Figure 5. Typical spotted bat foraging area. Note the vertical structure in the riparian area, dominated by cottonwoods.

Figure 6. Typical spotted bat foraging area. Note the vertical structure in the riparian area, dominated by cottonwoods.

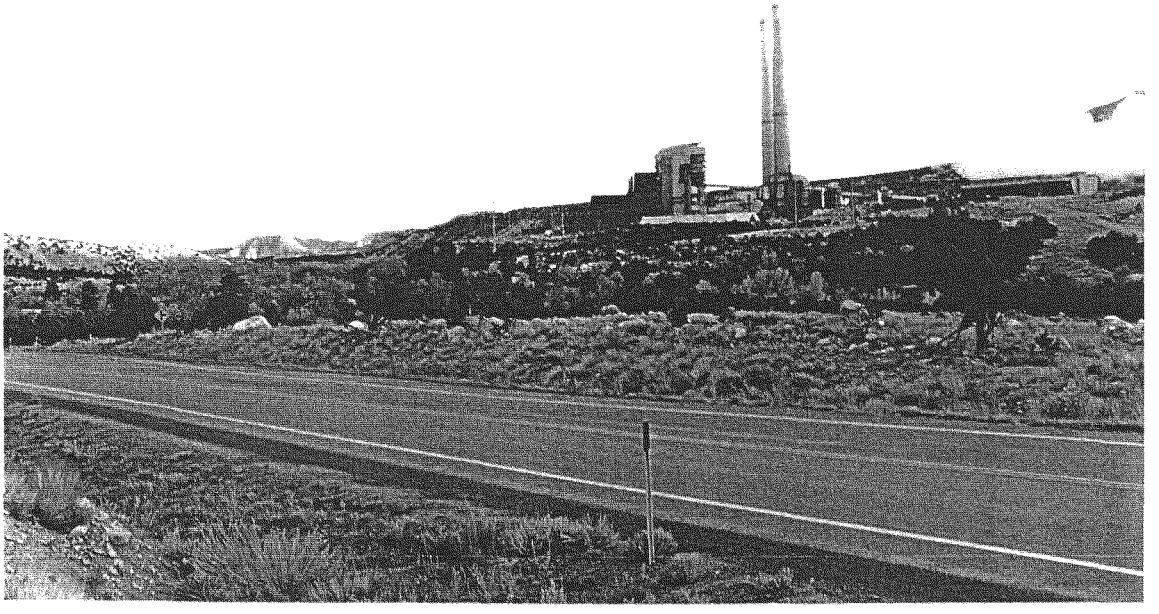

Figure 7. Typical spotted bat foraging area. Note the vertical structure in the riparian area, dominated by cottonwoods.

Figure 8. Typical spotted bat foraging area. Note the vertical structure in the riparian area, dominated by cottonwoods.

Figure 9. Spotted bat foraging area. Note roosting cliffs in the background.

Figure 10. Spotted bat flyway. Note roosting cliffs in background and lack of foraging habitat in flyway.

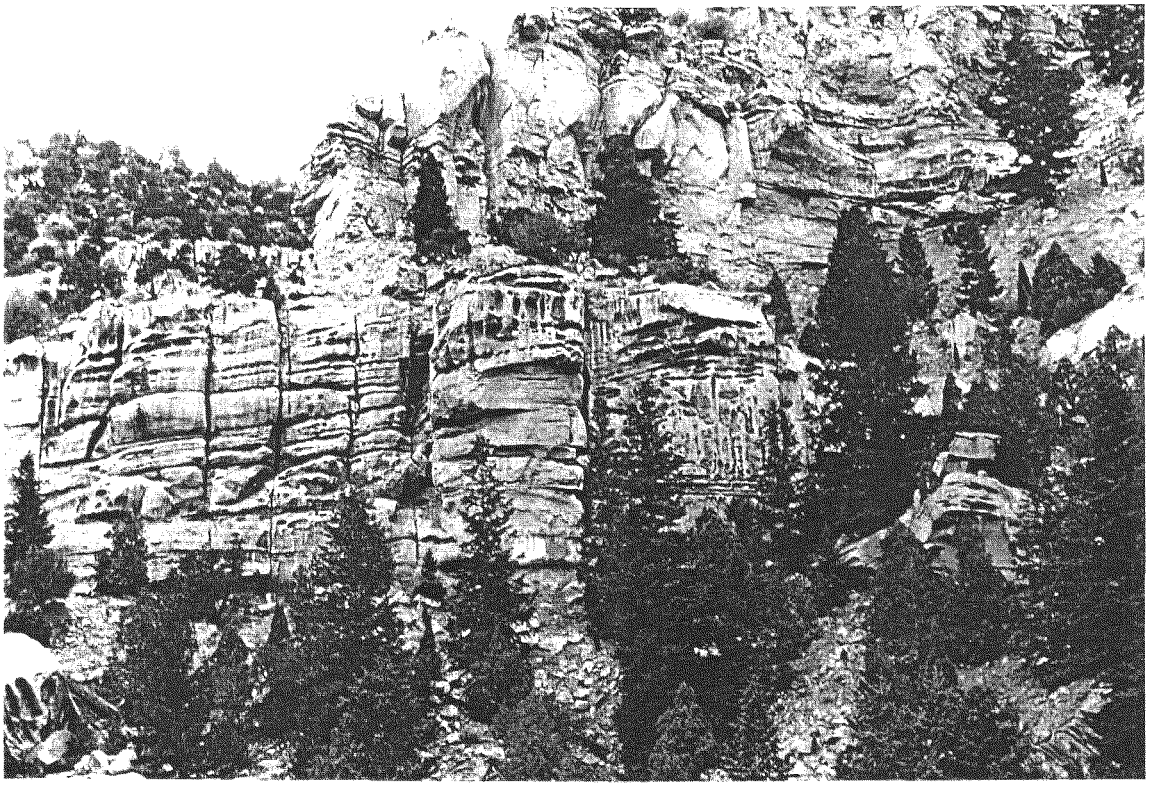

Figure 11. Typical spotted bat roosting habitat. Note the amount of surface complexity, including fractures and depressions.

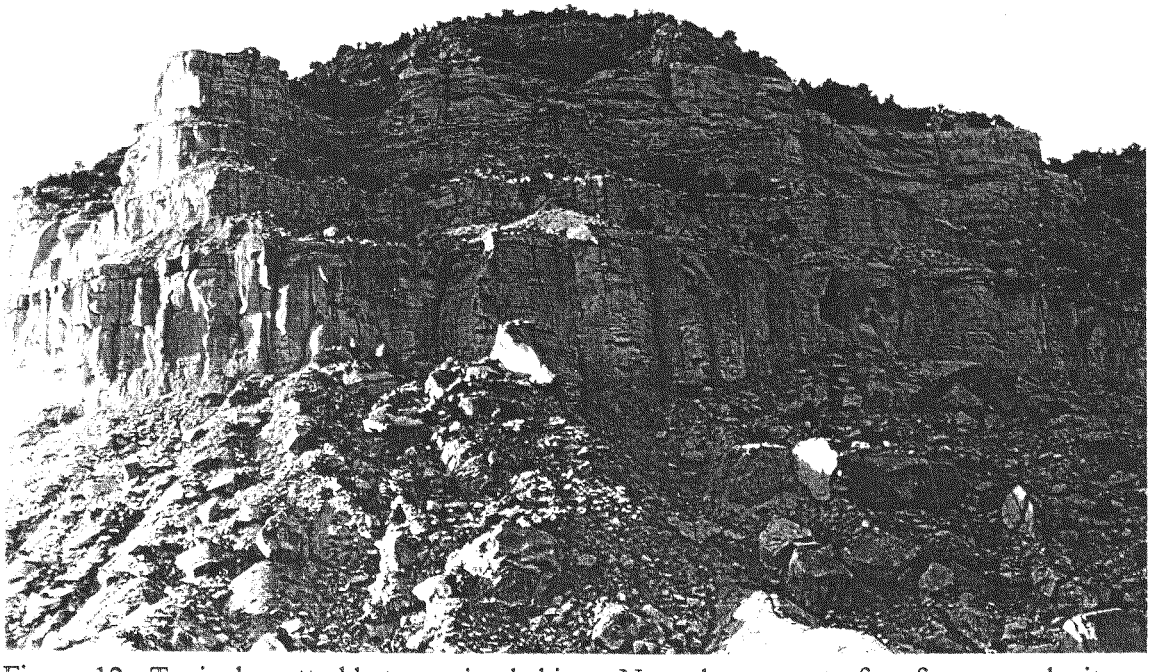

Figure 12. Typical spotted bat roosting habitat. Note the amount of surface complexity, including fractures and depressions.

