with upper Quitchupah Creek could be filled during road construction.

Vegetation - Riparian zones within the project area would be impacted by road construction.

Wildlife - The proposed road could interfere with big game use of the winter ranges and agricultural fields. The potential for vehicle-wildlife collisions and possible mortality may increase due to the construction of and travel on the Quitchupah Creek Road.

TES Species - The construction of the road could impact four threatened, endangered, sensitive (TES) plant species and the habitat of the southwest willow flycatcher, a listed bird species.

Range Resources - The high speed road would interfere with livestock trailing to and from adjacent summer ranges. Vehicle-livestock collisions would increase greatly along the road.

Land Use - Landowners along the proposed route are reluctant to provide right-of-ways across their ranch lands.

Visual Resources - The aesthetics and solitude of the remote canyon would be impacted by the high speed roadway and associated increased human activity. The road would dominate the immediate landscape along the route.

Recreation - All-terrain vehicle use in the creek area would be affected by the highway by limiting access and blocking use of an existing two-track trail. The remoteness and solitude of the canyon would be eliminated due to easy public access along the highway.

Cultural Resources - Known historic and prehistoric sites in the narrow canyon could not be avoided by the proposed road. Known rock art sites would be indirectly impacted through ease of public access.

Native American Religious Concerns - The Paiute Tribe has insisted the entire Quitchupah Creek area is sacred and traditional. The Hopi, who claim affiliation with the Fremont culture, have requested that no cultural sites be disturbed. The Utes desire a one-mile buffer around the rock art site, and no disturbance of recorded sites.

Transportation - The proposed road would reduce the round-trip coal haul by 50 miles and remove coal haul traffic from portions of Interstate 70 (I-70) and SR-10.

Socioeconomic - Emery County has questioned the need for the road and the benefits for their residents. The shorter haul would greatly reduce SUFCO Mine hauling costs and save energy (fuel).

ALTERNATIVES

Based on the issues, four alternatives were considered for analysis in this EIS, as follows:

Alternative A No Action Alternative
Alternative B Quitchupah Creek Road Alignment (the proposed road)
Alternative C Alternate Junction with SR-10 and Alternate Design of Quitchupah Route
Alternative D Water Hollow Road Alignment

ALTERNATIVE A - NO ACTION ALTERNATIVE

Under the No Action Alternative, coal would continue to be hauled from the SUFCO Mine to the Hunter Power Plant and railroad loadouts near Price, Utah via the Acord Lakes Road, I-70, and SR-10. Beginning in 2002, between 2 million and 4.5 million tons of coal will be hauled to the Hunter Power Plant, which equates to 69,750 to 128,000 truck trips per year, respectively. An additional one million tons would be hauled to the railroad loadouts in Carbon County for shipment to eastern customers. Currently and into the foreseeable future, 4.7 million tons of coal would be hauled west to Levan Loadout.

Under this alternative, the environment in Quitchupah Creek would remain unchanged in the foreseeable future.

ALTERNATIVE B - QUITCHUPAH CREEK ROAD (THE PROPOSED ROAD)

The construction of the proposed road would upgrade 9.2 miles of an existing road/trail along Quitchupah Creek, connecting Acord Lakes Road in Sevier County with SR-10 in Emery County. The proposed road is the shortest of the three project alternatives, reducing the round-trip haul of coal trucks by 50 miles and result in a savings of up to 1.4 million gallons of fuel annually.

The route would cross 3.9 miles of private land requiring the acquisition of right-of-ways from six different land owners. At the junction with SR-10, turn lanes would need to be added to the highway, which would require widening of the bridge over Quitchupah Creek. Loaded haul trucks would ascend a steep grade on SR-10 that would reduce the speed of northbound traffic (Figure 1-2).

No facilities would be built in association with this alignment. The total maximum disturbance within the road corridor would be 88.4 acres. There would be temporary impacts to approximately 17.4 acres and approximately 45 acres would be permanently impacted at the end of construction.

ALTERNATIVE C - ALTERNATE JUNCTION WITH SR-10 AND ALTERNATE DESIGN

This alternate route would detour from the proposed route in the southwest quarter of Section 13, Township 22 South, Range 5 East and proceed east across Section 18, Township 22 South, Range 6 East to the junction with SR-10 in the southwest corner of Section 17, Township 22 South, Range 6 East (approximately 1.5 miles north of the proposed junction with SR-10). This would be slightly longer in length (9.3 miles) to the proposed road presented but it would bypass the grade on SR-10 that now slows loaded coal trucks, which potentially reduces other northbound traffic on SR-10. The average grade for this alternative is 0.6 percent for loaded coal trucks. The loaded trucks would junction with SR-10 at a point 270 feet higher than the proposed junction where the grade for northbound traffic is 0.07 percent. This route would require less elevation change along the travel route and allow loaded coal trucks to utilize their momentum gained while descending Quitchupah Creek Road to ascend the 0.6 percent grade. The route would cross lower Link Canyon channel, as does the proposed route. The acreage impacted would be 104.8 acres (Figure 1-2).

The Alternate Design would incorporate features to the proposed Quitchupah Creek Road to facilitate livestock movements within allotments, and also facilitate wildlife movements to and from the winter range. The wildlife/livestock facilities would include fencing portions of the road to keep the livestock off the roadway during the grazing season. Approximately 16.3 miles of fence would be installed under this alternative design. It is also proposed that five underpasses approximately 20 feet wide and 70 feet long would be incorporated into this build alternative to facilitate wildlife/livestock access to both sides of the fenced road for grazing purposes. The underpasses would also provide access to Quitchupah Creek, the only watering source in the allotments. Two additional underpasses would be constructed, one under the existing Acord Lakes Road adjacent to the intersection with the proposed Quitchupah Creek Road, and a second under the Quitchupah Creek Road to allow wildlife/livestock to cross under both roads at Broad Hollow during the spring and fall trailing.

While fencing and underpasses would allow trailing of livestock along portions of the proposed Quitchupah Creek Road, a continuous separate trail is not feasible due to constraints of the terrain.

ALTERNATIVE D - WATER HOLLOW ALIGNMENT

Water Hollow is a large northeast-southwest trending drainage which cuts through Old Woman Plateau on the Fishlake National Forest. The Water Hollow Road would utilize the Quitchupah Creek Road Alignment for 2.0 miles of the western most portion of its alignment. At this point, it crosses Quitchupah Creek and follows to the south of this drainage to Water Hollow. This alternative continues in an easterly direction along an existing jeep trail to Water Hollow Benches

where it then turns south to Saleratus Benches. From Saleratus Benches, the Water Hollow Road alternative then turns northward to connect with SR-10 (Figure 1-2).

The Water Hollow Road alternative alignment heads at about 7,550 feet above mean sea level and generally follows an existing jeep trail. The proposed road alignment is 11.2 miles long and drops 1,430 feet in elevation for an average grade of 2.5 percent. The descent into Water Hollow has an average grade of four percent, and the ascent out of Water Hollow onto Water Hollow Bench is seven percent. This alignment crosses several perennial and ephemeral tributary drainages, for a total of nine crossings. An aggregate borrow source of 15 acres would be located off-site on private lands at an existing commercial aggregate operation. The acreage of impact for the Water Hollow Road is 155.4 acres.

SUMMARY OF ENVIRONMENTAL IMPACTS

(See Table 2.4-10 at end of Section 2.0 Alternatives for detailed comparison of all impacts)
Common to all the alternatives, including the No Action Alternative, is the increased truck traffic due to contract commitments by SUFCO Mine for delivery of coal to the Hunter Power Plant at Castledale. One million tons of coal delivered in 2001 results in an additional 186 loads per day traveling east on existing roads or on one of the alternative routes when completed. Two million tons of coal delivered in 2002 would result in 279 loads per day, and the maximum of 4.5 million tons of coal to Hunter Power Plant after 2002 would result in 512 loads per day. Increases in traffic, wear on the roads, and noise levels on SR-10, and in the roadside communities would continue regardless of which alternative is selected. The continued delivery of coal to the Hunter Power Plant will result in a positive economic effect for Emery County.

The selection of one of the build alternatives would shift the truck traffic from portions of I-70 and SR-10 to the new route and also shift noise, emissions, and human activity to Quitchupah Creek.

The proposed routes for the three build alternatives (B,C,D) junction with Acord Lakes Road and traverse east for two miles on a common route dictated by constraints of Convulsion Canyon, the upper canyon of Quitchupah Creek. Within this area are the impacts to jurisdictional wetlands(JW), riparian zones, the habitat of the southwest willow flycatcher, and the upper portion of the livestock trail.

Other impacts common to all the build alternatives B, C and D:

Geology - The mapped landslide feature is presently stable and non-threatening to the road alternatives in Convulsion Canyon.

Air Quality - Truck emissions would be reduced due to shorter haul mileage; however, emissions would be concentrated within the Quitchupah Creek area.

Noise - The noise level would increase from faint to moderate in Quitchupah Creek.

Water Quality - Improvements in roadway design for the Quitchupah Creek Road, specifically improvements in drainage and runoff control, would result in reductions in the amount of total dissolved solids within Quitchupah Creek.

Wildlife - Wildlife-vehicle collisions would increase along with increased human presence within the Quitchupah Creek and adjacent remote terrains.

Land Use - Construction and operation of the proposed roadway would change the land use characteristics of the area from a historically remote and rural area to one of increased human activity (i.e., significantly increasing commercial truck traffic) and accessibility.

Visual Resources - The Quitchupah Creek Road would be more visible than the existing two-track roadway and there would be a change in peacefulness and rural character of area. The proposed road, once constructed, would meet the objectives of both the USFS and BLM visual resource management classes.

Cultural Resources - Historic and prehistoric cultural sites would be directly impacted from the construction of the proposed road. Historic and prehistoric sites may also be indirectly impacted by the increased public visitation of the area as a result of improved public accessibility.

Native American Religious Concerns - Consultation to date by the USFS and BLM have indicated that portions of the area have been historically used by Native Americans and may have cultural relevance.

ALTERNATIVE B - QUITCHUPAH CREEK ROAD

The Quitchupah Creek Road, Alternative B, is the shortest of the three project alternatives. Under this alternative, the drainage control design and culverted crossings (12) of the creek would reduce sedimentation to the creek as now experienced on the unimproved road that has 16 ford crossings of the creek. Salinity in the creek would decrease slightly due to less sedimentation, positively affecting the 303d category for the lower creek and discharges to the Colorado River. Forty percent of the route would be in erodible soils adjacent to the creek.

This alternative has a high potential to adversely impact sensitive plant species on the lower portions of the route. Biological clearance prior to roadway construction would allow for mitigating actions to reduce impacts to TES habitat. The construction of the road would remove four animal unit months of forage from the grazing allotments and 1.4 acres of cultivated pasture.

Known cultural sites located where the terrain restricts road alignment could be impacted by the road construction.

The route would cross 3.9 miles of private land requiring the acquisition of right-of-ways from six different landowners. At the junction with SR-10, turn lanes would need to be added to the highway and this would require widening of the bridge over Quitchupah Creek. Loaded haul trucks must also ascend a steep grade on SR-10 that would reduce the speed of northbound traffic.

The route would reduce the round-trip haul by 50 miles and result in a savings of up to 1.4 million gallons of fuel annually. Economic benefits would accrue to the SUFCO Mine from the cost savings and to the economy of Sevier County due to the increased profitability of the mine.

ALTERNATIVE C - ALTERNATE JUNCTION WITH SR-10 AND ALTERNATE DESIGN

This route is identical to the proposed Quitchupah Creek Road except for the inclusion of fencing and underpasses to facilitate wildlife/livestock use of the forage adjacent to the road and for movement of livestock along the creek. Also, the last two miles of this route deviates 1.5 miles to the north to junction with SR-10 above the grade that impedes northbound traffic due to the slowing of the truck traffic.

Impacts are similar to those summarized under Alternative B, except the route would be slightly longer; however, it would save an additional 53 miles on the round-trip haul saving up to 1.5 million gallons of fuel annually. The route would also be more efficient for the truck haul because the loaded haul trucks would use the momentum gained descending Quitchupah Creek to ascend the 2.5 percent maximum grade and junction with SR-10 at a level grade.

This route has the potential to impact cultural sites along Quitchupah Creek, as described under Alternative B. Implementation of this alternative, Alternative C, also has the potential to impact cultural sites located at the Link Canyon crossing.

ALTERNATIVE D - WATER HOLLOW ALIGNMENT

The Alternative D route deviates from the proposed Quitchupah Creek Road after exiting Convulsion Canyon by traversing Water Hollow, a perennial stream. Water Hollow and Saleratus benches before descending to junction with SR-10 south of Quitchupah Creek. The route traverses steeply incised terrain that would require extensive cut and fill construction.

Because the route departs from Quitchupah Creek, it would result in the construction of a new roadway alignment. Under this scenario, the existing Quitchupah Creek two-track road would remain and the two-track road would continue to contribute sediments into the creek at the many crossings and from the road surface, next to the creek.

The existing benches along the Water Hollow route provide big game winter range. Under this scenario, the construction of a road across the benches would disturb game habitat along the road corridor and would greatly increase the potential for wildlife-vehicle collisions. The potential to impact habitat for sensitive plants species is low.

The Water Hollow Alignment would represent a hazard to livestock due to potential conflicts between accessing the water source and increased truck traffic. Specifically, Water Hollow is the water source for the allotment and the cattle would need to cross the road to access the creek. Livestock use on the benches would also be impacted by the road traversing through the middle of the benches.

The road would only cross 0.19 miles of private land and require a right-of-way from only one landowner. The route would avoid all eligible cultural sites and would not be near existing known rock art sites.

The Water Hollow Alternative would result in the construction of a longer road which would require loaded haul trucks to ascend steep 7 percent grades. Under this alternative, the round-trip haul by coal trucks would be shortened by only 42 miles. The savings on fuel would result in approximately 1.4 million gallons annually. The junction with SR-10 is on level grade with good sight distance.

CHAPTER 1.0

INTRODUCTION

1.0 INTRODUCTION

This EIS considers a single proposed federal action, with alternatives, and is a joint document between the United States Forest Service (USFS), Fishlake National Forest and the Bureau of Land Management (BLM), Richfield Field Office. This National Environmental Policy Act (NEPA) analysis will consider the potential environmental consequences associated with implementing the Proposed Action and alternatives, as described below.

The Proposed Action involves consideration of a right-of-way application for construction of the Quitchupah Creek Road. NEPA requires that the environmental analysis compare alternatives to satisfy the identified purpose and need of the Proposed Action, to disclose environmental effects, analyze opportunities, and to resolve issues.

The Sevier County Special Services District (SSD) has submitted a right-of-way application to the USFS and the BLM for the construction of the Quitchupah Creek Road, a public road. The Quitchupah Creek Road would be generally located between the Acord Lakes Road and a junction with State Route 10 (SR-10). Lands along the route are administered by the USFS, the BLM, Utah State School and Institutional Trust Lands Administration (SITLA) in Richfield, and private interests.

Decisions to be made, authorizing actions and a description of the federal right-of-way application process are further discussed in the following sections.

1.1 PURPOSE AND NEED

The purpose of the federal action is to consider granting right-of-ways to Sevier County SSD to construct a public road. Southern Utah Fuel Company (SUFCO) Mine would then be a toll user of this road to facilitate coal hauling to Hunter Power Plant and Savage Loadout at Wellington, Utah. The Forest Supervisor of the Fishlake National Forest under the National Forest Management Act of 1976 is charged with determining the conditions for granting a right-of-way, according to Forest Service Handbook 2709.12, across Forest Service-administered lands. The Field Manager for the Richfield BLM Field Office under the Federal Land Policy and Management Act of 1976 is charged with determining the conditions for granting a right-of-way, according to Manual 2800.01-03, across BLM-administered lands. The SSD would also be required to obtain right-of-ways from SITLA and the private landowners along the route.

The purpose of the EIS analysis is to evaluate the potential environmental consequences of granting a right-of-way to construct a public road and, subsequent changes in transportation system.

The primary purpose of the road is to provide another coal hauling route for the SUFCO Mine. The use of this road by the SUFCO Mine for coal hauling would reduce the trip to Wellington and Hunter

Power Plant by 50 miles (round-trip); thus, reducing time and fuel required to deliver the coal. The secondary purpose is to provide an alternate access to the mine for safe conduct of traffic and rescue units in the event of a mine emergency. The road would also provide public access from SR-10 to the Acord Lakes Road. After coal mining and hauling have ceased, the road will still be maintained by Sevier County SSD for public use as a collector road in the state collector system. (Fig. 1-1).

Further discussion on the authorizing actions is provided in Section 1.5.

1.2 GENERAL LOCATION AND DESCRIPTION OF PROPOSED ROAD

Sevier County SSD has proposed the upgrade of 9.2 miles of an existing road/trail along Quitchupah Creek in 2002, to connect the Acord Lakes Road in Sevier County with SR-10 in Emery County. The land ownership in this corridor is a combination of private, USFS, BLM, and State of Utah.

The proposed 9.2-mile Quitchupah Creek Road would be located along an existing route adjacent to Quitchupah Creek. The road would intersect SR-10 in the N½ of Section 30, Township 22 South, Range 6 East Salt Lake Base Meridian (SLBM). Continuing to the northwest into Sevier County, and then westward, the road would generally follow an existing trail along Quitchupah Creek, into Convulsion Canyon, where it would connect with the paved Acord Lakes Road in SW¼ of Section 11, Township 22 South, Range 4 East SLBM. Figure 1-1 presents the project's regional location. The proposed alignment for Quitchupah Creek Road is presented in Figure 1-2. Legal descriptions of each of the project components are given in Appendix A.

The finished road would be a 28-foot wide paved surface, with an operational right-of-way of 66 feet. Three pull-outs for parking off the road shoulder would be provided at the Link Canyon channel crossing, North Fork, and at East Springs Creek Canyon, respectively. The construction corridor would vary from 50 feet to 60 feet on the flatter ground (eastern end) to an average 100 feet for the remainder of the road. The road would be designed for a speed of 40 miles per hour, constructed according to the standards of the American Association of State Highway and Transportation Officials (AASHTO) and the Utah Department of Transportation (UDOT) 1992 Standard Specifications for Road and Bridge Construction.

No facilities would be built in association with this alignment. The total maximum disturbance within the road corridor would be 88.4 acres. Once reclamation is complete, the net loss of vegetation would be 45 acres of paved roadbed.

The project area includes all the terrain affected by the proposed road. The Quitchupah Creek Road alignment is generally east-west. Within the span, an approximately 1,600-foot change in elevation occurs. The proposed road junctions with SR-10, a north-south route that extends from Interstate 70 (I-70) on the south to U.S. Highway 6 on the north. The project area contains a diverse set of climatic, geologic, physiographic, and ecosystem characteristics.

REGIONAL CHARACTERISTICS

From a regional perspective, the project area is predominantly located within the High Plateaus Section of the Colorado Plateau Physiograhic Province. The High Plateaus are marked by gently rolling or near-flat surfaces, through which drainages have dissected the otherwise gentle topography. The drainages typically form steep canyons cut through sedimentary rock. Adjacent to the High Plateaus, the eastern edge of the project area is located within the Mancos Shale Lowlands Subsection of the Canyonlands Section of the Colorado Plateau Province. Topography in this Subsection is influenced by the weak sedimentary rock at the eastern base of the High Plateaus.

The majority of the project area can be classified as a Steppeland climate, according to the modified Köppen System (Weber State College, 1981). Steppelands are located between the true desert areas and the higher mountains. They are generally semi-arid, with annual evaporation exceeding annual precipitation; a summer moisture deficit is typical. The western-most edge of the project area borders on Undifferentiated Highlands, according to the modified Köppen System, and has a less significant moisture deficit.

The regional physiography and climate influence vegetation characteristics. Located within the Upper Sonoran and Transition Vegetation Zones, the area contains a variety of vegetative types and habitats ranging from forest to brush-dominated communities to sparse small desert shrub lands. The presence of water further modifies these vegetative types, and localized areas of riparian and wetland communities are also found.

LOCAL CHARACTERISTICS

At the upper, western end of the proposed alignment, the project area is near the top of the north-south trending Wasatch Plateau. Following along a major dissection in the Plateau, the Convulsion Canyon/Quitchupah Creek drainage traverses across the east side of the Plateau and out of canyon confines. The Water Hollow Benches are south of Quitchupah Creek. They are highly dissected with numerous ephemeral drainages that cut through the bench surfaces. The eastern portion of the project area crosses shale flats to the alignments' terminus at SR-10. It is where each alignment drop from the high plateau country to the flatland, that project area characteristics vary significantly.

As mentioned above, the project area is associated with a canyon complex that dissects the plateau surface. The proposed Quitchupah Creek Road alignment traverses, and cuts through, numerous sedimentary geologic formations as it makes its way eastward across the plateau. These formations include the Mesaverde Group and the Mancos Shale Group.

The horizontally bedded nature of these formations, as well as their component range of texture classes, is evident from the steep canyon walls, escarpments, and badlands visible in the project area. Flat ledges, vertical cliffs, and sloping erosional and depositional surfaces all contribute to the varied

relief in the project area. Faulting and fracturing also affect the local topography, and in fact, the location of Quitchupah Canyon and its tributaries are likely dictated by the geologic structure.

The project area is located in the Quitchupah Creek watershed, which is part of the Colorado River system. At its upper end, where it is known as Convulsion Canyon, the watershed collects flows from small tributaries. Water Hollow, The North Fork of Quitchupah Creek, and Link Canyon Wash are three of the larger tributary channels that drain toward the project area. The Water Hollow Benches area to the south of Quitchupah Creek has numerous ephemeral drainages that head primarily southeast toward the creek. These drainages and tributaries have had a major influence on the area's topography as they cut down through, and laterally across, the valley bottom sediments.

The climate and physiography within the majority of the project area has generally not been conducive to extensive soil development; vegetation is sparse over much of the project area. However, at the upper, western-most end, where climate and topography are more amenable, soils with defined horizons and an organic component have developed over time and have not eroded away. They support pine, aspen, scrub oak, and mountain mahogany, as well as significant understory vegetation.

Over most of the rest of the area, significant exposed bedrock occurs adjacent to the proposed and alternate road alignments. Many other areas where soil development has occurred have been subject to extensive erosion by wind and water. These areas support only sparse vegetation, ranging from scattered pinyon and juniper woodlands with sparse understory to low density desert brush lands where shadscale and other salt bush communities dominate. The former floodplain (now terrace) of Quitchupah Creek contains well-developed soils that support sagebrush/grass vegetation communities. The perennially flowing stream corridors of Quitchupah and Water Hollow creeks support a varying mixture of riparian species.

In addition to the function of the project area in filling various habitat niches for wildlife, cattle grazing has occurred within the bounds of the project area for many years. These land uses are the predominant ones within the sparsely populated region.

1.3 RELATIONSHIP TO USFS/BLM AND NON-USFS/BLM POLICIES, PLANS, AND PROGRAMS

Two land use plans apply to the lands involved in the Proposed Action and alternatives. The San Rafael Resource Management Plan (RMP) dated 1989 applies to the BLM public lands in the project area. In section 4211 Rights-of-Ways (page 23) lands available for right-of-ways are divided into four major categories:

1. Lands designated right-of-way corridors where standard operating procedures apply,

2. Lands outside designated corridors where standard conditions apply,

3. Areas to be avoided where special conditions may apply after site specific NEPA documentation, and

4. Areas to be excluded.

Portions of the project area include Categories 1, 2 and 3 according to the maps in the RMP.

The USFS Fishlake National Forest System land and RMP (1986) applies to all National Forest lands in the project area. The management prescription for the forest lands in the project area emphasizes livestock grazing via intensive management level D for range resources. Also included in the project area is *Area Travel Restriction C*, which denotes lands closed year-around to all motorized vehicle travel. Travel Area C includes The Cove on Old Woman Plateau and the trail in Water Hollow. However, road system expansion to accommodate mineral activities is allowed.

The Proposed Action would conform to the overall guidance of the Fishlake Land and RMP and Final EIS, and the BLM San Rafael RMP and Final EIS. This EIS tiers to the decisions of both Land Use Plans, which are available for review at the USFS and BLM offices, both located in Richfield, Utah.

1.4 DECISIONS TO BE MADE BY RESPONSIBLE OFFICIALS

This EIS addresses the need for federal decisions approving a right-of-way application, or an alternative, which would cross federal lands. The Forest Supervisor for the Fishlake National Forest and the Field Manager for the Richfield BLM Field Office are jointly the responsible officials for the EIS. They will make their respective decisions regarding the Proposed Actions after considering the comments, responses, and environmental consequences discussed in the EIS. The rationale for each agency decision will be documented in separate Record of Decisions. No plan amendments would be required either for the Forest Service Fishlake Plan or the BLM San Rafael Plan for the Proposed Action.

1.5 AUTHORIZING ACTIONS

In addition to this EIS, approval of the Proposed Action or an Alternative would require authorizing actions from other federal, state, or local agencies with jurisdiction over the project. Authorizing actions include land use and environmental permits, licenses and approvals. Table 1.5-1 presents the principal authorization actions required for the Proposed Action.

Table 1.5-1 Summary of Permits and Approvals Required for the Quitchupah Creek Road Project

Permit/Approval	Granting Agency
Permits Required by the Record of Decision	
Special Use Permit*	U.S. Forest Service
Right-of-Way Grant*	Bureau of Land Management
Temporary Use Permit*	Bureau of Land Management
Farmland Protection Policy Act Farmland Conversion Impact Rating*	Natural Resources Conservation Service
Clean Water Act Section 404 Permit*	U.S. Army Corps of Engineers
Stream Alteration Permit	Utah Division of Water Rights Stream Alteration
Section 7 Consultation, Habitat Conservation Plan*	U.S. Fish and Wildlife Service
Permits Required for Construction of Road	
Fugitive Dust Control Plan	Utah Department of Environmental Quality
Encroachment Permit	Utah Department of Transportation
Easement Application	Utah School and Institutional Trust Lands Administration
Right-of-Way Acquisition	Private Landowners
National Pollution Discharge Elimination System Permit for Storm Water	Utah Department of Environmental Quality, Division of Water Quality
Surface Disturbance Permit, Air Quality	Utah Department of Environmental Quality, Division of Air Quality
Construction Permit	Emery County

*Federal permit, license, or other entitlement that must be obtained in implementing the proposal. (40 CFR 1502.25(b))
CFR=Code of Federal Regulations.

1.6 ISSUES

Initial scoping for the Quitchupah Creek Road project began on January 15, 1999 in anticipation of the preparation of an EA. Comments were solicited from appropriate agencies, specific individuals, and the general public. Due to the level of public concern for the proposed project, and the issues identified during that scoping process, the USFS and the BLM determined in June 1999 that preparation of an EIS was warranted.

Comments received during the scoping process were analyzed and summarized to represent the issues and concerns of the respondents. Based on comments received and in response to the issues raised, the USFS and BLM developed three action alternatives that meet the purpose of and need for the project (as identified in Section 1.1 Purpose and Need). A no-action alternative is also considered.

PUBLIC INVOLVEMENT PROCESS

Public involvement is an important part of the environmental analysis process. The public involvement plan describes the methods and techniques that will be used to involve the public in the environmental analysis. It allows the public to participate actively in the NEPA process and to communicate their concerns regarding the Proposed Action. In addition, involvement of local, state, and other federal agencies helps these entities to anticipate the effects and benefits that could occur from the project, then make necessary plans and changes in public policy.

The USFS and BLM initiated public scoping for the Quitchupah Creek Road Project on January 15, 1999 with the intent of preparing an EA. Informal meetings were held in Emery County, including a field meeting on March 30, 1999. Other meetings including the Quitchupah Grazing Association Meeting (January 27, 1999) and the Emery County Public Lands Council Meeting (June 8, 1999) were attended by agency and consultant representatives. Due to the level of public concern for the proposed project, and the issues identified during the scoping process, the USFS and the BLM determined that the proposed project warranted preparation of an EIS. A Notice of Intent for the Quitchupah Creek Road EIS was published in the Federal Register on July 1, 1999. The legal notice, Request for Comments, was published in the *Richfield Reaper* July 14, 1999; *Emery County Progress* July 13, 1999; *Salt Lake Tribune* and *Deseret News* July 15, 1999.

A public mailing list was compiled and 160 letters were sent to interested individuals, agencies, and groups. Public meetings were held as scheduled in Castle Dale on July 21, 1999 at the Museum of the San Rafael, and in Richfield on July 22, 1999 at the Quality Inn Center. Comment forms were available at the meetings. Over 30 people attended the Castle Dale meeting and 23 people signed in at the Richfield meeting. A complete summary of the public participation is available in the Public Involvement Plan on file at the USFS Fishlake National Forest Office and the BLM Richfield Field Office.

The following official site tours were conducted in Quitchupah Canyon:

June 4, 1999	Representatives of the Paiute Indian Tribe of Utah
June 30, 1999	Agency and Sevier County SSD Representatives
July 15, 1999	Concerned Individuals of Emery County
August 6, 1999	Representatives of the Koosharem Band of Paiute Indian Tribe of Utah
March 30, 2000	Representatives of the Uinta and Ouray Ute Indian Tribe of Utah
October 18, 2000	Representatives of the Koosharem Band of Paiute Indian Tribe of Utah

Rock art groups and Historical Society members have also visited the canyon.

A total of 35 comment letters or forms have been received as a result of the EIS scoping effort. Approximately 25 comments had previously been received during scoping for the EA in January-February 1999. Consultation with interested parties has been ongoing throughout the EA process and initiation for the EIS. The decision was made by the USFS and BLM to carry over all comments made during the EA scoping into the official record of scoping for the EIS. Those providing comments on the EA will maintain their standing in the EIS process.

ISSUES CARRIED FORWARD IN ANALYSIS

The scoping comments were examined for common themes, then combined, as appropriate, into issues. The issues were further organized by resource or issue topic. Based on internal discussions, the issues were organized by resource into key issues to be carried forward as the focus for analysis in the EIS. See the Summary of Public Scoping for all the comments, and the Significant Issues Document for details on the selection of key issues. These documents are on file at the USFS Fishlake National Forest and the BLM Richfield Office, Utah.

Geology

The horizontally bedded nature of the formations within the area, as well as their component range of texture classes accounts in part for dramatic, moderately to severely dissected scenery of steep canyon walls, escarpments, and badlands. Faulting and fracturing also affect the local topography. The surficial geology of the Convulsion Canyon and Quitchupah Creek area would be affected by road construction mainly in areas that require blasting. Surficial rocks and exposures of formations would be impacted by road construction, but these impacts would be confined to aesthetic ones. There is a mapped slide feature along the north side of Convulsion Canyon at the intersection of the existing haul road and the jeep trail. The potential for additional landslides in the project area was reviewed and no recognized active landslides were identified.

Air Quality

Some air quality impacts may result from either the continued operation of the SUFCO Mine or the construction and operation of a new coal haul route. Air pollution can readily dissipate; however, the cumulative effects of air pollution can impact the quality of life, environmental quality and diversity, and aesthetic attributes of the Quitchupah Creek area.

Noise

The change in nature of a remote area to a readily accessible area with the high speed transportation network would also increase the noise level, both in intensity of the noise and frequency of events. This basic change would potentially degrade the recreation experience of those seeking a remote type of recreation, and would also degrade the quality of living for those engaged in traditional pursuits.

Water Quality

Changes may occur to the water quality in Quitchupah Creek and other creeks within the project area due to rerouting the headwaters and eliminating some of the stream-side hydric fringe and wetlands. Water quality may also diminish due to increased sedimentation from disturbed erosive soil sections. The increase in sedimentation in these creeks may increase salinity due to the highly saline soils in the Quitchupah Creek drainage. The increase in salinity may affect the salinity management of the Colorado River system.

Soils

The presence of erodible soils, and consequently potentially unstable soils, in the middle stretches of the Quitchupah Creek area, would increase road construction costs. Approximately 25 to 30 percent of the proposed road alignment in the Quitchupah Creek area is located on erodible soils as defined by Natural Resources Conservation Service (NRCS). The need for additional borrow material would increase borrow area use, therefore increasing the areas of disturbance. The unstable soil areas could also be a high maintenance item in the future as evidenced by maintenance requirements in the unstable areas within the SR-10 alignment. The disturbance of erosive soils also contributes sediments and salts to the creek.

Wetlands

Some wetlands associated with Quitchupah Creek would be filled during construction of the road. The filled wetlands would not function to filter sediments or absorb flood flows for the creek flow regime. Most of the proposed filled wetlands are at the head of these creeks where they presently function as a sediment filter to preserve the water quality of the creek and as flood basins to absorb excess waters and regulate the flows in the channel. The filled wetlands would need to be mitigated by constructing wetlands at other sites along the creek.

Permits for altering a stream would be required from the Utah State Engineers Office and a 404 permit would be required from the U.S. Army Corps of Engineers (Corps) to fill or impact Waters of the U.S., including wetlands.

Vegetation

Riparian zones within the project area and those associated with wetlands would be impacted due to construction of the road. The loss of riparian vegetation could impact wildlife and could cause increased sedimentation in the stream. Surface disturbance could also create direct impacts to vegetation, including the potential to encourage the invasion of noxious weeds and/or exotic plants. The plant communities of the project area should be identified and mapped to provide data for a more specific analysis.

Wildlife

The proposed road in the project area could interfere with big game use of the winter ranges on the benches and in the agricultural fields. Fencing of the road could become a barrier to big game migration and also to daily movements between the fields and cover in the nearby hills. Traffic on the roads in the form of large loaded trucks going downhill would be a hazard to all wildlife, especially big game and raptors.

Raptor nesting within the project area could be affected by road construction and operation. The increased human presence and use may cause raptors to abandon active nesting sites.

The project area is home to a wide variety of wildlife species that could be impacted by the construction of the road and subsequent haul truck traffic.

Increased sedimentation and destabilization of Quitchupah Creek and other creeks in the project area could impact fisheries and aquatic macroinvertebrates in the stream. The loss of the hydric fringe and stream-side wetlands could affect the reproductive success of fish species and some macroinvertebrates species that depend on vegetation for cover and prey.

Threatened, Endangered, and Sensitive Species

Originally four species of threatened, endangered, and sensitive (TES) plants were suspected by BLM of occurring in the project area. However, additional information supplied by Valori Armstrong of the BLM and Bob Campbell of the USFS indicates that there is the potential for seven species of TES plants to occur in the project area. The presence of a potentially larger number of TES plant species in the project area would increase the potential for disturbance and loss of these TES plants. Each TES plant species would need to be identified and mapped in the project area to ensure the road design avoids or minimizes impacts to these TES plants. The location and use of staging and borrow areas would need to be coordinated to avoid known TES plant species locations.

The presence of a singing male southwest willow flycatcher in the large willow riparian area along Quitchupah Creek during 1999 baseline surveys raises the potential of impacts to the nesting habitat of a listed species. Surveys conducted in 2000 did not reveal the presence of any southwest willow flycatchers. The road as presently designed would impact a portion of this habitat.

The flannelmouth sucker and the leatherside chub, state sensitive fish species, occur in the lower portion of Quitchupah Creek. The potential of increased sedimentation and stream destabilization may or may not impact these fish species.

Implementation of the proposed project will require Section 7 Consultation with the U.S. Fish and Wildlife Service (USFWS).

Range Resources

Livestock grazing is the traditional use of the project area. Livestock are wintered in the Quitchupah Creek area on the lower benches and in the agricultural fields. Livestock are moved to and from the summer range on forest lands by trailing along Quitchupah Creek. The presence of a road would change the way livestock are trailed along the creek, causing changes in traditional ranching methods. The presence of a road would increase the need for the construction of more fences and other facilities to keep livestock off the road and allow them to trail and graze in adjacent areas of forage and water. The increase in fences and trucks for livestock hauling would increase the operating and maintenance costs for the rancher. There would also need to be parking areas for the livestock trucks and trailers along the road (pullouts are planned for the North Fork and East Spring Creek Canyon). There may also be a need for a constructed livestock trail to bypass some of the restricted portions of the route where it would not be feasible to use the road.

The road presents a hazard, in the form of vehicle-livestock collisions, to any livestock that enter onto the roadway. The ranchers predict an increase in livestock loss due to collisions on the road, similar to what is now being experienced on the Acord Lakes Road. There would be some loss of feed production in the agricultural fields in the project area due to the proposed road alignment and the removal of some agricultural lands from production.

Land Use and Recreation

Although access to the public lands and the National Forest System would be made easier with the construction of the proposed road, the recreational experience within the project area would be changed. The traditional uses of ranching, hunting, trapping, and remote country adventure would be replaced with increased tourism and public use. Those who advocate all-terrain vehicle (ATV) use request an ATV trail be constructed alongside the road to allow continued access into the forest lands. The construction of a paved road on the current road/trail alignment, where ATVs presently travel at will, would restrict access for ATV users. There would be pull-offs and parking along the paved road at North Fork and at East Spring Creek Canyon. Those who enjoy the peacefulness and solitude of the canyon would see a change. ATV use in the project area was addressed by many who commented during scoping on both sides of the issue. Hunting use may decrease due to the number and frequency of haul truck traffic causing displacement of wildlife.

The wilderness and roadless areas issues were raised but no wilderness or inventoried roadless areas are designated on the forest or public lands near the project area. The project area is not affected by the USFS moratorium on road maintenance or construction in inventoried roadless areas.

Other permitted facilities in the creek that may be affected include the drainfield for the mine wastewater system, the power line which follows the creek, and the irrigation system for the agricultural fields near the creek.

Private Lands

Some of the private landowners in the project area have questioned the need for a road and have not been favorable to granting a right-of-way for the road. The ranchers assert the road would interfere with their ranching operations and reduce the quality of life in the Quitchupah Creek area. The proposed road would cross 3.9 miles of private lands, mostly ranch lands adjacent to the lower creek. Five parcels of undeveloped land adjacent to SR-10 would also be affected.

Visual Resources

The road would change the nature of the project area. The aesthetics of a remote but accessible creek area with several scenic canyons would change to an easily accessible area with the possibility of increased public use. There would be a loss of natural beauty and peacefulness in the creek. The road would be readily visible in the landscape and would attract the attention of the casual visitor, in contrast to the existing two-track road which is barely visible against the landscape. The views in the project area would be affected by the presence of the road. The BLM public lands are a Visual Class IV, which means that changes which dominate the landscape are permitted. The National Forest System lands Visual Quality Objective (VQO) is modification, which indicates activities within the area can be visually dominant.

Cultural Resources and Paleontology

Based on consultation performed to date, several Native Americans have provided comments on the proposed road project. The presence of rock art, a highly visible cultural site, increases the potential for impacts as these sites become more accessible to the public. The relative remote nature of the rock art site setting would be compromised by the presence of the paved road. Additional comments received from the public indicated that the presence of the road immediately adjacent to the rock art site may affect the solar, lunar, and audio interactions with the site.

There is a concern for historical sites in the project area. Many individuals feel that their historical and personal connection to the Quitchupah Creek would be affected greatly by the road construction and operation. Ranch houses, wagon roads, rock writing, and building foundations are some of the known historical sites along the Quitchupah Creek project alignment.

Native American Religious Concerns

The Paiute Indian Tribe has stated that the entire Quitchupah Creek area is sacred with them. The Ute Indian Tribe are reluctant to discuss what items are sacred; however, they have expressed concern that the proposed road will lead to impacts to the rock art present in the area. The Hopi, who claim affiliation with the Fremont culture, have requested that no site be disturbed. Since the general project area is considered sacred, locations of specific sacred components are not discussed by Native Americans.

Transportation

A new road system would be developed that would link the Acord Lakes Road with SR-10 by bypassing I-70. The road would facilitate coal hauling to the east by reducing the round-trip distance by approximately 50 miles. The road would also reduce the distance for coal mine service providers located in Carbon County traveling to the SUFCO Mine. Carbon County is the center for the coal mine service industry. The proposed road would also be an alternate access to the SUFCO Mine providing increased mine safety. The new road would also lessen coal haul traffic on a narrow stretch of SR-10 from the I-70 junction north to the new junction near Emery. The coal haul traffic from the Quitchupah Creek area would still be routed through the town of Emery. The road would open access to alternative customers in the local area and in eastern coal markets.

There is concern regarding the location and design of the junction of the proposed Quitchupah Creek Road with SR-10. The proposed junction is adjacent to a bridge that would need to be widened to facilitate the placement of turn and acceleration/deceleration lanes. Just north of the proposed junction is an increased grade up a hill that slows northbound trucks and may interfere with the regular movement of traffic. Accelerating trucks may be slowed by the grade, consequently slowing northbound traffic on SR-10.

The shortening of the coal haul round-trip east would increase the competitive balance for the SUFCO Mine with the other coal mines in Emery and Carbon counties that are close to loadouts. This in turn could increase sales to eastern coal markets. This may increase coal haul traffic on SR-10 through the towns of Emery, Ferron, Clawson, Castledale, and Huntington.

An increase in coal haulage would also increase the deterioration of SR-10, which is a high maintenance road due to the presence of Mancos shale-derived soils underlying the road base.

The need for the road on the basis of shortening the round-trip haul distance for the SUFCO Mine, mine safety, and the increased access to the Acord Lakes area has been questioned by project opponents.

Socioeconomics

Residents of Emery County are concerned whether construction of the road would lead to increased economic benefits to Emery County, and if so, would these benefits from the proposed road outweigh perceived environmental and social impacts?

Coal mining provides economic benefits such as employment, payroll, federal coal royalties, and tax revenues on a local and regional level. Would these economic benefits change as a result of any of the alternatives?

ISSUES NOT ANALYZED IN DETAIL

The following issues identified through the public scoping process were determined to be outside the scope of the Proposed Action, already decided (by law or Forest Plan, etc.), irrelevant to the decision, or not affected by the Proposed Action. Therefore, these issues were not analyzed in this EIS. Issues not analyzed in detail in this EIS are summarized below. The rationale or justification for not analyzing these issues in detail is presented immediately following the summation of each individual issue.

Issue 1: *Trucking cattle is not a viable option due to the potential for cow and calf deaths resulting from trampling and also for the potential for cows abandoning calves.*

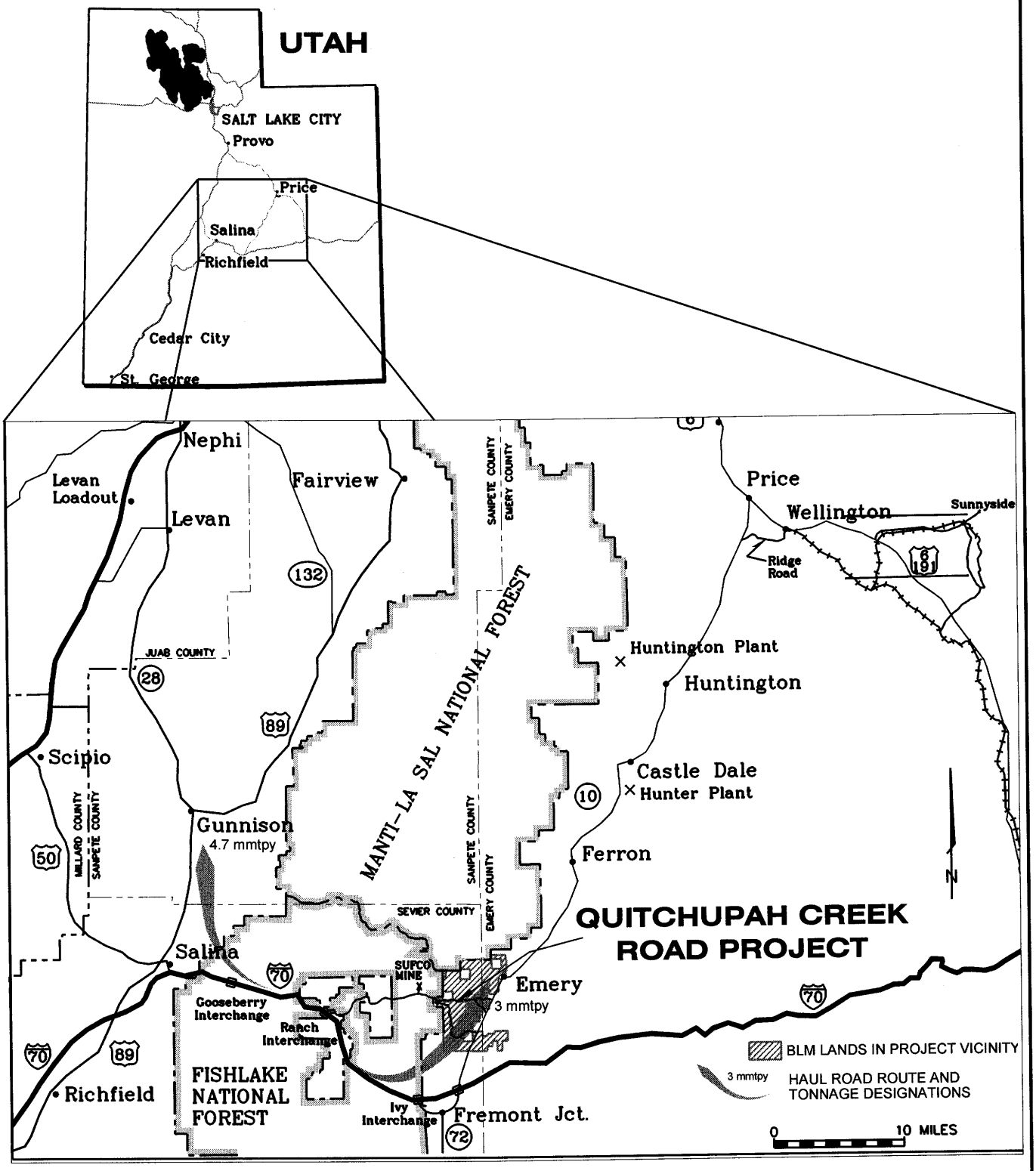
Trucking cattle is a commonly used method in Utah to move livestock to and from summer ranges, with negligible adverse results.

Issue 2: *Cattle guards are not practical under the use of heavy coal trucks.*

Cattle guard structures are utilized on other coal haul roads and will be designed for use with heavy trucks.

Issue 3: *SUFCO Mine is a non-union mine. With the potential for an increased competitive position for markets east of the Plateau, there could be an impact to the union coal mines in Carbon and Emery counties. Non-union mines could perceive preferential treatment based on this economic advantage.*

Due to closing or declining production in some union mines in Carbon and Emery counties, some coal sales have already shifted to the SUFCO Mine out of necessity not competitive advantage.



QUITCHUPAH CREEK ROAD EIS

FIGURE 1-1
REGIONAL LOCATION MAP

jbr environmental consultants, inc.
Salt Lake City, Utah Cedar City, Utah Reno, Nevada Elko, Nevada

DESIGN BY	DRAWN BY	CH'D BY	SCALE
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REVISION	DATE DRAWN
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	9/6/01
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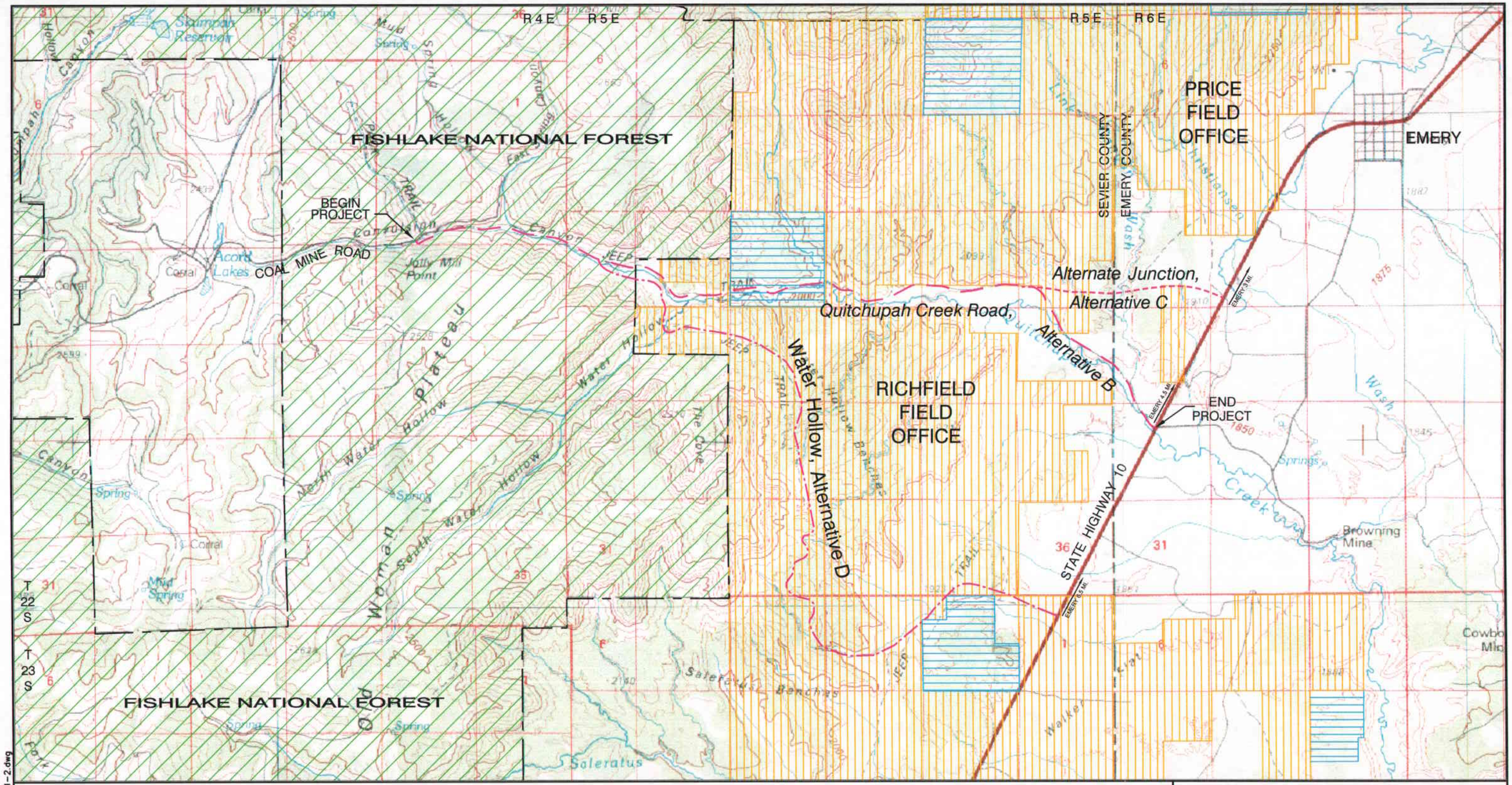

EXPLANATION

- FISHLAKE NATIONAL FOREST BOUNDARY
- QUITCHUPAH CREEK ROAD, ALTERNATIVE B
- ALTERNATE JUNCTION, ALTERNATIVE C
- WATER HOLLOW, ALTERNATIVE D

LANDSTATUS

- FISHLAKE NATIONAL FOREST BOUNDARY
- BLM LAND
- STATE LAND
- PRIVATE LAND

N

1 0 1 MILE

QUITCHUPAH CREEK ROAD EIS

FIGURE 1–2
PROJECT AREA AND ALTERNATIVES

jbr environmental consultants, inc.
Salt Lake City, Utah Cedar City, Utah Reno, Nevada Elko, Nevada

DESIGN BY	DRAWN BY	CH'D BY	SCALE	DATE DRAWN	REVISION
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CHAPTER 2.0

ALTERNATIVES INCLUDING THE PROPOSED ACTION

2.0 ALTERNATIVES INCLUDING THE PROPOSED ACTION

The formulation of alternatives was guided by the focus issues; purpose and need; land use objectives of the USFS Fishlake National Forest Land and RMP and the BLM San Rafael RMP; and the need to comply with federal, state, and local laws, regulations, and policies. The potential alternatives were evaluated by the Interdisciplinary Team (IDT) to determine whether they addressed the focus issues, met the purpose and need of the project, and were technically and economically feasible.

During the alternatives development process, the IDT reviewed a reasonable range of potential alternatives to the Proposed Action. The alternatives developed encompass the complete spectrum of possible decisions that range from no action to selection of one of three alignment alternatives. A variety of factors were examined during the development of the alternatives for the DEIS. Consideration was given to avoidance and/or minimization of effects to water (surface and groundwater), wetlands, vegetation, wildlife, special status species, range/livestock, cultural resources, public safety, and aesthetics. However, the steep natural terrain between the Acord Lakes Road and SR-10 limits the options available for locating roads and other surface facilities.

All alternatives that were fully developed are consistent with the Fishlake National Forest Land and RMP and the BLM San Rafael RMP. Four alternatives were considered for analysis in this EIS, as shown in Figure 1-2, and are as follows:

Alternative A No Action
Alternative B Quitchupah Creek Road Alignment
Alternative C Alternate Junction with SR-10 and Alternate Design of Quitchupah Route
Alternative D Water Hollow Road Alignment

2.1 ALTERNATIVE A - NO ACTION

The SUFCO Mine is located 30 miles east of Salina in the Wasatch Plateau portion of the Uinta Coal Basin, the primary source of coal in Utah (Figure 1-1). The SUFCO Mine was established in 1955 and now produces nearly seven million tons of coal per year (6.7 mmtpy estimated in 2001). The SUFCO Mine is one of the most efficient underground coal mines in the Nation utilizing a super panel longwall system to mine the 13.5 foot thick coal seams. Coal quality is high with 11,450 BTUs per ton and a sulfur content of less than 0.35 percent, among the lowest in the Nation. Total recoverable coal reserves are 130 million tons with the potential for additional coal reserves in the vicinity. Most of the coal is sold for use as fuel in electrical power generating plants.

Coal is currently, and has been for many years hauled west, in covered double trailer trucks, to the Levan loadout facility via Acord Lakes Road, I-70, SR-89, and SR-28. At the Levan loadout, coal is loaded on railroad cars for shipment to electrical power generating plants in Nevada and to California for export. Some coal is also trucked directly west to smaller markets in Nevada and California. Altogether 4.7 million tons of coal are hauled annually to western customers requiring approximately 109,250 trips per year. The round-trip to the Levan loadout is 164 miles.

Due to changes in coal availability at other coal mines and increased demand for electrical power, SUFCO Mine has a contract with PacifiCorp to haul one million tons of coal to Hunter Power Generating Plant near Castledale in 2001, and 2 million to 4.5 million tons beginning in 2002. Increased revenues will be realized by SUFCO Mine from the increased sales of coal.

Coal is currently hauled from the SUFCO Mine east to the Hunter Power Generating Plant and railroad loadouts near Price, Utah via the Acord Lakes Road, 1-70, and SR-I0. Beginning in 2002, between 2 million and 4.5 million tons of coal will be hauled annually to the Hunter Power Generating Plant, which equates to 69,750 - 128,000 trips per year, respectively. An additional one million tons is and will be hauled annually via the same route to loadouts in Carbon County for shipment by rail to eastern customers. The round-trip to the Hunter Power Generating Plant is 124 miles, and to the loadouts in Carbon County is 166 miles. The SUFCO Mine supplies 24 percent of the coal that is produced in Utah. Table 2.1-1 is a summary of coal production and haulage at the SUFCO Mine.

Table 2.1-1 Haulage Truck Requirements for Estimated Coal Production from the SUFCO Convulsion Canyon Coal Mine

Coal Production	Acord Lakes Road at SUFCO Mine		I-70 East or Quitchupah Creek Road		I-70 West to Levan, Apex, etc.	
Year - mmtpy	loads/day[1]	AADT[3] weekday	loads/day	AADT weekday	loads/day	AADT weekday
1998 - 5.7	530	1060	93	186	437	874
2001 - 6.7	623	1246	186	372	437	874
2002 - 7.7	716	1432	279	558	437	874
Max. - 10.2[2]	949	1898	512	1024	437	874

mmtpy = million tons per year AADT = average annual daily trips

[1] Based on 43-ton loads hauled 5 days/week, 24 hours/day, 250 days/year

[2] Maximum of 4.5 mmtpy east to Hunter Plant after 2002
Hunter Power Plant Schedule
2001 - 1 mmtpy
2002 - 2 mmtpy with maximum of 3 mmtpy
2003 - 2 mmtpy with maximum of 4.5 mmtpy

[3] Based on 1440 minutes in 24 hour day, interval in minutes between trucks:
500 AADT = 2.88
1000 AADT = 1.44
1500 AADT = 0.96
2000 AADT = 0.72

UDOT has initiated studies to determine what is needed on SR-10 to handle the large increase in coal truck traffic from the junction with I-70 to the Hunter and Huntington power generating plants. SR57, which formerly was the sole transport route for coal haulage, was designed and constructed to accommodate coal truck traffic from the adjacent mines to the power generating plants. SR-10 was not originally designed and constructed to accommodate large volumes of coal truck traffic. To accommodate this coal truck traffic the southern 20 mile section of SR-10 from I-70 to Muddy Creek would need to be rebuilt and bridges replaced. Passing lanes would also need to be constructed at Quitchupah Hill and Rock Creek.

According to a study (Parsons Brinkerhoff, 2001), the consequences of increased coal truck traffic on SR-10 highway conditions (from 20% trucks to 60% trucks in the AADT) include:

- Severe pavement rutting,
- Pavement cracking,
- Increased pot-holing and patching,
- Accelerated bridge deterioration,
- Ride deterioration, and
- Increased traffic congestion.

SR-10 is a high maintenance road due to the presence of Mancos shale-derived soils underlying the road base. Expenditures for accelerated maintenance on this road under this alternative would require UDOT to spend an additional $12.5 million on improvements and $1 million additional for maintenance.

The No Action Alternative does not provide any relief for truck traffic on SR-10 as the current route would continue as the future route. The longer haul would forgo the opportunity for significant fuel savings (up to 1.5 million gallons annually) that would be realized under the build alternatives (B,C,D) with a shorter haul route. The SUFCO Mine would not realize any reduction in haul costs due to a shorter haul route. Any competitive advantage in the coal market for SUFCO Mine due to savings on haulage costs would also be forfeited under No Action.

Under the No Action Alternative, the Acord Lakes Road would continue to experience periodic congestion during peak times and would also likely require maintenance and upgrading to accommodate the increase in coal haul traffic. Upgrading the Acord Lakes Road would affect SUFCO Mine production during construction due to constraints in road use. Road construction on the Acord Lakes Road has the potential to limit employment opportunities for Emery County residents and other because of the interruption to production at the mine. Under the No Action Alternative, commuting distances from Emery County communities to SUFCO Mine would not be decreased.

The No Action Alternative does not meet the project purpose and need because this alternative does not provide an alternative access to SRI 0 from the Acord Lakes Road to allow for the safe conduct of traffic and emergency or rescue units; or allow an alternative access route to the SUFCO Mine for emergencies.

Under this alternative, the existing uses and environment in Quitchupah Creek and Water Hollow would continue unchanged in the foreseeable future. Emphasis on livestock grazing via intensive range management as recorded in the Fishlake National Forest Land and RMP would continue as the primary management for Forest lands in Quitchupah Creek area. On BLM lands, the avoidance areas for right-of-ways as recorded in the San Rafael RMP would not be subject to right-of-way applications for a road.

2.2 ALTERNATIVE B - QUITCHUPAH CREEK ROAD ALIGNMENT

Sevier County SSD No.1 has proposed the upgrade of 9.2 miles of an existing road/trail in Quitchupah Canyon, which connects the Acord Lakes Road in Sevier County with SR-10 in Emery County. The lands in this corridor are a combination of private, USFS, BLM, and State of Utah. Under this alternative, the round-trip haul distance would be decreased by approximately 50 miles, which would also shorten the trip for mine services located in Carbon and Emery counties. The proposed Quitchupah Creek Road would be located along an existing route through Quitchupah Canyon from SR-10 in Emery County to an existing mine road in Convulsion Canyon, Sevier County. The road would intersect SR-10 in the north half of Section 30, Township 22 South, Range 6 East. Continuing to the northwest into Sevier County, and then westward, the road would generally follow an existing trail along Quitchupah Creek, into Convulsion Canyon, where it would connect with the paved mine road in the southwest quarter of Section 11, Township 22 South, Range 4 East.

The finished road would be a 28-foot wide paved surface, with an operational right-of-way of 66 feet. Three pull-outs for parking off the road shoulder would be provided at the Link Canyon channel crossing, the North Fork crossing, and the East Springs Creek crossing. The construction corridor would vary from 50 feet to 60 feet on the flatter ground (eastern end) to an average 100 feet for the remainder of the road. The road would be designed for a speed of 40 miles per hour, and constructed according to the standards of AASHTO, the UDOT 1992 Standard Specifications for Road and Bridge Construction, and any additional requirements of the County. No facilities would be built in association with this alignment. The details of the engineering design are presented in Appendix B.

