



**RED LINE - STRIKE OUT**

**Response to TA dated May 20, 2005**

**Copy 3/3**

**June 15, 2005**

R. Jay Marshall  
UtahAmerican Energy, Inc.  
P.O. Box 986  
Price, Utah 84501

**112.230.** The abandoned mine land reclamation fee will be paid by:

Robert E. Murray  
UtahAmerican Energy, Inc.  
Box 187

St. Clairsville

153 Highway  
7 South  
Pow  
at an  
Point,  
Ohio  
43950  
O H  
43942

**112.300.** The person's name, address and employer identification number for each person who owns or controls the applicant is listed under Appendix 1-1. In addition Appendix 1-1 shows the persons ownership or control relationship to the applicant, percentage of ownership, and location in the organizational structure.

**112.310.** Persons who own or control names, address social security numbers and employer identification numbers can be found in Appendix 1-1.

**112.320.** Persons ownership or control relationship to the applicant can be found in Appendix 1-1.

**112.330.** Title of the person's position and date position was assumed can be found in Appendix 1-1.

**112.340.** UtahAmerican Energy, Inc.,

**Josiah K Eardley:**  
2433 S HWY 10  
Route 1, Box 119  
Price, Utah 84501

**Robert K. Peper:**  
975 W 600 S  
Orem, Ut 84058

**UTAHAMERICAN ENERGY, INC.:**  
Box 187  
St. Clairsville, Ohio 43950

**UNITED STATES DEPARTMENT OF THE INTERIOR:**  
Bureau of Land Management  
Utah State Office  
324 South State  
Salt Lake City, Utah 84111

**STATE OF UTAH:**  
Utah School and Institutional Trust Lands  
Administration (SITLA)  
675 East 500 South Suite 500  
Salt Lake City, Utah 84114-5703

**Subsurface Owners:**

**UTAHAMERICAN ENERGY, INC.:**  
Box 187 153 Highway 7 South  
St. Clairsville

Powhatan  
Point,  
Ohio  
H  
43950  
42

**Robert K. Peper:**  
975 W 600 South  
Orem, Utah 84058

**UTAHAMERICAN ENERGY, INC.:**

Box 187 153 Highway 7 South

St. Clairsville

Powhatan

Point,

Ohio

H

43950

42

**WILLIAM MARSING LIVESTOCK INC.:**

4330 E 8900 N

Price, Utah 84501

**Contiguous Subsurface Owners:**

**UNITED STATES DEPARTMENT OF THE INTERIOR:**

Bureau of Land Management

Utah State Office

324 South State

Salt Lake city, Utah 84111

**STATE OF UTAH:**

Utah School and Institutional Trust Lands  
Administration (SITLA)

675 East 500 South Suite 500

Salt Lake City, Utah 84114-5703

**UTAHAMERICAN ENERGY, INC.:**

Box 187 153 Highway 7 South

St. Clairsville

Powhatan

Point,

Ohio

H

43950

**Robert K. Peper:**  
975 West 600 South  
Orem, Utah 84058

- 112.700.** The following is a list of MSHA numbers associated with the permit.

MSHA ID Number: 42-00100 (Horse Canyon)  
MSHA ID Number 42-02241 (Lila Canyon)  
Refuse Pile I.D. Number: 1211-UT-09-02241-01

United States Department of Labor  
Mine, Safety and Health Administration  
P.O. Box 25367  
Denver, Colorado 80225

- 112.800.** ~~There are no lands, interest in lands, options, or pending bids on interests held or made by the applicant for lands contiguous to the area described in the permit application.~~ In February 2002, UEI submitted a lease by application to the BLM. Four thousand acres were identified as an area of interest to the south and east of current UEI reserves. The LBA delineation and recoverable reserves has yet to be determined by the BLM. If the area of interest is offered for lease, and if UEI bids on the LBA, and if UEI is the successful bidder, then it could be anticipated that mining in the leased area would occur once current Lila reserves are exhausted. (Approximately in the year 2020)

- 112.900.** After **UtahAmerican Energy, Inc.**, is notified that the application is approved, but before the permit is issued, **UtahAmerican Energy, Inc.**, will update, correct or indicate that no change has occurred in the information previously submitted under R645-301-112.100 to R645-301-112.800.

~~Out~~ The perimeter of the disturbed area contains approximately 42.6 surface acres within the disturbed boundaries area but only 25.3 acres will ~~actually~~ be disturbed. ~~The remainder will be left~~ av ~~in isolated islands~~ g 17.3 acres of undisturbed islands within the disturbed boundary area. ~~See Plate 1-2.~~

**116.200.** The initial permit application is for a five year term with anticipated successive five year permit renewals.

**116.210** Since the initial permit application is for a term of five years this section does not apply.

**116.220** Since the initial permit application is for a term of five years this section does not apply.

**117. Insurance, Proof of Publication and Facilities or Structures Used in Common**

**117.100.** The Certificate of Liability Insurance is included as Appendix 8-2.

**117.200.** A copy of the newspaper advertisement of the permit extension and proof of publication can be found in Appendix 1-5.

**117.300.** Since no structures are going to be shared by two or more separately permitted coal mining permit applications this section does not apply.

**118. Filing Fee.**

A filing fee of \$5.00 has been submitted.

**120. Permit Application Format and Contents.**

R. Jay Marshall  
UtahAmerican Energy, Inc.  
P.O. Box 986  
Price, Utah 84501

**112.230.** The abandoned mine land reclamation fee will be paid by:

Robert E. Murray  
UtahAmerican Energy, Inc.  
153 Highway 7 South  
Powhatan Point, OH 43942

**112.300.** The person's name, address and employer identification number for each person who owns or controls the applicant is listed under Appendix 1-1. In addition Appendix 1-1 shows the persons ownership or control relationship to the applicant, percentage of ownership, and location in the organizational structure.

**112.310.** Persons who own or control names, address social security numbers and employer identification numbers can be found in Appendix 1-1.

**112.320.** Persons ownership or control relationship to the applicant can be found in Appendix 1-1.

**112.330.** Title of the person's position and date position was assumed can be found in Appendix 1-1.

**112.340.** UtahAmerican Energy, Inc.,  
The American Coal Company  
PennAmerican L.P.  
Canterbury Coal Company  
Energy Resources, Inc.  
Oklahoma Coal Company  
Ohio Valley Coal Company  
MonValley Transportation Center, Inc.  
KenAmerican Resources, Inc.

**UTAHAMERICAN ENERGY, INC.:**

Box 187  
St. Clairsville, Ohio 43950

**UNITED STATES DEPARTMENT OF THE INTERIOR:**

Bureau of Land Management  
Utah State Office  
324 South State  
Salt Lake City, Utah 84111

**STATE OF UTAH:**

Utah School and Institutional Trust Lands  
Administration (SITLA)  
675 East 500 South Suite 500  
Salt Lake City, Utah 84114-5703

**Subsurface Owners:**

**UTAHAMERICAN ENERGY, INC.:**

153 Highway 7 South  
Powhatan Point, OH 43942

**Robert K. Peper:**

975 W 600 South  
Orem, Utah 84058

**STATE OF UTAH:**

Utah School and Institutional Trust Lands  
Administration (SITLA)  
675 East 500 South Suite 500  
Salt Lake City, Utah 84114-5703

**UNITED STATES DEPARTMENT OF THE INTERIOR:**

Bureau of Land Management  
Utah State Office  
324 South State  
Salt Lake City, Utah 84111

**112.600.** The name and address of each owner (surface and subsurface) of all property contiguous to the proposed permit

area is shown on Plate 4-1 for surface, and Plate 5-4 for subsurface. Plate 1-1 is the official boundary map and it will be used to clarify any questions about the permit boundaries. Plate 1-2 shows the disturbed area.

**Contiguous Surface Owners:**

**UNITED STATES DEPARTMENT OF THE INTERIOR:**

Bureau of Land Management  
Utah State Office  
324 South State  
Salt Lake City, Utah 84111

**STATE OF UTAH:**

Utah School and Institutional Trust Lands  
Administration (SITLA)  
675 East 500 South Suite 500  
Salt Lake City, Utah 84114-5703

**Josiah K Eardley:**

2433 S HWY 10  
Route 1, Box 119  
Price, Utah 84501

**Robert K. Peper:**

975 W 600 S  
Orem, Ut 84058

**UTAHAMERICAN ENERGY, INC.:**

153 Highway 7 South  
Powhatan Point, OH 43942

**WILLIAM MARSING LIVESTOCK INC.:**

4330 E 8900 N  
Price, Utah 84501

**Contiguous Subsurface Owners:**

**UNITED STATES DEPARTMENT OF THE INTERIOR:**

Bureau of Land Management  
Utah State Office  
324 South State  
Salt Lake city, Utah 84111

**STATE OF UTAH:**

Utah School and Institutional Trust Lands  
Administration (SITLA)  
675 East 500 South Suite 500  
Salt Lake City, Utah 84114-5703

**UTAHAMERICAN ENERGY, INC.:**

153 Highway 7 South  
Powhatan Point, OH 43942

**Robert K. Peper:**

975 West 600 South  
Orem, Utah 84058

**112.700.** The following is a list of MSHA numbers associated with the permit.

MSHA ID Number: 42-00100 (Horse Canyon)  
MSHA ID Number 42-02241 (Lila Canyon)  
Refuse Pile I.D. Number: 1211-UT-09-02241-01

United States Department of Labor  
Mine, Safety and Health Administration  
P.O. Box 25367  
Denver, Colorado 80225

**112.800.** In February 2002, UEI submitted a lease by application to the BLM. Four thousand acres were identified as an area of interest to the south and east of current UEI reserves. The LBA delineation and recoverable reserves has yet to be

determined by the BLM. If the area of interest is offered for lease, and if UEI bids on the LBA, and if UEI is the successful bidder, then it could be anticipated that mining in the leased area would occur once current Lila reserves are exhausted. (Approximately in the year 2020)

**112.900.** After **UtahAmerican Energy, Inc.**, is notified that the application is approved, but before the permit is issued, **UtahAmerican Energy, Inc.**, will update, correct or indicate that no change has occurred in the information previously submitted under R645-301-112.100 to R645-301-112.800.

**113. Violation Information.**

**113.100.** Neither **UtahAmerican Energy, Inc.**, or any subsidiary, affiliate, or persons controlled by or under common control with the applicant, has had any federal or state permit to conduct coal mining and reclamation operations suspended or revoked in the five years preceding the date of submission of the application.

**113.110.** No federal or state permits to conduct coal mining and reclamation operations has been suspended or revoked in the five years preceding the date of submission of the application.

**113.120.** Neither **UtahAmerican Energy, Inc.**, nor any subsidiary, affiliate, or persons controlled by or under common control with the applicant, have forfeited a performance bond or similar security deposited in lieu of bond.

**113.200.** Since no suspensions revocations, or forfeitures have taken place section 113.200 with subsections is not applicable.

Terminate Mining

Dec. 2019

Reclamation operation dates can be found in Table 3-3.

Approximately 5,992.07 surface acres, which include federal, state and private lands are included within the permit area. These surface acres are described in Table 4-2, and coal acres are shown on Table 4-2A.

The perimeter of the disturbed area contains approximately 42.6 surface acres within the disturbed area but only 25.3 acres will be disturbed leaving 17.3 acres of undisturbed islands within the disturbed area.

**116.200.** The initial permit application is for a five year term with anticipated successive five year permit renewals.

**116.210** Since the initial permit application is for a term of five years this section does not apply.

**116.220** Since the initial permit application is for a term of five years this section does not apply.

**117. Insurance, Proof of Publication and Facilities or Structures Used in Common**

**117.100.** The Certificate of Liability Insurance is included as Appendix 8-2.

**117.200.** A copy of the newspaper advertisement of the permit extension and proof of publication can be found in Appendix 1-5.

**117.300.** Since no structures are going to be shared by two or more separately permitted coal mining permit applications this section does not apply.

surface and the relatively hot and dry site conditions. Minimal topsoil development and an accumulation of carbonates in the subsoil are typical characteristics of these soils along with a high rock fragment content. Soil textures are typically fine sandy loam or sandy loam. Thin layers of sandy clay loam and loamy sand are intermittently present.

The dominant soils are well drained and have moderately rapid permeability. Soil erosion potential is moderately low over most of the area, but ranges from low to severe (on shale exposures). Rooting depths observed were mostly at 30 to 48 inches.

**222.400** Present and potential productivity determinations of the existing soils conducted by Mr. George Cook of the NRCS in the summer of 1998 are presented in Appendix 3-7~~2~~.

**223.** The soil survey was conducted according to the standards of the National Cooperative Soil Survey as described in the Soil Survey Manual (Soil Survey Staff, 1993), the National Soil Survey Handbook, (soil Survey Staff, 1993), and Keys to Soil Taxonomy, seventh edition (Soil Survey Staff, 1996).

**224** Soil inventories indicate that no borrow area will be needed for substitute topsoil. There is an adequate amount of suitable soil as indicated by root distribution and soil characteristics over the proposed area to be disturbed.

### **230. Operation Plan.**

#### **231. General Requirements.**

**231.100** In reference to topsoil in this plan, it is considered to be the soil down to a maximum depth of 18". The typically dark colored A horizon often referred to as topsoil is very thin (< 6 inches) under the environmental conditions of the project site. Topsoil generally consists of the A and B horizon materials that have suitable characteristics for plant growth and show natural rooting present within the soil. Of the salvageable soil

construction, the pile will be roughened again immediately prior to seeding. Side slopes will be monitored for erosion and will be repaired if erosion appears to be excessive.

Undisturbed islands located within the disturbed area will not be disturbed unless the mine reclamation plan is amended to allow for the disturbance. The islands will be signed as undisturbed to help protect them from any disturbance.

**231.200.** Soil inventories indicate that no topsoil substitutes will be needed.

**231.300.** Topsoil will be tested as per Section 243. If testing identifies a potential problem, additional samples may be collected to determine the extent and severity of the problem.

Vegetation monitoring will compare the results of plant growth on the replaced topsoil with the growth on the in-place soil materials. If there is a distinct difference between the two areas, the Operator will consult with the DOGM to determine the nature of the problem and will make corrections as recommended for improvement.

**231.400.** Construction of the topsoil storage site will begin by removing any large boulders and existing vegetation. Diversion ditches will be installed after the stockpiles are in place to channel drainage away from the stockpiles. Once the topsoil stockpile has been created with the material removed during construction of the proposed mine site, it will be reseeded and will remain in place until final reclamation occurs.

The surface of the stockpile will be left rough and irregular to increase retention of rainfall and snow melt. Seeding will be done following placement of the topsoil, and ~~after September~~ between Sept. 15 and Jan. 15, to take advantage of winter moisture. If seeding does not immediately follow topsoil pile construction, the pile will be roughened again immediately prior to seeding.

A silt fence or berm/ditch configuration will be installed at the perimeter of the pile to protect it from water erosion and vehicular traffic. Maintenance of the topsoil pile, during the life

erosion. As much as practical, the same vegetation techniques used on the main topsoil pile will be utilized on the fan topsoil berm. Silt fence will be utilized to prevent the topsoil from leaving the site.

Presently there is not a subsoil stockpile required for this project, therefore, details are not provided.

- 234.200.** Section 232.100 contains information on the topsoil stockpile.
- 234.210.** The stockpile site selected is on the Strych soil. It is a well drained and stable site on cobbly alluvium.
- 234.220.** The stockpile will be located and protected to avoid contamination. Unacceptable compaction will not be permitted. In areas where undisturbed soils are in close proximity to coal mining or reclamation activities a 20 foot buffer zone will be delineated by "Undisturbed Area" signs. Quarterly inspections will be made to insure there is not an accumulation of coal dust or coal related debris. In the event coal dust is observed ~~in excess of one inch on undisturbed areas, a vacuum truck~~, water sprays according to air quality permit (DAQE-702-99) or alternative measures such as wind fence, or broadening of the topsoil salvage area will be employed to ~~clean up residual~~ control the coal dust and fines. \_\_\_\_\_
- 234.230.** The stockpile will be mulched and seeded with the seed mix presented in Table 3-4. Up to 1% by volume of the sifted soil crusts will be added to each load of Wood fiber mulch applied to the top soil pile. The slopes will have an irregular, pitted surface to help retain precipitation and minimize runoff. Silt fencing will be placed at the base of the stockpile.
- 234.240.** Plans are to leave the topsoil in place for the life of the mine.
- 234.300.** These regulations are not applicable to the action described

surface and the relatively hot and dry site conditions. Minimal topsoil development and an accumulation of carbonates in the subsoil are typical characteristics of these soils along with a high rock fragment content. Soil textures are typically fine sandy loam or sandy loam. Thin layers of sandy clay loam and loamy sand are intermittently present.

The dominant soils are well drained and have moderately rapid permeability. Soil erosion potential is moderately low over most of the area, but ranges from low to severe (on shale exposures). Rooting depths observed were mostly at 30 to 48 inches.

**222.400** Present and potential productivity determinations of the existing soils conducted by Mr. George Cook of the NRCS in the summer of 1998 are presented in Appendix 3-2.

**223.** The soil survey was conducted according to the standards of the National Cooperative Soil Survey as described in the Soil Survey Manual (Soil Survey Staff, 1993), the National Soil Survey Handbook, (soil Survey Staff, 1993), and Keys to Soil Taxonomy, seventh edition (Soil Survey Staff, 1996).

**224** Soil inventories indicate that no borrow area will be needed for substitute topsoil. There is an adequate amount of suitable soil as indicated by root distribution and soil characteristics over the proposed area to be disturbed.

## **230. Operation Plan.**

### **231. General Requirements.**

**231.100** In reference to topsoil in this plan, it is considered to be the soil down to a maximum depth of 18". The typically dark colored A horizon often referred to as topsoil is very thin (< 6 inches) under the environmental conditions of the project site. Topsoil generally consists of the A and B horizon materials that have suitable characteristics for plant growth and show natural rooting present within the soil. Of the salvageable soil

construction, the pile will be roughened again immediately prior to seeding. Side slopes will be monitored for erosion and will be repaired if erosion appears to be excessive.

Undisturbed islands located within the disturbed area will not be disturbed unless the mine reclamation plan is amended to allow for the disturbance. The islands will be signed as undisturbed to help protect them from any disturbance.

**231.200.** Soil inventories indicate that no topsoil substitutes will be needed.

**231.300.** Topsoil will be tested as per Section 243. If testing identifies a potential problem, additional samples may be collected to determine the extent and severity of the problem.

Vegetation monitoring will compare the results of plant growth on the replaced topsoil with the growth on the in-place soil materials. If there is a distinct difference between the two areas, the Operator will consult with the DOGM to determine the nature of the problem and will make corrections as recommended for improvement.

**231.400.** Construction of the topsoil storage site will begin by removing any large boulders and existing vegetation. Diversion ditches will be installed after the stockpiles are in place to channel drainage away from the stockpiles. Once the topsoil stockpile has been created with the material removed during construction of the proposed mine site, it will be reseeded and will remain in place until final reclamation occurs.

The surface of the stockpile will be left rough and irregular to increase retention of rainfall and snow melt. Seeding will be done following placement of the topsoil, and between Sept. 15 and Jan. 15, to take advantage of winter moisture. If seeding does not immediately follow topsoil pile construction, the pile will be roughened again immediately prior to seeding.

A silt fence or berm/ditch configuration will be installed at the perimeter of the pile to protect it from water erosion and vehicular traffic. Maintenance of the topsoil pile, during the life of the mining operation, will consist of: seeding the new

erosion. As much as practical, the same vegetation techniques used on the main topsoil pile will be utilized on the fan topsoil berm. Silt fence will be utilized to prevent the topsoil from leaving the site.

Presently there is not a subsoil stockpile required for this project, therefore, details are not provided.

- 234.200.** Section 232.100 contains information on the topsoil stockpile.
- 234.210.** The stockpile site selected is on the Strych soil. It is a well drained and stable site on cobbly alluvium.
- 234.220.** The stockpile will be located and protected to avoid contamination. Unacceptable compaction will not be permitted. In areas where undisturbed soils are in close proximity to coal mining or reclamation activities a 20 foot buffer zone will be delineated by "Undisturbed Area" signs. Quarterly inspections will be made to insure there is not an accumulation of coal dust or coal related debris. In the event coal dust is observed, water sprays according to air quality permit (DAQE-702-99) or alternative measures such as wind fence, or broadening of the topsoil salvage area will be employed to control the coal dust.
- 234.230.** The stockpile will be mulched and seeded with the seed mix presented in Table 3-4. Up to 1% by volume of the sifted soil crusts will be added to each load of Wood fiber mulch applied to the top soil pile. The slopes will have an irregular, pitted surface to help retain precipitation and minimize runoff. Silt fencing will be placed at the base of the stockpile.
- 234.240.** Plans are to leave the topsoil in place for the life of the mine.
- 234.300.** These regulations are not applicable to the action described within this permit document.
- 234.310.** These regulations are not applicable to the action

was used to identify potential MSO habitat. The results can be found in Appendix 3-4.

The proposed addition to the permit area does not contain habitat for southwestern willow flycatchers. There are no perennial water sources or riparian areas in either the current permit area or the proposed addition, and according to verbal information from UEI's consultant, there are few, if any, willows or similar riparian-type vegetation associated with the seeps and springs in the proposed addition to the permit area. There may have been a few willows or shrubs, but there were no dense patches as would be required by southwestern willow flycatchers.

Lila Canyon Mine will have below-ground electrical power lines. These lines will be constructed to minimize potential hazards to all raptors new to the site, all will be designed and constructed in accordance with the guidelines set forth in Environmental Criteria for Electric Transmission Systems or as approved by DOGM.

**322.220.**

The permit area for Lila Canyon Mine is located within the Price River Resource Area. Surface water in the adjacent areas drains into Grassy Trail Creek and Cottonwood Wash, both tributaries of the Price River. The environment around the 42.6 acre mine site is within the Upper Sonoran life zone. The dominate Vegetation communities within the proposed disturbed area are pinyon-juniper and grass-shrub. Community types surrounding the proposed disturbed area are primarily pinyon-juniper, mixed conifer, spruce-fir, grass, and sagebrush-grass.

The Upper Sonoran life zone can provide habitat for approximately one hundred and forty-two species of wildlife. Two separate reports by

the Utah Division of Wildlife Resources (DWR) identify species having potential to inhabit the region. The species that is considered to be of high interest in the local area is the Pronghorn. Pronghorns are found as year-long residents within and adjacent to the permit area. These animals were transplanted to this site by the DWR in 1972 and are part of the Icelander Antelope Herd Unit II. Pronghorn prefer open sagebrush-desert and shrub-grassland habitats in areas of the Western United States. They are primarily browsers but are known to forage on grasses and forbs during spring and summer (FWS, 1978).

The pinyon-juniper woodlands, and interspersed sagebrush parks are winter range for mule deer. Many of the drier slopes are essentially juniper stands of scattered trees. The mule deer winter use is restricted to periods when snow is available or surface water is present during snow melt in the early spring, and the UDWR has rated this winter range as high priority.

Elk winter range is located at higher elevations than that of the disturbed area and is not a factor in the disturbed site.

Other wildlife in the pinyon-juniper woodlands are reptiles, passerine birds, lagomorphs, and small rodents.

The talus slopes in the canyon are home to rodents and reptiles. They are also used by chukars. Snake dens are unknown in the talus slopes.

The cliffs are generally north-facing and have potential as raptor nesting sites. Spring raptor inventories were initiated in the spring of 1998 and have been completed annually since 1998. The results of the annual raptor surveys are

Assessment submitted in association with the Right-Of-Way applications.

The USFWS recognizes that the permit area is within range of endangered species, including the black-footed ferret (*Mustela nigripes*), and the bald eagle (*Haliaeetus leucocephalus*). (Letter dated February 4, 1998, Appendix 3-3)..