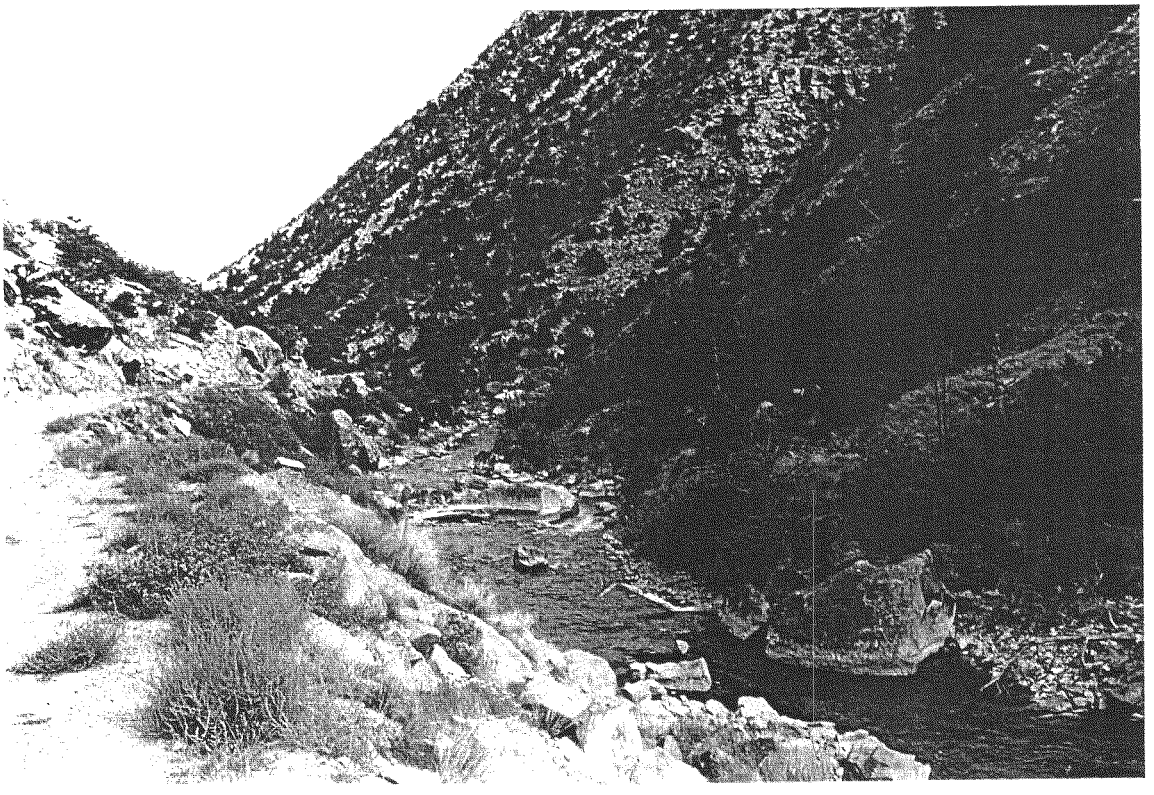

Figure 13. Typical area where no spotted bats were detected. Note the lack of nearby roosting cliffs and the lack of suitable foraging habitat.

# CULTURAL RESOURCE EVALUATION

# OF ESCARPMENTS

# IN THE RILDA CANYON LOCALITY

# OF EMERY COUNTY, UTAH

Report Prepared for Energy West Mining Company

AERC Project 1579 (EWM-97-1)

Utah State Project No.: UT-97-AF-0487f

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August 11, 1997

## ABSTRACT

A cultural resource evaluation has been conducted for Energy West Mining Company of a series of escarpment locations situated in Rilda Canyon, Emery County, Utah. Surface areas involved in this study are administered by Price Ranger District of the Manti-LaSal National Forest. This series of evaluations involved initial reconnaissance conducted by Glade Hadden on July 17, and intensive escarpment investigations performed by Glade Hadden and Brian Mueller on August 7, 1997. The intensive field investigations included ca. 27 acres within this canyon.

No previously recorded significant or National Register eligible cultural resources will be adversely affected by the proposed development.

No diagnostic isolated artifacts were collected or observed during the evaluation.

No historic or prehistoric cultural resource loci were identified and recorded during the evaluations.

No newly identified paleontological loci were discovered during the examination.

AERC recommends project clearance based on adherence to the stipulations noted in the final section of this report.

## TABLE OF CONTENTS

## LIST OF MAPS OF THE PROJECT AREA

## GENERAL INFORMATION

On July 17, 1997, AERC archaeologist, Glade Hadden conducted a remote reconnaissance cultural resource evaluation for Energy West Mining Company (hereafter EWMCo) involving the escarpment and talus slope zone in the North Rilda Lease Area associated with Rilda Canyon in Emery County, Utah (see Maps 1 and 2). Forest Service (Price Ranger District of the Manti-LaSal National Forest) and Division of Oil, Gas, and Mining (DOGM) requirements relative to the development of the North Rilda Lease Area included a request for assessment of any escarpment zones that could contain significant cultural resources that would be endangered by mining related escarpment/surface failure. Accordingly, EWMCo requested that AERC conduct an assessment of potential resource areas within the project area that could be endangered by future subsidence. AERC's initial assessments included a Class I inventory of known cultural resources in the locality and Mr. Hadden's visual reconnaissance of the canyon walls on July 17. The visual reconnaissance from the canyon floor was used to determine whether any escarpment areas might register the potential for containing rock shelter and terrace site loci that could only be identified through an intensive (Class III) evaluation on the canyon wall.

A letter including AERC recommendations was sent to EWMCo (Robert W. Willey) and the Forest Service (Stan McDonald) on July 22 stating that four potential resource areas were identified during the July 17 reconnaissance (Hauck 1997). Two of these areas were determined to be situated on National Forest lands and two were situated on privately owned lands. AERC recommended that the two zones on federal lands be intensively evaluated and requested a determination from the Forest Service relative to initiating archaeological examinations on the private lands. After consultation among the client, Forest Service, and DOGM offices, a recommendation was subsequently returned to AERC from EWMCo that all four potential resource areas situated in the Rilda Canyon escarpments be intensively examined to determine resource presence or absence.

Accordingly, Glade Hadden and Brian Mueller conducted an intensive investigation of all four areas on August 7, 1997. Map 2 shows the project locality and the four areas where the archaeological evaluations were conducted. Because of the steepness of the associated slopes, the inventory of areas 3 and 4 were linked as shown on the map. About 10 acres were examined in areas 1 and 3/4 with ca. 7 acres examined in area 2. Thus, ca. 27 acres were evaluated using these methods.

The purpose of the field study and this report is to identify and document cultural site presence and assess National Register potential significance relative to established criteria (cf., Title 36 CFR 60.6). The development of the North Rilda Lease Area requires an archaeological evaluation in compliance with U.C.A. 9-8-404, the Federal Antiquities Act of 1906, the Reservoir Salvage Act of 1960-as amended by P.L. 93-291, Section 106 of the National Historic Preservation Act of 1966-as amended, the National Environmental Policy Act of 1969, the Federal Land Policy and Management Act of 1979, the Archaeological Resources Protection Act of 1979, the Native American Religious Freedom Act of 1978, the Historic Preservation Act of 1980, and Executive Order 11593.

