

C/025/005 Incoming

#4652



**Alton Coal Development, LLC**

463 North 100 West, Suite 1

Cedar City, Utah 84720

Phone (435) 867-5331 • Fax (435) 867-1192

August 14, 2014

RECEIVED

AUG 15 2014

DIV. OF OIL, GAS & MINING

Director John R. Baza  
Utah Division of Oil, Gas and Mining  
1594 West North Temple, Suite 1210  
P.O. Box 145801  
Salt Lake City, UT 84114-5801

Re: Request for Reconsideration, Application for Addition of Underground Mining Area, Alton Coal Development, LLC, Coal Hollow Mine, C/025/0005

Dear Director Baza:

Alton Coal Development, LLC, respectfully requests the Division to reconsider the decision dated July 22, 2014 and accept the attached application for the addition of an area of underground mining as a minor amendment to the Coal Hollow Mine Permit No. C/025/0005.

The underground mining proposal meets the criteria for a minor permit amendment under R645-303-224. The underground mining area is located entirely within the current permit area boundaries, within the boundaries of the existing CHIA cumulative impact area and within the hydrologic basin addressed by the original permit and highwall alternative. See criteria set forth at R645-303-224. 200-.400.

The application also meets the criteria for a permit amendment under R645-303-224.100. The addition of the proposed underground mining area results in an increase of the surface or subsurface disturbed area of the Coal Hollow Mining and Reclamation Plan (MRP) of less than 15%. The "disturbed area" is defined as "an area where vegetation, topsoil, or overburden is removed or upon which topsoil, spoil, coal processing waste, underground development waste, or non-coal waste is placed by coal mining and reclamation operations." R645-100-200. The rules further define "coal mining and reclamation operations" in the context of surface and underground mining operations as "(a) activities conducted on the surface of lands in connection with a surface coal mine...and surface impacts incident to an underground coal mine...and (b) the areas upon which the activities described under part (a) of this definition occur or where such activities disturb the natural land surface..." R645-100-200.

Alton is proposing to add the area of underground mining within the permit boundaries of its current surface mine permit. Therefore, for purposes of the disturbed area calculation at R645-303-224.100, Alton has combined the surface disturbed area from its current surface mining permit with the subsurface disturbed area from proposed underground mining area. See Disturbance Sequence Drawing 5-2 and Disturbance Sequence – Surface and Highwall Drawing 5-2A. As set forth below, the disturbed area for surface mining under the existing permit (including the original permit and highwall alternative) is currently 421 acres. The proposed amendment for underground mining will add 62 acres of subsurface disturbance within the

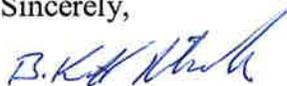
Director John R. Baza  
August 14, 2014  
Page 2

existing permit boundaries. The total disturbed acreage (421 plus 62 acres) will be 483 acres resulting in a 14.72% increase in disturbance. This is less than the 15% increase which triggers a significant revision.

The 421 acres of current surface disturbed area is the combined total of the disturbed area within the original permit and the recently approved highwall alternative. This area is less than the total permit area of 721 acres. The original permit for the Coal Hollow Mine issued on November 8, 2010 authorized "coal mining and reclamation operations connected with a surface mine" within a permit area of 635.64 acres. Non-Federal Permit, Section 2. On March 24, 2014, the Division approved an Incidental Boundary Change & Highwall Alternative authorizing the highwall mining method and adding 85.88 acres to the permit area (721 acres total permitting). The highwall alternative was approved as a minor permit amendment under R645-303-224 and Alton requests that the new application also be processed as a permit amendment consistent with this rule.

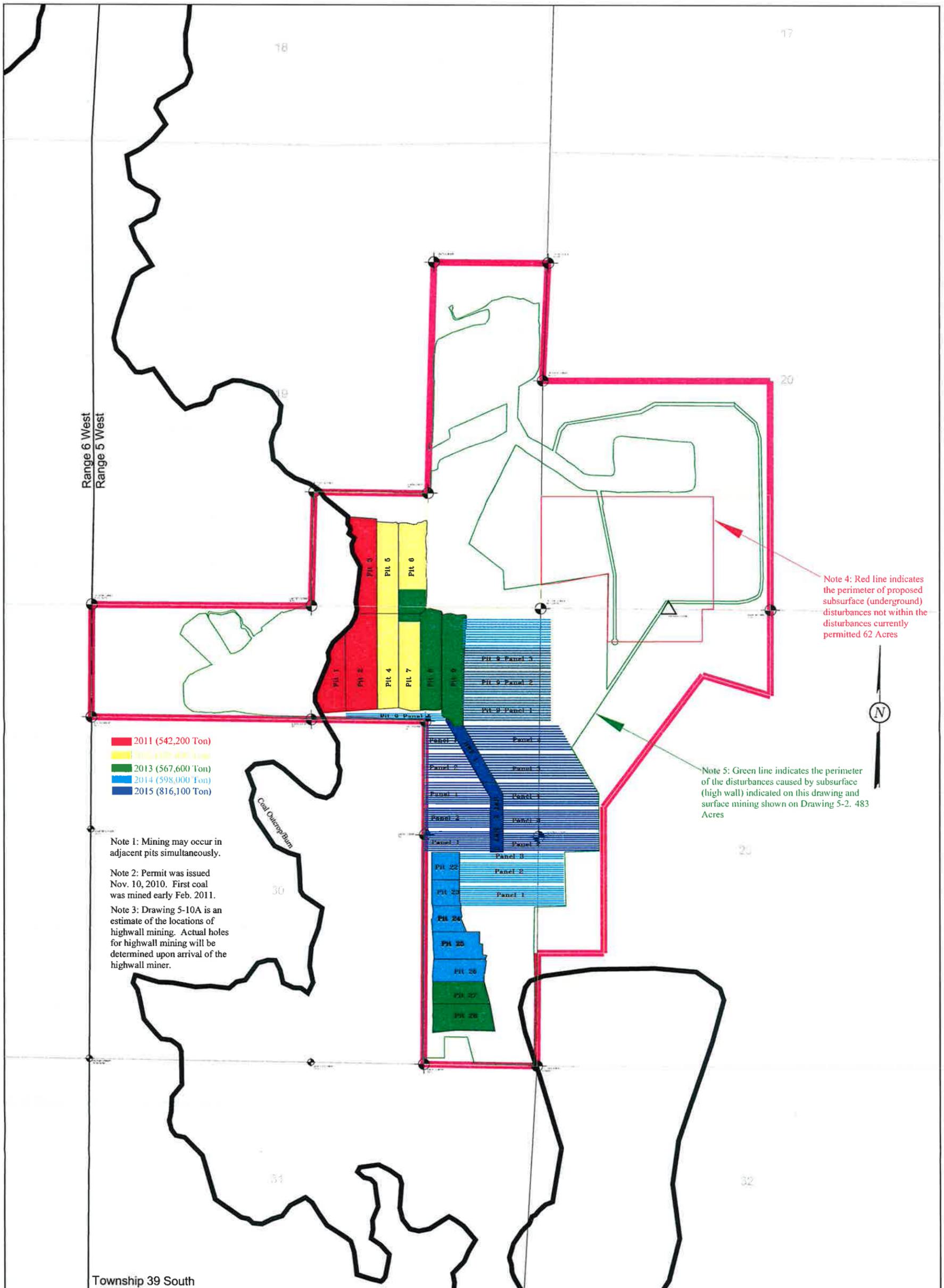
We appreciate your reconsideration of this application and ask that the Division review the proposed change as a minor permit amendment consistent with R645-300-224. Enclosed please find the July 3, 2014 application package which includes executed Forms C-1 and C-2, one redline copy of the revised text for review and two clean copies of the text and drawings for insertion into the MRP. Please do not hesitate to contact me if you have questions at 435-691-1551.

Sincerely,



B. Kirk Nicholes  
Environmental Specialist  
Alton Coal Development, LLC

cc: Dana Dean, Associate Director  
Daron Haddock, Coal Program



- 2011 (542,200 Ton)
- 2012 (137,441 Ton)
- 2013 (567,600 Ton)
- 2014 (598,000 Ton)
- 2015 (816,100 Ton)

Note 1: Mining may occur in adjacent pits simultaneously.

Note 2: Permit was issued Nov. 10, 2010. First coal was mined early Feb. 2011.

Note 3: Drawing 5-10A is an estimate of the locations of highwall mining. Actual holes for highwall mining will be determined upon arrival of the highwall miner.

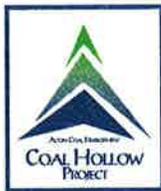
Note 4: Red line indicates the perimeter of proposed subsurface (underground) disturbances not within the disturbances currently permitted 62 Acres

Note 5: Green line indicates the perimeter of the disturbances caused by subsurface (high wall) indicated on this drawing and surface mining shown on Drawing 5-2. 483 Acres



<b>LEGEND:</b> PERMIT BOUNDARY PRIVATE COAL OWNERSHIP COAL LINE BOUNDARY COAL RECOVERY SECTION LINE FOUND SECTION CORNER FOUND PROPERTY CORNER	DRAWN BY: C. McCOURT	CHECKED BY: LWJ	<b>REVISIONS</b>		<b>COAL REMOVAL SEQUENCE</b> SURFACE & HIGHWALL MINING  <b>COAL HOLLOW PROJECT</b> ALTON, UTAH <b>DRAWING: 5-10A</b>		 463 North 100 West, Suite 1 Cedar City, Utah 84721 Phone (435)867-5331 Fax (435)867-1192
	DRAWING: 5-10A	DATE: 4/20/07	DATE: 1/30/14	BY: KN			
	JOB NUMBER: 1400	SCALE: 1" = 500'	DATE: 5/7/14	BY: KN			
	SHEET						

C/025/005 Incoming



## Alton Coal Development, LLC

463 North 100 West, Suite 1

Cedar City, Utah 84720

Phone (435) 867-5331 • Fax (435) 867-1192

Resubmitted 8/15/2014  
Task ID #4652

July 3, 2014

Daron R. Haddock  
Coal Program Manager  
Oil, Gas & Mining  
1594 West North Temple, Suite 1210  
Salt Lake City, UT 84114-5801

Subject: **Amendment to MRP for addition of Underground Mining, Alton Coal Development, LLC, Coal Hollow Mine, Kane County, Utah, C/025/0005**

Dear Mr. Haddock,

Alton Coal Development, LLC is providing this submittal to amend the Coal Hollow MRP to include underground mining. The changes proposed to the existing Coal Hollow Mine MRP will add underground mining activities within the current permit boundary. The total acreage currently permitted for surface mining is 421 acres. The proposed amendment will add 62 acres of subsurface disturbance, which is less than a 15% increase in the disturbed area under the approved permit. Therefore, this amendment meets the criteria under R645-303-224.100 to allow processing as a minor permit amendment. In addition, the proposed underground mining activities are located within the current permit boundaries and will not result in operations outside of the existing CHIA cumulative impact area or affect hydrologic basins beyond those addressed in the current MRP and mine permit. R645-303-224.200 and .300.

Please find enclosed 1 (one) redline copies of the revised text for review and 2 (two) clean copies of text and drawings for insertion into the MRP. Please do not hesitate to contact me if you have any questions 435-691-1551.

Sincerely

B. Kirk Nicholes  
Environmental Specialist

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### 332. SUBSIDENCE

~~Because mining in the Coal Hollow Project area will be a surface operation, either open pit or highwall mining, and subsidence is usually associated more with underground mining, it is not considered a factor for the Coal Hollow Project. The alternate Highwall mining is designed such that subsidence does not occur to the surface with nonyieldable webs and barriers. Mining in the Coal Hollow project area will be a combination of surface mining, either open pit or highwall mining and underground mining. Both the highwall mining and underground mining are designed such that subsidence is not expected to occur or have a negative impact on renewable resource lands. This is further discussed in Section 525 of Chapter 5.~~

However, current elevation of the existing topography may be slightly altered in the mining and reclamation operations with open pit mining. The alternate Highwall mining or underground mining will have only the disturbance associated with the trench for placement of the highwall miner or portals and will have no impact on the surface above the highwall panels

Reclamation has been planned to minimize the impact to the renewable resources identified in this section by promptly reclaiming each mine segment contemporaneously by controlling erosion and re-seeding with a mixture of native plant species that will re-establish the plant communities to vegetative cover that will be diverse, effective, permanent, and consistent with the postmining land use. More details regarding postmining land and topography have been provided in Chapter 4 and Chapter 5 of this document, respectively.

The mine plan is not expected to negatively impact the plants and wildlife in the Coal Hollow Project area. Onsite revegetation research and sage-grouse mitigation plans have been designed. Details of this work have been made available to DOGM specialists for their comments and participation in the process.

553.800	Backfilling and Grading: Thick Overburden	5-76
560.800	Performance Standards	5-81

## APPENDICES

5-1	Geotechnical Analysis - Sediment Impoundments and Excess Spoil Structure
5-2	Sediment Impoundment and Diversion Structure Analysis
5-3	Robinson Creek Culvert and Diversion Analysis
5-4	Coal Hollow Mine Blasting Plan
5-5	Reclamation Slope Stability Evaluation/Analysis
5-6	Post-Mining Roads Backfill Analysis
5-7	Location of & Standards and Specifications for ASCAs and ASCMs in use at Coal Hollow Mine
5-8	Feasibility of Highwall Mining the Smirl Seam at the Alton Coal Development, LLC Coal Hollow Mine
5-9	<u>Norwest Corporation Underground Letter Reports</u>

## DRAWINGS

### General

5-1	Pre-mining Topography
5-2	Disturbance Sequence
5-2A	Disturbance Sequence – Surface & Highwall Mining

### Facilities (5-3 to 5-8C)

5-3	Facilities and Structures Layout
5-3A	Culverts
5-4	Loadout Elevation View 1
5-5	Loadout/Stockpile Elevation View 2
5-6	Office Elevation View
5-7	Maintenance Shop Elevation View
5-8	Wash Bay, Oil and Fuel Storage Elevation View
5-8A	Wash Bay Equipment Layout
5-8B	Facilities and Structural – Electrical
5-8C	Facilities and Structural – Water Plan

### Coal Recovery (5-9 to 5-14)

5-9	Coal Extraction Overview
5-9A	Coal Extraction Overview – Surface & Highwall Mining
5-10	Coal Removal Sequence
5-10A	Coal Removal Sequence – Surface & Highwall Mining
5-10B	Coal Removal Sequence – Surface & Highwall Mining
5-11	Shallow Coal Recovery Cover Cross Section
5-12	Deep Coal Recovery Cross Section
5-13	Strip Ratio Isopach
5-14	Coal Thickness Isopach

### Overburden Handling (5-15 to 5-19)

5-15	Overburden Isopach
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515.300. Temporary Cessation

515.311

During a temporary cessation of the Underground operations, surface access openings to underground operations and facilities in areas in which there are no current operations, but in which operations are to be resumed under an approved permit will be effectively secured.

515.312.

During a temporary cessation, surface facilities in areas in which there are no current operations, but in which operations are to be resumed under an approved permit will be effectively secured.

515.320.

Before temporary cessation of coal mining and reclamation operations for a period of 30 days or more, or as soon as it is known that a temporary cessation will extend beyond 30 days, a notice of intention to cease or abandon operations will be submitted to the division. This notice will include:

- A statement of the exact number of acres which have been affected in the permit area prior to such temporary cessation,
- The extent and kind of reclamation of those areas which has been accomplished, and
- Identification of the backfilling, regrading, revegetation, environmental monitoring, and water treatment activities that will continue during the temporary cessation.

**516. PREVENTION OF SLIDES**

The moderate topography in the area of the planned Coal Hollow Mine will minimize the potential for unplanned slides. A natural barrier will, however, be left undisturbed except as necessary for roads, sedimentation control, temporary topsoil and spoil storage and similar features, beginning at the elevation of the coal seam and extending from the outslope for a distance of at least 50 ft. The barrier will be retained in place to prevent slides and erosion.

## 520. OPERATION PLAN.

### 521. GENERAL.

The proposed Coal Hollow Mine is located approximately 2.5 miles south of Alton, Utah. In order to maximize the use and conservation of the coal resource, coal will be recovered using large hydraulic excavators, front end loaders, off-road trucks, underground miner and highwall miner. Mined coal will be hauled to a central coal area for crushing and placement into a stockpile. Coal from the stockpile will be transferred into a bin and loaded into over the road trucks for transport.

The plan, with Drawings, cross sections, narrative, descriptions, and calculations indicates how the relevant requirements will be met. The lands subject to coal mining and reclamation operations over the estimated life of the operations are identified and briefly described. All appropriate information is located in the subsequent sections and Drawings 5-1 through 5-44 and Appendices 5-1 through 5-89. Topsoil piles and removal sequencing is shown on Drawing 2-2.

#### 521.100. Cross Sections and Drawings.

The application includes cross sections, Drawings and plans showing all the relevant information required by the Division. Appropriate information is provided in Drawings and cross sections 5-1 through 5-44.

#### 521.110. Previously Mined Areas.

Historically, there has been some underground mining of coal within the Alton Amphitheater. The following underground mines are known to have historically existed within the Amphitheater:

- Seaman Mine
- Smirl Mine
- Alton Mine
- Johnson Mine
- Silver Mine

There are not any known mines that existed or currently exist within the permit area or the adjacent area as defined in R645-100-200. There is also not any active coal mining operations in the area.

#### 521.120. Existing Surface and Subsurface Facilities and Features.

#### 521.121. Buildings

The location of all buildings in and within 1,000 feet of the proposed permit area, with identification of the current use of the buildings is shown on Drawings 1-5 and 1-6.

If a circumstance occurs where mining of the permit area is complete and ACD has acquired the federal lease but permit approval has not yet been acquired to continue mining in the federal coal reserves; ACD requests that the Division consider a temporary cessation of operations at that time rather than requiring implementation of the alternate reclamation scenario. This temporary cessation could be granted for a sufficient period of time to allow ACD to acquire approval for transitioning mining operations into the adjacent federal coal reserves. The Division does have the authority to grant such an allowance based on R645-301-515.300. Should the alternative reclamation scenario be implemented prematurely, reclamation along the western side and south end of the permit area will either be excavated to recover coal or these coal reserves beneath and adjacent to the reclamation will be unrecoverable. Also, an additional excess spoil structure will have be constructed for the boxcut for the federal reserves. A detailed description of the two reclamation scenarios and how each scenario would apply is provided in Section 528.200 Overburden and 553 Backfilling and Grading of this Chapter.

If ACD does not acquire the federal coal lease by the time that the final pit is complete, ACD will then immediately transition the reclamation plan to the alternative scenario.

Additionally, two options are provided for surface mining of the permit area. The Preferred option is shown on Drawings 5-2, 5-9, 5-10, and 5-16. The anticipated time schedule for this option is shown on Drawing 5-38. This option shows coal recovery through traditional open pit operations with coal being recovered by hydraulic excavators or loader and off-road trucks. ~~In the case that ACD acquires a highwall mining system, an optional plan is provided in Drawing 5-2A, 5-9A, 5-10A and 5-16A~~The second option for surface mining is the highwall mining system as shown in Drawing 5-2A, 5-9A, 5-10A and 5-16A. The estimated time schedule for this option is shown on Drawing 5-38A. This option shows coal recovery through traditional open pit operations with coal being recovered by a highwall mining system, loader and off-road trucks. Under this option surface disturbance will be considerably less.

Underground mining is also proposed for this site. Mine portals will be within an existing pit and coal will be loaded within the pit and hauled in the same manner as with the surface mining. Underground mining plans are shown in Drawing 5-3B and 5-10A.

~~The optional plan is provided with the anticipation that a highwall mining system will be employed. The stage at which it begins will be determined by the arrival date of the highwall miner and conditions favorable to highwall mining.~~

521.142

Drawing 5-10A show the underground workings. All underground coal mining will be first mining only. Subsidence will be prevented by following the recommendations provided in the Norwest Corporation letter report found in Appendix 5-9.

521.143 The proposed disposal sites for placing excess spoil generated at surface areas affected by surface operations, underground operations and facilities for the purposes COAL MINING and RECLAMATION ACTIVITIES according to:

- *R645-301-211: The applicant will present a description of the premining soil resources as specified under R645-301-221. Topsoil and subsoil to be saved under R645-301-232 will be separately removed and segregated from other material.*

The soil resources for the proposed excess spoil disposal area are described in Appendix 2-1. A plan has been developed for removal of topsoil and suitable subsoil based on the soil descriptions in this appendix. The handling plan can be viewed on Drawing 2-2. Topsoil and acceptable subsoil will be separately removed and segregated from other material prior to placement of any spoil.

- *R645-301-212: After removal, topsoil will be immediately redistributed in accordance with R645-301-242, stockpiled pending redistribution under R645-301-234, or if demonstrated that an alternative procedure will provide equal or more protection for the topsoil, the Division may, on a case-by case basis, approve an alternative;*

Excess spoil will have topsoil and subsoil redistributed in an approximately uniform, stable thickness with the approved post mining land use, contours and surface water drainage systems. Material handling practices will prevent excess compaction of these materials. Handling practices will also protect the materials from wind and water erosion before and after seeding and planting.

- *R645-301-412.300: Criteria for Alternative Postmining Land Uses.*

The MRP does not contemplate alternative postmining land uses.

- *R645-301-512.210: Excess Spoil. The professional engineer experienced in the design of earth and rock fills will certify the design according to R645-301-535.100.*

A professional engineer experienced in the design of earth and rock fills with assistance from a geotechnical expert has certified the design according to R645-301-535.100. These certifications can be viewed on Drawings 5-35, 5-36 and 5-17 through 5-19.

- *R645-301-512.220: Durable Rock Fills*

No durable rock fills are planned.