Raptor surveys were ~~conducted in the spring of 1998, 1999, 2000, 2001, 2002, and 2003.~~ initiated in 1998, and have continued through 2005 with the exception of 2004. These raptor surveys were initiated long before ground-breaking of the Lila project. The results of these survey are contained in Appendix 3-5. The entire Book Cliffs escarpment within the permit area was inventoried for cliff nesting raptors. In addition, a 1-mile buffer zone was inventoried around areas of potential development.

None of the Eagle nests in the close proximity to the mines surface facilities (less than 1/4 mile). have been active nor tended in the last three years. However, historically one active and one tended Golden Eagle Nest is within close proximity to the mines surface facilities. After consultation with USFW, Laura Roma, UDWR, Chris Colt, and BLM, Dave Mills, it was determined that there was a high probability these nest sites would be abandoned. A cooperative agreement with the regulatory agencies and UEI was finalized and is made part of the mitigation for the Lila Canyon EA. One nest discussed above, also lies in an area of potential subsidence which is a mute point due to its close proximity to the mine site. Since the nests are located so close to the mine surface facility, their future potential use was deemed to be lost and were so mitigated by a prey base off-site vegetation treatment project approved by the USFWS, UDWR and BLM. However, if this nest(s) or any future nest is lost

summer of 2003. The reference area was chosen in an area which represents the natural premining conditions of the permit area. The reference area will facilitate the determination of successful revegetation and the resultant final bond release for the Applicant.

**323.200.** Monitoring locations are shown on Plate 3-1 and can also be found on the raptor inventory map in Appendix 3-5.

**323.300.** Protection facilities: There will be no facilities used exclusively for the protection or enhancement of fish and wildlife. The goal of the mine is to construct all facilities and conduct mining in such a manner to minimize adverse impacts to wildlife. These measures will include but are not limited to:

1. Interim revegetation with desirable plant species for wildlife, with the exception of transportation corridors.
2. Speed limits on all roads to lesson potential for possible animal/vehicular collisions.
3. Wildlife awareness training to be incorporated into the annual safety training for all employees.
4. Possible restrictions on firearms on the mine site, and restrictions on off road vehicle usage to lesson disturbance.
5. ~~Raptor surveys will be conducted 1-year~~The Operator will ensure that DWR surveys proposed facilities areas at least two years prior and one year following ~~all purposed new construction or potentially disruptive mining activity~~construction. The Division, in consultation with DWR, cleared the two year requirement if the mine begins construction sometime between 2005 and February 2006. This clearance is because UEI already had eight years of data as well as data for spring 2005. The Operator will continue annual raptor surveys in 2006.
6. An active golden eagle nest, with young, was documented during the 1999 spring raptor survey. The nest is located in the left fork of Lila

Canyon within the 1-mile buffer zone. (See Plate 3-1). A consultation with USF&W, BLM, and UDWR was held in the fall of 1999. Line of site and potential mitigation was addressed during this meeting. The results of this consultation are addressed in Sec 322.220 and the Lila Canyon EA. This nest was not active in 2000, 2001, 2002, or 2003.

- 323.400.** Plate 3-2 Identifies each vegetative type and plant community. The sample locations used during the vegetation inventory can be found on Figure 1 of Appendix 3-1. Critical or high priority wildlife use areas can be correlated to vegetation with the incorporation of the Wildlife Map, Plate 3-1.

Appendix 7-8 provides a description of each water monitoring location. In Summary monitoring locations L-6-G, L-7-G, and L-11-G have a habitat overstory of Douglas Fir-Mountain Brush association. Water monitoring location L-8-G has a habitat of predominantly pinyon - juniper and sagebrush grass associations. Water monitoring locations L-9-G, L-10-G, and L-12-G have some minor wet meadow habitat with an overstory of pinyon-juniper and sagebrush grass immediately adjacent along each side of the sites. Water monitoring sites L-16-G and L-17-G are both seeps and have a habitat of a mix of grasses and salt desert shrub with some invasive tamarisk.

Sites L-1-S, L-2-S, L-3-S, L-13-S, L-14-S and L-15-S are dry washes with a habitat consisting of sagebrush with an overstory of pinion-juniper.

Monitoring site L-4-S and L-5-G are for sediment pond discharge and for the mine discharge and have a habitat consisting of an overstory of pinion-juniper.

- 330. Operation Plan.** A plan for protection of vegetation, fish and wildlife resources follows:
- 331.** The permit area is approximately 5,992.07 acres of which only 42.6 acres are within the surface disturbance area. All incidental

**Table 3-3  
Time Table of Reclamation**

April 16, 2020	Begin Demolition
November 15, 2020	Complete Demolition
April 16, 2021	Commence Earthwork
August 30, 2021	Completion of Phase 1 (Earthwork) Lower Area
September 1, 2021	Begin Earthwork Road / Portal Upper Area
October 1, 2021	Seeding and Mulching (Weather dependent) Completion of Earthwork Upper Area
November 1, 2021	Fencing
November 15, 2021	Reclamation Completed
July 2025	Ocular Estimates of Success (Remedial seeding if necessary September 2026)
October 2023	Planting Seedlings
July 2027	Quantitative Vegetation Inventory
August 2029	Quantitative Vegetation Inventory Site and Reference Area
August 2034	Quantitative Vegetation Inventory of Referenced Area and Project Site, Bond Release Criteria

The tentative life of a mine is twenty years depending on market and mining conditions. As such, the time table is generic and no set year will be specified for the cessation and abandonment of operations.

radius of the surface facilities were assumed lost due to indirect disturbance associated with mine activities. The Lila Canyon EA # UT-070-99-22, outlines mitigation recommended through a cooperative effort between Utah Department of Wildlife Resources, Bureau of Land Management, U.S. Fish and Wildlife and UtahAmerican Energy, Inc. where mitigation would be implemented to increase prey base off-site. The construction of alternative nests was considered to be ineffective. Eagle distribution was not limited by suitable nest sites but by available prey.

An MSO survey will be completed according to Appendix 3-4. Results as described in Appendix 3-4 will be reported to the Division, UDWR, and USFWS.

Construction at the mine to upgrade drainage controls and to construct the road will have a minor impact on wildlife in the area. The impact will mainly be increased human activity associated with the construction and a small, less than 42.6 acre, loss of habitat for the mine site, roads and sedimentation pond. These impacts will have little or no affect on the wildlife because they will be completed in an environmentally sound manner.

UEI will instruct all personnel as to current regulations regarding the use of off-road vehicles, firearm regulations, and where current UDWR proclamations are available. This training will be part of the annual refresher offered to all employees. The company will encourage strict compliance with these regulations.

DWR will be notified of any road kills involving large game and request to have them removed to safeguard raptors. Mine personnel will be instructed to remove road kills a safe distance from the road way.

The Lila Canyon Mine has agreed to mitigate the loss of wildlife habitat as well as the potential loss of habitat use due to disturbance.

This mitigation is under advisement of the wildlife professionals of both the BLM and the Utah Division of Wildlife Resources. The mitigation designed will offset impacts to bighorn sheep, mule deer, elk, and chukker specifically. The mitigation committed to in association with the Lila Mine EA is :

- (1) Install two guzzlers

- (2) Participate in a habitat enhance program on 70+ acres-conversion from Pinyon/Juniper to shrubs, forbs, and grasses.

The implementation dates, and project locations will not be determined until the BLM notice to proceed is given, after permit approval. The overseeing agency for the EA mitigation will be the BLM. Details will be reported to DOGM in the Annual Report immediately following the notice to proceed.

**333.100.** This section is addressed in 333. And 333.300.

**333.200.** This section is addressed in 333. And 333.300.

**333.200.** The Applicant does not plan to monitor any wildlife species during the life of the operation with the exception of raptors. Helicopter spring raptor surveys will be conducted at a minimum of a 1-mile radius around any new or potentially disruptive mining activity, 2-years prior and ~~one year~~ annually after the proposed activity  
~~In addition, raptor surveys will be conducted within a one-mile buffer zone of the surface facilities area once every three years.~~

The mine will emphasize their commitment to legal requirements of firearm and off-road vehicle-use by employees. This type of program has been adopted by the operator and will continue throughout the operation. An education program aimed at minimizing potential negative impacts by employees will be presented during the Operators annual retaining programs. Employees will be informed about the wildlife in the area and about which species are protected. They will be counseled to refrain from poaching or harassing animals and about the need to preserve the wildlife. They will also be instructed on the danger of animals on the road during dusk and night hours and consequently the need to reduce speed to avoid colliding with animals difficult to see in these periods of poor light. All threatened or endangered wildlife sighted within or adjacent to the permit area will be reported to the appropriate state and / or federal agency.

was used to identify potential MSO habitat. The results can be found in Appendix 3-4.

The proposed addition to the permit area does not contain habitat for southwestern willow flycatchers. There are no perennial water sources or riparian areas in either the current permit area or the proposed addition, and according to verbal information from UEI's consultant, there are few, if any, willows or similar riparian-type vegetation associated with the seeps and springs in the proposed addition to the permit area. There may have been a few willows or shrubs, but there were no dense patches as would be required by southwestern willow flycatchers.

Lila Canyon Mine will have below-ground electrical power lines. These lines will be constructed to minimize potential hazards to all raptors new to the site, all will be designed and constructed in accordance with the guidelines set forth in Environmental Criteria for Electric Transmission Systems or as approved by DOGM.

**322.220.**

The permit area for Lila Canyon Mine is located within the Price River Resource Area. Surface water in the adjacent areas drains into Grassy Trail Creek and Cottonwood Wash, both tributaries of the Price River. The environment around the 42.6 acre mine site is within the Upper Sonoran life zone. The dominate Vegetation communities within the proposed disturbed area are pinyon-juniper and grass-shrub. Community types surrounding the proposed disturbed area are primarily pinyon-juniper, mixed conifer, spruce-fir, grass, and sagebrush-grass.

The Upper Sonoran life zone can provide habitat for approximately one hundred and forty-two species of wildlife. Two separate reports by

the Utah Division of Wildlife Resources (DWR) identify species having potential to inhabit the region. The species that is considered to be of high interest in the local area is the Pronghorn. Pronghorns are found as year-long residents within and adjacent to the permit area. These animals were transplanted to this site by the DWR in 1972 and are part of the Icelander Antelope Herd Unit II. Pronghorn prefer open sagebrush-desert and shrub-grassland habitats in areas of the Western United States. They are primarily browsers but are known to forage on grasses and forbs during spring and summer (FWS, 1978).

The pinyon-juniper woodlands, and interspersed sagebrush parks are winter range for mule deer. Many of the drier slopes are essentially juniper stands of scattered trees. The mule deer winter use is restricted to periods when snow is available or surface water is present during snow melt in the early spring, and the UDWR has rated this winter range as high priority.

Elk winter range is located at higher elevations than that of the disturbed area and is not a factor in the disturbed site.

Other wildlife in the pinyon-juniper woodlands are reptiles, passerine birds, lagomorphs, and small rodents.

The talus slopes in the canyon are home to rodents and reptiles. They are also used by chukars. Snake dens are unknown in the talus slopes.

The cliffs are generally north-facing and have potential as raptor nesting sites. Spring raptor inventories were initiated in the spring of 1998. The results of the annual raptor surveys are

Assessment submitted in association with the Right-Of-Way applications.

The USFWS recognizes that the permit area is within range of endangered species, including the black-footed ferret (*Mustela nigripes*), and the bald eagle (*Haliaeetus leucocephalus*). (Letter dated February 4, 1998, Appendix 3-3)..

Raptor surveys were initiated in 1998, and have continued through 2005 with the exception of 2004. These raptor surveys were initiated long before ground-breaking of the Lila project. The results of these survey are contained in Appendix 3-5. The entire Book Cliffs escarpment within the permit area was inventoried for cliff nesting raptors. In addition, a 1-mile buffer zone was inventoried around areas of potential development.

None of the Eagle nests in the close proximity to the mines surface facilities (less than 1/4 mile). have been active nor tended in the last three years. However, historically one active and one tended Golden Eagle Nest is within close proximity to the mines surface facilities. After consultation with USFW, Laura Roma, UDWR, Chris Colt, and BLM, Dave Mills, it was determined that there was a high probability these nest sites would be abandoned. A cooperative agreement with the regulatory agencies and UEI was finalized and is made part of the mitigation for the Lila Canyon EA. One nest discussed above, also lies in an area of potential subsidence which is a mute point due to its close proximity to the mine site. Since the nests are located so close to the mine surface facility, their future potential use was deemed to be lost and were so mitigated by a prey base off-site vegetation treatment project approved by the USFWS, UDWR and BLM. However, if this nest(s) or any future nest is lost as a result of mining activities (subsidence), UEI

area which represents the natural premining conditions of the permit area. The reference area will facilitate the determination of successful revegetation and the resultant final bond release for the Applicant.

**323.200.** Monitoring locations are shown on Plate 3-1 and can also be found on the raptor inventory map in Appendix 3-5.

**323.300.** Protection facilities: There will be no facilities used exclusively for the protection or enhancement of fish and wildlife. The goal of the mine is to construct all facilities and conduct mining in such a manner to minimize adverse impacts to wildlife. These measures will include but are not limited to:

1. Interim revegetation with desirable plant species for wildlife, with the exception of transportation corridors.
2. Speed limits on all roads to lesson potential for possible animal/vehicular collisions.
3. Wildlife awareness training to be incorporated into the annual safety training for all employees.
4. Possible restrictions on firearms on the mine site, and restrictions on off road vehicle usage to lesson disturbance.
5. The Operator will ensure that DWR surveys proposed facilities areas at least two years prior and one year following construction. The Division, in consultation with DWR, cleared the two year requirement if the mine begins construction sometime between 2005 and February 2006. This clearance is because UEI already had eight years of data as well as data for spring 2005. The Operator will continue annual raptor surveys in 2006.
6. An active golden eagle nest, with young, was documented during the 1999 spring raptor survey. The nest is located in the left fork of Lila Canyon within the 1-mile buffer zone. (See Plate 3-1). A consultation with USF&W, BLM, and UDWR was held in the fall of 1999. Line of site and potential mitigation was addressed

during this meeting. The results of this consultation are addressed in Sec 322.220 and the Lila Canyon EA. This nest was not active in 2000, 2001, 2002, or 2003.

- 323.400.** Plate 3-2 Identifies each vegetative type and plant community. The sample locations used during the vegetation inventory can be found on Figure 1 of Appendix 3-1. Critical or high priority wildlife use areas can be correlated to vegetation with the incorporation of the Wildlife Map, Plate 3-1.

Appendix 7-8 provides a description of each water monitoring location. In Summary monitoring locations L-6-G, L-7-G, and L-11-G have a habitat overstory of Douglas Fir-Mountain Brush association. Water monitoring location L-8-G has a habitat of predominantly pinyon - juniper and sagebrush grass associations. Water monitoring locations L-9-G, L-10-G, and L-12-G have some minor wet meadow habitat with an overstory of pinyon-juniper and sagebrush grass immediately adjacent along each side of the sites. Water monitoring sites L-16-G and L-17-G are both seeps and have a habitat of a mix of grasses and salt desert shrub with some invasive tamarisk.

Sites L-1-S, L-2-S, L-3-S, L-13-S, L-14-S and L-15-S are dry washes with a habitat consisting of sagebrush with an overstory of pinion-juniper.

Monitoring site L-4-S and L-5-G are for sediment pond discharge and for the mine discharge and have a habitat consisting of an overstory of pinion-juniper.

- 330. Operation Plan.** A plan for protection of vegetation, fish and wildlife resources follows:

- 331.** The permit area is approximately 5,992.07 acres of which only 42.6 acres are within the surface disturbance area. All incidental disturbance, which will not be utilized in operations, will be revegetated with an interim seed mix proven beneficial to wildlife. The revegetation plan is addressed in Section 341 and the seed mixes are addressed in Tables 3-4 and 3-5. Revegetation will occur

**Table 3-3  
Time Table of Reclamation**

April 16, 2020	Begin Demolition
November 15, 2020	Complete Demolition
April 16, 2021	Commence Earthwork
August 30, 2021	Completion of Phase 1 (Earthwork) Lower Area
September 1, 2021	Begin Earthwork Road / Portal Upper Area
October 1, 2021	Seeding and Mulching (Weather dependent) Completion of Earthwork Upper Area
November 1, 2021	Fencing
November 15, 2021	Reclamation Completed
July 2025	Ocular Estimates of Success (Remedial seeding if necessary September 2026)
October 2023	Planting Seedlings
July 2027	Quantitative Vegetation Inventory
August 2029	Quantitative Vegetation Inventory Site and Reference Area
August 2034	Quantitative Vegetation Inventory of Referenced Area and Project Site, Bond Release Criteria

The tentative life of a mine is twenty years depending on market and mining conditions. As such, the time table is generic and no set year will be specified for the cessation and abandonment of operations.

radius of the surface facilities were assumed lost due to indirect disturbance associated with mine activities. The Lila Canyon EA # UT-070-99-22, outlines mitigation recommended through a cooperative effort between Utah Department of Wildlife Resources, Bureau of Land Management, U.S. Fish and Wildlife and UtahAmerican Energy, Inc. where mitigation would be implemented to increase prey base off-site. The construction of alternative nests was considered to be ineffective. Eagle distribution was not limited by suitable nest sites but by available prey.

An MSO survey will be completed according to Appendix 3-4. Results as described in Appendix 3-4 will be reported to the Division, UDWR, and USFWS.

Construction at the mine to upgrade drainage controls and to construct the road will have a minor impact on wildlife in the area. The impact will mainly be increased human activity associated with the construction and a small, less than 42.6 acre, loss of habitat for the mine site, roads and sedimentation pond. These impacts will have little or no affect on the wildlife because they will be completed in an environmentally sound manner.

UEI will instruct all personnel as to current regulations regarding the use of off-road vehicles, firearm regulations, and where current UDWR proclamations are available. This training will be part of the annual refresher offered to all employees. The company will encourage strict compliance with these regulations.

DWR will be notified of any road kills involving large game and request to have them removed to safeguard raptors. Mine personnel will be instructed to remove road kills a safe distance from the road way.

The Lila Canyon Mine has agreed to mitigate the loss of wildlife habitat as well as the potential loss of habitat use due to disturbance.

This mitigation is under advisement of the wildlife professionals of both the BLM and the Utah Division of Wildlife Resources. The mitigation designed will offset impacts to bighorn sheep, mule deer, elk, and chukker specifically. The mitigation committed to in association with the Lila Mine EA is :

- (1) Install two guzzlers

- (2) Participate in a habitat enhance program on 70+ acres- conversion from Pinyon/Juniper to shrubs, forbs, and grasses.

The implementation dates, and project locations will not be determined until the BLM notice to proceed is given, after permit approval. The overseeing agency for the EA mitigation will be the BLM. Details will be reported to DOGM in the Annual Report immediately following the notice to proceed.

**333.100.** This section is addressed in 333. And 333.300.

**333.200.** This section is addressed in 333. And 333.300.

**333.200.** The Applicant does not plan to monitor any wildlife species during the life of the operation with the exception of raptors. Helicopter spring raptor surveys will be conducted at a minimum of a 1-mile radius around any new or potentially disruptive mining activity, 2-years prior and annually after the proposed activity.

The mine will emphasize their commitment to legal requirements of firearm and off-road vehicle-use by employees. This type of program has been adopted by the operator and will continue throughout the operation. An education program aimed at minimizing potential negative impacts by employees will be presented during the Operators annual retaining programs. Employees will be informed about the wildlife in the area and about which species are protected. They will be counseled to refrain from poaching or harassing animals and about the need to preserve the wildlife. They will also be instructed on the danger of animals on the road during dusk and night hours and consequently the need to reduce speed to avoid colliding with animals difficult to see in these periods of poor light. All threatened or endangered wildlife sighted within or adjacent to the permit area will be reported to the appropriate state and / or federal agency.

Appendix 5-8. Includes areas of undisturbed within the disturbed area.

Top Soil removal / Actual Disturbance:

25.063 Acres discussed in Section 232.100" This is the actual area anticipated to be disturbed for the life of the mine.

The permit area for the Lila Canyon mine is depicted on Plate 4-1. Included in this map are: the boundary of the permit area, the area which will include surface facilities, and the new portals. Existing roads, power lines, and railroads are identified. Private, federal, and state ownership are also identified on this plate. Wildlife habitats have been identified on Plate 3-1 and grazing allotment boundaries are depicted on Plate 4-2.

Table 4-1 lists the various owners of land within and around the permit area. The permit area is approximately 5992.07 acres. Within the permit area, 1446.64 acres comprise private land and 289.06 acres comprise state lands. The remaining 4,256.37 acres is federal land owned and managed by the United States Bureau of Land Management (BLM). Table 4-2 describes the surface ownership and Table 4-2A describes the coal ownership of the permit and surrounding area.

Lila Canyon lies within a region identified by the BLM as the Range Valley Mountain Habitat Management Plan Area ( U-6-WHA-T4). This region was designated as such by a technical committee comprising state, federal, local government agencies and private citizens. This Habitat Management Plan area was established in September 1991 to provide management for the wildlife species of the area, including federally protected wildlife and plant species, big game, upland and small game waterfowl, unique and limited high value wildlife habitat, and access management. Big game and raptor habitat within the Lila Canyon Mine permit area, along with the Range Valley Mountain HMA, have been identified on Plate 3-1.

Appendix 5-8. Includes areas of undisturbed within the disturbed area.

Top Soil removal / Actual Disturbance:

25.3 Acres discussed in Section 232.100" This is the actual area anticipated to be disturbed for the life of the mine.

The permit area for the Lila Canyon mine is depicted on Plate 4-1. Included in this map are: the boundary of the permit area, the area which will include surface facilities, and the new portals. Existing roads, power lines, and railroads are identified. Private, federal, and state ownership are also identified on this plate. Wildlife habitats have been identified on Plate 3-1 and grazing allotment boundaries are depicted on Plate 4-2.

Table 4-1 lists the various owners of land within and around the permit area. The permit area is approximately 5992.07 acres. Within the permit area, 1446.64 acres comprise private land and 289.06 acres comprise state lands. The remaining 4,256.37 acres is federal land owned and managed by the United States Bureau of Land Management (BLM). Table 4-2 describes the surface ownership and Table 4-2A describes the coal ownership of the permit and surrounding area.

Lila Canyon lies within a region identified by the BLM as the Range Valley Mountain Habitat Management Plan Area ( U-6-WHA-T4). This region was designated as such by a technical committee comprising state, federal, local government agencies and private citizens. This Habitat Management Plan area was established in September 1991 to provide management for the wildlife species of the area, including federally protected wildlife and plant species, big game, upland and small game waterfowl, unique and limited high value wildlife habitat, and access management. Big game and raptor habitat within the Lila Canyon Mine permit area, along with the Range Valley Mountain HMA, have been identified on Plate 3-1.

earth and rock fills has certified that the durable rock fill design will ensure the stability of the fill and that the fill meets design requirements.

- 512.230** The professional engineer experienced in the design of coal mine waste piles has certified the design of the coal mine waste disposal facility. (See Appendix 5-7)
- 512.240** Prudent engineering practices was used in the design and construction of impoundments in the permit area. The impoundment designs have been certified by a qualified registered professional engineer. (See Plate 7-6)
- 512.250** The professional engineer has certified the design and construction or reconstruction of primary roads as meeting the appropriate design criteria.
- 512.260** The operator is not requesting a variance from the approximate original contours (AOC).