**MAP 1: GENERAL PROJECT LOCALITY**
**IN**
**EMERY COUNTY**
**UTAH**

N

PROJECT: EWM - 97 - 1
SCALE: see below
QUAD: see below
DATE: August 11, 1997


UTAH GEOLOGICAL AND MINERAL SURVEY
MAP 43 1977
PHYSIOGRAPHIC SUBDIVISIONS OF UTAH
BY W.L. STOKES

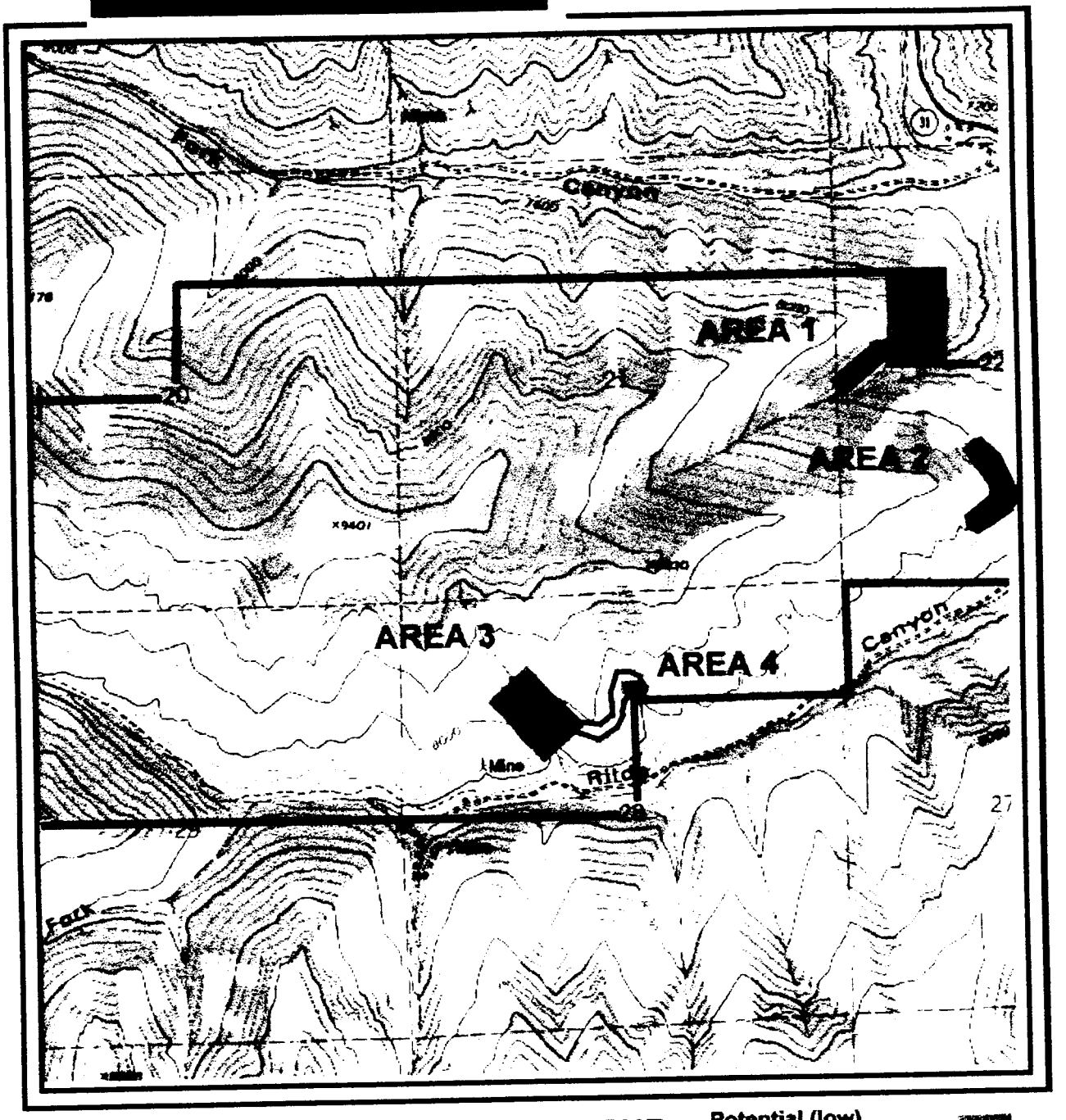
X
UTAH

TOWNSHIP: MULTIPLE
RANGE: MULTIPLE
MERIDIAN: SALT LAKE & UINTAH B. & M.

**MAP 2: CULTURAL RESOURCE SURVEY OF POTENTIAL SUBSIDENCE/RESOURCE LOCALITIES IN THE NORTH RILDA AREA IN EMERY COUNTY, UTAH**

N

**PROJECT:** EWM - 97 -1
**SCALE:** 1 : 24,000
**QUAD:** Rilda Canyon, Utah
**DATE:** August 11, 1997




**LEGEND**

- Potential (low) Resource Area
- North Rilda Area Boundary
- Intensive Survey Zone

**UTAH**

**TOWNSHIP:** 16 South
**RANGE:** 7 East
**MERIDIAN:** Salt Lake B. & M.

In addition to documenting cultural identity and significance, mitigation recommendations relative to the preservation of cultural data and materials can be directed to the Utah State Historical Preservation Office, Antiquities Section and to the Manti-LaSal National Forest Supervisor's office in Price, Utah.

## Project Location

The study area is situated on the talus slopes and escarpments associated Rilda Canyon on the eastern slope of East Mountain in central Utah. As Map 2 demonstrates, the four potential resource loci are situated at the 7400 to 8200 foot elevation on the south and east facing wall of Rilda Canyon situated about 200 to 1000 feet above the canyon floor. These four areas are situated in Sections 22 and 28 of Township 16 South, Range 7 East. Area 1 is in the northwest quarter of Section 22; area 2 is in the southwest quarter of Section 22; areas 3 and 4 are linked in the northwest quarter of Section 28.

The project location is located on the Rilda Canyon, Utah 7.5 minute topographic quad.

## Environmental Description

The project area is situated between the 7400 and the 8200 foot elevation zone above sea level. Ponderosa/Fir stands and Aspen communities are associated with these upper terraces on Trail Mountain. Pinyon-Juniper and transitional woodlands are common to the lower slopes and terraces. Within the present project area, the vegetation communities consist of transitional woodlands and Fir/Aspen woodlands in association with the canyon walls.

The vegetation in the project area consists mainly of high elevation rangeland species including *Chrysothamnus spp., Artemisia spp., Lupinus, Achillea, Penstemon, Berberis* and a variety of grasses. Stands of Aspen *(Populus tremuloides)*, Mountain Mahogany *(Cercocarpus montanus)*, and Douglas-Fir *(Pseudotsuga menziesii)* can be found on the north-facing slopes of these canyons.

The geological associations within the project area consist of the Price River, Castlegate and Black Hawk Formations of upper Cretaceous age.

# PREVIOUS RESEARCH IN THE LOCALITY

## File Search

Records searches of the site files and maps at the Antiquities Section of the State Historic Preservation Office in Salt Lake City on July 11, 1997. The AERC database developed from these and other sources was also consulted for data concerning the known archaeological sites in this locality. A file search was also conducted in the Forest Service offices in Price in late July. The

National Register of Historic Places has been consulted and no registered historic or prehistoric properties will be affected by the proposed developments.

A variety of known cultural sites are situated in Cottonwood Canyon, on Trail Mountain, on East Mountain, and in Huntington Canyon to the north as reported over the years by a number of archaeologists.

Archaeological studies of importance that have been conducted in this general locality include the 1974 Forest Service preliminary excavations at Joes Valley Alcove or Site 42EM 693/1932 (DeBloois, Green, and Wylie 1979). This valuable site was found to contain stratigraphic occupations that date to the Middle and Late Archaic and Formative Stages. Recently, the University of Utah has conducted field school excavations at that same site (McDonald 1990: personal communication, Barlow and Metcalfe 1993) resulting in the discovery of cultural materials that provide pertinent information on prehistoric subsistence in the locality.

AERC has completed numerous archaeological programs within and adjacent to the present project area for Utah Power & Light Company, accomplished between 1979 and the present. The 1979 project involved both intensive surface evaluations and excavation on private and BLM administered lands on East Mountain and its associated canyons. Among the sites recorded in Cottonwood Canyon during that program, Sites 42EM 959 (Harvest Moon Shelter) and 42EM 960 (Peephole Site) were subsequently excavated by AERC (Hauck and Weder 1982). Both shelters were found to contain Archaic and Formative occupational components.

In 1980, AERC conducted a 15% sample survey program of 18,000 acres for Utah Power & Light Company in the southern portion of East Mountain. This survey resulted in the identification and reporting of cultural resource sites 42EM 1307 through 42EM 1310 and a variety of isolated artifacts which demonstrate the presence of Archaic, Formative, and Late Prehistoric occupations in the locality (Hauck and Weder 1980).

AERC returned to Cottonwood Canyon in 1983 to provide Utah Power & Light Company a preliminary assessment of significance for the Old Johnson Mines, Site 42EM 1633 (Hauck 1983b).

An intensive surface inventory (Class III) of 2280 acres on East Mountain was initiated in 1990 by AERC for Utah Power & Light Company (see Norman 1990). This study resulted in the identification and recording of three prehistoric sites (42EM 2222 through 2224) and isolated artifacts that are associated with both Archaic and Late Prehistoric activities.

During the fall of 1991, AERC conducted a 15% sample survey on Trail Mountain and in upper Cottonwood Canyon of 8,025 acres (Hauck 1991b). A total of 15 sites, 14 of them containing prehistoric components was recorded during that Class II survey. Those sites included 42EM 2258 through 42EM 2272 featuring a historic wagon trail in Cottonwood Canyon, a prehistoric hunting blind, and a variety of lithic scatters and open occupations.