- *R645-301-514.100: Excess Spoil. The professional engineer or specialist will be experienced in the construction of earth and rock fills and will periodically*

\*All strip ratios are bank cubic yards of overburden to tons of coal

\*\*All coal tons are based on a 95% recovery factor

A detailed mine plan has been developed for the proposed permit area and the following table along with Drawing 5-9A summarize the coal extraction for the permit area for the alternate option, highwall mining and underground mining:

Description	Extraction Status	Average Coal Thickness (ft)	Average Strip Ratio* (yd <sup>3</sup> /Ton)	Quantity (**Ton)
Total Coal within Permit Boundary	N/A	16.3	7.7	12,092,000
High Strip Ratio Area (NE corner of permit area)	Not Mined	16.0	13.5	<u>4,268,930</u> ,000
Coal under highwalls and sedimentation structures	Not Mined	17.2	4.8	<u>900,305</u> ,000
Coal under Robinson Creek Diversion	Not Mined	15.5	3.9	<u>2,305,172</u> ,000
<u>Highwall &amp; Underground</u>	<u>Not Mined</u>	<u>16.0</u>	<u>0</u>	<u>2,662,000</u>
Recoverable Coal (Surface)	Mined	16.3	6.4	<u>3,066,298</u> ,000
<u>Recoverable Coal (Underground)</u>	<u>Mined</u>	<u>16.0</u>	<u>0</u>	<u>725,000</u>

\*All strip ratios are bank cubic yards of overburden to tons of coal

\*\*All coal tons are based on a 95% recovery factor for open pit mining and 45% for highwall mining and the underground mining.

Once approval is received to progress with mining on the adjacent federal coal reserves, an additional 57% of the coal under the highwalls will be recovered as part of the progression into these adjacent reserves.

With open pit mining, the application of highly flexible, open pit truck/shovel techniques will minimize losses of coal due to pit geometry or spoil support requirements, allowing the maximum possible exposure of the coal resource. The full seam section will be loaded primarily using large hydraulic backhoes. The backhoes, which can work from the top of the seam, provide the ability to efficiently and cleanly excavate the lower part of the coal seam without disturbing the pit floor. This, along with the machine's high degree of bucket horizon control will minimize floor losses. The backhoes can also work safely from the top of the seam to oversteepen the loading face along the pit walls, thus recovering the maximum amount of coal.

Where pit geometry or operational factors preclude the use of backhoes for loading, a large rubber tire front end loader will be used. These machines provide similar horizon control, can operate on the floor of the pit or on an intermediate bench, and can recover coal from confined areas such as the ends of the pits.

With the alternative surface option, the application of a highwall mining system will be employed to recover coal from the exposed face. In this method of mining, an unmanned cutter module is driven underground and operated in front of the highwall. The highwall mining machine stands on the pit floor or on a bench, directly in front of the exposed seam and makes long parallel rectangular drives into the coal seam. A remote-operated cutter module is pushed into the seam by a string of push beams (unmanned coal-conveying elements) that transport the mined coal back to the entry of the drive onto a stockpile.

The underground mining will utilize standard extraction methods. These will include a continuous miner, shuttle cars and a conveyor system to the surface. The mine plan calls for first mining only to prevent subsidence. Coal brought to the surface will flow to a stacking conveyor and stockpile as shown on Drawing 5-3B.

Rear dump haul trucks, loaded by the backhoes or front end loader, will be used to move the coal from the pit via in-pit roads and the primary haulroad to the crusher and stockpile. The trucks will be equipped with “combo” beds suitable for hauling both coal and overburden, and configured to minimize coal spillage.

A net recovery of 95% (including the effects of in-pit coal losses and out-of-seam dilution) of the coal exposed in the open pit is anticipated. A net recovery of 45% of the coal mined by the alternative highwall system as well as the underground mining is anticipated. Normal coal losses are expected due to cleaning of the top of the seam, loading losses at the seam floor, and coal oxidation near the outcrop.

No coal washing is contemplated at this time, thus there will be no coal processing losses.

Maps and cross sections providing detailed information related to coal recovery activities can be viewed on Drawings 5-9 through 5-14.

### 523. MINING METHOD(s).

The Coal Hollow Mine will be a surface coal mining operation using open pit mining methods to produce up to 2 million tons of coal per year. Primary mining equipment will include hydraulic excavators, a highwall miner and end-dump mining trucks. The coal will be crushed at the mine site, and hauled to market in over-the-road coal trucks.

The mine is planned to produce approximately 4.64 million tons of coal over a life of approximately 6 years for the preferred option and approximately 3.0 million tons of coal over a life of approximately 5 years for the alternate option. The estimated production schedule is summarized below for the two options:

Preferred option			Alternative option		
		Tons Produced			Tons Produced
Year		(000)	Year		(000)
1		542	1		542
2		505	2		505
3		750	3		568
4		1,000	4		<del>598685</del>
5		1,000	5		<del>816762</del>
6		844	<del>6</del>		<del>431</del>
Total		4,641	Total		<del>3,029493</del>

Initial mine development will involve removal and storage of topsoil from mine infrastructure locations. Facilities for equipment maintenance/warehouse, coal handling, and offices will be constructed. During the development and initial mining period, facilities temporary in nature may be used until permanent facilities can be built. Construction of sedimentation ponds, diversion ditches, and mine roads accessing the initial mining areas will also be ongoing.

Mining will employ typical open pit methods using truck/loader type equipment to remove overburden and recover the coal. Mining will advance across the property in successive cuts approximately 250 ft. in width and 800 to 1,300 ft. long (generally equal to the width of the property less property barriers). Layout of these pits can be viewed on Drawing 5-10. The overburden will be removed in layers or lifts approximately 20 to 40 feet deep. In practice, these overburden lifts are mined in a stairstep fashion ahead of the coal removal operation to provide adequate working room for the equipment and stable advancing slopes. Once mining is complete, excavated overburden (spoil) from a successive cut is used to backfill the excavation. General cross sections of this process can be viewed on Drawings 5-11 and 5-12.

Prior to beginning mining, the area will be cleared of vegetation, and the topsoil will be recovered and either stockpiled or live hauled to regraded areas. It is not anticipated that blasting of the overburden will be necessary based on drilling data. Should this process become necessary, this is the phase where it would be implemented. Overburden will then be removed using large hydraulic excavator(s) or front end loaders and off-road trucks which will haul the spoil and place it in parts of the pit where the coal has been removed, or in the excess spoil area shown on Drawings 5-3, 5-35 and 5-36. Overburden is removed in successively deeper benches until the coal seam is exposed. Some overburden in lower lifts may be moved by direct dozing into the mined out pit by large bulldozers.

When overburden removal is finished in a particular pit, the top of the coal will be cleaned (removal of any roof rock or other non-coal material on top of the seam) using a motor grader, dozer or front end loader. The material removed will be placed in the adjacent mined out pit. For the open pit mined coal, if necessary, the coal seam will be loosened by drilling and blasting or ripping prior to loading. Drilling and blasting of the coal is not expected to be necessary. The cleaned, exposed coal is then excavated by backhoe or front end loader and placed into off-road rear dump trucks. Coal mined with a highwall miner would not require blasting.

Once the coal is removed, the pit will be backfilled by spoil from adjacent mine pits. Spoil will be placed in lifts and spread with a dozer. Once the pit is backfilled to the planned final surface contour, suitable topsoil and subsoil will be replaced, and the area reseeded. Revegetation work will proceed seasonally as appropriate for planting.

Overburden excavation and coal mining at Coal Hollow will begin near the subcrop of the coal seam at the western end of the permit area in the NW  $\frac{1}{4}$  NE  $\frac{1}{4}$  of Section 30, T39S, R5W. Topsoil will be removed and stored separately in topsoil stockpiles as shown on Map 2-2. Overburden from the initial pits will be hauled to the excess spoil pile east of the mining area. Once the initial pits are established, as much spoil as possible will be placed directly in the pit backfill, allowing reclamation to closely follow mining. This initial phase includes pits 1 through 8 as shown on Drawing 5-10. The mining and reclamation process for this phase can be viewed on Drawing 5-17.

From the initial mining area, operations will proceed eastward through the NE  $\frac{1}{4}$  of Section 30 to the NW  $\frac{1}{4}$  of Section 29 (as shown on Drawing 5-10) and from the southeast  $\frac{1}{4}$  of Section 30, beginning with pit 28 and proceeding north. The mining and reclamation process for this phase can be viewed on Drawing 5-18. As shown on Drawing 5-19, pit 9 will not be backfilled at this stage. The proposed method for filling this pit back to approximate original contour will be accomplished by utilizing overburden from the pit(s) in the adjacent federal reserves located immediately southwest or north of this area. Alton Coal Development, LLC is currently in the process of an Environmental Impact Study for these reserves with the intent of acquiring the rights to mine. It is expected that these rights will be acquired prior to the completion of the final phase in the proposed Permit Area. The final landform for the Permit Area is shown on Drawings 5-35 and 5-36.

In the case that Alton Coal Development, LLC is not successful with acquiring the rights to the adjacent federal coal reserves, spoil will be rehandled from the excess spoil and variance from the approximate original contour to fill the remaining pits. The final landform for this alternate scenario is shown on Drawing 5-37 and 5-37A.

Two other mining methods will be employed at the Coal Hollow Mine.

1. Highwall mining, where an unmanned cutter is driven underground and operated in front of the highwall; and

2. Standard underground mining utilizing a continuous miner, shuttle cars and underground conveyor system.

These mining methods were previously described in Section 522. It should be noted that each of these mining operations are located within an existing pit from the surface mining operation.

An estimate of the primary mining equipment planned for use at the Coal Hollow Mine is listed below:

Diesel - Hydraulic Excavators (15 to 38 cu. yd. capacity)  
Highwall Mining System (CAT HW300 or equivalent)  
Rubber Tired Front End Loaders (8 to 20 cu. yd. capacity)  
End Dump Trucks (100 to 240 ton capacity class)  
Track Dozers (Caterpillar D7 through D11 Class)  
Motor Graders (Caterpillar 16H to 24H Class)  
Water Trucks (8,000 to 20,000 Gallon Class)

Underground miner and associated equipment

A variety of other equipment will also be used to support the mining operation.

Proposed engineering techniques for meeting the proposed mining methods will include:

- Design support for roads, pits, sediment impoundments etc...
- Field staking of designs utilizing high precision GPS survey systems.
- Weekly field engineering support to view and provide guidance related to designs and environmental controls.
- Ongoing geotechnical support for ensuring highwall stability
- As additional information becomes available, update geological models to ensure full recovery of resource.
- Weekly mine plans that specify appropriate engineering and environmental specifications.

There are no known underground mines within 500 feet of the permit boundary; ~~therefore, n~~ No surface mining or reclamation activities ~~will~~ are proposed to take place within 500 feet of ~~any~~ the underground mine.

## 524. BLASTING AND EXPLOSIVES

As a result of the 2005 drilling program and overburden characterization, it was determined that the soil over the coal seam is void of any solid structure and that the overburden is extremely homogenous consisting of soft clay and soft shale. As results of this cursory investigation, it is anticipated that there would be no need to drill and blast the overburden to facilitate the removal of the spoil above the coal seam. Also, due to the fact that the coal will have to be mined from on top of the seam due to wet clay zone

for each blast. The method for the analysis of the predominant frequency contained in the blasting records will be approved by the Division before application of this alternative blasting criterion.

524.690. Standards not Applicable

The maximum airblast and ground-vibration standards of 524.620 through 524.632 and 524.640 through 524.680 will not apply at the following locations: At structures owned by Alton Coal Development LLC and not leased to another person; and at structures owned by Alton Coal Development LLC and leased to another person, if a written waiver by the lessee is submitted to the Division before blasting.

524.700 Records of Blasting Operations:

Blasting records will be maintained at the mine site for at least three years and upon request, records will be available for inspection by the Division or the public. A blasting record will contain the name of Alton Coal Development LLC; location, date, and time of the blast; name, signature, and Utah certification number of the blaster conducting the blast. It will also include the identification, direction, and distance, in feet, from the nearest blast hole to the nearest dwelling, public building, school, church, community or institutional building outside the permit area, except those described in 524.690 and weather conditions, including those which may cause possible adverse blasting effects.

The blasting record will include: The type of material blasted; sketches of the blast pattern including number of holes, burden, spacing, decks, and delay pattern; diameter and depth of holes; types of explosives used; total weight of explosives detonated in an eight-millisecond period; initiation system; type and length of stemming; and mats or other protection used.

If required, a record of seismographic and airblast information will include: type of instrument, sensitivity, and calibration signal or certification of annual calibration; exact location of instrument and the date, time, and distance from the blast; name of the person and firm analyzing the seismographic record; and the vibration and/or airblast level recorded; and the reasons and conditions for each unscheduled blast.

524.800 Use of Explosives:

Alton Coal Development LLC will comply with all appropriate Utah and federal laws and regulations in the use of explosives.

525. SUBSIDENCE CONTROL PLAN

The underground mining has limited extraction with no subsidence. Refer to Appendix 5-9 (Norwest Report) for geotechnical and design information. Do to the design and

will be used to supply electricity to the coal conveying, sizing, stockpiling and loading system. The anticipated layout of the electrical system is shown on Drawing 5-8B.

- Dust Control Structures: A water system will be constructed to provide water for non-potable uses at the facilities and also for fugitive dust control measures. This system will consist of a water well, 6" water transport pipe, and two 16,000 gallon water tanks. The first water tank will be placed near the mining area and will be used specifically to load the water truck which will spray water on the active roads within the permit area to control dust. The second tank is located at the facilities area to provide a water supply to the facilities for non-potable uses (cleaning equipment, restrooms, etc...). Further details related to this water system can be viewed on Drawing 5-8C.
- Underground Mining Facilities: Mine fan, portable generator, stacking conveyor. The generator and stacker are mobile and considered temporary. The mine fan is a single unit that is mounted, but easily removed. All of these facilities are in an existing pit, and shown on Drawing 5-3B.

During mine development and the initial mining period, some facilities of a temporary nature such as mobile buildings and crusher/stacking conveyors may be utilized.

Support facilities to provide lighting at night will be kept to a minimum but will need to be sufficient enough to provide safe operating conditions in the dark. The following lighting equipment is anticipated to be used to provide safe working conditions:

- Two to three mobile light plants: Each light plant will have up to four 1,000 watt lights.
- Four to six exterior lights at the facilities area for lighting walkways and miscellaneous work areas: Each of these is expected to be 250 watt lights.
- Lights on mobile mining equipment, support vehicles and building lights

The support facilities will be located, maintained, and used in a manner that prevent or control erosion and siltation, water pollution, and damage to public or private property; and to the extent possible use the best technology currently available to minimize damage to fish, wildlife, and related environmental values; and minimize additional contributions of suspended solids to stream flow or runoff outside the mine permit area. Any such contributions will not be in excess of limitations of Utah or Federal law.

The facilities will be fully reclaimed at the end of mining operations with the exception of the water well. The final contour for this area can be viewed on Drawing 5-35 and 5-37 and an anticipated timetable is shown on Drawing 5-38.

#### 526.300 Water Pollution Control Facilities:

Water pollution associated with mining and reclamation activities within the permit areas will be controlled by:

Mine development work will include a temporary diversion of Lower Robinson Creek away from the mining area. This diversion has been designed for a flow capacity of a 100 year, 24 hour storm event. The sides will be graded to a 3h:1v slope and rip-rap will be appropriately placed to minimize erosion of the channel beyond current channel conditions. All specifications required to meet the requirements for such a diversion have been included in this diversion design. Appendix 5-2 details the analysis/specifications for this diversion and Drawings 5-20 and 5-21 show the details of this design.

As part of the reclamation process, Lower Robinson Creek will be reconstructed to its approximate original location. The design for this reconstruction is shown on Drawings 5-20A and 5-21A. This design includes considerable improvements to the channel compared to the channel's current condition. The current condition is such that less than 25% of the channel within the disturbed area has a flood plain present and most of the slopes are near the angle of repose with fair to poor vegetative cover. The reconstructed channel includes stable slope angles that will be revegetated with a flood plain on both sides of the channel for the entire length reconstructed. Sharp corners in the original alignment have been rounded to sinuous curve shapes and rip-rap will be installed in the bottom section of the channel to minimize erosion. The flood plain will be seeded and covered with erosion matting to control erosion until a natural vegetative condition can be attained.

#### 527.230 Road Maintenance

All roads will be maintained on an as needed basis using motor graders, water trucks for dust suppression, and other equipment as necessary. Crushed stone and/or gravel will be used as a surface course for primary roads outside the active mining area, and may be used as needed for ramps and travelways within the pit. Should the roads be damaged by a catastrophic event, such as an earthquake or a flood, repairs will be made as soon as possible after the damage has occurred or the road will be closed and reclaimed.

#### 527.250. Geotechnical Analysis

No alternative specifications or steep cut slopes associated with roads are anticipated outside the active mine area. A report of appropriate geotechnical analysis will be provided should such alternative specifications or steep cut slopes where approval of the Division is required, become necessary.

### **528. HANDLING AND DISPOSAL OF COAL, OVERBURDEN, EXCESS SPOIL, AND COAL MINE WASTE:**

#### 528.100. Coal removal, handling, storage, cleaning, and transportation areas and structures;

Coal handling activities are confined to the active pit/ Underground Portal, and the coal sizing/loading areas located north of the pit. All areas and facilities will be designed and constructed, utilized and maintained in conformance with industry standards and all

The Preferred scenario for overburden removal will minimize overall disturbance and maximize resource recovery by providing a transition into the adjacent federal reserves with minimal effect to existing reclamation and backfill in the Permit Area. This scenario will also minimize variances from approximate original contour on the federal lands by eliminating the need for an excess spoil structure from the initial boxcut once operations are transitioned into these reserves.

During the course of mining, some additional excavated overburden may be placed temporarily on mined over and backfilled areas due to operational considerations. This material will be re-excavated and moved to its final placement location as operations allow.

The underground mining will be accessed through portals in an existing pit. There will be no additional overburden removal associated with the underground mining; however, cross sections of the portal area are show on Drawing 5-3B. Cover or overburden depths for the underground mining are described in Section 627.

All maps related to the overburden removal process can be viewed on Drawings 5-15 through 5-19.

528.300. Spoil, coal processing waste, mine development waste, and noncoal waste removal, handling, storage, transportation, and disposal areas and structures;

528.310. Excess Spoil. Excess spoil will be placed in designated disposal areas within the permit areas, in a controllable manner to ensure mass stability and prevent mass movement during and after construction. Excess spoil will meet the design criteria of R645-301-535. For the purposes of SURFACE COAL MINING AND RECLAMATION ACTIVITIES, the permit application must include a description of the proposed disposal site and the design of the spoil disposal structures according to R645-301-211, R645-301-212, R645-301-412.300, R645-301-512.210, R645-528.310, R645-301-535.100 through R645-301-535.130, R645-301-535.300 through R645-301-535.500, R645-536.300, R645-301-542.720, R645-301-553.240, R645-301-745.100, R645-301-745.100, R645-301-745.300, and R645-301-745.400.

Excess spoil will be placed in the area designated on Drawing 5-3 and 5-35. This fill will be placed in lifts not to exceed 4 feet in thickness. The material will be transported from the overburden removal area to the fill by end dump haul trucks and a dozer(s) will spread the spoil to this lift thickness. The fill will meet at minimum 85% compaction as related to the standard Procter. Final slopes will be regraded to a maximum slope of 3h:1v. The top of the fill will be sloped to approximately 2% to prevent pooling of water and to reestablish drainage similar to original flow patterns. The excess spoil placed on the non-mined areas is approximately 32 acres and varies in height from 35 to 120 feet. The area of excess fill over mined out areas (variance from approximate original contour) is an extension of the fill placed on the non-mined area and is approximately 35 acres. Combined acreage of the excess fill placed on mined and non-mined areas

553.600, R645-301-553.900, and R645-301-747. Appropriate measures will be implemented to preclude sustained combustion of such materials; and

528.400. Dams, embankments and other impoundments.

Plans do not include using dams, embankments or other impoundments for disposal of coal, overburden, excess spoil or coal mine waste

529. **MANAGEMENT OF MINE OPENINGS.**

When no longer required, underground mine openings will be closed in accordance with MSHA approved requirements and backfilled.

Each entry to the Underground mine if temporarily inactive, but having further projected useful service will be secured by barricades or other covering devices and posted with signs, to prevent access into the entry and identify the hazardous nature of the openings.

Alternative highwall mining will produce openings (holes) in the coal at the bottom of trenches specifically constructed for highwall mining. Trench depth to the holes range from 60 feet to 200 feet. After highwall mining is completed in a given trench, that trench will be completely backfilled, burying any openings made by highwall mining.

All wells will be managed to comply with R645-301-748 and R645-301-765. Water monitoring wells will be managed on a temporary basis according to R645-301-738.

Wells constructed for monitoring groundwater conditions in the proposed Coal Hollow Mine permit and adjacent area, including exploration holes and boreholes used for water wells or monitoring wells, will be designed to prevent contamination of groundwater and surface-water resources and to protect the hydrologic balance. A diagram depicting typical monitoring well construction methods is shown in Drawing 7-11. Monitoring wells will include a protective hydraulic seal immediately above the screened interval, an annular seal plugging the borehole above the hydraulic seal to near the ground surface, and a concrete surface seal extending from the top of the hydraulic seal to the ground surface which is sloped away from the well casing to prevent the entrance of surface flows into the borehole area. Well casings will protrude above the ground surface a sufficient height so as to minimize the potential for the entrance of surface water or other material into the well. A steel surface protector with a locking cover will be installed at monitoring wells to prevent access by unauthorized personnel. Where there is potential for damage to monitoring wells, the wells will be protected through the use of barricades, fences, or other protective devices. These protective devices will be periodically inspected and maintained in good operating conditions. Monitoring wells will be locked in a closed position between uses.

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 temporarily stored in appropriate containers and removed from the permit area and will be properly disposed of according to applicable State and Federal regulations.

528.332.

Final disposal of noncoal mine wastes will be in a State-approved solid waste disposal site not located within the permit area. One exception to the removal of all noncoal mine waste from the permit area is perforated piping used in the construction of Alluvial Ground Water Drains will be left in place as mining advances. This perforated piping will be covered in place approximately 20' to 30' below the final reclaimed surface. All other waste materials (ie. metal culvert) associated with the Alluvial Ground Water Drains will be removed and disposed of in a State-approved solid waste disposal site.

528.333.

