

**Summit Creek LBA**

**UTU-79975**

**Environmental Assessment**

**Carbon County, Utah**

BLM EA No. UT-070-2003-48



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## **List of Acronyms and Abbreviations**

|       |  |
|-------|--|
| ACEC  | Area of Critical Environmental Concern               |
| BLM   | Bureau of Land Management                            |
| CE-2  | Critical Environmental Zone 2                        |
| CFR   | Code of Federal Regulations                          |
| EA    | Environmental Assessment                             |
| EIS   | Environmental Impact Statement                       |
| ESA   | Endangered Species Act                               |
| FCLAA | Federal Coal Leasing Amendments Act of 1976          |
| FLPMA | Federal Lands Policy and Management Act              |
| GOPB  | Governor's Office of Planning & Budget               |
| LBA   | Lease By Application                                 |
| MFP   | Management Framework Plan                            |
| MLA   | Mineral Leasing Act of 1920                          |
| MRP   | Mining and Reclamation Plan                          |
| NEPA  | National Environmental Policy Act                    |
| NRCS  | Natural Resources Conservation Service               |
| OSM   | Office of Surface Mining Reclamation and Enforcement |
| RFD   | Reasonable Foreseeable Development                   |
| RMP   | Resource Management Plan                             |
| SMCRA | Surface Mining Control & Reclamation Act of 1977     |
| TES   | Threatened, Endangered, & Sensitive                  |
| UDOGM | Utah Division of Oil, Gas, & Mining                  |
| UDWR  | Utah Division of Wildlife Resources                  |
| USDI  | United States Department of the Interior             |
| USGS  | United States Geological Survey                      |
| WSA   | Wilderness Study Area                                |

# Chapter 1 - Introduction/ Purpose of and Need for Action

## Introduction

This Environmental Assessment (EA) is being prepared by the Utah State Office and Price Field Office of the Bureau of Land Management (BLM), with the cooperation of the Office of Surface Mining Reclamation and Enforcement (OSM) in response to an application submitted by ANDALEX Resources Inc. (AMCA Coal Leasing, Inc.) for leasing of the Summit Creek Tract (see **Figures 1 and 2**).

When a project involves Federal action, the National Environmental Policy Act (NEPA) requires that an environmental analysis be conducted, and that public participation be solicited. This EA discloses the anticipated environmental consequences of the proposal and provides the basis for the BLM to decide whether or not to offer the Summit Creek Tract for competitive leasing. Alternatives to the Proposed Action include No Action and fuller extraction of coal within the lease tract.

The Summit Creek Tract is located approximately 10 miles north-northeast of Price, Utah, in the westernmost portion of the Soldier Canyon Area of the Book Cliffs Coal Field. The Summit Creek Tract is contiguous to ANDALEX's existing Centennial Project, Aberdeen Mine (Federal Lease UTU-66060). The surface is privately owned, and the Bureau of Land Management (BLM) administers the coal/mineral estate. These lands were included in the 4,198-acre Coal Creek Tract (see **Figure 2**), delineated in 1981 and analyzed as part of the Round Two leasing process (BLM 1983).

The coal lease application will be processed and evaluated under the following authorities: Mineral Leasing Act of 1920, as amended; Federal Coal Leasing Amendments Act of 1976 (FCLAA); Federal Land Policy and Management Act of 1976 (FLPMA); Surface Mining Control and Reclamation Act of 1977 (SMCRA); National Environmental Policy Act of 1969 (NEPA); and Federal Regulations 43 CFR 3425.

The **Bureau of Land Management, Utah State Office**, in response to the proposed coal lease application, is responsible for the following actions:

- Preliminary evaluation of the application to determine if it meets the criteria for a lease;
- Notification of the Governor of the State of Utah of the application;
- Preparation of the environmental documentation needed to comply with NEPA, determination of fair market value, and the tract delineation review report; and
- If appropriate, preparation for and holding of the lease sale and issuance of a lease for the mining of coal resources from the lands involved.

The **Office of Surface Mining Reclamation and Enforcement (OSM)** has jurisdiction over any mining plan application that may result from BLM's leasing decision. OSM is a cooperating agency in the preparation of this EA (40 CFR §1501.6). OSM has the responsibility, through SMCRA, to administer programs that regulate surface coal

mining operations and surface effects of underground coal mining operations. In 1981, the Secretary of the Interior approved the Utah Division of Oil, Gas, & Mining (UDOGM) program to regulate surface coal mining operations and surface effects of underground coal mining on non-Federal lands within the state of Utah, pursuant to Section 503 of SMCRA. In 1987, UDOGM and the Secretary of the Interior entered into a cooperative agreement authorizing UDOGM to regulate surface coal mining operations and surface effects of underground coal mining on Federal lands within the state, pursuant to Section 523(c) of SMCRA.

Federal coal leaseholders in Utah must submit permit application packages to OSM and UDOGM for proposed mining and reclamation activities on Federal lands in the state. UDOGM reviews the packages to ensure that the permit application complies with the permitting requirements and that the coal mining operation will meet the performance standards of the approved permanent program. If it does comply, UDOGM issues the applicant a permit to conduct coal mining operations. OSM, BLM, and other Federal agencies review the permit application package to ensure that it complies with the terms of the coal lease, the Mineral Leasing Act of 1920 (MLA), the National Environmental Policy Act of 1969, and other Federal laws and regulations. OSM recommends approval, approval with conditions, or disapproval of the MLA mining plan to the Assistant Secretary, Land and Minerals Management. Before the MLA mining plan can be approved, BLM and the surface-managing agency (if other than BLM) must concur with this recommendation.

The following environmental studies have preceded this EA, which provide potentially useful information that will be reviewed in the preparation of the EA. They are:

- The Uinta-Southwestern Utah Coal Region Round Two Final Environmental Impact Statement, 1983
- The ANDALEX Resources, Centennial Project Environmental Assessment, 1990 (EA#UT-066-90-12)

## **Purpose of and Need for Action**

The purpose of the Proposed Action is to make available for mining the coal underlying private lands in the area defined as the Summit Creek Tract. The Proposed Action is needed to continue economically viable development of Federal coal reserves as part of the Aberdeen Mine operation.

The need for Federal leasing action to develop coal resources is to further the economic viability of Price, Utah and Carbon County, and to help meet energy demands in the United States. Utah's coal mines are among the most productive underground mines in the United States.

Development of the coal resource associated with this Lease by Application (LBA) from existing adjacent workings would assure the maximum economic recovery of coal in this tract.

## Conformance with Land Use Plans

The Price River Resource Area Management Framework Plan (MFP) (BLM, 1984) provides guidance for management decisions regarding coal leasing. The minerals multiple use objective states that the agency must “allow and encourage development of those leasable minerals known to occur within the planning area in accordance with current laws and regulations so as to aid in filling the local and national energy requirements.” It requires consideration for “leasing those coal lands within the planning area that have been found acceptable for further consideration for leasing through previous planning amendments.” This leasing action would be in accordance with the Price River Resource Area MFP.

## Decisions To Be Made

The BLM Utah State Office will decide whether or not it is in the public interest to hold a competitive coal lease sale for the Summit Creek Tract.

## Scoping Process

Scoping is a process of seeking comment on proposed Federal actions that may affect use or access to public lands, resources, or programs. Scoping is conducted within agencies as well as to gain public input. Internal scoping by the BLM Price Field Office was conducted on September 10, 2003, and included most renewable resource specialists. Normal issues of impacts to water, wildlife, and cultural resources were noted if surface-disturbing activities would be allowed. However, with the Proposed Action of only deep underground mining with little or no mining-induced subsidence, resource specialists indicated no issues or concerns, provided the lease would contain standard lease stipulations (see **Appendix B**).