In 1992, AERC completed a sample survey of the northern portion of East Mountain for Genwal Coal Company (Hauck 1992b). Seven prehistoric cultural resource activity loci (Sites 42EM 2296 through 42EM 2302) and a variety of isolated diagnostic artifacts were observed and recorded during that program. Anasazi Gray Ware (Tusayan Corrugated) vessel fragments were observed and documented on two separate high-altitude sites. The full range of diagnostic artifacts identified during this inventory demonstrate definite Late Archaic and Formative occupations within the locality.

AERC has also conducted numerous small-scale evaluations on Trail Mountain, in Huntington Canyon and on adjacent East Mountain. Trail Mountain evaluations were initiated in 1983, 1987 and, 1988 for exploratory drill locations and access routes (see Hauck 1983a, 1987, 1988a, 1988b). Several isolated artifacts were observed and recorded during several of these surveys. These artifacts include a Rose Spring arrow point (Hauck 1987) and a non-diagnostic dart point fragment (Hauck 1988b). Beginning in 1990, AERC returned to Trail Mountain to conduct surface evaluations for Utah Power & Light Company of a series of proposed coal exploratory drilling locations and access routes (Hauck 1990a, 1990b, and 1993a, 1993b). Richard Beaty identified several isolated artifacts west of North Point Spring during one of these surveys and a cultural activity locus at that spring was hypothesized on the basis of that association (Hauck 1990b). In 1991, AERC conducted a sample survey project on Trail Mountain and in Cottonwood Canyon for Utah Power involving about 1000 acres of intensive survey. A total of 15 cultural resource sites including one historic trail and wagon road was recorded including Sites 42EM 2258 through 42EM 2272 (Hauck 1991b). More recently, Sites 42EM 2330 (a lithic scatter possibly of Early Archaic derivation), 42EM 2349 (late Archaic) 42EM 2350, and several isolated artifacts have been recorded on the southern end of Trail Mountain (Hauck 1993a, 1993b).

Since 1976, AERC has conducted a total of 30 cultural resource evaluations for Utah Power & Light Company on the southern and central portions of East Mountain and in the adjacent canyons (Norman 1990:4). This firm has also initiated a roadway and well pad survey for Meridian Oil Company adjacent to the Genwal lease area (Hauck 1987), for Coal Systems/Nevada Electric Investment Company within the Genwal lease area (Hauck 1989), evaluations of the Genwal transmission line corridors in 1989 resulted in the recording of Sites 42EM 2185, 2186, and 2187 (Norman 1989), and for drilling locations on the mountain related to the development of Genwal Coal Company (Hauck 1991a).

Other firms have also initiated archaeological investigations in this general locality. A survey in Rilda Canyon resulted in the identification of Sites 42EM 1330, 1331, and 1332 (Farmer 1980). In 1982 a Class II sample survey in the Crandall Canyon and Mill Fork Canyon was initiated by Utah Archaeological Research Corporation without significant results (Cook 1982). Keith Montgomery conducted surface evaluations in 1988 for Meridian Oil Company in the bottom of Cottonwood canyon but encountered no cultural resources (Montgomery 1988). Other investigations in this locality have yielded limited results (cf., Christensen 1980, Cook 1980, Gillio 1975, Howell 1980, 1981, 1982).

Archaeological excavations in the general project area include U.S. Forest Service and University of Utah excavations at the Joes Valley Rock Shelter (Debloois, Green and Wylie 1979, Barlow and Metcalfe 1993), AERC's 1980 excavations of occupation sites 42EM 959 and 42EM 960 in Cottonwood Canyon (Hauck and Weder 1982), Forest Service test excavations at Sherman Shelter or Site 42EM 722 in Crandall Canyon (Wikle 1981, 1988) and the more recent excavations in Huntington Canyon conducted by Abajo Archaeology (Howell, Davis and Peterson 1986).

## Prehistory and History of the Cultural Region

Currently available information indicates that the Wasatch Plateau and adjacent Colorado Plateau Cultural Regions have been occupied by a variety of cultures beginning perhaps as early as 10,000 B.C. These cultures, as identified by their material remains, demonstrate a cultural developmental process that begins with the earliest identified Paleoindian peoples (10,000 -- 7,000 B.C.) and extends through the Archaic (ca. 7,000 B.C. -- A.D. 300), and Formative (ca. A.D. 400 -- 1100) Stages, and the Late Prehistoric-Protohistoric periods (ca. A.D. 1200 -- 1850) to conclude in the Historic-Modern period which was initiated with the incursion of the Euro-American trappers, explorers, and settlers. Basically, each cultural stage -- with the possible exception of the Late Prehistoric hunting and gathering Shoshonean bands -- features a more complex life-way and social order than occurred during the earlier stage of development (Hauck 1991:53). For a more comprehensive treatment of the prehistory and history of the adjacent cultural area see Archaeological Evaluations in the Northern Colorado Plateau Cultural Area (Hauck 1991).

## Site Potential in the Project Development Zone

Previous archaeological evaluations in the general project area have resulted in the identification and recording of a variety of cultural resource sites having eligibility for potential nomination to the National Register of Historic Places (NRHP). The majority of these sites are lithic scatters containing biface thinning and reduction materials generally procured in this highland mountain/plateau complex. Occupations are also frequently identified in this locality. Sites associated with the rock shelters on the main canyon floors and open occupations on the mountain ridges and upper slopes generally appear to have been occupied during the Middle and Late Archaic Stages with occasional indications of Formative Stage activity based on radiometric dates and the recovery of associated artifacts. The major canyons appear to have been more actively occupied during the Formative Stage by the Fremont peoples based on the Huntington Canyon and Cottonwood Canyon excavations. To-date, very sparse evidence of Late Prehistoric (Numa) activity has been documented in the general area.

Site density appears to range from zero to five sites per section based on topographic factors. Sections which feature steep slopes and narrow canyons appear to have little potential for containing significant prehistoric or historic activity loci. Sections which feature ridge tops and knolls

associated with springs and seeps and sections which contain the broader canyons and valleys with flowing streams have the greatest potential for containing significant sites.

The 1991 and 1992 archaeological evaluations in the East Mountain and Trail Mountain sample units have resulted in the identification of a significantly higher site density in the upland areas than was previously recognized within this locality. The 1980 AERC sample survey of 2705 acres on the southern portion of East Mountain resulted in the discovery of three prehistoric sites for a Site/Acre Ratio of 1:760 (cf., Hauck and Weder 1980). In 1990, AERC returned to East Mountain and completed a 2280 acre intensive survey on the central portion of the mountain spine. That study resulted in the documentation of four sites for a Site/Acre Ratio of 1:676 (cf., Norman 1990). The 715 acres associated with the 1991 Trail Mountain highland sample unit study contained a total of 11 prehistoric sites resulting in a Site/Acre Ratio of 1:65. This statistic suggests that in comparison with East Mountain, Trail Mountain has 10 times the site density (Hauck 1991c:27). (For additional information on Site/Acre Densities in other regions see Hauck 1991b).

## FIELD EVALUATIONS

### Methodology

The intensive evaluation of the ca.27 acres associated with the four Rilda Canyon escarpment and talus slope areas consisted of the archaeological team walking a series of 10 to 15 meter-wide transects throughout each potential resource area as shown on Map 2.

Observation of cultural materials results in intensive examinations to determine the nature of the resource (isolate or activity locus). The analysis of each specific cultural site results in its subsequently being sketched, photographed, and appropriately recorded on standard Intermountain Antiquities Computer System (IMACS) forms.

Cultural sites are then evaluated by the Principal Investigator for depth potential utilizing AERC's portable ground penetrating radar (GPR) computerized system (SIR-2 manufactured by Geophysical Survey Systems, Inc. [GSSI] of North Salem, New Hampshire). Radar assessment within archaeological sites is accomplished by one team member pulling the radar antenna across the site's surface while the Principal Investigator "reads" data directly observable on a battery powered computer's monitor that is directly linked to the antenna. GPR is a valuable tool for determining the presence and density of any buried materials, features or strata whether cultural or natural, but it is particularly valuable in ascertaining archaeological depth potential on a site because it provides an immediate view on the computer's monitor of the buried strata and features. In addition, ground penetrating radar is a non-intrusive and non-destructive method of verifying site depth potential -- an important consideration in ensuring the protection and integrity of the rare, non-replaceable, non-renewable cultural resources.

With depth of deposit and feature/strata information provided by GPR, the standards described in the section below are used by the Principal Investigator to establish site significance.