At no time will any noncoal mine waste be deposited in a refuse pile or impounding structure, nor will any excavation for a noncoal mine waste disposal site be located within eight feet of any coal outcrop or coal storage area.

528.334.

Notwithstanding any other provision to the R645 Rules, any noncoal mine waste defined as "hazardous" under 3001 of the Resource Conservation and Recovery Act (RCRA) (Pub. L. 94-580, as amended) and 40 CFR Part 261 will be handled in accordance with the requirements of Subtitle C of RCRA and any implementing regulations.

528.340

As development of the Underground workings originates in the existing Surface mining Pit, development wastes have been stored in the excess spoils pile. Once all mining is complete spoils will be returned to the mined out Pit following the surface mining regulations.

528.350. Acid-Forming and Toxic Materials

If coal, having qualities that make it unmarketable, are to be left in the pit backfill in quantities greater than 5,000 tons: a minimum of 1 composite sample per 5,000 Tons of coal will be analyzed for the parameters list in Table 3 and 7 of the "Soil and Overburden Guidelines". A record of the volume of coal remaining and laboratory analytical results will be kept onsite. Debris, acid-forming, toxic-forming materials and materials constituting a fire hazard will be identified and disposed of in accordance with R645-301-528.330, R645-301-537.200, R645-301-542.740, R645-301-553.100 through R645-301-

There are no rock chimneys or drainage blankets proposed.

- 5) *A stability analysis including, but not limited to, strength parameters, pore pressures and long-term seepage conditions. These data will be accompanied by a description of all engineering design assumptions and calculations and the alternative considered in selecting the specific design specifications and methods.*

The stability analysis and all supporting data are available in Appendix 5-1.

- *If for the purposes of SURFACE COAL MINING AND RECLAMATION ACTIVITIES, under R645-301-535.112 and R645-301-535.113, rock-toe buttresses or key-way cuts are required, the will include the following:*

Neither rock-toe buttresses or key-way cuts are required under R645-301-535.112 or R645-301-535.113.

535.200. Disposal of Excess Spoil: Valley Fills/Head-of-Hollow Fills.

The MRP does not contemplate disposal of excess spoil as valley fill or head-of-hollow fills.

535.300. Disposal of Excess Spoil: Durable Rock Fills.

The MRP does not contemplate disposal of excess spoil as durable rock fill.

535.400. Disposal of Excess Spoil: Preexisting Benches.

The MRP does not contemplate disposal of excess spoil on preexisting benches.

535.500 Disposal of Excess Spoil: At Drift Entries.

The MRP does not contemplate disposal of spoils resulting from face-up operations at the drift entries. Drift entries will originate from the existing Pit, excess spoil for which are stored in the approved Excess Spoils Pile.

536. Coal Mine Waste.

The MRP does not contemplate processing of coal that would produce coal mine waste.

537 **REGRADED SLOPES:**

537.100 Geotechnical Analysis:

The excess spoil structure and fill above approximate original contour are the only alternative specifications proposed. A geotechnical analysis has been completed for this proposal and can be viewed in Appendix 5-1. All other mined areas, for surface or underground will be restored to approximate original contour.

#### 540 RECLAMATION PLAN:

##### 541.100 - 400 General

When coal mining is completed, all pits will be backfilled and reclaimed in accordance with the R645 rules and this permit. All equipment, structures, and other facilities, unless approved by the Division as suitable for the postmining land use or environmental monitoring, will be removed and the affected land reclaimed.

Underground mine portals will be closed in accordance with approved MSHA plans and backfilled.

When no longer needed for monitoring or other use approved by the Division upon a finding of no adverse environmental or health and safety effects, or unless approved for transfer as a water well under R645-301-731.100 through R645-301-731.522 and R645-301-731.800, each well will be capped, sealed, backfilled, or otherwise properly managed, as required by the Division in accordance with R645-301-529.400, R645-301-631.100, and R645-301-748. Permanent closure measures will be designed to prevent access to the mine workings by people, livestock, fish and wildlife, machinery and to keep acid or other toxic drainage from entering ground or surface waters.

If a water well is exposed by coal mining and reclamation operations, it will be permanently closed unless otherwise managed in a manner approved by the Division.

Permanent closure and abandonment of water wells greater than 30 feet in depth will be in accordance with the requirements of "Administrative Rules for Water Well Drillers", State of Utah, Division of Water Rights or other applicable state regulations. Abandonment of wells will be performed by a licensed water well driller. The wells to be abandoned will be completely filled using neat cement grout, sand cement grout, unhydrated bentonite, or bentonite grout, or other materials approved by the Utah State Engineer's office. Alternatively, the well may be abandoned using a different procedure upon approval from the Utah State Engineer's office.

Abandonment materials will be introduced at the bottom of the well or required sealing interval and placed progressively upward to the top of the well. The casing will be severed a minimum of 2 feet below the ground surface. A minimum of 2 feet of compacted native material will be placed above the abandoned well upon completion.

Within 30 days of the completion of well abandonment procedures, a report will be submitted to the State Engineer by the responsible licensed driller giving data related to the abandonment of the well. This shall include the name of the licensed driller or other

subsoil layers will be dozed to a consistent thickness. Approximately 8 inches of topsoil is expected to be removed ahead of mining and replaced over the regraded area. Subsoil removed and replaced will average 40 inches thick and will be placed between the topsoil layer and run of mine spoil. The total profile thickness of topsoil and subsoil in mined areas will average 48 inches. Once in place, the area will be fine graded to remove small erosion features and depressions.

- Revegetation. Following replacement of topsoil the area will be revegetated by seeding. Mulch will be placed on the seedbed surface once soil amendments have been incorporated and seeding has been accomplished in areas that will be reclaimed to native plant communities. The mulch should control erosion by wind and water, decrease evaporation and seed predation, and increase survivability of the seeded species. Like the seeding methods, mulch will be applied with a variety of techniques and materials depending on the reclaimed area.

Generally, mined areas will be backfilled and graded within approximately 180 days following coal removal, or 1,500 feet of the active coal removal face. One exception to this standard is during mining and backfilling of the Highwall Trench south of Pit 9. During this phase of mining, Pit 9 will be left open for access to the Highwall Trench and underground mine. A detailed description of the reason for this variation are fully described in section 528 (Overburden) and the major steps can be viewed on Drawings 5-17 through 5-19. Areas needed for in-pit roads, ramps, drainage controls or areas which must be left open temporarily for operational reasons will be backfilled and graded when they are no longer needed. The rate of backfilling will depend on the availability of mined out pit areas for backfilling, and the rate of production at the mine. Based on anticipated production rates, Drawing 5-38, or Drawing 5-38A if the alternative highwall mining is selected, provides an estimated sequence and timing for reclamation.

Topsoil will be replaced on the graded areas as soon as operationally practicable. This work will depend on weather and soil conditions in the removal and replacement areas, but is generally anticipated to occur within 90 days of completion of regrading.

Revegetation activities will be seasonal in nature. As currently planned, initial seeding will occur at the first planting opportunity following replacement of topsoil. Supplemental seeding may be done subsequently as needed.

Some delay is unavoidable in reclamation of the initial mining areas due to the time required to establish the initial working pit and backfill area, and to achieve a steady state excavation/backfill operation. As currently planned the initial mining areas will be backfilled to the planned post mining contour, graded, and the topsoil replaced by late in the first year or in the first half of the second year of mining. Reclamation activities will proceed at the regular planned rate thereafter. Proposed final reclamation contours and cross sections can be viewed on Drawings 5-35 and 5-36.

The location of these roads is shown on Drawings 5-35 and 5-37 along with the post mining topography.

- Removal of Water Control Structures. All sedimentation control structures, including ditches, berms and sedimentation ponds not retained as part of the approved post-mining land use will be removed, the areas regraded, topsoiled, and revegetated. All water control structures will be removed at final reclamation.

Final pit backfilling, removal of buildings, roads and other facilities, along with replacement of topsoil is expected to require approximately 15 months after the last coal is removed. In the alternate reclamation scenario (Drawing 5-37), the bulk of this period will be required to backfill the final pits.

#### 542.700. Final Abandonment of Mine Openings and Disposal Areas.

Final abandonment of alternative mined highwall panels will be at the time when completed panels are backfilled as described in Section 529.

Underground mine openings will be closed in accordance with approved MSHA requirements and backfilled.

When no longer needed for monitoring or other use approved by the Division upon a finding of no adverse environmental or health and safety effects, or unless approved for transfer as a water well under R645-301-731.100 through R645-301-731.522 and R645-301-731.800, each well will be capped, sealed, backfilled, or otherwise properly managed, as required by the Division in accordance with R645-301-529.400, R645-301-631.100, and R645-301-748. Permanent closure measures will be designed to prevent access to the mine workings by people, livestock, fish and wildlife, machinery and to keep acid or other toxic drainage from entering ground or surface waters.

If a water well is exposed by coal mining and reclamation operations, it will be permanently closed unless otherwise managed in a manner approved by the Division.

Permanent closure and abandonment of water wells greater than 30 feet in depth will be in accordance with the requirements of “Administrative Rules for Water Well Drillers”, State of Utah, Division of Water Rights or other applicable state regulations. Abandonment of wells will be performed by a licensed water well driller. The wells to be abandoned will be completely filled using neat cement grout, sand cement grout, unhydrated bentonite, or bentonite grout, or other materials approved by the Utah State Engineer’s office. Alternatively, the well may be abandoned using a different procedure upon approval from the Utah State Engineer’s office.

Abandonment materials will be introduced at the bottom of the well or required sealing interval and placed progressively upward to the top of the well. The casing will be severed a minimum of 2 feet below the ground surface. A minimum of 2 feet of compacted native material will be placed above the abandoned well upon completion.

#### 542.740. Disposal of Noncoal Mine Wastes.

Noncoal mine waste 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 temporarily stored in a controlled manner in a designated portion of the permit area and hauled offsite to a state approved recycling or solid waste disposal site. Final disposal of noncoal mine waste will not take place within the permit area. With the exception of removal of perforated piping used in the construction of Alluvial Ground Water Drains that will be left in place as mining advances. This perforated piping will be covered in place approximately 20' to 30' below the final reclaimed surface. All other waste materials (ie. metal culvert) associated with the Alluvial Ground Water Drains will be removed and disposed of in a State-approved solid waste disposal site.

#### 542.800. Reclamation Cost.

The amount of the bond will depend upon the requirements of the *approved* permit and reclamation plan (R645-830.120).

A preliminary estimate of reclamation costs is included in Appendix 8-1. This estimate is based upon the proposed plan of open pit mining. The cost for the alternative plan of highwall mining will be considerably less because of reduced surface disturbance with this mining operation. Therefore the cost estimate will remain based on the proposed plan of open pit mining. A final bond estimate will be provided by the applicant to the Division upon completion of the approved permit and reclamation plan.

### 550. **RECLAMATION DESIGN CRITERIA AND PLANS**

#### 551. **SEALING AND CASING OF UNDERGROUND OPENINGS**

When no longer required, underground mine openings will be closed in accordance with MSHA approved requirements and backfilled. When no longer needed for monitoring or other use approved by the Division upon a finding of no adverse environmental or health and safety effects, or unless approved for transfer as a water well under R645-301-731.100 through R645-301-731.522 and R645-301-731.800, each well will be capped, sealed, backfilled, or otherwise properly managed, as required by the Division in accordance with R645-301-529.400, R645-301-631.100, and R645-301-748. Permanent closure measures will be designed to prevent access to the mine workings by people, livestock, fish and wildlife, machinery and to keep acid or other toxic drainage from entering ground or surface waters.

the excess spoil would likely be material removed from the Permit Area to access the coal beneath the Permit Area highwalls and provide the proper layback of the backfill material along the Permit boundary.

If the As alternative highwall mining is selected, highwall mining would begin in Pit 9. Then, once coal is removed from Pit 22, the coal east of Pits 22 and 23 will be mined using the highwall miner while Highwall Trench 1 (HWT1) is excavated. In this method of mining, an unmanned cutter module is driven underground and operated in front of the highwall. The highwall mining machine stands on the pit floor or on a bench, directly in front of the exposed seam and makes long parallel rectangular drives into the coal seam. A remote-operated cutter module is pushed into the seam by a string of push beams (unmanned coal-conveying elements) that transport the mined coal back to the entry of the drive onto a stockpile. Coal is then removed to the sizing/loading area. The miner is moved along the face making successive pushes into the coal face. Once coal is removed from the Pits/Highwall Trench, overburden from excavation of the next Highwall Trench is used to backfill the mined out area continuing with the progression of the trench.

The anticipated coal removal sequence for the Highwall mining is shown on drawing 5-10A. As is depicted, each Pit/Highwall Trench consists of Panels, each panel consisting of 10 holes. The spacing between the holes and the spacing between the panels are dictated by the amount of overburden over the panels. The alternate Highwall mining is designed such that subsidence does not occur to the surface with nonyieldable webs and barriers. Specific information concerning these design are found in Appendix 5-8. Highwall mining will have only the disturbance associated with the pit/trench for placement of the highwall miner and will have no impact on the surface above the highwall panels.

The following tables summarizes the overburden and backfill balance for these two scenarios:

Alternate Scenario (Adjacent Federal Reserves Not Acquired)				
Phase	Overburden (LCY)	Available Backfill (LCY)	Excess Spoil (LCY)	Total Excess Spoil (LCY)
1	7,936,000	5,195,000	2,741,000	2,741,000
2	14,168,000	11,127,000	3,041,000	5,782,000
3	14,631,000	14,631,000	0	5,782,000
4 (Rehandle)	0	2,545,000	-2,545,000	3,237,000
Total	36,735,000	33,498,000	3,237,000	3,237,000

Alternate Scenario (Highwall mining)				
Phase	Overburden (LCY)	Available Backfill (LCY)	Excess Spoil (LCY)	Total Excess Spoil (LCY)
1	7,936,000	5,195,000	2,741,000	2,741,000
2	7,381,000	7,277,000	104,000	2,845,000
3	5,257,000	5,257,000	0	2,845,000
4 (Federal)	2,545,000	2,545,000	0	2,845,000
Total	23,119,000	20,274,000	2,845,000	2,845,000

In both scenarios (Preferred and Alternate), Rough backfilling and grading operations will follow coal removal by not more than 60 days or 1500 linear feet except for the exemption Pit 9. Pit 9 will be utilized for access to the Highwall Trench. Once mining is complete, the proposed plan for backfilling Pit 9 includes acquiring the right to mine the adjacent federal coal reserves, located immediately southwest or north of Pit 9. In the case that Alton Coal Development is not successful with acquiring the adjacent federal coal reserves, all the fill above approximate original contour and part of the excess spoil structure will be rehandled and placed back in the remaining backfill area. The underground mining will be accessed through portals in an existing pit. There will be no additional overburden removal associated with the underground mining.

Major steps in the backfilling and grading process are:

- Backfilling of the Mined Out Pit. Material from active pits will be used to backfill mined out pits as mining progresses. Material will be placed in the in-pit backfill in lifts, until the approximate planned final elevation is reached. Working stability in the backfill will be achieved by placement of the material, and control of the overall spoil face slope at stable angles. The mined out area will be filled to its planned post-mining elevation, which approximates the pre-mining land contour. The backfill will be inherently stable because the exposed surface will have shallow slopes, and the backfill surface will not be significantly higher than the surrounding undisturbed ground with the exception of the variance shown on Drawing 5-3.
- Backfilling of Ramps. Ramps and travelways within the active mining will be moved as necessary for safe operation and efficient hauling of overburden and coal. When a particular ramp or travelway is no longer needed, it will be backfilled with excavated overburden from the advancing pit.
- Grading. After backfilling is complete in each mined out area, the area will be graded using dozers and motor graders to achieve the planned post-mining contour, facilitate stable positive drainage patterns, and to blend in with the surrounding topography. Postmining slopes will not exceed either the angle of repose or such lesser slope as is necessary to achieve a minimum long-term static

(materials with elevated SAR ratios or other physical or chemical characteristics that could cause appreciable adverse impacts on vegetation).

Several investigations involving reclamation of surface disturbed areas in the vicinity have been performed by other entities. These included the use of test plots to measure reclamation feasibility and success. The results of these investigations have been presented in published documents (Ferguson and Frischknecht 1985; USDI 1975). These investigations have demonstrated the feasibility of successful reclamation in the area.

### 623-300 Subsidence Control Plan

~~The proposed mining in the proposed Coal Hollow Mine permit area does not include underground coal mining activities. This section is not applicable. The underground mining has limited exaction with no subsidence. Refer to Appendix 5-9 (Norwest Report) for geotechnical and design information. Do to the design and mining method of underground mining in this plan, no subsidence is projected and no monitoring is planned.~~

## **624 GEOLOGIC DESCRIPTION**

### 624.100 Regional and Structural Geology

The coal to be mined in the proposed Coal Hollow Mine permit area is of Cretaceous age and resides in the Alton Coal Field of southwestern Utah. The Alton Coal Field is a roughly horseshoe-shaped region that is situated between the Kaiparowits Coal Field to the east, and the Kolob Coal Field to the west.

The topography in the Alton Coal Field is marked by bench and slope topography. Topographic relief in the region is approximately 2,800 feet, with elevations ranging from about 9,300 feet on top of the Paunsaugunt Plateau, to about 6,500 feet in the valley bottoms. The economic coal seams are located primarily along the western and southern flanks of the Paunsaugunt Plateau.

The geologic history, geology, stratigraphy, and structure of the Alton Coal Field have been described by Doelling (1972) and Tilton (Appendix 6-3; 2001) and are summarized below. A map of geologic formations exposed at the surface in the proposed Coal Hollow Mine permit area is shown in Drawing 6-1. Cross-sections showing the regional geologic conditions in the Alton Coal Field are presented in Drawings 6-3 and 6-9.

#### Stratigraphy

Stratigraphic units present in the Alton Coal Field area are described in ascending order below. A stratigraphic column showing these geologic formations is shown in Drawing 6-3. A diagrammatic

624.230

Chemical analyses of the Smirl coal seam for acid- or toxic-forming materials including total sulfur and pyritic sulfur are presented in Appendix 6-1 (confidential binder).

624.300

~~The proposed mining in the proposed Coal Hollow Mine permit area does not include underground coal mining activities. This section is not applicable. Logs of drill holes are presented in Appendix 6-1. Chemical analysis of strata overlying and immediately below the coal seam are shown in Appendix 6-2. Chemical analysis of the coal seam for acid or toxic forming materials including total sulfur and pyritic sulfur are presented in Appendix 6-1 (Confidential binder).~~

624.400

~~Physical properties of the stratum immediately above and below the coal seam are shown in Appendix 6-1 (Confidential Binder)~~

## 627 OVERBURDEN THICKNESS AND LITHOLOGY

The planned mining in the proposed Coal Hollow Mine permit area does ~~not~~ include underground coal mining activities. Overburden thickness and lithology are shown in Appendix 6-1, and Drawing 5-15 and 6-3.

Overburden in planned mining areas in the proposed Coal Hollow Mine permit area consists of the following.

### Alluvium

Alluvial sediments are present at the surface in most areas proposed for mining. These sediments consist primarily of clays, silts, and fine-grained sands. The thickness of the alluvium in proposed mining areas ranges from a thin veneer to about 50 feet. The alluvial sediments in most areas are not well sorted and are derived largely from weathering of the Tropic Shale in adjacent upland areas.

### Tropic Shale

In all proposed mining areas, the lower portion of the Tropic Shale overlies the Dakota Formation Smirl coal zone to be mined. The thickness of the Tropic Shale overlying the coal seam in proposed mining areas ranges from a few feet up to about 200 feet. The lower Tropic Shale consists predominantly of soft shales, silty shales, and claystones, with occasional thin layers of siltstone and bentonite-like clay layers up to about 1 foot in thickness. Strong, competent rock strata were not

Permanent closure and abandonment of water wells greater than 30 feet in depth will be in accordance with the requirements of “Administrative Rules for Water Well Drillers”, State of Utah, Division of Water Rights or other applicable state regulations. Abandonment of wells will be performed by a licensed water well driller. The wells to be abandoned will be completely filled using neat cement grout, sand cement grout, unhydrated bentonite, or bentonite grout, or other materials approved by the Utah State Engineer’s office. Alternatively, the well may be abandoned using a different procedure upon approval from the Utah State Engineer’s office.

Abandonment materials will be introduced at the bottom of the well or required sealing interval and placed progressively upward to the top of the well. The casing will be severed a minimum of 2 feet below the ground surface. A minimum of 2 feet of compacted native material will be placed above the abandoned well upon completion.

Within 30 days of the completion of well abandonment procedures, a report will be submitted to the State Engineer by the responsible licensed driller giving data related to the abandonment of the well. This shall include the name of the licensed driller or other person(s) performing abandonment procedures, name of well owner at the time of abandonment, the address or location of the well by section, township, and range, abandonment materials and equipment used, water right or file number covering the well, the final disposition of the well, and the date of completion.

Exploration holes and boreholes will be backfilled, plugged, cased, capped, sealed, or otherwise managed to prevent acid or toxic contamination of water resources and to minimize disturbance to the prevailing hydrologic balance. Exploration holes and boreholes will be managed to ensure the safety of people, livestock, fish and wildlife, and machinery.

If a water well is exposed by coal mining and reclamation operations, it will be permanently closed unless otherwise managed in a manner approved by the Division.

Boreholes will be backfilled to within 1 foot of the land surface with concrete or other materials approved by the Division as necessary to prevent contamination of groundwater or surface-water resources or to protect the prevailing hydrologic balance. The upper approximately 1 foot will be backfilled with native materials to facilitate reclamation (see Drawing 6-11). Exploration holes and boreholes that may be uncovered during mining and reclamation activities will be permanently closed unless approved for water monitoring or otherwise managed in a manner approved by the Division.

## 632 SUBSIDENCE MONITORING

~~The underground mining has limited extraction with no subsidence. Refer to Appendix 5-9 (Norwest Report) for geotechnical and design information. Do to the design and mining method of underground mining in this plan, no subsidence is projected and no monitoring is planned. The proposed mining in the proposed Coal Hollow Mine permit area does not include underground coal mining activities. This section is not applicable.~~

permit (which is considered unlikely), Alton Coal Development, LLC may when necessary and with the approval of the Utah Division of Oil, Gas and Mining construct supplemental containment and settlement ponds in which mine discharge waters may be held for treatment (where necessary) and subsequent discharge through UPDES discharge points in compliance with the UPDES discharge permit.