LANDS

The lands crossed by this proposed road include private, public, and State Institutional Trust Lands (see Figures 2-1 and 2-2). Public lands include those managed by the USFS, Fishlake National Forest and the BLM, Richfield Field Office. There are several private landowners along the route, listed as follows:

Wynona P. Olsen, Trustee
Patricia Lois and George E. Olsen
Earl R. and Dixie Olsen, Trustees
James V. Olsen, Trustee
Thomas C. Bunn Et al.
Glendon E. Johnson, Jr.
Castle Valley Ranches, LLC

The following table (Table 2.2-1) describes land status, length of proposed road within each jurisdiction, and estimated disturbance.

Table 2.2-1 Quitchupah Creek Road Alignment Land Status and Proposed Disturbance

Land Management	QCR Road Distance (miles)	County Jurisdiction	Road Construction Disturbance (acres)	Existing Road/Trail Disturbance (acres)	Staging Areas (acres)	Borrow Areas (acres)	Total New Surface Disturbance (acres)
USFS	2.3	Sevier	24.0	3.3	5	0	25.7
BLM	1.9	Sevier	18.4	1.8	10	0	26.6
State of Utah	1.1	Sevier	12.3	0.9	0	0	11.4
Private	3.9	Sevier & Emery	33.7	5.7	0	10	38.0
Totals	**9.2**		**88.4**	**11.7**	**15**	**10**	**101.7**

Road Corridor

The construction corridor for the Quitchupah Creek Road would range from 50 feet to 220 feet, depending upon terrain, soil stability, and proximity to Quitchupah Creek. Approximately 15 percent of the construction right-of-way would be on previously disturbed ground. The total maximum disturbance within the road construction corridor would be 88.4 acres. Approximately 45 acres of paved road would remain unreclaimed when the construction has been completed.

The requested right-of-ways for the permanent road corridor would include 18.4 acres of USFS lands, 15.2 acres of BLM lands, 8.8 acres on State of Utah lands, and 31.2 acres private lands. Right-of-way applications have been submitted to the USFS and BLM. Right-of-ways across private lands are dependent upon individual negotiations.

The Quitchupah Creek Road alignment would require expansion of the SR-10 bridge crossing over Quitchupah Creek to accommodate additional lanes for acceleration of traffic and turn lanes for vehicles.

Staging Areas

It is anticipated that there would be two to three staging areas associated with this project. These would be located upon USFS, BLM, and/or State of Utah administered land; each would be approximately three to five acres. Staging areas would be utilized for equipment storage, maintenance, and parking. The staging areas would be bladed, with erosion control provisions installed as necessary. They would be reclaimed at the end of the construction period. Potential staging areas are:

1) existing road north of station 22+00
2) area south of station 220+00
3) area north of station 390+00

Borrow Material Areas

The materials required for construction of the road include 75,000 cubic yards (yd^3) of granular borrow, 40,000 yd^3 of untreated base course, and 20,000 yd^3 of gravel to make asphalt. These materials would be purchased from a local gravel pit or extracted from an aggregate borrow source in an area of about ten acres in the S½ NE¼ of Section 24, Township 22 South, Range 5 East, SLBM on property owned by Thomas C. Bunn, et al.

Calculated design for the road indicates that no more than a 12-inch thick layer of granular borrow will be necessary below the untreated base course. Calculation of California Bearing Ratio from 16 soil samples collected on the alignments supports the 12-inch granular borrow layer (see Appendix B for details). However, some of the soils contain a high percentage of expandable clays that can deform and break up road base and asphalt. UDOT has had extensive experience with these expandable soils under some of the major roads within the area, and recommends up to three feet of granular fill and base on top of them. The use of three feet or more of granular borrow would be an option for sites with particular soil problems. These clayey soils are also highly saline, so they should not be used as fill or for fill slopes.

CONSTRUCTION PROCEDURES

It is anticipated that the road would be built in 10 months using a construction spread that would employ an estimated peak work force of approximately 30 to 50 persons.

The design and construction of the road would be in general conformance with applicable industry standards as determined through engineering design.

The construction sequence includes preparing the right-of-way and roadbed, construction of the road, and restoring the staging areas and material borrow areas.

Preparation of the Right-of-Way and Roadbed

Preparation of the construction corridor would involve blading and removing vegetation over the entire length of the right-of-way and at staging areas, within the staked limits of the roadway. A maximum of 88.4 acres of vegetated land would be affected. Spoil and cut vegetation would be temporarily stockpiled along the right-of-way edges.

The contractor would not disturb areas outside the staked corridor without prior written permission from the appropriate land managing agency or individual owner.

Upon completion of roadbed clearing, crews would begin construction of the roadway subgrade. Graders, scrapers, and dozers would be utilized to obtain the necessary grade and alignment.

Construction of the Road

After crews have prepared the road subgrade, the contractor would begin hauling, placing, and compacting the granular borrow to an estimated depth of eight to 12 inches. This is the first phase of the surfacing process. The second phase would involve placement and compaction of an eight-inch lift of untreated base course. Figures 2-3 and 2-4 show typical cross sections for road construction. Figure 2-3 is a typical section for the road on suitable soils and Figure 2-4 is a typical section for road construction on unsuitable soils (expansive soils).

The completed road would have a 28-foot paved surface width. The road would consist of six to eight inches of untreated base course overlaid by 5½ inches of asphalt concrete.

Approximately 400,000 yd^3 of roadway excavation, 41,000 tons of non-rutting asphalt concrete and asphalt mix, 80,000 tons of untreated base course, and 75,000 yd^3 of granular borrow are proposed.

Blasting

The proximity of the Quitchupah Creek Road alignment to rock canyon walls in some areas suggests the need for blasting to remove rock. The areas that may require blasting include:

Station 25+00 to 50+00
Station 80+00 to 81+00
Station 108+00 to 111+00
Station 116+00 to 122+00
Station 156+00 to 174+00
Station 233+00 to 237+00
Station 262+00
Station 275+00 to 283+00

Appendix B contains maps showing the locations of these blast sites.

The contractor must exercise great care in blasting and would be responsible for and shall assume all liability connected with the blasting and use of explosives. The contractor would be liable for all damage to work on adjacent property, all injuries, law suits, complaints, and any other actual or alleged damages. No blasting shall be done within 15 feet of a structure. The contractor shall observe all safety rules for the handling of explosives, and in no case shall blasting caps be stored near the explosives. No blasting shall be done outside the regular working hours except with special approval. All explosives shall be stored in compliance with laws and regulations and all storage places shall be properly marked. The contractor shall comply with Utah Occupational Safety and Health (UOSH) construction standards, chapter "U" rules and regulations. The contractor shall provide a qualified explosives expert to act as advisor and consultant during drilling and blasting operations. Blasted material would be used for riprap if it meets riprap specifications, otherwise it would be used as fill material.

Erosion Control

Silt fences, water bars, or other sediment control structures would be utilized to prevent sediment loading during streambank manipulation and road construction. Some of these controls will be left in place until full stabilization of the roadway and slopes has been reached. A Storm Water Pollution Prevention Plan (SWPPP) will be developed prior to construction that will detail how and when each control device will be utilized. The SWPPP will be developed to ensure that the construction project comply with all permit requirements including the 401 Water Quality Certification Application conditions. Appendix B contains some of the Best Management Practices (BMPs) that would be utilized during and after construction.

Dust Control

Water for dust control and compaction during construction of the lower portions of the road would be solicited from a local irrigation company, depending upon the time of year of construction. In the event no water is available during irrigation season, water would be requested from Emery or other sources and trucked to the site. At the upper end of the road, water would be obtained from the mine pump station by Sta. 65+00.

Stream Crossings and Culverts

There would be six stream crossings required during construction of the road. Depending upon the season of construction, between four and five of these crossings would be expected to be wet. Stream crossings would require corrugated metal pipe culverts, multiplate culverts, or concrete box culverts depending on the volume of flow at each specific site. Additional metal culverts would be required at the numerous dry wash crossings. The existing bridge on SR-10 would require alteration.

Several culverts will be placed under the proposed road alignment to direct surface water runoff in order to protect the road integrity and decrease erosion potential. Figure 2-5 shows the alignment of Alternative A with proposed culverts. Table 2.2-2 shows the design conditions for each culvert crossing. Borrow ditch relief culverts would be spaced at 500 to 700 feet intervals, depending upon slope, to discharge away from drainages.

Table 2.2-2 Quitchupah Alignment Alternative B - Culvert Sizing Design

Approximate Station	Design Flow (cfs)	Design Frequency (years)	CMP Diameter (inches)
11+00 (Convulsion)	123	100	60
15+00	66	25	48
20+00	173	100	72
47+40	112	25	60
70+00	234	100	72
80+00	8	25	24
92+65	191	2525	72
100+50	33	25	36
119+75	61	25	48
130+30	72	25	48
153+50	38	25	36
161+15	12	25	24
167+25	13	25	24
176+25	8	25	24
186+00	360	25	96
188+80	30	25	36
200+25	94	25	60
202+15	20	25	30
205+75	9	25	24
212+70	82	25	60
227+00	1702	100	(2) 120
232+00	1702	100	(2) 120
242+00	29	25	36
246+60	1144	100	(2) 108
258+80	17	25	24
268+00	215	25	72
285+00	29	25	36
300+00	156	100	72
314+65	21	25	30
322+35	89	25	60
333+35	27	25	36
348+35	28	25	36
359+35	31	25	36
377+10	19	25	30
387+75	31	25	36
398+75	18	25	30
413+50	26	25	30
427+80	40	25	36
438+00	19	25	24
452+00	586	100	108
471+25	78	25	48

Stream Re-Alignment

Steam re-alignment would occur at Stations 14+00-15+00, 22+00-25+00, 27+00, 29+00, 39+00-41+00, and 44+00 for a total of 1100 feet in Convulsion Canyon; and at Stations 254+00, and from 260+00 to 262+00 for 450 feet in Quitchupah Creek. The stream re-alignment process requires a State of Utah Stream Alteration Permit. The permit would set conditions for hydraulic design of each realigned section to maintain the integrity of the creek both upstream and downstream. Figure 2-6 shows a typical example of realignment.

Construction Equipment

The following equipment would be utilized during various phases of construction:

- Road grader
- Rubber tired loader
- Conventional scrapers
- Hydraulic excavators, track mounted and wheel mounted
- Rear dump trucks
- Belly dump trailers
- Asphalt paving machines
- Water truck for dust control
- Steel drum static compactors
- Sheeps foot compactors
- Hand held vibratory plate compactors
- Gravel crushing facility
- Track dozers
- Construction office trailer

Hazardous Materials

The contractor for Sevier County SSD would manage all hazardous materials (including hazardous chemicals, substances, and wastes) in full accordance with all applicable federal, state, and local regulations.

Sevier County SSD and its contractors would transport, locate, handle (including notification of employees and local emergency planning personnel, and including disposal if required), store, and use regulated hazardous materials in an appropriate manner that protects workers and the public, and prevents accidental releases to the environment. In the event that any such materials were to be released to the environment in excess of the reportable quantities defined under the relevant federal or state regulations, the required notifications would be made, and required reports would be completed and submitted to the appropriate agencies. In such an event, the USFS and BLM would be provided with copies of any such reports, along with the designated recipient agencies.

Reclamation

Reclamation would consist of recontouring the staging areas to their original grade or as requested by the agencies or landowners. Crews would reseed the staging and borrow areas using seed mixtures as directed by the appropriate land managing agency.

All disturbed areas would be recontoured so that the disturbed area blends into the surrounding terrain. Appropriate measures would be taken as necessary to prevent erosion, including the use of water bars.

Topsoil would be separated by means of windrowing or sidecasting. A minimum of the upper six inches of topsoil would be stored along the edge of the bladed right-of-way. During rehabilitation, the topsoil would be spread evenly over the disturbed borrow and staging areas.

Reclamation would be conducted upon completion of the road, after seedbed preparation, while the growth medium is still comparatively soft and loose. All disturbed areas along the road right-of-way would be reseeded with certified "weed-free" seed mixtures specified in Table 2.2-3. Reseeding would commence upon completion of the road, or at a time specified by the land managing agency. The areas would be broadcast seeded, and run over with a tractor to push the seed in and provide small pockets where moisture may collect. In areas where the seed is hand broadcast, the seeding rates listed in Table 2.2-3 would be doubled. The use of fertilizer is not anticipated at this time. However, a tackifier will be used with the seeding and mulching in order to decrease the potential for erosion and give the seed base a stable environment to grow.

Table 2.2-3 Site-Specific Seed Mixtures for Quitchupah Creek Road

Agency	Common Name	Application Rate (PLS Pounds per Acre)[1]
USFS/BLM	Hycrest crested wheatgrass	2
	Luna pubescent wheatgrass	2
	sheep fescue	3
	Magnar Great Basin wildrye	2
	Appar Lewis flax	2
	Delar small burnet	2
	forage kochia	2
	Ladak alfalfa	1
	yellow sweet clover	1
	Total	**17**

[1] PLS = Pure live seed

The existing road and two-track trail not included in the road construction area (14 acres) would be reclaimed to stabilize old road surfaces and reduce erosion and sedimentation. A few small sections

may not be reclaimed due to rockiness or very steep slopes around headcuts. The stabilization of the adjoining proposed road corridor due to reclamation and drainage control would reduce the discharge of sediments onto the reclaimed existing road. The few small unreclaimed sections would be expected to slowly revegetate due to stabilization of adjoining reclaimed road.

No special efforts would be expended on the existing fords on Quitchupah Creek as they are currently stable and would revegetate slowly when relieved of traffic.

The reclamation procedures would include:

- ripping the old road surface to relieve compaction,
- removing culverts and regrading road to natural grades and drainage,
- installing water bars per agency specifications,
- seeding to establish vegetation,
- mulching with coarse rock to protect reclaimed surfaces and maximize moisture retention,
- barriers to prevent traffic on reclaimed road surface.

For reseeding of low elevation saline soils a more drought and saline tolerant seed mix would be utilized (Table 2.2-4).

Table 2.2-4 Seed Mixture for Low Elevation Saline Soils Quitchupah Creek Road

Agency	Common Name	Application Rate (PLS Pounds per Acre)
BLM	Alkali sacaton	1
	Blue grama - Alma	2
	Galleta grass	2
	Gooseberry globemallow	2
	Black greasewood	1
	Castle Valley saltbush	2
	Kochia, prostrate	2
	Total	**12**

Quitchupah Creek Road Use

The proposed road would be utilized by haul trucks from the SUFCO Mine on a five days per week, 24 hours per day, 250 days per year basis. The rate of use would be dependent upon the amount of coal shipped to eastern markets. In addition, there would be traffic related to mine services, employee commutes, and general or recreational travel.

The coal hauling trucks currently in use on the Acord Lakes Road consist of a dual trailer with a loaded weight of 43 tons. These trucks would also be utilized on the Quitchupah Creek Road.

Operation and Maintenance

The proposed road would be maintained primarily by Sevier County, who would be responsible for scheduling of maintenance and repairs. Sevier County would also be responsible for monitoring storm event or runoff damage. The current road maintenance agreement between Sevier and Emery counties for the easternmost 1.5 miles of Quitchupah Creek Road would be revised. The Emery County portion of the road could be maintained by either county, by agreement.

2.3 ALTERNATIVE C - ALTERNATE JUNCTION WITH SR-10 AND ALTERNATE DESIGN

This alternate route would leave the proposed route in the southwest quarter of Section 13, Township 22 South, Range 5 East and proceed east across Section 18, Township 22 South, Range 6 East to the junction with SR-10 in the southwest corner of Section 17, Township 22 South, Range 6 East. This would be equal in length to Alternative B but it would bypass the grade on SR-10 that now slows loaded coal trucks and potentially slows all northbound traffic on SR-10. The grade for this alternative is 0.6 percent for loaded coal trucks. The loaded trucks would junction with SR-10 at a point 270 feet higher than the Alternative B junction where the grade for northbound traffic is 0.07 percent. This route would require less elevation change along the travel route and allow loaded coal trucks to utilize their momentum gained while descending Quitchupah Creek Road to ascend the 0.6 percent grade. The route would cross lower Link Canyon channel, as does the proposed route. The total acreage impacted would be 104.8 acres.

The Alternate Design would incorporate features to the proposed Quitchupah Creek Road to facilitate livestock movements within allotments, and also facilitate wildlife movements to and from the winter range. The wildlife/livestock facilities would include fencing portions of the road to keep the livestock off the roadway during the grazing season. Approximately 16.3 miles of fence would be installed under this alternative design. It is also proposed that five underpasses approximately 20 feet wide and 70 feet long would be incorporated into this build alternative to facilitate wildlife/livestock access to both sides of the fenced road for grazing purposes. The underpasses would also provide access to Quitchupah Creek, the only watering source in the allotments. Two additional underpasses would be constructed, one under the existing Acord Lakes Road adjacent to the intersection with the proposed Quitchupah Creek Road, and a second under the Quitchupah Creek Road to allow wildlife/livestock to cross under both roads at Broad Hollow during the spring and fall trailing.

While fencing and underpasses would allow trailing of livestock along portions of the proposed Quitchupah Creek Road, a continuous separate trail is not feasible due to constraints of the terrain.

LANDS

The lands crossed by this alternative include private, public, and State Institutional Trust Lands. Public lands include those managed by the USFS, Fishlake National Forest, and the BLM, Richfield Field Office (Figures 2-1 and 2-2). There are several private landowners along the route, listed as follows:

Thomas C. Bunn & Carolee Hammel
Castle Valley Ranches, LLC
Glendon E. Johnson, Jr.

Table 2.3-1 describes land status, length of build alternative within each jurisdiction, and estimated disturbance.

Table 2.3-1 Alternate Junction with SR-10 and Alternate Design Land Status and Proposed Disturbance

Land Management	Road Distance (miles)	County Jurisdiction	Construction Disturbance (acres)	Existing Road/Trail Disturbance (acres)	Staging Areas (acres)	Borrow Areas (acres)	Total New Surface Disturbance (acres)
USFS	2.3	Sevier	24.0	3.3	5	0	25.7
BLM	2.5	Sevier	21.1	1.4	10	0	29.7
State of Utah	1.1	Sevier	12.3	0.9	0	0	11.4
Private	3.4	Sevier & Emery	33.0	5.0	0	10	38.0
Totals	**9.3**		**90.4**	**10.6**	**15**	**10**	**104.8**

The road construction corridor, staging area, and borrow material area details for this alternative would be similar to the information presented in Alternative B, except this alignment would not require alteration of the SR-10 bridge crossing over Quitchupah Creek since no additional traffic lanes for accelerating and turning vehicles would be necessary at that site.

CONSTRUCTION PROCEDURES

The design, preparation of right-of-way and roadbed, and general construction procedures of this alternative route would be similar to the information presented in Alternative B.

Stream Re-Alignment

Stream re-alignment would occur at Stations 14+00-15+00, 22+00-25+00, 27+00, 29+00, 39+00-41+00, and 44+00 for a total of 1100 feet in Convulsion Canyon; and at Station 254+00, and from 260+00-262+00 for 450 feet in Quitchupah Creek. The stream re-alignment process requires a State of Utah Stream Alteration Permit. The permit will set conditions for hydraulic design of each realigned section to maintain the integrity of the creek both upstream and downstream. Figure 2-6 show a typical example of realignment.

Stream Crossings and Culverts

There would be eight stream crossings required during construction of the build alternative. Depending upon the season of construction, between three and five of these crossings would be expected to be wet. Stream crossings would require corrugated metal pipe culverts, multiplate culverts, or concrete box culverts depending on the volume of flow at each specific site. Additional metal culverts would be required at the numerous dry wash crossings.

Several culverts will be placed under the build alternative alignment to direct surface water runoff in order to protect the road integrity and decrease erosion potential. Figure 2-7 shows the alignment

of Alternative C with proposed culverts. Table 2.3-2 shows the design conditions for each culvert crossing.

Additional detailed measures would be required for stream crossings, drainage fill areas, and construction in wetlands.

Table 2.3-2 Quitchupah Alignment Alternative C - Culvert Sizing Design

Approximate Station	Design Flow (cfs)	Design Frequency (years)	CMP Diameter (inches)
361+25	19	25	30
375+00	25	25	30
383+75	3	25	24
390+40	3	25	24
393+50	581	100	108
417+25	16	25	24
419+55	536	25	108
456+80	104	25	60
477+80	11	25	24

Reclamation

Reclamation along the Alternate Junction with SR-10 alignment would be similar to the reclamation procedures identified in Alternative B.

Road Use

Use of the Alternate Junction with SR-10 road alignment would be equivalent to that identified in Alternative B.

Operation and Maintenance

Operations and maintenance actions and requirements along the Alternate Junction with SR-10 would be equivalent to those identified in Alternative B, except that additional maintenance by SSD of wildlife/livestock infrastructure such as fencing and underpasses would also be required.

2.4 ALTERNATIVE D - WATER HOLLOW ROAD

Water Hollow is a large northeast-southwest trending drainage which cuts through Old Woman Plateau on the Fishlake National Forest. The Water Hollow Road would utilize the Quitchupah Creek Road Alignment for 2.0 miles of the western most portion of its alignment. At this point, it crosses Quitchupah Creek and follows to the south of this drainage to Water Hollow. This alternative continues in an easterly direction along an existing jeep trail to Water Hollow Benches where it then turns south to Saleratus Benches. From Saleratus Benches, the Water Hollow Road alternative then turns northward to connect with SR-10.

The Water Hollow Road alternative alignment heads at about 7,550 feet above mean sea level (AMSL) and generally follows an existing jeep trail. The build alternative alignment is 11.2 miles long and drops 1,430 feet in elevation for an average grade of 2.5 percent. The descent into Water Hollow has an average grade of four percent, and the ascent out of Water Hollow onto Water Hollow Bench is seven percent for 900 feet. This alignment crosses several perennial and ephemeral tributary drainages, for a total of nine crossings. An aggregate borrow source of 15 acres would be located off-site either on BLM-administered public lands or from an existing aggregate operation. The material for the borrow source would be obtained from commercial or private sources. The acreage of impact for the Water Hollow Road is 155.4 acres (Figure 1-2).

LANDS

The lands crossed by this build alternative include mostly public lands and one parcel of private land. Public lands include those managed by the BLM, Richfield Field Office in Sevier County. The National Forest System lands are managed by the Fishlake National Forest headquartered in Richfield, Utah. The proposed route also crosses one parcel of State Trust Lands. The private landowner is listed below (see Figures 2-2 and 2-8):

Castle Valley Ranches, LLC

Table 2.4-1 describes the length of the build alternative within each jurisdiction and the estimated disturbance.

Table 2.4-1 Water Hollow Road Land Status and Proposed Disturbance

Land Management	Road Distance (miles)	County Jurisdiction	Construction Disturbance (acres)	Existing Road Disturbance (acres)	Staging Areas (acres)	Borrow Areas (acres)	Total New Surface Disturbance (acres)
USFS	2.52	Sevier	30.5	2.6	5.0	0	32.9
BLM	7.86	Sevier	95.3	0	5.0	15.0	115.3
State of Utah	0.26	Sevier	2.4	0	0	0	2.4
Private	0.53	Sevier	4.8	0	0	0	4.8
Totals	**11.17**		**133.0**	**2.6**	**10.0**	**15.0**	**155.4**

Details for design and construction are available for this alternative alignment (Appendix B). Wherever possible, design and construction practices similar to those described for the Quitchupah Creek Road alignment would be followed. However, the Water Hollow alternative alignment crosses significantly rougher terrain for much of its route and more extensive cuts and fills would be likely, as well as perhaps more substantial blasting requirements. This may require a longer period of construction. Road operations, maintenance, and usage would be similar to those described for the Quitchupah Creek Road alignment.

Stream Re-Alignment

Stream re-alignment would occur at Stations 14+00-15+00, 22+00-25+00, 27+00, 29+00, 39+00-41+00, and 44+00 for a total of 1100 feet in Convulsion Canyon. The stream re-alignment process requires a State of Utah Stream Alteration Permit. The permit will set conditions for hydraulic design of each realigned section to maintain the integrity of the creek both upstream and downstream. Figure 2-6 show a typical example of realignment.

Stream Crossings and Culverts

Four stream crossings would be required during construction of the road. Depending upon the season of construction, most would be wet. Stream crossings would require corrugated metal pipe culverts, multiplate culverts, or concrete box culverts depending on the volume of flow at each specific site. Additional metal culverts would be required at the numerous dry wash crossings.

Several culverts will be placed under the road alternative alignment to direct surface water runoff in order to protect the road integrity and decrease erosion potential. Figure 2-9 shows the alignment of Alternative D with proposed culverts. Table 2.4-2 shows hydraulic design conditions for the Water Hollow Route culverts.

Additional detailed measures would be required for stream crossings, drainage fill areas, and construction in wetlands. This route poses the greatest erosion hazard potential because of the extensive amount of cuts and fills that would have to be constructed in order to build the road, which would tend to expose more erosive material.

Table 2.4-2 Quitchupah Alignment Alternative D - Culvert Sizing Design

Approximate Station	Design Flow (cfs)	Design Frequency (years)	CMP Diameter (inches)
11+00(Convulsion)	123	100	60
15+00	66	25	48
20+00	173	100	72
47+40	112	25	60
70+00	234	100	72
80+00	8	25	24
92+65	191	25	72
100+50	33	25	36
115+00	61	25	42
119+30	419	100	96
131+33	95	25	60
142+85	59	25	48
150+40	25	25	24
158+35	16	25	24
171+30	22	25	30
177+00	1060	100	(2) 96
215+00	59	25	42
223+00	59	25	42
227+00	39	25	36
230+00	39	25	36
247+00	22	25	30
255+00	42	25	36
272+00	36	25	36
278+00	24	25	30
279+00	24	25	30
283+00	33	25	36
285+00	33	25	36
292+00	46	25	36
297+00	25	25	30
306+50	92	25	48
315+00	53	25	36
322+00	30	25	30
324+00	30	25	30
334+00	44	25	36
338+00	57	25	42
339+00	57	25	42
354+00	39	25	36
368+00	50	25	42
371+50	50	25	42
384+00	32	25	30
409+00	105	25	60
422+00	105	25	60
431+50	105	25	60
440+00	412	100	84
471+00	31	25	30
514+00	279	100	(3) 48
531+00	41	25	36
573+00	55	25	(2) 30

2.5 OTHER SCENARIOS CONSIDERED BUT ELIMINATED FROM DETAILED STUDY

Other alternatives or scenarios considered during agency review of the Proposed Action and during public scoping were centered around different routes for the road or different methods to ship the coal to market.

Different routes proposed basically considered constructing a road across the Old Woman Plateau or through Link Canyon. The Old Woman Plateau is an area south of the SUFCO Mine portal mostly on forest system lands that are managed as a research area and portions have restrictions prohibiting vehicle travel, so the construction of a haul road would require modifications of the existing forest management direction. The route through Link Canyon is located just west of the Town of Emery. Link Canyon has a good county-maintained road to the old mine workings where a portal could be located for loading trucks. The portal was identified in the Pines Tract EIS as a potential site for accessing coal in the Pines Tract. However, the SUFCO mine plan and mining schedule do not make this site economically feasible to construct and operate a loadout. Issues such as constructing a way through burning coal at the portal site and restructuring the mine conveyor system to discharge at this portal site were expensive items. The mine engineers for the BLM in a meeting on June 23, 2000, after reviewing the mine plans and conceptual plans for a Link Canyon Portal, advised the responsible USFS and BLM officials that a portal plan was not economically viable (Appendix C). Also, this alternative fails to meet part of the purpose and need because this route does not provide access to other sections of Sevier County.

Different methods to transport coal centered on constructing conveyor systems to convey coal to a loadout facility where trucks would then continue the transport to the destination in Carbon County. The first conveyor system suggested would begin at the SUFCO Mine portal then down East Spring Creek Canyon to Quitchupah Creek where a loadout facility would be constructed. The grade down East Springs Creek Canyon is too steep for a conveyor system so this alternative is not feasible from an engineering standpoint. A conveyor system in Link Canyon was also suggested, if a portal is feasible, because a county road currently exists in the canyon. A conveyor system in Link Canyon would require a loadout facility in the vicinity of Emery Town to load the trucks destined for Carbon County. Since a county road exists in Link Canyon that could be upgraded to a haul road, and the conveyor requires a road for maintenance and repair, the advantages of a conveyor system over a haul road were not clearly demonstrated either on a cost basis or on the impacts to the human and natural environments. Because the portal facility was not economically feasible, a conveyor system in Link Canyon becomes a moot point.

2.6 SUMMARY COMPARISON OF ALTERNATIVES RELATIVE TO ISSUES

Table 2.6-1 presents a summary comparison of resources potentially affected by each alternative. The information presented in this table is a summary comparison of the data presented in detail in Chapter 3 of this EIS. The effects identified in this table also assume that mitigation has been implemented. The comparison of effects also includes effects that are common to all build alternatives to demonstrate the relative effect of each alternative.

2.7 PAST, PRESENT, REASONABLY FORESEEABLE FUTURE ACTIONS

Council of Environmental Quality (CEQ) regulations (40 CFR 1508.7) define cumulative impact as "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonable foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time."

Past, present, and foreseeable future actions in the Quitchupah Creek Road Project Area have been developed. The action, year of occurrence, and estimates of residual, current, or anticipated effects, if any, are presented in tables provided in Appendix D. Actions are grouped by resource. The sum of the effects of these actions, in addition to the anticipated direct and indirect effects of the Proposed Action, will form the basis for the cumulative effects analysis. Appendix D presents a summary of past, present, and reasonably foreseeable actions in the Quitchupah Creek Road Project Area.

The cumulative area for most resources is the Quitchupah Creek Road Project Area, which is defined as the Quitchupah Creek watershed west of SR-10 and excluding the North Fork and Link Canyon drainage areas. The Quitchupah Creek watershed area as defined includes Convulsion Canyon, Spring Creek (where SUFCO Mine is located), the lower portion of Water Hollow Creek, the drainages on Water Hollow and Saleratus benches, the junction of Quitchupah Creek and North Fork, and the lower portion of Link Canyon. The cumulative area for noise, transportation, and socioeconomics includes the tri-county area of Carbon, Emery, and Sevier counties.

Table 2.6-1 Comparison of Alternatives

Key Issue	Alternative			
	A - No Action	B - Proposed Road	C - Junction & Design	D - Water Hollow Road
Road Costs 1 - length 2 - acres disturbed 3 - cost to construct 4 - round-trip miles saved	1 - 0 miles 2 - 0 acres 3 - $0 M 4 - 0	1 - 9.2 miles 2 - 101.7 acres 3 - $ 5.5 M 4 - 50	1 - 9.3 miles 2 - 104.8 acres 3 - $ 5.9 M 4 - 53	1 - 11.2 miles 2 - 155.4 acres 3 - $ 13.0 M 4 - 42
Geology 1 - landslide	1 - Landslide presently stable, not a threat to Acord Lakes Rd	1 - Landslide presently stable, not a threat to road	1 - Landslide presently stable, not a threat to road	1 - Landslide presently stable, not a threat to road
Air Quality 1 - cumulative effects	1 - Continued emissions and particulates due to extended haul	1 - The potential increase in emissions and particulates would be concentrated in Quitchupah Creek, but reduced area wide	1 - The potential increase in emissions and particulates would be concentrated in Quitchupah Creek, but reduced area wide	1 - The potential increase in emissions and particulates would be concentrated in Quitchupah Creek and Water Hollow, but reduced area wide
Noise 1 - noise level in canyon	1 - The noise level would remain "faint" in canyon	1 - The change in use to a high speed road would increase noise level from "faint" to "moderate" in canyon	1 - The change in use to a high speed road would increase noise level from "faint" to "moderate" in canyon	1 - The change in use to a high speed road would increase noise level from "faint" to "moderate" in canyon
2 - noise level in Town of Emery	2 - The projected increase in coal hauling would increase noise level from "moderately faint" to "moderate" in Emery	2 - The projected increase in coal hauling would increase noise level from "moderately faint" to "moderate" in Emery	2 - The projected increase in coal hauling would increase noise level from "moderately faint" to "moderate" in Emery	2 - The projected increase in coal hauling would increase noise level from "moderately faint" to "moderate" in Emery

Table 2.6-1 continued

Key Issue	Alternative			
	A - No Action	B - Proposed Road	C - Junction & Design	D - Water Hollow Road
Water Quality				
1- Quitchupah Creek	1 - Erosion continues on exposed existing road surface	1 - Sedimentation controlled due to design may reduce Total Dissolved Solids in creek	1 - Sedimentation controlled due to design may reduce Total Dissolved Solids in creek	1 - Disturbance of erodible soils not a factor to Total Dissolved Solids levels in creek
2 - salinity, Colorado River & 303d listing of lower creek	2 - Salinity in creek continues at existing levels	2 - Decreased salinity in creek may slightly decrease salinity in river system	2 - Decreased salinity in creek may slightly decrease salinity in river system	2 - Salinity due to discharges in ephemeral drainages would probably not be detectable in river system
3 - major culverts or crossings	3 - 16 non-culverted crossings (fords)	3 - 13 culverts	3 - 14 culverts	3 - 18 culverts
4 - sedimentation potential, road <500 feet to creek	4 - 73 percent of road/ 16.2 acres	4 - 69 percent of road/ 30.7 acres	4 - 63 percent of road/ 28.3 acres	4 - 20 percent of road/ 11 acres
Soils				
1 - erodible soils	1 - 40 percent of the two-track road is in erodible soils	1 - 40 percent of the road would be in erodible soils	1 - 40 percent of the road would be in erodible soils	1 - 56 percent of the road would be in erodible soils
2 - Farmland soils	2 - 0.0 acres impacted	2 - 1.4 acres impacted	2 - 1.4 acres impacted	2 - 0.0 acres impacted
Wetlands				
1 - filling of wetlands	1 - No filling of wetlands	1 - One wetland totaling 0.07 acres would be filled	1 - One wetland totaling 0.07 acres would be filled	1 - One wetland totaling 0.07 acres would be filled

Table 2.6-1 continued

Key Issue	Alternative			
	A - No Action	B - Proposed Road	C - Junction & Design	D - Water Hollow Road
Vegetation				
1 - riparian	1 - No filling of riparian zone	1 - Approximately 1.7 acres of riparian zone would be filled	1 - Approximately 1.7 acres of riparian zone would be filled	1 - Approximately 1.7 acres of riparian zone would be filled
2 - noxious weeds	2 - The existing scattered colonization would continue	2 - Disturbances in the 9.2 mile road corridor could be subject to noxious weed invasion	2 - Disturbances in the 9.3 mile road corridor could be subject to noxious weed invasion	2 - Disturbances in the 11.2 mile road corridor could be subject to noxious weed invasion
3 - specific analysis	3 - The only impact to vegetation would be road maintenance on east end	3 - The 9.2 mile road corridor would cause disturbance in 5 different plant communities	3 - The 9.3 mile road corridor would cause disturbance in 5 different plant communities	3 - The 11.2 mile road corridor would cause disturbance in 5 different plant communities
Wildlife				
1 - road hazard	1 - Road not a hazard to wildlife	1 - Wildlife would be subject to road hazards along the 9.2 mile road corridor	1 - Wildlife collisions would be reduced due to fencing and underpasses along the 9.3 mile corridor	1 - Wildlife would be subject to road hazards along the 11.2 mile road corridor
2 - raptor nesting	2 - Low level of human activity	2 - Noise and increased human activity may affect raptor nesting	2 - Noise and increased human activity may affect raptor nesting	2 - Noise and increased human activity may affect raptor nesting
3 - displacement	3 - Low level of human activity	3 - Human activity along 9.2 mile road corridor would cause displacement of wildlife	3 - Human activity along 9.3 mile road corridor would cause displacement of wildlife	3 - Human activity along 11.2 mile road corridor would cause displacement of wildlife

Table 2.6-1 continued

Key Issue	Alternative			
	A - No Action	B - Proposed Road	C - Junction & Design	D - Water Hollow Road
TES Species				
1 - TES plants	1 - Little potential to impact TES plants	1 - A high potential to impact TES plant habitats	1 - A high potential to impact TES plant habitats	1 - A low potential to impact TES plant habitats
2 - flycatcher	2 - No Effect on flycatcher habitat	2 - Flycatcher habitat (2.75 ac) in riparian zone would be impacted	2 - Flycatcher habitat (2.75 ac) in riparian zone would be impacted	2 - Flycatcher habitat (2.75 ac) in riparian zone would be impacted
3 - TES fish, impacts due to sedimentation	3 - Continued sedimentation may affect fish populations	3 - Decrease in sedimentation throughout project area	3 - Decrease in sedimentation throughout project area	3 - Decrease in sedimentation throughout project area
4 - Section 7	4 - No Effect	4 - No adverse effect	4 - No adverse effect	4 - No adverse effect
Range Resources				
1 - loss of forage	1 - 0 AUMs	1 - 4 AUMs	1 - 4 AUMs	1 - 5 AUMs
2 - changes in livestock operations	2 - No changes	2 - The road would force livestock operators to truck livestock between ranges	2 - The road would force livestock operators to truck livestock between ranges	2 - The road would force livestock operators to truck livestock between ranges
3 - road hazard	3 - Not a hazard	3 - The 9.2 miles of road would be a hazard to livestock	3 - No Effect, fencing and underpasses to keep livestock off road	3 - The 11.2 miles of road would be a hazard to livestock
4 - feed production on private land	4 - No Effect on pastures	4- The elimination of 1.4 acres of pasture land would reduce feed production slightly	4 - The elimination of 1.4 acres of pasture land would reduce feed production slightly	4 - No impact to pastures

AUM = Animal Unit Month

Table 2.6-1 continued

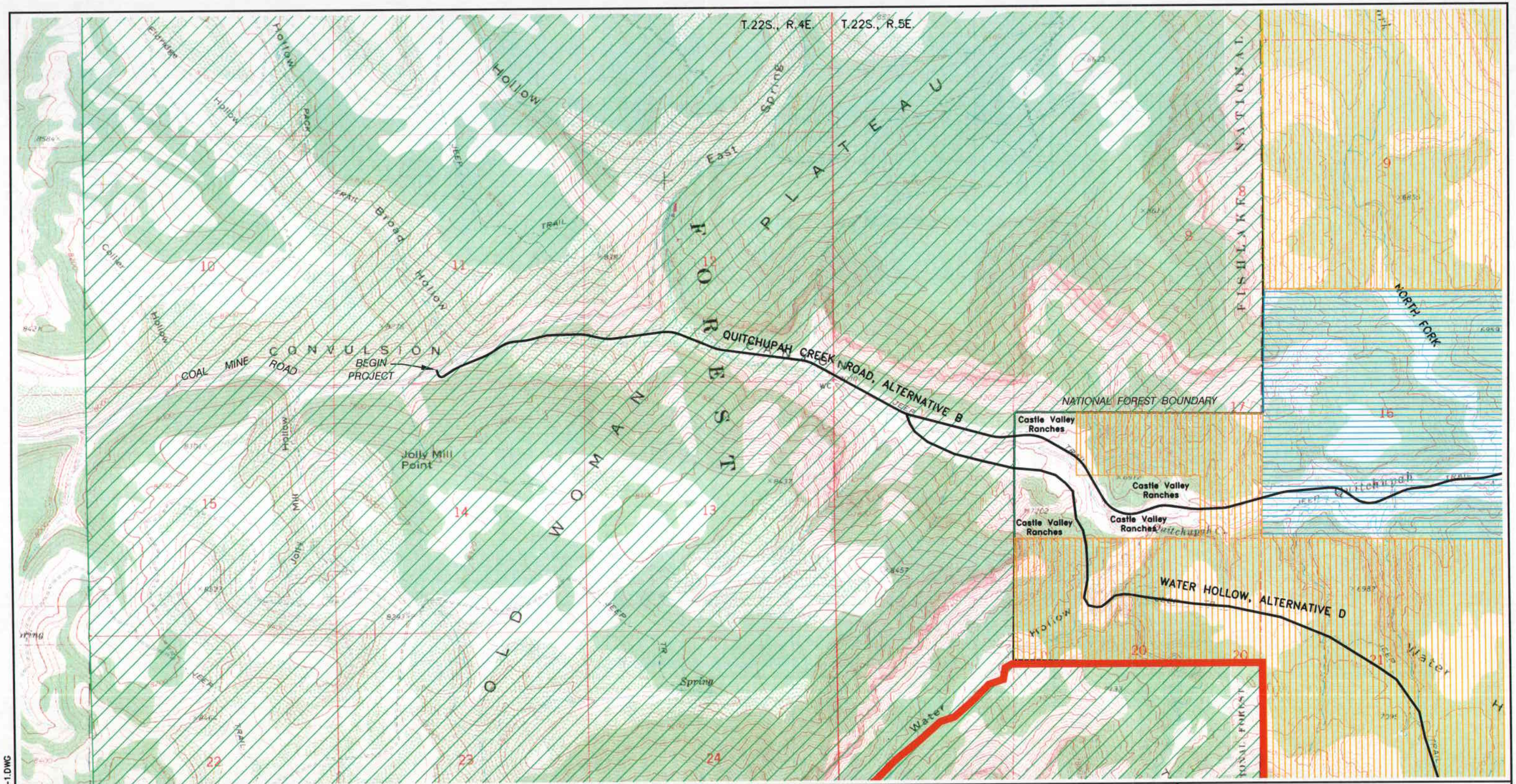
Key Issue	Alternative			
	A - No Action	B - Proposed Road	C - Junction & Design	D - Water Hollow Road
Visual Resources				
1 - change in aesthetics	1 - Peaceful and remote	1 - The road would change nature and peacefulness of this remote area	1 - The road would change nature and peacefulness of this remote area	1 - The road would change nature and peacefulness of this remote area
2 - road visibility	2 - Hardly visible	2 - The road would be readily visible, compared to existing road/trail, in the landscape	2 - The road would be readily visible, compared to existing road/trail, in the landscape	2 - The road would be readily visible, compared to existing road/trail, in the landscape
3 - Visual Class	3 - Compatible	3 - Compatible	3 - Compatible	3 - Compatible
Land Use and Recreation				
1 - traditional uses	1 - Traditional uses unaffected	1 - The introduction of easy access and industrialization would reduce or eliminate many traditional uses	1 - The introduction of easy access and industrialization would reduce or eliminate many traditional uses	1 - The introduction of easy access and industrialization would reduce or eliminate many traditional uses
2 - ATV access	2 - Existing road would continue as ATV route	2 - Existing road would no longer be used as ATV route	2 - Existing road would no longer be used as ATV route	2 - Existing road would no longer be used as ATV route
3 - roadless	3 - No roadless issues in area	3 - No roadless issues in area	3 - No roadless issues in area	3 - No roadless issues in area
4 - other facilities	4 - Facilities built around existing road	4 - Road construction would affect mine wastewater system, fences, and power line	4 - Road construction would affect mine wastewater system, fences, and power line	4 - Road construction would affect mine wastewater system, fences, and power line
5 - transportation corridor	5 - No issuance of right-of-ways	5 - No need of right-of-way in restricted area	5 - No need of right-of-way in restricted area	5 - Restrictions on issuance of right-of-ways
6 - private lands	6 - Road covered by prescriptive right-of-ways	6 - The road would cross 3.9 miles of private land requiring the acquisition of right-of-ways from 6 landowners	6 - The road would cross 2.93 miles of private land requiring the acquisition of right-of-ways from 3 landowners	6 - The road would cross 0.19 miles of private land requiring the acquisition of right-of-ways from 1 landowner

Table 2.6-1 continued

Key Issue	Alternative			
	A - No Action	B - Proposed Road	C - Junction & Design	D - Water Hollow Road
Cultural Resources				
1 - Sacredness	1 - Low level of impact to sacred ground; unknown impact to untested sites	1 - Violating sacred ground; a high potential to impact untested or unknown sites	1 - Violating sacred ground; a high potential to impact untested or unknown sites	1 - Violating sacred ground; a high potential to impact unknown sites
2 - rock art	2 - Low level indirect impact to known rock art sites	2 - Indirect impacts to known rock art sites	2 - Indirect impacts to known rock art sites	2 - No Effect to known rock art sites
3 - historical	3 - Little impact due to existing road	3 - Indirect impacts to historical sites and uses	3 - Indirect impacts to historical sites and uses	3 - Indirect impacts to historical sites and uses
4 - impacts to prehistoric sites	4 - Possible impacts to one eligible site	4 - 4-6 eligible sites	4 - 4-6 eligible sites	4 - 0 eligible sites
Transportation				
1 - reduce distance	1 - There would be no reduction in the round-trip haul	1 - Provide alternate route to mine and would reduce round-trip haul by 50 miles	1 - Provide alternate route to mine and would reduce round-trip haul by 53 miles	1 - Provide alternate route to mine and would reduce round-trip haul by 42 miles
2 - junction	2 - No change in existing junction	2 - The junction would require refitting of bridge and ascending steep grade on SR-10	2 - The junction would require only turn lanes on level grade	2 - The junction would require only turn lanes on level grade
3 - SR-10 surface	3 - The increased coal truck traffic will increase maintenance on SR-10 from milepost 0 to Muddy Creek	3 - The increased coal truck traffic may increase maintenance on SR-10 from milepost 9 to Muddy Creek	3 - The increased coal truck traffic may increase maintenance on SR-10 from milepost 10 to Muddy Creek	3 - The increased coal truck traffic may increase maintenance on SR-10 from milepost 6 to Muddy Creek

Table 2.6-1 continued

Key Issue	Alternative			
	A - No Action	B - Proposed Road	C - Junction & Design	D - Water Hollow Road
Socioeconomics				
1 - economic benefits, mine production, mine employment	1 - Increase in mine production, employment, and revenues due to increased contract sales to east	1 - A potential increase in mine production, employment, and revenues due to increased sales to eastern markets	1 - A potential increase in mine production, employment, and revenues due to increased sales to eastern markets	1 - A potential increase in mine production, employment, and revenues due to increased sales to eastern markets
2 -Emery County	2 - Increased economic stimulus and truck traffic due to contract sales	2 - Potential for increased economic stimulus, increased coal truck traffic due to future contracts	2 - Potential for increased economic stimulus, increased coal truck traffic due to future contracts	2 - Potential for increased economic stimulus, increased coal truck traffic due to future contracts
3 - fuel savings to SUFCO Mine	3 - No fuel savings to SUFCO Mine due to continued use of longer route	3 - The shorter haul route would have fuel savings up to 1.4 million gallons per year	3 - The shorter haul route would have fuel savings up to 1.5 million gallons per year	3 - The shorter haul route would have fuel savings up to 1.4 million gallons per year
4 - lifestyle impacts	4 - Traditional uses continue in canyon	4 - Impacts to current canyon users would occur	4 - Impacts to current canyon users would occur	4 - Impacts to current canyon users would occur
5 - UDOT Maintenance costs on SR-10	5 - Cost of $1.84 million	5 - Cost of $1.06 million, a savings of $773,000 as compared to No Action	5 - Cost of $0.92 million, savings of $918,000 as compared to No Action	5 - Cost of $1.27 million, savings of $564,000 as compared to No Action
6 - Safety	6 - No second route to SUFCO Mine, and increased probability of accidents due to increased coal truck traffic	6 - Second access route to SUFCO Mine; and increased probability of accidents due to increased coal truck traffic	6 - Second access route to SUFCO Mine; and increased probability of accidents due to increased coal truck traffic	6 - Second access route to SUFCO Mine; and increased probability of accidents due to increased coal truck traffic



EXPLANATION

ROAD ALIGNMENT

OLD WOMAN RNA

LAND STATUS

FOREST SERVICE

STATE

BLM

PRIVATE

INDEX MAP

2000 0 2000 FEET

N

QUITCHUPAH CREEK ROAD EIS

FIGURE 2-1
LAND STATUS AND OWNERSHIP MAP

jbr environmental consultants, inc.
Salt Lake City, Utah Cedar City, Utah Reno, Nevada Elko, Nevada

DESIGN BY	LM	DRAWN BY	CP	CH'D BY		SCALE	1"=2000'

DATE DRAWN	1/29/01
REVISION	7/2/01
	10/18/01

drawings\QUITCHUPAH\DEIS\FIGURE 2-1.DWG

T.22S., R.5E. | T.22S., R.6E.

NATIONAL FOREST BOUNDARY

FISHLAKE

NORTH FORK

Quitchupah Trail

Castle Valley Ranches

Castle Valley Ranches

Quitchupah Cr.

WATER HOLLOW, ALTERNATIVE D

Water Hollow

Tree Cove

FISHLAKE NATIONAL FOREST

Benches

Creek

QUITCHUPAH CREEK ROAD

Quitchupah ALIGNMENT B

ALTERNATE JUNCTION, ALTERNATIVE C

Glendon E. Johnson, Jr.

Thomas E. Bunn, et al

Thomas E. Bunn, et al

Thomas E. Bunn, Carole Hammel

Castle Valley Ranches

Castle Valley Ranches

LINK CANYON WASH

Wash

SEVIER COUNTY

EMERY COUNTY

Kenneth Lee, Earlene R. Christiansen

EMERY 3MI

STATE HIGHWAY 10

Glendon E. Johnson, Jr.

James V. Olsen, Trustee

SEVIER CO

EMERY CO

Earl R. & Dixie Olsen, Trustees

George E. & Patricia L. Olsen

Wynona P. Olsen, Trustee

Thomas C. Bunn, etal

Emery County

Josiah K. & Etta M. Eardly

Bonnie A. Petty, Trustee

END PROJECT

Consolidation Coal Company

Emery Co.

Gravel

drawings\QUITCHUPAH\DEIS\Figure 2-2.dwg

EXPLANATION

ROAD ALIGNMENT

OLD WOMAN RNA

LAND STATUS

FOREST SERVICE

STATE

BLM

PRIVATE

INDEX MAP

N

2000 2000 FEET

QUITCHUPAH CREEK ROAD EIS

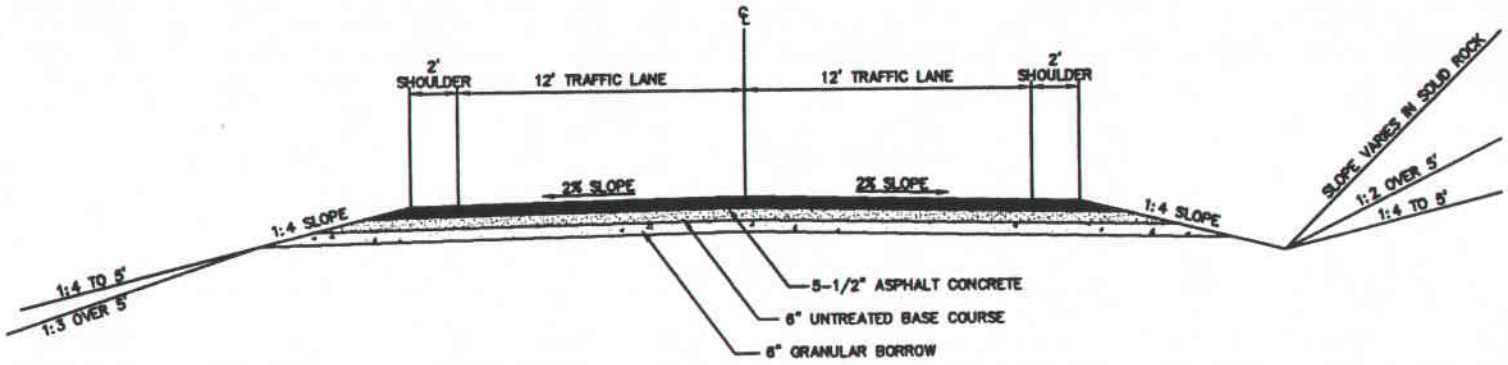
FIGURE 2-2
LAND STATUS AND OWNERSHIP MAP

jbr environmental consultants, inc.
Salt Lake City, Utah Cedar City, Utah Reno, Nevada Elko, Nevada

DESIGN BY	DRAWN BY	CH'D BY	SCALE
LM	CP		1" = 2000'

DATE DRAWN	REVISION
1/29/01	
	3/13/01
	6/30/01
	10/18/01

Quitchupah\PDESI\Figure 2-3.dwg



QUITCHUPAH CREEK ROAD EIS

FIGURE 2-3
TYPICAL ROADBED SECTION
FOR SUITABLE SOILS

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Drawing Courtesy of Jone & DeMille Engineering

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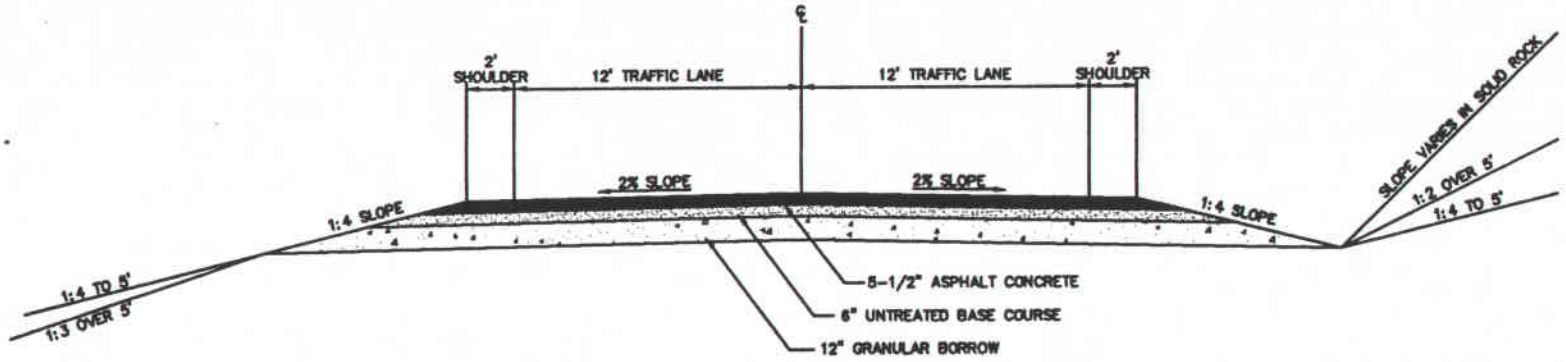

QUITCHUPAH CREEK ROAD EIS

FIGURE 2-4
TYPICAL ROADBED SECTION
FOR UNSUITABLE SOILS

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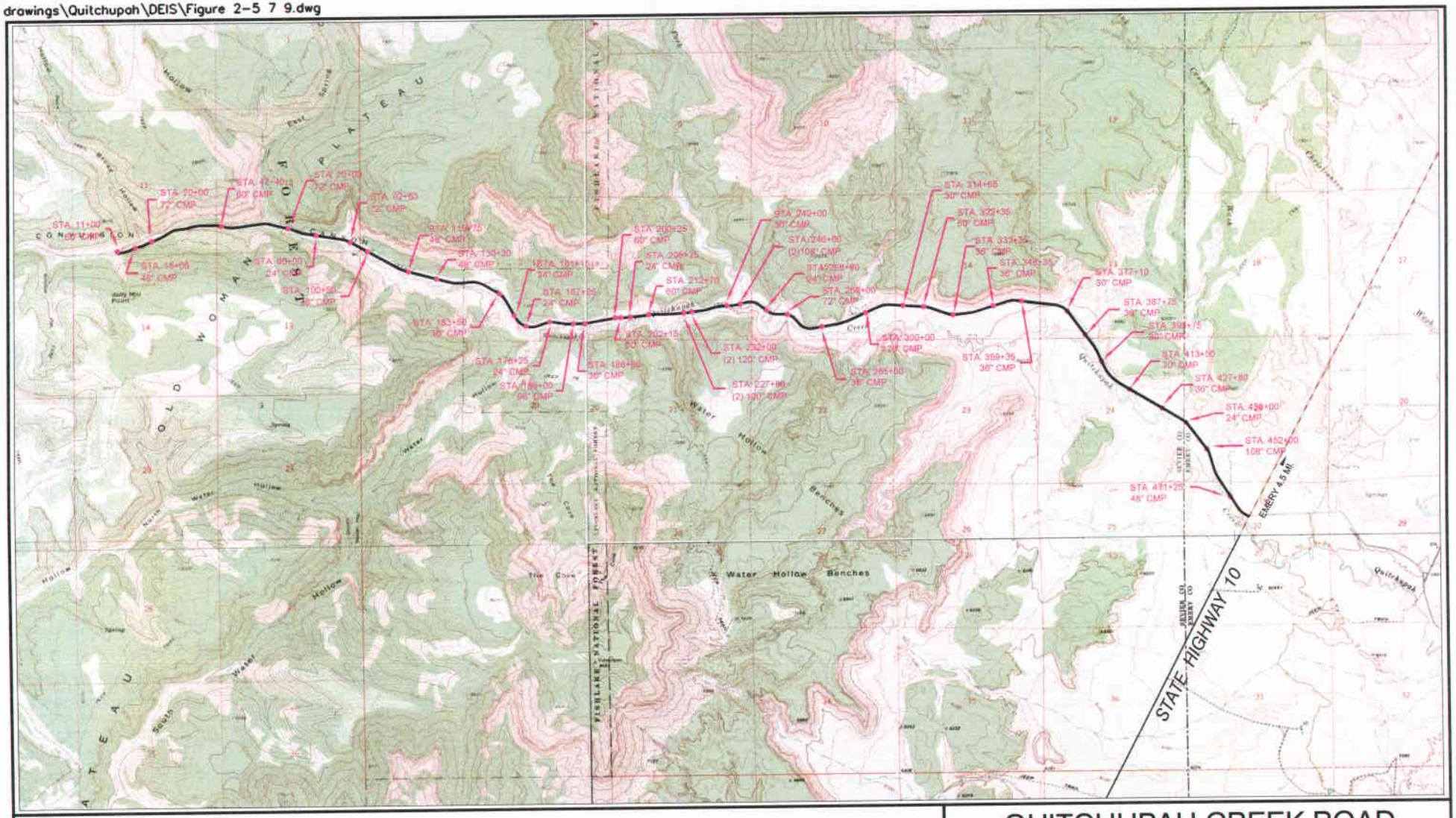

EXPLANATION

QUITCHUPAH CREEK ROAD, ALTERNATIVE B

CULVERT LOCATION

N

1 0 1 MILE

QUITCHUPAH CREEK ROAD EIS

FIGURE 2-5
ALTERNATIVE B CULVERT LOCATIONS

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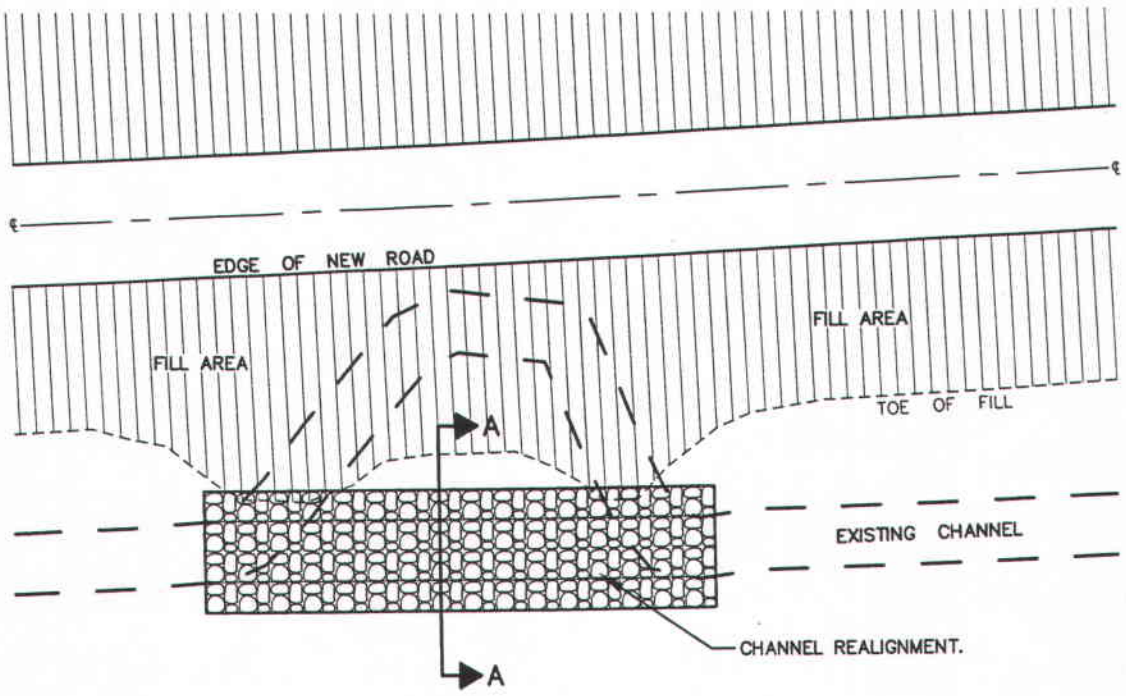
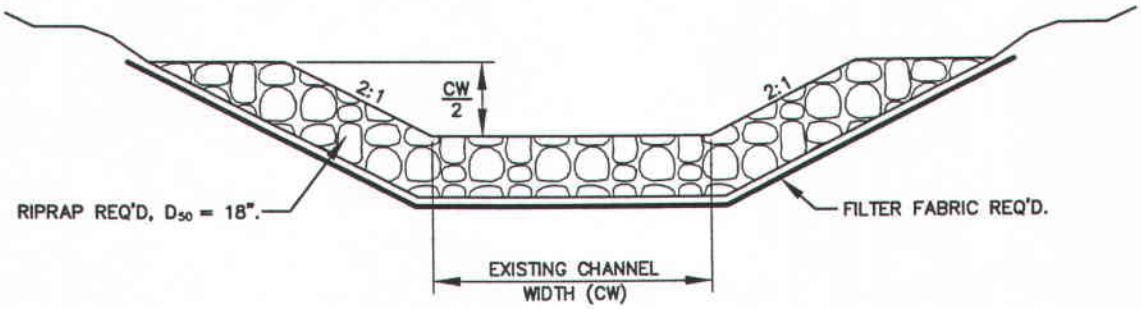


PLAN



SECTION A–A

NOTE: THICKNESS OF RIPRAP TO BE DETERMINED AS SHOWN IN SECTION A–A OF EXHIBIT "C".