The BLM distributed a news release in late September 2003 to the *Emery County Progress*, *Price Sun Advocate*, KOAL Radio, and KRPX radio, requesting public input as to any issues concerning the ANDALEX coal lease application. A copy of this news release is included in Appendix A. The news release was also mailed to the following landowners and interested parties:

- Dave R. and Mildred Cave, et al.
- Mathis Land Company
- F. and D. Shimmin
- Price City
- School and Institutional Trust Lands Administration
- Utah Division of Oil, Gas and Mining

To date, no letters have been received by the Price BLM Field Office in response to the scoping announcement. Two phone calls were received by the office in regards to the scoping announcement, one from a landowner on the lease tract, and one from a landowner adjacent to the lease tract. Concerns were expressed about mining subsidence and effects to water sources, and the effects of mining on potential oil & gas rights held by the landowners.

## Chapter 2 - Proposed Action and Alternatives

### Introduction & Background

Chapter 2 describes the activities of the No Action Alternative and the leasing alternative.

In November 2001, ANDALEX submitted an application for a coal lease on approximately 463 acres of unleased Federal coal lands within T. 12 S., R. 11 E., SLM (Summit Creek Tract) (**Figure 2**). The June 2003 Summit Creek Tract Delineation Report for LBA UTU-79975 recommended an approximately 703-acre tract, allowing for expansion of the existing Aberdeen Mine longwall operation to recover all Federal coal resources that could likely be mined in a logical and timely manner from this tract. It is estimated that the 703-acre tract contains 11.6 million tons of in-place coal. There is no part of the property designated unsuitable for mining according to Title 30.

The proposed Summit Creek Tract has been delineated as follows (BLM 2003):

Township 12 South, Range 11 East, Salt Lake Base Meridian  
Section 29, SW $\frac{1}{4}$  SW $\frac{1}{4}$ , SW $\frac{1}{4}$  SE $\frac{1}{4}$ ;  
Section 30, lots 4, 12, and 14-16;  
Section 31, lots 1, 2, and 7-11;  
Section 32, W $\frac{1}{2}$  NE $\frac{1}{4}$ , E $\frac{1}{2}$  NW $\frac{1}{4}$ , NW $\frac{1}{4}$  NW $\frac{1}{4}$ , and NE $\frac{1}{4}$  SW $\frac{1}{4}$

The proposed coal tract lies north of, and adjacent to, ANDALEX's lease holdings where the current Aberdeen Mine is extracting coal by underground longwall mining methods. ANDALEX has been operating this mining complex in Deadman's Canyon (located about 9 miles northeast of Price, Utah) since 1980. Current coal production of about 1 million tons per year from the Aberdeen Mine is transported by conveyor out of the mine to the tipples and loading facilities in Deadman Canyon and trucked to various railroad loading facilities and customers. Existing reserves of the Aberdeen coal seam are limited to about 2 to 3 years at existing rates. ANDALEX wishes to obtain the Summit Creek Coal Tract that would extend mining operations for another 8 to 9 years. Existing surface facilities would be used with production remaining at the current rate.

As required for all leasing, BLM proposes to hold a competitive sale of the proposed Summit Creek Tract. However, the only logical access to these coal reserves is from the existing Aberdeen Mine workings.

Two alternatives have been identified for analysis in this EA and a third alternative has not been brought forward. The No Action Alternative is mandated by 40 CFR § 1502.14(d) and provides the conceptual baseline for impacts. The Proposed Action would be a continuation of current underground mining operations into the new area.

Lease-Committed Measures would be adopted under the leasing alternative (see **Appendix B**).

## **Description of Alternatives**

### ***Alternative A – No Action***

Under Alternative A, the Summit Creek Tract would not be offered for leasing at this time. This tract would remain unmined but current operations at the Aberdeen Mine would continue for 2-3 years until existing coal reserves are exhausted. ANDALEX would not extend their Aberdeen mining operations an additional 8 to 9 years and would not extract the 8.62 million tons of coal located in the Summit Creek Tract.

### ***Alternative B - Proposed Action***

Under the Proposed Action, the Summit Creek Coal Lease Tract would be offered for competitive bids. As ANDALEX is the only logical lessee, the Proposed Action would analyze ANDALEX's proposed development scenario. ANDALEX would access recoverable coal reserves of the Summit Creek Tract from their Aberdeen Mine utilizing methods approved in the current Mining and Reclamation Plan (MRP). Main entry and development mining would take place for approximately the first year; then longwall extraction would commence. The Aberdeen Mine map, including mined panels and proposed panels, is illustrated in **Figure 3**.

The first year of development mining is expected to produce approximately 0.5 million tons of coal. Following that the first year, mining within the tract would be operated at a level of approximately 1.0 million tons per year for 8 years. Final extraction would result in total recovery of 8.62 million tons of coal, approximately 75 percent of the in-place reserves.

All necessary support for the mining of both the existing lease and the Summit Creek Tract would be from the existing surface facilities located on the current lease block in Deadman Canyon. Though previous mining has caused little or no subsidence on ANDALEX's property, the Proposed Action may involve possible mining induced subsidence. No new surface facilities would be required; no surface disturbing activities are proposed. No additional exploration would be required. Average cover over the coal beds is approximately 3,000 feet.

### ***Alternatives Proposed But Not Brought Forward – Fuller Extraction of Coal Resource***

Under this Alternative, the company would be required to reduce the size of the barrier pillars between longwall panels. The extraction of coal from each panel would be greater than for the Proposed Action. Other aspects of development and production would be the same as under the Proposed Action. This alternative allows for increased extraction of the coal resource by increasing the panel width and decreasing the width of pillars left in place, should continued monitoring data show that increased coal recovery is safe and feasible. No new surface facilities would be required. No surface disturbing activities are proposed.

This alternative was evaluated but dropped in that the setting of a mining scenario cannot be chosen as an alternative during the leasing stage. This action is a mine permit decision, after a lease is in place. This alternative was to allow evaluation of impacts of subsidence, as fuller extraction of the coal seam would increase the possibility and amount of mining induced subsidence. This evaluation will be done in Alternative B.

## Chapter 3 - Affected Environment

### BLM Critical Elements

In addition to issues and concerns brought out in the public scoping process, the BLM requires that potential impacts be addressed for the following critical elements of the environment:

- Air Quality
- Areas of Critical Environmental Concern (ACECs)
- Cultural Resources
- Environmental Justice
- Floodplains
- Invasive, Non-Native Species
- Migratory birds
- Native American Religious Concerns
- Prime or Unique Farmlands
- Threatened, Endangered, or Sensitive Species (TES)
- Wastes - Hazardous or Solid
- Water Quality (surface and ground)
- Wetlands and Riparian zones
- Wild and Scenic Rivers
- Wilderness (including BLM WSAs)

#### Other Elements Considered:

- Land Uses
- Native American Trust Resources
- Noise
- Oil & Gas Rights
- Paleontological Resources
- Range and Livestock
- Recreation
- Socioeconomics
- Subsidence
- Topography and Geology
- Visual
- Wildlife and Wildlife Habitats

#### Elements carried forward for analysis:

- Topography and Geology
- Subsidence
- Water Quality (surface and ground)
- Paleontological Resources
- Threatened, Endangered, or Sensitive Species
- Range and Livestock
- Land Uses
- Cultural Resources
- Socioeconomics

### ***Issues Eliminated from Further Study***

The following issues and critical elements would not be affected by the proposed project and will not be carried forward for analysis:

*ACECs:* There are no Areas of Critical Environmental Concern in or near the project area. The closest ACEC is located at least 20 miles to the south in the San Rafael Resource Area.

*Air Quality & Noise:* This project would not affect the ambient air quality or background noise in the vicinity of the project. No surface disturbance would take place. No increase in mine-related traffic would take place in Deadman Canyon as a result of this leasing action.

*Environmental Justice:* No minority or low-income communities would be disproportionately affected by the project.

*Farmlands, Prime/Unique:* There are no prime/unique farmlands present.

*Floodplains:* No floodplains have been identified in or near the project area. There would be no impacts to floodplains.

*Invasive, Non-Native Species:* There are no known invasive/non-native species in the project area.

