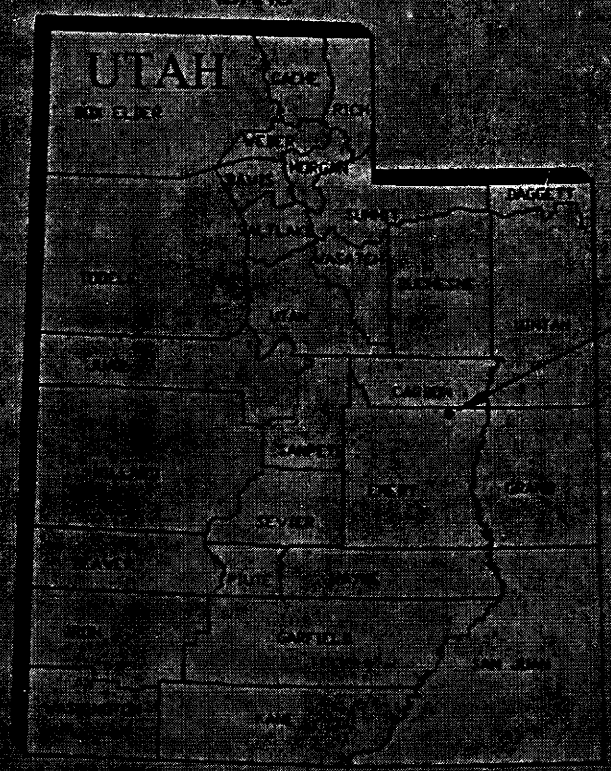
U.S. Department of Interior
Bureau of Land Management
Price Field Office

U.S. Department of Interior
Office of Surface Mining
Denver Office

Environmental Assessment

DEVELOPMENT OF THE LILA CANYON PROJECT EMERY COUNTY, UTAH

EA No. UT-070-99-22



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JULY 2000

LILA CANYON PROJECT
EMERY COUNTY, UTAH

ENVIRONMENTAL ASSESSMENT
UT-070-99-22

PREPARED BY

USDI, Bureau of Land Management
Price Field Office
125 South 600 West
Price, Utah 84501
(435) 636-3600

COOPERATING AGENCY

USDI, Office of Surface Mining
1999 Broadway, Suite 3320
Denver, Colorado 80202
(303) 844-1489

JULY 2000

TABLE OF CONTENTS

	Table of Contents	i
	List of Plates	v
	Acronyms and Abbreviations	vi
	Glossary of Terms	viii
CHAPTER 1.0	**PURPOSE AND NEED FOR THE ACTION**	1
1.1	Purpose and Need for the Action	1
1.2	Authorizing Actions and Permits	1
	1.2.1 Conformance with the Bureau of land Management Land Use Plans	1
Table 1.1	Proposed Action Conformance with the objectives of the Price River Management Framework Plan	1
	1.2.2 Relationship to Other Statutes, Plans and Required Permits	2
1.3	Project Initiation, Public Participation, and Issues Identified for Analysis	3
	1.3.1 Issues to be Analyzed	4
	1.3.2 Comment, Concerns and Critical Elements of the Human Environment Not Analyzed in Detail	4
Table 1.2	Permits and Other Legal Requirements	6
CHAPTER 2.0	**ALTERNATIVES INCLUDING THE PROPOSED ACTION**	7
2.1	Introduction	7
2.2	Alternatives Considered in Detail	7
	2.2.1 Alternative A - No Action	7
	2.2.2. Alternative B - Proposed Action	7
Table 2.1	Summary of Row Acreage Associated with the Proposed New Coal Haul Road	9
Figure 2.1	Typical Road Cross Section	11
Figure 2.2	Typical for the Proposed Acceleration/Deceleration Intersection	12
Figure 2.3	Typical Power Pole	14
Figure 2.4	Typical Power Pole	15
Figure 2.5	Typical Power Pole	16
Figure 2.6	Typical Power Pole	17
Table 2.2	Recommended Seed Mix for All Disturbed Areas	31
Table 2.3	Construction Time Frame for Phase I and Phase II	32
2.3	Alternatives Considered but Not Analyzed Further	33

2.3.1 Alternative A - Use of Existing Horse Canyon Site for Coal Mine Operation 33
2.3.2 Alternative B - Use of the Horse Canyon Road/Lila Canyon Road for Coal Mine Operation 34

CHAPTER 3.0 AFFECTED ENVIRONMENT 35
3.1 General Setting 35
3.2 Geology 35
Figure 3.1 Geologic Cross Section Of Lila Canyon Area 36
3.3 Soils 37
3.4 Hydrology 38
3.4.1 Climate 38
3.4.2 Surface Water 38
3.4.3 Ground Water 38
3.5 Land Use 39
3.5.1 Grazing 39
3.5.2 Vehicular Traffic 40
3.5.3 Visual Resources 40
Exhibit 3.1 View Looking Southeast along Existing Lila Canyon Road 41
Exhibit 3.2 View Looking Northeast From U.S. Highway 191/6 (KOP) 41
3.6 Vegetation 42
Table 3.2 List of Plant Species Identified Within the Project Area 43
3.7 Wilderness Values 43
3.8 Wildlife 44
3.8.1 Amphibians 44
3.8.2 Reptiles 44
3.8.3 Birds 44
3.8.4 Mammals 45
3.9 Cultural Resources 46

CHAPTER 4.0 ENVIRONMENTAL CONSEQUENCES 47
4.1 Impacts Associated with Alternative A - No Action 47
4.2 Impacts Associated with Alternative B - Proposed Action 47
Table 4.1 Areas of Impact Associated with the Proposed Action 47
4.3 Geology Impacts 48
4.3.1 Geology Mitigation 48
4.4 Soils Impacts 49
4.4.1 Soils Mitigation 49
4.5 Hydrology Impacts 50
4.5.1 Hydrology Mitigation 50

4.6 Land Use Impacts 51
4.6.1 Grazing 51
4.6.2 Grazing Mitigation 51
4.6.3 Vehicular Traffic Impacts 51
4.6.4 Vehicular Traffic Mitigation 52
4.6.5 Visual Resources Impacts 52
4.6.6 Visual Resources Mitigation 52
4.7 Vegetation Impact 53
4.7.1 Vegetation Mitigation 53
Table 4.2 Habitat Associated with the Proposed Action 54
4.8 Wilderness Values 54
4.8.1 Wilderness Values Mitigation 55
4.9 Wildlife Values Impacts 57
4.9.1 Wildlife Values Mitigation 57
4.10 Cultural Resources Impacts 58
4.10.1 Cultural Value Mitigation 58

CHAPTER 5.0 ANALYSIS OF CUMULATIVE IMPACTS 59
5.1 Issues and Resources Cumulatively Impacted 59
5.1.1 Surface Impacts Resulting from Mine Induced Subsidence 59
5.1.2 Soils and Reclamation Potential 59
5.1.3 Ground Water and Surface Water Hydrology 59
5.1.4 Livestock Grazing 59
5.1.5 Vehicular Traffic 59
5.1.6 Visual Resources 60
5.1.7 Loss of Vegetation Diversity, Cover and Productivity 60
5.1.8 Wilderness Values 60
5.1.9 Displacement and Direct Disturbance of Wildlife 60
5.2 Past, Present and Reasonably Foreseeable Action Within the Area 60
5.2.1 Exploration Drilling Associated With the Lila Canyon Project 60
5.2.2 Development of the Blue Castle Mine 61
5.2.3 Regional Traffic 61
5.3 Cumulative Affects on Identified Resources 61
5.3.1 Exploratory Drilling 61
5.3.2 Vehicular Traffic 61
5.3.3 Displacement and Direct Disturbance of Wildlife 62

CHAPTER 6.0 CONSULTATION AND COORDINATION 64
6.1 Agencies, Organizations and Individuals Contacted 64
6.1.1 Public Government/Public Agencies 64

6.1.2 State of Utah 64
6.1.3 Local Governments and Organizations 64
6.1.4 Industry and Business 65
6.2 List of Preparers and Interdisciplinary Team 65
6.2.1 EIS Environmental & Engineering Consulting (EIS); Helper, Utah 65
6.2.2 BLM Interdisciplinary Team 65
6.3 References 66

CHAPTER 7.0 APPENDICES

APPENDIX A A Summary of Public Scoping Comments

APPENDIX B Engineering Associated with the Existing Lila Canyon Road
Emery County Road Department Correspondence

APPENDIX C Utah Department of Transportation Right-of-Way Encroachment Permit

APPENDIX D Mine Surface Facility Reclamation Plan

APPENDIX E Natural Resource Conservation Service Correspondence - Prime Farmlands
Soil Characteristics

APPENDIX F Water Rights

APPENDIX G TES Survey Reports
1998 and 1999 Raptor Surveys
U.S. Fish and Wildlife Services Correspondence - TES Species

LISTS OF PLATES

PLATE I	GENERAL LOCATION
PLATE II	PROPOSED ACTION
PLATE II-A	SURFACE AREA - LILA CANYON MINE
PLATE III	SOILS
PLATE IV	LAND USE
PLATE V	VEGETATION
PLATE VI	WILDLIFE - DEER
PLATE VII	WILDLIFE - ELK
PLATE VIII	WILDLIFE - RAPTORS
PLATE IX	WILDLIFE - BIGHORN SHEEP AND ANTELOPE

ACRONYMS AND ABBREVIATIONS

AASHTO	American Association of State Highway and Transportation Officials
AUM	animal unit month
BLM	Bureau of Land Management
BP	Before Present
cfs	cubic feet per second
CFR	Code of Federal Regulations
CR	County Road (Emery)
fps	Feet per Second
FLPMA	Federal Land Policy Management Act
gpm	Gallons per Minute
hp	Horsepower
IMP	Interim Management Plan (BLM)
IPA	Intermountain Power Agency
KOP	Key Observation Point
kV	kilovolt
MFP	Management Framework Plan (BLM)
MLA	Mineral Leasing Act of 1920
MRP	Mine Reclamation Plan
NAS	National Academy of Science
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act of 1986
NRHP	National Register of Historic Places
NRCS	Natural Resource Conservation Service
OSM	Office of Surface Mining
PAP	Permit Application Package (UDOGM)
psf	Pounds per Square Foot
R	Range
ROW	right-of-way
SLB&M	Salt Lake Base and Meridian
SMRCA	Surface Mining Control and Reclamation Act of 1977, as amended
SPCC	Spill Prevention Control and Countermeasure Plan
T	Township
TDS	Total Dissolved Solids
TES	Threatened, Endangered and Sensitive (Species)
TSS	Total Suspended Solids
UDOT	Utah Department of Transportation
UDWR	Utah Division of Wildlife Resources
UDOGM	Utah Division of Oil, Gas and Mining
UEI	UtahAmerican Energy, Incorporated

UNPDES	Utah Nonpoint Discharge Effluent Source
UP&L	Utah Power & Light
U.S.	United States
USDI	U.S. Department of the Interior
USFWS	U.S. Fish and Wildlife Service
VRM	Visual Resource Management
WSA	Wilderness Study Area

GLOSSARY OF TERMS

Access	Passage to proposed site
Affected Environment	The biotic, abiotic, and human-related environment that is sensitive to changes due to the actions propose in any of the alternatives.
Agency	The land management agency, in this case the BLM and OSM.
Allotment	A unit of land suitable and available for livestock grazing that is managed as one grazing unit.
Alternative	Other reasonable courses of action to any proposal which involves unresolved conflicts, concerns or alternate uses of available resources.
Animal Unit Month	For the BLM allotments, it is the forage consumed by a 1,000 pound cow over a one month period, approximately 800 pounds of forage. An animal unit month is then multiplied by 1.32 for a cow/calf operation and is equivalent to an animal month for purposes of this document.
Assessment	An evaluation of existing resources and potential impacts to them from a proposed act or change to the environment.
Background	The viewing area of a distance zone that lies beyond the foreground -middleground. Usually from a minimum of 3 to 5 miles to a maximum of about 15 miles from a travel route, use area, or other observer position. Atmospheric conditions in some areas may limit the maximum to about 8 miles or increase it beyond 15 miles.
Community	A group of one or more populations of organisms that form a distinct ecological unit. Such a unit may be defined in terms of plants, animals or both.
Contrast	The effect of a striking difference in the form, line, color, or texture of the landscape features within the area being viewed.
Cultural Resources	The archeological and historical remains of human occupation or use. Includes any manufactured objects, such as tools or buildings. May also include objects, sites, or geological/geographical locations significant to Native Americans

Cumulative Effects	As defined in 40 CFR 1508.7, cumulative effects are the impacts on the environment which result from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions, regardless of what agency or person undertakes such other actions. Cumulative effects can result from individually minor but collectively significant actions taking place over a period of time.
Direct Impacts	As defined within 40 CFR 1508.9, these are the effects which are caused by the action and occur at the same time and place as the action. Synonymous with direct effects.
Endangered species	Any species in danger of extinction throughout all or a significant portion of its range as identified by the Endangered Species Act of 1973 (ESA) . This definition excludes species of insects that the Secretary of Interior determines to be pests and whose protection under the ESA would present an overwhelming and overriding risk to man.
Environment	The surrounding conditions, influences, or forces that affect or modify an organism or an ecological community and ultimately determine its form and survival.
Environmental Assessment	A concise public document which serves to a) Briefly provide sufficient evidence and analysis for determining whether to prepare and EIS or a Finding of No Significant Impact, b) Aid an agency's compliance with NEPA when no EIS is necessary, c) Facilitate preparation of an EIS when necessary.
Ephemeral	Flowing in response only to direct precipitation, and whose channel is at all times above the water table, and restricted to streams that do not flow continuously for at least 30 days.
Erosion	The group of processes whereby earth or rock material is loosened or dissolved and removed from any part of the earth's surface.
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.

Indirect Impact	As defined within 40 CFR 1508.8, these are the effects which are caused by the action but occur later in time or are removed in distance from the action, but are still reasonably foreseeable. Synonymous with indirect effects.
Key Observation Point	Critical viewpoints that are usually along commonly traveled routes or at likely observation points.
Landscape	That which makes up the various attributes of land surface as a result of geologic activity and weathering, such as plateaus, mountains, plains and valleys. In addition to both biotic features such as vegetation, forest, etc., as well as man-made features-such as: urban landscape.
Mitigation	Mitigation includes a)Avoiding the impact altogether by not taking certain action or parts of actions, b) Minimizing impacts by limiting the degree or magnitude of the action and its implementation, c) Rectifying the impact by repairing, rehabilitating, or restoring the affect 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 substantial resources or environments.
Public Lands	Federally owned lands administered by the Bureau of Land Management.
Raptor	A bird of prey.
Right-of-Way	Public lands authorized to be used or occupied pursuant to a right-of-way grant.
Riparian	Any area of land directly influenced by permanent water that has visible vegetation or physical characteristics reflective of permanent water influence. This can include streams, springs, seeps, wet meadows, aspen stands, and similar habitats.
Scoping	Procedures by which agencies determine the extent of analysis necessary for a proposed action, (i.e., the range of actions, alternatives, and impacts to be addressed; identification of significant issues related to a proposed action; and the depth of environmental analysis, data and task assignments needed).

Species	A group of individuals of common ancestry that closely resemble each other structurally and physiological and in nature interbreed producing fertile offspring.
Threatened species	Any species likely to become endangered within the foreseeable future throughout all or a significant part of its range.
Visual Resources	Classification of landscape based on scenic quality, sensitivity to change, and distance from the observer. Determines the amount of visible change to a characteristic landscape that is acceptable.

CHAPTER 1.0 PURPOSE AND NEED FOR THE ACTION

1.1 Purpose and Need for the Action

The underlying need for the proposed action is to access and produce 1.5 million to four million tons of coal per year from 5,605.66 acres of federal and State of Utah leased coal reserves held by UtahAmerican Energy, Incorporated (UEI). These reserves are located in the Book Cliffs coal field in Emery County near East Carbon and Sunnyside, Utah (PLATE I). These reserves include several pre-Federal Land Policy Act of 1976 (FLPMA) federal coal leases under serial numbers SL-066145 (Issued 6/19/46), SL-066490 (Issued 12/31/47), SL-069291 (Issued 4/1/50), and state leases U-0126947 (Issued 12/1/47), U-014217 (Issued 2/1/55), and U-014218 (Issued 2/1/55). These lease areas are shown on PLATE II. The general area along this portion of the Book Cliffs is currently accessed by numerous unmaintained dirt roads and routes. These existing roads and routes are inadequate to facilitate the haulage of approximately 1.5 million to four million tons of coal annually from the proposed mining operation, nor the associated personnel, vendors and supply vehicles a mine of this magnitude would necessitate.

1.2 Authorizing Actions and Permits

1.2.1 Conformance with the Bureau of Land Management Land Use Plan

The proposed action is in conformance with the objectives and recommendations of the Bureau of Land Management (BLM) Price River Resource Area Management Framework Plan (MFP), approved in 1983 and as amended. Table 1.1 list the pertinent objectives of the MFP that the proposed action is covered by and in conformance with.

TABLE 1.1
PROPOSED ACTION CONFORMANCE WITH THE OBJECTIVES OF THE PRICE RIVER MANAGEMENT FRAMEWORK PLAN

Resource		Objective
Cultural	C-1	Protection and Promotion of Cultural Resource Values
Lands	L-2	Right-of-Ways and Land Use Permits
Minerals	M-1	Development of Leasable Minerals
Range Management	RM-1	Allocation and Production of Grazing Lands
Recreation	R-1	Preservation and Protection of Visual Resources
	R-2	Review and Identification of Wilderness Values

TABLE 1.1
PROPOSED ACTION CONFORMANCE WITH THE OBJECTIVES OF THE PRICE RIVER MANAGEMENT FRAMEWORK PLAN (Continued)

Resource	Objective	
Recreation	R-3	Value of Paleontological Resources - Negative Determination based on lack of suitable geologic layers.
	R-8	Maintenance of Undeveloped Recreation Resources
Watershed	W-2	Protection of Watersheds
	W-3	Protection and Enhancement of Water Quality
Wildlife	WL-1	Management of Mule Deer Habitat
	WL-2	Management of Icelander Antelope Herd
	WL-3	Management of Elk Habitat
	WL-6	Management of Bighorn Sheep Habitat
	WL-8	Management of Raptor Habitat
	WL-9	Management of Non-Game Species Habitat
	WL-10	Special Management of Threatened, Endangered or Sensitive Species

1.2.2 Relationship to Other Statutes, Plans and Required Permits

The area of the proposed action is located upon federal lands administered by the BLM, Office of Surface Mining Reclamation and Enforcement (OSM), State of Utah, and private jurisdictions. Various federal, state, local, and private statues, permits, and easements would be required for actions associated with the proposed development.

The granting of the rights-of-ways (ROW) by the BLM is pursuant to the requirements of Title 5 of the FLPMA, and regulations found within Title 43 of the Code of Federal Regulations (CFR), part 2800. These requirements would cover all actions proposed that are off the coal lease area.

The coal lease would be administered under the requirements of the Mineral Lease Act of 1920 (MLA), and regulations found within Title 30 of the CFR (U.S.C. 181-287). The proposed operation and mining activities would be administered by OSM under Chapter 7 of Title 30 of the CFR (700-895) and by the Utah Division of Oil, Gas and Mining (UDOGM) under State of Utah the R645 administrative rules for coal mining (100-402). The Surface Mining Control and Reclamation Act of 1977, as amended (SMCRA) gives OSM primary responsibility to administer programs that regulate surface coal mining operations and the surface effects of underground coal mining operations in the United States. Pursuant to Section 503 of SMCRA, UDOGM developed and Secretary of the Interior approved, Utah's permanent regulatory program authorizing UDOGM to regulate surface coal mining operations and surface effects of underground coal mining on private

and State lands within Utah. In March 1987, pursuant to Section 523(c) of SMCRA, UDOGM entered into a cooperative agreement with the Secretary of the Interior authorizing them to regulate surface coal mining operations and the surface effects of underground coal mining on federal lands within the state.

Pursuant to the cooperative agreement, federal coal lease holders in Utah must submit a permit application package (PAP) to OSM and UDOGM for proposed mining and reclamation operations on federal lands in the state. UDOGM reviews the PAP to ensure that it complies with the approved state permanent program and other statutes. If it does comply, UDOGM issues the applicant a permit to conduct coal mining operations. OSM and other federal agencies review the PAP to ensure that it contains the necessary information for compliance with the coal lease, MLA, NEPA, and other applicable federal laws and attendant regulations. OSM recommends to the Assistant Secretary of the Interior, Land and Minerals Management the (1) approval of the MLA mining plan, (2) approval of the MLA mining plan with conditions, or (3) disapproval of the MLA mining plan. Before making a recommendation on the mining plan, OSM may obtain input from certain other federal agencies, including the surface management agency (BLM).

UDOGM would enforce the performance standards and permit requirements during the mine's operation and have primary authority in environmental emergencies. OSM retains oversight responsibility of this enforcement. BLM would have authority in emergency situations in which UDOGM or OSM inspectors cannot act before environmental harm or damage would occur.

The area of the proposed action is zoned as MG-1, mining and grazing, by the Emery County Zoning and Planning Office, and is consistent with the existing land use plan for the county.

TABLE 1.2 is a summary of the permits and approvals from federal, state and local agencies that UEI would need to obtain for the project.

1.3 Project Initiation, Public Participation, and Issues Identified for Analysis

Project initiation was started with a request for a ROW with the BLM Price Field Office in February 1998. Agency scoping was initiated in September of 1998. A request for public comments in the scoping process was initiated on March 2, 1999. A news article requesting public comment and input was printed in March 4, 11, 18 and 25 issues of the *Sun Advocate*.

Six parties, organizations or agencies responded to the public scoping process with comments, questions or issues regarding the proposed action. Three responses were received concerning the project as of April 6, 1999. APPENDIX A contains a summary table of the comments received throughout the public participation and formal scoping process. Comments are grouped by organizations and by resource issues. The scoping response number appears followed by a narrative summary.

1.3.1 Issues To Be Analyzed

Based on public input and agency recommendations, the following issues were determined to be relevant:

- **Surface Subsidence**
- **Soils, Slope Stability and Rehabilitation Potential**
- **Ground Water and Surface water**
- **Livestock Grazing**
- **Vehicular Traffic**
- **Visual Resources**
- **Vegetation Potential for Loss in Species Diversity, Cover and Productivity**
- **Wilderness Values**
- **Displacement and Direct Disturbance of Wildlife**
- **Cultural Resources**

1.3.2 Comment, Concerns and Critical Elements of the Human Environment Not Analyzed in Detail

The following resources have not been identified within the area of the proposed project, and therefore will not be addressed in the discussion of associated on-site resources (Affected Resources).

Areas of Critical Environmental Concern - No such areas occur within or would be impacted by the proposed project.

Environmental Justice - The proposed action would not have any impact to human health and environmental effect on minority or low-income populations.

Prime or Unique Farm Lands - A negative determination by the Natural Resource Conservation Service (NRCS) of the presence of such lands with the proposed project area is included as APPENDIX E.

Flood plains and Wetlands - No such areas occur within the proposed project area or along the proposed ROW's.

Native American Religious Concerns - The proposed project area does not contain any known sites of Native American Religious concern.

Threatened and Endangered Species - According to information within Utah Endangered, Threatened, and Sensitive Plant Field Guide, published by the USFWS Intermountain Region, and correspondence with the USFWS, no endangered or threatened plant or wildlife species are known to occur within the project area. However, several candidate/sensitive species were indicated by

USWFS as potentially occurring within the area. An inventory of the project area was conducted in the spring of 1998. A four hundred foot corridor along the proposed action transportation routes, and similar area surrounding the proposed mine surface facility and power line were surveyed for threatened, endangered and sensitive plants (TES). No candidate or sensitive species were located within the project area. APPENDIX G contains the report on the TES surveys conducted.

Wild and Scenic Rivers - The proposed project area does not include, nor would any action associated with it impact any eligible and/or designated waterways.

TABLE 1.2 PERMITS AND OTHER LEGAL REQUIREMENTS

Agency	Act or Regulation	Requirement
Federal		
Council for Environmental Quality	National Environmental Policy Act of 1969 (NEPA), as amended (40 CFR 1500) Public Law 91-90, 42 U.S.C. 4321	Environmental Assessment.
Bureau of Land Management	Federal Land Policy Act of 1976 (FLPMA) (43 CFR 2800 & 3100) Public Law 94-579 (10/21/76)	Right-of-Way, Notice to Proceed, Temporary Use Permits, and Consultation.
	Mineral Lease Act of 1920 (Title 30; U.S.C. 181-287)	Mining plan approval.
Office of Surface Mining	Administrative Regulations 30 CFR (30 CFR 700-895)	Coal lease development and mine operation.
	Mineral Lease Act of 1920 (Title 30; U.S.C. 181-287)	Mining plan document preparation
Fish and Wildlife Service	Endangered Species Act of 1973 (ESA) (16 U.S.C. 1539)	Provide biological opinion of wildlife and plants that are federally listed, and impacts of the proposed action to listed species.
	Migratory Bird Treaty Act (16 U.S.C. 703-711)	Consultation and review of impacts to listed species.
	Bald Eagle Protection Act (U.S.C. 663a)	Consultation and review of impacts to golden eagles.
State of Utah		
Department of Transportation	Permit to Encroach Road Easement	Consider issuance of permit to intersect state road ROW.
	Permit to Cross a Road Easement	Consider issuance of permit for crossing of road ROW.
Department of Natural Resources		
Division of Water Rights	Permit to Alter a Natural Drainage Channel	Alteration Permit GP-40
Division of Oil, Gas and Mining	Permit for Mine and Reclamation (R645-301)	Mine plan approval and operation.
Department of Community & Economic Development		
Utah State Historical Society	National Historic Preservation Act (CFR 800, Section 106)	Consider NRHP eligibility and mitigation of cultural resources.
Department of Environmental Quality		
Division of Air Quality	Permit to Affect Air Quality	Notification of Intent
Division of Water Quality	Construction and Operational Permits	UNPDES and Storm Water Discharge Permits.
Emery County	Large site development permits	
	County Zoning Ordinances	Determine compliance with existing land use designation.
Private		
	Confirmation and Review of ROW	Obtain Easements

CHAPTER 2.0 ALTERNATIVES INCLUDING THE PROPOSED ACTION

2.1 Introduction

This chapter describes the alternatives developed in response to the issues and concerns addressed in CHAPTER 1.0 and as identified within the scoping process.

2.2 Alternatives Considered in Detail

2.2.1 Alternative A - No Action

Under the No Action alternative, the ROW would not be issued and mine plan proposed would not be developed.

2.2.2 Alternative B - Proposed Action

The proposed action would be located in Emery County, approximately 6.68 miles north-northwest of U.S. Highway 191/6 (See PLATE I). The project would be implemented in two phases:

Phase I - This phase involves the construction and operation of the Lila Canyon Mine for conventional room and pillar mining, as well as the construction and operation of its associated surface facilities, utilities and transportation routes. Based on current conditions, exploratory drilling would not be expected to be required for the development of the coal lease. To facilitate the development and operation of the proposed mine, the existing Lila Canyon Road that ties into Emery County Road (CR) 125 at the existing Horse Canyon Mine Site would be upgraded to facilitate personnel and construction equipment travel. Concurrent with upgrading the existing access road, a separate operational coal haul road would also be constructed. An acceleration and deceleration intersection would be constructed at the junction of U.S. Highway 191/6 in the SE 1/4 SW 1/4 of Section 9, T. 17 S., R. 14 E.. The proposed road would proceed northwest 6.8 miles, terminating at the proposed Lila Canyon Mine surface facility. A ROW for an underground telephone line/utility corridor would be established within the proposed road ROW. The phone line would be adjacent to the paved surface and would follow the road to the mine site. A 46 kV power line that ties to the existing Moab/Price/Green River line approximately one mile south of the proposed mine facilities would be constructed to provide the necessary power requirements.

Phase II - This phase would be based on an anticipated projected increase in coal production over the next five years. The mine would move from conventional room and pillar to long wall mining, and the coal haul road would be paved to accommodate up to four million tons of coal haulage annually. For sake of discussion, activities as currently proposed for Phase II are presented.

However, the implementation of this phase would be dependent on coal sales and market conditions. As previously indicated in Phase I, exploratory drilling would likewise not be required for the anticipated actions of Phase II.

Description of Physical Facilities of the Proposed Action - Phase I The proposed action to be taken by UEI on public, state, and private land for the development and operation of Phase I includes:

- Upgrade of the existing Lila Canyon Road.
- Proposed coal haul road development.
- Development of the 46 kV power line to the proposed mine surface facility.
- Development of the Lila Canyon Mine surface facility.
- Conventional mining of existing coal reserves.
- Wildlife enhancement projects

The planned surface routes of the existing and proposed roads and power line, as well as the area of the proposed mine surface facility and lease area are shown on PLATE II. Details of the proposed surface facilities associated with mine are shown on PLATE II-A. The following section describes each of the attributes of the proposed action.

Upgrade of the Existing Lila Canyon Road - The existing Lila Canyon Road was constructed in the early 1940's with the intent of developing the Horse Canyon Mine South Lease area. Over the last 50 years, the road has received little if any maintenance, but has remained accessible by four wheel drive vehicles. The road, with an average width of 50 feet, was constructed to a standard that would accommodate coal haulage with an average grade that does not exceed four percent. Culverts were installed at all drainage crossings, and with associated barrow ditches. Currently this road is controlled by Intermountain Power Agency (IPA) with easements in place for future development and use by UEI.

UEI would upgrade 2.8 miles of the Lila Canyon Road in cooperation with IPA and Emery County. The majority of the road, within a deeded 50 foot ROW, crosses private land owned by UEI (16.28 acres). Approximately 600 feet (0.69 acres) would be on public land near the tie-in with the proposed mine surface facility. No additional disturbance is proposed outside of the existing ROW. The proposed upgrade would establish a 30 foot unpaved two lane road, designed for a maximum speed of 35 miles per hour. All culverts would be replaced, the surface regraded, and approximately 27,400 cubic yards of granular road base hauled and placed onto the road surface. All road base material would be purchased from an existing commercial supplier and transported to the site over the current Emery County Road system. Borrow ditches would be reestablished and the road would be posted with the necessary speed and caution signs to ensure vehicular safety.

Construction crews associated with the development of the proposed action would travel to and from the work site via U.S. Highway 191/6 and CR 125. During construction of the proposed road approximately 30 people would be employed. The existing Horse Canyon Road (CR 125) would

be used to gain access to the existing Lila Canyon Road. No modifications nor upgrade to this road would be required or conducted during the proposed construction related use. A letter from the Emery County Road Department is attached as APPENDIX B, and details the requirements of use in association with this road. Upon completion of the proposed mine surface facility and proposed haul road, the existing Lila Canyon Road would be gated at the intersection with the Horse Canyon Road to prohibit public access on this route into the mine area.

A plan and profile, showing grade, drainage, and culvert placement, as well as a typical cross-section is attached as APPENDIX B.

Coal Haul Road Development - A proposed two lane, 30 foot gravel surface Class B road, totaling 4.7 miles, would transect public and state land. The proposed road, designed for a maximum speed of 45 miles per hour, would be constructed according to the standards of the American Association of State Highway and Transportation Officials (AASHTO) and the Utah Department of Transportation 1992 Standard Specifications for Road and Bridge Construction. The total acreage of the proposed 100 foot construction and 70 foot operational ROW for the new coal haul road upon public and state land is shown in TABLE 2.1.

TABLE 2.1
SUMMARY OF ROW ACREAGE ASSOCIATED WITH THE PROPOSED NEW COAL HAUL ROAD

Ownership	Miles	Acres-100' ROW (Construction)	Acres 70' ROW (Operational)
BLM	3.54 (18,691.20 feet)	42.90	30.04
State of Utah	1.16 (6,124.80 feet)	14.06	9.84
TOTAL	4.7miles (24,816 feet)	56.96 Acres	39.88 Acres

The area to be disturbed as a result of the construction would vary in width from 50 feet to approximately 100 feet depending on the natural terrain. The desired construction ROW would be 100 feet (56.96 acres) to allow the construction of cut and fill slopes. Upon completion of the road, the temporary construction ROW would be stabilized and reclaimed to BLM and/or state standards, thus minimizing the permanent operational ROW to a width of 70 feet (39.88 acres), or 35 feet on each side of the center line of the travel surface. A three wire strand fence built to BLM range and wildlife standards would be constructed on each immediate side of the proposed operational ROW.

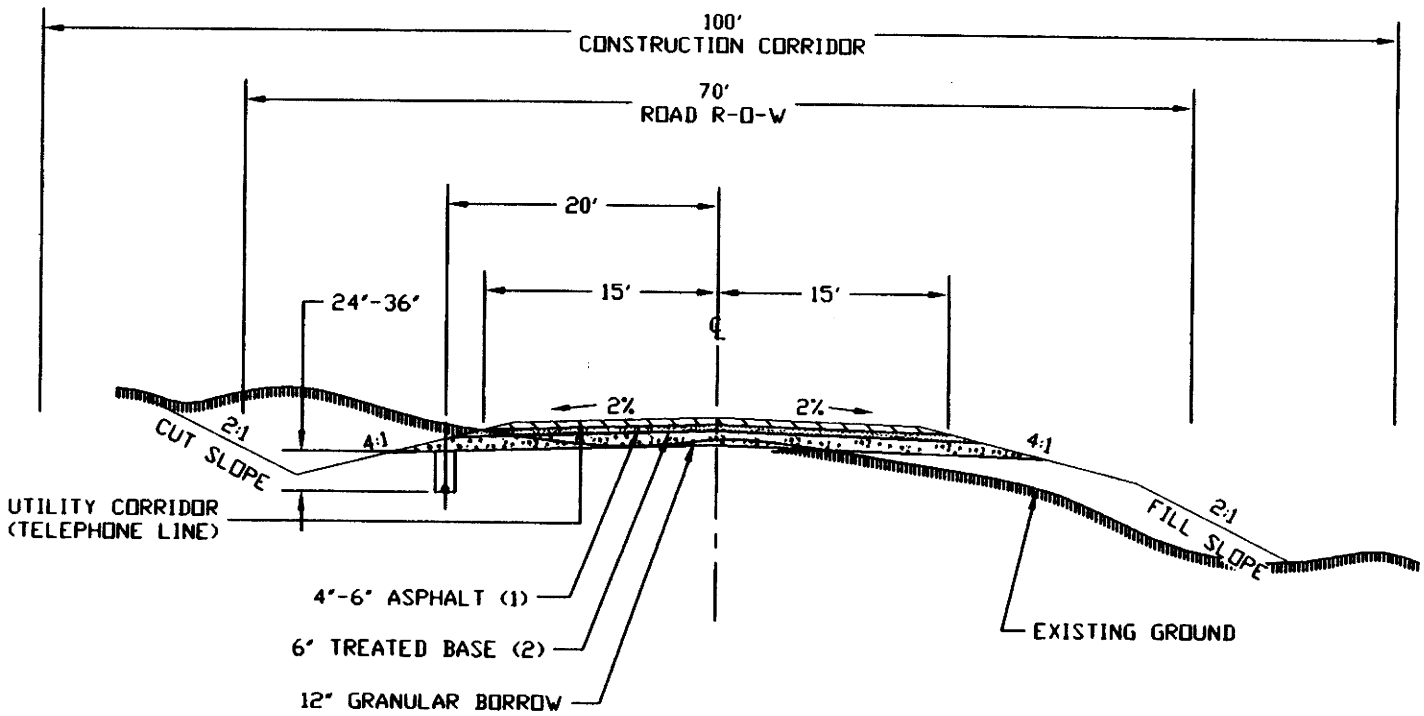
FIGURE 2.1 is a typical cross-section of the proposed coal haul road. Twelve inches of granular borrow would be used for the sub-base. The base course would consist of six inches of enzyme treated mineral aggregate. This well graded gravel would have a maximum size of one inch. The enzyme treatment would help stabilize the road surface and reduce dust emissions. The 30 foot graveled surface would be wide enough for future asphalt paving. Upon completion, an enzyme armor coating would be applied to the proposed road.

Construction of the coal haul road would involve the same access and crew sizes required for the upgrade of the existing Lila Canyon Road. Operational use of the coal haul road would be associated with transport and production of an estimated 2.5 million tons of coal a year during Phase I. This number is based on UEI's proposal in the Resource Recovery and Protection Plan submitted to the BLM in December 1998. Vehicular use would include the personnel associated with the mine, delivery of material to the mine, and the transport of the coal via the proposed road to U.S. Highway 191/6 and the loadout site on the Ridge Road near Wellington. UEI has indicated that at full capacity after five years, as many as 315 coal haul trucks per day and 63 personal and delivery vehicles per day would travel to and from the proposed mine via U.S. Highway 191/6. Coal haul travel would utilize U.S. Highway 191/6 through Wellington, and onto the loadout site on Ridge Road off U.S. Highway 191/6.

In association with the development of the coal haul road, an acceleration and deceleration intersection on U.S. Highway 191/6 would be constructed. This four lane intersection, within the Utah Department of Transportation (UDOT) ROW, would be approximately 2,300 feet in length and allow for heavy truck traffic to leave and enter the highway. The intersection would be constructed concurrent with the construction of the proposed coal haul road, and be completed prior to initial coal haulage. A typical design for the proposed intersection is shown in FIGURE 2.2. APPENDIX C, contains a copy of the UDOT ROW Encroachment Permit filed by UEI for the proposed activity.

In association with the construction areas that would be reclaimed upon completion of the proposed project, an effort would be made to reclaim existing roads and routes on public lands that intersect the proposed road. This would be completed to minimize the potential disturbed area and number of approaches to the proposed coal haul road. As much as four miles of roads and routes could be reclaimed. Roads and routes required to facilitate grazing management (movement and water) and access would be left in place. Where existing areas are eliminated, cuts would be pulled back to the approximate original contour and drainages would be reestablished. Concurrent with recontouring, revegetation using an approved BLM seed mix (TABLE 2.2) would be completed.

Utility Corridor - UEI would install, upon completion of the new proposed coal haul road, a telephone line within a corridor adjacent to the road to serve the proposed mine. The line would be buried at a depth of 24 to 36 inches, approximately ten feet from the edge of the surface. A junction box would be installed approximately 3,000 feet from the intersection with U.S. Highway 191/6. At approximately 6,000 foot intervals along the length of the road, similar boxes would be installed. The four by five inch boxes, colored an approved BLM color, would stand approximately 36 inches above the surface. A 10 foot wide (5.7 acre) corridor on the cut, or uphill, side of the road, would be located within the permanent ROW of the proposed road. The utility corridor would be located entirely within the disturbance associated with the new road and could accommodate any future utilities (i.e., gas, water and/or sewer lines) during the life of the mine.



2. ENZYME TREATED BASE COURSE.
1. 6" ASPHALT ON U.S. HIGHWAY 191/6 AND 4" ON COAL HAUL ROAD. ASPHALTING COMPLETE ROAD (4.8 MILES) IN PHASE II.

NOTES: UNLESS OTHERWISE SPECIFIED.

PHASE I MATERIAL ESTIMATE

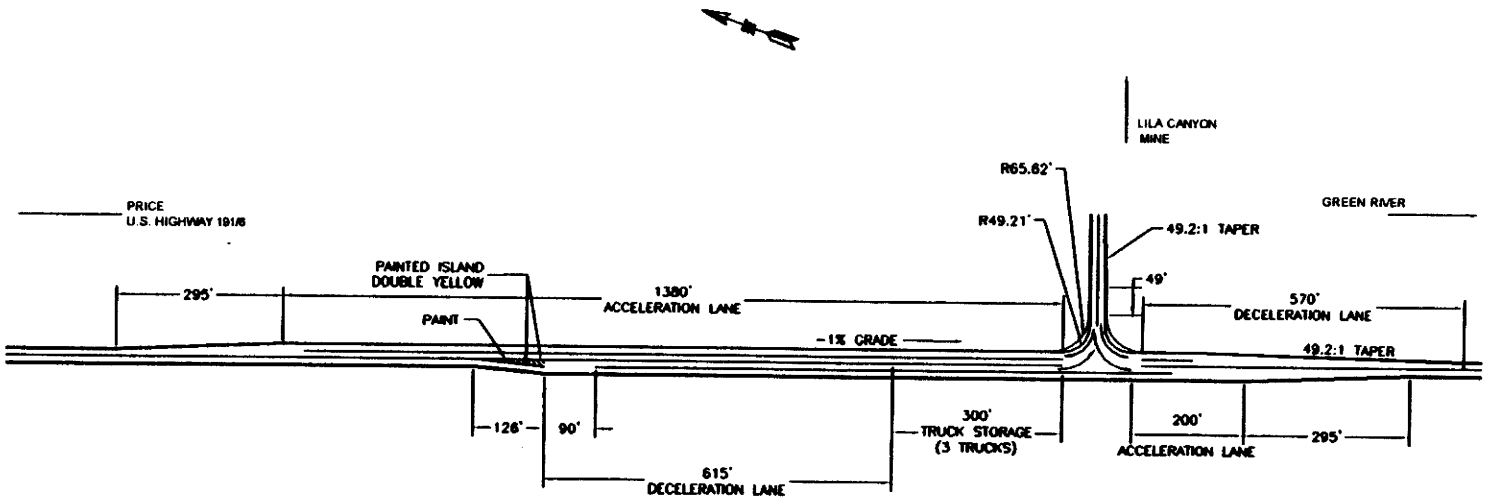
ITEM	IN PLACE QUANTITIES
ASPHALT	1,382 YD^3
ENZYME TREATED BASE	15,019 YD^3
UNTREATED BASE	1,007 YD^3
GRANULAR BORROW	37,775 YD^3

EIS

LILA CANYON

TYPICAL HAUL ROAD SECTION

DATE: DECEMBER 1999
SCALE: NONE
DESIGNED BY: EIS
FIGURE 2.1



4. COAL HAUL ROAD WOULD BE PAVED FOR 1/4 MILE.
3. ALL LANES TO BE 11.8 FT WIDE.
2. ALL SHOULDERS TO BE 2 FT WIDE.
1. ALL DIMENSIONS SHOWN ARE FEET (FT).

NOTES: UNLESS OTHERWISE SPECIFIED.

DESIGN INFORMATION TAKEN FROM UTAH DEPARTMENT OF TRANSPORTATION STANDARD DRAWING FOR ROAD AND BRIDGE CONSTRUCTION, AND AASHTO-GEOMETRIC DESIGN OF HIGHWAYS AND STREETS.

EIS

LILA CANYON

TYPICAL ACCELERATION DECELERATION INTERSECTION

DATE: DECEMBER 1999

DRAWN BY: EIS

SCALE: 1" = 350'

FIGURE 2.2

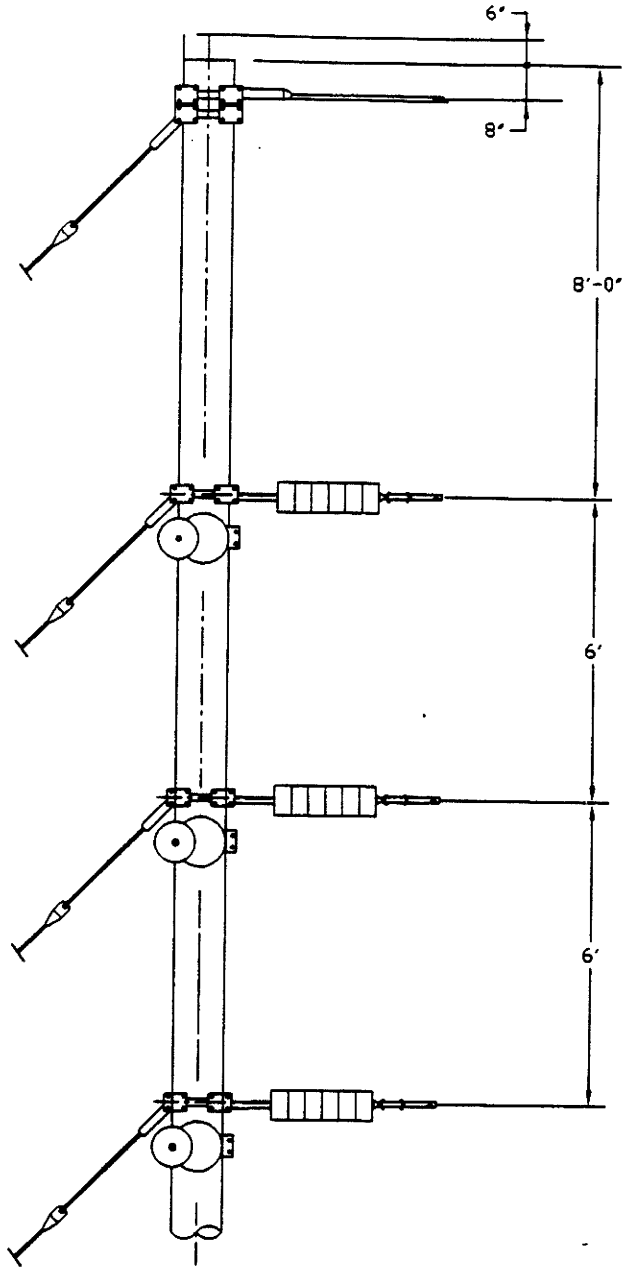
46 kV Power Line Development - A 1.3 mile 46 kV (46,000 volt) power line located on public land would be constructed concurrent with construction of the surface facility and proposed road. The proposed power line would tap the existing Utah Power 46 kV Moab-Price #1 power line in T. 16 S., R. 14 E., Section 16 and proceed east to the proposed mine surface facility. Construction within a 100 foot wide ROW (15.76 acres) would be conducted by ground crews using tracked and/or rubber tire vehicles. Specific steps to complete the power line includes pole placement, cross arm assembly, line suspension and tension, installation of a switching station at the tap point, and metering station and substation within the area of the proposed mine surface facility. Upon completion of the line, the operational ROW would be minimized to 80 feet (12.61 acres). The proposed route of the power line and associated facilities are shown on PLATE III.

The power line would require the establishment of approximately 15 pole sites. Pole types would be single "C2T" and "HPS" structures, double "ES" structures, and triple "C3P" structures (FIGURE 2.3, 2.4, 2.5, and 2.6). Structures would be constructed using wood poles, with heights ranging from 60 to 80 feet. All features of the line hardware (insulators, wire, poles) would be non-reflective and designed to be raptor-safe, as described by the Raptor Research Foundation in Suggested Practices for Raptor Protection on Power Lines: The State of the Art in 1996.

Construction of the power line in the second year of construction could employ as many as 20 people. No new roads would be created during the construction, operation or maintenance of the proposed power line. Access for all phases of the power line would be gained by the existing roads within the area. Where accessible, rubber tired construction/maintenance vehicles would travel perpendicular from the road or trail to each pole location. The proposed power line has been designed to minimize the number of employees necessary to maintain its length. Maintenance of the line and associated operational facilities would be on an as-needed/emergency basis. Maintenance access would be along established roads by 4x4 vehicle or snow machine and within the 80 foot operational ROW. The proposed power line would be compatible with the other ROW's. The power line would be intersected to the proposed coal haul road ROW at the surface facility site. However, no interference with this line or any other line within the area would be anticipated.

The staging areas would be located within the proposed surface facility area, and would be utilized for equipment and material storage and assembly. The construction vehicles to be used would include two line trucks, two bucket trucks, a wire trailer, a pole trailer, and a crew truck. A crew consisting of 12 individuals and a line truck with an auger attachment would be used to dig the holes within accessible areas along the ROW. Holes would be excavated to a depth of eight to 10 feet and 14 feet where anchor structures are required. In areas of limited access, the 20 foot boom on the line trucks could be used to auger holes. All holes would be located as to create as little disturbance as possible.

Poles would be transported to the site by truck, where the structure components (cross pieces and insulators) would be assembled on the ground and erected by a truck-mounted crane. In areas of thick vegetation and/or where vegetation may impede the performance of the active line, vegetation would be cleared by hand-held chainsaws. This cut vegetation would be stockpiled and used later to scatter over any reclaimed areas to provide solar protection on newly revegetated sites.



NOTES:

1. FOR SOCKET EYE, EXTENSIN LINK AND CONDUCTOR STRAIN CLAMP CHOOSE APPROPRIATE TENSION HARDWARE.
2. GROUND WIRE TO BE CLIPPED TO POLE AT 2'-0" INTERVALS AND BONDED TO POLE BANDS.

FIGURE 2.3

C2T

46 & 69 K.V. STRUCTURE
(6 INSULATORS PER STRING)

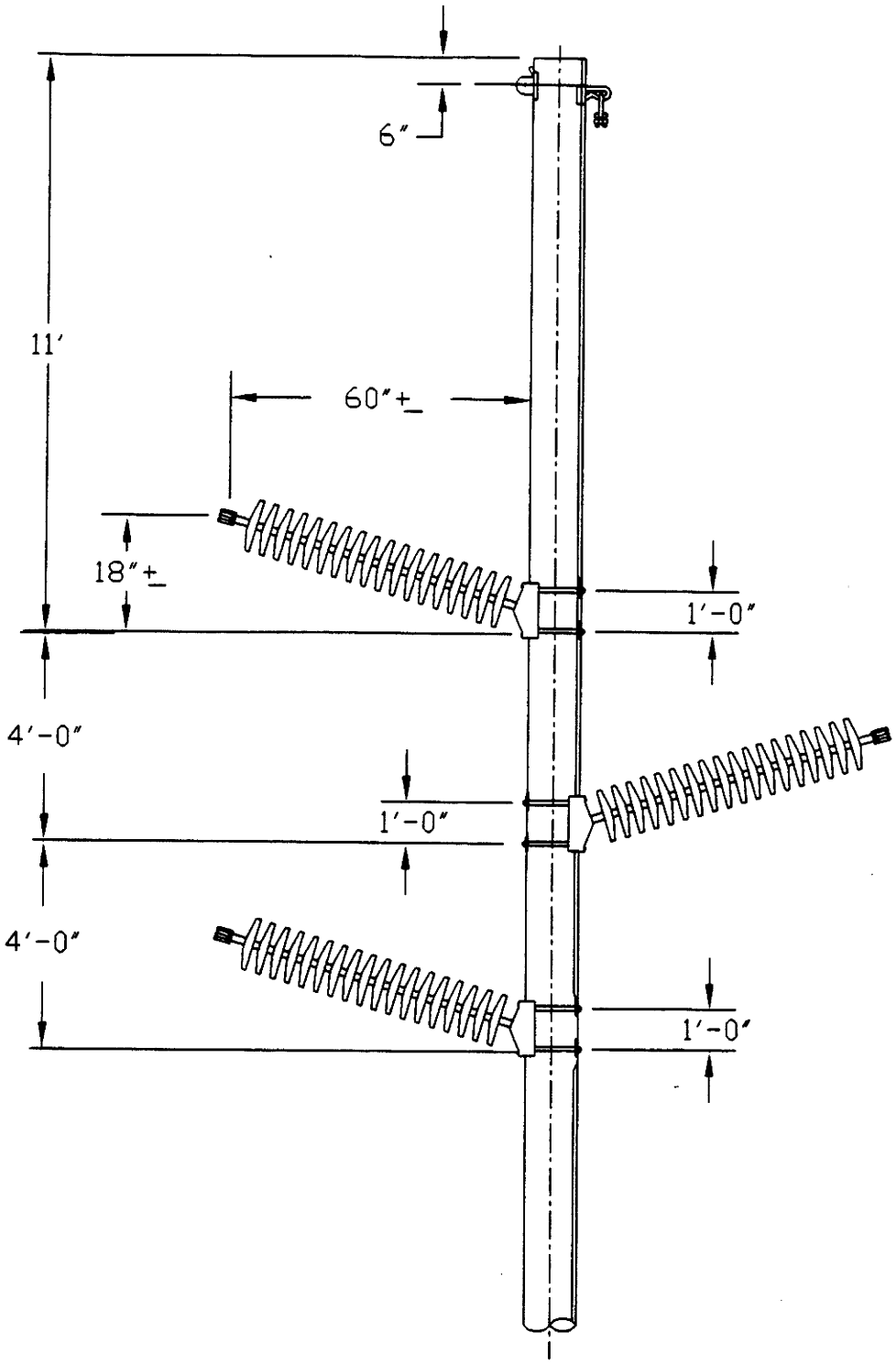


FIGURE 2.4

"HPS" RAPTOR SAFE
46 / 69 K.V. STRUCTURE
(POLYMER INSULATORS)

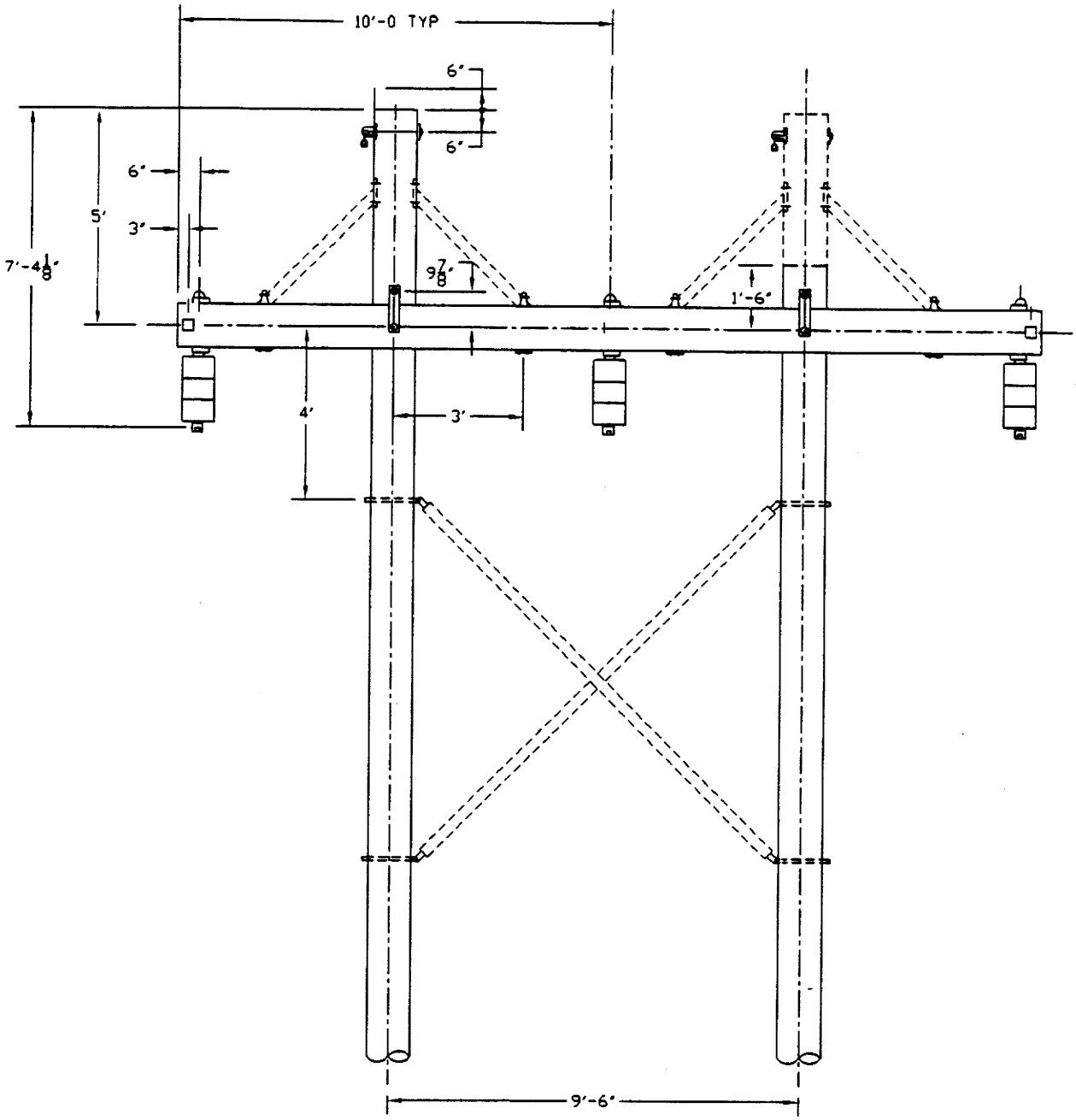
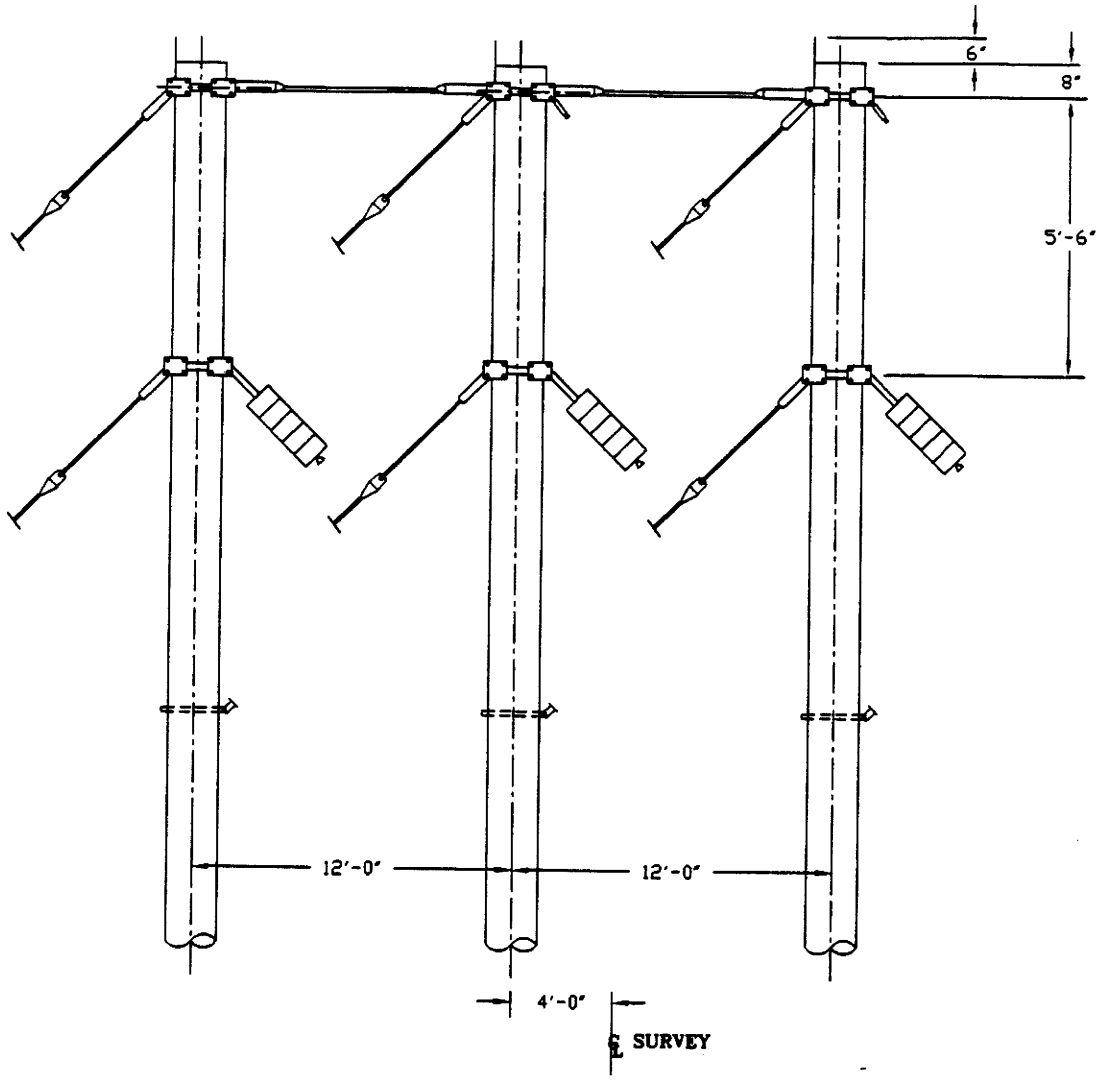


FIGURE 2.5

ES 46 KV STRUCTURE
(3 INSULATORS PER STRING)



NOTES:

1. CHOOSE CORRECT MODULE FOR CONDUCTOR HARDWARE.
2. GROUND WIRE TO BE CLIPPED TO POLE AT 2'-0" INTERVALS AND BONDED TO POLE BANDS.

FIGURE 2.6

C3P

46 & 69 K.V. STRUCTURE

When the structures are in place, the conductor would be strung. A sock line would be laid along the route by hand and light vehicle. Ground crews would place the sock line in pulleys on each structure at the insulator location. The conductor would then be pulled up by the pulleys and through the insulator with the assistance of a reel truck, or by hand, before moving to the next pole location. Wire stringing lengths for this project would be limited to 0.5 miles between pull sites due to the angles, terrain, and inability of the wire pulling equipment to pull the conductor into place. Locations within the proposed power line route would be utilized as pull sites during stringing activities. These pull sites, approximately 0.25 acres in size, would be situated within the ROW. A switching station may be installed where the proposed power line would tap the existing power line. Location of the switching station would be located on a 200 foot by 200 foot area adjacent to the existing power line.

Development of the Lila Canyon Mine Surface Facility - Construction would commence concurrently on the surface facilities associated with the development of the Lila Canyon Mine. The proposed surface disturbance area is shown on PLATE I and II. These plates depict the maximum potential disturbance around the facilities that would be used for the life of the mine. The proposed facility area would be approximately 39.6 acre, but only composed of an anticipated on-the-ground disturbance of 35 acres. This area would be the total disturbance needed for the 20 year life of the mine and would be reclaimed following the completion of underground mining activities. Surface structures and facilities for the Lila Canyon Mine, an underground mine, would be constructed in Lila Canyon near the fork in the canyon located at T.16 S., R.14 E., Section 15, SE 1/4 SW 1/4 (PLATE II and PLATE II-A). The function of the surface facility area would be to provide for mine access, mine ventilation, coal storage, coal loading, warehousing, offices, and the bathhouse.

The Lila Canyon Mine is currently within the permit review process of a Mine and Reclamation Plan (MRP) Permit Application for the UDOGM (Review in Progress). This permit application with the UDOGM requires that all proposed mine and mining activities be described in full detail in relation to legal issues and bonding, as well as engineering and how it relates to soils, biology, land use, geology, and hydrology. In association with the proposed Lila Canyon Mine engineering actions, mitigation as recommended by the UDOGM in the form of operational stipulations and creation of successful reclamation procedures upon the cessation of mine operations have been incorporated into each resource discussion within the MRP. Therefore, each action as proposed within this EA has taken into consideration the various resources present and UDOGM requirements to minimize impacts to them. Actions as described within this EA have been summarized from the detailed Lila Canyon Mine analysis.

The mine site surface facilities would be located in Lila Canyon where the Lower Sunnyside coal seam outcrop is accessible. Because of the narrowness of the canyon in this area, surface facilities would be confined to a narrow strip along the bottom of the canyon. Suitable surface area for the mine site would be created by constructing a series of earthen pads within the canyon bottom. This would be accomplished by cut fill material and by leveling out the area in the bottom of the canyon drainage. The average gradient of Lila Canyon in the mine site area is approximately 10 percent. Therefore, the mine pads would be constructed as a relatively level pad with a cut at the base of the

escarpment. Each individual pad would be dedicated to a specific function as part of the overall mine site operation. Access roads would connect the various pad levels with one another, as well as to an underground rock slope to the portal bench.

The proposed mine site is located upon an alluvium bench in an area where the two forks of Lila Canyon converge. The mine office, parking lot and a sediment pond would be located within the main canyon. The proposed road which provides access to the mine site would enter the mine yard in this area. The truck loop and truck loadout would be located within the confluence area. The confluence area would also would contain the crusher building, the coal storage pile, a topsoil storage area, the employee parking area, bath house, substation, portal area, and a shop/warehouse material storage area. The left fork would contain the water treatment facility and storage tanks.

As part of the overall mine site development plan, certain major construction tasks must be accomplished in a prescribed manner. Most of these construction tasks are common to many, if not all of the area described above. The following tasks are listed in order in which they would generally be expected to occur within any given area of the mine site. However, in practice many of these construction tasks would be occurring simultaneously, but at different areas, throughout the mine site. This is attributable to the fact that the mine site construction would be started at the base of the alluvium bench and proceed toward the escarpment and up the canyon. As primary initial tasks are completed at the lower reaches of the site, secondary tasks can begin even though the primary tasks may not yet be completed in the upper reaches of the site. A more detailed construction and reclamation plan, as prepared by UEI for their MRP is included as APPENDIX D.

- **Clearing and Grubbing** - One of the earlier phases of construction would involve the removal of all trees and shrubs from the mine site area. Since there are no large commercially valuable trees, a BLM timber appraisal would not be necessary to determine the value of these resources. Smaller pinyon and juniper trees would be cleared and transported to a green wood storage area within the proposed ROW for public fuel harvesting use. Shrubs and all other slash material would be buried in a controlled manner within the pad fill in nonstructural areas such as the coal storage pad and the material storage area. In order to avoid compaction complications, slash would be buried away from any structure that would be installed in the general area.

- **Construction of the Sediment Pond** - Once the initial grades are established the construction of the initial sediment pond would commence. The sediment pond would consist of an 8.4 acre- foot retention pond with an emergency spillway and decant device. The pond could be decanted into the existing drain ditch adjacent to the road where it would flow unimpeded to the adjacent undisturbed drainage. In this manner the sediment pond would be installed as early as possible in the construction schedule. The pond would then be in place for the entirety of the remaining construction activities and would provide maximum sediment control for the rest of the project.

  The pond would be constructed in the lowest quadrant of the disturbed area whereby most mine site disturbed area drainage would drain initially to the pond. The capacity of the pond

would be well in excess of the 10 year, 24 hour precipitation event requirements. However, if the total pond capacity was exceeded, the over flow from the pond would exit through a riser-type culvert primary spillway equipped with an oil skimmer. This riser spillway would lead directly to the main drainage located below the surface facility area. One advantage of the pond is its proposed location adjacent to the roadway. This would greatly simplify sediment monitoring and clean out. It would also simplify the process of decanting the pond in a manner that meets Utah Nonpoint Discharge Effluent Source (UNPDES) requirements. The open channel spillways would be constructed to pass the 10 year, 24 hour storm event. The spillway would be lined with concrete or grouted rip-rap, and have a bottom width of five feet; a freeboard depth of two feet; and 2:1 sideslopes. The pond would also be equipped with an open channel emergency spillway capable of handling a 25 year, 6 hour storm event. Rip-rap would be installed at the outlet of the open channel spillways to protect the earthen structures from erosional forces.

- **Topsoil Removal, Salvage and Stockpiling** - Available soil over the area ranges from about six to 48 inches, of which an average soil layer of about eight inches thick would be removed and stockpiled as topsoil. The upper six to twelve inches is the most suitable soil, however, the subsoils over much of the area support root growth to depths of about 48 inches. Topsoil would be salvaged with backhoes, trackhoes, and/or front end loaders and hauled by dump trucks to the designated UDOGM topsoil storage area within the permit area. As much as 43,000 cubic yards of topsoil would be salvaged. In conjunction with topsoil salvage, the large boulders of approximately three feet in diameter and larger would be separated and piled near the topsoil stockpile or placed at appropriate sites in the area.

  The topsoil storage area is proposed in the southwest corner of the facilities site near the sediment pond. The stockpile would be protected from erosion and sediment production by roughening the surface, revegetation, berms, and silt fences. Subsoil materials would be used over the area for facilities site development and then retrieved for soil reconstruction during reclamation.

- **Face Up of Coal Seam/Preparation of Portal** - Two underground rock slopes (approximately 1,200 feet long) would be tunneled up from the toe of the mountain on a 12 percent grade to intercept the down dipping coal seam. The coal would be mined to the south to break out at the escarpment face approximately 500 feet above the mine facility yard. At this point, the mine ventilation and belt portal would be developed. As soon as possible after construction begins, the coal seam would be faced up and the portal area excavated on the southeast side of canyon within the right fork. Prior to facing up the portals, the area would be cleared and grubbed, and topsoil stored. The pad would be constructed long enough to accommodate at least two portal openings for a travel-way and belt, while minimizing the height of the cut face. Minimizing the extent of the cut face is an important consideration not only in the initial mine development but also and even more so for final reclamation. The portal pad would be constructed and stabilized as necessary to conform to the safety requirements of Mine Safety and Health Administration (MSHA).

In order to achieve minimum disturbance of the canyon side slope, the portal pad would be built on fill.

- **Construction of Earthen Pad and Access Roads** - According to computer models of the mine site earthwork, all borrow would be generated within the site to achieve the proposed mine yard configuration. Fill would be placed in 18 to 24 inch lifts and compacted to a minimum 90 percent density for nonstructural areas, and to 95 percent density in structural areas. Nonstructural areas include parking lots, material storage areas and coal storage areas. Structural areas include all areas under buildings, conveyor belts, substation, backfilled areas around culverts and reclaim tunnels, roadways, mine fan and reinforced earth retaining walls. Experience has shown that this material can usually exceed 95 percent compaction using standard wheel rolling methods, although vibratory compaction would be used in critical structural areas. All earthwork would be required to meet a minimum of 4,000 pounds per square foot (psf) load-bearing capacity. Construction emphasis and priority would be given to those pad levels that are designed to accommodate key structural elements of the surface facilities. These include the pad levels associated with the coal pile reclaim system, the substation, the elevated conveyor gallery, bath house, and shop/warehouse building. Some pad construction would involve cutting into the existing side slopes. Cuts would be minimal, and would not usually extend up-slope more than about 20 feet above the completed pad level. The primary purpose of the sideslope cuts is not to generate fill volumes. Cut slopes area would also be necessary to define the limits of the pads for the purpose of layout and engineering design. Clear slopes would also be needed to assure long term site maintenance. Before any slope cuts are made, topsoil would first be salvaged and stockpiled. After the topsoil has been removed and protected as described previously for topsoil stockpiling, the substrate material would be excavated.

- **Installation of Drainage Controls** - As previously stated, the sediment pond would be constructed as early as possible in order to provide maximum sediment control during the term of the construction project. Once the pad levels are constructed, along with the interconnecting roadways, drainage control ditches and culverts would be constructed and culverts installed. Disturbed area ditches and culverts would be designed to handle a 10 year, 24 hour storm event. Where necessary, ditches would be lined with concrete or rip-rap to prevent erosion where velocities are expected to exceed five feet per second (fps). Culvert inlets would be designed to provide adequate freeboard for design flows; outlets would be rip-rapped where necessary to prevent scouring.

- **Construction of Coal Handling and Associated Facilities** - Construction of the coal handling facilities would be scheduled to allow the mine to get into full production as quickly as possible. The underground mining operation cannot function smoothly until the elevated conveyor gallery and discharge structure are fully operational. On the other hand, the mine conveyor cannot become fully operational until the mine working area is developed far enough underground from the portals to allow the conveyor to be extended into the mine works and become an integral working part of the continuous miner production section.

Once the initial mine works have begun, connected up underground with crosscuts, the conveyor can then become operational.

Other integral components of the coal handling facilities necessary for full production include the coal reclaim tunnel, crusher building, truck loadout and interconnecting conveyors. Only after this system is completely operational, can mine development and coal production begin in earnest. Other important structures necessary for full-scale mine surface production include the main substation, water delivery system, and mine ventilation fan.

After the critical path coal handling facilities and mine development structures are fully operational and the underground mine development is proceeding on course, full attention would be focused on completing the ancillary surface facilities. Once the permanent structures are finished, the temporary accommodations used during construction can be removed from the site.

Buildings to be constructed at the mine site include: an administrative office, a shop/warehouse building, and a bathhouse/lamphouse building. The shop/warehouse would be used to repair and store mine equipment and supplies. The yard area around these buildings would be used for additional outside storage and parking. The bathhouse and office buildings would be sized to accommodate a workforce of approximately 140 people.

PLATE II-A is an overview of the mine surface facility. The following facilities would be constructed in conjunction with the mining operation:

Administration Office/Bathhouse/Lamphouse- The main office would be a framed building measuring approximately 80 feet wide by 250 feet long. It would handle the administrative functions such as accounting, engineering, payroll, marketing and management. The bathhouse would be sized to accommodate the anticipated workforce. Located at one end of the bathhouse building would be the lamphouse. The main office would be located on a dedicated pad at the lower (western) extent of the mine yard. Parking would be made available in the area adjacent to the main office.

Mine Fan - The mine fan would be located at the return air portal. It would be a 12 foot diameter, direct drive, 1,000 horsepower (hp), axial vane exhausting type fan. The fan housing would include airlock travel doors for machinery and personnel. The exhaust duct work would be equipped with acoustical sound-proofing material to minimize noise levels.

Shop/Warehouse - The shop/warehouse building would be a prefabricate metal structure measuring approximately 100 feet wide by 150 feet long. It would be located in the southwestern part of the mine yard conveniently adjacent to the mine road. A storage area for materials and supplies would be located nearby, as would be the fuel storage, rock dust storage and garbage repository (dumpster) facilities.

Coal Stockpiling Facilities - Coal would be brought out of the mine and delivered to the surface via a 2,000 ton per hour, 60 inch wide mine conveyor belt. The mine conveyor would exit out of a portal located about 40 feet high on the west side of the right fork of Lila Canyon. Even though the mine portals are located in the right fork, the run-of-mine coal would be stockpiled in a storage area located in the confluence of the forks. Coal would be transported from the right fork portals to the stockpile by a 600 foot long, elevated overland conveyor gallery. This 2,000 ton per hour, 60 inch wide conveyor would be covered and supported along a series of box truss galleries, elevated approximately 50 to 60 feet above the mine yard. These conveyor truss galleries would be supported by several two-legged steel bents spaced approximately 120 feet apart. After crossing the point that separates the right and left forks, the conveyor would terminate at a cantilevered discharge structure at a location above the coal stockpile area. A conical coal pile would be built directly below the discharge structure. The pile would be about 80 feet high at full capacity and contain about 30,000 tons of coal. Storage can be obtained by pushing the pile northward onto the coal storage pad.

Coal Reclaiming Facilities - A 13 foot diameter multi-plate reclaim tunnel would be located below (underneath) the coal pile. Two reclaim draw down ports located at the end of the tunnel would allow coal to be reclaimed from the bottom of the pile directly onto a 54 inch reclaim conveyor located within the tunnel. Each reclaim port would contain a pile activator, a hydraulically operated single bladed shut-off gate, and a discharge chute leading to the reclaim conveyor. Each port would be capable of loading the reclaim conveyor at a full capacity of approximately 1,400 tons per hour. Once the coal has been loaded onto the reclaim conveyor, it would then be transported out from underneath the pile. The reclaim conveyor would bring the coal out of the tunnel and transport it to a crushing/screening building.

The crusher building would be an open steel structure containing a 40 hp, eight by 20 foot scalping screen which would remove all minus two inch coal ahead of the crusher. The plus two inch coal from the top screen deck would be fed to a 300 hp hammermill impact crusher where the coal would be reduced to a two inch product. All transfer points within the crusher building would utilize enclosed chute work to contain and control fugitive dust emissions. These transfer points include the transfer from the reclaim conveyor to the screen, the screen unders (minus two inch) to the loadout conveyor, the screen overs (plus two inch) to the crusher, and the crusher discharge (minus two inch) to the loadout conveyor.

Within the crusher building would also be located a self cleaning tramp iron magnet (located at the reclaim conveyor discharge pulley ahead of the crusher), and an automated sampling system. The crusher building and the coal reclaim tunnel would be separated by a 25 foot wire reinforced earth wall. The crusher building would be located on a bench on the lower (down-canyon) side of the wall and positioned in such a manner that gravity flow would aid the movement of coal through the screening, crushing, and sampling operations.

From the crusher building the crushed and screened two inch coal would then be loaded onto

a covered 48 inch wide loadout conveyor operating at a rate of 1,400 tons per hour and pass to one of three product piles or transport storage pile (approximately 100,000 tons). The coal would then be transported to an automated truck or loadout station. The truck loadout would be an elevated steel frame structure constructed high enough to allow the trucks to be positioned under a contained chute during loading. Electronic sensors would determine when the truck is properly positioned under the chute. The feed conveyors (i.e., loadout conveyor and reclaim conveyor) would start and stop automatically to load the individual truck trailers with a predetermined amount of coal. Certified belt scales would be used to control the loading process.

The truck loadout would be located at the upper end of the truck loop. The loop would be long enough to accommodate up to four empty trucks in the queuing lane waiting to be loaded. After being loaded, the trucks would leave the mine site and haul the coal to an off-site unit train loading facility. All conveyors would be covered and all conveyor transfer points would be enclosed.

Electrical power - The proposed 46kV overhead power line would terminate at a substation on the mine site. Located in the right fork below the portal bench, the substation would contain a 12 MVA 69 kV/12.5 kV transformer, along with various other electrical power control apparatus (air-break switches, visual disconnects, bussing, ground fault detection, vacuum circuit breakers, power factor capacitor banks, metering equipment, and a control room). From the secondary side of the substation, power would be distributed throughout the mine yard and to the underground workings at 12.5 kV. At various locations within the mine yard, the power would be routed through a set of 12.5 kV/4160 V/480 V transformer banks and motor control centers to operate the surface equipment. These combination transformer/motor control center units would be located at the crusher building, overhead conveyor drive station, mine fan, and shop/warehouse.

Water Facilities - A water right would be filed with the Utah Division of Water Rights for use of the water from the flooded Horse Canyon mine works. Upon approval of the water right application, a water line within the underground workings from the flooded works to the storage facilities within the surface facility area would be constructed to serve the culinary/potable requirements of the proposed mine. Water storage facilities (tanks) would be located on the surface to provide storage for usage and as pre-storage before being pumped into the mine to an underground storage sump for use in the mining operation. The surface storage tanks would be located above the bath house to provide sufficient static head (pressure) for yard distribution. Sewage from the administrative office and bathhouse would be treated by separate underground septic tanks and drain fields.

Telephone Service - Telephone service would be provided using conventional phone service provided via a fiber optic line as described in the utility corridor section.

Other Structures - Additional, smaller structures include miscellaneous storage sheds, pump house, above ground storage tanks (for fuel, water, and dust control chemicals), powder

magazines, rock dust storage tanks and trash containment structures. All buildings and structures would be made of conventional construction materials including wood, masonry, or steel. Buildings would be color coordinated to blend in with the natural surroundings.

Conventional Mining of Existing Coal Reserves - Mining would begin in Section 15, T.16 S., R.14 E. in the Sunnyside seam. Development of the Sunnyside seam would be in a down dip directions toward the east, and would be accessed by two 1,200 foot slopes driven up at 12 percent slope from the base of the cliffs. Phase I production has been estimated at 200,000 tons of coal during the first year and escalating to 2.5 million tons by the fifth year.

Mine pillars would be sized by taking into consideration the coal strength, depth of cover, width, and height of pillars. Mine structural design would incorporate one or more of the following methodologies: Obert-Duvall, Holand-Graddy, Holland, Salamon-Munro, or Bieniawski. Mine experience and past mining history in the area would have as much influence on pillar sizes as do the engineering formulas.

Mine production would begin with the slope construction. Once the coal is encountered development would proceed using continuous miners and various haulage equipment. Battery, cable, or continuous haulage may be used in conjunction with continuous miners in development. Continuous miners would account for all the production during the first two years. Mining would consist of driving mains, developing room and pillar panels. Gate entries would also be proposed for future long wall mining associated with proposed Phase II actions. No exploratory drilling is anticipated.

Roof control and ventilation plans would be submitted to the Mine Safety and Health Administration and approved prior to any underground mining activities. Ventilation of the mine would be by an exhaust type system. It has been estimated that 900,000 cfm would be required at full production. Intake air would be supplied by slopes and entries from the surface. Dust suppression would be accomplished by the use of sprays on all underground equipment as required. Sprays would also be used along sections of the conveyors and at transfer points.

The workings are expected to produce some water with more water being produced as the depth of mining increases. Part of this water would be used for dust suppression. The remainder would be collected in sumps and pumped to mined out sections of the mine or to the surface and treated when necessary.

Wildlife Enhancement Projects - UEI would provide two rainfall water catchments to benefit bighorn sheep populations and habitat use within the area above the proposed mine site. These guzzlers would be installed by BLM and Utah Division of Wildlife Resources (UDWR) in suitable locations along the cliff-talus habitat south of the Lila Canyon area. This project would be implemented in the same manner as described in detail in the EA "Saddlehorn Water Catchment" EA Number UT-066-97-1 which addressed similar concerns relative to Bighorn Sheep.

In addition to this project, UEI would complete a vegetation treatment project within the affected area to increase small mammal populations, and thus increasing the forage capacity for area raptor populations. Project design would be provided by BLM and UDWR and involve treating and reseeding approximately 93 acres of habitat. The vegetation treatment would be designed to improve diversity and density of vegetation cover types and create a mosaic of treated and untreated areas to maximize benefits of edge for wildlife species.

Description of Physical Facilities of the Proposed Action - Phase II Activities associated with Phase II are solely dependent upon market conditions and status of production associated with Phase I. However, the actions currently proposed for Phase II are known and include:

- Asphalt paving of the coal haul road
- Long wall mining of existing coal resources

The following section describes the general proposal for each activity associated with this phase.

Asphalt Paving of the Proposed Coal Haul Road - A four inch asphalt layer would be added to the new coal haul road constructed from the mine to U.S. Highway 191/6. This would not constitute additional disturbance, but would allow for increased traffic and speed while resulting in a complete reduction in fugitive dust. Traffic resulting from Phase II development has been estimated at 550 vehicles (staff and coal haulage) per day at full production of four million tons of coal.

Long wall Mining of Existing Coal Reserves - The proposed Phase II mining would utilize all of the same equipment, personnel and facilities as described in Phase I. However, a long wall unit may be introduced, thus potentially increasing production to as much as four million tons of coal per year with the same workforce. PLATE II shows what portions of the existing lease areas would be mined with the long wall miner. Surface facilites described in the proposed action as Phase I were designed to accommodate the potential increase in production. No exploratory drilling is anticipated.

Stabilization, Maintenance and Operation Plan Procedures that make up the following operation plan are designed to minimize and stabilize disturbances to resources present within Phase I and Phase II of the proposed action during its construction, operation and maintenance. Construction activities as described for the mine surface facility were designed to minimize and stabilize disturbances associated with that portion of the proposed action. Support facilities would be operated and maintained in accordance with the permit issued for the Lila Canyon Mine and located, operated and maintained in a manner that prevents or controls erosion and siltation, water pollution and damage to public, state, or private property. To the extent possible, the best technology currently available would be utilized to minimize impacts to area resources and related environmental values. The support facilities would be designed to minimize additional contributions of suspended solids to the stream flow or runoff outside the permit area and, should any contributions occur, such contributions would not be in excess of limitations of Utah or federal law. A full description of the affected resources and impacts to them are described in CHAPTER 3.0 and CHAPTER 4.0

Soil disturbance during the construction would be restricted to the ROW associated with each portion of the proposed action. Unauthorized cross-country vehicular travel by construction crews would be prohibited. Construction activities would be conducted to minimize erosion and in accordance with the natural topography where possible. Exposed areas resulting from construction and the excavation of the described sites would be stabilized using wood fiber mulch and tackifier with the approved BLM seed mix deemed to stabilize the slope and reduce erosion. On slopes exceeding 2:1, native shrubs with significant root structure may be hand planted on a 10 foot spacing.

In order to minimize watershed and erosion damage during wet or muddy periods, access to the ROW's and mine construction site would be restricted. Construction procedures would be consistent with those described within the Utah Nonpoint Source Best Management Plan for Hydrologic Modification. Where runoff and drainage controls would be required, they would be constructed to BLM and/or UDOGM standards. Culverts underneath the road would be installed at a grade no greater than three percent, with rip-rap armoring on the outflow. In areas that warrant there use, perforated culverts may be used to minimize alteration of existing surface/subsurface water exchange. The hydrologic regime would be protected by the installation and implementation of protection measures at all proposed crossings and drainage modifications. This would deter the potential for side cutting and further impact to the drainages surrounding the crossing. Where required, other flow control structures may include energy dissipaters and channel to sheet flow dispersion fans. As required, hydrological protection in the form of sediment and runoff controls would be installed below all drainage areas. Straw bales would be installed in the established borrow ditch along all slopes in excess of 12 percent. Activities within all wash and gully areas would be limited.

All drainage from the mine site disturbed area would be conveyed to and treated by a sediment pond located within the disturbed area. The sediment pond size has been calculated based on a 10 year, 24 hour event. Ditch and culvert design are also based on a 10 year, 24 hour event. During routine operation, the pond would be visually inspected daily for unusual conditions and integrity. Maintenance of the mine surface facility would include the periodic cleaning of the sediment pond, drainage control ditches and culverts in order to maintain their function. Clean out material would be disposed of off-site in an approved solid waste disposal facility, such as East Carbon Development Corporation (approximately ten miles northwest of the surface facility). A spill prevention control and countermeasure plan (SPCC plan) has been developed to protect the undisturbed drainages from accidental spills of oil or other petroleum products within the disturbed area. This plan would be available for review at the Lila Canyon Mine site.

In the event of spills of petroleum based products during the construction of the proposed action, procedures outlined in the Emery County and Lila Canyon SPCC Plans would be followed. The BLM, as well as the Utah Department of Environmental Quality, would be notified if the release meets the definition of a hazardous waste as defined in 40 CFR 261.

During the operation and maintenance of the road, the use of covered trucks to prohibit blow off of coal fines along the proposed haul road and U.S. Highway 191/6 would be used. Enforced speed

limits of 35 MPH would also reduce the potential of coal blow-off.