QUITCHUPAH CREEK ROAD EIS

FIGURE 2–6
TYPICAL CHANNEL REALIGNMENT

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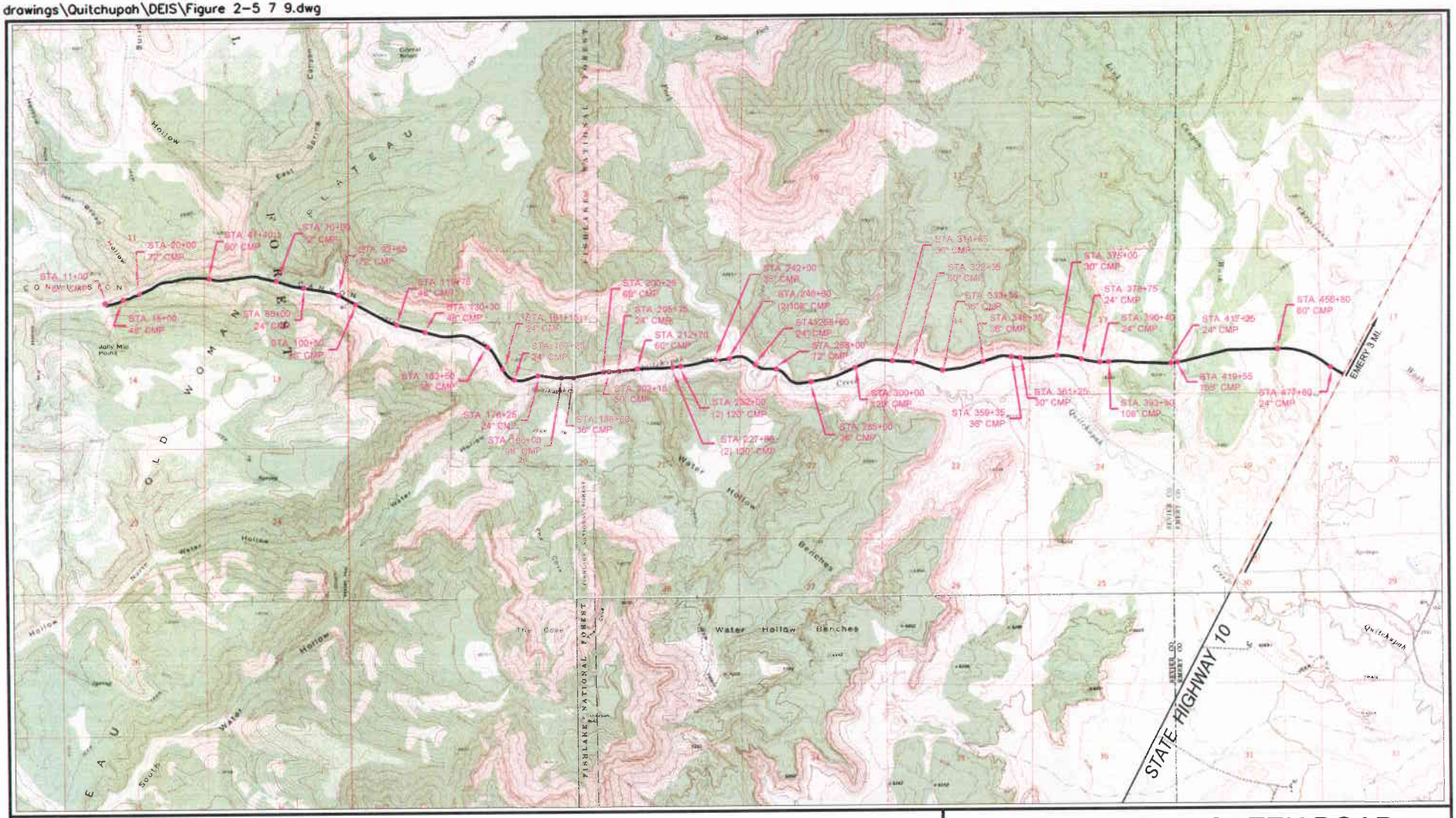

EXPLANATION

ALTERNATE ROUTE, ALTERNATIVE C

CULVERT LOCATION

N

1 0 1 MILE

QUITCHUPAH CREEK ROAD EIS

FIGURE 2-7
ALTERNATIVE C CULVERT LOCATIONS

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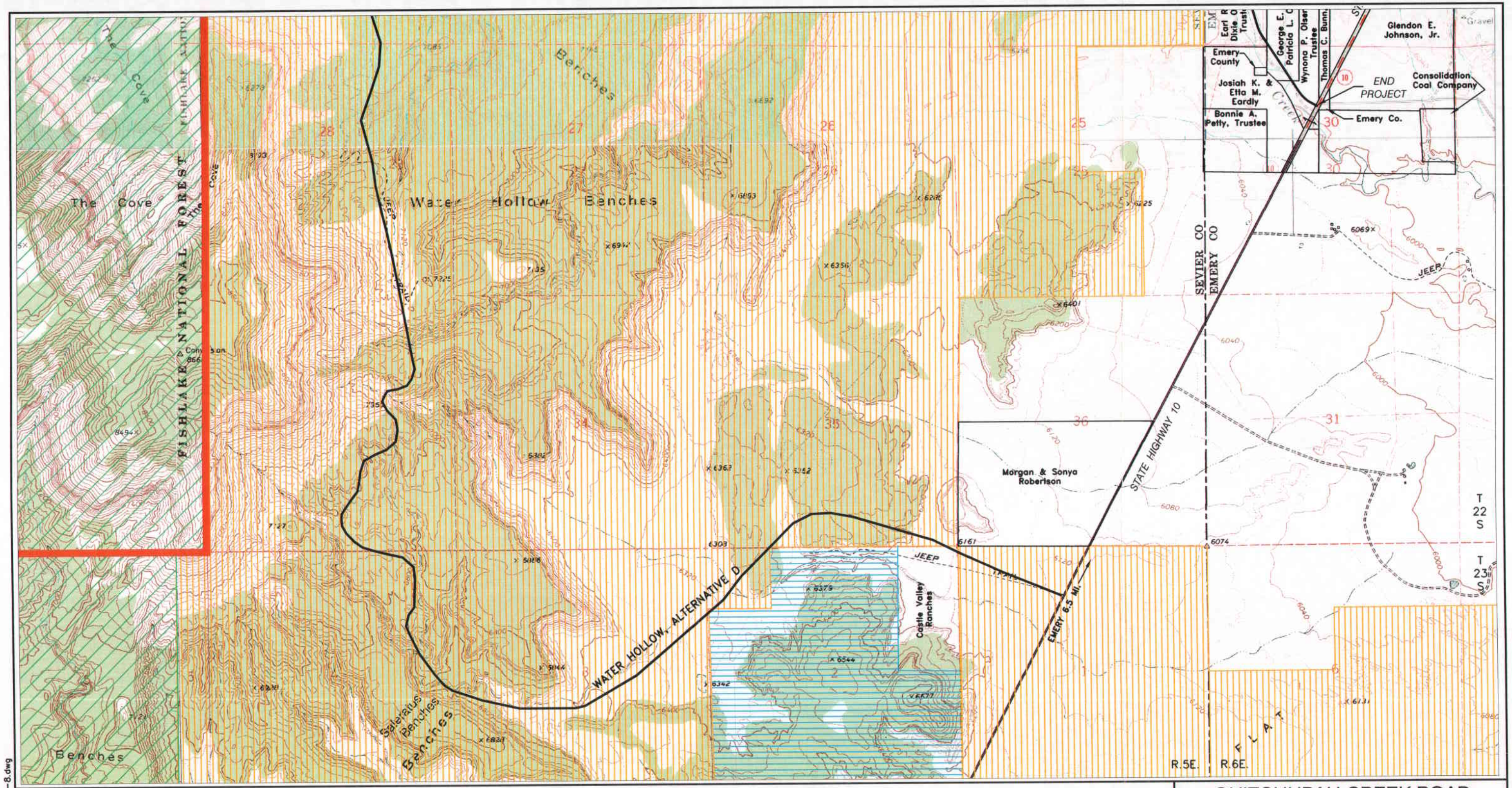

EXPLANATION

ROAD ALIGNMENT

OLD WOMAN RNA

EXPLANATION

LAND STATUS

FOREST SERVICE

STATE

BLM

PRIVATE

INDEX MAP

N

2000 0 2000 FEET

QUITCHUPAH CREEK ROAD EIS

FIGURE 2-8
LAND STATUS AND OWNERSHIP MAP

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Salt Lake City, Utah Cedar City, Utah Reno, Nevada Elko, Nevada

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				3/13/01	
				6/30/01	
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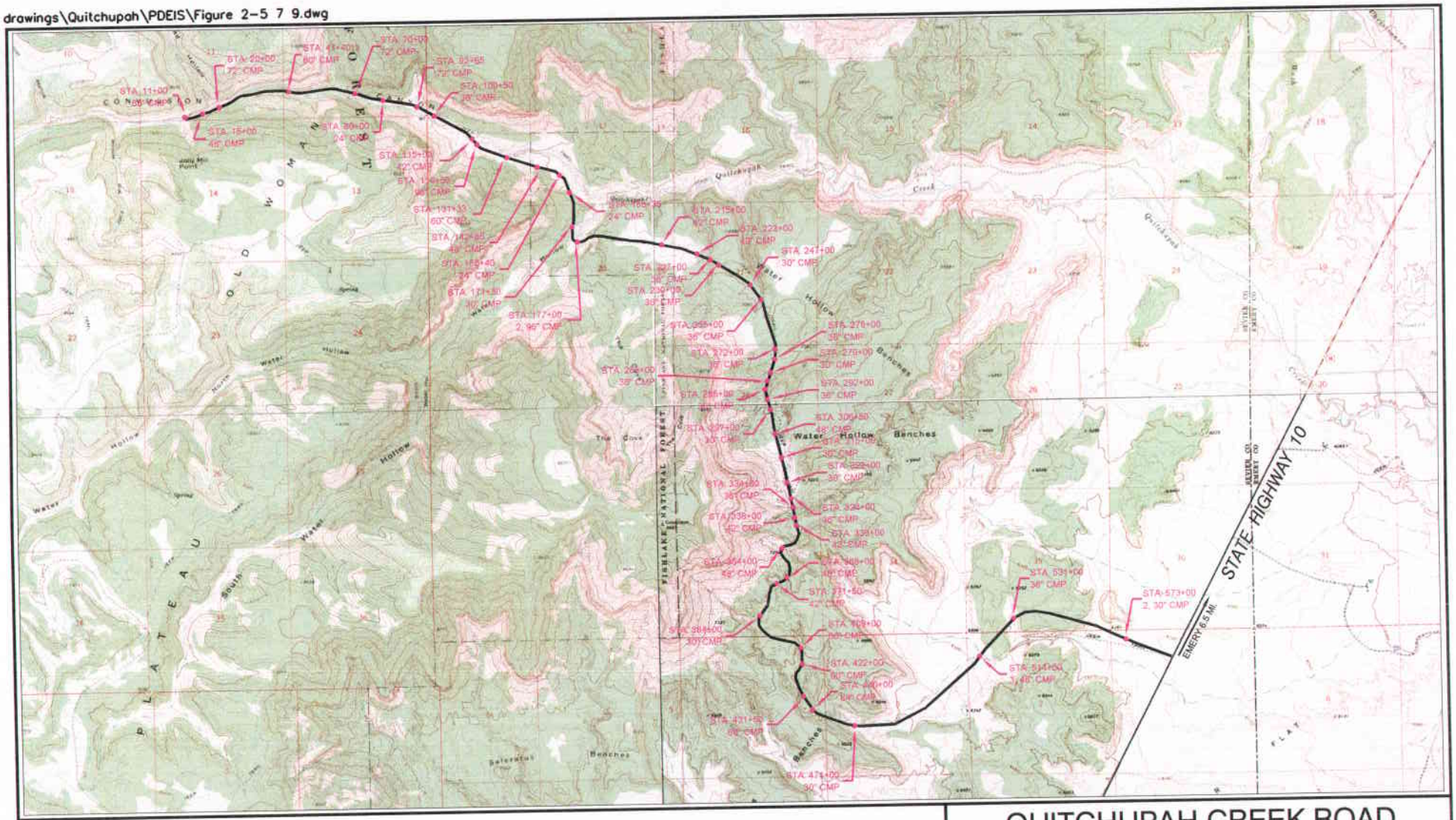

EXPLANATION

WATER HOLLOW, ALTERNATIVE D

CULVERT LOCATION

N

1 0 1 MILE

QUITCHUPAH CREEK ROAD EIS

FIGURE 2-9
ALTERNATIVE D CULVERT LOCATIONS

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	10/6/01
	10/26/01

CHAPTER 3.0

AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

3.0 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

The following sections describe the existing environment, as presented by individual resource elements, that would be affected by the Proposed Action and alternatives.

The BLM's NEPA Handbook (H-1790-1) requires that all EIS documents address certain Critical Elements of the Human Environment. The following critical elements are not present or are not affected by the Proposed Action or alternatives and are not discussed in this EIS:

- Areas of Critical Environmental Concerns
- Floodplains
- Hazardous or Solid Wastes
- Drinking Water/Groundwater Quality
- Environmental Justice
- Wild and Scenic Rivers

The following critical elements are present within the Proposed Action area and are carried forward for analysis:

- Topography, Geology, and Minerals - Section 3.2
- Air Resources, including Air Quality and Noise - Section 3.3
- Water Resources - Section 3.4
- Soils, including Prime or Unique Farmlands - Section 3.5
- Vegetation and Wetlands, including Riparian Zones and Noxious Weeds - Section 3.6
- Wildlife Resources - Section 3.7
- Fisheries and Aquatic Resources - Section 3.8
- Threatened, Endangered, and Sensitive Species - Section 3.9
- Range Resources - Section 3.10
- Land Use - Section 3.11
- Visual, Recreation, and Wilderness - Section 3.12
- Cultural and Paleontological Resources - Section 3.13
- Native American Religious Concerns - Section 3.14
- Transportation - Section 3.15
- Social and Economic Resources Section 3.16

3.1 ENVIRONMENTAL CONSEQUENCES

Potential direct and indirect impacts of the proposed Quitchupah Creek Road are discussed in this chapter. This chapter also evaluates direct and indirect impacts of the alternatives to the Proposed Action that are designed to reduce or eliminate potential impacts resulting from the Proposed Action.

The Proposed Action and alternatives are described in Chapter 2. Alternatives eliminated from further consideration are also described in Chapter 2.

The construction and continued operation of the proposed road would result in irreversible and irretrievable commitments of resources, residual adverse impacts, and cumulative effects.

- Irreversible commitments are those that cannot be reversed, except over a very long period of time.
- Irretrievable commitments are those that are lost for a period of time.
- Residual adverse impacts are those effects remaining after implementation of mitigation measures.
- Cumulative effects result from the incremental effects of the Proposed Action and Alternatives when combined with past, present, and reasonably foreseeable actions.

Implementation of the Proposed Action or alternatives would cause resources to be consumed, committed, or lost during and after closure of the project. Lands committed to the right-of-way would be permanently lost to other uses as the proposed road would be a public road integrated into the public transportation system of Utah. The increase in coal production at the SUFCO Mine is driven by contractual commitments, so the forecasted increase in coal hauling would continue under any of the alternatives including the No Action Alternative. There are no connected actions or other facilities to be built in conjunction with the proposed road.

The USFS and the BLM have reviewed all aspects of the Proposed Action and following alternatives to the Proposed Action: Alternative A - No Action Alternative; Alternative B - Quitchupah Creek Road Alignment (the proposed road); Alternative C - Alternate Junction with SR-10 and Alternate Design of Quitchupah Route; Alternative D - Water Hollow Road. The review included mitigation measures to avoid, minimize, and reduce adverse impacts to the environment.

3.2 TOPOGRAPHY, GEOLOGY, AND MINERALS

TOPOGRAPHY

From a regional perspective, the project area is predominantly located within the Wasatch Plateau Subsection of the High Plateaus Section of the Basin and Range-Colorado Plateau Physiograhic Province. The Wasatch Plateau is marked by gently rolling or near-flat surfaces on the plateau summits and stream cut canyons on the flank of the east flank plateau. The streams in typically steep canyons cut through the near-horizontally bedded resistant and non-resistant sediments and rocks. Adjacent to the Wasatch Plateau, the eastern end of the project area is located within the Mancos Shale Lowlands Subsection of the Canyonlands Section of the Colorado Plateau Province.

Topography in this Subsection is influenced by easily eroded sedimentary rock at the eastern base of the High Plateaus.

The horizontally bedded nature of these formations, as well as their component range of texture classes, is evident from the steep canyon walls, escarpments, and badlands visible in the project area. Flat ledges, vertical cliffs, and sloping erosional and depositional surfaces due to the differential erosion of interbedded shale and sandstones all contribute to the varied relief in the project area. Faulting and fracturing also affect the local topography, and in fact, the location of Quitchupah Canyon and its tributaries are likely dictated by the geologic structure. Topographic relief across the project site ranges from approximately 7,700 feet at the western boundary to 6,000 feet on the east.

No Action - Alternative A
The existing maintained gravel road and the two-track road would continue as slight modifications to the terrain.

Quitchupah Creek Road Alignment - Alternative B
The proposed road alignment traverses, and cuts through, numerous sedimentary geologic formations as it makes it way eastward across the plateau. The horizontally bedded nature of these formations, as well as their component range of texture classes, is evident from the steep canyon walls, escarpments, and badlands that dominate the project area. The construction of the road, even with blasting, would only slightly modify the topography. Steep side slopes and drainage crossings would be the most prominent modification.

Alternate Junction and Alternate Design - Alternative C
The impacts would be the same as those described in Alternative B.

Water Hollow Alternate Alignment - Alternative D
The impacts to topography would be similar to those described in Alternative B, but there would be additional large cuts and fills that would slightly modify the diverse terrain.

GEOLOGY

Sources of Granular Borrow Material
Sources of granular borrow are present along the Quitchupah Creek Road. A Quaternary alluvial deposit was identified on private land 1.3 miles west of the intersection of SR-10 and the existing road. The material is sandy gravel ranging in grain size from some boulders to minor fine sand and silt. If ten acres of the borrow area were excavated to a depth of 20 feet, a 50 percent recovery rate would yield 161,000 yd^3 of suitable granular material. Several other deposits of this alluvial material are visible from the existing Quitchupah Creek Road east and west of SR-10.

An adequate amount of granular borrow was not located along the Water Hollow alternate alignment. An alternative source granular borrow was not identified during this study.

Geology Review

All of the alternative routes for the proposed project would descend from the southeast side of the Wasatch Plateau through canyons into Castle Valley.

The project area includes the Cretaceous Mesaverde Group (roughly 2,000 feet thick in this area) consisting of siltstone, sandstone, and thin coal seams; and the Cretaceous Mancos Shale (roughly 4,000 to 5,000 feet thick) from west to east (Chronic, 1990).

West of the project area, the highlands are capped by the Price River Formation. Below the Price River Formation are the Castlegate Sandstone and the Blackhawk Formation which are separated by an unconformity. The west end of the Quitchupah Creek Road alignment begins in the cliff-bound portions of Convulsion Canyon. Descending through Convulsion Canyon, down which Quitchupah Creek flows, the following bedrock formations are crossed: lower Blackhawk Formation, Star Point Sandstone, Masuk Shale, and the Emery Sandstone. Once out of the canyon and east toward SR-10, Emery Sandstone and the Blue Gate Shale are crossed. Quaternary fluvial deposits and gravel terrace deposits predominate adjacent to Quitchupah Creek (Doelling, 1972), and the alignment would primarily be constructed on these materials. The Water Hollow alternate alignment would descend through a similar stratigraphic section. Figure 3-1 shows the surficial geology in the project area.

Along the Quitchupah Creek Road alignment most of the alluvial deposits are easily eroded fine sand to silts with minor coarse sand and gravel. The existing road in Quitchupah Creek Canyon is subject to the effects of erosion, and at times becomes impassable due to washouts and deposition of alluvial debris on lowlands. Near the east end of the existing road are Quaternary deposits consisting of coarse sands to cobbles and boulders with minor fine sand and silt. These alluvial deposits make a substantial portion of the existing road surface.

Landslide Review

Open-File Report 275, *The Landslide Map of the Salina 30' x 60' Quadrangle, Utah* (Harty, 1993), was reviewed to investigate the possibility that landslides might potentially occur in the project area. The only feature mapped in the area that might be of concern was located on the north side of Convulsion Canyon at the intersection of the existing haul road and the jeep trail. This feature, which does not occur within the proposed construction corridors, is mapped as "Landslides, and landslides undifferentiated from talus, colluvial, rock-fall, glacial, and soil-creep deposits." Other than identifying this singular geologic hazard, the Open-File Report gave no specific, pertinent information to the landslide issue in the proposed alignments.

A field investigation was conducted by a geologist in the vicinity of the noted landslide (JBR, 2000 e). Buttresses below the present haul road were observed and could be indication of previous mass movement. Minor soil creep and potential rock topple sites were also noted. An interview with SUFCO mine personnel, responsible for road maintenance in the vicinity, indicated that movement

on or near the state identified landslide area had not been noticed, thus indicating that this landslide area appears to be inactive and poses no threat to the proposed haul road route.

No Action - Alternative A
The No Action Alternative would have no effect on the geology of the area. There would be no irreversible or irretrievable commitment of resources.

Quitchupah Creek Road Alignment - Alternative B
The surficial geology of the Convulsion Canyon and Quitchupah Creek area would be affected by road construction. Road cuts would be made by blasting equipment. The area would be impacted by widening the road, which would change the appearance of some cliff exposures. The potential blasting areas include the following lengths between survey stations along the Quitchupah Creek Road alignment: Stations 25+00 to 50+00, 80+00 to 81+00, 108+00 to 111+00, 116+00 to 122+00, 156+00 to 174+00, 233+00 to 237+00, 262+00, and 275+00 to 283+00.

The mapped slide feature along the north side of Convulsion Canyon at the intersection of the existing haul road and the 4 x 4 trail should not affect the new haul road any more than it has affected the current haul road. However, throughout the location of the proposed project there may be the possibility of slumping, soil creep, and rock fall that have not been identified on a published map or specifically observed in the field. Numerous slides, slumps, mass movement and rock fall have occurred in the area in the past and would continue to take place in the future.

Shales and clays are interbedded with sandstones. These clays would have the potential of buckling, warping, slumping, and offsetting of the proposed road surface. Proper road construction techniques and construction designs would be implemented and followed in order to minimize these types of movements.

Alternate Junction and Alternate Design - Alternative C
Impacts would be the same as described for Alternative B.

Water Hollow Alternate Alignment - Alternative D
Impacts would generally be the same as described for Alternative B. The need to obtain an outside source of borrow materials may expand the area for the types of impacts described.

MINERALS
No mining claims are located in the immediate project area (BLM records). Each alignment follows canyon bottoms where locatable mineral deposits would not be expected to occur, or be economically feasible to mine. Placer deposits are not known in this area.

Authorized federal oil and gas leases in the project area are listed below, none are currently active:

UTU - 075067	Texaco	Section 17,18	T22S, R6E
UTU - 075062	Texaco	Section 13,14,15	T22S, R5E
UTU -074819	Texaco	Section 17,20,21,22	T22S, R5E
UTU - 072583	Texaco	Section 27,28,33,34	T22S, R5E
UTU- 075224	Texaco	Section 25,26,34,35	T22S, R5E
UTU - 075063	Texaco	Section 1, 12,14	T23S, R5E
UTU - 072753	Texaco	Section 3,4,5,8,9,10	T23S, R5E
UTU - 073214	Texaco	Section 2	T23S, R5E
SITLA oil & gas lease		Section 16	T23S, R5E

The coal leases near the project area belong to Canyon Fuel Company, the owners of the SUFCO Mine.

No leaseable or saleable minerals leases in the project area.

No Action - Alternative A
There would be no impact to coal tracts. Section 16 would be accessible by the two-track road.

Quitchupah Creek Road Alignment - Alternative B
The leaseable coal reserves in the area, adjacent to the project area, are currently being mined with underground methods by the SUFCO Mine or under lease to the mine. No other coal tracts have been delineated in the project area. There would be no impact to coal tracts due to the construction and operation of the proposed road.

SITLA has leased Section 16 in the project area for the exploration and development of coal-bed methane gas resources. The proposed road on public lands would traverse Section 16 and would provide improved access for exploration and development. Potential gas reserves on public lands would also be accessible.

Sand and gravel in disposal pits would be extracted for road construction.

Alternative Junction and Alternate Design - Alternative C
The impacts would be the same as those described under Alternative B.

Water Hollow Alternate Alignment - Alternative D
There would be no impacts to coal tracts or coal-bed methane gas fields as this alignment does not traverse Section 16, but does traverse gas leases on public lands. The road would improve access to oil and gas leases on public lands and could facilitate exploration and development.

Mitigation and Monitoring

Prior to start of the project, a BMP Report will be prepared to mitigate for any impacts, which might occur, during the construction of the road. This BMP report will relate to storm water protection and water quality monitoring. A schedule will be set up for the monitoring of all BMPs, and the construction supervisor, using a checklist, will observe and write down project conditions and compliance with the BMP report. That person will also make recommendations as to the repair or addition of BMPs. The reports will be placed in a central location and made available to any construction inspectors. At the end of the project, the reports will be placed into the As-built Report.

The issues that will be addressed in this plan will include the following:

a) Development of a site plan: this identifies the physical features of the site, the location of the proposed development, and the location of temporary and/or permanent BMPs. The purpose of which is to minimize earth movement and vegetation removal, the avoidance of steep slopes, and retain natural drainage systems. It also includes maintenance of this plan - meaning updating it regularly as conditions change;
b) Grading season and construction practices;
c) Access roads;
d) Dust control and topsoil management; and
e) Designs of temporary and permanent soil stabilization through engineered and bio-engineered techniques.

Irretrievable or Irretrievable Commitment of Resources and Residual Adverse Impacts

Depending on the alternative alignment selective, between 45 and 54 acres of permanent disturbance would occur. The development of the Proposed Action would represent a total of 100 to 155 acres of disturbance. Of this, approximately 38 to 80 acres would be reclaimed, depending on which alternative is selected. With proper road design, no residual adverse impacts to topography, geology, or minerals are anticipated from any of the alternatives analyzed above.

Cumulative Effects

Under Alternatives B and C, approximately 14 acres of existing road would be reclaimed reducing the acreage dedicated to road construction to 60 acres of permanent disturbance. There would be no cumulative impact to mineral resources.

3.3 AIR RESOURCES

AIR QUALITY

Air Quality Regulations

The air pollutant emissions associated with this project, which are listed under the Clean Air Act Amendments, National Ambient Air Quality Standards (NAAQS), are identified below. The NAAQS are health-based standards which serve to limit the concentrations of the following air pollutants:

- Particulates less than 10 microns (PM_{10})
- Sulfur Dioxide (SO_2)
- Oxides of Nitrogen (NO_x)
- Carbon Monoxide (CO)
- Volatile Organic Compounds (VOCs)[1]

When any of these pollutants are above specific levels, an area is described as non-attainment. Areas where the concentrations are below the specified levels are labeled as attainment areas. Non-attainment areas require that plans be implemented which will eventually cause the area to be in attainment. Attainment areas are controlled through permitting requirements for certain types of emission sources, and general air regulations, which can be expected to keep the area in attainment status. Attainment or non-attainment status is designated by airshed. Airsheds can be defined by county or geographical boundaries. The project area is an attainment area for all NAAQS pollutants.

In addition to regulations which are designed to protect against NAAQS violations, additional regulations are in place which limit the degradation of air quality in any area which is attainment for NAAQS. These federal regulations are referred to as Prevention of Significant Deterioration (PSD). PSD regulations address the pollutants' PM_{10}, SO_2, and NO_x. PSD regulations limit the amount of degradation of air quality in attainment areas to one of three levels. The three levels are Class I, Class II, and Class III, described as follows: Class I allows the smallest degradation and is applicable to pristine areas. Class II areas are the most common designation. Areas that do not fall into Class I (pristine) nor Class III (heavy industrial) are designated Class II. Industrial areas may be designated as Class III, but this designation does not apply to this study or area. All PSD areas in Utah are categorized as either Class I or Class II.

The project area is classified as a Class II-Attainment area under the PSD regulations, Part D, of the 1977 Clean Air Act Amendments. Attainment status means that current and past ambient air quality sampling indicates that state or federal criteria pollutant standards are satisfied. Class I areas are protected against adverse impacts to air quality related values, such as: visibility, odors, flora and fauna impacts, soil, water, geological, and cultural structures. Because of the potential of air

[1] VOCs are regulated because they are a precursor of ozone.

pollutants to be transported great distances, the project is assessed for both local impact and regional impact.

Regional Weather and Climate

The project area is located between Steppelands and Undifferentiated Highlands. Steppelands (semiarid) occur between the desert margins and higher mountain regions. The average annual precipitation of the Steppelands is less than the potential evapotranspiration. Undifferentiated Highlands, which are located west of the project area are generally considered as humid regions with severely cold winters and cool to cold summers.

Air movements are predominantly from the west and northwest, year round. Meteorological data obtained for Clawson, Utah-1986, in the region suggests the wind blows out of the west and northwest the majority of the time. The strongest wind blows from the west, with wind speeds exceeding 21 knots. The maximum wind speed west-southwest is around 6 knots.

Prevailing wind and dispersion patterns are modified by the complexity of the terrain. Significant diurnal drainage flows can be expected within the project area. Drainage flows (slope and valley winds) are likely with local geological features such as Quitchupah Creek Canyon. The project area may be subject to the possibility of inversions, with calm winds present slightly more than a quarter of time.

Existing Air Quality Environment

Based on the Environmental Protection Agency's (EPA) "Envirofacts Warehouse," which is part of the Aerometric Information Resource System (AIRS), there are no major sources located within a 20-mile radius of the project area. The closest major sources, Pacificorp's Huntington and Hunter power plants, are located 38 miles and 28 miles away from the project area, respectively. Arches, Bryce Canyon, Capitol Reef, Canyonlands, and Zion National Parks are Class I areas located within 100 miles of the project area. Capital Reef National Park is the closest Class I area, 25 miles south of the project site.

Little ambient air monitoring data is available for Emery, Sanpete, or Sevier Counties. The closest PM_{10} data found in EPA's AIRS database is for Grand County. PM_{10} annual average has ranged between 20 and 28 ug/M^3. Most documented data for other air pollutants in this area default to background levels (measured in Utah's pristine areas).

Currently, there is very little traffic on the existing Quitchupah Creek Road and, therefore, low vehicle emissions are likely. Existing vehicle traffic likely includes limited recreational private vehicles, agricultural vehicles, and rock art enthusiasts. Limited support vehicle travel related to operation of the SUFCO Mine, or Utah Power and Light Company (UP&L) maintenance trucks, may also be part of the existing traffic volume.

Vehicle traffic on the current road results in emissions of criteria pollutants. Mainly, particulate emissions resulting from vehicle traffic suspending silt and dust present on the roads. Public roads with low "average daily traffic" (ADT) have normal silt loading values of 0.4 grams per square meter of road surface area (g/m^2). EPA's geometric mean value for Western Surface Coal Mining haul roads were measured to have 40.8 g/m^2 silt loading.

The nearest stationary source of emissions to the project area is the SUFCO Mine. Based on its Utah Department of Air Quality permit, allowable emissions for the SUFCO Mine are 13 tons per year (tpy) for CO, 33 tpy of NO_x, 13 tpy of PM_{10}, 43 tpy of PM, and 3 tpy of VOC. However, mobile source emission impacts for haul truck emission estimates for hydrocarbons, CO, and NO_x are not included in these allowable emissions. Therefore, this study compares existing air pollutant emissions to emissions resulting from the proposed project.

Paved Road Emissions

Operation of motor vehicles on both paved and unpaved roads results in particulate emissions. These air emissions are mostly a result of re-entrainment of particulates into the atmosphere from dirt that has been deposited on the road surface. For all contaminants of a paved road surface, the initial deposit of the material on the road surface is generally coarse particles. Vehicles driving on the deposited material grinds it into finer particles and entrains it into the atmosphere as a regulated air pollutant, PM_{10}. The dirt that is on the road surface can be "track-out" dirt from connecting unpaved roads or from the shoulders of the road. Brake wear, diesel exhaust, tire wear, and spillage from haul trucks are also contributors to particulates on roadways. Track-out and spillage (if not controlled) are typically the largest contributors of silt loading, and thus fugitive dust emissions in regard to paved road pollutant emissions.

REGULATORY

A fugitive dust control plan would be required by the State of Utah to suppress particulate emissions during the construction phase of the project. Particulate emissions resulting from material handling and road dust would likely be mitigated to below estimated values. Because the net effect of air emissions associated with the proposed project would be a decrease in emissions, a comparison of the impacts on NAAQS and PSD standards is not applicable. The action alternatives, as compared with the alternative of not building/utilizing the road, are estimated to result in less of an impact for criteria and fugitive pollutants. Because of the decrease in emissions, Class I impact analysis will not have to be performed.

POTENTIAL IMPACTS

Emissions resulting from road construction, combustion emissions from vehicles on existing and proposed roads, and dust from haul road traffic are addressed below. Road construction would cause air emissions resulting from:

- Material handling activities,
- Internal combustion engine emissions, and
- Particulate emissions (road dust) from construction vehicles.

Material Handling

Material handling associated with construction of the road would result in particulate emissions impacts to the project area. PM_{10} emissions, that portion of the particulates less than 10 microns, are regulated by the NAAQS and PSD regulations. The particulate air emissions would result from earth moving activities associated with road construction. Material handling equipment is likely to include bulldozers, scrapers, compactors, haul trucks, asphalting equipment, etc. VOC emissions would likely result when paving the proposed haul road. However, the road construction emissions would be temporary, occurring only during the duration of the road construction. Emissions resulting from asphalting activities would be temporary, lasting slightly longer than road construction activities.

Construction and projected traffic use of the new road would result in air emissions of regulated air pollutants. The emissions resulting from construction activities are expected to be insignificant, occur in an area where background concentrations are low, and occur only during the duration of the construction activity. Emissions from the asphalt paving of the road would emit petroleum hydrocarbons during and slightly after the construction phase. Internal combustion engine emissions associated with operation of equipment during construction of the road would be of short duration and considered insignificant. Thus, emissions from construction activities would impact the study area for approximately a one-year duration. These impacts occur in an area where background concentrations from surrounding air emission sources are considered pristine. Quantitatively, health issues based on NAAQS ambient air standards for construction activity emissions are not expected to be of concern. With required standard regulatory controls (Utah's fugitive dust control regulations) ambient air pollutant levels should not be significantly affected.

The new vehicle traffic is expected to be principally coal haul trucks traveling to and from the SUFCO Mine. Support mining vehicle traffic would also likely increase.

Internal Combustion Engine Emissions

Operation of motor vehicles and construction equipment associated with the building of the road would result in emissions of air pollutants. The combustion of fuels, both gasoline and diesel result in emissions of the regulated pollutants of PM_{10}, SO_2, NO_x, CO, and VOCs. Published emission factors developed by EPA include CO, NO_x, and VOCs. PM_{10} is not usually a concern because diesel

combustion particulate is characteristically of large diameter and heavier weight. Particles from diesel combustion usually are not entrained in the air.

Particulate Emissions

The majority of air pollutant emissions generated in regard to the project would be particulates resulting from vehicle spillage and track-out. The largest contributor of these particulates would result from coal haul truck activity from the SUFCO Mine.

However, while the net change in air emissions would decrease, the location of these emission impacts would change. There would be concentrations of all air pollutants near the proposed road, which would be higher than would exist if the road was not built, because this area would be closer the source(s) of emissions. Similarly, there would be a decrease in impacts near the existing highways because less sources of emissions would exist near the roads, and because the overall quantity of emissions released in the general area would be less.

In Table 3.2-1, regional emission estimates (uncontrolled) are shown for four criteria pollutants for Alternative B and other alternatives.

Table 3.2-1 Emissions from Different Haul Road Scenarios for the Project Area

Location	Emissions			
Existing Road Only (Alt. A)	**PM_{10}**	**VOCs**	**CO**	**NOx**
Mining Production	**(lbs/day)**	**(lbs/day)**	**(lbs/day)**	**(lbs/day)**
1998 - 5.7 mmtpy	166,208	532	1,382	1,065
2001 - 6.7 mmtpy	195,373	626	1625	1,251
2002 - 7.7 mmtpy	224,538	719	1,867	1,438
max. - 10.2 mmtpy	297,606	953	2,475	1,906
Existing Road + Quitchupah Creek Road (Alt. B)	**PM_{10}**	**VOCs**	**CO**	**NOx**
Mining Production	**(lbs/day)**	**(lbs/day)**	**(lbs/day)**	**(lbs/day)**
1998 - 5.7 mmtpy	146,813	470	1,221	940
2001 - 6.7 mmtpy	156,584	502	1,302	1,003
2002 - 7.7 mmtpy	166,354	533	1,385	1,066
max - 10.2 mmtpy	190,852	611	1,587	1,222
Existing Road + Alternate to SR-10 (Alt. C)	**PM_{10}**	**VOCs**	**CO**	**NOx**
Mining Production	**(lbs/day)**	**(lbs/day)**	**(lbs/day)**	**(lbs/day)**
1998 - 5.7 mmtpy	145,793	467	1,212	934
2001 - 6.7 mmtpy	154,542	495	1,285	990
2002 -7.7 mmtpy	163,292	523	1,358	1,046
max. - 10.2 mmtpy	190,832	611	1,587	1,222
Existing Road + Water Hollow Road (Alt. D)	**PM_{10}**	**VOCs**	**CO**	**NOx**
Mining Production	**(lbs/day)**	**(lbs/day)**	**(lbs/day)**	**(lbs/day)**
1998- 5.7 mmtpy	150,022	480	1,248	961
2001 - 6.7 mmtpy	163,000	522	1,356	1,044
2002 - 7.7 mmtpy	175,978	564	1,463	1,127
max. - 10.2 mmtpy	190,832	611	1,587	1,222

No Action Alternative - Alternative A

Under the No Action Alternative, the current estimates for the existing road would apply for the short-term. In the near and longer terms, pollutant emissions would gradually increase with increased traffic to markets located to the east.

Quitchupah Creek Road Alignment - Alternative B
Emissions associated with the use of the road over an indefinite period would represent a reduction of overall emissions in the general area. If the proposed Quitchupah Creek Road is constructed and used for haul truck traffic, pollutant emissions in the region, both from internal engine combustion emissions and paved road emissions, would decrease due to the shorter haul.

Alternate Junction and Alternate Design - Alternative C
Impacts would be essentially the same as described qualitatively and quantitatively for Alternative B. Table 4-2.1 provides emissions estimates for this alternative and compares them to the other alternatives.

Water Hollow Alternate Alignment - Alternative D
Impacts would be the same as described qualitatively for Alternative B; quantitative emissions estimates, given in Table 3.2-1, are greater for this alternative than for Alternatives B and C due to the greater road length. However, they still indicate a net reduction in emissions over the existing condition.

Mitigation and Monitoring
No mitigation or monitoring measures are proposed beyond current Utah Division of Air Quality requirements.

Irretrievable or Irretrievable Commitment of Resources and Residual Adverse Impacts
An increase in emissions would occur within the Proposed Action area, due to increased coal truck traffic. No residual adverse impacts were determined under this resource for the Proposed Action area.

Cumulative Effects
Based on past, present, or reasonably foreseeable future actions, no cumulative impacts are anticipated to occur.

NOISE

The project area is generally characterized as rural or undeveloped. The town of Emery can be characterized as a rural community. Ambient or background noise in the majority of the project area is typically natural outdoor and wildlife sounds. Additional noise at the west end of the project area results from mining and haul truck activity associated with the SUFCO Mine. Local traffic and community activity are also noise sources associated with the town of Emery and are classified as ambient noise. Emery is located approximately three miles northeast of the project area.

Noise associated with construction activity is difficult to estimate. Construction activity noise levels would be temporary, thus, would have minimal long-term effects. Table 3.2-2 presents typical sound levels in dBA (decibel-A weighted) associated with noise sources.

Table 3.2-2 Sound Levels Associated with Ordinary Noise Sources

Noise Source	Noise Level	Subjective Description
Commercial Jet Take off	120 dBA	deafening
Road Construction Jackhammer	100 dBA	deafening
Busy Urban Street	90 dBA	very loud
Standard For Hearing Protection 8-Hour Exposure PEL (MSHA) Action Level	90 dBA 85 dBA	very loud loud - to very loud
Limits at 50 ft for Construction Equipment used on Government Contracts (US GSA)	80-75 dBA	loud
Freeway Traffic at 50 feet	70 dBA	loud
Noise Mitigation Level for Residential Areas (FWHA)	67 dBA	loud
Normal Conversation at 6 feet	60 dBA	moderate
Noise Mitigation Level for Serene Lands (FWHA)	57 dBA	moderate
Typical Office (interior)	50 dBA	moderate
Soft Radio Music	40 dBA	faint
Typical Residential (interior)	30 dBA	faint

PEL Permissible Exposure Level
MSHA Mining Safety and Health Administration
US GSA United States General Services Administration

The unit of sound level measurement is decibel (dB), expressed as dBA (decibel-A weighted). The A-weighted decibel measure is used to evaluate ambient noise levels and common noise sources. Environmental noise is best studied by A-weighted sound level. Sound measurements in dBA give greater emphasis to sound at the mid- and high- frequency levels, which are more discernible to humans. The decibel is a logarithmic measurement, thus, the value increases one fold for every increase in 10 dBA.

Generally, noise levels will be around 35 dBA in rural areas away from communities and roads. Within a rural community, the noise level ranges from 45 dBA to 52 dBA. According to the Noise Effects Handbook (NEH, 1998), the day-night sound level of residential areas should not exceed 55 dB to protect against activity interference and annoyance.

For this project, a total of six noise level monitoring sites were established and are described in the Final Noise Technical Report, Quitchupah Creek Road EIS (JBR, 2001a).

Site #1 - 8 - mile marker on Acord Lakes Road, approximately 30 feet south side of road, level with the road surface.

Site #2 - Intersection of Acord Lakes Road and Quitchupah Creek Road. Approximately 0.7 miles from mine site entrance gate and 35 feet from the center line of the haul road.

Site #3 - 1.75 miles east of Site #2 on Quitchupah Creek Road. Assume fence line of State-owned property and Canyon Fuel Company's property line; near the divergence of the Water Hollow alternate alignment.

Site #4 - 2.9 miles east of Site #2 on Quitchupah Creek Road.

Site #5 - Intersection of SR-10 and Quitchupah Creek Road, 80 feet from centerline of SR-10.

Site #6 - Downtown Emery at the town park, adjacent to SR-10, 90 feet from centerline of four lane SR-10.

The following statistical values were determined based on the noise study conducted on July 14, 1999. Background noise levels were assumed to be between 25 and 35 dBA; the sound level meter's minimum recording level was 40 dBA. Noise levels as a function of exceeding 50 dBA 50 percent of the time (L_{50}) and Equivalent Sound Level (L_{eq}) were compared for the six sites. This measurement, considered near the upper range that constitutes a disturbance or annoyance in rural communities, was highest for Site #1 and Site #2, as shown in Table 3.2-3.

Table 3.2-3 Results of Noise Level Monitoring

Site ID	Duration (minutes)	Traffic Count	Peak (Slow -A)/(A)L_{50}	L_{50}	L_{eq}	Subjective
#1	81	75 Haul Truck, 11 Vehicles	70/95	49.4	55.7	Moderate
#2	64	66 Haul Trucks 6 Vehicles	70/97	59.5	59.6	Moderate
#3	16	0	68/25	34.4	36.7	Faint
#4	13	0	35/25	31.1	35.0	Faint
#5	30	13 Vehicles (on SR-10)	74/75	34.7	52.3	Moderate
#6	40	2 Haul Trucks 7 Vehicles 8 Heavy Duty Trucks	56/75	34.8	47.0	Moderate to Faint

Table 3.2-3 also shows the L_{eq} value for each of the sites. This measurement of constant noise level, over a given period of time, expends the same amount of energy as the fluctuating level over the

same time period. The Federal Highway Administration (FHWA) considers tracts of lands in which serenity and quiet are of extraordinary significance and serve the public need to have a L_{eq} of no greater than 57 dBA. Site #2 exceeds this FHWA standard, while Site #1 is slightly below the standard. The Peak Slow-A value recorded at Site #3 was likely caused by the closing of the monitoring truck's door.

Data Analysis

Table 3.2-3 shows the actual sound level readings for all six monitoring sites. The prescribed background noise level (35 dBA) is zeroed out to aide in the graphic representation. The L_{50} noise levels shows the six sites as a function of exceeding 50 dBA 50 percent of the time. Hearing is affected (i.e, hearing loss) if the L_{eq} is equal to or above 70 dBA. None of the sites measured resulted in an L_{eq} near this EPA standard. Noise associated with haul trucks is episodic, thus the L_{eq} is significantly lower than that of a busy urban street. L_{eq} statical measurements are shown for the six sites in Figure 3-2. These types of community noise measurements show a significant difference in noise levels from the present haul truck route, background noise levels existing currently on the Quitchupah Creek Road, and expected noise levels for a rural community near a road. These are expected results, given the size and frequency of haul truck traffic, current conditions on the Quitchupah Creek Road, and the size and activity associated with the town of Emery. Subjective descriptions are used for the data and analyses performed during the noise study and are also shown in Table 3.2-3.

Background levels, which were expected to be higher at Site #5 because of a rainstorm, proved insignificant compared to traffic noise levels. Downtown Emery noise levels were slightly above background levels and comparable to roadside SR-10 levels.

Comparisons

Comparisons were made between Site #1 and Site #2 and the town of Emery (Site #6) in order to predict impacts to Emery, because of the similar road conditions and speed limits. Comparisons of the noise levels experienced on the existing Acord Lakes Road to the proposed Quitchupah Creek Road alignment and alternatives was also done, by assuming the high traffic volume conditions on Acord Lakes Road could be transposed to the proposed road.

REGULATORY

Occupational Safety and Health Administration (OSHA) and FHWA have the most comprehensive regulatory requirements in regard to noise and its abatement. OSHA is concerned with protection of workers within the workplace; OSHA regulations would not pertain to noise levels on transportation routes, and so would not be relevant to this project. Similarly, the FHWA policy issues guidance on noise abatement procedures as they relate to new state and federal highway projects, but such policies would not be relevant to this county-funded project. These guidance noise levels can, however, provide a scale to determine how the town of Emery would be impacted by an increase in haul road traffic in the future. Such an increase is not, however, predicted to occur

simply as a result of this project, according to the socio-economic analysis conducted for this project (JBR, 2001j). The following FHWA mitigative levels are listed below for informational purposes:

Leq ≤ 57 dBA: Lands on which serenity and quiet are of extraordinary significance and serve as important public need and where the preservation of those qualities is essential of the area is to continue to serve its intended purpose.

Leq ≤ 67 dBA: Picnic areas, recreation areas, playgrounds, active sports areas, parks, residences, motels, schools, churches, libraries, and hospitals.

Leq ≤ 72 dBA: Developed lands, properties or activities not included above.

POTENTIAL IMPACTS

No Action - Alternative A

The noise and vibration associated with haul truck traffic on SR-10 and in Emery would continue at levels dependent upon coal marketability.

Quitchupah Creek Road Alignment - Alternative B

L_{eq} and L_{50} levels at the town of Emery would remain analogous to existing levels because construction of the Quitchupah Creek Road would not increase coal haul traffic through Emery in the short term. However, the current conditions in Emery are expected to be greater than when the noise study was conducted due to a recent increase in coal contract sales (Table 3.2-3). If increases occur in the future, the town of Emery would likely experience an increase in noise levels (subjective description) from "moderate-to-faint" to a "moderate" characterization.

Assuming that the high traffic volume conditions currently on the Acord Lakes Road become transposed to the Quitchupah Creek Road, an equivalent L_{eq} of approximately 60 dBA could be experienced. Peak levels occur when two or more haul trucks travel together or pass each other on the road. If during this situation, the occurrence happens next to a canyon wall, noise level projection out to the environment is nearly doubled. Using the subjective descriptions, the area noise level would change from a "faint " to a "moderate" noise characterization. A "moderate-to-faint" classification would likely occur at, and to a distance of, 800 meters from the road. Since there is little damping effect by the sparse vegetative cover, noise levels would likely impact wildlife 200 meters and to a lesser extent 800 meters from the road, as described below.

Noise levels projected out to 200 meters can provide an estimate of impact to wildlife due to increased traffic on the Quitchupah Creek Road. However, with several values assumed, such as maximum permissible sound power level and sound level per frequency, this analysis is an inexact estimate. Using documented values for diesel engines sound power levels, and correlating recorded noise levels from Site #1, an estimate of the impact of haul truck (and other support vehicles) on wildlife can be estimated. The results of this exercise are as follows:

Sound Pressure Level	=	L_{PT}	=	49.70 dB
Sound Level	=	L_{pAT}	=	47.10 dBA

These values show that noise pressure and sound levels experienced at a distance of 200 meters away from the haul road would be approximately two times louder than existing, normal background levels. This assumes noise is projected equally in all directions. An increase in these measurements would be experienced if noise is prohibited from projecting in all directions, such as having a canyon wall immediately to one side of the haul road.

Under the assumption that approximately 40 percent of the existing haul truck traffic would travel through Quitchupah Creek Canyon, a measurable increase in noise levels in Quitchupah Creek Canyon would be experienced. Noise is measured on a logarithmic scale; this results in a one fold increase of noise levels for every 10 dBA. The immediate area of the road would likely experience an episodic two to three-fold increase in noise level measurements compared to existing conditions.

Regarding vibration, no direct assessments were made. Nonetheless, the sound pressure levels calculated show that at distances 200 meters away, a diesel engine will have enough energy to cause higher than normal sound pressure levels. Combining the noise level of a diesel engine with the associated noise of a 43-ton haul truck traveling at 40 miles per hour, it can be assumed sound pressure levels would be well above the calculated 49.70 dB.

Alternate Junction and Alternate Design - Alternative C
Noise impacts under this alternative would be similar to those for Alternative B. However, noise levels in underpasses may be more concentrated. This would mainly affect livestock and wildlife utilizing the underpasses as haul trucks pass on the road overhead.

Water Hollow Alternate Alignment - Alternative D
Noise impacts under this alternative would be similar to those for Alternative B.

Mitigation and Monitoring
No mitigation or monitoring measures are proposed.

Irreversible or Irretrievable Commitment of Resources and Residual Adverse Impacts
No irreversible noise related impacts are anticipated. An increase in noise levels would occur within the Quitchupah Creek area as a result of vehicle travel.

Cumulative Effects
The noise proposed by traffic on the proposed road would replace the noise from the sparse traffic on the existing road. Additional noise may be generated due to exploration and development of the gas field in Section 16.

3.4 WATER RESOURCES

The project area is located within the Colorado River Basin near the south end of the Wasatch Plateau. All drainage from the area flows to Quitchupah Creek or its tributaries, including Water Hollow Creek. A 1,700-foot or more elevation difference between the upper and lower ends of the project area influences the flow regimes and fluvial morphology of the streams within it. Precipitation ranges from averages of nine inches annually near the lower levels of the project area to more than 20 inches annually near the top of the Plateau.

Quitchupah Creek flows perennially, and receives significant amounts of flow from mine discharge into its North Fork, and irrigation return flow near the eastern project boundary. The SUFCO Mine monitors flow rate and water quality on a quarterly basis at several sites along Quitchupah Creek. Flow rate varies seasonally, but the region's larger perennial streams, such as Quitchupah Creek, typically peak in May and June as a result of snow melt runoff. However, later summer thunderstorms can also produce extremely high flows for short time periods (Thiros and Cordy, 1991). Runoff events in the ephemeral watercourses that feed Quitchupah Creek most commonly occur in July, August, and September from intense thunderstorms. Salinity, as measured by total dissolved solids (TDS), and sulfates increase in a downstream direction in Quitchupah Creek, in part because of geologic changes. Quitchupah Creek is morphologically an active stream, and became entrenched early this century. It conveys high sediment loads, and receives sediments from both upland and in-channel sources. Used under existing water rights, Quitchupah Creek provides water for irrigation and stock watering.

Water Hollow Creek flows into upper Quitchupah Creek from the southwest. It flows perennially, but no stream flow or water quality records are available. The Water Hollow Benches, south of Quitchupah Creek and east of Water Hollow Creek are dissected by numerous ephemerally flowing channels that drain primarily east and north. These ephemeral channels contribute to a high drainage density that results in extensive hydrologic connectivity of most parts of the watershed, and in turn results in high peak flows and rapid watershed response to intense thunderstorm events.

Downstream of the project area, and upstream of its confluence with Ivie Creek, Quitchupah Creek has been listed on the Year 2000 State of Utah's 303(d) listed as a TDS-limited stream segment.

The headwaters of Quitchupah Creek are close to 9,000 feet AMSL; at the western end of the proposed project, elevation of the creek (in this area, known as Convulsion Canyon Creek) is about 7,700 feet. Convulsion Canyon Creek conveys flows from the Broad Hollow, Spring Hollow, and East Spring Canyon tributaries to Quitchupah Creek. These flows join with Water Hollow Creek and the North Fork of Quitchupah Creek about midway through the project area. Numerous ephemeral channels are also tributary to Quitchupah Creek in the project area, including Link Canyon Wash that crosses the existing road near the eastern project boundary. To the south, the Water Hollow Benches area is drained by steep, entrenched, ephemerally flowing channels that trend primarily northeastward toward Quitchupah Creek. Elevation of Quitchupah Creek at the eastern project boundary is slightly more than 6,000 feet, and at that location, Quitchupah Creek drains an area of about 100 square miles.

Stream Channel Descriptions

Upper Quitchupah Creek and most of its tributaries are contained within narrow corridors between steep canyon walls. Functional flood plains in these upper reaches are essentially non-existent due to the canyon confinement, basin position, gradient, and flow regime. The stream-side areas where floods occur are not extensive, flat-surfaced overbank areas, nor do they possess extensive stream-lain alluvium, bar features, etc. Instead they are typically narrow extensions of the active channel where flood flows are conveyed within the confinement of the canyon walls.

Typically, once out of the confines of the canyons, these types of streams are generally freer to develop a floodplain. The extent of the floodplain depends in part upon flow regime and available material to construct the floodplain. At one time, Quitchupah Creek appears to have been a small, narrow stream with adjacent floodplains that supported homesteading and farming activities (Historical Committee of Emery, 1981).

However, currently, Quitchupah Creek is confined within a relatively narrow corridor between terraces, having vertically abandoned that historic floodplain. The stream was formerly at the surface of relatively thick, aggraded alluvium overlying the bedrock. But, as is typical of many streams in the region, it incised dramatically through that alluvium, resulting in an entrenched channel with a new base level with banks 50 or more feet high. Much of that incision apparently occurred as a result of a single runoff event in 1912 (Historical Committee of Emery, 1981). Currently, a limited floodplain has formed and functions between the incised banks. Field observations indicate that tributary channels have also been, and continue to be, undergoing rejuvenation to match this base elevation. In addition, the flashy, widely fluctuating stream flows, and the large amount of available sediments available for transport, make the possibility of Quitchupah Creek obtaining a true, dynamic equilibrium relatively unlikely. Down-cutting and head-cutting through the terrace materials is still occurring, although apparently to a lesser degree than during the main period of incision. The terrace materials, barren and over-steepened, are also subject to significant sloughing and mass wasting into the channel.

These over-steepened terrace slopes, as well as other upland slopes at or near angle of repose, appear to be subject to periodic sloughing or other forms of mass wasting. Whether the result of head-cutting from the mainstem or side tributaries, piping due to runoff, rock toppling, or other mechanisms, alteration of the terrain on the small scale appears common and frequent in the general area. The existing road also appears to exacerbate this type of erosion as well.

The stream stability ratings have been described in the Final Water Resources Technical Report Quitchupah Creek Road EIS (JBR, 2001b) and provide information about the stability of Quitchupah Creek at this "newer" base level. Quitchupah Creek's stability generally decreases with distance downstream. No reaches were rated as excellent; the majority were within the fair range. It is interesting to note that the three Quitchupah Creek aquatic sites were generally rated more stable than the nearby reaches. The lower Water Hollow Creek site had the second-best rating out of all locations studied.

The median diameter of the bed particles (grain size) at the bed surface of each of the locations where the stream stability ratings were done, indicate that the uppermost sites are generally sand and

smaller sizes, while the majority of the reaches were within the medium gravel sizes. These particle sizes would be readily moved as either suspended load or bedload during moderate runoff events.

The relative fineness of the bed particles reflects a stream system that conveys large quantities of sediments. Field observations during what appeared to be a fairly typical thunderstorm runoff event provide an indication of the level of sediments Quitchupah Creek conveys. While mapping channel features and collecting bed materials as part of the fisheries investigation (JBR, 2001c), an increase in bed deposits of approximately 0.75 feet vertical height was noted on the inside of a meander bed after a slightly more than bankfull flow event. The source of this material, while not known specifically, could easily have been from upland sources (tributary channels were observed to be running very turbid, overland flow was sediment laden), in-channel erosion of old terrace banks, or in-channel rearrangement of previously deposited sediments from further upstream channel bed, banks, or bars. Highly erodible soils are present throughout much of the watershed (JBR, 2001d) and upland sources of sediment. In summary, there is no shortage of available, easily transported sediment sizes currently in the system.

Flow Information

Quitchupah Creek has been the subject of numerous studies where flow monitoring has occurred over recent years. Much of this data has been reported and analyzed by Mayo and Associates (1997).

Flow measurements near the upper end of Convulsion Canyon (Station 046 on Figure3-3), made by Canyon Fuel Company on a quarterly schedule since 1983 (Canyon Fuel Company, 1999), range from 0.01 cubic feet per second (cfs) to 0.52 cfs. Downstream from that location, flows from East Spring Canyon, a pump house that discharges excess water from a water well, discharge from a mine sediment pond in East Spring Canyon, and numerous small ephemeral tributaries can all contribute flow to Quitchupah Creek above its confluence with the North Fork. East Spring Canyon Creek drains an area of about 8.5 square miles; Thiros and Cordy (1991) predict its average annual flow at about 1.8 cfs, and its 10-year peak at about 191 cfs. The SUFCO Mine (Canyon Fuel Company, 1999) records of quarterly flow monitoring since 1983 show flows at the mouth of East Spring Canyon Creek (Station 047A on Figure 3-3) ranging from 0.09 cfs to 1.1 cfs.

Observations of lower Water Hollow Creek in winter, 2000 indicated that, at least during those observed base flow conditions, this tributary to Quitchupah Creek supplies an amount of flow at least equal to the amount of flow in the main stem channel.

The North Fork of Quitchupah Creek is one of the primary tributaries to Quitchupah Creek. It is the receiving stream for the current Utah Pollutant Discharge Elimination System (UPDES) discharge point of about 1,000 to 1,500 gallons per minute (gpm) of groundwater intercepted from the existing SUFCO Mine. The discharge is essentially constant at that rate, and is anticipated to continue for a least the next several years. Generally, flow from the North Fork, including the mine discharge water, supplies about two-thirds of the flow in Quitchupah Creek at its confluence with the North Fork, according to Mayo and Associates (1997).

Irrigation also affects flows in Quitchupah Creek and in the lowermost reach of Link Canyon Creek. Figure 3-3 shows two locations where canal diversions remove water from Quitchupah Creek on a

seasonal basis. Further, field observations show that irrigation return flow from the Muddy Creek Canal enters both Link Canyon and Quitchupah Creek near the eastern project boundary.

Stream flows in the ephemeral channels that drain the Water Hollow Benches are not recorded, but can be expected to be erratic and flashy due to the nature of the precipitation events that produce them.