### 513. Compliance With MSHA Regulations and MSHA Approvals.

- 513.100** ~~No~~Neither Coal processing waste dams or embankments are ~~not~~ anticipated during the term of this permit. Therefore, this section is not applicable.
- 513.200** Planned impoundments and sedimentation ponds do not meet the size or other qualifying criteria of MSHA, 30 CFR 77.216(a). Therefore, this section is not applicable.
- 513.300** Underground development waste transported to the surface, coal processing waste and excess spoil will not be disposed of underground. However, material such as overcast material, rock falls, and slope material, not transported to the surface, may be disposed of underground according to the appropriate MSHA regulations.
- 513.400** Refuse piles meet the requirements of MSHA, 30 CFR 77.214 and 30 CFR 77.215 and all appropriate R645 regulations. (See Appendix 5-7)
- 513.500** Shafts, drifts, adits, tunnels, exploratory holes, entryways or

other opening to the surface from the underground will be capped, sealed, backfilled or otherwise properly managed consistent with MSHA, 30 CFR 75.17711.

- 513.600** Surface water discharges into the underground mine workings is not anticipated or planned, Therefore, this section is not applicable.
- 513.700** ~~M~~Surface mining within 500 feet to an active underground mine is not planned nor anticipated. Therefore, this section does not apply.
- 513.800** Coal mine waste fires plans will be submitted to MSHA and the Division for their approval prior to extinguishing any coal mine waste fires. (See Appendix 5-3)

#### **514. Inspections**

All engineering inspections, except the quarterly inspections of impoundments not subject to MSHA, will be conducted by a qualified registered professional engineer or other qualified professional specialist under the direction of the professional engineer.

- 514.100** Lila Canyon is an underground operation and it is not anticipated that any spoil will be produced. Therefore, this section does not apply.
- 514.200** Refuse Piles. A professional engineer or specialist experienced in the construction of similar earth and waste structures will inspect the refuse pile during construction.
- 514.210** Regular inspections by the engineer or specialist will also be conducted during placement and compaction of coal mine waste materials. If it has been determined that a danger of harm exists to the public health and safety or the environment, more frequent inspections will be conducted. Inspections will continue until the refuse pile has been finally graded and revegetated or until a later time as required by the Division.
- 514.220** The refuse pile inspections will be performed at least quarterly throughout construction and during the

building will jointly house all support personnel such as accounting, administration, engineering, and safety and will provide a comfortable office environment for all employees. Bathhouse and toilet facilities will be found for all employees at this location. The bathhouse will be provided for a location for underground miners to change from clean street clothes to clothing suitable for underground use. The area will be provided showers for employees for use after their scheduled work shifts so they can clean up prior to returning home. Both the bathhouse and office buildings will be of prefabricated construction and will rest on a concrete pad. The pad dimensions will be approximately 150' by 100' by 12". The facility will be designed to accommodate up to 145 employees working rotating shifts.

### **Shop Warehouse**

The shop warehouse building is shown on plate 5-2. Parts and supplies consumed during the mining process will be stored in the warehouse to be issued as needed. The shop area will be used to perform minor equipment repairs and overhauls. The shop warehouse will be a prefabricated modular type building approximately 100' by 150' and will rest on a 4" concrete pad.

### **Security Shack**

The Security Shack shown on Plate 5-2, when used will provide security to the mine site. The security shack will be used primarily at times when the mine is not in production. Security may be provided to protect the public from hazards associated with a mine site and to protect company property from unauthorized use. The security shack will be approximately 10' by 20' by 8" and will be of prefabricated construction and will rest on a 4" concrete slab.

### **Mine Substation**

The mine substation will be located as shown on Plate 5-2 will provide power to surface and underground areas of the mine property. The substation will comprise of approximately four transformers setting on a concrete pad approximately 20' by 20' by 12" and fully fenced. The total area of the substation is approximately 40' by 40'. Power will be fed into the transformers at 46 KVA and will be transformed down to usage voltages for both the surface and underground facilities. It is anticipated that voltages of 110, 220, 440 will be used on the surface and 12,470 volts will be utilized underground. The mine substation will be constructed in a way to fulfill all appropriate MSHA regulations.

### Underground Power Lines and Power Poles

The power lines and power poles location and design will be determined by UP&L. Within the disturbed area it is anticipated all power lines will be underground. Underground lines will be run where feasible. As builds will be provided.

Underground Power Lines will be left in place upon reclamation.

### Water Treatment Plant

The water treatment plant is located on the north-east side of the surface facility area. The plant will rest on a 15' by 15' slab. Process water will flow through the treatment plant at which time it will be treated and made suitable for potable water uses. The potable water will be stored in the potable water tank until it is used. The location of the water treatment plant can be found on Plate 5-2.

### Potable Water Tank

Water treated by the water treatment plant and intended to be used as potable water will be stored in this 15' diameter by 20' high tank. The tank will set on a 15' by 15' concrete pad designed for adequate support of the tank. The location of the potable water tank can be found on Plate 5-2.

### Process Water Tank

Process water, water to be used for mine use or to be treated for potable use, will be stored in this tank. The 15' diameter by 20' high process water tank will rest on a 15' by 15' concrete pad. Process water tank will be filled by using mine discharge water or may be hauled in from off site. The location of the process water tank can be found on Plate 5-2.

### Sewer Tank & Drain Field

The sewer ~~system~~ tank has been designed to facilitate 145 employees working on rotating shifts. The sewer tank ~~and drain field~~ will be located under the south end of the office and bathhouse parking area. The location of the sewer tank can be found on Plate 5-2. The design for the Sewer Tank can be found in Appendix 5-4.

### Drain Field

The drain field has been designed to facilitate 145 employees working on rotating shifts The drain field will be located at a lower elevation and south of the sewer tank. The location of the ~~sewer tank and~~ drain field can be found on Plate 5-2. -The design for the ~~Sewer Tank and Drain F~~drain field can be found in Appendix 5-4.

### Ventilation Fan

The ventilation fan will be accessed and installed from underground. The ventilation portal will be driven from underground and broken from inside out. The location of the portal and fan is shown on Plate 5-2. Fan power will be run underground. Fan access for maintenance and monitoring will be from the underground works. The need for surface fan access is not anticipated at this time, access will be from underground.

### 60-inch Conveyor from ~~slopes~~tunnels to Coal Stockpile-(Main Conveyor)

The Run of Mine underground belt will provide for a means for coal to be conveyed from the working faces to the run of mine coal storage pile on the surface. The belt will provide capacity to convey to the surface, all coal mined in the underground workings. Preliminary design suggests that the conveyor that extends from the bottom of the rock slopes to the stacking tube at the coal storage area, shown on Plates 5-2 and 5-8, will have the following specifications: 60" wide, speed approximately 700 fpm with a length of approximately 320 feet long. Since the ground beneath the conveyor will not be disturbed due to the steepness and remoteness of the area, this conveyor will be completely contained within a tube type structure.

### Reclaim Conveyor(ROM) Underground Belt from Stockpile to Crusher

The Reclaim conveyor will provide for a means for coal to be conveyed from the coal stockpile to the crusher. The belt will provide capacity to convey to the crusher at a rate suitable for crushing. Preliminary design suggests that the reclaim conveyor, shown on Plates 5-2 and 5-8, will have the following specifications: 48" wide, speed approximately 500 fpm with a length of approximately 280 feet long. The portions of the conveyor running on the surface will be covered.

### Loadout 48-inch Conveyor from Crusher to Loadout Bin

The Loadout conveyor will provide for a means for coal to be conveyed from the crusher to the loadout bin. The belt will provide capacity to convey to the loadout at the same rate as the Reclaim conveyor. Preliminary design suggests that the Loadout conveyor, shown on Plates 5-2 and 5-8, will have the following specifications: 48" wide, speed approximately 500 fpm with a length of approximately 210 feet long. The portions of the conveyor running on the surface will be covered.

### Tru 48-inch Conveyor from Loadout Bin to Truck Loadout

The Truck conveyor will provide for a means for coal to be conveyed from the loadout bin to the trucks being loaded. The belt will provide capacity to convey to the trucks at a rate suitable for truck loading. Preliminary design suggests that the truck conveyor, shown on Plates 5-2 and 5-8, will have the following specifications: 48" wide, speed will vary with a length of approximately 50 feet long. The portions of the conveyor running on the surface will be covered.

### Reclaim Tunnel, Escape Tunnel, Fans

Design for the escape and reclaim tunnels is not complete. Standard practice is to construct the tunnels from either concrete or corrugated metal. The reclaim tunnel is approximately 275' long with a 14' diameter. The escape tunnel will be approximately 100' long with a diameter of 4'. Appropriate safety and environmental concerns will be addressed upon detailed design. The preliminary layout is shown on Plates 5-2 and 5-8.

### ROM Storage Pile

The run of mine storage pile receives coal directly from the underground works and provides storage for the coal until it is crushed and loaded into trucks for transportation to a unit train loadout. The coal from the underground run of mine belt will be dropped into a stacking tube located in the center of the run of mine storage pile. This tube will help reduce any fugitive dust. The stacking tube will be approximately 80' high and will allow for approximately 27,000 tons of open storage in the run of mine storage pile. The run of mine storage pile is shown on Plates 5-2 and 5-8.

### Crusher

The enclosed crusher will crush coal from the 8" minus down to a 2" minus size, at the rate of approximately 500 tons per hour. No screening is anticipated at this time. The crushed coal will leave the crusher and be stored temporarily in a 500 ton storage bin located at the truck loadout. The crusher location is shown in Plates 5-2 and 5-8.

### Truck Scale and Loadout

Coal will be reclaimed from the coal storage bin, weighed and then loaded into coal haul trucks for transportation to the various unit train loadouts. A small loadout shack will be constructed to provide cover and protection for the various equipment and controls need for the coal loading process. The truck scale and loadout are shown on Plates 5-2 and 5-8.

### Coal Storage Bin

The coal storage bin is part of the truck loadout and is shown of Plate 5-2. The coal storage bin is where crushed coal is stored waiting to be loaded into coal haul trucks. The bin provides for surge capacity and allows for better control of crushing time. The coal storage bin provides for an enclosed dry location for temporary crushed coal storage. Coal is delivered from the crusher to the coal storage bin by use of a 48" covered surface conveyor running at a speed of approximately 500 FPM. The preliminary layout is shown on Plates 5-2 and 5-8.

### Coal Stacking Tube.

The final design for the coal stacking tube is not yet complete. Preliminary design indicates that the stacking tube will be approximately 15' ~~radius~~ Diameter and approximately 80 feet high. Standard practice is to construct the tube of either concrete or steel. The preliminary layout is shown on Plates 5-2 and 5-8.

### Culverts

A complete list and design for the culverts can be found in Appendix 7-4 Tables 9 and 10, and are shown on Plate 7-2. A summary of the culverts follows:

<u>Culvert</u>	<u>Length</u>	<u>Width</u>
DC-5	40'	18"
DC-6	60'	24"
DC-7	40'	24"
DC-8	40'	18"
DC-9	40'	18"
UC- <u>21</u>	50 <u>30</u> '	60"

### Guard Rails

Approximately 1,520 feet of Guard rails will be installed on the mine access road according to the detailed engineering plan being prepared. Appropriate MSHA and UDOT requirements will be taken into consideration.

### Underground Pipes

Locations of the underground pipes have yet to be determined. Once detailed engineering design is completed the underground pipes will be added to Plate 5-2 or other appropriate Plates. Under ground pipes will be left in place upon reclamation.

### Chain Link Fence

Approximately 1,500' of a six foot high chain link fence will be constructed as shown on Plate 5-2. The fence will be constructed to protect the public, and provide security along the section of county road that runs adjacent to the property.

### Non-Coal Waste Area

An area for non-coal waste has been identified on Plate 5-2. Non-coal waste such as papers, timbers, cans, and miscellaneous scrap that is brought to the surface will be disposed of in a metal bin or "dumpster" located in the non-coal waste area identified on Plate 5-2. Metal will be separated from other forms of trash for salvage. Material not salvageable will be transported to the East Carbon Development Corporation (ECDC)

will be used as fill material for the surface facilities. The rock slope material / underground development waste will contain mostly shale, sandstone and mudstone. Traces of coal may be found but the amount will be insignificant. There are no known coal seams or significant rider seams found below the Sunnyside Seam in the Lila Canyon Portal Area. The rock slope locations are shown on Plate 5-2.

### **Mine Facilities Road / Truck Loadout Road**

The mine facility road shown on Plate 5-2 begins at the edge of County Road 164 and allows for access to the various surface facilities. The road has been located in the most practical location taking into consideration grade, stability, and alignment. Employees will use this road to access the office & bathhouse facilities. Coal haul trucks will use this road to access the scales and truck loadout. All supplies will be hauled on a short portion of this road from the supply storage area to the slope access road. The road will ~~initially be graveled but will be paved in the long term~~ be paved during construction of the facilities and before coal mining operations begin in order to minimize dust and provide good surface for heavy truck traffic as well as facility access. The facility access road will be approximately 24' wide to provide for two lane traffic and will have the appropriate drainage controls to insure long term life and low maintenance. The has been constructed and will be maintained according to the appropriate R645-534 and R645-527 regulations.

### **Office/Bathhouse/Warehouse Parking Area**

Parking will be as shown on Plate 5-2. Parking facilities for office, mine, and warehouse employees will be provided jointly as shown. This area will also provide parking for all vendors, and visitors. The surface of the 150' by 475' area will initially be graded and graveled but may eventually be paved. The parking area is located and designed to allow for convenient and safe parking of personal vehicles. The sewer tank and drain field will be located on the south end of this parking area.

### **Mine Parking**

A mine parking area will be provided as shown on Plate 5-2. The mine parking area is where all mine and mine related mobile equipment will be

parked when on the surface. This is the location where the underground work crews will be loaded into man trips for transportation to the various work areas. The mine parking area will initially be graded and graveled but eventually may be paved. The mine parking area will be approximately 100' by 200'.

### Fuel Tanks

Fuel tanks will be located in the Equipment & Supplies Storage Area and be installed as discussed under Equipment & Supplies Storage Area. A 1,500 gallon diesel tank, 500 gallon hydraulic tank and a 500 gallon gasoline tank will be needed.

### Powder and Cap Magazines

Powder and cap magazines will be mobile temporary, and supplied by the explosive distributor. Upon reclamation the powder and cap magazines will be returned to the distributor.

As per the approved Air Quality Order haul roads will be paved and unpaved roads and pad areas used by mobile equipment will be treated with water or dust suppressant, open stockpiles will be watered as conditions warrant.

**521.** Included in this section are maps, cross sections, narratives, descriptions and calculations used to satisfy the relevant requirements. This section describes and identifies the lands subject to coal mining and reclamation operations covering the estimated life of the project.

**521.100** This application includes the cross sections, maps and plans needed to present the relevant information required by the Division. This information includes the following:

**521.110.** Plate 5-1 Shows area previously mined and approximate dates of mining.

**521.111** Plate 5-1 of part 'B' and 2-2 of part "A" shows the location and extent of known workings of inactive, or abandoned underground mines. The surface portals or mine openings to the surface are shown. Plates 5-1 and 2-2 of part "A" have been

- 521.133.2** The current permit does not propose any relocation of public roads. Therefore, this section is not applicable.
- 521.140** Mine maps and permit area maps and or cross-sections will clearly indicate the following:
- 521.141** ~~Plate 5-1 shows the permit boundary and Plate 5-2 shows the~~ disturbed area boundaries are shown on Plate 5-1 and Plate 5-2 as well as others boundary. ~~At this time, no a~~ Additional subareas requiring additional permits are proposed for the life of the mine addressed in Section 112.800.
- 521.142** The underground workings are shown on Plate 5-5.
- 521.143** The proposed disposal site for placing the slope rock is shown on Plate 5-2 as well as other appropriate plates.
- 521.150** Plates 6-2, 6-3, and 6-4, show surface contours that represent the existing land surface configuration of the proposed permit area.
- 521.151** The Plates show the surface contours for all areas to be disturbed as well as over the total permit area. The Plates showing the surface contours has been prepared by or under the supervision of a registered engineer.
- 521.152** No previously mined areas are included within Part "B". Therefore this section does not apply.
- 521.160** The maps, plates, and cross sections associated with this chapter clearly show:
- 521.161** Proposed buildings, utility corridors, and facilities are shown on Plate 5-2 as well as others.
- 521.162** Area of land affected according to the sequence

of mining and reclamation is shown on the appropriate plates.

- 521.163** Land for which a performance bond will be posted is shown on the appropriate plate. Plate 5-2 as well as others show the area for which the performance bond will be posted. All disturbed areas within the permit boundary has been bonded.
- 521.164** Coal storage and loading areas are shown on Plate 5-2 and certified as required. Additional information can be found in Appendix 5-4.
- 521.165** Topsoil, and waste piles are shown on Plate 5-2 as well as others.
- 521.166** The waste disposal areas are shown for non-coal waste and underground mine waste on Plate 5-2.
- 521.167** No explosives are expected to be stored on site. However, if explosives are stored they will be stored as discussed in Section 520. on Plate 5-2.
- 521.168** Since Lila Canyon mine is an underground operation this paragraph is not applicable.
- 521.169** The refuse pile is shown on Plate 5-2 and discussed in Appendix 5-7.
- 521.170** Transportation facility maps describing roads, and conveyor maintained within the permit is shown with descriptions of roads, embankments, culverts, and drainage structures are presented in section 520 and are shown on Plates 5-2, and 7-2.
- 521.180** Support facilities are described in section 520 and are shown on Plate 5-2. Plate 5-2 is the official disturbed area boundary map.
- 521.190** Other relevant information required by the Division will be addressed.
- 521.200** Signs and markers will:

- 524.746** The maximum weight of explosives detonated in an eight-millisecond period will be recorded on the blasting record.
- 524.747** Information on the initiation system will be recorded on the blasting record.
- 524.748** The type and length of the stemming will be recorded on the blasting record.
- 524.749** Mats or other protections used will be recorded on the blasting record.
- 524.750** Since all structures are either owned by the permittee and not leased to another person or are located over six miles distance from the permit area a record of seismographic and airblast information is not required.
- 524.760** Since a blasting schedule is not required this section does not apply.
- 524.800** The operator will comply with the various appropriate State and Federal laws and regulations in the use of explosives.

**525. Subsidence:** The permittee will comply with the appropriate R645-301-525 requirements.

#### **525.100 Subsidence Control Plan**

**525.110** **Plate 5-3 shows the location of State-appropriated State appropriated water and 5-3 (Confidential) shows the eagle nests that potentially could be diminished or interrupted by subsidence.**

**525.120** No major impacts of subsidence to the surface caused by the underground mining methods proposed during the permit term are anticipated.

The coal seam is approximately 12.5 feet thick with only about 10.5 feet being extracted, and the depth of cover ranges from 0' to approximately 2,300'. The rocks

- 525.230.** Since there are no planned operations under urbanized areas, cities, towns, and communities, or adjacent to industrial or commercial buildings, major impoundments, or perennial streams this section does not apply.
- 525.240.** A detailed plan of the underground workings including maps and descriptions, of significant features of the underground mine, including the size, configuration, and approximate location of pillars and entries, extraction ratios, measure taken to prevent or minimize subsidence and related damage, and areas of full extraction can be found in the R<sup>2</sup>P<sup>2</sup> on file with the BLM local and state offices.
- 525.300.** Subsidence control.
- 525.310.** Measures to prevent or minimize damage.
- 525.311** No attempt will be made to prevent subsidence in any area except where the escarpment near the outcrop is to be protected and to insure that subsidence remains within the permit area.- The use of continuous miners in a pillar section as well as longwall technology provides for planning subsidence in a predictable and controlled manner. Some surface expressions of tension cracks, fissures, or sink holes may be experienced but should be insignificant. The chances of subsidence related damage to any perceived renewable resource is minimal. The value and foreseeable use of the surface lands will not be affected by potential subsidence.
- 525.312** Since there are no buildings or occupied residential dwellings or structures within the Lila Canyon project area this section does not apply.
- 525.313** Room-and-pillar mining in addition to longwall methods will be used at the Lila Canyon Mine.
- 525.400.** Since state-appropriated water supplies exists on the surface 525.400 has been addressed.

- 525.410** Coal will be removed using a combination of continuous miner and long wall methods as described in sections 522 and 523. Sequence and timing for the development of underground workings are also discussed in sections 522 and 523.
- 525.420** Plate 5-5 shows the underground workings and depicts areas where first mining only will be utilized to protect the escarpment and raptor nests that may exist on the escarpment and to insure that subsidence remains within the permit area. State-appropriated water rights are shown on Plates 5-3, 5-5 as well as Plate 7-1.
- 525.430** No major impacts of subsidence to the surface caused by the underground mining methods proposed during the permit term are anticipated.

The coal seam is approximately 12.5 feet thick with only about 10.5 feet being extracted, and the depth of cover ranges from ~~+500'~~0' to approximately 2,300'. The rocks overlaying the coal seam are sandstones and mudstones with some thin bands of coal. Due to the strength of the overburden, and depth of workings, even with full seam extraction, only minimal subsidence if any is anticipated.

- 525.440** Aerial subsidence monitoring will be done annually while the significant subsidence is taking place. The subsidence monitoring will be initiated in an area prior to any 2<sup>nd</sup> mining being done within that area. Initially a 200 foot grid along with baseline photograph will be established prior to any 2<sup>nd</sup> mining. Approximately 12-16 control points will be needed to cover the total mining area. Six of these points will be located outside of the subsidence zone. The accuracy of this survey will be plus or minus 6" horizontally and vertically. From this data a map will be created that will show subsided areas. Once a year a follow up aerial will be performed to determine the extent and degree of active subsidence. Subsidence monitoring will continue for a minimum of 5 years after the mining ceases. If at the end of the 5 year period the annual subsidence in any of the 3 prior years measures more than 10 percent of the

highest annual subsidence amount, subsidence monitoring will continue until there are 3 consecutive years where the annual subsidence amount is less than 10 percent of the highest annual subsidence amount. If for three years in a row the subsidence is measured to be less than 10% of the highest subsidence year, subsidence will be determined to be complete, and no additional monitoring for that area will be required.

A ground survey will be performed, ~~beginning no earlier than six months after mining in the panel has ceased but no more than twelve months after mining ended,~~ in conjunction with the quarterly water monitoring program. During the normal water monitoring program any cracks observed will be noted and reported to DOGM.

**525.450** Subsidence control measures.

- 525.451.** No backstowing or backfilling of voids used as a subsidence control measure is planned at this time. Therefore, this section is not applicable.
- 525.452.** Support pillars as a subsidence control measure is not anticipated at this time. However, an area of partial mining where an unmined coal block will be left for subsidence control is shown on Plate 5-5. First mining indicates an area where a block of coal is roomed leaving pillars for support with no mining of the remaining pillars. Partial mining as shown on Plate 5-5 indicates an area where a block of coal has been isolated without the rooms being developed. Both first mining and partial mining will leave support that can be used to control subsidence. If the partially mined area shown on Plate 5-5 is ever roomed out, the area now defined as partially mined would become an area defined as being first mined.
- 525.453.** An outcrop barrier of coal will be left to protect the escarpments at the outcrop. As per the R2P2 only first mining will be allowed within 200' of the outcrop. Mains, submains, and ventilation portals will be allowed within the outcrop.

**528.322** Refuse Piles. Each pile will meet the requirements of MSHA, 30 CFR 77.214 and 30 CFR 77.215, meet the design criteria of R645-301-210, R645-301-512.230, R645-301-513.400, R645-301-514.200, R645-301-515.200, R645-301-528.320, R645-301-536 through R645-301-536.200, R645-301-536.500, R645-301-536.900, R645-301-542.730, R645-301-553.250, R645-301-746.100, R645-301-746.200, and any other applicable requirements.