To maintain the cultural, historical and paleontological resource integrity of the area, construction crews and staff would be provided with instructional materials regarding the identification, value, legal protection and treatment of these resources. If any cultural, archeological or paleontological resources are discovered during construction or any operations associated with the road, power line, or mine, all activities would cease at the area of the manifestation. The authorized agency would then be contacted to evaluate the importance and potential of the site. Mitigation measures would, at that time, be made for the value of the resource site. Construction and/or maintenance crews would avoid the site until the resource potential has been determined.

All existing grazing management facilities (corrals, water sources, etc.) would be replaced concurrent with the construction described. A fence would be constructed along the road prior to its use. This three wire strand fence built to BLM grazing management standards, would take into account wildlife and visual resources, and would prohibit livestock access along the traveled road for the life of the project. UEI would install and maintain a 12,000 gallon water tank for the life of the project to facilitate livestock use of the allotment on the northern side of the proposed road and fence. A section of the existing route in the NE 1/4 NE 1/4 of Section 32 in T. 16 S. R. 14 E. would be left to facilitate placement and access of the water tank from the proposed coal haul road. Upon review of roads to be removed as described within the proposed action, the establishment of cattle guards on any remaining roads intersecting the haul road would be evaluated. With termination of use of the haul road, maintenance of these facilities would be transferred to the BLM on public lands.

For reducing visual contrast, reduction of disturbance along the route of the road is the most effective operational technique. Consideration would be given to the basic landscape (form, line, color, and texture) to minimize visual change, while meeting the safety and use capacity of the road. When possible, soil would be contoured using equipment necessary to conform with the terrain and adjacent land within the road ROW. All constructed facilities (fences, mine surface facilities, etc.) would be painted an approved BLM flat grey color, developed to reduce line and form contrast with the existing environment. During the operation of the proposed action, the use of enzyme treatment during Phase I and asphalt paving in Phase II on the road surface would minimize and eliminate dust plumes from traffic. An effort would be made to direct light toward the mountain face as opposed to the valley floor to minimize night glow. No long distance views of bare bulbs would be seen and all lights within the surface facility would be shielded.

To the extent possible, all foliage adjacent to the power line would remain undisturbed to provide maximum available screening of the line relative to the landscape character type. Visual disturbances would be minimized by using poles colored a shade darker in tone than the surrounding landscape, the use of non-reflective hardware, and by placing the poles out of public view where possible. To minimize the view of the power line from the proposed road, the construction and operational power line ROW's would be placed approximately 0.75 miles from the junction with the existing line and intercepting the proposed haul road at the proposed mine site.

Potential measures to help improve air quality for construction activities include proper maintenance of the construction equipment and limited travel on the construction ROW and dirt access roads. Dust generation from disturbed areas would be reduced through interim watering of active construction areas. An enzyme armor coating on the proposed coal haul road would minimize dust generated by traffic during Phase I, with paving in Phase II eliminating it all together. Final reclamation, which includes revegetation of all disturbed areas, would eliminate further impacts.

An air quality permit for the Lila Canyon Mine would be obtained from the Utah Division of Air Quality prior to conducting operational activities. Coal dust associated with the operations of the mine surface facility would be controlled on the conveyor system and transfer points by enclosures and sprays as necessary. Dust from unpaved mine access roads would be controlled by applying water or a dust suppressing solution. Coal would be reclaimed from the bottom of the stockpile directly onto a conveyor belt located within an enclosed tunnel located under the pile. The coal moisture level within the coal pile would be maintained at approximately 6.5 percent or greater by water sprays located on the main mine conveyor.

Noise reduction and control measures for construction activities would include proper operation and maintenance of manufacturer-installed noise abatement equipment. During operational use, enforced speed limits would limit area wide noise by reducing the need for Jake Brake application on descending grades along the proposed road.

Due to the increase in truck traffic along U.S. Highway 191/6, the operation plan would include the installation of signs warning of heavy truck traffic. Enforcement of posted speed limits, especially from the proposed coal haul road tie-in to U.S. Highway 191/6, would increase the awareness of the truck drivers and the reaction time to potential hazards. There would be an acceleration and deceleration lane to facilitate a safe merging of traffic.

Vegetation removal necessitated by the proposed action would be confined to the ROW. Vegetation removed would be set aside during construction activities, and/or left in place upon completion of construction where possible. Vegetation removed would be limbed, lopped and distributed over the disturbed or reclaimed area to increase solar protection for emerging vegetation. Reclamation or surface contouring to restore all disturbed areas would start upon completion of the project, or as specified by the BLM. Reseeding associated with the road, power and mine surface facility would be completed between October 1 and October 31 for both years. The area would be drill seeded with the seed mix shown in TABLE 2.2. This mix, designed for erosion control and slope stabilization, would be seeded along the edge of the roads and power line corridors and all disturbances anticipated during the life of the mine. The same mix, less the shrubs, would be used on the interim reclamation. Slopes exceeding 2:1 would be hydroseeded and hydromulched at twice the seed rate outlined for drill seeding.

In association with the areas that would be reclaimed, an effort would be made to reclaim the existing roads and four wheel drive trails that intersect the existing haul road. Where road sections are eliminated, cuts would be pulled back to the approximate original contour and drainages would be reestablished. Concurrent with recontouring, 200 pounds per acre of 16-16-8 fertilizer would be

incorporated into the top six inches of soil. An additional 100 pounds per acre of 16-16-8 fertilizer would be incorporated into the 2,000 pounds of wood fiber mulch and 200 pounds of tackifier per acre application if hydroseeding is utilized.

An awareness and appreciation of wildlife would be taught to all employees associated with the proposed action. All activities associated with the proposed action development would be coordinated to avoid optimal habitat use periods and areas for all wildlife species. If active/occupied raptor nests are located within 0.5 miles of any portion of the proposed action, construction would not begin within that area during the period of February 1 to July 15. Completion of all construction would occur on or before October 31 for each year, and prior to any established winter big game use of the area. Construction activity within bighorn sheep habitat would be prohibited during the lambing period of May 1 to June 15. The wildlife enhancement projects proposed should benefit local wildlife populations and their respective habitat uses.

All speed limits would be posted at 35 miles per hour or less on the proposed coal haul road. Where visibility along the road is limited by vegetation in excess of four feet, selective thinning would be conducted to minimize the potential for collision between vehicles and wildlife. BLM wildlife standards for fence construction would be incorporated into the coal haul road fence to allow for antelope and other wildlife movement, while allowing for livestock grazing management. The fence would be a wire fence, not exceeding 38 inches in height. The bottom strand would be a smooth (barbless), twisted metal strand, no less than 16 and half inches above the ground. The second barbed strand would be 10 inches above the bottom strand, with the top barbed strand 12 inches above the second. Distance between posts would be on exact 16 foot centers. As previously stated, existing roads and trails would be reclaimed.

TABLE 2.2
RECOMMENDED SEED MIX FOR ALL DISTURBED AREAS

	LBS PURE LIVE SEED/ACRE*
GRASSES	
Needle and Thread	
Stipa comata	2.0
Indian ricegrass	
Oryozopis hymenoides	2.0
Great basin wildrye	
Elymus cinereus	1.0
Galleta	
Hilaria jamesii	1.5
Russian wildrye	
Elymus junceus	1.5
FORBS	
Lewis flax	
Linum lewisii	1.5
Yellow sweetclover	
Melilotus officinalis	1.5
Palmer penstemon	
Penstemon palmeri	1.0
Globemallow	
Sphaeralcea ambigua	1.0
Small burnet	
Sanguisorba minor	1.0
Prostrate kochia	
Kochia prostrata	0.5
SHRUBS	
Winterfat	
Eurotia lanata	1.0
Wyoming big sagebrush	
Artemisia tridentata wyomingensis	0.5
Douglas rabbitbrush	
Chrysothamnus viscidiflorus	1.0
Fourwing saltbush	
Atriplex canescens	1.0
TOTAL	**20.0**

Time-frame TABLE 2.3 is a breakdown of activities proposed for both phases.

TABLE 2.3
CONSTRUCTION TIME FRAME FOR PHASE I AND PHASE II

Phase I

July 15, 2000-August 2000

- Upgrade existing Lila Canyon Road to proposed surface facility site.
- Replace old culverts, borrow ditches and resurface and initiation of rock slopes.
- Implement interim drainage controls, earthwork for pad and site facilities
- Completion of rock slopes

August 2000-September 30, 2000

- Construct surface facility structures
- Begin construction of coal haul road

September 30, 2000-November 1, 2000

- Construction of coal haul road/acceleration, and deceleration lanes.
- Complete surface facilities (structures)
- Permanent sediment controls, sediment pond and all drainage diversions
- Construct 46 kV power line

November 1, 2000-Dec 31, 2000

- Begin coal production and stock piling

May 15, 2001-July 15, 2001

- Completion of coal haul road
- Initiate haulage of test quantities of coal

Phase II - Anticipated

January 2005

- Submit engineering and final design for paving coal haul road
- Initiate review of actions and impacts associated with Phase II

April 30, 2005

- BLM approval of final design

May 15, 2005

- Begin Phase II paving-coal haul road
- Mobilize equipment

October 15, 2005

- Completion of coal haul road upgrade, asphalt surface, signs, painting, guard rails

November 7, 2005

- Reclamation of all disturbed area no longer need for operational purposes

Abandonment and Reclamation The existing Lila Canyon Road would be maintained as a private mine road that would prohibit public access through the property for the life of the mine. The new coal haul road would be maintained by Emery County through a cooperative agreement with UEI. The expected life of the mine is 20 years, which upon cessation of activities, would be

dismantled and reclaimed. Lila Canyon Mine is in the process of obtaining their operation MRP with the UDOGM. Activities described for construction are described in full detail within that document. A summary of proposed reclamation activities is included in APPENDIX D. At the time of closure and subsequent reclamation of the Lila Canyon Mine, Emery County may find it to their advantage to cease full season maintenance of the road. However, elimination of the road is not expected to occur.

If UEI and/or UP&L terminate the use of the power line, it would be done in accordance to the BLM guideline stipulations at the time of removal. An appropriate schedule for activities associated with dismantling of the power line would be established at that time. Upon dismantling of the line, a reclamation plan would be implemented for the established ROW.

2.3 Alternatives Considered But Not Analyzed Further

The following alternatives were discussed and dismissed during agency scoping in 1998 and 1999.

2.3.1 Alternative A - Use of Existing Horse Canyon Site for Coal Mine Operation

This alternative would have utilized CR 125 (Horse Canyon Road) to the existing Horse Canyon graveled road that accesses the abandoned Horse Canyon Mine site. Rather than being located within Lila Canyon, the proposed mine surface facilities would be constructed at the old Horse Canyon Mine site, with access to the coal lease area being gained through improvement of the old underground workings. Generally, it is more dangerous to re-enter an abandoned mine due to the existing conditions within it than to develop a new entry. Preliminary engineering evaluation of this option determined that ventilation, mine dewatering and safety concern problems would be encountered with re-entering the Horse Canyon site.

The Lila Canyon reserves are located approximately 14,000 feet (2.65 miles) from the current Horse Canyon portal. Due to the amount of ventilation required to operate a modern mine and distance to the coal reserves, it would be necessary to develop as many a five new surface entries. These new entries, constructed as either a vertical shaft or outcrop access, would require additional fans and powerlines outside of the surface facility area. Preliminary engineering of this option indicated that as much as 1.8 billion gallons of water have entered the mine since its sealing in 1984. Past mine water samples have indicated that this water has a high total dissolved solid (TDS)and iron concentration. To meet UPDES discharge requirements of one ton per day of dissolved solids, only 85,000 gallons could be pumped out daily at this site.

The mixture of water and air tends to expand the rock and coal strata, creating an extremely unstable and unsafe condition to access the south lease reserves. In order to compensate for this structural problem, the entry material would need to be excavated and a shoring base built strong enough to compensate for the loss in integrity. Since some of the main pillars required for roof support that are in route to the Lila Canyon reserves have been mined, an additional unstable situation would

need to rectified prior to the safe operation of the facility. Therefore, due to the project infeasibility associated with the construction of a numerous entries and extended ventilation system, the supported entry, and the increase in project disturbance to the surrounding environment in association with dewatering the old mine works, this alternative was dismissed from further consideration.

2.3.2 Alternative B - Use of the Horse Canyon Road/Lila Canyon Road for Coal Mine Operation

This alternative would have utilized the proposed Lila Canyon Mine surface facility, power line and coal mining activity as described within the proposed action. However, CR 125 (Horse Canyon Road) would be upgraded and utilized for coal haulage and mine operations in association with the existing Lila Canyon Road. The existing Lila Canyon dirt road would be required to be upgraded to enable coal haul traffic and daily use for mine operations. Extensive cut and fill would be needed to create a wide enough road, as well as to establish a suitable grade and a safe and usable road to access CR 125. CR 125 would require that the entire road be redesigned and established to create an access suitable for coal haul traffic as well as remain usable for day to day use as a access route to Columbia and East Carbon from U.S. Highway 191/6. Due to the considerable upgrade of these two roads that would be required, this alternative was dismissed from consideration. APPENDIX B contains a letter from the Emery County Road Department as to the proposed requirements.

CHAPTER 3.0 AFFECTED ENVIRONMENT

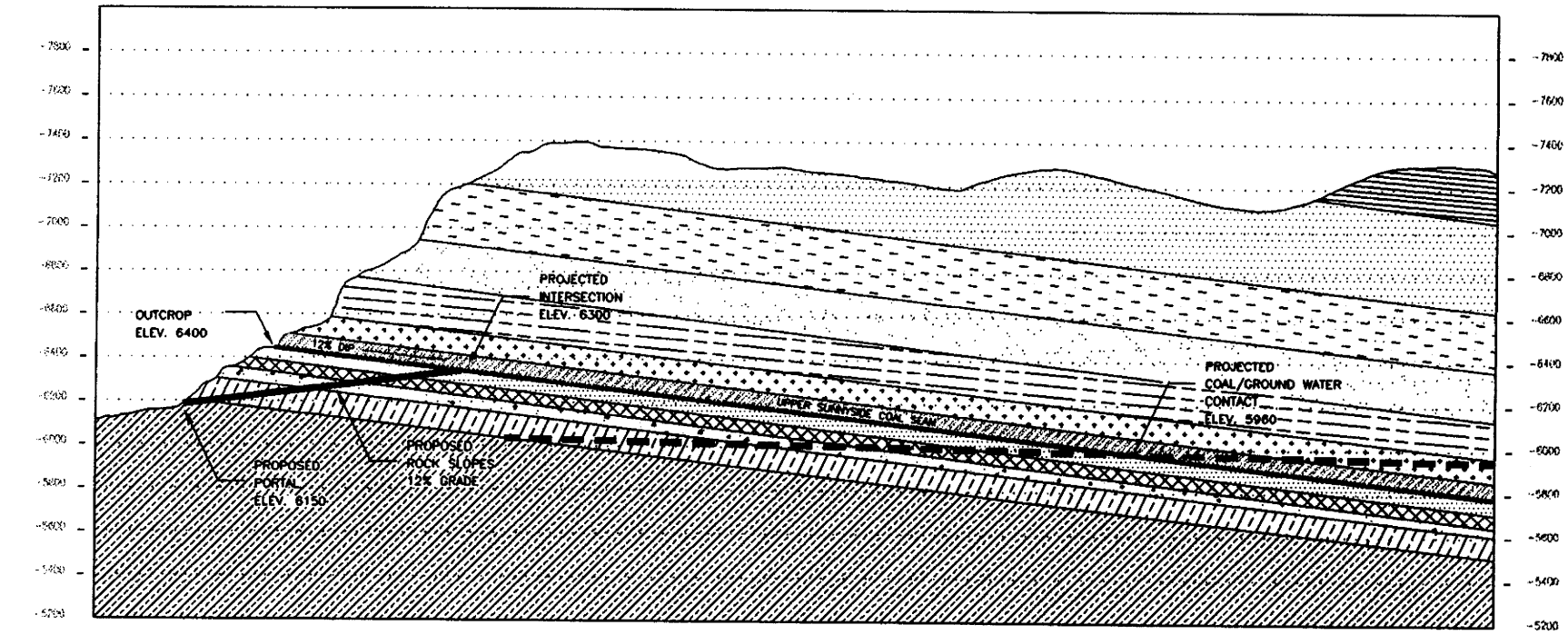
3.1 General Setting

Elevations in the area of the proposed action ranges from 5,700 feet to 7,000 feet above sea level and is characterized by hot, dry summers and cold, moist winters. Most of the available water results from winter snow accumulation. Summer precipitation comes from short duration thunderstorms which often result in flooding and erosion (Lines et al, 1984). Characteristic vegetation includes Douglas fir in the highest elevations, pinyon-juniper forests over most of the bench areas, and a mixture of shrubs and grasses in the low areas. The general area is predominantly a natural but disturbed setting, with several dirt roads and routes presumably constructed for grazing and mineral exploration activities meandering through the area.

3.2 Geology

Lila Canyon is located within the Colorado Plateau Physiographic Province. The High Plateaus of Utah and the Canyonlands sections meet within the area along the Book Cliffs, an escarpment that extends from Castle Gate east to Grand Junction, Colorado. The project area is characteristic of the mid-elevations of the province, consisting of deep, rugged washes and open plateaus. The geologic structure of the region is controlled predominantly by the uplift of the San Rafael Swell, approximately 25 miles southwest of the project area. Beds are mostly uniform and are inclined from three to eight degrees away from the uplift. The strike of the beds are generally parallel to the face of the cliff. Exposed members of the Price River Formation and Upper Cretaceous Blackhawk Formation are evident in the Lila Canyon Area. The Castlegate Sandstone is approximately 170 feet thick in this area and forms an abrupt cliff over the site. Immediate subsurface geology in Lila Canyon consists of the Upper Mudstone, and Sunnyside Members, with a thin cover of alluvial and colluvial material. FIGURE 3.1 is a typical cross-section of the geology present within the Lila Canyon area.

The majority of coal is located under less than 2,000 feet of cover. The deeper coal is generally located in the northern and eastern portions of the property. A small portion of the reserves are deeper than 2,500 feet. Two coal seams, the Upper Sunnyside and Lower Sunnyside seams, are located in the Blackhawk Formation. Numerous easterly trending normal faults exist within the area. The main faults were mapped by Dunrud and Barnes (1972) and Osterwald and Mayberry (1974). Vertical displacement ranges from 15 feet to more than 275 feet, with displacement diminishing toward the east. Unmapped minor faults may also be present.



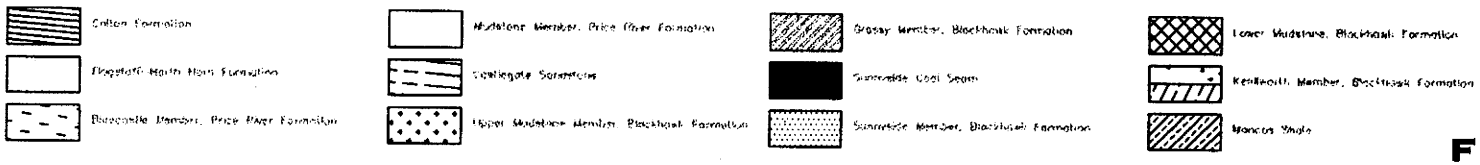


FIGURE 3.1

GEOLOGIC CROSS SECTION OF LILA CANYON AREA

3.3 Soils

The area of the mine site and transportation corridors encompass steep rocky cliff lands, pediments and basins. The mine site is at the toeslope of the Book Cliffs and has mostly a southwest aspect. In going toward U.S. Highway 191/6 from the mine site, the landscape extends into the Mancos shale basin. Sandstone predominates in the cliff lands with shale dominating in the basin areas. Below the cliffs are deposits of stony to very bouldery colluvium. The pediments are composed of very cobbly to bouldery materials. Nearly all rock fragments are composed of sandstone. Soils are well-drained and surface drainage is limited to runoff events. It is an erosional environment where maintaining soil protection by rock fragments and vegetation is critical to holding soil in place. Soil conditions combined with high intensity, short duration storms create rapid runoff conditions. Runoff has caused extensive natural erosion damage to the landscape.

The soils in the project area have been mapped and described at the third order soil survey intensity level as part of the Soil Survey of the Emery Area, Utah. This soil survey is presently in progress by the USDA, Natural Resources Conservation Service(NRCS), and will be a published soil survey meeting national quality standards. The soils map for the project area is presented in PLATE III. An Order 1 soil survey was completed at the Lila Canyon mine surface facilities site in 1998. The detailed soil survey report is contained within the MRP (On-file). The soil map units] identified are those as described by NRCS as of February 1, 1999. Soil map units identified by the NRCS that are within the area are listed below:

Transportation corridor from the Horse Canyon Road to the mine facilities site:

BNE2	Strych very bouldery, fine sandy loam, 3 to 20% slopes.
NGG2	Gerst-Strych-Badland Complex, 30 to 70% slopes.
BY	Badland-Rubbleland-Rock Outcrop Complex
BMD	Strych very stony fine sandy loam, 3 to 30% slope
BME2	Strych very stony loam, dry, 3 to 30 % slopes.

Mine facilities site:

BNE2	Strych very bouldery, fine sandy loam, 3 to 20% slopes.
BMD	Strych very stony fine sandy loam, 3 to 30% slope
NGG2	Gerst-Strych-Badland Complex, 30 to 70% slopes.
RZH	Rock outcrop-Atchee-Rubbleland Complex, 50 to 80% slopes.

Transportation corridor from Highway 191/6 to the mine facilities site:

CHC2	Chipeta silty clay loam, 8 to 15% slopes.
EED2	Hanksville very gravelly, fine sandy loam, 3 to 15% slopes
RIA2	Ravola-Toddler Complex, 1 to 6% slopes
KAC	Persayo-Greybull Complex
SMD2	Clifsand-Minchey Complex 1 to 8% slopes.
BNE2	Strych very bouldery, fine sandy loam, 3 to 20% slopes.

APPENDIX E contains a summary of some of the features of the soil map units.

It has been determined that no prime farmlands or soils of statewide importance are present in the proposed project area (APPENDIX E). Alluvial valley floors are not present in the area based on soil survey information and field observations. Although some soils are formed in alluvium, they are well-drained and lack a high water table typical of alluvial valley floors.

3.4 Hydrology

Hydrologic resources are assessed through examination of existing reports (USGS Open File Report 83-38, Water Supply Paper 2246, and other widely referenced published documents), the Horse Canyon MRP, existing monitoring wells within the vicinity of Lila Canyon, and a historic seep and spring inventories of the proposed mine site and adjacent areas.

3.4.1 Climate

Lila Canyon receives 18-20 inches of mean annual precipitation, primarily in the form of winter snow and secondarily as late summer rains. This information is from extrapolated isohyets, not direct precipitation measurements. Due to a high (modeled) evaporation rate (18-21 inches) and local geology, Lila Canyon does not have perennial stream surface flow. Runoff from brief intense precipitation events is generally severe.

3.4.2 Surface Water

Surface channels in the area of study consist of Lila Canyon, which forms the right fork of Grassy Wash. Grassy Wash drains into Marsh Flat Wash, which in turn is tributary to the Price River. The Price River is currently listed as a Clean Water Act 303d (non-compliance) water body for TDS and total suspended solids (TSS), among other parameters. Horse Canyon has a similar surface drainage pattern to the north of Lila Canyon. There are no perennial stream surface flows within the immediate area of the proposed action. However, numerous spring and seep outcrops exist throughout the area. Locations of seeps and springs, based on the existing inventory, are shown on PLATE IV. Within and adjacent to the permit area, 19 springs and seeps were identified in the most recent available inventory. Flows occur from perched local aquifers (North Horn formation) at rock and shale outcrops. The Blackhawk coal formation is classified as a regional aquifer, and is also the source of seeps and springs at lower elevations within the canyons. Flow rates from the springs, as measured for the previous inventory, varied from less than one gallon per minute (gpm) to about 10 gpm.

3.4.3 Ground Water

In the deeply incised mountainous areas of the Book Cliffs, groundwater is present in consolidated bedrock, in both a regional aquifer (the Blackhawk formation) and in perched local aquifers (the North Horn sandstone). Associated with the bedrock aquifers is groundwater within fractures. Groundwater is also found in shallow alluvial deposits at the bottoms of the larger drainages. Lines and others (1984) indicate that most recharge to the ground water system is due to infiltration of

rainfall and snowmelt at the higher elevations. Another potential factor in groundwater movement is a network of east-west fractures beneath Lila and Horse Canyons. It is presumed that potentially affected formations are presently saturated, therefore no underground water movement through the fractures is currently occurring.

Evaluations by JBR Consultants Group (1986) in the Sunnyside and Horse Canyon areas indicate that the most probable water bearing formations are the Upper Price River and the Flagstaff and North Horn (undifferentiated). Waddell and others (1986) found that the water levels in the North Horn Formation in the Book Cliffs were generally several hundred feet above the regional aquifer potentiometric surface found in the Blackhawk Formation. These North Horn Formation aquifers are considered to be perched.

Groundwater resources in the permit area are limited due to the small surface area and low recharge rates. The local recharge and discharge areas for perched aquifers (North Horn Formation and statigraphically above) generally lie within the drainage divide of Horse and Lila Canyons. These local systems are complex and highly dependent on topography.

The regional aquifer consists of interspersed sandstone and shale. The aquifer is laterally continuous as a unit but some of the individual sandstone bodies are discontinuous. Three water monitoring wells were drilled in the Lila Canyon Permit area by Intermountain Power Agency (IPA). These wells were designated IPA-1, IPA-2, and IPA-3, and have been monitored for water depth from July 1994 to April 1996. These holes show water levels above the coal seam in those areas. The regional aquifer is underlain by relatively impermeable shale.

UEI is currently in possession of water rights for the industrial use of underground water within the Horse Canyon mine works, which is the same source the proposed works would have. A listing of water rights (taken from the Utah Division of Water Rights database) for the area of the proposed action is included in this EA as APPENDIX F.

3.5 Land Use

Land use resources and surface ownership within the area of the proposed action are shown on PLATE I and PLATE IV.

3.5.1 Grazing

Two grazing allotments occur within the vicinity of the project area. The existing road, proposed road, proposed power line and mine surface facility would occur within the Cove Allotment. The proposed road would pass near the main watering sources and holding corral for livestock on this allotment. The season of use on the Cove Allotment is during the spring from March 1 to May 31 with 250 head of cattle currently using 750 animal unit months (AUM's). The coal lease area would occur within the Little Park Allotment. This allotment has a summer season of use from May 25 to October 31 with 60 head of cattle using 242 AUM's. (See PLATE IV).

3.5.2 Vehicular Traffic

CR 125, connecting U.S. Highway 191/6 to Horse Canyon and East Carbon, had an annual average daily traffic of 280 vehicles in 1995 (UDOT), 1995). Travel to and from the area of the proposed action would use the Emery County maintained CR 125, for approximately five miles from its intersection with UDOT maintained U.S. Highway 191/6. Access to the Book Cliffs from CR 125 is limited, with traffic on the primary access to Horse Canyon from US Highway 191/6 at 280 vehicles per day. An unmaintained dirt road, which the proposed action would follow closely along the entirety of its length, transects the project area. Access on this dirt road is limited due to weather conditions and maintenance. During inclement weather there are sections that are impassible, and since the road is not maintained on a regular basis, it is virtually inaccessible during late fall through early spring when snow and/or mud preclude conventional vehicles. The heaviest use occurs during the fall in association with hunting, with some additional travel involving grazing, recreational driving, site seeing, and wildlife viewing in the spring and summer.

U.S. Highway 191/6 is a major route for commercial transportation (heavy trucks) between Interstate 70 and the Wasatch Front. South bound traffic normally remains on Interstate 70. It is estimated that more than 5,000 heavy trucks travel between Green River and Price per day. In addition, recreational use has increased to 208 vehicles per hour, thereby creating an overall traffic rate of as many as 10,600 vehicles per day.

3.5.3 Visual Resources

The project area is located in an area of broad open landscapes, broken benches, and steep canyons characteristic of the regional landscape of Southeastern Utah. EXHIBIT 3.1 and 3.2 display views of the characteristic landscape of the project area from Key Observation Points (KOP's) near the intersection of the proposed coal haul road and U.S. Highway 191/6 and CR 125 near the intersection with the existing Lila Canyon Road. From the intersection with the Horse Canyon Road, the existing Lila Canyon Road would proceed south-southeast across a pinyon-juniper bench, before descending a Mancos bench to the proposed mine surface facility site (EXHIBIT 3.1). EXHIBIT 3.2 is a midground view of the proposed area of the coal haul road and a long distance view of the proposed mine site area from U.S. Highway 191/6. The proposed road would proceed east across a bare, gently sloping plain for approximately 7.68 miles to the proposed mine surface facility, located along the broken sloping pinyon-juniper benches below the Book Cliffs. The project area is within an area managed as VRM Class III (objects may be seen, but not dominate the landscape), as established by the Price River MFP.

EXHIBIT 3.1View Looking Southeast Along Existing Lila Canyon Road

EXHIBIT 3.2 View Looking Northeast From U.S. Highway 191/6 (KOP)

3.6 Vegetation

3.6 Vegetation

The proposed action would traverse several plant communities common to this area of Utah. The intersection of the county road with the existing Lila Canyon Road is located on a gently sloping rocky bench, predominantly covered with pinyon pine, *Pinus edulis* and Utah juniper, *Juniperus osteosperma*. From the intersection with the state road, the county road descends from the rocky bench and transects a steep bare escarpment dominated by shadscale, *Atriplex confertifolia*, mat saltbush, *Atriplex cuneata*, cheatgrass, *Bromus tectorum*, and numerous herbs as groundcover. Within this area of the existing road and proposed surface facility, vegetation was largely burned during a range fire in the early 1950's. The area was reseeded with a nonnative seed mix. However, native species were able to persist, with shrubs and grasses dominated by basin big sage, *Artemisia tridentata*, black sage, *Artemisia nova*, needle-and-thread, *Stipa comata*, and Indian rice grass, *Oryozopis hymenoides*. From the proposed mine site west to U.S. Highway 191/6, the predominant vegetation gradually changes to a grass shrub community dominated by Indian ricegrass and sagebrush, to a mat saltbush dominated community of the Mancos slopes near the proposed intersection.

As the elevation gradually increases, and water becomes more available, tree species again become prevalent. The remainder of the area consists of a mosaic of habitats beginning with sections of widely spaced Utah juniper. Areas of sagebrush and grass are still scattered throughout but become much smaller as the route enters the area dominated by pinyon pine and Utah juniper. Within Lila Canyon the vegetation changes to a transitional habitat that incorporates the end of the pinyon and juniper range with microsites, moist enough to support Douglas fir, *Pseudotsuga menziesii*, at the top of the ridge.

TABLE 3.2 contains a list of the various plant species identified within the project area. PLATE V shows the location of the various vegetation communities present within the area of the proposed action. APPENDIX G contains a summary of the TES survey conducted for such plants and a negative determination for their occurrence within the area of the proposed action.

TABLE 3.2
LIST OF PLANT SPECIES IDENTIFIED WITHIN THE PROJECT AREA

COMMON NAME	SCIENTIFIC NAME
Grasses	
cheatgrass	*Bromus tectorum*
needle-and-thread	*Stipa comata*
Indian ricegrass	*Oryozopis hymenoides*
wheatgrass	*Agropyron* spp.
Forbs	
mustard	*Brassica* spp.
locoweed	*Astragolus* spp.
cryptantha	*Cryptantha jonsia*
Shrubs	
greasewood	*Sarcobatus vermiculatus*
prickly pear	*Opuntia* spp.
yucca	*Yucca* spp.
shadscale	*Atriplex confertifolia*
mat saltbush	*Atriplex cuneata*
claret cup cactus	*Echinocereus triglochidiatus*
basin big sagebrush	*Artemisia tridentata*
black sage	*Artemisia nova*
Trees	
tamarisk	*Tamarix ramosissima*
Utah juniper	*Juniperus osteosperma*
pinyon pine	*Pinus edulis*

3.7 Wilderness Values

The area of the proposed action is located partially within and adjacent to two wilderness inventory areas, and adjacent to an established BLM Wilderness Study Area (WSA). A portion of the mine surface facility and underground coal lease would be located on the edge of and partially within the Desolation Canyon Inventory Unit 8 of the 1999 BLM Utah Wilderness Inventory. This 48,900 acre unit has been found to have generally retained its natural character. A few road ways associated with coal exploration have been noted, but were determined by the BLM that individually and/or cumulatively did not detract from the overall naturalness of the unit. Opportunities for solitude and unconfined recreation are outstanding, especially when considered in conjunction with the contiguous established 291,000 acre Desolation Canyon WSA. Supplemental values, such as high

value wildlife and sensitive species habitat have also been found throughout this unit.

The 7,300 acre Turtle Canyon Inventory Unit 4 and small portion of the Turtle Canyon WSA covers the majority of the pre-FLPMA coal lease area. This unit, contiguous to the existing Turtle Canyon WSA, has been determined to have retained its natural character. Outstanding opportunities for solitude and primitive and unconfined recreation exist, due primarily to the extension of the values from the existing WSA. Supplemental values, such as for archeological, scenic, wildlife habitat, and special status plant habitat found within the WSA extend into this inventory unit.

PLATE IV shows the location of the WSA unit and re-inventory units in relation to the general area of the proposed action.

3.8 Wildlife

Wildlife indigenous to the general area of the project include amphibians, reptiles, birds and mammals. General wildlife use of the area is shown on PLATE VI through PLATE IX. APPENDIX G contains correspondence with the U.S. Fish and Wildlife Service (USFWS) regarding the potential of wildlife species concerns within the project area.

3.8.1 Amphibians

There are six species of amphibians known to occur within the general area of the Wasatch Plateau and Book Cliffs. These species are classified as common, but are limited to mesic areas. These species could be present within the Lila Canyon area, but their occurrence is doubtful due to arid conditions that prevail over the majority of the area. The pinyon/juniper and sagebrush/grass areas that make up most of the affected habitat are not considered important or limiting to their survival (Dalton et al, 1990).

3.8.2 Reptiles

There are ten species of reptiles known to inhabit the region. The habitat requirements for these species range in value from critical to substantial. The limited acreage of disturbance within the area of the proposed action, however, is not considered a threat to these species. This is due to the abundance of the preferred pinyon and juniper habitat, as well as sagebrush and grass habitat throughout the area.

3.8.3 Birds

There are approximately 185 bird species that could possibly be either year long residents or frequent the site during portions of the year. Of these, wildlife species of management concern include, loggerhead shrike (BLM Sensitive species) and raptors which will be discussed in-depth.

Loggerhead shrike An intensive survey of the proposed action indicated no nesting loggerhead

shrikes, *Lanius ludovicianus*, near the proposed roads or power line ROW's. This species is dependent upon the broad, open sagebrush and grass plain, as well as the presence of widely spaced pinyons and junipers. A summary of the inventory conducted for this species and a negative determination of its presence is attached as APPENDIX G.

Raptors Raptor surveys, completed in May of 1998 and 1999 by the UDWR, revealed a number of active and inactive raptor nest sites on the open lower benches and cliff faces in and surrounding Lila Canyon (PLATE VIII). In 1998, one tended and two inactive golden eagles, *Aquila chrysaetos*, nests were located along the cliffs surrounding the Lila Canyon area. Two old, dilapidated historic golden eagle nests were monitored, as well as an inactive prairie falcon, *Falco mexicanus*. The 1999 spring inventory, identified one active and one tended Golden Eagle nest within a 1/4 mile of the proposed mine site. APPENDIX G includes a more detailed description of the survey findings.

An inventory in May and June 1998 for burrowing owls, *Athene cunicularia*, and ferruginous hawks, *Buteo regalis*, did not reveal the presence of these species within the project area.

3.8.4 Mammals

Ninety-two (92) species of mammals are known to exist in, or have the potential to inhabit the region. Of these, the following species of management concern; mule deer, *Odocoileus hemionus*, elk, *Cervus elaphus*, Rocky Mountain Sheep, *Ovis canadensis*, and pronghorn antelope, *Antilocapra americana*, have been identified within the affected area (PLATE VI - PLATE IX).

Mule deer Mule deer habitats within the affected area include critical and high priority winter ranges located on the higher elevation benches, as well as year-long range located on the lower elevation foothills below the Book Cliffs. Mule deer population densities within this herd unit are well below management objectives.

Rocky Mountain elk Elk high priority winter ranges are found on the higher elevation benches above the mine surface area and lease area. No winter range is located within the area of the mine surface facility or roads. Population levels for elk are at or near management objectives for this herd unit.

Rocky Mountain bighorn sheep Rocky Mountain bighorn sheep occupy the cliff talus habitat above the surface facility area. Radio telemetry data collected by the UDWR show that Lila Canyon is particularly important to bighorn sheep and supports as many as 15 to 25 head of bighorn sheep year round. This is attributed to the presence of springs and seeps within the Lila Canyon area of the Book Cliffs, as compared with the noticeable lack of water for most of the cliff talus habitat.

Pronghorn antelope Pronghorn antelope occupy the salt desert shrub habitat of the lower elevation ranges along the proposed coal haul road route. This habitat is classified as high priority year-long range for pronghorn. Population levels of pronghorn are at or near management objectives for this herd unit.

3.9 Cultural Resources

There is a long and diverse cultural history associated with the Price and Green River Basins and the Book Cliffs region of east-central Utah. Archaeological inventories in the area of the proposed action (Rouch, 1981; Miller,1991; Montgomery,1998; Montgomery, 1999), have identified eight archaeological sites and several isolated artifacts. The type and time period of these sites fit well into the cultural overview described above. Seven of the sites are located in Little Park, above the mine's surface facilities. Site 42EM2517, a Fremont component rock shelter is adjacent to and visible from the Lila Canyon Road and the proposed mining facilities.

The site is a south-facing shelter located under a large bolder and measures about eight meters east-west, 5.2 meters high and 1.4 meters deep. It has diagnostic chipped stone tools and Emery Gray ceramic shards associating it with the Fremont Cultural. The still intact cultural remains, in particular, the presence of charcoal and oxidized rocks suggest the presents of features or occupational horizons. It is eligible for the National Register of Historic Places under Criterion (d) of 36CFR60.4, based on its potential for contributing significant data relative to the research domains of the area. Investigations of the site could provide data relative to chronology, site function, technology, subsistence, seasonality of occupation, social organization, and extra regional relationships.

CHAPTER 4.0 ENVIRONMENTAL CONSEQUENCES

4.1 Impacts Associated with Alternative A - No Action

Associated impacts identified with the No Action alternative are derived from the inability to supply the necessary utilities, access and development requirements for the proposed coal mine in Lila Canyon. The proposed facility would need to be abandoned and/or relocated and required to establish some other means of access or transport and an alternative power and utility source. Planned development for the facilities described would not occur.

4.2 Impacts Associated with Alternative B - Proposed Action

TABLE 4.1 shows how activities associated with Phase I and Phase II of the proposed action (construction and operation of the proposed roads, power line, development and operation of the mine surface facility, and underground extraction of coal) on federal, state and private lands affect the resources described in CHAPTER 3.0 and as identified during the scoping process.

TABLE 4.1
AREAS OF IMPACT ASSOCIATED WITH THE PROPOSED ACTION

Category	Area (acres)	Remarks
Soils	115.11	Construction Disturbance
	93.11	Operational Disturbance
Hydrology	<1.0	Channel Culverts
Grazing	115.11	Construction Disturbance
	93.11	Operational Disturbance
Visual	Minor	Varies From KOP
Vegetation/Habitat	115.11	Construction Disturbance
	93.11	Operational Disturbance
Wilderness Values	7.50	Surface Disturbance within Desolation Canyon Unit 8
	25.12	Indirect Disturbance within Desolation Canyon Unit 8

TABLE 4.1
AREAS OF IMPACT ASSOCIATED WITH THE PROPOSED ACTION (Continued)

Category	Area (acres)	Remarks
Wildlife	115.11	Direct Construction Disturbance
	93.11	Direct Operational Disturbance
	0	800 Meter Displacement On Each Side of ROW Corridor (ELK)
	0	200 Meter Displacement On Each Side of ROW Corridor (DEER)
	40.0	Direct Antelope High Priority/Fawning Range Disturbance
	37.0	Direct Bighorn Sheep Habitat Disturbance
	93.11	Direct Operational Raptor Foraging Habitat Disturbance

4.3 Geology Impacts

The proposed upgrade and use of the Lila Canyon road, the new coal haul road, development of the mine surface facility and construction and operation of the power line would not impact geological resources. However, proposed mining activities could potentially result in subsidence impacts within the lease area. The degree and extent of subsidence would depend on mining methods used, height of coal extracted and the amount of overburden present. The average coal height to be mined using room and pillar conventional mining and/or long wall would be approximately 10 feet. Since the majority of the proposed mining would take place under 1,500 to 2,300 feet of cover, subsidence would be low or nonexistent at the surface.

Subsidence monitoring at the now inactive Sunnyside Mine operation demonstrated that subsidence overlying that mine was gradual over a period of seven years and only one third to half of the coal thickness mined. Operators of the mine theorized that major sandstone units in the overlying material act to buffer subsidence effects. They also postulated that the presence of a generally thick overburden serves to dampen subsidence. The proposed action would be mining the same seam and is located in the same geologic formations as the Sunnyside Mine. It is anticipated that the same type and amount of subsidence could occur. However, it is expected that due to the remoteness of the location, no surface facilities or structures would be damaged if subsidence was to occur. No renewable resources would be affected.

4.3.1 Geology Mitigation

No mitigation is anticipated. Ongoing monitoring of subsidence and a commitment to repair of an subsequent damage is committed by UEI in the Lila Canyon MRP as part of their proposed operation plans.

4.4 Soils Impacts

The combined construction impact to soil resources from the proposed action would be 115.11 acres. This figure includes all of the proposed mine surface facility disturbance associated with the required cut and fill slopes. The grading required for construction would displace topsoil and associated horizons throughout the total area of the facility. In association with the pad construction, road upgrading, and the construction of a new haul road, the removal of vegetative cover would result in an increased susceptibility to soil erosion throughout the disturbed sites.

A temporal unquantifiable loss in soil productivity and hydrologic formation could occur on the sites occupied by mine facilities and transportation systems during the life of the mining project. Upon reclamation, the area would be returned to approximate neutral conditions, with soil functioning being a major consideration.

Since no grading would be required, the acreage of potential construction impact to soil resources by the establishment of the power line has been calculated to be 10 percent of the ROW. With the construction ROW acreage, shared staging area, pull sites and switching station, disturbance to soils would be less than a half acre. Within the proposed power line ROW, surface disturbance to soil resources at specific pole sites would be minimal (less then 0.01 acres). A temporary impact to soil could occur within the ROW where construction vehicles would compact topsoil layers by gaining access within the ROW for pull sites and the switching station.

An approximate 0.05 acre area of compaction to soils around the livestock water tank proposed would occur due to increased use of the area by livestock. This could result in an unquantified loss of soils due to wind and water erosion. However, since the tank would be located on a portion of an existing disturbed, but retired route that has been heavily compacted by past vehicular use, this potential loss would be minimal. An unquantifiable increase in dissolved solids and salts in the soils could result from runoff from the road surface and from coal fines blowing off haul trucks. No impact to soils present within the area of the mineral lease area are expected.

4.4.1 Soil Mitigation

No mitigation is anticipated. Since UDOGM, in coordination with OSM, would have primacy over the mine site, soil management standards as defined and addressed within the MRP would be followed. BLM standards and requirements for soil handling, protection, and management would be followed to avoid impacts to the soil resources along the coal haul road and outside of the mine site permit area. The actions taken as required by the responsible agencies (UDOGM, OSM, and BLM) would minimize the extent of erosional impacts and eliminate the need for mitigation of impacts. As part of the operation plan for the mine facility, topsoil would be salvaged from construction areas and stockpiled for use during final reclamation. Erosion control and revegetation measures would be applied to protect stockpiled soil materials as discussed within the stabilization and maintenance plan. As discussed within the MRP, prior to any revegetation, soils would be tested and fertilizer or other soil amendments would be added as appropriate. As discussed in the

reclamation plan, soil would be loosened by ripping where soil compaction could limit plant growth. As discussed within the SPCC Plan, any soils contaminated by oil, gas, or other substances, would be disposed of or treated to correct the problem.

4.5 Hydrology Impacts

Any reduction of surface vegetation during the first three years of the project (24 month construction time frame and 36 month revegetation establishment) would decrease infiltration and increase surface runoff. This could contribute to the previously mention soil erosion and downstream sediment loading. Sheet erosion would increase and water quality could be affected by greater sediment loading. However, due to the sparsity of natural vegetation, changes resulting from vegetation reduction are expected to be relatively minor. Of greater concern are changes to flow patterns resulting from the construction of roadway and surface facilities.

Springs could be altered from land subsidence resulting from underground mining. This could effectively change the current hydrological regime, thus altering vegetation community structure and area wildlife use. In the event important water sources are lost or reduced, the proponent is obligated by regulation to replace it. Mine dewatering could augment surface flows to the existing channels. These channels could undergo channel dimension alterations, causing increased bank erosion. Artificial riparian areas could develop as a result of more consistently available water. Any flows allowed to reach the Price River may constitute an unquantifiable source of TDS/TSS loading, due to the saline soils and increased erosion to channel banks.

4.5.1 Hydrology Mitigation

The impacts described for the proposed action are minimized through UDOGM, OSM and BLM regulatory requirement currently in effect. A complete Sedimentation and Drainage Control Plan to control and contain off-site discharge of water from the mine site as required by UDOGM and OSM, is included in the MRP. The proposed sediment storage facilities (PLATE II-A), as described in the MRP and as required by UNPDES regulatory requirements would control and minimize off-site transport on sediments to downstream resources. Maintenance of these facilities would be for the life the mining operation and until final reclamation has been completed. BLM Class III road standards and guidelines for hydrologic modifications for access roads are specifically designed to minimize effects from such changes. These would be included as stipulations to approval of this action. Site specific conditions associated with drainage crossings and sediment controls are further addressed by Class III Road Standards and Price Field Office Hydrologic Modification Standards for Roads. Since UEI has proposed a substitute or replacement water sources (i.e., rainfall catchment guzzlers), the impact to nearby springs for wildlife use would be minimized.

4.6 Land Use Impacts

4.6.1 Grazing

Livestock would be allowed on the allotments described, but excluded from 115.11 acres associated with the active work areas during the two year construction time frame. Upon operation activities, livestock would be precluded during the life of the project on 93.11 acres associated with the proposed surface facility area and operational ROW of the coal haul road. The Cove Allotment would be effectively split by the operation of the road and bordering fences, thus potentially altering the future utilization of the allotment. No reduction of current AUM numbers are anticipated. No range resources, improvements and/or management facilities would be directly impacted by the proposed action on the Little Park Allotment .

4.6.2 Grazing Mitigation

Actions taken by UEI as part of the Stabilization. Maintenance and Operation Plan, discussed in CHAPTER 2.0 would minimize impacts to grazing resources, thus eliminating the need for mitigation. The construction of the fence along the coal haul road would eliminate the potential of vehicular collisions with livestock during the life of the operation. To maintain the current utilization of the Cove Allotment, a 12,000 gallon water tank would be installed and maintained by UEI for the life of the project. The establishment of a water tank on the northern side of the road and a retired portion of the existing route would allow for livestock use within this area of the allotment while minimizing the overall impact to current grazing management. Forage produced by the reclamation of retired routes and roads would increase the use made by cattle in those areas. As discussed previously, UEI would also maintain and/or replace all range improvements which would be affected during construction and operation (ponds, fencing, cattle guards, corrals, etc.).

4.6.3 Vehicular Traffic Impacts

Construction crews associated with the development of the proposed action would travel to and from the work site via U.S. Highway 191/6 and CR 125. During construction of the proposed road approximately 30 people would be employed. Construction of the power-line in the second year of construction could employ as many as 20 people. UEI would employ as many as 30 people during the construction of the mine surface facility. This added traffic would have minimal impacts based on the relatively short construction schedule of approximately 180 days over the two year time frame.

Operational impacts are associated with transport and production of an estimated 2.5 million tons of coal a year during Phase I. This number is based on UEI's proposal in the Resource Recovery and Protection Plan submitted to the BLM in December 1998. Vehicular use would include the personnel associated with the mine, delivery of material to the mine, and the transport of the coal via the proposed road to U.S. Highway 191/6 and the loadout site on the Ridge Road near Wellington. UEI has indicated that at full capacity after five years, as many as 315 coal haul trucks

per day would travel from the proposed mine, through Wellington, and onto the loadout site on Ridge Road off U.S. Highway 191/6. This additional volume of traffic, as well as the increase traffic resulting from as many as 63 mine employees and support traffic, would result in a 3.5 percent daily increase along this 35 mile section of the highway. The potential for an unquantifiable increase in vehicle-vehicle accidents, as well, could increase as a result of this potential traffic volume. Traffic resulting from Phase II development has been estimated at 550 vehicles (staff and coal haulage) per day at full production of four million tons of coal. This would result in a 5.2 percent increase in traffic volume based on the current use of the road (10,600 vehicles per day).

4.6.4 Vehicular Traffic Mitigation

No mitigation has been identified. To minimize congestion impacts of the proposed merging haul road, the proposed action includes the construct of an acceleration and turning deceleration lane from U.S. Highway 191/6. Caution signs, and warning signs would be established along the highway and prior to the intersection of the proposed haul road.

4.6.5 Visual Resources Impacts

Effects to visual resources were assessed for the construction, operation, and closure of the proposed action. Two issues were addressed in determining impacts: 1) the type and extent of actual physical contrast resulting from the proposed action and related activities to existing conditions; and 2) the level of visibility. The majority of the existing Lila Canyon Road is situated along the base of foothills below the southern edge of Horse Canyon Bench. Visual contrast of the road is reduced due to topography and vegetation screening.

U.S. Highway 191/6 would be the KOP for the lower portion of the proposed road and mine surface facility. Road cuts created by the realignment of the new road would be evident from a short distance, but should not have a long range physical contrast. Since the mine surface facility would be located within the narrow Lila Canyon, visibility of the facility from any KOP would be minimal. However, the surface facilities when lighted at night would be visible form numerous points along U.S. Highway 191/6 and to a lesser degree a "glow" may be in evidence from U.S. Highway 10 between Price and Huntington.

The visual impacts of the power line would be an increase in contrast to the surrounding landscape. However, since minimal vegetation removal would be required, physical contrast over the area of the power line would be minimal and not visible from a KOP.

4.6.6 Visual Resource Mitigation

No visual resource mitigation has been identified. Actions taken as part of the Stabilization, Maintenance and Operation Plan in CHAPTER 2.0 would meet the established VRM standards.

4.7 Vegetation Impact

The vegetation disturbed by the proposed action is shown in TABLE 4.2. As previously discussed, the area of the proposed action construction could compromises as much as 115.11 acres. Vegetation and habitats impacted are not limiting nor specific to the project area. Therefore, the acreage of impact would not affect the health of the local community structure. Vegetation bordering the existing road would be eliminated in most cases to minimize the potential for vehicle-wildlife incidents. Vegetation within Lila Canyon would be eliminated or temporarily impacted (three years) by construction and operation of the proposed road, power line and mine. Vegetation within 35 acres of the 39 acre mine surface facility would be removed for the life of the operation.

Impact to vegetation populations away from the road and mine site would be minimal, and limited to activities associated with construction of the power line. Vehicular travel along the power line ROW may flatten and crush ground cover. No impact to the sagebrush-grass habitat is expected. Disturbance to reclaimed areas would be temporal, from 24 to 36 months, and/or until vegetation becomes fully established. Upon reclamation of the road cuts and unused portions of the mine surface facility, operational impacts to vegetation would be minimized to 93.11 acres. This life of project acreage would encompass the 50 foot ROW of the road, mine surface area, and power line facilities. No impact to vegetation resources is expected from the proposed underground mining activities.

4.7.1 Vegetation Mitigation

No mitigation is anticipated. Activities proposed as part of the proposed action should effectively minimize all impacts to vegetation resources. All disturbed areas not needed for operations would be revegetated during the first available growing season. A commitment to reclaim all areas at the conclusion of mining is made in the Lila Canyon MRP and a reclamation bond would be held in force until all disturbance has been satisfactorily reclaimed.

TABLE 4.2
HABITAT DISTURBANCE ASSOCIATED WITH THE PROPOSED ACTION

	Habitat Type	Construction(Acres)	Operation (Acres)
Lila Canyon Road:			
	Sagebrush-Grass	17.23	13.23
	Pinyon-Juniper	3.74	3.74
Road:			
	Sagebrush-Grass	41.30	31.11
	Pinyon-Juniper	11.11	8.77
Power Line *:			
	Sagebrush-Grass	1.22	0.98
	Pinyon-Juniper	0.35	0.28
Mine Surface Facility:			
	Pinyon-Juniper	19.00	16.40
	Grass/Brush	21.16	18.60
TOTAL ACREAGE		**115.11**	**93.11**

*** Disturbance Determined as 10 Percent of Power Line ROW**

4.8 Wilderness Values

Surface facilities associated with the proposed mine site and guzzlers would directly disturb eight acres of the natural wilderness value and future designation of the immediate areas as Wilderness within the Desolation Canyon Inventory Unit 8. Since the proposed mine site would be adjacent to the inventory unit, opportunities for solitude and primitive/unconfined recreation would be indirectly degraded by sight and sound during the 20 year life of the mine. However, due to topography, the indirect area of impact would be restricted 25.12 acres below the canyon face.

Noise from the operation of the surface facility and increased vehicular travel from the proposed road would indirectly diminish the quality of the opportunities for solitude and primitive recreation along a portion of the Book Cliffs face area at the western boundary of the inventory unit, but would have little impact within the rest of the inventory unit with wilderness characteristics. No impact to wilderness quality and values would occur above the canyon from the location and operation of the mine facility.

Approximately 901 acres of the Desolation Canyon Inventory Unit 8 would be undermined by underground coal extraction. Naturalness, opportunities for solitude and primitive/unconfined recreation and cumulative values would not be diminished nor degraded by the proposed underground mining due to the substantial cover anticipated (at least 1,500 feet). Subsidiary surface disturbing actions resulting from surface subsidence may occur, but would not appear different from

the surrounding geology.

The Turtle Canyon Inventory Unit 4 and the Turtle Canyon WSA would not be directly impacted by surface disturbing activities associated with the proposed action. Naturalness, opportunities for solitude and primitive/unconfined recreation and supplemental values would not be degraded. Subsidiary surface disturbing actions resulting from surface subsidence may occur within these areas as well, but would not appear different from the surrounding geology.

4.8.1 Wilderness Values Mitigation

The proposed action meets the Wilderness Interim Management Plan (IMP) objectives. No action is proposed that would impair the wilderness character of the established WSA. Therefore, no mitigation is proposed for the development of the mine surface facility area, or indirect impacts associated with its operation and use of the proposed road for the re-inventory units. However, the incorporation of the original IMP stipulations for actions resulting from mining of the pre-FLPMA coal leases under the Turtle Canyon WSA would be incorporated for all areas deemed to be affected by subsurface actions.

4.9 Wildlife Value Impacts

The primary concerns relative to wildlife within the area of the proposed action are:

1. Direct impacts which include surface disturbance resulting in loss of habitat, key habitat components and/or direct mortality to wildlife;

2. Indirect impacts which result is loss of habitat suitability resulting from intrusion of human presence and activity within sensitive wildlife habitats.

Direct impacts of the proposed action include surface disturbance required for facility construction, potential disruption of springs and seeps from underground mining activity, and direct mortality associated with subsequent coal haul traffic. Indirect impacts of the proposed action include human related intrusions/disturbances into wildlife habitats which can cause loss of habitat suitability. Human related intrusions/disturbances include human presence, equipment operation, and construction activity. These intrusions can in turn result in reductions in use of habitat by wildlife and changes in distribution and movement patterns by wildlife. Loss of habitat suitability becomes particularly important when it affects habitats of species known to be sensitive to such intrusions or occurs during critical periods of the year when wildlife are more vulnerable to these adverse impacts (i.e., fawning, lambing, critical winter range, nesting).

Mule deer Direct surface disturbance associated with operation of the proposed action would affect approximately 93.11 acres of mule deer year-long range. Since mule deer year-long range supports relatively low population densities, this loss of habitat is not expected to have any

noticeable effect on numbers or distribution patterns for this species. Potential de-watering of springs and seeps could adversely effect high priority and critical winter range for mule deer. Distribution of mule deer on these winter ranges could be affected, particularly in years with light snow conditions and during the early and late winter periods when snow is absent. Coal haul and related traffic to the mine facility would potentially affect mule deer year-long range. Mule deer densities on year-long range are extremely low. For this reason, mortality related to vehicle collisions would be rare and should not affect mule deer populations. Mule deer are vulnerable to disturbances of human activity when concentrated on winter ranges and animal physical conditions are depleted. Indirect impacts of the proposed action would only affect mule deer year-long ranges and therefore should have little effect on mule deer.

Elk No direct surface disturbing activity would occur on elk habitats within the affected area. Potential de-watering of springs and seeps could occur on elk high priority winter range. As discussed for mule deer, distribution of elk on these winter ranges could be affected, particularly in years with light snow conditions and during the early and late winter periods when snow is absent. Mortality associated with coal haul and related vehicle traffic would have no adverse effect on elk, since the access routes do not go through elk habitat.

Elk, as with mule deer are vulnerable to disturbances of human activity when concentrated on winter ranges and animal physical conditions are depleted. No indirect impacts would affect elk winter ranges and therefore should have no adverse effect on elk.

Pronghorn Direct surface disturbance would affect approximately 40 acres of pronghorn high priority year-long range. As discussed for mule deer year-long range, pronghorn high priority year-long ranges support relatively low population densities. This loss of habitat is not expected to have any noticeable effect on numbers or distribution patterns for pronghorn. Potential de-watering of springs and seeps that could occur as a result of mining activity would not occur on pronghorn range and therefore would not affect pronghorn. Though difficult to quantify, direct mortality of pronghorn, as a result of coal haul and related traffic, could occur. However, since the proposed coal haul traffic would not go through habitats in which pronghorn are concentrated, vehicle collisions would be rare and have little effect on population levels.

Pronghorn are sensitive to human intrusion during the fawning season, May 15 to June 20. The proposed action includes a seasonal constraint on construction activity during the fawning period. Therefore, no adverse effect would occur during this phase of the project. However, coal haul traffic would occur during this period of time for the operational life of the facility and could affect pronghorn to some degree. Pronghorn fawning is not concentrated in any one area but rather widely dispersed throughout their high priority range. For this reason, indirect disturbances to pronghorn during the fawning season are not expected to adversely effect the population.

Rocky Mountain bighorn sheep Direct surface disturbance would affect approximately 37 acres of bighorn sheep habitat. The Lila Canyon area is considered to be a relatively high concentration area for bighorn sheep. This is attributed to the presence of springs and seeps along the cliff-talus habitat within Lila Canyon, as well as, the relative absence of water in most cliff-talus habitat areas.

The surface disturbance alone or loss of forage on this disturbed area should have little effect on bighorn sheep. However, the potential de-watering of springs and seeps, a key habitat component for bighorn sheep, as a result of the proposed action could directly affect bighorn sheep continued use of the Lila Canyon area. This impact could displace up to 25 bighorn sheep. The proposed guzzlers would avoid this impact. Mortality associated with coal haul and related traffic represent very little risk to bighorn sheep, since very little of the road system goes through bighorn habitat.

Bighorn are sensitive to human intrusion, particularly during the lambing season, May 1 to June 15. A seasonal restriction on construction activity in bighorn sheep habitat during the lambing season would avoid this adverse impact. Since this restriction has been incorporated into the Stabilization, Operation and Maintenance Plan, no adverse effect would occur during the construction phase of the project. However, operations at the facility would occur during this period of time for the operational life of the facility and could affect bighorn to some degree. These disturbances would be expected to displace bighorn sheep from the immediate area surrounding the facilities.

Raptors Direct operational surface disturbance would affect approximately 93.11 acres of raptor foraging habitat. This loss in itself is not expected to adversely effect raptors. Likewise, potential de-watering of springs and seeps could have some affect on availability of prey species, but is not expected to affect raptors to any great degree.

Raptors are known to be sensitive to human intrusion during the nesting cycle. Disturbances during this period of time can cause birds to abandon their nesting territories or disrupt adults tending the young in the nest resulting in mortality of young in the nest. Indirect impacts to raptors and in particular, the nesting territories within 0.5 miles of the facility location, would likely be adversely affected by the proposed action.

The 1999 spring inventory, identified one active and one tended Golden Eagle nest within a quarter mile of the proposed mine site, informal consultation between USFWS; UDWR, and BLM was initiated to devise a course of action and potential mitigation. Due to the nests close proximity to the proposed mine (approximately 800 feet), it was felt that the nest sites would be abandoned for the life of the operation. Planning guidelines outlined in the MFP give specific direction to protect the continued productivity to raptor nest sites.

4.9.1 Wildlife Values Mitigation

No additional mitigation is proposed for impacts associated with the proposed action. Potential impacts to all wildlife use (especially bighorn lambing) associated with construction, would be minimized with a seasonal closure. The proposed fence along the coal haul road would be constructed to allow for wildlife (antelope) movement, and therefore, would not prohibit range use. Potential loss of springs and seeps which could adversely affect most wildlife species present (particularly bighorn sheep) has been addressed by the proposed guzzlers. The proposed guzzlers would eliminate long term impacts to area wildlife, especially bighorn sheep, from human intrusion over the life of the mine.

Adverse impacts to raptors would be avoided with a seasonal restriction and prohibiting construction activity within 0.5 miles of occupied nest sites from February 1 to July 15. Impacts associated with mining operation for the life of the mine that could adversely effect continued productivity of the nest sites would be minimized by the proposed 93 acre vegetation treatment. On similar projects, construction of artificial nests have been attempted to mitigate a similar type impact with varying degrees of success. Since a vast amount of suitable cliff nesting substrate would be available for nesting pairs to construct new nests, UDWR and USFWS suggested to increase prey populations rather than an artificial nest replacement. Based on these informal consultations, the vegetation treatment project designed to increase small mammal populations was identified as suitable to offset impacts to affected raptor nests.

4.10 Cultural Resources Impacts

Rauch (1981) has identified potential impacts of coal mining in this area as: 1) impacts from construction activities. 2) subsidence damage resulting from underground mining. 3) vandalism to site near mine roads and others facilities. Most of the areas of proposed constructions have been inventoried for cultural resources (Mongomery,1998: Montgomery,1999) and no cultural resource should be directly affected by construction.

On the effects of subsidence to cultural resources Rauch(1981) says:

> "Given the amount of acreage sampled and the type and density of sites recorded and expected as an extrapolation of this sample to the entire area, it seems reasonable that if slumping or crackage does occur, the probability of these occurrences falling within site boundaries should be considered as low. Subsequently, even if limited disturbance does occur, the sites are of a nature (e.g., no structures or cultural depth) that their integrity should not be irreparably damaged."

Vandalism is an indirect impact of the coal mine development. Sites in close proximity to access routes and mine facilities would be affected by the loss of integrity to information and artifacts of the sites. Since 42EM2517 is adjacent to and visible from both a access route and the mines facilities it would be effected. Because cultural resources are not always visible, it is possible that unknown resources may be uncovered during construction.

4.10.1 Cultural Value Mitigation

UEI shall submit to the BLM, a data recovery plan for 42EM2517. In order to approve this plan the BLM will have to enter into a Programmatic Agreement with the Utah State Historic Preservation Office and possible other consulting parties. The Programmatic Agreement must be signed and the plan approved before the right-of-way is authorized. UEI shall implement the approved plan.

5.0 ANALYSIS OF CUMULATIVE IMPACTS

5.1 Issues and Resources Cumulatively Impacted

A cumulative impact, as defined within 40 CFR 1508.7, is the impact on the environment which results from the incremental impact of the action (proposed action) when added to other past, present and feasiblely foreseeable future actions. To assess the cumulative impacts of the proposed action, it is necessary to identify those components of environment that could be affected that were not minimized by actions taken as part of the proposed action scenario or mitigated upon review of direct and indirect impacts of the proposed action. Specific issues raised during scoping formed the basis of review of cumulative impacts.

5.1.1 Surface Impacts Resulting From Mine Induced Subsidence

Mining activities described as part of Phase I and Phase II, though possible over a larger area of the described lease area, would not result in any more subsidence than what was indicated for the direct and indirect impacts of the proposed action. Mining actions initiated as part of the development of the proposed action would not result in any cumulative impacts to any resource.

5.1.2 Soils and Reclamation Potential

Development of the coal lease area through Phase II would not result in any other additional disturbance to described resources. Actions taken as part of the permit stipulations, Stabilization, Operation and Maintenance Plan for the proposed action and reclamation plan associated with the mine and mine surface facility have eliminated the need for mitigation of direct and indirect impacts, as well as area wide cumulative impacts.

5.1.3 Ground Water and Surface Water Hydrology

Mitigation required for possible impacts to hydrology and regional water quality of the Colorado River Basin and proposed operational stipulations would minimize the cumulative impacts to this resource throughout the Phase I and Phase II development.

5.1.4 Livestock Grazing

Actions taken as part of the proposed action have minimized all direct and indirect impacts to this resource. No cumulative impacts are expected throughout the Phase I and Phase II development.

5.1.5 Vehicular Traffic

This resource will be analyzed for cumulative impacts.

5.1.6 Visual Resources

Actions taken as part of the proposed action to minimize direct and indirect impacts would also minimize cumulative impacts during the Phase I and Phase II development.

5.1.7 Loss of Vegetation Diversity, Cover and Productivity

Interim and final reclamation of the proposed action as described would not change for the area of disturbance analyzed for Phase I to Phase II. The actions taken to minimize or eliminate such direct and indirect impacts would minimize the cumulative impacts during the phased development and after full reclamation.

5.1.8 Wilderness Values

Development of the lease area described could constitute additional surface disturbance during the proposed life of the project. Exploration drilling could be required during the operation of the underground mine to develop the future mining of the leases identified. Therefore, this value will be analyzed for cumulative impacts.

5.1.9 Displacement and Direct Disturbance of Wildlife

Mitigation proposed to address the direct and indirect impacts to wildlife resources within the area of the proposed action would minimize all impacts to this resource through Phase II. However, development of future actions within the vicinity of the proposed action would necessitate the review of cumulative impacts to this resource.

5.2 Past, Present and Reasonably Foreseeable Actions Within the Area

5.2.1 Exploration Drilling Associated with the Lila Canyon Project

To allow for future modifications to the underground mining of the coal leases described, it may be necessary to conduct exploratory core drilling and sampling to determine mineable resources. Though the regional coal geology for the lease area is known, as many as five 0.75 acre sites (3.75 acres total) could be developed over the course of operations. Since the surface area overlying the underground coal resources is currently cherry-stemmed with an existing network of roads and routes, potential drilling actions could be accessed and conducted within these transportation corridors over the entire lease area. Initiated within a three month summer field season, temporary exploratory drilling would most likely entail a rotary drill rig drilling on a 24 hour basis for up to 10 days. Water for use during drilling would be trucked to the site via the existing transportation system. Upon completion of drilling and sampling actions, the site would be reclaimed and revegetated to UDOGM and BLM requirements.

No new surface access would be anticipated within the re-inventory units or existing Turtle Canyon WSA. No permanent surface disturbance outside of the current cherry-stemmed transportation system would be anticipated.

5.2.2 Development of the Blue Castle Mine

Reasonably foreseeable minerals development in the area consists of the establishment an extraction mine and facility by Gold Terra Incorporated. The proposed development of the Blue Castle Mine would extract gold from the Mancos Shale benches adjacent to the Lila Canyon project area in the east half of Section 29 in T. 16 S. R. 14 E. Surface disturbance anticipated for this project is 132.57 acres. The primary access to this site would utilize the proposed Lila Canyon project coal haul road, with upgrading of existing access roads and routes and creation of new roads within the gold mine area. These existing and new roads would be within the 132.57 acre disturbance proposed for this cumulative development scenario. As many as 85 vehicles would access the site each day during the 20 year life of the mine.

5.2.3 Regional Traffic

The existing road system to be utilized through the operation of the Lila Canyon project is also utilized by two operating coal mines and a substantial volume of commercial and commuter traffic. U.S. Highway 191/6, currently at an estimated 10,600 non-coal related vehicles per day, is a heavily traveled route between the Wasatch Front and Interstate 70. Traffic from the proposed Lila Canyon project has been estimated at 550 vehicles (staff and coal haulage) per day at full production of four million tons of coal during Phase II. Traffic from similar nearby actions includes the West Ridge, Dugout Mines at 400 and 343 vehicles per day respectively. The proposed Blue Castle Mine would have approximately 85 vehicles per day that would merge on to the proposed coal haul road before entering U.S. Highway 191/6.

5.3 Cumulative Affects on Identified Resources

5.3.1 Exploratory Drilling

Since the potential of exploratory drilling required to delineate mining of the pre-FLPMA leases would most like occur within the cherry-stemmed road that transects the area (PLATE IV), direct and indirect impact to resources would be minimal. Impact to soils, vegetation, cultural resources, land uses, and wildlife would be minimized due to timing of activities (summer), the location within disturbed road corridors, and stipulations as part of UDOGM and BLM permits for erosion control, protection of resource values, reclamation and revegetation.

Though potential drilling actions as described would not directly impact wilderness character of the surface area, indirect impacts associated with the operation of the Lila Canyon Mine and potential exploratory drilling and sampling of the pre-FLPMA coal leases could affect the wilderness values

of the re-inventory units present. Though the potential drilling could occur within the cherry-stemmed road system that transects the coal leases, naturalness and opportunities for solitude would be diminished on those areas adjacent to the drill site locations during the 10 day drilling schedule for each road site. In combination with the indirect impacts occurring as discussed for the surface operations associated with the Lila Canyon Mine, a cumulative impact to wilderness character (naturalness and solitude) and manageability of these portions of the overlying Desolation Canyon Unit 8 and Turtle Canyon Unit 4 could occur. The overall wilderness value of the area from the mine site to the cherry-stemmed transportation corridor could be diminished during the temporary three month exploration program.

5.3.2 Vehicular Traffic

Cumulatively, the traffic from the present ongoing actions (West Ridge and Dugout Mines) in association with the proposed full Phase II development traffic of the proposed action would result in a 12 percent increase in commuter and heavy truck traffic over the next 20 years on U.S. Highway 191/6. In the event that the Gold Terra project is developed, the traffic volume would increase slightly to 13 percent over the next 20 years. These figures are based upon the estimated current highway use of 10,600 vehicles per day. However, use of this highway by commuter and commercial traffic is believed to be increasing at an un-quantified rate. Therefore, current impacts on traffic volumes may not be valid during the course of operation of these ongoing and foreseeable actions.

Regardless of the increase in commuter and commercial traffic volume on the highway, the potential cumulative increase of these projects would directly impact the safety and manageability of this transportation route. The rate of incidence of vehicular accidents could potentially increase, especially with the additional heavy truck traffic associated with the present facilities and future actions proposed. Additional highway costs for repairs required by the added heavy truck traffic would also be incurred during the anticipated cumulative life of these projects. Present and future highway management decisions for the proposed use of this state and federal highway should take into consideration the increase of commuter and commercial traffic in relation to these actions.

Cumulative impacts to wildlife within the immediate and transport area would also occur as a result of vehicular traffic. These impacts are discussed in the next section.

5.3.3 Displacement and Direct Disturbance of Wildlife

The operation of the proposed action in association with the reasonable and foreseeable development of the 133 acre Blue Castle Mine would cumulatively and directly impact wildlife within the immediate vicinity of the project. As discussed within CHAPTER 4.0, direct and indirect impacts to big game use resulting from the operation of the coal haul road were minimal due to the low densities of mule deer and antelope and lack of critical habitat. However, with the future development of the Blue Castle Mine and subsequent surface disturbance, direct disruption of mule deer and antelope year long habitat would occur. This unquantified disruption could result in the cumulative indirect impact of displacement of wildlife due to the combined operation of

these two projects in close proximity. Future wildlife resource management decisions would need to take the potential full operational impacts into account in order to an adequate herd management plan.

Vehicular traffic impacts on these big game species and raptors could occur as well. An increase in traffic volume on the proposed coal haul road by the potential Gold Terra action could result in an increase in vehicular-wildlife incidents over time. Indirectly, the potential movement of wildlife and habitat use by raptors could be further restricted and displaced. The use of U.S. Highway 191/6 and subsequent site access roads for the described cumulative scenarios would be impacted in a similar manner. Future land use decisions should take into account this cumulative scenario impact to develop a mitigation for the related direct disturbance and indirect displacement impacts on wildlife that result from increased vehicular use.

CHAPTER 6.0 CONSULTATION AND COORDINATION

6.1 Agencies, Organizations and Individuals Contacted

Numerous contacts with associated land use agencies, interested parties and individuals have been made during the course of this environmental assessment. The input from meetings, briefings and conversations during the months of February 1998 through June 2000 has resulted in the completion of this third party prepared (EIS) interagency (BLM/OSM) document. A list of specific individuals contacted is listed under references.

6.1.1 Federal Government/Agencies

- U.S. Department of Agriculture
  - a. Natural Resource Conservation Service - Soil Resources
- U.S. Department of the Interior
  - a. U.S. Fish and Wildlife Service - Threatened and Endangered Species and Raptors

6.1.2 State of Utah

- Department of Community and Economic Development
  - a. State Historical Preservation Office - Cultural Resources
- Department of Natural Resources
  - a. Division of Oil, Gas and Mining - Mine Plan and Resource Analysis
  - b. Division of Water Rights - Water Rights
  - c. Division of Wildlife Resources - Wildlife Resources
- Department of Transportation - Road Crossings and Traffic
- Office of Rehabilitation
  - a. School and Institutional Trust Lands Administration - State Land Easements

6.1.3 Local Governments and Organizations

- Emery County Recorder - Land Use and Resource Analysis
- Emery County Planning and Zoning - Land Use and Zoning
- Emery County Road Department - Road Design and Proposed Action
- Emery County Engineer - Road Design
- Emery County Commissioners - Land Use and Easements

6.1.4 Industry and Business

- Bear West Company; Salt Lake City, UT - Legal Review and NEPA Compliance
- Blackhawk Engineering; Price, UT - Proposed Action Design
- Montgomery Archeological Consultants; Moab, UT - Cultural Resources
- Intermountain Power Agency; Los Angeles, CA - Property Ownership
- Talon Resources; Price, UT - Proposed Action Design
- U.S. West; Salt Lake City, UT - Proposed Action Design
- UtahAmerican Energy, Inc; Price, UT - Proposed Action
- Utah Power & Light; Salt Lake City, UT - Proposed Action Design

6.2 List of Preparers and Interdisciplinary Team

6.2.1 EIS Environmental & Engineering Consulting (EIS); Helper, Utah

•	**Melvin Coonrod**	**Project Manager and Coordinator, Wildlife, Vegetation, Construction and Operations, Reclamation** B.S. Chemistry and Invertebrate Zoology M.S. Silviculture
•	**Carl East**	**Wildlife and Vegetation** B.S. Wildlife Management
•	**Dan Larsen**	**Soils** B.S. Conservation of Natural Resources M.S. Soil Science
•	**Tom Paluso**	**Mine Engineering, Geology and Hydrology** B.S. Engineering M.S. Civil/Environmental Engineering
•	**David Steed**	**Co-Project Manager, NEPA Development, Land Use and Wilderness** B.S. Ecology

6.2.2 BLM Interdisciplinary Team

•	**Mark Mackiewicz**, Realty Specialist	**Project Manager, NEPA Development**
•	**Kerry Flood**, Hydrology Specialist	**Hydrology, Soils**
•	**Chad Hunter**, Range Specialist	**Grazing and Vegetation**
•	**Tom Gnochek**, Wilderness Specialist	**Wilderness Values**
•	**Blaine Miller**, Cultural Specialist	**Cultural Resources**
•	**David Mills**, Wildlife Specialist	**Wildlife**
•	**George Tetrault,** Geologist	**Mineral Resources**
•	**Greg Thayn,** NEPA Coordinator	**EA Review**
•	**Dennis Willis**, NEPA Coordinator	**NEPA Development, Vehicular Traffic, Visual Resources, and Wilderness Values**

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CHAPTER 7.0 APPENDICES

APPENDIX A	A Summary of Public Scoping Comments
APPENDIX B	Engineering Associated with the Existing Lila Canyon Road Emery County Road Department Correspondence
APPENDIX C	Utah Department of Transportation Right-of-Way Encroachment Permit
APPENDIX D	Mine Surface Facility Reclamation Plan
APPENDIX E	Natural Resource Conservation Service Correspondence - Prime Farmlands Soil Characteristics
APPENDIX F	Water Rights
APPENDIX G	TES Survey Reports 1998 and 1999 Raptor Surveys U.S. Fish and Wildlife Services Correspondence - TES Species

APPENDIX A

A SUMMARY OF PUBLIC SCOPING COMMENTS

IDENTIFIED ISSUES IDENTIFIED DURING PUBLIC SCOPING

Party	Concerns	Issues and Requests for Evaluation	
Grazing Permittee	Impacts to grazing	1.	Fencing on both sides of road and cattle guards placed at appropriate sites.
		2	Access to water sources if fences are constructed.
		3	Possible construction of an underpass to alleviate water source issue.
	Impact to hydrological resources	4.	Evaluation of impacts of mining on ground water and surface water.
UDOT Engineer	Need for upgrading current road conditions	1.	The need for full acceleration and deceleration lanes to handle traffic use. increased
Rex Funk, Emery County Roads	Need for upgrading current road conditions	1.	Horse Canyon road needs to be widened, drainage work, and restructuring to an improved gravel road treated with an enzyme base to tie road base together.
SUWA	Impact to proposed wilderness designations	1.	Surface disturbance overlapping the existing and proposed BLM Wilderness Study Areas.
	Impacts to Resources	2.	Impact to resources within the area resulting from dust, noise, light and traffic associated with the operation.
		3	Socio-economic figures presented in the scoping document are heavily skewed, and must be balanced by the significant costs of the impacts on the rare resources.
		4.	Mitigation, reclamation and monitoring procedures must be fully addressed and included as enforced stipulations.
	Development of an Environmental Impact Statement	5.	Since surface disturbance encompasses 2,000 acres, an Environmental Impact Statement (EIS) should be conducted vs. an EA.
UEI President	Conflict of proposed wilderness study areas	1.	WSA delineations overlap UEI subleased Federal coal leases under and/or has applied for ROW for roads, utilities, and surface facilities.
		2.	The errors identified in Utah Wilderness Inventory 1999" document regarding inability, access and established land use should not be used for resource review in the EA.
		3.	Evaluation of the proposed WSA boundaries negatively impact the economics of the project.

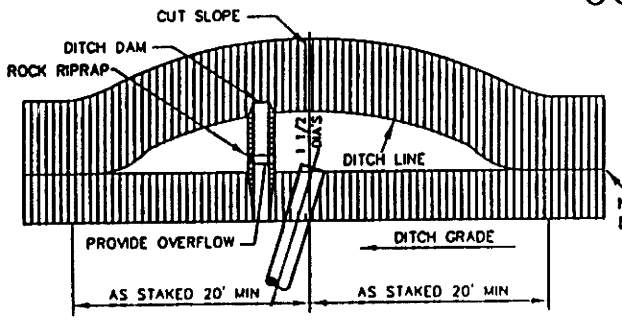
APPENDIX B

ENGINEERING ASSOCIATED WITH THE LILA CANYON ROAD

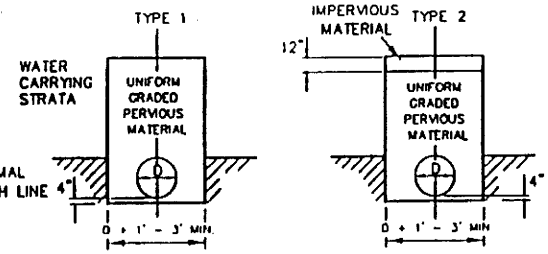
EMERY COUNTY ROAD DEPARTMENT CORRESPONDENCE

CULVERT CONSTRUCTION DETAILS

FIGURE



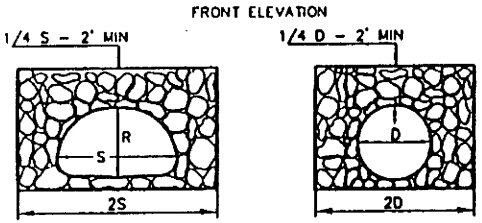
PLAN VIEW TYPES 2 AND 3



PLACE PERFORATIONS ON LOWER SIDE OF PIPE

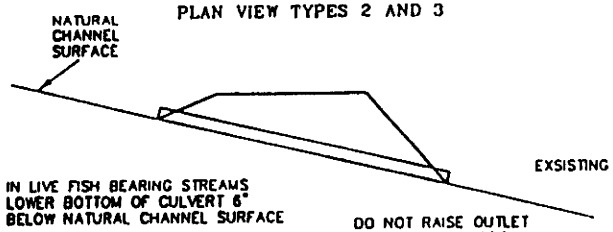
LINE AND GRADE TO BE AS GIVEN ON THE DRAWINGS AS STAKED ON THE GROUND

PERFORATED UNDERDRAINS



NOTE

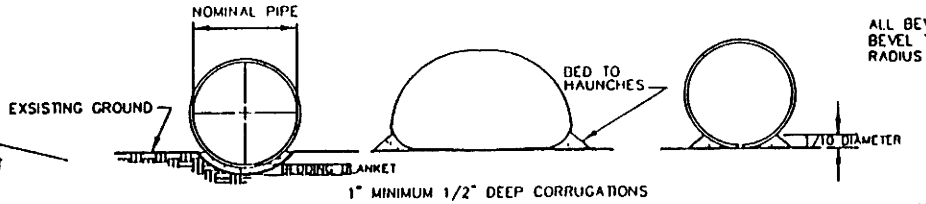
IN NARROW CHANNELS ADJUST RIPRAP TO FIT ORIGINAL STREAM BANKS.