Water Quality Information

The Colorado River Basin Salinity Control Act, as amended in 1995, requires that USFS and BLM focus on minimizing salt contributions to the Colorado River from the lands that they administer. TDS concentrations are a measure of salinity. Specific conductance, and therefore, TDS varies seasonally within Quitchupah Creek (Thiros and Cordy, 1991). It also varies spatially, with a noted increase in a downstream direction. Both concentration and type of major ions change as the geology through which the flow passes changes, experiencing a dramatic difference as flow crosses the Mancos Shale area, noted for highly soluble salts. Water quality data (Mayo and Associates, 1997; and Thiros and Cordy, 1991) show that TDS increase in a downstream direction in Quitchupah Creek, with sulfates most noticeably becoming elevated. However, the noted TDS in the ranges of about 500 to 1,200 mg/l in Quitchupah Creek - just above the confluence of the North Fork - apparently do not hinder the existing beneficial uses of stock watering and irrigation. Some of the salinity contributed by Quitchupah Creek to the Colorado River system would originate from natural and/or accelerated erosion of Mancos Shale derived soils.

Immediately downstream of the project area, Quitchupah Creek is currently listed on the State of Utah's 303(d) list as being water quality limited for TDS. This means that the stream through that reach is not thought to be able to support its beneficial uses due to elevated levels of this parameter. Additional point sources of a listed parameter are not typically allowable under the UPDES program administered by the State Division of Water Quality. That agency has the regulatory authority for the Storm Water Discharge Permits that would be required for the proposed project; they would also have to provide 401 Water Quality Certifications for any wetland (Section 404) permits that the project would require. Further, the State Division of Water Rights would be required to insure that any Stream Alteration Permits they grant for the road meet water quality certification requirements by having Division of Water Quality Review. Currently, the listed Quitchupah Creek segment is not considered as a high priority for load allocation.

The aforementioned SUFCO Mine data do not include sediment analysis. However, suspended sediment data from various locations in the upper Quitchupah watershed show that area streams typically convey highly sediment-laden water during thunderstorm events; the Quitchupah Creek watershed seems particularly prone to this given the prevalence of highly erodible soils (JBR, 2001d).

While some of this sediment load may be from natural sources given the geologic, soil, and climate characteristics, existing land uses may exacerbate this. Grazing, instream cattle watering, and the proximity of the existing, unstable Quitchupah Creek Road are all potential sources of sediment. Because some of the erodible watershed soils are also saline (JBR, 2001d), sources of sediment must also be considered as sources of TDS.

Data are not available for Water Hollow Creek, but it likely has a similar water quality to upper Quitchupah Creek above the North Fork, given the similar geology through which it flows.

Groundwater Resources

As noted in the Final Geology Technical Report for this project (JBR, 2001e), the Quitchupah Creek Road alignment would be constructed primarily on Quaternary fluvial deposits and gravel terrace deposits adjacent to Quitchupah Creek. These unconsolidated alluvial and colluvial deposits are generally permeable, but are discontinuous and of varying thicknesses. Given these characteristics, they historically functioned as minor valley aquifers with rapid recharge and discharge capabilities, and were closely tied to streamflow, storm runoff, and precipitation patterns. Currently, much of the alluvium is separated vertically from Quitchupah Creek's active fluvial system (as a result of its incision). Once storing enough groundwater to enhance farming activities (Historical Committee of Emery, 1981), these abandoned floodplains now only function as terraces; these materials no longer represent a source of shallow groundwater.

Bedrock formations that are adjacent to (or are overlain by) the alluvial deposits through which all of the road alternatives would cross are the lower Blackhawk Formation, Star Point Sandstone, and three members of the Mancos Shale Formation (the Masuk Shale, the Emery Sandstone, and the Blue Gate Shale). These formations consist of interbedded horizons of varying thicknesses of sandstone, siltstone, mudstone, and shales. The coarser of these horizons support groundwater, while the more impermeable, finer beds impede its vertical movement and redirect its horizontal flow. Movement and discharge of groundwater is stratigraphically controlled by these interbedded layers and by secondary permeability via faults and fractures. Recharge areas are spatially limited. For these reasons, as demonstrated by others (Mayo and Associates, 1997; Thiros and Cordy, 1991), groundwater in the general vicinity of the project area is typically localized within small, perched zones, and is inactive. Consequently, the project area does not overlie any regional aquifers capable of supporting significant water usage.

Water Rights

Information from the Utah State Engineers' office indicates that there are numerous water rights that are held in the vicinity of all of the alternate road alignments. The majority of these are rights for stock watering directly on Quitchupah Creek, Water Hollow Creek, and their ephemeral tributaries. In fact, essentially all water courses, both perennial and ephemeral, within the project area are subject to these in-channel stock watering rights. Typically, these surface water rights for stock water do not give specific quantities of water; instead, they specify a stream reach and duration whereupon a given number of livestock may drink.

Two points of diversion of irrigation water from the creek are also located near the proposed road upgrade, as shown on Figure 3-3. The quantity of water associated with the upstream diversion is four cubic feet per second (cfs).

REGULATORY

Appropriate permitting and consultations with the Corps and the UDWR Stream Alteration section would be required. In Utah, the Corps regulates fill in "waters of the U.S." in intermittent and ephemeral channels, and the state has primacy for actions in perennial streams.

No Action - Alternative A

There would be no change to the current state of water resources and existing influences on it as a result of the No Action Alternative in regard to regulatory impacts. No Stream Alteration Permits would be needed under this alternative. The existing road would remain in place and in use, and the existing twelve stream crossings would remain as fords.

Quitchupah Creek Road Alignment - Alternative B

The proposed Quitchupah Creek Road alignment would cross Quitchupah Creek and its tributaries at four locations. However, the number of crossings would be reduced in number from those that exist on the current road. Table 4.4-1 shows the number of crossings currently on the road, and the number required for each alternative. Crossings currently are primarily undesigned fords that are subject to washing out. No fords would exist on the proposed road; proposed crossings would be culverted. Culverts (two intermittent, one perennial crossing) on the Fishlake National Forest lands would be designed as per USFS specifications for the peak flow from a 100-year, 24-hour storm event. Other culverts would be designed to pass the peak flow from a 25-year storm event as required by governing agencies. Additional sediment passage, debris trapping, and fish considerations would also be accommodated at all culverted crossings. Culverted crossings are further discussed in potential impacts.

Table 3.4-1 Stream Crossings - Quitchupah Creek Road and Alternatives

Stream Regime	Existing Road (Same as Alternative A)	Alternative B	Alternative C	Alternative D
Perennial	8	4	4	3
Intermittent	2	2	2	2
Ephemeral	6	7	7	13
Total	16 fords	13	13	18

Table3.4-2 provides measurements made in the field at most of the proposed crossings. The volume per foot column represents the approximate volume of defined waters (under or stream-ward of the Ordinary High Water Mark) per foot through the width of the crossing that would be filled either by the culvert itself or associated back fill.

Table 3.4-2 Waters of the U.S. or State at Crossings - Quitchupah Creek Road

Station	OHWM width (inches)	OHWM depth (inches)	Volume/ foot	Channel Description
10+50	30	6	1.25 cu. ft.	Intermittent Section of Quitchupah Creek
20+00	30	6	1.25 cu. ft.	Intermittent Section of Quitchupah Creek
74+00	40	11	3.06 cu. ft.	East Spring Canyon (perennial)
95+00	40/23	2	0.44 cu. ft.	ephemeral tributary
175+00	52/42	6	1.95 cu. ft.	ephemeral tributary
200+00	33/21	8	1.60 cu. ft.	ephemeral tributary
215+00	32/21	8	1.50 cu. ft.	ephemeral tributary
228+00	108/48	18	9.75 cu. ft.	Quitchupah Creek (perennial)
232+00	108/48	18	9.75 cu. ft.	Quitchupah Creek (perennial)
250+00	156/72	30	23.75 cu. ft.	North Fork (perennial)
270+00	102/78	10	6.25 cu. ft.	ephemeral tributary
301+00	57/48	5	1.82 cu. ft.	ephemeral tributary
450+00	114/97	12	8.79 cu. ft.	Link Canyon (ephemeral)

The Quitchupah Creek bridge on SR-10 near the terminus of the alignment would require alterations, and the Corps 404 issues would have to be considered as part of that activity.

Some overbank fill areas may also be associated with these crossings, as well as with six areas in Convulsion Canyon and two separate areas where the road toe may infringe on a channel meander bend in Quitchupah Creek. These overbank areas are not flood plains in the morphological sense of an extensive alluvial overbank area subject to frequent reworking by stream flows; however, they may be considered flood plains in a regulatory sense. Filling of such areas would be restricted to isolated areas directly associated with the culvert crossings, or in the case of road toe infringement, for very short reaches. Any wetlands associated with these areas would be properly dealt with through the Corps 404 permitting process as described in the Vegetation Technical Report (JBR, 2001k).

In addition, a reach of upper Quitchupah Creek, near the western road project area, would require realignment. While the channel in this location is small, fairly straight, lacking a defined morphologic floodplain, and is already apparently spatially confined by the existing road, regulatory issued dealing with floodplains and wetlands would also apply to this section of road.

Additionally, a potential regulatory issue is the 303(d) listing of the downstream segment of Quitchupah Creek for TDS. The Division of Water Quality would oversee this potential impact through its issuance of a permit for storm water discharges during construction, and through its issuance of Stream Alteration Permits associated with any crossings and realignments where waters of the State are present. Longer term, post-construction impacts to water quality are described in potential impacts.

Water right holders have the authority to use Quitchupah Creek waters for instream stock watering and irrigation. The integrity and functioning of the irrigation system would be maintained with the construction of the road; access to those features would be maintained. The stream would remain accessible to livestock, as well, water right holders' ability to use their water rights would not be compromised. Further, the project would not reduce the amount or quality of available water to meet those rights.

Alternate Junction and Alternate Design - Alternative C

Regulatory impacts would generally be the same as for Alternative B. This alternative would require most of the same crossings as the Quitchupah Creek Road alignment, as shown in Tables 3.4-1 and 3.4.-2. The exception is the Link Canyon crossing that would be upstream from the location for Alternative B. There would be no need to alter the Quitchupah Creek bridge crossing at SR-10 under this alternative.

Water Hollow Alternate Alignment - Alternative D

The Water Hollow alignment would require stream crossings in 18 locations, as shown in Table 3.4-3. The majority of these would be ephemeral washes, however crossings would be needed at three perennial locations: East Spring Creek, Quitchupah Creek above Water Hollow, and Water Hollow Creek. Appropriate permitting and consultations with the Corps and the UDWR Rights Stream Alteration section would be required. Table 3.4-3 provides measurements made in the field at the majority of the crossings. It is important to note that construction of Alternative D would not result in removal of all of the crossings associated with the current road, the majority of the current road would remain in place and in use under this alternative. Therefore, in addition to the 18 crossings proposed, another 12 ford crossings would remain along the existing road.

Table 3.4-3 Waters of the U.S. at Crossings - Water Hollow Alignment

Station	OHWM width (inches)	OHWM depth (inches)	Volume/ foot	Channel Description
10+50	30	6	1.25 cu. ft.	Intermittent Section of Quitchupah Creek
20+00	30	6	1.25 cu. ft.	Intermittent Section of Quitchupah Creek
74+00	40	11	3.06 cu. ft.	East Spring Canyon (perennial)
95+00	40/23	2	0.44 cu. ft.	Ephemeral Tributary
23,000	36	5	1.25 cu. ft.	Unnamed Ephemeral Wash
25,500	60	8	2.1 cu. ft.	Unnamed Ephemeral Wash
33,000	12	4	0.3 cu. ft.	Unnamed Ephemeral Wash
34,200	48	6	2.0 cu. ft.	Unnamed Ephemeral Wash
34,600	60	6	2.5 cu. ft.	Unnamed Ephemeral Wash
36,000	72	10	5.0 cu. ft.	Unnamed Ephemeral Wash
40,000	30	5	1.0 cu. ft.	Unnamed Ephemeral Wash
44,800	24	4	0.7 cu. ft.	Unnamed Ephemeral Wash
43,000	10	4	0.3 cu. ft.	Unnamed Ephemeral Wash
44,000	48	6	2.0 cu. ft.	Unnamed Ephemeral Wash
44,500	96	6	4.0 cu. ft.	Unnamed Ephemeral Wash
51,000	48	10	3.3 cu. ft.	Unnamed Ephemeral Wash

This alternative would not require any activities associated with the Quitchupah Creek bridge crossing at SR-10.

POTENTIAL IMPACTS

Road building and associated impacts to water resources are currently of major concern nationwide. In contrast, the proposed road (as well as the other two build alternatives) would not be typical of roads constructed on public land in the past; nor would they be typical of short-term use roads such as are constructed for timber removal. While this in itself does not mean that the proposed road would not have the potential to be susceptible to various types of impacts common on Public Land roads, it does provide for certain means to reduce that potential. The proposed road would be engineered to meet standards of SP96 Specifications, in order to ensure its long term stability. The high level of expected use of this toll road means that the proponents have a large stake in seeing that the road remains driveable at all times. Culvert failure, fill erosion, or even a temporary ditch/culvert overflow situation could easily render the road impassable; thus, halting traffic and becoming an unacceptable situation for economic reasons. Therefore, engineering designs have minimized the potential for these types of failures, and maintenance would be frequent to further insure road stability and function (Section 3.14 Acord Lakes Road). While the proponents' primary interest may

be economic, the effect is that water-caused damage that introduces sediments to the stream system would also be minimized by those same design and maintenance features. Also, in contrast to many infrequently used roads on public lands, any potential problem areas on the road, such as a plugged culvert, would be immediately noticed and repaired. These considerations are taken into account in the impacts assessments for each alternative. Further, the fact that an existing road is in place, and is currently in poor condition, receiving little or no maintenance, is also relevant to this analysis of alternatives.

Lastly, predicted impacts are based upon detailed road designs, BMPs, construction techniques, and reclamation as provided in Chapter 2.

No Action - Alternative A

There would be no change to the current state of water resources and existing influences on it as a result of the No Action Alternative. Quitchupah Creek would continue to convey sediments at occasionally high concentrations, the existing road would continue to be a source of sediment to the stream, and the stream would, at least in the near-term, continue to susceptible to destabilization. The salinity of the stream would also continue to be influenced by sedimentation due to the erosion of saline soils.

Quitchupah Creek Road Alignment - Alternative B

Road construction and related ground disturbing activities can often cause accelerated erosion and introduction of sediment into stream channels. Various types of erosion and sediment controls would be implemented in order to maintain water quality during and immediately after construction. These controls include such structures as silt fences, and such practices as limiting the areas for construction activities. When properly implemented, such techniques can dramatically reduce potential sediment loads.

Once construction has been completed, disturbances associated with the finished roadway can also provide a source of sediment to streams. The disturbance corridor would be reclaimed, including areas no longer in use as well as road fill, slope and borrow areas (Section 2.4, Reclamation). Surfaces immediately adjacent to the paved roadway (i.e. shoulders/borrow areas) should revegetate fairly quickly, because they receive additional runoff water from the road surface. Larger, steeper fills and cuts may reclaim more slowly and some erosion may occur. Sediment loading from rilling, or from small mass failures such as slumps occurring on these fill- and cut-slopes could contribute additional sediment to the stream. The closer the road is to the stream, the more likely this eroded material could make its way to the stream and degrade water quality. To provide a relative indication of this, Table 3.4-4 provides a comparison of the existing condition (equivalent to No Action) and the other alternatives in regard to proximity to a perennial stream reach.

Table 3.4-4 Proximity to Perennial Stream - Quitchupah Creek Road and Alternatives

Proximity to Stream	Existing Road (Same as Alternative A)	Alternative B	Alternative C	Alternative D
<50 feet	2,450	950	950	300
<300 feet	30,550	28,150	26,900	8,200
<500 feet	35,400	33,500	30,850	12,000
Percent of total <500 feet	73	69	63	20
Acreage <500 feet	16.2	30.7	28.3	11

In essence, construction of Alternative B would result in a reduction of the length of roadway close to Quitchupah Creek by 61%, because the existing road would be reclaimed. The existing road alongside Quitchupah Creek crosses erodible soils, is in close proximity to the stream for much of its length, and relies upon the native unconsolidated terrace deposits for much of its substrate. As a result, it currently adds sediment to the stream. The proposed alignment and design would improve, to some degree, all of those characteristics, with the result of reducing sedimentation potential.

While the width associated with the proposed road would be greater than the width associated with the current road, the engineering and construction techniques of the new road would tend to negate the width difference as far as sediment or runoff concerns (AASHTO & UDOT Standards). A compacted roadway with proper control of drainage and storm runoff, and use of imported materials such as rock, fill, and/or retaining walls, where necessary, would be an improvement over the current road situation with its native, un-engineered substrate and no drainage controls. Further, the current road receives little or no maintenance through most of its length and little usage. This means that problems that currently develop on it, such as head-cutting up from a side-drainage, go unnoticed and add sediments to the stream on a chronic basis. In contrast, the proposed road would have frequent traffic, primarily with trucks that are dependant upon the road to get their product out, so maintenance would be frequent and problems would be quickly reported and rectified.

However, as noted in Section 3.3 and 3.7 Sediment Sampling, Quitchupah Creek's overall stability is only fair, at best, based upon the Phankuch ratings. Further, the upper terrace banks are often very unstable, sediment loads are currently high, the stream channel is active, and the stream flow regime is very flashy. There would, therefore, always be some risk of large channel changes caused by changes in its watershed or by rare flow events.

While under normal, typical circumstances, the road may perform well with little or no increase in sedimentation, under rarer events, destabilization could occur and result in a short term, larger pulse of sediment into the stream. Using a culvert failure as an example, should a greater-than-design event occur, streamflow would likely overtop the road. It may simply cross the road, and continue

across the fill without major damage, or it may result in a wedge of roadway and associated fill being eroded away. Assuming proper design, placement, and maintenance of culverts, the risk associated with failure would be primarily related to the probability of the design capacity being exceeded. Where a culvert has been designed for the 25-year event, the risk associated with failure of that culvert in any given year would be 1 in 25 (conservatively assuming that exceeding the capacity would result in failure, which does not always happen). While such a failure would likely result in a pulse of sediment into the stream, such a pulse would be similar in nature to pulses that currently come from washouts of the existing road, ephemeral tributaries, etc.

Any sediment increases would indirectly have the potential to increase TDS, a parameter of concern in the 303(d) listed stream segment downstream of the property. This would depend upon the nature of the eroded materials, which is further discussed in the Soils Technical Report (JBR, 2001d). However, as noted above, salinity greatly increases in a downstream direction already, due to geological formations, and any incremental additions to salinity loading would not necessarily be identifiable.

Other impacts to water quality as a result of increased traffic, hauling of coal materials, fuels, etc. would not be expected during the normal course of use. During most instances, roadside ditches and culvert crossings would be dry. Should spillage of coal, fuel, or other materials occur due to an accident, it should be able to be cleaned and mitigated without contacting stormwater runoff or perennial waters. However, there would be some potential for an accident to result in direct release of pollutants such as coal or fuel to Quitchupah Creek itself, either by spilling into the stream itself, or into a culvert crossing during a runoff event.

As noted, while it has not been subject to long term stream flow gaging, Quitchupah Creek is known to experience a wide fluctuation in stream flow due to intense storm activity. In part, this is due to the watershed characteristics, which primarily result in a high ratio of runoff to precipitation. In general, disturbances such as road construction tend to locally increase runoff within the area of disturbance when compared to the pre-disturbed condition, and this would be the case for this road as well. In addition, road drainage features such as cross drains, ditches etc typically increase the hydrologic connectivity of the system, increasing (at least locally) peak flows associated with any given event. Currently, the existing road has a high degree of connectivity with Quitchupah Creek; as portions of it would be reclaimed, the connectivity would diminish. The proposed road would not have a high degree of connectivity due to the planned storm drainage features. Whether or not the proposed road would locally increase peak flows would be dependent on the net effect of: (1) removing some of the existing connectivity that occurs from the existing road; (2) minimizing connectivity due to new road drainage features; (3) increasing the distance of the road away from the channel over what is currently; and (4) increasing the width of disturbance and runoff production potential. On balance, at least some increase in localized peak flow would be likely. However, the net affect on the hydrologic regime in Quitchupah Creek, already noted to be extremely flashy and variable in flow would likely go unnoticed (Section 2.2 Stream Crossing and Road Culverts).

The effect of locally increased runoff on the flow in Quitchupah Creek can be assessed by a comparison of areas. The entire watershed at the downstream end of the project area is 100 square miles. The area to be disturbed by the proposed road is approximately 100 acres. Even if the 100 acres generates runoff at a greater rate than background, the incremental addition to the peak generated by the remainder of the watershed would be minimal. This is in part due to the ratio of areas, but more importantly due to the existing high percentage of precipitation that generates runoff over the watershed. Therefore, peak flows on Quitchupah Creek would not likely be affected by the proposed project.

The perennial stream reaches where culverted crossings would occur are located in the western end of the project area. These reaches coincided with areas of the stream that were rated better in the Phankuch stability rating than the lower reaches, where no crossings would be required. The better rating, in general, means that these areas should adapt better to presence of the culvert than a lower reach with poorer stability. However, even in these more adaptable reaches, proper design, placement, and maintenance would be key. These upper reaches also, in general, convey less sediment, so sediment plugging would be less likely. Lastly, in regard to the fact that perennial crossings would only be required in the upper reaches, is the issue of fish passage. As described in the Aquatics Technical Report (JBR, 2001c), few fish were found in the upper reaches, both in number and in diversity. Where needed, however, culvert passage (either meaning sufficient depth during low flows or reduced velocities during high flows) would be considered in the final design phase based upon the fish species present and their specific seasonal requirements.

Along the western end of the proposed roadway, Quitchupah Creek would be realigned for 1100 feet at six sites. This would likely result in some straightening of the already fairly straight stream, and could slightly increase its gradient. The stabilization of the road fill and channel banks would prevent erosion or sedimentation from both as the new stream location becomes stabilized.

Impacts to groundwater would be minimal, if at all, due to its limited extent and depth. Road cuts and drainage ditches are not likely to intercept or redirect groundwater. Both field vegetative evidence, direct observations of existing near-road surfaces during various seasons, and soil survey information indicate little potential for any extensive areas of shallow groundwater that would be likely to be intercepted. However, some very localized areas of season shallow subsurface water related to snow melt may appear at some cut faces. If so, it would be expected to enter inner roadway ditches and be directed to the nearest ditch relief culvert. Any groundwater associated with the impacted wetlands would be minimal in extent and those impacts would be mitigated under the Corps of Engineers 404 permit, as discussed in the wetlands section of the Vegetation Technical Report (JBR, 2001k).

Alternate Junction and Alternate Design - Alternative C

Potential impacts would generally be the same as for Alternative B, although as shown in Table 3.4-4, Alternative C would have slightly more of its length greater than 500 feet away from a perennial stream reach (37 percent versus 31 percent).

Water Hollow Alternate Alignment - Alternative D

This route would avoid the majority of Quitchupah Creek, including its middle and lower reaches that are most susceptible to instability impacts. As shown in Table 3.4-4, the Water Hollow alignment would have only 20 percent of its length within 500 feet of a perennial stream, in contrast to Alternative B which would have 69 percent of its length within 500 feet.

Mitigation and Monitoring

To reduce the impacts of accidents and spills, a spill prevention program would be developed and all coal truck drivers would be trained in what to do in the event of a spill. A spill prevention plan would include a checklist of necessary equipment to be carried on each truck hauling coal. Some examples of equipment to be carried include fire extinguisher, shovel, and absorbent material. In addition, all trucks would need to pass routine inspections and have proper maintenance performed on them regularly. Spills, leaks, and contaminated soils would be cleaned up as per a SUFCO Mine program, to prevent pollution to surface or ground waters. BMPs would be utilized and are described in permits obtained in associated with the Proposed Action in Table 1.1.

Irreversible or Irretrievable Commitment of Resources and Residual Adverse Impacts

An improved road design will slightly decrease sedimentation and salinity into the drainages from existing environment. Truck accidents could introduce coal and fuel into the streams even with mitigation and monitoring measures in place. This would produce residual adverse impacts to water resources from Alternatives B, C or D.

Cumulative Effects

Increased public access to the Proposed Action area would produce cumulative impacts to water resources. These cumulative impacts would primarily occur from sediment loading/erosion impacts, salinity, or fuel spills generated by the public. The reduction in sediments under Alternatives B & C would have a minor impact on current sedimentation rates due to grazing.

3.5 SOILS

The Quitchupah Creek Road alignment and all proposed alternatives would traverse a total of three soil mapping units within Fishlake National Forest and 39 soil mapping units surveyed by NRCS. Soil boundaries and mapping unit designations within the entire project area are presented in Final Soils Technical Report, Quitchupah Creek Road EIS (JBR, 2001d).

Erosion and salinity are of particular importance to the project. Soil erodibility is based only upon the physical characteristics of a given soil. For water, erodibility is described by the erodibility factor (K) factor; it rates a soil's susceptibility to detachment and transport by rainfall and runoff. The rating is based upon the interaction of a given soil's properties, including texture, structure, and permeability. K values can range from 0.02 to 0.69, with greater values representing higher inherent erodibility. Erosion hazard (by water) is a qualitative ranking that takes into account the soil's inherent erodibility (K value), the slope of the land on which the soil typically occurs, and the soil's permeability class. A given soil may have a high inherent erodibility (as described by its K value), but if it occurs on flat or low gradient slopes and has a rapid permeability, it would have a low erosion hazard ranking. Because of the presence of erodible saline soils, sediments produced by the erosion of saline soils can affect surface water quality.

Similarly, a Wind Erodibility Group (WEG) value is a wind erodibility grouping that indicates a soil's susceptibility to wind erosion based upon its particle resistance as described by the percentage of dry soil aggregates larger than 0.033 inches. WEG values range from one to eight with one being the most erodible; one subgroup is indicated by the letter L, denoting the presence of lime.

Salinity is a measure of a soil's soluble salts as measured by its electrical conductivity. Salinity can range from 0 to greater than 16 millimhos/centimeter. Table 3.5-1 provides correlations for erodibility and salinity rating values and their standard qualitative descriptors of level.

Table 3.5-1 Soil Ratings and Descriptors

Numerical Rating	Description of Level	Numerical Rating	Description of Level	Numerical Rating	Description of Level
Wind Erodibility Group		**K Value**		**Salinity**	
8	non	.20 or less	low	0 to 2	non-saline
5,6,7	slight	.21-.40	moderate	2 to 4	slightly
3,4,4L	moderate	> .40	high	4 to 8	moderately
2	high			8 to 16	strongly
1	very high			> 16	very strongly

A summary of the soils present within the project area is presented in Table 3.5-2. Their locations within the Proposed Action area is presented in Figure 3-4.

Table 3.5-2 Soil Resources in the Project Area

USFS/NRCS Map Unit	Soil Series, Components, and Inclusions[1]	Classification[2]	Landscape Position and Slope[3]	Elevation AMSL[4] (feet)	Water Erodibility[5] (K factor)	Wind Erodibility[6]	Salinity[7]	Drainage Class[8]	Permeability[9]	Erosion Hazard[10]
21A	(component-50%)	*Lithic Ustic Torriorhents*	15-60% slopes	N/A*	N/A*	N/A*	Non-Saline	Well Drained	Moderately Rapid	High
	(component-30%)	*Ustic Torriorthents*	15-60% slopes	N/A*	N/A*	N/A*	Non-Saline	Well Drained	Moderately Rapid	Moderate
	Rock outcrop *(component-10%)*	--	--	–	–	–	–	–	–	--
69	*(component-50%)*	*Cumulic Haplustolls*	0-8% slopes	N/A*	N/A*	N/A*	Non-Saline	Well Drained	Moderate	Slight
	(component-30%)	*Fluvaquentic Haplustolls*	0-8% slopes	N/A*	N/A*	N/A*	Non-Saline	Moderately Well Drained	Moderately Slow	None
	(inclusion-20%)	--	--	–	–	–	–	--	–	--
78	*(component)*	*Typic Ustorthents and Rubbleland*	25-60% slopes	N/A*	N/A*	N/A*	Non-Saline	Variable	Moderate	Slight to High
Persayo-Badland-Rock Outcrop complex, 1 to 45 percent slopes 131	Persayo Series	*Typic Torriorthents*	hillslopes 1-30% slopes	5,300-5,800	0.10-0.37	4L	slightly to strongly	well drained	moderately permeable	moderate
Mivida very fine sandy loam, 1 to 8 percent slopes 224	Mivida Series	*Ustollic Haplocalcids*	benches, mesas, and fan terraces 1-8% slopes	5,450-6,400	0.49	3	non-saline	well drained	moderately permeable	moderate
Gerst-Travessilla-Chupadera Association, 1 to 15 percent slopes 254	Gerst Series	*Ustic Torriorthents*	sides of mesas, benches, terraces, and canyons; mountain and hill slopes 3-70% slopes	5,500-7,400	0.05-0.24	8	non-saline	well drained	moderately slow	severe
	Travessila Series	*Lithic Ustic Torriorthents*	mesas, benches, canyon sides; mountain and foot slopes 1-80% slopes	5,500-7,400	0.28	3	non-saline	well drained	moderately rapid	high
	Chupadera Series	*Ustollic Calciorthids*	benches and terraces 1-15% slopes	5,500-7,400	0.32	3	non-saline	well drained	moderately rapid	moderate

Table 3.5-2 continued

USFS/NRCS Map Unit	Soil Series, Components, and Inclusions[1]	Classification[2]	Landscape Position and Slope[3]	Elevation AMSL[4] (feet)	Water Erodibility[5] (K factor)	Wind Erodibility[6]	Salinity[7]	Drainage Class[8]	Permeability[9]	Erosion Hazard[10]
Gerst-Travessilla-Strych-Rock Outcrop complex, 1 to 30% slopes 255	Gerst Series	*Ustic Torriorthents*	sides of mesas, benches, terraces, and canyons; mountain and hill slopes 3-70% slopes	5,500-7,500	0.05-0.24	8	non-saline	well drained	moderately slow	severe
	Travessilla Series	*Lithic Ustic Torriorthents*	mesas, benches, canyon sides; mountain and foot slopes 1-80% slopes	5,500-7,500	0.28	3	non-saline	well drained	moderately rapid	high
	Strych Series	*Ustic Haplocalcids*	canyon and escarpments sideslopes, generally on toeslopes and south aspects 20-80% slopes	5,500-7,500	0.2	8	non-saline	well drained	moderately rapid	moderate to high
Cabba-Strych-Badland complex, 3 to 70 percent slopes 261	Cabba Series	*Typic Ustorthents*	benches, canyon rims, steep canyon sides 3-70% slopes	5,000-8,200	0.17	8	non-saline	well drained	moderately permeable	moderate
	Strych Series	*Ustic Haplocalcids*	canyon and escarpments sideslopes, generally on toeslopes and south aspects 20-80% slopes	5,000-8,200	0.2	8	non-saline	well drained	moderately rapid	moderate to high
Moffat fine sandy loam, 1 to 6 percent slopes 522	Moffat Series	*Typic Haplocalcids*	alluvial fans and benches 1-6% slopes	5,400-5,600	0.24	3	non-saline	well drained	moderately rapid	moderate
Strych very stony loam, dry, 3 to 30 percent slopes 534	Strych Series	*Ustic Haplocalcids*	canyon and escarpments sideslopes, generally on toeslopes and south aspects 20-80% slopes	5,400-6,400	0.2	8	non-saline	well drained	moderately rapid	moderate to high
Strych very stony loam, 3 to 15 percent slopes 561	Strych Series	*Ustic Haplocalcids*	canyon and escarpments sideslopes, generally on toeslopes and south aspects 20-80% slopes	5,800-7,200	0.2	8	non-saline	well drained	moderately rapid	moderate to high

Table 3.5-2 continued

USFS/NRCS Map Unit	Soil Series, Components, and Inclusions[1]	Classification[2]	Landscape Position and Slope[3]	Elevation AMSL[4] (feet)	Water Erodibility[5] (K factor)	Wind Erodibility[6]	Salinity[7]	Drainage Class[8]	Permeability[9]	Erosion Hazard[10]
Gerst-Strych-Badland complex, 3 to 50 percent slopes 569	Gerst Series	*Ustic Torriorthents*	sides of mesas, benches, terraces, and canyons; mountain and hill slopes 3-70% slopes	6,100-7,200	0.05-0.24	8	non-saline	well drained	moderately slow	severe
	Strych Series	*Ustic Haplocalcids*	canyon and escarpments sideslopes, generally on toeslopes and south aspects 20-80% slopes	6,100-7,200	0.2	8	non-saline	well drained	moderately rapid	moderate to high
Hernandez-Chupadera complex, 1 to 8 percent slopes AKC2	Hernandez Series	*Ustollic Calciorthids*	fan terraces 1-8% slopes	5,600-7,400	0.28	4L	non-saline	well drained	moderate	moderate
	Chupadera Series	*Ustollic Calciorthids*	benches and terraces 1-15% slopes	5,600-7,400	0.32	3	non-saline	well drained	moderately rapid	moderate
Beebe loamy fine sand, 1 to 3 percent slopes BeB	Beebe Series	*Typic Torrifluvents*	alluvial fans and flood plains 0-6% slopes	4,000-6,500	0.49	2	moderate to very strongly	well drained	rapid	high
Badland-Rubbleland-Rock Outcrop complex, 50 to 80 percent slopes BY	N/A*	*N/A**	N/A*	N/A*	N/A*	N/A*	N/A*	N/A*	N/A*	N/A*
Chipeta-Badland complex, 3 to 20 percent slopes CBF2	Chipeta Series	*Typic Torriorthents*	hills 1-20% slopes	5,400-6,100	0.43	4L	moderate to strong	well drained	slow	very high
Shupert-Winetti complex, 1 to 8 percent slopes CIC	Shupert Series	*Typic Ustifluvents*	narrow valley and canyon floors 1-8% slopes	4,600-7,200	0.24	8	non-saline	well drained	slow	moderate
	Winetti Series	*Typic Ustifluvents*	narrow valley and canyon floors 1-8% slopes	4,600-7,200	0.2	8	non-saline	well drained	moderately rapid	slight

Table 3.5-2 continued

USFS/NRCS Map Unit	Soil Series, Components, and Inclusions[1]	Classification[2]	Landscape Position and Slope[3]	Elevation AMSL[4] (feet)	Water Erodibility[5] (K factor)	Wind Erodibility[6]	Salinity[7]	Drainage Class[8]	Permeability[9]	Erosion Hazard[10]
Persayo-Greybull-Utaline complex, 5 to 15 percent slopes COD2	Persayo Series	*Typic Torriorthents*	hillslopes 1-30% slopes	5,400-5,700	0.10-0.37	4L-8	slightly to strongly	well drained	moderately permeable	moderate
	Greybull Series	*Typic Torriorthents*	foot slopes of shale hills 3 to 8% slopes	5,400-5,700	0.37	4L	non-saline	well drained	moderately slow	moderate
	Utaline Series	*Typic Haplocalcids*	mesas, high terraces, and fan remnants 1-25% slopes	5,400-5,700	0.28	8	non-saline	well drained	moderate	moderate to high
Comodore-Datino Variant complex, 40 to 60 percent slopes DHG2	Comodore Series	*Lithic Haploborolls*	mountain slopes 50-70% slopes	6,800-8,100	0.10	8	non-saline	well drained	moderate	high
	Datino Variant	*Typic Haploborolls*	mountain slopes 15-80% slopes	6,800-8,100	0.02	8	non-saline	well drained	moderate	high
Ferron silt loam, 0 to 3 percent slopes Fr	Ferron Series	*Typic Fluvaquents*	alluvial fans and alluvial valley bottoms 0-3% slopes	5,400-5,700	0.49	8	slight to strong	poorly drained	moderate	slight
Glenberg-Pherson-Colorow Complex, 0 to 15 percent slopes GLC	Glenberg Series	*Ustic Torrifluvents*	flood plains, valley floors, and low terraces 1-6% slopes	5,000-7,000	0.32	2	non-saline	well drained	moderately rapid	moderate
	Pherson Series	*Ustic Torrifluvents*	drainageways 2-15% slopes	5,000-7,000	0.25-0.34	4	non-saline	well drained	moderately rapid	slight
	Colorow Series	*Oxyaquic Torrifluvents*	floodplains, fans, low terraces 0-4% slopes	5,000-7,000	0.32	2	non-saline	moderately well drained	moderately rapid	moderate
Ravola-Gullied Land-Libbings-Hunting (saline) complex, 0 to 10 percent slopes Gu	Ravola Series	*Typic Torrifluvents*	alluvial fans and narrow valley floors 1-6% slopes	5,300-6,000	0.49	4L	non- to moderate	well drained	moderately permeable	moderate
	Gullied Land Series	*N/A**	N/A*	5,300-6,000	N/A*	N/A*	N/A*	N/A*	N/A*	N/A*
	Libbings Series	*Gypsic Aquisalids*	foot slopes or shale hills 0-3% slopes	5,300-6,000	0.43	4L	strongly saline	poorly drained	slow	moderate
	Hunting Series	*Aquic Torrifluvents*	alluvial fans and valley floors	5,300-6,000	0.43	4L	slight to	somewhat	moderate	slight

Table 3.5-2 continued

USFS/NRCS Map Unit	Soil Series, Components, and Inclusions[1]	Classification[2]	Landscape Position and Slope[3]	Elevation AMSL[4] (feet)	Water Erodibility[5] (K factor)	Wind Erodibility[6]	Salinity[7]	Drainage Class[8]	Permeability[9]	Erosion Hazard[10]
Hunting loam, 1 to 3 percent slopes Hn	Hunting Series	Hunting Series	*Aquic Torrifluvents*	alluvial fans and valley floors 1-3% slopes	5,400-5,700	0.43	4L	slight to strong	somewhat poorly drained	moderate
Persayo-Greybull complex, 3 to 8 percent slopes KAC	Persayo Series	*Typic Torriorthents*	hillslopes 1-30% slopes	5,400-5,700	0.10-0.37	4L-8	slightly to strongly	well drained	moderately permeable	moderate
	Greybull Series	*Typic Torriorthents*	foot slopes of shale hills 3 to 8% slopes	5,400-5,700	0.37	4L	non-saline	well drained	moderately slow	moderate
Podo-Rock Outcrop complex, 50 to 70 percent slopes KXH	Podo Series	*Lithic Ustorthents*	canyon slopes 30-80% slopes	5,200-8,900	0.15	8	non-saline	well drained	moderately rapid	moderate
Minchey-Clifsand complex, 0-30 percent slopes MsB	Minchey Series	*Typic Haplocalcids*	benches and mesas 1-3% slopes	5,500-6,000	0.37	4L	non-saline	well drained	moderate	moderate
	Clifsand Series	*Typic Haplocalcids*	mesas and benches 3-10% slopes	5,500-6,000	0.28	8	non-saline	well drained	rapid	moderate to high
Podo-Cabba-Doney Family complex, 2 to 70 percent slopes MUE	Podo Series	*Lithic Ustorthents*	canyon slopes 30-80% slopes	5,900-9,000	0.15	8	non-saline	well drained	moderately rapid	moderate
	Cabba Series	*Typic Ustorthents*	benches, canyon rims, steep canyon sides 3-70% slopes	5,900-9,000	0.17	8	non-saline	well drained	moderately permeable	moderate
	Doney Family Series	*Typic Haplocryalfs*	mountain sideslope, generally north aspect or in draws 20-80% slopes	5,900-9,000	0.2	8	non-saline	well drained	moderate	moderate

Table 3.5-2 continued

USFS/NRCS Map Unit	Soil Series, Components, and Inclusions[1]	Classification[2]	Landscape Position and Slope[3]	Elevation AMSL[4] (feet)	Water Erodibility[5] (K factor)	Wind Erodibility[6]	Salinity[7]	Drainage Class[8]	Permeability[9]	Erosion Hazard[10]
Lazear-Pinon-Gerst complex, 5 to 30 percent slopes NFE	Lazear Series	*Lithic Ustic Torriorthents*	ridges and edges of mesas 0-35% slopes	5,200-8,000	0.2-0.28	4L	non-saline	well drained	moderately permeable	severe
	Pinon Series	*Lithic Ustollic Calciorthids*	knolls, ridges, mesas and hillslopes 1-30% slopes	5,200-8,000	0.2-2.8	4L	non-saline	well drained	moderately slow	N/A*
	Gerst Series	*Ustic Torriorthents*	sides of mesas, benches, terraces, and canyons; mountain and hill slopes 3-70% slopes	5,200-8,000	0.05-0.24	8	non-saline	well drained	moderately slow	severe
Gerst-Lazear-Badland complex, 2 to 65 percent slopes NNE2	Gerst Series	*Ustic Torriorthents*	sides of mesas, benches, terraces, and canyons; mountain and hill slopes 3-70% slopes	5,200-8,000	0.05-0.24	8	non-saline	well drained	moderately slow	severe
	Lazear Series	*Lithic Ustic Torriorthents*	ridges and edges of mesas 0-35% slopes	5,200-8,000	0.2-0.28	4L	non-saline	well drained	moderately permeable	severe
Haverdad loam, alkali, 0 to 3 percent slopes OCA2	Haverdad Series	*Ustic Torrifluvents*	alluvial fans, fan terraces, and valley floors 1-8% slopes	5,600-6,200	0.32	4L	non-saline	well drained	moderately permeable	moderate
Penoyer Variant loam, 1 to 3 percent slopes PeB	Penoyer Variant Series	*Typic Torriorthents*	alluvial fans and valley floors 1-6% slopes	5,400-6,000	0.43	4L	non- to slighty saline	well drained	moderate	moderate
Penoyer Variant loam, 3 to 6 percent slopes PeC2	Penoyer Variant Series	*Typic Torriorthents*	alluvial fans and valley floors 1-6% slopes	5,400-5,900	0.43	4L	non- to slighty saline	well drained	moderate	moderate
(Similar to) Penoyer Variant loam, 3 to 6 percent slopes PsC2	Penoyer Variant Series	*Typic Torriorthents*	alluvial fans and valley floors 1-6% slopes	5,400-5,900	0.43	4L	non- to slighty saline	well drained	moderate	moderate

Table 3.5-2 continued

USFS/NRCS Map Unit	Soil Series, Components, and Inclusions[1]	Classification[2]	Landscape Position and Slope[3]	Elevation AMSL[4] (feet)	Water Erodibility[5] (K factor)	Wind Erodibility[6]	Salinity[7]	Drainage Class[8]	Permeability[9]	Erosion Hazard[10]
Ravola-Toddler complex, 1 to 6 percent slopes RIA2	Ravola Series	*Typic Torrifluvents*	alluvial fans and narrow valley floors 1-6% slopes	4,550-5,800	0.49	4L	non- to moderate	well drained	moderately permeable	moderate
	Toddler Series	*Typic Torrifluvents*	lake terraces and fans 1-6% slopes	4,550-5,800	0.24	5	strongly saline	well drained	moderate	moderate
Ravola loam, 1 to 3 percent slopes RIB	Ravola Series	*Typic Torrifluvents*	alluvial fans and narrow valley floors 1-6% slopes	5,400-5,800	0.49	4L	non- to moderate	well drained	moderately permeable	moderate
Ravola loam, 1 to 6 percent slopes, eroded RIC2	Ravola Series	*Typic Torrifluvents*	alluvial fans and narrow valley floors 1-6% slopes	5,300-6,000	0.49	4L	non- to moderate	well drained	moderately permeable	moderate
Ravola-Slickspots complex, 0 to 10 percent slopes RuB2	Ravola Series	*Typic Torrifluvents*	alluvial fans and narrow valley floors 1-6% slopes	5,300-5,900	0.49	4L	non- to moderate	well drained	moderately permeable	moderate
Clifsand, 1 to 8 percent slopes SID2	Clifsand Series	*Typic Haplocalcids*	mesas and benches 3-10% slopes	5,000-6,500	0.28	8	non-saline	well drained	rapid	moderate to high
Stormitt-Minchey complex, 1 to 10 percent slopes SMD2	Stormitt Series	*Ustic Haplocalcids*	hillslopes, benches, and mesas 3-30% slopes	5,500-6,000	0.15	8	non-saline	well drained	moderate	medium
	Minchey Series	*Typic Haplocalcids*	benches and mesas 1-3% slopes	5,500-6,000	0.37	4L	non-saline	well drained	moderate	moderate
Lazear-Pinon-Rock Outcrop complex, 0 to 30 percent slopes THD2	Lazear Series	*Lithic Ustic Torriorthents*	ridges and edges of mesas 0-35% slopes	5,200-7,200	0.2-0.28	4L	non-saline	well drained	moderately permeable	severe
	Pinon Series	*Lithic Ustollic Calciorthids*	knolls, ridges, mesas and hillslopes 1-30% slopes	5,200-7,200	0.2-2.8	4L	non-saline	well drained	moderately slow	N/A*

Table 3.5-2 continued

USFS/NRCS Map Unit	Soil Series, Components, and Inclusions[1]	Classification[2]	Landscape Position and Slope[3]	Elevation AMSL[4] (feet)	Water Erodibility[5] (K factor)	Wind Erodibility[6]	Salinity[7]	Drainage Class[8]	Permeability[9]	Erosion Hazard[10]
Trook gravelly fine sandy loam, 2 to 6 % slopes TrC	Trook Series	*Typic Calciorthids*	fan pediments 2-6% slopes	6,000-8,000	0.32	3	non-saline	well drained	moderate to rapid	slight
Green River-Juva Variant complex, 0 to 5 percent slopes TY	Green River	*Aquic Ustifluvents*	flood plains 0-2% slopes	4,600-5,900	0.43	4L	none to slight	moderately well drained	moderate	slight
	Juva Variant	*Typic Torrifluvents*	alluvial fans and valley floors 1-5% slopes	4,600-5,900	0.37	3	non-saline	well drained	moderately rapid	slight

*N/A is not available, the data or information for this soil parameter is not available.

[1]Soil series is an official map unit for mapping and describing soils, either mapped as a single series or combined with other series into associations and complexes.

[2]Soil taxonomy is the establishment of hierarchies of classes that permit us to understand, as fully as possible, the relationship among soils and between soils.

[3]The position in the landforms that the soil series occupies. The slope or grade is expressed in a percentage as an inclination above horizontal (0%).

[4]AMSL is above mean sea level or elevation in feet above seal level (0 feet).

[5]The susceptibility of soil surface to erosion by the action of water.

[6]A set of classes given integer designations for 1 to 8 based on properties of surface horizon that affect susceptibility to wind erosion.

[7]The relative amount of soluble salts in the soil as measured by electrical conductivity.

[8]The relative wetness of the soil under natural conditions as it pertains to wetness due to water table.

[9]The classes are based on the amount of water that would move downward through a saturated in-place soil.

[10]The is the probability that erosion damage may occur as a result of site preparation and construction.

Limitations

The NRCS has developed criteria by which they assess the limitations of various soil type in regard to their potential uses. These limitations are typically contained in tables within published soil surveys. Because the project area soils information is preliminary in nature, these tables have not yet been developed, but because many of the soils are equivalent to soils in the Carbon Area survey, that information is applicable to much of this area. In addition, some of the limitation-type information can be inferred from the soils descriptions even where the limitations tables have not been derived. Therefore, Table 3.5-3 provides, where available, some indication of limitations of the soils in regard to the proposed road construction project. Where information is not available, or cannot be derived from the available information, the symbol N/A (not available) is used.

Table 3.5-3 Soil Characterizations and Limitations Regarding Proposed Project

Soil Name	Typically poor for road fill[1]	Shrink swell concern[2]	Frost heave concern[3]	Inundation Class[4]	Erodibility Ratings[5]		Salinity Rating[6]
					Wind	Water	
Beebe	No	No	No	Rare	X	XX	X
Cabba	Yes	No	Yes	None	–	--	--
Chipeta	Yes	Yes	No	None	X	XX	XX
Chupadera	Yes	No	Yes	None	X	X	--
Clifsand	No	No	No	None	--	X	--
Colorow	No	No	Yes	Rare	X	X	--
Comodore	Yes	No	Yes	None	--	--	--
Datino Var.	Yes	No	Yes	None	--	--	--
Doney	Yes	No	Yes	None	--	--	--
Ferron	No	No	Yes	None	--	XX	XX
Gerst	Yes	Yes	Yes	None	--	--	--
Glenberg	No	No	Yes	None	X	X	--
Green River	No	No	Yes	Frequent	X	XX	--
Greybull	Yes	No	No	None	X	X	--
Haverdad	No	Yes	Yes	None	X	X	--
Hernandez	No	No	Yes	None	X	X	--
Hunting	No	Yes	Yes	None	X	XX	XX
Juva Var.	No	No	Yes	None	X	X	--
Lazear	Not Known	No	No	None	--	X	--
Libbings	Yes	Yes	Yes	None	X	XX	XX
Minchey	No	Yes	Yes	None	X	X	--
Mivida	No	No	Yes	None	X	XX	--
Moffat	No	No	No	None	X	X	--
Pathead	Yes	No	Yes	None	--	--	--

Table 3.5-3 Continued

Soil Name	Typically poor for road fill[1]	Shrink swell concern[2]	Frost heave concern[3]	Inundation Class[4]	Erodibility Ratings[5]		Salinity Rating[6]
					Wind	Water	
Penoyer	No	No	Yes	None	X	XX	--
Persayo	Yes	Yes	No	None	X	X	XX
Pherson	No	No	Yes	None	X	X	--
Pinon	N/A	No	No	None	--	X	--
Podo	Yes	No	Yes	None	--	--	--
Ravola	No	No	No	None	X	XX	X
Shupert	No	Yes	Yes	None	--	X	--
Stormitt	Yes	No	Yes	None	--	--	--
Strych	No	No	Yes	None	--	--	--
Toddler	N/A	N/A	N/A	None	--	X	XX
Travessilla	Yes	No	Yes	None	X	X	--
Trook	No	No	No	None	X	X	--
USFS 21A	Yes	No	No	None	N/A	X	N/A
USFS 69	No	No	No	Rare	N/A	N/A	N/A
USFS 78	Yes	No	No	None	N/A	N/A	N/A
Utaline	N/A	N/A	N/A	N/A	--	X	--
Winetti	No	No	Yes	No	--	--	--

-- = not of concern X = moderate XX = high for erodibility, strongly saline for salinity

[1]Soils may have properties that may adversely affect the stability of the roadbed.

[2]The shrinking of soil when dry and swelling when wet may affect roadbed stability.

[3]Frost heave causes the soil to expand upward affecting structures.

[4]The frequency of flooding at the soil surface.

[5]The susceptibility of the soil surface to erosion by water and wind.

[6]The relative amount of soluble salts in the soil profile.

Where the available data indicate a range of values that span different ratings, the upper value was used to determine the limitation.

Prime or Unique Farmlands

Several soils in the project area, in the vicinity of Quitchupah Creek, are classed by the NRCS as Prime Farmlands. These soils met the criteria only when irrigated. They are mapping units TY (Green River-Juva Variant Complex), PeB (Penoyer Variant loam), TrC (Trook gravelly fine sandy loam), RIA2 (Ravola -Toddler Complex), RIB (Ravola loam), and CIC (Shupert-Winetti Complex). Only the Trook soil is irrigated.

REGULATORY

The Corps would oversee regulatory requirements in the areas where hydric soils are located (JBR, 2001d). Construction and related soil disturbance within areas mapped as Prime or Unique Farmlands would come under the Farmland Protection Policy Act.

No Action - Alternative A

Soil resources would continue to respond to natural forces in the way they currently do, should the No Action Alternative be chosen. Soils that are erodible would continue to have the potential to easily erode, and saline soils would continue to supply salts to surface waters via runoff and sediments. Erosion of unmaintained two-track road would continue to produce sediments and salinity to Quitchupah Creek.

Quitchupah Creek Road Alignment - Alternative B

Table 3.5-4 shows soil mapping units and approximate linear feet of each unit that would be disturbed for this alignment. It is organized by the approximate order in which the soils are encountered from west to east. Note that much of the area is within the existing road footprint and thus has been previously disturbed.

Table 3.5-4 Soil Disturbance by Mapping Units - Alternative B

Mapping Unit Designation	Major Soils In Unit	Approximate linear feet of disturbance
21A	Torriorthents with rock outcrop	1,700
69	Haplustolls	11,500
CIC	Shupert, Winetti	2,900
255	Gerst, Travessilla , Strych, Rock Outcrop	2,000
224	Mivida	2,500
569	Gerst, Strych, Badland	1,200
OCA2	Haverdad	5,300
GLC	Glenberg, Pherson, Colorow	4,500
TrC	Trook	5,000
131	Persayo, Badland, Rock Outcrop	2,800
RlA2	Ravola, Toddler	5,200
SMD2	Stormitt, Minchey	1,500
BeB	Beebe	1,000
PeB	Penoyer Variant	1,200
TY	Green River, Juva Variant	300
	Total	**28,000**

A comparison of Tables 3.5-2 and 3.5-4 indicates that: approximately 9,200 feet or 19 percent of this alignment may cross soils that are typically poor for road fill; approximately 15,700 feet or 32 percent of this alignment may cross soils that have shrink-swell concerns; 17,300 feet or 36 percent of this alignment may cross soils that have frost heave concerns; and 5,800 feet or 12 percent of this alignment may have rare flooding problems. All of these soil characteristics can adversely affect the stability of the roadbed. The incorporation of 12 inches of granular borrow in the roadbed, and the option to use up to 36 inches of granular borrow in the construction of the roadbed in particularly unstable areas would, by design, overcome the poor soils conditions underlying the roadbed.

Approximately 29,200 feet or 60 percent of this alignment has the potential to cross soils with moderate or severe erodibility ratings and 9,000 feet or 18 percent has the potential to cross moderate to strongly saline soils. These numbers do not include the soils for which this information is not available. In addition, several of the soil mapping units in this area include rock outcrop and badlands, for which soils descriptions are also unavailable. Rock outcrops are stable and non-eroding, while Badlands are erosive and saline.

These limitations suggest that many of the areas presently disturbed by road construction activities have experienced increased erosion, either by wind or water. Given the proximity of the present alignment to Quitchupah Creek, increased erosion could be increasing sediment loading and increasing salinity to the stream. The inclusion of BMPs in the proposed road design for drainage control and subsequently for erosion and sedimentation, and reclamation of existing road would greatly reduce sediment loading and salinity in the creek from this source.

A simple application of the Universal Soil Loss Equation (USLE) was done to provide a general indication of the order-of-magnitude change in erosion rate from sheet erosion processes that may occur as a result of roadway disturbances. USLE calculates longterm average annual erosion rate in tons/acre/year based upon inputs of rainfall factor, soil erodibility factor, slope length/steepness factor, and cover/practices factor.

To perform this application, a conservative, worst-case type approach was used. By this, the steepest planned road cut or fill slope, of 2h:1v, was used to provide the slope steepness factor. An erodibility factor represented by the worst-case native soils on the project area was used in the calculation, and the cover/practice factor was based upon essentially compacted, bare ground that has been seeded but with negligible growth. Factors used were:

R = 30 (from old SCS statewide R factor map for Utah)
K = .55 (from NRCS mapping information)
LS = 9.5 based upon 2:1 slopes over a 30' length
CP = .8

This results in an estimated sheet erosion rate of 125 tons per acre per year from the disturbed road cut/fill areas. Using a conservative, appropriate area-derived sediment delivery ratio of .4, this

estimate results in 50 tons/acre/year of sediment entering Quitchupah Creek from the disturbed, unreclaimed road fill/cut slope areas.

In contrast, the USLE equation was run using more of an existing scenario, assuming a typical plot of ground where the road disturbance would be would have the same R and K values, but that native slope would be 10 percent, length 100' and CP .29 due to some vegetative cover. This results in a background erosion rate of 2 tons/acre/year. Applying the same sediment delivery ratio of 0.4 gives an estimate of .8 tons/acre per year currently from that type of slope.

It is important to note that, for the background and for the roadbed conditions, the calculation represents only one scenario; in reality many other numbers for most of those factors would occur through both the entire watershed and the roadway disturbance, and expected calculation results would vary.

It is also important to note that USLE predicts sheet erosion, not gullying or other forms or slope failure or mass wasting.

Approximately 14,600 feet of this alignment would cross soils mapped as Prime or Unique Farmlands, none of which is currently irrigated. Approximately 600 linear feet (1.4 acres) of the alignment would be within irrigated pasture mapped as Trook gravelly fine sandy loam, a Prime or Unique Farmland.

Alternate Junction and Alternate Design - Alternative C

Table 3.5-5 shows soil mapping units and approximate linear feet of each unit that would be disturbed for this alternative. Note that a significant part of the area is within the existing road footprint and so has been previously disturbed.

Table 3.5-5 Soil Disturbance by Mapping Units - Alternative C

Mapping Unit Designation	Major Soils In Unit	Approximate linear feet of disturbance
21A	Torriorthents with rock outcrops	1,700
69	Haplustolls	11,500
CIC	Shupert, Winetti	2,900
255	Gerst, Travessilla , Strych, Rock Outcrop	1,400
224	Mivida	5,900
569	Gerst, Strych, Badland	2,700
OCA2	Haverdad	5,300
GLC	Glenberg, Pherson, Colorow	2,350
TrC	Trook	4,950
131	Persayo, Badland, Rock Outcrop	3,500
RlA2	Ravola, Toddler	2,550
SlD2	Clifsand	300
MsB	Minchey, Clifsand	2,100
NFE	Lazear, Pinyon, Gerst	750
NNE2	Gerst, Lazear, Badland	1,200
	Total	**15,350**

This alignment is the same as for Alternative B, except for the easternmost leg. Therefore, the impacts would be similar. A comparison of Tables 3.5-2 and 3.5-5 indicates that: approximately 10,700 feet or 22 percent of this alignment may cross soils that are typically poor for road fill; approximately 19,400 feet or 40 percent of this alignment may cross soils that have shrink-swell concerns; 18,200 feet or 37 percent of this alignment may cross soils that have frost heave concerns; and 2,400 feet or five percent may have occasional flooding problems. The incorporation of 12 inches of granular borrow in the roadbed, and the option to use up to 36 inches of granular borrow in the construction of the roadbed in particularly unstable areas would, by design, overcome the poor soils conditions underlying it.

Approximately 31,300 feet or 64 percent of alignment has the potential to cross soils with moderate or severe erodibility ratings and 6,000 feet or 12 percent has the potential to cross moderate to strongly saline soils. These limitations suggest that many of the areas presently disturbed by road construction activities have experienced increased erosion, either by wind or water. Given the proximity of the present alignment to Quitchupah Creek, increased erosion could be increasing sediment loading and increasing salinity to the stream. The inclusion of BMPs in the proposed road design for drainage control and subsequently for erosion and sedimentation, and reclamation of existing road would greatly reduce sediment loading and salinity in the creek from this source.

The sediment production would be similar to that of Alternative B.

Approximately 10,400 feet of this alignment would cross soils mapped as Prime or Unique Farmlands; none of which is currently irrigated. Approximately 600 linear feet (1.4 acres) of the alignment would be within irrigated pasture mapped as Trook gravelly fine sandy loam, a Prime and Unique Farmland.

Water Hollow Alternate Alignment - Alternative D

Table 3.5-6 shows soil mapping units and approximate linear feet of each unit that would be disturbed for this alternative.

Table 3.5-6 Soil Disturbance by Mapping Units - Alternative D

Mapping Unit Designation	Major Soils In Unit	Approximate linear feet of disturbance
21A	Torriorthents with rock outcrops	1,700
69	Haplustolls	9,200
78	Ustorthents and rubblelands	2,400
CIC	Shupert, Winetti	2,300
MUE	Podo, Caba, Doney	400
261	Cabba, Strych, Badland	2,300
569	Gerst, Strych, Badland	4,100
OCA2	Haverdad	2,600
254	Gerst, Travessilla, Chupadera	19,800
AKC2	Hernandez, Chupadera	1,000
NNE2	Gerst, Lazear, Badland	3,000
255	Gerst, Travessilla, Strych, Rock Outcrop	1,100
522	Moffat	3,000
Not Mapped	Not Mapped	6,000
	Total	**58,900**

The first two miles of this alignment would be the same as for Alternative B & C. Approximately 10 percent of the alignment would be in soils that have not yet been mapped by the NRCS. For the remaining soils, a comparison of Tables 3.5-2 and 3.5-6 indicates that: approximately 31,700 feet or 54 percent of this alignment would cross soils that are typically poor for road fill; approximately 33,900 feet or 58 percent of this alignment would cross soils that have shrink-swell concerns; and 36,000 feet or 61 percent of this alignment would cross soils that have frost heave concerns. The incorporation of 12 inches of granular borrow in the roadbed, and the option to use up to 36 inches of granular borrow in the construction of the roadbed in particularly unstable areas would, by design, overcome the poor soils conditions underlying the roadbed.

Approximately 32,800 feet or 56 percent of alignment has the potential to cross soils with moderate or severe erodibility ratings. No moderate to strongly saline soils are crossed by this alignment. In addition, several of the soil mapping units crossed by the alignment include rock outcrop and badlands, for which soils descriptions are also unavailable. Rock outcrops are stable and badlands erosive and saline.