GPR data reflecting the buried potential of the resource coupled with the Principal Investigator's surface evaluation of the site results in the determination whether a particular site is a significant resource, i.e., whether it satisfies one or more of the criteria established in Title 36 CFR 60 as explained below. The Principal Investigator then develops one or more mitigation actions as recommendations that can aid federal and state cultural resource administrators in facilitating the preservation of any given significant resource which may be situated within the potential development zone.

## Site Significance Criteria

Prehistoric and historic cultural sites which can be considered as eligible for nomination to the National Register of Historic Places have been outlined as follows in the National Register's Criteria for Evaluation as established in Title 36 CFR 60.6:

*The quality of significance in American ... archaeology ... and culture is present in ... sites ... that possess integrity of location, design, setting, materials, workmanship, feeling, and association and:*

*a. That are associated with events that have made a significant contribution to the broad patterns of our history; or*

*b. that are associated with the lives of persons significant in our past; or*

*c. that embody the distinctive characteristics of a type, period, or method of construction ... ; or*

*d. that have yielded, or may be likely to yield, information important in prehistory or history.*

In addition to satisfying one or more of these general conditions, a significant cultural resource site in Utah will generally be considered as being eligible for inclusion in the National Register if it should advance our current state of knowledge relating to chronology, cultural relationships, origins, and cultural life ways of prehistoric or historic groups in the area.

In a final review of any site's cultural significance, the site must possess integrity and at least one of the above criteria to be considered eligible for nomination to the National Register of Historic Places.

## Results of the Inventory

No previously recorded cultural sites will be adversely affected within this project area.

No historic or prehistoric cultural loci were observed or identified within the four intensive survey areas and there exists little to no potential for significant resources within all the other talus slope and escarpment areas in the North Rilda Lease Area.

No diagnostic isolated artifacts were observed or collected from the project area.

No paleontological loci were observed or recorded during the evaluation.

## CONCLUSION AND RECOMMENDATIONS

There is no potential for significant cultural resources within the four potential areas (areas 1 through 4) involved in this evaluation.

AERC recommends that a cultural resource clearance be granted to Energy West Mining Company based upon adherence to the following stipulation: the authorized official should be consulted should cultural remains from subsurface deposits be exposed as a result of subsidence activities related to future mining development within the North Rilda Lease Area.

F. Richard Hauck, Ph.D.
President and Principal
Investigator

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# VISUAL ASSESSMENT OF NORTH RILDA ESCARPMENT

## VISUAL RESOURCE

National Forest System lands provide a diversity of views in foreground, middleground, and background when viewed from on or off Forest.[1]

The Manti Division provides varied quality in viewing. Above average views are composed at high elevation plateaus, in canyons displaying a high degree of visual landscape diversity, around moderate to large size water impoundments, and at areas containing large, near vertical cliff escarpments. Below average views are composed of relatively flat appearing sagebrush covered expanses.[1]

Many areas on the Manti Division are visually sensitive because of the significant visual variety which is viewed by large numbers of recreation oriented visitors. These are areas where certain management activities would be highly visible and could cause a high degree of man-made visual contrast. Developed and dispersed recreation environments in Huntington Canyon, Joe's Valley (including Straight Canyon), Ferron Reservoir, Skyline Drive, Forest border slopes and escarpments are in this category.[1]

## SCENIC QUALITY

The visual resource evaluation and management process is a classification of visual resources according to visual quality, distance from viewers and man-made intrusions present. Based on these criteria, all areas are placed in one of three major classes, Class "A", unique, distinctive, or outstanding landscape variety; Class "B", prevalent, usual, or widespread variety; Class "C", little or no visual variety.[1]

## VISUAL QUALITY

Visual quality is measured in five levels of excellence based on physical (scenic quality) and sociological (user's concern) characteristics of an area. It allows for an acceptable degree of alteration of the characteristic landscape. The levels include: preservation, retention, partial retention, modification, and maximum modification.[1]

## RILDA CANYON

These management classes are designed to maintain or enhance visual quality and describe acceptable degrees of change to landscape elements. The Forest lands associated with the North Rilda escarpment area are classified as mg2B (middleground viewed, medium sensitivity level, common variety class).[1] Changes in the basic elements caused by management activities should be moderate. Management activities may attract attention but should not

dominate the view of the casual observer. Changes under this class should repeat the basic elements found in the predominant natural features of the characteristic landscape.[1]

The most significant impact of the escarpment failure is to the visual aesthetics of the area. The area is visible at various locations along Highway 31, which is the major access route in Huntington Canyon. However, failures which have occurred in previously mined area (Cottonwood Mine: Newberry Canyon and Corncob Wash, Trail Mountain Mine: 5th East ) do not appear to be out of place since failure of the Castlegate Sandstone escarpment is a natural occurrence facilitated by the erosional forces of nature. This process has been slowly occurring for thousands of years. Mining underneath the Castlegate Sandstone accelerates the failure process.

To evaluate the potential impacts of the visual resources, a series of photos were taken along State Highway 31 from the town of Huntington to the intersection of Rilda Canyon/Huntington Canyon (refer to Drawing #DS1745D Rilda Canyon: View of Castlegate Sandstone Outcrop from State Highway 31). As the photos document, the view of the Castlegate Sandstone is limited to a small area located in Section 21, Township 16S, Range 7E (PacifiCorp Fee Land).

## REFERENCE MATERIAL & MAPS

- ❖ Map: Drawing # DS1745D Rilda Canyon: View of Castlegate Sandstone Outcrop From State Highway 31.

## REFERENCES

1 USDA, Forest Service. 1986. Land and Resource Management Plan, Manti-La Sal National Forest, USFS Intermountain Region, Ogden, Ut.

# EAST MOUNTAIN RAPTOR NESTING & HABITAT DATA

Raptor surveys were first conducted on Energy West/PacifiCorp properpties in 1981, 1982 and have been conducted on an annual basis since 1986. The most recent raptor survey (May 19 and 20, 1997) did not locate any raptor nests in the area directly associated with the North Rilda lease area. Based upon this information, possible escarpment failure will not impact existing raptor nest locations. Results from this survey and the accompanying raptor maps are located in the appendix. Only nests observed during the 1997 raptor nest survey are included in the results and on the map.

REFERENCE DATA:

Appendix A: East Mountain Raptor Nest Data

Maps: Drawing # GENS1746D East Mountain Property: Raptor Nesting Location & Habitat Map

# State of Utah
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF WILDLIFE RESOURCES

Michael O. Leavitt
Governor
Ted Stewart
Executive Director
Robert G. Valentine
Division Director

Southeastern Region
455 West Railroad Avenue
Price, Utah 84501-2829
801-637-3310
801-637-7361 (Fax)


July 22, 1997

Energy West
Chuck Semborski
15 North Main
P.O. Box 310
Huntington, Utah 84528

Chuck:

Enclosed are the raptor maps and reports for the Energy West raptor flights. The survey was flown on May 19 and 20, 1997 by Bill Bates, UDWR, Ben Morris, UDWR, Bob Willey, Energy West and Mike Dennis, Energy West. The survey found 68 golden eagle nests, 15 tended, 13 old/dilapidated, 32 inactive, and eight active nests. Three inactive redtail hawk nests were found. One unidentified tended hawk nest was found. Two prairie falcon nests were found, one active and one inactive. One inactive falcon perch was found. Three peregrine falcon sites were located, one inactive, and two sightings of birds in flight. Five raven nests were found, one inactive, two tended, one old/dilapidated, and one active. Several historic nests were not found and are mark as a red cross on the maps.

Information on Genwal's flight is also found on the summary and Rilda Canyon/Hiawatha map. Your survey area ends with site number 76. Nest number 29 was taken without a laser and is actually located to the north of its position on the map next to nest number 29a.

If you have any questions call Ben Morris at 636-0279 or Bill Bates at 636-0267.