**528.323** Burning and Burned Waste Utilization.

**528.323.1.** Coal mine waste fires will be extinguished by the person who conducts coal mining and reclamation operations, in accordance with a plan approved by the Division and MSHA. The plan will contain, at a minimum, provisions to ensure that only those persons authorized by the operator, and who have an understanding of the procedures to be used, will be involved in the extinguishing operations. The coal mine waste fire plan can be found in Appendix 5-3. MSHA approval is not required unless you have an actively burning fir. (Phone conversation with Billy Owens MSHA Denver 5/31/05)

**528.323.2.** No burning or burned coal mine waste will be removed from the permitted disposal area.

**528.330** Noncoal Mine Waste.

**528.331** Noncoal mine wastes including, but not limited to, grease, lubricants, paints, flammable liquids, garbage, abandoned mining machinery, lumber and other combustible materials generated during mining activities will be placed and stored in a controlled manner in a designated portion of the permit area. The noncoal mine waste will be

---

---

---

## 540. Reclamation Plan.

### 541. General.

- 541.100.** The operator is committed to performing all reclamation as in accordance with R645 rules.
- 541.200.** N/A. The operator is not involved in surface mining activities.
- 541.300.** The operator is committed to the removal of all equipment facilities and structures upon cessation of mining activities.
- 541.400.** The operator will address all reclamation activities as referenced in Chapter 5 of this document.

### 542 Narratives, Maps and Plans.

- 542.100.** See Table 3-3 time table based on project reserves markets and life of mine.
- 542.200.** The ~~surface facility~~ perimeter of the disturbed area ~~comprises~~ contains approximately 42.6 surface acres within the disturbed area ~~boundary~~. ~~The actual disturbance, pads, silos, coal processing structures, parking constitute a total of 25.3 acres.~~ but only 25.3

acres will be disturbed leaving 17.3 acres of undisturbed islands within the disturbed area.

The following R645 regulations will give detailed description and reclamation procedures to address these areas of disturbance. The reclamation plan for the sediment pond and drainage control structures can be found in Appendix 7-4.

Topsoil amounts can be found in Section 232.100 and are calculated from Plate 203. Concrete amounts can be calculated from the text in Section 520. Coal Mine Waste volumes can be found in Appendix 5-7. Volumes were calculated using a Cad system.

- 542.300.** Included.
- 542.310.** Included. (See Plates 5-26 & 7-7)
- 542.320.** There will not be any surface facilities left post mining.
- 542.400.** Not applicable. No surface facilities will remain post bond liability period.
- 542.500.** A reclamation time table is included as Table 3-3.
- 542.600.** All roads within the disturbed area will be reclaimed immediately after they are no longer needed for mining and reclamation operations.
- 542.610.** The time table of reclamation activities will enable the roads to be removed concurrently with reclamation activities. So, no closures specific to traffic would be anticipated.
- 542.620.** All bridges and culverts will be removed concurrent with reclamation.
- 542.630.** All disturbed areas will be ripped and top soiled prior to revegetation activities in compliance with all applicable R645 regulations. (See Appendix 5-

earth and rock fills has certified that the durable rock fill design will ensure the stability of the fill and that the fill meets design requirements.

- 512.230** The professional engineer experienced in the design of coal mine waste piles has certified the design of the coal mine waste disposal facility. (See Appendix 5-7)
- 512.240** Prudent engineering practices was used in the design and construction of impoundments in the permit area. The impoundment designs have been certified by a qualified registered professional engineer. (See Plate 7-6)
- 512.250** The professional engineer has certified the design and construction or reconstruction of primary roads as meeting the appropriate design criteria.
- 512.260** The operator is not requesting a variance from the approximate original contours (AOC).

### **513. Compliance With MSHA Regulations and MSHA Approvals.**

- 513.100** Neither Coal processing waste dams or embankments are anticipated during the term of this permit. Therefore, this section is not applicable.
- 513.200** Planned impoundments and sedimentation ponds do not meet the size or other qualifying criteria of MSHA, 30 CFR 77.216(a). Therefore, this section is not applicable.
- 513.300** Underground development waste transported to the surface, coal processing waste and excess spoil will not be disposed of underground. However, material such as overcast material, rock falls, and slope material, not transported to the surface, may be disposed of underground according to the appropriate MSHA regulations.
- 513.400** Refuse piles meet the requirements of MSHA, 30 CFR 77.214 and 30 CFR 77.215 and all appropriate R645 regulations. (See Appendix 5-7)
- 513.500** Shafts, drifts, adits, tunnels, exploratory holes, entryways or

other opening to the surface from the underground will be capped, sealed, backfilled or otherwise properly managed consistent with MSHA, 30 CFR 75.1711.

- 513.600** Surface water discharges into the underground mine workings is not anticipated or planned, Therefore, this section is not applicable.
- 513.700** Surface mining within 500 feet to an active underground mine is not planned nor anticipated. Therefore, this section does not apply.
- 513.800** Coal mine waste fires plans will be submitted to MSHA and the Division for their approval prior to extinguishing any coal mine waste fires. (See Appendix 5-3)

#### **514. Inspections**

All engineering inspections, except the quarterly inspections of impoundments not subject to MSHA, will be conducted by a qualified registered professional engineer or other qualified professional specialist under the direction of the professional engineer.

- 514.100** Lila Canyon is an underground operation and it is not anticipated that any spoil will be produced. Therefore, this section does not apply.
- 514.200** Refuse Piles. A professional engineer or specialist experienced in the construction of similar earth and waste structures will inspect the refuse pile during construction.
- 514.210** Regular inspections by the engineer or specialist will also be conducted during placement and compaction of coal mine waste materials. If it has been determined that a danger of harm exists to the public health and safety or the environment, more frequent inspections will be conducted. Inspections will continue until the refuse pile has been finally graded and revegetated or until a later time as required by the Division.
- 514.220** The refuse pile inspections will be performed at least quarterly throughout construction and during the

building will jointly house all support personnel such as accounting, administration, engineering, and safety and will provide a comfortable office environment for all employees. Bathhouse and toilet facilities will be found for all employees at this location. The bathhouse will be provided for a location for underground miners to change from clean street clothes to clothing suitable for underground use. The area will be provided showers for employees for use after their scheduled work shifts so they can clean up prior to returning home. Both the bathhouse and office buildings will be of prefabricated construction and will rest on a concrete pad. The pad dimensions will be approximately 150' by 100' by 12". The facility will be designed to accommodate up to 145 employees working rotating shifts.

### **Shop Warehouse**

The shop warehouse building is shown on plate 5-2. Parts and supplies consumed during the mining process will be stored in the warehouse to be issued as needed. The shop area will be used to perform minor equipment repairs and overhauls. The shop warehouse will be a prefabricated modular type building approximately 100' by 150' and will rest on a 4" concrete pad.

### **Security Shack**

The Security Shack shown on Plate 5-2, when used will provide security to the mine site. The security shack will be used primarily at times when the mine is not in production. Security may be provided to protect the public from hazards associated with a mine site and to protect company property from unauthorized use. The security shack will be approximately 10' by 20' by 8" and will be of prefabricated construction and will rest on a 4" concrete slab.

### **Mine Substation**

The mine substation will be located as shown on Plate 5-2 and will provide power to surface and underground areas of the mine property. The substation will comprise of approximately four transformers setting on a concrete pad approximately 20' by 20' by 12" and fully fenced. The total area of the substation is approximately 40' by 40'. Power will be fed into the transformers at 46 KVA and will be transformed down to usage voltages for both the surface and underground facilities. It is anticipated that voltages of 110, 220, 440 will be used on the surface and 12,470 volts will be utilized underground. The mine substation will be constructed in a way to fulfill all appropriate MSHA regulations.

### **Underground Power Lines**

Within the disturbed area it is anticipated all power lines will be underground. Underground lines will be run where feasible. As builds will be provided. Underground Power Lines will be left in place upon reclamation.

### **Water Treatment Plant**

The water treatment plant is located on the north-east side of the surface facility area. The plant will rest on a 15' by 15' slab. Process water will flow through the treatment plant at which time it will be treated and made suitable for potable water uses. The potable water will be stored in the potable water tank until it is used. The location of the water treatment plant can be found on Plate 5-2.

### **Potable Water Tank**

Water treated by the water treatment plant and intended to be used as potable water will be stored in this 15' diameter by 20' high tank. The tank will set on a 15' by 15' concrete pad designed for adequate support of the tank. The location of the potable water tank can be found on Plate 5-2.

### **Process Water Tank**

Process water, water to be used for mine use or to be treated for potable use, will be stored in this tank. The 15' diameter by 20' high process water tank will rest on a 15' by 15' concrete pad. Process water tank will be filled by using mine discharge water or may be hauled in from off site. The location of the process water tank can be found on Plate 5-2.

### **Sewer Tank**

The sewer tank has been designed to facilitate 145 employees working on rotating shifts. The sewer tank will be located under the south end of the office and bathhouse parking area. The location of the sewer tank can be found on Plate 5-2. The design for the Sewer Tank can be found in Appendix 5-4.

### **Drain Field**

The drain field has been designed to facilitate 145 employees working on rotating shifts. The drain field will be located at a lower elevation and

south of the sewer tank. The location of the drain field can be found on Plate 5-2. The design for the drain field can be found in Appendix 5-4.

### **Ventilation Fan**

The ventilation fan will be accessed and installed from underground. The ventilation portal will be driven from underground and broken from inside out. The location of the portal and fan is shown on Plate 5-2. Fan power will be run underground. Fan access for maintenance and monitoring will be from the underground works. The need for surface fan access is not anticipated at this time, access will be from underground.

### **60-inch Conveyor from tunnels to Coal Stockpile(Main Conveyor)**

The Run of Mine underground belt will provide for a means for coal to be conveyed from the working faces to the run of mine coal storage pile on the surface. The belt will provide capacity to convey to the surface, all coal mined in the underground workings. Preliminary design suggests that the conveyor that extends from the bottom of the rock slopes to the stacking tube at the coal storage area, shown on Plates 5-2 and 5-8, will have the following specifications: 60" wide, speed approximately 700 fpm with a length of approximately 320 feet long. Since the ground beneath the conveyor will not be disturbed due to the steepness and remoteness of the area, this conveyor will be completely contained within a tube type structure.

### **(ROM) Underground Belt from Stockpile to Crusher**

The Reclaim conveyor will provide for a means for coal to be conveyed from the coal stockpile to the crusher. The belt will provide capacity to convey to the crusher at a rate suitable for crushing. Preliminary design suggests that the reclaim conveyor, shown on Plates 5-2 and 5-8, will have the following specifications: 48" wide, speed approximately 500 fpm with a length of approximately 280 feet long. The portions of the conveyor running on the surface will be covered.

### **48-inch Conveyor from Crusher to Loadout Bin**

The Loadout conveyor will provide for a means for coal to be conveyed from the crusher to the loadout bin. The belt will provide capacity

to convey to the loadout at the same rate as the Reclaim conveyor. Preliminary design suggests that the Loadout conveyor, shown on Plates 5-2 and 5-8, will have the following specifications: 48" wide, speed approximately 500 fpm with a length of approximately 210 feet long. The portions of the conveyor running on the surface will be covered.

#### **48-inch Conveyor from Loadout Bin to Truck Loadout**

The Truck conveyor will provide for a means for coal to be conveyed from the loadout bin to the trucks being loaded. The belt will provide capacity to convey to the trucks at a rate suitable for truck loading. Preliminary design suggests that the truck conveyor, shown on Plates 5-2 and 5-8, will have the following specifications: 48" wide, speed will vary with a length of approximately 50 feet long. The portions of the conveyor running on the surface will be covered.

#### **Reclaim Tunnel, Escape Tunnel, Fans**

Design for the escape and reclaim tunnels is not complete. Standard practice is to construct the tunnels from either concrete or corrugated metal. The reclaim tunnel is approximately 275' long with a 14' diameter. The escape tunnel will be approximately 100' long with a diameter of 4'. Appropriate safety and environmental concerns will be addressed upon detailed design. The preliminary layout is shown on Plates 5-2 and 5-8.

#### **ROM Storage Pile**

The run of mine storage pile receives coal directly from the underground works and provides storage for the coal until it is crushed and loaded into trucks for transportation to a unit train loadout. The coal from the underground run of mine belt will be dropped into a stacking tube located in the center of the run of mine storage pile. This tube will help reduce any fugitive dust. The stacking tube will be approximately 80' high and will allow for approximately 27,000 tons of open storage in the run of mine storage pile. The run of mine storage pile is shown on Plates 5-2 and 5-8.

#### **Crusher**

The enclosed crusher will crush coal from the 8" minus down to a 2"

minus size, at the rate of approximately 500 tons per hour. No screening is anticipated at this time. The crushed coal will leave the crusher and be stored temporarily in a 500 ton storage bin located at the truck loadout. The crusher location is shown in Plates 5-2 and 5-8.

### **Truck Scale and Loadout**

Coal will be reclaimed from the coal storage bin, weighed and then loaded into coal haul trucks for transportation to the various unit train loadouts. A small loadout shack will be constructed to provide cover and protection for the various equipment and controls need for the coal loading process. The truck scale and loadout are shown on Plates 5-2 and 5-8.

### **Coal Storage Bin**

The coal storage bin is part of the truck loadout and is shown of Plate 5-2. The coal storage bin is where crushed coal is stored waiting to be loaded into coal haul trucks. The bin provides for surge capacity and allows for better control of crushing time. The coal storage bin provides for an enclosed dry location for temporary crushed coal storage. Coal is delivered from the crusher to the coal storage bin by use of a 48" covered surface conveyor running at a speed of approximately 500 FPM. The preliminary layout is shown on Plates 5-2 and 5-8.

### **Coal Stacking Tube.**

The final design for the coal stacking tube is not yet complete. Preliminary design indicates that the stacking tube will be approximately 15' Diameter and approximately 80 feet high. Standard practice is to construct the tube of either concrete or steel. The preliminary layout is shown on Plates 5-2 and 5-8.

### **Culverts**

A complete list and design for the culverts can be found in Appendix 7-4 Tables 9 and 10, and are shown on Plate 7-2. A summary of the culverts follows:

<u>Culvert</u>	<u>Length</u>	<u>Width</u>
----------------	---------------	--------------

DC-5	40'	18"
DC-6	60'	24"
DC-7	40'	24"
DC-8	40'	18"
DC-9	40'	18"
UC-1	530'	60"

### **Guard Rails**

Approximately 1,520 feet of Guard rails will be installed on the mine access road according to the detailed engineering plan being prepared. Appropriate MSHA and UDOT requirements will be taken into consideration.

### **Underground Pipes**

Locations of the underground pipes have yet to be determined. Once detailed engineering design is completed the underground pipes will be added to Plate 5-2 or other appropriate Plates. Under ground pipes will be left in place upon reclamation.

### **Chain Link Fence**

Approximately 1,500' of a six foot high chain link fence will be constructed as shown on Plate 5-2. The fence will be constructed to protect the public, and provide security along the section of county road that runs adjacent to the property.

### **Non-Coal Waste Area**

An area for non-coal waste has been identified on Plate 5-2. Non-coal waste such as papers, timbers, cans, and miscellaneous scrap that is brought to the surface will be disposed of in a metal bin or "dumpster" located in the non-coal waste area identified on Plate 5-2. Metal will be separated from other forms of trash for salvage. Material not salvageable will be transported to the East Carbon Development Corporation (ECDC) dump or other approved disposal site for permanent disposal. Once a dumpster has reached capacity, the full dumpster will be replaced with an empty dumpster, and then the full dumpster will be hauled by a contract hauler to the specified disposal site.

### **Mine Facilities Road / Truck Loadout Road**

The mine facility road shown on Plate 5-2 begins at the edge of County Road 164 and allows for access to the various surface facilities. The road has been located in the most practical location taking into consideration grade, stability, and alignment. Employees will use this road to access the office & bathhouse facilities. Coal haul trucks will use this road to access the scales and truck loadout. All supplies will be hauled on a short portion of this road from the supply storage area to the slope access road. The road will be paved during construction of the facilities and before coal mining operations begin in order to minimize dust and provide good surface for heavy truck traffic as well as facility access. The facility access road will be approximately 24' wide to provide for two lane traffic and will have the appropriate drainage controls to insure long term life and low maintenance. The road has been constructed and will be maintained according to the appropriate R645-534 and R645-527 regulations.

### **Office/Bathhouse/Warehouse Parking Area**

Parking will be as shown on Plate 5-2. Parking facilities for office, mine, and warehouse employees will be provided jointly as shown. This area will also provide parking for all vendors, and visitors. The surface of the 150' by 475' area will initially be graded and graveled but may eventually be paved. The parking area is located and designed to allow for convenient and safe parking of personal vehicles. The sewer tank and drain field will be located on the south end of this parking area.

### **Mine Parking**

A mine parking area will be provided as shown on Plate 5-2. The mine parking area is where all mine and mine related mobile equipment will be parked when on the surface. This is the location where the underground work crews will be loaded into man trips for transportation to the various work areas. The mine parking area will initially be graded and graveled but eventually may be paved. The mine parking area will be approximately 100' by 200'.

### **Fuel Tanks**

Fuel tanks will be located in the Equipment & Supplies Storage Area and be installed as discussed under Equipment & Supplies Storage Area. A

1,500 gallon diesel tank, 500 gallon hydraulic tank and a 500 gallon gasoline tank will be needed.

### **Powder and Cap Magazines**

Powder and cap magazines will be mobile temporary, and supplied by the explosive distributor. Upon reclamation the powder and cap magazines will be returned to the distributor.

As per the approved Air Quality Order haul roads will be paved and unpaved roads and pad areas used by mobile equipment will be treated with water or dust suppressant, open stockpiles will be watered as conditions warrant.

**521.** Included in this section are maps, cross sections, narratives, descriptions and calculations used to satisfy the relevant requirements. This section describes and identifies the lands subject to coal mining and reclamation operations covering the estimated life of the project.

**521.100** This application includes the cross sections, maps and plans needed to present the relevant information required by the Division. This information includes the following:

**521.110.** Plate 5-1 Shows area previously mined and approximate dates of mining.

**521.111** Plate 5-1 of part 'B' and 2-2 of part 'A' shows the location and extent of known workings of inactive, or abandoned underground mines. The surface portals or mine openings to the surface are shown. Plates 5-1 and 2-2 of part 'A' have been prepared and certified by or under the direction of a registered professional engineer.

Doelling lists several coal mines and mining activity in within or adjacent to the permit area. Doelling lists the Calkins prospect, the Lila Canyon prospect, and the Prentiss prospect. In addition Doelling lists several coal mines Prentiss, Utah Blue Diamond, Blue Diamond and Heiner Mines. The research has shown that the

waste, coal development waste, or non-coal waste disposal, dams, embankments, other impoundments, and water treatment and air pollution control facilities within part "B" of the proposed permit area. This section is not Applicable.

**521.125** There are no existing sedimentation ponds, permanent water impoundment, coal processing waste banks or coal processing waste dams near or within the permit area.

**521.130** Landowner and right of entry maps are included in the permit application. These maps and cross sections show the following:

**521.131** Plate 4-1 shows the surface ownership and Plate 5-4 shows the coal ownership of land included in or contiguous to the permit area.

**521.132** The applicant has the legal right to enter and begin coal mining and reclamation operations on all areas shown within the permit area. The permit area is shown on Plates 5-3 and 5-4 as well as others.

**521.133** Coal mining or reclamation operations are planned within 100 feet of a public road. There are no plans to relocate public roads.

**521.133.1** Emery County has given permission to conduct coal mining or reclamation operations within 100 feet of the county road. (See Appendix 1-4)

**521.133.2** The current permit does not propose any relocation of public roads. Therefore, this section is not applicable.

**521.140** Mine maps and permit area maps and or cross-sections will clearly indicate the following:

**521.141** Plate 5-1 shows the permit boundary and Plate 5-

- 2 shows the disturbed area boundary. Additional subareas requiring additional permits are addressed in Section 112.800.
- 521.142** The underground workings are shown on Plate 5-5.
- 521.143** The proposed disposal site for placing the slope rock is shown on Plate 5-2 as well as other appropriate plates.
- 521.150** Plates 6-2, 6-3, and 6-4, show surface contours that represent the existing land surface configuration of the proposed permit area.
- 521.151** The Plates show the surface contours for all areas to be disturbed as well as over the total permit area. The Plates showing the surface contours has been prepared by or under the supervision of a registered engineer.
- 521.152** No previously mined areas are included within Part "B". Therefore this section does not apply.
- 521.160** The maps, plates, and cross sections associated with this chapter clearly show:
- 521.161** Proposed buildings, utility corridors, and facilities are shown on Plate 5-2 as well as others.
- 521.162** Area of land affected according to the sequence of mining and reclamation is shown on the appropriate plates.
- 521.163** Land for which a performance bond will be posted is shown on the appropriate plate. Plate 5-2 as well as others show the area for which the performance bond will be posted. All disturbed areas within the permit boundary has been bonded.
- 521.164** Coal storage and loading areas are shown on Plate 5-2 and certified as required. Additional

- 524.750** Since all structures are either owned by the permittee and not leased to another person or are located over six miles distance from the permit area a record of seismographic and airblast information is not required.
- 524.760** Since a blasting schedule is not required this section does not apply.
- 524.800** The operator will comply with the various appropriate State and Federal laws and regulations in the use of explosives.
- 525. Subsidence:** The permittee will comply with the appropriate R645-301-525 requirements.

**525.100 Subsidence Control Plan**

- 525.110** Plate 5-3 shows the location of State appropriated water and 5-3 (Confidential) shows the eagle nests that potentially could be diminished or interrupted by subsidence.
- 525.120** No major impacts of subsidence to the surface caused by the underground mining methods proposed during the permit term are anticipated.

The coal seam is approximately 12.5 feet thick with only about 10.5 feet being extracted, and the depth of cover ranges from 0' to approximately 2,300'. The rocks overlaying the coal seam are sandstones and mudstones with some thin bands of coal. Due to the strength of the overburden, and depth of workings, even with full seam extraction, only minimal subsidence if any is anticipated.

Some surface expressions of tension cracks, fissures, or sink holes may be experienced but should be insignificant. The chances of subsidence related damage to any perceived renewable resource is minimal.

All dirt roads above the mine are in areas in excess of 1,000 feet of cover or in areas where mining will not take

**525.300.** Subsidence control.**525.310.** Measures to prevent or minimize damage.

**525.311** No attempt will be made to prevent subsidence in any area except where the escarpment near the outcrop is to be protected and to insure that subsidence remains within the permit area. The use of continuous miners in a pillar section as well as longwall technology provides for planning subsidence in a predictable and controlled manner. Some surface expressions of tension cracks, fissures, or sink holes may be experienced but should be insignificant. The chances of subsidence related damage to any perceived renewable resource is minimal. The value and foreseeable use of the surface lands will not be affected by potential subsidence.

**525.312** Since there are no buildings or occupied residential dwellings or structures within the Lila Canyon project area this section does not apply.

**525.313** Room-and-pillar mining in addition to longwall methods will be used at the Lila Canyon Mine.

**525.400.** Since state-appropriated water supplies exists on the surface 525.400 has been addressed.

**525.410** Coal will be removed using a combination of continuous miner and long wall methods as described in sections 522 and 523. Sequence and timing for the development of underground workings are also discussed in sections 522 and 523.

**525.420** Plate 5-5 shows the underground workings and depicts areas where first mining only will be utilized to protect the escarpment and raptor nests that may exist on the escarpment and to insure that subsidence remains within the permit area. State-appropriated water rights are shown on Plates 5-3, 5-5 as well as Plate 7-1.

**525.430** No major impacts of subsidence to the surface caused

by the underground mining methods proposed during the permit term are anticipated.

The coal seam is approximately 12.5 feet thick with only about 10.5 feet being extracted, and the depth of cover ranges from 0' to approximately 2,300'. The rocks overlaying the coal seam are sandstones and mudstones with some thin bands of coal. Due to the strength of the overburden, and depth of workings, even with full seam extraction, only minimal subsidence if any is anticipated.