The incorporation of BMPs for drainage and erosion control would greatly lessen the production of sediments from the road corridor. Salinity would not be an issue under this alignment. This alignment's distance from perennial waters would reduce the potential for eroded material to result in increased sediment loading.

Approximately 2,300 feet of this alignment would cross soils mapped as Prime or Unique Farmlands; none of which is currently irrigated.

Mitigation and Monitoring

Sources of fill material would need to be aggregate based and non-saline to reduce the potential for increased salinity within Quitchupah Creek. See Appendix B.

Irreversible or Irretrievable Commitment of Resources and Residual Adverse Impacts

Depending on the alignment selected, between 45 and 54 acres of permanent disturbance would occur to soil resources. The Proposed Action would result in 100 to 155 total acres of disturbance, of which approximately 38 to 80 acres of soil resources would be reclaimed depending on the alternative alignment that is selected. The Proposed Action would cross 600 feet of irrigated and 14,600 feet of non-irrigated Prime Farmland under Alternative B. For Alternative C, the same 600 feet of irrigated Prime and Unique Farmland would be crossed; however, 10,400 feet of non-irrigated Prime Farmland would be affected. Alternative D crosses 2,300 feet of non-irrigated Prime and Unique Farmland.

Cumulative Effects

Reclaimed portions of the existing road surfaces (14 acres) would become available through natural processes for productivity.

3.6 VEGETATION AND WETLANDS

VEGETATION

Vegetation within the Quitchupah area varies from the greasewood community at lower elevations to the Douglas-fir woodland on north slopes at the junction with Acord Lakes Road (Figure 3-5). Within the vegetation types of the corridor are cultivated pastures, riparian zones along Quitchupah Creek, wetlands, and big sagebrush flats. Signs of heavy grazing were evident in the condition of understory vegetation (or lack thereof) and soil disturbance.

The Alternate Junction with SR-10 crosses mainly the greasewood community, with scattered juniper and low shrubs, grasses and forbs on the rocky slopes and upper benches. Vegetation on the Water Hollow Benches consists of an open pinyon-juniper community with an underlying low sagebrush shrub cover, and various grasses and forbs. Chaining for wildlife habitat objectives occurred on these benches about 40 years ago.

In the draws, serviceberry, mountain mahogany, and yucca are present on north facing slopes. Nearest the Water Hollow route junction with SR-10 is an area of open pinyon-juniper "parkland" with low sage providing fairly sparse ground cover, and grasses which reflect heavy grazing. Other plants include yucca, Mormon tea, cactus, and the more common variety of townsendia (Jones). Soils on many areas of this route are cryptogamic. The bottomlands are cut by deep gullies similar to the active downcutting in the Quitchupah drainage. A description of each community is as follows:

Greasewood Community

The greasewood community is present throughout the lower elevation portions of the project area, in combination with shadscale and/or sagebrush, rabbitbrush, and patchy understory grasses.

Included in this type are pockets of a low shrub community (shadscale and sagebrush), which is characterized by a lack of greasewood.

Pinyon-Juniper Community

The pinyon-juniper community type includes areas of sparse juniper on the steep south-facing slopes above Quitchupah Creek Road, as well as the pinyon and juniper community present on slopes in the upper parts of the canyon.

Mountain Brush Community

The mountain brush community occurs in the bottom areas of the upper canyon and includes patches of gambel's oak as well as bigtooth maple, serviceberry, woods rose, Oregon grape, sagebrush, rabbitbrush, and manzanita.

Douglas-fir Woodland

Near the junction of Quitchupah Creek Road and Acord Lakes Road at about 7,600 feet elevation, the vegetation on the north facing slopes transitions to a Douglas-fir Woodland, with Mountain Brush in the drainage bottom. Across the Acord Lake Road on south facing slopes, the pinyon-juniper community predominates, including mountain mahogany.

Invasive Species

The Utah State Noxious Weed List includes plants that have been determined to be especially injurious to public health, crops, livestock, land, or other property. Neither Emery County nor Sevier County have added particular County noxious weeds to this list.

TES Species

Several TES plant species have the potential to occur in the project area. A full discussion of those species is contained in the Final Special Status Species Technical Report, Quitchupah Creek Road EIS (JBR, 2001f).

WETLANDS

The upland plant community is a sagebrush *(Artemisia sp.)* - grass community located on unsurveyed coarse textured soils and unsurveyed fine textured erodible soils of the terraces, and benches. A riparian plant community dominated by tamarisk (*Tamarix pentandra)* and willows (*Salix exigua*) exists on the banks of Quitchupah Creek. The stream downstream from the juncture of Spring Creek is deeply incised and riparian zones are limited and narrow.

The most common wetland community at the upper elevations is a herbaceous community of grasses, sedge (*Carex aquatilis)*, water cress (*Rorripa nasturtium-aguaticum*), and willows. The wetland community at the lower elevations consists of salt grass (*Distichlis spicata),* rush (*Juncus arcticus*) and tamarisk. This wetland community is generally found on sandy alluvial soils and loams of the floodplains. The wetland community or hydric fringe along the stream banks is absent due to scouring in some places, and well developed at other sites.

Four jurisdictional wetlands (JW) were delineated within the survey area. Each is located on the floodplain associated with the stream channel. One wetland is located in an oxbow not directly connected to the channel. A summary for each wetland is shown in Table 3.6-1.

Table 3.6-1 Jurisdictional Wetlands Types and Acreages

JW Area	Site	Hydrology	Acreage
45+00	floodplain	seep	0.076
50+00	floodplain	spring	0.21
65+00	floodplain	stream	0.46
210+00	floodplain - oxbow	stream	0.46

REGULATORY

The 404 permitting process would include verification and approval by the Corps of the jurisdictional wetland delineation for the Quitchupah Creek Road corridor. An individual 404 permit would be required to fill the wetlands in conjunction with a Streambed Alteration Permit.

No Action - Alternative A

The vegetation communities in the project area would not be disturbed by road construction at this time.

POTENTIAL IMPACTS

Impacts common to all alignments:

- It is estimated that approximately 0.076 acres of a wetland and 3.2 acres of riparian habitat in the upper Quitchupah Creek drainage would be disturbed by road construction.

Quitchupah Creek Road Alignment - Alternative B

Approximately 100 acres of vegetation would be disturbed by construction of the road, borrow sites, and staging areas. This would include 73.5 acres greasewood community; one acre pinyon-juniper; 25 acres mountain brush; 0.5 acres Douglas-fir woodland, and 3.3 acres wetland/riparian. Of the total 100 acres, it is expected that 40 acres of uplands would be reclaimed. A discussion of reclamation procedures is provided in Chapter 2.

The 100 acres of disturbance would be subject to noxious weed invasion until construction was complete and reclamation had stabilized the disturbed acreage.

Alternate Junction and Alternate Design - Alternative C

Under this alternative, total disturbed acreage would be similar to Alternative B. This would include approximately 72.9 acres greasewood, 1.6 acres pinyon-juniper, 25 acres mountain brush, 0.5 acres Douglas-fir woodland, and 3.3 acres wetland/riparian. Approximately 38.8 acres of uplands would be reclaimed.

The 100 acres of disturbance would be subject to noxious weed invasion until construction was complete and reclamation had stabilized the disturbed acreage.

Water Hollow Alternate Alignment - Alternative D

Approximately 155 acres of vegetation would be disturbed by construction of the road. This would include approximately 0.5 acres Douglas-fir woodland, 3.3 acres wetland/riparian, 85 acres pinyon-juniper, 23 acres low shrub, and 44 acres mountain brush. Approximately 80 upland acres of the 155-acre disturbance would be reclaimed.

The 155 acres of disturbance would be subject to noxious weed invasion until construction was complete and reclamation had stabilized the disturbed acreage.

Mitigation and Monitoring

If noxious weeds are discovered, a noxious weed control plan would be developed in cooperation with the land management agencies and implemented as necessary. Mitigation and monitoring for impacts to wetlands within the Proposed Action area would be coordinated with the Corps during Clean Water Act Section 404 Permitting.

Irreversible or Irretrievable Commitment of Resources and Residual Adverse Impacts

Between 45 and 54 acres of permanent disturbance to vegetation communities would occur as a result of the Proposed Action. Permanent disturbance of 0.076 acres to wetlands would occur as a result of the Proposed Action. Of the 100 to 155 acres of total disturbance that would occur as a result of the Proposed Action, a total of 38.8 to 80 acres of upland vegetation would be reclaimed. Approximately 2.75 acres of riparian vegetation would be restored in conjunction with TES species mitigation in Section 4.9. A total of 3.3 acres of wetland/riparian vegetation would be temporarily disturbed as a result of the Proposed Action. No residual adverse impacts were identified for vegetation or wetland resources within the Proposed Action area.

Cumulative Effects

The past land practices of grazing and farming have changed the plant communities in the project area. The current grazing system will reinforce these changes in the future. While the permanent loss of vegetated acreage would accrue due to the construction of the road, the project would not affect changes in the overall plant communities.

3.7 WILDLIFE RESOURCES

The following description of the existing affected environment includes the project and all alternate alignments. Unless otherwise specifically noted, there are no substantial differences in the wildlife resources among the areas where the alternate alignments diverge.

MAMMALS

The diversity of mammal species includes members of the rodent family, bats, intermediately sized species such as skunks, coyotes, badgers, bobcats, cottontails and jackrabbits, and big game including elk, mule deer, mountain lion, and bear.

Big Game

Elk (*Cervus canadensis*) and mule deer (*Odocoileus hemionus*) are highly visible mammals that commonly occur in the area. Critical and high value winter use and high volume summer use areas for elk, and critical and high value winter use areas for deer occur within the Quitchupah Creek drainage (Figure 3-6). High value summer range for deer occurs adjacent to the project area south of Convulsion Canyon. The Water Hollow Benches area, through which an alternate alignment would pass, is also within critical and high value elk and deer winter range. Elk winter range use occurs on snow-free open areas, such as the grassland and sagebrush vegetation types associated with lower elevations and drainage bottoms. Although critical elk winter range occurs adjacent to the Quitchupah Creek Road alignment project area, in high snow years the high value elk winter range in the project area is reclassified as critical elk winter range. A 1997 elk census reported a concentration of elk on the Saleratus Benches area, located between the Water Hollow Benches and SR-10. Mule deer use the south-facing slopes, mountain shrub communities, and riparian areas in the drainage. The mule deer move out of the area to higher elevations in spring to heavier cover for fawning and areas of greater herbaceous and shrub cover for summer.

In addition to elk and deer, several moose (*Alces alces*) have been relocated into the Fishlake National Forest with marginal success. One moose has been known to travel through the Quitchupah drainage during the winter months (Rasmussen, 1999). Black bear (*Ursus americanus*) are also known to occasionally occur at the higher elevations of the Quitchupah Creek drainage, but are not very common.

Chaining occurred in the Water Hollow Benches area approximately 40 years ago to assist in the development of wildlife habitat.

Bats

Riparian areas within the Quitchupah Creek drainage provide foraging habitat for a variety of bat species. The forested areas and surrounding escarpments provide roosting sites for summer resident bats and hibernation sites for year-long resident bats. Bats use riparian areas extensively for foraging due to the abundance of insects. The Townsend's big-eared bat (*Corynorhinus townsendii*) and the

spotted bat (*Euderma maculatum*), both sensitive forest species, are discussed in greater detail in the Final Special Status Species Technical Report, Quitchupah Creek Road EIS (JBR, 2001f).

BIRDS

A variety of vegetation types throughout the project area provide habitats for many species of birds. While each vegetation type offers important habitat components, the riparian areas that occur along Quitchupah Creek are the most heavily utilized by the birds in the area. The riparian areas are important during migration as these are often the only habitats within the arid west that have similar characteristics of more mesic habitats found outside the Intermountain region. The abundance of insects make riparian areas important foraging habitats for species that nest in the grass or shrublands adjacent to the riparian areas.

On the Water Hollow Benches, south of Quitchupah Creek, birds associated with the dominant Pinyon-Juniper/Mountain Brush communities are most likely to occur.

Raptors

The timbered areas within the upper drainage area of Quitchupah Creek, as well as escarpments in the project area, provide numerous nesting opportunities for raptors. Foraging opportunities for raptors are also plentiful and occur throughout the various habitat types found within the area. The aerial survey performed by Utah Division of Wildlife Resources (UDWR) in 2000 identified 13 raptor nests within one mile of the proposed Quitchupah Creek Road alignment: one prairie falcon (*Falco mexicanus*) nest and 12 golden eagle (*Aquila chrysaetos*) nests. Of the 12 golden eagle nests, three were listed as active, seven as inactive, and two were tended. The prairie falcon nest was listed as active during the 2000 aerial survey. Nine of the 13 nests (all golden eagle) were located within 0.5 miles (the spatial buffer zone distance required for active golden eagle nests during the dates of January 1 through August 31) of proposed activities and five of those were either tended or active in 2000. The survey also identified four raptor nests within one-half mile of portions of the Water Hollow alternate alignment that occur apart from the Quitchupah Creek Road area: two tended golden eagle nests, one active great horned-owl nest, and one American kestrel nest.

Several other raptors, such as red-tailed hawk (*Buteo jamaicensis*), American kestrel (*Falco sparverius*), and sharp-shinned hawk (*Accipiter striatus*) may nest in the aspen or conifer stands, or forage within the various vegetation types of the analysis area.

Upland Game Birds

Ruffed grouse (*Bonasa umbellus*) are been found in the upper reaches of the Quitchupah drainage area. No known sage grouse (*Centrocercus urophasianus*) leks are located within the project area or the general vicinity. Chukar (*Alectoris chukar*) do occur in the drainage area, but are not abundant.

AMPHIBIANS

UDWR identified seven amphibian species that could potentially occur within the project area; one salamander (tiger salamander - *Ambystoma tigrinum*), four toads (Great Basin Spadefoot toad - *Spea intermontanus*, boreal toad - *Bufo boreas*, Great Plains toad - *Bufo cognatus*, Woodhouse's toad - *Bufo woodhousei*), and two frogs (boreal chorus frog - *Pseudacris maculata*, northern leopard frog - *Rana pipiens*). Amphibians' dependence on water limits their distribution in the project area. Perennial water is available in Quitchupah Creek and associated springs, as well as lower portions of East Spring Canyon Creek and lower Water Hollow Creeks at their confluences with Quitchupah Creek. Ephemeral water sources occur in minor drainages that are tributary to Quitchupah Creek. These sites are used as breeding sites and areas where the young develop.

One amphibian species was observed during the amphibian surveys conducted in the Quitchupah Creek drainage in 1999. Numerous tadpoles and young Great Basin Spadefoot Toads (*Spea intermontanus*) were discovered in a wetland area south of Quitchupah Creek, located in the SW¼ of Section 16, Township 22 South, Range 5 East. No other amphibian species were observed within the Quitchupah Creek Road alignment. Amphibian surveys were not conducted within the Water Hollow Benches area. Similar species to those potentially found in the Quitchupah Creek Road alignment also have the possibility of being found within the Water Hollow area, however, the lack of riparian/wetland habitat limits their potential abundance.

REPTILES

Because of the different habitat types found within the project area, the potential for a variety of reptile species to occur is fairly high. Based upon habitat requirements, of the 36 species of reptiles that occur in southeastern Utah, less than half potentially could occur within the area. The sagebrush lizard (*Sceloporus graciosus*) and western terrestrial garter snake (*Thamnophis elegans*) were two of the common reptiles observed during various field studies.

REGULATORY

Although specific permits would not be required for construction activities in regard to wildlife resources, UDWR would be consulted for mitigation and reclamation requirements for impacted big game range use areas and other wildlife related issues. These would likely include construction timing limitations to prevent impacts to big game and raptors during key seasons.

Potential Impacts

No Action - Alternative A

Selection of the No Action Alternative would not result in any direct, indirect, or cumulative impacts to wildlife resources in the project area. The road would not be constructed in the Quitchupah Creek drainage and no disturbance would be anticipated. The existing environment in the Quitchupah Creek drainage would continue for the near future.

Quitchupah Creek Road Alignment - Alternative B

MAMMALS

Big Game

Road construction activities would result in total new surface disturbance of 88.4 acres, with an additional 25 acres of new surface disturbance possible from staging and borrow areas. All disturbance would occur within big game range. After reclamation of some of the disturbance associated with construction in the road corridor, and reclamation of all of the staging and borrow areas, there would be a net permanent loss of 45 acres. Complete revegetation of the 41 reclaimed acres would probably require several years.

Displacement of resident big game would occur during construction activities. However, the majority of construction activities would occur during the summer and fall when big game are not as abundant in the project area, thus limiting the displacement impact.

After construction, big game would likely avoid or move away from the disturbance (i.e., vehicle traffic and noise) caused by the road to other suitable habitat areas (Section 3.3, Noise). Habitat near the road would be underused as the big game animals would tend to be displaced from this area. According to studies, the density of animals and overall species richness decrease with increasing proximity to a road (USFWS, 1999). This displacement could alter the natural distribution patterns and result in the overuse of other habitat areas if big game animals become concentrated.

Mortality and injury of big game resulting from collisions with vehicles is likely to occur. As vegetation becomes reestablished alongside the reclaimed portions of the road corridor, game may be attracted toward the road by palatable species growing within the corridor; agency-specified seed mixes may help to reduce this attraction.

Bats

Impacts to suitable foraging areas for bats within riparian habitat would occur. Approximately 2.75 acres of riparian habitat (potential foraging habitat) would be impacted by the construction activities. Similar foraging habitat occurs nearby, but is most abundant at the extreme lower portion of the area and is limited throughout most other higher areas in Quitchupah Creek. The forested areas and surrounding escarpments that potentially provide roosting sites for summer resident bats and hibernation sites for year-long resident bats might be impacted by blasting activities that may be required during construction. Noise and vibration associated with blasting activities could also impact bats using the immediate area.

BIRDS

Several of the habitat types used by birds found in the area would be impacted by construction activities. Of the 101.7 acres of proposed new surface disturbance, most of the disturbance would occur within habitats that are abundant throughout the Quitchupah Creek drainage. However, the riparian habitat that would be impacted near the western end of the alignment is somewhat limited in other adjacent areas. Birds that currently use this riparian area may leave the area during

construction activities. These birds may not return following construction of the road because of the noise and activity caused by haul trucks.

Construction activities would cause displacement of birds to similar adjacent areas and would likely have minor impacts to the displaced birds. Birds utilizing the riparian habitat may be most affected. Increased mortality from vehicle collisions would also be likely to occur.

Raptors

The buffer zones and seasonal construction restrictions that would likely be required by UDWR in regard to active nest sites would prevent impacts to nesting raptors due to construction activities. Abundant foraging opportunities exist adjacent to the proposed project, thus limiting the impacts caused by the proposed new surface disturbance. The presence of a paved road would likely increase road kill in the area resulting in an additional food source that could increase raptor populations in the area. However, raptors that feed on the road kills would be more susceptible to collisions with vehicles.

AMPHIBIANS

Impacts would occur to some, but not all, of the suitable amphibian habitat throughout the Quitchupah Creek drainage. However, the wetland area, in which the Great Basin spadefoot toads were observed during the summer surveys, would not be disturbed. After construction, the paved road and increased traffic would cause increased mortalities to amphibians, especially after periods of rainfall when amphibians are most active and could occur on the road.

REPTILES

New surface disturbance during construction activities would displace, kill, or injure reptiles within the area. After construction, the paved road and increased traffic would cause increased mortalities. Displaced reptiles would reestablish in undisturbed habitats away from the road.

Alternate Junction with SR-10 and Alternate Design - Alternative C

Impacts to wildlife resources would be similar to those described for the Alternative B with the exception of impacts to big game and raptors. Under this alternative, underpasses to facilitate big game movements would be installed, reducing the potential impacts to big game caused by vehicle collisions. In addition, this alternative would also reduce the susceptibility of raptors from vehicle collisions. Installation of the wildlife underpasses would presumably result in less road-killed wildlife for the raptors to feed on, thus decreasing the likelihood of raptors foraging on the road.

Water Hollow Alternate Alignment - Alternative D

Impacts to wildlife resources would be similar to those described for Alternative B, except that an additional 53.7 acres (bringing the total to 155.4 acres) of impacts to wildlife habitat would occur under this alignment. In addition, the Saleratus Benches area appears to winter greater elk numbers than the Quitchupah drainage, so impacts to that species may be greater for this alternative than for Alternatives B or C.

Further, an additional four active raptor nests would occur within 0.5 miles of this alternate alignment and would need to be evaluated prior to planned construction. Buffer zones and seasonal construction restrictions would be implemented for nests determined to be active for the year of planned construction to prevent impacts potentially caused during construction activities to nesting raptors.

Impacts to suitable habitat for amphibians are likely to occur. However, because this alignment would be away from the better quality, creek-side habitat for most of its distance, the extent of impacts would be less for this alternative than for Alternatives B and C, which are much closer to Quitchupah Creek for most of its distance. After construction, the paved road associated traffic would cause increased mortalities to amphibians.

Mitigation and Monitoring

Should Alternatives B or D be selected, impacts to wildlife would be mitigated by placing fencing and underpasses along the roadway. Palatable species would be seeded along the underpasses to entice wildlife to utilize the underpasses to cross the roadway. Should Alternative D be selected, offsite mitigation could include additional winter range projects for big game.

Irreversible or Irretrievable Commitment of Resources and Residual Adverse Impacts

Depending on the Alternative selected, between 45 and 54 acres of permanent disturbance to habitat would occur as a result of the Proposed Action. Of the 100 to 155 acres of total disturbance that would occur as a result of the Proposed Action, between approximately 38 and 80 acres of habitat would be reclaimed based on which alternative is selected.

Cumulative Effects

Increased public access would occur as a result of the Proposed Action, which would increase noise and also disturbance to wildlife habitat. Past range improvements, such as the reservoir on Saleratus Bench, has provided a water source that benefits wildlife species. Gas drilling may occur and such drilling may affect up to 78 acres at any one time. Reclamation would occur on sites that do not enter into production. The construction of fencing along SR-10 and in Quitchupah Creek would impede wildlife movement in the area.

3.8 FISHERIES AND AQUATIC RESOURCES

The following is a summary description of the existing affected environment for aquatic resources in Quitchupah Creek and lower Water Hollow Creek. A full description is presented in Final Aquatic Resources Technical Report, Quitchupah Creek Road EIS (JBR, 2001c).

FLOW RATES

Flow rate measurements were taken at two different times of the year for the Quitchupah stations and once in Water Hollow Creek. At the Quitchupah stations, the first set of flow rate measurements coincided with the fish electroshocking and macroinvertebrate sampling in July 1999 and the second set of flow rate measurements were taken in early October 1999 when flow rates are expected to be near the lowest of the year. The single flow rate measurement in Water Hollow Creek coincided with the fish electroshocking and macroinvertebrate sampling in November 2000. Table 3.8-1 displays the flow rates from the sampling periods. The locations of the aquatic sampling stations are presented in Figure 3-3.

Table 3.8-1 Flow Rate Measurements for Aquatic Sampling Stations

Stations	Flow Rates (cfs)	
	July	October or November
Quitch-01	3.0 cfs	6.26 cfs*
Quitch-02	7.86 cfs	6.00 cfs
Quitch-03	0.81 cfs	0.70 cfs
Quitch-04	0.13 cfs	0.10 cfs
WH-01	not taken	0.50 cfs

* Increase in flow presumably caused by decrease in irrigation upstream of station and flow from Muddy Creek return canal into Quitchupah Creek (not flowing during July flow rate measurement).

FISH SAMPLING

Fish were only captured at the three lowest stations (Quitch-01, Quitch-02, and Quitch-03). No fish were captured at the highest stations, WH-01 and Quitch-04. A large natural waterfall barrier (>40 feet tall) occurs between stations Quitch-03 and Quitch-04, but above WH-01 and presumably prevents fish from reaching the upper parts of the creek (Quitch-04) and associated tributaries above this point. It is not known why fish were not observed at WH-01.

A baseline fisheries study was conducted on Quitchupah, Water Hollow Creek, and East Spring Canyon Creeks. A total of five stations were selected (Quitch-01 through Quitch-04 and WH-01) and sampled via electrofishing. The greatest diversity (4 species) and highest numbers of fish (142) were found at the lowest station (Quitch-01). Speckled dace were the most common fish caught, occurring at three stations and in the highest number. In addition, speckled dace were the only species captured at stations Quitch-02 and Quitch-03.

Two fish species listed on UDWR's Utah Sensitive Species List, the flannelmouth sucker and the leatherside chub, were caught during the surveys at the lowest station.

MACROINVERTEBRATE SAMPLING

A range of between 10 to 16 different species of macroinvertebrates were found at the five stations sampled on Quitchupah, Water Hollow, and East Spring Canyon Creeks, station Quitch-01 having the lowest diversity and station Quitch-03 having the highest diversity of species. Quitch-04 (East Spring Canyon Creek) had the highest grams/square meter of the five stations. Not surprisingly, the highest number of macroinvertebrates were of those species with high tolerance quotients. The high tolerance quotients are a strong indication that the majority of species in Quitchupah Creek are accustomed to stressed environmental conditions. The Biotic Condition Index (BCI) data for these stations indicate that they are at or near their potential, and that given the existing stream and watershed conditions, these stations are about as good as they can be. However, there is potential that the aquatic macroinvertebrate community could be degraded below current levels by eliminating the few intolerant and moderately tolerant taxa present, reducing the numbers of taxa, or by reducing their biomass. The Shannon-Weaver Index (used to measure the diversity of a community) results are typically higher than found within the project site when the community is in better condition. However, the lower results can easily be attributed to the minium number of samples (3) taken.

Station Quitch-03 contains 16 taxa, many of which have low tolerance quotients. This is reflected by the low Actual Community Tolerance Quotient (CTQa) value of 67 and high BCI score of 112. The BCI score of 112 does indicate that the Predicted Community Tolerance Quotient (CTQp) is likely too high, however this value was kept the same as Winget (1983) for comparison purposes. Station Quitch-02 still has some of these sensitive taxa but in reduced numbers. However, it still has a relatively low CTQa value of 77 and a high BCI score of 97. The lowest station Quitch-01 exhibits very few sensitive taxa. In fact, the single specimens of *Drunella doddsi* and *Isoperla* could have drifted down from above and are probably not indicators of established populations.

Station Quitch-04 contained many taxa that are indicators of a more lentic or slow flowing water habitat. Organisms such as the micro caddisfly family Hydroptilidae, the Odonata, *Argia* and *Cordulagaster* and the tiny clam shrimp, Ostracoda, indicate that the system is not a fast flowing creek. The system must, however, be unique because it contains the relatively rare aquatic insects *Cordulagaster* (dragonfly) and *Oxyethira* (caddisfly). The very high CTQa score of 99 and low BCI number of 74 indicate poor lentic conditions.

WH-01 had four taxa that were not present in the Quitchupah stations. For three of these, their presence was essentially a factor of the season of collection (Baumann,2000). Further, Baumann (2000) noted a scarcity of midges from the family Chironomidae at this station.

The results of the 1999 and 2000 sampling were compared with results from the 1980 to 1982 sampling (Winget, 1983) where applicable. No sampling had occurred previously in Water Hollow Creek and therefore no comparisons are made for station WH-01.

The Quitchupah Creek drainage is in about the same aquatic condition in 1999 as it was in 1980-1982. Comparable stations showed similar diversity and BCI values. The organisms were essentially the same and the species that were different exhibit similar tolerance quotients. Water Hollow Creek is in worse condition when compared to Quitchupah, but is still in relatively good shape (Baumann, 2000).

SEDIMENT SAMPLING

During the data collection effort, sediment mobility and active erosion/deposition that affects habitat features was evident. A flash flood, with a peak just over bank full, occurred during the sampling, and the following day, one of the pools that had been selected for sampling was no longer even present. The stream as a whole appears to be very active, and habitat features appear to undergo frequent modifications.

Riffles or runs were the most common feature observed; pools were much less prevalent in number, and where noted, were generally small, shallow, poorly formed, and did not tend to span the width of the channel. It appeared that many of the identified pools were low flow features only, and would not be identifiable in a high flow event. Perhaps related to the poor quality and low number of pools, and the active frequent modifications that the channel undergoes, pools with identifiable tails typical of salmonid spawning sites were minimal.

The most notable conclusion from the sampling was that, out of the 37 samples collected at the Quitchupah stations, all had greater than 30 percent fines (less than 6 Millimeters (mm). Previous study of sediments in the bed of Quitchupah Creek has shown similar results. Over a two-year period in the early 1980s, Winget (1983) collected four stream bed sediment samples from two locations on Quitchupah Creek. One location was below the mouth of East Spring Canyon Creek, and the other was just upstream of the confluence with the North Fork. Information on sampling methodology, site selection, or other collection details is not available, but the particle size distribution data presented in the report indicate high levels of fine sediments at both stream locations. An examination of Winget's (1983) data show that, for the eight samples, the range in the percent smaller than 4.75 mm was 31 to 74 percent, and the average was 56 percent. The riffle samples from our study showed essentially the same, with a range from 32 to 72 percent and an average of 50 percent.

Comparisons between the four stations could not be readily made due to the varying number of samples and due to the varying habitat types sampled within each reach. However, based upon the range of fines reported for only the riffle samples collected from each station, there was not an identifiable difference between stations. Riffles within Quitch-01 ranged between 33 to 73 percent fines, riffles within Quitch-02 between 36 to 62, riffles within Quitch-03 between 42 to 66, and the lone riffle within Quitch-04 had 52 percent. Comparisons between habitat types show (1) Pools, as may be expected, had the finest sized particles and the least variation; and (2) Pool tails had generally finer sizes than did the riffles, but both were quite variable.

Water Hollow samples were generally similar to Quitchupah Creek samples. Any differences would not be expected to be statistically meaningful.

REGULATORY

Regulatory issues regarding potential aquatic impacts would be limited to those relating to wetlands issues (Corps 404 process), and water quality issues (Clean Water Act as implemented by the Utah Division of Water Quality). The permitting for this project would require a 404 permit to mitigate loss of wetlands and filling in "waters of the U.S.", and a Streambed Alteration Permit.

POTENTIAL IMPACTS

Impacts to, and issues on, resources related to aquatic resources are described in the Vegetation and Wetlands (Section 3.6) for impacts to wetlands and riparian zones; in the Water Resources (Section 3.4) impacts to water quality, the nearby 303d-listed stream segment, flood plains, and related subjects; and in the Wildlife Resources (Section 3.7) impacts to species such as amphibian are discussed.

No Action - Alternative A

Selection of the No Action Alternative would not result in any change in direct, indirect, or cumulative impacts to aquatic resources in the project area. The new road would not be constructed in the Quitchupah Creek drainage or the adjacent Water Hollow Bench area. The existing road would remain as a sediment source to the stream, and the existing environment in the Quitchupah Creek drainage would continue for the near future.

Quitchupah Creek Road Alignment - Alternative B

Quitchupah Creek is currently an active stream that conveys significant amounts of sediment and dissolved solids, as reflected by the fish and macroinvertebrate species present in its waters, particularly in the lower reaches of the project area. Speckled dace are found in all the lower stream reaches conditioned to the sediment laden waters and salinities. The high tolerance quotient and generally low biotic index in the macroinvertebrates community indicates an aquatic environment that is under stress. Table 3.8-2 gives a summary of the macroinvertebrate community by station to indicate the poor condition of the aquatic ecosystem in Quitchupah Creek.

Table 3.8-2 Macroinvertebrate Community Indicators

Station	CTQa[1]	Percent of BCI[2]	Condition of Ecosystem	1980-81 CTQa	1980-81 BCI
01	87	86	Poor	78/97	103/82
02	77	97	Fair	82/92	95/102
03	67	112	Good	-	-
04	99	74	Poor	-	-
WH-01	75	100	Good	-	-

1. Community Tolerance Quotients is average of community tolerance, high numbers indicate pollutant tolerance species dominate community.
2. Percentage of predicated stream condition, low percentage indicates poor condition of aquatic ecosystem.

As described in the Water Resources section, sediment production from the proposed road would be less than from the existing road given the higher level of engineering design and protective measures. Under unexpected circumstances (such as if a culvert were to fail during a greater-than-design event) where a pulse of sediment could be introduced, the highly tolerant species present in the stream system would be expected to absorb such an occurrence, as they do currently (for example, when tributaries dump heavily-laden storm water runoff into the stream).

Impacts to the aquatic resources as a result of increased traffic, hauling of coal materials, fuels, etc. would not be expected during the normal course of use. In the event of a truck accident, coal and fuels could inadvertently be introduced to the stream. Should such an event occur in the vicinity of station Quitch-04, where the more unusual and specialized macroinvertebrates were found, any degradation of the habitat would likely impact them by rendering their habitat unsuitable.

Alternate Junction and Alternate Design - Alternative C

Potential impacts to aquatic resources would generally be the same as for Alternative B. As described in Water Resources (Section 3.4), the proximity of the road to the stream, the number of required crossings, and the risk to the stream from implementation of Alternatives B and C are similar.

Water Hollow Alternate Alignment - Alternative D

The Water Hollow Road alignment would be placed further away from Quitchupah Creek than either Alternative B or Alternative C. This would mean that any erosion that occurred as a result of road construction, or of failure of road features due to drainage or stability problems, would be less likely to affect Quitchupah Creek. Further, any spills of coal, fuels, etc. would be less likely to reach Quitchupah Creek than they would be under Alternative B or C. Also, this route would avoid the majority of Quitchupah Creek, including its middle and lower reaches that are most susceptible to instability impacts. However, it is important to note that the existing Quitchupah Creek Road would remain in use and in its current unstable state under this alternative, and would thus continue to contribute sediments to the stream. Water Resources (Section 3.4) discusses the net effect of

building the Water Hollow alignment and leaving the existing road. However, a spill at Water Hollow would affect this stream and reach Quitchupah Creek.

Mitigation and Monitoring

No mitigation or monitoring, beyond what is described in Section 3.4 for Water Resources, are necessary for the Proposed Action.

Irreversible or Irretrievable Commitment of Resources and Residual Adverse Impacts

An improved road design would decrease sedimentation and salinity into the drainages from the existing environment. However, the interceptions and discharge of storm water would be in greater and faster amounts into drainages as a result of the build alternatives. Truck accidents could introduce coal and fuel into the streams even with mitigation and monitoring measures in place. This would produce residual adverse impacts to fisheries and aquatics from Alternatives B, C, or D.

Cumulative Effects

Increased public access to the Proposed Action area would produce cumulative impacts to fisheries and aquatic resources. These cumulative impacts would primarily occur from sediment loading/erosion impacts, salinity, or fuel spills generated by the public.

3.9 THREATENED, ENDANGERED, AND SENSITIVE SPECIES

The area of analysis for special status species encompasses the Quitchupah Creek Road project area and alternatives. As required by the Endangered Species Act (ESA), a Biological Assessment (BA) has been prepared under separate cover and is on file at the Fishlake National Forest Office and the BLM Richfield Field Office in Richfield, Utah. The BA evaluates the potential effects of a proposed action on federally listed threatened, endangered, proposed and candidate species, and determines whether any such species and habitat are likely to be adversely affected by the action. The species accounts and discussion of potential impacts on these species, as discussed below, resulting from Alternatives are taken from the BA.

The USFS requires a Biological Evaluation (BE) for the assessment/summary of the effects of a proposed action on USFS Sensitive Species. The information presented below has been utilized by the USFS for preparing a BE of the Alternatives.

In the case of species which occur or may occur in the project area, and species which may be directly or indirectly affected by the Alternatives, a further evaluation of potential impacts was prepared.

THREATENED, ENDANGERED, PROPOSED, AND CANDIDATE SPECIES

A total of 12 federally protected plant and animal species were listed by the USFWS as having the potential to occur within Emery and Sevier counties and are shown in Table 3.8-1. These species are listed as either threatened, endangered or candidate; no proposed species occur on the list. The following discussion evaluates the likelihood for these species to occur in the area, based on habitats present, known occurrences, and the results of dedicated surveys for these species. If a species is known to occur in the area or has the potential to occur, the potential impacts resulting from the project on that species are discussed.

A literature search reviewed the preferred habitats, elevational ranges, and occurrence records for each of these species. Based upon this information, a determination was made regarding the potential for each species to occur within the project area, or to be directly or indirectly affected by the Alternatives (i.e., for the species to occur within the Action Area). The basis for these determinations is presented in the following discussion. In the case of species which clearly do not occur in the project area and have no potential to be directly or indirectly impacted by the Alternatives (e.g., plant species occurring only at high elevations), a "No Effect" determination was made.

In the case of species which occur or may occur in the project area and species which may be directly or indirectly affected by one or more of the Alternatives, a further evaluation of potential impacts was prepared.

Table 3.9-1 Federally Listed Species Potentially Occurring within the Project Area

Common Name	Specific Name	Federal Status
Jones Cycladenia	*Cycladenis humilis* var. *jonesii*	Threatened
Maquire Daisy	*Erigeron maguirei*	Threatened
Last Chance Townsendia	*Townsendia aprica*	Threatened
Barneby Reed-Mustard	*Schoenocrambe barnebyi*	Endangered
San Rafael Cactus (Despain Footcactus)	*Pediocactus despainii*	Endangered
Winkler Cactus (Winkler Footcactus)	*Pediocactus winkleri*	Threatened
Wright Fishhook Cactus	*Sclerocactus wrightae*	Endangered
Heliotrope Milkvetch	*Astragalus montii*	Threatened
Bald Eagle	*Haliaeetus leucocephalus*	Threatened
Southwestern Willow Flycatcher	*Empidonax traillii extimus*	Endangered
Mexican Spotted Owl	*Strix occidentalis lucida*	Threatened
Yellow-billed Cuckoo	*Coccyzus americanus occidentalis*	Candidate

Threatened and Endangered Plants

Several of the listed plant species which have the potential to occur in the project area are restricted to, or most commonly occur on, particular soil or geological formation types. Soils in the area are generally derived by deposits of Quaternary alluvium and gravel deposits. The project area cuts through numerous sedimentary geologic formations which include the Mesaverde Group and the Mancos Shale.

Jones Cycladenia (*Cycladenia humilis* var. *jonesii*) - Threatened

This species occurs at lower elevations than those found in the project area (4,400 to 6,000 feet vs. 6,000 to 7,600 feet in the project area) and on formations and soil types which do not occur in the area. Therefore, this species would not be expected to occur in the project area.

Maguire Daisy (*Erigeron maguirei*) - Threatened

The upper elevational range of this species, as reported by Atwood et al. (1991), is within the elevations of the project area and suitable habitat for this species (cliff crevices and the sandy bottoms of washes) does occur within the project area, but the geologic formations from which the species has been reported (Wingate, Chinle, and Navajo sandstone formations) are not found in the area. Therefore, this species is believed to be absent from the project area.

Last Chance Townsendia (*Townsendia aprica*) - Threatened

This species grows in salt desert shrub and pinyon juniper habitats on clay or clay-silt exposures of the Arapien and the Blue Gate member of the Mancos Shale, at elevations between 6,100 to 8,000 feet (Welsh et al., 1987; Atwood et al., 1991). Flowering occurs in April and May.

This species is known from locations near the project area (Section 13, Township 22 South, Range 5 East). Field surveys were conducted within the project corridor in May 1999 and June 2000; however, this species was not observed during either survey.

Winkler Cactus (*Pediocactus winkleri*) - Threatened
The Winkler cactus generally occurs at elevations below that found in the project area. However, this species may be found near the lower, eastern, boundary of the project area (Armstrong, 1999). Field surveys were conducted within the project corridor in May 1999 and no Winkler cactus were found.

Heliotrope Milkvetch (*Astragalus montii*) - Threatened
Welsh et al. (1987) state that the heliotrope milkvetch is known only from the Flagstaff Limestone on the Wasatch Plateau, at an elevation of approximately 11,000 feet. The heliotrope milkvetch would not be expected to occur in the project area, where elevations reach only about 7,600 feet.

Barneby Reed-Mustard (*Schoenocrambe barnebyi*) - Endangered
This species occurs at elevations below those found in the project area and on soils derived from the Chinle Formation, which does not occur in the project area. The species is thus not expected to occur within the project area.

Despain Footcactus (*Pediocactus despainii*) - Endangered
The Despain footcactus occurs at elevations similar to those found in the project area. Conversations with the botanist for the BLM's Richfield Field Office, indicate the species has the potential to occur within the project area (Armstrong, 1999), however, no Despain footcactus were observed during May 1999 field surveys.

Wright Fishhook Cactus (*Sclerocactus wrightiae*) - Endangered
Although appropriate habitat and formations for this species do occur within the project area, no Wright Fishhook Cactus were observed during a May 1999 field survey.

Threatened, Endangered, and Candidate Wildlife
Four federally listed wildlife species were identified by the USFWS has having the potential to occur within the project area. All four species are birds. They include: the bald eagle, southwestern willow flycatcher, Mexican spotted owl, and yellow-billed cuckoo.

Bald Eagle (*Haliaeetus leucocephalus*) - Threatened
No bald eagle nests are known to occur within or in the general vicinity of the project area. Most sightings have been made in the Joes Valley Reservoir and Huntington Canyon areas, the closest of which (Joes Valley Reservoir) is approximately 17 miles north of the project area (USDA-USFS, 2000). A bald eagle nest has been reported in the vicinity of Castle Dale, approximately 20 miles northeast of the project area. No roost sites have been found in the project area, and bald eagles are not expected to occur in the area except as transient birds, most commonly occurring in the winter months.

Mexican Spotted Owl (*Strix occidentalis lucida*) - Threatened
Dedicated surveys for the Mexican spotted owl were deemed unnecessary, thus were not conducted. The Mexican spotted-owl is not expected to occur in the analysis area or general vicinity.

Southwest Willow Flycatcher (*Empidonax traillii extimus*) - Endangered
The southwestern willow flycatcher utilizes dense riparian habitats in Arizona, New Mexico, southern California, and extreme southern Nevada and Utah. The species may also occur in southwestern Colorado and extreme northwestern Mexico (Endangered Species Technical Bulletin, 1993). Habitat for this species includes dense growths of willow and structurally similar vegetation.

Initial dedicated surveys for the southwestern willow flycatcher were conducted in May, June, and July1999 and a follow-up survey was conducted in May and June 2000 in suitable habitat in the upper reaches of the Quitchupah Creek drainage (JBR 2001g). During the last survey period in 1999 on July 1 (Survey 3), one lone southwestern willow flycatcher was observed. No nesting or breeding activity was noted. Because this southwestern willow flycatcher was found during the "non-migrant" period, which is generally from about June 15 to July 20 (Unitt, 1987), presumably it is a resident bird on a territory. However, according to Sogge et al. (1997), there is a small chance the individual could be a non-territorial "floater" (Sogge and Tibbitts, 1994; Sogge et al. in press).

As a result of the lone southwestern willow flycatcher observation in 1999, follow-up surveys were conducted in 2000. No observations of the southwestern willow flycatcher occurred during the 2000 surveys. The 2000 survey results could support the presumption that the lone southwestern willow flycatcher observed in 1999 might have been a non-territorial "floater."

The Salt Lake Field Office of the USFWS has the current distribution line of *E. t. extimus* under review (Romin, 2001). Until a decision has been made, it will be assumed that the lone male southwestern willow flycatcher observed during the 1999 surveys is the federally endangered subspecies.

Dedicated surveys for the southwestern willow flycatcher were not conducted in the Water Hollow Road project area. Suitable habitat for the southwestern willow flycatcher does not occur within the area, thus surveys for it were not warranted.

Yellow-billed cuckoo (*Coccyzus americanus occidentalis*) - Candidate
Dedicated surveys for the yellow-billed cuckoo were not conducted and deemed unnecessary. Habitat for this species is essentially nonexistent or extremely limited within the area. Subsequently, the yellow-billed cuckoo is not expected to occur in the project area or general vicinity.

Sensitive Species
Each land management agency maintains their own region-specific sensitive species lists. The purpose of the listings for sensitive species is to identify those species in the managed area that are the most vulnerable to population or habitat loss. Typically, the conservation strategies recommend that proposed developments avoid sensitive species and their habitat so as not to render the species potentially threatened or endangered species under the Endangered Species Act (ESA). The sensitive listed species are not afforded protection required under the ESA for federally listed threatened or endangered species. Based upon agency consultation, it has been determined that the sensitive species shown in Table 3.8-2 have the potential to occur within the project area.

Under Policy Number W2AQ-4, the UDWR also develops and maintains a list of sensitive species. Designated as the Utah Sensitive Species List, it identifies sensitive species as belonging to one of the following defined categories: extinct, extirpated, state-endangered, state-threatened, of special concern, or conservation species.

In addition, the Utah Natural Heritage Program maintains a list of "rare" species. Several of the listed rare species are also land management agency sensitive species and are addressed below. However, those species that are not sensitive are not afforded protection under the ESA or any land management agency conservation strategy and are, therefore, not discussed further.

Table 3.9-2 USFS & BLM Sensitive Species Potentially Occurring in the Project Area

Common Name	Specific Name	Status
FISHLAKE NATIONAL FOREST SENSITIVE SPECIES		
Elsinore Buckwheat	*Eriogonum batemanii* var. *ostlundii*	Sensitive
Ward Beardtongue	*Penstemon wardii*	Sensitive
Sevier Townsendia	*Townsendia jonesii* var. *lutea*	Sensitive
Rabbit Valley Gilia	*Gilia caespitosa*	Sensitive
Townsend's Big-eared Bat	*Corynorhinus townsendii*	Sensitive
Spotted Bat	*Euderma maculatum*	Sensitive
Peregrine Falcon	*Falco peregrinus*	Sensitive
Northern Goshawk	*Accipiter gentilis*	Sensitive
Flammulated Owl	*Otus flammeolus*	Sensitive
Northern Three-toed Woodpecker	*Picoides tridactylus*	Sensitive
Colorado Cutthroat and Bonneville Cutthroat Trout	*Oncorhynchus clarki var. pleuriticus and utah, respectively*	Sensitive
BLM RICHFIELD DISTRICT SENSITIVE SPECIES		
Bicknell Milkvetch	*Astragalus consobrinus*	Sensitive
Basalt Milkvetch	*Astragalus subcinereus var. basalticus*	Sensitive
BLM PRICE DISTRICT SENSITIVE SPECIES		
Low Hymenoxys	*Hymenoxys depressa*	Sensitive

Fishlake National Forest Sensitive Species

Elsinore Buckwheat (*Eriogonum batemanii* var. *ostundii*)

No igneous gravels occur within the general vicinity and therefore, this species is believed to be absent from the area.

Ward Beardtongue (*Penstemon wardii*)

Neither of the two formations on which this species usually found occurs within the area; thus it is believed to be absent from the area.

Sevier Townsendia (*Townsendia jonesii* var. *lutea*)

Arapien shale and clays in volcanic rubble do not occur in the project area, therefore the species is believed to be absent from the area.

Rabbit Valley Gilia (*Gilia caespitosa*)
The Carmel and Navajo formations do not occur in the project area. In addition, the project area does not occur within Wayne County, the only county in which this species has been discovered to date. Therefore, this species is not expected to occur within the project area.

Townsend's Big-eared Bat (*Corynorhinus townsendii*)
Dedicated bat surveys in Quitchupah Creek have not been conducted; however, surveys in 1997 in nearby Link Canyon (Perkins and Peterson, 1997) detected no big-eared bat use of the area. Perkins and Peterson concluded potential for the occurrence of big-eared bats in the area was low, and suitable big-eared bat habitat was not present.

Spotted Bat (*Euderma maculatum*)
Spotted bats occur in a variety of habitats including open ponderosa pine (*Pinus ponderosa*), desert scrub, pinyon-juniper, and open pasture and hay fields (Leonard and Fenton, 1983). Most often, they are found in dry, rough desert terrain (Watkins, 1977). Spotted bats roost alone in rock crevices high up on steep cliff faces. Generally, spotted bats are found in relatively remote, undisturbed areas, suggesting that they may be sensitive to human disturbance (USDA-USFS, 1991).

In the summer of 1997, surveys conducted by Genwal Resources Incorporated detected spotted bats utilizing habitats within Mill Fork Canyon, Crandall Canyon, Biddlecome Hollow, Tie Fork, Huntington Canyon, and Bear Creek Canyon, approximately 25 to 30 miles north of the project area. Other known observations of spotted bats on the Ferron/Price Ranger District have been at Joes Valley Reservoir and at Emerald Lake. Surveys by Perkins and Peterson (1997) documented spotted bat use in nearby Link Canyon; however, no surveys have been conducted within the project area.

Peregrine Falcon (*Falco peregrinus*)
The peregrine falcon is a wide ranging species which utilizes a variety of habitats. Peregrines usually nest on large rock cliffs in open country; preferred sites overlook water and allow an extensive view of the surrounding terrain (Herron et al., 1985). In the Rocky Mountain southwest, the walls of canyons and gorges are often used for nest sites (Call, 1978).

The closest known peregrine falcon eyrie, located in Link Canyon approximately five miles to the north, was found active in 1997; however, the eyrie has not been active since that time based upon surveys conducted by UDWR in 1998 and 1999.

Northern Goshawk (*Accipiter gentilis*)
Goshawks are not known to nest within the Quitchupah Canyon or Water Hollow project areas and thus, dedicated surveys were deemed unnecessary because of limited suitable habitat. However, goshawks could occasionally use portions of the project area for foraging opportunities.

Flammulated Owl (*Otus flammeolus*)
This diminutive owl, approximately six inches in length, inhabits the montane coniferous forests of North and Central America, ranging from southern British Columbia to Guatemala (Ryser, 1985). In most areas, this owl occurs in close association with ponderosa pine (*Pinus ponderosa*) and Jeffery pine (*Pinus jefferyi*), though it has been recorded less commonly in other forest types (Johnsgard, 1988). This small and secretive owl is a cavity nester, and thus requires natural or woodpecker-excavated cavities as a component of its habitat. Flammulated owls are almost exclusively insectivorous, preying on small to medium sized moths, beetles, caterpillars, and crickets (Reynolds and Linkhart, 1987; Johnsgard, 1988; Bull et al., 1990). Like most insectivores, but unlike most owls, flammulated owls are migratory (Winter, 1974; Balda et al., 1975; Collins et al., 1986; Gaines, 1988).

Flammulated owls have been found in the Quitchupah Creek drainage on the Old Woman Plateau located at the western end of the Quitchupah drainage and suitable habitat, although limited, does occur within or adjacent to the project area.

Three-toed Woodpecker (*Picoides tridactylus*)
Three-toed woodpeckers are known to occur in the general area from dedicated surveys conducted during 1992 through 1996 throughout suitable habitat in adjacent forested areas. Limited habitat occurs within or adjacent to the upper portions of the project area.

Colorado Cutthroat and Bonneville Cutthroat Trout (*Oncorhynchus clarki* var. *pleuriticus* and *utah*, respectively)
Both species require clear, cool water. Optimum habitat consists of suitable 1:1 pool to riffle ratio and slow, deep water with vegetated streambanks for shade, bank stability, and cover. Both species could also inhabit lakes. Habitat for these species is not found within the project area. Furthermore, electroshocking in Quitchupah and lower Water Hollow creeks verified that these species do not occur in the area (JBR, 2001c).

BLM Richfield Field Office Sensitive Species
Bicknell Milkvetch (*Astragalus consobrinus*)
The Bicknell milkvetch is known to occur within sagebrush-grassland and pinyon-juniper habitat communities on the Mancos Shale Formation (Atwood et al., 1991). It has also be found on volcanic gravel, open gravelly or sandy knolls, and barren stony hillsides between 5,200 to 9,000 feet elevation.

Because the appropriate habitat and the Mancos Shale formation for this species does occur within portions of the project area, preconstruction surveys for this species should be conducted during appropriate flowering times in the spring/summer prior to construction activities in suitable habitat.

Basalt Milkvetch (*Astragalus subcinereus* var. *basalticus*)

The Basalt milkvetch is known to occur within pinyon-juniper and ponderosa pine communities between 4,520 to 7,970 feet elevation (Atwood et al., 1991). Because the appropriate habitat and the Mancos Shale formation for this species does occur within the project area, preconstruction surveys for this species would be conducted during appropriate flowering times in the spring/summer prior to construction activities in suitable habitat.

BLM Price Field Office Sensitive Species

Low Hymenoxys (*Hymenoxys depressa*)

Low hymenoxys is known to occur within ephedra, sagebrush, shadscale, and pinyon-juniper habitat communities on fine silty clay to clay loam soils between 4,400 to 7,120 feet elevation (Atwood et al., 1991).

Suitable soils for this species are very limited within the project area, and thus low hymenoxys is not expected to be present within the project area.

UDWR Utah Sensitive Species List

The UDWR Utah Sensitive Species List includes several fish species that are endemic to the Colorado River Basin in which the project area occurs, or whose known historical range does not exclude the project area. These species are: roundtail chub (*Gila robusta*), leatherside chub (*Gila copei*), flannelmouth sucker (*Catostomus latipinnus*), bluehead sucker (*Catostonus discobolus*), and least chub (*Iotichthys phlegethontis*).

As discussed in more detail in the Final Aquatic Resources Technical Report, Quitchupah Creek Road EIS (JBR, 2001c), two of these listed fish species were found in Quitchupah Creek during July 1999 fish sampling. At one out of five total locations that were electroshocked, 13 individual flannelmouth suckers and one leatherside chub were captured. At the other four locations, these species were absent. None of the other fish species on the Utah Sensitive Species List were found during the fish sampling.

REGULATORY

Upon review and approval of the BA by the USFWS, a Biological Opinion would be prepared and required to be adhered to if the USFWS makes the determination that a threatened or endangered plant or animal species or habitat (i.e. southwestern willow flycatcher) would be impacted or adversely affected by the proposed project. Similar review and approval of the BE by the USFS would be conducted. Appropriate mitigation and monitoring measures may be recommended and implemented if sensitive species might be impacted by the proposed project.

POTENTIAL IMPACTS

This assessment evaluates the potential for each Special Status Species to be directly or indirectly impacted by the Alternatives. This assessment is based on a review of the species' preferred habitats

and their recorded occurrence. Based upon this information, a determination can be made regarding the potential for each species to be directly or indirectly affected by the Alternatives.

In the case of species that clearly do not occur in the project area and have no potential to be directly or indirectly impacted by the Alternatives (plant species occurring at elevations outside that of the project area, for example), a "No Effect" (in the case of listed species) or "No Impact" (in the case of Sensitive Species) determination was made. In the case of species that occur or may occur in the project area and which may be directly or indirectly affected by the Alternatives, a further evaluation of potential impacts was prepared.

No Action Alternative - Alternative A

Selection of the No Action Alternative would not result any direct, indirect, or cumulative impacts to listed or sensitive species occurring in the project area. The road would not be constructed in the Quitchupah Creek drainage or the Water Hollow Benches area, and thus related disturbances would be anticipated in those areas. The existing environment in the Quitchupah Creek drainage would continue for the near future.

Quitchupah Creek Road Alignment - Alternative B

Threatened, Endangered, and Candidate Species

Table 3.9-3 developed from the BA, summarizes the occurrence and effects analysis for threatened, endangered, and candidate species potentially occurring in the project area. This table includes the rationale for the determinations shown. The only federally protected species that may be impacted would be the southwestern willow flycatcher.

Approximately 2.75 acres of suitable southwestern willow flycatcher habitat would be impacted by construction activities. Construction activities would be restricted to non-breeding and non-nesting times for the southwestern willow flycatcher.

Sensitive Species

Table 3.9-4 summarizes the occurrence and effects analysis for Sensitive Species potentially occurring in the project area. The table also includes the rationale for the determinations shown.

Limited suitable habitat for the northern goshawk, flammulated owl, and three-toed woodpecker would be impacted. In addition, approximately 3.3 acres of riparian habitat, potential foraging habitat for spotted bats, northern goshawks, and flammulated owls would be disturbed. Blasting during road construction activities could also impact spotted bats (if present) as potential roosting sites could be destroyed or disturbed.

Impacts to potentially suitable habitat for the Bicknell and Basalt milkvetch could occur. However, direct impacts to these species should not occur, as preconstruction surveys would identify the location of these species within proposed disturbance areas and appropriate mitigation measures would be implemented to avoid potential impacts.

Alternate Junction with SR-10 and Alternate Design - Alternative C
Similar impacts to federally listed and sensitive species would occur as described for Alternative B.

Water Hollow Alternate Alignment - Alternative D
Similar impacts to federally listed and sensitive species would occur as described for Alternative B.

Mitigation and Monitoring
Impacts to 2.75 acres of habitat to the southwestern willow flycatcher would be restored as per Section 7 of the ESA. Impacts to other TES species will be avoided as described previously and therefore, no mitigation or monitoring is necessary for these species.

Irretrievable or Irretrievable Commitment of Resources and Residual Adverse Impacts
The development of the Alternatives would represent a total of 2.75 acres of disturbance to riparian habitat. An increase in noise levels would occur within the Alternatives area as a result of vehicle travel.

Cumulative Effects
Increased public access would occur as a result of the Alternatives, which would increase noise and also disturbance to TES species' habitat. Past range improvements, such as the reservoir on Saleratus Bench, has provided a water source that benefits certain species. Gas drilling may occur and such drilling may affect up to 78 acres at any one time. Reclamation would occur on sites that do not enter into production.

Table 3.9-3 Potential Occurrence and Effects Analysis of Federally Listed Species - Summary of BA

Species	ALT A	ALT B	ALT C	ALT D	RATIONALE
Jones Cycladenia	NE	NE	NE	NE	Not known to occur in the project area; geologic formations on which this species occurs do not occur in the project area.
Maguire Daisy	NE	NE	NE	NE	Not known to occur in the project area; geologic formations on which this species occurs do not occur in the project area.
Last Chance Townsendia	NE	NE	NE	NE	Suitable habitat near project area, but not discovered during dedicated surveys.
Barneby Reed-Mustard	NE	NE	NE	NE	Not known to occur in the project area; geologic formations on which this species occurs are not found in the project area.
San Rafael Cactus	NE	NE	NE	NE	Unknown to occur within the project area.
Winkler Cactus	NE	NE	NE	NE	Unknown to occur within the project area.
Wright Fishhook Cactus	NE	NE	NE	NE	Unknown to occur within the project area.
Heliotrope Milkvetch	NE	NE	NE	NE	Not known to occur in the project area.
Bald Eagle	NE	NE	NE	NE	Does not make regular use of the project area; construction impacts would not alter the limited use.
Southwestern Willow Flycatcher	NE	MA-NLAA	MA-NLAA	MA-NLAA	Southwestern willow flycatchers present in project area; direct impacts to habitat; no suitable habitat known to occur in project area for Alt. D.
Mexican Spotted Owl	NE	NE	NE	NE	Does not occur in project area.
Yellow-billed Cuckoo	NE	NE	NE	NE	Does not occur in project area.

NE = No Effect
MA-NLAA = May Affect -Not Likely to Adversely Affect
MA-LAA = May Affect -Likely to Adversely Affect
BE = Beneficial Effect

Table 3.9-4 Potential Occurrence and Effects Analysis of Sensitive Species - Summary of BE

Species	ALT A	ALT B	ALT C	ALT D	RATIONALE
Elsinore Buckwheat	NI	NI	NI	NI	Not known to occur in the project area; suitable habitat not present.
Ward Beardtongue	NI	NI	NI	NI	Not known to occur in the project area; suitable habitat not present.
Sevier Townsendia	NI	NI	NI	NI	Not known to occur in the project area; suitable habitat not present.
Rabbit Valley Gilia	NI	NI	NI	NI	Not known to occur in the project area; suitable habitat not present.
Townsend's Big-eared Bat	NI	MIIH	MIIH	MIIH	Not recorded in project area, but suitable roosting and habitat may be present.
Spotted Bat	NI	MIIH	MIIH	MIIH	Not recorded in project area, but suitable roosting and foraging habitat occurs in project area.
Peregrine Falcon	NI	NI	NI	NI	Known eyrie in Link Canyon area, approximately 5 miles to the north, not recorded in project area.
Northern Goshawk	NI	MIIH	MIIH	MIIH	Not recorded in project area, but suitable foraging habitat occurs in general area.
Flammulated Owl	NI	MIIH	MIIH	MIIH	Limited available habitat in area, foraging areas could be impacted.
Northern Three-toed Woodpecker	NI	MIIH	MIIH	MIIH	Known to occur in general area, available habitat could be impacted.
Colorado Cutthroat and Bonneville Cutthroat Trout	NI	NI	MIIH	NI	Does not occur in project area.
Bicknell Milkvetch	NI	MIIH	MIIH	MIIH	Unknown to occur within the project area; however low potential suitable habitat does occur; preconstruction surveys will be conducted.
Basalt Milkvetch	NI	MIIH	MIIH	MIIH	Unknown to occur within the project area; however low potential suitable habitat does occur; preconstruction surveys will be conducted.
Low Hymenoxys	NI	NI	NI	NI	Not known to occur in the project area; no suitable habitat.