Sincerely,

Ben Morris

Ben Morris
Habitat Biologist

Copy: Raptor File

Enclosures: 6

Mines ENRGYWST 97

a:a1..l3

| (map no) | Quad | Year | Species | Nest Typ | Status | Yo | AGE WKS | Eggs | X | Y | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 56 | RED POINT | 1997 | GOLDEN EAGLE | CLIFF | OLD-D | 0 | 0 | 0 | 491087 | 4350493 | |
| 57 | RED POINT | 1997 | GOLDEN EAGLE | CLIFF | INACTIVE | 0 | 0 | 0 | 495527 | 4348840 | |
| 58 | RED POINT | 1997 | GOLDEN EAGLE | CLIFF | ACTIVE | 2 | 0 | 0 | 493026 | 4346743 | |
| 59 | RED POINT | 1997 | RAVEN | CLIFF | ACTIVE | 0 | 0 | 0 | 493177 | 4347291 | |
| 60 | RED POINT | 1997 | GOLDEN EAGLE | CLIFF | INACTIVE | 0 | 0 | 0 | 492926 | 4352086 | |
| 61 | RED POINT | 1997 | BUTEO | CLIFF | TEND | 0 | 0 | 0 | 494775 | 4351089 | |
| 62 | RED POINT | 1997 | GOLDEN EAGLE | CLIFF | ACTIVE | 1 | 0 | 0 | 494984 | 4351239 | |
| 63 | RED POINT | 1997 | GOLDEN EAGLE | CLIFF | TENDED | 0 | 0 | 0 | 495147 | 4351768 | |
| 64 | RED POINT | 1997 | GOLDEN EAGLE | CLIFF | OLD-D | 0 | 0 | 0 | 492654 | 4354618 | |
| 65 | RED POINT | 1997 | GOLDEN EAGLE | CLIFF | OLD-D | 0 | 0 | 0 | 492570 | 4355218 | |
| 66 | RED POINT | 1997 | GOLDEN EAGLE | CLIFF | TENDED | 0 | 0 | 0 | 491291 | 4353899 | |
| 67 | RED POINT | 1997 | GOLDEN EAGLE | CLIFF | INACTIVE | 0 | 0 | 0 | 491039 | 4354987 | |
| 68 | RED POINT | 1997 | REDTAIL HAWK | CLIFF | INACTIVE | 0 | 0 | 0 | 489600 | 4356211 | |

| (map no) | Quad | Year | Species | Nest Typ | Status | Yo | AGE WKS | Eggs | X | Y | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 69 | RILDA CANYON | 1997 | GOLDEN EAGLE | CLIFF | INACTIVE | 0 | 0 | 0 | | | |
| 70 | RILDA CANYON | 1997 | PEREGRINE FALC | CLIFF | TENDED | 0 | 0 | 0 | 488767 | 4359643 | |
| 71 | HIAWATHA | 1997 | GOLDEN EAGLE | CLIFF | INACTIVE | 0 | 0 | 0 | 489434 | 4359892 | |
| 72 | RILDA CANYON | 1997 | GOLDEN EAGLE | CLIFF | TENDED | 0 | 0 | 0 | 486739 | 4360531 | |
| 73 | RILDA CANYON | 1997 | GOLDEN EAGLE | CLIFF | OLD-D | 0 | 0 | 0 | 485009 | 4360379 | |
| 74 | RILDA CANYON | 1997 | PEREGRINE FALC | CLIFF | TENDED | 0 | 0 | 0 | 485359 | 4361181 | |
| 75 | RILDA CANYON | 1997 | GOLDEN EAGLE | CLIFF | TENDED | 0 | 0 | 0 | 484601 | 4365362 | |
| 76 | RILDA CANYON | 1997 | GOLDEN EAGLE | CLIFF | ACTIVE | 0 | 0 | 0 | 486109 | 4364557 | |
| 77 | RILDA CANYON | 1997 | GOLDEN EAGLE | CLIFF | OLD-D | 0 | 0 | 0 | 486291 | 4364467 | |
| 78 | RILDA CANYON | 1997 | GOLDEN EAGLE | CLIFF | INACTIVE | 0 | 0 | 0 | 486282 | 4364508 | |
| 79 | RILDA CANYON | 1997 | GOLDEN EAGLE | CLIFF | ACTIVE | 0 | 0 | 2 | 487156 | 4364294 | |
| 80 | RILDA CANYON | 1997 | GOLDEN EAGLE | CLIFF | OLD-D | 0 | 0 | 0 | 484589 | 4367255 | |
| 81 | RILDA CANYON | 1997 | GOLDEN EAGLE | CLIFF | OLD-D | 0 | 0 | 0 | 483957 | 4368452 | |
| 82 | RILDA CANYON | 1997 | GOLDEN EAGLE | CLIFF | OLD-D | 0 | 0 | 0 | 484626 | 4368354 | 2 NESTS |
| 83 | RILDA CANYON | 1997 | GOLDEN EAGLE | CLIFF | INACTIVE | 0 | 0 | 0 | 483295 | 4374337 | |
| 84 | RILDA CANYON | 1997 | GOLDEN EAGLE | CLIFF | INACTIVE | 0 | 0 | 0 | 483487 | 4374209 | |
| 85 | RILDA CANYON | 1997 | GOLDEN EAGLE | CLIFF | INACTIVE | 0 | 0 | 0 | 490130 | 4364802 | |
| 86 | RILDA CANYON | 1997 | GOLDEN EAGLE | CLIFF | ACTIVE | 0 | 0 | 0 | 490980 | 4362832 | |

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| Nest No. | (map no) | Quad | Year | Species | Nest Typ | Status | Yo | AGE WKS | Eggs | X | Y |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 31 | MAHOGANY POINT | 1997 | GOLDEN EAGLE | CLIFF | INACTIVE | 0 | 0 | 0 | 480862 | 4347732 |
| | 31A | MAHOGANY POINT | 1997 | GOLDEN EAGLE | CLIFF | INACTIVE | 0 | 0 | 0 | 480899 | 4347818 |
| | 32 | MAHOGANY POINT | 1997 | GOLDEN EAGLE | CLIFF | INACTIVE | 0 | 0 | 0 | 481174 | 4347449 |
| | 33 | MAHOGANY POINT | 1997 | RAVEN | CLIFF | TENDED | 0 | 0 | 0 | 481735 | 4347415 |
| | 34 | MAHOGANY POINT | 1997 | GOLDEN EAGLE | CLIFF | INACTIVE | 0 | 0 | 0 | 481770 | 4347511 |
| | 35 | MAHOGANY POINT | 1997 | GOLDEN EAGLE | CLIFF | OLD-D | 0 | 0 | 0 | 483828 | 4348209 |
| | 36 | MAHOGANY POINT | 1997 | PEREGRINE FALC | CLIFF | INACTIVE | 0 | 0 | 0 | | |
| | 37 | MAHOGANY POINT | 1997 | GOLDEN EAGLE | CLIFF | INACTIVE | 0 | 0 | 0 | 482742 | 4353705 |
| | 38 | MAHOGANY POINT | 1997 | GOLDEN EAGLE | CLIFF | INACTIVE | 0 | 0 | 0 | 482211 | 4355555 |
| | 39 | MAHOGANY POINT | 1997 | GOLDEN EAGLE | CLIFF | INACTIVE | 0 | 0 | 0 | 482368 | 4355136 |
| | 40 | MAHOGANY POINT | 1997 | GOLDEN EAGLE | CLIFF | OLD-D | 0 | 0 | 0 | 483900 | 4353229 |
| | 41 | MAHOGANY POINT | 1997 | GOLDEN EAGLE | CLIFF | INACTIVE | 0 | 0 | 0 | 484425 | 4352690 |
| | 42 | MAHOGANY POINT | 1997 | GOLDEN EAGLE | CLIFF | INACTIVE | 0 | 0 | 0 | 484399 | 4352648 |
| | 43 | MAHOGANY POINT | 1997 | GOLDEN EAGLE | CLIFF | ACTIVE | 0 | 0 | 0 | 484544 | 4351518 |
| | 44 | MAHOGANY POINT | 1997 | GOLDEN EAGLE | CLIFF | INACTIVE | 0 | 0 | 0 | 485119 | 4351601 |
| | 45 | MAHOGANY POINT | 1997 | GOLDEN EAGLE | CLIFF | INACTIVE | 0 | 0 | 0 | 485216 | 4351592 |
| | 46 | MAHOGANY POINT | 1997 | GOLDEN EAGLE | CLIFF | INACTIVE | 0 | 0 | 0 | 485109 | 4351636 |
| | 47 | MAHOGANY POINT | 1997 | GOLDEN EAGLE | CLIFF | OLD-D | 0 | 0 | 0 | 485657 | 4351508 |
| | 48 | MAHOGANY POINT | 1997 | GOLDEN EAGLE | CLIFF | TEND | 0 | 0 | 0 | 485460 | 4351248 |
| | 49 | MAHOGANY POINT | 1997 | RAVEN | CLIFF | INACTIVE | 0 | 0 | 0 | 485657 | 4351507 |
| | 49A | MAHOGANY POINT | 1997 | GOLDEN EAGLE | CLIFF | INACTIVE | 0 | 0 | 0 | 485360 | 4351192 |
| | 50 | MAHOGANY POINT | 1997 | PRAIRIE FALCON | CLIFF | INACTIVE | 0 | 0 | 0 | 485407 | 4349607 |
| | 51 | MAHOGANY POINT | 1997 | GOLDEN EAGLE | CLIFF | ACTIVE | 1 | 0 | 0 | 488617 | 4351506 |
| | 52 | MAHOGANY POINT | 1997 | GOLDEN EAGLE | CLIFF | TENDED | 0 | 0 | 0 | 488745 | 4351448 |
| | 53 | MAHOGANY POINT | 1997 | GOLDEN EAGLE | CLIFF | INACTIVE | 0 | 0 | 0 | 488938 | 4352651 |
| | 54 | MAHOGANY POINT | 1997 | GOLDEN EAGLE | CLIFF | OLD-D | 0 | 0 | 0 | 489055 | 4352595 |
| | 55 | MAHOGANY POINT | 1997 | GOLDEN EAGLE | CLIFF | INACTIVE | 1 | 0 | 0 | 490323 | 4351131 |