IN LIVE FISH BEARING STREAMS LOWER BOTTOM OF CULVERT 6" BELOW NATURAL CHANNEL SURFACE

DO NOT RAISE OUTLET ABOVE STREAM BED

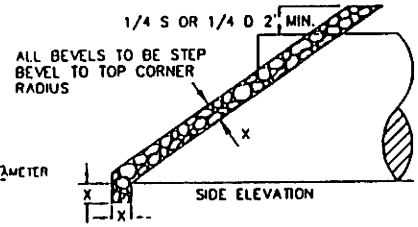
TYPE 1



1/10 DIAMETER EXCEPT FOR STRUCTURAL PLATE PIPE. LENGTH OF BEDDING ARC NEED NOT EXCEED WIDTH OF BOTTOM OF PLATE

1" MINIMUM 1/2" DEEP CORRUGATIONS
2" MINIMUM 1" DEEP CORRUGATIONS
3" MINIMUM 2" OR 2 1/2" DEEP CORRUGATIONS

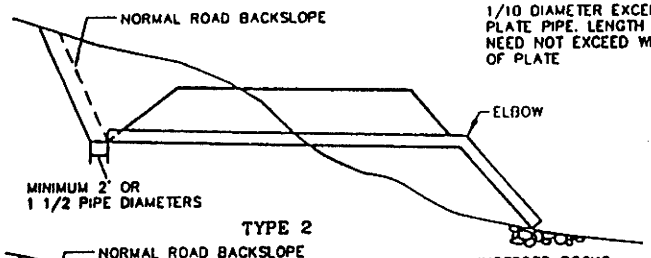
TYPICAL BEDDING DETAILS



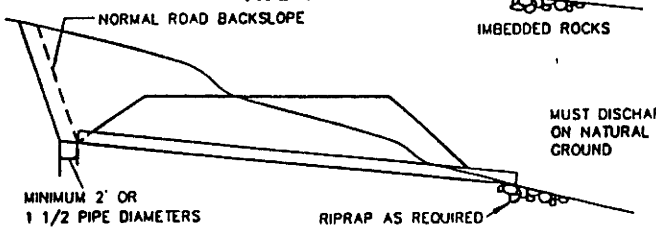
VARIES WITH PIPE D OR S

D OR S	
LESS THAN 60"	12"
60" TO 96"	18"
MORE THAN 96"	24"

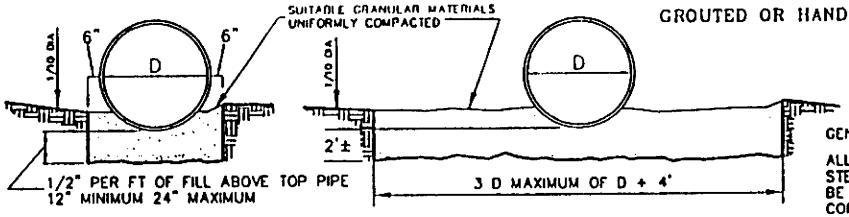
GROUTED OR HAND PLACED RIPRAP HEADWALLS



TYPE 2



TYPE 3

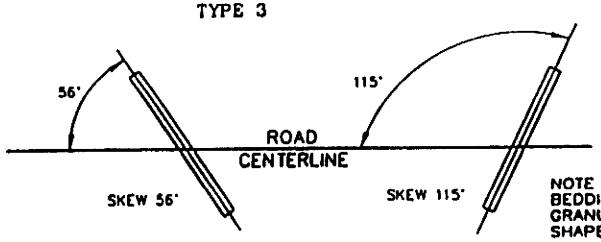


ROCK FOUNDATION

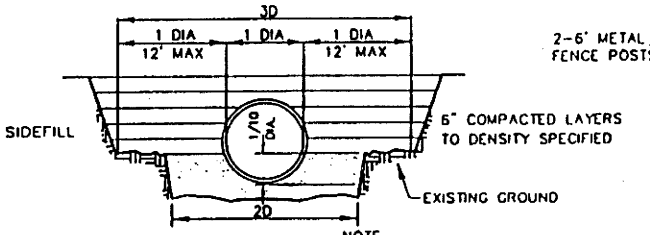
YIELDING FOUNDATION

GENERAL NOTES

ALL BEVELED PIPES ARE TO HAVE STEP BEVELS. PIPE ARCHES SHALL BE BEVELED TO THE TOP OF THE CORNER RADIUS



SKEW DIAGRAM



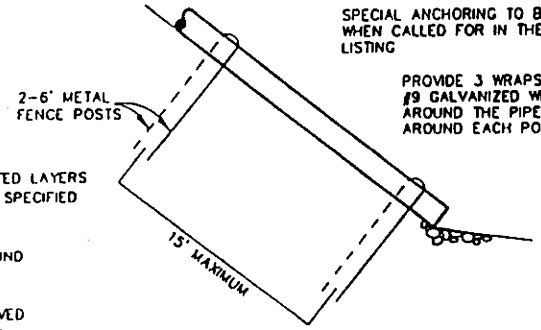
NOTE
BEDDING BLANKET TO BE SUITABLE GRANULAR MATERIAL ROUGHLY SHAPED TO FIT BOTTOM OF PIPE

NOTE
MINIMUM COVER FOR PAVED SURFACE IS 12" MINIMUM
COVER FOR DIRT SURFACE IS 18"

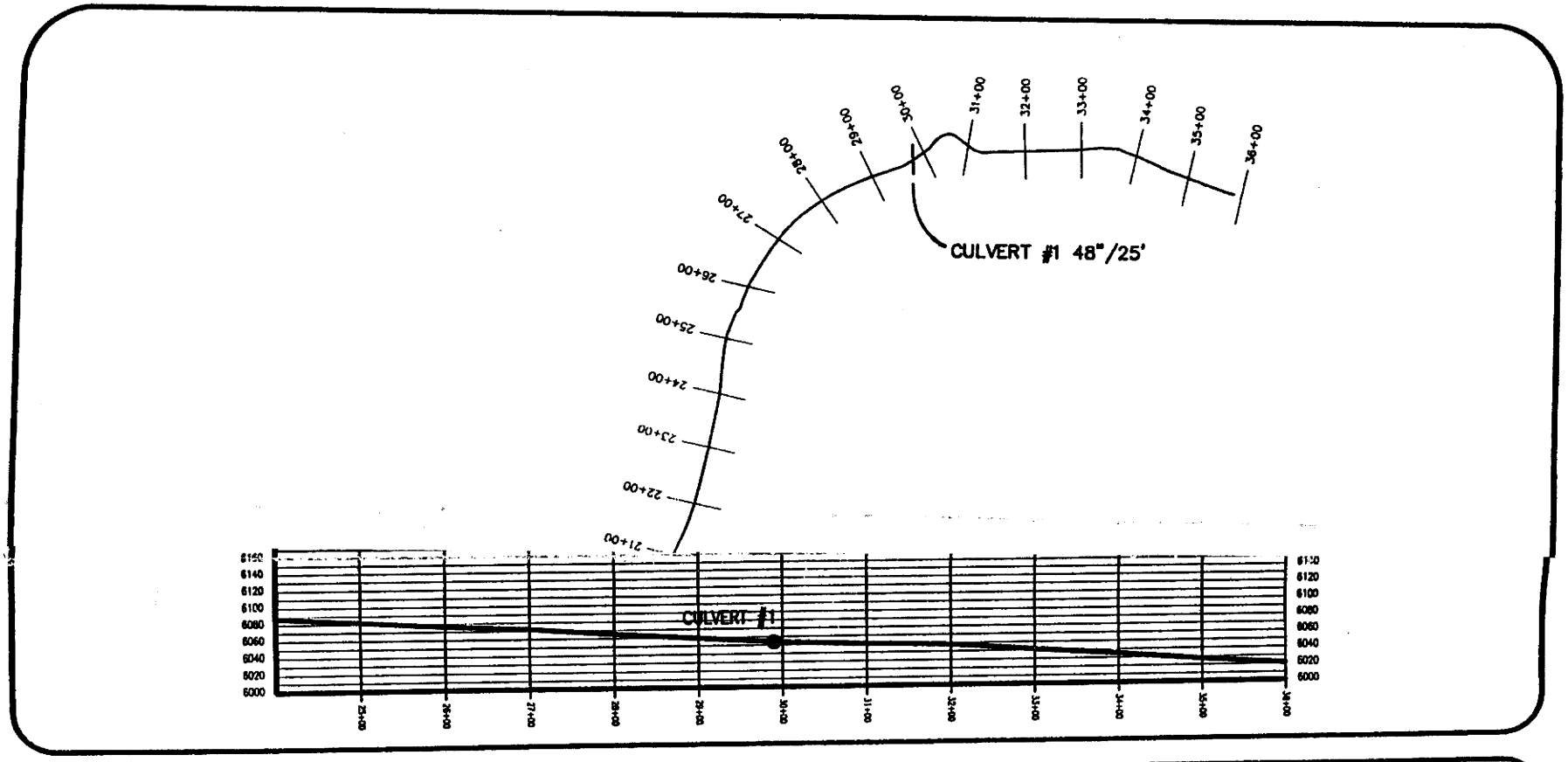
SIDEFILL

SPECIAL ANCHORING TO BE PROVIDED WHEN CALLED FOR IN THE CULVERT LISTING

PROVIDE 3 WRAPS OF #9 GALVANIZED WIRE AROUND THE PIPE AND AROUND EACH POST

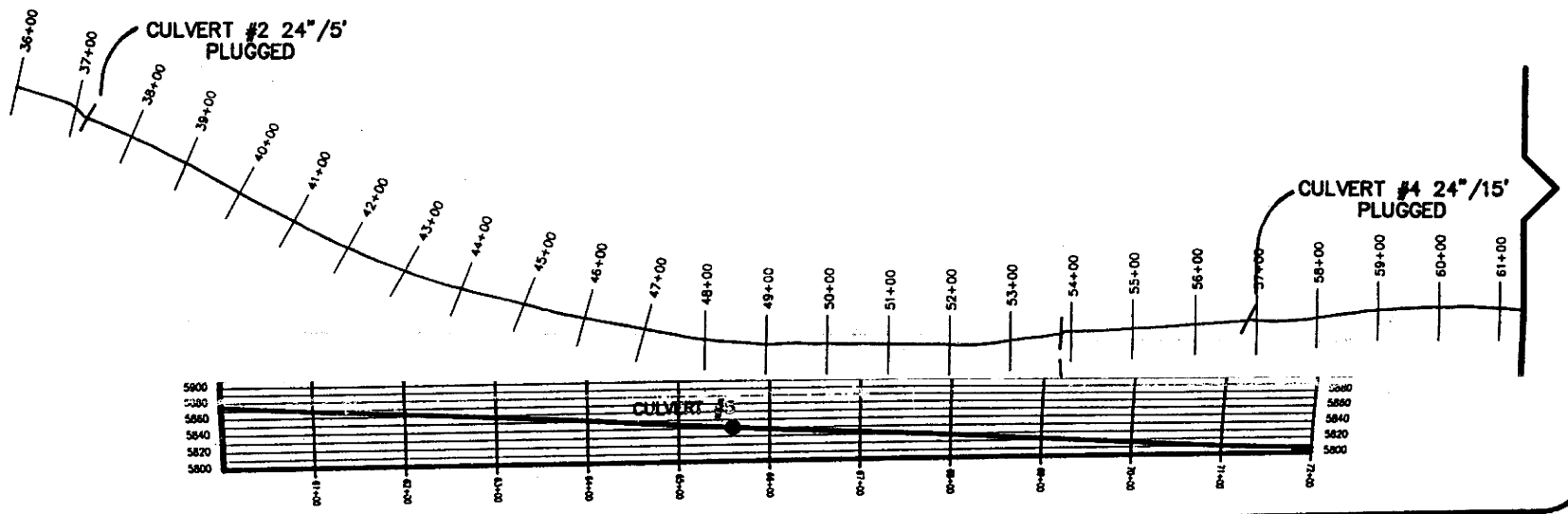


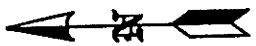
SPECIAL ANCHORING TYPE 2 DOWNDRAINS



LEGEND:

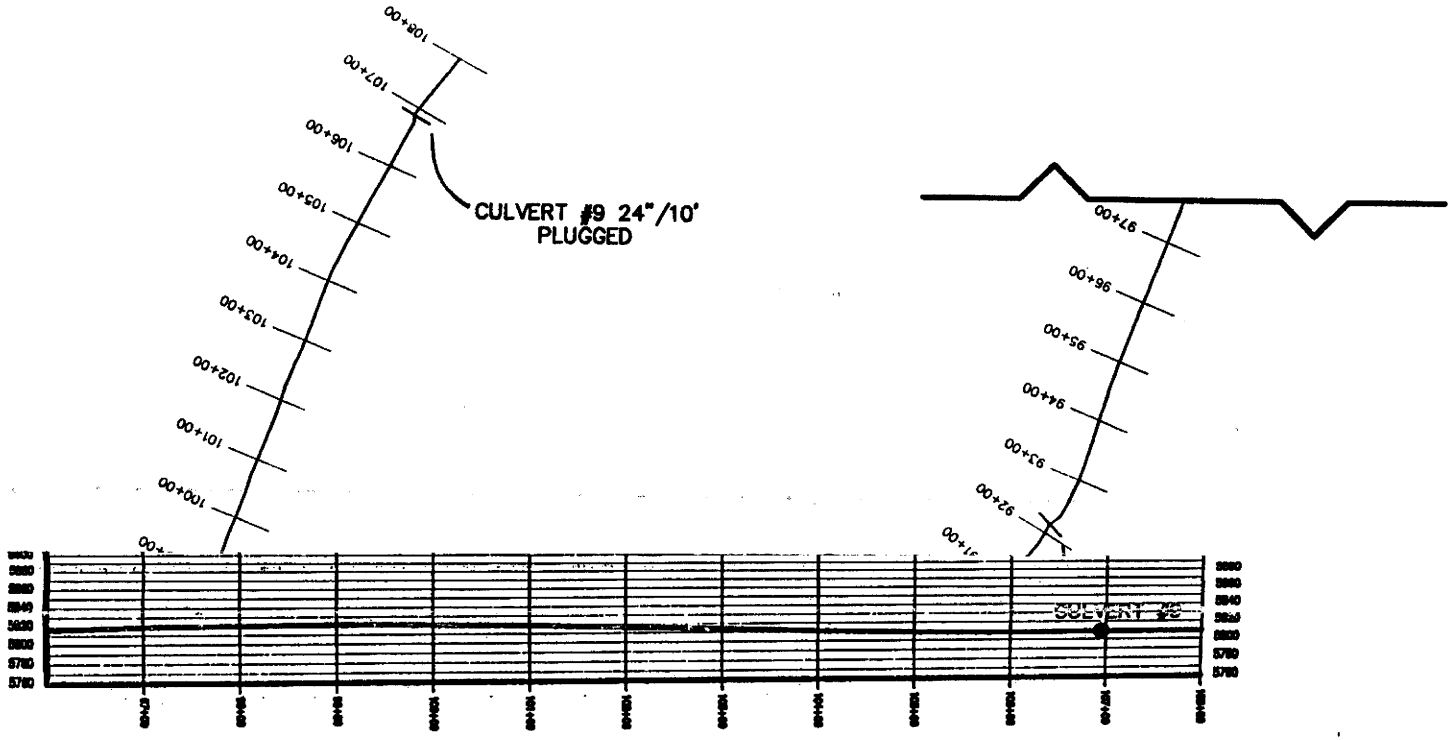
LILA CANYON ROAD PLAN AND PROFILE

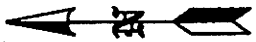




LEGEND:

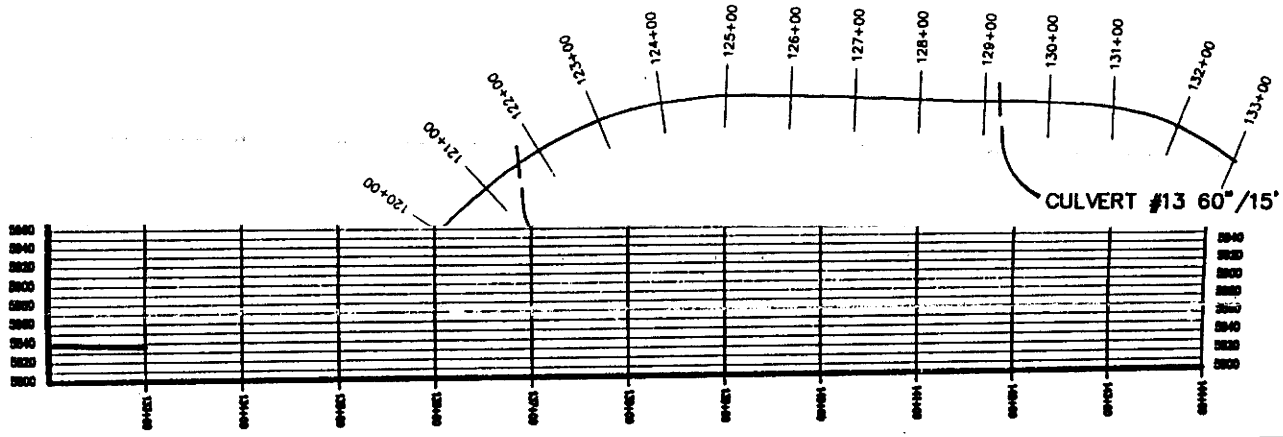
LILA CANYON ROAD PLAN AND PROFILE

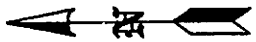




LEGEND:

LILA CANYON ROAD PLAN AND PROFILE





LEGEND:

LILA CANYON ROAD PLAN AND PROFILE

Again, the lower route is the only realistic haul route to consider and of course that is why Commissioners signed an agreement with UtahAmerican Energy for utilizing the Lila Canyon Road (#126) instead of the Horse Canyon Road. When other coal resources or timbering begin which directly impact the upper Horse Canyon Road (#125) Emery County will deal with the users through its Encroachment process to improve that road. We, of course, do not want to lose sight of the fact that the lower #126 route also serves other users such as the Gold Terra Mine development, cattlemen and other recreational interests.

To suppose that UtahAmerican Energy, Inc. and Emery County could economically upgrade the old trolley grade and ensure year round access and safety is not realistic. It is my opinion however that four wheel drive vehicles using the trolley grade would not necessarily require road improvement during mine development even though the road is very rough to the mine site; it's a slow go but we have visited the site several times in our 4 wheel drive Bronco.

Sincerely,

Rex Funk,
Road Supervisor

RF/ls

cc Kent Petersen, Commissioner
Ira Hatch, Commissioner
Randy Johnson, Commissioner
Val Payne, Public Lands Director

APPENDIX C

UTAH DEPARTMENT OF TRANSPORTATION RIGHT-OF-WAY ENCROACHMENT PERMIT

UtahAmerican Energy Inc.

P.O. Box 986
Price, Utah 84501
+1 (435) 613 0393
Fax +1 (435) 613 0393

July 28, 1999

Dale Stapley
Utah Department of Transportation
Encroachment & Permits Officer
Price District
940 South Carbon Avenue
Price, UT 84501-0903

RE: Application for Right of Way Encroachment Permit

Dear Mr. Stapley:

Please find attached a copy of the Right of Way Encroachment Permit Application filled out by UtahAmerican Energy, Inc.

If you have any questions or concerns about this matter, please feel free to call Jay Marshall at (435)613-0393 or Tom Paluso at (435)472-3814.

Sincerely,

R. Jay Marshall

R. Jay Marshall, P.E.

JM/cr

ATTACHMENT 1

Form T-223

UTAH DEPARTMENT OF TRANSPORTATION
Application for Right of Way Encroachment Permit
(WORK CANNOT BEGIN UNTIL PERMIT IS APPROVED)

Date July 28, 1999

To: District Director
UTAH DEPARTMENT OF TRANSPORTATION

*(1) Application is hereby made by: UtahAmerican Energy, Inc
*(2) Address: P. O. Box 986 Price, UT 84501 Telephone Number (435) 613-0393
*(3) for permission to do the following: Connect 30' graveled coal haul road with U. S. Highway 191/6.
*(4) Location: 3.5 miles south of State Highway 124 junction with U. S. Highway 191/6. New coal haul road will head east from U. S. Highway 191/6.
City N/A County Emery Highway No. 191/6
Milepost 270.5 on Hwy SR 6 in accordance with the attached plan *(5)

*(6) Construction will begin on or about June 15, 2000
and will be completed on or before October 31, 2000.

New underground utility installations crossing highway must be placed by boring. If boring is impossible due to unusual circumstances such as soil conditions, existing utilities, etc., a request for an exception may be made to the District Director and the following information provided:

a. Type of pavement N/A
b. Excavation will be _____ feet long by _____ feet wide and _____ feet deep.
c. A bond in the amount of $_____ has been posted with _____ _____ Tel. No. _____ to run for a term of three (3) years after completion of work to guarantee satisfactory performance.

If this permit is granted, we agree to comply with all conditions, restrictions, and regulations contained in the UDOT Policy 08-87 "Accommodation of Utilities on Federal-Aid and Non Federal-Aid Highway Right of Way", and "Special Limitations" required by the District Director or his duly authorized representative.

UtahAmerican Energy, Inc.
Owner

R. Jay Marshall
Signature

Chief Engineer
Title

*Refer to Instruction on back

==========

To be filled in by the District Director:
Permit _____ should _____ should not be granted.
Special Limitations: _____

District Traffic Engineer

District Director

APPENDIX D

MINE SURFACE FACILITY RECLAMATION PLAN

Reclamation and Enhancement Plan Associated with the Lila Canyon Mine Site

I. Description of Existing Area

The Lila Canyon Mine constitutes a disturbance of approximately 47.9 acres. For the purpose of reclamation, the total area is divided into two units. The upper unit consists of the water treatment area and the portal pad (Approximately 3.4 acres). The lower unit consists of the majority of the facilities; bath house, parking, shop, and coal handling structures (approximately 44.5 acres, See Plate 5-2 Surface Facilities). In addition to the above, there is a spoil/refuse disposal area and a sediment pond. The pond is the only structure that will remain through phase 2 bond liability.

This new disturbance constitutes a loss of approximately 47.9 acres of critical high value big game winter range. In addition, it distracts from the general aesthetics of the upper reaches of Lila Canyon.

The following reclamation plan is designed to rehabilitate this area to such a degree that the appearance would be aesthetically compatible with the adjacent undisturbed area and reestablish a desirable and diverse vegetative cover that will enhance wildlife habitat and domestic grazing.

II. Demolition and Clean Up

After abandonment the area will be cleared of all mine related material and structures. The majority of the coal handling equipment; belt lines, conveyors, and some of the metal fab buildings, will be sold as used equipment and removed prior to demolition. The balance of the structures will be demolished utilizing heavy equipment such as; dozers, loaders, trackhoes, various shears for steel dismantling etc. The trash (non metal, non concrete material) will be removed from the site and hauled to an approved land fill. Any contaminated soil or debris, such as coal refuse, that has petroleum additives would be hauled to an approved disposal site. The balance of the non-combustible, non-ferrous debris such as concrete would be buried on site.

All material with salvage value would be removed by a licensed salvage company.

III. Reclamation Plan

Following the cessation of mining, the portal cuts can be brought back to approximate original contours on all areas other than the rock ledges.

Earthwork

Pad and Facility Site- This area would be recontoured utilizing a D-8 Class or larger crawler dozer in conjunction with a trackhoe. The level nature of the topography would allow the equipment to work in unison.

To create a natural slope similar to the premining topography (see Plate7-7 Post Mining Contour Map), the natural channels would be reconstructed and rip rap to minimize the potential for erosion as detailed in Chapter 7 Appendix 7-4.

Erosion

Following the ripping the stored topsoil (growth media) would be spread to a uniform depth over the entire lower area.

It is imperative that as the area is recontoured that the surface is pock-marked (see Figure 1). Pock-marking creates a very uneven surface which to a large degree diminishes the likelihood of erosion (gullies and rills) and enhances the success of revegetation.

In conjunction with the pock-marking the trackhoe can cast any vegetation; dead trees, large rocks, back onto the recontoured surface. The pock-marking creates a more mesic site by trapping precipitation, both rain and snow, in the depressions. The debris (dead trees, rocks etc.) on the surface accomplish the same function to a lesser degree by providing solar protection. In addition, the combination of the above makes the site more aesthetically compatible with the adjacent undisturbed areas and to a large degree discourages both domestic stock as well as big game from adversely impacting the site until the vegetation can become established.

Revegetation

In conjunction with the earth moving the site will be hydro seeded, mulched, tackafied and fertilized. The following methodologies have been incorporated on numerous sites on both private and federal lands and have proven very successful frequently allowing Phase 2 Bond release in as little as three growing seasons.

A. Methodology-Seeding and Mulching

A hydro-seeder is positioned directly behind the trackhoe as the hoe recontours and implements the site seed bed preparation, the hydro-seeder can spray over the hoe or

utilize a hose line to apply the seed in combination with 500#/acre wood fiber much and 100#/acre of a tac agent. Following the seeding the entire area is then over sprayed with 1500 to 2000 pounds of wood fiber mulch per acre.

An additional 100#/acre of tac and 200#/acre of 16-16-8 fertilizer would be added to this mulch slurry. The lower area would be hydro-seeded and mulched utilizing the same procedures with the exception the operation can occure as each area is ready and should interfere with adjacent earthmoving activities.

Depending on weather conditions the hydro-mulched areas should be allowed to harden off (dry on the surface) from 24 to 72 hours before the area is walked on.

B. Methodology-Seedling Planting

Bare root or containerized seedling will be planted at a rate of approximately 200/acre. (Ratio and species to be determined by BLM and UDOGM).

The planting procedures as outlined must be strictly adhered to in order to insure a reasonable degree of success. The following is a list of key points:

1. Live Seedlings - ideally dormant planting stock
2. Stock - primarily root mass kept moist at all times
3. Position of seedlings to maximize survival potential
4. Proper Planting Procedure (Figure 4)
    - A. Straight and natural root alignment (no"J" roots)
    - B. Firm soil placement length of root mass (no air pockets)
    - C. The root collar needs to be ½ to 1 inch below grade (soil depth)

The actual planting of seedling can follow the seeding mulching anywhere from 24 hours up to two years with little or no adverse results. Ideally, planting should occur as late as possible in the fall prior to the first snow or as early in the spring as the site is accessible. Fall planting normally produces better results and is not as vulnerable to weather conditions. In both cases, survival will increase if the planting stock is dormant when planted.

The root mass should be kept moist at all times, during transport, handling and planting.

This is somewhat easier with containerized stock, but can be accomplished with bare root stock if a few simple procedures are followed.

A good procedure to insure moist roots on bare root stock is to mix a slurry of vermiculite and/or potting soil in a 30 gallon water filled barrel. Cut pieces of burlap approximately 18X24 inches and soak overnight in the slurry. Wrap the root mass of the bare root stock loosely in a roll of saturated burlap prior to planting. Each roll should contain 50 to 100 seedling loosely rolled within the burlap and placed in a planting bucket or bag for field use. Periodically during the day the rolls can be wet down in the event they start to dry.

It is imperative to have the hole dug and ready to plant, prior to removing the seedling from the container or burlap roll. In warm or windy conditions a seedling's root hairs can dry out in as little as seven seconds, effectively killing the plant.

When selecting the location for the seedling always keep in mind to maximize potential for moisture and shade, select "depressions" over "humps" and areas adjacent to rocks, dead trees, etc. to provide solar protection. In pock marks, the seedling should be placed approximately one-third the way up from the bottom. This area allows the roots to extend into the moist soil and avoids having the seedling covered by sluffing or siltation. (See Figure 2)

The last area of concern is to utilize correct planting procedures. There are a variety of planting tools on the market. They range from a 16 inch tile spade to a region 6 "hoedad." Any tool capable of digging a hole at least two inches deeper than that the root mass is adequate.

It is imperative that the root mass is placed in the hole in a straight near natural configuration. The soil should be firmly pressed around the roots utilizing your hand, not a foot or stick. The planter must make sure there are no air pockets left in the hole, and ensure the seedling is planted to the correct depth.

This is accomplished by showing each planter the location of the root crown. It is advantageous for the root crown to be covered by ½ to 1 inch of soil at time of planting. This allows the soil to settle without exposing the root crown. (See Figure 3)

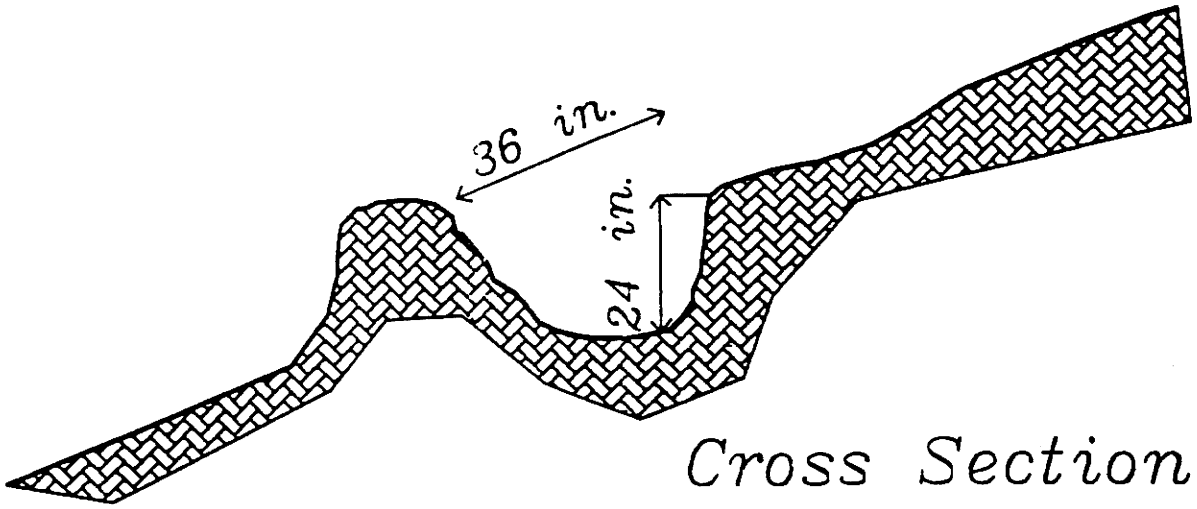
Following the planting all trash containers etc. would be removed from the site. A four strand barb-wire fence will be constructed around the lower area to preclude domestic stock.

A sign saying "This Area is Temporarily Closed for Reclamation" should be posted on the fence and maintained until the site is revegetated After the vegetation is well established (Phase 2 Bond Release) the sediment pond can be removed by simply recontouring back

over the pond area.

The same seeding and planting methodologies will be utilized to revegetate this small area.

Figure 1
Pock Mark Configuration



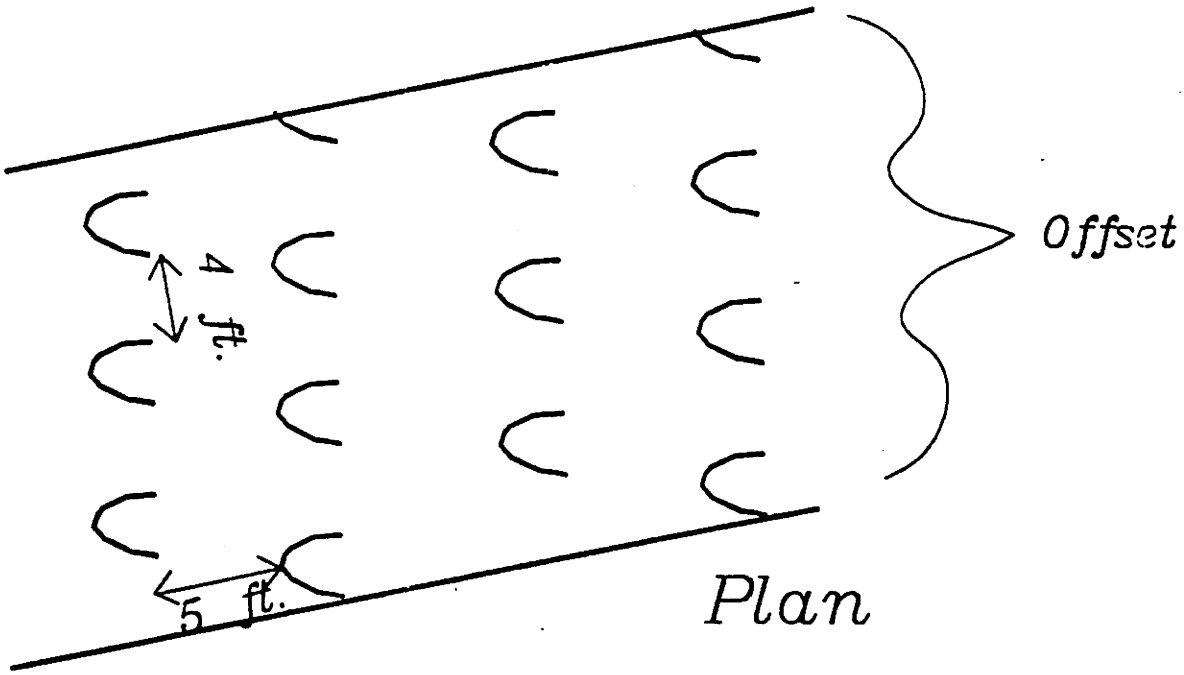
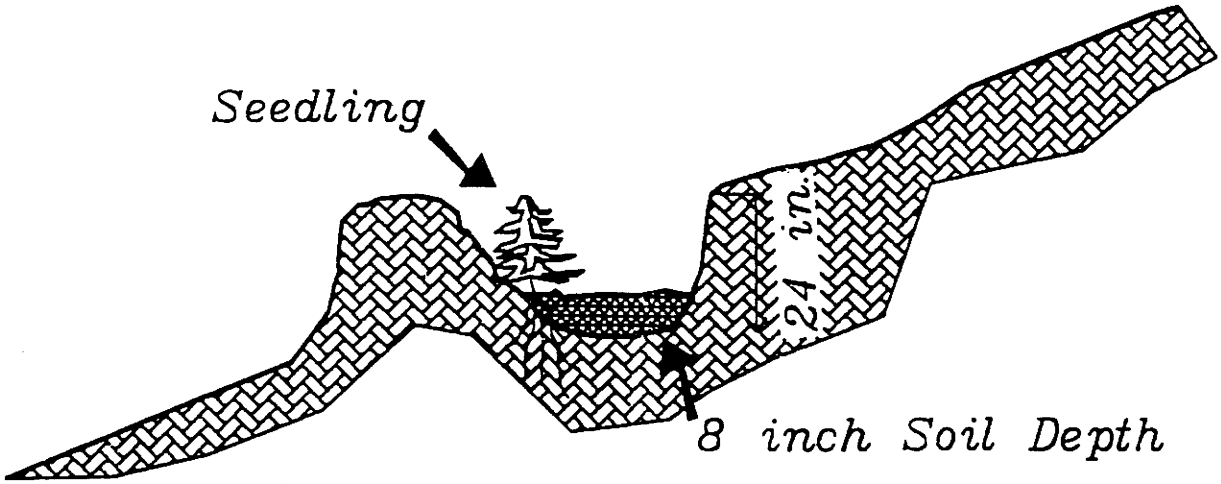


Figure 2
Seedling Locations



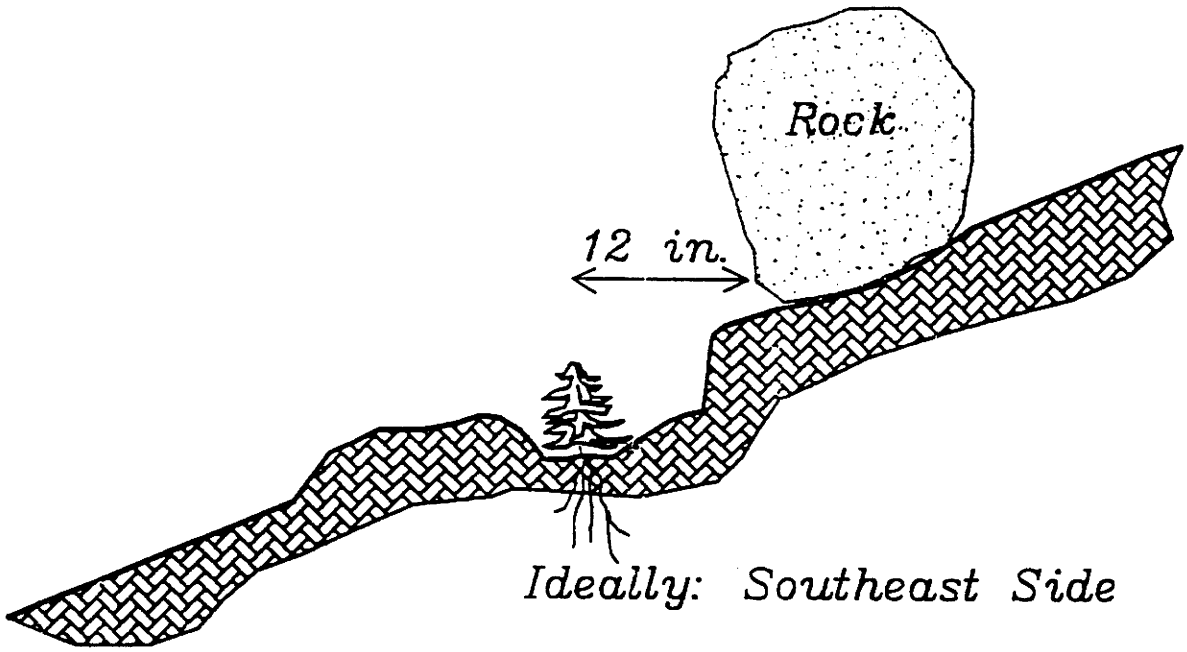
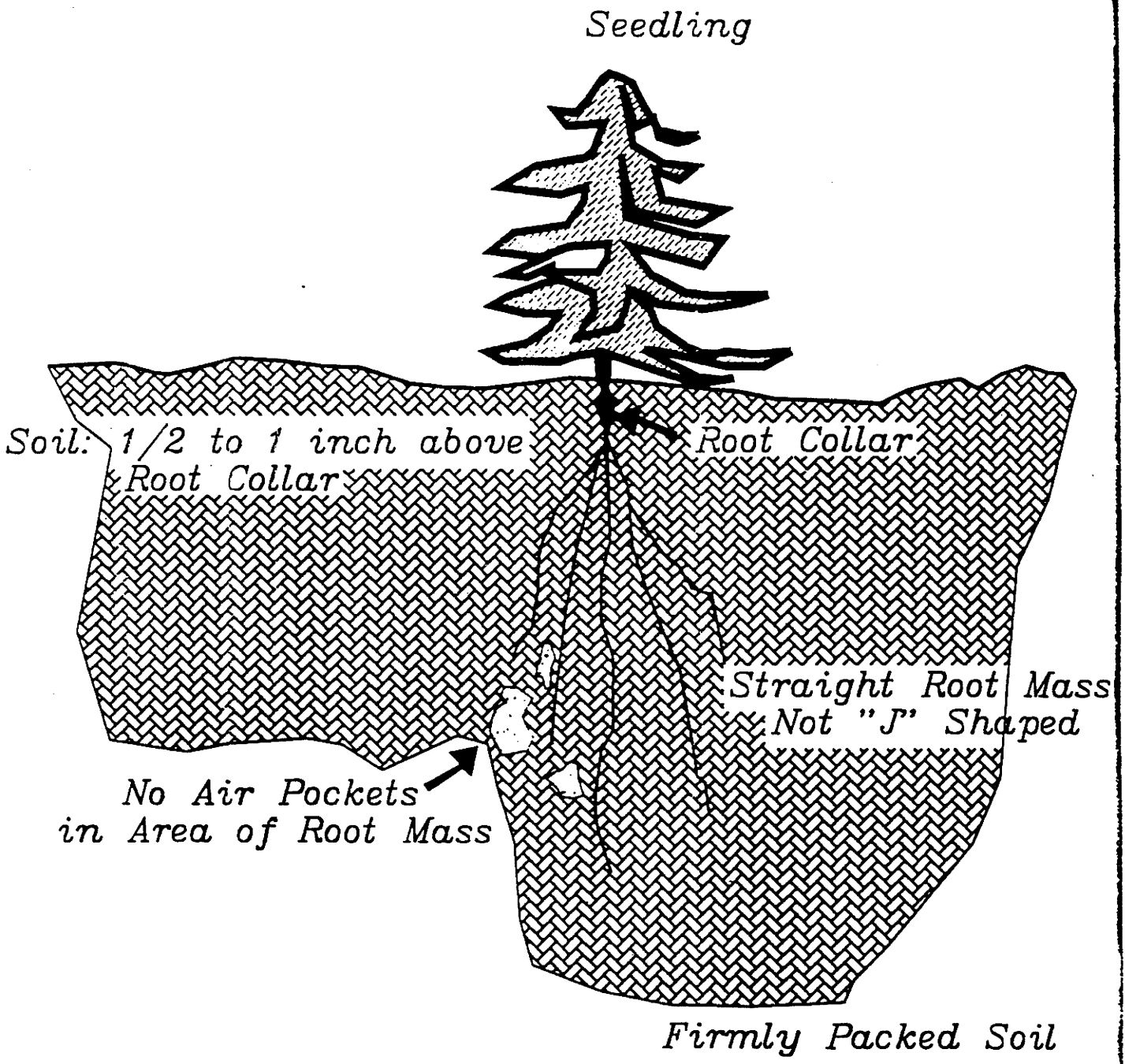


Figure 3
Seedling Planting Procedure



APPENDIX E

NATIONAL RESOURCE CONSERVATION SERVICE CORRESPONDENCE - PRIME FARMLANDS

SOIL CHARACTERISTICS

USDA Natural Resources Conservation Service

350 North 400 East
Price, Utah 84501
801-637-0041

DATE: June 8, 1998

FILE CODE: 290-11-11-5

SUBJECT: PRIME FARMLAND DETERMINATIONS

TO: Environmental Industrial Services
31 NO Main Street
Helper, Ut 84526

RE: Lila Canyon Coal Lease Area and Support Facilities, Emery County Utah

After site investigation, the Natural Resources Conservation Service has determined that no prime farmland or farmland of statewide importance occurs on the proposed transportation and utility corridor and area of surface facilities for the proposed Lila Canyon Coal Lease Area because there is no developed irrigation system on arid soils.

Location map is enclosed.

Leland Sasser
Soil Scientist

Attachment

cc: William Broderson, State Soil Scientist, NRCS, UT

FEATURES OF SOIL MAP UNITS

Map Unit Symbol	Soil Components	% Slope	Land Capability Class (nonirrigated)	Range and Woodland Sites	Erosion Rooting Depth (Inches)	Erosion Hazard (By water)
BMD	Strych, very stony, fine sandy loam	3-30	VIIs	Semi-desert Stony Loam (Utah Juniper-Pinyon)	60 or more	Moderate
BME2	Strych, very stony loam, dry	3-30	VIIs	Semi-desert Stony Loam (Utah Juniper-Pinyon)	60 or more	Moderate
BNE2	Strych, very bouldery fine sandy loam	3-20	VIIs	Semi-desert Bouldery Loam	60 or more	Moderate
BY	Badland, Rubbleland, Rock outcrop	30-80	VIIIe VIIIs	N/A	N/A	Severe or Badland
CHC2	Shipeta, silty, clay loam	8-15	VIIIe	Desert Shallow Clay	10-20	Severe
EED2	Hanksville, very gravelly fine sandy loam	3-15	VIIIe	Desert Clay (shadscale)	10-20	Moderate
KAC	Persayo Greybull	3-15	VIIIe VIIIe	Desert Loamy Clay (shadscale) Desert Loam	10-20 20-40	Severe Moderate
NGG2	Gerst Strych Badland	30-70	VIIIe VIIIe VIIIe	Semidesert Very Steep Shallow Clay Semidesert Very Steep Loam N/A	8-20 60/more	Moderate Severe Severe
RIA2	Ravolta Toddler	1-6	VIIs VIIs	Desert Loam (shadscale) Alkali Flat (greasewood)	60/more 60/more	Moderate Moderate
RZH	Rock Outcrop Atchee Rubbleland	50-80	VIIs	N/A Semidesert, Very Steep, Shallow Loam, (Utah Juniper-Pinyon) N/A	N/A 5-20 N/A	N/A High N/A
SMD2	Cliffsand Minchey	1-8	VIIs VIIIe	Desert Sandy Loam Desert Loam	60/more 60/more	Slight Slight

APPENDIX F

WATER RIGHTS

UTAH DIVISION OF WATER RIGHTS
WATER RIGHT POINT OF DIVERSION PLOT CREATED FRI, JUL 30, 1999, 12:46 PM
PLOT SHOWS LOCATION OF 1 POINTS OF DIVERSION

PLOT OF ALL QUARTER(S) IN SECTION 35 TOWNSHIP 15S RANGE 14E SL BASE AND MERIDIAN
PLOT SCALE IS APPROXIMATELY 1 INCH = 1000 FEET

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                 N O R T H
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PLOT OF ALL QUARTER(S) IN SECTION 35 TOWNSHIP 15S RANGE 14E SL BASE AND MERIDIAN
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NWPLAT POINT OF DIVERSION LOCATION PROGRAM

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MAP  WATER        QUANTITY      SOURCE DESCRIPTION or WELL INFO   POINT OF DIVERSION DESCRIPTION   N P E E U G T E
CHAR RIGHT    CFS  AND/OR  AC-FT  DIAMETER  DEPTH  YEAR LOG NORTH  EAST  CNR SEC  TWN  RNG B&M  N P R R R W P D

0 91 1903     .0800        .00 Unnamed Spring                            X X X
     WATER USE(S): STOCKWATERING                              PRIORITY DATE: 00/00/1869
     State of Utah School & Institutional Tru 675 East 500 South, 5th Floor    Salt Lake City    UT 84102
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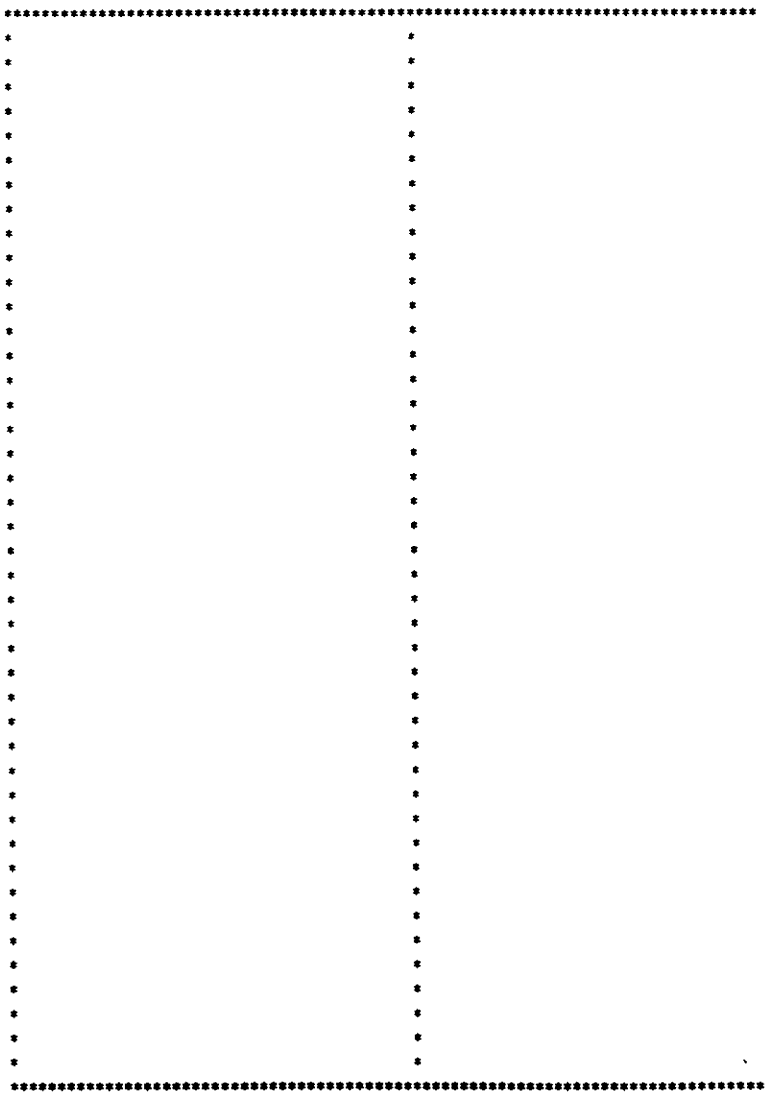
NORTH



APPENDIX G

TES SURVEY REPORT

1998 AND 1999 RAPTOR SURVEYS

U.S. FISH AND WILDLIFE SERVICES CORRESPONDENCE - TES SPECIES

CANYON SWEETVETCH, CREUTZFELDT-FLOWER, LOGGERHEAD SHRIKE, AND BURROWING OWL INVENTORIES FOR THE LILA CANYON MINE PROPOSAL

CONDUCTED BY

EIS ENVIRONMENTAL CONSULTING

MAY 21st, 22nd, AND 26th

Introduction

Basic Management, Price Utah, has proposed to build a mine facility located within Lila Canyon of the Book Cliffs/Roan Cliffs Plateau Physiographic Region. The proposed mine facility includes a transportation/utility corridor and a mining surface facility. The transportation/utility corridor will consist of an access road, rail line, power line, and utility line. Other proposed actions are a permit area and two borrow areas.

A ground inventory for loggerhead shrike, *Lanius ludovicianus*, creutzfeldt-flower, *Cryptantha creutzfeldtii*, burrowing owls, *Athene cunicularia*, and Canyon sweetvetch, *Hedysarum occidentale* variety *canone* was conducted on May 21, 22, and 26 by employees of EIS. The proposed access/utility corridor and surface facility were inventoried by walking linear transects over the entire area of concern.

Methodology

Loggerhead shrike - Burrowing owl

Inventories were conducted between sunrise and 10:00A.M., the period of highest bird activity, on May 21, 22, and 26th. Binoculars and spotting scopes were used to note shrike activities and the entire proposed area was searched for white-tailed prairie dog, (Cynomys leucurus) towns. Prairie dog towns are the preferred habitat of borrowing owls. If shrikes were observed, a thorough search of the site was conducted to identify the presence of a nest. Field personnel would also conduct a thorough search of identified prairie dog towns to reveal the presence of on-going or historic burrowing owl activities (scratchings, droppings, tracks, ect.). Habitat present in the proposed area was noted, as was the general topography, weather conditions and general mitigation suggestions.

Canyon sweetvetch - creutzfeldt-flower

Inventories were conducted during sunrise and 3:00P.M. on May 21, 22, and 26th. The areas were searched by walking linear transects over the entire area of concern. If target taxa were

located field personnel flagged the location, collected voucher specimens, marked the location on a quad-map, and took a photograph of the plant and habitat. Habitat present in the proposed area was noted, as was the general topography, weather conditions, and general mitigation suggestions.

Results

Loggerhead shrike

A thorough search of the area did not reveal the presence of Loggerhead shrikes, though the proposed surface facility area contains suitable shrike habitat.

Burrowing owl

No burrowing owls were located within any of the proposed area. A thorough search of the area revealed no prairie dog towns and therefor no on-going or historic burrowing owl activity.

Creutzfeldt-flower

No creutzfeldt-flower was identified in the proposed area although there were several areas of suitable habitat (Mancos Shale substrate).

Canyon sweetvetch

Canyon sweetvetch was located in a dry wash located in the south west corner of section 21, Township 16 East, Range 14 East, found on the ---------- USGS quad. Approximately 20 plants occurred in this area. The voucher sample was positively identified by qualified BLM staff. This was the only occurrence of *Hedysarum occidentale* in the proposed area.

Recommendations: It is recommended that construction of the transportation/utility corridor minimize sediment loading to the ephemeral stream mentioned. Increased erosion and subsequent sedimentation could possibly impact existing plants or alter future establishment of Canyon sweetvetch. Sediment traps should be employed during road construction. The population of sweetvetch should be monitored annually to assess effects of road, rail line, power line, and utility line construction on Canyon sweetvetch population dynamics.

Lila Point

Nest N	Map N	Quad Name	Last Year Surveyed	First Year Surveyed	Species	Status	Elevation	Type	Yo Ag	Eg	UTM Coordinates Nothing	Easting
1.000		Lila Point	1998		Golden Eagl	Old/Dilapit	6800	Cliff	0	0		
2a		Lila Point	1998		Golden Eagl	Old/Dilapit	6700	Cliff	0	0		
2b		Lila Point	1998		Golden Eagl	Inactive*	6700	Cliff	0	0		
3.000		Lila Point	1998		Golden Eagl	Inactive	6800	Cliff	0	0		
4.000		Lila Point	1998		Golden Eagl	Tended	6900	Cliff	0	0		
5.000		Lila Point	1998		Golden Eagl	Tended	7200	Cliff	0	0		
6a		Lila Point	1998		Golden Eagl	Old/Dilapit	7000	Cliff	0	0		
6b		Lila Point	1998		Golden Eagl	Inactive	7000	Cliff	0	0		
7a		Lila Point	1998		Golden Eagl	Inactive	7200	Cliff	0	0		
7b		Lila Point	1998		Golden Eagl	Tended	7200	Cliff	0	0		
7c		Lila Point	1998		Golden Eagl	Tended	7200	Cliff	0	0		
8.000		Lila Point	1998		Golden Eagl	Inactive	6800	Cliff	0	0		
9.000		Lila Point	1998		Unidentified	Inactive	7100	Cliff	0	0		
10.000		Lila Point	1998		Falcon	Inactive	7300	Cliff	0	0		
11.000		Lila Point	1998		Golden Eagl	Active	7200	Cliff	2	0		
12.000		Lila Point	1998		Golden Eagl	Inactive	7300	Cliff	0	0		

*Corrected from "Tended" to "Inactive" by Derris Jones on July 9, 1998.

1999 LILA CANYON RAPTOR INVENTORY
CONDUCTED BY UDWR

NEST NO.	X	Y	ID	DATE	SPECIES	TYPE	STATUS	EGGS	YNG	AGE	COMMENTS	QUAD
455	556839	4364290	7	05/12/99	Unidentified	Cliff	Old/Dilap	0	0	0	Possible Golden Eagle $455 - no nest material left	LilaPt
456	556642	4364476	2	05/12/99	Golden Eagle	Cliff	Active	0	99		Hen on nest; couldn't see young	LilaPt
714	555261	4365754	1	05/12/99	Falcon	Cliff	Inactive	0	0	0	Whitewash in evidence, uppermost escarpment	LilaPt
715	551565	4362502	3	05/12/99	Raven	Cliff	Inactive	0	0	0		Cedar
176	551677	4362484	4	05/12/99	Golden Eagle	Cliff	Old/Dilap	0	0	0		Cedar
717	552315	4361770	5	05/12/99	Golden Eagle	Cliff	Active	0	99		Hen on nest; couldn't see young	Cedar
718	553221	4363356	6	05/12/99	Ferruginous Hawk	Ground	Old/Dilap	0	0	0	Historical nest; structure not intact	Cedar
719	557000	4364310	8	05/12/99	Golden Eagle	Cliff	Inactive	0	0	0	Upper level	Cedar

While most of the above species may not be directly affected by mining, impacts such as subsidence, altered hydrologic flows, and mining effluent may cause significant changes or losses in wildlife habitat, wetlands, riparian areas, stream flows, and water quality. The FWS is concerned about the impacts that mining may have on all wildlife species and their habitat.

Electrocution is a major cause of mortality among raptors. Power line construction should conform with designs established in the following publications: Avian Power Line Interaction Committee's (APLIC), "Mitigating Bird Collisions with Power Lines: The State of the Art in 1994," and, "Suggested Practices for Raptor Protection on Power Lines: The State of the Art in 1996," prepared for the Edison Electric Institute/Raptor Research Foundation, Washington, D.C.

Coal exploration drilling may be needed to evaluate coal quality and quantity. Well pad construction requires clearing vegetation which removes occupied and potential habitat for a variety of wildlife. Construction also fragments contiguous habitat and increases edge habitat. Species populations requiring contiguous habitat decline as the amount of edge habitat increases.

The FWS suggests that wildlife surveys be conducted to determine habitat availability, raptor nest sites, seep locations, etc. so that these areas may be protected. A monitoring program should also be established to help control and identify any additional impacts to wildlife. Mitigation will be required for any loss of habitat resulting from subsidence or seep, spring, or stream flow alterations or depletions.

Coal mine operation may result in subsidence that can cause alterations and changes in ground and surface flows that may result in significant depletion of water to the Colorado River System. Utah State law states that the permittee or lessee will be responsible to replace any surface water that may be lost or adversely affected by mining operations. Water lost from surface flow may enter a ground water aquifer. A water budget analysis would be required to determine if the loss of surface water results in increased ground water outflow and therefore no loss to the Colorado River System. An estimate of the amount of water depleted from the Colorado River System should be made and consultation under Section 7 of the ESA be initiated with the FWS. The FWS recommends that no mining occur within a 22 degree angle-of-draw to any stream for the protection of the river channel, riparian habitat, wetlands, and fish and wildlife species and their habitat.

The proposed coal mine includes a water discharge line into the Price River. A Section 7 consultation under the Endangered Species Act should be initiated with the U.S. Fish and Wildlife Service (FWS). A consultation will be required to determine impact of mine effluent on the Colorado squawfish. Colorado squawfish are known to occur in the Price River up to mile mark 88.

You should review your proposed action and determine if the action would affect any listed species or critical habitat. You should also determine if the action is likely to jeopardize the continued existence of proposed species or result in the destruction or an adverse modification of any critical habitat proposed for such species. If the determination is "may affect" for listed species, you must request in writing formal consultation from the Field Supervisor, at the address

given above. In addition, if you determine that the proposed action is likely to jeopardize the continued existence of proposed species or result in the destruction or adverse modification of proposed critical habitat, you must confer with this office. At that time, you should provide this office a copy of the biological assessment and any other relevant information that assisted you in reaching your conclusion.

The Service can enter into formal Section 7 consultation only with another Federal agency. State, county, or any other governmental or private organizations can participate in the consultation process, help prepare information such as the biological assessment, participate in meetings, etc.

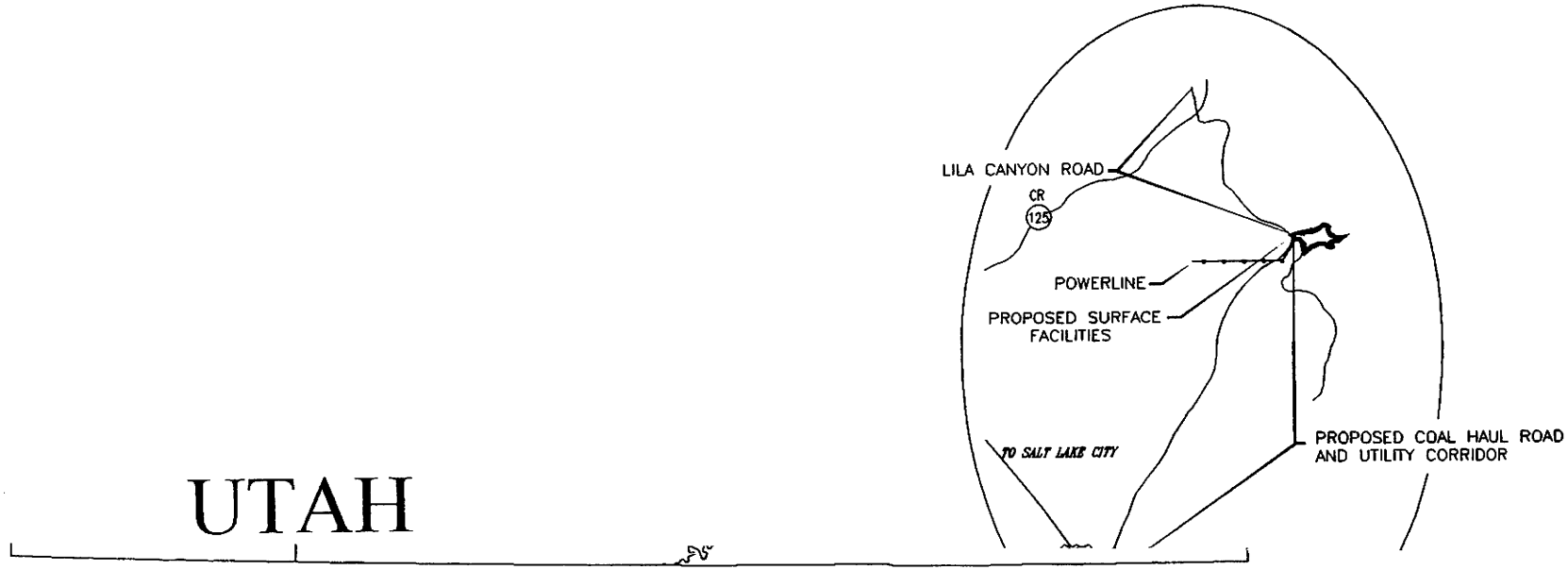
Your attention is also directed to Section 7(d) of the Endangered Species Act, as amended, which underscores the requirement that the Federal agency or the applicant shall not make any irreversible or irretrievable commitment of resources during the consultation period which, in effect, would deny the formulation or implementation of reasonable and prudent alternatives regarding their actions on any endangered or threatened species.

If we can be of further assistance, please feel free to contact Jim Muck in our office at (801)524-5001 ext. 133.

Sincerely,

Reed E. Harris

Reed E. Harris
Utah Field Supervisor

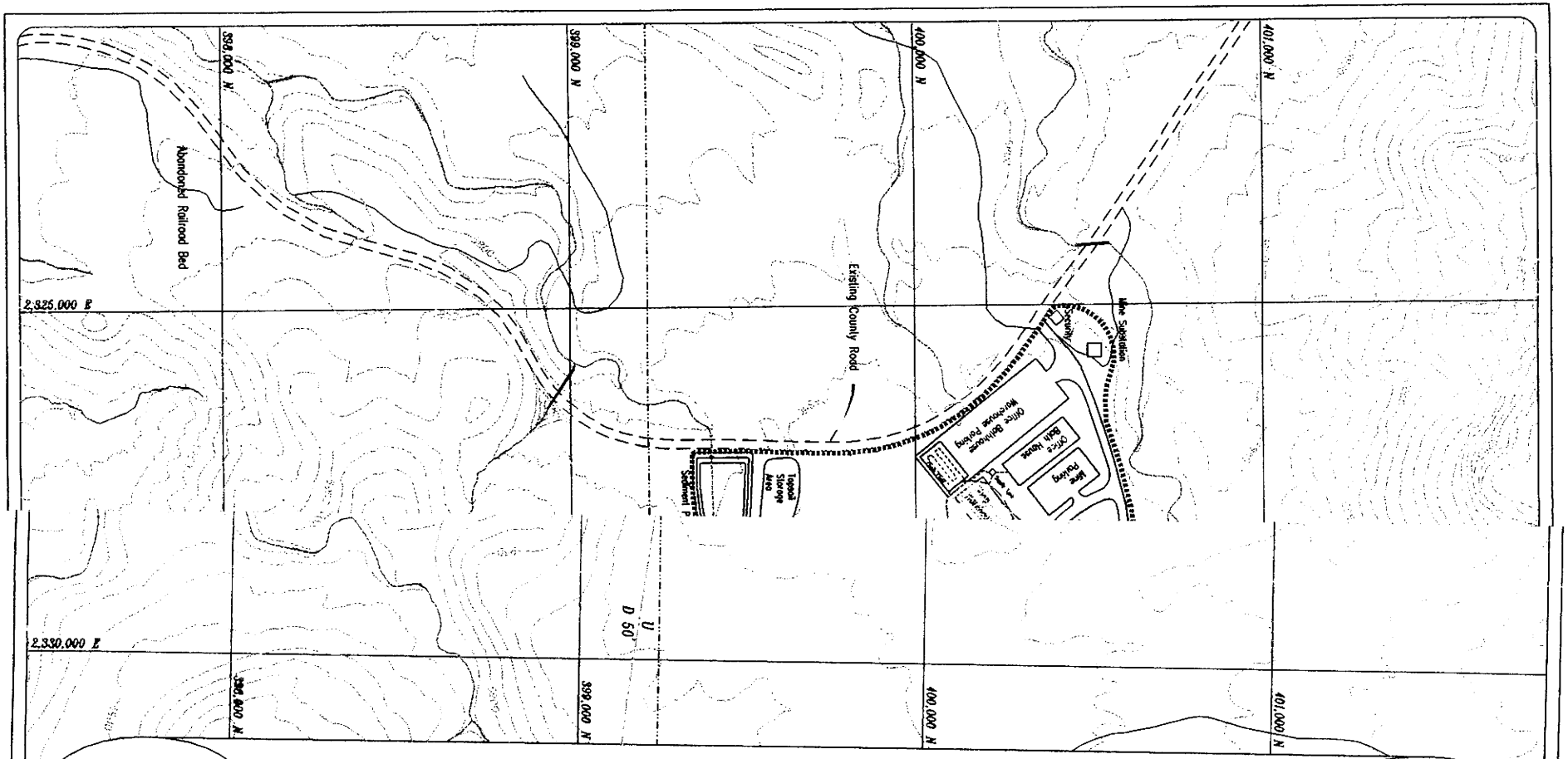


UTAHAMERICAN ENERGY, INC.

LILA CANYON MINE

GENERAL LOCATION

DATE: DECEMBER 1999	DRAWN BY: EJS
SCALE: AS SHOWN	FIGURE #: PLATE 1



LEGEND:

NATURAL DRAINAGE: _____

DISTURBED AREA BOUNDARY: .....

REFUSE AREA: .....

R 14 E, T 16 S

100' 0' 200' 400'

REVISION DATE:

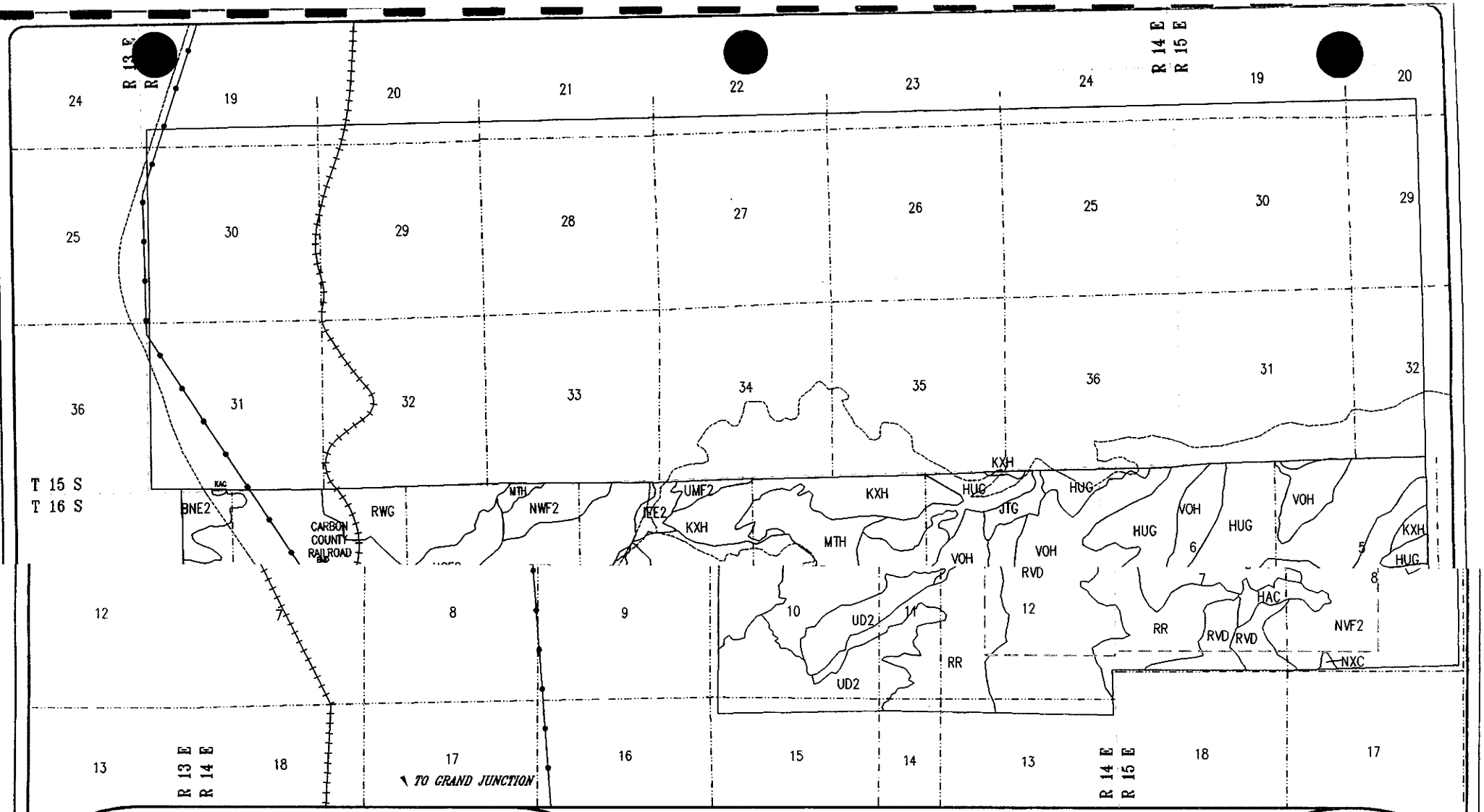
JAN 1999	WJ		

UTAHAMERICAN ENERGY, INC.

LILA CANYON MINE

SURFACE AREA
LILA CANYON MINE

DECEMBER 1999	BLACKHAWK ENG.
AS SHOWN	II-A



SOIL LEGEND:

SOILS WITHIN AND ADJACENT TO THE MINE FACILITIES SITE.

RR	ROCK OUTCROP
NGG2	Gerst–Strych–Badland Complex, 30–70% slopes
NXC	Lazear–Rock outcrop complex, high rainfall, 1 to 8% slopes
RZH	Rock outcrop–Atchee–Rubble land complex
BMD	Strych very stony fine sandy loam, 3–30% slopes
BL	Persao–Chipeta Badland, 3–20% slopes
BNE2	Strych, very bouldery fine sandy loam, 3–20% slopes

Ref: NRCS, Soil Survey of Emery Area, Utah, in progress, 7/99 update.

REVISION DATE:

DATE	BY	DATE	BY
07-22-99	RCR		

N

1000' 0' 2000' 4000'

UTAHAMERICAN ENERGY, INC.

LILA CANYON MINE

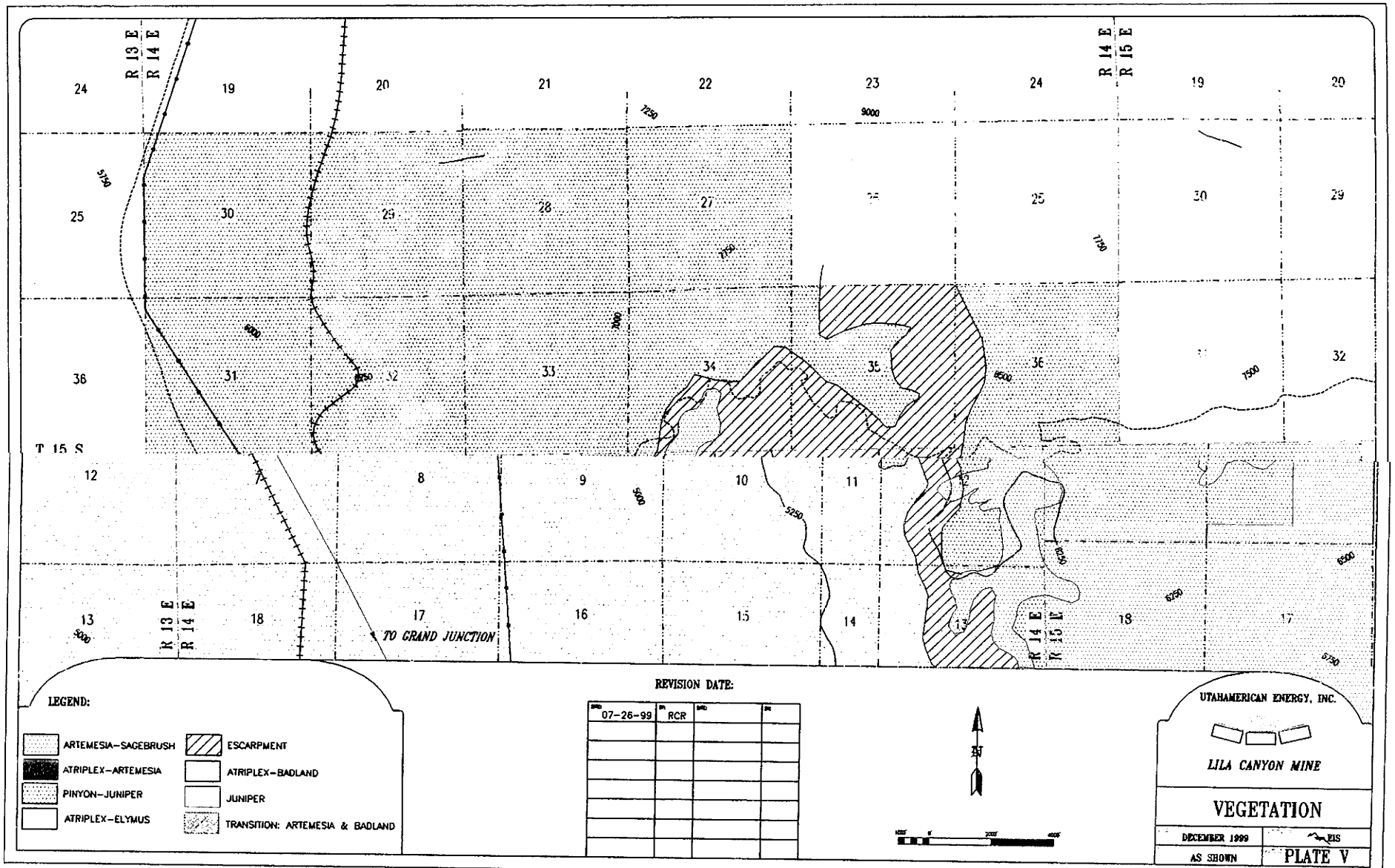
SOILS MAP

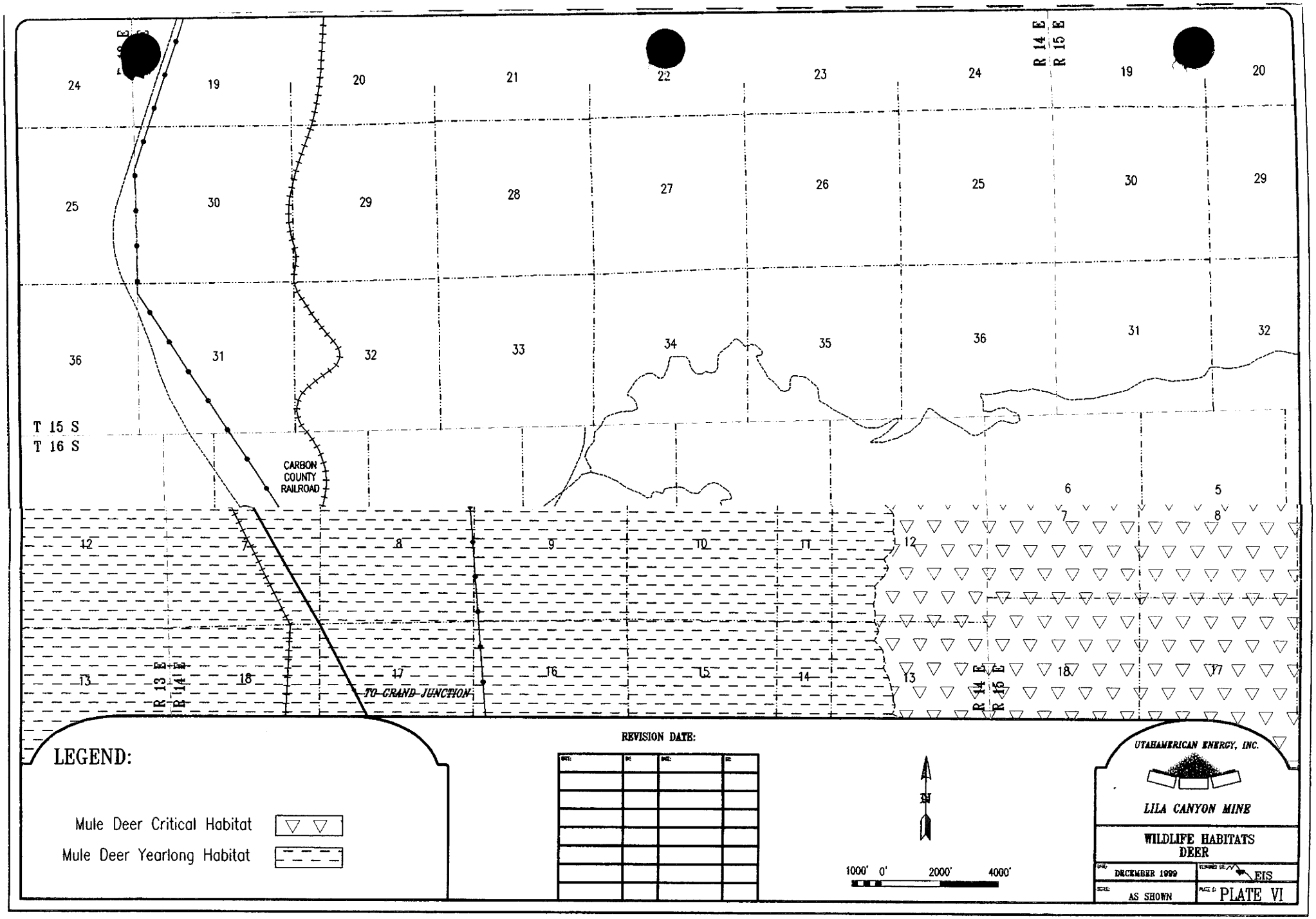
DATE: DECEMBER 1999

DESIGNED BY: FIS

SCALE: AS SHOWN

PLATE III


R 13 E
R 14 E
R 14 E
R 15 E
T 15 S
TO GRAND JUNCTION
LEGEND:
ARTEMESIA-SAGEBRUSH
ATRIPLEX-ARTEMESIA
PINYON-JUNIPER
ATRIPLEX-ELYMUS
ESCARPMENT
ATRIPLEX-BADLAND
JUNIPER
TRANSITION: ARTEMESIA & BADLAND
REVISION DATE:
07-26-99
RCR
UTAHAMERICAN ENERGY, INC.
LILA CANYON MINE
VEGETATION
DECEMBER 1999
AS SHOWN
PLATE V



R 14 E
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CARBON COUNTY RAILROAD
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R 13 E
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TO GRAND JUNCTION
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LEGEND:
Mule Deer Critical Habitat
Mule Deer Yearlong Habitat
REVISION DATE:
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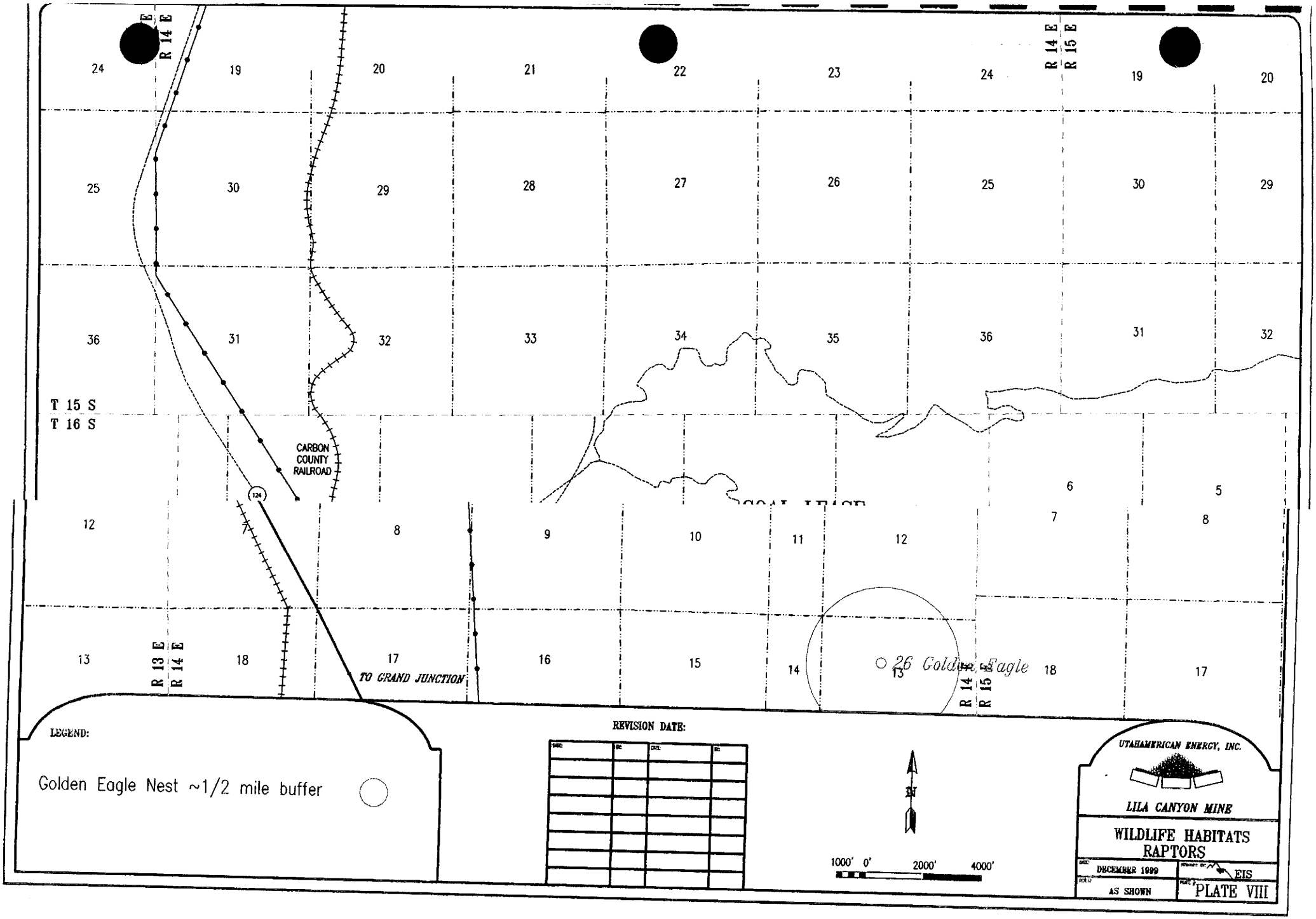
1000' 0' 2000' 4000'
UTAHAMERICAN ENERGY, INC.
LILA CANYON MINE
WILDLIFE HABITATS
DEER
DECEMBER 1999
EIS
AS SHOWN
PLATE VI


R 14 E
R 14 E
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T 15 S
T 16 S
CARBON COUNTY RAILROAD
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TO GRAND JUNCTION
R 13 E
R 14 E
R 14 E
R 15 E
26 Golden Eagle
LEGEND:
Golden Eagle Nest ~1/2 mile buffer
REVISION DATE:
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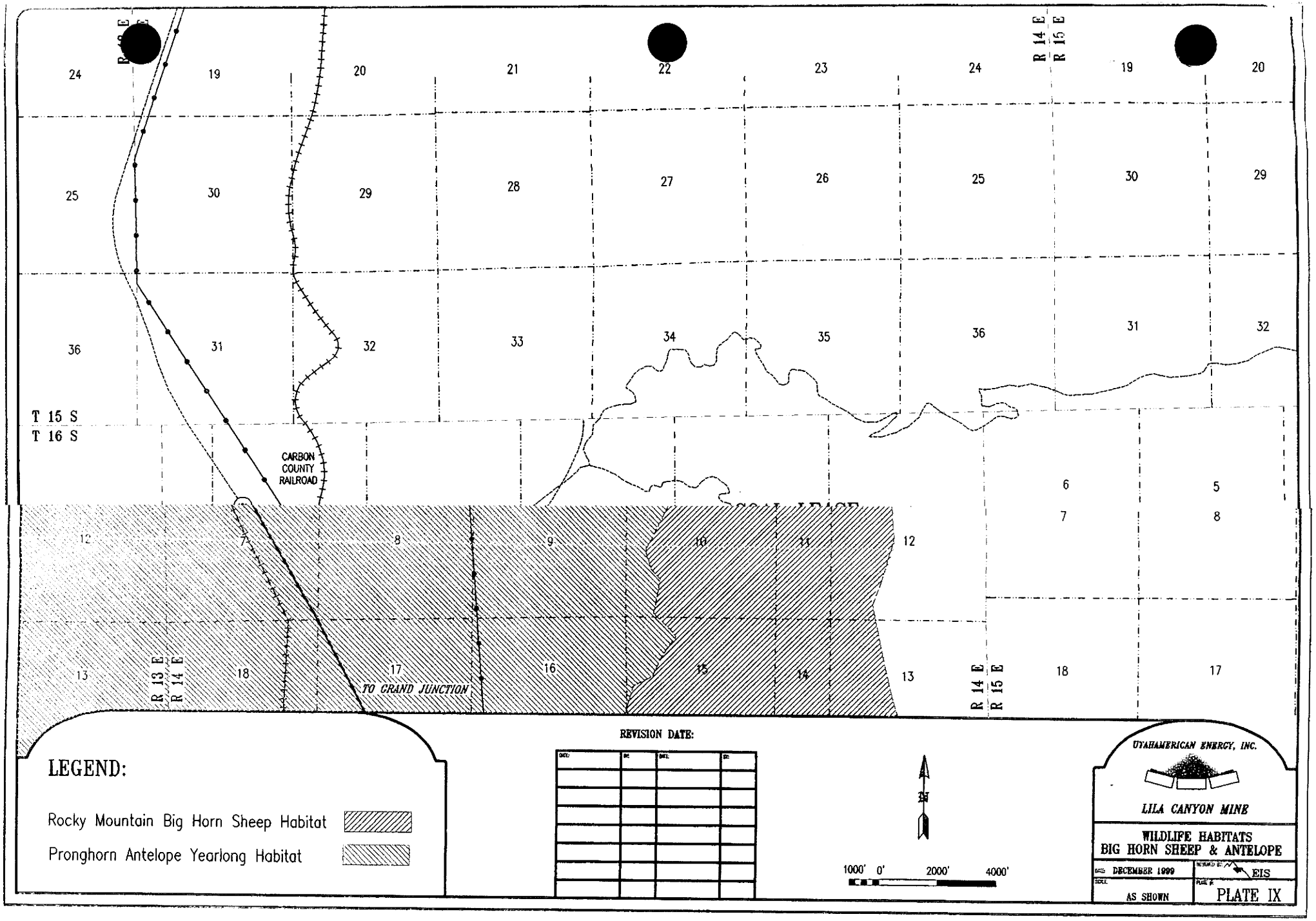
1000' 0' 2000' 4000'
UTAHAMERICAN ENERGY, INC.
LILA CANYON MINE
WILDLIFE HABITATS
RAPTORS
DECEMBER 1999
AS SHOWN
EIS
PLATE VIII



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R 14 E
TO GRAND JUNCTION
R 14 E
R 15 E
LEGEND:
Rocky Mountain Big Horn Sheep Habitat
Pronghorn Antelope Yearlong Habitat
REVISION DATE:
N
1000' 0' 2000' 4000'
UTAHAMERICAN ENERGY, INC.
LILA CANYON MINE
WILDLIFE HABITATS
BIG HORN SHEEP & ANTELOPE
DECEMBER 1999
EIS
AS SHOWN
PLATE IX

LILA CANYON PROJECT
EMERY COUNTY, UTAH

ENVIRONMENTAL ASSESSMENT
UT-070-99-22

PREPARED BY

USDI, Bureau of Land Management
Price Field Office
125 South 600 West
Price, Utah 84501
(435) 636-3600

COOPERATING AGENCY

USDI, Office of Surface Mining
1999 Broadway, Suite 3320
Denver, Colorado 80202
(303) 844-1489

SEPTEMBER 2000

TABLE OF CONTENTS

	Table of Contents	i
	List of Plates	v
	Acronyms and Abbreviations	vi
	Glossary of Terms	viii
CHAPTER 1.0	**PURPOSE AND NEED FOR THE ACTION**	1
1.1	Purpose and Need for the Action	1
1.2	Authorizing Actions and Permits	1
	1.2.1 Conformance with the Bureau of land Management Land Use Plans	1
Table 1.1	Proposed Action Conformance with the objectives of the Price River Management Framework Plan	1
	1.2.2 Relationship to Other Statutes, Plans and Required Permits	2
1.3	Project Initiation, Public Participation, and Issues Identified for Analysis	3
	1.3.1 Issues to be Analyzed	4
	1.3.2 Comment, Concerns and Critical Elements of the Human Environment Not Analyzed in Detail	4
Table 1.2	Permits and Other Legal Requirements	6
CHAPTER 2.0	**ALTERNATIVES INCLUDING THE PROPOSED ACTION**	7
2.1	Introduction	7
2.2	Alternatives Considered in Detail	7
	2.2.1 Alternative A - No Action	7
	2.2.2. Alternative B - Proposed Action	7
Table 2.1	Summary of Row Acreage Associated with the Proposed New Coal Haul Road	9
Figure 2.1	Typical Road Cross Section	12
Figure 2.2	Typical for the Proposed Acceleration/Deceleration Intersection	13
Figure 2.3	Typical Power Pole	15
Figure 2.4	Typical Power Pole	16
Figure 2.5	Typical Power Pole	17
Figure 2.6	Typical Power Pole	18
Table 2.2	Recommended Seed Mix for All Disturbed Areas	33
Table 2.3	Construction Time Frame for Phase I and Phase II	34
2.3	Alternatives Considered but Not Analyzed Further	35
	2.3.1 Alternative A - Use of Existing Horse Canyon Site for Coal Mine	

Operation 35
2.3.2 Alternative B - Use of the Horse Canyon Road/Lila Canyon Road for Coal Mine Operation 36

CHAPTER 3.0 AFFECTED ENVIRONMENT 37
3.1 General Setting 37
3.2 Geology 37
Figure 3.1 Geologic Cross Section Of Lila Canyon Area 38
3.3 Soils 39
3.4 Hydrology 40
3.4.1 Climate 40
3.4.2 Surface Water 40
3.4.3 Ground Water 40
3.5 Land Use 41
3.5.1 Grazing 41
3.5.2 Vehicular Traffic 42
3.5.3 Visual Resources 42
Exhibit 3.1 View Looking Southeast along Existing Lila Canyon Road 43
Exhibit 3.2 View Looking Northeast From U.S. Highway 191/6 (KOP) 43
3.6 Vegetation 44
Table 3.2 List of Plant Species Identified Within the Project Area 45
3.7 Wilderness Values 45
3.8 Wildlife 46
3.8.1 Amphibians 46
3.8.2 Reptiles 46
3.8.3 Birds 46
3.8.4 Mammals 47
3.9 Cultural Resources 48

CHAPTER 4.0 ENVIRONMENTAL CONSEQUENCES 49
4.1 Impacts Associated with Alternative A - No Action 49
4.2 Impacts Associated with Alternative B - Proposed Action 49
Table 4.1 Areas of Impact Associated with the Proposed Action 49
4.3 Geology Impacts 50
4.3.1 Geology Mitigation 51
4.4 Soils Impacts 51
4.4.1 Soils Mitigation 51
4.5 Hydrology Impacts 52
4.5.1 Hydrology Mitigation 52
4.6 Land Use Impacts 53

4.6.1 Grazing 53
4.6.2 Grazing Mitigation 53
4.6.3 Vehicular Traffic Impacts 54
4.6.4 Vehicular Traffic Mitigation 54
4.6.5 Visual Resources Impacts 54
4.6.6 Visual Resources Mitigation 55
4.7 Vegetation Impact 55
4.7.1 Vegetation Mitigation 55
Table 4.2 Habitat Associated with the Proposed Action 56
4.8 Wilderness Values 56
4.8.1 Wilderness Values Mitigation 57
4.9 Wildlife Values Impacts 57
4.9.1 Wildlife Values Mitigation 59
4.10 Cultural Resources Impacts 60
4.10.1 Cultural Value Mitigation 60

CHAPTER 5.0 ANALYSIS OF CUMULATIVE IMPACTS 61
5.1 Past, Present and Reasonably Foreseeable Action Within the Area 61
5.1.1 Exploration Drilling Associated With the Lila Canyon Project 61
5.1.2 Development of the Blue Castle Mine 61
5.1.3 Regional Traffic 61
5.2 Cumulative Affects on Identified Resources 62
5.2.1 Exploratory Drilling 62
5.2.2 Displacement and Direct Disturbance of Wildlife 62
5.2.3 Surface Impacts Resulting from Mine Induced Subsidence 63
5.2.4 Soils and Reclamation Potential 63
5.2.5 Ground Water and Surface Water Hydrology 64
5.2.6 Livestock Grazing 64
5.2.7 Vehicular Traffic 64
5.2.8 Visual Resources 64
5.2.9 Loss of Vegetation Diversity, Cover and Productivity 64

CHAPTER 6.0 CONSULTATION AND COORDINATION 65
6.1 Agencies, Organizations and Individuals Contacted 65
6.1.1 Federal Government/Agencies 65
6.1.2 State of Utah 65
6.1.3 Local Governments and Organizations 65
6.1.4 Industry and Business 65
6.2 List of Preparers and Interdisciplinary Team 66

6.2.1 EIS Environmental & Engineering Consulting (EIS); Helper, Utah 66
6.2.2 BLM Interdisciplinary Team 66
6.3 References 66

CHAPTER 7.0 APPENDICES

APPENDIX A A Summary of Public Scoping Comments

APPENDIX B Engineering Associated with the Existing Lila Canyon Road
Emery County Road Department Correspondence

APPENDIX C Utah Department of Transportation Right-of-Way Encroachment Permit

APPENDIX D Mine Surface Facility Reclamation Plan

APPENDIX E Natural Resource Conservation Service Correspondence - Prime Farmlands
Soil Characteristics

APPENDIX F Water Rights

APPENDIX G TES Survey Reports
1998 and 1999 Raptor Surveys
U.S. Fish and Wildlife Services Correspondence - TES Species
Lila Canyon Biological Assessment

LISTS OF PLATES

PLATE I	GENERAL LOCATION
PLATE II	PROPOSED ACTION
PLATE II-A	SURFACE AREA - LILA CANYON MINE
PLATE III	SOILS
PLATE IV	LAND USE
PLATE V	VEGETATION
PLATE VI	WILDLIFE - DEER
PLATE VII	WILDLIFE - ELK
PLATE VIII	WILDLIFE - RAPTORS
PLATE IX	WILDLIFE - BIGHORN SHEEP AND ANTELOPE

ACRONYMS AND ABBREVIATIONS

AASHTO	American Association of State Highway and Transportation Officials
AUM	animal unit month
BLM	Bureau of Land Management
BP	Before Present
cfs	cubic feet per second
CFR	Code of Federal Regulations
CR	County Road (Emery)
fps	Feet per Second
FLPMA	Federal Land Policy Management Act
gpm	Gallons per Minute
hp	Horsepower
IMP	Interim Management Plan (BLM)
IPA	Intermountain Power Agency
KOP	Key Observation Point
kV	kilovolt
MFP	Management Framework Plan (BLM)
MLA	Mineral Leasing Act of 1920
MRP	Mine Reclamation Plan
NAS	National Academy of Science
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act of 1986
NRHP	National Register of Historic Places
NRCS	Natural Resource Conservation Service
OSM	Office of Surface Mining
PAP	Permit Application Package (UDOGM)
psf	Pounds per Square Foot
R	Range
ROW	right-of-way
R2P2	Resource Recovery and Protection Plan (BLM)
SLB&M	Salt Lake Base and Meridian
SMRCA	Surface Mining Control and Reclamation Act of 1977, as amended
SPCC	Spill Prevention Control and Countermeasure Plan
T	Township
TDS	Total Dissolved Solids
TES	Threatened, Endangered and Sensitive (Species)
TSS	Total Suspended Solids
UDOT	Utah Department of Transportation
UDWR	Utah Division of Wildlife Resources
UDOGM	Utah Division of Oil, Gas and Mining

UEI	UtahAmerican Energy, Incorporated
UNPDES	Utah Nonpoint Discharge Effluent Source
UP&L	Utah Power & Light
U.S.	United States
USDI	U.S. Department of the Interior
USFWS	U.S. Fish and Wildlife Service
VRM	Visual Resource Management
WSA	Wilderness Study Area

GLOSSARY OF TERMS

Access	Passage to proposed site
Affected Environment	The biotic, abiotic, and human-related environment that is sensitive to changes due to the actions propose in any of the alternatives.
Agency	The land management agency, in this case the BLM and OSM.
Allotment	A unit of land suitable and available for livestock grazing that is managed as one grazing unit.
Alternative	Other reasonable courses of action to any proposal which involves unresolved conflicts, concerns or alternate uses of available resources.
Animal Unit Month	For the BLM allotments, it is the forage consumed by a 1,000 pound cow over a one month period, approximately 800 pounds of forage. An animal unit month is then multiplied by 1.32 for a cow/calf operation and is equivalent to an animal month for purposes of this document.
Assessment	An evaluation of existing resources and potential impacts to them from a proposed act or change to the environment.
Background	The viewing area of a distance zone that lies beyond the foreground -middleground. Usually from a minimum of 3 to 5 miles to a maximum of about 15 miles from a travel route, use area, or other observer position. Atmospheric conditions in some areas may limit the maximum to about 8 miles or increase it beyond 15 miles.
Community	A group of one or more populations of organisms that form a distinct ecological unit. Such a unit may be defined in terms of plants, animals or both.
Contrast	The effect of a striking difference in the form, line, color, or texture of the landscape features within the area being viewed.
Cultural Resources	The archeological and historical remains of human occupation or use. Includes any manufactured objects, such as tools or buildings. May also include objects, sites, or geological/geographical locations significant to Native Americans

Cumulative Effects	As defined in 40 CFR 1508.7, cumulative effects are the impacts on the environment which result from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions, regardless of what agency or person undertakes such other actions. Cumulative effects can result from individually minor but collectively significant actions taking place over a period of time.
Direct Impacts	As defined within 40 CFR 1508.9, these are the effects which are caused by the action and occur at the same time and place as the action. Synonymous with direct effects.
Endangered species	Any species in danger of extinction throughout all or a significant portion of its range as identified by the Endangered Species Act of 1973 (ESA) . This definition excludes species of insects that the Secretary of Interior determines to be pests and whose protection under the ESA would present an overwhelming and overriding risk to man.
Environment	The surrounding conditions, influences, or forces that affect or modify an organism or an ecological community and ultimately determine its form and survival.
Environmental Assessment	A concise public document which serves to a) Briefly provide sufficient evidence and analysis for determining whether to prepare and EIS or a Finding of No Significant Impact, b) Aid an agency's compliance with NEPA when no EIS is necessary, c) Facilitate preparation of an EIS when necessary.
Ephemeral	Flowing in response only to direct precipitation, and whose channel is at all times above the water table, and restricted to streams that do not flow continuously for at least 30 days.
Erosion	The group of processes whereby earth or rock material is loosened or dissolved and removed from any part of the earth's surface.
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.