Mining in the Coal Hollow project area will be a combination of surface mining, either open pit or highwall mining, and underground mining. Both the highwall mining and underground mining are designed such that subsidence is not expected to occur or have a negative impact on renewable resources lands.

724.700      Alluvial Valley Floor Determination

A field investigation has been performed in the proposed Coal Hollow Mine permit and adjacent area to provide to the Division the information required to make an evaluation regarding the existence of a probable alluvial valley floor in the proposed Coal Hollow Mine permit and adjacent area. The results of this field investigation and related information is provided in Appendix 7-1. Additional information regarding potential alluvial valley floors in the area is provided in Appendix 7-7.

A report detailing the findings of a previous field investigation performed by Water Engineering & Technology, Inc., entitled “Geomorphological and sedimentological characteristics of Sink Valley, Kane County, Utah” is included as Appendix 7-4.

725      **BASELINE CUMULATIVE IMPACT AREA INFORMATION**

Appendix 7-1 contains the results of a comprehensive investigation of groundwater and surface-water systems in the proposed Coal Hollow Mine permit and adjacent area (including the 85.88-acre Dame Lease IBC area). Appendix 7-1 also includes information regarding the probable hydrologic consequences of coal mining in the proposed Coal Hollow Mine permit area and recommendations for hydrologic monitoring. Appendix 7-1 also includes the results of a field investigation performed in the proposed Coal Hollow Mine permit and adjacent area to provide to the Division of Oil, Gas and Mining the information required to make an evaluation regarding the existence of a probable alluvial valley floor in the proposed Coal Hollow Mine permit and adjacent area. This Information together with the information submitted herein can be used to assess the probable cumulative hydrologic impacts of coal mining and reclamation operations in the proposed Coal Hollow Mine permit and adjacent area (including the 85.88-acre Dame Lease IBC area) as required by R645-301-729.

R645-301-726      Modeling

No numerical models have been created for the permit area nor are any planned.

## 730 OPERATION PLAN

Coal mining in the proposed Coal Hollow Mine permit area will occur using surface and underground mining techniques. All coal mining and reclamation operations will be conducted to minimize disturbance to the hydrologic balance within the permit and adjacent areas, to prevent material damage to the hydrologic balance outside the permit area and support approved postmining land uses in accordance with the terms and conditions of the approved permit and the performance standards of R645-301 and R645-302. Operations will be conducted to assure the protection or replacement of water rights in accordance with the terms and conditions of the approved permit and the performance standards of R645-301 and R645-302.

In order to maximize the use and conservation of the coal resource, coal will be recovered using a combination of large hydraulic backhoes or front end loaders and off-road trucks, highwall mining and underground mining. Mined coal will be hauled to a central coal processing area for crushing and placement into a stockpile. Coal from the stockpile will be transferred into a bin and loaded into over the road trucks for transport.

The plan, with Drawings, cross sections, narrative, descriptions, and calculations indicates how the relevant requirements will be met. The lands subject to coal mining and reclamation operations over the estimated life of the operations are identified and briefly described. All appropriate information is located in the subsequent sections and Drawings 5-1 through 5-39 and Appendices A5-1 through A5-3.

## 731 GENERAL REQUIREMENTS

Operations will be conducted to assure protection or replacement of water rights in accordance with the terms and conditions of the approved permit and the performance standards of R645-301 and R645-302.

### Groundwater and Surface-Water Protection

To protect the hydrologic balance, coal mining and reclamation operations will be conducted to handle earth materials and runoff in a manner that minimizes acid, toxic, or other harmful infiltration to the groundwater system. Additionally, excavations, and disturbances will be managed to prevent or control discharges of pollutants to the groundwater.

Products including chemicals, fuels, and oils used in the mining process will be stored and used in a manner that minimizes the potential for these products entering groundwater systems. Concrete oil and fuel containments will be constructed as shown on Drawings 5-3 and 5-8.

mining promulgated by the U.S. Environmental Protection Agency set forth in 40 CFR part 434. Discharge of mine waters will be regulated by a Utah UPDES discharge permit.

Water pollution associated with mining and reclamation activities within the permit areas will be controlled by:

- Construction of berms and/or diversion ditches to control runoff from all facilities areas.
- Roads will be constructed with ditches to capture runoff
- Diversion ditches will be constructed as necessary around active mining and reclamation areas to capture runoff from those areas.
- Sedimentation impoundments will be constructed to control discharges
- In areas where impoundments or diversions are not suitable to the surrounding terrain, silt fence or straw bales will be utilized to control sediment discharge from the permit area.

In order to accomplish these objectives, watershed analysis of the permit and adjacent areas has been completed and specific designs are established for each water pollution control structure. Primary control structures include four sediment impoundments, four diversion ditches and miscellaneous berms. The locations of these structures can be viewed on Drawing 5-3. The detailed analysis for these structures and specific designs can be viewed on Drawings 5-25 through 5-34. In addition, a geotechnical analysis of the impoundments to ensure stability can be viewed in Appendix 5-1. The watershed and structure sizing analysis can be viewed in Appendix 5-2. In addition to these primary structures, temporary diversions and impoundments may also be implemented, as necessary, in mining areas to further enhance pollution controls.

Sediment control measures will be located, maintained, constructed and reclaimed according to plans and designs given under R645-301-732, R645-301-742 and R645-301-760. Siltation structures and diversions will be located, maintained, constructed and reclaimed according to plans and designs given under R645-301-732, R645-301-742 and R645-301-763. Storm water and snow melt that occurs within the facilities area will be routed to an impoundment that will contain sediment. This impoundment will have a drop-pipe spillway installed that will allow removal of any oil sheens that may result from parking lots or maintenance activities by using absorbent materials to remove the sheen. Details for this impoundment can be viewed on Drawings 5-28.

There are ~~four~~ five sediment impoundments proposed for the permit area. These structures will be constructed using a combination of dozers and backhoes. The structures have been designed to contain the required storm events as specified in Appendix 5-2. The structures will have sediment removed as necessary to ensure the required capacities. Details for these structures can be viewed on Drawings 5-25, 5-26 and 5-28 through 5-32. Calculations and supporting text can be viewed in Appendix 5-2.

## 732 Sediment Control Measures

Sediment control measures have been designed, constructed and maintained to prevent additional contributions of sediment to streamflow or to runoff outside the permit area.

### 732.100 Siltation Structures

Siltation structures within the permit area are described in Section 732.200

### 732.200 Sedimentation Ponds

Four diversion ditches along with ~~four~~ five sediment impoundments are proposed for the permit area. In addition, miscellaneous controls such as silt fence and berms are also proposed for specific areas. The proposed locations for these structures are shown on Drawing 5-3. Details associated with these structures can be viewed on Drawings 5-25 through 5-34 and Appendix 5-2.

Sedimentation ponds have been designed in compliance with the requirements of R645-301-356.300, R645-301-356.400, R645-301-513.200, R645-301-742.200 through R645-301-742.240, and R645-301-763.

No sedimentation ponds or earthen structures that will remain open are planned.

The sedimentation plan has been designed to comply with the MSHA requirements given under R645-301-513.100 and R645-301-513.200.

### 732.300 Diversions

The runoff control plan is designed to isolate, to the maximum degree possible, runoff from disturbed areas from that of undisturbed areas. Where possible, this has been accomplished by allowing up-stream runoff to bypass the disturbed area, and routing any runoff from undisturbed areas that enter the disturbed area into a sediment control system.

Four diversion ditches along with ~~four~~ five sediment impoundments are proposed for the permit area. In addition, miscellaneous controls such as silt fence, berms and temporary diversion ditches are also proposed for specific areas. The proposed locations for these structures are shown on Drawing 5-3. Details associated with these structures can be viewed on Drawings 5-25 through 5-34 and Appendix 5-2. All temporary ditches will meet the design requirements of Diversion Ditch 4 (designed for the 100-year, 24 hour storm) and will be adjusted within the permitted active mining area in relation to the active pit, current spoils pile configuration and reclamation.

The excess spoil is planned to be placed in an area where natural grades range from 0 to 5%. This is one of the most moderately sloping locations in the Permit Area. Stability of this structure is estimated to be 1.6 to 1.7 based on the Appendix 5-1.

Geotechnical borings were completed in the foundation of the proposed disposal area. Laboratory analysis of these borings has also been completed. Details of this analysis can be viewed in Appendix 5-1.

Permanent slopes for the proposed excess spoil will not exceed 3h:1v (33 percent), therefore no keyway cuts have been proposed in the design. Appendix 5-1 details the stability analysis for the proposed structure.

Excess spoil will not be disposed of in underground mine workings.

Horizontal lifts will not exceed four feet in thickness unless otherwise approved by the Division. The lifts will be concurrently compacted to meet 85% of the standard Procter. The geotechnical analysis (Appendix 5-1), provides information showing that these construction standards will provide mass stability and will prevent mass movement during and after construction. The excess spoil will be graded to provide drainage similar to original flow patterns. Topsoil and subsoil as designated in Chapter 2 will be removed and separated from other materials prior to placement of spoil.

A description of the character of the bedrock and any adverse geologic conditions in presented in Appendix 5-1.

Spring and seep survey information is provided on Drawing 7-1. There are no springs or seeps identified in the excess spoil area.

There are no historical underground mining operations in the proposed excess spoil area. There are also no future underground operations proposed.

There are no rock chimneys or drainage blankets proposed.

A stability analysis including strength parameters, pore pressures and long-term seepage conditions is presented together with all supporting data in Appendix 5-1.

Neither rock-toe buttresses nor key-way cuts are required under R645-301-535.112 or R645-301-535.113.

No valley fills or head-of-hollow fills are proposed.

No durable rock fills are proposed.

No disposal of waste on preexisting benches is planned

The diversions ditches will be utilized to direct runoff from disturbed areas to the sediment impoundments. The channel sizing for the four proposed diversion ditches has been evaluated using the TR-55 method to determine peak flows and the Manning's Equation (ME) to determine appropriate dimensions. The TR-55 method of analysis is the same method used to size impoundments and was utilized in this case to provide a peak flow for each diversion during a 100 year, 24 hour storm event. This peak flow was then input into the ME to determine an appropriate open channel design for minimizing the effects of erosion during peak flows. Similar to the impoundment sizing, the Carlson Software Hydrology module was utilized to perform these calculations. The ditch locations, designs and cross sections can be viewed on Drawings 5-33 and 5-34.

The following table summarizes the inputs and results for each diversion based on flows during a 100 year, 24 hour storm event:

Diversion Ditch Summary							
Ditch	*Base (ft)	Manning's n	Average Slope (%)	Peak Flow (cfs)	Flow Depth (ft)	Velocity (fps)	Freeboard (ft)
1	3.0	0.020	2.8	14.8	0.5	6.8	0.3
2	2.5	0.020	3.5	6.9	0.4	6.0	0.3
3	4.5	0.020	2.4	16.7	0.5	6.3	0.3
4	5.0	0.020	1.8	19.8	0.6	5.4	0.3

\*All side slopes are 2h:1v

The sedimentation plan has been designed to comply with the MSHA requirements given under R645-301-513.100 and R645-301-513.200.

These structures will retain sediment within the disturbed area. The diversion ditches are designed in manner that will minimize erosion of the channels and will divert runoff from disturbed areas to the impoundments. These sediment control measures are designed to meet the effluent limitations under R645-301-751.

742.126

Water encountered underground will be stored and treated as needed in underground sumps. It is anticipated most or all of such water would be utilized in the underground mining operation. Excess water would only be discharged after meeting applicable UPDES standards.

742.200      Siltation Structures

Siltation structures have been designed in compliance with the requirements of R645-301-742.

Miscellaneous controls such as silt fence and berms are proposed for specific areas. The proposed locations for these structures are shown on Drawing 5-26. Details associated with these structures can be viewed on Drawings 5-25 through 5-34 and Appendix 5-2.

742.210 General Requirements

Additional contributions of suspended solids and sediment to streamflow or runoff outside the permit area will be prevented to the extent possible using the best technology currently available. Siltation structures for an area will be constructed before beginning any coal mining and reclamation operations in that area and, upon construction, will be certified by a qualified registered professional engineer to be constructed as designed and as approved in the reclamation plan. Any siltation structures which impounds water will be designed, constructed and maintained in accordance with R645-301-512.240, R645-301-514.300, R645-301-515.200, R645-301-533.100 through R645-301-533.600, R645-301-733.220 through R645-301-733.224, and R645-301-743.

The primary controls for limiting suspended solids and sediment to stream flow and runoff outside the permit area is sediment impoundments and diversions ditches. The proposed system described in section 742.110 is designed to control storm water/runoff discharges from the disturbed areas. Discharges from this system are expected to be minimal and infrequent. Discharges that may occur will comply with R645-301-751.

The impoundment and ditch system will be inspected regularly and discharges will be sampled for water quality purposes.

742.214

Water encountered underground will be stored and treated as needed in underground sumps. It is anticipated most or all of such water would be utilized in the underground mining operation. Excess water would only be discharged after meeting applicable UPDES standards.

742.220 Sedimentation Ponds.

742.221.1 The proposed sediment ponds are designed to be used individually

742.221.2 The locations for the sediment ponds were selected to be as near as possible to the disturbed areas and are not located in perennial streams

742.221.3 The ponds are designed and will be constructed and maintained to:

742.221.31 The ponds have been designed with excess capacity by at least 15% to allow for adequate sediment storage volume. The following table provides the design capacities in relation to a 24 hour duration, 100 year storm event:

<b>Sedimentation Impoundment Capacities</b>				
Structure	Storage Required	Design Storage*	Percent of	Additional

A geotechnical analysis has been completed for the proposed excess spoil structure. This analysis estimates the long-term safety factor to be 1.6 to 1.7 based on the proposed design. Following proper construction practices of building the structure in maximum four foot lifts and meeting 85% compaction based on the standard Procter will ensure that the structure will be stable under all conditions of construction. This construction will occur only in the designated excess spoil area as shown on Drawing 5-3 and 5-35. The fill will be placed with end dump haul trucks and lifts will be constructed using dozers. High precision GPS systems will be regularly utilized to check grades and appropriate lift thickness. The geotechnical analysis for this structure can be viewed in Appendix 5-1.

The excess spoil is planned to be placed in an area where natural grades range from 0 to 5%. This is one of the most moderately sloping locations in the Permit Area. Stability of this structure is estimated to be 1.6 to 1.7 based on the Appendix 5-1.

Geotechnical borings were completed in the foundation of the proposed disposal area. Laboratory analysis of these borings has also been completed. Details of this analysis can be viewed in Appendix 5-1.

Permanent slopes for the proposed excess spoil will not exceed 3h:1v (33 percent), therefore no keyway cuts have been proposed in the design. Appendix 5-1 details the stability analysis for the proposed structure.

Excess spoil will not be disposed of in underground mine workings.

Horizontal lifts will not exceed four feet in thickness unless otherwise approved by the Division. The lifts will be concurrently compacted to meet 85% of the standard Procter. The geotechnical analysis (Appendix 5-1), provides information showing that these construction standards will provide mass stability and will prevent mass movement during and after construction. The excess spoil will be graded to provide drainage similar to original flow patterns. Topsoil and subsoil as designated in Chapter 2 will be removed and separated from other materials prior to placement of spoil.

A description of the character of the bedrock and any adverse geologic conditions in presented in Appendix 5-1.

Spring and seep survey information is provided on Drawing 7-1. There are no springs or seeps identified in the excess spoil area.

There are no historical underground mining operations in the proposed excess spoil area. There are also no future underground operations proposed.

There are no rock chimneys or drainage blankets proposed.

A stability analysis including strength parameters, pore pressures and long-term seepage conditions is presented together with all supporting data in Appendix 5-1.

746.330. Drainage control.

No coal mine waste and associated drainage control is anticipated.

746.400. Return of Coal Processing Waste to Abandoned Underground Workings.

No coal mine processing waste is anticipated, ~~nor are any underground workings planned to be placed in underground workings.~~

747. **DISPOSAL OF NONCOAL WASTE**

747.100

Noncoal mine waste, including but not limited to grease, lubricants, paints, flammable liquids, garbage, machinery, lumber and other non combustible materials generated during coal mining and reclamation operations will be temporarily placed in covered dumpsters. This waste will be regularly removed from the project area and disposed of at a state approved solid waste disposal site outside the project area.

747.200

Noncoal mine waste will be stored in a metal, covered dumpster which will prevent storm precipitation or runoff from coming in contact with the waste.

747.300

No noncoal mine waste will be disposed of within the permit area with the exception perforated piping used in the construction of Alluvial Ground Water Drains. This will be left in place as mining advances. This perforated piping will be covered in place approximately 20' to 30' below the final reclaimed surface. All other waste materials (ie. metal culvert) associated with the Alluvial Ground Water Drains will be removed and disposed of in a State-approved solid waste disposal site.

748. Casing and Sealing of Wells.

Wells constructed for monitoring groundwater conditions in the proposed Coal Hollow Mine permit and adjacent area, including exploration holes and boreholes used for water wells or monitoring wells, will be designed to prevent contamination of groundwater and surface-water resources and to protect the hydrologic balance. A diagram depicting typical monitoring well construction methods is shown in Drawing 7-11. Monitoring wells will include a protective hydraulic seal immediately above the screened interval, an annular seal plugging the borehole above the hydraulic seal to near the ground surface, and a concrete surface seal extending from the top of the hydraulic seal to the ground surface which is sloped away from the well casing to prevent the entrance of surface

830.140 Detailed Estimated Costs

The bonding amount for final reclamation will depend upon the approved permit and reclamation plan (R645-301-830.120). The alternative highwall mining and underground mining will reduce surface disturbance. Mining disturbance to the surface will be reduced along with reclamation needs. Thus, estimates have been completed for the individual mining phases shown in Drawings 5-17, 5-18 and 5-19, the mining that will generate the largest disturbance and require the larger bond. These estimates are provided as Appendix 8-1. These cost calculations are based on the specific details shown on these drawings. As requested by the Division, a separate bond estimate is completed for all three phases shown in the drawings and in general, each stage is representative of the expected reclamation liability for Phase 1, 2 and 3, respectively. ~~If the alternative highwall mining is selected the bond will be reduced as appropriate for the area of disturbance generated.~~ Based on the existing highwall mining and proposed underground mining, which reduce the disturbed area, the present posted bond is more than adequate. The bond estimate by Phase, escalated for the 2017 (anticipated end of mining) is the following:

Phase 1:	\$5,346,000
Phase 2:	\$9,888,000
Phase 3:	\$6,624,000

A summary and supporting calculations for these cost estimates is provided in Appendix 8-1.

840. GENERAL TERMS AND CONDITIONS OF THE BOND

General terms and conditions of the bond as stated at R645-301-840 through R645-301-840.520 will be met by Alton Coal Development, LLC

850. BOND REQUIREMENTS FOR UNDERGROUND COAL MINING

Not Applicable

860. FORM OF BOND

860.100 Surety Bond

The applicant will submit a surety bond as defined under R645-100-200 and meet all the requirements under R645-301-860.110 to .120.

870. REPLACEMENT OF BONDS

Equivalent bond coverage will be provided if Alton Coal Development, LLC replaces the surety bond.

880. REQUIREMENT TO RELEASE PERFORMANCE BONDS

Range 6 West  
Range 5 West

18

19

20

30

31

32

Township 39 South

COUNTY RD 136

TEMPORARY REROUTED COUNTY RD 136

COUNTY RD INTERSECTION

Lower Robinson Creek

ROADWAY  
18" Culvert 13  
18" Culvert 12  
18" Culvert 1  
18" Culvert 2  
18" Culvert 3  
18" Culvert 4  
Pond 1  
24 INCH DROP PIPE SPILLWAY  
TOP OF RISER 6919  
BOTTOM OF RISER 6917  
24 INCH PIPE  
OUTLET 6915  
Pond 1B  
24 INCH INLET PIPE  
24 INCH DROP PIPE SPILLWAY  
Straw Bale  
COUNTY ROAD 136  
CLOSURE POINT  
24 INCH CULVERT  
OUTLET 6907  
24 INCH CULVERT  
INLET 6901

Robinson Creek  
to be Reconstructed  
after mining  
Robinson Creek  
Temporary Diversion

DIVERSION DITCH 4

DIVERSION DITCH 8  
(Configuration will change  
as mining progresses)

DITCH TO BE  
PLACED IN FILL

PHASE  
EXCESS SPOIL  
1

PHASE  
3

PHASE  
2

PHASE 1 = 289 acres  
PHASE 2 = 40 acres  
PHASE 3 = 89 acres

UNDERGROUND  
PORTALS

Diversion Ditch 1

Primary Railroad

Pond 4

COUNTY ROAD 136  
CLOSURE POINT

NOTES:  
Refer to drawing 2-2 for topsoil  
placement.