*Migratory Birds:* No migratory birds would be affected by this project, as there would be no surface development; no nesting, foraging, or roosting habitats would be affected.

*Native American Trust Resources:* There are no interests or properties held in trust for Tribes by the United States government within the Project Area

*Oil & Gas Rights:* The coal tract is small; therefore, gas rights could be developed as part of a larger adjacent gas project through use of a directional drill. There is no conflict with Oil & Gas rights.

*Recreation:* The surface land is privately owned and public access is restricted; no surface facilities would be constructed, therefore public recreation use would not be affected by the leasing of the Summit Creek Tract.

*Visual:* There would be no surface impacts, thus no visual impacts.

*Wastes – Hazardous or Solid:* Any waste materials from underground development of the Summit Creek Tract would be handled appropriately, according to the existing MRP.

*Wetlands and Riparian zones:* No wetlands or riparian zones have been identified in the project area.

*Wild and Scenic Rivers:* There are no designated wild and scenic rivers in or near the project area.

*Wilderness:* There are no designated wilderness areas or WSAs within or adjacent to the project area.

*Wildlife and Wildlife Habitats:* Wildlife habitats present in the area include mule deer and elk summer range as well as habitat for small animals and birds. Vegetation is mainly big sagebrush-grass with large aspen patches. None of these habitats or wildlife would be impacted by the proposed leasing or development of the Summit Creek Tract; there would be no surface development and subsidence impacts would be minimal.

## **Description of Resources**

### **Topography and Geology**

The Summit Creek Tract is located in the Book Cliffs coal field, which lies slightly east of the central part of Utah in Carbon and Emery counties. The Book Cliffs are a major physiographic feature in the region and range from 5,500 feet at the base to over 8,500 feet in elevation. The area exhibits extreme topographic relief and is mountainous with steep cliffs and incised drainages. The Summit Creek Tract is located on the top of the plateau in an area known as Emma Park, where topography is rolling with some knolls and steep slopes, but no cliff faces.

Overall, gradient across the Tract is generally toward the north. Elevations range from about 8,000 feet on the north boundary to about 8,500 feet at the south boundary. Topographic variation is provided by several small headwater drainages that flow northward across the Tract.

The surface geology exposed over much of the surface of the Summit Creek Tract is Flagstaff Limestone, which interfingers with the North Horn Formation in the Emma Park area. The Paleocene-aged Flagstaff Limestone is a member of the Wasatch Formation, and is comprised of interbedded limestones, claystones, and sandstones.

Underlying the Flagstaff Limestone are, in descending order, the North Horn Formation, the Price River Formation, the Castlegate Sandstone, and the Blackhawk Formation. The latter three comprise the Upper Cretaceous-aged Mesaverde Group. The North Horn is made up primarily of shales interbedded with sandstone, limestone and conglomerate. The Price River Formation consists of thick sandstone layers between a shale layer. The Castlegate sandstone is predominantly composed of a massive, fluvial sandstone layer with relatively high permeability. The Blackhawk Formation contains

interbedded materials of various makeup and porosity; it is the coal-bearing formation within the proposed Summit Creek Tract.

Although there are several major coal beds in the Blackhawk Formation in the region, only the Aberdeen (also known as the Castlegate A) bed is found in commercial thickness in the immediate area. This is the bed that would be mined within the proposed Summit Creek Tract. In the Tract area, overburden thickness ranges from 2,500 to 3,000 feet above this minable seam. The dip is northeastward at approximately six degrees, which is essentially equivalent to the direction and gradient of the surface topography. No faults are known to exist in the immediate area.

Conventional natural gas and coal bed methane gas exploration occurs in areas of Emma Park and Indian Canyon, approximately four miles to the northwest, focusing on coal beds of the Blackhawk Formation and sandstone members of the Mancos Shale underlying the Blackhawk Formation. To date there has been no interest in expanding these operations into the Blackhawk Formation or the Summit Creek area.

## **Water Resources**

The Summit Creek Tract is located in the headwaters of the Summit Creek watershed, which drains generally north, then west, to Willow Creek before entering the Price River. The Price River is tributary to the Green River, a major Colorado Plateau watercourse. Summit Creek heads at the top of the Book Cliffs, collecting flow in East Fork Summit Creek and West Fork Summit Creek, both of which drain the Summit Creek Tract. The upper reaches of Left Fork Antone Creek, also a tributary to Summit Creek, drain the westernmost portion of the Tract.

According to the United States Geological Survey (USGS) 7.5-minute quadrangle of the area, Left Fork Summit Creek is intermittent or ephemeral in the southern portion of the Summit Creek Tract and becomes perennial as it progresses northward through the area. The entire reach of Right Fork Summit Creek as it traverses the tract is mapped as perennial, while Left Fork Antone Creek is mapped as intermittent or ephemeral. Stockwatering rights are held on various stream segments in and near the Summit Creek Tract (Utah Division of Water Rights, 2003).

Several stockponds, apparently intercepting occasional spring flow as well as storm water or snowmelt runoff are located along these three watercourses. The Natural Resources Conservation Service (NRCS) notes several of these as being intermittent in nature (Soil Conservation Service, 1988). Landowners have existing water rights for stockwatering at various stockponds in and near the Summit Creek Tract (Utah Division of Water Rights, 2003).

Groundwater throughout the region and within the geologic formations in which the Summit Creek Tract is located is typically found only in isolated perched aquifers coinciding with lenticular sandstone beds interspersed throughout the less permeable strata. Occasionally, these water-bearing beds discharge to the surface via small springs where dip, topography, and storage volume allow. In the Book Cliffs, these springs are commonly found where the Flagstaff Limestone is exposed at the surface

and contacts the North Horn Formation; often they exhibit great seasonal variability (Waddell, et al, 1986), reflecting a small recharge area and minimal aquifer extent. Within the boundaries of the Summit Creek Tract, water rights for stockwatering uses are held on several small springs. These springs were not identified in previous ANDALEX surveys (Mayo and Associates, 2002; Vaughn Hansen Associates, 1981) and at least some of these may no longer produce flow.

South of the project area, ANDALEX operates the Aberdeen Mine, and has an intermittent need to pump intercepted groundwater from the mine into Deadman Canyon. Deadman Canyon is an ephemeral tributary which flows south toward the Price River.

## **Paleontological Resources**

The Summit Creek Tract includes the Blackhawk Formation of the Upper Cretaceous Mesaverde Group, the Castlegate Sandstone Formation, the Price River Formation, and Mancos Shale. Important fossils are known to occur in the Blackhawk Formation in central Utah. Some invertebrate fossils are common in the Mancos Shale, Castlegate Sandstone, and Price River Formation. Vertebrate fossils of scientific and educational value, on public lands, are protected under the "Baucus Bill" (Paleontological Resources website).

No paleontological inventories have been conducted in the proposed Summit Creek Tract. The subject property is located in a "potential fossil bearing area of slight value" (USDI, 1979). Although some invertebrate fossils could be found in the Mancos Shale, Castlegate Sandstone, and Price River Formation, the chance of finding valuable fossils is small (BLM, 1983).

## **Special Status Species**

Section 7 of the Endangered Species Act (ESA) of 1973 (the Act), as amended, stipulates that Federal actions shall not jeopardize the continued existence of any threatened or endangered species or adversely modify their critical habitat. The status of threatened and endangered species has been determined by the U.S. Fish & Wildlife Service under the provisions of the ESA. Under the ESA, endangered species are defined as being in danger of extinction throughout their entire range, or a significant portion of it. Threatened species are likely to become endangered in the foreseeable future.

In addition, the Utah Division of Wildlife Resources (UDWR) maintains lists of sensitive species by County. Sensitive species are those species for which population viability is a concern, as evidenced by: (1) significant current or predicted downward trend in population numbers or density, or (2) a significant current or predicted downward trend in habitat capability that would reduce the species' existing distribution.