Indirect Impact	As defined within 40 CFR 1508.8, these are the effects which are caused by the action but occur later in time or are removed in distance from the action, but are still reasonably foreseeable. Synonymous with indirect effects.
Key Observation Point	Critical viewpoints that are usually along commonly traveled routes or at likely observation points.
Landscape	That which makes up the various attributes of land surface as a result of geologic activity and weathering, such as plateaus, mountains, plains and valleys. In addition to both biotic features such as vegetation, forest, etc., as well as man-made features-such as: urban landscape.
Mitigation	Mitigation includes a)Avoiding the impact altogether by not taking certain action or parts of actions, b) Minimizing impacts by limiting the degree or magnitude of the action and its implementation, c) Rectifying the impact by repairing, rehabilitating, or restoring the affect 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 substantial resources or environments.
Public Lands	Federally owned lands administered by the Bureau of Land Management.
Raptor	A bird of prey.
Right-of-Way	Public lands authorized to be used or occupied pursuant to a right-of-way grant.
Riparian	Any area of land directly influenced by permanent water that has visible vegetation or physical characteristics reflective of permanent water influence. This can include streams, springs, seeps, wet meadows, aspen stands, and similar habitats.
Scoping	Procedures by which agencies determine the extent of analysis necessary for a proposed action, (i.e., the range of actions, alternatives, and impacts to be addressed; identification of significant issues related to a proposed action; and the depth of environmental analysis, data and task assignments needed).

Species	A group of individuals of common ancestry that closely resemble each other structurally and physiological and in nature interbreed producing fertile offspring.
Threatened species	Any species likely to become endangered within the foreseeable future throughout all or a significant part of its range.
Visual Resources	Classification of landscape based on scenic quality, sensitivity to change, and distance from the observer. Determines the amount of visible change to a characteristic landscape that is acceptable.

CHAPTER 1.0 PURPOSE AND NEED FOR THE ACTION

1.1 Purpose and Need for the Action

The underlying need for the proposed action is to access and produce 1.5 million to four million tons of coal per year from 5,605.66 acres of federal and State of Utah leased coal reserves held by UtahAmerican Energy, Incorporated (UEI). These reserves are located in the Book Cliffs coal field in Emery County near East Carbon and Sunnyside, Utah (PLATE I). These reserves include several pre-Federal Land Policy Mngmt Act of 1976 (FLPMA) federal coal leases under serial numbers SL-066145 (Issued 6/19/46), SL-066490 (Issued 12/31/47), SL-069291 (Issued 4/1/50), and state leases U-0126947 (Issued 12/1/47), U-014217 (Issued 2/1/55), and U-014218 (Issued 2/1/55). These lease areas are shown on PLATE II. The general area along this portion of the Book Cliffs is currently accessed by numerous unmaintained dirt roads and routes. These existing roads and routes are inadequate to facilitate the haulage of approximately 1.5 million to four million tons of coal annually from the proposed mining operation, nor the associated personnel, vendors and supply vehicles a mine of this magnitude would necessitate.

1.2 Authorizing Actions and Permits

1.2.1 Conformance with the Bureau of Land Management Land Use Plan

The proposed action is in conformance with the objectives and recommendations of the Bureau of Land Management (BLM) Price River Resource Area Management Framework Plan (MFP), approved in 1983 and as amended. Table 1.1 list the pertinent objectives of the MFP that the proposed action is covered by and in conformance with.

TABLE 1.1
PROPOSED ACTION CONFORMANCE WITH THE OBJECTIVES OF THE PRICE RIVER MANAGEMENT FRAMEWORK PLAN

Resource		Objective
Cultural	C-1	Protection and Promotion of Cultural Resource Values
Lands	L-2	Right-of-Ways and Land Use Permits
Minerals	M-1	Development of Leasable Minerals
Range Management	RM-1	Allocation and Production of Grazing Lands
Recreation	R-1	Preservation and Protection of Visual Resources
	R-2	Review and Identification of Wilderness Values

TABLE 1.1
PROPOSED ACTION CONFORMANCE WITH THE OBJECTIVES OF THE PRICE RIVER MANAGEMENT FRAMEWORK PLAN (Continued)

Resource	Objective	
Recreation	R-3	Value of Paleontological Resources - Negative Determination based on lack of suitable geologic layers.
	R-8	Maintenance of Undeveloped Recreation Resources
Watershed	W-2	Protection of Watersheds
	W-3	Protection and Enhancement of Water Quality
Wildlife	WL-1	Management of Mule Deer Habitat
	WL-2	Management of Icelander Antelope Herd
	WL-3	Management of Elk Habitat
	WL-6	Management of Bighorn Sheep Habitat
	WL-8	Management of Raptor Habitat
	WL-9	Management of Non-Game Species Habitat
	WL-10	Special Management of Threatened, Endangered or Sensitive Species

1.2.2 Relationship to Other Statutes, Plans and Required Permits

The area of the proposed action is located upon federal lands administered by the BLM, Office of Surface Mining Reclamation and Enforcement (OSM), State of Utah, and private jurisdictions. Various federal, state, local, and private statues, permits, and easements would be required for actions associated with the proposed development.

The granting of the rights-of-ways (ROW) by the BLM is pursuant to the requirements of Title 5 of the FLPMA, and regulations found within Title 43 of the Code of Federal Regulations (CFR), part 2800. These requirements would cover all actions proposed that are off the coal lease area.

The coal lease would be administered under the requirements of the Mineral Lease Act of 1920 (MLA), and regulations found within Title 30 of the CFR (U.S.C. 181-287). The proposed operation and mining activities would be administered by OSM under Chapter 7 of Title 30 of the CFR (700-895) and by the Utah Division of Oil, Gas and Mining (UDOGM) under State of Utah the R645 administrative rules for coal mining (100-402). The Surface Mining Control and Reclamation Act of 1977, as amended (SMCRA) gives OSM primary responsibility to administer programs that regulate surface coal mining operations and the surface effects of underground coal mining operations in the United States. Pursuant to Section 503 of SMCRA, UDOGM developed and Secretary of the Interior approved, Utah's permanent regulatory program authorizing UDOGM to regulate surface coal mining operations and surface effects of underground coal mining on private

and State lands within Utah. In March 1987, pursuant to Section 523(c) of SMCRA, UDOGM entered into a cooperative agreement with the Secretary of the Interior authorizing them to regulate surface coal mining operations and the surface effects of underground coal mining on federal lands within the state.

Pursuant to the cooperative agreement, federal coal lease holders in Utah must submit a permit application package (PAP) to OSM and UDOGM for proposed mining and reclamation operations on federal lands in the state. UDOGM reviews the PAP to ensure that it complies with the approved state permanent program and other statutes. If it does comply, UDOGM issues the applicant a permit to conduct coal mining operations. OSM and other federal agencies review the PAP to ensure that it contains the necessary information for compliance with the coal lease, MLA, NEPA, and other applicable federal laws and attendant regulations. OSM recommends to the Assistant Secretary of the Interior, Land and Minerals Management the (1) approval of the MLA mining plan, (2) approval of the MLA mining plan with conditions, or (3) disapproval of the MLA mining plan. Before making a recommendation on the mining plan, OSM must obtain input from certain other federal agencies, including the surface management agency and from the BLM in relation to the Resource Recovery and Protection Plan (R2P2).

UDOGM would enforce the performance standards and permit requirements during the mine's operation and have primary authority in environmental emergencies. OSM retains oversight responsibility of this enforcement. BLM would have authority in emergency situations in which UDOGM or OSM inspectors cannot act before environmental harm or damage would occur.

The area of the proposed action is zoned as MG-1, mining and grazing, by the Emery County Planning Commission, and is consistent with the existing land use plan for the county.

TABLE 1.2 is a summary of the permits and approvals from federal, state and local agencies that UEI would need to obtain for the project.

1.3 Project Initiation, Public Participation, and Issues Identified for Analysis

Project initiation was started with a request for a ROW with the BLM Price Field Office in February 1998. Agency scoping was initiated in September of 1998. A request for public comments in the scoping process was initiated on March 2, 1999. A news article requesting public comment and input was printed in March 4, 11, 18 and 25 issues of the *Sun Advocate*.

Six parties, organizations or agencies responded to the public scoping process with comments, questions or issues regarding the proposed action. Three responses were received concerning the project as of April 6, 1999. APPENDIX A contains a summary table of the comments received throughout the public participation and formal scoping process. Comments are grouped by organizations and by resource issues. The scoping response number appears followed by a narrative summary.

1.3.1 Issues To Be Analyzed

Based on public input and agency recommendations, the following issues were determined to be relevant:

- **Surface Subsidence**
- **Soils, Slope Stability and Rehabilitation Potential**
- **Ground Water and Surface water**
- **Livestock Grazing**
- **Vehicular Traffic**
- **Visual Resources**
- **Vegetation Potential for Loss in Species Diversity, Cover and Productivity**
- **Wilderness Values**
- **Displacement and Direct Disturbance of Wildlife**
- **Cultural Resources**

1.3.2 Comment, Concerns and Critical Elements of the Human Environment Not Analyzed in Detail

The following resources have not been identified within the area of the proposed project, and therefore will not be addressed in the discussion of associated on-site resources (Affected Resources).

Air Quality - The proposed action would not impact regional air quality.

Areas of Critical Environmental Concern - No such areas occur within or would be impacted by the proposed project.

Environmental Justice - The proposed action would not have any impact to human health and environmental effect on minority or low-income populations.

Prime or Unique Farm Lands - A negative determination by the Natural Resource Conservation Service (NRCS) of the presence of such lands within the proposed project area is included as APPENDIX E.

Flood plains and Wetlands - No such areas occur within the proposed project area or along the proposed ROW's.

Native American Religious Concerns - The proposed project area does not contain any known sites of Native American Religious concern.

Threatened and Endangered Species - A biological assessment was completed for the proposed action area utilizing information within Utah Endangered, Threatened, and Sensitive Plant Field

Guide, correspondence with the USFWS, and information gathered from a field inventory of the project area conducted in the spring of 1998. A four hundred foot corridor along the proposed action transportation routes, and similar area surrounding the proposed mine surface facility and power line were surveyed for threatened, endangered and sensitive plants (TES). No endangered or threatened plant or wildlife species were identified within the vicinity of the proposed action. Several candidate/sensitive species were indicated by USWFS and BLM as potentially occurring within the area. No candidate or sensitive species were located within the project area. Therefore, activities associated with the proposed action would not impact any TES species. APPENDIX G contains the report on the TES surveys and biological assessment conducted.

Wild and Scenic Rivers - The proposed project area does not include, nor would any action associated with it impact any eligible and/or designated waterways.

TABLE 1.2 PERMITS AND OTHER LEGAL REQUIREMENTS

Agen	Act or Regulation	Requirement
Federal		
Council for Environmental Quality	National Environmental Policy Act of 1969 (NEPA), as amended (40 CFR 1500) Public Law 91-90, 42 U.S.C. 4321	Environmental Assessment.
Bureau of Land Management	Federal Land Policy Act of 1976 (FLPMA) (43 CFR 2800 & 3100) Public Law 94-579 (10/21/76)	Right-of-Way, Notice to Proceed, Temporary Use Permits, and Consultation.
	Mineral Lease Act of 1920 (Title 30; U.S.C. 181-287)	Mining plan approval.
Office of Surface Mining	Administrative Regulations 30 CFR (30 CFR 700-895)	Coal lease development and mine operation.
	Mineral Lease Act of 1920 (Title 30; U.S.C. 181-287)	Mining plan document preparation
Fish and Wildlife Service	Endangered Species Act of 1973 (ESA) (16 U.S.C. 1539)	Provide biological opinion of wildlife and plants that are federally listed, and impacts of the proposed action to listed species.
	Migratory Bird Treaty Act (16 U.S.C. 703-711)	Consultation and review of impacts to listed species.
	Bald Eagle Protection Act (U.S.C. 663a)	Consultation and review of impacts to golden eagles.
State of Utah		
Department of Transportation	Permit to Encroach Road Easement	Consider issuance of permit to intersect state road ROW.
	Permit to Cross a Road Easement	Consider issuance of permit for crossing of road ROW.
Department of Natural Resources		
Division of Water Rights	Permit to Alter a Natural Drainage	Channel Alteration Permit GP-40
Division of Oil, Gas and Mining	Permit for Mine and Reclamation (R645-301)	Mine plan approval and operation.
Department of Community & Economic Development		
Utah State Historical Society	National Historic Preservation Act (CFR 800, Section 106)	Consider NRHP eligibility and mitigation of cultural resources.
Department of Environmental Quality		
Division of Air Quality	Permit to Affect Air Quality	Notification of Intent
Division of Water Quality	Construction and Operational Permits	UNPDES and Storm Water Discharge Permits.
Emery County		
Planning Commission	Large site development permits	
	County Zoning Ordinances	Determine compliance with existing land use designation.
Road Department	Road Use Permits (Ordinance No. 8-7-85A)	Road Encroachment
Private		
	Confirmation and Review of ROW	Obtain Easements

CHAPTER 2.0 ALTERNATIVES INCLUDING THE PROPOSED ACTION

2.1 Introduction

This chapter describes the alternatives developed in response to the issues and concerns addressed in CHAPTER 1.0 and as identified within the scoping process.

2.2 Alternatives Considered in Detail

2.2.1 Alternative A - No Action

Under the No Action alternative, the ROW would not be issued and mine plan proposed would not be developed.

2.2.2 Alternative B - Proposed Action

The proposed action would be located in Emery County, approximately five miles north-northwest of U.S. Highway 191/6 (See PLATE I). The project would be implemented in two phases:

Phase I - This phase involves the construction and operation of the Lila Canyon Mine for conventional room and pillar mining, as well as the construction and operation of its associated surface facilities, utilities and transportation routes. Based on current conditions, exploratory drilling would not be expected to be required for the development of the coal lease. To facilitate the development and operation of the proposed mine, the existing Lila Canyon Road that ties into Emery County Road (CR) 125 at the existing Horse Canyon Mine Site would be upgraded to facilitate personnel and construction equipment travel. Concurrent with upgrading the existing access road, a separate operational coal haul road would also be constructed. An acceleration and deceleration intersection would be constructed at the junction of U.S. Highway 191/6 in the SE 1/4 SW 1/4 of Section 6, T. 17 S., R. 14 E.. The proposed road would proceed northwest 4.7 miles, terminating at the proposed Lila Canyon Mine surface facility. A ROW for an underground telephone line/utility corridor would be established within the proposed road ROW. The phone line would be adjacent to the paved surface and would follow the road to the mine site. A 46 kV power line that ties to the existing Moab/Price/Green River line approximately one mile south of the proposed mine facilities would be constructed to provide the necessary power requirements.

Phase II - This phase would be based on an anticipated projected increase in coal production over the next five years. The mine would move from conventional room and pillar to long wall mining, and the coal haul road would be paved to accommodate up to four million tons of coal haulage annually. For sake of discussion, activities as currently proposed for Phase II are presented.

However, the implementation of this phase would be dependent on coal sales and market conditions. As previously indicated in Phase I, exploratory drilling would likewise not be required for the anticipated actions of Phase II.

Description of Physical Facilities of the Proposed Action - Phase I The proposed action to be taken by UEI on public, state, and private land for the development and operation of Phase I includes:

- Upgrade of the existing Lila Canyon Road.
- Proposed coal haul road development.
- Development of the 46 kV power line to the proposed mine surface facility.
- Development of the Lila Canyon Mine surface facility.
- Conventional mining of existing coal reserves.
- Wildlife enhancement projects

The planned surface routes of the existing and proposed roads and power line, as well as the area of the proposed mine surface facility and lease area are shown on PLATE II. Details of the proposed surface facilities associated with mine are shown on PLATE II-A. The following section describes each of the attributes of the proposed action.

Upgrade of the Existing Lila Canyon Road - The existing Lila Canyon Road was constructed in the early 1940's with the intent of developing the Horse Canyon Mine South Lease area. Over the last 50 years, the road has received little if any maintenance, but has remained accessible by four wheel drive vehicles. The road, with an average width of 50 feet, was constructed to a standard that would accommodate coal haulage with an average grade that does not exceed four percent. Culverts were installed at all drainage crossings, and with associated barrow ditches. Currently this road is controlled by Intermountain Power Agency (IPA) with easements in place for future development and use by UEI.

UEI would upgrade 2.8 miles of the Lila Canyon Road in cooperation with IPA and Emery County. The majority of the road, within a deeded 50 foot ROW, crosses private land owned by UEI (16.28 acres). Approximately 600 feet (0.69 acres) would be on public land near the tie-in with the proposed mine surface facility. No additional disturbance is proposed outside of the existing ROW. The proposed upgrade would establish a 30 foot unpaved two lane road, designed for a maximum speed of 35 miles per hour. All culverts would be replaced, the surface regraded, and approximately 27,400 cubic yards of granular road base hauled and placed onto the road surface. All road base material would be purchased from an existing commercial supplier and transported to the site over the current Emery County Road system. Borrow ditches would be reestablished and the road would be posted with the necessary speed and caution signs to ensure vehicular safety.

Construction crews associated with the development of the proposed action would travel to and from the work site via U.S. Highway 191/6 and CR 125. During construction of the proposed road approximately 30 people would be employed. The existing Horse Canyon Road (CR 125) would

be used to gain access to the existing Lila Canyon Road. No modifications nor upgrade to this road would be required or conducted during the proposed construction related use. A letter from the Emery County Road Department is attached as APPENDIX B, and details the requirements of use in association with this road. Upon completion of the proposed mine surface facility and proposed haul road, the existing Lila Canyon Road would be gated at the intersection with the Horse Canyon Road to prohibit public access on this route into the mine area.

A plan and profile, showing grade, drainage, and culvert placement, as well as a typical cross-section is attached as APPENDIX B.

Coal Haul Road Development - A proposed two lane, 30 foot gravel surface Class B road, totaling 4.7 miles, would transect public and state land. The proposed road, designed for a maximum speed of 45 miles per hour, would be constructed according to the standards of the American Association of State Highway and Transportation Officials (AASHTO) and the Utah Department of Transportation 1992 Standard Specifications for Road and Bridge Construction. The total acreage of the proposed 100 foot construction and 70 foot operational ROW for the new coal haul road upon public and state land is shown in TABLE 2.1.

TABLE 2.1
SUMMARY OF ROW ACREAGE ASSOCIATED WITH THE PROPOSED NEW COAL HAUL ROAD

Ownership	Miles	Acres-100' ROW (Construction)	Acres 70' ROW (Operational)
BLM	3.54 (18,691.20 feet)	42.90	30.04
State of Utah	1.16 (6,124.80 feet)	14.06	9.84
TOTAL	4.7miles (24,816 feet)	56.96 Acres	39.88 Acres

The area to be disturbed as a result of the construction would vary in width from 50 feet to approximately 100 feet depending on the natural terrain. The desired construction ROW would be 100 feet (56.96 acres) to allow the construction of cut and fill slopes. Upon completion of the road, the temporary construction ROW would be stabilized and reclaimed to BLM and/or state standards, thus minimizing the permanent operational ROW to a width of 70 feet (39.88 acres), or 35 feet on each side of the center line of the travel surface. A three wire strand fence built to BLM range and wildlife standards would be constructed on each immediate side of the proposed operational ROW.

FIGURE 2.1 is a typical cross-section of the proposed coal haul road. Twelve inches of granular borrow would be used for the sub-base. The base course would consist of six inches of enzyme treated mineral aggregate. This well graded gravel would have a maximum size of one inch. The enzyme treatment would help stabilize the road surface and reduce dust emissions. The 30 foot

graveled surface would be wide enough for future asphalt paving. Upon completion, an enzyme armor coating would be applied to the proposed road.

Construction of the coal haul road would involve the same access and crew sizes required for the upgrade of the existing Lila Canyon Road. Operational use of the coal haul road would be associated with transport and production of an estimated 2.5 million tons of coal a year during Phase I. This number is based on UEI's proposal in the Resource Recovery and Protection Plan submitted to the BLM in December 1998. Vehicular use would include the personnel associated with the mine, delivery of material to the mine, and the transport of the coal via the proposed road to U.S. Highway 191/6 and the loadout site on the Ridge Road near Wellington. UEI has indicated that at full capacity after seven years, as many as 273 coal haul trucks per day (547 round-trip) and 88 personal and delivery vehicles per day (175 round-trip) could travel to and from the proposed mine via U.S. Highway 191/6 during the anticipated 24 hour, seven day a week operating schedule of the mine. Coal haul travel would utilize U.S. Highway 191/6 through Wellington, and onto the loadout site on Ridge Road off U.S. Highway 191/6 near Wellington, an approximate 64 mile round-trip from the mine.

In association with the development of the coal haul road, an acceleration and deceleration intersection on U.S. Highway 191/6 would be constructed. This four lane intersection, within the Utah Department of Transportation (UDOT) ROW, would be approximately 2,300 feet in length and allow for heavy truck traffic to leave and enter the highway. The intersection would be constructed concurrent with the construction of the proposed coal haul road, and be completed prior to initial coal haulage. A typical design for the proposed intersection is shown in FIGURE 2.2. APPENDIX C, contains a copy of the UDOT ROW Encroachment Permit filed by UEI for the proposed activity.

In association with the construction areas that would be reclaimed upon completion of the proposed project, an effort would be made to reclaim existing roads and routes on public lands that intersect the proposed road. This would be completed to minimize the potential disturbed area and number of approaches to the proposed coal haul road. As much as four miles of roads and routes could be reclaimed. Roads and routes required to facilitate grazing management (movement and water) and access would be left in place. Where existing areas are eliminated, cuts would be pulled back to the approximate original contour and drainages would be reestablished. Concurrent with recontouring, revegetation using an approved BLM seed mix (TABLE 2.2) would be completed.

Utility Corridor - UEI would install, upon completion of the new proposed coal haul road, a telephone line within a corridor adjacent to the road to serve the proposed mine. The line would be buried at a depth of 24 to 36 inches, approximately ten feet from the edge of the surface. A junction box would be installed approximately 3,000 feet from the intersection with U.S. Highway 191/6. At approximately 6,000 foot intervals along the length of the road, similar boxes would be installed. The four by five inch boxes, colored an approved BLM color, would stand approximately 36 inches

above the surface. A 10 foot wide (5.7 acre) corridor on the cut, or uphill, side of the road, would be located within the permanent ROW of the proposed road. The utility corridor would be located entirely within the disturbance associated with the new road and could accommodate any future utilities (i.e., gas, water and/or sewer lines) during the life of the mine.

INSERT FIGURE 2.1

INSERT FIGURE 2.2

46 kV Power Line Development - A 1.3 mile 46 kV (46,000 volt) power line located on public land would be constructed concurrent with construction of the surface facility and proposed road. The proposed power line would tap the existing Utah Power 46 kV Moab-Price #1 power line in T. 16 S., R. 14 E., Section 16 and proceed east to the proposed mine surface facility. Construction within a 100 foot wide ROW (15.76 acres) would be conducted by ground crews using tracked and/or rubber tire vehicles. Specific steps to complete the power line includes pole placement, cross arm assembly, line suspension and tension, installation of a switching station at the tap point, and metering station and substation within the area of the proposed mine surface facility. Upon completion of the line, the operational ROW would be minimized to 80 feet (12.61 acres). The proposed route of the power line and associated facilities are shown on PLATE III.

The power line would require the establishment of approximately 15 pole sites. Pole types would be single "C2T" and "HPS" structures, double "ES" structures, and triple "C3P" structures (FIGURE 2.3, 2.4, 2.5, and 2.6). Structures would be constructed using wood poles, with heights ranging from 60 to 80 feet. All features of the line hardware (insulators, wire, poles) would be non-reflective and designed to be raptor-safe, as described by the Raptor Research Foundation in Suggested Practices for Raptor Protection on Power Lines: The State of the Art in 1996.

Construction of the power line in the second year of construction could employ as many as 20 people. No new roads would be created during the construction, operation or maintenance of the proposed power line. Access for all phases of the power line would be gained by the existing roads within the area. Where accessible, rubber tired construction/maintenance vehicles would travel perpendicular from the road or trail to each pole location. The proposed power line has been designed to minimize the number of employees necessary to maintain its length. Maintenance of the line and associated operational facilities would be on an as-needed/emergency basis. Maintenance access would be along established roads by 4x4 vehicle or snow machine and within the 80 foot operational ROW. The proposed power line would be compatible with the other ROW's. The power line would be intersected to the proposed coal haul road ROW at the surface facility site. However, no interference with this line or any other line within the area would be anticipated.

The staging areas would be located within the proposed surface facility area, and would be utilized for equipment and material storage and assembly. The construction vehicles to be used would include two line trucks, two bucket trucks, a wire trailer, a pole trailer, and a crew truck. A crew consisting of 12 individuals and a line truck with an auger attachment would be used to dig the holes within accessible areas along the ROW. Holes would be excavated to a depth of eight to 10 feet and 14 feet where anchor structures are required. In areas of limited access, the 20 foot boom on the line trucks could be used to auger holes. All holes would be located as to create as little disturbance as possible.

Poles would be transported to the site by truck, where the structure components (cross pieces and insulators) would be assembled on the ground and erected by a truck-mounted crane. In areas of thick vegetation and/or where vegetation may impede the performance of the active line, vegetation would be cleared by hand-held chainsaws. This cut vegetation would be stockpiled and used later to scatter over any reclaimed areas to provide solar protection on newly revegetated sites.

FIGURE 2.3

FIGURE 2.4

FIGURE 2.5

FIGURE 2.6

When the structures are in place, the conductor would be strung. A sock line would be laid along the route by hand and light vehicle. Ground crews would place the sock line in pulleys on each structure at the insulator location. The conductor would then be pulled up by the pulleys and through the insulator with the assistance of a reel truck, or by hand, before moving to the next pole location. Wire stringing lengths for this project would be limited to 0.5 miles between pull sites due to the angles, terrain, and inability of the wire pulling equipment to pull the conductor into place. Locations within the proposed power line route would be utilized as pull sites during stringing activities. These pull sites, approximately 0.25 acres in size, would be situated within the ROW. A switching station may be installed where the proposed power line would tap the existing power line. Location of the switching station would be located on a 200 foot by 200 foot area adjacent to the existing power line.

Development of the Lila Canyon Mine Surface Facility - Construction would commence concurrently on the surface facilities associated with the development of the Lila Canyon Mine. The proposed surface disturbance area is shown on PLATE I and II. These plates depict the maximum potential disturbance around the facilities that would be used for the life of the mine. The proposed facility area would be approximately 39.6 acre, but only composed of an anticipated on-the-ground disturbance of 35 acres. This area would be the total disturbance needed for the 20 year life of the mine and would be reclaimed following the completion of underground mining activities. Surface structures and facilities for the Lila Canyon Mine, an underground mine, would be constructed in Lila Canyon near the fork in the canyon located at T.16 S., R.14 E., Section 15, SE 1/4 SW 1/4 (PLATE II and PLATE II-A). The function of the surface facility area would be to provide for mine access, mine ventilation, coal storage, coal loading, warehousing, offices, and the bathhouse.

The Lila Canyon Mine is currently within the permit review process of a Mine and Reclamation Plan (MRP) Permit Application for the UDOGM (Review in Progress). This permit application with the UDOGM requires that all proposed mine and mining activities be described in full detail in relation to legal issues and bonding, as well as engineering and how it relates to soils, biology, land use, geology, and hydrology. In association with the proposed Lila Canyon Mine engineering actions, mitigation as recommended by the UDOGM in the form of operational stipulations and creation of successful reclamation procedures upon the cessation of mine operations have been incorporated into each resource discussion within the MRP. Therefore, each action as proposed within this EA has taken into consideration the various resources present and UDOGM requirements to minimize impacts to them. Actions as described within this EA have been summarized from the detailed Lila Canyon Mine analysis.

The mine site surface facilities would be located in Lila Canyon where the Lower Sunnyside coal seam outcrop is accessible. Because of the narrowness of the canyon in this area, surface facilities would be confined to a narrow strip along the bottom of the canyon. Suitable surface area for the mine site would be created by constructing a series of earthen pads within the canyon bottom. This would be accomplished by cut fill material and by leveling out the area in the bottom of the canyon drainage. The average gradient of Lila Canyon in the mine site area is approximately 10 percent. Therefore, the mine pads would be constructed as a relatively level pad with a cut at the base of the escarpment. Each individual pad would be dedicated to a specific function as part of the overall

mine site operation. Access roads would connect the various pad levels with one another, as well as to an underground rock slope to the portal bench.

The proposed mine site is located upon an alluvium bench in an area where the two forks of Lila Canyon converge. The mine office, parking lot and a sediment pond would be located within the main canyon. The proposed road which provides access to the mine site would enter the mine yard in this area. The truck loop and truck loadout would be located within the confluence area. The confluence area would also would contain the crusher building, the coal storage pile, a topsoil storage area, the employee parking area, bath house, substation, portal area, and a shop/warehouse material storage area. The left fork would contain the water treatment facility and storage tanks.

As part of the overall mine site development plan, certain major construction tasks must be accomplished in a prescribed manner. Most of these construction tasks are common to many, if not all of the area described above. The following tasks are listed in order in which they would generally be expected to occur within any given area of the mine site. However, in practice many of these construction tasks would be occurring simultaneously, but at different areas, throughout the mine site. This is attributable to the fact that the mine site construction would be started at the base of the alluvium bench and proceed toward the escarpment and up the canyon. As primary initial tasks are completed at the lower reaches of the site, secondary tasks can begin even though the primary tasks may not yet be completed in the upper reaches of the site. A more detailed construction and reclamation plan, as prepared by UEI for their MRP is included as APPENDIX D.

- **Clearing and Grubbing** - One of the earlier phases of construction would involve the removal of all trees and shrubs from the mine site area. Since there are no large commercially valuable trees, a BLM timber appraisal would not be necessary to determine the value of these resources. Smaller pinyon and juniper trees would be cleared and transported to a green wood storage area within the proposed ROW for public fuel harvesting use. Shrubs and all other slash material would be buried in a controlled manner within the pad fill in nonstructural areas such as the coal storage pad and the material storage area. In order to avoid compaction complications, slash would be buried away from any structure that would be installed in the general area.

- **Construction of the Sediment Pond** - Once the initial grades are established the construction of the initial sediment pond would commence. The sediment pond would consist of an 8.4 acre- foot retention pond with an emergency spillway and decant device. The pond could be decanted into the existing drain ditch adjacent to the road where it would flow unimpeded to the adjacent undisturbed drainage. In this manner the sediment pond would be installed as early as possible in the construction schedule. The pond would then be in place for the entirety of the remaining construction activities and would provide maximum sediment control for the rest of the project.

  The pond would be constructed in the lowest quadrant of the disturbed area whereby most mine site disturbed area drainage would drain initially to the pond. The capacity of the pond would be well in excess of the 10 year, 24 hour precipitation event requirements. However,

if the total pond capacity was exceeded, the over flow from the pond would exit through a riser-type culvert primary spillway equipped with an oil skimmer. This riser spillway would lead directly to the main drainage located below the surface facility area. One advantage of the pond is its proposed location adjacent to the roadway. This would greatly simplify sediment monitoring and clean out. It would also simplify the process of decanting the pond in a manner that meets Utah Nonpoint Discharge Effluent Source (UNPDES) requirements. The open channel spillways would be constructed to pass the 10 year, 24 hour storm event. The spillway would be lined with concrete or grouted rip-rap, and have a bottom width of five feet; a freeboard depth of two feet; and 2:1 sideslopes. The pond would also be equipped with an open channel emergency spillway capable of handling a 25 year, 6 hour storm event. Rip-rap would be installed at the outlet of the open channel spillways to protect the earthen structures from erosional forces.

- **Topsoil Removal, Salvage and Stockpiling** - Available soil over the area ranges from about six to 48 inches, of which an average soil layer of about eight inches thick would be removed and stockpiled as topsoil. The upper six to twelve inches is the most suitable soil, however, the subsoils over much of the area support root growth to depths of about 48 inches. Topsoil would be salvaged with backhoes, trackhoes, and/or front end loaders and hauled by dump trucks to the designated UDOGM topsoil storage area within the permit area. As much as 43,000 cubic yards of topsoil would be salvaged. In conjunction with topsoil salvage, the large boulders of approximately three feet in diameter and larger would be separated and piled near the topsoil stockpile or placed at appropriate sites in the area.

  The topsoil storage area is proposed in the southwest corner of the facilities site near the sediment pond. The stockpile would be protected from erosion and sediment production by roughening the surface, revegetation, berms, and silt fences. Subsoil materials would be used over the area for facilities site development and then retrieved for soil reconstruction during reclamation.

- **Face Up of Coal Seam/Preparation of Portal** - Two underground rock slopes (approximately 1,200 feet long) would be tunneled up from the toe of the mountain on a 12 percent grade to intercept the down dipping coal seam. The coal would be mined to the south to break out at the escarpment face approximately 500 feet above the mine facility yard. At this point, the mine ventilation and belt portal would be developed. As soon as possible after construction begins, the coal seam would be faced up and the portal area excavated on the southeast side of canyon within the right fork. Prior to facing up the portals, the area would be cleared and grubbed, and topsoil stored. The pad would be constructed long enough to accommodate at least two portal openings for a travel-way and belt, while minimizing the height of the cut face. Minimizing the extent of the cut face is an important consideration not only in the initial mine development but also and even more so for final reclamation. The portal pad would be constructed and stabilized as necessary to conform to the safety requirements of Mine Safety and Health Administration (MSHA). In order to achieve minimum disturbance of the canyon side slope, the portal pad would be built on fill.

- **Construction of Earthen Pad and Access Roads** - According to computer models of the mine site earthwork, all borrow would be generated within the site to achieve the proposed mine yard configuration. Fill would be placed in 18 to 24 inch lifts and compacted to a minimum 90 percent density for nonstructural areas, and to 95 percent density in structural areas. Nonstructural areas include parking lots, material storage areas and coal storage areas. Structural areas include all areas under buildings, conveyor belts, substation, backfilled areas around culverts and reclaim tunnels, roadways, mine fan and reinforced earth retaining walls. Experience has shown that this material can usually exceed 95 percent compaction using standard wheel rolling methods, although vibratory compaction would be used in critical structural areas. All earthwork would be required to meet a minimum of 4,000 pounds per square foot (psf) load-bearing capacity. Construction emphasis and priority would be given to those pad levels that are designed to accommodate key structural elements of the surface facilities. These include the pad levels associated with the coal pile reclaim system, the substation, the elevated conveyor gallery, bath house, and shop/warehouse building. Some pad construction would involve cutting into the existing side slopes. Cuts would be minimal, and would not usually extend up-slope more than about 20 feet above the completed pad level. The primary purpose of the sideslope cuts is not to generate fill volumes. Cut slopes area would also be necessary to define the limits of the pads for the purpose of layout and engineering design. Clear slopes would also be needed to assure long term site maintenance. Before any slope cuts are made, topsoil would first be salvaged and stockpiled. After the topsoil has been removed and protected as described previously for topsoil stockpiling, the substrate material would be excavated.

- **Installation of Drainage Controls** - As previously stated, the sediment pond would be constructed as early as possible in order to provide maximum sediment control during the term of the construction project. Once the pad levels are constructed, along with the interconnecting roadways, drainage control ditches and culverts would be constructed and culverts installed. Disturbed area ditches and culverts would be designed to handle a 10 year, 24 hour storm event. Where necessary, ditches would be lined with concrete or rip-rap to prevent erosion where velocities are expected to exceed five feet per second (fps). Culvert inlets would be designed to provide adequate freeboard for design flows; outlets would be rip-rapped where necessary to prevent scouring.

- **Construction of Coal Handling and Associated Facilities** - Construction of the coal handling facilities would be scheduled to allow the mine to get into full production as quickly as possible. The underground mining operation cannot function smoothly until the elevated conveyor gallery and discharge structure are fully operational. On the other hand, the mine conveyor cannot become fully operational until the mine working area is developed far enough underground from the portals to allow the conveyor to be extended into the mine works and become an integral working part of the continuous miner production section. Once the initial mine works have begun, connected up underground with crosscuts, the conveyor can then become operational.

Other integral components of the coal handling facilities necessary for full production include the coal reclaim tunnel, crusher building, truck loadout and interconnecting conveyors. Only after this system is completely operational, can mine development and coal production begin in earnest. Other important structures necessary for full-scale mine surface production include the main substation, water delivery system, and mine ventilation fan.

After the critical path coal handling facilities and mine development structures are fully operational and the underground mine development is proceeding on course, full attention would be focused on completing the ancillary surface facilities. Once the permanent structures are finished, the temporary accommodations used during construction can be removed from the site.

Buildings to be constructed at the mine site include: an administrative office, a shop/warehouse building, and a bathhouse/lamphouse building. The shop/warehouse would be used to repair and store mine equipment and supplies. The yard area around these buildings would be used for additional outside storage and parking. The bathhouse and office buildings would be sized to accommodate a workforce of approximately 140 people.

PLATE II-A is an overview of the mine surface facility. The following facilities would be constructed in conjunction with the mining operation:

Administration Office/Bathhouse/Lamphouse- The main office would be a framed building measuring approximately 80 feet wide by 250 feet long. It would handle the administrative functions such as accounting, engineering, payroll, marketing and management. The bathhouse would be sized to accommodate the anticipated workforce. Located at one end of the bathhouse building would be the lamphouse. The main office would be located on a dedicated pad at the lower (western) extent of the mine yard. Parking would be made available in the area adjacent to the main office.

Mine Fan - The mine fan would be located at the return air portal. It would be a 12 foot diameter, direct drive, 1,000 horsepower (hp), axial vane exhausting type fan. The fan housing would include airlock travel doors for machinery and personnel. The exhaust duct work would be equipped with acoustical sound-proofing material to minimize noise levels.

Shop/Warehouse - The shop/warehouse building would be a prefabricate metal structure measuring approximately 100 feet wide by 150 feet long. It would be located in the southwestern part of the mine yard conveniently adjacent to the mine road. A storage area for materials and supplies would be located nearby, as would be the fuel storage, rock dust storage and garbage repository (dumpster) facilities.

Coal Stockpiling Facilities - Coal would be brought out of the mine and delivered to the surface via a 2,000 ton per hour, 60 inch wide mine conveyor belt. The mine conveyor would exit out of a portal located about 40 feet high on the west side of the right fork of Lila Canyon. Even though the mine portals are located in the right fork, the run-of-mine coal

would be stockpiled in a storage area located in the confluence of the forks. Coal would be transported from the right fork portals to the stockpile by a 600 foot long, elevated overland conveyor gallery. This 2,000 ton per hour, 60 inch wide conveyor would be covered and supported along a series of box truss galleries, elevated approximately 50 to 60 feet above the mine yard. These conveyor truss galleries would be supported by several two-legged steel bents spaced approximately 120 feet apart. After crossing the point that separates the right and left forks, the conveyor would terminate at a cantilevered discharge structure at a location above the coal stockpile area. A conical coal pile would be built directly below the discharge structure. The pile would be about 80 feet high at full capacity and contain about 30,000 tons of coal. Storage can be obtained by pushing the pile northward onto the coal storage pad.

Coal Reclaiming Facilities - A 13 foot diameter multi-plate reclaim tunnel would be located below (underneath) the coal pile. Two reclaim draw down ports located at the end of the tunnel would allow coal to be reclaimed from the bottom of the pile directly onto a 54 inch reclaim conveyor located within the tunnel. Each reclaim port would contain a pile activator, a hydraulically operated single bladed shut-off gate, and a discharge chute leading to the reclaim conveyor. Each port would be capable of loading the reclaim conveyor at a full capacity of approximately 1,400 tons per hour. Once the coal has been loaded onto the reclaim conveyor, it would then be transported out from underneath the pile. The reclaim conveyor would bring the coal out of the tunnel and transport it to a crushing/screening building.

The crusher building would be an open steel structure containing a 40 hp, eight by 20 foot scalping screen which would remove all minus two inch coal ahead of the crusher. The plus two inch coal from the top screen deck would be fed to a 300 hp hammermill impact crusher where the coal would be reduced to a two inch product. All transfer points within the crusher building would utilize enclosed chute work to contain and control fugitive dust emissions. These transfer points include the transfer from the reclaim conveyor to the screen, the screen unders (minus two inch) to the loadout conveyor, the screen overs (plus two inch) to the crusher, and the crusher discharge (minus two inch) to the loadout conveyor.

Within the crusher building would also be located a self cleaning tramp iron magnet (located at the reclaim conveyor discharge pulley ahead of the crusher), and an automated sampling system. The crusher building and the coal reclaim tunnel would be separated by a 25 foot wire reinforced earth wall. The crusher building would be located on a bench on the lower (down-canyon) side of the wall and positioned in such a manner that gravity flow would aid the movement of coal through the screening, crushing, and sampling operations.

From the crusher building the crushed and screened two inch coal would then be loaded onto a covered 48 inch wide loadout conveyor operating at a rate of 1,400 tons per hour and pass to one of three product piles or transport storage pile (approximately 100,000 tons). The coal would then be transported to an automated truck or loadout station. The truck loadout would be an elevated steel frame structure constructed high enough to allow the trucks to be

positioned under a contained chute during loading. Electronic sensors would determine when the truck is properly positioned under the chute. The feed conveyors (i.e., loadout conveyor and reclaim conveyor) would start and stop automatically to load the individual truck trailers with a predetermined amount of coal. Certified belt scales would be used to control the loading process.

The truck loadout would be located at the upper end of the truck loop. The loop would be long enough to accommodate up to four empty trucks in the queuing lane waiting to be loaded. After being loaded, the trucks would leave the mine site and haul the coal to an off-site unit train loading facility. All conveyors would be covered and all conveyor transfer points would be enclosed.

Electrical power - The proposed 46kV overhead power line would terminate at a substation on the mine site. Located in the right fork below the portal bench, the substation would contain a 12 MVA 69 kV/12.5 kV transformer, along with various other electrical power control apparatus (air-break switches, visual disconnects, bussing, ground fault detection, vacuum circuit breakers, power factor capacitor banks, metering equipment, and a control room). From the secondary side of the substation, power would be distributed throughout the mine yard and to the underground workings at 12.5 kV. At various locations within the mine yard, the power would be routed through a set of 12.5 kV/4160 V/480 V transformer banks and motor control centers to operate the surface equipment. These combination transformer/motor control center units would be located at the crusher building, overhead conveyor drive station, mine fan, and shop/warehouse.

Water Facilities - A water right would be filed with the Utah Division of Water Rights for use of the water from the flooded Horse Canyon mine works. Upon approval of the water right application, a water line within the underground workings from the flooded works to the storage facilities within the surface facility area would be constructed to serve the potable requirements of the proposed mine. Water storage facilities (tanks) would be located on the surface to provide storage for usage and as pre-storage before being pumped into the mine to an underground storage sump for use in the mining operation. The surface storage tanks would be located above the bath house to provide sufficient static head (pressure) for yard distribution. Sewage from the administrative office and bathhouse would be treated by separate underground septic tanks and drain fields. Culinary water would initially be hauled to the mine site from an approved water source. Once the mine started making water, a treatment plant may be incorporated to make the necessary water to meet culinary demands.

Water usage, based on a one million tons of coal per year production, would be:

Bath House/Office (Culinary Water)	1,260,000 gallons per year
Mining	4,500,000 gallons per year
Fan Evaporation	1,183,000 gallons per year
Total	**6,943,000 gallons per year**

(21 acre feet per year)

Mine water usage would increase as the tonnage of production increases from one million tons per year to four million tons per year. As production increases to two million tons per year, the acre feet of water used would increase to 35.12 acre feet. Water usage would increase to 48.93 acre feet at three million tons annually before peaking at 62.74 acre feet at four million tons of coal at full production.

Telephone Service - Telephone service would be provided using conventional phone service provided via a fiber optic line as described in the utility corridor section.

Other Structures - Additional, smaller structures include miscellaneous storage sheds, pump house, above ground storage tanks (for fuel, water, and dust control chemicals), powder magazines, rock dust storage tanks and trash containment structures. All buildings and structures would be made of conventional construction materials including wood, masonry, or steel. Buildings would be color coordinated to blend in with the natural surroundings.

Conventional Mining of Existing Coal Reserves - Mining would begin in Section 15, T.16 S., R.14 E. A detailed explanation of coal geology and anticipated reserves are described in the R2P2 and the MRP. In the Lila Canyon area there are primarily two coal seams located in the Blackhawk Formation, the Sunnyside main seam (Upper Sunnyside) and the lower seam (Lower Sunnyside). The two seams have merged within the anticipated area of mining. The Upper Sunnyside seam averages 12.4 feet thick according to estimated in the R2P2 and the MRP. The Lower Sunnyside seam in the southern portion of the mining area, where it separates again from the Upper Sunnyside, is much thinner (0 to 5.7 feet). Due to the thinness of the coal and separation expected, the Lower Sunnyside seam would not be mined in the southern portion of the mining area.

Development of the Upper Sunnyside seam would be in a down dip directions toward the east, and would be accessed by two 1,200 foot slopes driven up at 12 percent slope from the base of the cliffs. Phase I production has been estimated at 200,000 tons of coal during the first year and escalating to 2.5 million tons by the fifth year.

Mine pillars would be sized by taking into consideration the coal strength, depth of cover, width, and height of pillars. Mine structural design would incorporate one or more of the following methodologies: Obert-Duvall, Holand-Graddy, Holland, Salamon-Munro, or Bieniawski. Mine experience and past mining history in the area would have as much influence on pillar sizes as do the engineering formulas.

Mine production would begin with the slope construction. Once the coal is encountered development would proceed using continuous miners and various haulage equipment. Battery, cable, or continuous haulage may be used in conjunction with continuous miners in development. Continuous miners would account for all the production during the first two years. Mining would consist of driving mains, developing room and pillar panels. Gate entries would also be proposed for future long wall mining associated with proposed Phase II actions. No exploratory drilling is

anticipated.

Roof control and ventilation plans would be submitted to the Mine Safety and Health Administration and approved prior to any underground mining activities. Ventilation of the mine would be by an exhaust type system. It has been estimated that 900,000 cfm would be required at full production. Intake air would be supplied by slopes and entries from the surface. Dust suppression would be accomplished by the use of sprays on all underground equipment as required. Sprays would also be used along sections of the conveyors and at transfer points.

The workings are expected to produce some water with more water being produced as the depth of mining increases. It is anticipated that 75 percent of the proposed mining activities would be below the projected piezometric surface. Part of this water would be used for dust suppression. The remainder would be collected in sumps and pumped to mined out sections of the mine or to the surface and treated when necessary.

Wildlife Enhancement Projects - UEI would provide two rainfall water catchments to benefit bighorn sheep populations and habitat use within the area above the proposed mine site. These guzzlers would be installed by BLM and Utah Division of Wildlife Resources (UDWR) in suitable locations along the cliff-talus habitat south of the Lila Canyon area. This project would be implemented in the same manner as described in detail in the EA "Saddlehorn Water Catchment" EA Number UT-066-97-1 which addressed similar concerns relative to Bighorn Sheep.

In addition to this project, UEI would complete a vegetation treatment project within the affected area to increase small mammal populations, and thus increasing the forage capacity for area raptor populations. Project design would be provided by BLM and UDWR and involve treating and reseeding approximately 93 acres of habitat. The vegetation treatment would be designed to improve diversity and density of vegetation cover types and create a mosaic of treated and untreated areas to maximize benefits of edge for wildlife species.

Description of Physical Facilities of the Proposed Action - Phase II Activities associated with Phase II are solely dependent upon market conditions and status of production associated with Phase I. However, the actions currently proposed for Phase II are known and include:

- Asphalt paving of the coal haul road
- Long wall mining of existing coal resources

The following section describes the general proposal for each activity associated with this phase.

Asphalt Paving of the Proposed Coal Haul Road - A four inch asphalt layer would be added to the new coal haul road constructed from the mine to U.S. Highway 191/6. This would not constitute additional disturbance, but would allow for increased traffic and speed while resulting in a complete reduction in fugitive dust. Traffic resulting from Phase II development has been estimated at 550 vehicles (staff and coal haulage) per day at full production of four million tons of coal.

Long wall Mining of Existing Coal Reserves - The proposed Phase II mining would utilize all of the same equipment, personnel and facilities as described in Phase I. However, a long wall unit may be introduced, thus potentially increasing production to as much as four million tons of coal per year with the same workforce. Long wall mining would allow for a higher recovery rate of reserves at greater depths as compared to the use of continuous mining equipment. The recovery rate is projected to be approximately 37 percent. Due to the high amount of cover above the Lila Canyon Mine, normally the use continuous mining equipment rather than long wall equipment would reduce the overall recovery rate. The use of long wall mining methods would increase the life of the mine by allowing for the mining of approximately 40 percent of the projected reserves that have cover exceeding 1,500 feet.

PLATE II shows what portions of the existing lease areas would be mined with the long wall miner. Surface facilites described in the proposed action as Phase I were designed to accommodate the potential increase in production. No exploratory drilling is anticipated.

Stabilization, Maintenance and Operation Plan Procedures that make up the following operation plan are designed to minimize and stabilize disturbances to resources present within Phase I and Phase II of the proposed action during its construction, operation and maintenance. Construction activities as described for the mine surface facility were designed to minimize and stabilize disturbances associated with that portion of the proposed action. Support facilities would be operated and maintained in accordance with the permit issued for the Lila Canyon Mine and located, operated and maintained in a manner that prevents or controls erosion and siltation, water pollution and damage to public, state, or private property. To the extent possible, the best technology currently available would be utilized to minimize impacts to area resources and related environmental values. The support facilities would be designed to minimize additional contributions of suspended solids to the stream flow or runoff outside the permit area and, should any contributions occur, such contributions would not be in excess of limitations of Utah or federal law. A full description of the affected resources and impacts to them are described in CHAPTER 3.0 and CHAPTER 4.0

Soil disturbance during the construction would be restricted to the ROW associated with each portion of the proposed action. Unauthorized cross-country vehicular travel by construction crews would be prohibited. Construction activities would be conducted to minimize erosion and in accordance with the natural topography where possible. Exposed areas resulting from construction and the excavation of the described sites would be stabilized using wood fiber mulch and tackifier with the approved BLM seed mix deemed to stabilize the slope and reduce erosion. On slopes exceeding 2:1, native shrubs with significant root structure may be hand planted on a 10 foot spacing.

In order to minimize watershed and erosion damage during wet or muddy periods, access to the ROW's and mine construction site would be restricted. Construction procedures would be consistent with those described within the Utah Nonpoint Source Best Management Plan for Hydrologic Modification. Where runoff and drainage controls would be required, they would be constructed to BLM and/or UDOGM standards. Culverts underneath the road would be installed at a grade no greater than three percent, with rip-rap armoring on the outflow. In areas that warrant there use,

perforated culverts may be used to minimize alteration of existing surface/subsurface water exchange. The hydrologic regime would be protected by the installation and implementation of protection measures at all proposed crossings and drainage modifications. This would deter the potential for side cutting and further impact to the drainages surrounding the crossing. Where required, other flow control structures may include energy dissipaters and channel to sheet flow dispersion fans. As required, hydrological protection in the form of sediment and runoff controls would be installed below all drainage areas. Straw bales would be installed in the established borrow ditch along all slopes in excess of 12 percent. Activities within all wash and gully areas would be limited.

All drainage from the mine site disturbed area would be conveyed to and treated by a sediment pond located within the disturbed area. The sediment pond size has been calculated based on a 10 year, 24 hour event. Ditch and culvert design are also based on a 10 year, 24 hour event. During routine operation, the pond would be visually inspected daily for unusual conditions and integrity. Maintenance of the mine surface facility would include the periodic cleaning of the sediment pond, drainage control ditches and culverts in order to maintain their function. Clean out material would be disposed of off-site in an approved solid waste disposal facility, such as East Carbon Development Corporation (approximately ten miles northwest of the surface facility). A spill prevention control and countermeasure plan (SPCC plan) has been developed to protect the undisturbed drainages from accidental spills of oil or other petroleum products within the disturbed area. This plan would be available for review at the Lila Canyon Mine site.

In the event of spills of petroleum based products during the construction of the proposed action, procedures outlined in the Emery County and Lila Canyon SPCC Plans would be followed. The BLM, as well as the Utah Department of Environmental Quality, would be notified if the release meets the definition of a hazardous waste as defined in 40 CFR 261.

During the operation and maintenance of the road, the use of covered trucks to prohibit blow off of coal fines along the proposed haul road and U.S. Highway 191/6 would be used. Enforced speed limits of 45 MPH would also reduce the potential of coal blow-off.

To maintain the cultural, historical and paleontological resource integrity of the area, construction crews and staff would be provided with instructional materials regarding the identification, value, legal protection and treatment of these resources. If any cultural, archeological or paleontological resources are discovered during construction or any operations associated with the road, power line, or mine, all activities would cease at the area of the manifestation. The authorized agency would then be contacted to evaluate the importance and potential of the site. Mitigation measures would, at that time, be made for the value of the resource site. Construction and/or maintenance crews would avoid the site until the resource potential has been determined.

All existing grazing management facilities (corrals, water sources, etc.) would be replaced concurrent with the construction described. A fence would be constructed along the road prior to its use. This three wire strand fence built to BLM grazing management standards, would take into account wildlife and visual resources, and would prohibit livestock access along the traveled road for the life

of the project. UEI would install and maintain a 12,000 gallon water tank for the life of the project to facilitate livestock use of the allotment on the northern side of the proposed road and fence. A section of the existing route in the NE 1/4 NE 1/4 of Section 32 in T. 16 S. R. 14 E. would be left to facilitate placement and access of the water tank from the proposed coal haul road. Upon review of roads to be removed as described within the proposed action, the establishment of cattle guards on any remaining roads intersecting the haul road would be evaluated. With termination of use of the haul road, maintenance of these facilities would be transferred to the BLM on public lands.

For reducing visual contrast, reduction of disturbance along the route of the road is the most effective operational technique. Consideration would be given to the basic landscape (form, line, color, and texture) to minimize visual change, while meeting the safety and use capacity of the road. When possible, soil would be contoured using equipment necessary to conform with the terrain and adjacent land within the road ROW. All constructed facilities (fences, mine surface facilities, etc.) would be painted an approved BLM flat grey color, developed to reduce line and form contrast with the existing environment. During the operation of the proposed action, the use of enzyme treatment during Phase I and asphalt paving in Phase II on the road surface would minimize and eliminate dust plumes from traffic. An effort would be made to direct light toward the mountain face as opposed to the valley floor to minimize night glow. No long distance views of bare bulbs would be seen and all lights within the surface facility would be shielded.

To the extent possible, all foliage adjacent to the power line would remain undisturbed to provide maximum available screening of the line relative to the landscape character type. Visual disturbances would be minimized by using poles colored a shade darker in tone than the surrounding landscape, the use of non-reflective hardware, and by placing the poles out of public view where possible. To minimize the view of the power line from the proposed road, the construction and operational power line ROW's would be placed approximately 0.75 miles from the junction with the existing line and intercepting the proposed haul road at the proposed mine site.

Potential measures to help improve air quality for construction activities include proper maintenance of the construction equipment and limited travel on the construction ROW and dirt access roads. Dust generation from disturbed areas would be reduced through interim watering of active construction areas. An enzyme armor coating on the proposed coal haul road would minimize dust generated by traffic during Phase I, with paving in Phase II eliminating it all together. Final reclamation, which includes revegetation of all disturbed areas, would eliminate further impacts.

An air quality permit for the Lila Canyon Mine would be obtained from the Utah Division of Air Quality prior to conducting operational activities. Coal dust associated with the operations of the mine surface facility would be controlled on the conveyor system and transfer points by enclosures and sprays. Dust from unpaved mine access roads would be controlled by applying water or a dust suppressing solution. Coal would be reclaimed from the bottom of the stockpile directly onto a conveyor belt located within an enclosed tunnel located under the pile. The coal moisture level within the coal pile would be maintained at approximately 6.5 percent or greater by water sprays located on the main mine conveyor.

Noise reduction and control measures for construction activities would include proper operation and maintenance of manufacturer-installed noise abatement equipment. During operational use, enforced speed limits would limit area wide noise by reducing the need for Jake Brake application on descending grades along the proposed road.

Due to the increase in truck traffic along U.S. Highway 191/6, the operation plan would include the installation of signs warning of heavy truck traffic. Enforcement of posted speed limits, especially from the proposed coal haul road tie-in to U.S. Highway 191/6, would increase the awareness of the truck drivers and the reaction time to potential hazards. There would be an acceleration and deceleration lane to facilitate a safe merging of traffic.

Vegetation removal necessitated by the proposed action would be confined to the ROW. Vegetation removed would be set aside during construction activities, and/or left in place upon completion of construction where possible. Vegetation removed would be limbed, lopped and distributed over the disturbed or reclaimed area to increase solar protection for emerging vegetation. Reclamation or surface contouring to restore all disturbed areas would start upon completion of the project, or as specified by the BLM. Reseeding associated with the road, power and mine surface facility would be completed between October 1 and October 31 for both years. The area would be drill seeded with the seed mix shown in TABLE 2.2. This mix, designed for erosion control and slope stabilization, would be seeded along the edge of the roads and power line corridors and all disturbances anticipated during the life of the mine. The same mix, less the shrubs, would be used on the interim reclamation. Slopes exceeding 2:1 would be hydroseeded and hydromulched at twice the seed rate outlined for drill seeding.

In association with the areas that would be reclaimed, an effort would be made to reclaim the existing roads and four wheel drive trails that intersect the existing haul road. Where road sections are eliminated, cuts would be pulled back to the approximate original contour and drainages would be reestablished. Concurrent with recontouring, 200 pounds per acre of 16-16-8 fertilizer would be incorporated into the top six inches of soil. An additional 100 pounds per acre of 16-16-8 fertilizer would be incorporated into the 2,000 pounds of wood fiber mulch and 200 pounds of tackifier per acre application if hydroseeding is utilized.

Prior to construction and operation of the proposed action, an awareness and appreciation of wildlife would be taught to all employees associated with the project. All activities associated with the proposed action development would be coordinated to avoid optimal habitat use periods and areas for all wildlife species. If active/occupied raptor nests are located within 0.5 miles of any portion of the proposed action, construction would not begin within that area during the period of February 1 to July 15. Completion of all construction would occur on or before October 31 for each year, and prior to any established winter big game use of the area. Construction activity within bighorn sheep habitat would be prohibited during the lambing period of May 1 to June 15. The wildlife enhancement projects proposed should benefit local wildlife populations and their respective habitat uses.

All speed limits would be posted at 45 miles per hour or less on the proposed coal haul road. Where

visibility along the road is limited by vegetation in excess of four feet, selective thinning would be conducted to minimize the potential for collision between vehicles and wildlife. BLM wildlife standards for fence construction would be incorporated into the coal haul road fence to allow for antelope and other wildlife movement, while allowing for livestock grazing management. The fence would be a wire fence, not exceeding 38 inches in height. The bottom strand would be a smooth (barbless), twisted metal strand, no less than 16 and half inches above the ground. The second barbed strand would be 10 inches above the bottom strand, with the top barbed strand 12 inches above the second. Distance between posts would be on exact 16 foot centers. As previously stated, existing roads and trails would be reclaimed.

TABLE 2.2
RECOMMENDED SEED MIX FOR ALL DISTURBED AREAS

	LBS PURE LIVE SEED/ACRE*
GRASSES	
Needle and Thread	
Stipa comata	2.0
Indian ricegrass	
Oryozopis hymenoides	2.0
Great basin wildrye	
Elymus cinereus	1.0
Galleta	
Hilaria jamesii	1.5
Russian wildrye	
Elymus junceus	1.5
FORBS	
Lewis flax	
Linum lewisii	1.5
Yellow sweetclover	
Melilotus officinalis	1.5
Palmer penstemon	
Penstemon palmeri	1.0
Globemallow	
Sphaeralcea ambigua	1.0
Small burnet	
Sanguisorba minor	1.0
Prostrate kochia	
Kochia prostrata	0.5
SHRUBS	
Winterfat	
Eurotia lanata	1.0
Wyoming big sagebrush	
Artemisia tridentata wyomingensis	0.5
Douglas rabbitbrush	
Chrysothamnus viscidiflorus	1.0
Fourwing saltbush	
Atriplex canescens	1.0
TOTAL	**20.0**

Time-frame TABLE 2.3 is a breakdown of activities proposed for both phases.

TABLE 2.3
CONSTRUCTION TIME FRAME FOR PHASE I AND PHASE II
(In Months from Approval)

Phase I

Month 1
- Upgrade existing Lila Canyon Road to proposed surface facility site.
- Replace old culverts, borrow ditches and resurface and initiation of rock slopes.
- Implement interim drainage controls, earthwork for pad and site facilities
- Completion of rock slopes

Month 2 - 3
- Construct surface facility structures
- Begin construction of coal haul road

Month 3 - 5
- Construction of coal haul road acceleration and deceleration lanes
- Complete surface facilities (structures)
- Permanent sediment controls, sediment pond and all drainage diversions
- Construct 46 kV power line

Month 5 - 6
- Begin coal production and stock piling

Month 10 - 14
- Completion of coal haul road
- Initiate haulage of test quantities of coal

Phase II - Anticipated

January 2006
- Submit engineering and final design for paving coal haul road
- Initiate review of actions and impacts associated with Phase II

April 2006
- BLM approval of final design

May 2006
- Begin Phase II paving coal haul road
- Mobilize equipment

October 2006
- Completion of coal haul road upgrade, asphalt surface, signs, painting, guard rails

November 2006
- Reclamation of all disturbed area no longer need for operational purposes

Abandonment and Reclamation The existing Lila Canyon Road would be maintained as a private mine road that would prohibit public access through the property for the life of the mine. The new coal haul road would be maintained by Emery County through a cooperative agreement with

UEI. The expected life of the mine is 20 years, which upon cessation of activities, would be dismantled and reclaimed. Lila Canyon Mine is in the process of obtaining their operation MRP with the UDOGM. Activities described for construction are described in full detail within that document. A summary of proposed reclamation activities is included in APPENDIX D. At the time of closure and subsequent reclamation of the Lila Canyon Mine, Emery County may find it to their advantage to cease full season maintenance of the road. However, elimination of the road is not expected to occur.

If UEI and/or UP&L terminate the use of the power line, it would be done in accordance to the BLM guideline stipulations at the time of removal. An appropriate schedule for activities associated with dismantling of the power line would be established at that time. Upon dismantling of the line, a reclamation plan would be implemented for the established ROW.

2.3 Alternatives Considered But Not Analyzed Further

The following alternatives were discussed and dismissed during agency scoping in 1998 and 1999.

2.3.1 Alternative A - Use of Existing Horse Canyon Site for Coal Mine Operation

This alternative would have utilized CR 125 (Horse Canyon Road) to the existing Horse Canyon graveled road that accesses the abandoned Horse Canyon Mine site. Rather than being located within Lila Canyon, the proposed mine surface facilities would be constructed at the old Horse Canyon Mine site, with access to the coal lease area being gained through improvement of the old underground workings. Generally, it is more dangerous to re-enter an abandoned mine due to the existing conditions within it than to develop a new entry. Preliminary engineering evaluation of this option determined that ventilation, mine dewatering and safety concern problems would be encountered with re-entering the Horse Canyon site.

The Lila Canyon reserves are located approximately 14,000 feet (2.65 miles) from the current Horse Canyon portal. Due to the amount of ventilation required to operate a modern mine and distance to the coal reserves, it would be necessary to develop as many a five new surface entries. These new entries, constructed as either a vertical shaft or outcrop access, would require additional fans and powerlines outside of the surface facility area. Preliminary engineering of this option indicated that as much as 1.8 billion gallons of water have entered the mine since its sealing in 1984. Past mine water samples have indicated that this water has a high total dissolved solid (TDS)and iron concentration. To meet UPDES discharge requirements of one ton per day of dissolved solids, only 85,000 gallons could be pumped out daily at this site.

The mixture of water and air tends to expand the rock and coal strata, creating an extremely unstable and unsafe condition to access the south lease reserves. In order to compensate for this structural problem, the entry material would need to be excavated and a shoring base built strong enough to compensate for the loss in integrity. Since some of the main pillars required for roof support that are in route to the Lila Canyon reserves have been mined, an additional unstable situation would

need to rectified prior to the safe operation of the facility. Therefore, due to the project infeasibility associated with the construction of a numerous entries and extended ventilation system, the supported entry, and the increase in project disturbance to the surrounding environment in association with dewatering the old mine works, this alternative was dismissed from further consideration.

2.3.2 Alternative B - Use of the Horse Canyon Road/Lila Canyon Road for Coal Mine Operation

This alternative would have utilized the proposed Lila Canyon Mine surface facility, power line and coal mining activity as described within the proposed action. However, CR 125 (Horse Canyon Road) would be upgraded and utilized for coal haulage and mine operations in association with the existing Lila Canyon Road. The existing Lila Canyon dirt road would be required to be upgraded to enable coal haul traffic and daily use for mine operations. Extensive cut and fill would be needed to create a wide enough road, as well as to establish a suitable grade and a safe and usable road to access CR 125. CR 125 would require that the entire road be redesigned and established to create an access suitable for coal haul traffic as well as remain usable for day to day use as a access route to Columbia and East Carbon from U.S. Highway 191/6. Due to the considerable upgrade of these two roads that would be required, this alternative was dismissed from consideration. APPENDIX B contains a letter from the Emery County Road Department as to the proposed requirements.

CHAPTER 3.0 AFFECTED ENVIRONMENT

3.1 General Setting

Elevations in the area of the proposed action ranges from 5,700 feet to 7,000 feet above sea level and is characterized by hot, dry summers and cold, moist winters. Most of the available water results from winter snow accumulation. Summer precipitation comes from short duration thunderstorms which often result in flooding and erosion (Lines et al, 1984). Characteristic vegetation includes Douglas fir in the highest elevations, pinyon-juniper forests over most of the bench areas, and a mixture of shrubs and grasses in the low areas. The general area is predominantly a natural but disturbed setting, with several dirt roads and routes presumably constructed for grazing and mineral exploration activities meandering through the area.

3.2 Geology

Lila Canyon is located within the Colorado Plateau Physiographic Province. The High Plateaus of Utah and the Canyonlands sections meet within the area along the Book Cliffs, an escarpment that extends from Castle Gate east to Grand Junction, Colorado. The project area is characteristic of the mid-elevations of the province, consisting of deep, rugged washes and open plateaus. The geologic structure of the region is controlled predominantly by the uplift of the San Rafael Swell, approximately 25 miles southwest of the project area. Beds are mostly uniform and are inclined from three to eight degrees away from the uplift. The strike of the beds are generally parallel to the face of the cliff. Exposed members of the Price River Formation and Upper Cretaceous Blackhawk Formation are evident in the Lila Canyon Area. The Castlegate Sandstone is approximately 170 feet thick in this area and forms an abrupt cliff over the site. Immediate subsurface geology in Lila Canyon consists of the Upper Mudstone, and Sunnyside Members, with a thin cover of alluvial and colluvial material. FIGURE 3.1 is a typical cross-section of the geology present within the Lila Canyon area.

The majority of coal is located under less than 2,000 feet of cover. The deeper coal is generally located in the northern and eastern portions of the property. A small portion of the reserves are deeper than 2,500 feet. Two coal seams, the Upper Sunnyside and Lower Sunnyside seams, are located in the Blackhawk Formation. Numerous easterly trending normal faults exist within the area. The main faults were mapped by Dunrud and Barnes (1972) and Osterwald and Mayberry (1974). Vertical displacement ranges from 15 feet to more than 275 feet, with displacement diminishing toward the east. Unmapped minor faults may also be present.

INSERT FIGURE 3.1

3.3 Soils

The area of the mine site and transportation corridors encompass steep rocky cliff lands, pediments and basins. The mine site is at the toeslope of the Book Cliffs and has mostly a southwest aspect. In going toward U.S. Highway 191/6 from the mine site, the landscape extends into the Mancos shale basin. Sandstone predominates in the cliff lands with shale dominating in the basin areas. Below the cliffs are deposits of stony to very bouldery colluvium. The pediments are composed of very cobbly to bouldery materials. Nearly all rock fragments are composed of sandstone. Soils are well-drained and surface drainage is limited to runoff events. It is an erosional environment where maintaining soil protection by rock fragments and vegetation is critical to holding soil in place. Soil conditions combined with high intensity, short duration storms create rapid runoff conditions. Runoff has caused extensive natural erosion damage to the landscape.

The soils in the project area have been mapped and described at the third order soil survey intensity level as part of the Soil Survey of the Emery Area, Utah. This soil survey is presently in progress by the USDA, Natural Resources Conservation Service(NRCS), and will be a published soil survey meeting national quality standards. The soils map for the project area is presented in PLATE III. An Order 1 soil survey was completed at the Lila Canyon mine surface facilities site in 1998. The detailed soil survey report is contained within the MRP (On-file). The soil map units] identified are those as described by NRCS as of February 1, 1999. Soil map units identified by the NRCS that are within the area are listed below:

Transportation corridor from the Horse Canyon Road to the mine facilities site:

BNE2	Strych very bouldery, fine sandy loam, 3 to 20% slopes.
NGG2	Gerst-Strych-Badland Complex, 30 to 70% slopes.
BY	Badland-Rubbleland-Rock Outcrop Complex
BMD	Strych very stony fine sandy loam, 3 to 30% slope
BME2	Strych very stony loam, dry, 3 to 30 % slopes.

Mine facilities site:

BNE2	Strych very bouldery, fine sandy loam, 3 to 20% slopes.
BMD	Strych very stony fine sandy loam, 3 to 30% slope
NGG2	Gerst-Strych-Badland Complex, 30 to 70% slopes.
RZH	Rock outcrop-Atchee-Rubbleland Complex, 50 to 80% slopes.

Transportation corridor from Highway 191/6 to the mine facilities site:

CHC2	Chipeta silty clay loam, 8 to 15% slopes.
EED2	Hanksville very gravelly, fine sandy loam, 3 to 15% slopes
RIA2	Ravola-Toddler Complex, 1 to 6% slopes
KAC	Persayo-Greybull Complex
SMD2	Clifsand-Minchey Complex 1 to 8% slopes.
BNE2	Strych very bouldery, fine sandy loam, 3 to 20% slopes.

APPENDIX E contains a summary of some of the features of the soil map units.

It has been determined that no prime farmlands or soils of statewide importance are present in the proposed project area (APPENDIX E). Alluvial valley floors are not present in the area based on soil survey information and field observations. Although some soils are formed in alluvium, they are well-drained and lack a high water table typical of alluvial valley floors.

3.4 Hydrology

Hydrologic resources are assessed through examination of existing reports (USGS Open File Report 83-38, Water Supply Paper 2246, and other widely referenced published documents), the Horse Canyon MRP, existing monitoring wells within the vicinity of Lila Canyon, and a historic seep and spring inventories of the proposed mine site and adjacent areas.

3.4.1 Climate

Lila Canyon receives 18-20 inches of mean annual precipitation, primarily in the form of winter snow and secondarily as late summer rains. This information is from extrapolated isohyets, not direct precipitation measurements. Due to a high (modeled) evaporation rate (18-21 inches) and local geology, Lila Canyon does not have perennial stream surface flow. Runoff from brief intense precipitation events is generally severe.

3.4.2 Surface Water

Surface channels in the area of study consist of Lila Canyon, which forms the right fork of Grassy Wash. Grassy Wash drains into Marsh Flat Wash, which in turn is tributary to the Price River. The Price River is currently listed as a Clean Water Act 303d (non-compliance) water body for TDS and total suspended solids (TSS), among other parameters. Horse Canyon has a similar surface drainage pattern to the north of Lila Canyon. There are no perennial stream surface flows within the immediate area of the proposed action. However, numerous spring and seep outcrops exist throughout the area. Locations of seeps and springs, based on the existing inventory, are shown on PLATE IV. Within and adjacent to the permit area, 19 springs and seeps were identified in the most recent available inventory. Flows occur from perched local aquifers (North Horn formation) at rock and shale outcrops. The Blackhawk coal formation is classified as a regional aquifer, and is also the source of seeps and springs at lower elevations within the canyons. Flow rates from the springs, as measured for the previous inventory, varied from less than one gallon per minute (gpm) to about 10 gpm.

3.4.3 Ground Water

In the deeply incised mountainous areas of the Book Cliffs, groundwater is present in consolidated bedrock, in both a regional aquifer (the Blackhawk formation) and in perched local aquifers (the North Horn sandstone). Associated with the bedrock aquifers is groundwater within fractures. Groundwater is also found in shallow alluvial deposits at the bottoms of the larger drainages. Lines and others (1984) indicate that most recharge to the ground water system is due to infiltration of

rainfall and snowmelt at the higher elevations. Another potential factor in groundwater movement is a network of east-west fractures beneath Lila and Horse Canyons. It is presumed that potentially affected formations are presently saturated, therefore no underground water movement through the fractures is currently occurring.

Evaluations by JBR Consultants Group (1986) in the Sunnyside and Horse Canyon areas indicate that the most probable water bearing formations are the Upper Price River and the Flagstaff and North Horn (undifferentiated). Waddell and others (1986) found that the water levels in the North Horn Formation in the Book Cliffs were generally several hundred feet above the regional aquifer potentiometric surface found in the Blackhawk Formation. These North Horn Formation aquifers are considered to be perched.

Groundwater resources in the permit area are limited due to the small surface area and low recharge rates. The local recharge and discharge areas for perched aquifers (North Horn Formation and statigraphically Blackhawk Formation above) generally lie within the drainage divide of Horse and Lila Canyons. These local systems are complex and highly dependent on topography. The regional aquifer within the Blackhawk Formation consists of interspersed sandstone and shale. Based on Lines and others (1984), the recharge rate is calculated at approximately one inch per year. The recharge of the North Horn perched aquifers are complex and dependent upon topography. The aquifer is laterally continuous as a unit but some of the individual sandstone bodies are discontinuous.

Three water monitoring wells were drilled in the Lila Canyon Permit area by Intermountain Power Agency (IPA). These wells were designated IPA-1, IPA-2, and IPA-3, and have been monitored for water depth from July 1994 to April 1996. These holes show water levels above the coal seam in those areas. The regional aquifer is underlain by relatively impermeable shale.

UEI is currently in possession of water rights for the industrial use of underground water within the Horse Canyon mine works, which is the same source the proposed works would have. A listing of water rights (taken from the Utah Division of Water Rights database) for the area of the proposed action is included in this EA as APPENDIX F.

3.5 Land Use

Land use resources and surface ownership within the area of the proposed action are shown on PLATE I and PLATE IV.

3.5.1 Grazing

Two grazing allotments occur within the vicinity of the project area. The existing road, proposed road, proposed power line and mine surface facility would occur within the Cove Allotment. The proposed road would pass near the main watering sources and holding corral for livestock on this allotment. The season of use on the Cove Allotment is during the spring from March 1 to May 31

with 250 head of cattle currently using 750 animal unit months (AUM's). The coal lease area would occur within the Little Park Allotment. This allotment has a summer season of use from May 25 to October 31 with 60 head of cattle using 242 AUM's. (See PLATE IV).