NI = No Impact
MIIH = May Impact Individuals or Habitat, But Will Not Likely Contribute to a Trend Towards Federal Listing or Loss of Viability to the Population or Species
WIFV= Will Impact Individuals or Habitat with a Consequence that the Action May Contribute to a Trend Toward Federal Listing or Loss of Viability to the Population or Species
BI = Beneficial Impact

3.10 RANGE RESOURCES

AGENCY FILES

Livestock winter on the lower rangeland slopes adjacent to SR-10 or on the nearby irrigated fields, then move up the Quitchupah Canyon to a state-owned land section for spring grazing. Quitchupah Creek serves as the source of water for livestock in the winter and spring and again in the fall. In the late spring, livestock are trailed up the creek to summer pasture on the Fishlake National Forest. Cattle return to the creek in the fall and trail down to winter pastures. In order to reach summer pastures, or return from them, the cattle must cross the Acord Lakes Road in Convulsion Canyon near Broad Hollow. Livestock also graze along this paved road, and some unknown number of cattle are killed each year by coal hauling trucks that travel the Acord Lakes Road to and from the SUFCO mine.

In the Water Hollow Benches area, the G. L. Olsen Allotment is grazed from May 15 to June 30. The cattle are trailed between the early spring pasture and this allotment and return by trailing in the summer to the corrals by a drift fence located in Quitchupah Canyon.

The livestock movement within each allotment is controlled by fences, natural slope and terrain barriers, and the watering sources, Quitchupah and Water Hollow creeks. Thus, livestock are generally confined to an area within one mile of the creeks during spring and fall grazing seasons. Livestock movements during trailing are generally controlled by the permittees who push the larger herds of cattle along the existing unpaved road adjacent to Quitchupah Creek. The trailing of livestock in the spring and fall is confined to the existing road and two-track because it is part of a traditional livestock trail, and because the terrain generally confines trailing to the existing road and immediate vicinity. The smaller herds and stragglers move on their own along the road until they come to their destination.

The boundary fence running north-south across the Quitchupah Canyon bottom on the Fishlake National Forest border prevents livestock from entering the Quitchupah Allotment in the spring until the allotted turn-in date. In the fall, the gate is open to allow livestock to drift down the canyon and off the allotment. The lower fence runs north-south in the middle of Section 15 and along the west boundary of the patent land and the irrigated croplands. This fence is used to prevent livestock from entering the croplands until so desired. The lower fence is also used as a drift fence to hold livestock trailing down the canyon in the fall so they can be corralled and separated for transfer to winter ranges. In the spring, this fence also prevents livestock from drifting off of winter ranges onto spring range until the allotted turn-in date.

A drift fence is also located across lower Water Hollow Creek to keep cattle from drifting down the stream and into Quitchupah Creek. A small corral is also located adjacent to this drift fence to aid in the gathering of cattle.

FISHLAKE NATIONAL FOREST

One allotment, the Quitchupah Allotment, provides the summer forage for livestock trailing out of Quitchupah Creek to Fishlake National Forest lands. Most of the summer pasture is located on Duncan and Little Duncan mountains, and the Skutumpah basin. The grazing season is from June 11 to September 30 annually for 813 cattle plus calves. It takes one to two weeks of trailing the cattle up the creek to arrive at the higher elevation summer pastures. Cattle take one to two weeks of trailing and drifting to come off the summer pastures in the fall. During trailing the cattle graze along Quitchupah Creek.

BLM PRICE FIELD OFFICE

Four BLM allotments are located in the Quitchupah Creek watershed. The large Saleratus Allotment which includes the valley and benches south of the creek is used as winter range. The Johnson Allotment which includes the benches north of the creek is also used as winter range. The other two allotments are used as spring range. See Table 3.10-1 for specific information on each allotment, including the number of AUMs.

The G. L. Olsen Allotment on the Water Hollow Benches is a late spring - early summer allotment. See Figure 3-7 for allotment boundaries.

Table 3.10-1 BLM Grazing Allotment Information

Allotment Name	Permittee	Season of Use (acres per AUM)	Head of Cattle	AUMs*
E. Olsen	Glendon E. Johnson (Castle Valley Ranch)	April 16-June 15 (22.1 acres)	20	20
Saleratus	Robert E. Anderson	November 16	69	308
	Josiah K. Eardley	--	108	483
	George U. Lewis	March 31	28	126
	Glendon E. Johnson	--	156	698
	J.R. Lawrence	-- (12.5 acres)	49	219
G.L. Olsen	Robert E. Anderson	May 16-June 30 (6.8 acres)	165	250
Johnson	John L. Byars	October 16-December 31 (30.6 acres)	72	182

* An AUM is calculated as the forage needed to sustain one head of cattle for one month.

STATE LANDS

The state lands in Section 16 are run in conjunction with the BLM Saleratus Allotment.

REGULATORY

These allotments are operated under the open range law, which requires those who wish to exclude livestock from their lands or facilities to fence the livestock out. This would require Sevier County to fence the road to exclude livestock and minimize the incidence of vehicle-livestock collisions.

The construction and operation of the road would have no affect on the permittees' licenses to graze in their respective allotments under provisions of Federal Land Management Practices Act.

POTENTIAL IMPACTS

No Action - Alternative A

The coal hauling traffic would still use the Acord Lakes Road, I-70, and SR-10 to haul coal to the Hunter Power Plant and Banning loadout. The livestock grazing would continue in traditional ways with generally unrestricted access to most of the Quitchupah Creek area. Livestock trailing between summer and winter pastures would continue in the traditional way along the creek corridor. Straggling livestock crossing the Acord Lakes Road at Broad Hollow would be potential victims of truck-livestock collisions.

Quitchupah Creek Road Alignment - Alternative B

The loss of forage would amount to eight AUMs based on the net disturbance of 101 acres due to road construction. Once reclamation is complete and the seeded vegetation has matured, the net loss of AUMs would be four, due to 45 acres of paved roadbed. There is a concern that the revegetation may fail because the reclaimed areas may not be fenced to protect them from cattle grazing.

This road alignment would cross 600 feet of cultivated pasture owned by Castle Valley Ranches. Approximately 1.4 acres of pasture, out of approximately 160, would be lost for livestock (and wildlife) winter forage. The construction of the road would require relocating the corrals and portions of the lower drift fence.

Livestock in the BLM Saleratus and E. Olsen allotments, and USFS Quitchupah allotments would be in proximity to the proposed road during the permitted grazing seasons. Since the road would continue to be in proximity to Quitchupah Creek, which serves as the water source for cattle, the cattle would be concentrated in an area immediately adjacent to the road. Although it would be difficult to predict the number of vehicle-livestock encounters annually, they could occur on any portion of the road that is not fenced.

The construction and operation of a heavily traveled road over and adjacent to a traditional livestock trail would render most of the trail unusable by cattle. To use the road as a trail would require coordination with the mine to cease coal hauling during the designated trailing time. Coal hauling

now occurs 24 hours per day on weekdays, possibly leaving the weekends open for cattle trailing. Cattle straggling on the road would be potential victims of truck-livestock collisions.

At the junction with the Acord Lakes Road the two roads would be in close proximity. Trailing cattle across these roads during coal hauling would be hazardous.

Alternate Junction with SR-10 and Alternate Design - Alternative C
The Alternate Junction with SR-10 would disturb slightly more land (104 acres), but affect an equivalent amount of AUMs (8), as described for Alternative B.

The alternative design to fence and provide underpasses for wildlife/livestock would significantly reduce the potential for vehicle-wildlife/livestock collisions. The fencing and underpasses would allow livestock to graze freely in the allotments and have access to Quitchupah Creek, the only water source in the allotments. The fencing, in a few places, could restrict livestock use of forage located between the proposed road and the plateaus to the north.

The fencing and underpasses would allow for some trailing, but the lack of a continuous separate trail would still force livestock operators to truck the livestock between the allotments as described in Alternative B.

Water Hollow Alternate Alignment - Alternative D
The loss of forage would amount to twelve AUMs based on the net disturbance of 155 acres due to road construction. Approximately 4.5 AUMs of the loss of forage would occur in the G. L. Olsen Allotment on Water Hollow Bench. Once reclamation is complete and the seeded vegetation has matured, the net loss of AUMs would be five AUMs due to an unreclaimed area of 54 acres of paved road. Much of the proposed route through the Saleratus Allotment is in rugged terrain where there is little use of forage by cattle. There is a concern that the revegetation may be a failure because the reclaimed areas may not be fenced to protect them from cattle grazing.

Cattle in the G. L. Olsen Allotment water in Water Hollow Creek, trailing in and out daily to graze on the benches above the creek. Truck - livestock encounters could be frequent in this area during the spring to early summer grazing season.

Cattle trailing and gathering around lower Water Hollow Creek would need to be scheduled for weekends when coal hauling is not scheduled.

The construction and operation of a heavily traveled road over and adjacent to a traditional livestock trail in the upper section of Quitchupah Creek would render this section of the trail unusable by cattle. To use the road as a trail would require coordination with the mine to cease coal hauling during the designated trailing time. Coal hauling would occur 24 hours per day on weekdays, leaving the weekends open for cattle trailing. Cattle straggling on the road would be potential victims of truck-livestock collisions.

Mitigation and Monitoring

Should Alternatives B or D be selected, impacts to livestock could be mitigated by placing fencing and underpasses along the roadway. Palatable species would be seeded along the underpasses to entice livestock to utilize the underpasses to cross the roadway. If noxious weeds are discovered, a noxious weed control plan should be developed in cooperation with the land management agencies and implemented as necessary.

Irreversible or Irretrievable Commitment of Resources and Residual Adverse Impacts

Depending on the alternative alignment selective, between 45 and 54 acres of permanent disturbance to vegetation would occur. The development of the Proposed Action would represent a total of 100 to 155 acres of disturbance to vegetation. Of this, approximately 38 to 80 acres would be reclaimed, depending on which alternative is selected.

Cumulative Effects

Past livestock improvements, including the development of a reservoir on Saleratus Bench have increased water distribution for livestock. The proposed fencing will limit livestock movement along SR-10. Gas drilling may occur and such drilling may affect up to 78 acres at any one time. Reclamation would occur on sites which do not enter into production.

Although the past, current, and anticipated effects to range resources have or could change the nature of the landscape, the lands are in functioning condition and are meeting the land use plan goals for the area.

3.11 LAND USE

HISTORICAL BACKGROUND

Quitchupah, described as a long narrow valley of sagebrush and greasewood, coyotes and prairie dogs, was opened for homesteading in the 1880s. Within a few years several ranches were established, growing alfalfa, wheat, oats, and barley in the fields, and raising sheep and cattle. Goods were traded in nearby Emery. A terrible storm in 1912 drastically changed the nature of the valley, and the placid Quitchupah Creek was transformed to a deeply gouged wash with many deep gullies. Over time, although the settlers attempted to utilize a dam and canals, the fields were drained by the wash, and the families began to leave Quitchupah. Other ranchers purchased lands both north and south of the creek. Emery was incorporated as a town in 1901 (Historical Committee of Emery, 1981).

LAND STATUS

The lands that would be crossed by the proposed road include private, public, and State Institutional Trust Lands, as shown on Figure 2-1. Public lands include those managed by the USFS, Fishlake National Forest and the BLM, Richfield Field Office.

Private landowners along the existing Quitchupah Creek Road include: Thomas E. Bunn, et al., Glendon E. Johnson Jr., James V. Olsen, Earl R. and Dixie Olsen, George E. and Patricia L. Olsen, and Wynona P. Olsen. Private landowners along the proposed Alternate Junction with SR-10 include: Thomas C. Bunn & Carolee Hammel; Castle Valley Ranches, LLC; Glendon E. Johnson Jr.; and Kenneth Lee & Earlene F. Christiansen. Private landowners in the area that would be crossed by the Water Hollow alternate alignment include Castle Valley Ranches, LLC. These land owners do not currently reside on those lands, but typically use them in conjunction with their livestock operations.

Table 3.11-1 provides a summary of land status and an estimate of new surface disturbance for the proposed Quitchupah Creek Road. Tables (3.11-2 and 3.11-3) that follow provide similar summaries for the Alternate Junction and Alternate Design alternative, and the Water Hollow alternate alignment.

Table 3.11-1 Land Status and Proposed Disturbance - Alternative B

Land Management	Road Distance (miles)	County Jurisdiction	Construction Disturbance (acres)	Existing Road/Trail Disturbance (acres)	Staging Areas (acres)	Borrow Areas (acres)	Total New Surface Disturbance (acres)
USFS	2.3	Sevier	24.0	3.3	5	0	25.7
BLM	1.9	Sevier	18.4	1.8	10	0	26.6
State of Utah	1.1	Sevier	12.3	0.9	0	0	11.4
Private	3.9	Sevier & Emery	33.7	5.7	0	10	38.0
Totals	**9.2**		**88.4**	**11.7**	**15**	**10**	**101.7**

Table 3.11-2 Land Status and Proposed Disturbance - Alternative C

Land Management	Road Distance (miles)	County Jurisdiction	Construction Disturbance (acres)	Existing Road/Trail Disturbance (acres)	Staging Areas (acres)	Borrow Areas (acres)	Total New Surface Disturbance (acres)
USFS	2.3	Sevier	24.0	3.3	5	0	25.7
BLM	2.5	Sevier	21.1	1.4	10	0	29.7
State of Utah	1.1	Sevier	12.3	0.9	0	0	11.4
Private	3.4	Sevier & Emery	33.0	5.0	0	10	38.0
Totals	**9.3**		**90.4**	**10.6**	**15**	**10**	**104.8**

Table 3.11-3 Land Status and Proposed Disturbance - Alternative D

Land Management	Road Distance (miles)	County Jurisdiction	Construction Disturbance (acres)	Existing Road Disturbance (acres)	Staging Areas (acres)	Borrow Areas (acres)	Total New Surface Disturbance (acres)
USFS	2.52	Sevier	30.5	2.6	5.0	0.0	32.9
BLM	7.86	Sevier	95.3	0.0	5.0	15.0	115.3
State of Utah	0.26	Sevier	2.4	0.0	0.0	0.0	2.4
Private	0.53	Sevier	4.8	0.0	0.0	0.0	4.8
Totals	**11.17**		**133.0**	**2.6**	**10.0**	**15.0**	**155.4**

Land Use And Land Use Plans

Historical and ongoing land uses and rights in the project area include livestock trailing and grazing, wildlife migration and wintering, mining, instream livestock watering rights, irrigation water rights, cultivated pasture, and recreation.

The management of public lands within the project area is guided and directed by the San Rafael RMP (USDI-BLM, 1989), and the Fishlake National Forest LRMP (USDA-USFS, 1986).

Although the Richfield Field Office is ultimately responsible for management of the BLM-administered lands in the project area, management guidance comes from the San Rafael (USDI-BLM, 1989) produced and implemented by the BLM's Price Field Office.

According to the RMP (USDI-BLM, 1989), the management objective for right-of-ways across BLM-administered land in the project area is "to designate right-of-way corridors; to allow discretionary right-of-ways only so long as RMP goals are met; and to process other right-of-ways upon request." The RMP designates four major right-of-way categories (USDI-BLM, 1989):

- Lands in designated right-of-way corridors where standard operating procedures apply;
- Lands outside designated corridors where standard operating procedures apply;
- Areas to be avoided and where special conditions may apply after site-specific NEPA of 1969 documentation; and
- Areas to be excluded.

BLM lands along the Quitchupah Creek Road alignment are, for the most part, classified in the 1st category. The Alternate Junction and Alternate Design takes in some of the 1st category near its eastern end, and the Water Hollow alternate alignment crosses areas in the 1st, 2nd, and 3rd categories. The RMP also states that new realty actions would be allowed in designated right-of-way corridors and avoidance areas subject to applicable conditions.

There are four types of wilderness designations/proposals in Utah. These are: designated Wilderness Areas; Wilderness Study Areas (WSA); Wilderness Inventory Units (WIU) (lands identified in 1999 by the BLM as having wilderness characteristics); and proposed wilderness areas (HR 1732 lands proposed by the Utah Wilderness Coalition (UWC).

According to the BLM (Finger, 2001), WSAs are managed under the Interim Management Policy and Guidelines for Lands Under Wilderness Review. The general standard for interim management of those lands is that they must be managed so their suitability for designation is not impaired. WIUs are lands inventoried and determined to have wilderness characteristics. These areas are presently being considered for WSA status through a land-use planning process. The Department of Interior policy is that while the planning process is being complete, the management prescriptions of existing land use plans will apply to these inventory units. The BLM policy is to pay careful and particular attention to proposals that could limit Congress' ability to designate the units as wilderness. Therefore, BLM considers actions proposed in the these lands on a case-by-case basis to determine

potential impacts to wilderness characteristics. The HR 1732 lands are not given special consideration under present federal government policy (Finger, 2001).

There are no Wilderness Areas, WSAs, Instant Study Areas, or Roadless Areas in the project area. The closest WSAs (BLM) are located about 15 to 20 miles southeast of the project area in the San Rafael Swell, as is the western boundary of the proposed San Rafael Swell National Conservation Area. The nearest Roadless Areas (USFS) are located 2½ to 3 miles north and northwest of the project area in the Manti LaSal and Fishlake National Forests. However, the Fishlake National Forest does not allow motorized vehicle travel in an area that generally coincides with the Old Woman Research Natural Area (RNA), located about ½ mile west of the Water Hollow alternate alignment.

Management of the State of Utah lands in the project area is directed by SITLA.

Land management decisions on private lands in Sevier and Emery counties are guided by county land use plans, and zoning ordinances and regulations. As described in the Emery County General Plan, Emery County is committed to preservation of a rural lifestyle, and citizens place great value upon open space, history, and preservation of their heritage. Maintaining access to, and use of, public lands within the county is also a commitment of the plan. The Sevier County General Plan (Sevier County, 1998) similarly expresses a desire to maintain access to public lands in their county, and to encourage multiple uses within those lands.

Zoning

The Emery County lands in the project area are zoned M&G-1, Mining and Grazing. This zone generally covers the dry mountain and desert areas of the county historically used for grazing on the open range, and mining and mineral exploration. The characteristics and conditions on these lands make them suited for a continuation of these uses. However, because of the relatively fragile balance of nature in the area, all permitted activities must be carried out in a manner consistent with the limitations of the environment (Zoning Ordinance for Emery County, 1999).

The Sevier County lands in the project area are zoned GRF-40, Grazing, Recreation, and Forestry. As described in the Sevier County Code (Sevier County, 1995), this zone has been established as a district in which the primary use of the land is for grazing, recreational, forestry, and wildlife purposes. Density requirements of structures within this zone are one unit per 40 acres. The code does not mention roads as a land use that is either automatically or conditionally permitted in this zone.

Access

The Quitchupah Creek area is accessed either from the east at SR-10, or from the west off the paved Acord Lakes Road, which is used as haul road by the SUFCO Mine. The Water Hollow Benches area is accessed off of the existing Quitchupah Creek Road, or off of a jeep trail leaving SR-10 south of the Quitchupah Creek Road. However, vehicle access to the Water Hollow Benches is possible

only with ATVs, and then only in some areas. The existing road along Quitchupah Creek is unpaved, dry, dusty, and prone to washouts and rutting as a result of storm events. Along portions of the road, it is unmaintained and occasionally impassable.

Structures and Utilities

The most noticeable man-made structure in Quitchupah Canyon is the UP&L Company power line, a 9.6-mile long 69 K.V. tap line for SUFCO, completed about 1977. It provides power to the SUFCO Mine. The right-of-way for this power line is 25 feet, 12.5 feet on either side of its center line. Three other power transmission lines cross the eastern part of the project area.

Other existing structures within the Quitchupah Creek Road corridor, and related to agricultural/livestock uses, include irrigation canals, corrals, livestock fences, and a baling yard. A metal pump house building and a septic leach field, both related to the SUFCO Mine are also within the Quitchupah Creek Road corridor. There are no other structures near the Water Hollow alternate alignment.

A telephone line has been installed underground along the Quitchupah Creek Road from the east to the Emery County line, and then strung from the existing UP&L poles up to the SUFCO Mine.

Texaco has an oil, gas, and hydrocarbon lease on the State land Section 16 - ML#47105. This lease expires in 2005. According to Mr. Ed Bonner of the SITLA, to date, no work has been conducted under this lease nor has any work been proposed. Texaco also has gas leases on public lands in area, see Section 3.2, Minerals.

REGULATORY

Existing permitted uses on the lands in the project area, such as grazing and water rights, would be accommodated. In Emery County, permitted activities must be carried out in a manner consistent with the limitations of the environment (Zoning Ordinance for Emery County, 1999). In Sevier County the primary uses must be preserved.

The proposed project is in compliance with the San Rafeal RMP for the public lands and the Fishlake National Forest Land and RMP for forest lands (See Section 1.3).

POTENTIAL IMPACTS

No Action - Alternative A

There would be no effects to lands along the existing Quitchupah Creek Road or along the Water Hollow Benches. Current land uses would continue.

Quitchupah Creek Road Alignment - Alternative B

Under this alternative, it is estimated that new disturbance would affect 25.7 acres of USFS land, 26.6 acres of BLM land, 11.4 acres of state land, and 38 acres of private land. The requested right-of-ways for the permanent road corridor would include 18.4 acres of USFS lands, 15.2 acres

of BLM lands, 8.8 acres on state lands, and 31.2 acres private lands. Right-of-way applications have been submitted to the USFS and BLM. Right-of-ways across seven private land parcels are dependent upon individual negotiations and/or Eminent Domain actions, if needed.

Fences and corrals would be removed from the road corridor during right-of-way preparations, and the necessary replacements or repairs made as agreed upon. Similarly, the baling yard, and the septic leach field would be altered or relocated to an agreed upon area.

The irrigation canal currently supplying the agricultural fields south of the road would be impinged upon by the new road footprint in several locations, necessitating realignment or culverting of about ½ mile of total canal length. This would affect the canal in the following locations: near station 290+00, from stations 302+00 to 308+50, from stations 321+00 to 324+00, and from stations 333+00 to 350+00 (see Appendix B, Engineering Details).

Preliminary design indicates that a power pole left of station 166+30 may need to be relocated. All power pole relocations would be performed by the owning power company (UP&L) and would be relocated to suitable locations as determined by UP&L. The relocations would be within either the road or powerline right-of-ways.

The Emery County telephone line, buried along the road east of the County line, may be affected by grading and right-of-way preparation. The same line would be affected by the above power pole relocation.

Mineral or fuel exploration and development efforts in the State lands section could be furthered by the presence of a paved road; however, no plans for exploration are currently proposed.

Alternate Junction and Alternate Design - Alternative C

This alterative includes the same road corridor as Alternative B, except for the easternmost two miles. Under this alternative, it is estimated that new disturbance would affect 25.7 acres of USFS land, 29.7 acres of BLM land, 11.4 acres of state land, and 38.0 acres of private land. Right-of-ways across five private land parcels are dependent upon individual negotiations and/or Eminent Domain actions, if needed.

Other impacts would be the same as described for Alternative B, except that the planned buried telephone line would not be affected. Further, the safe movement of wildlife and livestock across the road would be facilitated by fencing and under/over passes.

Water Hollow Alternate Alignment - Alternative D

Except for the westernmost two miles of road, where this alternative shares the same alignment as Alternative B, lands along Quitchupah Creek would not be affected by the Water Hollow alignment. Total new disturbance would affect 32.9 acres of USFS land, 115.3 acres of BLM land, 2.4 acres of

state land, and 4.8 acres of private land. Right-of-ways across two private land parcel are dependent upon individual negotiations and/or Eminent Domain actions, if needed.

An outside source for borrow materials would likely be required under this alternative, and could result in additional land disturbance in an area where such use is allowed.

Mitigation and Monitoring

All new roads across federal, state, or local lands would be constructed to applicable standards. No further mitigation and monitoring measures are necessary for land use resources.

Irreversible or Irretrievable Commitment of Resources and Residual Adverse Impacts

No irreversible or irretrievable commitment of resources are anticipated to occur as a result of the Proposed Action. No residual adverse impacts were identified for TES species resources within the Proposed Action area.

Cumulative Effects

The implementation of the Proposed Action, in conjunction with past, present, and reasonably foreseeable future actions could conflict with traditional land uses. Future development of gas fields would also conflict with traditional land uses.

3.12 VISUAL RESOURCES, RECREATION, AND WILDERNESS

VISUAL RESOURCES

Visual resources are a composite of basic terrain, geologic features, water features, vegetative patterns, and land use effects that typify an area and influence the visual appeal that the area may have to people (Forest Plan). The scenic quality of the project area is influenced by the canyons which dissect the Wasatch Plateau, and various geologic formations providing a range of textures and colors evident in escarpments, canyon walls, and badlands. The horizontally bedded nature of these formations, as well as their component range of texture classes, is evident from the steep canyon walls, escarpments, and badlands visible in the project area. Flat ledges, vertical cliffs, and sloping erosional and depositional surfaces all contribute to the varied relief in the project area. The presence of the meandering Quitchupah Creek, its flood plain, and its terrace features also contribute to the visual diversity of the lower elevations of the project area.

The nature of vegetation in the landscape is consistently low and shrubby in the bottomlands, and blankets the valleys with a consistent cover, contrasting with the dotted juniper on reddish-brown eroding slopes. White to grey slopes present in some parts of the project area have less evident, sparse vegetative cover. Water courses are generally accented with willows, tamarisk, and cottonwood trees; along lower Quitchupah Creek, portions of the flood plain lack noticeable vegetation, but have extensive areas of bright white alkali deposits that provide for visual variation. The upper Quitchupah drainage transitions from the pinyon-juniper slopes to oak scrub and conifers, with aspen and dense willow patches in the narrow drainage bottom. The contrast of agricultural fields is another feature present in parts of the project area. Facilities in the viewshed include roads (SR-10 and Quitchupah Road), fences, power lines, transmission lines, corrals, mine structures, and fairly constant haul truck traffic. The landscape within and surrounding the project area, as well as the remote and peaceful nature of the Quitchupah and Water Hollow areas, and historical/cultural ties to the area contribute to the people's sense of important aesthetic values in this area.

The objective of Visual Resource Management for BLM lands in the San Rafael Resource Area is "to provide design standards that protect or enhance designated VRM classes." (USDI-BLM, 1989). Visual Resource Management Classes I-IV are described as follows:

Class I	Preserve existing character of landscape; very limited management activity; low levels of change to the characteristic landscape.
Class II	Retain existing character of landscape; management activities should not attract attention; changes must blend with the natural landscape.
Class III	Partially retain existing character of landscape; moderate level of change allowed; management activities should not dominate the view; changes should blend with the natural landscape.
Class IV	Provision for management activities which require major modification of existing character of landscape; high level of change allowed; activities may dominate the view.

The areas of BLM public lands in the Quitchupah Creek area within Sevier County are classified as VRM Class IV. This classification provides for management activities which require major modification of the existing character of the landscape. In Emery County, the BLM portion of Section 19, Township 22 South, Range 6 East, is designated as VRM Class III. The closest VRM Class II area is near the junction of SR-10 and I-70. The I-70 scenic corridor to the east of SR-10 in Emery County is designated as Class I.

National Forest lands are typically inventoried based upon a system of VQOs as part of the forest unit planning process. The VQOs are categories of acceptable landscape alteration measured in degrees of deviation from the natural landscape (Forest Plan). They are similar in concept to the BLM classes of management, and are described as follows:

Preservation (P)	Ecological change only.
Retention (R)	Human activities should not be evident to the casual Forest visitor.
Partial Retention (PR)	Human activities may be evident but must remain subordinate to the characteristic landscape.
Modification (M)	Human activity may dominate the characteristic landscape, but at the same time must utilize naturally occurring elements of the landscape including form, line color, and texture.
Maximum Modification (MM)	Human activity may dominate the characteristic landscape, but should appear as a natural occurrence when viewed as a background.

Forest lands in the project area have been designated under the VQO system as Modification.

Key Observation Points

Key Observation Points (KOP) were established as the predominant points from which viewers would be most likely to observe changes imposed by the proposed project. Three KOPs involve views from SR-10 towards the project area (See Figure 3-8). One KOP was established at the point where Quitchupah Creek Road meets SR-10; the second KOP was taken from the point where the proposed Water Hollow route would join SR-10. The third KOP was established at the Alternate Junction with SR-10. Although these would not be designated view areas, traffic turning onto the Quitchupah Creek Road, Water Hollow road, or Alternate Junction from SR-10 would be forced to slow considerably, and most likely provide an opportunity for viewing the project changes (see Figure 3-8).

Two KOPs were also established within the project area at the junction of the Alternative Junction and Quitchupah Creek Road and along the proposed Water Hollow Route.

REGULATORY

The project would have no regulatory implications for visual resources, recreation, or wilderness. There would be no effects on visual classifications, a regulated land use planning criteria.

POTENTIAL IMPACTS

No Action - Alternative A

There would be no effects to existing recreation, visual and aesthetic qualities of the project area. Views from SR-10 would remain as they currently exist, including the steady stream of haul trucks along SR-10 during hours of SUFCO Mine operation.

Quitchupah Creek Road Alignment - Alternative B

The Quitchupah Creek Road itself would be visible in the immediate foreground as a paved lane entering SR-10, but would not be obvious unless viewed from the hill on SR-10 to the northeast, or passing directly across the intersection while traveling on SR-10. The dominant terrain at the intersection is stream terraces supporting tall brush. The haul truck traffic (trucks every 1.5 to 3 minutes) through lower Quitchupah Creek may be visible for a few minutes in the background south of the intersection by northbound travelers on SR-10. The background view is dominated by shrub-covered flats, low hills, and small mesas. Road cut and fill disturbance from construction would be visible in the immediate foreground from within the canyon, however, these contrasts would fade somewhat over time, with soil/rock weathering, and reclamation.

The project does meet the standards for BLMs VRM Class IV and the USFS's VQO activity of Modification. None of the visual classifications would need to be changed to accommodate the project.

The aesthetic qualities of the canyon, including its peaceful and remote nature, would be altered forever. However, the degree to which individuals are affected by the intrusion of a haul road and associated truck traffic would be personal and may vary depending upon reasons for using the canyon, as well as personal ties to the history of the area.

Alternate Junction and Alternate Design - Alternative C

Visual and aesthetic implications of this alternative would be similar to those of the Alternative B in the majority of the canyon. Additional structures in the form of concrete underpasses would be visible to travelers on the road, however they would not dominate the view.

Between the Sevier County/Emery County line and the junction with SR-10, this route crosses low shrub-covered gentle slopes. The existing character of the landscape would be partially retained in this area.

Water Hollow Alternate Alignment - Alternative D

Views from KOP #1 at the Quitchupah Creek Road junction with SR-10 would remain unaffected by this alternative. From KOP #2, the road would be obvious mainly in the foreground of low shrub-

covered valley slopes. The road would essentially disappear into the hills and bluffs to the west as it crosses behind some low tree-covered rugged hills less than one mile from SR-10.

Within the Water Hollow Benches, the visual changes would be dramatic, with the large cut and fill volumes needed to cross the many deep drainage cuts across these benches. The scenery within the project area consists of large mesas, wide benches, and deep dissected slopes. Views from the road on the Benches would be panaromic scenes of the valley below and mountains in the distance. But The changes due to large cut and fills would be within management activities criteria for VRM Class IV (KOP #5, Figure 3-8).

Mitigation and Monitoring

Careful consideration has been giving to the siting of the proposed alignments to reduce adverse visual impacts to the maximum extent possible. No further mitigation or monitoring activities are described for the Proposed Action.

Irreversible or Irretrievable Commitment of Resources and Residual Adverse Impacts

The aesthetic qualities of Quitchupah Creek would be altered forever.

Cumulative Effects

The Proposed Action, in conjunction with past, present, and reasonably foreseeable future actions would result in additional surface disturbance. Surface disturbance in the past has resulted from the development of the old road, mining facilities, powerlines, and power transmission lines. Once the reclamation has occurred, a large portion of the new surface disturbance would not be noticeable to the casual observer.

All reasonably foreseeable future exploration activities would be required to be consistent with land management plans and would be subject to site-specific analysis and approval.

RECREATION

The majority of the project area is located within Sevier County with a small portion located in Emery County. The project proposes to upgrade the existing USFS Road 006 which is classified as an unimproved road (Class 4). A Class 4 road is defined by the USFS as native surface, unimproved, jeep trail-high clearance road (Reed, 1999).

The dominant recreation activities within the project area are hunting in the fall and ATV use year long as conditions permit. The project area lies within the Manti Management Unit for elk and deer. In 1999, the large Manti Management Unit as a whole, reported about 16,500 deer hunters afield, with a 32 percent success rate, and almost 11,000 elk hunters with a 23 percent success rate, according to UDWR (2001). The project area has much less hunting effort than most of the Manti Unit. Local guides provide guided hunting trips in the project area for deer, elk, and mountain lion. Upland game is also hunted. Trapping for bobcat and coyote also occurs in the project area.

ATV use occurs both by individual local riders, and by organized clubs who gather regularly to ride in the area. One of those groups, the Southeastern Utah Off-Highway Vehicle (SEUOHV) Club has proposed that a series of two-track dirt roads across southeastern Utah be placed within a single system called the Castle Valley Trail System (Peterson, 1999). Included in the proposed Castle Valley Trail System is USFS Road 006, the existing dirt road within Quitchupah Creek Canyon. The proposed trail system will be submitted to both the USFS and the BLM for approval. The SEUOHV Club currently has approximately 160 members which use the existing road within Quitchupah Creek Canyon seasonally between April 15 to November 15. Additionally, the existing two-track dirt road within Quitchupah Creek Canyon is important to ATV users because it is one of the few ways that USFS land is accessed by ATVs from communities in Emery County (Peterson, 1999). Portions of the Water Hollow Benches and the flats to the east are accessible to ATVs, other portions are too rugged and dissected for vehicle use. The BLM has not designated vehicle routes. There are seasonal restrictions on vehicle use on some of the public lands for wildlife concerns.

Less dominant recreational uses in the general vicinity include dispersed camping, hiking, mountain bike riding, horseback riding, and sightseeing. There are no designated camp grounds or specific destination sites within the project area. Roads within the Quitchupah Creek Road project area are primarily four-wheel drive roads.

The public land in the project area has been classed by Recreational Opportunity Spectrum Class. According to the Fishlake National Forest LRMP, the majority of the USFS-administered lands in the project area are designated as having a semi-primitive motorized recreational opportunity (USDA-USFS, 1986). According to the San Rafael RMP (USDI-BLM, 1989), the BLM-managed lands along the Quitchupah Creek Road are classed as roadbed natural, and the Water Hollow Benches area is within roadbed natural and semi-primitive motorized.

The Acord Lakes recreational area to the west has approximately 100 seasonal homes.

The USFS has conducted various Roadless Area Review and Evaluations (RARE) on forest lands. The nearest designated RARE are located 2½ to 3 miles north and northwest of the project area, in the Manti-La Sal and Fishlake National Forests.

POTENTIAL IMPACTS

No Action - Alternative A

The dispersed recreation use would continue in this area as the dominant use.

Quitchupah Creek Road Alignment - Alternative B

Implementation of the proposed project would improve access to the area for big and upland game hunters and to other recreationists. Allocated harvest numbers set forth by UDWR for the Manti Management Unit would remain unaffected by the proposed Quitchupah Creek Road project, but the number of hunters in the area could increase. Local guided hunting trips in the area would likely decrease with easier access to the area, and poaching opportunities from the paved road could

potentially increase. However, construction activity and increased traffic can negatively impact wildlife and, if so, hunting opportunities may decline if wildlife numbers decrease due to collisions with vehicles or avoidance of the area.

Other recreationists, including campers, hikers, and sightseers would also have improved access to public land due to the project, however, the quality of these dispersed recreation activities may be reduced due to noise from construction or traffic, or if wildlife avoids the area. The greater access from the east that the road would afford to the Acord Lakes recreational areas could be an economic benefit to Sevier County.

During weekdays coal haul trucks would be traveling on the road at 1.5 - 3.0 minute intervals depending upon the volume coal hauled to eastern markets and power plants. This concentration of traffic would influence any recreational uses adjacent to or on the road. During most weekends the road would be free of coal haul trucks. Dispersed recreation use in an isolated setting would be no longer available in Quitchupah Creek.

Access through Quitchupah Canyon via ATVs would be eliminated because ATVs are not allowed on public highways. The existing dirt road is the only access currently available for ATVs up the canyon. The SEUOHV Club would have to withdraw or select another route for the proposed Castle Valley Trail System. Installation of an additional dirt road for ATV use alongside the proposed Quitchupah Creek Road project would not be feasible due to the spatial constraints imposed by the canyon. Hunters or other recreationists that rely on ATVs for access would have to trailer ATVs to pull-offs, unload, and access remote areas from these points.

Alternate Junction and Alternate Design - Alternative C

Impacts to recreational uses under this alternative would generally be the same as for Alternative B. However, an alternative design that incorporates features to facilitate wildlife movement to and from habitat could improve recreational opportunities. Fenced portions of the road and underpasses can help protect wildlife from traffic as they cross Quitchupah Creek Canyon to move between ranges. Recreation opportunities would improve for hunters due to a decreased direct impact to wildlife and opportunities would improve for dispersed recreationists such as hikers and sightseers that come to the area to view wildlife.

Water Hollow Alternate Alignment - Alternative D

The majority of the Quitchupah Creek Road would remain unpaved under this alternative, and thus it would have less of an effect on the proposed SEUOHV Castle Valley Trail system. There would be a much greater ease of access to the Water Hollow Benches under this alternative, and would open up this area to recreationists, likely increasing the level of use. The few recreationists who currently use the Water Hollow Benches presumably enjoy the remoteness of this hard-to-access area, and would likely be negatively affected due to the reduced solitude and isolation that construction of the road would bring.

Mitigation and Monitoring

No further mitigation or monitoring activities are proposed for recreation resources for the Proposed Action.

Irreversible or Irretrievable Commitment of Resources and Residual Adverse Impacts

Implementation of the Proposed Action would result in a loss of the natural, roaded, dispersed type of recreation. No residual adverse impacts were identified as a result of the proposed action.

Cumulative Effects

The Proposed Action, in conjunction with past, present, and reasonably foreseeable future actions would result in increased human activity in the area. As coal hauling activities take place, access to lands used by recreationists may become hindered during hours of operation.

WILDERNESS

The project area does not occur within a designated Wilderness Study Area. The closest proposed WSA is Devils Canyon, approximately 10 to 15 miles southeast of the project area (USDI-BLM, 1989). A Research Natural Area is located near the project area on Fishlake National Forest land. RNAs are tracts of land that approximate pristine conditions and are designated for scientific and educational uses. The RNA, referred to as Old Woman Cove, was officially designated in November 1998 (USDA-USFS, 1998). It encompasses approximately 2,520 acres and is located about ½ mile west and south of the Water Hollow alternate alignment.

There are no Wilderness Inventory Units nor Utah Wilderness Coalition proposed wilderness areas in the general vicinity of the project area.

POTENTIAL IMPACTS

No Action - Alternative A

There would be no effect upon any WSA, WIU, UWC proposed areas, or RNA.

Build Alternatives - Alternative B, C, D

No roadless areas are affected by the proposed Quitchupah Creek Road project or alternatives. There would be no effect upon any WSA, WIU, UWC proposed areas, or RNA by this project.

Irreversible or Irretrievable Commitment of Resources and Residual Adverse Impacts

No irreversible or irretrievable commitment of resources would occur as a result of the Proposed Action. No residual adverse impacts to wilderness resources are anticipated from any of the alternatives as analyzed above.

Cumulative Effects

The implementation of the Proposed Action, in conjunction with past, present, and reasonably foreseeable future actions would not conflict with wilderness resources.

3.13 CULTURAL AND PALEONTOLOGICAL RESOURCES

CLASS I FILE SEARCH

The previous inventories conducted in Convulsion Canyon have recorded a wide variety of prehistoric sites. The data suggests that the identified sites along Quitchupah Creek Road were primarily occupied during the Formative Fremont culture. More limited occupations are also suggested for the preceding Archaic period in a few of the sites. Little evidence of the protohistoric period has been found on the sites identified in Convulsion Canyon. However, some evidence for the protohistoric period may be in the form of some of the rock art in the canyon.

The previous inventories have resulted in the identification and recordation of several site types including an historic cabin/ranch, historic road segments, historic inscriptions, prehistoric villages, campsites, rockshelters, petroglyphs, and pictographs representing mainly the Fremont culture. Many of these sites are significant and qualify for inclusion on the National Register of Historic Places (NRHP) under criterion D of Title 36 Code of Federal Regulations 60.6.

Four projects have previously been completed in the Quitchupah Creek Road corridor, resulting in the recordation of 21 sites in Convulsion Canyon. The earliest archaeological work along Quitchupah Creek was performed by James Gunnerson in the 1950's during his explorations of central Utah (Gunnerson, 1969). His work recorded some of the more major sites in the canyon including 42SV12, now 42SV1064, that was revisited by both Brigham Young University (BYU) crews in 1977 and Archaeological Environmental Research Corporation (AERC) in 1995. The BLM also recorded sites in 1985 that are not associated with a particular project (Table 3.12-1).

A power line corridor for Utah Power was inventoried in 1977 by BYU. Eight sites were identified during that inventory (Berge, 1977). Many of these sites were revisited and site forms updated by AERC (Hauck, 1995) as part of the Quitchupah Creek Road corridor project performed for SUFCO. Table 3.12-1 contains a listing of known sites along the project corridor and their current NRHP status.

For the Water Hollow alternate alignment, a Class I file search of the project area was conducted on June 19, 2000 at the Utah State Historic Preservation Office (SHPO) in Salt Lake City. Four previous cultural resource inventories were conducted in the vicinity of that alignment. These include a transmission line survey (Berge, 1977), a sampling inventory located near Elmo, Emery, and Castle Valley (Black and Metcalf, 1985), a seismic line inventory (Billat, 1985) and a cultural resource evaluation of the Quitchupah Creek road corridor (Hauck, 1995). Some of the previously recorded sites from these inventories include 42SV922, 42SV923, 42SV1765, and 42SV1067. Only 42SV923 was found to be within the Water Hollow alternate alignment area.

A Class III field survey has been completed for the Alternate Junction with SR-10 and alternate design (Alternative C).

Site Summary - Quitchupah Creek Road

Table 3.13-1 presents a summary of the 21 individual sites, as provided in Hauck (1995) AERC, that were documented during the Class III inventory of the Quitchupah Creek Road. A description of each site is provided in the Final Cultural and Paleontological Resources Technical Report, Quitchupah Creek Road EIS (JBR, 2001i).

Table 3.13-1 Cultural Resource Sites within Quitchupah Creek Road Corridor

Site Number	Site Type	Cultural Affiliation	NRHP Evaluation	Recordation Date/Company
42SV1061	Occupation Lithic Scatter	Unknown	Eligible	1977 BYU 1995 AERC
42SV1062	Lithic Scatter	Unknown	Ineligible	1977 BYU 1995 AERC
42SV1063	Rock Art, Rockshelter, Occupation	Archaic Fremont	Eligible	1977 BYU 1995 AERC
42SV12/1064	Rock Art, Rockshelters	Archaic, Fremont	Eligible	1957 Gunnerson 1977 BYU 1996 AERC
42SV1065	Rockshelter Occupation	Fremont	Eligible	1977 BYU 1995 AERC
42SV1066	Campsite	Fremont	Eligible	1977 BYU 1995 AERC
42SV1067	Rock Art, Rockshelter, Occupation	Unknown	Eligible	1977 BYU 1995 AERC
42SV1068	Occupation	Unknown	Eligible	1977 BYU 1995 AERC
42SV2121	Rock Art	Archaic	Eligible	1985 BLM
42SV2122	Habitation	Fremont	Eligible	1985 BLM
42SV2123	Habitation	Fremont	Eligible	1985 BLM
42SV2348	Road	Historic	Not Eligible	1995 AERC
42SV2349	Rock Art Inscription	Unknown Historic	Not Eligible	1995 AERC
42SV2350	Inscription	Historic	Not Eligible	1995 AERC
42SV2351	Rock Art, Rockshelter Occupation	Fremont	Eligible	1995 AERC
42SV2352	Rock Art	Archaic	Eligible	1957 Gunnerson 1995 AERC
42SV2353	Inscription	Historic	Not Eligible	1995 AERC
42SV2354	Homestead	Historic	Not Eligible	Gunnerson 1957 1995 AERC
42SV2355	Pithouse/Village	Fremont	Eligible	1995 AERC
42SV2356	Open Occupation	Unknown	Not Eligible	1995 AERC
1463/fl	Poss. pictograph/alcove	Unknown	Not Eligible	1995 AERC

Site Summary - Alternate Junction And Alternate Design

Table 3.13-2 identifies cultural resource sites within Alternative Junction with SR 10 and Alternate Design of Quitchupah Route. Patterson and Montgomery (2001) identified a total of 12 sites within this area. Cultural site 42Sv2549 is a lithic scatter of unknown temporal affiliation that is recommended not eligible to the National Register of Historic Places (NRHP). Cultural site 42Sv2550 is an artifact scatter of unknown temporal affiliation recommended as not eligible to the NRHP. Cultural sites 42Sv2551 and 42Sv2552 represent Fremont temporary campsites that are recommended as eligible to the NRHP. Cultural site 42Em2717 consists of a concentration of fire-cracked rock eroding out of an ephemeral drainage that is recommended as eligible to the NRHP. Cultural site 42Em2718 is an Archaic and/ or Fremont temporary camp that is recommended as eligible to the NRHP. Cultural site 42Em2719 is a Middle Archaic temporary camp that is recommended as eligible. Cultural site 42Em2720 is an Archaic temporary campsite recommended as eligible to the NRHP. Cultural site 42Em2721 is an Archaic/Fremont temporary campsite recommended as eligible to the NRHP. Cultural site 42Em2722 is a temporary camp of unknown affiliation that is recommended as eligible to the NRHP. Site 42Em2723 is an Archaic/Fremont temporary camp recommended as eligible to the NRHP. Site 42Em2724 is an historic trash scatter of unknown affiliation recommended as not eligible to the NRHP.

Table 3.13-2 Cultural Resource Sites within Alternative Junction with SR-10 and Alternate Design of Quitchupah Route

Site Number	Site Type	Cultural Affiliation	NRHP Evaluation
42Sv2549	Lithic Scatter	Unknown	Not Eligible
42Sv2550	Artifact Scatter	Unknown	Not Eligible
42Sv2551	Temporary Campsite	Fremont	Eligible
42Sv2552	Temporary Campsite	Fremont	Eligible
42Em2717	Hearth	Unknown	Eligible
42Em2718	Archaic/Fremont Temporary Camp	Archaic and/or Fremont	Eligible
42Em2719	Middle Archaic Temporary Camp	Archaic	Eligible
42Em2720	Archaic Temporary Campsite	Unknown	Eligible
42Em2721	Archaic/Fremont Temporary Campsite	Archaic/Fremont	Eligible
42Em2722	Temporary Camp	Unknown	Eligible
42Em2723	Archaic/Fremont Temporary Camp	Middle Archaic	Eligible
42Em2724	Historic Trash Scatter	Unknown	Not Eligible

Site Summary - Water Hollow Alternate Alignment

Table 3.13-3 presents a summary for the 19 sites identified by JBR during the Class III field inventory conducted in 2000. The survey corridor for this alignment varied from 500 to 1,000 feet in width. A description of each site is provided in the Final Cultural and Paleontological Resources

Technical Report, Quitchupah Creek Road EIS (JBR, 2001i) and also in Billat and Crosland (2001), which has received SHPO approval.

Table 3.13-3 Cultural Resource Sites within Water Hollow Road Corridor

Site Number	Site Type	Cultural Affiliation	NRHP Evaluation
42SV923	Lithic/ceramic Scatter	Fremont??	Ineligible (S-3) collect.
42SV2512	Cabin/ Lithic and Ceramic Scatter	EuroAm/ Fremont	Eligible
42SV2513	Campsite	Fremont	Eligible
42SV2514	Debris Scatter	EuroAm	Ineligible
42SV2515	Lithic Scatter	Unknown Aboriginal	Ineligible
42SV2516	Lithic Scatter	Unknown Aboriginal	Ineligible
42SV2517	Debris Scatter Campsite	EuroAm Unknown Aboriginal	Eligible
42SV2518	Campsite	Unknown Aboriginal	Eligible
42SV2519	Campsite	Fremont	Eligible
42SV2520	Campsite	Fremont	Eligible
42SV2521	Campsite	Unknown Aboriginal	Eligible
42SV2522	Campsite	Fremont	Eligible
42SV2523	Debris Scatter	EuroAm	Ineligible
42SV2524	Room Shelter	EuroAm	Ineligible
42SV2525	Lithic Scatter	Unknown Aboriginal	Ineligible
42SV2526	Campsite	Unknown Aboriginal	Eligible
42SV2527	Ceramic/Lithic scatter	Fremont	Eligible
42SV2528	Historic Inscription	EuroAm	Ineligible
42SV2529	Historic Inscription	EuroAm	Ineligible

Paleontological Resources

No paleontological localities have been recorded along either of the project corridors (Hayden, 1999-2000). Formations exposed in the right-of-way include the Late Cretaceous Mancos Shale and the Late Cretaceous Blackhawk Formation. The Mancos Shale could possibly contain invertebrate fossils. There is a slight possibility of vertebrate fossils in the Blackhawk Formation as well. Overall, there is a low potential for significant fossil localities to be found in the project area.

REGULATORY

The Section 106 process requires consultation with the appropriate agencies to develop and evaluate alternatives or modifications to all of the proposed undertakings for this project in order to avoid, minimize or mitigate adverse effects on all historic properties. The tribes involved in the Native American consultation have expressed that they would like all of the identified cultural resource sites

within the project area left alone and intact. Under 36 CFR 800 regulations, data recovery is not available to achieve a no adverse effect. Native American consultation with the various tribes is ongoing and has been under the approach that Quitchupah Creek and surrounding areas, not the individual sites, has been the important component for Native American concerns. The BLM Richfield Field Office has been the primary consultant with the Native Americans for this project.

POTENTIAL IMPACTS

No Action - Alternative A

No cultural or paleontological resources would be impacted by this proposal under the No Action Alternative. Currently, cultural resources in the Proposed Action and Alternatives areas are being impacted by recreational activities (hunting, camping, ATV, etc), vandalism, and erosion. These impacts would continue under the No Action Alternative.

Quitchupah Creek Road Alignment - Alternative B

The Quitchupah Creek Road alignment was initially proposed for the primary route. AERC (Hauck, 1995) identified a total of 21 cultural resource sites within the initial corridor. Of these, six cultural resource sites recommended eligible for the NRHP would be within the Area of Potential Effect for construction of the proposed Quitchupah Creek Road. The remaining identified 15 sites are either recommended ineligible for the NRHP or are outside the area that would be affected during road construction.

Because of the steep variable topography of the canyon itself, sections of the road alignment would be filled or cut into the canyon bottom. Buried cultural materials could possibly be encountered during these excavation activities. A monitoring plan would be implemented during the project construction for the discovery of unknown buried cultural remains.

A fair number of the identified sites in the canyon have associated prehistoric rock art along the rock cliff faces. Though many of these rock art panels can be avoided, secondary impacts to these resources (i.e. vandalism) would be an important issue upon completion of a paved road.

According to Utah Geological Survey (UGS) (Hayden, 1999), unless fossil localities are discovered as a result of construction activities, this project should have no impact on paleontological resources. No known fossil locations have been identified in the project area.

Alternate Junction and Alternate Design - Alternative C

The two-mile portion of this route that diverges from Alternative B has been inventoried for cultural resources.

Preliminary findings indicate Fremont sites in and around the Link Canyon crossing. Potentially eligible sites could be impacted by road construction should this route be selected. Further field surveys indicate that the road crossing could be moved north 500 feet to avoid the known sites without impacting other sites.

According to UGS (Hayden 2000), unless fossil localities are discovered as a result of construction activities, this project should have no impact on paleontological resources. No known fossil locations have been identified into the project area.

Water Hollow Alternate Alignment - Alternative D

This alternative contains about the same amount of cultural resources present along its proposed route as the proposed Quitchupah Creek Road alignment. Of the 19 sites present, the most significant sites are found at the confluence of Quitchupah and Water Hollow drainages, near the west/upper portion of the road. The remaining sites are found east of the Old Woman Plateau and west of SR-10. Of the 19 sites identified, ten are considered eligible for the NRHP. Nine of the eligible sites are situated adjacent to Water Hollow canyon and the tenth site is west of SR-10. The majority of NRHP eligible sites are Fremont campsites, situated near the confluence of Quitchupah and Water Hollow drainages. One site is a historic cabin and spring, with associated wagon remains. Because there is a concentration of significant sites situated at this confluence, the original alignment for this alternative was altered to avoid those sites. The current Water Hollow alternate alignment is located further up-slope, where no additional sites were found. The Class III inventory conducted along the Water Hollow alternate alignment evaluated a 500- to 1000- foot wide corridor. The corridor varied in width to help identify sites in the nearby area and to maintain flexibility and options in the final placement of the road centerline, in connection to the rough topography of the route itself.

Because the Water Hollow alternate route traverses high bench areas and steep topography, its alignment has been outside and above the areas that have been identified as having rock art. No prehistoric rock art was identified along the Water Hollow route.

Mitigation and Monitoring

For site preservation, avoidance of impacts to eligible and unevaluated cultural resource sites is the preferred method of site preservation. However, when disturbance of NRHP eligible sites is unavoidable, direct and /or indirect impacts may be mitigated through data recovery, site monitoring, and research in accordance with standards and guidelines agreed upon by the USFS, BLM, SHPO, and the Advisory Council on Historic Places. However, both direct and indirect impacts would result in permanent loss of site context, and in the case of indirectly impacted sites, potential loss of information and artifacts.

Any cultural and/or paleontological resource discovered during construction would be immediately reported to the USFS and BLM. Construction would be suspended in the immediate area of the discovery until written authorization to proceed is issued by the USFS and BLM. An evaluation of the discovery would be made by the USFS and BLM to determine appropriate actions to prevent the loss of significant cultural or scientific values.

Protection of rock art sites would be developed in cooperation with the land management agencies.

Irreversible or Irretrievable Commitment of Resources and Residual Adverse Impacts

The Proposed Action would result in a loss of the isolated nature of the rock art sites. Residual adverse impacts to cultural resources would include compromised site integrity due to physical damage to the sites during construction or use of the Proposed Action. The presence of new roads can lead to increased access to site locations resulting in site disturbance and vandalism.

Cumulative Effects

Past actions concerning cultural resources within the Proposed Action area include cultural resource surveys that have identified prehistoric and historic sites, some of which are considered eligible for inclusion on the NRHP. Adverse activities have included unauthorized excavations and vandalism of archaeological sites. The direct and indirect adverse impacts under the Proposed Action could potentially destroy or compromise the integrity of many sites.

3.14 NATIVE AMERICAN RELIGIOUS CONCERNS

INTRODUCTION

The public scoping effort for this NEPA action attempted to reach all public and agencies concerned with coal mining and the construction of a public road in Quitchupah Creek. See Section 2.1 for details of scoping.

The Quitchupah drainage contains abundant evidence of prehistoric and historic activity, some of which is sacred to the various tribes who have historical interests in this area. Most of the eligible sites to date are connected to the Fremont Culture, but evidence of artifacts associated with the Archaic Period are also evident in this drainage.

The Fremont inhabited the region between 400-1350 A.D. They were horticulturists with varying dependencies on corn, beans, and squash. The Fremont also hunted small and large animals and utilized wild plant foods. They built semi-subterranean pit houses, surface jacal and masonry habitation units and coursed adobe granaries. Fremont sites are present in Convulsion Canyon and along Quitchupah Creek. The Fremont people left the region apparently due to environmental changes (drought) and were eventually replaced by Numic speaking groups (Utes and Goshutes) after 1300 A.D.

The Utes were hunter-gathers who settled in central and northeastern Utah and were present when European explorers first entered Utah. The southern boundary of their traditional territory was south to the Muddy River drainage and west to Utah Lake and Sevier Lake. The Moanunts and Sanpits bands were the Ute bands that roamed the project area of Quitchupah Creek (Sturtevant and D'Azevedo, 1986).

The Southern Paiutes were emigrants from southeastern California that occupied southern Utah. Their northern boundary was generally the divide between the Escalante and Sevier river drainages in the south and the Dirty Devil River to the north. The Southern Paiutes were also considered a southern branch of the Numic speaking people. The closest Southern Paiute band to the project area was the Fish Lake Band that occupied lands south of I-70 in Sevier and Wayne counties (Martineau, 1992).

The Goshutes were hunter-gatherers who occupied central and western Utah. The Western Shoshone occupied the remainder of Utah and eastern Nevada. All of these Numic peoples intermingled to some degree across their traditional boundaries.

NATIVE AMERICAN CONSULTATION

Federal agencies are required by law (Archaeological Resources Protection Act of 1979 and National Historic Preservation Act of 1966) and regulation to consult with Native Americans on actions that

may affect their traditions or uses of public lands. Specifically the agencies are required to follow Section 106 as recorded in 36CFR800 - Subpart B as revised July 1, 2000.

The BLM Manual Section 8160 states that the intent is to "assure that tribal governments, Native American communities, and individuals whose interests might be affected have sufficient opportunity for productive participation in BLM planning and resource management decision making."

On March 19, 1999, representatives from JBR, the Utah State Historic Preservation Office, Jones & DeMille Engineering and the BLM met on the site of the proposed Quitchupah Creek Road to discuss the archaeological sites located on the proposed route. Native American consultation had not started because the proposal was still in the conceptual stage. Following the March 19th meeting, the archaeologist from the BLM Richfield Field Office was assigned as the joint agency cultural specialist for this project. Coordination with the cultural representative from the Koosharem Band of the Paiute Tribe began on March 19, 1999. Over the next few months, representatives from the Paiutes visited the Quitchupah drainage several times to become familiar with the area and examine the proposal and alternatives being considered in this project. The Paiutes expressed opposition to any project along Quitchupah Creek because human activity could impact the sacredness of the canyon. The Tribe is equally opposed to any testing of archaeological sites which they view to be as destructive as road construction. The Paiute Tribe of Utah made this position known to the FS/BLM in a letter submitted on July 22, 1999.

Efforts were also underway during this time to identify other tribes who might have a historical interest in the general area involved in this project. On June 23, 1999, contact was made with Ms. Betsy Chapoose of the Uintah & Ouray Tribal Committee Cultural Rights & Protection Department in Ft. Duchesne, Utah. A field tour of the Quitchupah Creek Road was subsequently completed with a Tribe representative. The Ute's concern extends to all sites in the canyon, but focuses on the rock art. The Tribe has determined that at least a ½-mile buffer around rock art sites - preferably one mile buffer, is necessary to protect rock art sites.

On July 12, 1999, contact was made with the Navajo Nation in Window Rock, Arizona. A representative in the Navajo Nation Cultural Preservation Office indicated that their primary interest in this part of Utah is the dormitory facility for Native American youth in Richfield. It was explained that the Navajo Nation has no interest in other projects in this area including archaeological site projects.

On July 13, 1999, the Hopi Cultural Preservation Office was contacted. The response from the head of the Preservation Office was that they have a formal approach to consultation with Federal agencies on these matters. Mr. Leigh Kuwanwisiwma, head of the Hopi Cultural Preservation Office, stated that the Hopi are very interested in Fremont archaeological sites and projects that may affect them. Accordingly, the BLM Richfield Field Office opened formal consultation with the Hopi

Tribe on the Quitchupah Creek Road project on November 21, 2000. A letter sent on that date to the Hopi Tribe requested any comments or concerns the Tribe may have with the project.

A written response was received from the Hopi Tribe in December, 2000 claiming affiliation with the Fremont and asking for copies of all pertinent materials on the Quitchupah Creek Road project (these materials were forwarded to the Tribe). After the Tribe had reviewed the Quitchupah Creek Road material the BLM Richfield Field Office received an invitation to attend an upcoming Administrative Meeting. The Tribe stated in their invitation that they are interested in the Quitchupah Creek Road project and feel at this point that it is a non-controversial issue since the sites on the main Quitchupah Creek route can be avoided by implementing the Water Hollow alternative.

On March 21, 2001, representatives from the Richfield Field Office spoke at the Hopi Administrative meeting at Hopi Tribal Headquarters in Kykotsmovi, Arizona. Mr. Leigh Kuwanwisiwma and Clay Hamilton represented the Hopi Tribe. As per the Tribe's request, the BLM presented a briefing on the Quitchupah Creek Road Project and alternatives. Copies of the cultural inventory reports on the Quitchupah Creek Road and Water Hollow routes were provided to the Tribe. The Tribe has stated that as long as the sites on the Quitchupah Creek route can be avoided by implementing another alternative route, the Tribe has no issue with the project. They understand that avoidance is not an option along Quitchupah Creek because of the confines of the canyon, but for now approve of the Water Hollow alternative.