**525.440**

Aerial subsidence monitoring will be done annually while the significant subsidence is taking place. The subsidence monitoring will be initiated in an area prior to any 2<sup>nd</sup> mining being done within that area. Initially a 200 foot grid along with baseline photograph will be established prior to any 2<sup>nd</sup> mining. Approximately 12-16 control points will be needed to cover the total mining area. Six of these points will be located outside of the subsidence zone. The accuracy of this survey will be plus or minus 6" horizontally and vertically. From this data a map will be created that will show subsided areas. Once a year a follow up aerial will be performed to determine the extent and degree of active subsidence. Subsidence monitoring will continue for a minimum of 5 years after the mining ceases. If at the end of the 5 year period the annual subsidence in any of the 3 prior years measures more than 10 percent of the highest annual subsidence amount, subsidence monitoring will continue until there are 3 consecutive years where the annual subsidence amount is less than 10 percent of the highest annual subsidence amount. If for three years in a row the subsidence is measured to be less than 10% of the highest subsidence year, subsidence will be determined to be complete, and no additional monitoring for that area will be required.

A ground survey will be performed in conjunction with the quarterly water monitoring program. During the normal water monitoring program any cracks observed will be noted and reported to DOGM.

**525.450** Subsidence control measures.

**525.451.** No backstowing or backfilling of voids used as a subsidence control measure is planned at this time. Therefore, this section is not applicable.

**525.452.** Support pillars as a subsidence control measure is not anticipated at this time. However, an area of partial mining where an unmined coal block will be left for subsidence control is shown on Plate 5-5. First mining indicates an area where a block of coal is roomed leaving pillars for support with no mining of the remaining pillars. Partial mining as shown on Plate 5-5 indicates an area where a block of coal has been isolated without the rooms being developed. Both first mining and partial mining will leave support that can be used to control subsidence. If the partially mined area shown on Plate 5-5 is ever roomed out, the area now defined as partially mined would become an area defined as being first mined.

**525.453.** An outcrop barrier of coal will be left to protect the escarpments at the outcrop. As per the R2P2 only first mining will be allowed within 200' of the outcrop. Mains, submains, and ventilation portals will be allowed within the outcrop.

**525.454** No measures will be taken on the surface to prevent material damage or lessening of the value or reasonable foreseeable use of the surface.

**525.460.** Anticipated effects of planned subsidence may include tension cracks, fissures, or sink holes. Areas of minimal ground lowering may be anticipated. The chances of subsidence related damage to any perceived renewable resource is minimal.

**525.470.** Since no urbanized areas, cities, towns, public buildings, facilities, churches, schools, or hospitals exist within the permit area this section does not apply.

**525.480.** There are no plans to change or modify the mining plan

and reclamation operations, in accordance with a plan approved by the Division and MSHA. The plan will contain, at a minimum, provisions to ensure that only those persons authorized by the operator, and who have an understanding of the procedures to be used, will be involved in the extinguishing operations. The coal mine waste fire plan can be found in Appendix 5-3. MSHA approval is not required unless you have an actively burning fire. (Phone conversation with Billy Owens MSHA Denver 5/31/05)

**528.323.2.** No burning or burned coal mine waste will be removed from the permitted disposal area.

**528.330 Noncoal Mine Waste.**

**528.331** Noncoal mine wastes including, but not limited to, grease, lubricants, paints, flammable liquids, garbage, abandoned mining machinery, lumber and other combustible materials generated during mining activities will be placed and stored in a controlled manner in a designated portion of the permit area. The noncoal mine waste will be placed in dumpsters and emptied on a as needed basis. The designated noncoal waste area is shown on Plate 5-2.

**528.332** It is anticipated that final disposal of noncoal mine wastes will be at the ECDC facility near East Carbon City. Concrete will be disposed of in a specified area, refer to Plate 5-6 for this location. The disposal site will be located under the reclaimed coal stockpile. This area will receive the maximum fill during reclamation. Placement of this fill around the concrete will help to eliminate runoff. This will ensure that leachate and drainage does not degrade surface or underground water. The noncoal mine waste will

**537. Regraded Slopes.**

- 537.100** Each application will contain a report of appropriate geotechnical analysis, where approval of the Division is required for alternative specifications or for steep cut slopes under R645-301-358, R645-301-512.250, R645-301-527.100, R645-301-527.230, R645-301-534.100, R645-301-534.200, R645-301-534.300, R645-301-542.600, R645-301-742.410, R645-301-742.420, R645-301-752.200, and R645-301-762.

**540. Reclamation Plan.****541. General.**

- 541.100.** The operator is committed to performing all reclamation as in accordance with R645 rules.
- 541.200.** N/A. The operator is not involved in surface mining activities.
- 541.300.** The operator is committed to the removal of all equipment facilities and structures upon cessation of mining activities.
- 541.400.** The operator will address all reclamation activities as referenced in Chapter 5 of this document.

**542 Narratives, Maps and Plans.**

- 542.100.** See Table 3-3 time table based on project reserves markets and life of mine.
- 542.200.** The perimeter of the disturbed area contains approximately 42.6 surface acres within the disturbed area but only 25.3 acres will be disturbed leaving 17.3 acres of undisturbed islands within the disturbed area. The following R645 regulations will give detailed description and reclamation procedures to address

these areas of disturbance. The reclamation plan for the sediment pond and drainage control structures can be found in Appendix 7-4.

Topsoil amounts can be found in Section 232.100 and are calculated from Plate 203. Concrete amounts can be calculated from the text in Section 520. Coal Mine Waste volumes can be found in Appendix 5-7. Volumes were calculated using a Cad system.

- 542.300.** Included.
- 542.310.** Included. (See Plates 5-6 & 7-7)
- 542.320.** There will not be any surface facilities left post mining.
- 542.400.** Not applicable. No surface facilities will remain post bond liability period.
- 542.500.** A reclamation time table is included as Table 3-3.
- 542.600.** All roads within the disturbed area will be reclaimed immediately after they are no longer needed for mining and reclamation operations.
  - 542.610.** The time table of reclamation activities will enable the roads to be removed concurrently with reclamation activities. So, no closures specific to traffic would be anticipated.
  - 542.620.** All bridges and culverts will be removed concurrent with reclamation.
  - 542.630.** All disturbed areas will be ripped and top soiled prior to revegetation activities in compliance with all applicable R645 regulations. (See Appendix 5-8)
  - 542.640.** Road surfacing materials such as sand and gravel, which are not suitable for revegetation

## **Slope Access / Portal Access Road**

### **DESIGN**

See ~~Appendix 5-4~~ and Plate 5-2 for additional information:

**Slope Access / Portal Access Road**

**DESIGN**

Plate 5-2 for additional information:

Appendix 5-4

## Mine Facility Road

# DESIGN

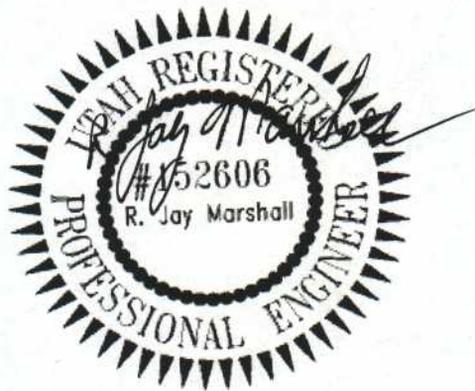
See Appendix 5-4 and Plate 5-2 for additional information:



Appendix 5-4

# Mine Facility Road

# DESIGN



long term to minimize dust and provide good surface for heavy truck traffic as well as facility access. The facility access road will be approximately 24' wide to provide for two lane traffic and will have the appropriate drainage controls to insure long term life and low maintenance. The has been constructed and will be maintained according to the appropriate R645-534 and R645-527 regulations. ~~When detailed engineering design is complete a copy of the detailed road design will be included in Appendix 5-4.~~

#### New Slope Access / Portal Access Road

The slope access road splits off the facility access road near the north-east corner of the equipment and supply storage area, and follows an alignment that takes into consideration grade and direct access. The slope access road will be used to provide access to the rock slopes which in-turn proved access to the underground workings. The slope access road will be used as access for all men, material and equipment need in the mine. Since the slope access road provides for frequent access for men, equipment and materials for a period of six months or longer the slope access road is classified as a primary road. The slope access road will be designed, constructed, and maintained according to appropriate R645 regulations. The slope access road is shown on Plate 5-2. ~~When detailed engineering design is complete a copy of the detailed road design will be included in Appendix 5-4.~~

long term to minimize dust and provide good surface for heavy truck traffic as well as facility access. The facility access road will be approximately 24' wide to provide for two lane traffic and will have the appropriate drainage controls to insure long term life and low maintenance. The has been constructed and will be maintained according to the appropriate R645-534 and R645-527 regulations.

#### New Slope Access / Portal Access Road

The slope access road splits off the facility access road near the north-east corner of the equipment and supply storage area, and follows an alignment that takes into consideration grade and direct access. The slope access road will be used to provide access to the rock slopes which in-turn proved access to the underground workings. The slope access road will be used as access for all men, material and equipment need in the mine. Since the slope access road provides for frequent access for men, equipment and materials for a period of six months or longer the slope access road is classified as a primary road. The slope access road will be designed, constructed, and maintained according to appropriate R645 regulations. The slope access road is shown on Plate 5-2.

#### Existing Little Park Road:

The Little Park road runs from the Horse Canyon Mine, up to the top of Little Park, and across Little Park to Turtle Canyon, then down Turtle Canyon to the Green River. This road has been used for years by residents of Carbon and Emery Counties for recreation, ranching, and hunting purposes. It is a public road and is

### Portal Access Road

This road is shown on Plate 5-2, and will provide access from the bathhouse area to the rock slope portals. The road is approximately 1600' in length, with a maximum grade of 12.5%. The road will be constructed using standard cut/fill techniques. Cut slopes are expected to be no steeper than  $.5H:1V$  with a maximum height of 23'. Fill slopes will not be steeper than 2H:1V with a maximum height of 50'.

### Mine Facilities Access Road

The mine facility road shown on Plate 5-2 begins at the edge of County Road 164 and allows for access to the various surface facilities. The road has been located in the most practical location taking into consideration grade, stability, and alignment. Employees will use this road to access the office & bathhouse facilities. Coal haul trucks will use this road to access the scales and truck loadout. All supplies will be hauled on a short portion of this road from the supply storage area to the slope access road. The road will be constructed using standard cut/fill techniques. Cut slopes are expected to be no steeper than 1H:1V with a maximum height of 5'. Fill slopes will not be steeper than 2H:1V with a maximum height of 5'. The road is relatively flat. Safety factors were not calculated for this road since the most severe conditions are found on the Portal Access Road. Since the Portal Access Road meets or exceeds the minimum safety standard of 1.3 of the Utah Coal Rules, then it should be intuitive that the much flatter mine facility access road will exceed the minimum 1.3 stability standard.

### Road Embankment Stability

The following parameters were used for input for the proposed road embankment:

Slope Height	-	50'
Slope Angle	-	26.5° (2H:1V)
Soil Density	-	116 lbs/ft <sup>3</sup>
Soil Cohesion	-	220 psf dry / 300psf saturated
Internal Friction Angle	-	41° dry / 24° saturated

The calculated Factor of Safety using the above parameters is 2.45 for dry conditions and 1.63 for saturated conditions. This exceeds the required 1.30 Factor of Safety required by the regulations.

### Portal Access Road

This road is shown on Plate 5-2, and will provide access from the bathhouse area to the rock slope portals. The road is approximately 1600' in length, with a maximum grade of 12.5%. The road will be constructed using standard cut/fill techniques. Cut slopes are expected to be no steeper than 1H:1V with a maximum height of 23'. Fill slopes will not be steeper than 2H:1V with a maximum height of 50'.

### Mine Facilities Access Road

The mine facility road shown on Plate 5-2 begins at the edge of County Road 164 and allows for access to the various surface facilities. The road has been located in the most practical location taking into consideration grade, stability, and alignment. Employees will use this road to access the office & bathhouse facilities. Coal haul trucks will use this road to access the scales and truck loadout. All supplies will be hauled on a short portion of this road from the supply storage area to the slope access road. The road will be constructed using standard cut/fill techniques. Cut slopes are expected to be no steeper than 1H:1V with a maximum height of 5'. Fill slopes will not be steeper than 2H:1V with a maximum height of 5'. The road is relatively flat. Safety factors were not calculated for this road since the most severe conditions are found on the Portal Access Road. Since the Portal Access Road meets or exceeds the minimum safety standard of 1.3 of the Utah Coal Rules, then it should be intuitive that the much flatter mine facility access road will exceed the minimum 1.3 stability standard.

### Road Embankment Stability

The following parameters were used for input for the proposed road embankment:

Slope Height	-	50'
Slope Angle	-	26.5° (2H:1V)
Soil Density	-	116 lbs/ft <sup>3</sup>
Soil Cohesion	-	220 psf dry / 300psf saturated
Internal Friction Angle	-	41° dry / 24° saturated

The calculated Factor of Safety using the above parameters is 2.45 for dry conditions and 1.63 for saturated conditions. This exceeds the required 1.30 Factor of Safety required by the regulations.

### Road Cut-Slope Stability

The following parameters were used for the proposed road cut slopes:

Slope Height	-	23'
Slope Angle	-	45° (1H:1V)
Soil Density	-	116 lbs/ft <sup>3</sup>
Soil Cohesion	-	220 psf dry / 300psf saturated
Internal Friction Angle	-	41° dry / 24° saturated

The calculated Factor of Safety for the cut slopes is 1.83 for dry conditions and 1.46 for saturated conditions. This also exceeds the 1.30 requirement of the regulations.

For non-circular failure the slip surface shape follow the arc of a circle through the soil until it intersects the bedrock layer. It then follows the bedrock surface until it again interests the slip circle. The soil strength used along the bedrock surface is the strength of the soil immediately above the bedrock. As can be seen on page 7-A, the safety factor for a worse case non-circular slip failure analysis is 1.51 for saturated conditions. This exceeds the 1.3 requirement of the regulations.

### Road Cut-Slope Stability

The following parameters were used for the proposed road cut slopes:

Slope Height	-	23'
Slope Angle	-	45° (1H:1V)
Soil Density	-	116 lbs/ft <sup>3</sup>
Soil Cohesion	-	220 psf dry / 300psf saturated
Internal Friction Angle	-	41° dry / 24° saturated

The calculated Factor of Safety for the cut slopes is 1.83 for dry conditions and 1.46 for saturated conditions. This also exceeds the 1.30 requirement of the regulations.

For non-circular failure the slip surface shape follow the arc of a circle through the soil until it intersects the bedrock layer. It then follows the bedrock surface until it again interests the slip circle. The soil strength used along the bedrock surface is the strength of the soil immediately above the bedrock. As can be seen on page 7-A, the safety factor for a worse case non-circular slip failure analysis is 1.51 for saturated conditions. This exceeds the 1.3 requirement of the regulations.

Steeper cut-slopes .5H:1V

~~A stability analysis was determined for slopes with a .5H to 1V. It was determined that the safety factor for a slope of 1/2 Horizontal to 1 Vertical was 1.28 for a dry slope and .99 for a saturated slope indicating some instability in the saturated state.~~

The calculated Factor of Safety for the reclaimed slope is 4.89 for dry conditions and 3.12 for saturated conditions. This also exceeds the regulatory requirement of 1.30.

NOTE: All slopes will have a maximum steepness of 1H : 1V. All such slopes will have a safety factor of 1.3 or greater as shown above.

### Reclaimed Slope

The proposed reclamation profile is shown on Plate 5-7C. A section of this profile, approximately 260' in length was selected for the stability calculation. This section is designated E-E' on Plate 5-7C and in Figure 3 of this Appendix. The section shows a maximum slope height of 34 feet at a slope angle of 12.8°. Density, cohesion and internal friction angles were assumed to be the same as the native soil for these calculations.

The calculated Factor of Safety for the reclaimed slope is 4.89 for dry conditions and 3.12 for saturated conditions. This also exceeds the regulatory requirement of 1.30.

NOTE: All slopes will have a maximum steepness of 1H : 1V. All such slopes will have a safety factor of 1.3 or greater as shown above.

### Pile Configuration and Drainage

The hole for the refuse will be filled with refuse. The subsoil will be redistributed and graded to allow drainage and prevent impoundment of water on the pile. Runoff from the refuse pile will drain to the sediment pond as shown on Plate 7-5. A berm will be placed along the perimeter of the pile to direct runoff into the Sediment Pond.

A projected plan and section view of the refuse disposal area is shown on Figure 1 of this Appendix.

### Site Inspection

The refuse disposal area will be inspected under the supervision of a qualified registered professional engineer during construction; this will continue until the area has been graded, covered, and reseeded. Inspections will include observations of any potential safety hazards, to assure that organic material and topsoil is removed before deposition and that construction and maintenance are being performed in accordance with the design plan.

If such inspection discloses a potential hazard, the inspector will immediately notify the regulatory authority of the hazard and the emergency procedures to be implemented.

Copies of the inspection reports will be maintained and available for review.

### Reclamation

Upon completion of operation, the topsoil will be redistributed over the previously placed subsoil. Finally, the refuse area will be covered with topsoil and seeded according to the approved plan. Runoff from the reclaimed refuse pile area will continue to flow to the sediment pond until Phase II Bond Release requirements for the reclaimed site are met.

### Factor of Safety

~~Using Geosystems Software SB-Slope Version 3.0 stability analysis for the refuse pile were run. Calculations were made at cross section 8+00. At this location the refuse depth would be at a maximum. To minimize Factor of Safety, minimum strength materials with maximum densities were used in these calculations. Under these conditions the minimum Factor of Safety was 16.19.~~

Since the pond is incised it is impossible to have a slope failure. Therefore, a safety factor calculation would be of no use. The factor of safety would be infinite.

### Pile Configuration and Drainage

The hole for the refuse will be filled with refuse. The subsoil will be redistributed and graded to allow drainage and prevent impoundment of water on the pile. Runoff from the refuse pile will drain to the sediment pond as shown on Plate 7-5. A berm will be placed along the perimeter of the pile to direct runoff into the Sediment Pond.

A projected plan and section view of the refuse disposal area is shown on Figure 1 of this Appendix.

### Site Inspection

The refuse disposal area will be inspected under the supervision of a qualified registered professional engineer during construction; this will continue until the area has been graded, covered, and reseeded. Inspections will include observations of any potential safety hazards, to assure that organic material and topsoil is removed before deposition and that construction and maintenance are being performed in accordance with the design plan.

If such inspection discloses a potential hazard, the inspector will immediately notify the regulatory authority of the hazard and the emergency procedures to be implemented.

Copies of the inspection reports will be maintained and available for review.

### Reclamation

Upon completion of operation, the topsoil will be redistributed over the previously placed subsoil. Finally, the refuse area will be covered with topsoil and seeded according to the approved plan. Runoff from the reclaimed refuse pile area will continue to flow to the sediment pond until Phase II Bond Release requirements for the reclaimed site are met.

### Factor of Safety

Since the pond is incised it is impossible to have a slope failure. Therefore, a safety factor calculation would be of no use. The factor of safety would be infinite.

## Earthwork

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

To create a natural slope similar to the premining topography (see [Plate 7-7](#) [Plate 5-6](#) Post Mining Contour Map), the natural channels would be reconstructed and rip rap to minimize the potential for erosion as detailed in Chapter 7 Appendix 7-4. Fill will be placed in a manner as to prevent water channelization.

## Erosion

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

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

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

## Revegetation

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

### A. Methodology-Seeding and Mulching

A hydro-seeder is positioned directly behind the trackhoe as the hoe recontours and

## Earthwork

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

To create a natural slope similar to the premining topography (see Plate 5-6 Post Mining Contour Map), the natural channels would be reconstructed and rip rap to minimize the potential for erosion as detailed in Chapter 7 Appendix 7-4. Fill will be placed in a manner as to prevent water channelization.

## Erosion

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

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

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

## Revegetation

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

### A. Methodology-Seeding and Mulching

A hydro-seeder is positioned directly behind the trackhoe as the hoe recontours and

**Horse**  
**Lila Canyon Extension-**  
**~~Lila Canyon Mine~~**

**Chapter 7**  
**Hydrology**

**Volume 6 of 7**

763. Siltation Structures .....	Page -59-
764. Structure Removal .....	Page -59-
765. Permanent Casing and Sealing of Wells .....	Page -60-

### List of Appendices

Appendix 7-1	Baseline Monitoring
Appendix 7-2	Water Monitoring Data (Horse Canyon)
Appendix 7-3	Probable Hydrologic Consequences
Appendix 7-4	Sedimentation and Drainage Control Plan
Appendix 7-5	U.P.D.E.S. Permits
Appendix 7-6	Seep/Spring Inventory
Appendix 7-7	Surface Water Characterizations
Appendix 7-8	Monitoring Location Descriptions
Appendix 7-9	Right Fork of Lila Canyon Flow and Geomorphic Evaluation

### List of Plates

Plate 7-1	Permit Area Hydrology
Plate 7-1A	Permit Area Hydrology (Geologic Map)
Plate 7-1-B	Hydro-Geologic Cross Section
Plate 7-2	Disturbed Area Hydrology & Water Shed Map
Plate 7-3	Water Rights
Plate 7-4	Water Monitoring Locations
Plate 7-5	Proposed Sediment Control
Plate 7-6	Proposed Sediment Pond
<del>Plate 7-7</del>	<del>Post Mining Hydrology</del>

### List of Figures

Figure 7-1	Stratigraphic Section	End of Chapter
Figure 7-2A	Water Level Map - Spring and Fall 2002	End of Chapter
Figure 7-2B	Seasonal Water Level Fluctuations in Piezometers	End of Chapter

### List of Tables

Table 7-1	1985 Spring & Seep Survey Results	Page 9
Table 7-1A	Period of Record Monthly Climate Summary	Page 18
Table 7-2	Water Rights	Page 20
Table 7-3	Water Monitoring Stations	Page 35
Table 7-4	Surface Water Monitoring Parameters	Page 36
Table 7-5	Ground Water Monitoring Parameters	Page 37

locations of the surface drainages, springs and seeps, and piezometers.

## 722. Cross Sections and Maps

**722.100 Subsurface Water.** The locations where subsurface water, including springs and seeps, have been identified are presented on Plates 6-5 and 7-1 and data results are included in Appendix 7-1. Relevant cross sections of subsurface water, geology, and drill holes are shown on Plate 6-5. Where sufficient data are available, the seasonal head differences are presented on contour maps (see Figure 7-2A) and on a piezometer well hydrograph plot (see Figure 7-2B).

**722.200 Surface Water.** Location of all streams and stockwatering ponds or tanks in the area of the mine are shown on Plate 7-1. There are no perennial streams, lakes or ponds known to exist within the proposed permit or adjacent areas.

A new diversion work has recently been constructed by the BLM at the confluence of the Right Fork of Lila Canyon and Grassy Wash. Water from this diversion is directed to the stock pond located in Section 28, T. 16 S., R 14 E. Figure 1 in Appendix 7-9 shows the location of the diversion and the alignment of the diversion channel to the stock pond. Also, the location of the overflow channel back to Grassy Wash is also presented on the figure. No other ditches or drains are known to have been constructed in the area of the mine.

**722.300 Baseline Data Locations.** Locations of all baseline data monitoring points are shown on Plate 7-1. Baseline water quality and quantity data is included in Appendix 7-1.

**722.400 Water Wells.** Three wells and three piezometers have been identified in the permit and adjacent areas. Two wells are located within the alluvium of lower Horse Canyon Creek. Three water Piezometers were drilled in the area, IPA #1, IPA #2 and IPA #3, to monitor mine water levels. Drill hole S-32 was drilled and converted to a water monitoring hole by Kaiser in 1981. The details of these wells ~~and piezometers~~ are discussed in Section 724.100 of the application. The location

of all these wells ~~and piezometers~~ is shown on Plate 7-1. No information on any other wells ~~or piezometers~~ has been identified.

**722.500 Contour Maps** Contour Maps of the proposed disturbed area and mining areas are included as Plates 5-2A, 5-2B, 7-1 and 7-2. These maps use U.S.G.S. based contours and accurately represent the proposed permit and adjacent areas. Disturbed area maps present greater detail from low-level aerial photography, for greater detail, and are tied to relevant U.S.G.S. elevations to ensure correlation between the maps.