Collectively, threatened, endangered, and sensitive species are referred to herein as Special Status Species. Any surface disturbing activity that has the potential to affect

individuals of these species, or to alter their habitats, must be evaluated in terms of the ESA and BLM policy. In addition, all raptor species are protected under authority of the Migratory Bird Treaty Act (16 U.S.C. 703-712). A brief account of the Federally listed and sensitive species that may occur in or near the project area is included below.

### **Federally Listed Species**

Of those Federally listed plant and wildlife species in Carbon County, only the bald eagle (*Haliaeetus leucocephalus*) and the Mexican spotted owl (*Strix occidentalis lucida*) have the potential to occur in or near the project area. The bald eagle may occasionally migrate through the area; the Mexican spotted owl would be unlikely to occur in this area. The list also includes four Federally endangered fish species; bonytail chub (*Gila elegans*), Colorado pikeminnow (*Ptychocheilus lucius*), Humpback chub (*G. cypha*), and razorback sucker (*Xyrauchen texanus*), however, no habitat for these fish occurs within the project area.

### **Sensitive Species**

Sensitive species recorded on the UDWR database within a one-mile radius of the lease tract include the following: ferruginous hawk (*Buteo regalis*), Swainson's hawk (*Buteo swainsoni*), Utah milk snake (*Lampropeltis triangulum taylori*), bluehead sucker (*Catostomus discobolus*), greater sage grouse (*Centrocercus urophasianus*), northern flying squirrel (*Glaucomys sabrinus*), peregrine falcon (*Falco peregrinus*), western red bat (*Lasiurus blossevillii*), and western toad (*Bufo boreas*).

### **Range and Livestock**

Livestock grazing and rangeland conditions are of great importance on both public and private lands in the Price River Resource Area. The comparatively mild and open winters make the area excellent winter range. However, expansive cliff formations and steepness of canyon walls has limited the grazing in the area to the canyon bottoms and area above the canyons. All livestock grazing on public land in the area is managed by the BLM, Price Field Office. One of several main livestock management objectives is to restore and improve rangeland conditions and productivity while providing for its use and development (BLM, 1991).

The Summit Creek Tract and private lands to the north and south are used in the spring and fall for cattle grazing. Cattle are trailed seasonally from the valley areas north through the canyons to the BLM allotments and private grazing lands on the mesa tops. Deadman Canyon has been historically used by ranchers for driving cattle (BLM, 1983).

## Land Uses

The proposed project occurs on privately owned lands with mineral rights administered by the Bureau of Land Management. The mineral rights encompassed within the project area are directed by the BLM's Price River Management Framework Plan (1984). Land use activities in and adjacent to the Proposed Action area include coal mining, livestock grazing, and dispersed recreation activities.

Land management decisions on private lands in Carbon County are guided by the county land use plans, and zoning ordinances and regulations. Lands in the immediate area are zoned Mining and Grazing. The Development Code (Carbon County, 2003) states, "The M&G Mining and Grazing zone generally covers the rangeland areas of Carbon County... Because of limitations imposed by climate, topography, soil capability, water supply and the presence of economically significant mineral deposits, this area has historically been utilized as a place for the grazing of livestock on the open range and as the location of numerous mining and mineral exploration sites. The particular characteristics and conditions present in this area make the land more appropriately suited for a continuation of these uses to promote the economic well-being of the people within the County, and to broaden the tax base."

The County specifically addresses coal development and expects coal mining proponents to assess project impacts and then identify plans to mitigate any impacts (BLM, 1983). County ordinances in relation to mining address watershed protection, mitigation of mine interception of water, subsidence, erosion, sediment, and the enforcement of regulations. There are several county ordinances specifically related to coal mining in the Book Cliffs (Carbon County, 1981). Those applicable are presented below:

According to the 1983 Round II Leasing EIS (BLM, 1983), the Book Cliffs tracts (which encompass the proposed lease area) are zoned as a Critical Environmental Zone 2 (CE-2). Coal mining development is classified as "permitted conditional uses" in this zone, and is permitted upon compliance with the requirements as set forth in the applicable county ordinance code and after approval has been given by the designated governmental agency.

As stated above, the surface land in the proposed project area is privately owned. The fairly rugged topography and sparse rainfall limit the current uses of the land. Two cabins are present, as are numerous two-track and four-wheel drive roads. The area is currently utilized for grazing, wildlife habitat, and outdoor recreation. Areas adjacent to the proposed project area are used for coal mining and associated activities. Recreational activities include deer hunting and enjoyment of open space; snow cover is generally too light and slopes too steep for winter recreation such as snowmobiling, cross-country skiing, or snowshoeing.

## **Cultural and Historical Resources**

A sample oriented cultural resource inventory (Reed and Chandler, 1984) was conducted in 1982-83 as discussed in the Uinta-Southwestern Utah Coal Region, Round Two, Final EIS (BLM, 1983). The inventory consisted of a 10 percent sampling of five proposed coal tracts, one of which was the Soldier Tract. The current project area was included in the Soldier Tract (encompassed Coal Creek, Soldier Creek, Whitmore Park, Dugout-Pace, and Alkali Creek tracts as delineated in the Uinta-Southwestern Utah Coal Region Final EIS); private lands are included in the study area when mineral rights are publicly owned. The sample areas were each 160 acres in size. Two sample areas were located within the proposed Summit Creek Tract (#2 and #19). No cultural resource sites were recorded within these two sample areas. Within the entire 1983 Soldier Tract inventory area, only two cultural resource sites were recorded.

The proposed Summit Creek Tract encompasses about 703 acres of land of which 80 acres were inventoried during the 1982-83 effort. No cultural resource sites were found within the 80 acres. Due to the nature of the sampling inventory, there is the possibility of unrecorded cultural resources being present within the Summit Creek Tract but the probability is low.

Cultural resource sites in the adjacent and nearby coal leases include historic coal mines, coal prospects, cabins, and graffiti; all have been deemed ineligible for inclusion on the National Register of Historic Places by SHPO.

## **Socioeconomics**

The Summit Creek Tract is located in Carbon County where coal mining is a major industry. In 2001, Carbon County produced 5.69 million tons of coal, the third highest coal producing county in Utah, after Emery County and Sevier County (Utah Department of Natural Resources, 2003).

The estimated county population in the year 2000 was 20,422 (Utah Census), down from its peak of 24,700 in 1982. The population continues to decline, estimated at 19,858 currently (source: July 2000-2002: Utah Population Estimates Committee), a population drop of 2.6 percent since 2000.

Mining jobs make up 9 percent of the employment in Carbon County (Workforce Services, 2002), as opposed to one percent in the State of Utah. According to the Utah Department of Workforce Services (GOPB, 2003), three of the top ten largest employers in Carbon County are coal mining companies (Canyon Fuels Company, ANDALEX Resources Inc., and West Ridge Resources, Inc.). The average monthly wage by major industry division is \$4,908 for mining in Carbon County (source: Utah Department of Workforce Services), the highest average wage for all industries in the county. This average monthly wage is about 19 percent higher than the state average for mining. Wages paid by the mining industry are an important component of Carbon County's economy, making up almost 20 percent of the total wages in the county

(source: Workforce Services). The employment is diversifying but is still dependant on the coal mining industry.

Economic multipliers are used to describe the effects on the economy of changes in the industrial sector. The Utah Governor's Office of Planning and Budget (GOPB) has developed multipliers for over 500 detailed industries in Utah. A direct effect employment multiplier is used to predict total changes in employment due to an initial direct change in a given sector or industry. The coal mining direct effect employment multiplier is 5.5, this indicates that for every job in the coal mining sector, employment in other sectors goes up by 4.5 jobs, and employment throughout the economy goes up by 5.5 jobs (GOPB, 2001). The coal mining multiplier, at 5.5, is well above the median multiplier of 2.5 of all jobs under all categories.