In summary, the Paiute, Hopi, and Ute tribes are opposed to the Quitchupah Creek route. The Paiute Tribe of Utah claims Convulsion Canyon as sacred, and the Hopi and Ute tribes do not want to see any of the archeological sites along Quitchupah Creek impacted in any way. Likewise, all three tribes are in favor of an alternative route that would avoid Quitchupah Creek.

POTENTIAL IMPACTS

Alternative A, No Action

There would be no impacts to prehistoric or historic sites due to road construction and operation although vandalism may continue.

Alternative B, Quitchupah Creek Road

The route down Convulsion Canyon and Quitchupah Creek would impact several known eligible prehistoric sites along the creek and be in close proximity to the rock art site at North Fork. The construction of this route would impact the sacred nature of the canyon as expressed by the Southern Paiutes, and not allow for a buffer zone around the rock art site as desired by the Utes. The Hopis would be concerned with disturbance to any of the sites.

Alternative C, Alternate Junction and Alternate Design

This alternative shares the route with Alternative B except for the eastern most two miles where it deviates northeasterly to cross Link Canyon and junction with SR10. The impacts to religious concerns would be those detailed in Alternative A,

Alternative D, Water Hollow Route

The route does not directly impact any of the known eligible prehistoric or historic sites along the road corridor. The impacts to known eligible Fremont sites in Quitchupah Creek would be avoided as would the rock art site. The sacredness of Convulsion Canyon would be impacted by this proposed route as explained in Alternative A.

Irreversible, Irretrievable, and Residual Impacts

The sacredness of the canyon as expressed by the Southern Paiutes would be irretrievably violated by the construction and operation of a public haul road. Eligible prehistoric sites not excavated for salvage would be unmitigated residual impacts due to the road construction.

3.15 TRANSPORTATION

The existing road in Quitchupah Creek Canyon was originally an old wagon road prior to 1900. It served ranches, allowed access to the forest up on the plateau, and provided a route for east-west travel. The road was possibly graded in the 1940's, and the earliest road maintenance logs are dated 1968. More recently some gravel has been added for about the first half mile going west from SR-10 with the remainder being a native surface. The easements for the road are based upon use (Funk, 1999).

Alternatives B and C would be located along an existing road/trail, the Quitchupah Creek Road #908, through Quitchupah Creek Canyon. The alignment begins near the SUFCO Mine in Convulsion Canyon and heads east to SR-10 (Figure 1-1). Currently, this road has a native (dirt) surface with some gravel on the last half mile before the highway and in other areas which have resulted from scarifying activities. Where this road enters the highway, the highway is on an uphill grade heading north. The alternate design of the Quitchupah route diverges from the existing alignment for the final two miles at the eastern end to avoid the uphill grade on SR-10 by intersecting it north of the crest of the hill.

The Water Hollow alternate alignment (Alternative D) involves leaving the existing Quitchupah Creek Road two miles east of its western end, and climbing up, then crossing the Water Hollow Benches and Saleratus Benches. The alignment then turns north to intersect SR-10. Unlike the other two alternatives, a large portion of the Water Hollow alternate alignment doesn't follow an existing road or trail.

Currently, the traffic from the mine travels southwest on the Acord Lakes Road to I-70. The haul trucks going west travel I-70 to Salina and then north on Highways 89 and 28 to the railroad loadout near Levan, while the trucks hauling east take I-70 to Fremont Junction and then turn north on SR-10 to the Hunter Power Plant or the Savage Coal Terminal (SCT) loadout near Price. SR-10 is a north-south highway that connects the central Utah area on the eastern side of the Wasatch Plateau. This two-lane paved highway extends from Fremont Junction on I-70 north to Price. About four miles south of Price, coal haul trucks traveling to SCT turn east on SR1306, Ridge Road.

STATE ROUTE 10

SR-10 is a north-south highway that connects Fremont Junction on I-70 with Price, Utah. It is an asphaltic concrete, generally two-lane highway that varies greatly in use depending upon the locality. It passes through the towns of Emery, Clawson, Ferron, Castle Dale, and Huntington. It is the primary road of interest since all alternatives would use this road.

SR-10 is an older road built on moisture sensitive soils, the most notorious of which are soils derived from Mancos shales. The road follows the ups and downs of the land. There was not a lot of earthwork done to eliminate the hills and valleys when this road was built more than 40 years ago.

Hence the roadway is susceptible to expansion that may occur within the native soils. Between I-70 and Emery Town the pavement structure is a mix of strengths. Some areas are rated as strong, others as medium, and between milepost 9 and 11 as weak. Under existing traffic the years to fatigue average 9 with 4 years being worst case.

Traffic Volumes on SR-10

The UDOT collects Average Annual Daily Traffic (AADT) information at various points throughout the state. The AADT is defined as the total volume passing a point or segment of a highway facility, in both directions, for one year, divided by the number of days in the year. There are no AADT data for the existing Acord Lakes Road, Quitchupah Creek Road, or Ridge Road. However, the Acord Lakes Road does experience periodic congestion which now has about 50 trucks per hour at peak times (Sorensen, 1999). The current volumes for all vehicular traffic for SR-10 are presented in Table 3.15-1 and include the present SUFCO Mine related traffic (Christensen, 1999). Predicted AADT for 2020 includes any additional traffic as a result of future coal hauling on SR-10.

Table 3.15-1 SR-10 Highway Traffic Volumes

From Interchange/Junction	To Interchange/Junction	AADT 1999 - % Trucks[1]	AADT 2020 -% Trucks @ Max. Haul[2]
Sevier Emery County Line	West Emery	540 - 20	1507 - 67
West Emery	East Emery	820 - 15	2107 - 49
East Emery	South Ferron	1885 - 07	4007 - 24
South Ferron	North Ferron	4420 - 04	8507 - 12
North Ferron	Junction SR-57	4200 - 12	7407 - 22
South Castle Dale	North Castle Dale	7220 - 07	7400 - 07
North Castle Dale	Junction SR-29	3790 - 12	6500 - 12
Junction SR-122	Junction SR-1306 Ridge Road	8215 - 11	12,700 - 11

Source: UDOT

1. Truck is defined as combination unit truck
2. Maximum haul would be 4.5 million tons annually to Hunter Power Generating Plant at SR-57.

The current volumes of traffic, pavement conditions, safety, and traffic service levels include the coal haulage, workers commuting to the mine, vendors providing equipment and supplies to the mine, and the general public on SR-10. Recently on SR-10, seven to twenty percent of the vehicles were noted as being dual trailer trucks (Hanshew, 1999). With the recently signed contract that will bring additional haul truck traffic to SR-10 as SUFCO conveys 2 million to 4.5 million tons/year to the Hunter Power Plant, these numbers have/will become inaccurate.

Surface Strength of SR-10

Three main factors affecting the longevity of the roadway include surface strength, subgrade strength, and cracking. The surface strength of SR-10 is ranked either medium or strong by UDOT, with a minor amount of weak south of Emery (Table 3.15-2).

Table 3.15-2 SR-10 Surface Strength

From Interchange/Junction	To Interchange/Junction	Surface Strength
Fremont Junction	Sevier Emery County Line	Strong with some medium
Sevier Emery County Line	Emery	Medium with some weak
Emery	North Junction, Moore Road	Strong with some medium
North Junction, Moore Road	Ferron	Medium
Ferron	North Junction SR-155	Strong with some medium
North Junction SR-155	Price	Strong

Source: UDOT

Subgrade Strength of SR-10

The subgrade strength of SR-10 varies more than does the surface strength (Table 3.15-3). Between Fremont Junction and the Sevier-Emery County Line and from Ferron to the junction with SR-57, the subgrade strength is ranked as weak. The remainder of the road is ranked either medium or strong. The portion of the road with the strongest subgrade is that between the north junction with SR-155 and the Carbon-Emery County Line, which is ranked strong, with some medium.

Table 3.15-3 SR-10 Subgrade Strength

From Interchange/Junction	To Interchange/Junction	Subgrade Strength
Fremont Junction	Sevier Emery County Line	Weak
Sevier Emery County Line	North Junction, Moore Road	Medium with some weak
North Junction, Moore Road	Ferron	Medium
Ferron	Junction SR-57	Weak
Junction SR-57	Junction SR-29	Medium
Junction SR-29	Huntington	Medium with some weak
Huntington	North Junction SR-155	Medium
North Junction SR-155	Carbon Emery County Line	Strong with some medium
Carbon Emery County Line	Price	Medium with some weak

Source: UDOT

Cracking of SR-10

Traverse cracking is present over the entire length of SR-10 (Table 3.15-4). Additionally, both longitudinal cracking and alligator cracking are present along stretches of the road. Alligator cracking is a series of interwoven cracks that resembles alligator skin. Alligator cracking represents

significant failure of the roadway surface and often of the subgrade as well. Alligator cracking will lead to large potholes and is difficult to repair with anything short of replacing the pavement.

Table 3.15-4 SR-10 Cracking

From Interchange/Junction	To Interchange/Junction	Cracking
Fremont Junction	Price	Traverse
Ferron	Junction SR-29	Alligator Cracking
Junction SR-57	Junction SR-29	Longitudinal Cracking
Huntington	North Junction SR-155	Longitudinal Cracking

Source: UDOT

Bridges on SR-10

There are 14 bridges crossing SR-10 between Fremont Junction and Price. Of the 14 bridges, 11 are in good shape; three appear to need replacing. The three that need replacing are located at Muddy Creek (Reference Post 15.91), Rock Canyon Wash (Reference Post 32.16), and Poulsen Wash (Reference Post 33.04). The structure at Muddy Creek is deemed to be structurally deficient. At least two of these structures were designed using HS-15 loading, which assumes lighter loads than the current standard of HS-10.

Acord Lakes Road

At the present time, all vehicles use the Acord Lakes Road which is a county road that extends from I-70 past a mountain homes development to the coal mine, a distance of about 10 miles. This road is classified as a collector road in the state collector system. It was upgraded in 1977 by the SUFCO Mine from a dirt USFS road. It is 28 feet wide with an asphaltic concrete surface and is designed for a traffic speed of 40 miles per hour. The road section consists of 17.5 inches of untreated base course overlaid by 2.5 inches of gravel sub-base. The asphaltic concrete surface consists of a three-inch base course overlaid by a 4.5-inch thick surface course. At least one surface seal coat with 0.75-inch chips provides a wear surface. No acid or toxic materials were used in the road surfacing (Duncan, 1982).

The Acord Lakes Road is maintained by the SUFCO Mine in cooperation with Sevier County SSD and UDOT. SUFCO repairs the road surface, blades the adjacent drainage ditches, fills potholes, and resurfaces the road. SUFCO spends $139,000/yr maintaining the Acord Lakes Road and has spent $52,000 so far in 2001 for chipping. The road is maintained consistent with a USFS Level 4 maintenance program (USDA-USFS, 1992). Drainage along the road is controlled by roadside drainage channels and culverts. The culverts were constructed in accordance with manufacturers recommendations. These culverts have sustained soil pressures, vehicular loads, and drainage flows. No significant structural problems have been observed with the culverts.

Traffic from the Acord Lakes Road must proceed either east or west on I-70. The majority of coal haul trucks head west to Salina and the Levan loadout. However, in the past as much as one million

tons a year of the coal from the SUFCO Mine has been hauled east to Fremont Junction and then north on SR-10 to railroad loadouts near Price. In 2002, an additional two mmtpy will also be taking this route between the SUFCO Mine and Pacificorp's Hunter Power Plant.

Ridge Road

Ridge Road, SR-1306, is classified as a "rural major collector" that was completed in 1989 to bypass Price for traffic eastbound to Wellington and US-6. It is 7.3 miles long and has 12 foot wide lanes in each direction, four foot shoulders, 5.5 inches of bituminous surface course and six inches of untreated base course. There is some confusion by the regulatory agencies about whether Carbon County or the State owns the road, however, UDOT performs the maintenance on it. It is used only for the first couple of miles to access the SCT coal loadout but continues on to terminate at the east side of Wellington at US-6.

REGULATORY

The proposed transportation systems to haul coal and service the SUFCO Mine would be required to meet the regulations from several entities who would be affected or have jurisdictional control. The Emery County planning process and local ordinance 8-7-85A would have to be adhered to. The existing Quitchupah Creek Road is covered under an interlocal agreement for maintenance between Emery and Sevier counties (Funk, 1999), but the agreement would likely be revised if the proposed project were constructed. If the construction corridor were to expand beyond the county-granted easement of 100 feet for Class B roads, then Sevier County would need to file an easement application with SITLA to cover the portion that may be outside the existing easement. With a changed road use, UDOT would require an Encroachment Permit for entrance on to SR-10 (Laws, 1999). In addition, the SR-10 right-of-way width is limited, which may necessitate the acquisition of more right-of-ways.

POTENTIAL IMPACTS

No Action - Alternative A

Existing traffic patterns in the area of interest would remain essentially the same except for the proportional amount attributed to future increased mine production. Essentially the increase in coal truck traffic to the east is dictated by contracts and would continue on the present road system. The Acord Lakes Road would continue to experience periodic congestion which now has about 50 trucks per hour at peak times (Sorensen, 1999).

Coal purchased by Pacificorp for use at the Hunter Power Generating Plant would continue to be hauled via the current route. There would be no decrease in wear due to coal truck traffic on I-70 between the Acord Lakes Road Junction and Fremont Junction and SR-10 south of the junction with Quitchupah Creek Road.

Quitchupah Creek Road Alignment - Alternative B

The primary impact of the Quitchupah Creek Road on transportation issues would be to reduce coal truck traffic on I-70 between the Acord Lakes Road junction and Fremont Junction and on eight miles of SR-10 south of the Quitchupah Creek Road. Additionally, where the current Quitchupah Creek Road intersects SR-10, significant modifications, in the form of turn lanes, to the highway and bridge would be necessary to allow all traffic to converge safely. Slow moving trucks that enter the highway must be avoided by oncoming traffic and allowed to gain highway speed before merging into the traffic flow.

Because of the uphill grade on SR-10 north of the proposed junction, loaded haul trucks would need a long acceleration lane to prevent traffic delays. A passing lane on the uphill grade is presently needed to accommodate the increased coal truck traffic and would also be required for the proposed Quitchupah Creek Road.

Beginning in 2002, the minimum amount of coal hauled to Emery County destinations will be two million tons annually. That is the minimum amount that Pacificorp has contracted to purchase for use in the Hunter Power Plant near Castle Dale, Utah. The maximum amount that Pacificorp is purchasing from the SUFCO Mine is 4.5 mmtpy. These will occur whether or not the proposed project is approved. Undoubtedly, there would be the one million tons hauled to railroad loadouts in Carbon County. Estimated increases in AADT on SR-10 due to coal truck traffic range from 372 to 1024, depending on the amount of coal trucked to the Hunter Power Plant and the Carbon County railroad loadouts. This is an increase of 8 percent to 23 percent over the current AADT on SR-10 between Ferron and SR-57, and an increase of 70 to 170 percent over the current AADT on SR-10 south of Emery (Table 3.14-1). When compared to AADT predicted for 2020, the increase is 8 percent to 14 percent on SR-10 at Castledale, and 70 percent to 128 percent on SR-10 at Emery.

Pacificorp will be purchasing coal from the SUFCO Mine for the Hunter Power Generating Plant regardless of whether the Quitchupah Creek Road is built. Building the Quitchupah Creek Road would shorten the one-way haul distance from the SUFCO Mine to destinations in Emery and Carbon counties by 25 miles. The Quitchupah Creek Road would remove coal trucks from I-70 between the Acord Lakes Road Junction and Fremont Junction and from SR-10 south of the junction with the Quitchupah Creek Road. Wear on these sections of road would decrease as compared to the No Action Alternative.

The surface strength of SR-10 is medium to strong for most of the route. Some weak sections occur between the Sevier County line and the town of Emery that would probably need replacement to support the increased truck traffic. The subgrade strength is rated medium to weak for most of SR-10 by UDOT. The weak subgrade has already been noted by UDOT and plans have been forwarded for funding to strengthen the subgrade by reconstruction of SR-10.

The surface cracking on SR-10 combined with the increased truck traffic has already contributed to potholes that required repairs to maintain the surface in the short-term. The problem would continue

to increase under the increased truck haul in 2002. The construction of Quitchupah Creek Road would alleviate this problem on SR-10 south of Quitchupah Creek.

Alternate Junction and Alternate Design - Alternative C

This alternative is identical to the above except for the final (easternmost) two miles. This route departs from the proposed route near the west boundary of Section 13, Township 22 South, Range 5 East and proceeds generally east across that section, continuing through Section 18, Township 22 South, Range 6 East, to intersect SR-10 in the northwest corner of Section 17, Township 22 South, Range 6 East. Where the loaded trucks would enter SR-10, the grade for northbound traffic is only 0.07 percent. Significantly less modifications to SR-10 would be needed for this scenario.

The number of trucks hauling coal from the SUFCO Mine through Emery and Carbon counties would be the same as under Alternatives A and B. Therefore, the estimated AADT on SR-10 as a result of coal haul traffic would be the same as Alternative B.

The Quitchupah Creek Road with an Alternative Junction would shorten the one-way distance from the SUFCO Mine to Emery and Carbon County destinations by 26.5 miles. As with Alternative B, coal truck traffic would be removed from I-70 between the Acord Lakes Road Junction and Fremont Junction and from SR-10 south of the junction 2.5 miles north of Quitchupah Creek. Wear on these sections of road due to coal truck traffic would decrease.

Water Hollow Alternate Alignment - Alternative D

Under Alternative D, the number of trucks hauling coal from the SUFCO Mine through Emery and Carbon counties would be the same as under Alternatives A, B, and C. Therefore, the estimated AADT on SR-10 as a result of coal haul traffic would be the same as Alternative B.

The Water Hollow Road would shorten the one-way distance from the SUFCO Mine to Emery and Carbon County destinations by 20 miles. As with Alternatives B and C, coal truck traffic would be removed from I-70 between the Acord Lakes Road Junction and Fremont Junction and from SR-10 south of the junction two miles south of Quitchupah Creek. Wear on these sections of road due to coal truck traffic would decrease.

Mitigation and Monitoring

All new roads across federal, state, or local lands would be constructed to those standards. No further mitigation and monitoring measures are necessary for transportation resources.

Irreversible or Irretrievable Commitment of Resources and Residual Adverse Impacts

Under the Proposed Action, a public roadway will be constructed that replaces the current dirt/two-track roadway. Truck traffic would utilize the roadway within the Proposed Action to travel to eastern loadouts over other roadways.

Cumulative Effects

Because coal mining and related activities have been occurring in the region for several decades, many access roads are evident within the surrounding area. Users, ranches, recreationists, miners, and others develop roads as needed. Some roads may become displaced through inactivity. The cumulative effect may be that some wildlife is disturbed. More maintenance of roads will be required in the Proposed Action area and the possibility of increased traffic accidents and delays may result.

The duration of cumulative effects (e.g., increased traffic volume, increased potential for accidents, increased traffic delays, and road degradation) resulting from past, present, and reasonably foreseeable actions combined with the Proposed Action would occur for the length of time coal is hauled.

3.16 SOCIAL AND ECONOMIC RESOURCES

The socioeconomic study area surrounding the proposed Quitchupah Creek Road consists of Carbon, Emery and Sevier Counties in central Utah. Carbon and Emery Counties are closely tied economically, while Sevier County's economy is more removed from the economy of the other two counties. This section describes relevant socioeconomic elements of the study area and sets the stage for the socioeconomic impact analysis.

Quitchupah Creek Area

This area is characterized as a quiet, undeveloped steep canyon area lying east of the SUFCO mine, opening to SR-10 in Emery County. The upper reaches of the creek are administered by the Forest Service and the BLM; the lower few miles are privately owned. The area currently has an unimproved two track road throughout its length. At the present time the primary socioeconomic uses of the Quitchupah Creek area are public (Forest Service and BLM) and private grazing, dispersed recreation (including hunting and sightseeing), and irrigated pasture activity in the lower reaches. Some ATV activity occurs in the canyon although this area is not currently regulated as an official ATV use area by either the Forest Service or BLM.

SUFCO Mine Employment

The SUFCO Mine is located in Sevier County. The most current (October 4, 2001) figure for mine employment is 276. That employee count, by county of residence, is shown in Table 3.16-1 for the years 1998 through the most current employment figures for October, 2001:

Table 3.16-1 SUFCO Mine Employment by County of Residence

County	End of Year 1998		End of Year 1999		End of Year 2000		October, 2001	
	Number	Proportion	Number	Proportion	Number	Proportion	Number	Proportion
Sevier	160	66.4%	158	67.5%	163	64.7%	163	59.1%
Sanpete	72	29.9%	68	29.1%	72	28.6%	72	26.1%
Emery	0	0.0%	0	0.0%	8	3.2%	27	9.8%
Juab	7	2.9%	7	3.0%	7	2.8%	7	2.5%
Carbon	0	0.0%	0	0.0%	0	0.0%	4	1.4%
Millard	1	0.4%	1	0.4%	1	0.4%	1	0.4%
Uintah	0	0.0%	0	0.0%	0	0.0%	1	0.4%
Wayne	1	0.4%	0	0.0%	1	0.4%	1	0.4%
Totals	**241**		**234**		**252**		**276**	

Source: Wess Sorensen, SUFCO Coal Mine (October, 2001)

As this table shows, employment in Sevier county held fairly steady during the period 1998-2001 while, at the same time, total employment increased. This led to a drop in the proportion of mine employees residing in Sevier county. However, during this same time period the number of employees residing in Emery county increased from 0 to 27. This raised Emery county from one of the three lowest counties to the third highest in terms of SUFCO mine employment.

SUFCO Mine coal production in 2000 was 5,901,601 tons. The mine estimates that its production will increase to a total of 7 million tons in the year 2001. SUFCO has recently signed a contract with Pacificorp to supply Pacificorp's Hunter Power Plant with coal. The Hunter contract calls for a minimum of 2 million tons per year and a maximum of 4.5 million tons per year. SUFCO expects to supply the Hunter plant with 3.1 million tons in 2002. SUFCO expects that Pacificorp will call for the maximum tonnage of 4.5 million over the next several years. The SUFCO Mine will most likely expand to the 8.0 to 8.5 million ton per year level over the next 10 years. At that production level, employment is expected to increase to about 310 employees. (Wess Sorensen, SUFCO mine).

Land Ownership

The counties of Sevier, Carbon, and Emery are contiguous, with Carbon County being immediately north of Emery County, and Sevier County being immediately west of the southern half of Emery County. None of the counties are considered part of a Metropolitan Statistical Area. Government is a significant landowner in each of the three counties (Table 3.16-2).

Table 3.16-2 Land Ownership

Description	Carbon County, UT	Emery County, UT	Sevier County, UT
Acres	947,632	2,850,356	1,222,107
Federal	47.5%	79.8%	76.0%
State	13.1%	11.8%	4.9%
Private/Local Government	39.4%	8.4%	19.1%

Source: Federal Land Payments in Utah, Governor's Office of Planning and Budget

Population

Carbon County is the most populous of the three counties, with a 1999 estimated population of 21,422. Emery County had a 1999 estimated population of 10,862, while Sevier County's population was 18,884. Over the past twenty years, the population of Carbon and Emery Counties has decreased slightly while Sevier County's population has grown by 1.2 percent annually.

Population projections through the year 2020 indicate an expected average increase of one percent per year in the three counties (Table 3.16-3). The three communities on the haul route from the SUFCO Mine to the Hunter Power Plant (Clawson, Emery, and Ferron) are projected to have a combined average annual increase in population of 0.9 percent between now and 2020. Castle Dale, Clawson, Emery, Ferron, Huntington, Price, and the other municipalities directly impacted by hauling coal from the SUFCO Mine to railroad loadouts near Price, are projected to collectively increase in population by 0.8 percent annually until 2020.

Table 3.16-3 Population Projections

	2000	2001	2005	2010	2020
Castle Dale City	1,691	1,697	1,753	1,829	2,005
Clawson Town	158	158	164	171	187
Emery Town	289	289	299	312	342
Ferron City	1,611	1,616	1,669	1,742	1,910
Huntington City	1,944	1,950	2,014	2,102	2,304
Price City	9,217	9,273	9,670	10,151	10,842
Carbon County	21,876	22,009	22,951	24,091	25,732
Emery County	10,395	10,428	10,772	11,243	12,322
Sevier County	19,160	19,485	20,635	22,155	24,598
Tri-County Area (Carbon/Emery/Sevier)	51,431	51,922	54,358	57,489	62,652

Source: Governor's Office of Planning and Budget

Study Area Employment and Income

Approximately 9.4 percent of the total nonagricultural employment in the study area counties is due to coal mining (Table 3.16-4). Electric power accounts for 3.0 percent of total employment, while trucking (primarily transporting coal) accounts for 3.9 percent. Coal mining accounted for 20.5 percent of total nonagricultural wages in the three counties in 1999, followed by electric power (7.2 percent), and trucking (5.1 percent). Each of these three industries pay higher than average wages.

Table 3.16-4 Employment and Wages due to Utah's Coal Industry

	1998	1999	Percent of Total Within Three County Area 1999	Three County Area* Percent Change 1998-1999
Employment				
Coal Mining	2,059	1,866	9.4	-9.4
Trucking	719	774	3.9	7.6
Electric Power	627	599	3.0	-4.5
Total Three Industries	3,405	3,239	16.2	-4.9
Total Tri-County	19,810	19,943	100.0	0.7
Wages				
Coal Mining	$108,634,532	$102,643,359	20.5	-5.5
Trucking	22,878,419	25,636,693	5.1	12.1
Electric Power	36,794,537	35,879,383	7.2	-2.5
Total Three Industries	168,307,488	164,159,435	32.9	-2.5
Total Tri-County	486,287,788	499,509,669	100.0	2.7
Average Monthly Wage				
Coal Mining	$4,397	$4,584	219.6	4.3
Trucking	2,652	2,760	132.2	4.1
Electric Power	4,890	4,992	239.2	2.1
Total Three Industries	4,119	4,224	202.4	2.5
Total Tri-County	2,046	2,087	100.0	2.0

***Three County Area: Carbon, Emery, and Sevier Counties**
SIC Codes: 12 - Coal Mining, 4212 - Local Trucking without Storage, 4213 - Trucking, Except Local, 4911 - Electric Services.
Source: Utah Department of Workforce Services.

Unemployment in Carbon and Emery Counties tends to be higher than that in Sevier County. During the 1990s, unemployment in Carbon County was in the range of 6.4 percent to 7.5 percent, while unemployment in Emery County was between 7.9 percent and 8.7 percent. By comparison, unemployment in Sevier County declined from 4.8 percent in 1994 to 4.3 percent in 1999.

Nonagricultural employment in Sevier County has steadily increased since 1980, rising from 5,742 in 1980 to 8,945 in 1998, an average annual increase of 2.5 percent. Nonagricultural employment in Carbon County rose from 9,943 in 1980 to 11,553 in 1998, an average annual increase of 0.8 percent. In 1998, mining accounted for 9.5 percent of the nonagricultural employment. Nonagricultural employment in Emery County was 5,037 in 1980, and declined to 4,712 in 1998, an average annual decrease of 0.37 percent. In 1998, mining was the largest industrial sector (in terms of employment) with 878 employees or 18.6 percent of total employment. Transportation and public utilities, which includes the Hunter and Huntington Power Plants, are estimated to have approximately 700 employees.

Emery County has the highest average monthly wage of the subject counties. From 1980 to 1998, Emery County's average monthly nonagricultural wage increased at an annual rate of 2.9 percent. The average monthly wage in Carbon County and Sevier County increased at 3.1 percent and 3.2 percent, respectively.

Although Emery County has the highest average wage ($2,728 vs. $2,291 for state), Carbon County has the highest per capita personal income of the three counties. Per capita personal income in Carbon County was $21,300 in 2000, as compared to $17,300 in Emery County, and $17,400 in Sevier County. Per capita income for the state in 2000 was an average of $23,907, for the nation it was $29,676.

The three counties vary widely in median household income. Emery County had the highest median household income in 2000 ($32,303), followed by Carbon County ($31,295) and Sevier County ($28,803). Emery County has the smallest number of households in the lower income brackets, and Carbon has the highest number in the upper income brackets.

Local Government Finances

Local government finances for the three counties are summarized in Table 3.16-5. These data include all local governments: county governments, municipalities, school districts, and special districts within the counties. Emery County had the highest general revenue and the highest per capita taxes. Sevier County had the lowest per capita taxes. Each of the counties spent the largest percentage of the budget on education, followed by health and hospitals and highways. Emery County had the highest outstanding debt per capita, followed by Carbon and Sevier Counties.

Table 3.16-5 Local Government Finances

Description	Carbon County, UT	Emery County, UT	Sevier County, UT
General Revenue (million $)	26.0	54.5	28.2
Total Taxes (million $)	6.1	8.9	15.8
Direct General Expenditures (million $)	36.2	50.0	26.0
Education	42.5%	29.5%	60.3%
Health and Hospitals	9.4%	1.2%	9.0%
Police	5.7%	3.1%	4.0%
Public Welfare	1.1%	0.0%	0.0%
Highways	9.1%	8.3%	4.4%
Total Outstanding Debt (million $)	49.9	266.6	18.8
Per Capita Outstanding Debt ($)	2,456	26,013	1,180

Source: U.S. Bureau of the Census, 1992 Census of Government, as cited in Gaquin and Littman.

In 1999, 74 percent of property taxes paid in Emery County were paid by the electric power industry, as a result of the Hunter and Huntington Power Generating Plants being in Emery County (Utah State Tax Commission, 2000).

Agriculture

Agriculture plays a role in the economy of each of the three counties. Sevier County produced over $39 million worth of agricultural products in 1997, while Carbon County produced $3.6 million, and Emery County $11 million. The value of production is dominated by livestock in each of the three counties, with cattle being the product with the highest total value in each of the counties.

Transportation Costs

Region 4 of the Utah Department of Transportation (UDOT) estimates that for normal existing traffic volume on I-70 for the 17 miles between Exit 72 and Exit 89 they have spent $500,000 in 2001 for surface seal, and will spend $50,000 in 2004 for surface rejuvenation, and $500,000 in 2007 for surface seal. I-70, although 28 years old, is in good condition and is expected to be able to handle forecasted increases in traffic volume without additional routine maintenance costs. A typical schedule for this interstate highway includes surface rejuvenation at three year intervals, alternating with surface seal at six year intervals, structural overlays at 15 year intervals, and new pavement structure at 48 years.

Region 4 of UDOT estimates that for normal existing traffic volume on SR-10 from the Fremont Junction (I-70 Exit 79) to south of the town of Emery, they will spend $20,000 in 2007 for surface rejuvenation and $200,000 in 2010 for surface seal under the existing traffic regime. SR-10 is an old road built on poor soil materials that is narrow, follows the contour of the land in hilly terrain, and has weak to medium strength pavement structure. Under existing traffic the years to fatigue average nine with four years being the worst case. (Scott Goodwin, Region 4, UDOT)

Utah Coal Mining Industry

The Utah coal industry is located in the three subject counties of Carbon, Emery, and Sevier. The SUFCO Mine is the only mine in Sevier County. Several other mines are located in Carbon and Emery Counties. Coal production in Utah in 2000 was 27,285,000 tons. Utah ranked twelfth out of 26 coal-producing states and accounted for 2.5 percent of total U.S. coal production (EIA, 2001).

Electric utility power plants consume the majority of Utah coal production. A total of 53 percent of the 2000 Utah coal production was purchased by five Utah power generating plants.

Coal production by SUFCO was 5.9 million tons in 2000, 24 percent of the total coal production in Utah. SUFCO Mine intends to increase annual production at the SUFCO Mine to a maximum of 8.5 million tons, market conditions allowing. The amount of coal trucked from the SUFCO Mine through Emery County will increase in the future due to already in place contract obligations at the Hunter Power Generating Plant in Emery County.

Federal Coal Royalty Payments in the Study Area

Mining companies extracting coal from federal coal deposits pay a royalty to the federal government (Table 3.16-6). The coal mining companies in Utah pay approximately $33 million annually in royalties. In 1999, coal royalties represented 53 percent of federal mineral lease payments in Utah. Fifty percent of federal mineral lease payments are returned to the state of origin. States have full discretion as to distribution of mineral lease payments, as long as priority is given to areas with social and/or economic impacts as a result of mineral lease activity.

Table 3.16-6 Utah Coal Production and Royalties on Federal Lands

Description	1997	1998	1999	2000
Carbon County, Utah				
Sales Volume (tons)	3,043,312	2,890,078	4,735,288	5,016,679
Royalties ($)	9,476,378	8,958,849	6,069,579	6,177,243
Disbursed to State ($)	4,738,189	4,479,425	3,034,789	3,088,621
Emery County, Utah				
Sales Volume (tons)	7,765,302	6,225,733	14,223,543	11,672,643
Royalties ($)	22,197,183	17,603,597	19,011,504	14,199,103
Disbursed to State ($)	11,098,592	8,801,799	9,505,752	7,099,551
Sevier County, Utah				
Sales Volume (tons)	2,348,711	2,566,422	6,014,967	5,632,331
Royalties ($)	6,710,997	7,356,402	8,407,485	9,314,751
Disbursed to State ($)	3,355,499	3,678,201	4,203,742	4,657,375

Source: Federal Mineral Revenue Disbursements by State and County, Minerals Management Service, Fiscal Years as indicated.

SOCIOECONOMIC IMPACTS

Introduction:

This impact analysis is predicated on the understanding that contracts are in place which will increase coal production at the SUFCO Mine no matter which alternative is selected including No Action; however, the proposed road could make the mine more competitive in acquiring future contracts thus influencing coal production. For example, beginning in 2002, SUFCO production is expected to increase as a result of the recently signed contract between SUFCO and Pacificorp whereby SUFCO would haul between 2 million and 4.5 million tons of coal annually to the Hunter Power Plant. Additionally, approximately one million tons would continue to be hauled annually by SUFCO to the railroad loadout in Carbon county for shipment to eastern customers. These production levels are expected to occur under the No Action alternative (Alternative A) as well as with the build alternatives (Alternatives B, C, D). Consequently, employment and payroll at the SUFCO mine would not change as a direct result of any of the alternatives. However, employment

and payroll could change in the future to accommodate production fluctuations associated with the Pacificorp contract and to accommodate any additional SUFCO contracts that are either signed or canceled. Regardless of the alternative selected, it is expected that SUFCO employment would increase from the current level of 276 to approximately 310 over the next several years once the mine reaches its maximum production of 8.5 million tons per year.

There would be no differences attributable to any of the alternatives in terms of the study area's:

- population growth estimates,
- land ownership (federal, state, private),
- agricultural production,
- Federal coal royalty payments to counties.

Additionally, there would be no difference among any of the alternatives in terms of noise, truck traffic, and probability of accidents through the communities of Emery, Ferron, Huntington, Clawson, and Castle Dale on SR-10.

The segment of I-70 on which SUFCO coal trucks now haul to the east is structurally sound and capable of handling expected increases in truck traffic without any additional maintenance costs. Therefore, there are no differences expected in I-70 maintenance costs regardless of whether SUFCO trucks operate on this segment of the highway (i.e. No Action alternative) or not (i.e. Alternatives B, C, D). (Scott Goodwin, UDOT, Region 4)

SR-10 is in need of improvements to handle existing and future coal truck traffic between I-70 and Price, including pavement overlays, bridge construction, and improvements in curves and passing lanes. These improvements include a number of projects already programmed to be completed within the next few years along the full length of SR-10, projects that are needed regardless of the alternative chosen, and would cost in the neighborhood of $30,000,000 (Scott Goodwin, UDOT). In order to accurately compare the costs among alternatives associated with upgrading SR-10, it is necessary to focus on the segment of road, and associated costs, that would experience differences attributable to the four alternatives. This means looking at the first 10.1 miles of SR-10 which would take the analysis to the northernmost junction of the proposed road, the Alternative C junction. Any impacts occurring to the north of that point would be common to all alternatives. With this in mind, the proposed route down Quitchupah Creek canyon would result in eliminating SUFCO coal truck traffic on the segment of SR-10 between I-70 and the proposed SR-10 intersections. See Figure 1-2 for the location of the three possible intersections with SR-10 associated with Alternatives B/C/D. By eliminating traffic on this segment of SR-10 south of these proposed intersection locations, there would be savings on SR-10 under alternatives B, C, and D as compared to the No Action alternative. These savings are discussed below under the respective impact sections. There will be no significant difference among any of the four alternatives in routine maintenance costs (e.g. chip seal, surface rejuvenation) on the first 10.1 miles of SR-10.

No Action - Alternative A

Under this alternative coal would continue to be hauled to the east under the current transportation route. This route leaves the SUFCO Mine via the Acord Lakes Road, then east on I-70, and then north on SR-10 to the Hunter Power Plant and to the rail loadout near Price, Utah.

The solitude and overall character of Quitchupah Creek canyon would not change under this alternative.

Fuel savings for the SUFCO mine would not occur under this alternative because there would not be a reduction in the round-trip mileage as compared to Alternatives B, C, and D (see those sections below for a discussion of SUFCO fuel savings, by alternative).

Ranching use in the Quitchupah Creek canyon would continue as is, with no impacts to ranching operations.

Under this alternative the commuting distance from communities to the east of the SUFCO Mine would not decrease for vendors traveling to the mine or for Emery county people employed at the mine.

Table 3.16-7 Annual Projected Fuel Consumption Under Alternative A

Coal Hauled per Year		Number of Truck Hauls	
Year	Tons	Number of Hauls	Consumed Fuel Gallons
2001	2,000,000	46,500	1,281,333
2002	3,000,000	69,750	1,922,000
2003 or max	5,500,000	128,000	3,527,111
Assumptions: 43 tons of coal per haul, 4.5 miles per gallon.			

The distance from the SUFCO Mine to Salina, in Sevier County, is approximately 30 miles. The distance from the SUFCO Mine to the town of Emery (population 289) is currently 39.8 miles, and 53.6 miles to Ferron (population 1,611). No savings to fuel consumption and other hauling costs would occur under the No Action Alternative resulting in no competitive advantage to the SUFCO Mine.

Under the No Action alternative current SUFCO coal truck traffic would continue to occur along SR-10 to coal haul destinations in Emery and Carbon counties. This alternative does not, when compared to alternatives B, C, D, allow for a reduction in SUFCO coal truck traffic from Fremont Junction on I-70 north along SR-10 to the three possible intersections (re: Figure 1-2) of the proposed Quitchupah Creek coal haul road with SR-10. In response to this, UDOT Region 4 has forecast the need to install a 3.5 inch pavement overlay to handle the expected increase in truck

traffic from the SUFCO mine along this segment of SR-10. This would cost approximately $181,818 per mile, resulting in a total cost of $1,836,362 to provide this pavement overlay on the first 10.1 miles of SR-10. This upgrade would avoid premature fatigue under the No Action alternative in order to accommodate the production associated with the recently signed SUFCO/Pacificorp contract. At the present time, the funding source for this activity is unclear. (Scott Goodwin, UDOT, Region 4)

Under the No Action alternative SUFCO would not have an alternate means of hauling coal to destinations east of the mine (e.g. Hunter Power Plant and the rail loadout near Price). This alternative would not provide for an alternate coal haul route during any road closures on I-70 (weather, accidents), if a problem occurs on the existing Accord Lakes road out of the mine, or in the event of an emergency at the mine.

Quitchupah Creek Road Alignment - Alternative B

Alternative B involves upgrading the existing road/trail in Quitchupah Canyon. The projected construction cost is $5.5 million. The distance upgraded would be 9.2 miles and the round-trip haul from the SUFCO Mine to destinations in Emery and Carbon Counties would be reduced by 50 miles or 40 percent of the round-trip haul to the Hunter Power Plant.

Table 3.16-8 Annual Projected Fuel Conservation Under Alternative B

Coal Hauled per Year		Reduction in Fuel Required		
Year	Tons	Number of Hauls	Consumed Fuel Gallons	Gallons Conserved as Compared to No Action
2001	2,000,000	46,500	764,666	516,667
2002	3,000,000	69,750	1,147,000	775,000
2003 or max	5,500,000	128,000	2,104,889	1,422,222
Assumptions: Reduction in round trip of 50 miles, 43 tons of coal per haul, 4.5 miles per gallon, 11.1 gallons saved per haul.				

A typical truck hauling coal with double trailers holds 43 tons of coal. The actual fuel mileage of coal trucks varies upon a number of factors such as cargo weight, road grade, and route. An average fuel mileage of 4.5 miles per gallon was assumed based upon conversations with officials in the trucking industry. The projected savings in fuel consumption, as compared to the No Action Alternative, are listed in Table 3.16-8. At 2 million tons per year in 2001, the projected saving in diesel fuel would be 516,667 gallon. At 3 million tons per year in 2002, the projected savings in diesel fuel would be 775,000 gallons. At 5.5 million tons per year, the projected saving in diesel fuel would be 1,422,222 gallons. Savings to fuel consumption and other hauling costs under Alternative B as compared to the No Action Alternative would result in a substantial competitive advantage to the SUFCO Mine.

The distance from the SUFCO Mine to Salina, in Sevier County, is approximately 30 miles. The distance from the SUFCO Mine to the town of Emery (population 289) is currently 39.8 miles, and 53.6 miles to Ferron (population 1,611). Construction of the proposed Quitchupah Creek Road would reduce the distances to the SUFCO Mine from Emery and Ferron to 12.3 and 26.6 miles, respectively.

Additionally, the proposed road under this alternative would provide SUFCO with an alternate route for hauling coal to destinations east of the mine (e.g. Hunter Power Plant and rail loadout near Price). An alternate route would be useful during any road closures on I-70 (weather, accidents), if a problem occurs on the existing Accord Lakes road out of the mine, or in the event of an emergency at the mine.

The dispersed type of recreational activity that is presently enjoyed in Quitchupah Creek would be impacted by traffic and associated noise from the proposed road. However, opportunities for increased passenger vehicle access would occur under this alternative. Additionally, the sense of solitude in the canyon would experience negative impacts caused by increased traffic, noise, and access. These represent changes to the lifestyles of individuals presently using the canyon for these purposes.

Under Alternative B, savings in highway maintenance costs would occur on SR-10, as compared to the No Action alternative. Again, we focus on the first 10.1 mile segment of SR-10 since all impacts to the highway north of that point are common to all alternatives. The first 8.5 miles of this segment of SR-10 north from I-70 would require a 2" overlay up to the Alternative B junction with SR-10. The remaining 1.6 miles would require a 3.5" overlay. These saving figures, compared to the No Action alternative, are shown below.

Alternative B:	8.5 miles of 2" overlay @ $90,909/mile =	$772,727
	1.6 miles of 3.5" overlay @ $181,181/mile =	$290,909
	Total Cost =	$1,063,656
No Action:	10.1 miles of 3.5" overlay @ $181,181/mile =	$1,836,362
Alternative B savings compared to the No Action alternative =		$772,727

In addition, there would be costs of approximately $600,000 to install a passing lane on Quitchupah Hill. (Scott Goodwin, UDOT, Region 4).

This alternative would eliminate the probability of traffic collisions with SUFCO coal trucks hauling east on I-70 and on the first 8.5 miles on SR-10.

Under this alternative, the commuting distance from communities to the east of the SUFCO Mine would decrease for vendors traveling to the mine or for Emery county people employed at the mine.

Alternative B is estimated to reduce available forage by six AUMs during road construction. Upon reclamation, the final net loss of forage is estimated to be two AUMs. This loss represents an insignificant economic impact to the livestock industry in the study area. However, the proposed road would lead to livestock/truck collisions and livestock trucking costs. Additionally, there would be costs associated with corral and loading/unloading facilities at the top and bottom. Individual livestock operators could experience increased costs/losses associated with this alternative; these could represent negative impacts to these ranching operations.

Alternative Junction with SR-10 - Alternative C

Alternative C involves leaving the existing Quitchupah Creek Road about 2 miles west of SR-10 and proceeding east to intercept SR-10 approximately 10.1 miles north of the I-70/SR-10 junction (i.e. a point 1.6 miles north of the proposed Quitchupah Creek road junction with SR-10 described under Alternative B). The total round-trip distance saved in hauling coal from the SUFCO Mine to destinations in Emery and Carbon Counties would be 53 miles or 44 percent of the round-trip haul to the Hunter Power Plant. The projected construction cost is $5.9 million.

Table 3.16-9 Annual Projected Fuel Conservation Under Alternative C

Coal Hauled per Year		Reduction in Fuel Required		
Year	Tons	Number of Hauls	Consumed Fuel Gallons	Gallons Conserved as Compared to No Action
2001	2,000,000	46,500	733,667	547,666
2002	3,000,000	69,750	1,100,500	821,500
2003 or max.	5,500,000	128,000	2,019,555	1,507,556
Assumptions: Reduction in round trip of 53 miles, 43 tons of coal per haul, 4.5 miles per gallon, 11.8 gallons saved per haul.				

The projected savings in fuel consumption, over the No Action Alternative, are listed in Table 3.16-9. At 2 million tons per year in 2001, the projected saving in diesel fuel would be 547,666 gallons. At 3 million tons per year in 2002, the projected savings in diesel fuel would be 821,500 gallons. At 5.5 million tons per year, the projected saving in diesel fuel would be 1,507,556 gallons. Savings to fuel consumption and other hauling costs under Alternative C as compared to the No Action Alternative would result in a substantial competitive advantage to the SUFCO Mine.

Additionally, the proposed road under this alternative would provide SUFCO with an alternate route for hauling coal to destinations east of the mine (e.g. Hunter Power Plant and rail loadout near Price). An alternate route would be useful during any road closures on I-70 (weather, accidents), if a problem occurs on the existing Accord Lakes road out of the mine, or in the event of an emergency at the mine.

The dispersed type of recreational activity that is presently enjoyed in Quitchupah Creek would be impacted by traffic and associated noise from the proposed road. However, opportunities for increased passenger vehicle access would occur under this alternative. Additionally, the sense of solitude in the canyon would experience negative impacts caused by increased traffic, noise, and access. These represent changes to the lifestyles of individuals presently using the canyon for these purposes.

Under Alternative C, savings in highway maintenance costs would occur on SR-10, as compared to the No Action alternative. Again, we focus on the first 10.1 mile segment of SR-10 since all impacts to the highway north of that point are common to all alternatives. The entire 10.1 miles of this segment of SR-10 north from I-70 would require a 2" overlay up to the Alternative C junction with SR-10. There would be no 3.5" overlay needed on this segment. These saving figures, compared to the No Action alternative, are shown below.

Alternative C:	10.1 miles of 2" overlay @ $90,909/mile =	$918,181
	0 miles of 3.5" overlay @ $181,181/mile =	$0
	Total Cost =	$918,181
No Action:	10.1 miles of 3.5" overlay @ $181,181/mile =	$1,836,362
Alternative C savings compared to the No Action alternative =		$918,181

Additionally, by locating the entrance of the proposed road onto SR-10 approximately 1.6 miles north of that proposed for Alternative B, costs of $600,000 for a passing lane on Quitchupah Hill would be avoided. (Scott Goodwin, UDOT, Region 4).

This alternative would eliminate the probability of traffic collisions with SUFCO coal trucks hauling east on I-70 and on the first 10.1 miles on SR-10.

Under this alternative the commuting distance from communities to the east of the SUFCO Mine would decrease for vendors traveling to the mine or for Emery county people employed at the mine.

Alternative C is estimated to impact the same amount of land and forage as Alternative B. This alternative would require livestock operators to truck livestock between allotments, increasing operating costs for trailering and increasing livestock losses from loading and unloading. Additionally, there would be costs associated with corral and loading/unloading facilities constructed in both the winter and summer allotments. Individual livestock operators would experience increased costs/losses associated with this alternative; these could represent negative impacts to their ranching operations. However, Alternative C incorporates features to facilitate livestock movements within allotments for grazing and watering, and greatly reduce livestock-vehicle collisions as compared to Alternative B.

Water Hollow Road - Alternative D

Alternative D involves following Quitchupah Creek for 2 miles from the SUFCO mine, then following Water Hollow Creek south to Water Hollow Benches and Saleratus Benches. The route then turns north to connect with SR-10 at a point about 6.2 miles north of the SR-10 intersection with I-70. The round-trip distance saved would be 42 miles or 34 percent of the round-trip haul from the SUFCO mine to the Hunter Power Plant. The projected construction cost is $13.5 million.

Table 3.16-10 Annual Projected Fuel Conservation Under Alternative D

Coal Hauled per Year		Reduction in Fuel Required		
Year	Tons	Number of Hauls	Consumed Fuel Gallons	Gallons Conserved as Compared to No Action
2001	2,000,000	46,500	847,333	434,000
2002	3,000,000	69,500	1,266,444	655,556
2003 or max.	5,500,000	128,000	2,332,444	1,194,667
Assumptions: Reduction in round trip of 42 miles, 43 tons of coal per trip, 4.5 miles per gallon, 9.33 gallons saved per haul.				

The projected fuel savings to SUFCO, compared to the No Action Alternative, are listed in Table 3.16-10. At 2 million tons per year in 2001, the projected saving in diesel fuel would be 434,000 gallons. At 3 million tons per year in 2002, the projected savings in diesel fuel would be 655,556 gallons. At 5.5 million tons per year, the projected saving in diesel fuel would be 1,194,667 gallons. Savings to fuel consumption and other hauling costs under Alternative D as compared to the No Action Alternative would result in a substantial competitive advantage to the SUFCO Mine.

Additionally, the proposed road under this alternative would provide SUFCO with an alternate route for hauling coal to destinations east of the mine (e.g. Hunter Power Plant and rail loadout near Price). An alternate route would be useful during any road closures on I-70 (weather, accidents), if a problem occurs on the existing Accord Lakes road out of the mine, or in the event of an emergency at the mine.

The dispersed type of recreational activity that is presently enjoyed in Quitchupah Creek would be impacted from traffic and noise on the westernmost two miles under this alternative. However, opportunities for increased passenger vehicle access would occur under this alternative. Additionally, the sense of solitude in the canyons and benches would experience negative impacts caused by increased traffic, noise, and access. These represent changes to the lifestyles of individuals presently using the canyons and benches for these purposes.

Under Alternative D, savings in highway maintenance costs would occur on SR-10, as compared to the No Action alternative. Again, we focus on the first 10.1 mile segment of SR-10 since all impacts to the highway north of that point are common to all alternatives. The first 6.2 miles of this segment

of SR-10 north from I-70 would require a 2" overlay up to the Alternative D junction with SR-10. The remaining 3.9 miles would require a 3.5" overlay. These saving figures, compared to the No Action alternative, are shown below.

Alternative D:	6.2 miles of 2" overlay @ $90,909/mile =	$563,636
	3.9 miles of 3.5" overlay @ $181,181/mile =	$709,090
	Total Cost =	$1,272,726
No Action:	10.1 miles of 3.5" overlay @ $181,181/mile =	$1,836,362
Alternative D savings compared to the No Action alternative =		$563,636

In addition, there would be costs of approximately $600,000 to install a passing lane on Quitchupah Hill. (Scott Goodwin, UDOT, Region 4).

This alternative would eliminate the probability of traffic collisions with SUFCO coal trucks hauling east on I-70 and on the first 6.2 miles on SR-10.

Under this alternative the commuting distance from communities to the east of the SUFCO Mine would decrease for vendors traveling to the mine or for Emery county people employed at the mine.

Under Alternative D, approximately 10 AUMs would be lost during construction, based upon a net surface disturbance of 124.7 acres. This is an insignificant loss of AUMs within the study area. Nevertheless, this alternative would force livestock operators to truck livestock and thereby increase their operating costs from trailering livestock between ranges, increase livestock losses from loading and unloading, and increased probability of livestock/truck collisions. Individual livestock operators could experience increased costs/losses associated with this alternative; these could represent negative impacts to these ranching operations. It is expected that there would be an increased probability of livestock/truck collisions with Alternative D as compared to Alternatives B or C.

Mitigation and Monitoring

No Action Alternative:

No mitigation would be necessary.

Alternatives B, C, D:

The offsite mitigation proposed for big game winter range would also provide additional forage for livestock. This additional forage would offset losses of AUMs to the livestock operators.

Alternative D:

Fence the upper portion of the road from Convulsion Canyon to Water Hollow to reduce livestock-vehicle collisions.

Irreversible and Irretrievable Commitment of Resources

No Action Alternative:

The existing SUFCO fuel consumption and associated costs to truck coal via the existing routes on Accord Lakes/I-70/SR-10 would continue. As compared to the build alternatives (B,C,D), the difference in fuel consumption would be irreversibly and irretrievably lost under the No Action alternative.

The resources needed to increase the pavement layer to 3.5 inches on SR-10 between I-70 and proposed road junctions (Alternatives B/C/D) would be irretrievably lost.

Alternatives B, C, D:

The solitude, recreation opportunities, and overall remote character of Quitchupah Creek canyon would be irretrievably lost to those individuals using the canyon for those purposes.

The loss of AUMs would be irretrievably lost with construction of a road through the canyon. Similarly, existing ranching operations would experience an irreversible loss of the existing manner of ranching in the canyon with coincident lifestyle changes for these operators.

Residual Adverse Impacts

The proposed mitigation of constructing a livestock trail, fencing, and offsite forage production would mitigate impacts to livestock operators.

Cumulative Effects

The SUFCO Mine may continue to increase coal production due to an expanding market for coal-fired electrical generation regardless of the alternative selected. This could lead to other coal tracts being leased and mined.

R4E R5E R5E R6E

SAMPLING LOCATION #7
SAMPLING LOCATION #8
SAMPLING LOCATION #9
SAMPLING LOCATION #5
SAMPLING LOCATION #6
SAMPLING LOCATION #4
SAMPLING LOCATION #3
SAMPLING LOCATION #2
SAMPLING LOCATION #1
SAMPLING LOCATION #11
SAMPLING LOCATION #10

CONVULSION CANYON
QUITCHUPAH CREEK
QUITCHUPAH CREEK ROAD, ALTERNATIVE B
ALTERNATIVE JUNCTION, ALTERNATIVE C
WATER HOLLOW, ALTERNATIVE D
STATE HIGHWAY 10
SEVIER COUNDY
EMERY COUNTY
Emery 3 Miles
Old Ridge Place
Quitchupah Ranch

T 22 S
T 23 S

QUATERNARY

Coal bed. Dashed where inferred or poorly exposed, dotted where burned. Thickness of coal in feet measured as triangles. Larger numbers refer to location of measured section shown on accompanying sheets.

Prospect

Coal mine

Burned zone. Area covered with natural clinker or red burned sandstone.

Coal drill hole

Strike and dip of beds

Apparent dip of beds

Syncline. Axis, dashed where approximately located or where ill defined.

Anticline. Axis, dashed where approximately located or where ill defined.

Monocline. Arrow points in direction of dip, dashed where approximately located or where ill defined.

Geologic unit contact. Dashed where location is approximate.

Horizontal strata

Fault. Dashed where inferred or ill defined.

Explanation For Measured Sections

Top of unit below not found-thickness is a minimum

Sandstone
Siltstone
Limestone
Carbonaceous Shale
Gray Shale
Bone Shale
Coal
Shaley Sandstone or Sandy Shale
Natural Clinker
Ash
Carbonaceous Shale and Coal poorly exposed

Base of unit above not found-thickness is a minimum

Section numbers corresponds to map numbers on corresponding quadrangle.

Thickness of unit in feet.

Vertical scale in feet

Complete thickness not shown

No horizontal scale intended.

Alluvium. Stratified clay, silt, sand, gravel and some reworked flood deposits. — Qal

Landslide Deposits. Mixed rubble and blocks of material dumped from formations at higher elevations. — Ql

Gravel Deposits. Poorly consolidated poorly sorted and stratified deposits of rock fragments of local origin, sediments on terrace, up to 75 feet thick. — Qg

TERTIARY

Volcanic Flows. Bullion Canyon Series, volcanic flows. — Tv

Green River Formation. Chiefly greenish lacustrine shale and siltstone. — Tg

Colton Formation. Variegated shale with sandstone and limestone lenses, thickest to the north, 300-1,500 feet. — Tc

Flagstaff Formation. Dark yellow-gray to cream limestone, evenly bedded with minor amounts of sandstone, shale and volcanic ash, ledge former, 200-1,500 feet. — Tf

TERTIARY CRETACEOUS

North Horn Formation. Variegated shales with subordinate sandstone, conglomerate and freshwater limestone, thickens to north, slope former, 500-2,500 feet. — Tw

Price River Formation. Gray to white green sandstone interbedded with subordinate shale and conglomerate, ledge and slope former, 200-1,600 feet. — Kp

Unconformity

Castlegate Sandstone. White to gray, coarse-grained often conglomeratic sandstone, cliff former, weathers to shades of brown, 150-500 feet. — Kc

Blackhawk Formation. Yellow to gray, fine- to medium-grained sandstone, interbedded with subordinate gray and carbonaceous shale, several thick coal seams, 500-1,200 feet. — Kb

Star Point Sandstone. Yellow-gray massive cliff-forming sandstone, often in several tongues separated by Masuk Shale, thickens westward, 400-1,000 feet. — Ksp

Masuk Shale. Yellow to blue-gray sandy shale, slope former, thick in north and central plateau area thins southward, 300-1,200 feet. — Km

Emery Sandstone. Yellow-gray fissile sandstone tongue or tongues, cliff former, may contain coal (?) in south part of plateau (if mapping is correct), thickens to west and south. Coal may be present in subsurface to west, 50-600 feet. — Ke

Blue Gate Shale. Pale blue-gray, nodular and irregularly bedded marine mudstone and siltstone with several prominent beds, weathers into low rolling hills and badlands, thickens northerly, 1,200-2,000 feet. — Kbg

Ferron Sandstone. Alternating yellow-gray sandstone, sandy shale and gray shale with important coal beds of Emery coal field, resistant cliff former, thickens to the south, 50-650 feet. — Kf

Tropic Shale. Blue-gray to black sandy marine slope forming mudstone, 400-650 feet. — Kt

GEOLOGY FROM DOELLING, H.H., 1972, CENTRAL UTAH COAL FIELDS: SEVIER-SANPETE, WASATCH PLATEAU, BOOK CLIFFS, AND EMERY, UTAH GEOLOGICAL AND MINERAL SURVEY, MONOGRAPH SERIES NO. 3, P. 135-137, 143, 148, 446.