**LEGEND:**

- PERMIT BOUNDARY
- PRIVATE COAL OWNERSHIP
- SECTION LINE
- FOUND SECTION CORNER
- FOUND PROPERTY CORNER
- DIVERSION DITCHES
- PROPOSED SEDIMENT IMPOUNDS
- BERM
- CENTERLINE
- WATER LINE
- WATER TANK / WELL

DRAWN BY:  
C. McCourt  
G. Crossman

DRAWING:  
5-3

JOB NUMBER:  
1400

CHECKED BY:  
LWJ

DATE:  
11/10/08

SCALE:  
1" = 500'

SHEET

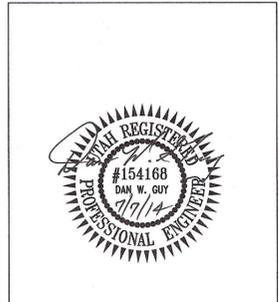
REVISIONS	
DATE:	BY:
8/13/13	KN
10/18/13	LWJ
02/26/14	KN
07/02/14	KN

**FACILITIES & STRUCTURES**

**LAYOUT**

COAL HOLLOW  
PROJECT  
ALTON, UTAH

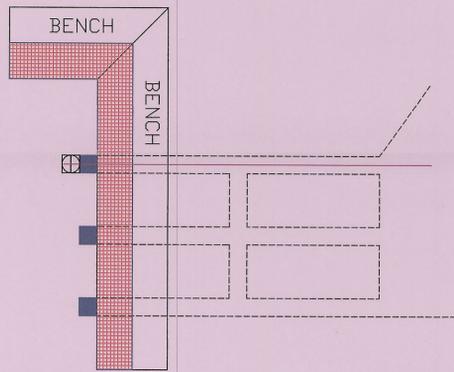
DRAWING: 5-3



463 North 100 West, Suite 1  
Cedar City, Utah 84721  
Phone (435)867-5331  
Fax (435)867-1192

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JUL 08 2014  
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PLAN VIEW  
UP IS NORTH



LOOKING TOWARDS THE NORTH  
FROM GROUND LEVEL

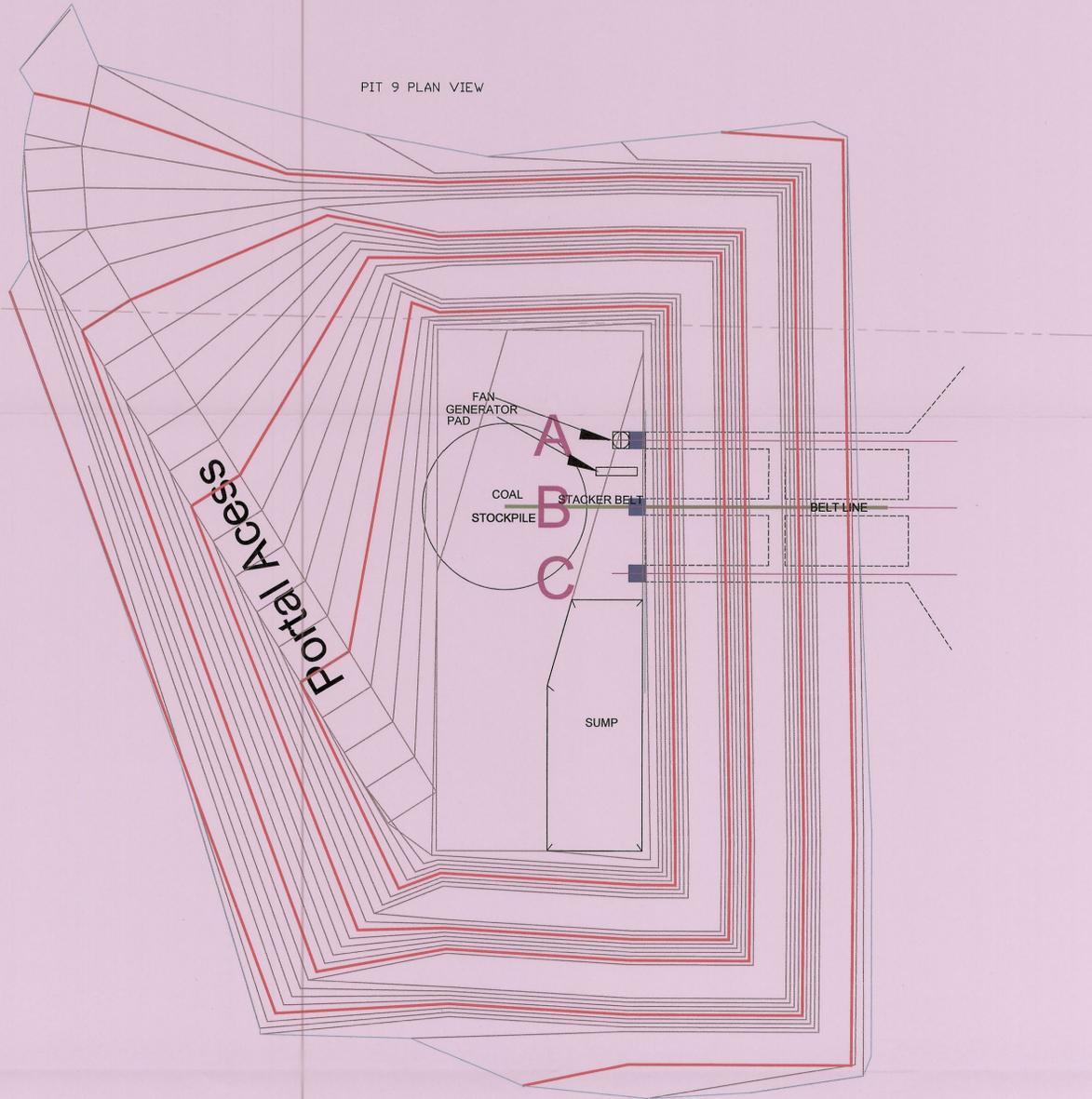


LOOKING TOWARDS THE EAST  
FROM GROUND LEVEL

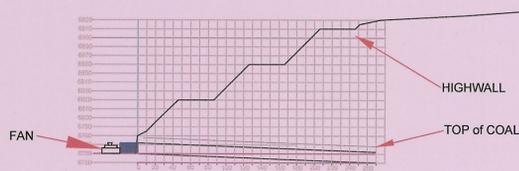


SHOTCRETE AREA
  UNDERGROUND PORTALS
  EXPOSED PORTALS

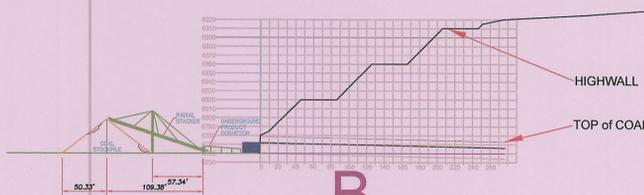
PIT 9 PLAN VIEW



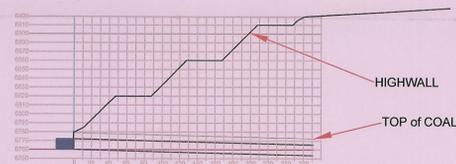
PROFILE OVER PORTALS



A



B



C

**LEGEND:**  
 SECTION LINE  
 FOUND SECTION CORNER  
 FOUND PROPERTY CORNER

DRAWN BY:  
 C. McCOURT  
 G. Grossman

CHECKED BY:  
 LWJ

DRAWING:  
 5-3B

DATE:  
 11/10/08  
 SCALE:  
 1" = 100'

JOB NUMBER:  
 1400

SHEET

**REVISIONS**

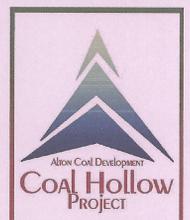
DATE:	BY:
07/02/14	KN

**UNDERGROUND FACILITIES & STRUCTURES**

**LAYOUT**

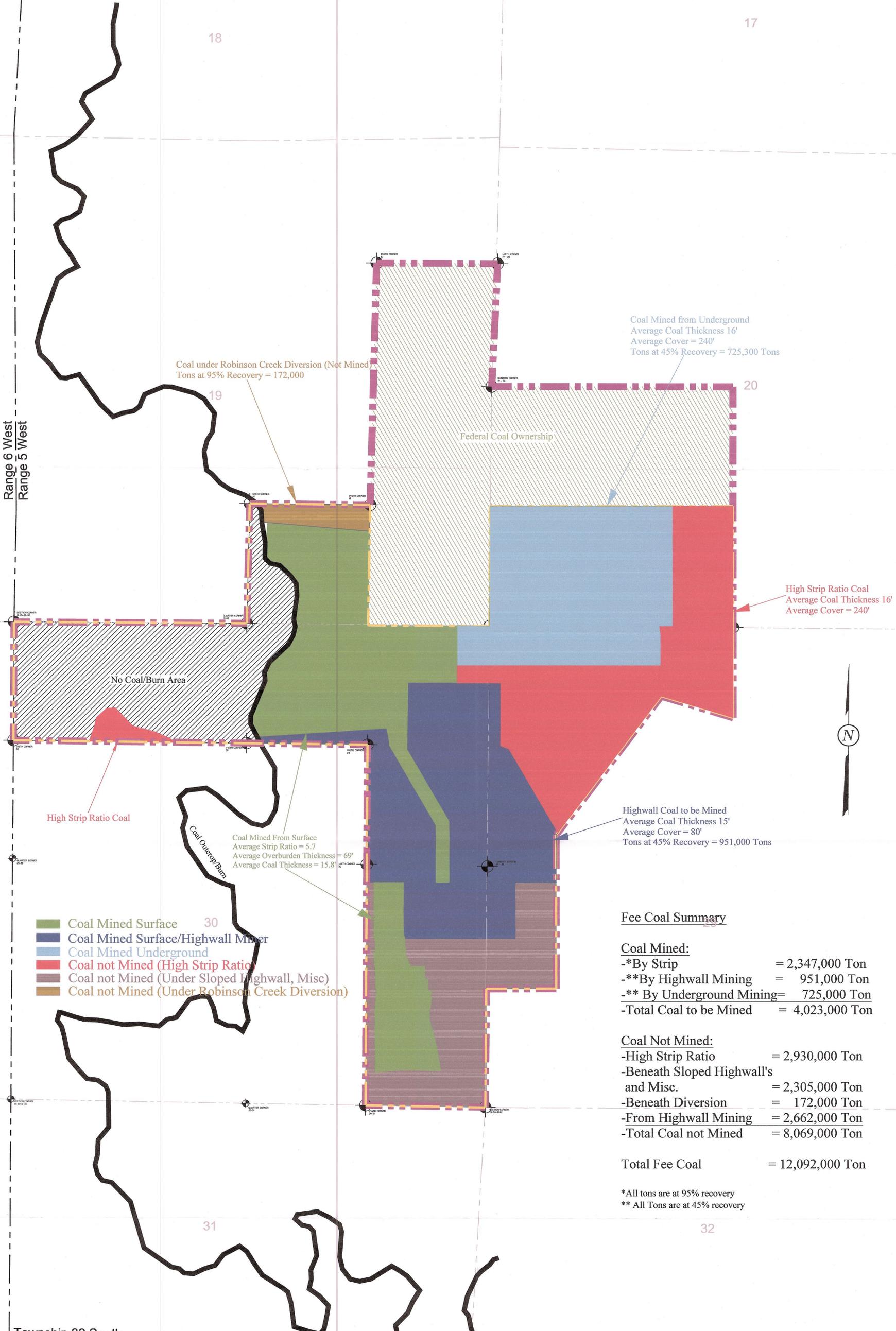
COAL HOLLOW  
 PROJECT  
 ALTON, UTAH

**DRAWING: 5-3B**



Alton Coal Development  
**Coal Hollow**  
 PROJECT  
 463 North 100 West, Suite 1  
 Cedar City, Utah 84721  
 Phone (435)867-5331  
 Fax (435)867-1192

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 JUL 08 2014



Coal under Robinson Creek Diversion (Not Mined)  
Tons at 95% Recovery = 172,000

Coal Mined from Underground  
Average Coal Thickness 16'  
Average Cover = 240'  
Tons at 45% Recovery = 725,300 Tons

Federal Coal Ownership

High Strip Ratio Coal  
Average Coal Thickness 16'  
Average Cover = 240'

No Coal/Burn Area

High Strip Ratio Coal

Coal Mined From Surface  
Average Strip Ratio = 5.7  
Average Overburden Thickness = 69'  
Average Coal Thickness = 15.8'

Highwall Coal to be Mined  
Average Coal Thickness 15'  
Average Cover = 80'  
Tons at 45% Recovery = 951,000 Tons

- Coal Mined Surface
- Coal Mined Surface/Highwall Miner
- Coal Mined Underground
- Coal not Mined (High Strip Ratio)
- Coal not Mined (Under Sloped Highwall, Misc)
- Coal not Mined (Under Robinson Creek Diversion)

**Fee Coal Summary**

**Coal Mined:**  
 -\*By Strip = 2,347,000 Ton  
 -\*\*By Highwall Mining = 951,000 Ton  
 -\*\*By Underground Mining = 725,000 Ton  
 -Total Coal to be Mined = 4,023,000 Ton

**Coal Not Mined:**  
 -High Strip Ratio = 2,930,000 Ton  
 -Beneath Sloped Highwall's and Misc. = 2,305,000 Ton  
 -Beneath Diversion = 172,000 Ton  
 -From Highwall Mining = 2,662,000 Ton  
 -Total Coal not Mined = 8,069,000 Ton

**Total Fee Coal = 12,092,000 Ton**

\*All tons are at 95% recovery  
 \*\* All Tons are at 45% recovery

**LEGEND:**

- PERMIT BOUNDARY
- PRIVATE COAL OWNERSHIP
- COAL LINE BOUNDARY
- SECTION LINE
- FOUND SECTION CORNER
- FOUND PROPERTY CORNER

**DRAWN BY:**  
C. McCOURT

**DRAWING:**  
5-9A

**JOB NUMBER:**  
1400

**CHECKED BY:**  
LWJ

**DATE:**  
4/20/07

**SCALE:**  
1" = 500'

**SHEET**

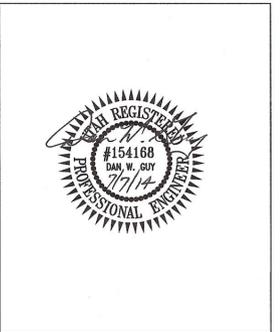
**REVISIONS**

DATE:	BY:
9/16/08	CRM
1/14/13	KN
10/01/13	LWJ
05/09/14	KN
07/03/14	KN

**COAL EXTRACTION OVERVIEW**  
 SURFACE & HIGHWALL MINING

**COAL HOLLOW PROJECT**  
 ALTON, UTAH

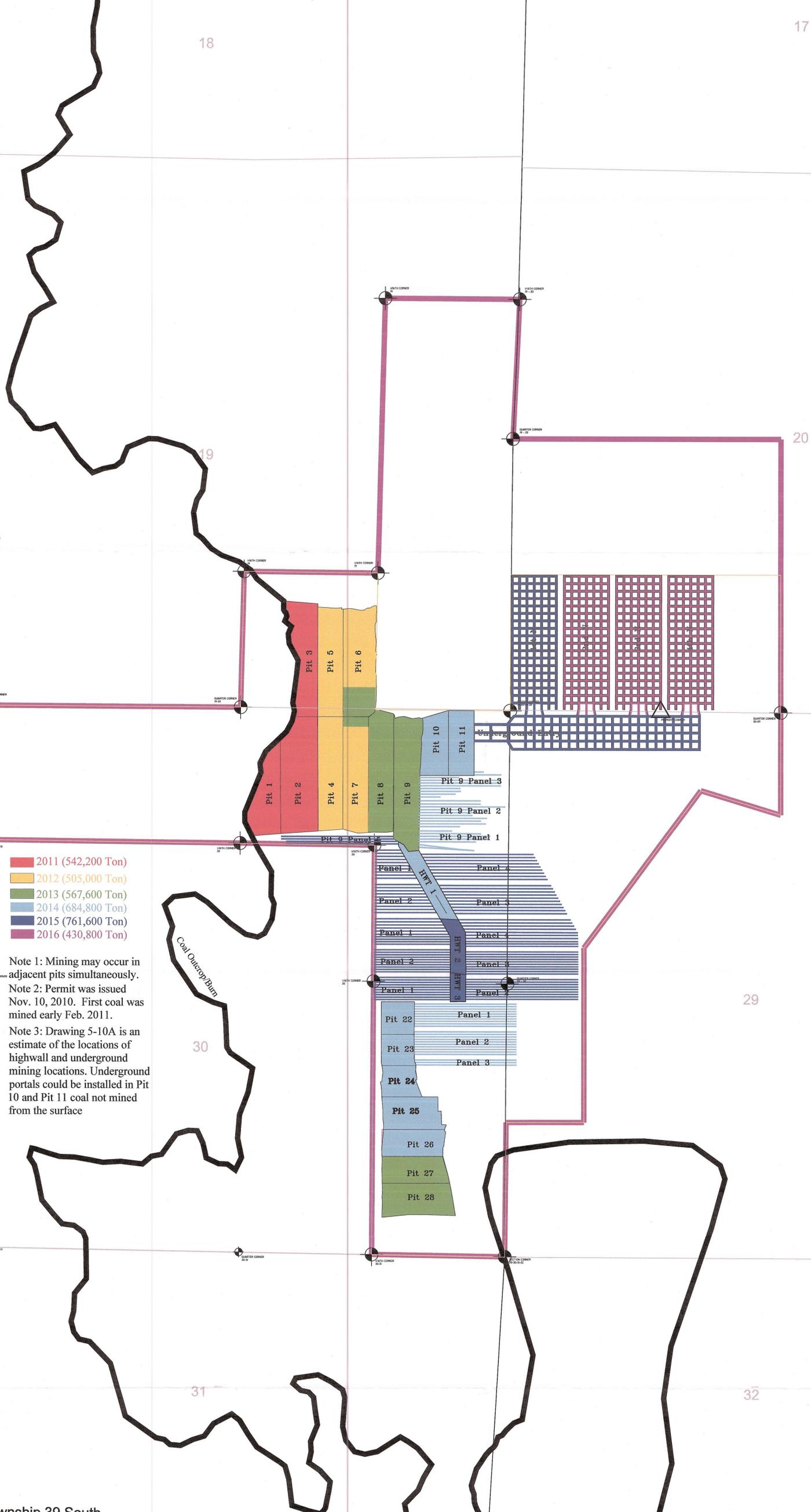
**DRAWING: 5-9A**



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Range 6 West  
Range 5 West



- 2011 (542,200 Ton)
- 2012 (505,000 Ton)
- 2013 (567,600 Ton)
- 2014 (684,800 Ton)
- 2015 (761,600 Ton)
- 2016 (430,800 Ton)

Note 1: Mining may occur in adjacent pits simultaneously.  
 Note 2: Permit was issued Nov. 10, 2010. First coal was mined early Feb. 2011.  
 Note 3: Drawing 5-10A is an estimate of the locations of highwall and underground mining locations. Underground portals could be installed in Pit 10 and Pit 11 coal not mined from the surface

Township 39 South

LEGEND:

- PERMIT BOUNDARY
- PRIVATE COAL OWNERSHIP
- COAL LINE BOUNDARY
- COAL RECOVERY
- SECTION LINE
- FOUND SECTION CORNER
- FOUND PROPERTY CORNER

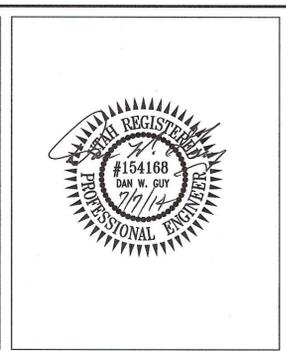
DRAWN BY:	C. McCOURT
DRAWING:	5-10
JOB NUMBER:	1400

CHECKED BY:	LWJ
DATE:	4/20/07
SCALE:	1" = 500'
SHEET	

REVISIONS	
DATE:	BY:
1/30/14	KN
5/7/14	KN
7/3/14	KN

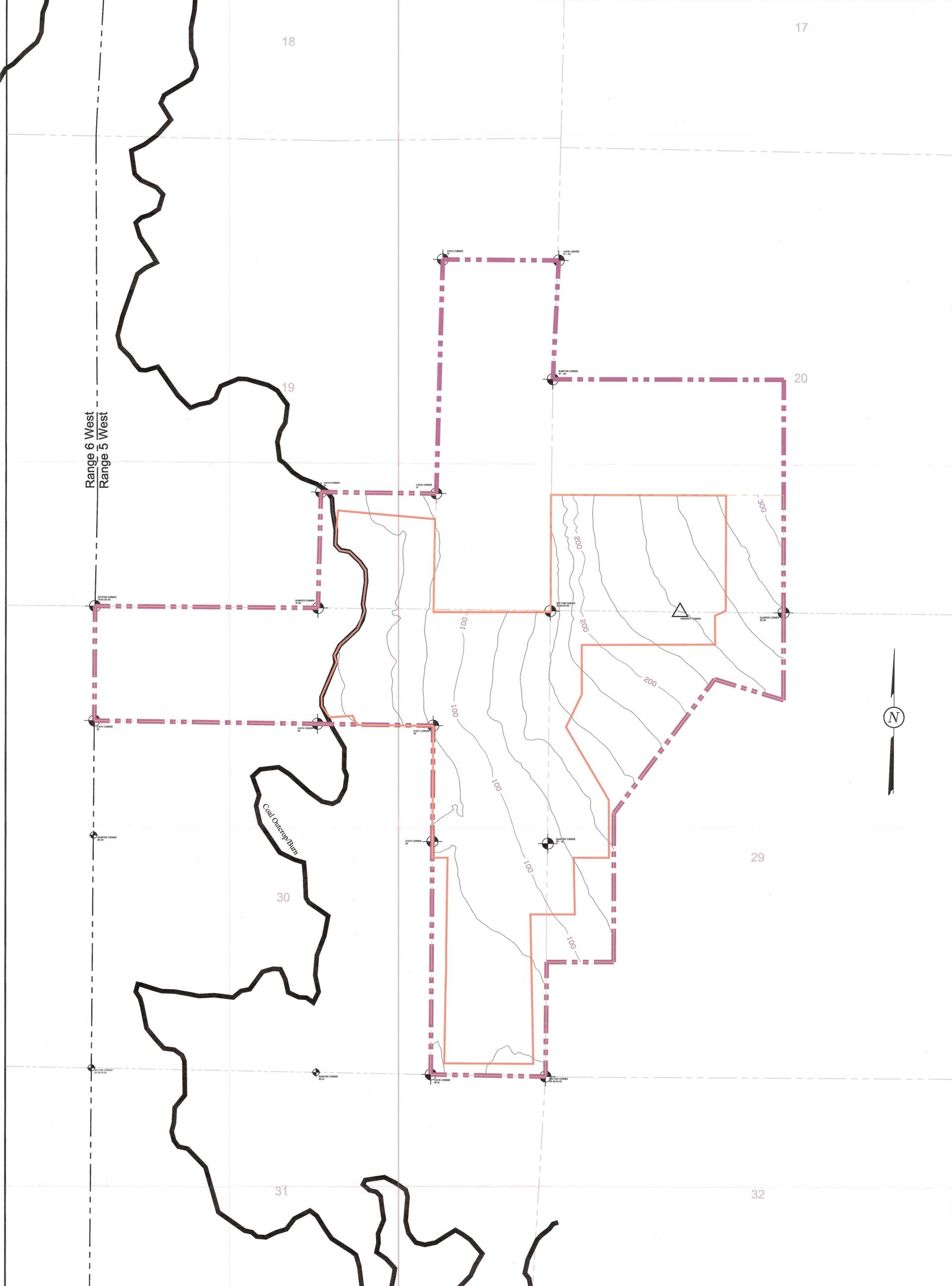
**COAL REMOVAL SEQUENCE**

COAL HOLLOW PROJECT  
ALTON, UTAH  
DRAWING: 5-10A



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CONTOURS ARE SHOWN AT 10' INTERVALS.