Federal coal leasing generates revenue including: (1) a bonus paid at the time the coal is leased, (2) rental payments to hold the lease, and (3) royalties paid on the value of the coal produced per year. The State in which the coal is leased receives half of the bonus bid as well as half of the royalties. Every competitively issued lease requires a royalty rate of 8 percent for coal mined by underground methods. The Utah Legislature distributes Federal mineral lease funds to communities, counties, and other entities as part of the annual budget and appropriation process.

## **Chapter 4 - Environmental Consequences**

### **Alternative A – No Action**

#### ***Topography and Geology***

If the lease were not made available for sale, there would be no coal extracted from the Summit Creek Tract, nor would there be potential for topographic alterations in the tract area due to mine-caused subsidence. Approximately 8.62 million tons of coal would be bypassed and probably never recovered.

#### ***Water Resources***

If the lease were not made available for sale, there would be no change in water resources in the Summit Creek Tract area. Mining of existing allowable coal would continue at the Aberdeen Mine, with the continuing intermittent need to pump intercepted groundwater from the mine into the Deadman Canyon drainage.

#### ***Paleontological Resources***

If the lease were not made available for sale, there would be no surface or underground disturbance in the lease area and therefore no impacts to paleontological resources as a result of this project.

#### ***Special Status Species***

Land uses including livestock grazing and limited recreational use in the area are expected to continue. Other surface disturbing activities are not currently proposed by the landowners. Special status species are not expected to be impacted by the continuation of existing uses on these private lands.

#### ***Range and Livestock***

Under the No Action alternative, the current uses of private surface lands for livestock grazing would continue. If the lease were not made available for sale, there would be no impacts to range and livestock resources.

#### ***Land Uses***

If the lease were not made available for sale, there would be no impacts to land uses. Any proposed developments by the landowners would be directed by the Carbon County Development Code (2003).

#### ***Cultural and Historical Resources***

There would be no impacts to known cultural resources. Existing grazing and recreational activities could impact unrecorded cultural resource sites.

#### ***Socioeconomics***

The Aberdeen Mine is expected to be out of reserves in two to three years. Without the Summit Creek Tract lease, either employment would have to shift to other coal producing operations or would decline. The employment multiplier would affect jobs in other sectors accordingly. Population in Carbon County would be expected to continue

to decline, according to trend. Potential coal royalties on 8.62 million tons of coal in the Summit Creek Tract would not be realized. The State of Utah would not receive the bonus bid payment from the lease and the annual royalties on coal produced. These funds would not be available for distribution to the counties, communities, and other eligible entities.

## **Alternative B – Proposed Action**

### ***Topography and Geology***

The leasing of the Summit Creek Tract and resulting barrier panel longwall mining is expected to result in recovery of approximately 8.62 million tons of coal (at 75 percent of in-place reserve).

Under this alternative, no surface subsidence would be expected due to: the cover thickness (approximately 2,600 - 3,000 feet); the use of barrier panels between the longwall runs; and the thickness and competence of the overlying Castlegate Sandstone. This conclusion is based upon analogous conditions at the adjacent Aberdeen Mine, where there have been no indications of ground surface lowering.

ANDALEX, as part of its obligation under its Utah Division of Oil Gas and Mining (UDOGM) operating permit, monitors surface subsidence associated with its Aberdeen Mine, adjacent to the Summit Creek Tract. Current monitoring of subsidence points in this area shows "no movement horizontally or vertically since they were established" according to the consultants under contract to ANDALEX to perform annual surveys (Ware Surveying and Engineering, 2003).

Should mine development occur in the Summit Creek Tract, subsidence monitoring would be expanded to cover the Tract area. Should surface subsidence occur, impacts would be limited to ground lowering in the order of 20-60 percent of the height of the extracted coal seam, i.e. 1.5 to 4.5 feet of ground lowering for an extracted 8-foot coal seam. Some surface tension cracks could appear which normally self heal within weeks of appearing.

Another mining scenario for ANDALEX involves the elimination of the barrier panels, or a substantial reduction in their size, that would result in a greater amount of coal potentially recovered (up to about 5 million tons), but would also increase ground movement in the mine based upon previous experience in similar geologic conditions at the existing Aberdeen Mine. The type of violent mine bumps (or rapid breakup of rock immediately above the mined seams) that occurred in the Aberdeen Mine prior to implementing the barrier panel plan currently in place could occur, causing unacceptable risks to mining personnel and equipment.

While there may be a greater likelihood of subsidence without the support of barrier pillars, it would likely be minor; the overburden thickness as well as the nature of the Castlegate Sandstone would still provide substantial vertical barriers to ground lowering. Minor surface cracking or isolated ground sagging could be more likely under this alternative, though rapid bridging would be expected. Escarpments such as are found

along the face of the Book Cliffs are not present on the gentler topography of the Summit Creek Tract, so that type of surficial failure would not be anticipated.

### ***Water Resources***

Under Alternative B, no impacts to surface or groundwater resources are expected to occur. There should be no surface disturbance within the Summit Creek Tract as a result of the leasing activity. If mining were to occur as a result of the lease sale, there should be only minimal surface disturbance. Measurable subsidence of the ground surface is not expected, as described in the Geology impacts sections, and thus no interruption of surface, spring, or groundwater water flows should occur. Similarly, stockponds should not be affected, nor should existing valid water rights be infringed upon. However, as part of the mine permitting process, UDOGM would require detailed inventories and continued monitoring of water resources prior to, during, and subsequent to mining activities.

Should ANDALEX obtain the lease and develop the coal in the Summit Creek Tract, the current situation whereby intercepted groundwater is intermittently pumped from the mine into the Deadman Canyon drainage would likely continue.

### ***Paleontological Resources***

If the Summit Creek Tract were leased and mined for coal utilizing longwall methods, fossils in the Blackhawk Formation could be destroyed during coal extraction activities. The Lease-Committed Measures (**Appendix B**) would provide mitigation measures for paleontological resources if future mine surface facilities or disturbances were needed.

### ***Range and Livestock***

Under the Proposed Action, there would be no surface disturbance and no substantive surface manifestations of mining; therefore, there should be no impacts to range and livestock resources and no impacts to water sources utilized for livestock (see Water Resources above).

### ***Special Status Species***

No surface disturbing activities are proposed, and the potential for subsidence is minimal; therefore, there should be no impacts to special status species. Nor should there be impacts to the four fish species due to water depletions or subsidence.

### ***Land Uses***

Under the Proposed Action, the Summit Creek Tract would be leased; this would be in conformance with the BLM's Price River Resource Area MFP. In addition, it would comply with county land use plans. Any minor subsidence associated with longwall mining should result in no material damage or diminution of value to land uses. The subsurface mining should not impact current land surface uses or potential for other surface uses as described by the Carbon County Development Code (2003).

### ***Cultural and Historical Resources***

The Proposed Action would have no impact on known cultural resource sites. There would be no surface disturbance and no substantive surface manifestations of mining;

therefore, there should be no impacts to cultural resources. The Lease-Committed Measures (**Appendix B**) would provide mitigation measures for cultural resources if future mine surface facilities or disturbances were needed.

### ***Socioeconomics***

The leasing of the Summit Creek Tract lease would extend the life of the Aberdeen Mine by 5 to 10 years. No additional employees would be needed, since full production under the current lease would be about the same as that under the Summit Creek lease. However, employment duration would be extended accordingly, and the stability of the economy in Price and Carbon County would be positively affected. In addition to extension of the mine-related jobs for 5 to 10 years, the employment of 4.5 jobs in other sectors would also continue for an additional 5 to 10 years. Carbon County population would be expected to continue to decline according to trend.

ANDALEX would be required to pay a bonus bid, as well as lease rental payments and royalties of 8 percent on coal to be mined. The State of Utah would receive half of the bonus bid as well as half of the royalties. Additionally, Carbon County, Price, and area communities could receive economic benefits from the State from the mineral lease funds.