### **723. Sampling and Analysis**

All water quality analyses performed to meet the requirements of R645-301-723 through R645-301-724.300, R645-301-724.500, R645-301-725 through R645-301-731, and R645-301-731.210 through R645-301-731.223 will be conducted according to the methodology in the current edition of "Standard Methods for the Examination of Water and Wastewater" or the methodology in 40 CFR Parts 136 and 434. Water quality sampling performed to meet the requirements of R645-301-723 through R645-301-724.300, R645-301-724.500, R645-301-725 through R645-301-731, and R645-301-731.210 through R645-301-731.223 will be conducted according to either methodology listed above when feasible. "Standard Methods for the Examination of Water and Wastewater" is a joint publication of the American Water Works Association, and the Water Pollution Control Federation and is available from the American Public Health Association, 1015 Fifteenth Street, NW, Washington, D.C. 20036.

### **724. Baseline Information**

This section presents a description of the groundwater and surface water hydrology, geology, and climatology resources to assist in determining the baseline hydrologic conditions which exist in the permit and adjacent areas. This information provides a basis to determine if mining operations can be expected to have a significant impact on the hydrologic balance of the area.

**724.100 Ground Water Information.** This section presents a discussion of baseline groundwater conditions in the permit

contains groundwater likely collect from infiltration of surface flows from the upper Horse Canyon area. As indicated in Section 722.400, the well located near the main Horse Canyon surface facilities, identified as Horse Canyon well on Plate 7-1A, is still open, although not operational at this time. The well was investigated and it was determined that it would not be useful as a Piezometer. The pump is sitting on the top of a concrete cap encapsulating the top of the well. The site could not be used as a piezometer without removing the pump. This well will be ~~refurbished and used during the mining and reclamation activities, then sealed and plugged~~ donated to the College of Eastern Utah as part of the Post Mine Land Use Change. The well located near the road junction, identified as MDC well on Plate 7-1A, is an abandoned well owned by Minerals Development Corporation. This well has been sealed to the operator's best knowledge. No hydrologic data is presently available from either of these wells.

Three water piezometers were drilled as part of plans to access the Kaiser South Lease by I.P.A. These piezometers were designated IPA-1, IPA-2 and IPA-3, and are located in the Lila Canyon Permit area (see Plate 7-1). IPA monitored these sites for water depth from 7/94 to 4/96. These monitoring results are included in Appendix 7-1 and monitoring points and measured water levels are shown on Plate 7-1. It should be noted that the monitoring of these holes was done over the 2 3/4 year period to provide baseline data for the South Lease by I.P.A. Monitoring of water depths at these points by UtahAmerican commenced in December 2000 and continued through present. As indicated by the data in Appendix 7-1, the water levels in the piezometers holes show very little fluctuation. Levels change from less than 1.2' to a maximum of 21.2' over an eight year monitoring period. Figure 7-2A and 7-2B present the seasonal fluctuations of the water levels as contour maps and hydrographs. Using these water levels, an estimate of the projected water level assuming that the zones from the individual piezometers wells are connected is shown on Plate 7-1 and the monitoring results are included in Appendix 7-1 - Baseline Monitoring.

The piezometers were installed to provide depth of water only. It is impossible to drop a bailer 1,000 ~~feet~~ and withdraw a water sample without contaminating the sample. ~~Therefore, the~~ The depth and diameter of the piezometers piezometer holes makes it impossible to use them for baseline quality.

it is assumed that the Geneva exploration entries driven south from the Horse Canyon Mine into the proposed Lila Canyon mining area do contain water since the tunnels elevation is approximately 5855 feet.

The Horse Canyon Mine has been closed and the surface area reclaimed. With no significant inflow to the old workings, no discharges are occurring from any of the portal areas nor are expected in the future. It is known however, that water has collected in the old entries. As future mining activities, for the proposed Lila Canyon Mine, will be occurring near this area of collected water in the old workings, it is likely that some or all of this water will be intercepted by the proposed Lila Canyon Mine (see Plate 7-1). Water may then have to be pumped from the mine. Because of undulating floor and unknown void areas, it is impossible to determine the amount of water that would be pumped. The rate of pumping, if any, would be determined by the water discharge system design. All water discharged from the mine would be discharged at UPDES Site # 002A which is Site L-5-G, and will meet all UPDES standards. DOGM has specified planning to include a mine discharge of 500 gpm maximum.

An inspection of the Horse Canyon area following mining has shown no diminution of reasonably foreseeable use of aquifers. Since mining ceased in 1983, subsidence should have occurred within two years. However, no deterioration of the aquifers in the area was identified. Mining has not yet begun on the Lila Canyon site; however, since the structure and groundwater regime is similar to the Horse Canyon area, no diminution or deterioration of groundwater resources is expected in this area.

Occurrences of ground water in the Lila Canyon Mine are expected to be similar to the Geneva Mine (Horse Canyon). Inflows of water encountered while mining reduced to seeps or dried up in a short period of time.

#### Groundwater Systems

In the Lila Canyon Lease area, the groundwater regime consists of two separate and distinct multilayered zones. The upper most zone consists of the Wasatch Group which consists of the Colton Formation, and the undifferentiated Flagstaff Limestone-North Horn Formation, and the Price River Formation. The lower zone consists of the Mesa Verde Group which contains the Price River Formation.

Castlegate Sandstone, and the Blackhawk Formation (where the coal seams are located). ~~This lower zone~~ The Mesa Verde Group is underlain by the Mancos Shale.

Geologic conditions in the permit and adjacent areas are described in detail in Chapter 6 of this P.A.P. Formal aquifer names have not been applied to any groundwater system in the permit and adjacent areas because the geometry, continuity, boundary conditions, and flow paths of the groundwater systems in the area are not fully understood. However, the data do suggest that groundwater systems in each of the bedrock groups are sufficiently different from each other to justify the informal designation of groundwater systems based on bedrock lithology. Thus, the informal designation of the Upper zone - Colton, ~~and~~ Flagstaff/North Horn, ~~and Price River~~ and the Lower zone - Price River, Blackhawk, and Mancos groundwater systems is adopted herein.

Groundwater in the permit and adjacent areas occurs within perched aquifers in the upper zone overlying the coal-bearing Blackhawk Formation as well as within the lower zone of the Blackhawk Formation and Mancos. Hydrogeologic conditions within the permit and adjacent areas are summarized below:

#### Upper Zone

Colton Formation. The Colton Formation outcrops in the northeast portion of the permit and adjacent areas. This formation consists predominantly of fine-grained calcareous sandstone with occasional basal beds of conglomerates and interbeds of mudstone and siltstone. Data presented in Plates 7-1 and 7-1A and Appendices 7-1 and 7-6 indicate that 16 springs issue from the Colton Formation within the permit and adjacent areas.

Waddell et al. (1986) evaluated the discharge of springs in the formation for the period of June to September 1980. The measured discharge rate generally declined during the 4-month period of evaluation. This suggests that the groundwater system has a good hydraulic connection with surface recharge and that most of the annual recharge quickly drains out of the system.

Groundwater issuing from the Colton Formation has a total dissolved solids ("TDS") concentration of 300 to 600 mg/l (as measured by specific conductance and laboratory analyses of TDS). The pH of

North Horn groundwater system and that recharge water entering the Flagstaff-North Horn Formation moves downward until it encounters low permeability shale or claystone layers in the lower portion of the formation, where almost all of the water is forced to flow horizontally to springs.

Data presented in Appendices 7-1 and 7-6 indicate that groundwater issuing from the Flagstaff-North Horn Formation has a TDS concentration range of 400 to 700 mg/l. This water tends to be slightly alkaline and, similar to conditions encountered in the overlying Colton Formation, is of the calcium-magnesium-bicarbonate type.

The data presented in Appendices 7-1 and 7-6 indicate that the total iron concentration of groundwater discharging from springs in the Flagstaff-North Horn Formation is generally less than 0.04 to 0.15 mg/l. Total manganese concentrations in Flagstaff-North Horn groundwater are generally less than 0.03 mg/l. These data do not exhibit seasonal trends.

#### Lower Zone

Price River Formation. The Price River Formation consists of interbedded mudstone and siltstone with some fine-grained sandstone and carbonaceous mudstone. Within the permit area, 17 springs have been found issuing from the Price River Formation as indicated based on data presented in Plates 7-1 and 7-1A and Appendices 7-1 and 7-6. ~~Flows from these springs are limited in quantity and generally show a seasonal decrease with time, being high in the spring and reduce to very low or dry conditions in the summer. Such fluctuations indicate that these springs originate from limited recharge areas. Therefore, these springs are not part a regional aquifer system.~~ Based on specific conductance measurements collected from these springs, the TDS concentration of water issuing from the Price River Formation varies from about 750 to 850 mg/l. The water is slightly alkaline, with a pH of 7.9 to 8.9.

#### Lower Zone

The IPA monitoring piezometers (Plate 7-1) were completed within the first formation with identifiable water above the coal seam, the Price River Formation. Data collected from the piezometers (Appendix 7-1) indicate that water levels in IPA 2 and 3 varied by approximately 2 feet during the period of July

1994 through April 1996, but showed no consistent trend. IPA 1 showed a rise of 5.6 feet over the same period. Measurements collected in 2001 indicated that the water levels in IPA 2 and 3 were 1 to 2 feet higher than the last time it was measured nearly 5 years earlier, while IPA 1 showed a rise of 16 feet. For the period since 2001, no trend has been identified for IPA 2 and 3, while IPA 1 has continued a slow increase. Although an in water levels has occurred during the period of record, this increase is not considered significant.

Assuming that the piezometers are completed in the same saturated zone, the piezometric surface shows that groundwater in the upper Price River Formation would be moving to the northeast, into the Book Cliffs (see Plate 7-1). The gradient of the surface is approximately 0.011 ft/ft. The seasonal fluctuations between fall and spring are almost undistinguishable. Based on the tabulated data (Appendix 7-1), the fluctuation range is less than 0.5 feet between summer and fall readings. Figures 7-2A and 7-2B attempt to show these variations in contour map and piezometer hydrographs.

Castlegate Sandstone. The Castlegate Sandstone consists of a fine-to medium-grained sandstone that is cemented with clay and calcium carbonate. The outcrops of this sandstone form prominent cliffs in the area. No springs were identified in this formation, suggesting that it is not a significant aquifer. The absence of springs is of great significance, since this formation is situated between the overlying Upper groundwater zone (in the Colton, Flagstaff/North Horn, and Price River Formations) and the underlying lower zone (in the Blackhawk Formation). This lackThe absence of springs indicates that there is separation between the upper and lower groundwater zones. MThe absence of springs is most likelythis zone is the result of two factors: 1) clay horizons in overlying formations inhibit vertical recharge from groundwaters in the Flagstaff-North Horn Formations, and 2) the exposed recharge area of the Price River Formation and Castlegate Sandstone is limited primarily to areas of steep cliff faces.

Blackhawk Formation. The Blackhawk Formation underlies the Castlegate Sandstone and consists of interbedded sandstone, siltstone, shale, and coal. The lower Sunnyside coal seam, to be mined by UtahAmerican, is located in the upper portion of the Blackhawk Formation.

Across the formation some of the individual sandstone bodies are discontinuous. This results in areas that are saturated; i.e. sandstone lenses; and areas that are dry; i.e. siltstone and shale sections. This discontinuous nature results in the typical pattern found in the mines of the Wasatch Plateau and the Book Cliffs. As mining advances an isolated area of saturation (perched aquifer) is encountered by the entry or by roof bolting or fractures due to subsidence. As the water from the saturated zone drains into the mine it starts at an initially high rate and over time as the limited extent of the zone is emptied, the rate of flow decreases. Some zones which are laterally connected are able to reach a consistent inflow which is a balance for the recharge to the system with the outflow to the mine entry.

The hydraulic conductivity of the lower zone is believed to be about 0.01 to 0.02 feet per day, similar to values reported by Lines (1985) from the Wasatch Plateau for similar lithologies. Structural dip in the Lila Canyon area is about 6 to 7 degrees. The gradient of the lower zone in the Horse Canyon/Lila Canyon area is probably less than 2 degrees.

---

~~The IPA monitoring piezometers (Plate 7-1) were completed within the first formation with identifiable water below the coal seam, the Sunnyside Sandstone of the Blackhawk Formation. In all three piezometers, immediately below the coal seam, a mudstone layer was encountered. Above the mudstone layer no significant water had been identified. Below the mudstone layer, a sharp transition to a sandstone layer was encountered. This sandstone layer was identified as the Sunnyside Sandstone. Water was identified as occurring from the sandstone layer in each of the piezometers. According to the EarthFax completion logs, the screened zones in the piezometers were located within the Sunnyside Sandstone layer and a cement-bentonite seal was placed from the top of the sandstone layer to the ground surface of the piezometer. Thus, the water level measured in the piezometers is indicative of the conditions found within the sandstone layer.~~

---

~~Data collected from the piezometers (Appendix 7-1) indicate that the water in the sandstone is under pressure. In IPA 1, the water level is approximately 590 feet above the completion zone. In IPA 2, the water level is about 810 feet above the screened level. While, IPA 3 has a water level approximately 250 feet above the completion level.~~

---

---

Additionally, water levels in IPA 2 and 3 varied by approximately 2 feet during the period of July 1994 through April 1996, but showed no consistent trend. IPA 1 showed a rise of 5.6 feet over the same period. Measurements collected in 2001 indicated that the water levels in IPA 2 and 3 were 1 to 2 feet higher than the last time it was measured nearly 5 years earlier, while IPA 1 showed a rise of 16 feet. For the period since 2001, no trend has been identified for IPA 2 and 3, while IPA 1 has continued a slow increase. Although an increase in water levels has occurred during the period of record, this increase is not considered significant.

---

As the piezometers are completed in the same saturated zone, the piezometric surface shows that groundwater in the Sunnyside Sandstone to be moving to the northeast, into the Book Cliffs (see Plate 7-1). The gradient of the surface is approximately 0.011 ft/ft. The seasonal fluctuations between fall and spring are almost undistinguishable. Based on the tabulated data (Appendix 7-1), the fluctuation range is less than 0.5 feet between summer and fall readings. Figures 7-1 and 7-2 attempt to show these variations in contour map and piezometer hydrographs.

The water monitoring piezometers show water levels above the lower zone containing the coal seam in area of the mine. However, as however, the zones recorded are not connected to the lower groundwater zone. As reported in the Castlegate Sandstone section, no springs or water bearing zones were identified in the spring and seep inventories or in the drilling of the water monitoring piezometers in the formation. Therefore, indicating that the piezometer-monitored zones are under pressure and that the water identified in the upper zone is perched and perched and are isolated from the lower groundwater zone.

---

While the water in the Sunnyside Sandstone is under pressure, there was no indication during drilling that the coal seam was saturated. Similar conditions have been identified in other mines in the Wasatch Plateau and the Book Cliffs. It is likely that the water within the Sunnyside Sandstone will not affect mining unless the confining mudstone layer is breached.

---

It is possible that mining will intercept some water as it progresses down dip. However, as discussed previously regarding mine water inflows to the Horse Canyon Mine, it is expected that water quantities and quality will be similar to that encountered in the Horse

a TDS concentration in the range of 2200 to 4200 mg/l and are of the sodium-sulfate-chloride type (Appendix 7-1). Total iron concentrations ranged from 0.35 to 11.8 mg/l. Total manganese concentrations ranged from 0.05 to 0.29 mg/l. Chemical compositions of other parameters are consistent with waters from the Mancos Shale in the Book Cliffs area. The springs appear to be fault related (see Appendix 7-7).

#### Recharge and Discharge Relations

Recharge rates were calculated by Waddell and others (1986, p. 43) for an area in the Book Cliffs. Waddell estimated recharge at about 9 percent of annual precipitation. Lines and others (1984) indicate the mean annual precipitation along the Book Cliffs in the area of the Horse Canyon Mines is about 12 inches, indicating a recharge rate of just over 1 inch per year.

The recharge and discharge areas for local perched aquifers in the upper zone (Colton, and Flagstaff-North Horn ~~and Price River~~ Formations) generally lie within the drainage areas of Horse and Lila Canyons. These local systems are complex and highly dependent on topography. Recharge water from precipitation or snow melt enters the Colton or Flagstaff-North Horn Formations and moves downward until it encounters low permeability shale or claystone layers in the formations, where almost all of the water is forced to flow horizontally to springs. The springs exhibit substantial variability in discharge in response both to spring snowmelt events and to drought and wet years. Discharge rates as great as 20 gpm have been recorded from the springs during the high-flow season, and discharge rates as low as 1 gpm are not uncommon during late summer. The effects of the drought occurring in the late 1980s and early 1990s are clearly evident in the flow records.

Recharge to the lower zone including the Price River, Castlegate Sandstone, Blackhawk Formation, and Mancos Shale is of limited magnitude, due primarily to the limited area of exposure on steep outcrops and the presence of low-permeability units in overlying formations. These two zones are separated by clay layers in the upper Blackhawk and Price River Formations and undifferentiated Flagstaff-North Horn Formations; which contain approximately 80 percent clays, siltstones, mudstones, and shales, ~~are~~ all highly restrictive to ~~vertical~~ groundwater movement (Fisher and others, 1960).

Recharge to the lower zone probably occurs primarily from vertical movement of water through the overlying formations and is probably greatest where surface fractures intersect the topographic highs where the upper zone formations outcrop. The rate of recharge to the lower zone is very slow. The lack of a significant recharge source results in limited discharge areas. The largest portion of recharge to the lower zone is in the ~~Castlegate Sandstone and upper member of the Blackhawk Formation with some leakage from the upper zone~~ is in the upper Price River Formation where the greatest number of springs in the lower zone are identified.

Faults may effect flow, direction and magnitude of both lateral and vertical flows. However, the area is abundant with plastic or swelling clays that can seal faults and fractures inhibiting both lateral and vertical flows.

Assuming mass-balance and stable hydrologic conditions, recharge will equal discharge over the long term. The relatively rapid groundwater discharge from the upper zone formations as compared with the underlying lower zone formations suggest that the stratigraphically-higher water discharges are local and are not hydraulically connected with the lower zone. Waddell et al. (1986) conclude that the perched nature of the upper zone formations protect them from the influence of dewatering of the coal-bearing zone unless the upper zone is influenced by subsidence.

Groundwater resources in the permit area are limited due to the small surface area and low recharge rates. There is not enough base flow from groundwater discharge to maintain a perennial flow in Horse Canyon Creek or Lila Canyon.

The upper groundwater zone produces low volume spring flows from up-dip exposures of bedrock and overlying alluvium. Some spring discharges from this zone have been developed and are used for livestock and wildlife. The lower groundwater zone has very limited discharges that are used for wildlife, generally during the early spring. Based on the location of these lower zone points and the vertical separation (500 feet) between the coal seam and the points, there is no possibility of mining impacting the springs.

**724.200 Regional Surface Water Resources.** The permit area exists entirely within the Horse Canyon, Lila Canyon, and Little Park

- (4) If adverse impacts to the receiving stream are noted, steps will be taken, with Division input and approval, to minimize or eliminate those impacts.

(Also see Appendix 7-3)

**728.334 Water Availability** (see Appendix 7-3)

**728.335 Other Characteristics** (see Appendix 7-3)

**728.340 Surface Mining Activity** N/A - Underground Mine

**728.400 Permit Revision** To be reviewed by the Division.

**729. Cumulative Hydrologic Impact Assessment (CHIA)**

**729.100 CHIA** Assessment provided by Division.

**729.200 Permit Revision** To be reviewed by the Division.

**730. Operation Plan**

**731. General Requirements** This will be an underground mine with the perimeter of the disturbed area containing approximately 42.6 surface acres within the disturbed area but only 25.3 acres will be disturbed leaving 17.3 acres of surface disturbance for mine site facilities and roads undisturbed islands within the disturbed area. Runoff from the disturbed minesite area is proposed to be controlled by a system of ditches and culverts which will convey all disturbed area runoff to a sediment pond for final treatment prior to discharge.

This permit application includes a plan, with maps and descriptions, indicating how the relevant requirements of R645-301-730, R645-301-740, R645-301-750 and R645-301-760 will be met. Each of these sections are addressed in this Chapter, along with relevant Maps and Appendices.

started, no underground water is presently available for sampling; selected springs are proposed for sampling under the Ground Water Monitoring Plan.

If ground water is encountered in the future mining of a quantity which requires discharge, the water will be monitored in accordance with requirements of this section and a monitoring plan will be proposed at that time.

For purposes of the water monitoring program, springs and seeps are considered ground water and will be monitored as such.

**731.211 Ground-Water Monitoring Plan** Based on information in the PHC determination (Appendix 7-3), and as indicated above, the only ground water resources on or adjacent to the permit area that can be monitored at this time; are springs and seeps. See Appendix 7-6 for a detailed description of the water monitoring locations.

There are a total of ~~47~~13 ground11 water monitoring sites proposed for this property. (See Table 7-3). Station L-5-G is the potential mine discharge point, and will be monitored at least monthly, or as occurs, in accordance with U.P.D.E.S. Permit requirements. (See Table 7-4) Stations L-5-G, L-7-G, L-8-G, L-9-G, L-11-G, and L-12-G are significant springs or seeps located over the area of proposed mining. These springs will be monitored on a quarterly basis for parameters listed in Table 7-5.

Station L-6-G (Table 7-3) is in the vicinity of 2 listed springs, Mont Spring and Leslie Spring. These springs are within the same small drainage, and may in fact be the same spring. Close examination of spring/seep and baseline monitoring stations show only one site in this drainage with any consistent flows - site H-18; therefore, this site was originally chosen to monitor the Mont and Leslie Spring area. However in recent years L-6-G has been dry and Location L-11-G has been

**731.312 Storage of Acid- or Toxic-Forming Materials** Storage of potentially acid- or toxic-forming materials, such as fuel, oils, solvents and non-coal waste will be in a controlled manner, designed to contain spillage and prevent runoff to surface or ground water resources.

All oils and solvents will be stored in proper containers within enclosed structures. Fuels will be stored in appropriate tanks, enclosed within concrete or earthen bermed areas designed to contain any spillage.

Non-coal waste (garbage) will be stored in a designated location, in dumpsters, and removed to an approved landfill (East Carbon Development Contractors - ECDC) on a regular, as-needed basis.

Unused or obsolete equipment or supplies will be stored in a designated area. Drainage from the storage area will be directed to the sediment pond as shown on the Sediment Control Map, Plate 7-5.

Underground development waste (if any) will also be stored in a designated area. Such waste will be tested for acid- or toxic-forming potential, and if found to be acid- or toxic-forming, the waste site will be protected from surface runoff by the use of earthen berms.

**731.320 Storage, Burial, Treatment** All storage, burial and treatment practices will be as described in this permit, and consistent with applicable material handling and disposal provisions of the R645-Rules.

**731.400 Transfer of Wells** There are presently three Piezometers on this permit. When these Piezometers are no longer required, they will be sealed in a safe, environmentally sound manner in accordance with regulations (see Section 631.200). The Horse Canyon Well will be donated to the College of Eastern Utah as part of the Post Mine Land Use Change.

~~There are presently no plans to transfer any wells to any other party.~~

**731.500 Discharges** The only proposed discharges from this operation will be from the sediment pond and/or underground mine water. Each of

At the present time, there are no plans to divert water from the underground workings of this operation to any other underground workings.

If it became necessary to discharge water from the mine, this water would be discharged in accordance with the UPDES permit application in Appendix 7-5. The water would be discharged into the North Fork of Coleman Wash (Lila Canyon). Refer to Plate 7-5.

**731.520 Gravity Discharges** Location of the proposed portal slopes are below the western (upper) exposure of the easterly dipping coal bed. In the area immediately around the proposed portals, no water is presently issuing from the strata above or below the coal outcrop; therefore, it is assumed any water encountered in the underground mining will not be under artesian pressure or with sufficient hydrostatic head to raise it to the portal site.