Township 39 South

**LEGEND:**

- PERMIT BOUNDARY
- PRIVATE COAL OWNERSHIP
- COAL LINE BOUNDARY
- COAL RECOVERY LINE
- SECTION LINE
- FOUND SECTION CORNER
- FOUND PROPERTY CORNER

DRAWN BY:	C. McCOURT
DRAWING:	5-15
JOB NUMBER:	1400

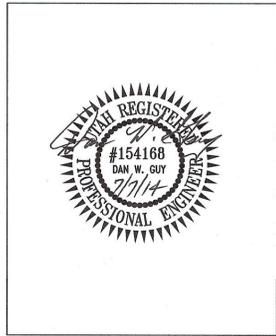
CHECKED BY:	GG
DATE:	4/20/07
SCALE:	1" = 500'
SHEET	

REVISIONS	
DATE:	BY:
9/16/08	CRM
6/26/14	KN

**OVERBURDEN ISOPACH**

COAL HOLLOW PROJECT  
ALTON, UTAH

**DRAWING: 5-15**



Alton Coal Development  
**Coal Hollow Project**

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### 332. SUBSIDENCE

Mining in the Coal Hollow project area will be a combination of surface mining, either open pit or highwall mining and underground mining. Both the highwall mining and underground mining are designed such that subsidence is not expected to occur or have a negative impact on renewable resource lands. This is further discussed in Section 525 of Chapter 5.

However, current elevation of the existing topography may be slightly altered in the mining and reclamation operations with open pit mining. The alternate Highwall mining or underground mining will have only the disturbance associated with the trench for placement of the highwall miner or portals and will have no impact on the surface above the highwall panels

Reclamation has been planned to minimize the impact to the renewable resources identified in this section by promptly reclaiming each mine segment contemporaneously by controlling erosion and re-seeding with a mixture of native plant species that will re-establish the plant communities to vegetative cover that will be diverse, effective, permanent, and consistent with the postmining land use. More details regarding postmining land and topography have been provided in Chapter 4 and Chapter 5 of this document, respectively.

The mine plan is not expected to negatively impact the plants and wildlife in the Coal Hollow Project area. Onsite revegetation research and sage-grouse mitigation plans have been designed. Details of this work have been made available to DOGM specialists for their comments and participation in the process.

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553.800	Backfilling and Grading: Thick Overburden	5-76
560.800	Performance Standards	5-81

## **APPENDICES**

5-1	Geotechnical Analysis - Sediment Impoundments and Excess Spoil Structure
5-2	Sediment Impoundment and Diversion Structure Analysis
5-3	Robinson Creek Culvert and Diversion Analysis
5-4	Coal Hollow Mine Blasting Plan
5-5	Reclamation Slope Stability Evaluation/Analysis
5-6	Post-Mining Roads Backfill Analysis
5-7	Location of & Standards and Specifications for ASCAs and ASCMs in use at Coal Hollow Mine
5-8	Feasibility of Highwall Mining the Smirl Seam at the Alton Coal Development, LLC Coal Hollow Mine
5-9	Norwest Corporation Underground Letter Reports

## **DRAWINGS**

### **General**

5-1	Pre-mining Topography
5-2	Disturbance Sequence
5-2A	Disturbance Sequence – Surface & Highwall Mining

### **Facilities (5-3 to 5-8C)**

5-3	Facilities and Structures Layout
5-3A	Culverts
5-4	Loadout Elevation View 1
5-5	Loadout/Stockpile Elevation View 2
5-6	Office Elevation View
5-7	Maintenance Shop Elevation View
5-8	Wash Bay, Oil and Fuel Storage Elevation View
5-8A	Wash Bay Equipment Layout
5-8B	Facilities and Structural – Electrical
5-8C	Facilities and Structural – Water Plan

### **Coal Recovery (5-9 to 5-14)**

5-9	Coal Extraction Overview
5-9A	Coal Extraction Overview – Surface & Highwall Mining
5-10	Coal Removal Sequence
5-10A	Coal Removal Sequence – Surface & Highwall Mining
5-10B	Coal Removal Sequence – Surface & Highwall Mining
5-11	Shallow Coal Recovery Cover Cross Section
5-12	Deep Coal Recovery Cross Section
5-13	Strip Ratio Isopach
5-14	Coal Thickness Isopach

### **Overburden Handling (5-15 to 5-19)**

5-15	Overburden Isopach
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### 515.300. Temporary Cessation

#### 515.311

During a temporary cessation of the Underground operations, surface access openings to underground operations and facilities in areas in which there are no current operations, but in which operations are to be resumed under an approved permit will be effectively secured.

#### 515.312.

During a temporary cessation, surface facilities in areas in which there are no current operations, but in which operations are to be resumed under an approved permit will be effectively secured.

#### 515.320.

Before temporary cessation of coal mining and reclamation operations for a period of 30 days or more, or as soon as it is known that a temporary cessation will extend beyond 30 days, a notice of intention to cease or abandon operations will be submitted to the division. This notice will include:

- A statement of the exact number of acres which have been affected in the permit area prior to such temporary cessation,
- The extent and kind of reclamation of those areas which has been accomplished, and
- Identification of the backfilling, regrading, revegetation, environmental monitoring, and water treatment activities that will continue during the temporary cessation.

### 516. **PREVENTION OF SLIDES**

The moderate topography in the area of the planned Coal Hollow Mine will minimize the potential for unplanned slides. A natural barrier will, however, be left undisturbed except as necessary for roads, sedimentation control, temporary topsoil and spoil storage and similar features, beginning at the elevation of the coal seam and extending from the outslope for a distance of at least 50 ft. The barrier will be retained in place to prevent slides and erosion.

## 520. OPERATION PLAN.

### 521. GENERAL.

The proposed Coal Hollow Mine is located approximately 2.5 miles south of Alton, Utah. In order to maximize the use and conservation of the coal resource, coal will be recovered using large hydraulic excavators, front end loaders, off-road trucks, underground miner and highwall miner. Mined coal will be hauled to a central coal area for crushing and placement into a stockpile. Coal from the stockpile will be transferred into a bin and loaded into over the road trucks for transport.

The plan, with Drawings, cross sections, narrative, descriptions, and calculations indicates how the relevant requirements will be met. The lands subject to coal mining and reclamation operations over the estimated life of the operations are identified and briefly described. All appropriate information is located in the subsequent sections and Drawings 5-1 through 5-44 and Appendices 5-1 through 5-9. Topsoil piles and removal sequencing is shown on Drawing 2-2.

#### 521.100. Cross Sections and Drawings.

The application includes cross sections, Drawings and plans showing all the relevant information required by the Division. Appropriate information is provided in Drawings and cross sections 5-1 through 5-44.

#### 521.110. Previously Mined Areas.

Historically, there has been some underground mining of coal within the Alton Amphitheater. The following underground mines are known to have historically existed within the Amphitheater:

- Seaman Mine
- Smirl Mine
- Alton Mine
- Johnson Mine
- Silver Mine

There are not any known mines that existed or currently exist within the permit area or the adjacent area as defined in R645-100-200. There is also not any active coal mining operations in the area.

#### 521.120. Existing Surface and Subsurface Facilities and Features.

#### 521.121. Buildings

The location of all buildings in and within 1,000 feet of the proposed permit area, with identification of the current use of the buildings is shown on Drawings 1-5 and 1-6.

#### 521.122. Surface and Subsurface Man-Made Features

The only known surface and subsurface manmade features that exist within the permit area are:

- County Road 136 ( location shown on Drawing 5-3)
- Water pipeline to Pond 20-1 (location shown on Drawing 7-7)

#### 521.123. Public Roads

One Class B public road, Kane County Road 136 (K3900) is located in or within 100 feet of the proposed permit area and is shown on Drawing 5-3. This road will be temporarily relocated outside the permit area until mining is complete and then reconstructed. In addition, Kane County has recently made a claim on the two-track road located adjacent to Lower Robinson Creek which is also located within the permit boundary. This road has mostly been closed to the public since it crosses private land and ACD has worked with Kane County to develop an access agreement which includes access through the permit area by mine personnel escort only. This agreement is included as Appendix 1-8 in Chapter 1. The County has named this Class D public road K3993.

The details for reestablishing road K3900 is shown on Drawings 5-22E, 5-22F and 5-22H. The details related to reestablishing K3993 following mining is shown on Drawing 5-22C.

#### 521.124. Existing areas of spoil, waste, coal development waste, and noncoal waste disposal, dams, embankments, other impoundments, and water treatment and air pollution control facilities.

There are three impoundments currently located within the permit area which are Pond 20-1, Pond 29-3 and Pond 29-5 shown on Drawing 7-7. The area of these impoundment are approximately 3,400, 10,500 and 6963 square feet respectively.

There no other areas of existing spoils, waste, coal development waste, and noncoal waste disposal, dams, embankments, other impoundments, and water treatment and air pollution control facilities within the permit area.

#### 521.125. Ponds and Other Impoundments

The MRP does not contemplate construction of any permanent water impoundments; coal processing waste banks and coal processing waste dams or embankments. The planned location of each sedimentation pond is shown on Drawing 5-3.

521.130. Landowners and Right of Entry and Public Interest Drawings.

All boundaries of lands and the names of present owners of record of both surface and subsurface within the Mine Permit Area are shown on Drawing 1-3 (Surface) and Drawing 1-4 (Subsurface).

521.132. Permit Boundary

The boundaries of land within the proposed permit area are shown on all applicable Drawings.

521.133. Public Roads

No mining or reclamation operations are planned within 100 ft. of a public road. However mine vehicles may cross the right-of-way of Kane County Road #136 for a short period early in the operation's life. Appropriate measures, including signage and mine operating practices and training will be implemented to protect the public.

521.133.2 Relocating a Public Road:

The design of any relocated road will be approved by Kane County authorities, or such other authorities as have jurisdiction. Appropriate measures will be taken to prevent entrance into the mining area via the pre-existing road, and appropriate signage and barriers will be installed to protect the public.

521.140. Mine Drawings and Permit Area Drawings.

521.141 The boundaries of all areas proposed to be affected over the estimated total life of the coal mining and reclamation operations, with a description of size, sequence and timing of the mining, the coal mining and reclamation operations to be conducted, the lands to be affected throughout the operation, and changes in facilities or features to be caused by the proposed operations;

These items are depicted on Drawings 5-1 through 5-44.

Two options are provided for final reclamation of the permit area. The Preferred option is shown on Drawings 5-35 and 5-36. The anticipated time schedule for this option is shown on Drawing 5-38. This option includes mining operations transitioning into the adjacent federal coal reserves. In the case that these reserves are not acquired by ACD, an alternative plan is provided in Drawing 5-37 and 5-37A which requires rehandling much of the fill above original contour to fill in the final pits.

If a circumstance occurs where mining of the permit area is complete and ACD has acquired the federal lease but permit approval has not yet been acquired to continue mining in the federal coal reserves; ACD requests that the Division consider a temporary cessation of operations at that time rather than requiring implementation of the alternate reclamation scenario. This temporary cessation could be granted for a sufficient period of time to allow ACD to acquire approval for transitioning mining operations into the adjacent federal coal reserves. The Division does have the authority to grant such an allowance based on R645-301-515.300. Should the alternative reclamation scenario be implemented prematurely, reclamation along the western side and south end of the permit area will either be excavated to recover coal or these coal reserves beneath and adjacent to the reclamation will be unrecoverable. Also, an additional excess spoil structure will have to be constructed for the boxcut for the federal reserves. A detailed description of the two reclamation scenarios and how each scenario would apply is provided in Section 528.200 Overburden and 553 Backfilling and Grading of this Chapter.

If ACD does not acquire the federal coal lease by the time that the final pit is complete, ACD will then immediately transition the reclamation plan to the alternative scenario.

Additionally, two options are provided for surface mining of the permit area. The Preferred option is shown on Drawings 5-2, 5-9, 5-10, and 5-16. The anticipated time schedule for this option is shown on Drawing 5-38. This option shows coal recovery through traditional open pit operations with coal being recovered by hydraulic excavators or loader and off-road trucks. The second option for surface mining is the highwall mining system as shown in Drawing 5-2A, 5-9A, 5-10A and 5-16A. The estimated time schedule for this option is shown on Drawing 5-38A. This option shows coal recovery through traditional open pit operations with coal being recovered by a highwall mining system, loader and off-road trucks. Under this option surface disturbance will be considerably less.

Underground mining is also proposed for this site. Mine portals will be within an existing pit and coal will be loaded within the pit and hauled in the same manner as with the surface mining. Underground mining plans are shown in Drawing 5-3B and 5-10A.

521.142

Drawing 5-10A show the underground workings. All underground coal mining will be first mining only. Subsidence will be prevented by following the recommendations provided in the Norwest Corporation letter report found in Appendix 5-9.

521.143 The proposed disposal sites for placing excess spoil generated at surface areas affected by surface operations, underground operations and facilities for the purposes COAL MINING and RECLAMATION ACTIVITIES according to:

- *R645-301-211: The applicant will present a description of the premining soil resources as specified under R645-301-221. Topsoil and subsoil to be saved*

*under R645-301-232 will be separately removed and segregated from other material.*

The soil resources for the proposed excess spoil disposal area are described in Appendix 2-1. A plan has been developed for removal of topsoil and suitable subsoil based on the soil descriptions in this appendix. The handling plan can be viewed on Drawing 2-2. Topsoil and acceptable subsoil will be separately removed and segregated from other material prior to placement of any spoil.

- *R645-301-212: After removal, topsoil will be immediately redistributed in accordance with R645-301-242, stockpiled pending redistribution under R645-301-234, or if demonstrated that an alternative procedure will provide equal or more protection for the topsoil, the Division may, on a case-by case basis, approve an alternative;*

Excess spoil will have topsoil and subsoil redistributed in an approximately uniform, stable thickness with the approved post mining land use, contours and surface water drainage systems. Material handling practices will prevent excess compaction of these materials. Handling practices will also protect the materials from wind and water erosion before and after seeding and planting.

- *R645-301-412.300: Criteria for Alternative Postmining Land Uses.*

The MRP does not contemplate alternative postmining land uses.

- *R645-301-512.210: Excess Spoil. The professional engineer experienced in the design of earth and rock fills will certify the design according to R645-301-535.100.*

A professional engineer experienced in the design of earth and rock fills with assistance from a geotechnical expert has certified the design according to R645-301-535.100. These certifications can be viewed on Drawings 5-35, 5-36 and 5-17 through 5-19.

- *R645-301-512.220: Durable Rock Fills*

No durable rock fills are planned.

- *R645-301-514.100: Excess Spoil. The professional engineer or specialist will be experienced in the construction of earth and rock fills and will periodically inspect the fill during construction. Regular inspections will also be conducted during placement and compaction of fill materials.*

A professional engineer or specialist that is experienced in the construction of earth and rock fills will inspect the fill during construction and regular inspections will also be conducted during placement and compaction of fill materials.

- *R645-301-528.310: Excess spoil will be placed in designated disposal areas within the permit area, in a controllable manner to ensure mass stability and prevent mass movement during and after construction. Excess spoil will meet the design criteria of R645-301-535. For the purposes of SURFACE COAL MINING AND RECLAMATION ACTIVITIES, the permit application must include a description of the proposed disposal site and the design of the spoil disposal structures according to R645-301-211, R645-301-212, R645-301-412.300, R645-301-512.210, R645-528.310, R645-301-535.100 through R645-301-535.130, R645-301-535.300 through R645-301-535.500, R645-536.300, R645-301-542.720, R645-301-553.240, R645-301-745.100, R645-301-745.100, R645-301-745.300, and R645-301-745.400.*

Excess spoil will be placed in the area designated on Drawing 5-3 and 5-35. This fill will be placed in lifts not to exceed 4 feet. The material will be transported from the overburden removal area to the fill by end dump haul trucks and a dozer(s) will spread the spoil to this lift thickness. The fill will meet at minimum 85% compaction as related to the standard Procter. Final slopes will be regraded to a maximum slope of 3h:1v. The top of the fill will be sloped to approximately 2% to prevent pooling of water and to reestablish drainage similar to original flow patterns. The excess spoil placed on the non-mined areas is approximately 32 acres and varies in height from 35 to 110 feet. The area of excess fill over mined out areas (variance from approximate original contour) is an extension of the fill placed on the non-mined area and is approximately 55 acres. Combined acreage of the excess fill placed on mined and non-mined areas is 87 acres and varies in height from 60 to 100 feet above original contour. Total excess fill is 8.6 million yards. Design of this fill can be viewed in Drawings 5-35 through 5-36 and the geotechnical study can be viewed in Appendix 5-1.

- *R645-301-535.100 through R645-301-130: Disposal of Excess Spoil*

A geotechnical analysis of the excess spoil structure design has been completed by an expert in this field. The long term static safety factor for this structure design is estimated at 1.6 to 1.7. Lifts will be placed in thicknesses not to exceed 4 feet. The lifts will meet 85% compaction by the standard Procter. The fill will be graded to allow for drainage similar to original patterns and to prevent excessive infiltration of water. Fill will be covered with subsoil and topsoil as specified in Chapter 2 to provide conditions suitable for revegetation of the area. The geotechnical study can be viewed in Appendix 5-1.

- *R645-301-535.300 through R645-301-535.500: Disposal of Excess - Spoil Durable Rock Fills.*

No durable rock fills are planned.

- *R645-301-536.300: Disposal of Coal Mine Waste in Excess Spoil*

No coal mine waste is planned in the excess spoil area.

- *R645-301-542.720: Excess spoil will be placed in designated disposal areas within the permit area, in a controlled manner to ensure that the final fill is suitable for reclamation and revegetation compatible with the natural surroundings and the approved postmining land use. Excess spoil that is combustible will be adequately covered with noncombustible material to prevent sustained combustion. The reclamation of excess spoil will comply with the design criteria under R645-301-553.240.*

The excess spoil as shown in Drawing 5-35 and 5-36 will be suitable to the surrounding area and for the postmining land use of primarily grazing. No combustible excess spoil will be placed in the proposed structure. The reclamation of the spoil does not include any terraces and the slopes will not exceed 3h:1v.

- *R645-301-553.240: The final fill configuration of the fill (excess spoil) will be suitable for the approved postmining land use. Terraces may be constructed on the outslope of the fill if required for stability, control of erosion, to conserve soil moisture, or to facilitate the approved postmining land use. The grade of the outslope between terrace benches will not be steeper than 2h:1v (50 percent).*

The excess spoil as shown in Drawings 5-35 and 5-36 will be suitable to the surrounding area and for the postmining land use of primarily grazing. The reclamation of the spoil does not include any terraces and the slopes will not exceed 3h:1v. The long term static safety factor for these slopes is estimated to be 1.6 to 1.7.

- *R645-301-745.100: General Requirements.*

*745.110: Excess Spoil will be placed in designated disposal areas within the permit area, in a controlled manner to:*

*745.111: Minimize the adverse effects of leaching and surface water runoff from the fill on surface and underground water;*

Reclamation of the excess spoil will include topsoil and a subsoil layer. Infiltration through the reclamation is expected to be minimal based on the high clay content of these soils. In addition, laboratory data for the overburden shows that there is minimal potential for leaching of pollutants should infiltration rates become higher than expected.

The foundation of the excess spoil area also has high clay content with minimal potential for infiltration. This will provide an additional, natural barrier to protect ground water present beneath the proposed structure.

*745.112: Ensure permanent impoundments are not located on the completed fill. Small depressions may be allowed by the Division if they are needed to retain moisture or minimize erosion, create and enhance wildlife habitat or assist revegetation, and if they are not incompatible with the stability of the fill; and*

Permanent impoundments are not planned on the excess spoil area. Small depressions may be constructed as allowed by the Division to retain moisture, minimize erosion, create and enhance wildlife habitat or assist revegetation.

*745.113: Adequately cover or treat the excess spoil that is acid- and toxic forming with nonacid nontoxic material to control the impact on the surface and ground water in accordance with R645-301-731.300 and to minimize adverse effects on plant growth and approved postmining land use.*

Laboratory data representative of the overburden planned for disposal in the excess spoil area does not show acid- and toxic forming characteristics.

*745.120: Drainage Control. If the disposal area contains springs, natural or manmade water courses, or wet weather seeps, the fill design will include diversions and underdrains as necessary to control erosion, prevent water infiltration into the fill and ensure stability.*

A spring and seep survey available in Chapter 7 has identified no springs or wet weather seeps in the proposed excess spoil area. The final surface will be regraded to a contour that will route water from snowmelt and rainfall around the excess spoil as shown on the final contours Drawing 5-35. There are no manmade water courses present in the excess spoil area. No underdrains are planned for the excess spoil structure.

*745.121: Diversions will comply with the requirements of R645-301-742.300*

No diversions are planned in the excess spoil area.

*745.122 : Underdrains*

No underdrains are planned in the excess spoil area.

*745.300: Durable Rock Fills*

No durable rock fills are planned in the excess spoil area.

*745.400: Preexisting Benches*

Excess spoil will not be disposed of through placement on preexisting benches.