## **Reasonable Foreseeable Development & Cumulative Impacts**

### ***Reasonable Foreseeable Development (RFD)***

The lands of the proposed lease area are privately owned; therefore, there are no other foreseeable public developments on the proposed project area. Adjacent lands with Federally administered mineral rights, to the north or the east, could be leased for additional underground coal mining. ANDALEX currently holds a private coal lease for the lands in Section 36 T12S R10E adjacent to the west. There are no other surface developments currently proposed.

### ***Cumulative Impacts***

Cumulative impacts are those that result from the incremental impact of an action in combination with other past, present, and reasonably foreseeable future actions.

There would be no cumulative surface resource impacts. The extraction of 8.625 million tons of coal from the Summit Creek Tract would add to the total extraction of coal in this area, under the Centennial Project. However, no incremental impacts are expected from the recovery of coal. Cumulative benefits are the contribution to continued economic stability for the town of Price, surrounding communities, and Carbon County.

## **Consultation and Coordination**

ANDALEX Resources, Inc.  
Mike Glasson

Carbon County, Planning and Building Departments  
Gayla Williams, Deputy Zoning Administrator

Private Landowners  
Mildred and Dave Cave  
Funnon T. Shimmin

Utah Division of Oil, Gas, & Mining  
Gregg Galecki, Reclamation Hydrologist

Utah Division of Wildlife Resources  
Chris Colt, Habitat Biologist  
Tony Wright, Habitat Biologist

Utah Natural Heritage Program Database

Utah Natural Resources Conservation Service, Price Field Office

Utah School and Institutional Trust Lands Administration  
John Blake, Mineral Resource Specialist

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Vaughn Hansen Associates, February 1981. Surface and Groundwater Hydrologic Inventory of the Tower Mine Plan and Adjacent Areas, Carbon County, Utah. The Centennial Project. Prepared for Tower Resources, Inc., Price, Utah.

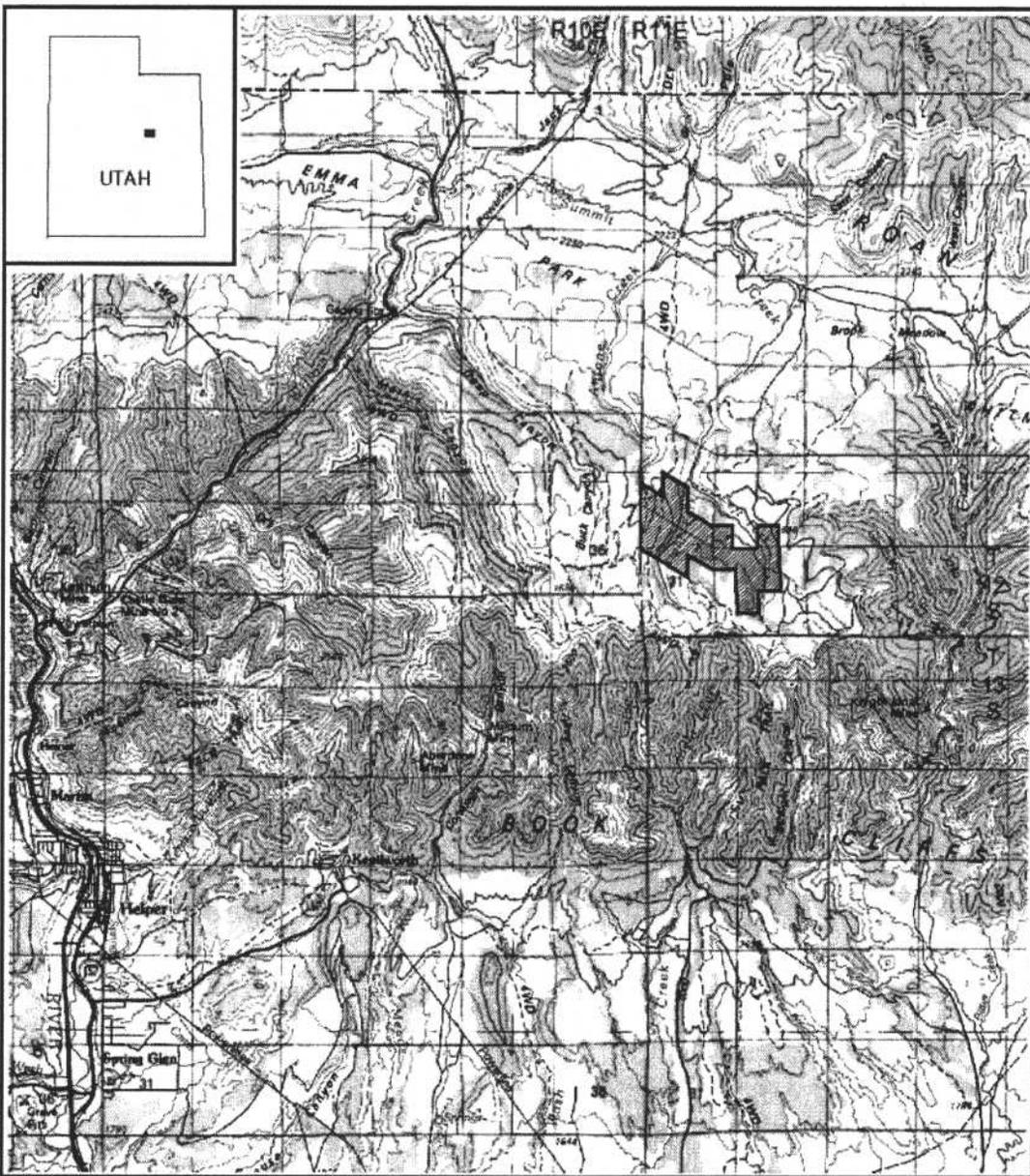
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Ware Surveying and Engineering, October 19, 2003. Letter to ANDALEX Resources, Inc. conveying 2003 Subsidence Survey results.

## List of Preparers

| <b>Bureau of Land Management</b>                            |   |  |
|---|---|--|
| Name  | Education and Experience  | Responsibility   |
| Stephen Falk  | B.S. Mining Engineering<br>22 Years Experience                            | Price Field Office BLM,<br>Project Manager   |
| Jim Kohler  | M.S. Geology<br>30 Years Experience                                       | State Office BLM,<br>Solid Minerals Branch.<br>Chief                                   |
| Jeff McKenzie   | B.S. Mining Engineering<br>MBA<br>30 Years Experience                     | State Office BLM,<br>Mining Engineer, COR  |
| Kerry Flood   | B.S. Chemistry<br>13 Years Experience                                     | Price Field Office, BLM,<br>Hydrologist  |
| Blaine Miller   | M.A. Archeology<br>32 Years Experience                                    | Price Field Office, BLM,<br>Archeologist   |
| Brad Higdon   | B.S. Interdisciplinary Studies<br>10 Years Experience                     | Price Field Office, BLM,<br>NEPA Coordinator   |
| <b>Office of Surface Mining Reclamation and Enforcement</b> |   |  |
| Name  | Education and Experience  | Responsibility   |
| Floyd McMullen  | M.S. Environmental Science<br>30 Years Experience                         | Denver, Colorado, OSM,<br>Environmental Project<br>Coordinator                         |
| <b>JBR Environmental Consultants, Inc.</b>                  |   |  |
| Name  | Education and Experience  | Responsibility   |
| Linda Matthews  | B.S. Environmental Studies<br>15 Years Experience                         | Project Management<br>EA Preparation   |
| Karla Knoop   | B.S. Watershed Science<br>Professional Hydrologist<br>17 Years Experience | Water Resources<br>Subsidence  |
| Jenni Prince-Mahoney  | B.A. Anthropology<br>10 Years Experience                                  | EA Preparation<br>Cultural/Paleo Resources<br>Land Use<br>Recreation<br>Socioeconomics |
| Jim Sage  | B.S. Geology<br>3 Years Experience  | Geology<br>Minerals  |