3.5.2 Vehicular Traffic

CR 125, connecting U.S. Highway 191/6 to Horse Canyon and East Carbon, had an annual average daily traffic of 280 vehicles in 1995 (UDOT), 1995). Travel to and from the area of the proposed action would use the Emery County maintained CR 125, for approximately five miles from its intersection with UDOT maintained U.S. Highway 191/6. Access to the Book Cliffs from CR 125 is limited, with traffic on the primary access to Horse Canyon from US Highway 191/6 at 280 vehicles per day. An unmaintained dirt road, which the proposed action would follow closely along the entirety of its length, transects the project area. Access on this dirt road is limited due to weather conditions and maintenance. During inclement weather there are sections that are impassible, and since the road is not maintained on a regular basis, it is virtually inaccessible during late fall through early spring when snow and/or mud preclude conventional vehicles. The heaviest use occurs during the fall in association with hunting, with some additional travel involving grazing, recreational driving, site seeing, and wildlife viewing in the spring and summer.

U.S. Highway 191/6 is a major route for commercial transportation (heavy trucks) between Interstate 70 and the Wasatch Front. South bound traffic normally remains on Interstate 70. It is estimated that more than 5,000 heavy trucks travel between Green River and Price per day. In addition, recreational use has increased to 208 vehicles per hour, thereby creating an overall traffic rate of as many as 10,600 vehicles per day.

3.5.3 Visual Resources

The project area is located in an area of broad open landscapes, broken benches, and steep canyons characteristic of the regional landscape of Southeastern Utah. EXHIBIT 3.1 and 3.2 display views of the characteristic landscape of the project area from Key Observation Points (KOP's) near the intersection of the proposed coal haul road and U.S. Highway 191/6 and CR 125 near the intersection with the existing Lila Canyon Road. From the intersection with the Horse Canyon Road, the existing Lila Canyon Road would proceed south-southeast across a pinyon-juniper bench, before descending a Mancos bench to the proposed mine surface facility site (EXHIBIT 3.1). EXHIBIT 3.2 is a midground view of the proposed area of the coal haul road and a long distance view of the proposed mine site area from U.S. Highway 191/6. The proposed road would proceed east across a bare, gently sloping plain to the proposed mine surface facility, located along the broken sloping pinyon-juniper benches below the Book Cliffs. The project area is within an area managed as VRM Class III (objects may be seen, but not dominate the landscape), as established by the Price River MFP.

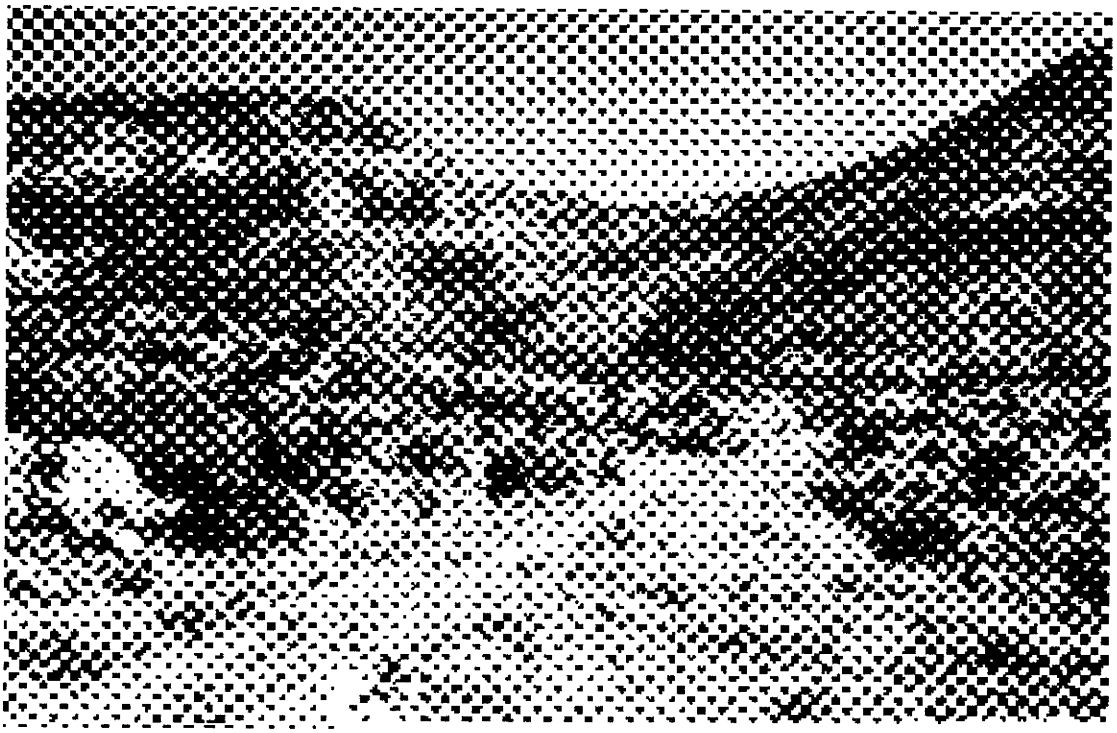

EXHIBIT 3.1View Looking Southeast Along Existing Lila Canyon Road

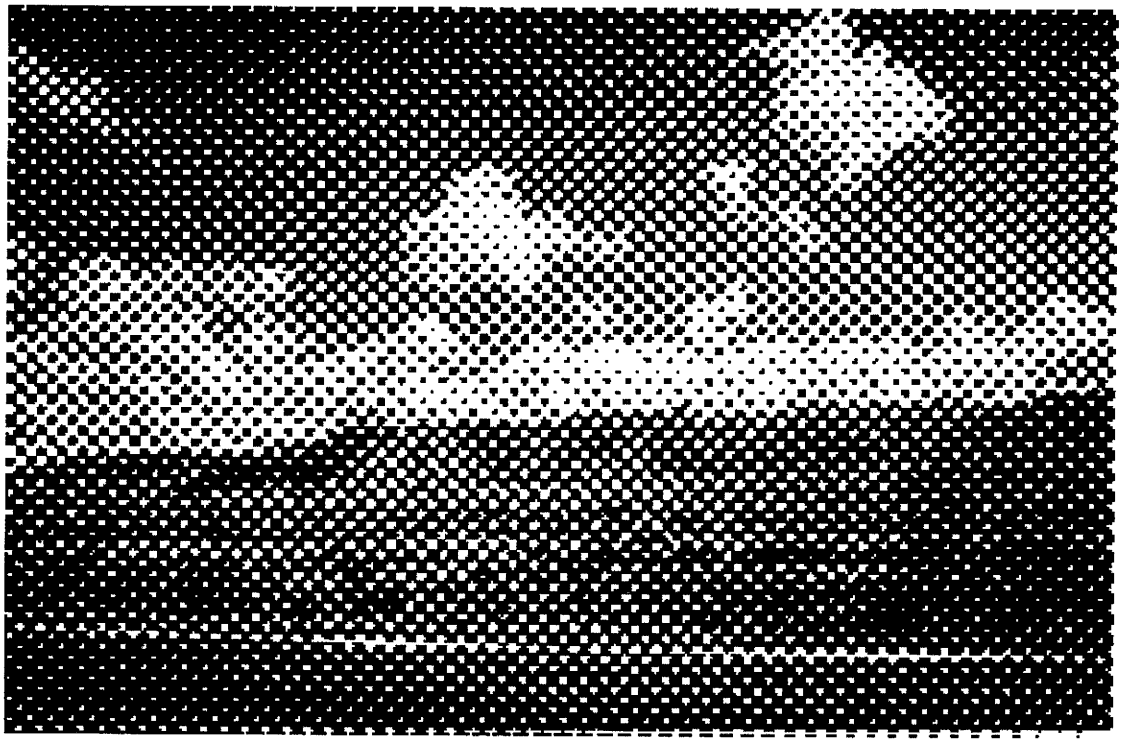

EXHIBIT 3.2 View Looking Northeast From U.S. Highway 191/6 (KOP)

3.6 Vegetation

The proposed action would traverse several plant communities common to this area of Utah. The intersection of the county road with the existing Lila Canyon Road is located on a gently sloping rocky bench, predominantly covered with pinyon pine, *Pinus edulis* and Utah juniper, *Juniperus osteosperma*. From the intersection with the state road, the county road descends from the rocky bench and transects a steep bare escarpment dominated by shadscale, *Atriplex confertifolia*, mat saltbush, *Atriplex cuneata*, cheatgrass, *Bromus tectorum*, and numerous herbs as groundcover. Within this area of the existing road and proposed surface facility, vegetation was largely burned during a range fire in the early 1950's. The area was reseeded with a nonnative seed mix. However, native species were able to persist, with shrubs and grasses dominated by basin big sage, *Artemisia tridentata*, black sage, *Artemisia nova*, needle-and-thread, *Stipa comata*, and Indian rice grass, *Oryozopis hymenoides*. From the proposed mine site west to U.S. Highway 191/6, the predominant vegetation gradually changes to a grass shrub community dominated by Indian ricegrass and sagebrush, to a mat saltbush dominated community of the Mancos slopes near the proposed intersection.

As the elevation gradually increases, and water becomes more available, tree species again become prevalent. The remainder of the area consists of a mosaic of habitats beginning with sections of widely spaced Utah juniper. Areas of sagebrush and grass are still scattered throughout but become much smaller as the route enters the area dominated by pinyon pine and Utah juniper. Within Lila Canyon the vegetation changes to a transitional habitat that incorporates the end of the pinyon and juniper range with microsites, moist enough to support Douglas fir, *Pseudotsuga menziesii,* at the top of the ridge.

TABLE 3.2 contains a list of the various plant species identified within the project area. PLATE V shows the location of the various vegetation communities present within the area of the proposed action. APPENDIX G contains a summary of the TES survey conducted for such plants and a negative determination for their occurrence within the area of the proposed action.

TABLE 3.2
LIST OF PLANT SPECIES IDENTIFIED WITHIN THE PROJECT AREA

COMMON NAME	SCIENTIFIC NAME
Grasses	
cheatgrass	*Bromus tectorum*
needle-and-thread	*Stipa comata*
Indian ricegrass	*Oryozopis hymenoides*
wheatgrass	*Agropyron* spp.
Forbs	
mustard	*Brassica* spp.
locoweed	*Astragolus* spp.
cryptantha	*Cryptantha jonsia*
Shrubs	
greasewood	*Sarcobatus vermiculatus*
prickly pear	*Opuntia* spp.
yucca	*Yucca* spp.
shadscale	*Atriplex confertifolia*
mat saltbush	*Atriplex cuneata*
claret cup cactus	*Echinocereus triglochidiatus*
basin big sagebrush	*Artemisia tridentata*
black sage	*Artemisia nova*
Trees	
tamarisk	*Tamarix ramosissima*
Utah juniper	*Juniperus osteosperma*
pinyon pine	*Pinus edulis*

3.7 Wilderness Values

The area of the proposed action is located partially within and adjacent to two wilderness inventory areas, and adjacent to an established BLM Wilderness Study Area (WSA). A portion of the mine surface facility and underground coal lease would be located on the edge of and partially within the Desolation Canyon Inventory Unit 8 of the 1999 BLM Utah Wilderness Inventory. This 48,900 acre unit has been found to have generally retained its natural character. A few road ways associated with coal exploration have been noted, but were determined by the BLM that individually and/or cumulatively did not detract from the overall naturalness of the unit. Opportunities for solitude and unconfined recreation are outstanding, especially when considered in conjunction with the contiguous established 291,000 acre Desolation Canyon WSA. Supplemental values, such as high

value wildlife and sensitive species habitat have also been found throughout this unit.

The 7,300 acre Turtle Canyon Inventory Unit 4 and small portion of the Turtle Canyon WSA covers the majority of the pre-FLPMA coal lease area. This unit, contiguous to the existing Turtle Canyon WSA, has been determined to have retained its natural character. Outstanding opportunities for solitude and primitive and unconfined recreation exist, due primarily to the extension of the values from the existing WSA. Supplemental values, such as for archeological, scenic, wildlife habitat, and special status plant habitat found within the WSA extend into this inventory unit.

PLATE IV shows the location of the WSA unit and re-inventory units in relation to the general area of the proposed action.

3.8 Wildlife

Wildlife indigenous to the general area of the project include amphibians, reptiles, birds and mammals. General wildlife use of the area is shown on PLATE VI through PLATE IX. APPENDIX G contains correspondence with the U.S. Fish and Wildlife Service (USFWS) regarding the potential of wildlife species concerns within the project area.

3.8.1 Amphibians

There are six species of amphibians known to occur within the general area of the Wasatch Plateau and Book Cliffs. These species are classified as common, but are limited to mesic areas. These species could be present within the Lila Canyon area, but their occurrence is doubtful due to arid conditions that prevail over the majority of the area. The pinyon/juniper and sagebrush/grass areas that make up most of the affected habitat are not considered important or limiting to their survival (Dalton et al, 1990).

3.8.2 Reptiles

There are ten species of reptiles known to inhabit the region. The habitat requirements for these species range in value from critical to substantial. The limited acreage of disturbance within the area of the proposed action, however, is not considered a threat to these species. This is due to the abundance of the preferred pinyon and juniper habitat, as well as sagebrush and grass habitat throughout the area.

3.8.3 Birds

There are approximately 185 bird species that could possibly be either year long residents or frequent the site during portions of the year. Of these, wildlife species of management concern include, loggerhead shrike (BLM Sensitive species) and raptors which will be discussed in-depth.

Loggerhead shrike An intensive survey of the proposed action indicated no nesting loggerhead

shrikes, *Lanius ludovicianus*, near the proposed roads or power line ROW's. This species is dependent upon the broad, open sagebrush and grass plain, as well as the presence of widely spaced pinyons and junipers. A summary of the inventory conducted for this species and a negative determination of its presence is attached as APPENDIX G.

Raptors Raptor surveys, completed in May of 1998 and 1999 by the UDWR, revealed a number of active and inactive raptor nest sites on the open lower benches and cliff faces in and surrounding Lila Canyon (PLATE VIII). In 1998, one tended and two inactive golden eagles, *Aquila chrysaetos*, nests were located along the cliffs surrounding the Lila Canyon area. Two old, dilapidated historic golden eagle nests were monitored, as well as an inactive prairie falcon, *Falco mexicanus*. The 1999 spring inventory, identified one active and one tended Golden Eagle nest within a 1/4 mile of the proposed mine site. APPENDIX G includes a more detailed description of the survey findings.

An inventory in May and June 1998 for burrowing owls, *Athene cunicularia*, and ferruginous hawks, *Buteo regalis*, did not reveal the presence of these species within the project area.

3.8.4 Mammals

Ninety-two (92) species of mammals are known to exist in, or have the potential to inhabit the region. Of these, the following species of management concern; mule deer, *Odocoileus hemionus*, elk, *Cervus elaphus*, Rocky Mountain Sheep, *Ovis canadensis*, and pronghorn antelope, *Antilocapra americana*, have been identified within the affected area (PLATE VI - PLATE IX).

Mule deer Mule deer habitats within the affected area include critical and high priority winter ranges located on the higher elevation benches, as well as year-long range located on the lower elevation foothills below the Book Cliffs. Mule deer population densities within this herd unit are well below management objectives.

Rocky Mountain elk Elk high priority winter ranges are found on the higher elevation benches above the mine surface area and lease area. No winter range is located within the area of the mine surface facility or roads. Population levels for elk are at or near management objectives for this herd unit.

Rocky Mountain bighorn sheep Rocky Mountain bighorn sheep occupy the cliff talus habitat above the surface facility area. Radio telemetry data collected by the UDWR show that Lila Canyon is particularly important to bighorn sheep and supports as many as 15 to 25 head of bighorn sheep year round. This is attributed to the presence of springs and seeps within the Lila Canyon area of the Book Cliffs, as compared with the noticeable lack of water for most of the cliff talus habitat.

Pronghorn antelope Pronghorn antelope occupy the salt desert shrub habitat of the lower elevation ranges along the proposed coal haul road route. This habitat is classified as high priority year-long range for pronghorn. Population levels of pronghorn are at or near management objectives for this herd unit.

3.9 Cultural Resources

There is a long and diverse cultural history associated with the Price and Green River Basins and the Book Cliffs region of east-central Utah. Archaeological inventories in the area of the proposed action (Rouch, 1981; Miller,1991; Montgomery,1998; Montgomery, 1999), have identified eight archaeological sites and several isolated artifacts. The type and time period of these sites fit well into the cultural overview described above. Seven of the sites are located in Little Park, above the mine's surface facilities. Site 42EM2517, a Fremont component rock shelter is adjacent to and visible from the Lila Canyon Road and the proposed mining facilities.

The site is a south-facing shelter located under a large bolder and measures about eight meters east-west, 5.2 meters high and 1.4 meters deep. It has diagnostic chipped stone tools and Emery Gray ceramic shards associating it with the Fremont Cultural. The still intact cultural remains, in particular, the presence of charcoal and oxidized rocks suggest the presents of features or occupational horizons. It is eligible for the National Register of Historic Places under Criterion (d) of 36CFR60.4, based on its potential for contributing significant data relative to the research domains of the area. Investigations of the site could provide data relative to chronology, site function, technology, subsistence, seasonality of occupation, social organization, and extra regional relationships.

CHAPTER 4.0 ENVIRONMENTAL CONSEQUENCES

4.1 Impacts Associated with Alternative A - No Action

Associated impacts identified with the No Action alternative are derived from the inability to supply the necessary utilities, access and development requirements for the proposed coal mine in Lila Canyon. The proposed facility would need to be abandoned and/or relocated and required to establish some other means of access or transport and an alternative power and utility source. Planned development for the facilities described would not occur.

4.2 Impacts Associated with Alternative B - Proposed Action

TABLE 4.1 shows how activities associated with Phase I and Phase II of the proposed action (construction and operation of the proposed roads, power line, development and operation of the mine surface facility, and underground extraction of coal) on federal, state and private lands affect the resources described in CHAPTER 3.0 and as identified during the scoping process.

TABLE 4.1
AREAS OF IMPACT ASSOCIATED WITH THE PROPOSED ACTION

Category	Area (acres)	Remarks
Soils	115.11	Construction Disturbance
	93.11	Operational Disturbance
Hydrology	<1.0	Channel Culverts
Grazing	115.11	Construction Disturbance
	93.11	Operational Disturbance
Visual	Minor	Varies From KOP
Vegetation/Habitat	115.11	Construction Disturbance
	93.11	Operational Disturbance
Wilderness Values	7.50	Surface Disturbance within Desolation Canyon Unit 8
	25.12	Indirect Disturbance within Desolation Canyon Unit 8

TABLE 4.1

AREAS OF IMPACT ASSOCIATED WITH THE PROPOSED ACTION (Continued)

Category	Area (acres)	Remarks
Wildlife	115.11	Direct Construction Disturbance
	93.11	Direct Operational Disturbance
	0	800 Meter Displacement On Each Side of ROW Corridor (ELK)
	0	200 Meter Displacement On Each Side of ROW Corridor (DEER)
	40.0	Direct Antelope High Priority/Fawning Range Disturbance
	37.0	Direct Bighorn Sheep Habitat Disturbance
	93.11	Direct Operational Raptor Foraging Habitat Disturbance

4.3 Geology Impacts

The proposed upgrade and use of the Lila Canyon road, the new coal haul road, development of the mine surface facility and construction and operation of the power line would not impact geological resources. However, proposed mining activities could potentially result in subsidence impacts within the lease area. The degree and extent of subsidence would depend on mining methods used, height of coal extracted and the amount of overburden present. The average coal height to be mined using room and pillar conventional mining and/or long wall would be approximately 12 feet.

Mines in the Book Cliffs area that have utilized long wall mining have experienced subsidence in the magnitude of one third to half the coal thickness mined over a gradual period of several years. Operators of the inactive Sunnyside Mine near the proposed action theorized that major sandstone units in the overlying material act to buffer subsidence effects. They also postulated that the presence of a generally thick overburden serves to dampen subsidence. The proposed action would be mining the same seam and is located in the same geologic formations as the Sunnyside Mine. It is anticipated that the same type and amount of subsidence could occur.

Based on this, as much as six feet of subsidence in overlying formations could be expected to occur. However, since the majority of the proposed mining would take place under 1,500 to 2,300 feet of cover, subsidence should be low to nonexistent at the surface. It is expected that due to the remoteness of the location, no surface facilities or structures would be damaged if subsidence was to occur. The gradual subsidence associated with long wall mining would be more uniform and extend over a larger area than that associated with the irregular drop anticipated with conventional mining.

No renewable resources would be affected.

4.3.1 Geology Mitigation

No mitigation is anticipated. Ongoing monitoring of subsidence and a commitment to repair of an subsequent damage is committed by UEI in the Lila Canyon MRP as part of their proposed operation plans.

4.4 Soils Impacts

The combined construction impact to soil resources from the proposed action would be 115.11 acres. This figure includes all of the proposed mine surface facility disturbance associated with the required cut and fill slopes. The grading required for construction would displace topsoil and associated horizons throughout the total area of the facility. In association with the pad construction, road upgrading, and the construction of a new haul road, the removal of vegetative cover would result in an increased susceptibility to soil erosion throughout the disturbed sites.

A temporal unquantifiable loss in soil productivity and hydrologic formation could occur on the sites occupied by mine facilities and transportation systems during the life of the mining project. Upon reclamation, the area would be returned to approximate neutral conditions, with soil functioning being a major consideration.

Since no grading would be required, the acreage of potential construction impact to soil resources by the establishment of the power line has been calculated to be 10 percent of the ROW. With the construction ROW acreage, shared staging area, pull sites and switching station, disturbance to soils would be less than a half acre. Within the proposed power line ROW, surface disturbance to soil resources at specific pole sites would be minimal (less then 0.01 acres). A temporary impact to soil could occur within the ROW where construction vehicles would compact topsoil layers by gaining access within the ROW for pull sites and the switching station.

An approximate 0.05 acre area of compaction to soils around the livestock water tank proposed would occur due to increased use of the area by livestock. This could result in an unquantified loss of soils due to wind and water erosion. However, since the tank would be located on a portion of an existing disturbed, but retired route that has been heavily compacted by past vehicular use, this potential loss would be minimal. An unquantifiable increase in dissolved solids and salts in the soils could result from runoff from the road surface and from coal fines blowing off haul trucks. No impact to soils present within the area of the mineral lease area are expected.

4.4.1 Soil Mitigation

No mitigation is anticipated. Since UDOGM, in coordination with OSM, would have primacy over the mine site, soil management standards as defined and addressed within the MRP would be followed. BLM standards and requirements for soil handling, protection, and management would be followed to avoid impacts to the soil resources along the coal haul road and outside of the mine site permit area. The actions taken as required by the responsible agencies (UDOGM, OSM, and BLM) would minimize the extent of erosional impacts and eliminate the need for mitigation of impacts. As part of the operation plan for the mine facility, topsoil would be salvaged from construction areas and stockpiled for use during final reclamation. Erosion control and revegetation

measures would be applied to protect stockpiled soil materials as discussed within the stabilization and maintenance plan. As discussed within the MRP, prior to any revegetation, soils would be tested and fertilizer or other soil amendments would be added as appropriate. As discussed in the reclamation plan, soil would be loosened by ripping where soil compaction could limit plant growth. As discussed within the SPCC Plan, any soils contaminated by oil, gas, or other substances, would be disposed of or treated to correct the problem.

4.5 Hydrology Impacts

Any reduction of surface vegetation during the first three years of the project (24 month construction time frame and 36 month revegetation establishment) would decrease infiltration and increase surface runoff. This could contribute to the previously mention soil erosion and downstream sediment loading. Sheet erosion would increase and water quality could be affected by greater sediment loading. However, due to the sparsity of natural vegetation, changes resulting from vegetation reduction are expected to be relatively minor. Of greater concern are changes to flow patterns resulting from the construction of roadway and surface facilities.

Springs could be altered from land subsidence resulting from underground mining and mine dewatering. This could effectively change the current hydrological regime, thus altering vegetation community structure and area wildlife use. As discussed within Chapter 2.0, mine water usage would increase as the tonnage of production increases from one million tons per year to four million tons per year. As production increases from one million (21.31 acre feet) to two million tons per year, the acre feet of water used would increase to 35.12 acre feet. Water usage would increase to 48.93 acre feet at three million tons annually before peaking at 62.74 acre feet at four million tons of coal at full production. In the event important water sources are lost or reduced, the proponent is obligated by regulation to replace it. Mine dewatering could augment surface flows to the existing channels. These channels could undergo channel dimension alterations, causing increased bank erosion. Artificial riparian areas could develop as a result of more consistently available water. Any flows allowed to reach the Price River may constitute an unquantifiable source of TDS/TSS loading, due to the saline soils and increased erosion to channel banks.

4.5.1 Hydrology Mitigation

The impacts described for the proposed action are minimized through UDOGM, OSM and BLM regulatory requirement currently in effect. A complete Sedimentation and Drainage Control Plan to control and contain off-site discharge of water from the mine site as required by UDOGM and OSM, is included in the MRP. The proposed sediment storage facilities (PLATE II-A), as described in the MRP and as required by UNPDES regulatory requirements would control and minimize off-site transport on sediments to downstream resources. Maintenance of these facilities would be for the life the mining operation and until final reclamation has been completed. BLM Class III road standards and guidelines for hydrologic modifications for access roads are specifically designed to minimize effects from such changes. These would be included as stipulations to approval of this action. Site specific conditions associated with drainage crossings and sediment controls are further

addressed by Class III Road Standards and Price Field Office Hydrologic Modification Standards for Roads. Since UEI has proposed a substitute or replacement water sources (i.e., rainfall catchment guzzlers), the impact to nearby springs for wildlife use would be minimized.

For new depletions less than 100 acre feet, an intra USFWS service agreement based on basin wide cumulative depletions precludes the need for a depletion charge. Based upon the anticipated depletion associated with the proposed action, the fee would be waived for this project. In order to maintain this waiver, monitoring of water depletion as required by the UDOGM for the MRP, would be conducted and provided to the USFWS.

4.6 Land Use Impacts

4.6.1 Grazing

Livestock would be allowed on the allotments described, but excluded from 115.11 acres associated with the active work areas during the two year construction time frame. Upon operation activities, livestock would be precluded during the life of the project on 93.11 acres associated with the proposed surface facility area and operational ROW of the coal haul road. The Cove Allotment would be effectively split by the operation of the road and bordering fences, thus potentially altering the future utilization of the allotment. No reduction of current AUM numbers are anticipated. No range resources, improvements and/or management facilities would be directly impacted by the proposed action on the Little Park Allotment .

4.6.2 Grazing Mitigation

Actions taken by UEI as part of the Stabilization. Maintenance and Operation Plan, discussed in CHAPTER 2.0 would minimize impacts to grazing resources, thus eliminating the need for mitigation. The construction of the fence along the coal haul road would eliminate the potential of vehicular collisions with livestock during the life of the operation. To maintain the current utilization of the Cove Allotment, a 12,000 gallon water tank would be installed and maintained by UEI for the life of the project. The establishment of a water tank on the northern side of the road and a retired portion of the existing route would allow for livestock use within this area of the allotment while minimizing the overall impact to current grazing management. Forage produced by the reclamation of retired routes and roads would increase the use made by cattle in those areas. As discussed previously, UEI would also maintain and/or replace all range improvements which would be affected during construction and operation (ponds, fencing, cattle guards, corrals, etc.).

4.6.3 Vehicular Traffic Impacts

Construction crews associated with the development of the proposed action would travel to and from the work site via U.S. Highway 191/6 and CR 125. During construction of the proposed road approximately 30 people would be employed. Construction of the power line in the second year of

construction could employ as many as 20 people. UEI would employ as many as 30 people during the construction of the mine surface facility. This added traffic would have minimal impacts based on the relatively short construction schedule of approximately 180 days over the two year time frame.

Operational impacts are associated with transport and production of an estimated four million tons of coal a year. This number is based on UEI's proposal in the R2P2 submitted to the BLM in December 1998. Vehicular use would include the personnel associated with the mine, delivery of material to the mine, and the transport of the coal via the proposed road to U.S. Highway 191/6 and the loadout site on the Ridge Road near Wellington. UEI has indicated that at full capacity, as many as 273 coal haul trucks per day would travel from the proposed mine, through Wellington, and onto the loadout site on Ridge Road off U.S. Highway 191/6 and back to the mine on a 24 hour, seven day a week schedule. This would result in a round-trip figure of 547 coal haul trucks per day. This additional volume of traffic, as well as the increase traffic resulting from as many as 88 mine employees and support traffic (175 round-trip), would result in a 6.81 percent daily increase along this 32 mile section of the highway (64 miles round-trip). The potential for an unquantifiable increase in vehicle-vehicle accidents, as well, could increase as a result of this potential traffic volume.

4.6.4 Vehicular Traffic Mitigation

No mitigation has been identified. To minimize congestion impacts of the proposed merging haul road, the proposed action includes the construct of an acceleration and turning deceleration lane from U.S. Highway 191/6. Caution signs, and warning signs would be established along the highway and prior to the intersection of the proposed haul road.

4.6.5 Visual Resources Impacts

Effects to visual resources were assessed for the construction, operation, and closure of the proposed action. Two issues were addressed in determining impacts: 1) the type and extent of actual physical contrast resulting from the proposed action and related activities to existing conditions; and 2) the level of visibility. The majority of the existing Lila Canyon Road is situated along the base of foothills below the southern edge of Horse Canyon Bench. Visual contrast of the road is reduced due to topography and vegetation screening.

U.S. Highway 191/6 would be the KOP for the lower portion of the proposed road and mine surface facility. Road cuts created by the realignment of the new road would be evident from a short distance, but should not have a long range physical contrast. Since the mine surface facility would be located within the narrow Lila Canyon, visibility of the facility from any KOP would be minimal. However, the surface facilities when lighted at night would be visible form numerous points along U.S. Highway 191/6 and to a lesser degree a "glow" may be in evidence from U.S. Highway 10 between Price and Huntington.

The visual impacts of the power line would be an increase in contrast to the surrounding landscape.

However, since minimal vegetation removal would be required, physical contrast over the area of the power line would be minimal and not visible from a KOP.

4.6.6 Visual Resource Mitigation

No visual resource mitigation has been identified. Actions taken as part of the Stabilization, Maintenance and Operation Plan in CHAPTER 2.0 would meet the established VRM standards.

4.7 Vegetation Impact

The vegetation disturbed by the proposed action is shown in TABLE 4.2. As previously discussed, the area of the proposed action construction could compromises as much as 115.11 acres. Vegetation and habitats impacted are not limiting nor specific to the project area. Therefore, the acreage of impact would not affect the health of the local community structure. Vegetation bordering the existing road would be eliminated in most cases to minimize the potential for vehicle-wildlife incidents. Vegetation within Lila Canyon would be eliminated or temporarily impacted (three years) by construction and operation of the proposed road, power line and mine. Vegetation within 35 acres of the 39 acre mine surface facility would be removed for the life of the operation.

Impact to vegetation populations away from the road and mine site would be minimal, and limited to activities associated with construction of the power line. Vehicular travel along the power line ROW may flatten and crush ground cover. No impact to the sagebrush-grass habitat is expected. Disturbance to reclaimed areas would be temporal, from 24 to 36 months, and/or until vegetation becomes fully established. Upon reclamation of the road cuts and unused portions of the mine surface facility, operational impacts to vegetation would be minimized to 93.11 acres. This life of project acreage would encompass the 50 foot ROW of the road, mine surface area, and power line facilities. No impact to vegetation resources is expected from the proposed underground mining activities.

4.7.1 Vegetation Mitigation

No mitigation is anticipated. Activities proposed as part of the proposed action should effectively minimize all impacts to vegetation resources. All disturbed areas not needed for operations would be revegetated during the first available growing season. A commitment to reclaim all areas at the conclusion of mining is made in the Lila Canyon MRP and a reclamation bond would be held in force until all disturbance has been satisfactorily reclaimed.

TABLE 4.2
HABITAT DISTURBANCE ASSOCIATED WITH THE PROPOSED ACTION

Habitat Type	Construction(Acres)	Operation (Acres)
Lila Canyon Road:		

	Sagebrush-Grass	17.23	13.23
	Pinyon-Juniper	3.74	3.74
Road:			
	Sagebrush-Grass	41.30	31.11
	Pinyon-Juniper	11.11	8.77
Power Line *:			
	Sagebrush-Grass	1.22	0.98
	Pinyon-Juniper	0.35	0.28
Mine Surface Facility:			
	Pinyon-Juniper	19.00	16.40
	Grass/Brush	21.16	18.60
TOTAL ACREAGE		**115.11**	**93.11**

*** Disturbance Determined as 10 Percent of Power Line ROW**

4.8 Wilderness Values

Surface facilities associated with the proposed mine site and guzzlers would directly disturb eight acres of the natural wilderness value and future designation of the immediate areas as Wilderness within the Desolation Canyon Inventory Unit 8. Since the proposed mine site would be adjacent to the inventory unit, opportunities for solitude and primitive/unconfined recreation would be indirectly degraded by sight and sound during the 20 year life of the mine. However, due to topography, the indirect area of impact would be restricted 25.12 acres below the canyon face.

Noise from the operation of the surface facility and increased vehicular travel from the proposed road would indirectly diminish the quality of the opportunities for solitude and primitive recreation along a portion of the Book Cliffs face area at the western boundary of the inventory unit, but would have little impact within the rest of the inventory unit with wilderness characteristics. No impact to wilderness quality and values would occur above the canyon from the location and operation of the mine facility.

Approximately 901 acres of the Desolation Canyon Inventory Unit 8 would be undermined by underground coal extraction. Naturalness, opportunities for solitude and primitive/unconfined recreation and cumulative values would not be diminished nor degraded by the proposed underground mining due to the substantial cover anticipated (at least 1,500 feet). Subsidiary surface disturbing actions resulting from surface subsidence may occur, but would not appear different from the surrounding geology.

The Turtle Canyon Inventory Unit 4 and the Turtle Canyon WSA would not be directly impacted by surface disturbing activities associated with the proposed action. Naturalness, opportunities for solitude and primitive/unconfined recreation and supplemental values would not be degraded. Subsidiary surface disturbing actions resulting from surface subsidence may occur within these areas

as well, but would not appear different from the surrounding geology.

4.8.1 Wilderness Values Mitigation

The proposed action meets the Wilderness Interim Management Plan (IMP) objectives. No action is proposed that would impair the wilderness character of the established WSA. Therefore, no mitigation is proposed for the development of the mine surface facility area, or indirect impacts associated with its operation and use of the proposed road for the re-inventory units. However, the incorporation of the original IMP stipulations for actions resulting from mining of the pre-FLPMA coal leases under the Turtle Canyon WSA would be incorporated for all areas deemed to be affected by subsurface actions.

guzzlers for supplemental wild. uses.

4.9 Wildlife Value Impacts

The primary concerns relative to wildlife within the area of the proposed action are:

1. Direct impacts which include surface disturbance resulting in loss of habitat, key habitat components and/or direct mortality to wildlife;

2. Indirect impacts which result is loss of habitat suitability resulting from intrusion of human presence and activity within sensitive wildlife habitats.

Direct impacts of the proposed action include surface disturbance required for facility construction, potential disruption of springs and seeps from underground mining activity, and direct mortality associated with subsequent coal haul traffic. Indirect impacts of the proposed action include human related intrusions/disturbances into wildlife habitats which can cause loss of habitat suitability. Human related intrusions/disturbances include human presence, equipment operation, and construction activity. These intrusions can in turn result in reductions in use of habitat by wildlife and changes in distribution and movement patterns by wildlife. Loss of habitat suitability becomes particularly important when it affects habitats of species known to be sensitive to such intrusions or occurs during critical periods of the year when wildlife are more vulnerable to these adverse impacts (i.e., fawning, lambing, critical winter range, nesting).

Mule deer Direct surface disturbance associated with operation of the proposed action would affect approximately 93.11 acres of mule deer year-long range. Since mule deer year-long range supports relatively low population densities, this loss of habitat is not expected to have any noticeable effect on numbers or distribution patterns for this species. Potential de-watering of springs and seeps could adversely effect high priority and critical winter range for mule deer. Distribution of mule deer on these winter ranges could be affected, particularly in years with light snow conditions and during the early and late winter periods when snow is absent. Coal haul and related traffic to the mine facility would potentially affect mule deer year-long range. Mule deer densities on year-long range are extremely low. For this reason, mortality related to vehicle

collisions would be rare and should not affect mule deer populations. Mule deer are vulnerable to disturbances of human activity when concentrated on winter ranges and animal physical conditions are depleted. Indirect impacts of the proposed action would only affect mule deer year-long ranges and therefore should have little effect on mule deer.

Elk No direct surface disturbing activity would occur on elk habitats within the affected area. Potential de-watering of springs and seeps could occur on elk high priority winter range. As discussed for mule deer, distribution of elk on these winter ranges could be affected, particularly in years with light snow conditions and during the early and late winter periods when snow is absent. Mortality associated with coal haul and related vehicle traffic would have no adverse effect on elk, since the access routes do not go through elk habitat.

Elk, as with mule deer are vulnerable to disturbances of human activity when concentrated on winter ranges and animal physical conditions are depleted. No indirect impacts would affect elk winter ranges and therefore should have no adverse effect on elk.

Pronghorn Direct surface disturbance would affect approximately 40 acres of pronghorn high priority year-long range. As discussed for mule deer year-long range, pronghorn high priority year-long ranges support relatively low population densities. This loss of habitat is not expected to have any noticeable effect on numbers or distribution patterns for pronghorn. Potential de-watering of springs and seeps that could occur as a result of mining activity would not occur on pronghorn range and therefore would not affect pronghorn. Though difficult to quantify, direct mortality of pronghorn, as a result of coal haul and related traffic, could occur. However, since the proposed coal haul traffic would not go through habitats in which pronghorn are concentrated, vehicle collisions would be rare and have little effect on population levels.

Pronghorn are sensitive to human intrusion during the fawning season, May 15 to June 20. The proposed action includes a seasonal constraint on construction activity during the fawning period. Therefore, no adverse effect would occur during this phase of the project. However, coal haul traffic would occur during this period of time for the operational life of the facility and could affect pronghorn to some degree. Pronghorn fawning is not concentrated in any one area but rather widely dispersed throughout their high priority range. For this reason, indirect disturbances to pronghorn during the fawning season are not expected to adversely effect the population.

Rocky Mountain bighorn sheep Direct surface disturbance would affect approximately 37 acres of bighorn sheep habitat. The Lila Canyon area is considered to be a relatively high concentration area for bighorn sheep. This is attributed to the presence of springs and seeps along the cliff-talus habitat within Lila Canyon, as well as, the relative absence of water in most cliff-talus habitat areas.

The surface disturbance alone or loss of forage on this disturbed area should have little effect on bighorn sheep. However, the potential de-watering of springs and seeps, a key habitat component for bighorn sheep, as a result of the proposed action could directly affect bighorn sheep continued use of the Lila Canyon area. This impact could displace up to 25 bighorn sheep. The proposed guzzlers would avoid this impact. Mortality associated with coal haul and related traffic represent

compensate for

very little risk to bighorn sheep, since very little of the road system goes through bighorn habitat.

Bighorn are sensitive to human intrusion, particularly during the lambing season, May 1 to June 15. A seasonal restriction on construction activity in bighorn sheep habitat during the lambing season would avoid this adverse impact. Since this restriction has been incorporated into the Stabilization, Operation and Maintenance Plan, no adverse effect would occur during the construction phase of the project. However, operations at the facility would occur during this period of time for the operational life of the facility and could affect bighorn to some degree. These disturbances would be expected to displace bighorn sheep from the immediate area surrounding the facilities.

Raptors Direct operational surface disturbance would affect approximately 93.11 acres of raptor foraging habitat. This loss in itself is not expected to adversely effect raptors. Likewise, potential de-watering of springs and seeps could have some affect on availability of prey species, but is not expected to affect raptors to any great degree.

Raptors are known to be sensitive to human intrusion during the nesting cycle. Disturbances during this period of time can cause birds to abandon their nesting territories or disrupt adults tending the young in the nest resulting in mortality of young in the nest. Indirect impacts to raptors and in particular, the nesting territories within 0.5 miles of the facility location, would likely be adversely affected by the proposed action.

The 1999 spring inventory, identified one active and one tended Golden Eagle nest within a quarter mile of the proposed mine site, informal consultation between USFWS; UDWR, and BLM was initiated to devise a course of action and potential mitigation. Due to the nests close proximity to the proposed mine (approximately 800 feet), it was felt that the nest sites would be abandoned for the life of the operation. Planning guidelines outlined in the MFP give specific direction to protect the continued productivity to raptor nest sites.

4.9.1 Wildlife Values Mitigation

No additional mitigation is proposed for impacts associated with the proposed action. Potential impacts to all wildlife use (especially bighorn lambing) associated with construction, would be minimized with a seasonal closure. The proposed fence along the coal haul road would be constructed to allow for wildlife (antelope) movement, and therefore, would not prohibit range use. Potential loss of springs and seeps which could adversely affect most wildlife species present (particularly bighorn sheep) has been addressed by the proposed guzzlers. The proposed guzzlers would eliminate long term impacts to area wildlife, especially bighorn sheep, from human intrusion over the life of the mine.

Adverse impacts to raptors would be avoided with a seasonal restriction and prohibiting construction activity within 0.5 miles of occupied nest sites from February 1 to July 15. Impacts associated with mining operation for the life of the mine that could adversely effect continued productivity of the nest sites would be minimized by the proposed 93 acre vegetation treatment. On similar projects, construction of artificial nests have been attempted to mitigate a similar type impact with varying

degrees of success. Since a vast amount of suitable cliff nesting substrate would be available for nesting pairs to construct new nests, UDWR and USFWS suggested to increase prey populations rather than an artificial nest replacement. Based on these informal consultations, the vegetation treatment project designed to increase small mammal populations was identified as suitable to offset impacts to affected raptor nests.

4.10 Cultural Resources Impacts

Rauch (1981) has identified potential impacts of coal mining in this area as: 1) impacts from construction activities. 2) subsidence damage resulting from underground mining. 3) vandalism to site near mine roads and others facilities. Most of the areas of proposed constructions have been inventoried for cultural resources (Mongomery,1998: Montgomery,1999) and no cultural resource should be directly affected by construction.

On the effects of subsidence to cultural resources Rauch(1981) says:

> "Given the amount of acreage sampled and the type and density of sites recorded and expected as an extrapolation of this sample to the entire area, it seems reasonable that if slumping or crackage does occur, the probability of these occurrences falling within site boundaries should be considered as low. Subsequently, even if limited disturbance does occur, the sites are of a nature (e.g., no structures or cultural depth) that their integrity should not be irreparably damaged."

Vandalism is an indirect impact of the coal mine development. Sites in close proximity to access routes and mine facilities would be affected by the loss of integrity to information and artifacts of the sites. Since 42EM2517 is adjacent to and visible from both a access route and the mines facilities it would be effected. Because cultural resources are not always visible, it is possible that unknown resources may be uncovered during construction.

4.10.1 Cultural Value Mitigation

UEI shall submit to the BLM, a data recovery plan for 42EM2517. In order to approve this plan the BLM will have to enter into a Programmatic Agreement with the Utah State Historic Preservation Office and possible other consulting parties. The Programmatic Agreement must be signed and the plan approved before the right-of-way is authorized. UEI shall implement the approved plan. This plan will delineate the objectives of recovery, timeframe for analysis and reporting procedures for any resources identified.

5.0 ANALYSIS OF CUMULATIVE IMPACTS

5.1 Past, Present and Reasonably Foreseeable Actions Within the Area

5.1.1 Exploration Drilling Associated with the Lila Canyon Project

To allow for future modifications to the underground mining of the coal leases described, it may be necessary to conduct exploratory core drilling and sampling to determine mineable resources. Though the regional coal geology for the lease area is known, as many as five 0.75 acre sites (3.75 acres total) could be developed over the course of operations. Since the surface area overlying the underground coal resources is currently cherry-stemmed with an existing network of roads and routes, potential drilling actions could be accessed and conducted within these transportation corridors over the entire lease area. Initiated within a three month summer field season, temporary exploratory drilling would most likely entail a rotary drill rig drilling on a 24 hour basis for up to 10 days. Water for use during drilling would be trucked to the site via the existing transportation system. Upon completion of drilling and sampling actions, the site would be reclaimed and revegetated to UDOGM and BLM requirements.

No new surface access would be anticipated within the re-inventory units of existing Turtle Canyon WSA. No permanent surface disturbance outside of the current cherry-stemmed transportation system would be anticipated.

5.1.2 Development of the Blue Castle Mine

Reasonably foreseeable minerals development in the area consists of the establishment an extraction mine and facility by Gold Terra Incorporated. The proposed development of the Blue Castle Mine would extract gold from the Mancos Shale benches adjacent to the Lila Canyon project area in the east half of Section 29 in T. 16 S. R. 14 E. Surface disturbance anticipated for this project is 132.57 acres. The primary access to this site would utilize the proposed Lila Canyon project coal haul road, with upgrading of existing access roads and routes and creation of new roads within the gold mine area. These existing and new roads would be within the 132.57 acre disturbance proposed for this cumulative development scenario. As many as 85 vehicles would access the site each day during the 20 year life of the mine.

5.1.3 Regional Traffic

The existing road system to be utilized through the operation of the Lila Canyon project is also utilized by two operating coal mines and a substantial volume of commercial and commuter traffic. U.S. Highway 191/6, currently at an estimated 10,600 non-coal related vehicles per day, is a heavily traveled route between the Wasatch Front and Interstate 70. Traffic from the proposed Lila Canyon project has been estimated at 722 vehicles (staff and coal haulage) per day at full production of four million tons of coal during Phase II. Traffic from similar nearby actions includes the West Ridge, Dugout Mines at 490 and 343 vehicles per day respectively. The proposed Blue Castle Mine would

have approximately 85 vehicles per day that would merge on to the proposed coal haul road before entering U.S. Highway 191/6.

5.2 Cumulative Affects on Identified Resources

A cumulative impact, as defined within 40 CFR 1508.7, is the impact on the environment which results from the incremental impact of the action (proposed action) when added to other past, present and feasibly foreseeable future actions. To assess the cumulative impacts of the proposed action, it is necessary to identify those components of environment that could be affected that were not minimized by actions taken as part of the proposed action scenario or mitigated upon review of direct and indirect impacts of the proposed action. Specific issues raised during scoping formed the basis of review of cumulative impacts.

5.2.1 Exploratory Drilling

Since the potential of exploratory drilling required to delineate mining of the pre-FLPMA leases would most like occur within the cherry-stemmed road that transects the area (PLATE IV), direct and indirect impact to resources would be minimal. Impact to soils, vegetation, cultural resources, land uses, and wildlife would be minimized due to timing of activities (summer), the location within disturbed road corridors, and stipulations as part of UDOGM and BLM permits for erosion control, protection of resource values, reclamation and revegetation.

Though potential drilling actions as described would not directly impact wilderness character of the surface area, indirect impacts associated with the operation of the Lila Canyon Mine and potential exploratory drilling and sampling of the pre-FLPMA coal leases could affect the wilderness values of the re-inventory units present. Though the potential drilling could occur within the cherry-stemmed road system that transects the coal leases, naturalness and opportunities for solitude would be diminished on those areas adjacent to the drill site locations during the 10 day drilling schedule for each road site. In combination with the indirect impacts occurring as discussed for the surface operations associated with the Lila Canyon Mine, a cumulative impact to wilderness character (naturalness and solitude) and manageability of these portions of the overlying Desolation Canyon Unit 8 and Turtle Canyon Unit 4 could occur. The overall wilderness value of the area from the mine site to the cherry-stemmed transportation corridor could be diminished during the temporary three month exploration program.

5.2.2 Vehicular Traffic

Cumulatively, the traffic from the present ongoing actions (West Ridge and Dugout Mines) in association with the proposed full Phase II development traffic of the proposed action would result in a 12 percent increase in commuter and heavy truck traffic over the next 20 years on U.S. Highway 191/6. In the event that the Gold Terra project is developed, the traffic volume would increase slightly to 14.6 percent over the next 20 years. These figures are based upon the estimated current highway use of 10,600 vehicles per day. However, use of this highway by commuter and

commercial traffic is believed to be increasing at an un-quantified rate. Therefore, current impacts on traffic volumes may not be valid during the course of operation of these ongoing and foreseeable actions.

Regardless of the increase in commuter and commercial traffic volume on the highway, the potential cumulative increase of these projects would directly impact the safety and manageability of this transportation route. The rate of incidence of vehicular accidents could potentially increase, especially with the additional heavy truck traffic associated with the present facilities and future actions proposed. Additional highway costs for repairs required by the added heavy truck traffic would also be incurred during the anticipated cumulative life of these projects. Present and future highway management decisions for the proposed use of this state and federal highway should take into consideration the increase of commuter and commercial traffic in relation to these actions.

Cumulative impacts to wildlife within the immediate and transport area would also occur as a result of vehicular traffic. These impacts are discussed in the next section.

5.2.3 Displacement and Direct Disturbance of Wildlife

The operation of the proposed action in association with the reasonable and foreseeable development of the 133 acre Blue Castle Mine would cumulatively and directly impact wildlife within the immediate vicinity of the project. As discussed within CHAPTER 4.0, direct and indirect impacts to big game use resulting from the operation of the coal haul road were minimal due to the low densities of mule deer and antelope and lack of critical habitat. However, with the future development of the Blue Castle Mine and subsequent surface disturbance, direct disruption of mule deer and antelope year long habitat would occur. This unquantified disruption could result in the cumulative indirect impact of displacement of wildlife due to the combined operation of these two projects in close proximity. Future wildlife resource management decisions would need to take the potential full operational impacts into account in order to an adequate herd management plan.

Vehicular traffic impacts on these big game species and raptors could occur as well. An increase in traffic volume on the proposed coal haul road by the potential Gold Terra action could result in an increase in vehicular wildlife incidents over time. Indirectly, the potential movement of wildlife and habitat use by raptors could be further restricted and displaced. The use of U.S. Highway 191/6 and subsequent site access roads for the described cumulative scenarios would be impacted in a similar manner. Future land use decisions should take into account this cumulative scenario impact to develop a mitigation for the related direct disturbance and indirect displacement impacts on wildlife that result from increased vehicular use.

5.2.4 Surface Impacts Resulting From Mine Induced Subsidence

Mining activities described as part of Phase I and Phase II, though possible over a larger area of the described lease area, would not result in any more subsidence than what was indicated for the direct and indirect impacts of the proposed action. Mining actions initiated as part of the development of the proposed action would not result in any cumulative impacts to any resource.

5.2.5 Soils and Reclamation Potential

Development of the coal lease area through Phase II would not result in any other additional disturbance to described resources. Actions taken as part of the permit stipulations, Stabilization, Operation and Maintenance Plan for the proposed action and reclamation plan associated with the mine and mine surface facility have eliminated the need for mitigation of direct and indirect impacts, as well as area wide cumulative impacts.

5.2.6 Ground Water and Surface Water Hydrology

Mitigation required for possible impacts to hydrology and regional water quality of the Colorado River Basin and proposed operational stipulations would minimize the cumulative impacts to this resource throughout the Phase I and Phase II development.

5.2.7 Livestock Grazing

Actions taken as part of the proposed action have minimized all direct and indirect impacts to this resource. No cumulative impacts are expected throughout the Phase I and Phase II development.

5.2.8 Visual Resources

Actions taken as part of the proposed action to minimize direct and indirect impacts would also minimize cumulative impacts during the Phase I and Phase II development.

5.2.9 Loss of Vegetation Diversity, Cover and Productivity

Interim and final reclamation of the proposed action as described would not change for the area of disturbance analyzed for Phase I to Phase II. The actions taken to minimize or eliminate such direct and indirect impacts would minimize the cumulative impacts during the phased development and after full reclamation.

CHAPTER 6.0 CONSULTATION AND COORDINATION

6.1 Agencies, Organizations and Individuals Contacted

Numerous contacts with associated federal, state and local agencies, interested parties and individuals have been made during the course of this environmental assessment.

6.1.1 Federal Government/Agencies

- U.S. Department of Agriculture
  - a. Natural Resource Conservation Service - Soil Resources
- U.S. Department of the Interior
  - a. U.S. Fish and Wildlife Service - Threatened and Endangered Species and Raptors

6.1.2 State of Utah

- Department of Community and Economic Development
  - a. State Historical Preservation Office - Cultural Resources
- Department of Natural Resources
  - a. Division of Oil, Gas and Mining - Mine Plan and Resource Analysis
  - b. Division of Water Rights - Water Rights
  - c. Division of Wildlife Resources - Wildlife Resources
- Department of Transportation - Road Crossings and Traffic
- Office of Rehabilitation
  - a. School and Institutional Trust Lands Administration - State Land Easements

6.1.3 Local Governments and Organizations

- Emery County Recorder - Land Use and Resource Analysis
- Emery County Planning and Zoning - Land Use and Zoning
- Emery County Road Department - Road Design and Proposed Action
- Emery County Engineer - Road Design
- Emery County Commissioners - Land Use and Easements

6.1.4 Industry and Business

- Bear West Company, Salt Lake City, UT - Legal Review and NEPA Compliance
- Montgomery Archeological Consultants, Moab, UT - Cultural Resources

6.2 List of Preparers and Interdisciplinary Team

6.2.1 EIS Environmental & Engineering Consulting (EIS); Helper, Utah

•	**Melvin Coonrod**	**Project Manager and Coordinator, Wildlife, Vegetation, Construction and Operations, Reclamation** B.S. Chemistry and Invertebrate Zoology M.S. Silviculture
•	**Carl East**	**Wildlife and Vegetation** B.S. Wildlife Management
•	**Dan Larsen**	**Soils** B.S. Conservation of Natural Resources M.S. Soil Science
•	**Tom Paluso**	**Mine Engineering, Geology and Hydrology** B.S. Engineering M.S. Civil/Environmental Engineering
•	**David Steed**	**Co-Project Manager, NEPA Development, Land Use and Wilderness** B.S. Ecology

6.2.2 BLM Interdisciplinary Team

•	Mark Mackiewicz, Realty Specialist	Project Manager, NEPA Development
•	Kerry Flood, Hydrology Specialist	Hydrology and Soils
•	Chad Hunter, Range Specialist	Grazing and Vegetation
•	Tom Gnochek, Wilderness Specialist	Wilderness Values
•	Floyd Johnson, NEPA Coordinator	NEPA Development
•	Blaine Miller, Cultural Specialist	Cultural Resources
•	David Mills, Wildlife Specialist	Wildlife
•	George Tetrault, Geologist	Mineral Resources
•	Greg Thayn, NEPA Coordinator	EA Review
•	Dennis Willis, Recreation Planner	Traffic, Visual Resources and Wilderness

6.3 References

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BLM. 1989. Price River Management Framework Plan. Moab District Office, Moab, Utah.

Dalton, L.B., J.S. Price and L.A. Romin. 1990. Fauna of Southeastern Utah and Life Requisites Regarding Their Ecosystems. Publication No. 90-11. Division of Wildlife Resources in cooperation with Utah Department of Natural Resources. Salt Lake City, Ut. 326 pp.

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Montgomery, Keith. 1998. Cultural Resource Inventory of the Soil Testing Area for the Lila Canyon Coal Project, Emery County, Utah. Montgomery Archaeological Consultants, Moab, Utah. On file at the Price Field Office, Bureau of Land Management. Report No. U-98-MQ-0399b.

Montgomery, Keith. 1999. Cultural Resource Inventory of Transportation Corridors and Power Line Route for the Lila Canyon Mine Project, Emery County, Utah. Montgomery Archaeological Consultants, Moab, Utah. On file at the Price Field Office, Bureau of Land Management. Report No. U-98-MQ-0739b.

Olendorff, Richard R. et al. 1996. Suggested Practices for Raptor Protection on Powerlines. Raptor Research Report No. 4. Raptor Research Foundation, Inc. 111 pages.

Rauch, Rebecca. 1981. A Cultural Resource Inventory of the Kaiser Steel Corporation South Lease Mine Property and a Test Excavation (42EM1343) in Emery County, East Central Utah. University of Utah Archeological Center, Report of Investigation No. 81-UT. On file at the Price Field Office, Bureau of Land Management.

CHAPTER 7.0 APPENDICES

APPENDIX A	A Summary of Public Scoping Comments
APPENDIX B	Engineering Associated with the Existing Lila Canyon Road Emery County Road Department Correspondence
APPENDIX C	Utah Department of Transportation Right-of-Way Encroachment Permit
APPENDIX D	Mine Surface Facility Reclamation Plan
APPENDIX E	Natural Resource Conservation Service Correspondence - Prime Farmlands Soil Characteristics
APPENDIX F	Water Rights
APPENDIX G	TES Survey Reports 1998 and 1999 Raptor Surveys U.S. Fish and Wildlife Services Correspondence - TES Species Lila Canyon Biological Assessment

APPENDIX A

A SUMMARY OF PUBLIC SCOPING COMMENTS

APPENDIX B

ENGINEERING ASSOCIATED WITH THE LILA CANYON ROAD

EMERY COUNTY ROAD DEPARTMENT CORRESPONDENCE

APPENDIX C

UTAH DEPARTMENT OF TRANSPORTATION RIGHT-OF-WAY ENCROACHMENT PERMIT

APPENDIX D

MINE SURFACE FACILITY RECLAMATION PLAN

APPENDIX E

NATIONAL RESOURCE CONSERVATION SERVICE CORRESPONDENCE - PRIME FARMLANDS

SOIL CHARACTERISTICS

APPENDIX F

WATER RIGHTS

APPENDIX G

TES SURVEY REPORT

1998 AND 1999 RAPTOR SURVEYS

U.S. FISH AND WILDLIFE SERVICES CORRESPONDENCE - TES SPECIES

LILA CANYON BIOLOGICAL ASSESSMENT

Lila Canyon
Biological Assessment

Prepared by

EIS Environmental & Engineering Consulting

August 2000

I. Introduction

The purpose of this biological assessment is to evaluate the potential impacts of construction, maintenance, and operation of a coal mine in Lila Canyon to those plant and animal species and their habitats. Federally listed or proposed as threatened and endangered.

The Endangered Species Act of 1973 (PL 93-205), as amended, require federal agencies to insure that any activities the authorize, fund, or carry out, do not jeopardize the continued existence of any wildlife species federally listed as threatened or endangered (Section 7). The biological assessment is an analysis of which threatened and endangered species may occur in the project area and whether any impacts to those species are anticipated. This biological assessment has been prepared using direction from the BLM manual 6840, Special Status Species Management.

II. Proposed Action

The proposed action to be taken by Utah American Energy would be the construction, operation, and maintenance of Lila Canyon Mine as well as the construction and operation of all associated surface facilities, utilities, and transportation routes. To facilitate the development and operation of the proposed mine, the existing Lila Canyon Road that ties into Emery County Road (CR) 125 at the existing Horse Canyon Mine Site would be upgraded to accommodate personnel and construction equipment travel. Concurrent with upgrading the existing access road, a separate operational coal haul road would also be constructed. A 46 kV power line that ties to the existing Moab/Price/Green River line approximately one mile south of the proposed mine facilities would be constructed to provide the necessary power requirements.

A more detailed account of Lila Canyon Mine and it's associated facilities can be found in the BLM Environmental Assessment for the Development of the Lila Canyon Project, Emery County Utah, Document (EA No. UT-070-99-22).

III. Species Potentially Impacted by the Project

Currently the following threatened, endangered, proposed endangered, and candidate species and habitat are found in Emery County. Candidate species have no legal protection under the Endangered Species Act (ESA).

Species	Scientific Name	Status
Bald Eagle	*Haliaeetus leucocephalus*	Threatened
Barneby Reed Mustard	*Schoenocrambe barnebyi*	Endangered
Black- footed Ferret	*Mustela nigripes*	Endangered
Bonytail Chub	*Gila elegans*	Endangered
Colorado Squawfish	*Ptychocheilus lucius*	Endangered
Humpback Chub	*Gila cypha*	Endangered
Jones Cycladenia	*Cycladenia humilis* var. *jonesii*	Threatened
Last Chance Townsendia	*Townsendia aprica*	Threatened
Maguire Daisy	*Erigeron maguirei*	Endangered
Razorback Sucker	*Xyrauchen texanus*	Endangered
San Rafael Cactus	*Pediocactus despainii*	Endangered
Winkler Cactus	*Pediocactus winkleri*	Proposed Endangered
Wright Fishhook Cactus	*Sclerocactus wrightiae*	Endangered

IV. Species Occurrences and Habitat Needs

Bald Eagle (*Haliaeetus leucocephalus*) During the breeding season bald eagles are closely associated with water, along coasts, lake shores, or river banks. During the winter bald eagles tend to concentrate wherever food is available. This usually means open water where fish and waterfowl can be caught. They also winter on more upland areas feeding on small mammals and deer carrion. At winter areas, bald eagles commonly roost in large groups. These communal roosts are located in forested stands that provide protection from harsh weather (Stalmaster, 1987).

Bald eagles can often be found near lakes and reservoirs, as well as within upland areas on the Manti National Forest during the late fall and early winter. When lakes and reservoirs freeze over in early winter, most eagles will leave these upland feeding sites. No bald eagles are known to nest in the area.

Barneby Reed Mustard (*Schoenocrambe barnebyi*) Barneby Reed Mustard grows on steep, northfacing slopes of the Moenkopi Formation. Elevation ranges between 1646- 1753 m (5400-5750 ft). This species grows in the salt desert shrub zone and is commonly found with Ephedra and Erigonum. The TES inventory done May 21, 22, and 26 1999 did not locate this species within the project area though not specifically noted in the inventory report.

Black -footed Ferret *(Mustela nigripes)* The relationship between black-footed ferrets and prairie dogs has long been known. Black- footed ferrets live in the burrows made by prairie dogs and probably exploit these rodents as their major food source. The high biomass of potential prey species and the abundance of burrows are equally important factors in attracting black-footed ferrets to this habitat. The Black- footed ferret is unlikely to occur in the proposed project area because of the lack of its major prey species, prairie dogs.

Bonytail Chub (*Gila elegans)* Historically bonytail chubs exists thoughout the Colorado River drainage. Recently, isolated captures of bonytail chubs have been made in the Colorado River basin but recruitment to the population is extremely low or nonexistent. The decline of the bonytail chub is attributed to dam construction and associated water temperature changes. Other factors contributing to the reduced numbers include flow depletion, hybridization, stream alterations associated with dam construction, and the introduction of non- native fish species. The bonytail chub is an omnivore, feeding mostly on terrestrial insects, plant debris and algae and begins to spawn at five to seven years of age (Behnke and Benson 1980). No bonytail chubs have been located in the project area primarily due to the lack of perennial stream flows.

Colorado Squawfish *(Ptychocheilus lucius)* The Colorado squawfish had a historic range from Green River, Wyoming, to the Gulf of California, but the species is now confined to the upper Colorado River Basin mainstream and larger tributaries. The lower Green River between the Price and San Rafael rivers contain abundant Colorado squawfish. The species decline can be attributed to direct loss of habitat, changes in water flow and temperature, blockage of migrations, and interactions with introduced fish species. Colorado squawfish adults are thought to prefer deepwater eddies and pools or other areas adjacent to the main water current, whereas the young inhabit shallow, quiet backwaters adjacent to high flow areas. Colorado squawfish feed on invertebrates while young but gradually become piscivorous after one year. No Colorado squawfish have been located within the proposed project area because of the lack of perennial stream flows.

Humpback Chub *(Gila cypha)* The humpback chub is believed to have inhabited all of the large rivers of the upper Colorado River basin and canyons of the lower Colorado River basin. Presently the humpback chub can be located in and above the Grand Canyon, Arizona, and the major tributaries to the Colorado River. The states stream alteration, including dewatering, dams and channelization, as factors causing the decline of the species. The humpback chub normally lives adjacent to high velocity flows, where they consume plankton and small invertebrates. The humpback chub has not been located in the proposed project area due to the lack of perennial stream flows.

Jones Cycladenia *(Cycladenia humilis* var. *jonesii)* Jones Cycladenia is found on the Cutler, Summerville, and Chinle Formations in the salt desert shrub, mixed desert shrub and juniper zones. Elevation ranges from 4400- 5970 ft. The plant occurs on the eroded slopes of the Summerville Formation, just east of the San Rafael Reef. This habitat species is not known to occur within the proposed project area, and was not located during the TES inventory conducted on May 21, 22, and 26, 1999.

Last Chance Townsendia *(Townsendia aprica)* Last Chance Townsendia occurs on the Ferron Sandstone and Carmel Formations. The plant apparently grows on several formations, but prefers fine-textured substrates and shallow soils close to sandstone bedrock. Elevation ranges from 6000-7400 ft. It is commonly found growing in the pinyon-juniper zone associated with grasses and mixed desert shrubs. Aspect is variable and slope does not exceed 10 degrees. There were no populations of this species found in the proposed project area during the May 21, 22, and 26, 1999 TES inventory.

Maguire Daisy *(Erigeron maquirei)* Maguire daisy occurs in the canyon bottoms of the Wingate and Chinle Formations at approximately 5600 ft. It has been found growing atop mesas and shaded canyon bottoms of the Navaho Sandstone Formation at approximately 6,800 ft. The daisy prefers cool, shaded, moist, mesic, wash bottoms and dry, partially shaded, slopes of eroded sandstone cliffs. Aspects is usually north, east, or northeast and slopes do not exceed 25 degrees. The daisy grows within the lower limits of the pinyon-juniper zone but seems to attain optimal growth conditions in the mountain shrub zone. This species was not found during the TES inventory conducted on May 21, 22, and 26, 1999.

Razorback Sucker *(Xyrauchen texanus)* Historic distribution of the razorback sucker was mainly along the mainstream of the Colorado, Green and San Juan Rivers. They presently only occur in a portion of their former range in these rivers and are normally found in water four to ten feet deep with area of strong currents and backwaters. The razorback sucker feeds on small invertebrates, and animals and organic debris on the river bottom. Behnke and Benson (1980) link the decline of the razorback sucker to the land and water uses, particularly dam construction and the associated change in flow regimes and river channel characteristics. Razorback Sucker are not present in the proposed project area due to the lack of perennial stream flows

San Rafael Cactus *(Pediocactus despainii)* San Rafael cactus is found on gray to white limestone of the Carmel Formation. Elevations range between 6,000- 6,300 ft. The cactus grows in a pinyon-juniper-grassland community. It grows flat on rolling terrain in full sunlight and the aspect is variable. No species were located during the inventory on May 21, 22, and 26, 1999.

Winkler Cactus *(Pediocactus winkleri)* Winkler cactus grows on clay subsoil normally associated with the salt desert shrub communties. The elevation ranges between 4,790 to 5,210 feet and can normally be located and identified between March and mid May. No Winkler cactus are known to be in the proposed project area. The TES inventory conducted on May 21, 22, 26, 1999 did not locate any species.

Wright Fishhook Cactus *(Sclerocactus wrightiae)* Wright Fishhook cactus is known to be found from Wayne County, southwestern Emery County, and southeastern Sevier County. The cactus has been found occupying a variety of geologic substrata. Throughout its distribution, the cactus does not favor one particular geologic substrate but it does seem to favor specific edaphic and geochemical conditions. The cactus occurs in salt desert shrub and mixed desert shrub zones between elevations of 4,550- 6,200 ft. Associated plant cover rarely exceeds 15 percent. Slope is usually between 0 to 10 degrees and aspect is variable. This habitat species is not known to occur

within the proposed project area. The TES inventory conducted on May 21, 22, 26, 1999 did not locate any species.

V. Determination of Effects

Suitable Habitat The area affected by the proposed action does not contain suitable habitat (i.e. elevation, vegetation, and/or geology) and known home ranges for many of the species in the above lists. Therefore, it is determined that there will be no effect upon them. These species (as listed below) are therefore eliminated from further analysis.

- **Bald Eagle (*Haliaeetus leucocephalus*)** - the proposed action is outside the range of this species.

- **Barneby Reed Mustard (*Schoenocrambe barnebyi*)**- The area affected by the proposed action does not contain suitable habitat for this endangered plant. The proposed action would not affect this plant.

- **Black -footed Ferret *(Mustela nigripes)***- The area affected by the proposed action does not contain any prairie dog towns which provide black- footed ferret habitat. The proposed action would not affect this species.

- **Bonytail Chub (*Gila elegans*)**-The area affected does not contain any of the endangered fish. All disturbed waters will be contained by sediments ponds thereby not affecting the amount or quality of the waters draining into the Colorado River Drainage.

- **Colorado Squawfish *(Ptychocheilus lucius)***-The area affected does not contain any of the endangered fish. All disturbed waters will be contained by sediments ponds thereby not affecting the amount or quality of the waters draining into the Colorado River Drainage.

- **Humpback Chub *(Gila cypha)***-The area affected does not contain any of the endangered fish. All disturbed waters will be contained by sediments ponds thereby not affecting the amount or quality of the waters draining into the Colorado River Drainage.

- **Jones Cycladenia *(Cycladenia humilis* var. *jonesii)***- The area affected by the proposed action does not contain suitable habitat for this endangered plant. The proposed action would not affect this plant.

- **Last Chance Townsendia *(Townsendia aprica)***- The area affected by the proposed action does not contain suitable habitat for this endangered plant. The proposed action would not affect this plant.

- **Maguire Daisy** ***(Erigeron maquirei)***- The area affected by the proposed action does not contain suitable habitat for this endangered plant. The proposed action would not affect this plant.

- **Razorback Sucker** ***(Xyrauchen texanus)***-The area affected does not contain any of the endangered fish. All disturbed waters will be contained by sediments ponds thereby not affecting the amount or quality of the waters draining into the Colorado River Drainage.

- **San Rafael Cactus** ***(Pediocactus despainii)***- The area affected by the proposed action does contain suitable habitat for this endangered plant. However, none have been identified within the area, and therefore, would not be affected by the proposed action.

- **Winkler Cactus** ***(Pediocactus winkleri)***- The area affected by the proposed action does contain suitable habitat for this endangered plant. However, none have been identified within the area, and therefore, would not be affected by the proposed action.

- **Wright Fishhook Cactus** ***(Sclerocactus wrightiae)***- The area affected by the proposed action does contain suitable habitat for this endangered plant. However, none have been identified within the area, and therefore, would not be affected by the proposed action.

VI. Listed Species Biological Assessment Summary of Conclusions of Effects

Project Name: BA for Lila Canyon Coal Mine and Associated Facilities

Proposed Action

Species	No Effect	May Effect- Not Likely to Adversely Affect	Likely to Adversely Affect	Beneficial Effect
Bald Eagle	X			
Barneby Reed Mustard	X			
Black- footed Ferret	X			
Bonytail Chub	X			
Colorado Squawfish	X			
Humpback Chub	X			
Jones Cycladenia	X			
Last Chance Townsendia	X			
Maguire Daisy	X			
Peregrine Falcon	X			
Razorback Sucker	X			
San Rafael Cactus	X			
Winkler Cactus	X			
Wright Fishhook Cactus	X			

VI. Mitigation

As there were no direct impacts on any of the species no mitigation is recommended at this time.

VII. Cumulative Impacts

The proposed action as delineated in this BA is exclusive to the potential impacts associated with the construction, operation, and maintenance of the Lila Canyon Coal Mine.

VIII. Documentation

Reference used to determine the presence (or absence) of Threatened, Endangered, Proposed and Sensitive as well as species characteristics and habitat information include.

Behnke, R.J. and D.E. Benson. 1980. Endangered and Threatened Fishes of the Upper Colorado River Basin Coop. Ext. Serv., Colorado State univ., Fort Collins, Bull. 503A. 34pp.

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Cade, T.J., J.H. Enderson, C.G. Thelander, and C. M. White. 1988. Peregrine Falcon Populations: Their Management and Recovery. The Peregrine Fund, Inc., Boise. 949 pp.

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Ratcliffe, D.A. 1980. The Peregrine Falcon. Buteo Books, Vermillion, SD. 416 pp.

Sigler, W.F. and R.R. Miller. 1963. Fishes in Utah. Utah State Dept. of Fish and Game, Salt Lake City. 203 pp.

Stalmaster, M.V. 1987. The Bald Eagle, Universe Books, New York. 227 pp.

Bureau of Land Management References

Resource area wildlife and plant observation and location area records.

USDI BLM manual 6840, Special Status Species Management.

FEATURES OF SOIL MAP UNITS

Map Unit Symbol	Soil Components	% Slope	Land Capability Class (nonirrigated)	Range and Woodland Sites	Erosion Rooting Depth (Inches)	Erosion Hazard (By water)
BMD	Strych, very stony, fine sandy loam	3-30	VIIs	Semi-desert Stony Loam (Utah Juniper-Pinyon)	60 or more	Moderate
BME2	Strych, very stony loam, dry	3-30	VIIs	Semi-desert Stony Loam (Utah Juniper-Pinyon)	60 or more	Moderate
BNE2	Strych, very bouldery fine sandy loam	3-20	VIIs	Semi-desert Bouldery Loam	60 or more	Moderate
BY	Badland, Rubbleland, Rock outcrop	30-80	VIIIe VIIIs	N/A Desert Shallow Clay	N/A 10-20	Severe or Badland Severe
CHC2	Shipeta, silty, clay loam	8-15	VIIIe			
EED2	Hanksville, very gravelly fine sandy loam	3-15	VIIIe	Desert Clay (shadscale)	10-20	Moderate
KAC	Persayo Greybull	3-15	VIIIe VIIIe	Desert Loamy Clay (shadscale) Desert Loam	10-20 20-40	Severe Moderate
NGG2	Gerst Strych Badland	30-70	VIIIe VIIIe VIIIe	Semidesert Very Steep Shallow Clay Semidesert Very SteepLoam N/A	8-20 60/more	Moderate Severe Severe
RIA2	Ravolta Toddler	1-6	VIIs VIIs	Desert Loam (shadscale) Alkali Flat (greasewood)	60/more 60/more	Moderate Moderate
RZH	Rock Outcrop Atchee Rubbleland	50-80	VIIs	N/A Semidesert, Very Steep, Shallow Loam, (Utah Juniper-Pinyon) N/A	N/A 5-20 N/A	N/A High N/A
SMD2	Cliffsand Minchey	1-8	VIIs VIIIe	Desert Sandy Loam Desert Loam	60/more 60/more	Slight Slight

UEI EXHIBIT 32

AVAILABLE SOIL RESOURCES

Map Unit	Potential Salvage Depth In.	Potential Acres	Potential Estimated Volume YD3	**Actual Salvage Depth In.**	**Actual Salvaged Acres**	**Actual Salvaged Top Soil YD3**
SBG	48	11.83	76343	**18**	**11.12**	**26910**
VBJ	30	9.62	38801	**18**	**4.46**	**10793**
XBS	12	12.09	19505	**12**	**4.77**	**7696**
DSH	40	1.56	8389	**18**	**1.39**	**3364**
RBL	8	9.34	10046	**8**	**2.56**	**2753**
RBT	6	3.79	3057	**6**	**0.76**	**613**
TOTAL		48.23	156141		**25.06**	**52129**
Bank to Loose Cubic Yards *1.18 (Amount topsoil pile is designed to hold.)						(1) **61512.00**

(1) An additional 800 yd^3 will come from the access road around the topsoil pile. This material will be placed in the berm around the topsoil pile.

The actual topsoil salvage will consist of removing a surface layer up to 18 inches thick over the disturbed area. If shale is encountered within 18 inches only the soil above the shale will be salvaged. (Plate 2-3). This would cover about 25 acres where soil would be salvaged and stored in the topsoil stockpile.

Total volumes of soil stored in the topsoil pile would be approximately 52,000 bank cubic yards. Removal of stones and boulders would be considered in volume estimates where they are part of the soil layer removed.

The stockpile has been sized to allow for bulking or swell of the soil as it is removed from the bank state to the loose state. A bulking number of 1.18 has been used. The area allowed for topsoil storage is 52,000 bank cubic yards *1.18 which equals 61,000 loose cubic yards to be placed on the topsoil pile.

Appendix 3-4

Threatened and Endangered Species Inventories

Appendix 3-4

CANYON SWEETVETCH, CREUTZFELDT-FLOWER, LOGGERHEAD SHRIKE, AND BURROWING OWL INVENTORIES FOR THE LILA CANYON MINE PROPOSAL

CONDUCTED BY

EIS ENVIRONMENTAL CONSULTING

MAY 21st, 22nd, AND 26th (1998)

Introduction

UtahAmerican Energy, Price Utah, has proposed to build a mine facility located within Lila Canyon of the Book Cliffs/Roan Cliffs Plateau Physiographic Region. The proposed mine facility includes a transportation/utility corridor and a mining surface facility. The transportation/utility corridor will consist of an access road, rail line, power line, and utility line. Other proposed actions are a permit area and two borrow areas.

A ground inventory for loggerhead shrike, (*Lanius ludovicianus)*, creutzfeldt-flower, *(Cryptantha creutzfeldtii,*) burrowing owls, (*Athene cunicularia,*) and Canyon sweetvetch, *(Hedysarum occidentale* variety *canone),* dispain footcactus, (*Pediocactus despainii),* and Wright fishhook cactus *(Sclerocatus wrightiae),* was conducted on May 21, 22, and 26 by employees of EIS. The proposed access/utility corridor and surface facility were inventoried by walking linear transects over the entire area of concern.

Methodology

Loggerhead shrike - Burrowing owl

Inventories were conducted between sunrise and 10:00A.M., the period of highest bird activity, on May 21, 22, and 26th. Binoculars and spotting scopes were used to note shrike activities and the entire proposed area was searched for white-tailed prairie dog, (Cynomys leucurus) towns. Prairie dog towns are the preferred habitat of borrowing owls. If shrikes were observed, a thorough search of the site was conducted to identify the presence of a nest. Field personnel would also conduct a thorough search of identified prairie dog towns to reveal the presence of on-going or historic burrowing owl activities (scratchings, droppings, tracks, ect.). Habitat present in the proposed area was noted, as was the general topography, weather conditions and general mitigation suggestions.

Canyon sweetvetch - creutzfeldt-flower-despain footcactus-Wright fishhook cactus.

Inventories were conducted from 7:30 A.M.to 3:00P.M. on May 21, 22, and 26th 1999. The areas were searched by walking linear transects over the entire area of concern. If target taxa were located field personnel flagged the location, collected voucher specimens, marked the location on a quad-map, and took a photograph of the plant and habitat. Habitat present in the proposed area was noted, as was the general topography, weather conditions, and general mitigation suggestions.

Results

Loggerhead shrike

A thorough search of the area did not reveal the presence of Loggerhead shrikes, though the proposed surface facility area contains suitable shrike habitat.

Burrowing owl

No burrowing owls were located within any of the proposed area. A thorough search of the area revealed no prairie dog towns and therefor no on-going or historic burrowing owl activity.

Creutzfeldt-flower

No creutzfeldt-flower was identified in the proposed area although there were several areas of suitable habitat (Mancos Shale substrate).

Canyon sweetvetch

Canyon sweetvetch was located in a dry wash located in the south west corner of section 21, Township 16 East, Range 14 East, found on the Lila Point USGS quad. Approximately 20 plants occurred in this area. The voucher sample was positively identified by qualified BLM staff. This was the only occurrence of *Hedysarum occidentale* in the proposed area.

Recommendations: It is recommended that construction of the transportation/utility corridor minimize sediment loading to the ephemeral stream mentioned. Increased erosion and subsequent sedimentation could possibly impact existing plants or alter future establishment of Canyon sweetvetch. Sediment traps should be employed during road construction. The population of sweetvetch should be monitored annually to assess effects of road, rail line, power line, and utility line construction on Canyon sweetvetch population dynamics.

Despain footcactus

No despain footcactus were located within the proposed area of disturbance or the surveyed areas adjacent to the proposed disturbed areas.

Wright fishhook cactus

No Wright fishhook cactus were found within the surveyed areas.

EIS ENVIRONMENTAL INDUSTRIAL SERVICES
435-472-2814 • 800-641-2922 • FAX 435-472-8780 • LISMCAST.ENET.COM • 31 NORTH MAIN STREET HELPER, UTAH 84526

July 29, 1999

UtahAmerican Energy
Mr. Jay Marshall
P. O. Box 986
Price, UT 84501

RE: Request for additional data on T E and S species

Dear Mr. Marshall:

As per your request, Despain Foot Cactus (Pediocactus despainii) and Wright Fishhook Cactus (Sclerocactus wrightiae) are not present within the Lila Canyon proposed area of disturbance.

Both species have been observed in Emery County, however, it would be an anomaly to find in this habitat and or this far north. Based on previous studies, the occurrence of either species within the Lila Canyon Area is highly unlikely.

Sincerely,

Melvin A. Coonrod,
Owner, EIS

MAC/cr

Lila Canyon

Vegetation Inventory

Prepared for:

UtahAmerican Energy, Inc.
(UEI)
P.O. Box 187
Clairsville, Ohio 43950

Prepared by:
Environmental Industrial Services
31 North Main Street
Helper, Utah 84526

October 1, 1999

Introduction

Lila Canyon, located in Emery County, was surveyed November 1st through the 11th, 1999. The purpose was to establish a vegetation inventory for a proposed coal mine for UtahAmerican Energy, Incorporated. Mr. Melvin A. Coonrod, Mr. Ken Salt, and George Cook from Environmental Industrial Services (EIS) conducted the survey.

Methodology

The area of potential disturbance was mapped relative to vegetation communities and a numbered grid was laid over the potential disturbed area.

Sampling of vegetation was accomplished by surveying 15 transects for each area, with transects spanning 100'. A table of random numbers arbitrarily determined the placement in the grid and direction of each transect. Every 10', a 2.5' x 2.5' iron rod with 10 random points was placed on alternating sides of the tape, determining the point of each sample. A total of 1,500 points were taken for each vegetation type. (15 Transects)

To establish revegetation success standards, a reference area correlating with brush and grass vegetation types was surveyed. A reference area measuring 330' x 330' (1acre^2) was laid out. Transects were conducted using the same methodology as the disturbed areas. (See Figure 1 Map, for location of transects and reference areas).

The Pinyon Juniper vegetation community was sampled to determine woody plant density using a circular plot with an 11'9" radius (1/100 of an acre) centered at the beginning of each transect. All woody plants within the circumference were counted. A total of 15 plots were conducted for each area.

The reference area was selected with a similar slope, aspect and like soil characteristics.

Findings

Lila Canyon consists of two main vegetation types. Shrubs and grasses cover approximately 20 acres of the lower boundary, while Pinyon and Juniper occupy the remaining 20 acres at higher elevations (see attached cover).

The surrounding vegetation is composed of similar zones, but with the addition of several wide, shallow drainage areas inhabited mainly by Salina Wild Rye (Elymus salinus,) Tamarisk (Tamarix pentandra), Greasewood (Sarcobatus vermiculatus), and Rabbitbrush (Chrysothamnus nauseosus). Shadscale (Atriplex confertifolia), was also associated with these areas, but not identified in the surveyed locations. No threatened or endangered species were identified within the permit or surrounding areas.

Species composition of the shrub and grass areas consist predominantly of Cheat Grass (Bromus

tectorum), Rabbitbrush (Chrysothamnus viscidiflorus), and Lichen. Salina Wild Rye (Elymus salinus) and Indian Rice Grass (Oryozopis hymenoides) also commonly occur over the survey area. Bare ground, rock and vegetation litter account for 55.2% of total ground cover in the reference area.

While Utah Juniper and Pinyon Pine identify the second vegetation type, Salina Wild Rye (Elymus salinus), Lichen and Rabbitbrush (Chrysothamnus viscidiflorus) attribute the highest yield to species composition. Bare ground, rock, and vegetative litter occupy 72.4% of total ground cover in the Pinyon/Juniper area. For a complete list of species identified, refer to Table 1.

Sample adequacy was demonstrated for ground cover, and density for both the proposed disturbed site and the reference area as suggested by the Vegetation Information Guidelines (1992). (See Tables 1 & 2).

Species composition similarity was demonstrated by using "Jaccard's Community Coefficient." The Jaccard's Community Coefficient for the proposed disturbed area compared to the reference area was 89%, which is higher than the 70% recommended in the Vegetation Information Guidelines (1992). See FIGURE 1.

Ground cover and woody plant density similarity was demonstrated by the use of a double "t" with a confidence interval of 90% as suggested by the Vegetation Information Guidelines (1992). Both the ground cover and wood plant density fell well within the 90% confidence interval. See FIGURE 2.

In all data sets, this survey exceeded the requirement that at least a 70% probability was achieved. In addition, all confidence levels were greater than 90%.

The Pinyon/Juniper study area as well as the Pinyon/Juniper reference area were deleted from the stydy after consultation with the BLM, Mr. David Mills, and DOGM Mr. Paul Baker. The consensus of all concerned agencies and individuals was that Pinyon/Juniper was not a desirable vegetation community to reestablish in a critical high value range for elk, deer and potentially Rocky Mountain Bighorn sheep. Within the Price River Resource Area Pinyon/Juniper comprise approximately 200,000 acres, occupying approximately 18% of the land area. This vegetation community is not deemed high value use for forage by big game species. The post mining land use is wildlife and grazing. The grass shrub community is far more desirable end community for this purpose.