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| (map no) | Quad | Year | Species | Nest Typ | Status | Yo | AGE WKS | Eggs | X | Y |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | The Cap | 1997 | GOLDEN EAGLE | CLIFF | OLD/D | 0 | 0 | 0 | 486949 | 4344092 |
| 2 | The Cap | 1997 | GOLDEN EAGLE | CLIFF | TEND | 0 | 0 | 0 | 486665 | 4343763 |
| 3 | The Cap | 1997 | GOLDEN EAGLE | CLIFF | TEND | 0 | 0 | 0 | 486469 | 4344066 |
| 4 | JOES VALLEY | 1997 | GOLDEN EAGLE | CLIFF | INACTIVE | 0 | 0 | 0 | 484868 | 4345621 |
| 5 | JOES VALLEY | 1997 | GOLDEN EAGLE | CLIFF | INACTIVE | 0 | 0 | 0 | 480377 | 4346582 |
| 6 | JOES VALLEY | 1997 | GOLDEN EAGLE | CLIFF | INACTIVE | 0 | 0 | 0 | 480565 | 4346713 |
| 7 | JOES VALLEY | 1997 | GOLDEN EAGLE | CLIFF | INACTIVE | 0 | 0 | 0 | 480657 | 4346928 |
| 8 | JOES VALLEY | 1997 | GOLDEN EAGLE | CLIFF | TEND | 0 | 0 | 0 | 480397 | 4347047 |
| 9 | JOES VALLEY | 1997 | GOLDEN EAGLE | CLIFF | OLD/D | 0 | 0 | 0 | 479655 | 4347824 |
| 10 | JOES VALLEY | 1997 | GOLDEN EAGLE | CLIFF | INACTIVE | 0 | 0 | 0 | 476607 | 4348588 |
| 11 | JOES VALLEY | 1997 | RAVEN | CLIFF | OLD-D | 0 | 0 | 0 | 476580 | 4348414 |
| 12 | JOES VALLEY | 1997 | PERCH | CLIFF | INACTIVE | 0 | 0 | 0 | 474612 | 4354686 |
| 13 | JOES VALLEY | 1997 | PRAIRIE FALCON | CLIFF | ACTIVE | 0 | 0 | 0 | 474616 | 4354745 |
| 14 | JOES VALLEY | 1997 | REDTAIL HAWK | CLIFF | INACTIVE | 0 | 0 | 0 | 474620 | 4354816 |
| 15 | JOES VALLEY | 1997 | REDTAIL HAWK | CLIFF | INACTIVE | 0 | 0 | 0 | 474716 | 4355231 |
| 16 | JOES VALLEY | 1997 | RAVEN | CLIFF | TEND | 0 | 0 | 0 | 474890 | 4355938 |
| 17 | JOES VALLEY | 1997 | GOLDEN EAGLE | CLIFF | INACTIVE | 0 | 0 | 0 | 474970 | 4356202 |
| 18 | JOES VALLEY | 1997 | GOLDEN EAGLE | CLIFF | TENDED | 0 | 0 | 0 | | |
| 19 | JOES VALLEY | 1997 | GOLDEN EAGLE | CLIFF | TENDED | 0 | 0 | 0 | 474899 | 4356214 |
| 20 | JOES VALLEY | 1997 | GOLDEN EAGLE | CLIFF | TENDED | 0 | 0 | 0 | | |
| 21 | JOES VALLEY | 1997 | GOLDEN EAGLE | CLIFF | TENDED | 0 | 0 | 0 | 474785 | 4356860 |
| 22 | JOES VALLEY | 1997 | GOLDEN EAGLE | CLIFF | OLD-D | 0 | 0 | 0 | 477559 | 4353900 |
| 23 | JOES VALLEY | 1997 | GOLDEN EAGLE | CLIFF | ACTIVE | 1 | 0 | 0 | 477294 | 4353321 |
| 24 | JOES VALLEY | 1997 | GOLDEN EAGLE | CLIFF | INACTIVE | 0 | 0 | 0 | 476754 | 4350645 |
| 25 | JOES VALLEY | 1997 | GOLDEN EAGLE | CLIFF | INACTIVE | 0 | 0 | 0 | 477338 | 4348715 |
| 26 | JOES VALLEY | 1997 | GOLDEN EAGLE | CLIFF | INACTIVE | 0 | 0 | 0 | 477262 | 4348691 |
| 27 | JOES VALLEY | 1997 | GOLDEN EAGLE | CLIFF | ACTIVE | 1 | 0 | 0 | 477454 | 4348763 |
| 28 | JOES VALLEY | 1997 | GOLDEN EAGLE | CLIFF | OLD-D | 0 | 0 | 0 | 477482 | 4348747 |
| 29 | JOES VALLEY | 1997 | GOLDEN EAGLE | CLIFF | TENDED | 0 | 0 | 0 | 477848 | 4348658 |
| 29A | JOES VALLEY | 1997 | GOLDEN EAGLE | CLIFF | ACTIVE | 0 | 0 | 0 | | |
| 29B | JOES VALLEY | 1997 | GOLDEN EAGLE | CLIFF | INACTIVE | 0 | 0 | 0 | | |
| 29C | JOES VALLEY | 1997 | GOLDEN EAGLE | CLIFF | INACTIVE | 0 | 0 | 0 | | |
| 30 | JOES VALLEY | 1997 | GOLDEN EAGLE | CLIFF | INACTIVE | 0 | 0 | 0 | 478454 | 4348775 |
| 30A | JOES VALLEY | 1997 | GOLDEN EAGLE | CLIFF | OLD-D | 0 | 0 | 0 | | |
| 30B | JOES VALLEY | 1997 | GOLDEN EAGLE | CLIFF | TENDED | 0 | 0 | 0 | | |

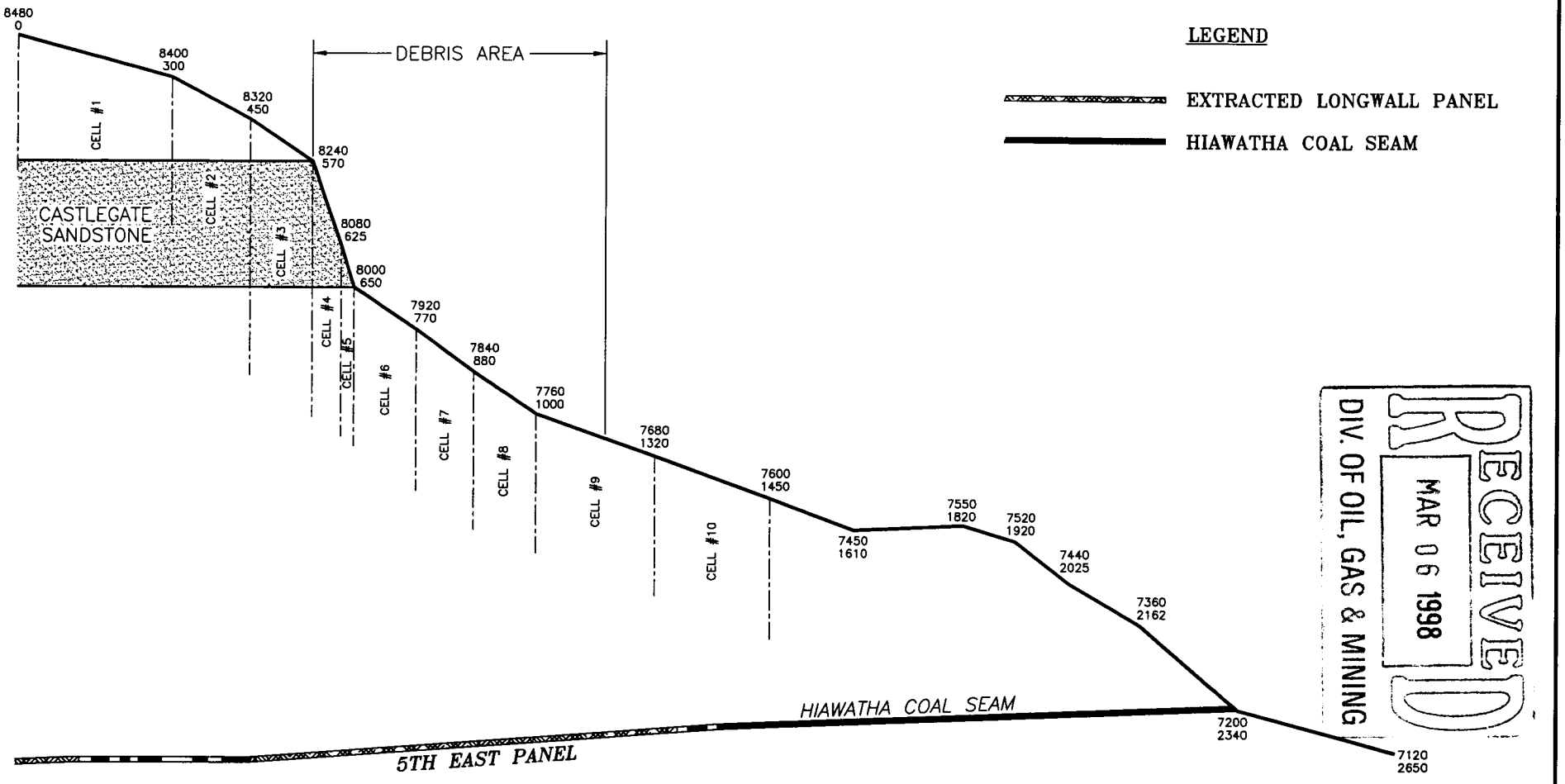
## STATUS REPORT - FEBRUARY 1998:

**Assessment of Surface Impacts to the Castlegate Sandstone Escarpment From Full Extraction Reserve Recovery**

**Overview of Castlegate Sandstone Escarpment Geotechnical Evaluation**

# LIST of MAPS & PHOTOS

- Drawing # TMS1721A TRAIL MOUNTAIN MINE: ESCARPMENT STUDY CROSS SECTION
- Drawing # TMS1711C TRAIL MOUNTAIN MINE: ESCARPMENT STUDY 5TH EAST TALUS CROSS SECTION
- Drawing: PRISM STAND and MOUNTING PLATE
- TRAIL MOUNTAIN MINE: 5TH EAST CASTLEGATE ESCARPMENT STUDY AREA - 9/96
- TRAIL MOUNTAIN MINE: 5TH EAST CASTLEGATE ESCARPMENT STUDY AREA - 12/96
- Drawing # KS1703D Cottonwood Mine: Escarpment Modeling Study 1997
- Drawing # CE10790EM Joint Mapping - Castlegate Sandstone Cliff Stability Rilda Canyon Area
- Drawing # KS1743D Cottonwood Mine: Escarpment Modeling Study Corncob Wash Jointing
- Drawing # KS1744D Deer Creek Mine: Escarpment Modeling Study Rilda Canyon Jointing
- Drawing # DS1741C Deer Creek Mine: North Rilda Area Vegetation Map
- Drawing # DS1697C Deer Creek Mine: North Rilda Area Bat Survey Information
- Drawing # DS1745D Rilda Canyon View of Castlegate Sandstone Outcrop From State Highway 31
- Drawing # DS1748D East Mountain Property: Raptor Nesting Location & Habitat Map Rilda Canyon Study Area






# SECTION A

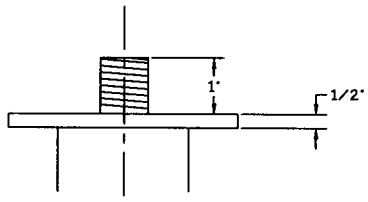
REFER TO DWG. NO. TMS1705D FOR LOCATION OF CROSS SECTION
*CAD FILE NAME/DISK#: TMS1721A*

ENERGY WEST
MINING COMPANY
HUNTINGTON, UTAH 84528

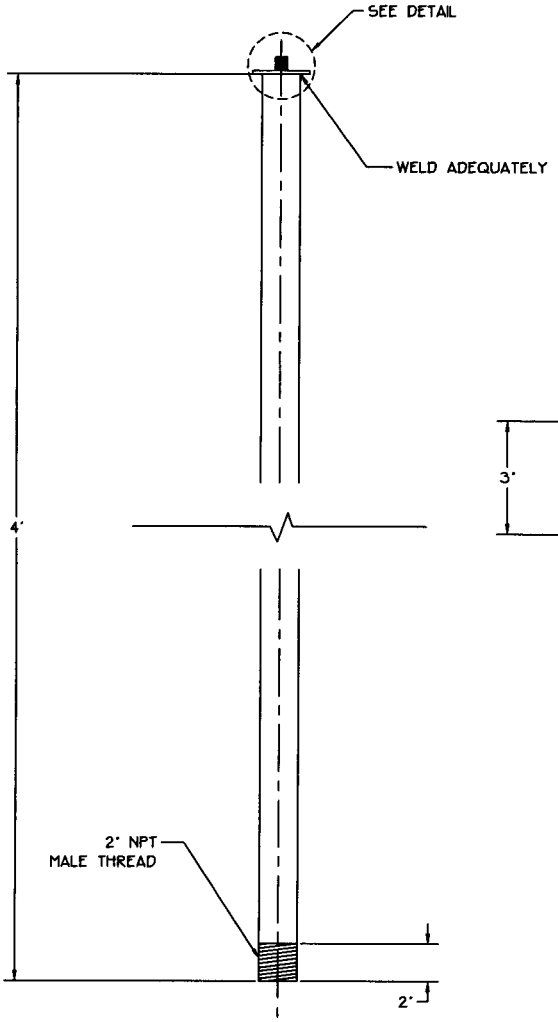
*TRAIL MOUNTAIN MINE*
*ESCARPMENT STUDY*
*CROSS SECTION*

| DRAWN BY: | KJL | *TMS1721A* |
|---|---|---|
| SCALE: | 1" =300' | DRAWING #: |
| DATE: | JUNE 25, 1997 | SHEET 1 OF 1 — REV. ___ |

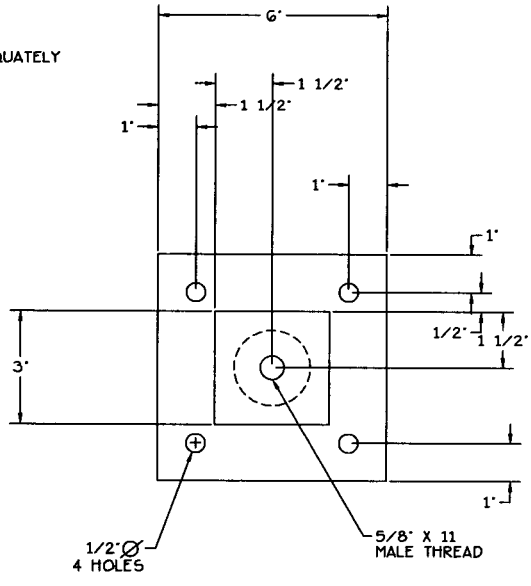
| DATE | REVISIONS | BY | CHK. |
|---|---|---|---|



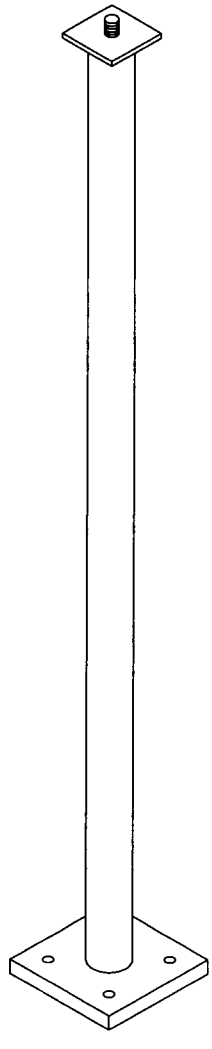

DETAIL




FRONT VIEW




TOPVIEW



PRISM STAND

NOTE:
FOUR LAG BOLTS REQUIRED
SIZE: 1/2" X 6" PER PRISM
STAND.

CAD FILE NAME/DISK#: PRISM

| | |
|---|---|
| ENERGY WEST MINING COMPANY<br>HUNTINGTON, UTAH 84528 | |
| *PRISM STAND AND MOUNTING PLATE* | |
| DRAWN BY: *P. BOYLEN* | *GENS1501A* |
| SCALE: *NTS* | DRAWING #: |
| DATE: *SEPTEMBER 29, 1994* | SHEET 1 OF 1 REV. |