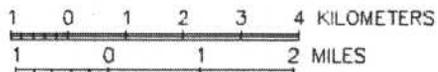
## FIGURES



TOPOGRAPHIC BASE USGS 1:100,000-SCALE MAP: PRICE, UTAH, 1989

**BLM**  
SUMMIT CREEK TRACT

FIGURE 1  
LOCATION MAP

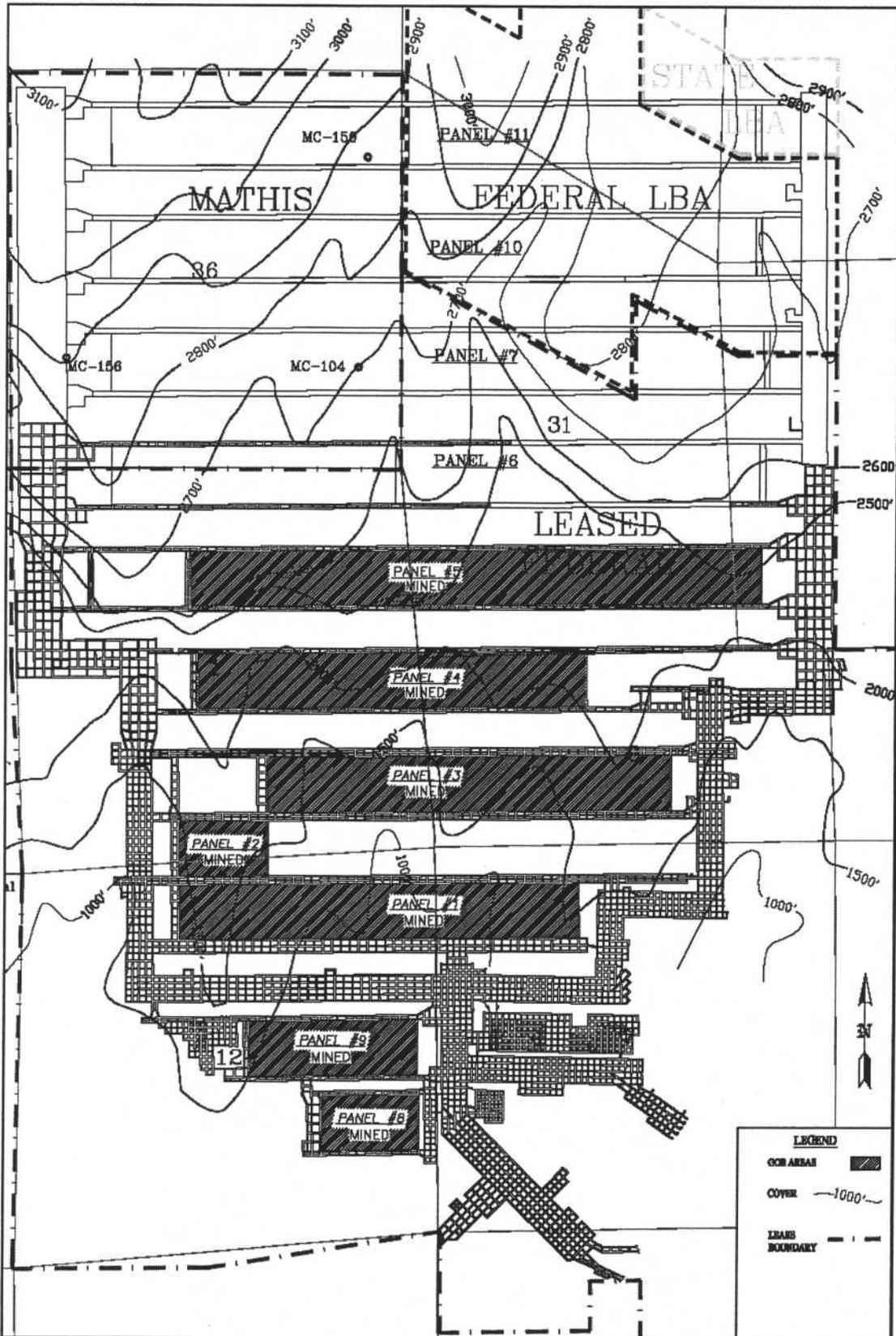


**jbr**  
environmental consultants, inc.  
DESIGN BY JM DRAWN BY CP CHECKED BY GHD  
SCALE 1:100,000

DATE DRAWN 10/23/03  
REVISION

drawing \BLM\UT01\SurfaceOwnership\ip.dwg





Aberdeen Mine Map  
Mining Projections

FIGURE 3  
SCALE: 1" = 1200'

October 31, 2003

Aberdeen Mine Lease Tinting 10-01-03.dwg



**ANDALEX**  
RESOURCES, INC.  
Tower Division

## **Appendix A - Public Scoping**



**UTAH**  
**BLM**  
BUREAU OF LAND MANAGEMENT  
**UNITED STATES**

**FOR RELEASE**  
**CONTACT**

Immediately  
Patrick Gubbins  
Field Manager

**News Release**  
**DEPARTMENT OF THE INTERIOR**

1222.21 (UT-070)

The Bureau of Land Management is requesting public comment in conjunction with the preparation of an environmental assessment for a Federal coal lease application. This request, referred to as scoping, seeks public input as to any issues concerning this coal lease application. Andalex Resources, Inc. has made application to lease Federal coal on a tract of land so named the Summit Creek Tract with assigned serial number UTU-79975, located adjacent to the existing Tower/Aberdeen Mine property north of Price in Carbon County, Utah.

The proposed lease tract contains 702.73 acres of unleased Federal coal with the surface estate held by private ownership. The lands are described as follows:

T. 12 S., R. 11 E., SLM, Utah  
Sec. 29, SW1/4SW1/4, SW1/4SE1/4;  
Sec. 30, lots 4, 12, 14-16;  
Sec. 31, lots 1, 2, 7-11;  
Sec. 32, W1/2NE1/4, E1/2NW1/4, NW1/4NW1/4, NE1/4SW1/4.

Andalex has applied for this lease tract to add coal reserves at the Tower/Aberdeen Mine. The tract lies back under the Book Cliffs north and adjacent to the existing mine property. There are no coal outcrops on the tract as the entire tract is under the Book Cliffs with the coal seams approaching 3000 feet deep. Though all coal leases are leased competitively, the probable access to these coal reserves is from the existing mine workings of the Aberdeen Mine. The Summit Creek Tract will be mined by underground mining methods with no new surface facilities expected.

The BLM will prepare an environmental assessment (EA) of the proposed coal lease tract to address impacts prior to holding a lease sale. Any public comment or input for the EA will be taken by the BLM within 30 days and considered for use in the document. A copy of the lease application and pertinent maps are available for inspection at BLM Price Field Office at 125 South 600 West, Price, Utah, during business hours of 7:45 a.m. to 4:30 p.m. Written comments should be mailed or delivered to the same address. For more information, you may contact Stephen Falk at the Price Field Office or phone 801-636-3600.

Distribution:

Emery Progress  
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# SLEEP

...ns, it is something we don't think much about. But for many of us, a good night's sleep is literally a dream. At Castleview's Sleep Disorders Clinic, we provide a complete evaluation of a variety of sleep disorders.

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**CASTLEVIEW HOSPITAL**

personnel, Maynes evacuated the school and a search was conducted for other explosives. No other devices were discovered. The investigation indicated two firebombs were thrown near the east entry of the school. The investigation was completed and the school was returned to normal. The investigation was reported to the Utah Crime Laboratory for analysis. To report information about the crime, residents call the Sunnyside Police Department at 888-4444 or the Price dispatch center at 637-0893.

## BLM accepting public input on Andalex application for Summit Creek coal lease

The United States Bureau of Land Management is requesting public comment in conjunction with the preparation of an environmental assessment for a federal coal lease application at a site located north of Price in Carbon County. The request, referred to as scoping, seeks public input as to any issues concerning the coal lease application, explained the federal agency.

**Thank You**

**AMERICA'S VETERANS!**

Veterans Day is the time to say thank you to those who have worn a military uniform and to those who today are keeping strong the unbroken bond of service.