TABLE 1

Lila Vegetation Inventory
GRASS / SHRUB
Mine Site Area
Transect Number

Common Name	Species Name	24° 1	70° 2	360° 3	95° 4	140° 5	72° 6	145° 7	002° 8	71° 9	317° 10	94° 11	93° 12	75° 13	11° 14	65° 15	Sum	AVG	STD	% Cover By Species
Desirable Species																				
Blue Grama	Bouteloua gracilis	5	0	0	1	5	7	1	2	3	2	11	3	8	6	11	65	4.33	3.534	4.33
Fish Hook Cactus	Sclerocactus	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0.07	0.249	0.07
Four-wing Salt Brush	Atriplex canescens	2	0	0	0	0	0	0	0	0	0	0	0	0	1	0	3	0.20	0.542	0.20
Galletta	Hilaria jamesii	0	3	8	3	5	3	0	1	2	2	0	6	0	1	0	34	2.27	2.380	2.27
Hedgehog Cactus	Echinocereus	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0.07	0.249	0.07
Indian Ricegrass	Oryzopsis hymenoides	3	1	0	2	0	0	4	2	4	3	3	1	7	3	1	34	2.27	1.843	2.27
Mormon Tea	Green Ephedra	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	2	0.13	0.340	0.13
Squirrel Tail	Elymus elymoides	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00	0.000	0.00
Needle & Thread Grass	Stipe comata	1	2	4	0	0	3	7	6	4	2	0	2	2	4	5	42	2.80	2.104	2.80
Prickly Per	Opuntia compressa	0	0	0	1	0	0	1	0	0	0	0	0	0	0	1	3	0.20	0.400	0.20
Purple Three-awn	Aristida purpurea	0	0	4	0	1	2	3	3	0	1	0	0	6	3	0	23	1.53	1.821	1.53
Rabbitbrush	Chrysothamnus nauseosus	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	2	0.13	0.340	0.13
Salina Wild Rye	Unus silennae	0	10	0	13	13	1	9	11	6	9	10	11	8	9	9	119	7.93	4.171	7.93
Scarlet Globe Mallow	Sphaeralcea coccinea	1	0	0	0	0	2	1	0	1	0	0	0	0	0	0	5	0.33	0.596	0.33
Shadscale	Atriplex confertigoliz	0	0	0	0	0	0	1	0	0	1	1	3	1	0	0	7	0.47	0.806	0.47
Winterfat	Ceratoides lanata	1	0	0	1	0	0	0	0	0	1	0	0	1	0	0	4	0.27	0.442	0.27
TOTAL DESIRABLE		**13**	**17**	**16**	**21**	**24**	**18**	**27**	**26**	**21**	**21**	**26**	**27**	**33**	**28**	**27**	**345**			**23.00**
Undesirable Species																				
Cheatgrass	Bromus tectorium	26	10	23	13	3	12	9	7	16	12	11	8	9	14	7	180	12.00	5.820	12.00
Snake Weed	Gutterrezia sarothrae	12	11	4	3	7	10	5	10	9	8	4	11	6	3	12	115	7.67	3.197	7.67
TOTAL UNDESIRABLE		**38**	**21**	**27**	**16**	**10**	**22**	**14**	**17**	**25**	**20**	**15**	**19**	**15**	**17**	**19**	**295**			**19.67**
PHYSICAL CHARACTERISTICS																				
Dirt	Bare Ground	35	40	26	35	16	31	42	35	24	39	36	33	29	32	41	496	33.07	6.668	33.07
Litter	Leaves, Stems, Organic Materia	13	8	29	21	37	21	13	13	27	7	11	15	19	12	4	250	16.67	8.723	16.67
Rock	Rock	1	14	0	7	13	8	4	9	3	13	12	6	4	11	9	114	7.60	4.363	7.60
TOTAL PHYSICAL CHARACTER		**49**	**62**	**57**	**63**	**66**	**60**	**59**	**57**	**54**	**59**	**59**	**54**	**52**	**55**	**54**	**860**			**57.33**
GRAND TOTAL		**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**1500**			**100.00**

Ground Cover = Desirable + Undesirable+Litter

TOTAL DESIRABLE		13	17	16	21	24	18	27	26	21	21	26	27	33	28	27	345	23.00	5.254	23.00
TOTAL UNDESIRABLE		38	21	27	16	10	22	14	17	25	20	15	19	15	17	19	295	19.67	6.446	19.67
Litter	Leaves, Stems, Organic Materia	13	8	29	21	37	21	13	13	27	7	11	15	19	12	4	250	16.67	8.723	16.67
Total		64	46	72	58	71	61	54	56	73	48	52	61	67	57	50	890	59.33	8.420	
Cover as a %		**4.3**	**3.1**	**4.8**	**3.9**	**4.7**	**4.1**	**3.6**	**3.7**	**4.9**	**3.2**	**3.5**	**4.1**	**4.5**	**3.8**	**3.3**		3.96	0.561	59.33

Parameter	n	Mean	Std	d	Deg	Conf	t	n_{min}
Cover as a %	15	3.95556	0.5613	0.1	14	0.90	1.345	3.64

TABLE 2

Lila Vegetation Inventory
GRASS / SHRUB
Reference Area
Transect Number

Common Name	Species Name	005° 1	285° 2	192° 3	291° 4	058° 5	113° 6	348° 7	83° 8	104° 9	111° 10	193° 11	006° 12	212° 13	298° 14	65° 15	Sum	AVG	STD	% Cover By Species
Desirable Species																				
Blue Grama	Bouteloua gracilis	5	1	9	7	1	13	4	8	5	5	3	8	0	5	10	84	5.60	3.499	5.60
Fish Hook Cactus	Sclerocacuts	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0.07	0.249	0.07
Four-wing Salt Brush	Atriplex canescens	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00	0.000	0.00
Galletta	Hilaria jamesii	11	0	2	1	1	0	3	1	5	0	4	7	3	4	2	44	2.93	2.909	2.93
Hedgehog Cactus	Echinocereus	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0.07	0.249	0.07
Indian Ricegrass	Oryzopsis hymenoides	1	12	1	5	6	8	3	1	2	0	3	2	3	4	0	51	3.40	3.158	3.40
Mormon Tea	Green Ephedra	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	2	0.13	0.340	0.13
Squirrel Tail	Elymus elymoides	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0.20	0.748	0.20
Needle & Thread Grass	Stipa comata	4	8	1	5	6	0	4	3	1	0	2	0	4	3	4	45	3.00	2.280	3.00
Prickly Per	Opuntia compressa	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	2	0.13	0.340	0.13
Purple Three-awn	Aristida purpurea	4	0	4	1	7	3	0	0	1	3	0	4	5	1	4	37	2.47	2.125	2.47
Rabbitbrush	Chrysothamnus nauseosus	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0.07	0.249	0.07
Salina Wild Rye	Unus silannse	0	0	9	6	2	1	8	12	5	4	8	5	8	4	0	72	4.80	3.600	4.80
Scarlet Globe Mallow	Sphaeralcea coccinea	0	0	2	0	0	0	0	1	0	0	0	0	1	0	0	4	0.27	0.573	0.27
Shadscale	Atriplex confertigoliz	5	3	1	0	1	0	0	0	0	1	0	0	2	0	0	13	0.87	1.408	0.87
Winterfat	Ceratoides lenata	0	2	0	0	0	1	0	0	2	0	0	1	0	0	0	6	0.40	0.712	0.40
TOTAL DESIRABLE		**33**	**26**	**29**	**26**	**24**	**27**	**24**	**26**	**22**	**14**	**20**	**27**	**27**	**21**	**20**	**366**			**24.40**
Undesirable Species																				
Cheatgrass	Bromus tectorium	5	22	9	10	10	16	17	12	17	22	20	7	13	14	16	210	14.00	5.046	14.00
Snake Weed	Gutierrezia aarothrae	7	14	8	8	2	5	9	8	4	3	6	4	8	5	5	96	6.40	2.871	6.40
TOTAL UNDESIRABLE		**12**	**36**	**17**	**18**	**12**	**21**	**26**	**20**	**21**	**25**	**26**	**11**	**21**	**19**	**21**	**306**			**20.40**
PHYSICAL CHARACTERISTICS																				
Dirt	Bare Ground	28	16	41	46	34	22	28	32	31	21	39	33	39	41	29	480	32.00	8.083	32.00
Litter	Leaves, Stems, Organic Materia	19	22	2	10	16	15	14	19	11	27	15	21	11	13	27	242	16.13	6.417	16.13
Rock	Rock	8	0	11	0	14	15	8	3	15	13	0	8	2	6	3	106	7.07	5.397	7.07
TOTAL PHYSICAL CHARACTER		**55**	**38**	**54**	**56**	**64**	**52**	**50**	**54**	**57**	**61**	**54**	**62**	**52**	**60**	**59**	**828**			**55.20**
GRAND TOTAL		**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**1500**			**100.00**

Ground Cover = Desirable + Undesirable+Litter

TOTAL DESIRABLE		33	26	29	26	24	27	24	26	22	14	20	27	27	21	20	366	24.40	4.379	24.40
TOTAL UNDESIRABLE		12	36	17	18	12	21	26	20	21	25	26	11	21	19	21	306	20.40	6.205	20.40
Litter	Leaves, Stems, Organic Materia	19	22	2	10	16	15	14	19	11	27	15	21	11	13	27	242	16.13	6.417	16.13
Total		64	84	48	54	52	63	64	65	54	66	61	59	59	53	68	914	60.93	8.410	
Cover as a %		**4.3**	**5.6**	**3.2**	**3.6**	**3.5**	**4.2**	**4.3**	**4.3**	**3.6**	**4.4**	**4.1**	**3.9**	**3.9**	**3.5**	**4.5**		4.06	0.561	60.93

Parameter	n	Mean	Std	d	Deg	Conf	t	n_{min}
Cover as a %	15	4.062	0.561	0.1	14	0.90	1.345	3.45

Woody Plant Density
Total Area (Grass Shrub Disturbed & Reference and PJ)

	Transect Number															
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	TOTAL
Utah juniper				2	1			2			1	1	4	5	6	22
pinyon pine											2	1		1	2	6
prickly gila												46	3			49
shadscale	3	3	1											3	1	11
four-wing salt bush	9	11	4		3	4	1									32
winterfat	2		7			1	5		1	1			1			18
gray rabbitbrush										1						1
Douglas rabbitbrush	2	1	6	1						1						11
greasewood	2		1													3
green ephedra				1						1						2
yucca sp.														1		1
snakeweed	3	90	40	32	88	78	54	94	50	65						594
Wyoming big sage						1										1
TOTAL Woody Plant	21	105	59	36	92	84	60	96	51	69	3	48	8	10	9	751
Avg. Wood Plant/Ac.																5006.7
Desirable / Ac																1046.7
Grass Shrub Dist.	6260 stems / acre															
Grass Shrub Refer						7200 stems / acre										
PJ Disturbed											1560 stems / acre					

Two Tailed "T"

When the population is normally distributed but the variance and the mean of the population is unknown the two tailed "t" test is used. The "t" distribution is used in place of the normal distribution "z". As the sample number (n) increases the "t" distribution approaches the normal (z) distribution. The vegetation guidelines used by DOGM (Revised, February 1992) suggests that the reference areas and proposed disturbed areas should be equal with a 90% confidence using the two tailed "t" test. Woody Plant Density and % cover are to be compared. Calculations for the double "t" test follows:

Mine Area

Cover as a %
Mean $= X_0 =$ 59.33
STD = 8.420
n = 15

Woody Plant Density
Mean $= X_0 =$ 70.40
STD = 68.417
n = 15

Reference Area

Cover as a %
Mean $= X_0 =$ 60.93

Woody Plant Density
Mean $= X_0 =$ 86.0

For a 90% confidence interval:

$$\frac{\text{"t" (STD)}}{n^{1/2}} \leq X_0 \leq \frac{\text{"t" (STD)}}{n^{1/2}}$$

where "t" = 1.761 from "t" distribution chart with df = (n-1)

Cover as a %

$$55.50 \leq X_0 \leq 63.16$$

Since X_0 of Cover as a % is 60.93 and can be found between 55.50 and 63.16 it can be concluded that the Mine Site and the Reference Area are equal with 90% confidence.

Woody Plant Density

$$39.29 \leq X_0 \leq 101.51$$

Since X_0 of Woody Plant Density is 86.0 and can be found between 39.29 and 101.51 it can be concluded that the Mine Site and the Reference Area are equal with 90% confidence.

Jaccard's Community Coefficient:

$$Si = c/(a+b-c)*100$$

Where:

Si= Similarity index;
a= Total number of species in the reference area;
b= Total number of species in mine site area;
b= Number of species common to both communities.

Si values can run from 1 to 100 with 1 being not similar at all and 100 being very similar.

a	b	c
17	17	16

Si = 89 making the sites very similar

The 89% Si exceeds DOGM requirements of 70%.

cc: Darron
Paul
Dave

United States Department of the Interior
FISH AND WILDLIFE SERVICE
UTAH FIELD OFFICE
LINCOLN PLAZA
145 EAST 1300 SOUTH, SUITE 404
SALT LAKE CITY, UTAH 84115

In Reply Refer To
(CO/KS/NE/UT)

April 28, 2000

RECEIVED
MAY 0 2 2000
DIVISION OF
OIL, GAS AND MINING

Mr. Darron Haddock, Permit Supervisor
Utah Division Oil, Gas, and Mining
1594 West North Temple, Suite 1210
P.O. Box 145801
Salt Lake City, Utah 84114-5801

RE: Section 7 Consultation on the Utah American Energy, Inc., Lila Canyon Mine application, ACT/007/013-SR98-1

Dear Mr. Haddock:

The U.S. Fish and Wildlife Service (Service) has reviewed your letters of April 3, 2000 and September 20, 1999. Potential impacts to proposed or listed species from mining activities have been previously addressed in the Service's September 24, 1996 Biological Opinion and Conference Report on Surface Coal Mining and Reclamation Operations under the Surface Coal Mining and Reclamation Act of 1977. As part of the terms and conditions of this BO, the regulatory authority must implement and require compliance with any species-specific protective measures developed by the Service field office and the regulatory authority. No species-specific protective measures are considered necessary for the subject project.

We concur with your "not likely to adversely affect" determination for the southwestern willow flycatcher, bald eagle, and listed plant species.

The project proposes to use about 21.3 acre-feet of water annually. Any water depletions from the Upper Colorado River Basin are considered to jeopardize the continued existence or adversely modify the critical habitat of the four Colorado River endangered fish species: Colorado pikeminnow, razorback sucker, bonytail chub, and humpback chub. However, depletions are addressed by existing inter-agency section 7 agreements. In 1998, the Department of the Interior, the states of Wyoming, Colorado, and Utah, and the Western Area Power Administration established the Recovery Implementation Program for Endangered Fish Species in the Upper Colorado River Basin (RIP). The purpose of the RIP is to recover listed species while providing for new water development in the Upper Colorado River Basin. In accordance with the RIP, the Service assesses impacts of projects that require section 7 consultation and determines how the RIP will serve as a reasonable and prudent alternative.

This is your future. Don't leave it blank. - *Support the 2000 Census*

For new depletions less than 100-acre feet, and intra-service agreement based on basin-wide cumulative depletions precludes the need for a depletion charge and the RIP recovery activities are considered to offset depletion impacts. Therefore, the depletion fee for this project is waived. It is important to note that the Service is required to consult on and keep track of all depletions, historic or new, of any magnitude. Therefore, UDOGM should report all water depletions to our office.

Should project plans change, or if additional information on the distribution of listed or proposed species becomes available, this determination may be reconsidered. Only a Federal agency can enter into formal Endangered Species Act section 7 consultation with the Service. A Federal agency may designate a non-Federal representative to conduct informal consultation or prepare a biological assessment by giving written notice to the Service of such a designation. The ultimate responsibility for compliance with ESA section 7, however, remains with the Federal agency.

As you are aware, the peregrine falcon was removed from the federal list of endangered and threatened species per Final Rule of August 25, 1999 (64 FR 46542). Protection is still provided for this species under authority of the Migratory Bird Treaty Act (16 U.S.C. 703-712) which makes it unlawful to take, kill, or possess migratory birds, their parts, nests, or eggs. When taking of migratory birds is determined by the applicant to be the only alternative, application for federal and state permits must be made through the appropriate authorities. For take of raptors, their nests, or eggs, Migratory Bird Permits must be obtained through the Service's Migratory Bird Permit Office in Denver at (303) 236-8145.

We recommend use of the *Utah Field Office Guidelines for Raptor Protection from Human and Land Use Disturbances* which were developed in part to provide consistent application of raptor protection measures statewide and provide full compliance with environmental laws regarding raptor protection. Raptor surveys and mitigation measures are provided in the Raptor Guidelines as recommendations to ensure that proposed projects will avoid adverse impacts to raptors, including the peregrine falcon.

We appreciate your interest in conserving endangered species and migratory birds. If further assistance is needed or you have any questions, please contact Laura Romin, at (801) 524-5001 extension 142.

Sincerely,

for Reed E. Harris
Utah Field Supervisor

cc: Sandy Vana-Miller, Office of Surface Mining, 1999 Broadway, Suite 3320, Denver, CO 80202

APPENDIX 4-3

Air Quality Permit

STATE OF UTAH

Department of Environmental Quality

Division of Air Quality

APPROVAL ORDER FOR A NEW COAL MINE IN THE LILA CANYON

Prepared By: Maung Maung, Engineer
(801) 536-4153

APPROVAL NUMBER

DAQE-702-99

Date: August 27, 1999

Source Contact

Utah American Energy, Inc.
R. Jay Marshall
(435) 613-0393

Ursula K. Trueman
Executive Secretary
Utah Air Quality Board

UtahAmerican Energy Inc.

P.O. Box 986
Price, Utah 84501
+1 (435) 613 0393
Fax: +1 (435) 613 0393

December 22, 1998

Executive Secretary
Division of Air Quality
Attention: New Source Review Section
P.O. Box 144820
Salt Lake City, Utah 84114-4820

Dear Sir:

UtahAmerican Energy, Inc. is herein submitting a Notice of Intent for a new source for our Lila Canyon Mine.

This NOI is being submitted to provide for a new underground coal mining operation in Emery County. This new operation is anticipated to begin construction in the spring of 1999 and will be in production by December 1999.

UtahAmerican Energy, Inc. is requesting approval for a throughput of up to 2,000,000 tons per year.

Based on the calculations, the facility meets the requirements of a "Minor Source". The NOI will meet requirements of a "Major Modification".

We appreciate your cooperation, and hope this plan will meet with our approval. If you have any questions, or need any further information, please contact me at (435) 613-0393.

Sincerely,

R. Jay Marshall

R. Jay Marshall P.E.
Chief Engineer
UtahAmerican Energy, Inc.

Michael O. Leavitt
Governor

Dianne R. Nielson, Ph.D.
Executive Director

Ursula K. Trueman
Director

DEPARTMENT OF ENVIRONMENTAL QUALITY
DIVISION OF AIR QUALITY

150 North 1950 West
P.O. Box 144820
Salt Lake City, Utah 84114-4820
(801) 536-4000 Voice
(801) 536-4099 Fax
(801) 536-4414 T.D.D.
Web: www.deq.state.ut.us

DAQE-400-99

June 2, 1999

R. Jay Marshall
Chief Engineer
Utah American Energy, Inc.
P. O. Box 986
Price, Utah 84501

Dear Mr. Marshall:

Re: Intent to Approve a New Coal Mine in the Lila Canyon, Emery County
CDS SM; ATT; NSPS, Title V

The attached document is an Intent to Approve for the above-referenced project. The Approval Order will be issued following the executive secretary's evaluation and approval.

Future correspondence on this Intent to Approve should include the engineer's name as well as the DAQE number as shown on the upper right-hand corner of this letter. Please direct any technical questions you may have on this project to Mr. Maung Maung. He may be reached at (801) 536-4153.

Sincerely,

Lynn R. Menlove, Manager
New Source Review Section

LRM:MM:re

cc: Southeastern Utah District Health Department

STATE OF UTAH

Department of Environmental Quality

Division of Air Quality

INTENT TO APPROVE FOR A NEW COAL MINE IN THE LILA CANYON

Prepared By: Maung, Engineer
(801) 536-4153

INTENT TO APPROVE NUMBER

DAQE-400-99

Date: May 27, 1999

Source

Utah American Coal Company
R. Jay Marshall
(435) 613-0393

Ursula K. Trueman
Executive Secretary
Utah Air Quality Board

Abstract

Utah American Energy, Inc. has proposed to construct and operate an underground coal mine in Emery County. This is a new site. The new Lila Canyon Mine will be located approximately 7 miles Southwest of Columbia, Utah.

Emery County is an attainment area of the national air quality standards for all pollutants. The emissions, in tons per year, are as follows: TSP = 12.95, PM_{10}=4.97, NO_x = 19.39, SO_2= 1.28, CO = 4.18, VOC = 1.58. Particulate emissions from handling coal will be mitigated by wet suppression. New Source Performance Standards (NSPS) 40 CFR subpart Y applies to this source. Therefore, Title V applies to this source. National Emission Standards for Hazardous Air Pollutants (NESHAP) regulations do not apply to this source. A 30-day public comment period will be required before granting an approval order.

The Notice of Intent for the above-referenced project has been evaluated and has been found to be consistent with the requirements of the Utah Air Quality Rules (UAQR) and the Utah Air Conservation Act. Air pollution producing sources and/or their air control facilities may not be constructed, installed, established, or modified prior to the issuance of an Approval Order (AO) by the Executive Secretary of the Utah Air Quality Board.

A Notice of Intent to issue an AO will be published in the Sun Advocate on June 8, 1999. A 30-day period following the publishing date will be allowed during which the proposal and evaluation of its impact on air quality will be available for both you and the public to review and comment. If anyone so requests within 15 days of publication of the notice, a hearing will be held. The hearing will be held as close as practicable to the location of the source. Any comments received during the 30-day period and the hearing, if held, will be evaluated.

Please review the proposed AO conditions during this period and make any comments you may have before its closure. The proposed conditions of the AO may be changed as a result of the comments received. Unless changed, the AO will be based upon the following conditions:

General Conditions:

1. This Approval Order (AO) applies to the following company:

   Corporate Office Location
   UtahAmerican Energy, Inc.
   1382 Scenic View
   P.O. Box 986
   Price, Utah 84501
   Phone Number: (435) 613-0393
   Fax Number: (435) 613-0393

   The equipment listed below in this AO shall be operated at the following location:

   PLANT LOCATION:

   From Price go East on Highway 6/191 approx. 40 miles to Horse Canyon turnoff (highway 125). Turn left on 125 and travel East approx. 4.5 miles to the junction of 125/126. Turn right on 126 and travel south on 126 approx. 2.3 miles to the site. Emery County

Universal Transverse Mercator (UTM) Coordinate System:
4,364.4 kilometers Northing; 557.0 kilometers Easting; Zone 12

2. Definitions of terms, abbreviations, and references used in this AO conform to those used in the Utah Administrative Code Rule 307 (UAC R307), and Series 40 of the Code of Federal Regulations (40 CFR). These definitions take precedence, unless specifically defined otherwise herein.

3. Utah American Energy, Inc. shall operate the Lila Canyon Mine in accordance with the terms and conditions of this AO as requested in the Notice of Intent submitted to the Division of Air Quality (DAQ) on December 24, 1998, and additional information submitted to the DAQ on February 19, 1999 and May 11, 1999.

4. At least once per calendar year, all employees who operate equipment (operator) that produces and/or controls emissions to the air shall receive proper training as to their responsibilities in operating that equipment according to all relevant conditions of this AO. The training for each operator shall be for all equipment that operator operates and the required training shall only be for pollution control equipment and/or procedures that have a direct effect on emissions to the ambient air. The equipment shall include all of the equipment listed below in Condition #5 and any other equipment that affects or produces air emissions that the operator operates. Within 60 days of every time this AO is modified or reissued, those employees who operate equipment that produces and/or controls emissions to the air that is affected by the AO changes shall receive proper training as to their responsibilities in operating equipment according to all relevant conditions of this AO. Within 60 days of a new operator being employed or assigned with the job responsibility to operate any of the equipment that produces and/or controls emissions to the air, the new operator shall receive proper training as to their responsibilities in operating the equipment according to all relevant conditions of this AO. Records of operator training shall be made available to the executive secretary or executive secretary's representative upon request and the records shall include the two-year period prior to the date of the request. This AO shall be made available to all employees who operate the equipment listed in this AO.

5. The approved installations shall consist of the following equipment or equivalent*:

   A. One enclosed crusher* rated at 500 tons per hour

   B. One truck loading facility* with enclosed 450 tons surge bin and sprays as needed

   C. One stacking tube with associated coal stockpile

   D. One underpile reclaim system

   E. Associated conveyors, mobile diesel equipment

   *Equivalency shall be determined by the executive secretary.

Any future changes or modifications to the equipment and processes approved by this AO that could affect the emissions covered by this AO must be approved in accordance with R307-401-1, UAC.

6. UtahAmerican Energy, Inc. shall notify the executive secretary in writing when the installation of the equipment listed in Condition #5 has been completed and is operational, as an initial compliance inspection is required. To insure proper credit when notifying the executive secretary, send your correspondence to the executive secretary, attn: Compliance Section.

   If construction and/or installation has not been completed within eighteen months from the date of this AO, the executive secretary shall be notified in writing on the status of the construction and/or installation. At that time, the executive secretary shall require documentation of the continuous construction and/or installation of the operation and may revoke the AO in accordance with R307-401-11, UAC.

7. Visible emissions from the following emission points shall not exceed the following values:

   A. Enclosed crusher exhaust - 20% opacity
   B. All conveyor transfer points - 20% opacity
   C. All diesel engines - 20% opacity
   D. Conveyor drop points - 20% opacity
   E. All other points - 20% opacity

   Opacity observations of emissions from stationary sources shall be conducted according to 40 CFR 60, Appendix A, Method 9.

8. The following production and consumption limits shall not be exceeded without prior approval in accordance with R307-401, UAC:

   A. 1,500,000 tons of coal per rolling 12-month period
   B. 63,000 gallons of diesel fuel per rolling 12-month period

   Compliance with the annual limitations shall be determined on a rolling 12-month total. The owner/operator shall calculate a new 12-month total by the twentieth day of each month using data from the previous 12 months. Records of consumption/production shall be kept for all periods when the plant is in operation. Records of consumption/production, including rolling 12-month totals, shall be made available to the executive secretary or executive secretary's representative upon request and the records shall include the two-year period prior to the date of the request. Production/Consumption shall be determined by examination of company coal sales records and examination of company fuel purchase records. The records of consumption/production shall be kept on a daily basis.

Roads and Fugitive Dust

9. All unpaved roads and other unpaved operational areas that are used by mobile equipment shall be water sprayed and/or chemically treated to control fugitive dust. The application

of water or chemical treatment shall be used. Treatment shall be of sufficient frequency and quantity to maintain the surface material in a damp/moist condition. The opacity shall not exceed 20% during all times the areas are in use or unless it is below freezing. Records of water and chemical treatment shall be kept for all periods when the plant is in operation. The records shall include the following items:

A. Date
B. Number of treatments made, dilution ratio, and quantity
C. Rainfall received, if any, and approximate amount
D. Time of day treatments were made

Records of treatment shall be made available to the executive secretary upon request and shall include a period of two years ending with the date of the request.

10. The haul road limitations shall be:

A. 0.68 miles in length of paved road
B. 25 miles per hour

These limitations shall not be exceeded without prior approval in accordance with R307-401, UAC. The haul road speed shall be posted.

11. Control of disturbed or stripped areas is required at all times (24-hours per day every day) for the duration of the project/operation until the area is reclaimed. Records of treatment and/or reclamation shall be kept for all periods when the plant is in operation. Records of treatment and/or reclamation shall be made available to the executive secretary or executive secretary's representative upon request and the records shall include the two-year period prior to the date of the request.

12. Visible fugitive dust emissions from haul-road traffic and mobile equipment in operational areas shall not exceed 20% opacity. Visible emissions determinations for traffic sources shall use procedures similar to Method 9. The normal requirement for observations to be made at 15-second intervals over a six-minute period, however, shall not apply. Six points, distributed along the length of the haul road or in the operational area, shall be chosen by the executive secretary or the executive secretary's representative. An opacity reading shall be made at each point when a vehicle passes the selected points. Opacity readings shall be made ½ vehicle length or greater behind the vehicle and at approximately ½ the height of the vehicle or greater. The accumulated six readings shall be averaged for the compliance value.

13. The 0.68 miles of haul road shall be paved and shall be periodically swept or sprayed clean as dry conditions warrant or as determined necessary by the executive secretary. Records of cleaning paved roads shall be made available to the executive secretary or the executive secretary's representative upon request. The records shall include the two-year period prior to the date of the request.

14. Water sprays or chemical dust suppression sprays shall be installed at the following points to control fugitive emissions:

A. Enclosed crusher exhaust
B. All conveyor transfer points

The sprays shall operate whenever dry conditions warrant or as determined necessary by the executive secretary. Water sprays are not required during freezing weather conditions.

15. The moisture content of the material passing a #40 U.S. Standard Sieve shall be maintained at a minimum of 4.0% by weight. The moisture content shall be tested if directed by the executive secretary using the appropriate American Society of Testing and Methods (ASTM) method.

16. The storage piles shall be watered to minimize generation of fugitive dusts, as dry conditions warrant or as determined necessary by the executive secretary. Records of water and/or chemical treatment shall be kept for all periods when the plant is in operation. Records of water and/or chemical treatment shall be made available to the executive secretary or executive secretary's representative upon request and the records shall include the two-year period prior to the date of the request.

17. The coal fines content of the stored coal shall not exceed 5.1% by weight and that of the haul roads and pile area shall not exceed 10% by weight without prior approval in accordance with R307-401, UAC. The coal fines content shall be determined if directed by the executive secretary using the appropriate ASTM method. The coal fines content is defined as all material passing a #200 U. S. Standard Sieve.

Fuels

18. The owner/operator shall use only #2 fuel oil as a primary fuel. If any other fuel is to be used, an AO shall be required in accordance with R307-401, UAC.

19. The sulfur content of any fuel oil or diesel burned shall not exceed 0.5 percent by weight. Sulfur content shall be decided by ASTM Method D2880-71 or D-4294-89, or approved equivalent. The sulfur content shall be tested if directed by the executive secretary. The percent by weight of the sulfur contained in the fuel can be obtained from the fuel oil certifications. Certification of fuels shall be either by UtahAmerican Energy, Inc. own testing or test reports from the fuel marketer. Records of fuel supplier's test report on sulfur content shall be available on-site for each load delivered.

Federal Limitations and Requirements

20. In addition to the requirements of this AO, all applicable provisions of 40 CFR 60, New Source Performance Standards (NSPS)[1] Subpart A, 40 CFR 60.1 to 60.18 and Subpart Y, 40 CFR 60.250 to 60.254 (Standards of Performance for Coal Preparation Plants) apply to this installation. The facility must operate in accordance with the most current version of 40 CFR 60 applicable to this plant.

---

[1] NSPS = New Source Performance Standards.

21. For sources that are subject to NSPS, opacity standards shall be determined by conducting observations in accordance with 40 CFR 60.11(b) and 40 CFR 60, Appendix A, Method 9. For purposes of determining initial compliance, the minimum total time of observations shall be 3 hours (30 6-minute averages) for the performance test or other set of observations (meaning those fugitive-type emission sources subject only to an opacity standard). It is the responsibility of the owner/operator of the source to supply these observations to the executive secretary. A currently certified observer must be used for these observations. Emission points that are subject to the initial observations are:

A. Enclosed crusher exhaust
B. Coal processing and conveying equipment
C. Coal storage systems
D. Coal transfer and loading systems
E. All conveyor transfer points

Records & Miscellaneous

22. All installations and facilities authorized by this AO shall be adequately and properly maintained. All pollution control equipment approved by this approval order shall be installed, maintained, and operated according to standard operating practices that will ensure that the air quality limits set forth in this AO will be met. Instructions from the vendor or established maintenance practices that maximize pollution control shall be used. All maintenance performed on equipment authorized by this AO shall be recorded, and the records shall be maintained for a period of two years. All necessary equipment control and operating devices, such as pressure gauges, amp meters, volt meters, flow-rate indicators, temperature gauges, CEMS, etc., shall be installed and operated properly and easily accessible to compliance inspectors. A copy of all the manufacturers' and company's own subsequent operating instructions for pollution control equipment and pollution emitting equipment shall be kept on site. These instructions shall be available to all employees who operate the equipment and shall be made available to compliance inspectors upon their request. Maintenance records shall be made available to the executive secretary or executive secretary's representative upon request, and the records shall include the two-year period prior to the date of the request.

23. The owner/operator shall comply with UAC, R307-150 Series. Inventories, Testing and Monitoring. This rule addresses regulated pollutant and hazardous air pollutant emission inventory reporting requirements, and emission statement inventory requirements. Each owner or operator of a stationary source subject to the emission statement inventory (R307-150-1) rule shall maintain for a period of five years from the due date of each emission statement, a copy of the emission statement submitted to the Division of Air Quality and records indicating how the information submitted in the emission statement was determined, including any calculations, data, measurements, and estimates used.

The full text of UAC R307-150 Series, Inventories, Testing and Monitoring is included as Appendix A. However, to be in compliance, this facility must operate in accordance with the most current version of R307-150 or the applicable section(s), if renumbered.

24. The owner/operator shall comply with R307-107, UAC. This rule addresses unavoidable breakdown reporting requirements. Any breakdown lasting longer than two hours shall be reported to the executive secretary within three hours of the breakdown if reasonable, but in no case longer than 18 hours after the beginning of the breakdown. During times other than normal office hours, breakdowns for any period longer than two hours shall be initially reported to the Environmental Health Emergency Response Coordinator. Within seven calendar days of the beginning of any breakdown lasting longer than two hours, a written report shall be submitted to the executive secretary. The owner/operator shall calculate/estimate the excess emissions (amount above AO limits) whenever a breakdown occurs. The total of excess emissions per calendar year shall be reported to the executive secretary with the inventory submittal, or as directed by the executive secretary. The owner or operator of an installation suffering an unavoidable breakdown shall assure that emission limitations and visible emission limitations are exceeded for only as short a period of time as reasonable. The owner or operator shall take all reasonable measures which may include but are not limited to the immediate curtailment of production, of operations, or activities at all installations of the source if necessary to limit the total aggregate emissions from the source to be no greater than the aggregate allowable emissions averaged over the periods provided in the source's approval orders.

All records referenced in this AO or in applicable NSPS, which are required to be kept by the owner/operator, shall be made available to the executive secretary or executive secretary's representative upon request, and the records shall include the two-year period prior to the date of the request. All records shall be kept for a period of two years. A summary of those records that are required as part of this Approval Order is included herein. This summary shall not be considered an additional requirement, but is included for informational purposes only. The condition that requires that these records be kept as part of the compliance with this AO is listed following the individual record. Examples of records to be kept at this source shall include the following as applicable:

Operator Training	(Condition number 4)
Consumption/Production rate	(Condition number 8)
Water Treatment	(Condition number 9, 11 & 16)
Fugitive emission control	(Condition number 13)
Sulfur content in diesel fuel	(Condition number 19)
Maintenance records	(Condition number 22)
Emission inventory	(Condition number 23)
Upset, breakdown episodes	(Condition number 24)

The list above may not be a complete list of all records that are required to be kept by UtahAmerican Energy; Inc. For a complete list of required records check all AO conditions, and all applicable Federal regulations such as NSPS standards that apply to this source.

Any future modifications to the equipment approved by this order must also be approved in accordance with R307-401, UAC.

The executive secretary shall be notified in writing if the company is sold or changes its name. The notification shall be submitted within 30 days of such action.

Under R307-150-1, UAC, The executive secretary may require a source to submit an emission inventory for any full or partial year on reasonable notice.

Organizations have the responsibility to take whatever steps are necessary to ensure continued full compliance with environmental laws and regulations including undertaking whatever steps are necessary and appropriate to assure the accuracy of information and data required to be reported to the U.S. EPA and state programs. This includes a full Year 2000 issues assessment of the possible vulnerabilities of data systems, monitoring and operating systems and embedded computer chips that are relied upon for business operation or as part of the data gathering and reporting process. Failure to comply with requirements because of Year 2000 problems may be considered violations and may result in enforcement.

This AO in no way releases the owner or operator from any liability for compliance with all other applicable federal, state, and local regulations including UAC R307.

Reorganization or change of rules of the Utah Air Quality Board resulted in the Utah Administrative Code (UAC) numbering being changed for rules cited in this AO. In the future there may be additional changes in the UAC rule numbering and/or content. A document is available that will cross reference old rules with new rules that have been renumbered or changed. If the rules are changed in the future an updated cross reference will be made available to the public. A change in the rules does not eliminate the requirement to comply with the new referenced rule.

A copy of the rules, regulations and/or attachments addressed in this AO may be obtained by contacting the Division of Air Quality. The Utah Administrative Code R307 rules used by DAQ, the Notice of Intent (NOI) guide, and other air quality documents and forms may also be obtained on the Internet at the following web site: http://www.eq.state.ut.us/eqair/aq_home.htm

R307-12 is the rule currently in force for Fugitive Emissions & Fugitive Dust.
A proposal to revise it is under consideration by the Air Quality Board. When the revision is complete, the rules for fugitive emissions and fugitive dust may be designated as R307-205 and R307-309.

Annual emissions for this source (the entire plant) are currently calculated at the following values:

	Pollutant	Tons/yr
A.	TSP	12.95
B.	PM_{10}	4.97
C.	SO_2	1.28
D.	NO_x	19.39
E.	CO	4.18
F.	VOC	1.58

The annual emission estimations above are for the purpose of determining the applicability of Prevention of Significant Deterioration, nonattainment area, Maintenance area, and Title V source requirements of the UAC R307. They are not to be used for purposes of determining compliance.

The Division of Air Quality is authorized to charge a fee for reimbursement of the actual costs incurred in the issuance of an AO. Unless public comments are received which require additional work, the fee for this AO will be $2,400.00. An invoice will follow. You may pay this fee prior to the end of the comment period. If there are comments or additional fees, you will be notified.

Sincerely,

Lynn R. Menlove, Manager
New Source Review Section

Appendix A

UtahAmerican Energy, Inc.
Lila Canyon Coal Mine

R307-150. Emission Inventories.
R307-150-1. General Applicability.
(1) The following sources shall submit an emission inventory report:
(a) any Part 70 source;
(b) any source that emits or is allowed under R307 to emit 100 ton per year or more of any regulated air pollutant;
© any source located in Davis, Salt Lake, Utah or Weber County that emits or is allowed under R307 to emit 25 tons per year or more of a combination of PM10, sulfur oxides, or oxides of nitrogen;
(d) any source located in Davis, Salt Lake, Utah or Weber County that emits or is allowed under R307 to emit 10 tons per year or more of volatile organic compounds;
(e) any source that emits or is allowed under R307 to emit 5 tons per year or more of lead;
(f) any source that emits or is allowed under R307 to emit 10 tons or more per year of ammonia;
(g) any source that is allowed under R307 to emit between 90 and 100 tons per year of any regulated air pollutant;
(h) any source that the executive secretary requires to submit an inventory for any full or partial year on reasonable notice.

R307-155. Hazardous Air Pollutant Inventory.
R307-155-1. General Applicability.

(1) The owner or operator of a Part 70 stationary source, either "major source" or "area source" as defined in the Clean Air Act Section 112 (42 U.S.C. 7412), that emits one or more hazardous air pollutants shall submit a hazardous air pollutant inventory.
(2) The owner or operator of a source which is not a Part 70 stationary source or a "major source" as defined in the Clean Air Act Section 112 (42 U.S.C. 7412) that emits one or more hazardous air pollutants shall submit a hazardous air pollutant inventory at the request of the executive secretary but not more often than once per year.
(3) Inventory data is not required for each hazardous air pollutant that has a threshold limit value and is emitted in an amount less than the smaller of the following:
(a) 500 pounds per year; or
(b) an annual emission level calculated to be the applicable threshold limit value - time weighted average (TLV-TWA) expressed in milligrams per cubic meter, or the threshold limit value - ceiling (TLV-C) expressed in milligrams per cubic meter multiplied by the appropriate emission threshold factor in cubic meter pounds per milligram year in Table 1 below.

TABLE 1

CONTAMINANT	FACTOR (in cubic meter pounds per milligram year)
Arsenic	21.22
Benzene	21.22
Beryllium	21.22
Ethylene oxide	21.22
Formaldehyde	15.81
All other acute hazardous air pollutants	15.81
All other chronic hazardous air pollutants	21.22
All other carcinogenic hazardous air pollutants	7.07

Michael O. Leavitt
Governor

Dianne R. Nielson, Ph.D.
Executive Director

Ursula K. Trueman
Director

DEPARTMENT OF ENVIRONMENTAL QUALITY
DIVISION OF AIR QUALITY

150 North 1950 West
P.O. Box 144820
Salt Lake City, Utah 84114-4820
(801) 536-4000 Voice
(801) 536-4099 Fax
(801) 536-4414 T.D.D.
Web: www.deq.state.ut.us

DAQE-702-99

August 27, 1999

R. Jay Marshall
Chief Engineer
Utah American Energy, Inc.
P. O. Box 986
Price, Utah 84501

Dear Mr. Marshall:

Re: Approval Order for a New Coal Mine in the Lila Canyon
Emery County - CDS SM; ATT; NSPS, Title V

The attached document is an Approval Order for the above-referenced project.

Future correspondence on this Approval Order should include the engineer's name as well as the DAQE number as shown on the upper right-hand corner of this letter. Please direct any technical questions you may have on this project to Mr. Maung Maung. He may be reached at (801) 536-4153.

Sincerely,

Ursula K. Trueman

Ursula K. Trueman, Executive Secretary
Utah Air Quality Board

UKT:MM:aj

cc: Southeastern Utah District Health Department

RECEIVED AUG 30

STATE OF UTAH

Department of Environmental Quality

Division of Air Quality

APPROVAL ORDER FOR A NEW COAL MINE IN THE LILA CANYON

Prepared By: Maung Maung, Engineer
(801) 536-4153

APPROVAL NUMBER

DAQE-702-99

Date: August 27, 1999

Source Contact

Utah American Energy, Inc.
R. Jay Marshall
(435) 613-0393

Ursula K. Trueman
Executive Secretary
Utah Air Quality Board

Abstract

Utah American Energy, Inc. has proposed to construct and operate an underground coal mine in Emery County. This is a new site. The new Lila Canyon Mine will be located approximately seven miles southwest of Columbia, Utah.

Emery County is an attainment area of the national air quality standards for all pollutants. The emissions, in tons per year, are as follows: TSP = 12.95, PM_{10} = 4.97, NO_x = 19.39, SO_2 = 1.28, CO = 4.18, VOC = 1.58. Particulate emissions from handling coal will be mitigated by wet suppression. New Source Performance Standards (NSPS) 40 CFR subpart Y applies to this source. Therefore, Title V applies to this source. National Emission Standards for Hazardous Air Pollutants (NESHAP) regulations do not apply to this source. A 30-day public comment period was required before granting an Approval Order (AO).

The above-referenced project has been evaluated and found to be consistent with the requirements of the Utah Administrative Code Rule 307 (UAC R307) and the Utah Air Conservation Act. A 30-day public comment period was held and all comments received were evaluated. The conditions of this AO reflect any changes to the proposed conditions which resulted from the evaluation of the comments received. This air quality AO authorizes the project with the following conditions and failure to comply with any of the conditions may constitute a violation of this order:

General Conditions:

1. This Approval Order (AO) applies to the following company:

   Corporate Office Location
   Utah American Energy, Inc.
   1382 Scenic View
   P.O. Box 986
   Price, Utah 84501
   Phone Number: (435) 613-0393
   Fax Number: (435) 613-0393

   The equipment listed below in this AO shall be operated at the following location:

   PLANT LOCATION:

   From Price go East on Highway 6/191 approx. 40 miles to Horse Canyon turnoff (highway 125). Turn left on 125 and travel East approx. 4.5 miles to the junction of 125/126. Turn right on 126 and travel south on 126 approx. 2.3 miles to the site. Emery County

   Universal Transverse Mercator (UTM) Coordinate System:
   4,364.4 kilometers Northing; 557.0 kilometers Easting; Zone 12

2. Definitions of terms, abbreviations, and references used in this AO conform to those used in the Utah Administrative Code Rule 307 (UAC R307), and Series 40 of the Code of Federal Regulations (40 CFR). These definitions take precedence, unless specifically defined otherwise herein.

3. Utah American Energy, Inc. shall operate the Lila Canyon Mine in accordance with the terms and conditions of this AO as requested in the Notice of Intent submitted to the Division of Air Quality (DAQ) on December 24, 1998, and additional information submitted to the DAQ on February 19, 1999 and May 11, 1999.

4. At least once per calendar year, all employees who operate equipment (operator) that produces and/or controls emissions to the air shall receive proper training as to their responsibilities in operating that equipment according to all relevant conditions of this AO. The training for each operator shall be for all equipment that operator operates and the required training shall only be for pollution control equipment and/or procedures that have a direct effect on emissions to the ambient air. The equipment shall include all of the equipment listed below in Condition #5 and any other equipment that affects or produces air emissions that the operator operates. Within 60 days of every time this AO is modified or reissued, those employees who operate equipment that produces and/or controls emissions to the air that is affected by the AO changes shall receive proper training as to their responsibilities in operating equipment according to all relevant conditions of this AO. Within 60 days of a new operator being employed or assigned with the job responsibility to operate any of the equipment that produces and/or controls emissions to the air, the new operator shall receive proper training as to their responsibilities in operating the equipment according to all relevant conditions of this AO. Records of operator training shall be made available to the executive secretary or executive secretary's representative upon request and the records shall include the two-year period prior to the date of the request. This AO shall be made available to all employees who operate the equipment listed in this AO.

5. The approved installations shall consist of the following equipment or equivalent*:

   A. One enclosed crusher* rated at 500 tons per hour

   B. One truck loading facility* with enclosed 450 tons surge bin and sprays as needed

   C. One stacking tube with associated coal stockpile

   D. One underpile reclaim system

   E. Associated conveyors, mobile diesel equipment

   *Equivalency shall be determined by the executive secretary.

   Any future changes or modifications to the equipment and processes approved by this AO that could affect the emissions covered by this AO must be approved in accordance with R307-401-1, UAC.

6. Utah American Energy, Inc. shall notify the executive secretary in writing when the installation of the equipment listed in Condition #5 has been completed and is operational,

as an initial compliance inspection is required. To insure proper credit when notifying the executive secretary, send your correspondence to the executive secretary, attn: Compliance Section.

If construction and/or installation has not been completed within eighteen months from the date of this AO, the executive secretary shall be notified in writing on the status of the construction and/or installation. At that time, the executive secretary shall require documentation of the continuous construction and/or installation of the operation and may revoke the AO in accordance with R307-401-11, UAC.

7. Visible emissions from the following emission points shall not exceed the following values:

   A. Enclosed crusher exhaust - 20% opacity
   B. All conveyor transfer points - 20% opacity
   C. All diesel engines - 20% opacity
   D. Conveyor drop points - 20% opacity
   E. All other points - 20% opacity

   Opacity observations of emissions from stationary sources shall be conducted according to 40 CFR 60, Appendix A, Method 9.

8. The following production and consumption limits shall not be exceeded without prior approval in accordance with R307-401, UAC:

   A. 1,500,000 tons of coal per rolling 12-month period
   B. 63,000 gallons of diesel fuel per rolling 12-month period

   Compliance with the annual limitations shall be determined on a rolling 12-month total. The owner/operator shall calculate a new 12-month total by the twentieth day of each month using data from the previous 12 months. Records of consumption/production shall be kept for all periods when the plant is in operation. Records of consumption/production, including rolling 12-month totals, shall be made available to the executive secretary or executive secretary's representative upon request and the records shall include the two-year period prior to the date of the request. Production/Consumption shall be determined by examination of company coal sales records and examination of company fuel purchase records. The records of consumption/production shall be kept on a daily basis.

Roads and Fugitive Dust

9. All unpaved roads and other unpaved operational areas that are used by mobile equipment shall be water sprayed and/or chemically treated to control fugitive dust. The application of water or chemical treatment shall be used. Treatment shall be of sufficient frequency and quantity to maintain the surface material in a damp/moist condition. The opacity shall not exceed 20% during all times the areas are in use or

unless it is below freezing. Records of water and chemical treatment shall be kept for all periods when the plant is in operation. The records shall include the following items:

A. Date
B. Number of treatments made, dilution ratio, and quantity
C. Rainfall received, if any, and approximate amount
D. Time of day treatments were made

Records of treatment shall be made available to the executive secretary upon request and shall include a period of two years ending with the date of the request.

10. The haul road limitations shall be:

A. 0.68 miles in length of paved road
B. 25 miles per hour

These limitations shall not be exceeded without prior approval in accordance with R307-401, UAC. The haul road speed shall be posted.

11. Control of disturbed or stripped areas is required at all times (24-hours per day every day) for the duration of the project/operation until the area is reclaimed. Records of treatment and/or reclamation shall be kept for all periods when the plant is in operation. Records of treatment and/or reclamation shall be made available to the executive secretary or executive secretary's representative upon request and the records shall include the two-year period prior to the date of the request.

12. Visible fugitive dust emissions from haul-road traffic and mobile equipment in operational areas shall not exceed 20% opacity. Visible emissions determinations for traffic sources shall use procedures similar to Method 9. The normal requirement for observations to be made at 15-second intervals over a six-minute period, however, shall not apply. Six points, distributed along the length of the haul road or in the operational area, shall be chosen by the executive secretary or the executive secretary's representative. An opacity reading shall be made at each point when a vehicle passes the selected points. Opacity readings shall be made ½ vehicle length or greater behind the vehicle and at approximately ½ the height of the vehicle or greater. The accumulated six readings shall be averaged for the compliance value.

13. The 0.68 miles of haul road shall be paved and shall be periodically swept or sprayed clean as dry conditions warrant or as determined necessary by the executive secretary. Records of cleaning paved roads shall be made available to the executive secretary or the executive secretary's representative upon request. The records shall include the two-year period prior to the date of the request.

14. Water sprays or chemical dust suppression sprays shall be installed at the following points to control fugitive emissions:

A. Enclosed crusher exhaust
B. All conveyor transfer points

The sprays shall operate whenever dry conditions warrant or as determined necessary by the executive secretary. Water sprays are not required during freezing weather conditions.

15. The moisture content of the material passing a #40 U.S. Standard Sieve shall be maintained at a minimum of 4.0% by weight. The moisture content shall be tested if directed by the executive secretary using the appropriate American Society of Testing and Methods (ASTM) method.

16. The storage piles shall be watered to minimize generation of fugitive dusts, as dry conditions warrant or as determined necessary by the executive secretary. Records of water and/or chemical treatment shall be kept for all periods when the plant is in operation. Records of water and/or chemical treatment shall be made available to the executive secretary or executive secretary's representative upon request and the records shall include the two-year period prior to the date of the request.

17. The coal fines content of the stored coal shall not exceed 5.1% by weight and that of the haul roads and pile area shall not exceed 10% by weight without prior approval in accordance with R307-401, UAC. The coal fines content shall be determined if directed by the executive secretary using the appropriate ASTM method. The coal fines content is defined as all material passing a #200 U. S. Standard Sieve.

Fuels

18. The owner/operator shall use only #2 fuel oil as a primary fuel. If any other fuel is to be used, an AO shall be required in accordance with R307-401, UAC.

19. The sulfur content of any fuel oil or diesel burned shall not exceed 0.5 percent by weight. Sulfur content shall be decided by ASTM Method D2880-71 or D-4294-89, or approved equivalent. The sulfur content shall be tested if directed by the executive secretary. The percent by weight of the sulfur contained in the fuel can be obtained from the fuel oil certifications. Certification of fuels shall be either by Utah American Energy, Inc. own testing or test reports from the fuel marketer. Records of fuel supplier's test report on sulfur content shall be available on-site for each load delivered.

Federal Limitations and Requirements

20. In addition to the requirements of this AO, all applicable provisions of 40 CFR 60, New Source Performance Standards (NSPS)[1] Subpart A, 40 CFR 60.1 to 60.18 and Subpart Y, 40 CFR 60.250 to 60.254 (Standards of Performance for Coal Preparation Plants) apply to this installation. The facility must operate in accordance with the most current version of 40 CFR 60 applicable to this plant.

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[1] NSPS = New Source Performance Standards.

21. For sources that are subject to NSPS, opacity standards shall be determined by conducting observations in accordance with 40 CFR 60.11(b) and 40 CFR 60, Appendix A, Method 9. For purposes of determining initial compliance, the minimum total time of observations shall be three hours (thirty six-minute averages) for the performance test or other set of observations (meaning those fugitive-type emission sources subject only to an opacity standard). It is the responsibility of the owner/operator of the source to supply these observations to the executive secretary. A currently certified observer must be used for these observations. Emission points that are subject to the initial observations are:

    A. Enclosed crusher exhaust
    B. Coal processing and conveying equipment
    C. Coal storage systems
    D. Coal transfer and loading systems
    E. All conveyor transfer points

Records & Miscellaneous

22. All installations and facilities authorized by this AO shall be adequately and properly maintained. All pollution control equipment approved by this AO shall be installed, maintained, and operated according to standard operating practices that will ensure that the air quality limits set forth in this AO will be met. Instructions from the vendor or established maintenance practices that maximize pollution control shall be used. All maintenance performed on equipment authorized by this AO shall be recorded, and the records shall be maintained for a period of two years.. All necessary equipment control and operating devices, such as pressure gauges, amp meters, volt meters, flow-rate indicators, temperature gauges, CEMS, etc., shall be installed and operated properly and easily accessible to compliance inspectors. A copy of all the manufacturers' and company's own subsequent operating instructions for pollution control equipment and pollution emitting equipment shall be kept on site. These instructions shall be available to all employees who operate the equipment and shall be made available to compliance inspectors upon their request. Maintenance records shall be made available to the executive secretary or executive secretary's representative upon request, and the records shall include the two-year period prior to the date of the request.

23. The owner/operator shall comply with UAC, R307-150 Series. Inventories, Testing and Monitoring. This rule addresses regulated pollutant and hazardous air pollutant emission inventory reporting requirements, and emission statement inventory requirements. Each owner or operator of a stationary source subject to the emission statement inventory (R307-150-1) rule shall maintain for a period of five years from the due date of each emission statement, a copy of the emission statement submitted to the Division of Air Quality and records indicating how the information submitted in the emission statement was determined, including any calculations, data, measurements, and estimates used.

    The full text of UAC R307-150 Series, Inventories, Testing and Monitoring is included as Appendix A. However, to be in compliance, this facility must operate in accordance with the most current version of R307-150 or the applicable section(s), if renumbered.

24. The owner/operator shall comply with R307-107, UAC. This rule addresses unavoidable breakdown reporting requirements. Any breakdown lasting longer than two hours shall be reported to the executive secretary within three hours of the breakdown if reasonable, but in no case longer than 18 hours after the beginning of the breakdown. During times other than normal office hours, breakdowns for any period longer than two hours shall be initially reported to the Environmental Health Emergency Response Coordinator. Within seven calendar days of the beginning of any breakdown lasting longer than two hours, a written report shall be submitted to the executive secretary. The owner/operator shall calculate/estimate the excess emissions (amount above AO limits) whenever a breakdown occurs. The total of excess emissions per calendar year shall be reported to the executive secretary with the inventory submittal, or as directed by the executive secretary. The owner or operator of an installation suffering an unavoidable breakdown shall assure that emission limitations and visible emission limitations are exceeded for only as short a period of time as reasonable. The owner or operator shall take all reasonable measures which may include but are not limited to the immediate curtailment of production, of operations, or activities at all installations of the source if necessary to limit the total aggregate emissions from the source to be no greater than the aggregate allowable emissions averaged over the periods provided in the source's AOs.

All records referenced in this AO or in applicable NSPS, which are required to be kept by the owner/operator, shall be made available to the executive secretary or executive secretary's representative upon request, and the records shall include the two-year period prior to the date of the request. All records shall be kept for a period of two years. A summary of those records that are required as part of this AO is included herein. This summary shall not be considered an additional requirement, but is included for informational purposes only. The condition that requires that these records be kept as part of the compliance with this AO is listed following the individual record. Examples of records to be kept at this source shall include the following as applicable:

Operator training	(Condition number 4)
Consumption/production rate	(Condition number 8)
Water treatment	(Condition number 9, 11 & 16)
Fugitive emission control	(Condition number 13)
Sulfur content in diesel fuel	(Condition number 19)
Maintenance records	(Condition number 22)
Emission inventory	(Condition number 23)
Upset, breakdown episodes	(Condition number 24)

The list above may not be a complete list of all records that are required to be kept by Utah American Energy, Inc. For a complete list of required records check all AO conditions, and all applicable Federal regulations such as NSPS standards that apply to this source.

Any future modifications to the equipment approved by this order must also be approved in accordance with R307-401, UAC.

The executive secretary shall be notified in writing if the company is sold or changes its name. The notification shall be submitted within 30 days of such action.

Under R307-150-1, UAC, The executive secretary may require a source to submit an emission inventory for any full or partial year on reasonable notice.

This AO in no way releases the owner or operator from any liability for compliance with all other applicable federal, state, and local regulations including UAC R307.

A copy of the rules, regulations and/or attachments addressed in this AO may be obtained by contacting the Division of Air Quality. The Utah Administrative Code R307 rules used by DAQ, the Notice of Intent (NOI) guide, and other air quality documents and forms may also be obtained on the Internet at the following web site: http://www.eq.state.ut.us/eqair/aq_home.htm

Annual emissions for this source (the entire plant) are currently calculated at the following values:

	Pollutant	Tons/yr
A.	TSP	12.95
B.	PM_{10}	4.97
C.	SO_2	1.28
D.	NO_x	19.39
E.	CO	4.18
F.	VOC	1.58

The annual emission estimations above are for the purpose of determining the applicability of Prevention of Significant Deterioration, nonattainment area, maintenance area, and Title V source requirements of the UAC R307. They are not to be used for purposes of determining compliance.

Approved By:

Ursula K. Trueman

Ursula K. Trueman, Executive Secretary
Utah Air Quality Board

Appendix A

Utah American Energy, Inc.
Lila Canyon Coal Mine

R307-150. Emission Inventories.
R307-150-1. General Applicability.
(1) The following sources shall submit an emission inventory report:
(a) any Part 70 source;
(b) any source that emits or is allowed under R307 to emit 100 ton per year or more of any regulated air pollutant;
© any source located in Davis, Salt Lake, Utah or Weber County that emits or is allowed under R307 to emit 25 tons per year or more of a combination of PM10, sulfur oxides, or oxides of nitrogen;
(d) any source located in Davis, Salt Lake, Utah or Weber County that emits or is allowed under R307 to emit 10 tons per year or more of volatile organic compounds;
(e) any source that emits or is allowed under R307 to emit 5 tons per year or more of lead;
(f) any source that emits or is allowed under R307 to emit 10 tons or more per year of ammonia;
(g) any source that is allowed under R307 to emit between 90 and 100 tons per year of any regulated air pollutant;
(h) any source that the executive secretary requires to submit an inventory for any full or partial year on reasonable notice.

R307-155. Hazardous Air Pollutant Inventory.
R307-155-1. General Applicability.

(1) The owner or operator of a Part 70 stationary source, either "major source" or "area source" as defined in the Clean Air Act Section 112 (42 U.S.C. 7412), that emits one or more hazardous air pollutants shall submit a hazardous air pollutant inventory.
(2) The owner or operator of a source which is not a Part 70 stationary source or a "major source" as defined in the Clean Air Act Section 112 (42 U.S.C. 7412) that emits one or more hazardous air pollutants shall submit a hazardous air pollutant inventory at the request of the executive secretary but not more often than once per year.
(3) Inventory data is not required for each hazardous air pollutant that has a threshold limit value and is emitted in an amount less than the smaller of the following:
(a) 500 pounds per year; or
(b) an annual emission level calculated to be the applicable threshold limit value - time weighted average (TLV-TWA) expressed in milligrams per cubic meter, or the threshold limit value - ceiling (TLV-C) expressed in milligrams per cubic meter multiplied by the appropriate emission threshold factor in cubic meter pounds per milligram year in Table 1 below.

TABLE 1

CONTAMINANT	FACTOR (in cubic meter pounds per milligram year)
Arsenic	21.22
Benzene	21.22
Beryllium	21.22
Ethylene oxide	21.22
Formaldehyde	15.81
All other acute hazardous air pollutants	15.81
All other chronic hazardous air pollutants	21.22
All other carcinogenic hazardous air pollutants	7.07

Michael O. Leavitt
Governor
Kathleen Clarke
Executive Director
Lowell P. Braxton
Division Director

State of Utah

DEPARTMENT OF NATURAL RESOURCES
DIVISION OF OIL, GAS AND MINING

1594 West North Temple, Suite 1210
PO Box 145801
Salt Lake City, Utah 84114-5801
801-538-5340
801-359-3940 (Fax)
801-538-7223 (TDD)

January 8, 2002

TO: Internal File

FROM: Daron R. Haddock, Permit Supervisor

RE: Response to Board Order, Finding that the Lila Canyon extension to the Horse Canyon Mine is processed as a new permit, UtahAmerican Energy, Inc., C/007/013, Internal File

SUMMARY:

The application for permitting the Lila Canyon facilities and federal lease was originally categorized as a Significant Revision. On December 14, 2001 the Board of Oil, Gas and Mining directed the Division to process the application as a new permit in accordance with R645-303-222. The following discussion documents the process used in permitting the Lila Canyon extension to the Horse Canyon Mine.

POLICY:

The current unwritten policy of the Division is to process extensions to an existing permit, other than incidental boundary changes, in the same manner as an application for a new permit. Rather than issue a new permit number and a second or third permit each time a new lease is added, the Division has chosen to revise or reissue the existing permit to include the extended permit area.

ANALYSIS AND FINDINGS:

Analysis #1:

R645-303-222 states that, "extensions to the approved permit area, except for Incidental Boundary Changes, must be processed and approved through application for a new permit and may not be approved under R645-303-221 through R645-303-228."

The application to add the Lila Canyon surface facilities and the associated federal lease to the Horse Canyon Mine will extend the permit area by 4704.34 Acres. Because this is an extension of an approved permit area it must be processed and approved as a new permit. This does not mean that the application needs to be assigned a new permit number or that an extension has to be separated from an existing permit. The very wording of the above regulation makes it clear that extensions to an already approved permit area are allowed and that changes to existing permits are contemplated. Indeed this very rule is found in the Utah regulations under the heading of "Permit Changes" (R645-220). It is clear that the Horse Canyon permit can be extended. It is also clear that extensions to approved permit areas must be accomplished under the same process as an application for a new permit. Emphasis should be placed on the process that is used and not on how the application is named.

Finding #1:

Changes to the Horse Canyon Mine permit are allowed under the R645 regulations. The Lila Canyon extension to the Horse Canyon Mine must be approved using the same process as an application for a new mine.

Analysis #2:

The administrative procedures for coal mine permitting are found at R645-300. This section sets forth the process which must be followed in order to issue a new permit. The specific requirements are discussed below.

Public Participation: R645-300-120

The first requirement after submitting an administratively complete application is to provide for public participation. The applicant must place an advertisement in a local newspaper of general circulation at least once a week for four consecutive weeks. The advertisement will contain 1) the name and business address of the applicant, 2) a description of the location and boundaries of the proposed permit area, 3) the location of where a copy of the application is available for public inspection, 4) the address of the Division where written comments, objections, or requests for informal conferences may be submitted, 5) a description of activity within 100 feet of the outside right-of-way of a public road.

The applicant, Utah American Energy Inc. placed an advertisement in the Sun Advocate on March 4, 11, 18, and 25 in 1999 and in the Emery County Progress on March 9, 16, 23, and 30 in 1999. It contained all of the necessary information required under R645-300.121. Utah American Energy Inc. also placed a copy of the application with the recorder at both the Carbon County courthouse and the Emery County courthouse as required by R645-300-121.200. The Division also notified local, state, and federal governmental agencies of Utah American Energy

Inc.'s intention to conduct coal mining and reclamation activities and solicited their input as required by R645-300-121.300.

Comments and Objections on Permit Application: R645-300-122

Written comments or objections to a permit application must be submitted to the Division within 30 days of the date of the last newspaper publication.

Only one comment from the public was received in the form of a letter of comment from a surface landowner, Josiah Eardley. His letter expressed concerns about potential for water loss on his property. The Division responded to Mr. Eardley's concern in a letter dated April 7, 1999. No other public comment was received and no request for a conference was received.

Informal Conferences: R645-300-123

Requests for informal conferences will be filed with the Division no later than 30 days after the last publication of the newspaper advertisement.

No request for an informal conference was made.

Public Availability of Permit Application: R645-124

Except for certain confidential information, all applications will be made available, at reasonable times, for public inspection and copying.

The Utah American Energy Inc. application was available for inspection and copying throughout the permitting process at the Division's Salt Lake City and Price offices. It was also available at the Carbon County and Emery County Recorders offices.

Review of Permit Application: R645-300-130

The Division will review permit applications according to the schedule outlined in this section of the regulations. The review will not exceed 120 days for significant revisions, 60 days for amendments, 120 days for permit renewals, and one year for new underground mine applications. Time is counted as cumulative days of Division review and does not include operator response time or delays attributed to conferences or hearings. The Utah American Energy Inc. application was reviewed well beyond the time allowed for significant revisions and was reviewed in line with the time allotted for new permit applications.

Review of Compliance: R645-300-132

The Division will make a finding that neither the applicant, nor any person who owns or controls the applicant, nor any person owned or controlled by the applicant is currently in

violation of any law, rule, or regulation referred to in this section. This determination is done through a check of the OSM Applicant Violator System. The Division completed this check on July 26, 2001 and a specific finding was written by Pam Grubaugh-Littig, Permit Supervisor, UCP, indicating that there were no outstanding violations blocking permit issuance. Another review was completed on January 9, 2002 with a resultant issue recommendation.

Written Findings for Permit Approval: R645-300-133

In order for a permit to be approved, specific written findings must be made that satisfy this section of the regulations. For the Utah American Energy Inc. application these findings were made and are included as part of the decision document. These written findings have been revised and are repeated below.

1. All procedures for public participation required by the Act, and the approved Utah State Program have been complied with. See Affidavit of Publication in Appendix 1-5 of PAP. (R645-300-120)

2. The permit application for the extraction of coal from federal leases SL-066145, SL-066490, U-014218, U-0126947, SL-069291, U-014217 using new surface facilities at Lila Canyon is accurate and complete and all requirements of the Surface Mining Control and Reclamation Act, and the approved Utah State Program (the "Act") have been complied with. See Technical Analysis dated July 19, 2001 and updated on January 9, 2002 to meet Board Order. (R645-300-133.100)

3. The proposed lands to be included within the permit area are:

   a. Not included within an area designated unsuitable for underground coal mining operations (R645-300-133.220); A small portion of the proposed permit area addition overlaps with the Turtle Canyon Wilderness Study Area. The BLM's 1993 Environmental Assessment (EA) prepared for management of the Turtle Canyon Wilderness Study Area, states that underground mining would be acceptable in this area. Also see TA dated July 19, 2001 and updated on January 9, 2002 to meet Board Order.

   b. not within an area under study for designated land unsuitable for underground coal mining operations (R645-300-133.210); The BLM's 1999 Utah Wilderness Inventory identifies the Desolation Canyon Wilderness Inventory Unit and the Turtle Canyon Inventory Unit as having wilderness characteristics, however, the BLM plan for this area has not changed to date. See TA dated July 19, 2001 and updated on January 9, 2002 to meet Board Order.

   c. not on any lands subject to the prohibitions or limitation of 30 CFR 761.11 {a} (national parks, etc), 761.11 {f} (public buildings, etc.) and 761.11 {g} (cemeteries);

   d. not within 100 feet of a public road except where the Lila Canyon road abuts the surface facilities area of the proposed mine In this case the permittee has obtained permission from the road authority for conducting mining activity within 100 feet of the road. (R645-300-133.220) See July 18, 2001 Analysis and Findings on the Lila Canyon Road; and

   e. not within 300 feet of any occupied dwelling (R645-300-133.220).

4. The applicant has the legal right to enter and complete mining activities in the Lila Canyon area through the federal coal leases and a right-of way issued by the Bureau of Land Management. (See September 7, 2001 letter to Lowell Braxton verifying that the leases are assigned to UEI and ROW dated July 27, 2001). (R645-300-133.300)

5. An assessment of the probable cumulative impacts of all anticipated coal mining and reclamation activities in the general area on the hydrologic balance has been conducted by the Division and no significant impacts were identified. See CHIA dated July 19, 2001. The Mining and Reclamation Plan

(MRP) proposed under the revised application has been designed to prevent damage to the hydrologic balance in the permit area and in associated off-site areas. (R645-300-133.400 and UCA 40-10-11 (2)(c))

6. The operation would not affect the continued existence of any threatened or endangered species or result in the destruction or adverse modification of their critical habitats as determined under the Endangered Species Act of 1973. The original Section 7 consultation with the Fish and Wildlife Service (letter dated April 28 2000) stated that no species-specific protective measures are considered necessary for the project, however recent correspondence (letter dated July 18, 2001) identified the possibility of spotted owl habitat within the permit area. To protect the spotted owl the following stipulation has been added to the permit: Prior to any surface disturbing activities, the Permittee must have a qualified person determine whether the proposed addition to the permit area contains suitable habitat for the Mexican spotted owl. Depending on the results of this evaluation, the Permittee will modify the mining and reclamation plan in accordance with requirements of the USFWS. An alternative to this action is to limit all coal mining and reclamation activities to time periods outside the breeding season, March 1 to August 31. (16 USC 1531 et seq.) (R645-300-133.500)

7. The Division's issuance of a permit is in compliance with the National Historic Preservation Act and implementing regulations (36 CFR 800). See Technical Analysis dated July 19, 2001 and updated on January 9, 2002 to meet Board Order. (R645-300-133.600)

8. The applicant proposes acceptable practices for the reclamation of disturbed lands. The Division has determined that reclamation, as required by the Act can be feasiblely accomplished following the approved plan as outlined in the PAP. See Technical Analysis dated July 19, 2001 and updated on January 9, 2002 to meet Board Order. (R645-300-133.710)

9. The applicant has demonstrated that all mine facilities and structures will comply with the applicable performance standards of R645-301. No special categories of mining are proposed so the R645-302 regulations do not apply. The Lila Canyon facilities will be newly constructed and will not utilize any existing structures. (R645-300-133.720, R645-300-133.740)

10. A 510 (c) report has been run on the Applicant Violator System (AVS), which shows that: prior violations of applicable laws and regulations have been corrected; neither UtahAmerican Energy, Inc. or any affiliated company, are delinquent in payment of fees for the Abandoned Mine Reclamation Fund; and the applicant does not control and has not controlled mining operations with demonstrated pattern of willful violations of the Act of such nature, duration, and with such resulting irreparable damage to the environment as to indicate an intent not to comply with the provisions of the Act. (See 510 (c) reports dated July 26, 2001 and January 9, 2002) (R645-300-133.730)

11. The proposed postmining land-use of the permit area will remain the same as the pre-mining land use.(R645-300-133.750)

12. The applicant has posted a surety bond for the Horse Canyon Mine which includes the Lila Canyon facilities in the amount of $2,809,000, payable to the Office of Surface Mining as well as the Utah Division of Oil Gas and Mining. (R645-300-134)

13. No lands designated as prime farmlands or alluvial valley floors occur on the permit area. See Technical Analysis dated July 19, 2001 and updated on January 9, 2002 to meet Board Order (R645-302-313.100 and R645-302-321.100)

14. The Division has made all specific approvals required by the Act, the Cooperative Agreement, and the Federal Lands Program.

The applicant has submitted a complete and accurate application and has complied with all the requirements of the State program.

Performance Bond Submittal: R645-300-134

If the Division decides to approve the application, it will require that the applicant file a performance bond or provide other equivalent guarantee before the permit is issued, in accordance with the provisions of R645-301-800.

Utah American Energy Inc. posted a reclamation bond in the amount of $2,809,000 which is the appropriate amount determined by the Division.

Permit Conditions: R645-300-140

This section spells out the conditions that must be part of each permit issued by the Division. Each of the permits issued by the Division contain this standard language.

The permit the Division issued to Utah American Energy Inc. on July 26, 2001 contains all of the standard conditions found in this section of the regulations.

Permit Term R645-300-153

Each permit will be issued for a fixed term of five years or less. The Horse Canyon permit, which included the Lila Canyon extension, was issued effective July 27, 2001 and expires on May 6, 2006.

The permit term is consistent with the requirements of the regulations.

Finding #2:

The Utah American Energy Inc. application to add the Lila Canyon facilities and federal lease to the Horse Canyon Permit was processed under all of the regulations as analyzed above, required for new permitting actions.

CONCLUSION:

R645-303-122 has been satisfied and the Board Order has been met. The Lila Canyon extension to the Horse Canyon Mine is processed as a new permit.

Appendix 3-2

Vegetation Study South Lease Area
Kaiser Steel

Chapter IX Vegetation Resources

9.0 Table of Contents

		Page
9.0	Table of Contents	
9.1	Scope	6
9.2	Methodology	7
9.3	Existing Resources	11
	9.3.1 General Site Description	11
	9.3.2 Vegetation Types:	13
	9.3.2.1 Cover Data	
	9.3.2.2 Production Data	
	9.3.2.3 Tree Data	
	9.3.2.4 General Description	
	9.3.2.5 Species List	
9.9	Bibliography	105

		Page
Table IX-1	Sampling Intensities for Measured Vegetation Parameters. South Lease, Utah. June-September 1981.	10
Table IX-2	Comprehensive Species List for the *Atriplex-Artemisia-Hilaria* Vegetation Type. South Lease, Utah. June-August 1981.	16-17
Table IX-3	Percent Cover and Constancy by Species for the *Atriplex-Artemisia-Hilaria* Vegetation Type. South Lease, Utah. July 1981.	18
Table IX-4	Vegetation Cover by Life Form 0.25 m^2 quadrats, *Atriplex-Artemisia-Hilaria* Vegetation Type. South Lease, Utah. July 1981.	20
Table IX-5	Shrub Stem Density by Species for the *Atriplex-Artemisia-Hilaria* Vegetation Type. South Lease, Utah. August 1981.	21
Table IX-6	Annual Primary Production by Life Form as Estimated through double-sampling. South Lease, Utah. September 1981.	22
Table IX-7	Vegetation Cover by Life Form from 0.25 m^2 quadrats. *Atriplex-Astragalus* Vegetation Type. South Lease, Utah. July 1981.	25
Table IX-8	Shrub Stem Density by Species for the *Atriplex-Astragalus* Vegetation Type. South Lease, Utah. July 1981.	26
Table IX-9	Comprehensive Species List for the *Atriplex-Astragalus* Vegetation Type. South Lease, Utah. June-August 1981.	28-29
Table IX-10	Percent Cover and Constancy by Species for the Saltbush-Milkvetch Vegetation Type. South Lease, Utah. July 1981.	30
Table IX-11	Vegetation Cover by Life Form from 0.25 m^2 quadrats, *Atriplex*-Badland Vegetation Type. South Lease, Utah, June 1981.	33
Table IX-12	Shrub Stem Density by Species for the *Atriplex*-Badland Vegetation Type. South Lease, Utah. July 1981.	34
Table IX-13	Percent Cover and Constancy by Species for the Saltbush-Badland Vegetation Type. South Lease, Utah. July 1981.	35
Table IX-14	Comprehensive Species List for the *Atriplex*-Badland Vegetation Type. South Lease, Utah. June-August 1981.	36
Table IX-15	Vegetation Cover by Life Form from 0.25 m^2 quadrats, *Juniperus* Savannah Vegetation Type. South Lease, Utah. July 1981.	40
Table IX-16	Vegetation Cover from 60 m line-intercept transect. *Juniperus* Savannah Vegetation Type. South Lease, Utah. July 1981.	41
Table IX-17	Shrub Stem Density by Species for the *Juniperus* Savannah Vegetation Type. South Lease, Utah. July 1981.	42

9.0 Cont.

		Page
Table IX-18	Tree Densities for the *Juniperus* Savannah Vegetation Type South Lease, Utah. July, 1981.	43
Table IX-19	Tree Basal area by Species for the *Juniperus* Savannah Vegetation Type. South Lease, Utah. July, 1981.	44
Table IX-20	Vegetation Cover by Life Form from 30 m point-line transects for the *Juniperus* Savannah Vegetation Type. South Lease, Utah. July, 1981.	46
Table IX-21	Percent Cover and Constancy by Species for the *Juniperus* Savannah Vegetation Type. South Lease, Utah. July, 1981.	47
Table IX-22	Comprehensive Species list for the Pinyon-Juniper Savannah Vegetation Type. South Lease, Utah. June-August, 1981.	48-49
Table IX-23	Vegetation Cover by Life Form from 0.25 m^2 quadrats, Pinyon-Juniper Cliffbottom Vegetation Type. South Lease, Utah. July, 1981.	52
Table IX-24	Shrub and Tree Cover from 30 m line-intercept transects. Pinyon-Juniper Cliffbottom Vegetation Type. South Lease, Utah. July, 1981.	53
Table IX-25	Vegetation Cover by Life Form from 30 m point-line transects Pinyon-Juniper Cliffbottom Vegetation Type. South Lease, Utah. August, 1981.	54
Table IX-26	Tree and Shrub Density by Species from the Pinyon-Juniper Cliffbottom Vegetation Type. South Lease, Utah. August, 1981.	56
Table IX-27	Tree Basal Area from the Pinyon-Juniper Cliffbottom Vegetation Type. South Lease, Utah. August, 1981.	57
Table IX-28	Seedling Density by Species from the Pinyon-Juniper Cliffbottom Vegetation Type. South Lease, Utah. July, 1981.	58
Table IX-28a	Percent Cover and Constancy by Species for the Pinyon-Juniper Cliffbottom Vegetation Type. South Lease, Utah. July, 1981.	59-60
Table IX-29	Comprehensive Species list of the Pinyon-Juniper Cliffbottom Vegetation Type. South Lease, Utah. June-August, 1981.	61-62
Table IX-30	Comprehensive Species List for the Pinyon-Juniper Clifftop Vegetation Type. South Lease, Utah. June-August, 1981.	65-66
Table IX-31	Shrub Stem Densities, Pinyon-Juniper Clifftop Vegetation Type. South Lease, Utah. July, 1981.	67
Table IX-32	Tree Densities, Pinyon-Juniper Clifftop Vegetation Type. South Lease, Utah. July-August, 1981.	68

9.0 Cont.

		Page
Table IX-33	Vegetation Cover by Life Form from o.25 m^2 quadrats, Pinyon-Juniper Clifftop Vegetation Type. South Lease, Utah. July, 1981.	69
Table IX-34	Shrub and Tree Cover from 30 m line-intercept transect, Pinyon-Juniper Clifftop Vegetation Type. South Lease, Utah. July, 1981.	70
Table IX-35	Vegetation Cover by Life Form from 30 m point-line transect, Pinyon-Juniper Clifftop Vegetation Type. South Lease, Utah. July, 1981.	71
Table IX-36	Percent Cover and Constancy by Species for the Pinyon-Juniper Clifftop Vegetation Type. South Lease, Utah. July, 1981.	72-74
Table IX-37	Tree Basal Area, Pinyon-Juniper Clifftop Vegetation Type. South Lease, Utah. July-August, 1981.	76
Table IX-38	Comprehensive Species list for the Sagebrush Vegetation Type. South Lease, Utah. June-August, 1981.	79-80
Table IX-39	Vegetation Cover by Life Form from 0.25 m^2 quadrats, Sagebrush Vegetation Type. South Lease, Utah. July, 1981.	81
Table IX-40	Shrub and Tree Cover from 50 m line-intercept transect, Sagebrush Vegetation Type. South Lease, Utah. June, 1981.	82
Table IX-41	Vegetation Cover by Life Form from 30 m point-line transects, Sagebrush Vegetation Type. South Lease, Utah. August, 1981.	83
Table IX-42	Percent Cover and Constancy by Species for the Sagebrush Vegetation Type. South Lease, Utah. July, 1981.	84-85
Table IX-43	Shrub Stem Density by Species for the Sagebrush Vegetation Type. South Lease, Utah. July, 1981.	86
Table IX-44	Importance of Revegetated Species as Forage.	98-100
Photograph IX-1	*Atriplex-Artemisia-Hilaria* Vegetation Type. September, 1981.	15
Photograph IX-2	*Atriplex-Astragalus* Vegetation Type. September, 1981.	24
Photograph IX-3	*Atriplex*-Badland Vegetation Type (close-up). South Lease, Utah. September, 1981.	32
Photograph IX-4	*Atriplex*-Badland Vegetation Type. South Lease, Utah. September, 1981.	32
Photograph IX-5	*Juniperus* Savannah Vegetation Type. South Lease, Utah. September, 1981.	39

9.0 Cont.

		Page
Photograph IX-6	Pinyon-Juniper Cliffbottom Vegetation Type. South Lease Utah. September, 1981.	51
Photograph IX-7	Pinyon-Juniper Clifftop Vegetation Type. South Lease, Utah. February, 1982.	64
Photograph IX-8	*Artemisia Tridextata* Vegetation Type. South Lease, Utah. February, 1982.	78
Photopraph IX-9	Transition Vegetation Type. September, 1981.	89

9.1 Scope

The objective of this study was to map and quantify the vegetation communities of the South Lease coal permit area. This report presents the information collected and is designed to satisfy the Utah Division of Oil, Gas and Mining (DOGM) and Office of Surface Mining (OSM) requirements.

The landscape of the South Lease permit area has been mapped to delineate the eight main vegetation communities present (Plate IX-1). The communities include:

1.	*Atriplex-Artemisia-Hilaria*	Saltbush-Sage-Galleta
2.	*Atriplex-Astragalus*	Saltbush-Milkvetch
3.	*Atriplex-* Badland	Saltbush-Badland
4.	*Juniperus* Savannah	Juniper Savannah
5.	*Pinus-Juniperus* Clifftop	Pinyon-Juniper Clifftop
6.	*Pinus-Juniperus* Cliffbottom	Pinyon-Juniper Cliffbottom
7.	*Artemisia tridentata*	Sagebrush
8.	Transition	

A cottonwood riparian type, small in extent, is found in the permit area adjacent to the developed stock water at the William's Draw Spring. No disturbance is scheduled near this spring.

Vegetation sampling was conducted from late June into September, 1982. All vegetation types scheduled for disturbance during this permit term were sampled. This information will be used as baseline data for evaluating reclamation success.

9.2 Methodology

Vegetation types were determined in the field by ocular reconnaissance and plotted on a 1:12000 topographic map, with the aid of color aerial photographs. Vegetation types were finalized on a 1:24000 topographic map and included all areas within and immediately adjacent to the permit area. The vegetation of planned disturbed areas was mapped on 1:4800 topographic maps (Plates IX-2 and IX-3).

The species list for each vegetation type was compiled from plants collected during reconnaissance and from plants collected during field measurements. All species were collected according to Harrington and Durrell (1957) and identified according to Welsh and Moore (1973) and Harrington (1964). Botanical nomenclature follows Welsh and Moore (1973). Difficult specimens were annotated by Dr. Stanley Welsh, Brigham Young University Herbarium, Provo, Utah. Some plants lacked structures needed for complete identification and were designated unknowns. The collected plants are retained in the Kaiser Steel Corporation Herbarium, Raton, New Mexico. All vegetation types were examined for threatened and endangered species according to Welsh (1977).

Vegetation measurements were collected from randomly located points determined from the Kaiser Steel Corporation mine coordinate grid; these points were stratified according to the vegetation type. From these random points, a random compass bearing and a random number of paces to be walked were selected to arrive at an unbiased sampling location.

Point-line transects to measure total first hit cover were laid out in all types with overstory cover. All transects were sampled on 0.5 meter intervals for the species first touched by a descending point. All transects were 30 meters long, unless vegetation distribution was very heterogeneous, then the length was extended.

9.2 Cont.

Herbaceous cover, by species, was estimated within a rectangular quadrat (Mueller-Dombois and Ellenberg, 1974). The 0.10 m^2 quadrat was used in the Sagebrush type, and a 0.25 m^2 in all others. Quadrats in all types were located randomly along 60 m line transects.

Tree and shrub cover, if present and over 12 inches in height, was measured along a 30, 50, or 60 m line-intercept transect. If less than 12 inches in height, trees and shrubs were included in herbaceous cover quadrat measurements. Different line lengths were used in different vegetation types to reduce between-stand variability. Thirty meter lines were appropriate in all types, except *Artemisia*, where a 50 m line was used and *Juniperus* Savannah, where a 60 m transect was necessary.

Shrub density for each species was measured by counting each shrub stem greater than 12 inches tall within either a 1 m^2, 0.02 ha, 0.04 ha, or 0.06 ha area. The 1 m^2 plot was used in the following communities: *Atriplex*-Badland, *Atriplex-Artemisia-Hilaria*, and *Atriplex-Astragalus*. The 0.02 ha was used in the Pinyon-Juniper Cliffbottom and Pinyon-Juniper Clifftop, the 0.06 ha in the *Juniperus* Savannah and the 0.04 ha in the Sagebrush. The plot size selected for use, best contained the between-stand variance.

Tree density was measured by the same technique used for shrub density, excluding the 1 m^2 plot size. Tree basal area was calculated from the basal stem diameter of all trees measured in the tree density plots. Tree seedling densities were counted to help determine population trends.

Productivity was measured by double sampling (Cook et al., 1974). The annual primary productivity, by lifeform for all vegetation types, was clipped in one 9.6 square foot quadrat for every five quadrats estimated. Clipped samples were air-

9.2 Cont.

dried for 5 days before weighing. Trees and perennial succulents were not clipped.