The coal seam to be mined dips away from the portal site at approximately 10%. If water is encountered in the mining, it will likely be at a static level far below the exposed outcrop or rock slopes. This may result in some possible mine discharge from pumping, but not from gravity.

**731.521 Portal Location** The proposed access portals are below the ~~characteristics will be properly stored, protected from runoff, removed to an approved disposal site or buried on site beneath a minimum of 4' of non-acid, non-toxic material.~~ coal outcrop, as shown on Figure 7-1, Plates 5-5 and 7-5. The fan is to be located above, at the outcrop. The rock slopes will slope up to the east at approximately 12% to contact the coal seam; however, the coal seam is dipping down to the east in this area. The approximate point of contact between the rock slopes and the coal seam will be 1227' from the surface at an elevation of 6300'. Ground water levels in the mining area, based on the 3 water monitoring holes and other geologic data, appear to be nearly static at elevation 5990 in this area (see Figure 7-1).

Water level in the mine would have to raise approximately 310' to reach the rock slope/coal seam contact and result in a gravity discharge. Water monitoring results and other historical data in the area do not indicate this is likely to occur.

**731.522 Surface Entries after January 21, 1981** This is not known to be an acid-producing or iron-producing coal seam; however, proposed portals are located to prevent gravity discharge from the mine (see Section 731.521).

**731.600 N/A** - There are no proposed coal mining or reclamation operations within 100 feet of a perennial or intermittent stream. Section 731.600 is not applicable.

**731.700 Cross Sections and Maps** The following is a list of cross-sections and maps provided in this section of the P.A.P.

Plate 7-1 Permit Area Hydrology Map  
Plate 7-2 Disturbed Area Hydrology/Watershed  
Plate 7-3 Water Rights Locations  
Plate 7-4 Water Monitoring Location Map  
Plate 7-5 Proposed Sediment Control Map  
Plate 7-6 Proposed Sediment Pond  
~~Plate 7-7 Post-Mining Hydrology~~

All required maps and cross-sections have been prepared by, or under the supervision of, and certified by a Registered Professional Engineer, State of Utah.

**731.710 General Area Hydrology** Plate 7-1.

**731.720** Plate 7-2.

**731.730 Water Monitoring Map** Plate 7-4.

**731.740 Sediment Pond Map** Plate 7-6.

**731.750** Plate 7-6.

**737. Noncoal Mine Waste** Storage and final disposal of noncoal mine waste are described under section 747.

**738. Temporary Casing and Sealing of Wells** There are no wells proposed to be used to monitor ground water conditions associated with this permit or operation.

**740. Design Criteria and Plans** Design criteria and plans for this permit are detailed in Appendix 7-4. The following section will describe the general drainage and sediment control plan.

**741. General Requirements** The proposed operation is an underground mine with a relatively small surface disturbance for transportation, support and coal handling facilities. The proposed surface facilities will comprise a disturbed area perimeter of approximately 42.6 acres. Access roads and utility lines will consist of approximately 10 acres of additional disturbance along a BLM Right-of-Way designated as a "Transportation Corridor".

The majority of undisturbed runoff from areas above the proposed mine site will be diverted beneath the site via an undisturbed diversion culvert. Runoff from the disturbed mine site area will be directed to a sediment pond, designed to contain and treat the runoff from a 10 year - 24 hour precipitation event for the contributing watershed. Disturbed area runoff will be directed to the sediment pond via a combination of properly sized ditches and culverts. The general drainage control plan for the mine site is shown on Plate 7-5. The complete Drainage Design and Control Plan is provided in Appendix 7-4 of this P.A.P.

**742. Sediment Control Measures** See Appendix 7-4 for Sediment Control Measure details.

#### **742.100 General Requirements**

**742.110 Designed/Constructed/Maintained** Appropriate sediment control measures will be designed, constructed and maintained using the best technology currently available to:

areas, to prevent material damage outside the permit area and to assure the safety of the public detailed diversion designs are presented in Appendix 7-4 of this P.A.P.

**742.312** See Appendix 7-4 for diversion designs.

**742.313** As indicated, all diversions for the Lila Canyon Mine are temporary, and will be removed when no longer needed. Land disturbed by removal will be reclaimed in accordance with R645-301 and R645-302. Prior to diversion removal, downstream water treatment facilities will be modified or removed. See Reclamation Hydrology Section of Appendix 7-4.

**742.320 Diversion of Perennial and Intermittent Steams** Section 742.320 is not applicable since there are no diversions planned for perennial or intermittent streams within the permit area.

**742.330 Diversion of Miscellaneous Flows** All diversions within the permit area are of miscellaneous flows.

**742.331** Certain miscellaneous undisturbed flows are proposed to be diverted around the disturbed area. Other flows are diverted within the disturbed area and to the sediment pond, as described in Appendix 7-4.

**742.332** See Appendix 7-4.

**742.333** All temporary diversions are designed to safely pass the peak runoff of a 10-year 6-hour event, resulting in a more robust design than the required 2 year - 6 hour precipitation event, as required. See Appendix 7-4 for details.

#### **742.400 Road Drainage**

**742.410 All Roads** All roads are designed in accordance with requirements of 534. Drainage control for all roads is

**Lila Canyon Extension**

**Chapter 7**  
**Hydrology**

**Volume 6 of 7**

763. Siltation Structures .....	Page -59-
764. Structure Removal .....	Page -59-
765. Permanent Casing and Sealing of Wells .....	Page -60-

### List of Appendices

Appendix 7-1	Baseline Monitoring
Appendix 7-2	Water Monitoring Data (Horse Canyon)
Appendix 7-3	Probable Hydrologic Consequences
Appendix 7-4	Sedimentation and Drainage Control Plan
Appendix 7-5	U.P.D.E.S. Permits
Appendix 7-6	Seep/Spring Inventory
Appendix 7-7	Surface Water Characterizations
Appendix 7-8	Monitoring Location Descriptions
Appendix 7-9	Right Fork of Lila Canyon Flow and Geomorphic Evaluation

### List of Plates

Plate 7-1	Permit Area Hydrology
Plate 7-1A	Permit Area Hydrology (Geologic Map)
Plate 7-1-B	Hydro-Geologic Cross Section
Plate 7-2	Disturbed Area Hydrology & Water Shed Map
Plate 7-3	Water Rights
Plate 7-4	Water Monitoring Locations
Plate 7-5	Proposed Sediment Control
Plate 7-6	Proposed Sediment Pond

### List of Figures

Figure 7-1	Stratigraphic Section	End of Chapter
Figure 7-2A	Water Level Map - Spring and Fall 2002	End of Chapter
Figure 7-2B	Seasonal Water Level Fluctuations in Piezometers	End of Chapter

### List of Tables

Table 7-1	1985 Spring & Seep Survey Results	Page 9
Table 7-1A	Period of Record Monthly Climate Summary	Page 18
Table 7-2	Water Rights	Page 20
Table 7-3	Water Monitoring Stations	Page 35
Table 7-4	Surface Water Monitoring Parameters	Page 36
Table 7-5	Ground Water Monitoring Parameters	Page 37

locations of the surface drainages, springs and seeps, and piezometers.

## 722. Cross Sections and Maps

**722.100 Subsurface Water.** The locations where subsurface water, including springs and seeps, have been identified are presented on Plates 6-5 and 7-1 and data results are included in Appendix 7-1. Relevant cross sections of subsurface water, geology, and drill holes are shown on Plate 6-5. Where sufficient data are available, the seasonal head differences are presented on contour maps (see Figure 7-2A) and on a well hydrograph plot (see Figure 7-2B).

**722.200 Surface Water.** Location of all streams and stockwatering ponds or tanks in the area of the mine are shown on Plate 7-1. There are no perennial streams, lakes or ponds known to exist within the proposed permit or adjacent areas.

A new diversion work has recently been constructed by the BLM at the confluence of the Right Fork of Lila Canyon and Grassy Wash. Water from this diversion is directed to the stock pond located in Section 28, T. 16 S., R 14 E. Figure 1 in Appendix 7-9 shows the location of the diversion and the alignment of the diversion channel to the stock pond. Also, the location of the overflow channel back to Grassy Wash is also presented on the figure. No other ditches or drains are known to have been constructed in the area of the mine.

**722.300 Baseline Data Locations.** Locations of all baseline data monitoring points are shown on Plate 7-1. Baseline water quality and quantity data is included in Appendix 7-1.

**722.400 Water Wells.** Three wells and three piezometers have been identified in the permit and adjacent areas. Two wells are located within the alluvium of lower Horse Canyon Creek. Three water Piezometers were drilled in the area, IPA #1, IPA #2 and IPA #3, to monitor mine water levels. Drill hole S-32 was drilled and converted to a water monitoring hole by Kaiser in 1981. The details of these wells are discussed in Section 724.100 of the application. The location of all these wells is

shown on Plate 7-1. No information on any other wells has been identified.

**722.500 Contour Maps** Contour Maps of the proposed disturbed area and mining areas are included as Plates 5-2A, 5-2B, 7-1 and 7-2. These maps use U.S.G.S. based contours and accurately represent the proposed permit and adjacent areas. Disturbed area maps present greater detail from low-level aerial photography, for greater detail, and are tied to relevant U.S.G.S. elevations to ensure correlation between the maps.

### **723. Sampling and Analysis**

All water quality analyses performed to meet the requirements of R645-301-723 through R645-301-724.300, R645-301-724.500, R645-301-725 through R645-301-731, and R645-301-731.210 through R645-301-731.223 will be conducted according to the methodology in the current edition of "Standard Methods for the Examination of Water and Wastewater" or the methodology in 40 CFR Parts 136 and 434. Water quality sampling performed to meet the requirements of R645-301-723 through R645-301-724.300, R645-301-724.500, R645-301-725 through R645-301-731, and R645-301-731.210 through R645-301-731.223 will be conducted according to either methodology listed above when feasible. "Standard Methods for the Examination of Water and Wastewater" is a joint publication of the American Water Works Association, and the Water Pollution Control Federation and is available from the American Public Health Association, 1015 Fifteenth Street, NW, Washington, D.C. 20036.

### **724. Baseline Information**

This section presents a description of the groundwater and surface water hydrology, geology, and climatology resources to assist in determining the baseline hydrologic conditions which exist in the permit and adjacent areas. This information provides a basis to determine if mining operations can be expected to have a significant impact on the hydrologic balance of the area.

**724.100 Ground Water Information.** This section presents a discussion of baseline groundwater conditions in the permit and adjacent areas. The data set consists of piezometer,

identified as Horse Canyon well on Plate 7-1A, is still open, although not operational at this time. The well was investigated and it was determined that it would not be useful as a Piezometer. The pump is sitting on the top of a concrete cap encapsulating the top of the well. The site could not be used as a piezometer without removing the pump. This well will be donated to the College of Eastern Utah as part of the Post Mine Land Use Change. The well located near the road junction, identified as MDC well on Plate 7-1A, is an abandoned well owned by Minerals Development Corporation. This well has been sealed to the operator's best knowledge. No hydrologic data is presently available from either of these wells.

Three water piezometers were drilled as part of plans to access the Kaiser South Lease by I.P.A. These piezometers were designated IPA-1, IPA-2 and IPA-3, and are located in the Lila Canyon Permit area (see Plate 7-1). IPA monitored these sites for water depth from 7/94 to 4/96. These monitoring results are included in Appendix 7-1 and monitoring points and measured water levels are shown on Plate 7-1. It should be noted that the monitoring of these holes was done over the 2 3/4 year period to provide baseline data for the South Lease by I.P.A. Monitoring of water depths at these points by UtahAmerican commenced in December 2000 and continued through present. As indicated by the data in Appendix 7-1, the water levels in the holes show very little fluctuation. Levels change from less than 1.2' to a maximum of 21.2' over an eight year monitoring period. Figure 7-2A and 7-2B present the seasonal fluctuations of the water levels as contour maps and hydrographs. Using these water levels, an estimate of the projected water level assuming that the zones from the individual wells are connected is shown on Plate 7-1 and the monitoring results are included in Appendix 7-1 - Baseline Monitoring.

The piezometers were installed to provide depth of water only. It is impossible to drop a bailer 1,000 and withdraw a water sample without contaminating the sample. The depth and diameter of the piezometer holes makes it impossible to use them for baseline quality.

Drill holes S-26, S-27, S-28, and S-31 were cased in 3" PVC pipe with bottom perforations for water monitoring; however, cement seals were faulty, allowing the PVC pipe to fill with cement. Drill hole S-26 was reported dry in the week prior to cementing.

the Horse Canyon Mine into the proposed Lila Canyon mining area do contain water since the tunnels elevation is approximately 5855 feet.

The Horse Canyon Mine has been closed and the surface area reclaimed. With no significant inflow to the old workings, no discharges are occurring from any of the portal areas nor are expected in the future. It is known however, that water has collected in the old entries. As future mining activities, for the proposed Lila Canyon Mine, will be occurring near this area of collected water in the old workings, it is likely that some or all of this water will be intercepted by the proposed Lila Canyon Mine (see Plate 7-1). Water may then have to be pumped from the mine. Because of undulating floor and unknown void areas, it is impossible to determine the amount of water that would be pumped. The rate of pumping, if any, would be determined by the water discharge system design. All water discharged from the mine would be discharged at UPDES Site # 002A which is Site L-5-G, and will meet all UPDES standards. DOGM has specified planning to include a mine discharge of 500 gpm maximum.

An inspection of the Horse Canyon area following mining has shown no diminution of reasonably foreseeable use of aquifers. Since mining ceased in 1983, subsidence should have occurred within two years. However, no deterioration of the aquifers in the area was identified. Mining has not yet begun on the Lila Canyon site; however, since the structure and groundwater regime is similar to the Horse Canyon area, no diminution or deterioration of groundwater resources is expected in this area.

Occurrences of ground water in the Lila Canyon Mine are expected to be similar to the Geneva Mine (Horse Canyon). Inflows of water encountered while mining reduced to seeps or dried up in a short period of time.

#### Groundwater Systems

In the Lila Canyon Lease area, the groundwater regime consists of two separate and distinct multilayered zones. The upper most zone consists of the Wasatch Group which consists of the Colton Formation and the undifferentiated Flagstaff Limestone-North Horn Formation. The lower zone consists of the Mesa Verde Group which contains the Price River Formation, Castlegate Sandstone, and the

Blackhawk Formation (where the coal seams are located). The Mesa Verde Group is underlain by the Mancos Shale.

Geologic conditions in the permit and adjacent areas are described in detail in Chapter 6 of this P.A.P. Formal aquifer names have not been applied to any groundwater system in the permit and adjacent areas because the geometry, continuity, boundary conditions, and flow paths of the groundwater systems in the area are not fully understood. However, the data do suggest that groundwater systems in each of the bedrock groups are sufficiently different from each other to justify the informal designation of groundwater systems based on bedrock lithology. Thus, the informal designation of the Upper zone - Colton and Flagstaff/North Horn and the Lower zone - Price River, Blackhawk, and Mancos groundwater systems is adopted herein.

Groundwater in the permit and adjacent areas occurs within perched aquifers in the upper zone overlying the coal-bearing Blackhawk Formation as well as within the lower zone of the Blackhawk Formation and Mancos. Hydrogeologic conditions within the permit and adjacent areas are summarized below:

#### Upper Zone

Colton Formation. The Colton Formation outcrops in the northeast portion of the permit and adjacent areas. This formation consists predominantly of fine-grained calcareous sandstone with occasional basal beds of conglomerates and interbeds of mudstone and siltstone. Data presented in Plates 7-1 and 7-1A and Appendices 7-1 and 7-6 indicate that 16 springs issue from the Colton Formation within the permit and adjacent areas.

Waddell et al. (1986) evaluated the discharge of springs in the formation for the period of June to September 1980. The measured discharge rate generally declined during the 4-month period of evaluation. This suggests that the groundwater system has a good hydraulic connection with surface recharge and that most of the annual recharge quickly drains out of the system.

Groundwater issuing from the Colton Formation has a total dissolved solids ("TDS") concentration of 300 to 600 mg/l (as measured by specific conductance and laboratory analyses of TDS). The pH of

North Horn groundwater system and that recharge water entering the Flagstaff-North Horn Formation moves downward until it encounters low permeability shale or claystone layers in the lower portion of the formation, where almost all of the water is forced to flow horizontally to springs.

Data presented in Appendices 7-1 and 7-6 indicate that groundwater issuing from the Flagstaff-North Horn Formation has a TDS concentration range of 400 to 700 mg/l. This water tends to be slightly alkaline and, similar to conditions encountered in the overlying Colton Formation, is of the calcium-magnesium-bicarbonate type.

The data presented in Appendices 7-1 and 7-6 indicate that the total iron concentration of groundwater discharging from springs in the Flagstaff-North Horn Formation is generally less than 0.04 to 0.15 mg/l. Total manganese concentrations in Flagstaff-North Horn groundwater are generally less than 0.03 mg/l. These data do not exhibit seasonal trends.

#### Lower Zone

Price River Formation. The Price River Formation consists of interbedded mudstone and siltstone with some fine-grained sandstone and carbonaceous mudstone. Within the permit area, 17 springs have been found issuing from the Price River Formation as indicated based on data presented in Plates 7-1 and 7-1A and Appendices 7-1 and 7-6. Based on specific conductance measurements collected from these springs, the TDS concentration of water issuing from the Price River Formation varies from about 750 to 850 mg/l. The water is slightly alkaline, with a pH of 7.9 to 8.9.

The IPA monitoring piezometers (Plate 7-1) were completed within the first formation with identifiable water above the coal seam, the Price River Formation. Data collected from the piezometers (Appendix 7-1) indicate that water levels in IPA 2 and 3 varied by approximately 2 feet during the period of July 1994 through April 1996, but showed no consistent trend. IPA 1 showed a rise of 5.6 feet over the same period. Measurements collected in 2001 indicated that the water levels in IPA 2 and 3 were 1 to 2 feet higher than the last time it was measured nearly 5 years earlier, while IPA 1 showed a rise of 16 feet. For the period since 2001, no trend has been identified for IPA 2 and 3, while IPA 1 has continued a slow increase.

Although an increase in water levels has occurred during the period of record, this increase is not considered significant.

Assuming that the piezometers are completed in the same saturated zone, the piezometric surface shows that groundwater in the upper Price River Formation would be moving to the northeast, into the Book Cliffs (see Plate 7-1). The gradient of the surface is approximately 0.011 ft/ft. The seasonal fluctuations between fall and spring are almost undistinguishable. Based on the tabulated data (Appendix 7-1), the fluctuation range is less than 0.5 feet between summer and fall readings. Figures 7-2A and 7-2B attempt to show these variations in contour map and piezometer hydrographs.

Castlegate Sandstone. The Castlegate Sandstone consists of a fine- to medium-grained sandstone that is cemented with clay and calcium carbonate. The outcrops of this sandstone form prominent cliffs in the area. No springs were identified in this formation, suggesting that it is not a significant aquifer. The absence of springs is of great significance, since this formation is situated between the overlying Upper groundwater zone and the underlying lower zone (in the Blackhawk Formation). The absence of springs indicates that there is separation between the upper and lower groundwater zones. The absence of springs is most likely the result of two factors: 1) clay horizons in overlying formations inhibit vertical recharge from groundwaters in the Flagstaff-North Horn Formation, and 2) the exposed recharge area of the Price River Formation and Castlegate Sandstone is limited primarily to areas of steep cliff faces.

Blackhawk Formation. The Blackhawk Formation underlies the Castlegate Sandstone and consists of interbedded sandstone, siltstone, shale, and coal. The lower Sunnyside coal seam, to be mined by UtahAmerican, is located in the upper portion of the Blackhawk Formation.

Across the formation some of the individual sandstone bodies are discontinuous. This results in areas that are saturated; i.e. sandstone lenses; and areas that are dry; i.e. siltstone and shale sections. This discontinuous nature results in the typical pattern found in the mines of the Wasatch Plateau and the Book Cliffs. As mining advances an isolated area of saturation (perched aquifer) is encountered by the entry or by roof bolting or fractures due to subsidence. As the water from the saturated zone drains into the mine it starts at an initially

high rate and over time as the limited extent of the zone is emptied, the rate of flow decreases. Some zones which are laterally connected are able to reach a consistent inflow which is a balance for the recharge to the system with the outflow to the mine entry.

The hydraulic conductivity of the lower zone is believed to be about 0.01 to 0.02 feet per day, similar to values reported by Lines (1985) from the Wasatch Plateau for similar lithologies. Structural dip in the Lila Canyon area is about 6 to 7 degrees. The gradient of the lower zone in the Horse Canyon/Lila Canyon area is probably less than 2 degrees.

The water monitoring piezometers show water levels above the lower zone containing the coal seam in area of the mine; however, the zones recorded are not connected to the lower groundwater zone. As reported in the Castlegate Sandstone section, no springs or water bearing zones were identified in the spring and seep inventories or in the drilling of the water monitoring piezometers in the formation. Therefore, indicating that the monitored zones are perched and are isolated from the lower groundwater zone.

It is possible that mining will intercept some water as it progresses down dip. However, as discussed previously regarding mine water inflows to the Horse Canyon Mine, it is expected that water quantities and quality will be similar to that encountered in the Horse Canyon Mine. While some pumping is likely for water from the isolated saturated zones within the lower groundwater zone; since the water in the upper groundwater zone appears to be perched aquifers 200 to 500 feet above the coal seams, no adverse effects on usable surface sources are expected.

No springs have been identified as issuing from the Blackhawk Formation (see Appendices 7-1 and 7-6 and Plates 7-1 and 7-1A).

The quality of groundwater in the Blackhawk Formation is assumed to be similar to water quality for data collected from leakage into the Horse Canyon Mine. These data indicate that Blackhawk Formation groundwater has a mean TDS concentration range of 1400 to 2400 mg/l and is of the sodium-bicarbonate type. These waters are chemically distinct from groundwater in overlying groundwater systems.

Quality and quantity of underground water is the most difficult to ascertain due to geologic variables such as faults, fractures, channel sands and isolation of these particular features when water is encountered in order to gain reliable samples. Underground water tends to be co-mingled with water from other places in the mine and water pumped through the mines for mine equipment and dust suppression. Thus, care needs to be taken to obtain representative samples. Specific undisturbed water samples of the subsurface inflows are not known to have been collected. However, the quality results reported in the Horse Canyon records are consistent with in-mine samples from adjacent mines.

The dissolved iron concentration of groundwater flowing into the Horse Canyon Mine has historically been less than 0.5 mg/l and is generally less than 0.1 mg/l (see Appendices 7-1 and 7-6). The total iron concentration of this water has historically been less than 0.7 mg/l and generally less than 0.1 mg/l. The total manganese concentration of Blackhawk Formation water (as measured in the Horse Canyon Mine) has historically been less than 0.05 mg/l and is typically less than 0.03 mg/l (see Appendices 7-1 and 7-6).

Mancos Shale. The Mancos Shale is exposed south and west of the permit area. This formation is a relatively impermeable marine shale and is not considered to be a regional or local aquifer. Groundwater samples collected from two monitoring sites located in Stinky Spring Canyon approximately 2 miles southeast of Lila Canyon Mine have a TDS concentration in the range of 2200 to 4200 mg/l and are of the sodium-sulfate-chloride type (Appendix 7-1). Total iron concentrations ranged from 0.35 to 11.8 mg/l. Total manganese concentrations ranged from 0.05 to 0.29 mg/l. Chemical compositions of other parameters are consistent with waters from the Mancos Shale in the Book Cliffs area. The springs appear to be fault related.

#### Recharge and Discharge Relations

Recharge rates were calculated by Waddell and others (1986, p. 43) for an area in the Book Cliffs. Waddell estimated recharge at about 9 percent of annual precipitation. Lines and others (1984) indicate the mean annual precipitation along the Book Cliffs in the area of the Horse Canyon Mines is about 12 inches, indicating a recharge rate of just over 1 inch per year.