*To each and every one who serves, we say thank you.*

[www.legion.org](http://www.legion.org)

Andalex Resources Inc. has made application-to-lease federal coal on the Summit Creek tract, located adjacent to the existing Tower/Aberdeen mine property north of Price in Carbon County.

The proposed lease tract contains 702.73 acres of unleased federal coal, with the surface estate retained by private ownership, pointed out the BLM.

Andalex has applied for the lease tract to add coal reserves at the Tower/Aberdeen mine.

The tract ties back under the Book Cliffs north and adjacent to the existing mine property.

There are no coal outcrops on the tract as the entire site is under the Book Cliffs with the coal seams approaching 3,000 feet deep, explained the federal agency.

Although all federal leases are awarded competitively, the BLM pointed out that the probable access to the coal reserves at the Summit Creek tract is from the existing workings of the Aberdeen mining operation.

The Summit Creek tract will be mined by underground mining methods with no new surface facilities expected.

The BLM will prepare an environmental assessment (EA) of the proposed coal lease tract to address impacts prior to conducting a sale.

Public input for the EA will be taken by the BLM within 30 days and considered for use in the document.

A copy of the application and pertinent maps are available for inspection at Price BLM field office Monday through Friday from 7:45 a.m. to 4:30 p.m. Written comments should be mailed or delivered to the office at 125 S. 600 West, Price, UT 84501.

For additional information, contact Stephen Falk or call the Price BLM field office at 636-3600.



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Price Field Office  
125 South 600 West  
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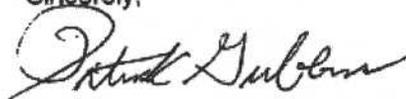
3420  
UTU-79975  
(UT-070)

Dear Private Land Owners/Affected Interests:

Enclosed is a copy of a news release announcing the intent of the Bureau of Land Management (BLM) to write an environmental assessment (EA) for a coal lease application submitted by Andalex Resources, Inc. The coal tract, named the Summit Creek Tract, is north adjacent to Andalex Resources Tower Division's current lease holdings in the Book Cliffs north of Price, Carbon County, Utah. As possible surface owners and/or interested parties, we have sent this copy to you for your use/information.

For further information or questions, a contact at the BLM is noted in the news release.

Sincerely,



Patrick Gubbins  
Field Manager

Enclosure  
News Release

cc: UT-923, SD, Utah (w/encl.)

SFalk:ks:9/19/03  
sumitcrksurfown.notic

Send to:

Dave R. and Mildred Cave, et. al  
Sunnyside Star Route  
Price, Utah 84501

Mathis Land Company  
Sunnyside Star Route  
Price, Utah 84501

F. and D. Shimmin  
711 North 500 East  
Price, Utah 84501

Price City  
185 East Main Street  
Price, Utah 84501

School & Institutional Trust Lands Administration  
675 East 500 South, Suite 500  
Salt Lake City, Utah 84102

Office of Surface Mining  
1999 Broadway, Suite 3320  
Denver, CO 80202

Utah Division of Oil, Gas and Mining  
1594 West North Temple, Suite 1210  
Salt Lake City, Utah 84114-5801

## **Appendix B – Lease-Committed Measures**

## **Standard Lease Stipulations - Lease-Committed Measures**

### Lease Form

#### *Reclamation*

In accordance with Section 523(b) of the Surface Mining Control and Reclamation Act of 1977 (SMCRA), surface mining and reclamation operations on this lease are to conform with the requirements of this act and are subject to compliance with OSM regulations, or as applicable, a Utah program equivalent approved under cooperative agreement in accordance with Section 523(c). The United States government does not warrant that the entire tract will be conducive to mining.

#### *Permitting*

The permitting of any mining operations on the lease will be subject to the possible designation of any portion of the lease as unsuitable for some or all kinds of surface mining under the regulations of the department under the SMCRA in effect at the time of action on the mine plan permit.

#### *Cultural Resources*

Before undertaking activities that may disturb the surface of previously undisturbed leased lands, the lessee may be required to conduct a cultural resource inventory of the areas to be disturbed. These studies shall be conducted by a qualified, professional cultural resource specialist and a report prepared itemizing the findings. A plan will then be submitted making recommendations for the protection of, or measures to be taken to mitigate impacts for identified cultural resources.

If significant cultural resources are discovered during operations under this lease, the lessee shall immediately bring them to the attention of the authorized officer who shall evaluate, or have evaluated, such discoveries and, within five working days, shall notify the lessee what action shall be taken with respect to such discoveries.

The cost of conducting the inventory, preparing reports, and carrying out necessary protective mitigating measures shall be borne by the lessee.

#### *Paleontological Resources*

Before undertaking activities that may disturb the surface of previously undisturbed leased lands, the lessee may be required to conduct a paleontological appraisal of the areas to be disturbed. The appraisal shall be conducted by qualified paleontologists and a report of the findings prepared. A plan will then be submitted making recommendations for the protection of, or measures to be taken to mitigate impacts for, identified paleontological resources.

If paleontological remains (fossils) of significant scientific interest are discovered during operations under this lease, the lessee shall immediately bring them to the attention of the authorized officer who shall evaluate, or have evaluated, such discoveries and, within five working days, shall notify the lessee what action shall be taken with respect to such discoveries. Paleontological remains of significant scientific interest do not include leaves, ferns, or dinosaur tracks commonly encountered during underground

mining operations.

The cost of conducting the inventory, preparing reports, and carrying out necessary protective mitigating measures shall be borne by the lessee. The cost of salvage of paleontological remains (fossils) shall be borne by the United States.

#### *T&E Species*

If there is reason to believe that threatened or endangered species of plants, animals, or migratory species of high Federal interest occur in the area, the lessee shall be required to conduct an intensive field inventory of the area to be disturbed and /or impacted. The inventory shall be conducted by a qualified specialist and a report of findings prepared. A plan will be prepared making recommendations for the protection of these species or action necessary to mitigate the disturbance.

The lessee shall conduct intensive raptor nesting surveys of all areas within one-mile circumference of the outside edge of any proposed surface disturbance. Any surveys will be conducted by qualified specialists. The cost of conducting the inventory, preparing reports, and carrying out necessary protective mitigating measures shall be borne by the lessee.

No permanent surface disturbance or occupancy will be permitted within one-half mile of any raptor nests identified as being occupied within a three year period. Site-specific evaluations in coordination with the U.S. Fish and Wildlife Service may allow for modification of this requirement.

#### *Surface Resources*

Should surface development be proposed, the lessee shall be required to perform a study to secure adequate baseline data to quantify the existing surface resources on and adjacent to the lease area. Existing data may be used if such data is adequate for the intended purposes. The study shall be adequate to locate, quantify, and demonstrate the interrelationship of the geology, topography, surface hydrology, vegetation, and wildlife. Baseline data will be established so that future programs of observation can be incorporated at regular intervals for comparison.

#### *Miscellaneous*

The lessee shall be required to establish a monitoring system to locate, measure, and quantify the progressive and final effects of underground mining activities on the topographic surface, underground and surface hydrology, and vegetation. The monitoring system shall utilize techniques that will provide a continuing record of changeover time and an analytical method for location and measurement of a number of points over the lease area. The monitoring shall incorporate and be an extension of the baseline data.

If a spring is located in the area and the BLM Area Manager determines that spring flow has been adversely impacted, the lessee would fund a water catchment project that would satisfactorily compensate for decreased flows or other adverse impacts. The project will be designed by the BLM and the timing of the project will be determined by the BLM. The maintenance of the project will be the responsibility of the leaseholder

and their successor in interest.

Except at specifically approved locations, underground mining operations shall be conducted in such a manner so as to prevent surface subsidence that would: 1) cause the creation of hazardous conditions, such as potential escarpment failure and landslides, 2) cause damage to existing surface structures, and 3) damage or alter the flow of perennial streams.