The sampling intensity was determined using the following formula which was recommended by DOGM (Mary Ann Wright, personal communication, 1981).

$$n_{min} = \frac{(t)^2 \quad (s^2)}{((.1)(\bar{x}))^2}$$

where n_{min} = the minimum number of samples,

t = two-tailed t-value with appropriate alpha level and degrees of freedom,

s^2 = sample variance,

$\bar{x}$ = sample mean.

Sampling intensity information is contained in Table IX-1.

All techniques were discussed with DOGM personnel and were found to be appropriate and acceptable.

9.2 Cont.

Table IX-1 Sampling intensities for measured vegetation parameters. South Lease, Utah. June-September 1981.

Vegetation Type	Parameter	$n_{sampled}$	n_{min}
Atriplex-Artemisia-Hilaria	Cover quadrats	180	75
	Shrub density	195	173
	Production	40	86
Atriplex-Astragalus	Cover quadrats	200	196
	Shrub density	180	116
	Production	40	32
Atriplex-Badland	Cover quadrats	200	150
	Shrub density	160	100
	Production	40	2
Juniperus-Savannah	Cover quadrats	200	190
	Point-lines	20	15
	Shrub density	22	20
	Line intercept	11	9
	Tree intercept	24	201
	Production	40	108
Pinus-Juniperus Clifftop	Cover quadrats	480	463
	Point-lines	12	10
	Shrub density	26	24
	Line intercept	29	26
	Tree density	32	30
	Production	40	120
Pinus-Juniperus Cliffbottom	Cover quadrats	280	277
	Point-lines	23	20
	Shrub density	32	29
	Line intercept	10	7
	Tree density	28	28
	Production	40	380
Artemisia tridentata	Cover quadrats	260	545
	Point-lines	15	13
	Shrub density	6	6
	Line intercepts	13	12
	Production	40	19

9.3 Existing Resources

The Mine Plan Area is found in the Major Land Resource Area (MLRA) (34) of the Central Desertic Basins, Mountains and Plateaus which is found in the Northern and Central Intermountain Desertic Basins Plant Growth Region. This Plant Growth Region is similar to that described by Thornburg and Fuchs (1978), but it has been adjusted to the MLRAs as defined by the SCS (Thornburg 1981). The proposed Mine Plan Area (MPA) is primarily on Federal and State owned properties which are currently being used for wildlife habitat, livestock grazing and recreation (Chapter IV), although the area is also used as access to coal, oil and gas exploration sites by various companies.

In the summer of 1981, a study of the MPA was begun in order to define the characteristics of the existing vegetation and soil resources. The information obtained from on-site study will be used both in reclamation planning as well as in the determination of final reclamation success.

9.3.1 General Site Description

The Mine Plan Area rises from an elevation of 5000 feet (1523 m) on Marsh Flat Wash and Grassy Wash to about 8200 feet (2498 m) on the peaks northeast of Little Park Wash. The permit area is geologically divided by the Book Cliffs into two life zones, or provinces, strikingly different in vegetation and soils: the Shadscale or *Atriplex* Zone or Province and the *Agropyron spicatum* Province represented by an *Artemisia tridentata* shrub steppe (Daubenmire 1978). The cliffs have a vertical rise of 800 to 1000 feet (244 to 305 m). Differences in the moisture regime is one of the primary factors responsible for the contrasts in soil and vegetation development.

The cliffs themselves are extremely rugged. Only small microsites such as crevices are vegetated, and then only sparsely. The face of the cliffs is traversed

9.3 Cont.

by a primitive trail, however this appears to be only infrequently used by wildlife.

Although site specific records are unavailable, pinyon-juniper woodlands usually develop in areas where effective annual precipitation is near 12 inches (30cm) (Cronquist et al., 1972). Pinyon-juniper is found as an edpahic climax on the thin, rocky soils above the cliffs where the precipitation is greater. Other pinyon-juniper communities are found below the cliffs on specific microsites. *Juniperus osteosperma* is the common juniper of the proposed permit area on dry sites, while *J. scopulorum* may be found along more moist ravines or on north facing slopes elsewhere in the MPA. Above the cliffs, a sagebrush-grass community is ecotonal on deeper soils adjacent to the pinyon-juniper community. *Artemisia tridentata* is commonly found on non-saline uplands adjacent to ephemeral channels (Branson et al., 1976) such as Little Park Wash which bisects the plateau above the cliffs.

The area below the cliffs is geologically and edaphically young in terms of development. The area is an actively eroding region, highly dissected by numerous rills, gullies and arroyos. Soils are minimally developed and are being formed from interbedded shales and sandstone of Cretaceous marine origin. Badlands of exposed Mancos Shale are common. The vegetation is dominated by species of *Atriplex* and other salt tolerant ecotypes, one of the most salt tolerant being *A. corrugata*. This species has an unusual capacity to remove soil water at very high osmotic stresses and is commonly dominant on marine derived shale sites (Branson et al., 1976).

9.3 Cont.

The location of the plant communities is strongly dictated by the soil types and erosion patterns. In general, the plant communities tend to reflect the macroclimate in their structural simplicity, as well as in specific adaptations to drought such as found in the species of *Atriplex, Opuntia, Ephedra* and others.

9.3.2 Vegetation Types

9.3.2.1 Cover Data

9.3.2.2 Production Data

9.3.2.3 Tree Data

9.3.2.4 General Description

9.3.2.5 Species List

The general descriptions of each vegetation type to be disturbed are presented in the following pages. Cover data, production data, species lists, and tree data are given, when appropriate, as Tables within each description. For easy reference, each Table is listed in the index under the specific subject heading.

9.3 Cont.

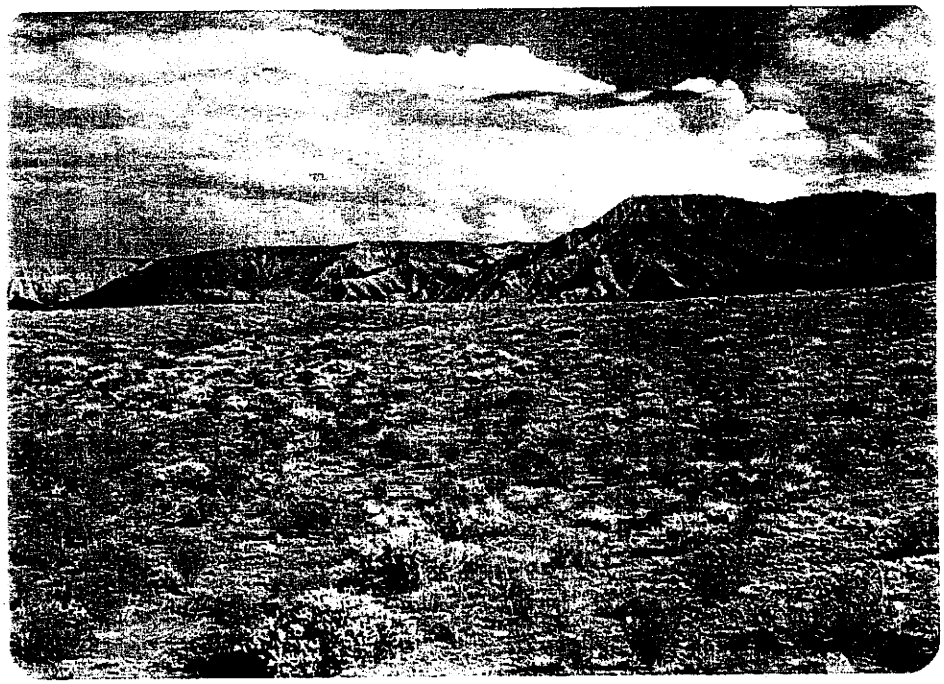
Atriplex-Artemesia-Hilaria

(Saltbush-Sagebrush-Galleta)

The *Atriplex-Artemisia-Hilaria* vegetation type is found from 5110 to 5230 feet (1567 to 1593 m) in elevation. Slopes vary from 1 to 3 percent. Aspect is typically south-facing (Photograph IX-1).

Stands occur on eroded BG loam, and eroded Ravola silt loam, saline soils. The BG soil averages greater than 60 inches (152 cm) in depth. Average surface layer (A1) thickness is one inch (2.5 cm) of loam, over 15 inches (38 cm) of loam subsoil (B2). Runoff is slow and erosion potential is moderate. The Ravola soil averages greater than 60 inches (152 cm) in depth. The surface layer (A1) averages 2 inches (5 cm) of silt loam atop C horizons to 60 inches (152 cm). Runoff is slow and erosion potential is moderate.

The *Atriplex-Artemisia-Hilaria* vegetation type displays some variability across different soils and aspects. To the west, near stock watering ponds where animals concentrate, broom snakeweed (*Xanthocephalum sarothrae*) is more prevalent. This is assumed to be the consequence of heavy livestock grazing. On the low eastern mesas where the rail loop is planned, broom snakeweed is a smaller part of the vegetation, and shadscale (*Atriplex confertifolia*) and bud sage (*Artemisia spinescens*) are the dominant shrubs. Galleta (*Hilaria jamesii*) is the dominant grass throughout, with sand dropseed (*Sporobolus cryptandrus*) common under light grazing pressure. Numerous annual and perennial forbs are present. Table IX-2 contains the species list for the *Atriplex-Artemisia-Hilaria* type. Cover and constancy information, by species, are included in Table IX-3.



Photograph IX-1 *Atriplex-Artemisia-Hilaria.* Vegetation Type. September 1981.

9.3 Cont.

Table IX-2. Comprehensive species list for the *Atriplex-Artemisia-Hilaria* vegetation type. South Lease, Utah. June-August 1981.

Shrubs

Artemisia spinescens	ARSP	Bud sagebrush
Atriplex confertifolia	ATCON	Shadscale
A. cuneata	ATCU	Castle Valley clover
Chrysothamnus viscidiflorus	CHVI	Low rabbitbrush
Ephedra viridis	EPVI	Green ephedra
Eurotia lanata	EULA	Winterfat
Sarcobatus vermiculatus	SAVE	Greasewood
Tetradymia spinosa	TESP	Cottonthorn horsebrush
Xanthocephalum sarothrae	XASA	Broom snakeweed

Forbs

Aster spp.	ASTER	
Astragalus asclepiadoides	ASAS	Milkweed milkvetch
Brassicaceae spp.	BRASS	Mustard
Cryptantha crassisepala	CRCR	Plains hiddenflower
C. spp.	CRYPT	
Echinocereus spp.	ECHIN	
Eriogonum gordonii	ERGO	
E. inflatum	ERIN	Desert trumpet eriogonum
Halogeton glomeratus	HAGL	Halogeton
Lappula spp.	LAPPU	
Lepidium montanum	LEMO	Mountain pepperweed
L. spp.	LEPID	Pepperweed
Lygodesmia spp.	LYGO	Skeleton plant
Machaeranthera canescens	MACA	Hoary aster
Opuntia spp.	OPUNT	Prickly pear cactus
Phacelia spp.	PHACE	
Plantago patagonica	PLPA	Wooly Plantain
Salsola kali	SAKA	Russian thistle
Sphaeralcea coccinea	SPCO	Scarlet globemallow
S. leptophylla	SPLE	
S. parvifolia	SPPA	

9.3 Cont.

Table IX-2 Cont.

Grasses

Bouteloua gracilis	BOGR	Blue grama
Bromus tectorum	BRTE	Cheatgrass brome
Hilaria jamesii	HIJA	Galleta
Oryzopsis hymenoides	ORHY	Indian rice grass
Sporobolus cryptandrus	SPCR	Sand dropseed
Vulpia octoflora	VUOC	Sixweeks fescue

Table VIII-3. Cont.

9.3 Cont.

Table IX-3. Percent Cover and Constancy by Species for the *Atriplex-Artemisia-Hilaria* Vegetation Type. South Lease, Utah. July 1981.

STAND NUMBER	1	2	3	4	5	6	7	8	9	CONSTANCY
STATE AND COUNTY	UT EMERY	UT EMERY	UT EMERY	UT EMERY	UT EMERY	UT EMERY	UT EMERY	UT EMERY	UT EMERY	%
GRID NUMBER	11	11	11	11	11	11	11	11	11	
ELEVATION IN FEET	5220	5200	5185	5220	5150	5200	5220	5230	5110	
ASPECT	NE	S	S	S	S	S	SW	S	S	
SLOPE IN PERCENT	2	1	1	2	3	3	3	3	1	
SOIL MAPPING UNIT	BGC2	BGC2	BGC2	BGC2	BGC2	BGC2	BGC2	BGC2	BGC2	
SHRUBS:										
Artemisia spinescens	0.10	3.84	•	.33	•	.74	.06	•	•	56
Atriplex confertifolia	•*	•	•	0.15	•	•	•	•	•	11
A. corrugata	•	•	0.01	•	4.25	•	•	•	3.73	33
A. cuneata	3.86	7.06	1.03	2.65	1.8	5.05	7.23	5.6	1.39	100
Chrysothamnus viscidiflorus	•	•	.04	•	•	•	•	•	0.20	22
Ephedra torreyana	•	•	•	•	•	.95	•	•	•	11
Sarcobatus vermiculatus	•	•	•	•	•	•	•	•	1.45	11
Tetradymia spinosa	•	•	•	•	.44	•	2.4	•	•	22
Xanthocephalum sarothrae	0.78	.18	1.28	0.65	+#	•	0.20	.01	1.11	89
Unknown shrub	•	•	•	•	.01	•	•	•	0.05	22
FORBS:										
Aster spp.	•	•	•	+	•	•	•	•	•	11
Astragalus asclepiadoides	•	•	•	•	.09	•	•	•	•	11
Brassicaceae spp.	0.02	•	•	.01	•	•	.01	•	.5	44
Cryptantha crassisepala	0.01	•	•	.14	•	•	0.40	•	•	33
C. spp.	•	•	•	.05	•	•	•	•	•	11
Echinocereus spp.	•	•	•	.02	•	•	•	•	•	11
Eriogonum gordonii	+#	•	•	•	•	•	.01	0.10	•	33
E. inflatum	•	•	•	•	•	•	.01	•	•	11
Halogeton glomeratus	•	•	•	•	•	.01	•	•	•	11
Lappula spp.	•	0.01	•	•	.02	.01	•	0.02	•	44
Lepidium montanum	0.05	•	•	•	•	•	•	•	•	11
L. spp.	0.04	0.19	•	0.63	.01	.26	+	1.23	•	78
Lygodesmia spp.	•	•	.02	•	•	•	•	•	•	11
Machaeranthera canescens	•	•	.28	•	•	•	•	•	•	11
Opuntia spp.	0.20	0.5	0.45	0.10	0.20	0.40	1.25	1.78	0.51	100
Phacelia spp.	•	+	•	•	•	•	•	•	•	11
Plantago patagonica	1.41	0.45	2.34	2.71	1.98	1.86	1.7	1.55	1.01	100
Salsola kali	•	•	•	•	•	•	+	•	•	11
Sphaeralcea coccinia	•	•	.01	•	•	•	•	•	•	11
S. leptophylla	•	•	.04	•	•	•	•	•	0.10	22
S. parvifolia	1.05	1.35	.01	0.46	•	.41	1.36	1.71	0.15	89
Unknown forb	•	•	•	•	•	•	+	•	0.01	22
GRASSES:										
Bouteloua gracilis	0.05	•	•	•	•	•	•	•	•	11
Bromus tectorum	+	0.02	•	•	.14	•	0.01	•	.21	56
Hilaria jamesii	2.41	13.36	3.8	2.49	.14	2.18	1.96	1.1	1.74	100
Oryzopsis hymenoides	•	•	0.02	•	0.01	•	•	•	0.04	33
Sporobolus airoides	•	•	•	•	•	•	.02	•	•	11
S. cryptandrus	.21	.43	•	0.66	•	2.79	.30	.58	•	67
Vulpia octoflora	.55	.34	0.01	0.16	.09	.09	.04	+	•	89

•* = Species not present
+# = Species found as a trace in plot or present outside plots

9.3 Cont.

The low mesa tops are currently the least disturbed portion of this vegetation type, and were chosen as most representative of the potential plant community. All sample stands are on these low mesas.

Total vegetation cover averages more than 12 percent. Grasses account for 21 percent, forbs for 25 percent and shrubs for 54 percent of the total vegetation cover. Cover for rock, bareground, litter and life forms from quadrat measurements are contained in Table IX-4. Shrub stem density figures are included in Table IX-5.

Annual primary production for 1981 was estimated to be 297 pounds air dry per acre (333 kg/ha). Production by life form is presented in Table IX-6.

The principal disturbances planned in this type will be the road corridor and rail loadout. These disturbances will approximately equal 64.4 acres (26.1 ha).

9.3 Cont.

Table IX-4 Vegetation cover by life form from 0.25 m^2 quadrats, *Atriplex-Artemisia-Hilaria* vegetation type. South Lease, Utah, July 1981.

Life form or Feature	Total Cover %	Relative Vegetation Cover %
Tree	---*	
Shrub	6.74	53.66
Forb	3.16	25.16
Grass	2.66	21.18
Vegetative Cover	12.56	
Rock	1.11	
Bareground	81.64	
Litter	4.69	
Total	100.00	100.00

* No trees present

9.3 Cont.

Table IX-5 Shrub stem density by species for the *Atriplex-Artemisia-Hilaria* vegetation type. South Lease, Utah. August 1981.

Species	Common Name	Stem Density	
		per acre	per hectare
Artemisia spinescens	Bud sagebrush	5063	12500
Atriplex confertifolia	Shadscale	284	700
A. cuneata	Castle Valley clover	4637	11450
Eurotia lanata	Winterfat	304	750
Tetradymia spinosa	Cottonthorn horsebrush	952	2350
Xanthocephalum sarothrae	Broom snakeweed	20	50
Total		11260	27800

Table IX-6. Annual primary production by life form as estimated through double-sampling, South Lease, Utah, September 1981.

Vegetation Type	Grass		Forbs		Shrubs		Total	
	lb/A	kg/ha	lb/A	kg/ha	lb/A	kg/ha	lb/A	kg/A
Atriplex-Astragalus-Hilaria	47	53	93	104	157	176	297	333
Atriplex-Astragalus	12	13	15	17	56	63	83	93
Atriplex- Badland	0	0	0	0	121	136	121	136
Juniperus Savannah	269	301	35	39	91	102	395	442
PJ Cliffbottom	29	33	11	12	45	50	85	95
PJ Clifftop	16	18	7	8	20	22	43	48
Artemisia tridentata	48	54	47	53	89	100	184	207

9.3 Cont.

Atriplex-Astragalus

(Saltbush-Milkvetch)

The *Atriplex-Astragalus* vegetation type is found from 5060 to 5115 feet (1542) to 1558 m) in elevation. Slopes vary from 1 to 6 percent. Aspect is variable from north to south-facing. Based on field reconnaissance, the aspect effect is small at these shallow slope angles (Photograph IX-2).

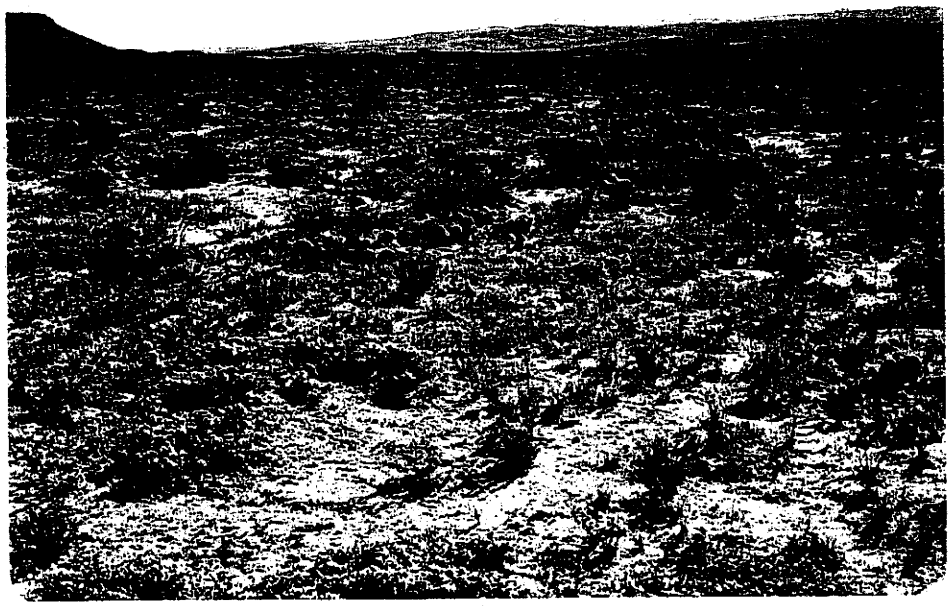
Atriplex-Astragalus stands occur on soils of the EA-Badland Complex. This complex consists of 60 percent EA extremely cobbly silty clay loam, 25 percent badland, and 15 percent other soils. The *Atriplex-Astragalus* type is primarily on the EA complex component. Average EA surface layer (A1) thickness is 2 inches (5 cm). It is underlain by 26 inches (66 cm) of C horizon to weathered shale. Runoff is rapid and erosion potential is high.

The *Atriplex-Astragalus* vegetation type to be disturbed is the least productive within the South Lease permit area. Cattle are attracted to this area by nearby watering ponds and use this type for grazing and standing.

Total vegetation cover of the *Atriplex-Astragalus* vegetation type is 7.5 percent; approximately half is contributed by shrubs (Table IX-7). The dominant shrubs are shadscale, Castle Valley clover (*Atriplex cuneata*), broom snakeweed, and bud sage. Most shrubs exhibit thick, truncated stems with small canopies protruding from the ground because erosion has removed the soil at the base. Shrub stem density information is contained in Table IX-8.

Milkweed milkvetch (*Astragalus asclepiadoides*) is the most conspicuous perennial forb species. It is accompanied by several less conspicuous annual and

9.3 Cont.



Photograph IX-2 *Atriplex-Astragalus* Vegetation Type. September, 1981.

9.3 Cont.

Table IX-7. Vegetation cover by life form from 0.25 m^2 quadrats, *Atriplex-Astragalus* vegetation type, South Lease, Utah, July 1981.

Life form or Feature	Total Cover %	Relative Vegetation Cover %
Tree	---*	
Shrub	3.35	45.45
Forb	1.90	25.78
Grass	2.12	28.77
Vegetation Cover	7.37	
Rock	1.66	
Bareground	86.94	
Litter	4.03	
Total	100.00	100.00

* No trees present

9.3 Cont.

Table IX-8 Shrub stem density by species for the *Atriplex-Astragalus* vegetation type. South Lease, Utah. July 1981.

Species	Common Name	Stem Density	
		per acre	per hectare
Artemisia spinescens	Bud sagebrush	1935	4778
A. confertifolia	Shadscale	630	1556
A. corrugata	Mat saltbush	180	444
A. cuneata	Castle Valley clover	3330	8222
A. gardneri	Gardner saltbush	45	111
Chrysothamnus nauseosus	Rubber rabbitbrush	23	56
C. viscidiflorus	Douglas rabbitbrush	45	111
Ephedra viridis	Green Mormon tea	23	56
Eriogonum spp.	Buckwheat	90	222
Eurotia lanata	Winterfat	428	1056
Xanthocephalum sarothrae	Broom snakeweed	5355	13222
Total		12084	29834

9.3 Cont.

perennial species of aster (*Aster spp.*), cryptantha (*Cryptantha spp.*), and wild buckwheat (*Eriogonum spp.*). Galleta is the dominant grass. Indian ricegrass (*Oryzopsis hymenoides*), sand dropseed and six weeks fescue (*Vulpia octoflora*) are also present. Table IX-9 contains the comprehensive species list for the *Atriplex-Astragalus* vegetation type. Cover and constancy by species are included in Table IX-10.

Annual primary production for 1981 was estimated to be 83 pounds air dry per acre (93 kg/ha). Production by life form is presented in Table IX-6.

The principal disturbance planned in the *Atriplex-Astragalus* type will be the road corridor. This disturbance will approximately equal 8.6 acres (3.5 hectares).

9.3 Cont.

Table IX-9. Comprehensive species list for the *Atriplex-Astragalus* vegetation type. South Lease, Utah. June-August 1981.

Shrubs

Artemisia spinescens	ARSP	Bud sagebush
Atriplex confertifolia	ATCON	Shadscale
A. corrugata	ATCOR	Mat saltbush
A. cuneata	ATCU	Castle Valley clover
A. gardneri	ATGA	Gardner saltbush
Cercocarpus intricatus	CEIN	Littleaf mountain mahogany
Chrysothamnus nauseosus	CHNA	Rubber rabbitbrush
Ephedra torreyana	EPTO	Green ephedra
Eriogonum spp.	ERIOG	Wild buckwheat
Eurotia lanata	EULA	Winterfat
Tetradymia spinosa	TESP	Cottonthorn horsebrush
Xanthocephalum sarothrae	XASA	Broom snakeweed
X. spp.	XANTH	Snakeweed

Forbs

Aster spp.	ASTER	
Astragalus asclepiadoides	ASAS	Milkweed milkvetch
A. spp.	ASTRA	Milkvetch
Brassicaceae spp.	BRASS	Mustard
Cryptantha crassisepala	CRCR	Plains hiddenflower
C. fulvocanescens	CRFU	Beggarlice hiddenflower
C. pterocarya	CRPT	Winged cryptantha
Eriogonum gordonii	ERGO	
E. inflatum	ERIN	Desert trumpet eriogonum
Hymenoxys acaulis	HYAC	Stemless hymenoxys
Lappula echinata	LAEC	European stickseed
L. occidentalis	LAOC	Annual stickseed
Leucelene eridoides	LEER	Heath aster
Opuntia spp.	OPUNT	Prickly pear cactus
Plantago patagonica	PLPA	Wooly plantain
Salsola kali	SAKA	Russian thistle

9.3 Cont.

Table IX-9 Cont.

Forbs - Continued

Sphaeralcea coccinea	SPCO	Scarlet globemallow
S. spp.	SPHAE	Globemallow
Townsendia incana	TOIN	Hoary townsendia

Grasses

Hilaria jamesii	HIJA	Galleta
Oryzopsis hymenoides	ORHY	Indian ricegrass
Sporobolus cryptandrus	SPCR	Sand dropseed
Vulpia octoflora	VUOC	Sixweeks fescue

Table VIII-3. Cont.

9.3 Cont.

Table IX-10. Percent Cover and Constancy by Species for the Saltbush-Milkvetch Vegetation Type. South Lease, Utah. July 1981

STAND NUMBER	1	2	3	4	5	6	7	8	9	10	CONSTANCY
STATE AND COUNTY	UT EMERY	UT EMERY	UT EMERY	UT EMERY	UT EMERY	UT EMERY	UT EMERY	UT EMERY	UT EMERY	UT EMERY	%
GRID NUMBER	10	10	10	10	10	10	10	10	10	10	
ELEVATION IN FEET	5080	5115	5060	5120	5100	5110	5090	5110	5080	5085	
ASPECT	NE	NE	N	SE	E	SW	NE	S	SE	S	
SLOPE IN PERCENT	3	1	1	1	1	3	4	5	4	6	
SOIL MAPPING UNIT	EED2	EED2	EED2	EED2	EED2	EED2	EED2	EED2	EED2	EED2	
SHRUBS:											
Artemisia spinescens	.17	.03	.05	.05	.04	•*	.13	•	•	.03	70
Atriplex confertifolia	.05	2.30	.88	.90	.09	1.37	•	1.3	3.35	1.08	90
A. corrugata	•*	•	•	•	1.3	•	2.88	•	•	•	20
A. cuneata	1.25	1.97	1.08	•	.95	•	3.2	.05	1.0	1.23	80
A. gardneri	•	•	•	+	•	•	•	•	•	•	10
Chrysothamnus nauseosus	•	•	•	•	•	.80	•	+	•	•	20
Ephedra viridis	+#	•	•	•	•	•	•	•	•	•	10
Eriogonum microthecum	•	+	•	•	•	•	•	•	•	•	10
Eurotia lanata	•	•	•	•	.25	.08	•	•	.50	•	30
Tetradymia spinosa	•	•	•	•	•	•	•	•	•	+	10
Ianthocephalum sarothrae	.89	.80	1.13	.70	•	.32	.3	.07	.40	.58	90
Unknown shrub	•	•	•	•	•	.04	•	•	•	•	10
FORBS:											
Aster spp.	•	•	.02	.04	.05	.04	•	1.01	.63	•	60
Astragalus asclepiadoides	•	+	•	+	•	+	•	•	•	•	30
A. spp.	•	•	•	•	•	.14	1.29	•	•	•	20
Brassicaceae spp.	•	•	•	•	•	•	•	.19	•	•	10
Cryptantha crassisepala	.23	•	•	•	.19	+	•	•	•	•	30
C. fulvocanescens	•	•	•	•	•	•	•	•	+	•	10
C. pterocarya	•	+	+	.09	.03	•	•	+	•	•	50
Eriogonum gordonii	+	•	+	.17	1.02	•	•	•	•	•	40
E. inflatum	•	•	•	•	•	.02	•	•	•	•	10
Fabaceae spp.	+	1.32	.03	•	•	•	•	•	•	•	30
Hymenoxys acaulis	.03	•	.12	•	+	•	•	•	.30	•	40
Lappula occidentalis	+	•	+	.04	+	•	•	+	•	•	50
Lepidium spp.	•	•	•	•	.10	•	•	+	•	•	10
Leucelene ericoides	.03	•	•	•	•	•	•	•	•	•	10
Machaeranthera canescens	•	•	•	•	4.20	•	.02	•	•	•	20
Opuntia spp.	•	•	•	1.05	3.85	.20	•	•	•	•	30
Plantago patagonica	.10	.07	.50	1.72	•	.15	.17	.08	.32	+	90
Salsola kali	•	•	•	•	•	•	•	+	•	•	10
Sphaeralcea coccinia	.04	•	•	•	•	•	.05	•	.05	•	30
S. spp.	•	.07	•	•	•	•	•	.05	•	.05	30
Townsendia incana	.32	•	.02	•	+	•	.07	•	•	•	40
Unknown forb	.02	•	•	•	+	•	•	•	.02	•	30
GRASSES:											
Hilaria jamesii	1.69	1.59	1.63	4.5	1.98	3.03	.64	1.5	2.34	.83	100
Oryzopsis hymenoides	•	•	.05	.19	.05	.07	.05	•	.64	+	70
Sporobolus cryptandrus	•	•	•	•	.28	•	•	•	•	•	10
Vulpia octoflora	•	•	•	+	+	.15	•	•	•	•	30
OTHER:											
Cryptogams	•	•	•	•	+	•	•	•	•	•	10

*• = Species not present
#+ = Species present as a trace in plot or present outside plots

9.3 Cont.

Atriplex-Badland

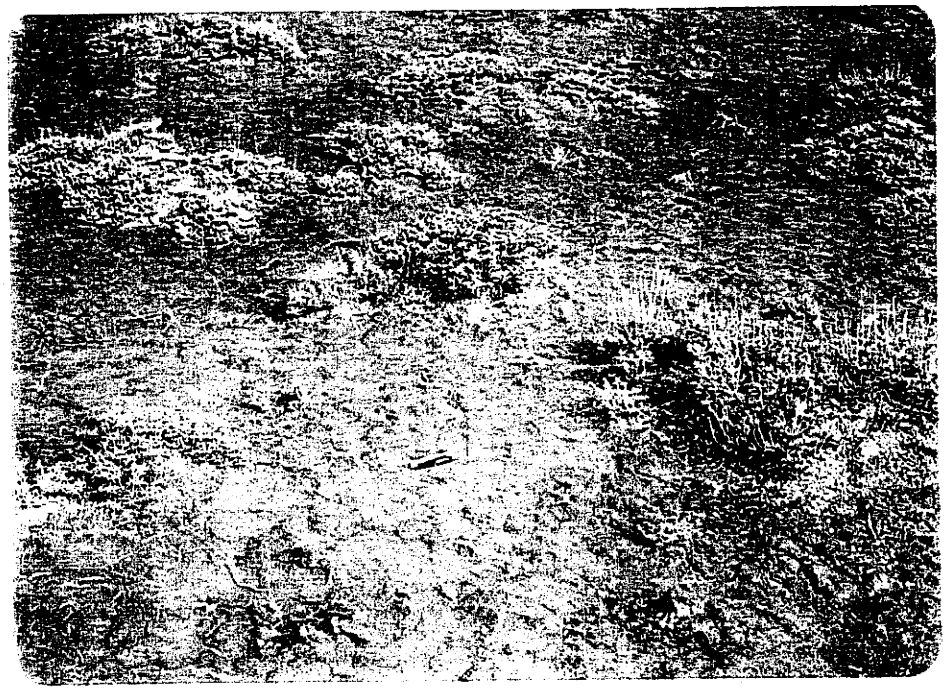
(Saltbush-Badland)

The *Atriplex*-Badland vegetation type is found from 4900 to 5300 feet (1493 to 1615 m) in elevation. Slopes range from 0 to 8 percent. Slope aspect is typically south to west-facing (Photographs IX-3 and IX-4).

The stands occur on soils of Chipeta silty clay loam. The Chipeta soil averages 15 inches (38 cm) deep over weathered shale. The average surface layer (A1) thickness is one inch (2.5 cm) of silty clay loam. Runoff is rapid and erosion potential is high.

The dominant species is mat saltbush *(Atriplex corrugata)*. Castle Valley clover and Gardner saltbush *(Atriplex gardneri)* are associated species. These shrub species are adapted to moderately salt-affected soils such as the Chipeta (Institute for Land Rehabilitation Staff, 1979). Life forms other than shrubs are not well-represented. Galleta and Indian ricegrass are present, with a complement of predominantly annual forbs. Rubber rabbitbrush *(Chrysothamnus nauseosus)* and winterfat *(Eurotia lanata)* are common in narrow drainage dissections. Total vegetation cover averages nine percent, with shrubs comprising 85 percent of the total cover. Vegetation cover by life form is included in Table IX-11. Shrub stem densities are contained in Table IX-12. Species cover and constancy data are summarized in Table IX-13, and a comprehensive species list is presented in Table IX-14.

The high frequency of annual forbs, together with the large amount of bare ground, is indicative of continuing disturbance. The disturbance results from natural erosion aggravated by the historically heavy grazing pressure.



Photograph IX-3 *Atriplex*-Badland vegetation type, (close-up). South Lease, Utah. September 1981.

Photograph IX-4 *Atriplex*-Badland vegetation type. South Lease, Utah. September 1981.

9.3 Cont.

Table IX-11 Vegetation cover by life form from 0.25 m^2 quadrats, *Atriplex*-Badland vegetation type. South Lease, Utah, June 1981.

Life form or feature	Total Cover %	Relative Vegetation Cover %
Tree	---*	
Shrub	8.70	95.08
Forb	.25	2.73
Grass	.20	2.19
Vegetation Cover	9.15	
Rock	1.04	
Bareground	87.08	
Litter	2.73	
Total	100.00	100.00

*No trees present

9.3 Cont.

Table IX-12 Shrub stem density by species for the *Atriplex*-Badland vegetation type. South Lease, Utah. July 1981.

Species	Common Name	Stem Density	
		per acre	per hectare
Artemisia spinescens	Bud sagebrush	1367	3375
Atriplex corrugata	Mat saltbush	28072	69313
A. cuneata	Castle Valley clover	886	2188
A. gardneri	Gardner saltbush	1063	2625
Chrysothamnus nauseosus	Rubber rabbitbrush	51	125
Erotia lanata	Winterfat	304	750
Xanthocephalum sarothrae	Broom snakeweed	1190	2938
Total		32933	81314

9.3 Cont.

Table IX-13. Percent Cover and Constancy by Species for the Saltbush-Badland Vegetation Type. South Lease, Utah. July 1981.

STAND NUMBER	1	2	3	4	5	6	7	8	9	10	CONSTANCY
STATE AND COUNTY	UT EMERY	UT EMERY	UT EMERY	UT EMERY	UT EMERY	UT EMERY	UT EMERY	UT EMERY	UT EMERY	UT EMERY	%
GRID NUMBER	10	10	10	10	10	10	10	10	10	10	
ELEVATION IN FEET	4990	4980	4960	4925	4947	4935	4900	4925	4950	4965	
ASPECT	N	S	E	W	N	NW	NW	NW	NW	SE	
SLOPE IN PERCENT	8	1.5	2	4	2	5	1	6	5	4	
SOIL MAPPING UNIT	CHC2	CHC2	CHC2	PME2	CHC2	CHC2	BNE2	CHC2	CHC2	CHC2	
SHRUBS:											
Artemisia spinescens	•*	•	•	•	•	•	•	.01	•	.01	20
Atriplex corrugata	6.9	4.96	.20	•	6.35	10.15	15.90	7.18	13.00	7.18	90
A. cuneata	•	2.06	1.25	•	•	•	•	.10	•	.10	40
A. gardneri	•	•	4.65	2.78	•	•	•	•	•	.03	30
Chrysothamnus viscidiflorus	•	•	•	.15	•	•	•	•	•	•	10
Ephedra torreyana	•	•	•	.10	•	•	•	•	•	•	10
Xanthocephalum sarothrae	•	•	•	•	•	•	•	.13	•	•	10
Unknown forb	•	.21	•	•	•	•	•	•	•	•	10
FORBS:											
Astragalus spp.	•	+	•	•	•	•	•	•	•	•	10
Brassicaceae spp.	•	•	•	•	•	•	•	+	•	+	20
Cryptantha spp.	•	•	•	•	•	•	.06	•	•	•	10
Eriogonum gordonii	•	•	.06	.10	.01	.20	•	•	•	•	40
E. inflatum	•	•	•	•	.01	.04	•	•	•	•	20
Haplopappus spp.	•	•	.73	.65	•	•	•	•	•	•	20
Lappula occidentalis	•	.03	•	.09	+	•	•	+#	•	+	50
Plantago patagonica	•	1.03	•	•	•	•	•	.04	•	.04	30
Opuntia spp.	•	.15	•	•	•	•	•	•	•	•	10
Sphaeralcea coccinea	•	.01	•	•	•	•	•	•	•	•	10
Unknown forb	•	.01	•	.01	•	•	•	•	•	•	20
GRASSES:											
Hilaria jamesii	•	.50	•	.38	•	•	•	.80	•	.80	40
Oryzopsis hymenoides	•	.04	•	.29	•	•	•	•	•	•	20

•* = Species not present
+# = Species found as a trace in plot or present outside plots

9.3 Cont.

Table IX-14 Comprehensive species list for the *Atriplex*-Badland vegetation type. South Lease, Utah. June-August 1981.

Shrubs

Artemisia spinescens	ARSP	Bud sagebrush
Atriplex canescens	ATCA	Fourwing saltbush
A. corrugata	ATCOR	Mat saltbush
A. cuneata	ATCU	Castle Valley clover
A. gardneri	ATGA	Gardner saltbush
Chrysothamnus nauseosus	CHNA	Rubber rabbitbrush
C. viscidiflorus	CHVI	Low rabbitbrush
Ephedra torreyana	EPTO	Torrey ephedra
Eurotia lanata	EULA	Winterfat
Xanthocephalum sarothrae	XASA	Broom snakeweed

Forbs

Asteraceae spp.	ASTER	
Astragalus asclepiadoides	ASAS	Milkweed milkvetch
Brassicaceae spp.	BRASS	Mustard
Cryptantha spp.	CRYPT	Cryptantha
Eriogonum gordonii	ERGO	
E. inflatum	ERIN	Desert trumpet eriogonum
Haplopappus spp.	HAPLO	Goldenweed
Lappula occidentalis	LAOC	Annual stickseed
Opuntia spp.	OPUNT	Prickly pear cactus
Plantago patagonica	PLPA	Wooly plantain
Sphaeralcea coccinea	SPCO	Scarlet globemallow

Grasses

Hilaria jamesii	HIJA	Galleta
Oryzopsis hymenoides	ORHY	Indian ricegrass

9.3 Cont.

Annual primary production for 1981 is estimated by double sampling to be 121 pounds air dry per acre (136 kg/ha) (Table IX-6).

The principal disturbances planned in this area will be a road corridor and a rock fill from the rotary breaker. These disturbances will equal approximately 239 acres (98 ha).

Juniperus Savannah
(Juniper Savannah)

The *Juniperus* Savannah vegetation type is found from 5460 to 5520 feet (1663 to 1682 m) in elevation. Slopes vary from 4 to 12 percent. Aspect is typically north to east (Photograph IX-5).

Soils underlying the *Juniperus* Savannah type are Chilton extremely bouldery fine sandy loam, low rainfall, 3 to 20 percent slopes eroded. The average surface layer (A1) is 3 inches (7.5 cm), extremely bouldery, of fine sandy loam and is underlain with 21 inches (53 cm) of very bouldery sandy clay loam (C1). Runoff is medium and erosion potential is high.

The *Juniperus* Savannah vegetation type lies on the toe of the Book Cliffs. The ground is strewn with boulders. Herbaceous and shrub vegetation dominate with occasional junipers *(Juniperus osteosperma)* giving the area a savannah appearance. The bouldery surface and remoteness from water has protected this area from intense cattle grazing.

Total vegetation cover of the *Juniperus* Savannah type is slightly less than 11 percent for herbaceous species, and woody species less than 12 inches (30 cm) in height. Tree canopy cover equals one percent. Cover by life form from quadrats is presented in Table IX-15. The dominant shrubs are shadscale, broom snakeweed, greasebush *(Forsellesia meionandra)*, and Mormon-tea *(Ephedra torreyana)*. Tree and shrub cover from line intercept information is contained in Table IX-16. Shrub stem and tree density data are summarized in Table IX-17 and Table IX-18, respectively. Tree basal areas are presented in Table IX-19.

Total canopy cover collected by point-line transects is 25 percent, including all strata. Cover by life form from the point-line method is reported in Table

9.3 Cont.

Photograph IX-5 *Juniperus* Savannah Vegetation Type.
South Lease, Utah. September, 1981.

9.3 Cont.

Table IX-15. Vegetation cover by life form from 0.25 m^2 quadrats. *Juniperus* Savannah vegetation type. South Lease, Utah, July 1981.

Life form or feature	Total Cover (%)	Relative Vegetative Cover (%)
Tree	-+	
Shrub	0.52	4.70
Forb	1.53	13.90
Grass	8.93	81.40
Vegetation Cover	10.98	
Rock	29.12	
Bareground	48.14	
Litter	11.76	
Total	100.00	100.00

+ Tree and shrub cover value is only for plants <12 inches in height. Complete shrub cover data is available in Table IX-16.

9.3 Cont.

Table IX-16. Vegetation cover from 60 m line-intercept transect, *Juniperus* Savannah vegetation type, South Lease, Utah, July 1981.

Species	Common Name	Cover (%)
Atriplex confertifolia	Shadscale	1.28
Chrysothamnus nauseosus	Rubber rabbitbrush	.40
Ephedra torreyana	Mormon tea	.97
E. viridis	Green Mormon tea	.05
Forsellesia meionandra	Greasebush	.39
Xanthocephalum sarothrae	Broom snakeweed	1.31
Juniperus osteosperma	Utah juniper	.98
Total		5.38

9.3 Cont.

Table IX-17 Shrub stem density by species for the *Juniperus* Savannah vegetation type. South Lease, Utah. July 1981.

Species	Common Name	Stem Density	
		per acre	per hectare
Artemisia nova	Black sagebrush	.31	.76
Atriplex confertifolia	Shadscale	247.26	609.88
Chrysothamnus nauseosus	Rubber rabbitbrush	11.98	29.55
C. viscidiflorus	Low rabbitbrush	31.64	78.03
Ephedra torreyana	Mormon tea	414.05	1021.26
Eriogonum microthecum	Slenderbush eriogonum	.61	1.52
Eurotia lanata	Winterfat	33.17	81.82
Forsellesia meionandra	Greasebush	203.95	503.06
Xanthocephalum sarothrae	Broom snakeweed	555.96	1371.28
Yucca spp.	Yucca	2.15	5.30
Total		1501.08	3702.46

9.3 Cont.

Table IX-18. Tree densities for the *Juniperus* Savannah vegetation type. South Lease, Utah. July 1981.

Species	Common Name	Tree Density	
		per acre	per hectare
Juniperus osteosperma	Utah Juniper	23.62	58.33
Pinus edulis	Pinyon pine	.84	2.08
Total		24.46	60.41

9.3 Cont.

Table IX-19. Tree basal areas by species for the *Juniperus* Savannah vegetation type. South Lease, Utah. July 1981.

Species	Common Name	Basal Area	
		ft^2/A	m^2/ha
Juniperus osteosperma	Utah juniper	1768	405.6
Pinus edulis	Pinyon pine	10	2.3
Total		1778	407.9

9.3 Cont.

IX-20. Cover and constancy by species is found in Table IX-21. A comprehensive species list is included in Table IX-22.

Annual primary production for 1981 was estimated to be 395 pounds air dry per acre (442 kg/ha). Production by life form is presented in Table IX-6.

The principal disturbance planned in *Juniperus* Savannah is a road corridor. Approximately 28.1 acres (11.4 ha) are scheduled for disturbance.

9.3 Cont.

Table IX-20. Vegetation cover by life form from 30 m point-line transects for the *Juniperus* Savannah vegetation type. South Lease, Utah. July 1981.

Life form or feature	Total Cover (%)	Relative Vegetation Cover (%)
Tree	1.20	4.88
Shrub	7.50	30.49
Forb	4.40	17.89
Grass	11.50	46.74
Vegetation Cover	24.60	
Rock	21.00	
Bareground	34.60	
Litter	19.80	
Total	100.00	100.00

9.3 Cont.

Table IX-21. Percent Cover and Constancy by Species for the *Juniperus* Savannah Vegetation Type. South Lease, Utah. July 1981.

STAND NUMBER	1	2	3	4	5	6	7	8	9	10	CONSTANCY
STATE AND COUNTY	UT EMERY	UT EMERY	UT EMERY	UT EMERY	UT EMERY	UT EMERY	UT EMERY	UT EMERY	UT EMERY	UT EMERY	%
GRID NUMBER	12	12	12	12	12	12	12	12	12	12	
ELEVATION IN FEET	5500	5480	5520	5510	5460	5490	5485	5515	5510	5490	
ASPECT	E	E	E	E	E	NE	NE	NE	N	N	
SLOPE IN PERCENT	4	4	10	10	12	11	4	4	11	11	
SOIL MAPPING UNIT	BNE2	BNE2	BNE2	BNE2	BNE2	BNE2	BNE2	BNE2	BNE2	BNE2	
SHRUBS:											
Artemisia nova	•*	+#	•	•	•	•	•	•	•	•	10
Atriplex confertifolia	•	2.35	2.50	•	•	•	.50	•	•	.90	40
Chrysothamnus nauseosus	.03	1.40	•	•	•	•	•	•	•	•	20
C. viscidiflorus	.20	.04	•	•	•	•	•	•	•	•	20
Ephedra torreyana	•	•	2.50	•	•	•	•	•	•	•	10
E. viridis	+	+	+	+	•	•	•	•	•	•	40
Eriogonum ovalifolium	•	•	•	•	•	•	.15	•	•	•	10
E. microthecum	.15	•	•	•	•	•	•	•	•	•	10
Eurotia lanata	.16	.01	•	.15	.06	•	•	•	•	•	40
Forsellesia meionandra	•	•	1.25	•	•	•	.08	0.03	.40	.69	50
Fraxinus anomala	.01	•	•	•	•	•	•	•	•	•	10
Xanthocephalum sarothrae	.13	.90	.05	•	•	+	.10	•	.15	•	60
Yucca spp.	•	•	•	+	•	•	•	•	•	•	10
FORBS:											
Astragalus mollissimus	•	•	•	•	+	•	•	•	•	•	10
A. spp.	•	.75	•	+	•	•	•	•	•	•	20
Brassicaceae spp.	+	•	•	+	•	•	•	•	•	•	20
Cryptantha pterocarya	.05	.06	•	•	.01	•	•	•	•	•	30
C. spp.	•	•	•	•	•	.04	•	•	•	•	10
Echinocereus spp.	•	•	•	+	+	•	•	•	•	•	20
Eriogonum bicolor	•	.01	•	•	•	•	•	•	•	•	10
E. ovalifolium	•	•	•	•	+	•	•	•	•	•	10
Euphorbia fendleri	•	•	•	•	•	.19	.23	.01	.08	.43	50
Hymenoxys richardsonii	•	•	.10	.08	.45	.28	.68	.15	.25	•	70
Lappula echinata	+	•	•	•	•	+	•	•	•	•	20
Lepidium lasiocarpum	•	•	•	•	•	•	.10	•	•	•	10
L. spp.	•	•	.10	+	+	.01	•	•	•	•	40
Leucelene ericoides	•	•	.03	•	.75	•	.84	1.00	.30	.81	60
Machaeranthera grindelioides	•	•	.05	•	.20	•	.50	.35	.41	.05	60
M. species	•	.14	.05	•	•	.43	.13	.11	•	•	50
Opuntia spp.	•	•	•	•	•	.03	•	.75	.65	.08	40
Plantago patagonica	+	.01	•	•	•	.01	.05	•	•	•	40
Phacelia spp.	•	•	•	+	•	•	•	•	•	•	10
Senecio spp.	•	•	+	•	•	•	•	•	•	•	10
Sphaeralcea munroana	.01	.03	•	•	•	•	•	•	•	•	20
S. parvifolia	•	•	•	+	•	•	•	•	•	•	10
Thelesperma submuticum	•	•	•	•	•	•	•	•	.28	.64	20
Townsendia incana	•	•	•	•	•	•	•	+	•	•	10
Unknown forb	.05	•	•	•	•	•	•	•	•	•	10
GRASSES:											
Aristida spp.	•	•	.15	•	•	.01	.65	•	•	•	30
Bromus tectorum	.01	.76	•	•	•	•	.01	•	•	•	30
Bouteloua gracilis	•	•	•	•	.10	.01	3.85	•	.54	.16	50
B. hirsuta	•	•	•	•	•	•	•	+	•	•	10
Elymus salina	2.75	4.59	14.65	5.10	2.19	5.34	4.45	5.90	3.46	4.68	100
Hilaria jamesii	3.95	3.01	4.40	1.80	2.58	.81	3.01	2.43	2.03	3.58	100
Oryzopsis hymenoides	•	•	.75	•	.25	•	•	•	.20	.05	40
Sporobolus cryptandrus	•	•	•	•	•	•	+	•	•	•	10
Stipa comata	•	.15	•	.55	.13	•	.08	•	•	•	40
Vulpia octoflora	+	.11	.03	+	+	+	.04	•	•	•	70

•* = Species not present
+# = Species found as a trace in plot or present outside plots

9.3 Cont.

Table IX-22. Comprehensive species list for the Pinyon-Juniper Savannah vegetation type. South Lease, Utah. June-August 1981.

Trees		
Juniperus communis	JUCO	Common juniper
J. osteosperma	JUOS	Utah juniper
Pinus edulis	PIED	Pinyon pine
Shrubs		
Artemisia nova	ARNO	Black sagebrush
Atriplex confertifolia	ATCON	Shadscale
Chrysothamnus nauseosus	CHNA	Rubber rabbitbrush
C. viscidiflorus	CHVI	Low rabbitbrush
Ephedra torreyana	EPTO	Torrey ephedra
E. viridis	EPVI	Green ephedra
Eriogonum ovalifolium	EROV	Cushion eriogonum
E. microthecum	ERMI	Slender eriogonum
Eurotia lanata	EULA	Winterfat
Forsellesia meionandra	FOME	Greasebush
Fraxinus anomala	FRAN	Singleleaf ash
Xanthocephalum sarothrae	XASA	Broom snakeweed
Yucca spp.	YUCCA	Yucca
Forbs		
Astragalus mollissimus	ASMO	Wooly milkvetch
A. spp.	ASTRA	Milkvetch
Brassicaceae spp.	BRASS	Mustard
Cryptantha spp.	CRYPT	Cryptantha
C. pterocarya	CRPT	Winged cryptantha
Echinocereus spp.	ECHIN	
Eriogonum bicolor	ERBI	
Euphorbia fendleri	EUFE	Fendler euphorbia
Hymenoxys richardsonii	HYRI	Pingue hymenoxys
Lappula echinata	LAEC	European stickseed

9.3 Cont.

Table IX-22 Continued

Forbs

Lepidium spp.	LEPID	Pepperweed
Leucelene ericoides	LEER	Heath aster
Machaeranthera grindellioides	MAGR	
M. spp.	MACHA	
Opuntia spp.	OPUNT	Prickly pear cactus
Plantago patagonica	PLPA	Wooly plantain
Phacelia spp.	PHACE	Phacelia
Senecio spp.	SENEC	Goundsel
Sphaeralcea munroana	SPMU	Munro globemallow
S. parvifolia	SPPA	
Thelesperma subnudum	THSU	Navajo-tea greenthread
Townsendia incana	TOIN	Hoary townsendia

Grasses

Aristida spp.	ARIST	Threeawn
Bromus tectorum	BRTE	Cheatgrass brome
Bouteloua gracilis	BOGR	Blue grama
B. hirsuta	BOHI	Hairy grama
Elymus salina	ELSA	Salina wildrye
Hilaria jamesii	HIJA	Galleta
Oryzopsis hymenoides	ORHY	Indian ricegrass
Sporobolus cryptandrus	SPCR	Sand dropseed
Stipa comata	STCO	Needle-and-thread
Vulpia octoflora	VUOC	Sixweeks fescue

9.3 Cont.

Pinus-Juniperus Cliffbottom
(Pinyon-Juniper Cliffbottom)

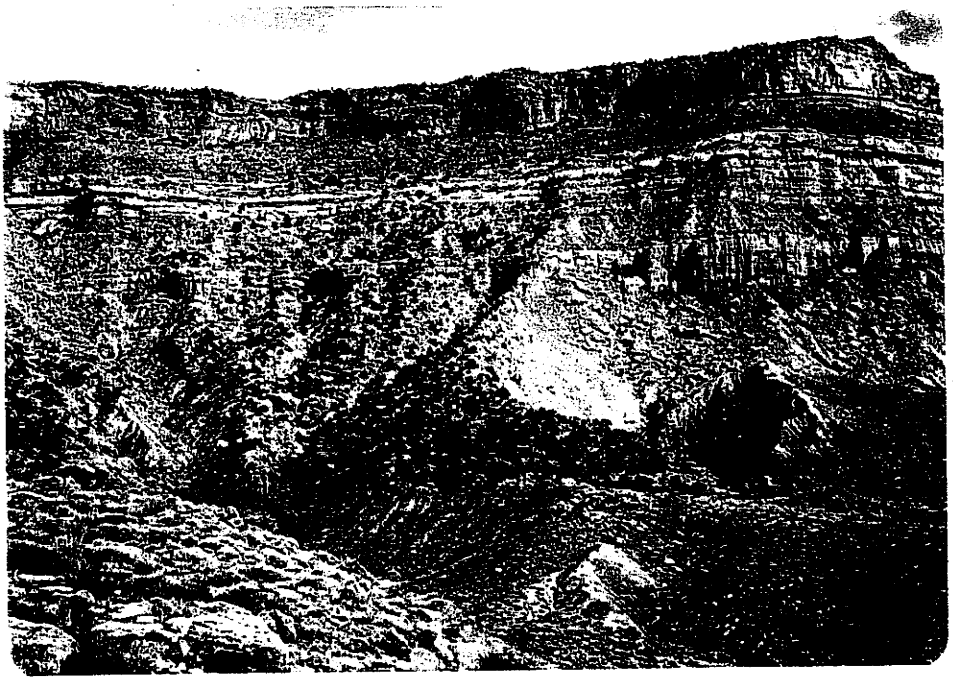
Pinyon-Juniper Cliffbottom vegetation type is found from 5525 to 5710 feet (1683 to 1740 m) in elevation. Slopes vary from 9 to 31 percent. Aspect is typically southwestern (Photograph IX-6).

Soils underlying this type are Chilton, extremely bouldery fine sandy loam (BNE2) and Rock Outcrop-Rubbleland-Badland Complex. The average surface layer (A1) of the Chilton soil is 3 inches (7.5 cm) of extremely bouldery fine sandy loam and is underlain with 21 inches (53 cm) of very bouldery sandy clay loam (C1). Runoff is medium and erosion potential is high.

The Rock Outcrop-Rubbleland-Badland Complex consists of about 40 percent Rock Outcrop, 35 percent Rubbleland, and 25 percent Badland. Rock Outcrop is exposed bedrock consisting of sandstone, conglomerate sandstone, and limestone. Rubbleland consists of areas covered by stones and boulders. Little soil is exposed at the surface. Badland consists of steep to very steep nearly barren beds of eroding shale. The Pinyon-Juniper Cliffbottom type lies on the Rubbleland in this complex.

The vegetation cover from quadrats of the herbaceous species and woody species less than 12 inches (30 cm) in height is 5.31 percent (Table IX-23). Line-intercept cover for trees and shrub is contained in Table IX-24. Using the point-line method, total first-hit vegetation cover is 22 percent, of which 12 percent is tree cover and 10 percent is cover contributed by herbaceous species and woody species less than 12 inches (30 cm) (Table IX-25).

9.3 Cont.



Photograph IX-6 Pinyon-Juniper Cliffbottom Vegetation Type. South Lease, Utah. September, 1981.

9.3 Cont.

Table IX-23. Vegetation cover by life form from 0.25 m^2 quadrats, Pinyon-Juniper Cliffbottom vegetation type. South Lease, Utah, July 1981.

Life form or feature	Total Cover %	Relative Vegetation Cover %
Tree	0	0
Shrub	1.30	30
Forb	.81	15
Grass	3.20	55
Vegetation Cover	5.31	
Rock	53.80	
Bareground	27.52	
Litter	13.37	
Total	100.00	100.00

9.3 Cont.

Table IX-24. Shrub and tree cover from 30 m line-intercept transects, Pinyon-Juniper Cliffbottom vegetation type. South Lease, Utah. July 1981.

Species	Common Name	Cover (%)
Artemisia nova	Black sagebrush	.07
Chrysothamnus nauseosus	Rubber rabbitbrush	.26
Cowania mexicana	Cliffrose	.21
Fraxinus anomala	Singleleaf ash	.42
Xanthocephalum sarothrae	Broom snakeweed	.27
Trees		
Juniperus osteosperma	Utah juniper	11.92
Pinus edulis	Pinyon pine	2.76
Total		15.91

9.3 Cont.

Table IX-25. Vegetation cover by life form from 30 m point-line transects, Pinyon-Juniper Cliffbottom vegetation type. South Lease, Utah. August 1971.

Life form or feature	Total Cover (%)	Relative Vegetation Cover (%)
Tree	11.91	54
Shrub	1.82	8
Forb	0.87	4
Grass	7.48	34
Vegetation Cover	22.08	
Rock	43.74	
Bareground	23.83	
Litter	10.35	
Total	100.00	100.00

9.3 Cont.

Tree cover is composed of Utah juniper and pinyon pine *(Pinus edulis)*. Density and basal area figures for trees are presented in Table IX-26 and Table IX-27, respectively. Seedling density information shows few seedlings present (Table IX-28). Cover and constancy data by species are summarized in Table IX-28a.

Rubber rabbitbrush, singleleaf ash *(Fraxinus anomala)*, black sage *(Artemisia nova)*, and broom snakeweed are the dominant shrubs. Shrub density data are included in Table IX-26.

Galleta, Salina wildrye *(Elymus salina)*, cheatgrass *(Bromus tectorum)*, and needle and thread *(Stipa comata)* are the most prevalant grasses. Table IX-29 contains the comprehensive species list for the Pinyon-Juniper Cliffbottom type. Annual primary production was estimated to be 85 pounds air dry per acre (95 kg/ha). Production by life form is presented in Table IX-6.

The disturbed areas planned in this type will be used for road corridor and surface facilities. These disturbances will comprise approximately 1.2 acres (.49 ha).

9.3 Cont.

Table IX-26. Tree and shrub stem density by species from the Pinyon-Juniper Cliffbottom vegetation type. South Lease, Utah. August 1981.

Species	Common Name	Stem Density per acre	Stem Density per hectare
Shrubs			
Artemisia nova	Black sagebrush	65	161
A. tridentata	Big sagebrush	2	5
Atriplex confertifolia	Shadscale	3	6
Chrysothamnus depressus	Little rabbitbrush	1	3
C. nauseosus	Rubber rabbitbrush	193	477
Cowania mexicana	Cliffrose	1	3
Ephedra torreyana	Mormon tea	64	158
E. viridis	Green Mormon tea	1	3
Eriogonum microthecum	Slenderbush eriogonum	60	148
Fraxinus anomala	Singleleaf ash	11	27
Xanthocephalum sarothrae	Broom snakeweed	111	275
Yucca spp.	Yucca	1	3
Total Shrubs		513	1269
Trees			
Juniperus osteosperma	Utah juniper	121	298
Pinus edulis	Pinyon pine	40	98
Total Trees		161	396

9.3 Cont.

Table IX-27. Tree basal area from the Pinyon-Juniper Cliffbottom vegetation type, South Lease, Utah. August 1981.

Species	Common Name	Basal Area	
		ft^2/A	m^2/ha
Juniperus osteosperma	Utah juniper	3657	834
Pinus edulis	Pinyon pine	441	101
Total		4098	935

9.3 Cont.

Table IX-28. Seedling density by species from the Pinyon-Juniper Cliffbottom vegetation type. South Lease, Utah. July 1981.

Species	Common Name	Seedling Density*	
		per acre	per hectare
Shrubs			
Artemisia nova	Black sagebrush	4	10
Eriogonum microthecum	Slenderbush eriogonum	1	3
Chrysothamnus nauseosus	Rubber rabbitbrush	1	3
Xanthocephalum sarothrae	Broom snakeweed	3	5
Shrub Total		9	21
Trees			
Juniperus osteosperma	Utah juniper	24	59
Pinus edulis	Pinyon pine	38	93
		62	152
Grand Total		71	173

* Plants less than one foot (33cm) in height

9.3 Cont.

Table IX-28a. Percent Cover and Constancy by Species for the Pinyon-Juniper Cliffbottom Vegetation Type. South Lease, Utah. July 1981

STAND NUMBER	1	2	3	4	5	6	7	8	9
STATE AND COUNTY	UT EMERY	UT EMERY	UT EMERY	UT EMERY	UT EMERY	UT EMERY	UT EMERY	UT EMERY	UT EMERY
GRID NUMBER	12	12	12	12	12	12	12	12	12
ELEVATION IN FEET	5670	5650	5590	5600	5695	5690	5620	5650	5645
ASPECT	SW	SW	SW	SW	SW	SW	SW	SW	SW
SLOPE IN PERCENT	27	27	27	27	9	24	24	31	31
SOIL MAPPING UNIT	RR	RR	RR	RR	BNE2	BNE2	BNE2	RR	RR
SHRUBS:									
Artemisia nova	.*	.	.	.	1.45	0.05	0.10	0.05	1.55
Chrysothamnus nauseosus	0.02	0.01	.	0.50	0.30	0.70	1.55	2.85	0.01
Cowania mexicana	.	0.05	.	.	.	.	.	.	.
Ephedra torreyana	.	.	.	0.55	.	.	.	.	.
Eriogonum microthecum	0.19	0.10	.	0.08	0.08	0.08	0.14	0.06	.
Eurotia lanata	.	.	.	0.01	.	.	.	0.01	.
Fraxinus anomala	.	.	0.35	.	.	.	.	.	.
Xanthocephalum sarothrae	.	.	.	.	0.02	0.80	0.05	.	0.12
FORBS:									
Aster spp.	.	.	.	+#	.	.	.	.	0.46
Astragalus spp.	0.08	.	.	.	.	0.01	0.04	0.26	.
Brassicaceae spp.	.	.	.	.	.	.	.	.	.
Commandra umbellatum	0.06	.	.	.	.	.	.	.	.
Cryptantha spp.	.	.	.	.	.	.	.	.	.
Erigeron spp.	.	.	.	.	.	.	.	.	.
Eriogonum bicolor	.	.	0.10	0.08	+	.	.	.	.
E. gordonii	.	.	.	.	.	.	.	.	.
Euphorbia fendleri	0.14	0.02	.	0.25	0.02	.	0.14	0.04	.
Hymenopappus filifolium	0.31	.	.	.	.	.	.	.	.
Hymenoxys acaulis	.	+	.	.	.	.	.	.	.
H. richardsonii	0.22	.	.	.	0.39	0.45	0.04	0.01	0.05
Lappula echinata	.	.	.	.	.	.	0.02	.	.
Leptodactylon pungens	0.06	.	.	0.02	.	.	0.25	0.08	0.10
Leucelene ericoides	.	.	.	.	0.02	0.08	.	0.02	.
Lygodesmia juncea	.	.	.	.	.	.	.	.	0.10
Machaeranthera grindelioides	0.45	.	0.05	.	0.10	.	.	0.35	0.35
Opuntia spp.	.	.	+	.	.	.	.	.	.
Penstemon palmerii	0.02	.	.	.	.	.	.	.	.
P. spp.	.	.	.	.	.	.	.	.	.
Sphaeralcea munroana	.	.	0.35	.	.	.	.	.	.
S. parvifolia	.	.	0.04	.	.	.	.	.	.
Unknown forb	0.02	0.21	+	0.05	0.06	.	+	0.02	0.02
GRASSES:									
Agropyron spp.	0.02	.	.	0.02	.	.	.	.	.
Aristida spp.	.	.	.	.	0.08	.	.	0.15	.
A. wrightii	.	.	0.36	.	.	.	.	.	.
Bouteloua gracilis	.	.	0.35	.	.	0.48	.	.	.
Bromus tectorum	.	.	.	.	.	+	+	+	.
Elymus salina	0.82	.	3.90	1.98	1.42	+	0.78	0.19	1.30
Hilaria jamesii	0.66	0.59	2.10	1.14	1.52	3.55	3.42	0.92	0.74
Oryzopsis hymenoides	.	.	.	.	.	0.61	0.05	.	.
Stipa comata	0.62	0.36	0.49	0.10	.	.	.	0.10	.
Vulpia octoflora	.	.	0.01	.	.	.	.	.	.

.* = Species not present
+# = Species found as a trace in plot or present outside plots

Table IX-28a Cont.

PINYON-JUNIPER CLIFFBOTTOM

STAND NUMBER	10	11	12	13	14	CONSTANCY
STATE AND COUNTY	UT EMERY	UT EMERY	UT EMERY	UT EMERY	UT EMERY	%
GRID NUMBER	12	12	12	12	12	
ELEVATION IN FEET	5710	5645	5635	5525	5615	
ASPECT	SW	SW	SW	SW	SW	
SLOPE IN PERCENT	19	19	23	29	29	
SOIL MAPPING UNIT	RR	RR	RR	RR	RR	
SHRUBS:						
Artemisia nova	•*	•	•	•	•	36
Chrysothamnus nauseosus	•	+	0.01	0.60	+	86
Cowania mexicana	•	•	•	•	•	7
Ephedra torreyana	•	•	•	•	•	7
Eriogonum microthecum	0.15	0.22	+	•	•	71
Eurotia lanata	•	•	•	•	•	14
Fraxinus anomala	•	•	0.15	•	0.05	21
Xanthocephalum sarothrae	•	+#	•	+	•	43
FORBS:						
Aster spp.	•	•	•	•	•	14
Astragalus spp.	0.18	1.32	0.05	•	•	50
Brassicaceae spp.	•	•	•	•	0.10	7
Commandra umbellatum	•	•	•	•	•	7
Cryptantha spp.	•	•	•	•	0.10	7
Erigeron spp.	•	0.01	•	•	•	7
Eriogonum bicolor	•	•	•	•	•	21
E. gordonii	+	•	•	•	•	7
Euphorbia fendleri	0.10	0.06	0.04	0.05	0.16	78
Hymenopappus filifolium	•	•	•	•	•	7
Hymenoxys acaulis	•	0.02	0.01	•	0.02	28
H. richardsonii	0.08	0.06	0.15	0.08	0.10	78
Lappula echinata	+	•	•	•	•	14
Leptodactylon pungens	•	0.09	•	•	•	43
Leucelene ericoides	•	•	0.10	•	0.06	36
Lygodesmia juncea	•	•	•	0.90	•	14
Machaeranthera grindelioides	0.08	0.15	0.02	0.11	•	64
Opuntia spp.	•	•	•	•	•	7
Penetemon palmerii	•	•	•	•	•	7
P. spp.	•	0.02	•	•	•	7
Sphaeralcea munroana	•	•	•	•	•	7
S. parvifolia	•	•	•	•	•	7
Unknown forb	•	0.03	0.04	0.05	•	78
GRASSES:						
Agropyron spp.	•	•	•	•	•	14
Aristida spp.	0.15	•	•	•	0.20	28
A. wrightii	•	•	•	•	•	7
Bouteloua gracilis	•	•	•	•	•	14
Bromus tectorum	•	+	+	+	•	43
Elymus salina	2.75	0.76	0.65	0.41	1.42	93
Hilaria jamesii	2.96	2.42	0.88	1.48	1.82	100
Oryzopsis hymenoides	•	•	•	•	•	14
Stipa comata	•	•	0.05	•	•	36
Vulpia octoflora	•	•	•	•	•	7

•* = Species not present
+# = Species present as a trace in plot or present outside plots

9.3 Cont.

Table IX-29. Comprehensive species list for the Pinyon-Juniper Cliffbottom vegetation type. South Lease, Utah. June-August 1981.

Trees		
Juniper osteosperma	JUOS	Utah juniper
Pinus edulis	PIED	Pinyon pine
Shrubs		
Artemisia nova	ARNO	Black sagebrush
A. tridentata	ARTR	Big sagebrush
Atriplex confertifolia	ATCON	Shadscale
Cercocarpus intricatus	CEIN	Littleleaf mountain mahogany
Chrysothamnus nauseosus	CHNA	Rubber rabbitbrush
C. viscidiflorus	CHVI	Low rabbitbrush
Cowania mexicana	COME	Cliffrose
Ephedra viridis	EPVI	Green ephedra
Eriogonum bicolor	ERBI	
E. jamesii	ERJA	James eriogonum
Eurotia lanata	EULA	Winterfat
Fraxinus anomala	FRAN	Singleleaf ash
Xanthocephalum sarothrae	XASA	Broom snakeweed
Forbs		
Aster spp.	ASTER	
Astragalus spp.	ASTRA	
Brassicaceae spp.	BRASS	Mustard
Commandra umbellatum	COUM	Bastard toadflax
Cryptantha spp.	CRYPT	
Erigeron spp.	ERIGE	
Eriogonum gordonii	ERIOG	
Euphorbia fendleri	EUFE	Fendler euphorbia
Hymenopappus filifolium	HYFI	Fineleaf hymenopappus
Hymenoxys acaulis	HYAC	Stemless hymenoxys
H. richardsonii	HYRI	Pingue hymenoxys

Table IX-29 Continued

Forbs - Continued

Lappula spp.	LAPPU	
Lepidium spp.	LEPID	Pepperweed
Leptodactylon pungens	LEPU	Prickly phlox
Leucelene ericoides	LEER	Heath aster
Lygodesmia juncea	LYJU	Rush skeletonplant
Machaeranthea grindelioides	MAGR	
Opuntia spp.	OPUNT	Prickly pear cactus
Penstemon palmerii	PEPA	Palmer penstemon
P. spp.	PENST	
Sphaeralcea munroana	SPMU	Munro globemallow
S. parvifolia	SPPA	

Grasses

Agropyron spp.	AGROP	Wheatgrass
Aristida spp.	ARIST	Threeawn
Bouteloua gracilis	BOGR	Blue grama
Bromus tectorum	BRTE	Cheatgrass brome
Elymus salina	ELSA	Salina wildrye
Hilaria jamesii	HIJA	Galleta
Oryzopsis hymenoides	ORHY	Indian ricegrass
Stipa comata	STCO	Needle-and-thread
Vulpia octoflora	VUOC	Sixweeks fescue

9.3 Cont.

Pinus-Juniperus Clifftop
(Pinyon-Juniper Clifftop)

The Pinyon-Juniper (PJ) Clifftop vegetation type is found from 6600 to 6900 feet (2011 to 2102 m) in elevation. Slopes vary from 12 to 52 percent. Slope aspect is typically east-facing (Photograph IX-7).

The PJ Clifftop vegetation type covers a large area of the permit above the Book Cliffs, and encompasses many similar soil mapping units. Vegetation sampling was conducted on the soil mapping units near planned disturbance locations. These soils include the Rock Outcrop-Sunup Complex, the Lazear Rock Outcrop Complex, and the Cabba-Podo-Patmos Complex. These complexes are located on steep slopes, are gravelly to stony at the surface and have minimal topsoil development. Complete mapping unit descriptions for these complexes are found in Chapter VIII.

The type is dominated by pinyon pine and Utah juniper. Understory dominants include black sage, rubber rabbitbrush, pingue (*Hymenoxys richardsonii*), Salina wildrye and Indian ricegrass. A comprehensive species list is presented in Table IX-30. Shrub and tree densities are summarized in Table IX-31 and Table IX-32, respectively.

Herbaceous and low (height less than 12 inches) woody vegetation cover collected by quadrats, averages 3.0 percent (Table IX-33). Tree and shrub cover from line intercept information averages 33 percent (Table IX-34). Point-line transect data indicates a total vegetation cover average of 36 percent (Table IX-35). Constancy and cover values from quadrat data is contained in Table IX-36.

9.3 Cont.

Photograph IX-7. Pinyon-Juniper Clifftop Vegetaion Type.
South Lease, Utah. February, 1982.

9.3 Cont.

Table IX-30. Comprehensive species list for Pinyon-Juniper Clifftop vegetation type. South Lease, Utah. June-August 1981.

Trees		
Juniperus communis	JUCO	Common juniper
J. osteosperma	JUOS	Utah juniper
Pinus edulis	PIED	Pinyon pine
Shrubs		
Artemisia nova	ARNO	Black sagebrush
A. tridentata	ARTR	Big sagebrush
Cercocarpus ledifolius	CELE	Curlleaf mountain mahogany
C. montanus	CEMO	True mountain mahogany
Chrysothamnus nauseosus	CHNA	Rubber rabbitbrush
C. vaseyi	CHVA	Vasey rabbitbrush
C. viscidiflorus	CHVI	Low rabbitbrush
Cowania mexicana	COME	Cliffrose
Ephedra torreyana	EPTO	Torrey ephedra
E. viridis	EPVI	Green ephedra
Eurotia lanata	EULA	Winterfat
Forsellesia meionandra	FOME	Greasebush
Symphoricarpos vaccinoides	SYVA	Snowberry
Xanthocephalum sarothrae	XASA	Broom snakeweed
Forbs		
Abronia spp.	ABRON	Sand verbena
Arabis perennans	ARPE	Rock cress
Caulanthus crassicaulus	CACR	Wildcabbage
Cryptantha spp.	CRYPT	Cryptantha
Echinocereus spp.	ECHIN	
Erigeron pumilis	ERUP	Low fleabane
Eriogonum jamesii	ERJA	James eriogonum
E. spp.	ERIOG	

9.3 Cont.

Table IX-30 Continued

Forbs - Continued

Euphorbia fendleri	EUFE	Fendler euphorbia
Gilia aggregata	GIAG	Skyrocket gilia
G. congesta	GICO	Ballhead gilia
Hedysarum boreale	HEBO	Northern sweetvetch
Hymenopappus filifolius	HYFI	Fineleaf hymenopappus
H. spp.	HYMEN	Hymenopappus
Hymenoxys richardsonii	HYRI	Pingue hymenoxys
Leptodactylon pungens	LEPU	Prickly phlox
Machaeranthera grindelioides	MAGR	
M. spp.	MACHA	Aster
M. tanacetifolia	MATA	Tansyleaf aster
Opuntia spp.	OPUNT	Prickly pear cactus
Penstemon subglaber	PESU	
P. spp.	PENST	Beardtongue
Senecio multilobatus	SEMU	Lobeleaf groundsel
Sphaeralcea spp.	SPHAE	Globemallow
Stanleya pinnata	STPI	Desert princeplume
Townsendia incana	TOIN	Hoary townsendia

Grasses

Agropyron spp.	AGROP	Wheatgrass
Aristida spp.	ARIST	Threeawn
Bouteloua gracilis	BOGR	Blue grama
B. hirsuta	BOHI	Hairy grama
Bromus tectorum	BRTE	Cheatgrass brome
Elymus salina	ELSA	Salina wildrye
Hordeum jubatum	HOJU	Foxtail barley
Koelaria cristata	KOCR	Prairie junegrass
Oryzopsis hymenoides	ORHY	Indian ricegrass
Poa secunda	POSE	Sandburg bluegrass
P. spp.	POA	Bluegrass
Sporobolus cryptandrus	SPCR	Sand dropseed
Stipa comata	STCO	Needle-and-thread

9.3 Cont.

Table IX-31 Shrub stem densities, Pinyon-Juniper Clifftop vegetation type. South Lease, Utah. July 1981.

Species	Common Name	Stem Density	
		per acre	per hectare
Artemisia nova	Black sagebrush	687.38	1698.08
A. tridentata	Big sagebrush	29.58	73.07
Cercocarpus ledifolius	Curlleaf mountain mahogany	12.46	30.77
C. montanus	True mountain mahogany	101.98	251.92
Chrysothamnus vaseyi	Vasey rabbitbrush	77.07	190.38
C. viscidiflorus	Low rabbitbrush	7.78	19.23
Cowania mexicana	Cliffrose	14.79	36.54
Ephidra torreyana	Mormon tea	70.84	175.00
Eriogonum microthecum	Slenderbush eriogonum	3.11	7.69
Eurotia lanata	Winterfat	10.12	25.00
Forsellesia meionandra	Greasebush	14.01	34.62
Philadelphus microphyllus	Mock orange	4.67	11.54
Symphoricarpos vaccinoides	Serviceberry	26.47	65.38
Xanthocephalum sarothrae	Broom snakeweed	104.31	257.69
Total		1164.57	2876.91

9.3 Cont.

Table IX-32. Tree densities, Pinyon-Juniper Clifftop vegetation type. South Lease, Utah· July-August 1981.

Species	Common Name	Tree Density	
		per acre	per hectare
Juniperus osteosperma	Utah juniper	149.27	368.75
Pinus edulis	Pinyon pine	98.67	243.75
Total		247.94	612.50

9.3 Cont.

Table IX-33. Vegetation cover by life form from 0.25 m^2 quadrats, Pinyon-Juniper Clifftop vegetation type. South Lease, Utah. July 1981.

Life form or feature	Total Cover (%)	Relative Vegetation Cover (%)
Tree	-*	
Shrub	0.80+	28.48
Forb	0.68	38.74
Grass	0.99	32.78
Cryptogam	.55	
Vegetation Cover	3.02	
Rock	47.46	
Bareground	19.40	
Litter	30.12	
Total	100.00	100.00

* Tree cover was not measured by quadrats. Tree cover data from line-intercept measurements appear in Table IX-34.

+ Shrub cover value is only for plants < 12 inches in height. Complete shrub cover data is available in Table IX-34.

9.3 Cont.

Table IX-34. Shrub and tree cover from 30 m line-intercept transects, Pinyon-Juniper Clifftop vegetation type. South Lease, Utah. July 1981.

Species	Common Name	Cover (%)
Shrub		
Artemisia nova	Black sagebrush	1.06
A. tridentata	Big sagebrush	.36
Cercocarpus ledifolius	Curlleaf mountain mahogany	.18
C. montanus	True mountain mahogany	1.39
Chrysothamnus vaseyi	Vasey rabbitbrush	.05
Cowania mexicana	Cliffrose	.30
Ephedra viridis	Green Mormon tea	.15
Eurotia lanata	Winterfat	.02
Symphoricarpos spp.	Snowberry	.09
Xanthocephalum sarothrae	Broom snakeweed	.39
Tree		
Juniperus osteosperma	Utah juniper	8.09
Pinus edulis	Pinyon pine	21.05
Total		33.13

9.3 Cont.

Table IX-35. Vegetation cover by life form from 30 m point-line transects, Pinyon-Juniper Clifftop vegetation type. South Lease, Utah. July 1981.

Life form or feature	Total Cover (%)	Relative Vegetation Cover (%)
Tree	29.83	80.59
Shrub	3.33	10.58
Forb	1.67	4.79
Grass	1.50	4.04
Vegetation Cover	36.33	
Rock	28.33	
Bareground	13.83	
Litter	21.51	
Total	100.00	100.00

9.3 Cont.

Table IX-36. Percent Cover and Constancy by Species for the Pinyon-Juniper Clifftop Vegetation Type. South Lease, Utah. July 1981.

STAND NUMBER	1	2	3	4	5	6	7	8	9
STATE AND COUNTY	UT EMERY	UT EMERY	UT EMERY	UT EMERY	UT EMERY	UT EMERY	UT EMERY	UT EMERY	UT EMERY
GRID NUMBER	12	12	12	12	12	12	12	12	12
ELEVATION IN FEET	6600	6600	6760	6760	6780	6780	6550	6550	6600
ASPECT	SW	SW	E	E	E	E	NE	NE	E
SLOPE IN PERCENT	37	37	14	14	12	12	15	15	19
SOIL MAPPING UNIT	NXC	NXC	NXC	NXC	NXC	NXC	RVD	RVD	RVD
TREES:									
Juniperus osteosperma	0.22	•	•	0.01	•	•	•	•	•
Pinus edulis	0.05	•	0.35	•	0.01	•	•	•	•
SHRUBS:									
Artemisia nova	•	•	•	•	•	•	0.92	1.05	•
Cercocarpus montanus	•	•	•	•	•	•	•	•	0.20
Chrysothamnus nauseosus	•	•	•	0.02	•	•	•	•	•
C. viscidiflorus	•	•	0.50	•	•	•	0.04	•	•
Eurotia lanata	0.25	5.12	•	•	•	•	•	•	•
Philidelphus microphyllus	0.05	•	•	•	•	0.60	•	•	0.16
Symphoricarpos vaccinioides	•	•	•	•	•	•	•	•	•
Xanthocephalum sarothrae	•	•	•	•	•	•	•	•	•
FORBS:									
Arabis perennans	0.01	0.10	0.02	•	•	•	•	•	•
Aster spp.	•	•	•	•	•	•	•	•	•
Brassicaceae spp.	•	•	•	•	•	•	•	•	•
Caulanthus crassicaulis	•	•	0.10	•	•	•	•	•	•
Cryptantha spp.	0.46	0.19	0.16	•	•	0.11	•	1.02	0.26
Echinocereus spp.	•	•	•	0.10	0.28	•	•	•	•
Eriogonum jamesii	•	•	0.30	•	•	•	•	•	•
Euphorbia fendleri	•	•	•	•	0.04	•	•	•	0.06
Gilia congesta	•	•	•	•	•	•	0.25	•	•
Hedysarum boreale	0.25	•	•	•	•	•	•	•	•
Hymenopappus spp.	•	•	•	•	•	•	•	•	•
Hymenoxys richardsonii	1.05	0.02	0.15	0.02	•	•	0.08	0.25	0.08
Leptodactylon pungens	0.22	0.35	•	•	•	•	•	•	•
Machaerantha grindelioides	0.15	0.12	0.05	•	0.12	0.15	0.05	0.12	0.05
M. tanacetifolia	•	•	•	•	0.04	•	•	•	•
Opuntia spp.	•	•	0.88	0.08	0.10	0.50	•	•	0.05
Penstemon spp.	•	•	•	0.12	•	•	•	•	•
Physaria spp.	•	•	•	•	•	•	•	•	•
Senecio multilobatus	0.02	0.12	•	•	•	•	•	0.30	0.17
Sphaeralcea spp.	•	•	•	0.01	•	•	•	•	•
Townsendia incana	0.05	•	•	•	•	•	•	•	•
Unknown forb	0.15	0.04	•	0.01	0.04	0.20	+	•	•
GRASSES:									
Agropyron spp.	+#	0.65	•	•	•	•	•	•	•
Aristida spp.	•	•	0.09	•	0.16	•	•	•	0.10
Bouteloua hirsuta	•	•	•	0.05	•	•	•	•	•
Bromus tectorum	•	•	•	+	•	•	+	1.25	•
Elymus salina	2.71	2.12	0.25	0.02	•	•	0.11	1.10	0.25
Hordeum jubatum	•	•	0.05	•	•	•	•	•	•
Koeleria cristata	•	•	•	•	•	•	•	•	•
Oryzopsis hymenoides	0.54	0.92	•	0.01	0.09	0.05	•	•	0.85
Poa secunda	•	0.02	•	•	•	•	•	•	•
P. spp.	•	0.60	•	•	•	•	•	0.18	•
Sitanion hystrix	•	•	•	•	•	•	•	•	•
Stipa comata	0.05	•	•	•	•	•	•	•	•
Vulpia octoflora	•	•	•	•	•	•	•	•	•
Cryptogams	•	•	0.52	0.40	0.85	0.65	0.25	0.15	0.25

• = Species not present
+ = Species present as a trace in plot or present outside plots.

Table IX-36 Cont.