The recharge and discharge areas for local perched aquifers in the upper zone (Colton and Flagstaff-North Horn Formations) generally lie within the drainage areas of Horse and Lila Canyons. These local systems are complex and highly dependent on topography. Recharge water from precipitation or snow melt enters the Colton or Flagstaff-North Horn Formations and moves downward until it encounters low permeability shale or claystone layers in the formations, where almost all of the water is forced to flow horizontally to springs. The springs exhibit substantial variability in discharge in response both to spring snowmelt events and to drought and wet years. Discharge rates as great as 20 gpm have been recorded from the springs during the high-flow season, and discharge rates as low as 1 gpm are not uncommon during late summer. The effects of the drought occurring in the late 1980s and early 1990s are clearly evident in the flow records.

Recharge to the lower zone including the Price River, Castlegate Sandstone, Blackhawk Formation, and Mancos Shale is of limited magnitude, due primarily to the limited area of exposure on steep outcrops and the presence of low-permeability units in overlying formations. These two zones are separated by clay layers in the upper Blackhawk and Price River Formations and undifferentiated Flagstaff-North Horn Formations which contain approximately 80 percent clays, siltstones, mudstones, and shales, all highly restrictive to groundwater movement (Fisher and others, 1960).

Recharge to the lower zone probably occurs primarily from vertical movement of water through the overlying formations and is probably greatest where surface fractures intersect the topographic highs where the upper zone formations outcrop. The rate of recharge to the lower zone is very slow. The lack of a significant recharge source results in limited discharge areas. The largest portion of recharge is in the upper Price River Formation where the greatest number of springs in the lower zone are identified.

Faults may effect flow, direction and magnitude of both lateral and vertical flows. However, the area is abundant with plastic or swelling clays that can seal faults and fractures inhibiting both lateral and vertical flows.

Assuming mass-balance and stable hydrologic conditions, recharge will equal discharge over the long term. The relatively rapid groundwater discharge from the upper zone formations as compared with the underlying lower zone formations suggest that the

- (4) If adverse impacts to the receiving stream are noted, steps will be taken, with Division input and approval, to minimize or eliminate those impacts.

(Also see Appendix 7-3)

**728.334 Water Availability** (see Appendix 7-3)

**728.335 Other Characteristics** (see Appendix 7-3)

**728.340 Surface Mining Activity** N/A - Underground Mine

**728.400 Permit Revision** To be reviewed by the Division.

**729. Cumulative Hydrologic Impact Assessment (CHIA)**

**729.100 CHIA** Assessment provided by Division.

**729.200 Permit Revision** To be reviewed by the Division.

**730. Operation Plan**

**731. General Requirements** This will be an underground mine with the perimeter of the disturbed area containing approximately 42.6 surface acres within the disturbed area but only 25.3 acres will be disturbed leaving 17.3 acres of undisturbed islands within the disturbed area. Runoff from the disturbed minesite area is proposed to be controlled by a system of ditches and culverts which will convey all disturbed area runoff to a sediment pond for final treatment prior to discharge.

This permit application includes a plan, with maps and descriptions, indicating how the relevant requirements of R645-301-730, R645-301-740, R645-301-750 and R645-301-760 will be met. Each of these sections are addressed in this Chapter, along with relevant Maps and Appendices.

**731.100 Hydrologic-Balance Protection**

sampling; selected springs are proposed for sampling under the Ground Water Monitoring Plan.

If ground water is encountered in the future mining of a quantity which requires discharge, the water will be monitored in accordance with requirements of this section and a monitoring plan will be proposed at that time.

For purposes of the water monitoring program, springs and seeps are considered ground water and will be monitored as such.

**731.211 Ground-Water Monitoring Plan** Based on information in the PHC determination (Appendix 7-3), and as indicated above, the only ground water resources on or adjacent to the permit area that can be monitored at this time; are springs and seeps. See Appendix 7-6 for a detailed description of the water monitoring locations.

There are a total of 11 water monitoring sites proposed for this property. (See Table 7-3). Station L-5-G is the potential mine discharge point, and will be monitored at least monthly, or as occurs, in accordance with U.P.D.E.S. Permit requirements. (See Table 7-4) Stations L-5-G, L-7-G, L-8-G, L-9-G, L-11-G, and L-12-G are significant springs or seeps located over the area of proposed mining. These springs will be monitored on a quarterly basis for parameters listed in Table 7-5.

Station L-6-G (Table 7-3) is in the vicinity of 2 listed springs, Mont Spring and Leslie Spring. These springs are within the same small drainage, and may in fact be the same spring. Close examination of spring/seep and baseline monitoring stations show only one site in this drainage with any consistent flows - site H-18; therefore, this site was originally chosen to monitor the Mont and Leslie Spring area. However in recent years L-6-G has been dry and Location L-11-G has been added to replace site L-6-G. Sampling at L-6-G will be suspended as of the First Quarter of 2003.

**731.312 Storage of Acid- or Toxic-Forming Materials** Storage of potentially acid- or toxic-forming materials, such as fuel, oils, solvents and non-coal waste will be in a controlled manner, designed to contain spillage and prevent runoff to surface or ground water resources.

All oils and solvents will be stored in proper containers within enclosed structures. Fuels will be stored in appropriate tanks, enclosed within concrete or earthen bermed areas designed to contain any spillage.

Non-coal waste (garbage) will be stored in a designated location, in dumpsters, and removed to an approved landfill (East Carbon Development Contractors - ECDC) on a regular, as-needed basis.

Unused or obsolete equipment or supplies will be stored in a designated area. Drainage from the storage area will be directed to the sediment pond as shown on the Sediment Control Map, Plate 7-5.

Underground development waste (if any) will also be stored in a designated area. Such waste will be tested for acid- or toxic-forming potential, and if found to be acid- or toxic-forming, the waste site will be protected from surface runoff by the use of earthen berms.

**731.320 Storage, Burial, Treatment** All storage, burial and treatment practices will be as described in this permit, and consistent with applicable material handling and disposal provisions of the R645-Rules.

**731.400 Transfer of Wells** There are presently three Piezometers on this permit. When these Piezometers are no longer required, they will be sealed in a safe, environmentally sound manner in accordance with regulations (see Section 631.200). The Horse Canyon Well will be donated to the College of Eastern Utah as part of the Post Mine Land Use Change.

**731.500 Discharges** The only proposed discharges from this operation will be from the sediment pond and/or underground mine water. Each of

At the present time, there are no plans to divert water from the underground workings of this operation to any other underground workings.

If it became necessary to discharge water from the mine, this water would be discharged in accordance with the UPDES permit application in Appendix 7-5. The water would be discharged into the North Fork of Coleman Wash (Lila Canyon). Refer to Plate 7-5.

**731.520 Gravity Discharges** Location of the proposed portal slopes are below the western (upper) exposure of the easterly dipping coal bed. In the area immediately around the proposed portals, no water is presently issuing from the strata above or below the coal outcrop; therefore, it is assumed any water encountered in the underground mining will not be under artesian pressure or with sufficient hydrostatic head to raise it to the portal site.

The coal seam to be mined dips away from the portal site at approximately 10%. If water is encountered in the mining, it will likely be at a static level far below the exposed outcrop or rock slopes. This may result in some possible mine discharge from pumping, but not from gravity.

**731.521 Portal Location** The proposed access portals are below the coal outcrop, as shown on Figure 7-1, Plates 5-5 and 7-5. The fan is to be located above, at the outcrop. The rock slopes will slope up to the east at approximately 12% to contact the coal seam; however, the coal seam is dipping down to the east in this area. The approximate point of contact between the rock slopes and the coal seam will be 1227' from the surface at an elevation of 6300'. Ground water levels in the mining area, based on the 3 water monitoring holes and other geologic data, appear to be nearly static at elevation 5990 in this area (see Figure 7-1).

Water level in the mine would have to raise approximately 310' to reach the rock slope/coal seam contact and result in a gravity discharge. Water monitoring results and other historical data in the area do not indicate this is likely to occur.

**731.522 Surface Entries after January 21, 1981** This is not known to be an acid-producing or iron-producing coal seam; however, proposed portals are located to prevent gravity discharge from the mine (see Section 731.521).

**731.600 N/A** - There are no proposed coal mining or reclamation operations within 100 feet of a perennial or intermittent stream. Section 731.600 is not applicable.

**731.700 Cross Sections and Maps** The following is a list of cross-sections and maps provided in this section of the P.A.P.

Plate 7-1	Permit Area Hydrology Map
Plate 7-2	Disturbed Area Hydrology/Watershed
Plate 7-3	Water Rights Locations
Plate 7-4	Water Monitoring Location Map
Plate 7-5	Proposed Sediment Control Map
Plate 7-6	Proposed Sediment Pond

All required maps and cross-sections have been prepared by, or under the supervision of, and certified by a Registered Professional Engineer, State of Utah.

**731.710 General Area Hydrology** Plate 7-1.

**731.720** Plate 7-2.

**731.730 Water Monitoring Map** Plate 7-4.

**731.740 Sediment Pond Map** Plate 7-6.

**731.750** Plate 7-6.

**731.760 Other Maps** (See Section 731.700 for a complete list of maps provided in this section).

**731.800 Water Rights and Replacement** (See Section 727)

**740. Design Criteria and Plans** Design criteria and plans for this permit are detailed in Appendix 7-4. The following section will describe the general drainage and sediment control plan.

**741. General Requirements** The proposed operation is an underground mine with a relatively small surface disturbance for transportation, support and coal handling facilities. The proposed surface facilities will comprise a disturbed perimeter of approximately 42.6 acres. Access roads and utility lines will consist of approximately 10 acres of additional disturbance along a BLM Right-of-Way designated as a "Transportation Corridor".

The majority of undisturbed runoff from areas above the proposed mine site will be diverted beneath the site via an undisturbed diversion culvert. Runoff from the disturbed mine site area will be directed to a sediment pond, designed to contain and treat the runoff from a 10 year - 24 hour precipitation event for the contributing watershed. Disturbed area runoff will be directed to the sediment pond via a combination of properly sized ditches and culverts. The general drainage control plan for the mine site is shown on Plate 7-5. The complete Drainage Design and Control Plan is provided in Appendix 7-4 of this P.A.P.

**742. Sediment Control Measures** See Appendix 7-4 for Sediment Control Measure details.

#### **742.100 General Requirements**

**742.110 Designed/Constructed/Maintained** Appropriate sediment control measures will be designed, constructed and maintained using the best technology currently available to:

**742.111** "Prevent, to the extent possible, additional contributions of sediment to stream flow or to runoff outside the permit area;"

This will be accomplished by the construction of undisturbed diversions to allow most undisturbed runoff to by-pass the site and by routing all disturbed runoff to a sediment pond for treatment prior to discharge.

**742.313** As indicated, all diversions for the Lila Canyon Mine are temporary, and will be removed when no longer needed. Land disturbed by removal will be reclaimed in accordance with R645-301 and R645-302. Prior to diversion removal, downstream water treatment facilities will be modified or removed. See Reclamation Hydrology Section of Appendix 7-4.

**742.320 Diversion of Perennial and Intermittent Steams Section** 742.320 is not applicable since there are no diversions planned for perennial or intermittent streams within the permit area.

**742.330 Diversion of Miscellaneous Flows** All diversions within the permit area are of miscellaneous flows.

**742.331** Certain miscellaneous undisturbed flows are proposed to be diverted around the disturbed area. Other flows are diverted within the disturbed area and to the sediment pond, as described in Appendix 7-4.

**742.332** See Appendix 7-4.

**742.333** All temporary diversions are designed to safely pass the peak runoff of a 10-year 6-hour event, resulting in a more robust design than the required 2 year - 6 hour precipitation event. See Appendix 7-4 for details.

#### **742.400 Road Drainage**

**742.410 All Roads** All roads are designed in accordance with requirements of 534. Drainage control for all roads is discussed in detail in Appendix 7-4. No part of any road is planned to be located in the channel of an intermittent or perennial stream. As shown on Plate 7-2, roads are located to minimize downstream sedimentation and flooding.

**742.420 Primary Roads** Primary road design is discussed under 534.

## 2.10 Main Canyon Culvert - Outlet Structure

The outlet of the 5' diameter culvert UC-2<sub>1</sub> has been designed to flow into a rip-rap apron to protect against souring and for energy dissipation. The rip-rap apron is designed to fit the natural channel configuration as closely as possible, and will allow runoff to re-enter the natural channel at a reduced velocity which is no greater than natural flow conditions. Runoff from the 100 year - 6 hour precipitation event in the canyon below the minesite has been calculated at 50.47 cfs, including sediment pond overflow.

The rip-rap apron design is based on Figure 7-26, Design of Outlet Protection - Maximum Tailwater Condition, "Applied Hydrology and Sedimentology for Disturbed Areas", Barfield, Warner and Haan, 1983. Based on the figure, the apron should be a minimum of 15' in length, widening from 5' to 9', with a 0% slope. The proposed length has been increased to 20', to ensure adequate time for velocity reduction. The slope is kept at 0%. Rip-rap size is conservatively placed at 12"  $D_{50}$ . Rip-rap will be placed to a depth of 1.5  $D_{50}$  and will be embedded in a 6" layer of 2" drain rock filter. Rip-rap will also be placed on 2:1 side slopes to the height of the culvert (4') at the culvert outlet tapering to 2' at the outlet of the apron. This rip-rap apron has been sized and designed to adequately dissipate energy from flow velocities of a 100 year - 6 hour precipitation event and resist dislodgement. The drain rock filter bed will also serve to secure the rip-rap boulders firmly in place, to add an additional element of stability, and prevent scouring underneath the boulder bed. (See Figure 4A for construction details). The channel is on a gradient of approximately 7.76%. When the flow is routed from the culvert across the apron to the natural channel, the velocity is reduced from 10.25 fps at the culvert outlet to 4.14 fps at the outlet of the apron. (See Culvert Outlet Rip-Rap Apron Flow Velocity Calculations in Appendix 1.)

It should be noted that these calculations are based on a 100 year - 6 hour event.

TABLE 10

Table 10 Undisturbed Culvert Design Summary		
Culvert	UC-1	
Slope (%)	5.56	
Length (ft.)	<del>500</del> <u>35</u>	
Manning's No.	0.025	
Peak Flow 10/6 (cfs)	38.21	
Peak Flow 100/6 (cfs)	51.67	
Min. Diam. Req'd (ft.) 10/6	2.26	
Min. Diam. Req'd (ft) 100/6	2.53	
Diam. Proposed (ft.)	5.00	
Velocity (fps) 10/6	9.57	
Velocity (fps) 100/6	10.32	
* Note: Peak Flows include 25 year - 6 hour design overflow from sediment pond.		

### 3.1 Design and Construction Specifications for Sedimentation Pond

- a) All construction of sedimentation ponds will be performed under the direction of a qualified, registered professional engineer.
- b) The sediment pond will be located in an existing low area where the Right Fork of Lila Canyon passes beneath the existing road. The existing road fill and culvert will be removed, and the pond embankment (road fill) will be reconstructed and compacted. The existing culvert will be replaced and extended approximately 300' up the Right Fork of Lila Canyon. This culvert will be equipped with a headwall, and will allow undisturbed runoff and treated access road drainage to pass beneath the sediment pond. The majority of the pond will be in an existing channel area, and is therefore considered incised. The embankment will be reconstructed to a maximum of 2h:1v slopes, with the total of inside and outside slopes not less than 5h:1v. The pond will be equipped with a culvert riser principal spillway with an oil skimmer, a decant, and a second culvert riser emergency spillway with an oil skimmer. Both spillways will discharge to the oversized (60") CMP culvert running beneath the pond.
- c) The area of pond constructed shall be examined for topsoil, and where present in removable quantities, such soil shall be removed separately and stored in an approved topsoil storage location.
- d) In areas where fill is to be placed for the pond impoundment structures, natural ground shall be removed for at least 12" below the base of the structure.
- e) Native materials shall be used where practical. Fill will be placed in lifts not to exceed 456" and compacted prior to placement of next lift. Compaction of all fill materials shall be at least 95%.
- f) Rip-rap or other protection (culverts, concrete, etc. ) will be placed at all inlets and outlets to prevent scouring. Rip-rap will consist of substantial (non-slaking) rock material of adequate size.
- g) Decanting of the pond, as required, will be accomplished by use of a decant pipe with an inverted inlet as shown on Plate 7-6. Samples will be

permanent drainage control. The culvert will be equipped with an inlet section and rip-rapped headwall. The culvert is adequately sized to safely pass runoff from a 100 year - 6 hour event, as shown in Table 10. To ensure that state of the art technology is incorporated, the final reclamation plans for the sedimentation pond area will be submitted prior to commencement of final reclamation of this area.

The remainder of culvert UC-1 will be removed, and the natural channel restored through the sediment pond area. The sediment pond structures will also be removed, the pond area regraded as necessary and reseeded. The pond embankment will remain as a permanent feature, since the existing (and proposed future) road through the area passes over the embankment.

Following the successful establishment of vegetation and when affluent standards are met, the sediment pond will be removed. The same methodologies relative to recontouring, top soil application and seeding will be utilized as outlined in Chapters 2, 5, and Appendix 5-8.

The pond embankment will be narrowed to facilitate the even character of the Lila Canyon Road. The existing 60 inch bypass culvert will be removed to within six feet of the road embankment. A newly formed channel will be constructed at an approximate four percent grade to intercept the inlet of the culvert at its intersection of the road. The road embankment and associated new channel will be armored by the Operator with an underlayment of filter gravel, with D<sub>50</sub>-30 inch rip-rap. The new area of disturbance including the newly formed channel will have top soil spread in and around the rip-rap. The Operator will use the same seeding and mulching methods described in Appendix 5-8 will be used on this area as well. See Figures 4 and 7 for a detailed design.

**TABLE 14**

Table 14 Final Reclamation Drainage Areas Contributing to Structures	
Channel	*Contributing Watershed/Structure
RD-1	DD-11
RD-2	DD-12
UC-1	UA-1

## 2.10 Main Canyon Culvert - Outlet Structure

The outlet of the 5' diameter culvert UC-1 has been designed to flow into a rip-rap apron to protect against souring and for energy dissipation. The rip-rap apron is designed to fit the natural channel configuration as closely as possible, and will allow runoff to re-enter the natural channel at a reduced velocity which is no greater than natural flow conditions. Runoff from the 100 year - 6 hour precipitation event in the canyon below the minesite has been calculated at 50.47 cfs, including sediment pond overflow.

The rip-rap apron design is based on Figure 7-26, Design of Outlet Protection - Maximum Tailwater Condition, "Applied Hydrology and Sedimentology for Disturbed Areas", Barfield, Warner and Haan, 1983. Based on the figure, the apron should be a minimum of 15' in length, widening from 5' to 9', with a 0% slope. The proposed length has been increased to 20', to ensure adequate time for velocity reduction. The slope is kept at 0%. Rip-rap size is conservatively placed at 12"  $D_{50}$ . Rip-rap will be placed to a depth of 1.5  $D_{50}$  and will be embedded in a 6" layer of 2" drain rock filter. Rip-rap will also be placed on 2:1 side slopes to the height of the culvert (4') at the culvert outlet tapering to 2' at the outlet of the apron. This rip-rap apron has been sized and designed to adequately dissipate energy from flow velocities of a 100 year - 6 hour precipitation event and resist dislodgement. The drain rock filter bed will also serve to secure the rip-rap boulders firmly in place, to add an additional element of stability, and prevent scouring underneath the boulder bed. (See Figure 4A for construction details). The channel is on a gradient of approximately 7.76%. When the flow is routed from the culvert across the apron to the natural channel, the velocity is reduced from 10.25 fps at the culvert outlet to 4.14 fps at the outlet of the apron. (See Culvert Outlet Rip-Rap Apron Flow Velocity Calculations in Appendix 1.)

It should be noted that these calculations are based on a 100 year - 6 hour event.

TABLE 10

Table 10 Undisturbed Culvert Design Summary		
Culvert	UC-1	
Slope (%)	5.56	
Length (ft.)	535	
Manning's No.	0.025	
Peak Flow 10/6 (cfs)	38.21	
Peak Flow 100/6 (cfs)	51.67	
Min. Diam. Req'd (ft.) 10/6	2.26	
Min. Diam. Req'd (ft) 100/6	2.53	
Diam. Proposed (ft.)	5.00	
Velocity (fps) 10/6	9.57	
Velocity (fps) 100/6	10.32	
* Note: Peak Flows include 25 year - 6 hour design overflow from sediment pond.		

### 3.1 Design and Construction Specifications for Sedimentation Pond

- a) All construction of sedimentation ponds will be performed under the direction of a qualified, registered professional engineer.
- b) The sediment pond will be located in an existing low area where the Right Fork of Lila Canyon passes beneath the existing road. The existing road fill and culvert will be removed, and the pond embankment (road fill) will be reconstructed and compacted. The existing culvert will be replaced and extended approximately 300' up the Right Fork of Lila Canyon. This culvert will be equipped with a headwall, and will allow undisturbed runoff and treated access road drainage to pass beneath the sediment pond. The majority of the pond will be in an existing channel area, and is therefore considered incised. The embankment will be reconstructed to a maximum of 2h:1v slopes, with the total of inside and outside slopes not less than 5h:1v. The pond will be equipped with a culvert riser principal spillway with an oil skimmer, a decant, and a second culvert riser emergency spillway with an oil skimmer. Both spillways will discharge to the oversized (60") CMP culvert running beneath the pond.
- c) The area of pond constructed shall be examined for topsoil, and where present in removable quantities, such soil shall be removed separately and stored in an approved topsoil storage location.
- d) In areas where fill is to be placed for the pond impoundment structures, natural ground shall be removed for at least 12" below the base of the structure.
- e) Native materials shall be used where practical. Fill will be placed in lifts not to exceed 6" and compacted prior to placement of next lift. Compaction of all fill materials shall be at least 95%.
- f) Rip-rap or other protection (culverts, concrete, etc. ) will be placed at all inlets and outlets to prevent scouring. Rip-rap will consist of substantial (non-slaking) rock material of adequate size.
- g) Decanting of the pond, as required, will be accomplished by use of a decant pipe with an inverted inlet as shown on Plate 7-6. Samples will be

permanent drainage control. The culvert will be equipped with an inlet section and rip-rapped headwall. The culvert is adequately sized to safely pass runoff from a 100 year - 6 hour event, as shown in Table 10. To ensure that state of the art technology is incorporated, the final reclamation plans for the sedimentation pond area will be submitted prior to commencement of final reclamation of this area.

The remainder of culvert UC-1 will be removed, and the natural channel restored through the sediment pond area. The sediment pond structures will also be removed, the pond area regraded as necessary and reseeded. The pond embankment will remain as a permanent feature, since the existing (and proposed future) road through the area passes over the embankment.

Following the successful establishment of vegetation and when affluent standards are met, the sediment pond will be removed. The same methodologies relative to recontouring, top soil application and seeding will be utilized as outlined in Chapters 2, 5, and Appendix 5-8.

The pond embankment will be narrowed to facilitate the even character of the Lila Canyon Road. The existing 60 inch bypass culvert will be removed to within six feet of the road embankment. A newly formed channel will be constructed at an approximate four percent grade to intercept the inlet of the culvert at its intersection of the road. The road embankment and associated new channel will be armored by the Operator with an underlayment of filter gravel, with D<sub>50</sub> -30 inch rip-rap. The new area of disturbance including the newly formed channel will have top soil spread in and around the rip-rap. The Operator will use the same seeding and mulching methods described in Appendix 5-8 will be used on this area as well. See Figures 4 and 7 for a detailed design.

**TABLE 14**

Table 14 Final Reclamation Drainage Areas Contributing to Structures	
Channel	*Contributing Watershed/Structure
RD-1	DD-11
RD-2	DD-12
UC-1	UA-1