EXPLANATION

- NATIONAL FOREST BOUNDARY
- PROPOSED QUITCHUPAH CREEK ROAD, ALTERNATIVE B
- PROPOSED ALTERNATIVE, ALTERNATIVE C
- PROPOSED WATER HOLLOW, ALTERNATIVE D
- IDENTIFIED LANDSLIDE AREA FROM OPEN FILE REPORT 275 (K. HARTY, 1993)

N

4000 0 4000 FEET

QUITCHUPAH CREEK ROAD EIS

FIGURE 3-1
GEOLOGY MAP

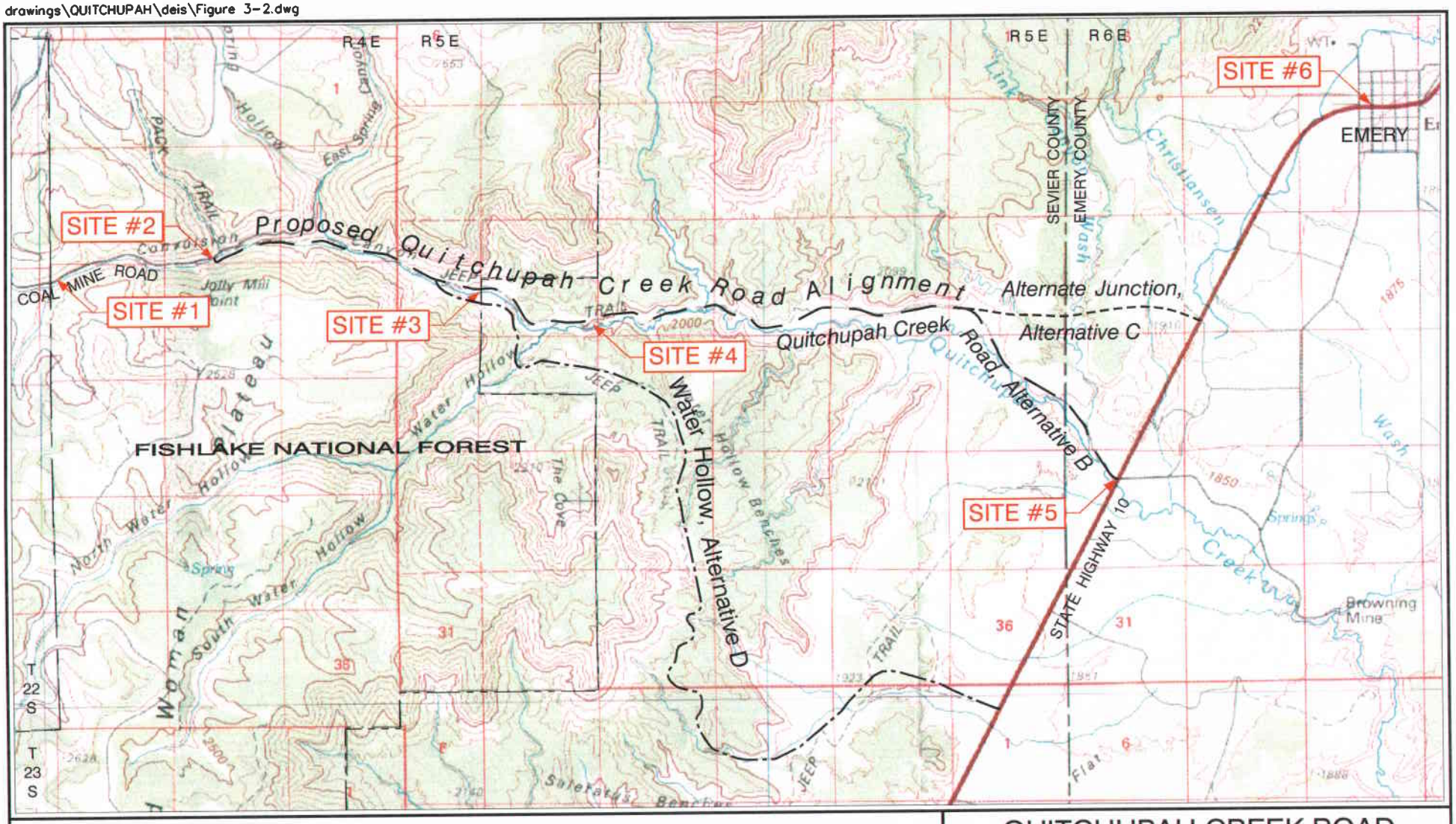
jbr environmental consultants, inc.
Salt Lake City, Utah Cedar City, Utah Reno, Nevada Elko, Nevada

DESIGN BY	DRAWN BY	CH'D BY	SCALE
WM	CP		1"=4000'

REVISION	DATE DRAWN
	6/14/01
	7/31/01
	9/11/01
	10/18/01

drawings\QUITCHUPAH\DEIS\Figure 3-1.dwg

drawings\QUITCHUPAH\deis\Figure 3-2.dwg



QUITCHUPAH CREEK ROAD EIS

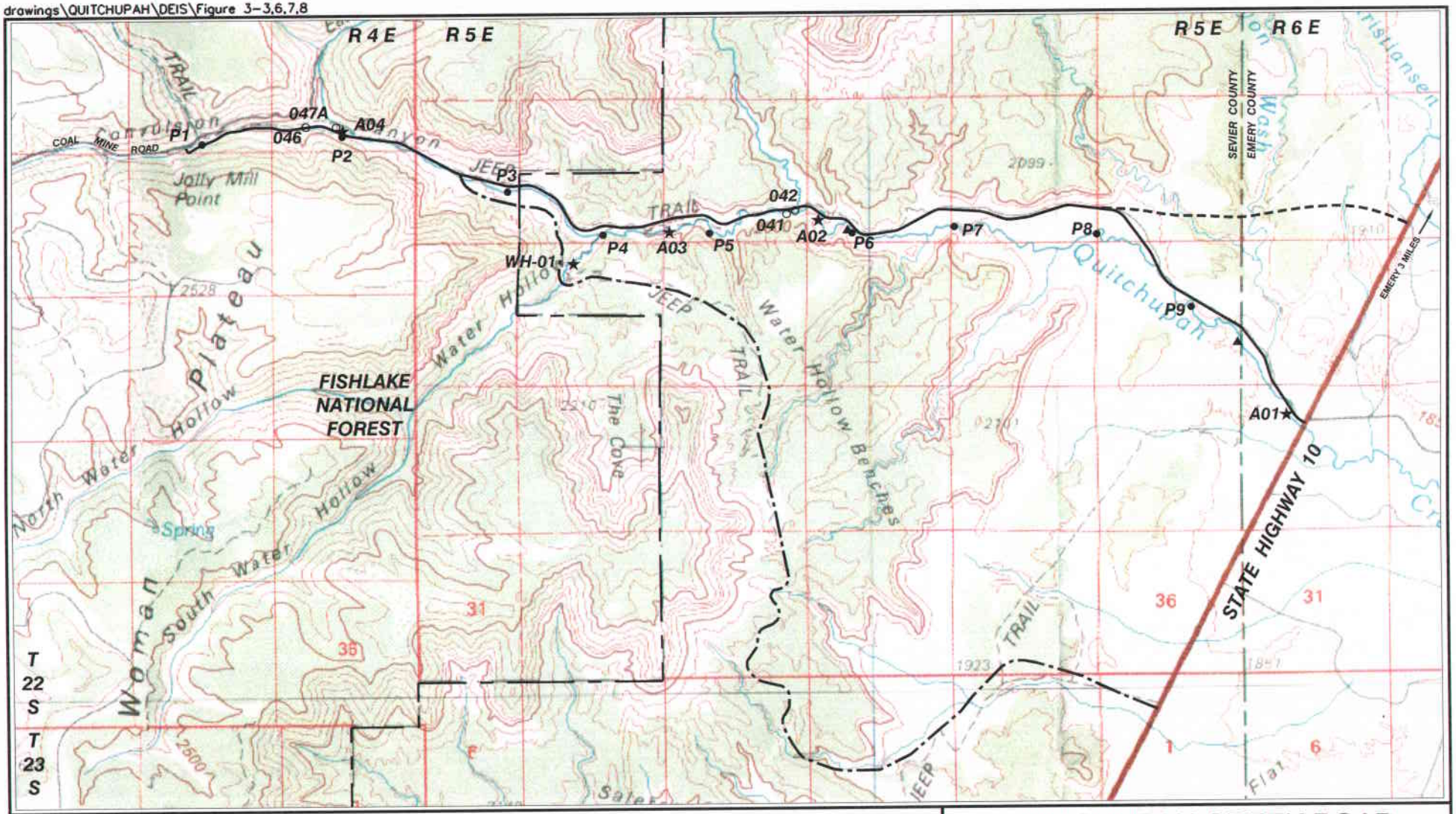
FIGURE 3-2
NOISE STUDY SITES

jbr environmental consultants, inc.
Salt Lake City, Utah Cedar City, Utah Reno, Nevada Elko, Nevada

DESIGN BY	DRAWN BY	CH'D BY	SCALE
EH	CP		1"=6000'

REVISION	DATE DRAWN
	3/13/01
	9/11/01
	10/10/01
	10/18/01

drawings\QUITCHUPAH\DEIS\Figure 3-3,6,7,8



EXPLANATION

- QUITCHUPAH CREEK ROAD, ALTERNATIVE B
- ALTERNATE JUNCTION, ALTERNATIVE C
- WATER HOLLOW, ALTERNATIVE D
- PFANKUCH STABILITY RATING SITE
- AQUATIC STUDY REACH
- IRRIGATION DIVERSION
- CANYON FUELS MONITORING STATIONS

N

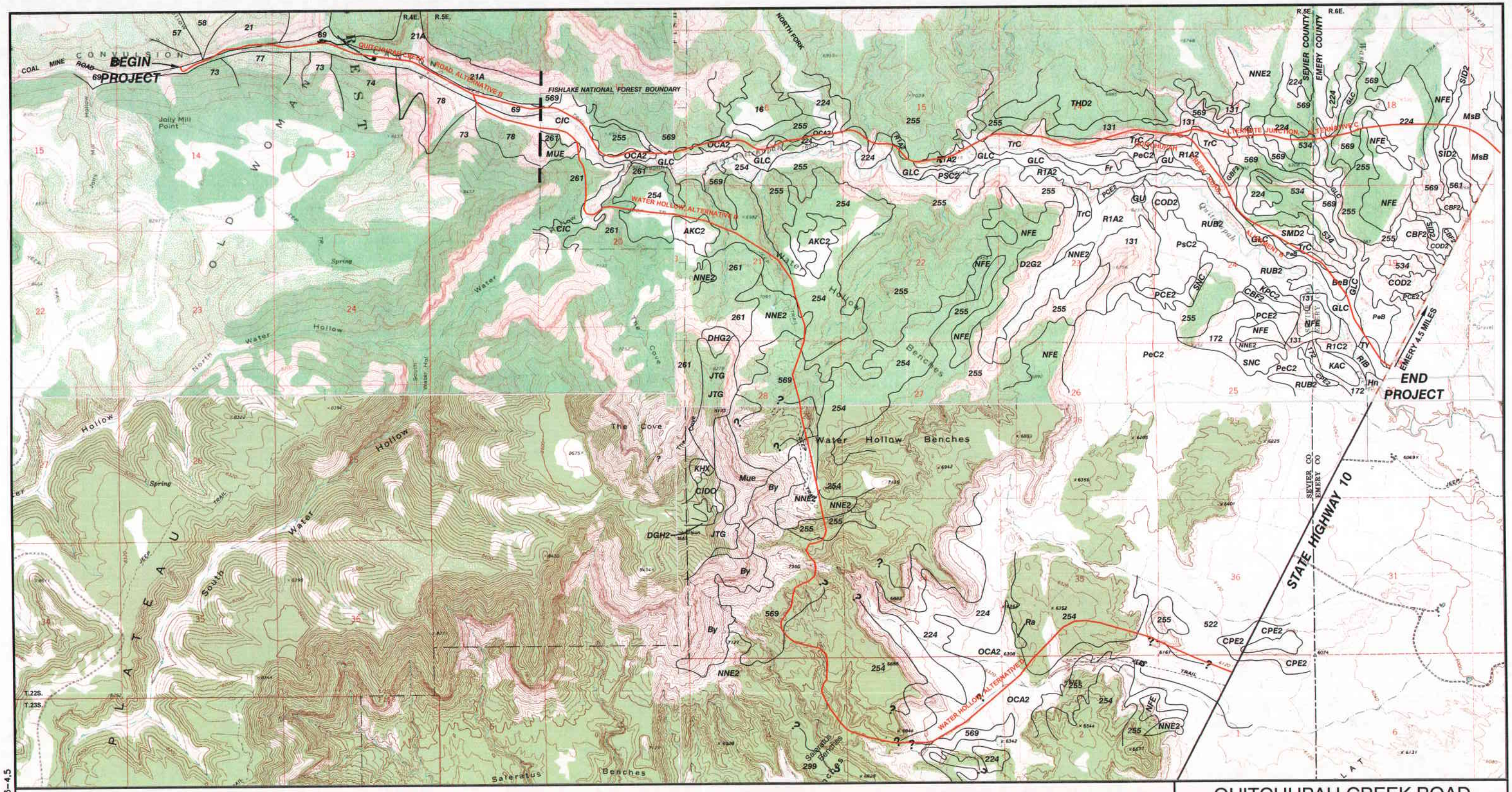
1 0 1 MILE

QUITCHUPAH CREEK ROAD EIS

FIGURE 3-3
HYDROLOGY MAP

jbr environmental consultants, inc.
Salt Lake City, Utah Cedar City, Utah Reno, Nevada Elko, Nevada

DESIGN BY	DRAWN BY	CH'D BY	SCALE	DATE DRAWN	REVISION
KK	CP		1"= 1 Mile	1/29/01	7/31/01 10/9/01 10/18/01



drawings\QUITCHUPAH\DEIS\Figure 3-4,5

EXPLANATION

ROAD ALIGNMENT

SOIL MAPPING UNIT BOUNDARY

RIB UNIT IDENTIFICATION

SOIL SURVEY BOUNDARY

NOTE: SOIL SURVEY BASED ON PRELIMINARY MAPS FROM N.R.C.S & U.S.F.S. – SUBJECT TO CHANGE

N

3200 0 3200 FEET

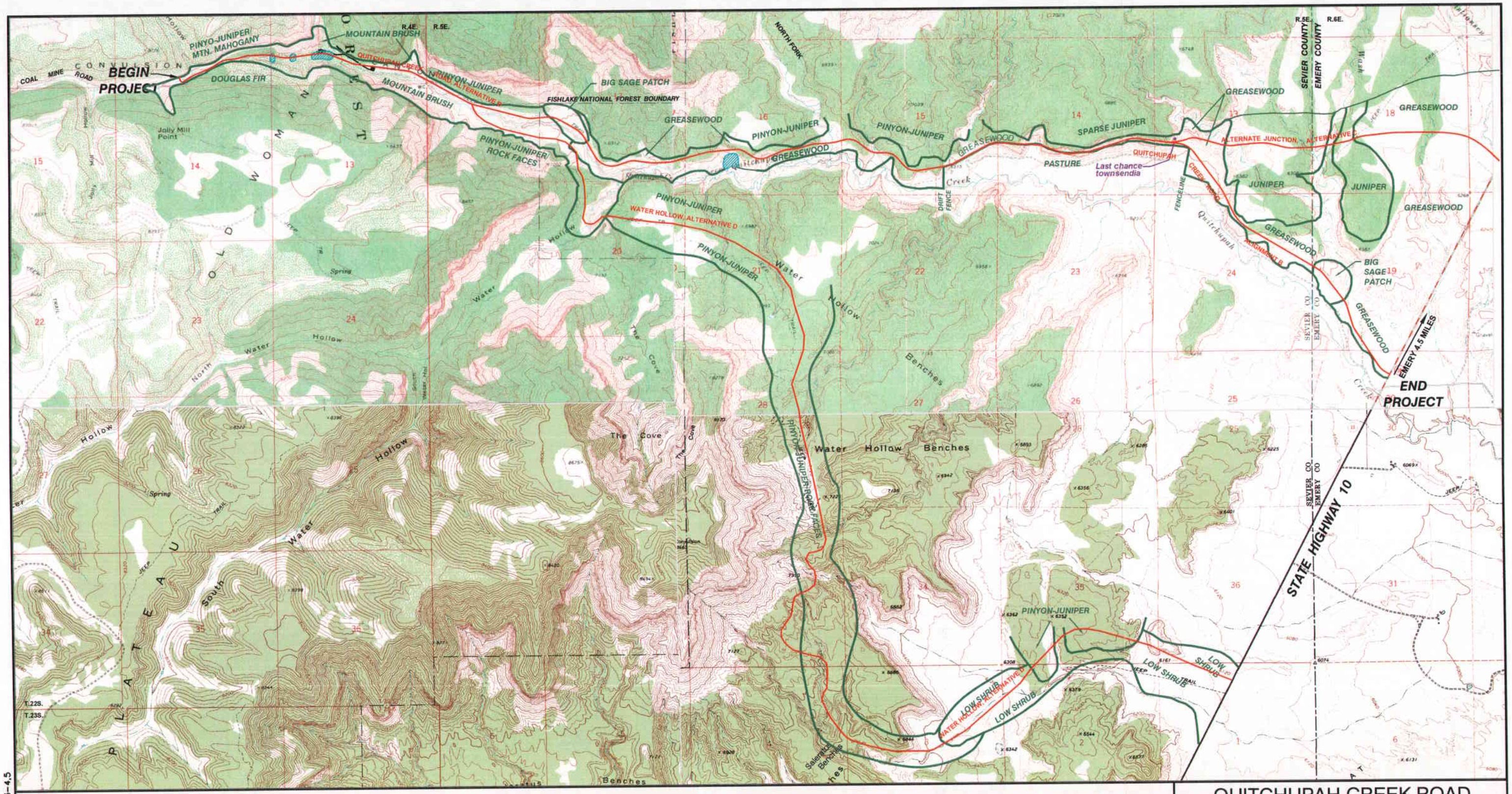
QUITCHUPAH CREEK ROAD EIS

FIGURE 3-4
SOILS MAP

jbr environmental consultants, inc.
Salt Lake City, Utah Cedar City, Utah Reno, Nevada Elko, Nevada

DESIGN BY	DRAWN BY	CH'D BY	SCALE
KK	CP		1"=3200'

REVISION	DATE DRAWN
	1/29/01
	10/9/01
	10/18/01



EXPLANATION

ROAD ALIGNMENT

VEGETATION

VEGETATION MAPPING UNIT BOUNDARY

WETLAND

PREVIOUSLY RECORDED LOCATION

N

3200 0 3200 FEET

QUITCHUPAH CREEK ROAD EIS

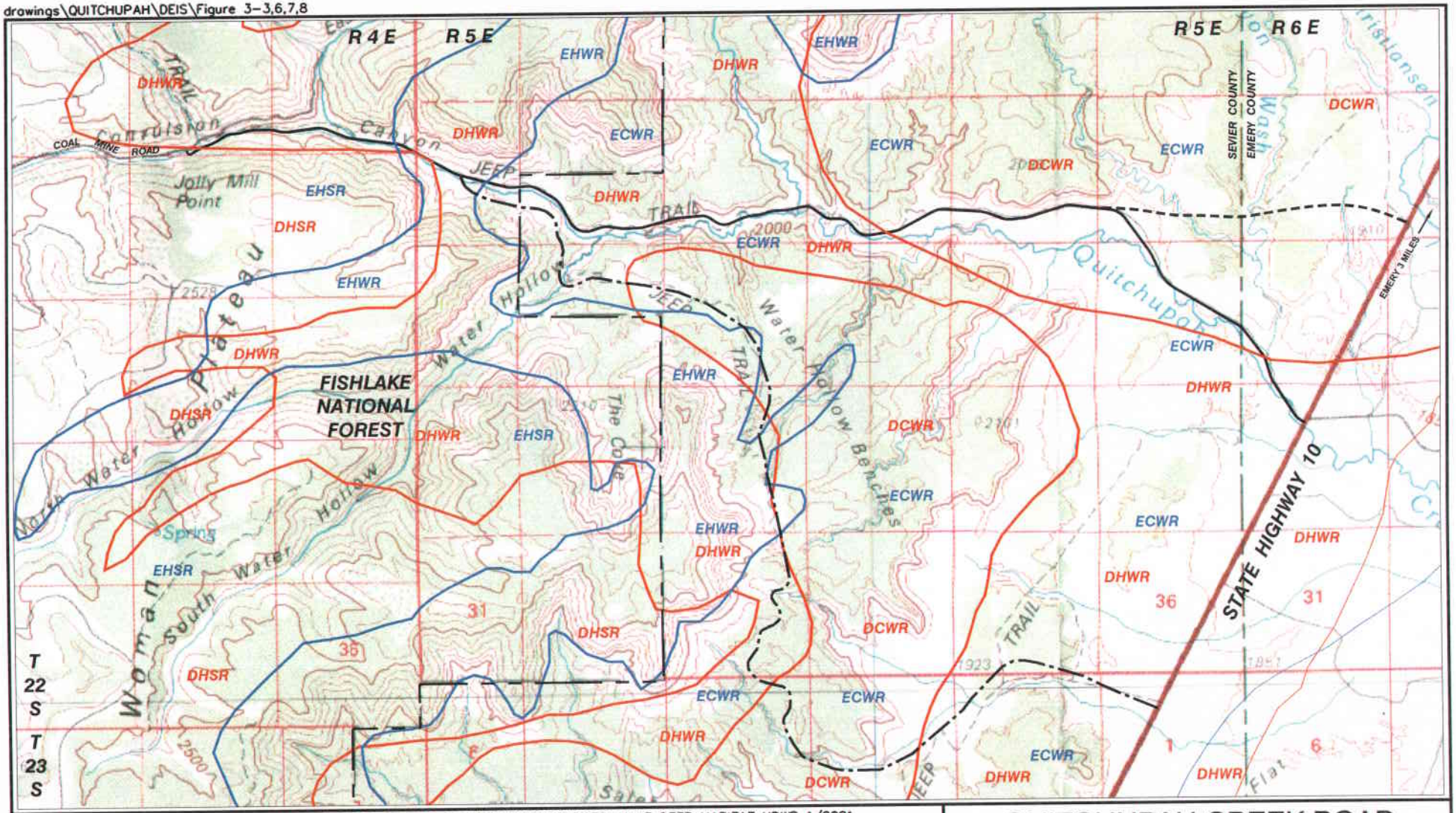
FIGURE 3-5
VEGETATION

jbr environmental consultants, inc.
Salt Lake City, Utah Cedar City, Utah Reno, Nevada Elko, Nevada

DESIGN BY	DRAWN BY	CH'D BY	SCALE	DATE DRAWN	REVISION
LM	CP		1"=3200'	6/22/01	
				7/31/01	
				10/9/01	
				10/18/01	

drawings\QUITCHUPAH\DEIS\Figure 3-4,5

drawings\QUITCHUPAH\DEIS\Figure 3-3,6,7,8



REFERENCE: STATE OF UTAH NATURAL RESOURCES, DIVISION OF WILDLIFE RESOURCES, MULE DEER HABITAT UDWR 1/2001

EXPLANATION

- QUITCHUPAH CREEK ROAD, ALTERNATIVE B
- ALTERNATE JUNCTION, ALTERNATIVE C
- WATER HOLLOW, ALTERNATIVE D
- DEER SUMMER & WINTER RANGE BOUNDARIES
- DHSR DEER HIGH VALUE SUMMER RANGE
- DHWR DEER HIGH VALUE WINTER RANGE
- DCWR DEER CRITICAL WINTER RANGE
- ELK SUMMER & WINTER RANGE BOUNDARIES
- DHSR ELK HIGH VALUE SUMMER RANGE
- DHWR DEER HIGH VALUE WINTER RANGE
- DCWR ELK CRITICAL WINTER RANGE

NOTE: BOUNDARIES ARE APPROXIMATE

1 0 1 MILE

N

QUITCHUPAH CREEK ROAD EIS

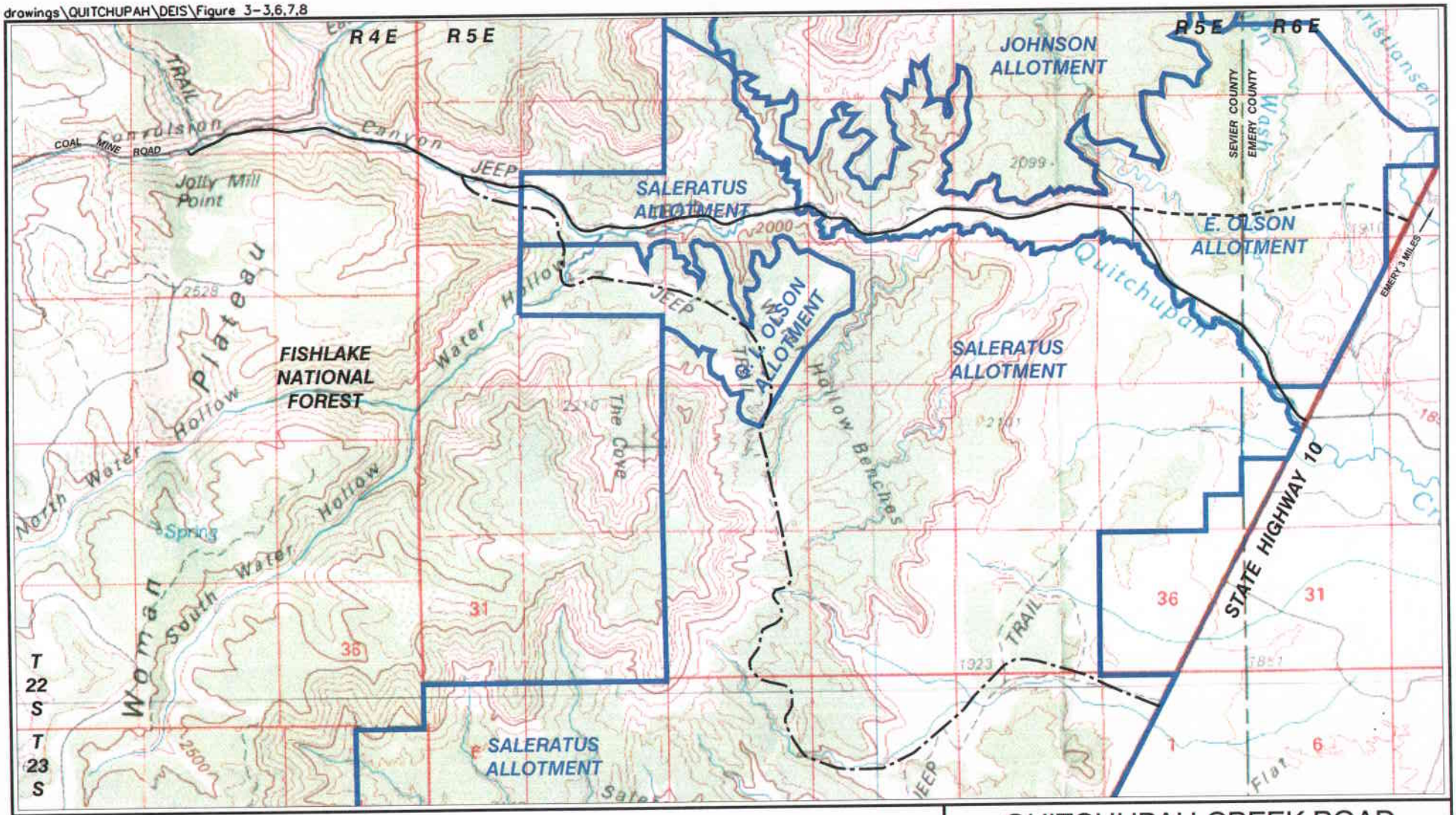
FIGURE 3-6
DEER AND ELK HIGH VALUE SUMMER AND WINTER RANGES

jbr environmental consultants, inc.
Salt Lake City, Utah Cedar City, Utah Reno, Nevada Elko, Nevada

DESIGN BY	DRAWN BY	CH'D BY	SCALE
GB	CP		1"=1 Mile

REVISION	DATE DRAWN
	1/29/01
	7/31/01
	10/9/01
	10/18/01

drawings\QUITCHUPAH\DEIS\Figure 3-3,6,7,8



EXPLANATION

- QUITCHUPAH CREEK ROAD, ALTERNATIVE B
- ALTERNATE JUNCTION, ALTERNATIVE C
- WATER HOLLOW, ALTERNATIVE D
- GRAZING ALLOTMENT BOUNDARY

N

1 0 1 MILE

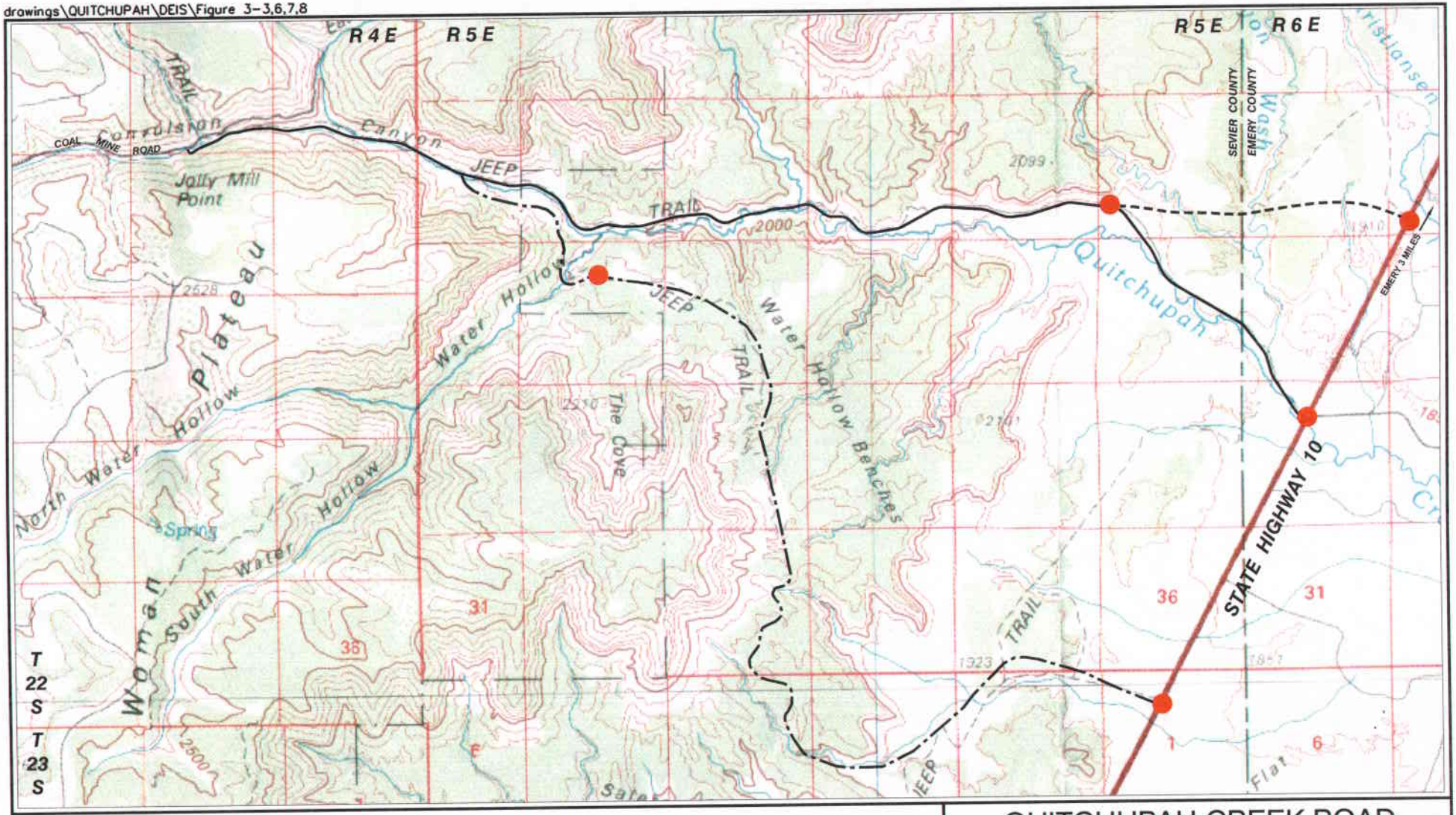
QUITCHUPAH CREEK ROAD EIS

FIGURE 3-7
GRAZING ALLOTMENT MAP

jbr environmental consultants, inc.
Salt Lake City, Utah Cedar City, Utah Reno, Nevada Elko, Nevada

DESIGN BY	DRAWN BY	CH'D BY	SCALE	DATE DRAWN	REVISION
KK	CP		1" = 1 Mile	1/29/01	7/31/01
					10/9/01
					10/18/01

drawings\QUITCHUPAH\DEIS\Figure 3-3,6,7,8



EXPLANATION

- QUITCHUPAH CREEK ROAD, ALTERNATIVE B
- ALTERNATE JUNCTION, ALTERNATIVE C
- WATER HOLLOW, ALTERNATIVE D
- KOP

1 0 1 MILE

N

QUITCHUPAH CREEK ROAD EIS

FIGURE 3-8
KOP LOCATIONS

jbr environmental consultants, inc.
Salt Lake City, Utah Cedar City, Utah Reno, Nevada Elko, Nevada

DESIGN BY	DRAWN BY	CH'D BY	SCALE	DATE DRAWN	REVISION
KK	CP		1" = 1 Mile	1/29/01	7/31/01 10/9/01 10/18/01

CHAPTER 4.0

CONSULTATION AND COORDINATION

4.0 CONSULTATION AND COORDINATION

4.1 SCOPING SUMMARY

Issues and concerns were identified through solicitation of public and internal scoping comments. The public and internal comments were then categorized into issues. The issues were examined to determine if they were outside the scope of the Proposed Action or analysis, already decided (by law or regulation, etc.), irrelevant to the decision, or not affected by the Proposed Action. Issues determined to fall into one of these categories were dropped from further analysis. The remaining issues became key issues to be analyzed in the EIS.

Issues have been identified through the scoping process. This process included contact with interested citizens, groups, organizations, and agencies, which included the following:

- BLM & Forest permittees and cooperators;
- BLM & Forest visitors;
- BLM & Forest employees;
- Federal, State, and local elected officials;
- Federal, State, and local agencies;
- Affected landowners;
- Key members of the community (opinion leaders);
- Industry contacts;
- Affected Native American tribes;
- Environmental community contacts; and
- Interested individuals

SUMMARY OF COMMENTS

A total of 35 comment letters or forms have been received as a result of the EIS scoping effort. Approximately 25 comments had previously been received during scoping for the EA in January-February 1999. Consultation with interested parties has been ongoing throughout the EA process and initiation for the EIS. The decision was made by the USFS and BLM to carry over all comments made during the EA scoping into the official record of scoping for the EIS. Comments received cover a large area of concern involving many resource issues. The Summary of Scoping Document, on file at the Fishlake National Forest Office and the BLM Richfield Field Office in Richfield, Utah, contains a summary of the scoping issues and all of the comments received during scoping.

4.2 PUBLIC INVOLVEMENT PLAN SUMMARY

Public involvement is an important part of the environmental analysis process. The purpose of the Public Involvement Plan is to describe in detail the methods and techniques that will be used to involve the public in development of the Quitchupah Creek Road EIS. It allows the public to participate actively in the NEPA process and to communicate their concerns regarding the Proposed Action. In addition, involvement by local governments helps them anticipate the effects and benefits that could occur from the project and allows them to make necessary plans and changes in public policy. The goal of the Public Involvement Plan is to gain public understanding and participation in the analysis and decision-making process regarding the proposed Quitchupah Creek Road Project. The goal is also to assure that the public's concerns are evaluated and addressed in the EIS being prepared for this road construction, and to detail how public input will be encouraged through the process.

IMPLEMENTATION

A Public Involvement Plan was prepared for the Quitchupah Creek Road Project documenting how the public will be kept informed during the EIS process. The phases of public participation included the following:

- Early and widespread notice of the Proposed Action
- Identification of public issues and concerns to be expressed in the analysis
- Identification of those issues not to be analyzed with an explanation why
- Sharing of resources and analytical data with the public
- Solicitation and incorporation of public input in development of alternatives
- Prediction of environmental impacts in areas of concern raised by the public
- Invite public review and obtain formal public comment on the DEIS
- Analyze and respond to DEIS public comments in the FEIS

LIST OF AGENCIES, ORGANIZATION AND PERSONS TO WHOM COPIES OF THE STATEMENT ARE SENT

The original mailing list for the Quitchupah Creek Road EA was generated on January 15, 1999. Since this date, the USFS and BLM have determined that the proposed project warranted the preparation of an EIS. On July 7, 1999, a revised EIS mailing list was generated and encompassed 213 parties. This list represented all individuals, agencies, or groups who have expressed interest in similar projects. The mailing list has been continuously revised by either adding individuals who did respond or deleting individuals who did not respond (either verbally or in writing) to the scoping letter, legal notices, Notice of Intent, or amended Notice of Intent.

A listing of the revised EIS mailing list is presented below.

Jori Adams
915 N. Hwy 89
Joseph, UT 84739

Director, Planning and Review
Advisory Council on Historic Preservation
1100 Pennsylvania Ave., NW
Suite 809
Washington, DC 20004

Carl R. Albrecht
General Manager
Garkane Power Assoc., Inc.
P. O. Box 790
Richfield, UT 84701

Craig Anderson
Lone Tree Properties
Diamond X Ranches
13520 Lone Point Lane #28107
Draper, UT 84020

Eric R. Anderson
P.O. Box 587
Emery, UT 84523

Glen R. Anderson
1462 W. 6235 So.
Taylorsville, UT 84523

Lyle D. & Belle V. Anderson
P. O. Box 523
Emery, UT 84522

Randy Anderson
Auctioneer
RMA Sales Management Company
Box 77
Emery, UT 84522

Robert Anderson
President
Quitchupah Grazers Association
Emery, UT 84522

Tim Anderson
P.O. Box 570126
Sigurd, UT 84657

Dr. Duane Atwood
BYU -- 2-0 MLBM
P.O. Box 20200
Provo, UT 84602-0200

Craig Axford
Utah Environmental Congress
1817 South Main Street, Suite 9
Salt Lake City, UT 84115

Back Country Horsemen of Utah
P. O. Box 13195
Ogden, UT 84412-3195

Back Country Horsemen Of Central Utah
P. O. Box 621
Richfield, UT 84701

Marvin D. Bagley
Atty.
Castle Valley Ranches
180 N. 100 E. Suite F
Richfield, UT 84701

Brad T. Barber
State Planning Coordinator
Utah Governors Office of Planning and Budget
116 State Capitol Building
Salt Lake City, UT 84114

Brad Barney
145 Sunnybrook Dr.
Salina, UT 84654

Craig Barney
Raven Rock Art Tours
P.O. Box 1397
Moab, UT 84532

Amy Barry
1178 Ramona Avenue
Salt Lake City, UT 84105

John F. Bates
Attorney-at-Law
455 South 300 East #200
Salt Lake City, UT 84111

Chad Beach
136 S. 200 E.
Salina, UT 84654

Susan Beach
136 S. 200 E.
Salina, UT 84654

Beaver County Commission
P. O. Box 392
Beaver, UT 84713

Mayor of Beaver
P. O. Box 271
Beaver, UT 84713

Scott Beckstead
Robinson Transport
1330 N. Hwy 89
Richfield, UT 84701

Steve Behling
CONSOL, Emery Mine
P. O. Box 527
Emery, UT 84522

Mark Belles
9318 Willard Street
Rowlett, TX 75088

Senator Robert F. Bennett
51 South University Ave, #310
Provo, UT 84601

Tom Bingham, President
Utah Mining Association
136 South Main, #709
Salt Lake City, UT 84101-1672

Morris E. Blackburn
P. O. Box 1
Emery, UT 84522

Senator Leonard Blackham
P. O. Box 337
Moroni, UT 84646

Janine Blaelock
Director
Western Land Exc. Project
P. O. Box 95545
Seattle, WA 98145-2545

John Blake
State Trust Lands Administration
675 East 500 South, Suite 500
Salt Lake City, UT 84102

Duane & Dora Jane Bresee
195 E. 500 N.
Richfield, UT 84701

Paul Brouha
Executive Director
American Fisheries Society
5410 Grosvenor Lane
Bethesda, MD 20814

John L Vickey Bryars
P. O. Box 576
Emery, UT 84522

Bureau of Land Management
Washington Office (2)
1849 C Street NW
Washington DC 20240

Bureau of Land Management
Utah State Office (2)
P.O. Box 45155
Salt Lake City, UT 84145-0155

Bureau of Land Management
Price Field Office
125 South 600 West
Price, UT 84501

Marty Burgess
921 N. Smith Dr.
Price, UT 84501

John L. & Vickie Byars
P.O. Box 576
Emery, UT 84522

Chris Cannon
Congressperson
51 South University Avenue, # 317
Provo, UT 84606

Len Carpenter
Wildlife Management Federation
4015 Cheney Drive
Ft. Collins, CO 80526

Dick Carter
Utah Wilderness Association
190 South 100 West
Hyrum, UT 84319

Castledale Library
145 North 100 East
Castledale, UT 84513

Betsy Chapoose
Cultural Rights and Protection
Dept. Director
Ute Indian Tribe
P. O. Box 190
Fort Duchesne, UT 84026

Cindy Charles
Chair
Koosharem Band
440 N. Paiute Dr.
Cedar City, UT 84720

Frank R. Chas
Sierra Club-Ogden Group
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Roy, UT 84067

Ross Christenson
Utah Dept. of Transporation
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Richfield, UT 84701

Ken Christiansen
Emery Stock Growers
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Emery, UT 84522

Merlin Christiansen
P. O. Box 36
Emery, UT 84522

Christopher L. Christie
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Jamul, CA 91935-1804

Richard Christianson
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Centerfield, UT 84622

Harry Collard
President
Utah Snowmobile Association
1207 West Quiet Acres Cove
South Jordan, UT 84095

Chris Colt
Utah Div. Of Wildlife Resources
1594 W. North Temple, #2110
Salt Lake City, UT 84116

Merrill Cook
Congressperson
2311 Federal Building
125 South State Street
Salt Lake City, UT 84138

Russ Cowley
Executive Director
Six County Assoc. of Gov't.
P. O. Box 820
Richfield, UT 84701

Craig Cox
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CHAPTER 7.0

GLOSSARY

7.0 GLOSSARY

Action: All activities or programs of any kind authorized, funded or carried out, in whole or in part, by federal agencies in the United States or upon the high seas. An action includes the granting of permits, contracts, or leases.

Action Area: All areas to be affected directly or indirectly by the federal action and not merely the immediate area involved in the action.

Affected Environment: Surface resources (including social and economic elements) within or adjacent to a geographic area that could potentially be affected by proposed activities. The environment of the area to be affected by the alternatives under consideration.

Air Quality Classes: Classifications established under the Prevention of Significant Deterioration portion of the Clean Air Act that limits the amount of air pollution considered significant within an area. Class I applies to areas where almost any change in air quality would be significant, Class II applies to areas where the deterioration normally accompanying moderate, well-controlled growth would be permitted, and Class III applies to areas where industrial deterioration would generally be allowed.

Airshed: A volume of air defined by geographical boundaries.

Alignment: The specific, surveyed route of the road.

Alluvial Material: Material transported and deposited by running water in riverbeds, lakes, alluvial fans and valleys. Includes clay, silt, sand, gravel, and mud.

Alternative: A combination of management prescriptions applied in specific amounts and locations to achieve a desired management emphasis as expressed in goals and objectives. One of several policies, plans, or projects proposed for decision making. One alternative need not substitute for another in all respects.

Analysis Area: A delineated area of land subject to analysis.

Animal Unit Month: The amount of forage necessary to sustain one cow and one calf or its equivalent for one month.

Aquatic Ecosystem: All organisms in a water-based community plus the associated environmental factors.

Aquifer: A layer of geologic material that contains water.

Attainment Area: An airshed or volume of air defined primarily by geographical boundaries in which the concentrations of criteria pollutants do not exceed the National Ambient Air Quality Standards.

Average Annual Daily Traffic: The total volume passing a point or segment of a highway facility, in both directions, for one year, divided by the number of days in the year.

Beneficial Effect: A "Beneficial Effect" decision is warranted when a project or activity will substantially improve the habitat or status of a listed species or its habitat.

Big Game Winter Range: The area available to and used by big game (large mammals normally managed for sport hunting) through the winter season.

Big Game: Larger species of wildlife that are hunted such as elk, deer, moose, and mountain lion.

Biological Diversity: The diversity or numbers of species that collectively represent the living plants and animals within a local, regional, or continental landscape.

Biological Assessment: Information prepared by or under the direction of the federal agency concerning listed species that may be present in the action area and the evaluation of potential effects of the action on such species and habitats. The purpose of the biological assessment is to evaluate the potential effects of the action on listed or proposed species or designated or proposed critical habitat, and determine whether any such species and habitats are likely to be adversely affected by the action. Biological Assessments are conducted for major federal construction projects requiring an EIS.

Biological Evaluation: A documented Forest Service activities in sufficient detail to determine how an action or proposed action may affect any threatened, endangered, proposed, or sensitive species.

Biological Opinion: An official report by the USFWS or National Marine Fisheries Service (NMFS) issued in response to a formal Forest Service request for consultation or conference. It states whether an action is likely to result in jeopardy to a listed species or adverse modification of its critical habitat.

Biotic Condition Index: Relative values of a biological community based on a comparison of the observed to an "expected" community at the area of interest.

Broadcast Seeding: Distribution of seed by a fan or hand spreading.

Browse: That part of the current leaf and twig growth of shrubs, wood vines, and trees available for animal consumption.

Bureau of Land Management: The U.S. Department of the Interior agency responsible for managing most Federal government subsurface minerals. It has surface-management responsibility for Federal lands designated under the Federal Land Policy and Management Act of 1976.

Candidate Species: Any species not yet officially listed but that are undergoing a status review or are proposed for listing according to the *Federal Register* notices published by the Secretary of the Interior or the Secretary of Commerce.

Contrast: The effect of a striking difference in the form, line, color, or texture of an area being viewed.

Colluvial: Consisting of a mixture of soil and angular fragments of rock which have accumulated at the foot and on slopes of mountainsides under the influence of gravity.

Council on Environmental Quality: An advisory council to the President established by the National Environmental Policy Act of 1969. It reviews Federal programs for their affect on the environment, conducts environmental studies, and advises the President on environmental matters.

Critical Habitat: Specific areas within the geographical area occupied by the species on which are found those physical and biological features (1) essential to the conservation of the species; and (2) which may require special management considerations or protection. Critical habitat shall not include the entire geographic area which can be occupied by the threatened and endangered species.

Crucial Habitat: A biological feature that, if lost, would adversely affect the species.

Cultural Resources Inventory Classes:

Class I - An existing data survey. This is an inventory of a study area to (1) provide a narrative overview of cultural resources by using existing information; and (2) compile existing cultural resource site record data on which to base the development of the Forest's site record system.

Class II - A sampling field inventory designed to locate, from surface and exposed profile indications, all cultural resource sites within a portion of an area so that an estimate can be made of the cultural resources for the entire area.

Class III - An intensive field inventory designed to locate, from surface and exposed profile indicators, all cultural resource sites within a portion of an area.

Cultural Resources Inventory: A survey of existing data.

Cultural Resources: Those fragile and nonrenewable remains of human activity, occupation, or endeavor reflected in districts, sites, structures, buildings, objects, artifacts, ruins, works or art, architecture, and natural features that were or importance in human events.

Cumulative Impact: The impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. cumulative impacts can result from individually minor, but collectively significant actions taking place over a period of time.

dBA - The sound pressure levels in decibels measured with a frequency weighing network corresponding to the A-scale on a standard sound level meter. The A-scale tends to suppress lower frequency that occur below 1,000 Hz.

Decibels - Units for describing amplitude of sound frequencies to which the human ear is sensitive.

Dispersed Recreation: That portion of outdoor recreation use that occurs outside of developed sites in the unroaded and roadbed Forest environment (i.e., hunting, backpacking, and camping).

Displacement: As applied to wildlife, forced shifts in the patterns of wildlife use either in location or timing of use.

Diversity: (1) The relative abundance of wildlife species, plant species, communities, habitats, or habitat features per unit of area; or (2) The distribution and abundance of different plant and animal communities and species within the area covered by a Land Resource Management Plan (36 CFR Part 219.3).

Duration: The length of time an activity and its impacts will be taking place.

Ecosystem: All organisms in a community plus the associated environmental factors.

Effects (also see Impacts):

Direct Effects - Caused by the action and occur at the same time and place.

Indirect Effects - Caused by the action later in time or farther removed in distance but still reasonably foreseeable. Indirect effects may include growth inducing effects and other effects related to induced changes in the pattern of land use, population density or growth rate, and related affects on air and water and other natural systems, including ecosystems.

Endangered Species: Any species in danger of extinction throughout all or a significant portion of its range.

Environmental Analysis: An analysis of alternative actions and their predictable short and long-term environmental effects that include physical, biological, economic, social, and environmental design factors and their interactions.

Environmental Assessment: A concise public document prepared to provide sufficient evidence and analysis for determining whether to prepare an environmental impact statement or a FONSI. It includes a brief discussion of the need for the proposal, alternatives considered, environmental impact of the proposed action and alternatives, and a list of agencies and individuals consulted. Prepared by the responsible Federal agency consistent with 40 CFR 1508.9.

Environmental Impact Statement: A formal public document prepared to analyze the impacts on the environment of the proposed project or action and released for comment and review. An EIS must meet the requirements of NEPA, CEQ guidelines, and directives of the agency responsible for the proposed project or action.

Erosion Hazard: The probability of soil loss resulting from complete removal of vegetation and litter. It is an interpretation based on potential soil loss in relation to tolerance values.

Ephemeral stream. Typically dry, except during direct and short-term response to storm runoff or snowmelt; is not influenced by the water table.

Erosion: (1) The wearing away of the land surface by running water, wind, ice, or other geological agents including such processes as gravitational creep; or (2) Detachment and movement of soil or rock fragments by water, wind, ice, or gravity.

Exotic: Foreign, not native

Exploration: Drilling, excavating, and geological, geophysical or geochemical surveying operations designed to obtain detailed data on the physical and chemical characteristics of Federal coal and its environment including the strata below the Federal coal, overburden, and strata above the Federal coal, and the hydrologic conditions associated with the Federal coal.

Fault: A fracture in bedrock along which there has been vertical and/or horizontal movement caused by differential forces in the earth's crust.

Faulting: Relative displacement of adjacent bedrock along a fracture.

Federal Land Policy and Management Act of 1976: Public Law 94-579 signed by the President on Management October 21, 1976. Established public land policy; to establish guidelines for its administration; to protect for the management, protection, development, and enhancement of the public lands; and for other purposes.

Federal Lands: Lands owned by the United States, without references to how the lands were acquired or what Federal agency administers the land, including surface estate, mineral estate and coal estate, but excluding lands held by the United States in trust for Indians, Aleuts or Eskimos.

Floodplain: The lowland and relatively flat area adjoining inland waters including, at a minimum, that area subject to a one percent or greater chance of flooding in any given year.

Fluvial: A comprehensive term describing river processes.

Forage: All browse and herbaceous foods that are available to grazing/browsing animals.

Forest Service: The agency of the United States Department of Agriculture responsible for managing National Forests and Grasslands under the Multiple Use and Sustained Yield Act of 1960.

Fossil: The remains or traces of an organism or assemblage of organisms that have been preserved by natural processes in the earth's crust exclusive of organisms that have been buried since the beginning of historical time.

Fracture: A crack, joint, fault, or other break in rocks.

Fugitive Dust - Dust particles suspended randomly in the air from road travel, excavation, and other similar types of operations.

Game Species: Any species of wildlife or fish for which seasons and bag limits have been prescribed and that are normally harvested by hunters, trappers, and fishermen under State or Federal laws, codes, and regulations.

Graben: An elongate, relatively depressed crustal unit or block that is bounded by faults on its long sides.

Gradient: The slope (rise/run) of a surface or stream profile.

Habitat Type: An aggregation of all land areas potentially capable of producing similar plan communities at climax.

Habitat: A specific set of physical conditions that surround a single species, a group of species, or a large community. In wildlife management, the major components of habitat are considered to be food, water, cover, and living space.

Human Environment: The factors that include, but are not limited to, biological, physical, social, economic, cultural, and aesthetic factors that interrelate to form the environment.

Impact (See Effects): The effect, influence, alteration, or imprint caused by an action.

Indirect Effects: Secondary effects that occur in locations other than the initial action or significantly later in time.

Intermittent stream. Flows are generally sustained for 6 months or more during the year, and are dry or has very diminished flow seasonally. During a portion of the year, flows are influenced by direct interaction with the water table.

Invertebrate: An animal lacking a spinal column.

Irretrievable: Not retrievable, irrecoverable, incapable of being recovered or regained; not capable of being restored remedied or made good.

Irreversible: Not reversible; incapable of being reversed or altered. Not having the ability to change and then revert to the original state.

Key Observation Point: Critical viewpoints that are usually along commonly traveled routes or at other likely observation points.

Landslide: A perceptible downhill sliding or falling of a mass of soil and rock lubricated by moisture or snow.

Leasable Minerals: Minerals acquired only by lease and generally include oil, gas, coal, oil shale, sodium, potassium, phosphate, native asphalt, solid and semi-solid bitumen, and deposits of sulfur.

Lease: A Federal lease, issued under the coal leasing provisions of the mineral leasing laws, which grants the exclusive right to explore for and extract coal. In provisions of this group that also refer to Federal leases for minerals other than coal, the term Federal coal lease may apply.

License to Mine: A license issued under the provisions of 43 CFR Part 3440 to mine coal for domestic use.

Licensee: The holder of an exploration license.

Long-Term: Describes impacts that would occur over a 20-year period or more.

May Affect - Likely to Adversely Affect: A "May Affect - Likely to Adversely Affect" determination is warranted when it is found a project or activity will have effects on a listed species or critical habitat, and those effects are likely to adversely affect listed species or critical habitat.

May Affect - Not Likely to Adversely Affect: A "May Affect - Not Likely to Adversely Affect" determination is warranted when it is found a project or activity will have effects on a listed species or critical habitat, but those effects are not likely to adversely affect listed species or critical habitat.

Mitigation: Includes:

(a) Avoiding the impact altogether by not taking a certain action or parts of an action.
(b) Minimizing impacts by limiting the degree of magnitude of the action and its implementation.
(c) Rectifying the impact of repairing, rehabilitating, or restoring the affected environment.
(d) Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action.
(e) Compensating for the impact by replacing or providing substitute resources or environments.

Multiple-Use: Management of the surface and subsurface resources so that they are jointly used in the manner that will best meet the present and future needs of the public without permanent impairment of the productivity of the land or the quality of the environment.

National Environmental Policy Act of 1969: Public Law 91-190. Established environmental policy for the nation. Among other items, NEPA requires Federal agencies to consider environmental values in decision-making processes.

National Forest Management Act: A law passed in 1976 as amendments to the Forest and Rangeland Renewable Resources Planning Act that requires the preparation of Regional and Forest plans and the preparation of regulations to guide that development.

National Forest System: All National Forest Systems lands reserved or withdrawn from the public domain of the United States; all National Forest System lands acquired through purchase, exchange, donation, or other means the National Grasslands and land use projects administered under Title III of the Bankhead-Jones Farm Tenant Act (7 U.S.C. 1010 et seq.); and other lands, waters, or interests therein which are administered by the U.S.D.A. Forest Service or are designated for administration through the U.S.D.A. Forest Service as a part of the system (16 U.S.C. 1609).

National Register of Historic Places: A listing of architectural, historical, archaeological, and cultural sites of local, state, or national significance established by the Historic Preservation Act of 1966.

No Action Alternative: No action or activity would take place. Another definition is where ongoing programs described within the existing Land Management Plan continue. No decision would be made and no leases would be offered.

No Effect: A "No Effect" determination is warranted when a project or activity will not have any effect on a listed species or its critical habitat.

Non-attainment Area: for any regulated air pollutant, an area for (1) which is shown by monitored data or is calculated by air quality modeling or any other method determined by the administrator to be reliable, to exceed any national standard of ambient air quality for the regulated air pollutant; (2) which is designated as a non-attainment area by the governor; and (3) which is promulgated as a non-attainment area by the administrator.

Noxious Weeds: Rapidly spreading plants that cause a variety of major ecological impacts to both agriculture and wild lands.

Off-Road Vehicle: Any motorized vehicle designed for or capable of cross-country travel on or immediately over land, water, snow, ice, marsh, swampland or other natural terrain. It includes, but is not limited to, four-wheel drive or low-pressure-tire vehicles, motorcycles and related two-wheel vehicles, amphibious machines, ground-effect, air-cushion, or all-terrain vehicles.

Overstory: The portion of a plant community consisting of the taller plants on the site; the forest or woodland canopy.

Particulates: Small particles suspended in the air and generally considered pollutants.

Perennial Stream. Flows approximately 90-100 percent of the time; has a significant base flow component derived from groundwater sources.

Prehistoric Site: Archaeologic sites associated with American Indians and usually occurring before contact with Europeans.

Prevention of Significant Deterioration: A classification established to preserve, protect, and enhance the air quality in National Wilderness Preservation System areas in existence prior to August 1977 and other areas of National significance while ensuring economic growth can occur in a manner consistent with the preservation of existing clean air resources. Specific emission limitations and other measures, by class, are detailed in the Clean Air Act (42 U.S.C. 1875, et seq.).

Prime Farmland: Land that is best suited to producing food, feed, forage, fiber, and oilseed crops. It has the soil quality, growing season, and moisture supply needed to economically produce sustained high crop yields if acceptable farming methods are used. Prime farmland produces the highest yields with minimal inputs of energy and money, and farming it result in the least damage to the environment.

Proposed Endangered Species: A taxon which has already been formally proposed to be listed as endangered.

Range Allotment: A designated area of land available for livestock grazing upon which a specified number and kind of livestock may be grazed under an allotment management plan. It is the basic land unit used to facilitate management of the range resource on National Forest System lands administered by the U.S.D.A. Forest Service.

Rare Species: A plan or wildlifet species, or subspecies, that is limited to a restricted geographic range or one that occurs sparsely over a wider area.

Reasonably Foreseeable Development Scenario: The prediction of potentially future actions, occurring in within the cumulative assessment area, within a designated period of time.

Reclamation: Returning disturbed lands to a form and productivity that will be ecologically balanced and in conformity with a predetermined land management plan.

Record of Decision: A document separate from, but associated with, an environmental impact statement that publicly and officially discloses the responsible official's decision on the proposed action.

Recreation Opportunity Spectrum: Land delineations that identify a variety of recreation experience opportunities in six classes along a continuum from primitive to urban. Each class is defined in terms of natural resource settings, activities and experience opportunities. The six classes are: Urban, Rural, Roadbed, Natural, Semiprimitive Motorized, Semiprimitive Nonmotorized, and Primitive.

Research Natural Area: An area in a natural condition which exemplifies typical or unique vegetation and associated biotic, soil, geologic, and aquatic features. The area is set aside to preserve a representative sample of an ecological community primarily for scientific and educational purposes.

Residual Adverse Impacts: Those effects remaining after implementation of mitigation measures.

Restore: To bring back landscape to a former or original condition or appearance.

Revegetation: The reestablishment and development of self-sustaining plant cover. On disturbed sites, this normally requires human assistance such as seed bed preparation, reseeding, and mulching.

Riffle: A shallow section of stream with rapid current and a surface broken by gravel, rubble, or boulders.

Right-of-way: An accurately located strip of land with a defined width, point of beginning, and point of ending. It is the area within which the user has authority to conduct operations approved or

granted by the landowner in an authorizing document, such as a permit, easement, lease, license, or Memorandum of Understanding.

Riparian: Riparian areas consist of terrestrial and aquatic ecosystems, those lands in a position to directly influence water quality and water resources, whether or not free water is available. This would include all lands in the active flood channel and lands immediately upslope of stream banks. These areas may be associated with lakes, reservoirs, estuaries, potholes, marshes, streams, bogs,, wet meadows, and intermittent or permanent streams where free and unbound water is available.

Roadbed, Natural: A recreation opportunity classification term describing a land area that has been predominately a natural appearing environment with moderate evidence of sights and sounds of humans. Concentration of users is moderate to low. Roads of better than primitive class are usually with 0.5 mile. A broad range of motorized and nonmotorized activity opportunities are available. Management activities, including timber harvest, are present and harmonize with the natural environment.

Roadless: Refers to the absence of roads that have been constructed and maintained by mechanical means to ensure regular and continuous use.

Scenic Quality Classes: The designation (A, B, or C) assigned a scenic quality rating unit to indicate the visual importance or quality of a unit relative to other units within the same physiographic province.

Scoping Process: An early and open public participation process for determining particular issues to be addressed in an environmental document and for identifying the significant issues related to a proposed action.

Sensitive Species: Those plant or animal species that are susceptible or vulnerable to activity impacts or habitat alterations.

Significant: An effect that is analyzed in the context of the proposed action to determine the importance of the effect either beneficial or adverse. The degree of significance is related to other actions with individually insignificant but cumulatively significant impacts. Significance exists if it is reasonable to anticipate a cumulatively significant impact on the environment and when the affects on the quality of the human environment are likely to be highly controversial.

Subgrade Strength: The portion of the roadway below the base and surface and its ability to carry loads.

Surface Strength: The portion of the roadway that includes the pavement and base material and its ability to carry loads.

Threatened Species: Any species that is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.

Total Dissolved Solids: Salt or an aggregate of carbonates, bicarbonates, chlorides, sulfates, phosphates, and nitrates of calcium, magnesium, manganese, sodium, potassium, and other cations that form sales that are dissolved or present in water.

Visual Quality Objectives: Based upon variety class, sensitivity level, and distance zone determinations. Each objective describes a different level of acceptable alteration based on aesthetic importance. The degree of alteration is based on contrast with the surrounding landscape.

Preservation: In general, human activities are not detectable to the visitor.

Retention: Human activities are not evident to the casual Forest visitor.

Partial Retention: Human activities may be evident, but must remain subordinate to the characteristic landscape.

Modification: Human activity may dominate the characteristic landscape, but must, at the same time, use naturally established form, line, color, and texture. It should appear as a natural occurrence when viewed in middleground or background.

Maximum Modification: Human activity may dominate the characteristic landscape but should appear as a natural occurrence when viewed as background.

Enhancement: A short-term management alternative that is completed with the express purpose of increasing positive visual variety where little variety now exists.

Visual Resource: The composite of basic terrain, geologic features, water features, vegetative patterns, and land use effects that typify a land unit and influence the visual appeal of the unit.

Visual Resource Management System: The BLM system for evaluating and classifying visual resources. The system uses line, form, color, texture, scale, and space to categorize lands into one of four classes:

ClassI: Preservation

ClassII: Retention

ClassIII: Partial Retention

Class IV: Modification

Watershed: An entire area that contributes water to a drainage system or stream.

Wilderness: An area designated by congressional action under the 1964 Wilderness Act. Wilderness is defined as undeveloped Federal land retaining its primeval character and influence without permanent improvements or human habitation.

Wind Erodibility Group: Indicates a soil's susceptibility to wind erosion based upon its particle resistance as described by the percentage of dry soil aggregates larger than 0.033 inches. These values range from 1 to 8 with 1 being the most erodible.

Wetlands: Lands where saturation with water is the primary factor determining the nature of soil development and the kinds of animal and plant communities living under or on it surface.

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