PINYON-JUNIPER/CLIFFTOP

STAND NUMBER	10	11	12	13	14	15	16	17	18
STATE AND COUNTY	UT EMERY	UT EMERY	UT EMERY	UT EMERY	UT EMERY	UT EMERY	UT EMERY	UT EMERY	UT EMERY
GRID NUMBER	12	12	12	12	12	12	12	12	12
ELEVATION IN FEET	6600	6640	6640	6620	6620	6610	6420	6425	6430
ASPECT	E	E	E	E	E	E	NE	NE	NE
SLOPE IN PERCENT	19	21	21	26	26	52	52	52	52
SOIL MAPPING UNIT	RVD	MUE	MUE	MUE	MUE	MUE	MUE	MUE	MUE
TREES:									
Juniperus osteosperma	•*	•	•	•	•	•	•	0.25	•
Pinus edulis	•	•	0.35	•	0.11	•	•	•	•
SHRUBS:									
Artemisia nova	1.10	•	2.40	•	0.58	•	0.70	•	0.70
Cercocarpus montanus	•	•	•	•	•	•	•	•	•
Chrysothamnus nauseosus	•	•	•	•	0.08	•	0.65	•	•
C. viscidiflorus	•	•	•	0.02	•	•	•	•	•
Eurotia lanata	•	•	•	•	•	•	•	•	•
Philidelphus microphyllus	•	•	•	•	0.78	0.10	•	•	•
Symphoricarpos vaccinioides	•	•	•	•	•	•	•	•	•
Xanthocephalum sarothrae	•	0.25	0.30	•	•	•	•	•	•
FORBS:									
Arabis perennans	•	0.02	•	•	+	•	•	•	•
Aster spp.	•	•	•	•	•	•	•	•	•
Brassicaceae spp.	•	•	•	•	•	•	0.02	•	+
Caulanthus crassicaulis	•	•	•	•	•	•	•	•	•
Cryptantha spp.	0.16	0.02	•	0.25	+	•	•	•	•
Echinocereus spp.	•	•	•	•	•	•	•	•	•
Eriogonum jamesii	•	•	•	•	•	•	•	•	•
Euphorbia fendleri	•	•	•	0.02	0.05	•	0.05	•	0.05
Gilia congesta	•	•	•	•	0.15	•	•	•	0.05
Hedysarum boreale	•	•	•	•	•	•	•	•	0.80
Hymenopappus spp.	•	•	•	0.20	•	0.01	•	0.05	•
Hymenoxys richardsonii	0.01	0.27	0.08	0.32	•	•	0.05	•	•
Leptodactylon pungens	•	•	0.01	0.35	•	0.25	•	0.15	•
Machaeranthe grindelioides	0.01	0.05	•	0.01	0.35	•	•	•	•
M. tanacetifolia	•	•	•	•	•	•	•	•	•
Opuntia spp.	0.30	0.40	•	•	•	•	•	•	•
Penstemon spp.	•	•	•	•	•	•	•	•	•
Physaria spp.	•	•	•	•	•	•	•	•	•
Senecio multilobatus	•	•	•	•	0.05	•	•	•	•
Sphaeralcea spp.	•	•	•	•	•	•	•	•	•
Townsendia inocana	•	•	•	•	•	•	•	•	•
Unknown forb	0.01	•	•	0.20	•	0.01	+	+	•
GRASSES:									
Agropyron spp.	•	•	•	•	•	0.02	•	•	•
Aristida spp.	•	0.02	•	0.15	•	•	•	•	•
Bouteloua hirsuta	•	•	•	•	•	•	•	•	•
Bromus tectorum	+#	•	•	•	•	•	•	•	•
Elymus salina	0.16	•	•	•	2.10	•	•	0.05	0.50
Hordeum jubatum	•	•	•	•	•	•	•	•	•
Koeleria cristata	0.02	•	•	•	•	•	•	•	•
Oryzopsis hymenoides	•	•	•	•	0.30	•	0.05	0.02	0.25
Poa secunda	•	•	•	•	•	•	•	•	•
P. spp.	•	•	•	•	•	•	•	•	•
Sitanion hystrix	•	•	•	•	•	0.20	•	•	•
Stipa comata	•	•	•	•	•	•	•	•	•
Vulpia octoflora	•	•	•	•	•	•	•	•	+
Cryptogams	0.05	0.60	•	0.89	0.08	1.10	0.50	0.65	1.00

•* = Species not present
+# = Species present as a trace in plot or present outside plot

Table IX-36 Cont.

PINYON-JUNIPER/CLIFFTOP

STAND NUMBER	19	20	21	22	23	24	CONSTANCY
STATE AND COUNTY	UT EMERY	UT EMERY	UT EMERY	UT EMERY	UT EMERY	UT EMERY	
GRID NUMBER	12	12	12	12	12	12	
ELEVATION IN FEET	6450	6485	6460	6490	6475	6480	
ASPECT	NE	NE	NE	NE	NE	NE	
SLOPE IN PERCENT	43	52	43	43	43	43	
SOIL MAPPING UNIT	MUE	MUE	MUE	MUE	MUE	MUE	
TREES:							
Juniperus osteosperma	•	•	•	•	•	•	12
Pinus edulis	•	•	•	•	•	•	21
SHRUBS:							
Artemisia nova	•	0.70	2.40	0.40	•	•	42
Cercocarpus montanus	•	•	•	•	•	•	4
Chrysothamnus nauseosus	0.90	0.65	0.30	0.60	0.25	0.50	38
C. viscidiflorus	•	•	•	•	•	•	12
Eurotia lanata	•	•	•	•	•	•	8
Philidelphus microphyllus	•	•	•	0.35	0.27	0.25	33
Symphoricarpos vaccinioides	•	0.25	•	•	•	•	4
Xanthocephalum sarothrae	•	•	•	•	•	•	8
FORBS:							
Arabis perennans	•	•	•	•	•	•	21
Aster spp.	•	•	•	0.05	•	•	4
Brassicaceae spp.	•	•	•	•	•	•	8
Caulanthus crassicaulis	•	•	•	•	•	•	4
Cryptantha spp.	•	•	•	•	•	•	42
Echinocereus spp.	•	•	•	•	•	•	8
Eriogonum jamesii	•	•	•	•	•	•	4
Euphorbia fendleri	•	0.20	•	•	•	0.42	33
Gilia congesta	•	•	•	•	•	•	12
Hedysarum boreale	•	0.30	•	0.15	•	•	17
Hymenopappus spp.	0.10	•	•	0.05	•	•	21
Hymenoxys richardsonii	•	•	•	•	•	•	50
Leptodactylon pungens	•	•	0.05	•	0.10	•	33
Machaeranthe grindelioides	•	•	•	•	•	•	50
M. tanacetifolia	•	•	•	•	•	•	4
Opuntia spp.	•	•	•	•	•	•	29
Penstemon spp.	•	•	•	•	•	•	4
Physaria spp.	0.10	•	•	•	•	•	4
Senecio multilobatus	•	•	•	•	•	•	21
Sphaeralcea spp.	•	•	•	•	•	•	4
Townsendia inoana	•	•	•	•	•	•	4
Unknown forb	•	•	•	•	•	+	50
GRASSES:							
Agropyron spp.	•	•	•	•	•	•	12
Aristida spp.	•	•	0.11	•	•	0.45	29
Bouteloua hirsuta	•	•	•	•	•	•	4
Bromus tectorum	•	•	•	•	•	•	17
Elymus salina	0.50	0.90	0.01	1.32	0.55	0.20	71
Hordeum jubatum	•	•	•	•	•	•	4
Koeleria cristata	•	•	•	•	•	•	4
Oryzopsis hymenoides	1.35	0.22	0.40	1.30	0.40	•	62
Poa secunda	•	•	•	•	•	•	4
P. spp.	•	•	•	•	•	•	8
Sitanion hystrix	0.10	•	•	•	•	•	8
Stipa comata	•	•	•	•	•	•	4
Vulpia octoflora	•	•	•	•	•	•	4
Cryptogams	0.30	0.80	0.15	0.40	0.40	1.90	88

• * = Species not present

9.3 Cont.

Annual primary production is estimated to be 43 pounds air dry per acre (48 kg/ha), reflecting the harsh, steep rock conditions beneath the PJ canopy. Primary production by life form is included in Table IX-6. Tree basal area per acre averages 8512 square feet (1953 m^2/ha) (Table IX-37). Planned disturbances in the PJ Clifftop type are ventilation shafts and less than one-half mile (0.8 km) of service road. These will be maintained for the life of the mine, and will occupy 15.5 acres (6.3 ha).

9.3 Cont.

Table IX-37. Tree basal area, Pinyon-Juniper Clifftop vegetation type, South Lease, Utah. July-August 1981.

Species	Common Name	Basal Area	
		ft^2/A	m^2/ha
Juniperus osteosperma	Utah juniper	4900	1124
Pinus edulis	Pinyon pine	3612	829
Total		8512	1953

9.3 Cont.

Artemisia tridentata
(Sagebrush)

The Sagebrush vegetation type in the South Lease properties lies between 6400 and 6500 feet (1950 to 1980 m) atop the Book Cliffs. Slopes are 0 to 6 percent. Aspect is typically eastern to southeastern (Photograph IX-8).

The soil underlying the sagebrush is Glenberg fine sandy loam. The Glenberg soil mapping unit is characterized by very deep, well-drained soils in intermittent stream bottoms. The average surface layer (A1) is 2 inches (5 cm) thick. The underlying C horizons extend to 60 inches (152 cm). Runoff is slow and erosion hazard is moderate.

The intermittent stream bottoms are standing and traveling areas for cattle and little vegetation remains in these bottoms, other than big sagebrush (*Artemisia tridentata*) and cheatgrass, with occasional forbs. Greasewood (*Sarcobatus vermiculatus*) individuals are found erratically within the Sagebrush. A comprehensive species list for Sagebrush is contained in Table IX-38.

Herbaceous and low (less than 12 inches) woody vegetation cover collected by quadrats, averages four percent (Table IX-39). Tree and shrub cover from line intercept information averages 24 percent; 89 percent of which is big sagebrush cover (Table IX-40). Point-line transect data indicates a total vegetation cover average of 30 percent (Table IX-41). Cover and constancy is contained in Table IX-42).

Shrub stem density information is summarized in Table IX-43. Annual primary productivity was estimated to be 184 pounds air dry per acre (207 kg/ha). Production by life form is presented in Table IX-6.

9.3 Cont.

Photograph IX-8 *Artemisia Tridextata* Vegetation Type.
South Lease, Utah. February, 1982.

9.3 Cont.

Table IX-38. Comprehensive species list for the Sagebrush vegetation type. South Lease, Utah. June-August 1981.

Trees		
Juniperus communis	JUCO	Common juniper
J. osteosperma	JUOS	Utah juniper
Pinus edulis	PIED	Pinyon pine
Shrubs		
Artemisia nova	ARNO	Black sagebrush
A. tridentata	ARTR	Big sagebrush
Atriplex canescens	ATCA	Fourwing saltbush
A. confertifolia	ATCON	Shadscale
Eurotia lanata	EULA	Winterfat
Sarcobatus vermiculatus	SAVE	Greasewood
Xanthocephalum sarothrae	XASA	Broom snakeweed
Forbs		
Aster spp.	ASTER	
Cryptantha spp.	CRYPT	Cryptantha
Euphorbia fendleri	EUFE	Fendler euphorbia
Lappula echinata	LAEC	European stickseed
Lepidium montanum	LEMO	Mountain pepperweed
L. spp.	LEPID	Pepperweed
Lupinus spp.	LUPIN	Lupine
Machaeranthera canescens	MACA	Hoary aster
Opuntia spp.	OPUNT	Prickly pear cactus
Plantago patagonica	PLPA	Wooly plantain
Sphaeralcea parvifolia	SPPA	
Grasses		
Agropyron smithii	AGSM	Western wheatgrass

9.3 Cont.

Table IX-38 Continued

Grasses - Continued

Agropyron spp.	AGROP	Wheatgrass
Bromus tectorum	BRTE	Cheatgrass brome
Oryzopsis hymenoides	ORHY	Indian ricegrass
Sitanion hystrix	SIHY	Bottlebrush squirreltail
Sporobolus cryptandrus	SPCR	Sand dropseed
Stipa comata	STCO	Needle-and-thread
Vulpia octoflora	VUOC	Sixweeks fescue

9.3 Cont.

Table IX-39. Vegetation cover by life form from 0.25 m^2 quadrats, Sagebrush vegetation type. South Lease, Utah. July 1981.

Life form or feature	Total Cover (%)	Relative Vegetation Cover (%)
Tree	*	
Shrub	+	
Forb	2.14	52
Grass	2.00	48
Vegetation Cover	4.14	
Rock	1.16	
Bareground	52.31	
Litter	42.39	
Total	100.00	100.00

* Not measured in quadrats unless <12 inches tall.

\+ Not measured in quadrats unless <12 inches tall.

9.3 Cont.

Table IX-40. Shrub and tree cover from 50 m line-intercept transects, Sagebrush vegetation type. South Lease, Utah. June 1981.

Species	Common Name	Cover (%)
Shrub		
Artemisia tridentata	Big sagebrush	21.22
Atriplex canescens	Fourwing saltbush	.45
Eurotia lanata	Winterfat	.76
Juniperus communis	Common juniper	.08
Sarcobatus vermiculatus	Greasewood	1.28
Tree		
Juniperus osteosperma	Utah juniper	.06
Pinus edulis	Pinyon pine	.09
Total		23.94

9.3 Cont.

Table IX-41. Vegetation cover by life form from 30 m point-line transects, Sagebrush vegetation type. South Lease, Utah. August 1981.

Life form or feature	Total Cover (%)	Relative Vegetation Cover (%)
Tree	.27	.90
Shrub	24.93	83.10
Forb	1.73	5.77
Grass	3.07	10.23
Vegetation Cover	30.00	
Rock	.93	
Bareground	39.74	
Litter	29.33	
Total	100.00	100.00

9.3 Cont.

Table IX-42. Percent Cover and Constancy by Species for the Sagebrush Vegetation Type. South Lease, Utah. July 1981.

STAND NUMBER	1	2	3	4	5	6	7	8	9
STATE AND COUNTY	UT EMERY	UT EMERY	UT EMERY	UT EMERY	UT EMERY	UT EMERY	UT EMERY	UT EMERY	UT EMERY
GRID NUMBER	12	12	12	12	12	12	12	12	12
ELEVATION IN FEET	6520	6520	6520	6520	6520	6520	6520	6520	6520
ASPECT	E	E	E	E	E	SE	SE	SE	SE
SLOPE IN PERCENT	2	2	5	6	3	3	3	2	2
SOIL MAPPING UNIT	GNA	GNA	GNA	GNA	GNA	GNA	GNA	GNA	GNA
FORBS:									
Aster spp.	•*	•	•	0.20	•	•	•	•	•
Cryptantha spp.	•	•	0.40	•	•	•	0.10	•	•
Euphorbia fendleri	•	•	•	•	•	•	•	•	•
Lappula echinata	•	•	•	•	•	1.10	•	•	•
Lepidium spp.	•	•	•	•	•	0.75	0.02	•	•
Lupinus spp.	•	•	•	•	•	•	•	•	•
Machaeranthera canescens	•	•	•	•	•	•	•	0.40	•
Opuntia spp.	•	•	0.20	•	•	•	•	•	0.40
Plantago patagonica	•	0.01	•	•	•	•	•	•	•
Sphaeralcea parvifolia	1.6	2.71	2.20	0.05	3.65	2.45	1.52	0.55	0.95
Unknown forb	•	•	•	0.01	0.04	•	•	•	•
GRASSES:									
Agropyron smithii	0.02	•	•	0.02	•	0.19	•	•	•
A. spp.	0.05	•	•	•	•	•	•	0.30	•
Bromus tectorum	0.72	0.10	•	•	0.12	0.10	2.25	0.05	0.9
Elymus salina	•	•	•	•	•	•	•	•	0.45
Oryzopsis hymenoides	0.95	0.85	1.91	1.25	•	•	0.75	1.20	•
Sitanion hystrix	0.25	•	•	•	•	•	•	•	•
Sporobolus cryptandrus	0.10	0.10	•	0.15	•	•	•	0.05	•
Stipa comata	1.35	1.70	0.75	0.30	0.35	•	0.45	1.55	0.22
Vulpia octoflora	•	0.35	•	•	•	•	0.20	•	•

•* = Species not present

Table IX-42 Cont.

				SAGEBRUSH	
STAND NUMBER	10	11	12	13	CONSTANCY
STATE AND COUNTY	UT EMERY	UT EMERY	UT EMERY	UT EMERY	%
GRID NUMBER	12	12	12	12	
ELEVATION IN FEET	6520	6520	6520	6520	
ASPECT	SE	SE	SE	SE	
SLOPE IN PERCENT	2	3	3	2	
SOIL MAPPING UNIT	GNA	GNA	GNA	GNA	
FORBS:					
Aster spp.	•*	•	•	•	8
Cryptantha spp.	•	•	0.15	•	23
Euphorbia fendleri	•	•	•	0.25	8
Lappula echinata	0.15	0.95	0.25	•	31
Lepidium spp.	•	•	0.40	•	23
Lupinus spp.	•	•	•	0.50	8
Machaeranthera canescens	•	•	•	•	8
Opuntia spp.	•	0.45	•	•	23
Plantago patagonica	•	•	•	•	8
Sphaeralcea parvifolia	0.15	1.10	3.65	0.45	100
Unknown forb	•	•	•	0.01	23
GRASSES:					
Agropyron smithii	0.25	•	•	•	23
A. spp.	•	•	•	•	15
Bromus tectorum	0.62	0.25	1.92	0.10	69
Elymus salina	•	•	•	•	8
Oryzopsis hymenoides	0.45	0.32	0.80	0.05	77
Sitanion hystrix	0.20	•	•	•	15
Sporobolus cryptandrus	0.08	•	•	•	38
Stipa comata	0.65	0.15	•	•	77
Vulpia octoflora	•	•	0.02	•	23

•* = Species not present

9.3 Cont.

Table IX-43. Shrub stem density by species for the Sagebrush vegetation type. South Lease, Utah. July 1981.

Species	Common Name	Stem Density	
		per acre	per hectare
Artemisia tridentata	Big sagebrush	2183	5391
Atriplex canescens	Fourwing saltbush	33	82
A. confertifolia	Shadscale	67	165
Sarcobatus vermiculatus	Greasewood	467	1152
Total Shrubs		2750	6790

9.3 Cont.

The planned disturbances for this area are a road, the surface facilities near the man shaft, and a temporary coal stockpile. These disturbances will comprise 13.5 acres (5.5 hectares).

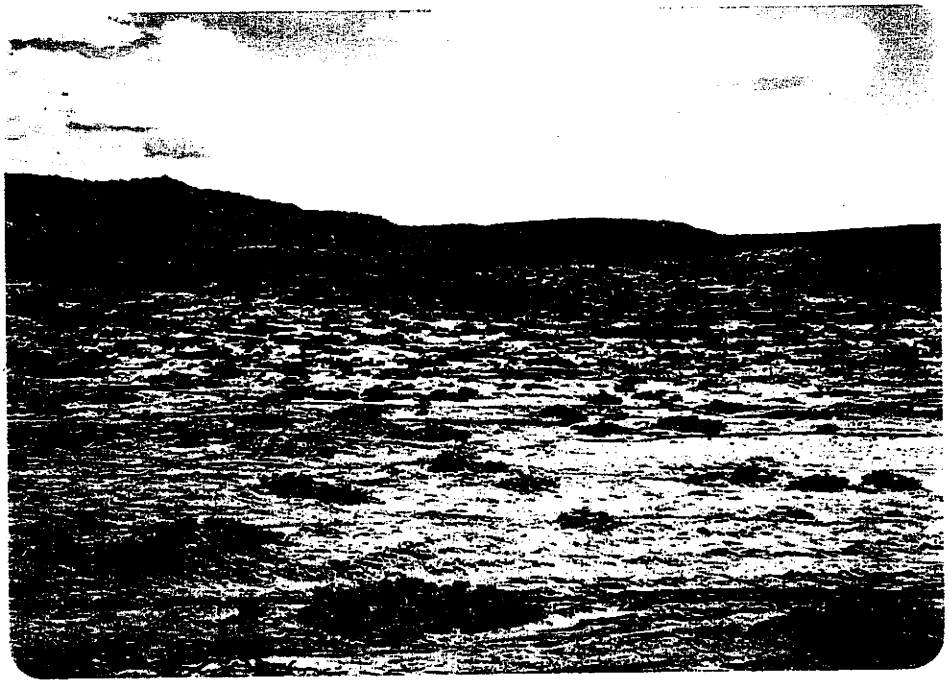
9.3 Cont.

Transition

The Transition vegetation type occurs in the ecotonal area between the *Atriplex*-Badland and *Atriplex-Artemisia-Hilaria* vegetation types (Photograph IX-9). The transition between these two types if very gradual and covers a large area. Because of its large size in the lease area, the dominants of the adjoining vegetation types are common in the Transition type.

No intensive sampling was conducted in the Transition type because of its ecotonal nature. The area planned for disturbance comprises 14.2 acres (5.75 ha), in the permit area. For reclamation purposes, the materials and methods planned for the *Atriplex-Artemisia-Hilaria* vegetation type will be appropriate with slight site specific modifications.

9.3 Cont.



Photograph IX-9 Transition Vegetation type.
South Lease, Utah. Sepetmber, 1981.

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9.10 Plates

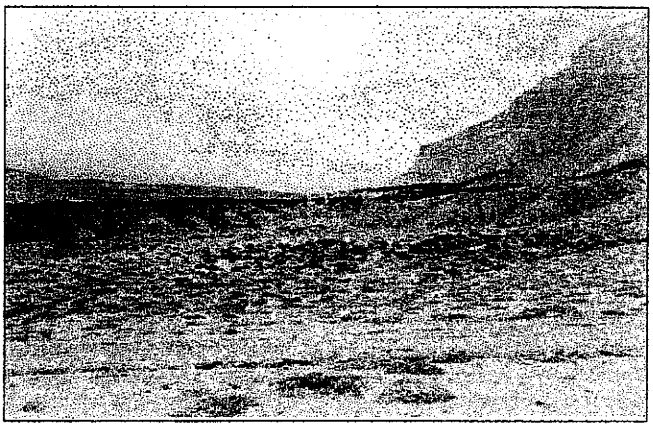
Plate IX-1 General Vegetation Map

Plate IX-2 Vegetation Map: Surface Plant and Facilities Area

Plate IX-3 Vegetation Map: Access/Haul Road and Rail Spur Area

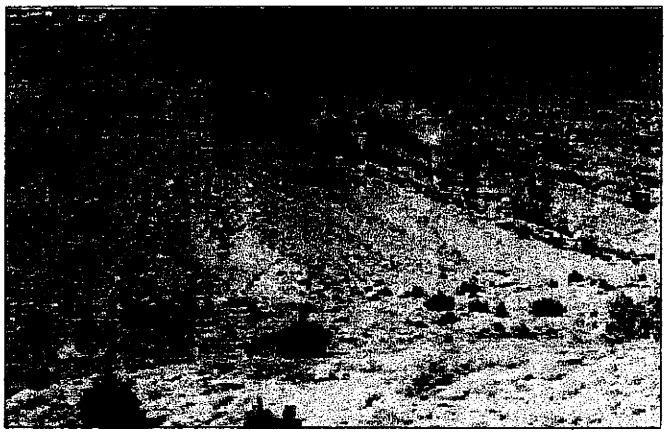
Lila Canyon

Vegetation Inventory



Prepared for:

UtahAmerican Energy, Inc.
(UEI)
P.O. Box 187
Clairsville, Ohio 43950



Prepared by:
Environmental Industrial Services
31 North Main Street
Helper, Utah 84526

October 1, 1999

Introduction

Lila Canyon, located in Emery County, was surveyed November 1st through the 11th, 1999. The purpose was to establish a vegetation inventory for a proposed coal mine for UtahAmerican Energy, Incorporated. Mr. Melvin A. Coonrod, Mr. Ken Salt, and George Cook from Environmental Industrial Services (EIS) conducted the survey.

Methodology

The area of potential disturbance was mapped relative to vegetation communities and a numbered grid was laid over the potential disturbed area.

Sampling of vegetation was accomplished by surveying 15 transects for each area, with transects spanning 100'. A table of random numbers arbitrarily determined the placement in the grid and direction of each transect. Every 10', a 2.5' x 2.5' iron rod with 10 random points was placed on alternating sides of the tape, determining the point of each sample. A total of 1,500 points were taken for each vegetation type. (15 Transects)

To establish revegetation success standards, a reference area correlating with brush and grass vegetation types was surveyed. A reference area measuring 330' x 330' (1acre^2) was laid out. Transects were conducted using the same methodology as the disturbed areas. (See Figure 1 Map, for location of transects and reference areas).

The Pinyon Juniper vegetation community was sampled to determine woody plant density using a circular plot with an 11'9" radius (1/100 of an acre) centered at the beginning of each transect. All woody plants within the circumference were counted. A total of 15 plots were conducted for each area.

The reference area was selected with a similar slope, aspect and like soil characteristics.

Findings

Lila Canyon consists of two main vegetation types. Shrubs and grasses cover approximately 20 acres of the lower boundary, while Pinyon and Juniper occupy the remaining 20 acres at higher elevations (see attached cover).

The surrounding vegetation is composed of similar zones, but with the addition of several wide, shallow drainage areas inhabited mainly by Salina Wild Rye (Elymus salinus,) Tamarisk (Tamarix pentandra), Greasewood (Sarcobatus vermiculatus), and Rabbitbrush (Chrysothamnus nauseosus). Shadscale (Atriplex confertifolia), was also associated with these areas, but not identified in the surveyed locations. No threatened or endangered species were identified within the permit or surrounding areas.

Species composition of the shrub and grass areas consist predominantly of Cheat Grass (Bromus

tectorum), Rabbitbrush (Chrysothamnus viscidiflorus), and Lichen. Salina Wild Rye (Elymus salinus) and Indian Rice Grass (Oryozopis hymenoides) also commonly occur over the survey area. Bare ground, rock and vegetation litter account for 55.2% of total ground cover in the reference area.

While Utah Juniper and Pinyon Pine identify the second vegetation type, Salina Wild Rye (Elymus salinus), Lichen and Rabbitbrush (Chrysothamnus viscidiflorus) attribute the highest yield to species composition. Bare ground, rock, and vegetative litter occupy 72.4% of total ground cover in the Pinyon/Juniper area. For a complete list of species identified, refer to Table 1.

Sample adequacy was demonstrated for ground cover, and density for both the proposed disturbed site and the reference area as suggested by the Vegetation Information Guidelines (1992). (See Tables 1 & 2).

Species composition similarity was demonstrated by using "Jaccard's Community Coefficient." The Jaccard's Community Coefficient for the proposed disturbed area compared to the reference area was 89%, which is higher than the 70% recommended in the Vegetation Information Guidelines (1992). See FIGURE 1.

Ground cover and woody plant density similarity was demonstrated by the use of a double "t" with a confidence interval of 90% as suggested by the Vegetation Information Guidelines (1992). Both the ground cover and wood plant density fell well within the 90% confidence interval. See FIGURE 2.

In all data sets, this survey exceeded the requirement that at least a 70% probability was achieved. In addition, all confidence levels were greater than 90%.

The Pinyon/Juniper study area as well as the Pinyon/Juniper reference area were deleted from the stydy after consultation with the BLM, Mr. David Mills, and DOGM Mr. Paul Baker. The consensus of all concerned agencies and individuals was that Pinyon/Juniper was not a desirable vegetation community to reestablish in a critical high value range for elk, deer and potentially Rocky Mountain Bighorn sheep. Within the Price River Resource Area Pinyon/Juniper comprise approximately 200,000 acres, occupying approximately 18% of the land area. This vegetation community is not deemed high value use for forage by big game species. The post mining land use is wildlife and grazing. The grass shrub community is far more desirable end community for this purpose.

TABLE 1

Lila Vegetation Inventory
GRASS / SHRUB
Mine Site Area
Transect Number

Common Name	Species Name	24° 1	70° 2	360° 3	95° 4	140° 5	72° 6	145° 7	002° 8	71° 9	317° 10	94° 11	93° 12	75° 13	11° 14	65° 15	Sum	AVG	STD	% Cover By Species
Desirable Species																				
Blue Grama	Bouteloua gracilis	5	0	0	1	5	7	1	2	3	2	11	3	8	6	11	65	4.33	3.534	4.33
Fish Hook Cactus	Sclerocacuts	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0.07	0.249	0.07
Four-wing Salt Brush	Atriplex canescens	2	0	0	0	0	0	0	0	0	0	0	0	0	1	0	3	0.20	0.542	0.20
Galleta	Hilaria jamesii	0	3	8	3	5	3	0	1	2	2	0	6	0	1	0	34	2.27	2.380	2.27
Hedgehog Cactus	Echinocereus	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0.07	0.249	0.07
Indian Ricegrass	Oryzopsis hymenoides	3	1	0	2	0	0	4	2	4	3	3	1	7	3	1	34	2.27	1.843	2.27
Mormon Tea	Green Ephedra	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	2	0.13	0.340	0.13
Squirrel Tail	Elymus elymoides	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00	0.000	0.00
Needle & Thread Grass	Stipa comata	1	2	4	0	0	3	7	6	4	2	0	2	2	4	5	42	2.80	2.104	2.80
Prickly Per	Opuntia compressa	0	0	0	1	0	0	1	0	0	0	0	0	0	0	1	3	0.20	0.400	0.20
Purple Three-awn	Aristida purpurea	0	0	4	0	1	2	3	3	0	1	0	0	6	3	0	23	1.53	1.821	1.53
Rabbitbrush	Chrysothamnus nauseosus	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	2	0.13	0.340	0.13
Saline Wild Rye	Unus elannae	0	10	0	13	13	1	9	11	6	9	10	11	8	9	9	119	7.93	4.171	7.93
Scarlet Globe Mallow	Sphaeralcea coccinea	1	0	0	0	0	2	1	0	1	0	0	0	0	0	0	5	0.33	0.598	0.33
Shadscale	Atriplex confertigoliz	0	0	0	0	0	0	1	0	0	1	1	3	1	0	0	7	0.47	0.806	0.47
Winterfat	Ceratoides lanata	1	0	0	1	0	0	0	0	0	1	0	0	1	0	0	4	0.27	0.442	0.27
TOTAL DESIRABLE		**13**	**17**	**16**	**21**	**24**	**18**	**27**	**26**	**21**	**21**	**26**	**27**	**33**	**28**	**27**	**345**			**23.00**
Undesirable Species																				
Cheatgrass	Bromus tectorium	26	10	23	13	3	12	9	7	16	12	11	8	9	14	7	180	12.00	5.820	12.00
Snake Weed	Gutierrezia sarothrae	12	11	4	3	7	10	5	10	9	8	4	11	6	3	12	115	7.67	3.197	7.67
TOTAL UNDESIRABLE		**38**	**21**	**27**	**16**	**10**	**22**	**14**	**17**	**25**	**20**	**15**	**19**	**15**	**17**	**19**	**295**			**19.67**
PHYSICAL CHARACTERISTICS																				
Dirt	Bare Ground	35	40	26	35	16	31	42	35	24	39	36	33	29	32	41	496	33.07	6.668	33.07
Litter	Leaves, Stems, Organic Materia	13	8	29	21	37	21	13	13	27	7	11	15	19	12	4	250	16.67	8.723	16.67
Rock	Rock	1	14	0	7	13	8	4	9	3	13	12	6	4	11	9	114	7.60	4.363	7.60
TOTAL PHYSICAL CHARACTER		**49**	**62**	**57**	**63**	**66**	**60**	**59**	**57**	**54**	**59**	**59**	**54**	**52**	**55**	**54**	**860**			[illegible]
GRAND TOTAL		**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**1500**			

Ground Cover = Desirable + Undesirable+Litter

TOTAL DESIRABLE		13	17	16	21	24	18	27	26	21	21	26	27	33	28	27	345	23.00	5.254	23.00
TOTAL UNDESIRABLE		38	21	27	16	10	22	14	17	25	20	15	19	15	17	19	295	19.67	6.446	19.67
Litter	Leaves, Stems, Organic Materia	13	8	29	21	37	21	13	13	27	7	11	15	19	12	4	250	16.67	8.723	16.67
Total		64	46	72	58	71	61	54	56	73	48	52	61	67	57	50	890	59.33	8.420	
Cover as a %		**4.3**	**3.1**	**4.8**	**3.9**	**4.7**	**4.1**	**3.6**	**3.7**	**4.9**	**3.2**	**3.5**	**4.1**	**4.5**	**3.8**	**3.3**		3.96	0.561	59.33

Parameter	n	Mean	Std	d	Deg	Conf	t	n_{min}
Cover as a %	15	3.95556	0.5613	0.1	14	0.90	1.345	3.64

E 2

Lila Vegetation Inventory
GRASS / SHRUB
Reference Area

Transect Number

Common Name	Species Name	005° 1	285° 2	192° 3	291° 4	058° 5	113° 6	348° 7	83° 8	104° 9	111° 10	193° 11	006° 12	212° 13	298° 14	65° 15	Sum	AVG	STD	% Cover By Species
Desirable Species																				
Blue Grama	Bouteloua gracilis	5	1	9	7	1	13	4	8	5	5	3	8	0	5	10	84	5.60	3.499	5.60
Fish Hook Cactus	Sclerocacuts	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0.07	0.249	0.07
Four-wing Salt Brush	Atriplex canescens	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00	0.000	0.00
Galletta	Hilaria jamesii	11	0	2	1	1	0	3	1	5	0	4	7	3	4	2	44	2.93	2.909	2.93
Hedgehog Cactus	Echinocereus	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0.07	0.249	0.07
Indian Ricegrass	Oryzopsis hymenoides	1	12	1	5	6	8	3	1	2	0	3	2	3	4	0	51	3.40	3.158	3.40
Mormon Tea	Green Ephedra	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	2	0.13	0.340	0.13
Squirrel Tail	Elymus elymoides	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0.20	0.748	0.20
Needle & Thread Grass	Stipa comata	4	8	1	5	6	0	4	3	1	0	2	0	4	3	4	45	3.00	2.280	3.00
Prickly Per	Opuntia compressa	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	2	0.13	0.340	0.13
Purple Three-awn	Aristida purpurea	4	0	4	1	7	3	0	0	1	3	0	4	5	1	4	37	2.47	2.125	2.47
Rabbitbrush	Chrysothamnus nauseosus	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0.07	0.249	0.07
Salina Wild Rye	Unus silannes	0	0	9	6	2	1	8	12	5	4	8	5	8	4	0	72	4.80	3.600	4.80
Scarlet Globe Mallow	Sphaeralcea coccinea	0	0	2	0	0	0	0	1	0	0	0	0	1	0	0	4	0.27	0.573	0.27
Shadscale	Atriplex confertigoliz	5	3	1	0	1	0	0	0	0	1	0	0	2	0	0	13	0.87	1.408	0.87
Winterfat	Ceratoides lanata	0	2	0	0	0	1	0	0	2	0	0	1	0	0	0	6	0.40	0.712	0.40
TOTAL DESIRABLE		**33**	**26**	**29**	**26**	**24**	**27**	**24**	**26**	**22**	**14**	**20**	**27**	**27**	**21**	**20**	**366**			
Undesirable Species																				
Cheatgrass	Bromus tectorium	5	22	9	10	10	16	17	12	17	22	20	7	13	14	16	210	14.00	5.046	14.00
Snake Weed	Gutierrezia sarothrae	7	14	8	8	2	5	9	8	4	3	6	4	8	5	5	96	6.40	2.871	6.40
TOTAL UNDESIRABLE		**12**	**36**	**17**	**18**	**12**	**21**	**26**	**20**	**21**	**25**	**26**	**11**	**21**	**19**	**21**	**306**			
PHYSICAL CHARACTERISTICS																				
Dirt	Bare Ground	28	16	41	46	34	22	28	32	31	21	39	33	39	41	29	480	32.00	8.083	32.00
Litter	Leaves, Stems, Organic Materia	19	22	2	10	16	15	14	19	11	27	15	21	11	13	27	242	16.13	6.417	16.13
Rock	Rock	8	0	11	0	14	15	8	3	15	13	0	8	2	6	3	106	7.07	5.397	7.07
TOTAL PHYSICAL CHARACTER		**55**	**38**	**54**	**56**	**64**	**52**	**50**	**54**	**57**	**61**	**54**	**62**	**52**	**60**	**59**	**828**			
GRAND TOTAL		**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**1500**			

Ground Cover = Desirable + Undesirable+Litter

TOTAL DESIRABLE		33	26	29	26	24	27	24	26	22	14	20	27	27	21	20	366	24.40	4.379	24.40
TOTAL UNDESIRABLE		12	36	17	18	12	21	26	20	21	25	26	11	21	19	21	306	20.40	6.205	20.40
Litter	Leaves, Stems, Organic Materia	19	22	2	10	16	15	14	19	11	27	15	21	11	13	27	242	16.13	6.417	16.13
Total		64	84	48	54	52	63	64	65	54	66	61	59	59	53	68	914	60.93	8.410	
Cover as a %		**4.3**	**5.6**	**3.2**	**3.6**	**3.5**	**4.2**	**4.3**	**4.3**	**3.6**	**4.4**	**4.1**	**3.9**	**3.9**	**3.5**	**4.5**		4.06	0.561	60.93

Parameter	n	Mean	Std	d	Deg	Conf	t	n_{min}
Cover as a %	15	4.062	0.561	0.1	14	0.90	1.345	3.45

Woody Plant Density
Total Area (Grass Shrub Disturbed & Reference and PJ)

	Transect Number															
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	TOTAL
Utah juniper				2	1			2			1	1	4	5	6	22
pinyon pine											2	1		1	2	6
prickly gila												46	3			49
shadscale	3	3	1											3	1	11
four-wing salt bush	9	11	4		3	4	1									32
winterfat	2		7			1	5		1	1			1			18
gray rabbitbrush										1						1
Douglas rabbitbrush	2	1	6	1						1						11
greasewood	2		1													3
green ephedra				1						1						2
yucca sp.														1		1
snakeweed	3	90	40	32	88	78	54	94	50	65						594
Wyoming big sage						1										1
TOTAL Woody Plant	21	105	59	36	92	84	60	96	51	69	3	48	8	10	9	751
Avg. Wood Plant/Ac.																5006.7
Desirable / Ac																1046.7
Grass Shrub Dist.	6260 stems / acre															
Grass Shrub Refer						7200 stems / acre										
PJ Disturbed											1560 stems / acre					

Two Tailed "T"

When the population is normally distributed but the variance and the mean of the population is unknown the two tailed "t" test is used. The "t" distribution is used in place of the normal distribution "z". As the sample number (n) increases the "t" distribution approaches the normal (z) distribution. The vegetation guidelines used by DOGM (Revised, February 1992) suggests that the reference areas and proposed disturbed areas should be equal with a 90% confidence using the two tailed "t" test. Woody Plant Density and % cover are to be compared. Calculations for the double "t" test follows:

Mine Area		Reference Area	
Cover as a %		Cover as a %	
Mean = X_0 =	59.33	Mean = X_0 =	60.93
STD =	8.420		
n =	15		
Woody Plant Density		Woody Plant Density	
Mean = X_0 =	70.40	Mean = X_0 =	86.0
STD =	68.417		
n =	15		

For a 90% confidence interval:

$$\frac{\text{"t" (STD)}}{n^{1/2}} \leq X_0 \leq \frac{\text{"t" (STD)}}{n^{1/2}}$$

where "t" = 1.761 from "t" distribution chart with df = (n-1)

Cover as a %

$$55.50 \leq X_0 \leq 63.16$$

Since X_0 of Cover as a % is 60.93 and can be found between 55.50 and 63.16 it can be concluded that the Mine Site and the Reference Area are equal with 90% confidence.

Woody Plant Density

$$39.29 \leq X_0 \leq 101.51$$

Since X_0 of Woody Plant Density is 86.0 and can be found between 39.29 and 101.51 it can be concluded that the Mine Site and the Reference Area are equal with 90% confidence.

Jaccard's Community Coefficient:

$$Si = c/(a+b-c)*100$$

Where:

Si= Similarity index;
a= Total number of species in the reference area;
b= Total number of species in mine site area;
b= Number of species common to both communities.

Si values can run from 1 to 100 with 1 being not similar at all and 100 being very similar.

a	b	c
17	17	16

Si = 89 making the sites very similar

The 89% Si exceeds DOGM requirements of 70%.

Appendix 3-2

Lila Canyon Vegetation Survey
November 28, 2000

ATTACHMENT 3-2
LILA CANYON VEG SURVEY

UTAH AMERICAN ENERGY INC.

LILA CANYON MINE SITE
VEGETATION GROUND COVER

CONDUCTED
NOVEMBER 28, 2000

BY
EIS
ENVIRONMENTAL ENGINEERING
AND
CONSULTING

31 NORTH MAIN STREET
HELPER, UTAH 84526
(435) 472-3814
FAX (435) 472-8780

Introduction

This report contains the percent vegetation cover inventory for pinyon- juniper stand located in the Lila Canyon mine site. The pinyon- juniper stand had minimal snow on the ground. At that time most plants still displayed evidences that they were viable. Of course all Pinyon- Juniper trees were green, as well as most of the shrubs. The grasses and forbes were not as easy to ascertain whether they were live plants in a state of dormancy or plant litter. A judgment call based on appearance of plant was made to determine if it was viable or not. No data was taken regarding the litter, rock, and bare ground as that the goal was to determined percent of vegetative cover and not total percent ground cover. The inventory was conducted by Melvin Coonrod and David Varner on November 28, 2000.

Methodology

Information acquired was recorded onto inventory field data sheets (See Attachment 1). Sampling of vegetation was accomplished by using ocular estimation approved by Division of Oil, Gas, and Mining Vegetation Information Guidelines (February 1992).

An estimate of the percent of vegetative ground cover was obtained by randomly selecting points throughout the pinyon- juniper stand and assessing the vegetation within a eleven foot nine inch radius. This makes each site 1/100 of an acre. Vegetation cover was then identified by species at each individual site (See Attachment 1).

Findings

The area supports relatively simple plant communities with a few conspicuous dominant vegetation types. The pinyon- juniper area of disturbance is comprised of sparsely associated species of all vegetation life forms including trees, shrubs, grasses, and forbes. Species composition of the shrub communities consisted predominantly of winterfat (*Ceratoides lanata)* and fourwing saltbush *(Atriplex canescens)*. The limited dispersal of grass and forbes species included Salina wild rye (*Elymus salinus*), galleta *(Hilaria jamesii)*, golden cryptantha (*Cryptantha flava*), and snakeweed *(Xanthocephalum sarothrae)*. For a complete listing of present species found in each quadrat (See Attachment 2).

An estimate was made for each species found in each individual site then total together to arrive at a total percent ground cover for each site (See Attachment 1). The total for each was used to achieve an average for the entire pinyon- juniper stand. It was determined that the pinyon- juniper stand had and average of 33 percent vegetation cover. In comparison the reference area is one acre^2 and maintains 44.8 percent vegetative cover and the Pinyon- Juniper area actually surveyed was one tenth in size and contained 33 percent vegetative cover. Field sheets are attached that show location, species, and estimated ground cover (see Attachment 2).

ATTACHMENT 1
PERCENT GROUND COVER
BY
SPECIES

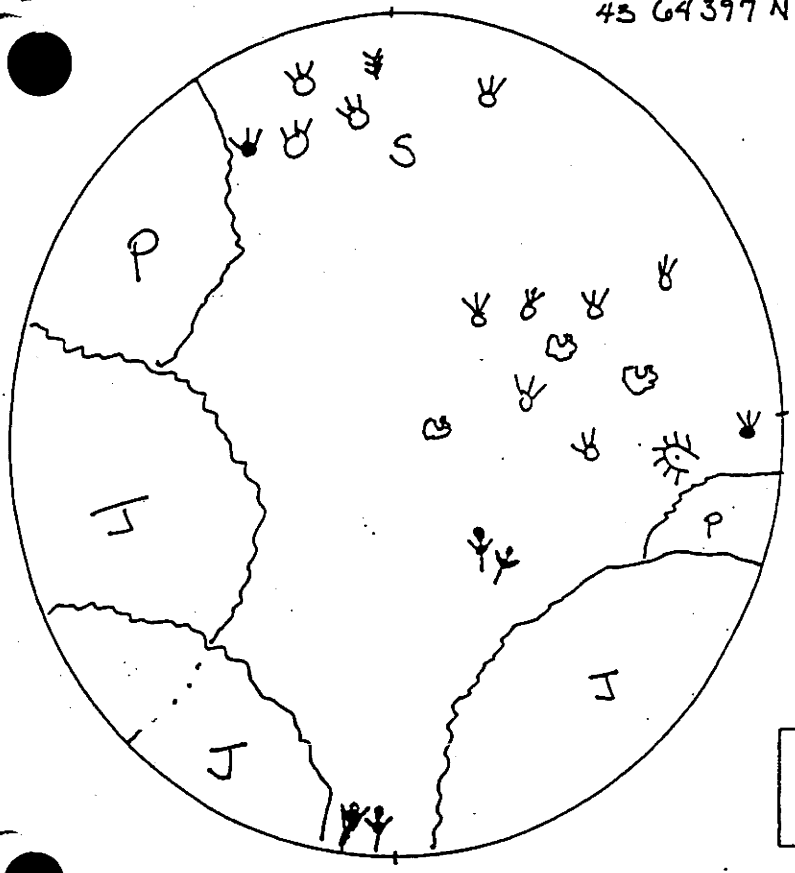
PERCENT OF GROUND COVER BY SPECIES											
SPECIES	SCIENTIFIC NAME	SITE 1	SITE 2	SITE 3	SITE 4	SITE 5	SITE 6	SITE 7	SITE 8	SITE 9	SITE 10
GALLETA	*Hilaria jamesii*	<1	4		1	<.1			<.5	<.1	<.5
PHLOX	*Linanthus grandiflorus*	<.5	1.5				<.1				
CRYPTANTHA	*Cryptantha flava*	<.5					1			<.1	<.5
S.W. RYE	*Elymus salinas*	<.5	1.5	1.5	12	4	<.1	5	<.5	<.1	<.5
PRICKLY GILA	*Leptodactylon pungens*							<.1			<.5
SNAKEWEED	*Xanthocephalum sarothrae*	<.5	5		1	<.1		<.1	<.5	<.1	
UTAH JUNIPER	*Juniperus osteosperma*	18	23	24	8	38	40	50	52	12	6
PINYON PINE	*Pinus edulis*	2									
PRICKLY PEAR	*Opuntia erinacea*	<.5	2	<.5	1	<.1				<.1	4
INDIAN RICEGRASS	*Achnatherum hymenoides*			<.5					<.5		
WINTERFAT	*Ceratoides lanata*										0.5
BARREL CACTUS	*Sclero species*									<.1	
FOURWING	*Atriplex canescens*			4				4	2		
GREEN EPHEDRA	*Ephedra viridis*				1						
SITE TOTAL		22	27	30.5	24	43	42	59.5	55	15	12
						TOTAL AVERAGE VEG. COVER 33 PERCENT					
Numbers in percents											

ATTACHMENT 2
FIELD SHEETS

Plot # Lila Canyon PJ Date 11/28/00 Sampler M.A.C. ; D.U.

Site 1#

12 555850 E
43 64397 N



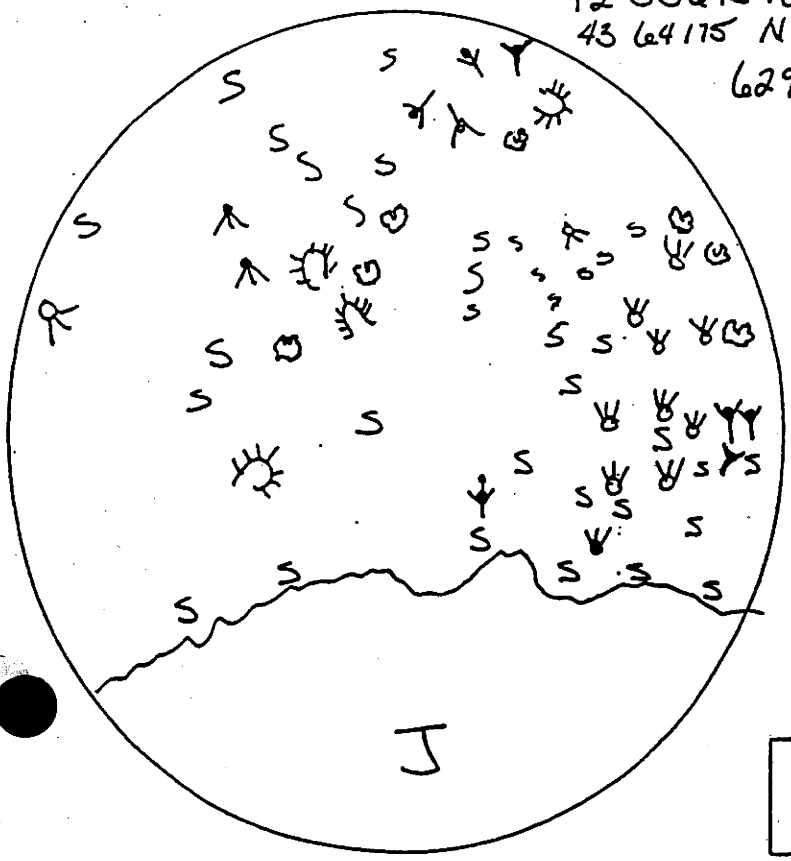
Species

<1%	1 galetta	9 P. Pear
<.5%	2 phlox	10 I. ricegrass (IR)
<5%	3 cryptantha	11 Barrel cactus
<.5%	4 S.W. Rye	12 winterfat
	5 P. Gila	13 fourwing 4W
<.5	6 S. WEED S	14 g. ephedra
18%	7 Juniper J	15
2%	8 Pinyon P	16

22 % Veg Cover

Site 2#

12 556139 E
43 64175 N
6293' Elev.



Species

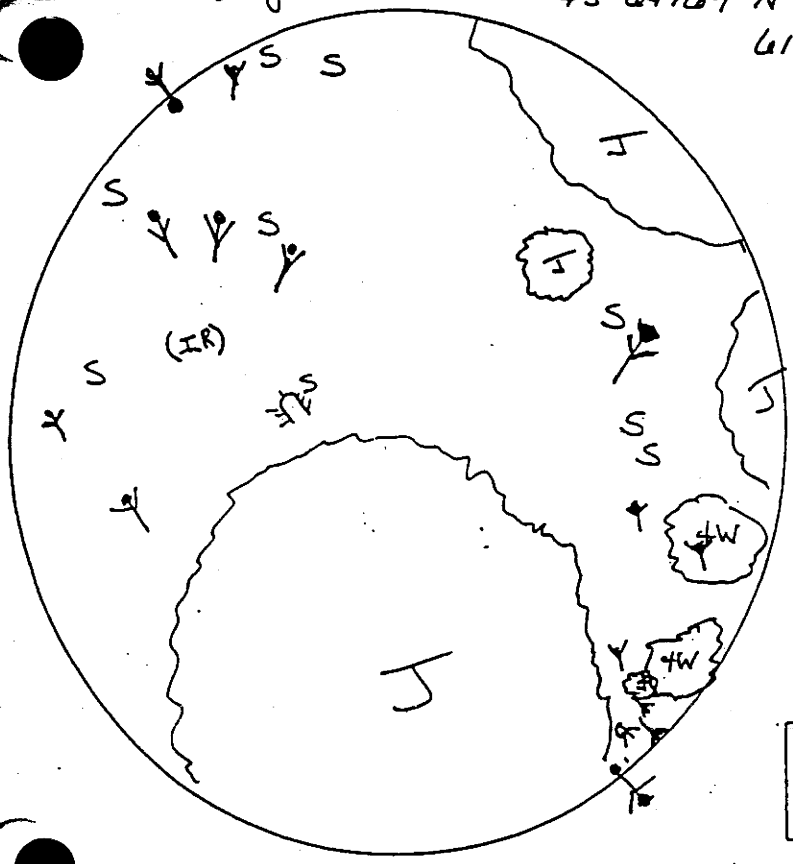
1 Juniper 23%	9
2 snakeweed 5%	10
3 galetta 4%	11
4 p. pear 2%	12
5 sw rye 1.5%	13
6 phlox 1.5%	14
7	15
8	16

27 % Veg Cover

Plot # 3 Date 11/26/00 Sampler MEL, Dave

Site Lila Canyon

12 556119E
43 641167 N
6112' Elev



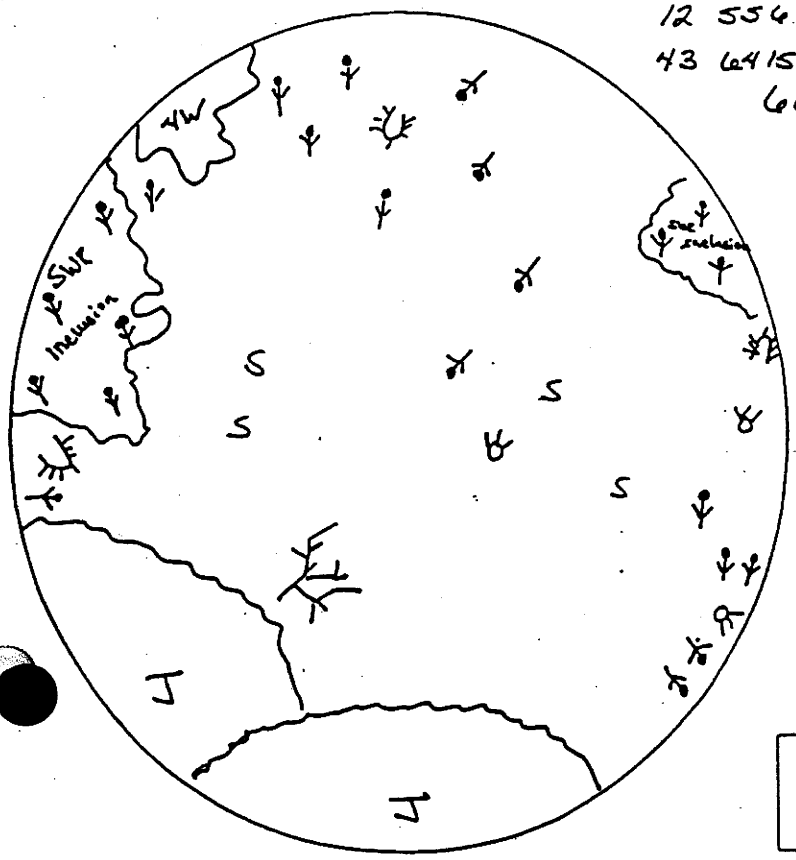
Species

1 Juniper 24%	9
2 4W 4%	10
3 S.W. Rye 1.5%	11
4 I.R & other 1%	12
5	13
6	14
7	15
8	16

30.5 % Veg Cover

Site 4#

12 556163E
43 641155N
6009' Elev



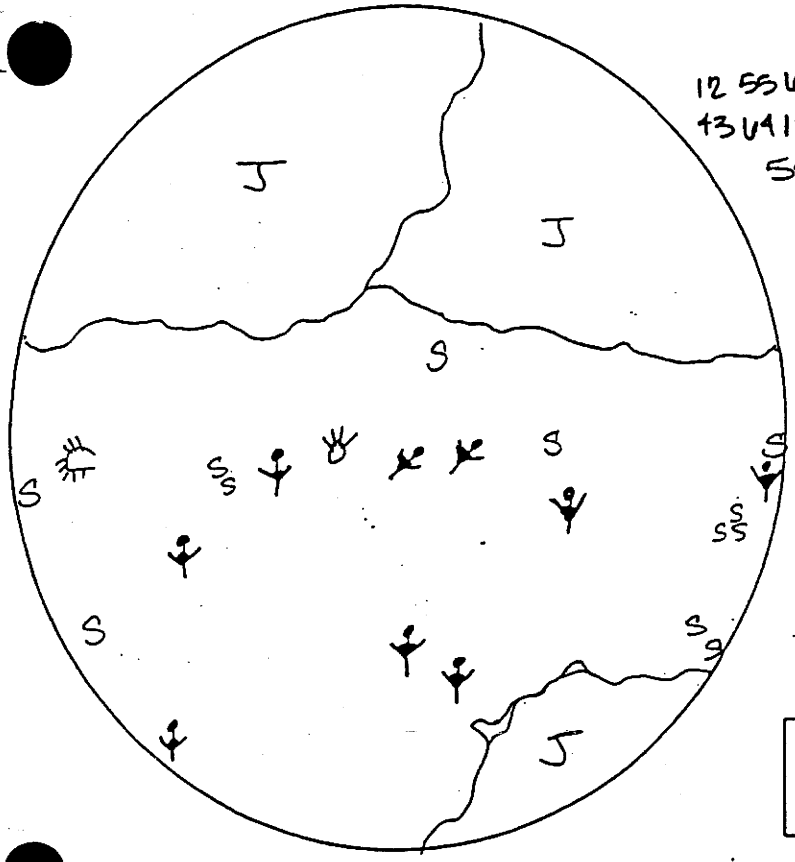
Species

1 Juniper 8%	9
2 S.W. Rye 12%	10
3 Green Ephedra 1%	11
4 galetta	12
5 P. Pear 3%	13
6 Snakeweed	14
7	15
8	16

24 % Veg Cover

Plot # Lila Canyon PJ Date 11/28/2000 Sampler M.A.C. & D.V

Site #5

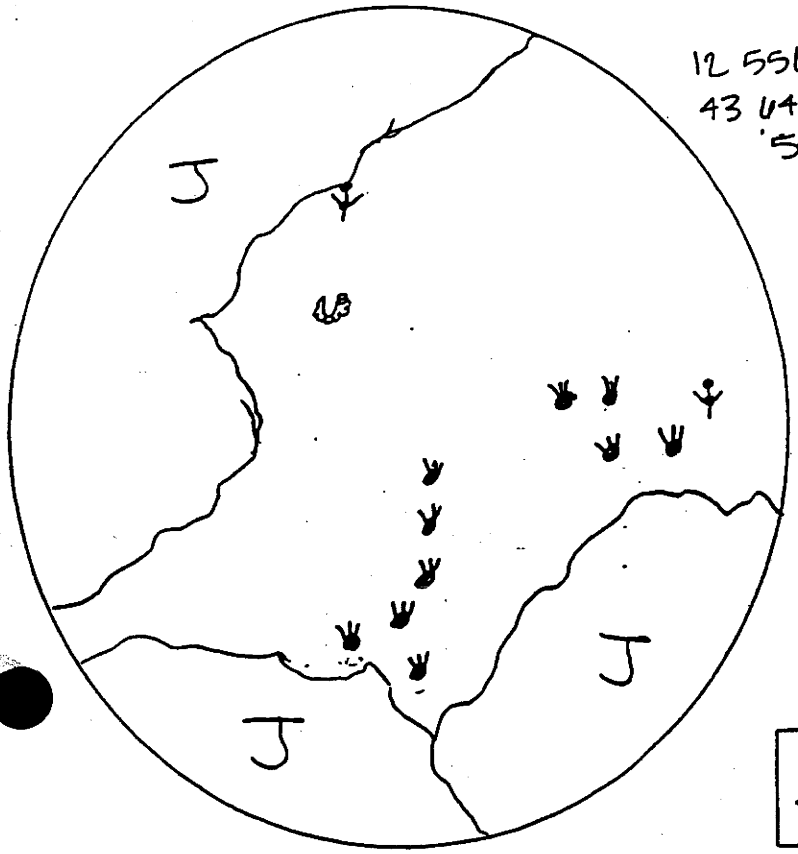


12 556212 E
4364187 N
5982' ELEV.

	Species	
38%	1 Juniper J	9
<1%	2 S WEED S	10
4%	3 S.W. RYE	11
<1%	4 P. PEAR	12
<1%	5 GALETA	13
	6	14
	7	15
	8	16

43 % Veg Cover

Site #6



12 556172 E
4364179 N
5977' ELEV.

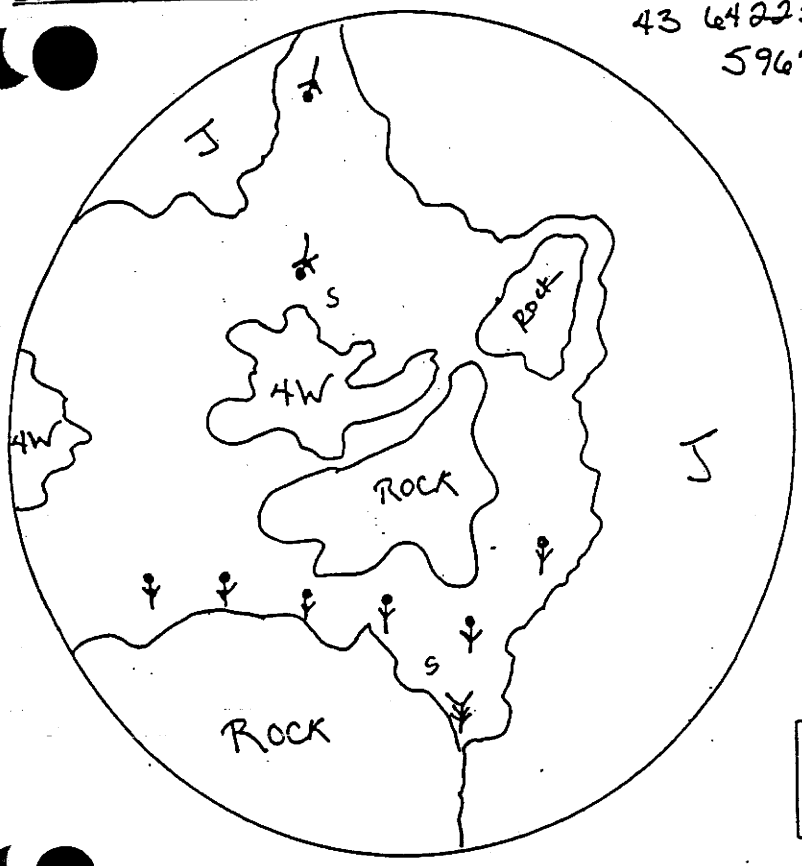
	Species	
40%	1 JUNIPER J	9
1%	2 CRYPTANTHA	10
<1%	3 PHLOX	11
<1%	4 S.W. RYE	12
	5	13
	6	14
	7	15
	8	16

42 % Veg Cover

Plot # Lila Canyon PJ Date 11/27/00 Sampler D.U. ; MAC

Site 7 #

12 556209E
43 64225N
5967' Elev



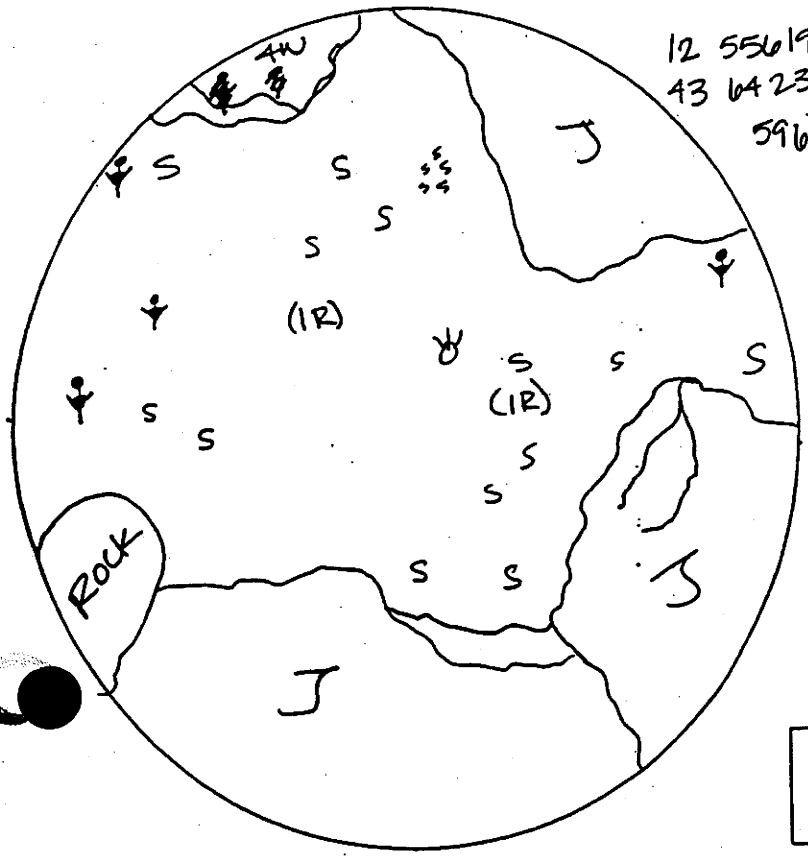
Species

1 Juniper 50%	9
2 S.W. Rye 5%	10
3 fourwing 4%	11
4 snakeweed 1>%	12
5 p. gila	13
6	14
7	15
8	16

59.5 % Veg Cover

Site 8 #

12 556199 E.
43 64238 N.
5964' elev.



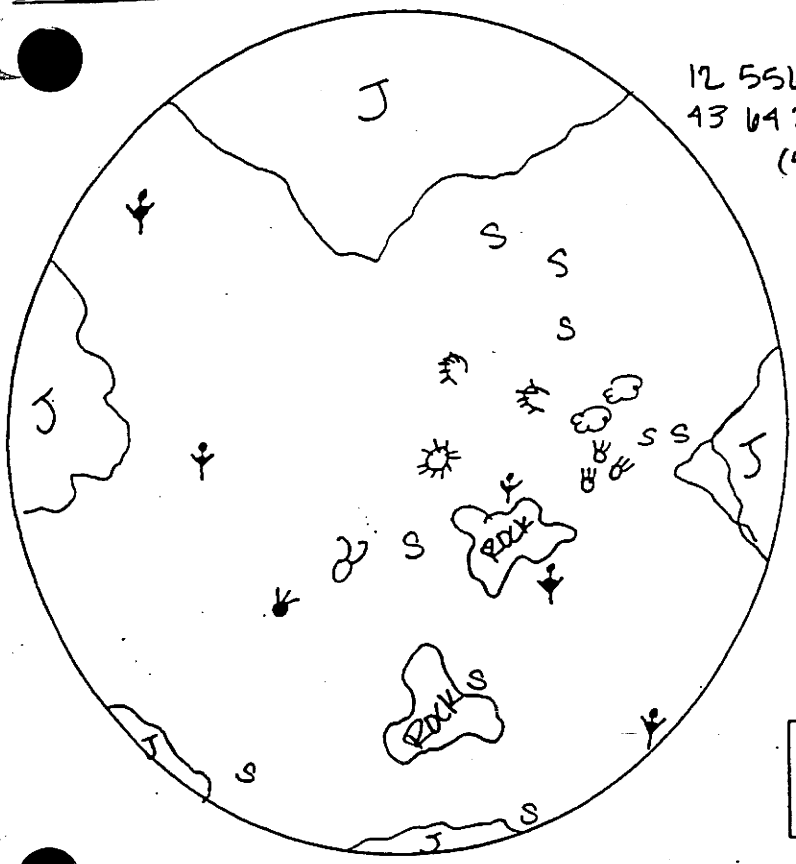
Species

1 JUNIPER 52%	9
2 4WING 2%	10
3 I.R. GRASS	11
4 GALETTA	12
5 S.WEED 1%	13
6 S.W RYE	14
7	15
8	16

55 % Veg Cover

Plot # Lik Canyon PJ Date Nov 28, 2000 Sampler M.A.C. & DV

Site #9



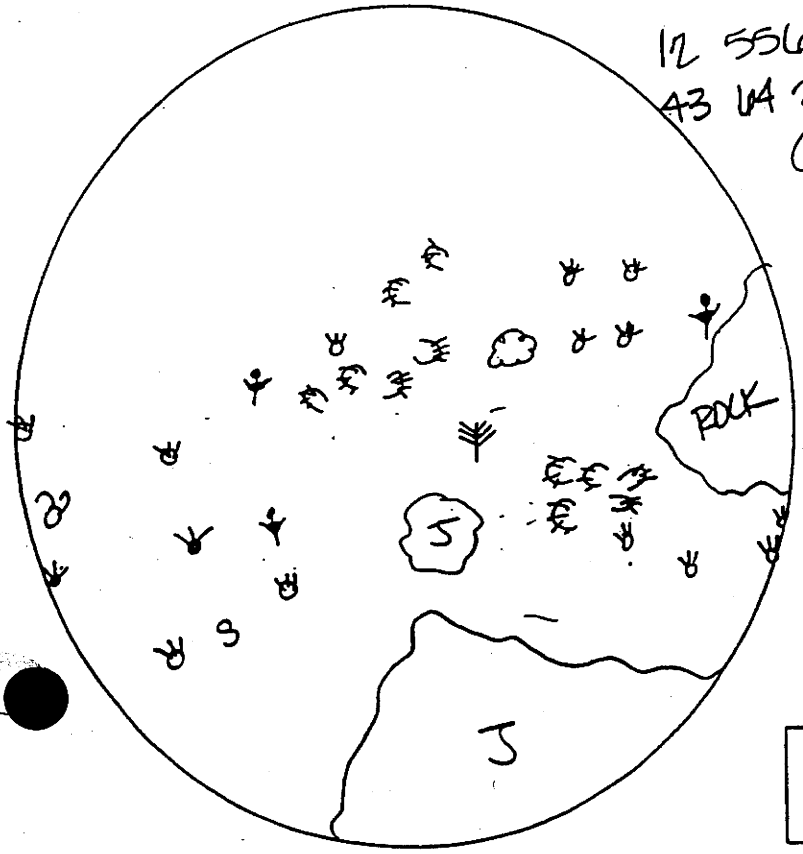
12 556138 E
43 64242 N
(5947' ELEV.)

Species

12	1 JUNIPER J	9
<1%	2 S. WEED S	10
<1%	3 CRYPTANTHA	11
<1%	4 S.W. RYE	12
1%	5 P. PEAR	13
<1%	6 WINTERFAT	14
<1%	7 GALLETA	15
<1%	8 BARRELL C.	16

15 % Veg Cover

Site #10



12 556106 E
43 64239 N
(5940 ft) ELEV.

Species

6%	1 JUNIPER J	9
4%	2 P. PEAR	10
.5%	3 WINTERFAT	11
<.5%	4 S.W. RYE	12
<.5%	5 GALLETA	13
<.5%	6 CRYPTANTHA	14
<.5%	7 P. GILA	15
<.5%	8	16

12 % Veg Cover

LEGEND:

NATURAL DRAINAGE:

DISTURBED AREA BOUNDARY:

UNDISTURBED

GRASS AND SHRUB

ROCK

PJ

N

R 14 E, T 16 S

100' 0' 200' 400'

Projected Coal Outcrop

REVISIONS

DATE	BY	DATE	BY

DRAWN BY: BJ

AUTOCAD REF: TRANSECTVEG

LILA CANYON MINE

TRANSECT VEG

DATE: JANUARY 1999

DESIGNED BY: EIS

SCALE: AS SHOWN

FIGURE NO. FIGURE ONE

Lila Canyon
Biological Assessment

Prepared by

EIS Environmental & Engineering Consulting

August 2000

I. Introduction

The purpose of this biological assessment is to evaluate the potential impacts of construction, maintenance, and operation of a coal mine in Lila Canyon to those plant and animal species and their habitats. Federally listed or proposed as threatened and endangered.

The Endangered Species Act of 1973 (PL 93-205), as amended, require federal agencies to insure that any activities the authorize, fund, or carry out, do not jeopardize the continued existence of any wildlife species federally listed as threatened or endangered (Section 7). The biological assessment is an analysis of which threatened and endangered species may occur in the project area and whether any impacts to those species are anticipated. This biological assessment has been prepared using direction from the BLM manual 6840, Special Status Species Management.

II. Proposed Action

The proposed action to be taken by Utah American Energy would be the construction, operation, and maintenance of Lila Canyon Mine as well as the construction and operation of all associated surface facilities, utilities, and transportation routes. To facilitate the development and operation of the proposed mine, the existing Lila Canyon Road that ties into Emery County Road (CR) 125 at the existing Horse Canyon Mine Site would be upgraded to accommodate personnel and construction equipment travel. Concurrent with upgrading the existing access road, a separate operational coal haul road would also be constructed. A 46 kV power line that ties to the existing Moab/Price/Green River line approximately one mile south of the proposed mine facilities would be constructed to provide the necessary power requirements.

A more detailed account of Lila Canyon Mine and it's associated facilities can be found in the BLM Environmental Assessment for the Development of the Lila Canyon Project, Emery County Utah, Document (EA No. UT-070-99-22).

III. Species Potentially Impacted by the Project

Currently the following threatened, endangered, proposed endangered, and candidate species and habitat are found in Emery County. Candidate species have no legal protection under the Endangered Species Act (ESA).

Species	Scientific Name	Status
Bald Eagle	*Haliaeetus leucocephalus*	Threatened
Barneby Reed Mustard	*Schoenocrambe barnebyi*	Endangered
Black- footed Ferret	*Mustela nigripes*	Endangered
Bonytail Chub	*Gila elegans*	Endangered
Colorado Squawfish	*Ptychocheilus lucius*	Endangered
Humpback Chub	*Gila cypha*	Endangered
Jones Cycladenia	*Cycladenia humilis* var. *jonesii*	Threatened
Last Chance Townsendia	*Townsendia aprica*	Threatened
Maguire Daisy	*Erigeron maguirei*	Endangered
Razorback Sucker	*Xyrauchen texanus*	Endangered
San Rafael Cactus	*Pediocactus despainii*	Endangered
Winkler Cactus	*Pediocactus winkleri*	Proposed Endangered
Wright Fishhook Cactus	*Sclerocactus wrightiae*	Endangered

IV. Species Occurrences and Habitat Needs

Bald Eagle (*Haliaeetus leucocephalus*) During the breeding season bald eagles are closely associated with water, along coasts, lake shores, or river banks. During the winter bald eagles tend to concentrate wherever food is available. This usually means open water where fish and waterfowl can be caught. They also winter on more upland areas feeding on small mammals and deer carrion. At winter areas, bald eagles commonly roost in large groups. These communal roosts are located in forested stands that provide protection from harsh weather (Stalmaster, 1987).

Bald eagles can often be found near lakes and reservoirs, as well as within upland areas on the Manti National Forest during the late fall and early winter. When lakes and reservoirs freeze over in early winter, most eagles will leave these upland feeding sites. No bald eagles are known to nest in the area.

Barneby Reed Mustard (*Schoenocrambe barnebyi*) Barneby Reed Mustard grows on steep, northfacing slopes of the Moenkopi Formation. Elevation ranges between 1646- 1753 m (5400- 5750 ft). This species grows in the salt desert shrub zone and is commonly found with Ephedra and Erigonum. The TES inventory done May 21, 22, and 26 1999 did not locate this species within the project area though not specifically noted in the inventory report.

Black-footed Ferret *(Mustela nigripes)* The relationship between black-footed ferrets and prairie dogs has long been known. Black- footed ferrets live in the burrows made by prairie dogs and probably exploit these rodents as their major food source. The high biomass of potential prey species and the abundance of burrows are equally important factors in attracting black-footed ferrets to this habitat. The Black- footed ferret is unlikely to occur in the proposed project area because of the lack of its major prey species, prairie dogs.

Bonytail Chub (*Gila elegans*) Historically bonytail chubs exists thoughout the Colorado River drainage. Recently, isolated captures of bonytail chubs have been made in the Colorado River basin but recruitment to the population is extremely low or nonexistent. The decline of the bonytail chub is attributed to dam construction and associated water temperature changes. Other factors contributing to the reduced numbers include flow depletion, hybridization, stream alterations associated with dam construction, and the introduction of non- native fish species. The bonytail chub is an omnivore, feeding mostly on terrestrial insects, plant debris and algae and begins to spawn at five to seven years of age (Behnke and Benson 1980). No bonytail chubs have been located in the project area primarily due to the lack of perennial stream flows.

Colorado Squawfish *(Ptychocheilus lucius)* The Colorado squawfish had a historic range from Green River, Wyoming, to the Gulf of California, but the species is now confined to the upper Colorado River Basin mainstream and larger tributaries. The lower Green River between the Price and San Rafael rivers contain abundant Colorado squawfish. The species decline can be attributed to direct loss of habitat, changes in water flow and temperature, blockage of migrations, and interactions with introduced fish species. Colorado squawfish adults are thought to prefer deepwater eddies and pools or other areas adjacent to the main water current, whereas the young inhabit shallow, quiet backwaters adjacent to high flow areas. Colorado squawfish feed on invertebrates while young but gradually become piscivorous after one year. No Colorado squawfish have been located within the proposed project area because of the lack of perennial stream flows.

Humpback Chub *(Gila cypha)* The humpback chub is believed to have inhabited all of the large rivers of the upper Colorado River basin and canyons of the lower Colorado River basin. Presently the humpback chub can be located in and above the Grand Canyon, Arizona, and the major tributaries to the Colorado River. The states stream alteration, including dewatering, dams and channelization, as factors causing the decline of the species. The humpback chub normally lives adjacent to high velocity flows, where they consume plankton and small invertebrates. The humpback chub has not been located in the proposed project area due to the lack of perennial stream flows.

Jones Cycladenia *(Cycladenia humilis* var. *jonesii)* Jones Cycladenia is found on the Cutler, Summerville, and Chinle Formations in the salt desert shrub, mixed desert shrub and juniper zones. Elevation ranges from 4400- 5970 ft. The plant occurs on the eroded slopes of the Summerville Formation, just east of the San Rafael Reef. This habitat species is not known to occur within the proposed project area, and was not located during the TES inventory conducted on May 21, 22, and 26, 1999.

Last Chance Townsendia *(Townsendia aprica)* Last Chance Townsendia occurs on the Ferron

Sandstone and Carmel Formations. The plant apparently grows on several formations, but prefers fine-textured substrates and shallow soils close to sandstone bedrock. Elevation ranges from 6000-7400 ft. It is commonly found growing in the pinyon-juniper zone associated with grasses and mixed desert shrubs. Aspect is variable and slope does not exceed 10 degrees. There were no populations of this species found in the proposed project area during the May 21, 22, and 26, 1999 TES inventory.

Maguire Daisy *(Erigeron maquirei)* Maguire daisy occurs in the canyon bottoms of the Wingate and Chinle Formations at approximately 5600 ft. It has been found growing atop mesas and shaded canyon bottoms of the Navaho Sandstone Formation at approximately 6,800 ft. The daisy prefers cool, shaded, moist, mesic, wash bottoms and dry, partially shaded, slopes of eroded sandstone cliffs. Aspects is usually north, east, or northeast and slopes do not exceed 25 degrees. The daisy grows within the lower limits of the pinyon-juniper zone but seems to attain optimal growth conditions in the mountain shrub zone. This species was not found during the TES inventory conducted on May 21, 22, and 26, 1999.

Razorback Sucker *(Xyrauchen texanus)* Historic distribution of the razorback sucker was mainly along the mainstream of the Colorado, Green and San Juan Rivers. They presently only occur in a portion of their former range in these rivers and are normally found in water four to ten feet deep with area of strong currents and backwaters. The razorback sucker feeds on small invertebrates, and animals and organic debris on the river bottom. Behnke and Benson (1980) link the decline of the razorback sucker to the land and water uses, particularly dam construction and the associated change in flow regimes and river channel characteristics. Razorback Sucker are not present in the proposed project area due to the lack of perennial stream flows

San Rafael Cactus *(Pediocactus despainii)* San Rafael cactus is found on gray to white limestone of the Carmel Formation. Elevations range between 6,000- 6,300 ft. The cactus grows in a pinyon-juniper-grassland community. It grows flat on rolling terrain in full sunlight and the aspect is variable. No species were located during the inventory on May 21, 22, and 26, 1999.

Winkler Cactus *(Pediocactus winkleri)* Winkler cactus grows on clay subsoil normally associated with the salt desert shrub communties. The elevation ranges between 4,790 to 5,210 feet and can normally be located and identified between March and mid May. No Winkler cactus are known to be in the proposed project area. The TES inventory conducted on May 21, 22, 26, 1999 did not locate any species.

Wright Fishhook Cactus *(Sclerocactus wrightiae)* Wright Fishhook cactus is known to be found from Wayne County, southwestern Emery County, and southeastern Sevier County. The cactus has been found occupying a variety of geologic substrata. Throughout its distribution, the cactus does not favor one particular geologic substrate but it does seem to favor specific edaphic and geochemical conditions. The cactus occurs in salt desert shrub and mixed desert shrub zones between elevations of 4,550- 6,200 ft. Associated plant cover rarely exceeds 15 percent. Slope is usually between 0 to 10 degrees and aspect is variable. This habitat species is not known to occur within the proposed project area. The TES inventory conducted on May 21, 22, 26, 1999 did not locate any

species.

V. Determination of Effects

Suitable Habitat The area affected by the proposed action does not contain suitable habitat (i.e. elevation, vegetation, and/or geology) and known home ranges for many of the species in the above lists. Therefore, it is determined that there will be no effect upon them. These species (as listed below) are therefore eliminated from further analysis.

- **Bald Eagle (*Haliaeetus leucocephalus*)** - the proposed action is outside the range of this species.

- **Barneby Reed Mustard (*Schoenocrambe barnebyi*)**- The area affected by the proposed action does not contain suitable habitat for this endangered plant. The proposed action would not affect this plant.

- **Black -footed Ferret *(Mustela nigripes)***- The area affected by the proposed action does not contain any prairie dog towns which provide black- footed ferret habitat. The proposed action would not affect this species.

- **Bonytail Chub (*Gila elegans*)**-The area affected does not contain any of the endangered fish. All disturbed waters will be contained by sediments ponds thereby not affecting the amount or quality of the waters draining into the Colorado River Drainage.

- **Colorado Squawfish *(Ptychocheilus lucius)***-The area affected does not contain any of the endangered fish. All disturbed waters will be contained by sediments ponds thereby not affecting the amount or quality of the waters draining into the Colorado River Drainage.

- **Humpback Chub *(Gila cypha)***-The area affected does not contain any of the endangered fish. All disturbed waters will be contained by sediments ponds thereby not affecting the amount or quality of the waters draining into the Colorado River Drainage.

- **Jones Cycladenia *(Cycladenia humilis* var. *jonesii)***- The area affected by the proposed action does not contain suitable habitat for this endangered plant. The proposed action would not affect this plant.

- **Last Chance Townsendia *(Townsendia aprica)***- The area affected by the proposed action does not contain suitable habitat for this endangered plant. The proposed action would not affect this plant.

- **Maguire Daisy *(Erigeron maquirei)***- The area affected by the proposed action does

not contain suitable habitat for this endangered plant. The proposed action would not affect this plant.

- **Razorback Sucker** ***(Xyrauchen texanus)***-The area affected does not contain any of the endangered fish. All disturbed waters will be contained by sediments ponds thereby not affecting the amount or quality of the waters draining into the Colorado River Drainage.

- **San Rafael Cactus** ***(Pediocactus despainii)***- The area affected by the proposed action does contain suitable habitat for this endangered plant. However, none have been identified within the area, and therefore, would not be affected by the proposed action.

- **Winkler Cactus** ***(Pediocactus winkleri)***- The area affected by the proposed action does contain suitable habitat for this endangered plant. However, none have been identified within the area, and therefore, would not be affected by the proposed action.

- **Wright Fishhook Cactus** ***(Sclerocactus wrightiae)***- The area affected by the proposed action does contain suitable habitat for this endangered plant. However, none have been identified within the area, and therefore, would not be affected by the proposed action.

VI. Listed Species Biological Assessment Summary of Conclusions of Effects

Project Name: BA for Lila Canyon Coal Mine and Associated Facilities

Proposed Action

Species	No Effect	May Effect- Not Likely to Adversely Affect	Likely to Adversely Affect	Beneficial Effect
Bald Eagle	X			
Barneby Reed Mustard	X			
Black- footed Ferret	X			
Bonytail Chub	X			
Colorado Squawfish	X			
Humpback Chub	X			
Jones Cycladenia	X			
Last Chance Townsendia	X			
Maguire Daisy	X			
Peregrine Falcon	X			
Razorback Sucker	X			
San Rafael Cactus	X			
Winkler Cactus	X			
Wright Fishhook Cactus	X			

VI. Mitigation

As there were no direct impacts on any of the species no mitigation is recommended at this time.

VII. Cumulative Impacts

The proposed action as delineated in this BA is exclusive to the potential impacts associated with the construction, operation, and maintenance of the Lila Canyon Coal Mine.

VIII. Documentation

Reference used to determine the presence (or absence) of Threatened, Endangered, Proposed and Sensitive as well as species characteristics and habitat information include.

Behnke, R.J. and D.E. Benson. 1980. Endangered and Threatened Fishes of the Upper Colorado River Basin Coop. Ext. Serv., Colorado State univ., Fort Collins, Bull. 503A. 34pp.

Boschen, Nelson. 1995. Bald Eagle in Southeastern Utah:1994 Nesting Season

Cade, T.J., J.H. Enderson, C.G. Thelander, and C. M. White. 1988. Peregrine Falcon Populations: Their Management and Recovery. The Peregrine Fund, Inc., Boise. 949 pp.

Kass, Ron 1990. Final Report of Habitat Inventory of Threatened, Endangered and Candidate Plant Species in the San Rafael Swell, Utah. 87 pp.

Ratcliffe, D.A. 1980. The Peregrine Falcon. Buteo Books, Vermillion, SD. 416 pp.

Sigler, W.F. and R.R. Miller. 1963. Fishes in Utah. Utah State Dept. of Fish and Game, Salt Lake City. 203 pp.

Stalmaster, M.V. 1987. The Bald Eagle, Universe Books, New York. 227 pp.

Bureau of Land Management References

Resource area wildlife and plant observation and location area records.

USDI BLM manual 6840, Special Status Species Management.