521.150. Land Surface Configuration Drawings.

Surface contours representing the existing land surface configuration of the proposed permit area are shown on Drawing 5-1 and the post mining land configuration is shown on 5-35. Cross sections with both these landforms are shown on Drawing 5-36.

521.160. Maps and Cross sections of the Proposed Features for the Proposed Permit Area. These maps and cross sections will clearly show:

521.161 Buildings, utility corridors, and facilities to be used:

These items are shown on Drawings 5-3 through 5-8C.

521.162 The area of land to be affected within the proposed permit area, according to the sequence of mining and reclamation:

A yearly and overall disturbance sequence for the permit area is provided on Drawing 5-2 for open pit mining and on Drawing 5-2A for the alternative method of highwall mining.

521.163 Each area of land for which a performance bond or other equivalent guarantee will be posted under R645-301-512;

The area of land that will have a performance bond posted is shown on Drawing 5-3.

521.164 Each coal storage, cleaning and loading area. The map will be prepared and certified according to R645-301-512;

These facilities can be viewed on Drawings 5-3 through 5-5.

521.165 Each topsoil, spoil, coal preparation waste, underground development waste, and noncoal waste storage area. The maps will be prepared and certified according to R645-301-512;

Topsoil storage areas and handling can be viewed on Drawing 2-2. Spoil placement and the excess spoil structure can be viewed on Drawings 5-3, 5-17, 5-18, 5-19, 5-35 and 5-36.

521.166 Each source of waste and each waste disposal area relating to coal processing or pollution control;

Only sizing of the coal is proposed. This process will not produce any waste.

521.167 Each explosive storage and handling facility;

Need for these facilities are not anticipated at this time. Should these facilities become necessary, appropriate drawings will be provided to the Division.

521.168 For the purposes of SURFACE COAL MINING AND RECLAMATION ACTIVITIES, each air pollution collection and control facility; and

There are no specific air pollution collection or control facilities proposed.

521.169 Each proposed coal processing waste bank, dam or embankment. The map will be prepared and certified according to R645-301-512.

The MRP does not contemplate processing of coal that will produce waste.

521.170. Transportation Facilities Drawings.

Transportation facilities for the Coal Hollow Mine include seven primary roads, a conveyor system, and miscellaneous ancillary/temporary roads. Numerous drawings detail the designs and specifications for each one of the proposed facilities. The following is a description of each facility and a reference for the associated drawings:

- Roads: Two primary mine haul roads are planned within the permit area. The first road extends from the coal unloading area to the first series of pits along the west side of the property. This road will be utilized for access to the pits (pits shown on Drawing 5-10). This road will be approximately 2,800 feet in length and will be utilized throughout mining. There will be three culverts installed along this road all sized for a 100 year, 24 hour storm event. The first culvert will be across a tributary of Lower Robinson Creek and will be a 36 inch corrugated steel pipe. The second culvert is the main crossing over Lower Robinson Creek and is a 96 inch corrugated steel pipe. Both of these culverts have been sized based on analysis of the Lower Robinson Creek watershed. This analysis can be viewed in Appendix A5-3. The third culvert is crossing over a diversion ditch that will route water mainly from disturbed areas along the south side of Lower Robinson Creek to a sediment impoundment. This culvert will be a 24 inch corrugated steel pipe.

The second road extends from an intersection with the first road, located just south of the Lower Robinson Creek crossing, and proceeds southeast to long term topsoil stockpile 2 and subsoil stockpile pile 1. This road is approximately 1,300 feet in length. There is one culvert crossing along this road to cross a diversion ditch. This culvert will be a 24 inch culvert sized for maximum anticipated flows in the diversion.

The following specifications apply to these Primary mine haul roads:

- 1) Roads will be approximately 80' in width
- 2) Approximately a 2% crown
- 3) Approximately one foot deep cut ditches along shoulders for controlling storm water
- 4) 18" of crushed rock or gravel for road surfacing
- 5) Cut and fill slopes of 1.5 h:1v
- 6) Minimum fill over each culvert will be 2 times diameter of culvert

## 7) Berms placed as necessary along fills

The ancillary roads will have similar specifications except surfacing will occur only as needed and may be narrowed to a 40 foot road width. A typical cross section for the ancillary roads can be viewed on Drawing 5-24.

The location and details for Primary Mine Haul roads can be viewed on Drawings 5-3 and 5-22 and 5-23.

In addition to the two roads primary Mine Haul roads, the road located within the facilities area is also classified as a primary road. This road is planned to be 24 feet wide with 24 inches of compacted sub base and 8 inches of compacted 1 inch minus gravel as surfacing. This road is referred to as "Facilities Roadway" and more details are described in 527.200 along with Drawings 5-22A and 5-22B.

In addition to the primary roads that will be present during active mining, four additional roads are planned to exist postmining and are also classified as primary roads for this reason.

Roads that will remain postmining are the following:

- Road to Water Well with details shown on Drawing 5-22D
- Road to east C. Burton Pugh property (K3993) with details shown on Drawing 5-22C. Kane County has claimed this road as County Road K3993.
- County Road 136 (K3900) with details on Drawing 5-22E, 5-22F and 5-22H. This County road will be reconstructed within the permit area by Kane County. This reconstruction will occur concurrently with the final phase of reclamation as scheduled on Drawing 5-38 and is expected to be completed by 2017.
- Road to Swapp Ranch (same specification as the Water Well Road)

The location of these roads is shown on Drawings 5-35 and 5-37 along with the post mining topography.

The ramps, benches and equipment travel paths within the active surface mining area are temporary in nature and will be relocated frequently as mining progresses. These temporary travelways are considered part of the pit due to their short term use, and are not individually designed nor engineered. They will be built and maintained to facilitate safe and efficient mine and reclamation operations.

- **Conveyors:** A conveyor system will be used to stockpile coal and to load highway approved haul trucks for transportation to market. The first conveyor is mainly a stacker system for the coal stockpile which will be located at the coal unloading area and will be approximately 451' in length. This conveyor is estimated to be a 48" solid frame system.

The second conveyor is a coal reclaim belt that will be loaded by an above ground reclaim feeder from the coal stockpile and will convey coal to the loadout chute which will load the highway approved coal haulage trucks. This section will be approximately 290' in length. Similar to the first section, this conveyor is estimated to be a 48" solid frame system.

Drawings of this system can be viewed on Drawings 5-3 through 5-5.

521.180. Support facilities.

Description of the support facilities is provided in Section 526.220. Drawings 5-3, 5-4, 5-5, 5-6, 5-7, 5-8, 5-8A, 5-8B, and 5-8C provide the maps, appropriate cross sections, design drawings and specifications to demonstrate compliance with R645-301-526.220 through R645-301-526.222 for each facility.

521.200. Signs and Markers Specifications.

Signs and markers will be posted, maintained, and removed by Alton Coal Development LLC. Signs and markers will be a uniform design that can be easily seen and read; made of durable material; conform to local laws and regulations, and be maintained during all activities to which they pertain;

521.240. Mine and Permit Identification Signs.

Identification signs showing the name, business address, and telephone number of Alton Coal Development LLC and the identification number of the permanent program permit authorizing coal mining and reclamation operations will be displayed at each point of access to the permit area from public roads, and will be retained and maintained until after the release of all bonds for the permit area;

521.250. Perimeter Markers.

The perimeter of a permit area will be clearly marked before the beginning of surface mining activities;

521.260. Buffer Zone Markers.

Buffer zones will be marked along their boundaries as required under 731.600521.270. Topsoil Markers.

Markers will be erected to mark where topsoil or other vegetation - supporting material is physically segregated and stockpiled.

## 522. COAL RECOVERY.

The MRP is designed to maximize recovery of the coal resource within technological, safety and legal limitations. Coal will be recovered from the Smirl Seam which ranges in thickness from 13.5 to 18.5 feet averaging approximately 16 feet in the planned mining area. The Smirl Seam is the only surface mineable seam in the permit area. Isopach maps of the coal thickness and strip ratio can be viewed on Drawings 5-13 and 5-14

Some coal along the boundaries of the mine area will not be recovered in conjunction with the proposed operation. This includes coal underlying the pit highwalls and areas where drainage or sedimentation control structures (diversions, ditches, ponds, etc) are located. The mine is designed to minimize such losses by locating haulage ramps in the spoil rather than on the pit wall, by oversteepening the coal face at the pit edges, and by minimizing the use of out of pit ancillary roads. Coal which is left in place in these areas may be recovered in the future when adjacent property rights are secured. Current plans are for a planned maximum mining depth of approximately 200 ft. and a strip ratio of 10:1; however, the ultimate mining depth will depend on cost related factors.

A detailed mine plan has been developed for the proposed permit area and the following table along with Drawing 5-9 summarize the coal extraction for the permit area for open pit mining.

Description	Extraction Status	Average Coal Thickness (ft)	Average Strip Ratio* (yd <sup>3</sup> /Ton)	Quantity (**Ton)
Total Coal within Permit Boundary	N/A	16.3	7.7	12,092,000
High Strip Ratio Area (NE corner of permit area)	Not Mined	16.0	13.5	4,268,000
Coal under highwalls and sedimentation structures	Not Mined	17.2	4.8	3,011,000
Coal under Robinson Creek Diversion	Not Mined	15.5	3.9	172,000
Recoverable Coal	Mined	16.3	6.4	4,641,000

\*All strip ratios are bank cubic yards of overburden to tons of coal

\*\*All coal tons are based on a 95% recovery factor

A detailed mine plan has been developed for the proposed permit area and the following table along with Drawing 5-9A summarize the coal extraction for the permit area for the alternate option, highwall mining and underground mining:

Description	Extraction Status	Average Coal Thickness (ft)	Average Strip Ratio* (yd <sup>3</sup> /Ton)	Quantity (**Ton)
Total Coal within Permit Boundary	N/A	16.3	7.7	12,092,000
High Strip Ratio Area (NE corner of permit area)	Not Mined	16.0	13.5	2,930,000

Coal under highwalls and sedimentation structures	Not Mined	17.2	4.8	2,305,000
Coal under Robinson Creek Diversion	Not Mined	15.5	3.9	172,000
Highwall & Underground Recoverable Coal (Surface)	Not Mined	16.0	0	2,662,000
Highwall & Underground Recoverable Coal (Underground)	Mined	16.3	6.4	3,298,000
Highwall & Underground Recoverable Coal (Underground)	Mined	16.0	0	725,000

\*All strip ratios are bank cubic yards of overburden to tons of coal

\*\*All coal tons are based on a 95% recovery factor for open pit mining and 45% for highwall mining and the underground mining.

Once approval is received to progress with mining on the adjacent federal coal reserves, an additional 57% of the coal under the highwalls will be recovered as part of the progression into these adjacent reserves.

With open pit mining, the application of highly flexible, open pit truck/shovel techniques will minimize losses of coal due to pit geometry or spoil support requirements, allowing the maximum possible exposure of the coal resource. The full seam section will be loaded primarily using large hydraulic backhoes. The backhoes, which can work from the top of the seam, provide the ability to efficiently and cleanly excavate the lower part of the coal seam without disturbing the pit floor. This, along with the machine's high degree of bucket horizon control will minimize floor losses. The backhoes can also work safely from the top of the seam to oversteepen the loading face along the pit walls, thus recovering the maximum amount of coal.

Where pit geometry or operational factors preclude the use of backhoes for loading, a large rubber tire front end loader will be used. These machines provide similar horizon control, can operate on the floor of the pit or on an intermediate bench, and can recover coal from confined areas such as the ends of the pits.

With the alternative surface option, the application of a highwall mining system will be employed to recover coal from the exposed face. In this method of mining, an unmanned cutter module is driven underground and operated in front of the highwall. The highwall mining machine stands on the pit floor or on a bench, directly in front of the exposed seam and makes long parallel rectangular drives into the coal seam. A remote-operated cutter module is pushed into the seam by a string of push beams (unmanned coal-conveying elements) that transport the mined coal back to the entry of the drive onto a stockpile.

The underground mining will utilize standard extraction methods. These will include a continuous miner, shuttle cars and a conveyor system to the surface. The mine plan calls

Rear dump haul trucks, loaded by the backhoes or front end loader, will be used to move the coal from the pit via in-pit roads and the primary haulroad to the crusher and stockpile. The trucks will be equipped with “combo” beds suitable for hauling both coal and overburden, and configured to minimize coal spillage.

A net recovery of 95% (including the effects of in-pit coal losses and out-of-seam dilution) of the coal exposed in the open pit is anticipated. A net recovery of 45% of the coal mined by the alternative highwall system as well as the underground mining is anticipated. Normal coal losses are expected due to cleaning of the top of the seam, loading losses at the seam floor, and coal oxidation near the outcrop.

No coal washing is contemplated at this time, thus there will be no coal processing losses.

Maps and cross sections providing detailed information related to coal recovery activities can be viewed on Drawings 5-9 through 5-14.

**523. MINING METHOD(s).**

The Coal Hollow Mine will be a surface coal mining operation using open pit mining methods to produce up to 2 million tons of coal per year. Primary mining equipment will include hydraulic excavators, a highwall miner and end-dump mining trucks. The coal will be crushed at the mine site, and hauled to market in over-the-road coal trucks.

The mine is planned to produce approximately 4.64 million tons of coal over a life of approximately 6 years for the preferred option and approximately 3.0 million tons of coal over a life of approximately 5 years for the alternate option. The estimated production schedule is summarized below for the two options:

Preferred option		
		Tons Produced
Year		(000)
1		542
2		505
3		750
4		1,000
5		1,000
6		844
Total		4,641

Alternative option		
		Tons Produced
Year		(000)
1		542
2		505
3		568
4		685
5		762
6		431
Total		3,493

Initial mine development will involve removal and storage of topsoil from mine infrastructure locations. Facilities for equipment maintenance/warehouse, coal handling, and offices will be constructed. During the development and initial mining period, facilities temporary in nature may be used until permanent facilities can be built. Construction of sedimentation ponds, diversion ditches, and mine roads accessing the initial mining areas will also be ongoing.

Mining will employ typical open pit methods using truck/loader type equipment to remove overburden and recover the coal. Mining will advance across the property in successive cuts approximately 250 ft. in width and 800 to 1,300 ft. long (generally equal to the width of the property less property barriers). Layout of these pits can be viewed on Drawing 5-10. The overburden will be removed in layers or lifts approximately 20 to 40 feet deep. In practice, these overburden lifts are mined in a stairstep fashion ahead of the coal removal operation to provide adequate working room for the equipment and stable advancing slopes. Once mining is complete, excavated overburden (spoil) from a successive cut is used to backfill the excavation. General cross sections of this process can be viewed on Drawings 5-11 and 5-12.

Prior to beginning mining, the area will be cleared of vegetation, and the topsoil will be recovered and either stockpiled or live hauled to regraded areas. It is not anticipated that blasting of the overburden will be necessary based on drilling data. Should this process become necessary, this is the phase where it would be implemented. Overburden will then be removed using large hydraulic excavator(s) or front end loaders and off-road

trucks which will haul the spoil and place it in parts of the pit where the coal has been removed, or in the excess spoil area shown on Drawings 5-3, 5-35 and 5-36. Overburden is removed in successively deeper benches until the coal seam is exposed. Some overburden in lower lifts may be moved by direct dozing into the mined out pit by large bulldozers.

When overburden removal is finished in a particular pit, the top of the coal will be cleaned (removal of any roof rock or other non-coal material on top of the seam) using a motor grader, dozer or front end loader. The material removed will be placed in the adjacent mined out pit. For the open pit mined coal, if necessary, the coal seam will be loosened by drilling and blasting or ripping prior to loading. Drilling and blasting of the coal is not expected to be necessary. The cleaned, exposed coal is then excavated by backhoe or front end loader and placed into off-road rear dump trucks. Coal mined with a highwall miner would not require blasting.

Once the coal is removed, the pit will be backfilled by spoil from adjacent mine pits. Spoil will be placed in lifts and spread with a dozer. Once the pit is backfilled to the planned final surface contour, suitable topsoil and subsoil will be replaced, and the area reseeded. Revegetation work will proceed seasonally as appropriate for planting.

Overburden excavation and coal mining at Coal Hollow will begin near the subcrop of the coal seam at the western end of the permit area in the NW  $\frac{1}{4}$  NE  $\frac{1}{4}$  of Section 30, T39S, R5W. Topsoil will be removed and stored separately in topsoil stockpiles as shown on Map 2-2. Overburden from the initial pits will be hauled to the excess spoil pile east of the mining area. Once the initial pits are established, as much spoil as possible will be placed directly in the pit backfill, allowing reclamation to closely follow mining. This initial phase includes pits 1 through 8 as shown on Drawing 5-10. The mining and reclamation process for this phase can be viewed on Drawing 5-17.

From the initial mining area, operations will proceed eastward through the NE  $\frac{1}{4}$  of Section 30 to the NW  $\frac{1}{4}$  of Section 29 (as shown on Drawing 5-10) and from the southeast  $\frac{1}{4}$  of Section 30, beginning with pit 28 and proceeding north. The mining and reclamation process for this phase can be viewed on Drawing 5-18. As shown on Drawing 5-19, pit 9 will not be backfilled at this stage. The proposed method for filling this pit back to approximate original contour will be accomplished by utilizing overburden from the pit(s) in the adjacent federal reserves located immediately southwest or north of this area. Alton Coal Development, LLC is currently in the process of an Environmental Impact Study for these reserves with the intent of acquiring the rights to mine. It is expected that these rights will be acquired prior to the completion of the final phase in the proposed Permit Area. The final landform for the Permit Area is shown on Drawings 5-35 and 5-36.

In the case that Alton Coal Development, LLC is not successful with acquiring the rights to the adjacent federal coal reserves, spoil will be rehandled from the excess spoil and variance from the approximate original contour to fill the remaining pits. The final landform for this alternate scenario is shown on Drawing 5-37 and 5-37A.

Two other mining methods will be employed at the Coal Hollow Mine.

1. Highwall mining, where an unmanned cutter is driven underground and operated in front of the highwall; and

2. Standard underground mining utilizing a continuous miner, shuttle cars and underground conveyor system.

These mining methods were previously described in Section 522. It should be noted that each of these mining operations are located within an existing pit from the surface mining operation.

An estimate of the primary mining equipment planned for use at the Coal Hollow Mine is listed below:

Diesel - Hydraulic Excavators (15 to 38 cu. yd. capacity)  
Highwall Mining System (CAT HW300 or equivalent)  
Rubber Tired Front End Loaders (8 to 20 cu. yd. capacity)  
End Dump Trucks (100 to 240 ton capacity class)  
Track Dozers (Caterpillar D7 through D11 Class)  
Motor Graders (Caterpillar 16H to 24H Class)  
Water Trucks (8,000 to 20,000 Gallon Class)  
Underground miner and associated equipment

A variety of other equipment will also be used to support the mining operation.

Proposed engineering techniques for meeting the proposed mining methods will include:

- Design support for roads, pits, sediment impoundments etc...
- Field staking of designs utilizing high precision GPS survey systems.
- Weekly field engineering support to view and provide guidance related to designs and environmental controls.
- Ongoing geotechnical support for ensuring highwall stability
- As additional information becomes available, update geological models to ensure full recovery of resource.
- Weekly mine plans that specify appropriate engineering and environmental specifications.

There are no known underground mines within 500 feet of the permit boundary. No surface mining or reclamation activities are proposed to take place within 500 feet of the underground mine.

## 524. BLASTING AND EXPLOSIVES

As a result of the 2005 drilling program and overburden characterization, it was determined that the soil over the coal seam is void of any solid structure and that the overburden is extremely homogenous consisting of soft clay and soft shale. As results of this cursory investigation, it is anticipated that there would be no need to drill and blast the overburden to facilitate the removal of the spoil above the coal seam. Also, due to the fact that the coal will have to be mined from on top of the seam due to wet clay zone beneath the coal seam it is anticipated that there would be no need to drill and blast the coal seam to facilitate coal removal.

As a safeguard or fallback position if mining condition should change, all blasting and explosive criteria will be addressed.

Though not anticipated, explosives may be utilized as necessary at Coal Hollow Mine to break the overburden over the coal and may be used to break the coal for loading if necessary. In accordance with the requirements of this section, a blasting plan is provided to the Division in Appendix 5-4. Blasts that use more than five pounds of explosives or blasting agents will be conducted according to the schedule provided in 524.400.

### 524.100 Blaster Certification

Alton Coal Development, LLC (ACD) will, prior to conducting any surface blasting operations, ensure that all surface blasting incident to surface mining in Utah is conducted under the direction of a Utah Certified Blaster. Certificates of blaster certification will be carried by the blasters or will be on file at the mine permit area during blasting operations. A blaster and at least one other person will be present at the firing of a blast.

Persons responsible for blasting operations at a blasting site will be familiar with the blasting plan and site-specific performance standards and give on-the-job training to persons who are not certified and who are assigned to the blasting crew or assist in the use of explosives.

### 524.200 Blast Design

There are no dwellings, public buildings, schools, churches, or community or institutional building within 1,000 feet of the planned blasting area in the initial (year 1) mining period. There are also no underground mines within 500 feet of the permit. The anticipated blast design can not be reasonably estimated at this time since ACD is not sure what geologic conditions exist that may require blasting. If conditions are encountered that require blasting, ACD will provide the Division with the designed pattern prior to conducting blasting.

Blasts conducted within 1000 ft. of a dwelling, public building, school, church, or community or institutional building will be submitted for Division and MSHA approval,

prior to blasting. The blast design will contain sketches of the drill and delay patterns, decking, type and amount of explosives required per blast, critical dimensions, design factors utilized to protect the public, general location drawings of protected structures, which meet the applicable airblast, flyrock, and ground vibration standards in 524.600.

The blast design will be prepared and signed by a Utah certified blaster.

#### 524.300 - 350 Preblasting Survey

A preblasting survey will be conducted prior to commencement of blasting operations. As part of the preblasting survey Alton Coal Development LLC will:

- Notify, in writing, all residents or owners of dwellings or other structures located within one-half mile of the permit area how to request a preblasting survey at least 30 days before initiation of blasting.
- Prepare a written report of any preblasting survey. A resident or owner of a dwelling or structure within one-half mile of any part of the permit area may request a preblasting survey. This request will be made, in writing, directly to Alton Coal Development LLC or to the Division, who will promptly notify Alton Coal Development LLC. Alton Coal Development LLC will promptly conduct a preblasting survey of the dwelling or structure and promptly prepare the written report. An updated survey of any additions, modifications, or renovation will be performed by Alton Coal Development LLC if requested by the resident or owner.
- Determine the condition of the dwelling or structure and will document any preblasting damage and other physical factors that could reasonably be affected by the blasting. Structures such as pipelines, cables, transmission lines, and cisterns, wells, and other water systems warrant special attention; however, the assessment of these structures may be limited to surface conditions and other readily available data.
- Require the written report of the survey be signed by the person who conducted the survey. Copies of the report will be promptly provided to the Division and to the person requesting the survey. If the person requesting the survey disagrees with the contents and/or recommendations contained therein, he or she may submit to both Alton Coal Development LLC and the Division a detailed description of the specific areas of disagreement.
- Complete any survey requested more than ten days before the planned initiation of blasting, before blasting occurs.

#### 524.400 Blasting Schedule

#### 524.410. Unscheduled Blasts

Unscheduled blasts will be conducted only where public or operator health and safety so requires and for emergency blasting actions. When an unscheduled surface blast incidental to coal mining and reclamation operations is conducted, Alton Coal Development LLC, using audible signals, will notify residents within one-half mile of the blasting site and document the reason in accordance with 524.760.

524.420. Timing of Blasting

All blasting will be conducted between sunrise and sunset unless nighttime blasting is approved by the Division. Alton Coal Development LLC will conduct blasting operations at times approved by the Division and announced in the blasting schedule.

524.450 - 453. Blasting Schedule Publication and Distribution.

Alton Coal Development, LLC will:

- Publish the blasting schedule in a newspaper of general circulation in the locality of the blasting site at least ten days, but not more than 30 days, before beginning a blasting program;
- Distribute copies of the schedule to local governments and public utilities and to each local residence within one-half mile of the proposed blasting site described in the schedule; and
- Republish and redistribute the schedule at least every 12 months and revise and republish the schedule at least ten days, but not more than 30 days, before blasting whenever the area covered by the schedule changes or actual time periods for blasting significantly differ from the prior announcement; and

524.460 - 465. Blasting Schedule Contents.

The blasting schedule will contain, at a minimum:

- Name, address, and telephone number of operator;
- Identification of the specific areas in which blasting will take place;
- Dates and time periods when explosives are to be detonated;
- Methods to be used to control access to the blasting area; and
- Type and patterns of audible warning and all-clear signals to be used before and after blasting.

524.500 - 532 Blasting and Warning Signs, Access Control

Blasting signs will read “**Blasting Area**” and be conspicuously placed along the edge of any blasting area that comes within 100 feet of any public right-of-way, and at the point

where any other road provides access to the blasting area. At all entrances to the mine permit area from public roads or highways, signs will be conspicuously placed which read “**Warning! Explosives in Use**”, clearly list and describe the meaning of the audible blast warning and all-clear signals in use, and explain the identification of blasting areas where charged holes await firing at the blasting site in the mine permit area.

Warning and all-clear signals of different character or pattern that are audible within a range of one-half mile from the point of the blast will be given. Each person within the permit area and each person who resides or works regularly within one-half mile of the blast site in the mine permit area will be notified of the meaning of the signals in the blasting schedule and notification.

Access within the blasting areas will be controlled to prevent presence of livestock or unauthorized persons during blasting and until an authorized representative of Alton Coal Development LLC has reasonably determined that no unusual hazards exist, such as imminent slides or un-detonated charges; and access to and travel within the blasting area can be safely resumed.

524.600 - 610 Adverse Effects Of Blasting

Blasting will be conducted to prevent injury to persons, damage to public or private property outside the mine permit area, and changes in the course, channels, or availability of surface or ground water outside the mine permit area.

524.620 Airblast Limits

Airblast will not exceed the maximum limits listed below at the location of any dwelling, public building, school, church, or community or institutional building outside the mine permit area, except for those structures and facilities owned by Alton Coal Development LLC as approved by the Division. Maximum airblast limits are as follows:

Lower Frequency Limit of Measuring System, HZ (+3dB)	Maximum Level dB
0.1 Hz or lower – flat response <sup>(1)</sup>	134 peak
2 Hz or lower – flat response	133 peak
6 Hz or lower – flat response	129 peak
C-weighted – slow response <sup>(1)</sup>	105 peak dBC

(1) Only when approved by the Division.

524.630. Monitoring:

Periodic monitoring will be conducted to ensure compliance with the airblast standards. Airblast measurements will be taken as required by the Division at locations specified by the Division. The measuring system used will have an upper-end flat frequency response of at least 200 Hz.

524.633. Flyrock:

Flyrock traveling in the air or along the ground will not be cast from the blasting site more than one-half the distance to the nearest dwelling or other occupied structure; beyond the area of blasting access control or beyond the mine permit area boundary.

524.640 - 662. Ground Vibration.

In all blasting operations, except as otherwise authorized by the Division, the maximum ground vibration will not exceed the values approved by the Division. The maximum ground vibration for protected structures will be in accordance with either the maximum peak-particle velocity limits, the scaled-distance equation, the blasting-level chart, or by the Division. All other structures in the vicinity of the blasting area such as water towers, pipelines and other utilities, tunnels, dams, impoundments, and underground mines will be protected from damage by establishment of a maximum allowable limit on the ground vibration. These limits will be submitted by Alton Coal Development LLC and approved by the Division prior to blasting. A seismographic record will be provided for each blast. **Maximum Peak-Particle Velocity Method:** The maximum ground vibration will not exceed the following limits at the location of any dwelling, public building, school, church, or community or institutional building outside the mine permit area in accordance with the following:

Distance (D) from Blast Site in feet	Maximum allowable Particle Velocity (Vmax) for ground vibration, in inches/second <sup>(1)</sup>	Scaled distance factor to be applied without seismic monitoring (Ds) <sup>(2)</sup>
0 to 300	1.25	50
301 to 5,000	1.00	55
5,001 and beyond	0.75	65

- (1) Ground vibration will be measured as the particle velocity. Particle velocity will be recorded in three mutually perpendicular directions. The maximum allowable peak particle velocity will apply to each of the three measurements.
- (2) Applicable in the scale-distance equation of 524.651.

**Scaled Distance Equation Method:** Alton Coal Development LLC will use the scaled-distance equation,  $W=(D/Ds)^2$ , to determine the allowable charge weight of explosives to be detonated in any eight-millisecond period, without seismic monitoring: where W = the maximum weight of explosives, in pounds: D = the distance, in feet, from the blasting site to the nearest protected structure: and Ds = the scaled-distance factor, which may initially be approved by the Division using the values for scaled-distance factor listed in 524.642.

The development of a modified scaled-distance factor may be authorized by the Division on receipt of a written request by Alton Coal Development LLC, supported by seismographic records of blasting at the mine site. The modified scaled-distance factor of

the predicted ground vibration will not exceed the prescribed maximum allowable peak particle velocity of 524.642 at a 95% confidence level.

**Blasting-Level-Chart.** Alton Coal Development LLC may use the ground-vibration limits in Figure 1 (Figure 1, showing maximum allowable ground particle velocity at specified frequencies, is incorporated by reference. Figure 1 may be viewed at 30 CFR 817.67 or at the Division of Oil, Gas and Mining State Office.) to determine the maximum allowable ground vibration. If the Figure 1 limits are used, a seismographic record including both particle velocity and vibration-frequency levels will be provided for each blast. The method for the analysis of the predominant frequency contained in the blasting records will be approved by the Division before application of this alternative blasting criterion.

524.690. Standards not Applicable

The maximum airblast and ground-vibration standards of 524.620 through 524.632 and 524.640 through 524.680 will not apply at the following locations: At structures owned by Alton Coal Development LLC and not leased to another person; and at structures owned by Alton Coal Development LLC and leased to another person, if a written waiver by the lessee is submitted to the Division before blasting.

524.700 Records of Blasting Operations:

Blasting records will be maintained at the mine site for at least three years and upon request, records will be available for inspection by the Division or the public. A blasting record will contain the name of Alton Coal Development LLC; location, date, and time of the blast; name, signature, and Utah certification number of the blaster conducting the blast. It will also include the identification, direction, and distance, in feet, from the nearest blast hole to the nearest dwelling, public building, school, church, community or institutional building outside the permit area, except those described in 524.690 and weather conditions, including those which may cause possible adverse blasting effects.

The blasting record will include: The type of material blasted; sketches of the blast pattern including number of holes, burden, spacing, decks, and delay pattern; diameter and depth of holes; types of explosives used; total weight of explosives detonated in an eight-millisecond period; initiation system; type and length of stemming; and mats or other protection used.

If required, a record of seismographic and airblast information will include: type of instrument, sensitivity, and calibration signal or certification of annual calibration; exact location of instrument and the date, time, and distance from the blast; name of the person and firm analyzing the seismographic record; and the vibration and/or airblast level recorded; and the reasons and conditions for each unscheduled blast.

524.800 Use of Explosives:

Alton Coal Development LLC will comply with all appropriate Utah and federal laws and regulations in the use of explosives.

**525. SUBSIDENCE CONTROL PLAN**

The underground mining has limited extraction with no subsidence. Refer to Appendix 5-9 (Norwest Report) for geotechnical and design information. Do to the design and mining method of underground mining in this plan, no subsidence is projected and no monitoring is planned.

Highwall mining or Auger mining, as defined in the definitions in R645-100-200 is Surface Mining, thus Underground regulations do not apply. Therefore, highwall mining in this plan have been addressed using the regulations contained in R645-302-240, Special Categories of Mining. The alternate highwall option has limited extraction with no subsidence. Refer to Appendix 5-8 (Feasibility of highwall mining the Smirl seam) for geotechnical and design information. Do to the design and mining method of highwall mining in this plan, no subsidence is projected and no monitoring is planned. Appendix 1-2 Right of Entry, Exhibit 5 contains the New Dame Lease. In this document, under Article 7 Section 7.03, provisions have been made if there is material damage as a result of subsidence.

## 526. MINE FACILITIES:

### 526.110-115 Existing Structures.

There are no existing structures within the permit area.

### 526.116. Public Roads:

#### 526.116.1. Operations Within 100 ft. of a Public Road

Initial mining operations at the Coal Hollow Mine will be on the western edge of the property, and will require rerouting Kane County Road #136 (K3900) so that operations do not come within 100 feet of this road. During the initial development phase (topsoil removal, diversion construction, etc.), equipment traffic may cross the county road right-of-way to access the necessary area. see Drawing 5-3. Details related to the road relocation and reestablishment can be viewed on Drawings 5-3, 5-22E, 5-22F, 5-22H and in Appendix 1-7.

In addition, the road adjacent to Lower Robinson Creek (K3993) has been claimed by Kane County as a public road. An agreement has been developed with the County to restrict access on this road to escort by mine personnel only. Details for the reestablishment of this road following mining are provided on Drawing 5-22C.

#### 526.116.2 Relocating a Public Road:

Following the initial development period, Kane County will temporarily relocate County Road #136 (K3900) to federal lands located west of the permit area which are managed by the BLM. This relocation will bypass the permit area for the duration of mining operations and is shown on Drawing 5-3. Details of agreements and appropriate approvals for this road relocation are located in Appendix 1-7. The relocated road is not within 100 ft. of mining or reclamation operations. The design and route of the relocated road has been approved by Kane County authorities and the BLM. Kane County will continue to have sole jurisdiction and will maintain it as a public road. Following completion of mining operations within the permit area, Kane County will reestablish the road to the approximate original location and will also reclaim the temporary road as required by the BLM. The existing road from the north relocation diversion point to the permit boundary will also continue to be maintained as a public road by Kane County. Once the road intersects the permit boundary, appropriate signs and barricades will be installed to protect the public. This road will be reestablished following mining as provided in the agreements in Appendix 1-7 and shown on Drawings 5-22E, 5-22F and 5-22H.

### 526.200 Utility Installation and Support Facilities

#### 526.210 Existing Utilities.

There are no known oil, gas, and water wells; oil, gas, and coal-slurry pipelines, railroads; electric and telephone lines; and water and sewage lines passing over, under, or through the permit area. Should such facilities be installed, mining and reclamation operations will be conducted in a manner that minimizes damage, destruction, or disruption of services provided by such facilities unless otherwise approved by the owner of those facilities and the Division.

#### 526.220 Support Facilities

The mine support facilities will include an office, shop, wash bay, oil containment, fuel containment, coal stacking system, coal loadout system and an equipment parking area. These facilities will be constructed on an isolated section of the permit area that is approximately 34 acres. This area is located immediately north of Lower Robinson Creek, in Township 39 South, Range 5 West, Section 19. A diversion ditch will route water from the upgradient area immediately east of the area around the facilities and into a tributary of Lower Robinson Creek as shown on Drawing 5-3. Storm water and snow melt that occurs within the facilities area will be routed to an impoundment that will contain sediment. This impoundment will have a drop-pipe spillway installed that will allow removal of any oil sheens that may result from parking lots or maintenance activities by using absorbent materials to remove the sheen. In addition to this pond, an additional small impoundment will also be located in the southwest corner of the facilities area to control drainage from the mine access road. Details for these impoundments can be viewed on Drawings 5-28 and 5-28B.

The following is a detailed description of each proposed facility and a reference to where detailed drawings can be found:

- **Office:** The office will be located on the northwest corner of the facilities area, immediately adjacent to the facilities access road. This building will be a steel structure with concrete footers. This structure will be 150 feet long by 100 feet wide and will be two stories in height. The office will provide working space for administrative and technical personnel. Details for the office can be viewed of Drawings 5-3 and 5-6.
- **Shop:** The shop will be located on the northeast side of the facilities area. This building will be a steel structure with concrete floors and foundation. The structure will be approximately 200 feet long by 100 feet wide and 50 feet high. This building will be used for maintenance of equipment, parts storage, tool storage, and office space for maintenance personnel. Details for this building can be viewed on Drawings 5-3 and 5-7.
- **Wash Bay:** The wash bay will be located immediately east of the shop. This building will be a steel structure with a concrete foundation. The structure will be 50 feet long by 60 feet wide and 50 feet high. Included will be a closed circuit water recycle system. This system will eliminate and store water impurities and reroute water back through the wash bay for cleaning equipment. Details for this structure can be viewed on Drawings 5-3, 5-8, and 5-8A.

- **Oil and Fuel Containments:** The oil and fuel containments will be concrete structures appropriately sized for containing metal tanks. The oil containment will contain 55 gallon barrels and up to 2,000 gallon totes. This containment will be 80 feet long by 30 feet wide and 3 feet deep. The fuel containment will store 3 fuel tanks. Included will be a 4,000 gallon unleaded fuel tank and two 12,000 gallon diesel tanks. This structure will 50 feet long by 30 feet wide and 3 feet deep. Details for this structure can be viewed on Drawings 5-3 and 5-8.
- **Coal Stacking System:** The coal stacking system will be located in the central part of the facilities area. This system will include a coal hopper, coal feeder breaker, feed conveyor, crusher, and an inclined conveyor belt. Trucks will dump coal into the coal hopper which will funnel coal through the feeder breaker onto a short feed conveyor belt. This conveyor belt will transport the coal approximately 195 feet to a crusher that will size the coal appropriately for market. Once the coal is sized through the crusher it will enter an inclined stacker conveyor belt that is angled at approximately 16 degrees and is 186 feet long. This system will be a radial conveyor which will feed a coal stock pile with a live storage of approximately 50,000 tons. This system can be viewed on Drawings 5-3 through 5-5.
- **Coal Loadout System:** The coal loadout system will be located in the central part of the facilities area. This system will include an above ground reclaim feeder, a coal reclaim conveyor and an inclined conveyor. The reclaim feeder will be loaded by a dozer pushing the coal onto the feeder. One inclined conveyor that is approximately 290 feet in length will convey the coal from the feeder to the loadout hopper. This loadout hopper will load highway approved haul trucks that transport coal to market.
- **Minor Facilities:** The minor facilities will include a septic vault at the office (Drawing 5-6), a power washing and water recycle system in the Wash Bay (Drawing 5-8A), conduit with electrical lines running from generators to various facilities (Drawing 5-8B), Water System (Drawing 5-8C), an Equipment Hotstart Area (Drawing 5-3, 5-8B) and a Field Hydrant (Drawing 5-4, 5-5, 5-8B).
- **Electrical System:** The electrical system for the facilities at Coal Hollow will consist of two diesel fuel powered generators. One generator is a 750 KVA unit that will provide electricity to all the buildings. The other generator is a 1200 KVA unit that will be used to supply electricity to the coal conveying, sizing, stockpiling and loading system. The anticipated layout of the electrical system is shown on Drawing 5-8B.
- **Dust Control Structures:** A water system will be constructed to provide water for non-potable uses at the facilities and also for fugitive dust control measures. This system will consist of a water well, 6" water transport pipe, and two 16,000 gallon water tanks. The first water tank will be placed near the mining area and will be used specifically to load the water truck which will spray water on the active roads within the permit area to control dust. The second tank is located at the facilities area to provide a water supply to the facilities for non-potable uses (cleaning equipment, restrooms, etc...). Further details related to this water system can be viewed on Drawing 5-8C.
- **Underground Mining Facilities:** Mine fan, portable generator, stacking conveyor. The generator and stacker are mobile and considered temporary. The mine fan is a

single unit that is mounted, but easily removed. All of these facilities are in an existing pit, and shown on Drawing 5-3B.

During mine development and the initial mining period, some facilities of a temporary nature such as mobile buildings and crusher/stacking conveyors may be utilized.

Support facilities to provide lighting at night will be kept to a minimum but will need to be sufficient enough to provide safe operating conditions in the dark. The following lighting equipment is anticipated to be used to provide safe working conditions:

- Two to three mobile light plants: Each light plant will have up to four 1,000 watt lights.
- Four to six exterior lights at the facilities area for lighting walkways and miscellaneous work areas: Each of these is expected to be 250 watt lights.
- Lights on mobile mining equipment, support vehicles and building lights

The support facilities will be located, maintained, and used in a manner that prevent or control erosion and siltation, water pollution, and damage to public or private property; and to the extent possible use the best technology currently available to minimize damage to fish, wildlife, and related environmental values; and minimize additional contributions of suspended solids to stream flow or runoff outside the mine permit area. Any such contributions will not be in excess of limitations of Utah or Federal law.

The facilities will be fully reclaimed at the end of mining operations with the exception of the water well. The final contour for this area can be viewed on Drawing 5-35 and 5-37 and an anticipated timetable is shown on Drawing 5-38.

#### 526.300 Water Pollution Control Facilities:

Water pollution associated with mining and reclamation activities within the permit areas will be controlled by:

- Construction of berms and/or diversion ditches to control runoff from all facilities areas.
- Roads will be constructed with ditches to capture runoff
- Diversion ditches will be constructed as necessary around active mining and reclamation areas to capture runoff from those areas.
- Sedimentation impoundments will be constructed to control discharges
- In areas where impoundments or diversions are not suitable to the surrounding terrain, silt fence or other appropriate structures will be utilized to control sediment discharge from the permit area.

In order to accomplish these objectives, watershed analysis of the permit and adjacent areas has been completed and specific designs are established for each water pollution control structure. Primary control structures include five sediment impoundments, four

diversion ditches and miscellaneous berms. The locations of these structures can be viewed on Drawing 5-3. The detailed analysis for these structures and specific designs can be viewed on Drawings 5-25 through 5-34. In addition, a geotechnical analysis of the impoundments to ensure stability can be viewed in Appendix 5-1. The watershed and structure sizing analysis can be viewed in Appendix 5-2.

In addition to these primary structures, temporary diversions and impoundments may also be implemented, as necessary, in mining areas to further enhance pollution controls.

All these facilities will be reclaimed to approximate original contour. The reclamation sequence and final landform can be viewed on Drawings 5-35 and 5-38.

#### 526.400 Air Pollution Control Facilities:

Air pollution (fugitive dust) emissions from mining and reclamation operations in the permit area will be controlled by a number of means, including:

- Haul roads will be maintained and will have water or other dust suppressants applied as appropriate.
- Road surfaces will be graded to stabilize/remove dust-forming debris as required.
- Areas adjoining primary roads will be stabilized and vegetated as required.
- Mobile equipment speeds will be controlled to minimize dusting conditions.
- Cleared vegetation debris within the mine area will be disposed of by placement in pit backfills.

A water system will be constructed to provide water for non-potable uses at the facilities and also for fugitive dust control measures. This system will consist of a water well, 6" water transport pipe, and two 16,000 gallon water tanks. The first water tank will be placed near the mining area and will be used specifically to load the water truck which will spray water on the active roads within the permit area to control dust. The second tank is located at the facilities area to provide a water supply to the facilities for non-potable uses (cleaning equipment, restrooms, etc...). Further details related to this water system can be viewed on Drawing 5-8C.

For details related to air pollution control and monitoring, refer to Chapter 4 and Appendix 4-2 and 4-5.

## 527. TRANSPORTATION FACILITIES

### 527.100 Classification of Roads

Primary roads are any road that is used to transport coal or spoil and is frequently used for access or other purposes for a period in excess of six months; or is to be retained for an approved postmining land use. The following is the roads that meet the classification of a primary road based on this standard:

#### **Roads used to transport coal or spoil in excess of six months**

There are two roads that will be used to transport coal or spoil in excess of six months and are referred to as “Year 1 and 2 Mine Haul Road” and “Year 2 and 3 Mine Haul Road”. These two roads will be the main accesses for the pits throughout the life of the mine. Details for these two roads are provided in Section 527.200 and on Drawings 5-22 and 5-23. In addition to these two roads, the road located within the facilities area is also classified as a primary road. This road is referred to as “Facilities Roadway” and details are described in 527.200 along with Drawings 5-22A and 5-22B.

#### **Roads retained for an approved postmining land use**

Roads retained for an approved postmining land use include the following: Access to East Pugh Property (K3993), County Road 136 (K3900), Access to Water Well and Road to Swapp Ranch. Details and locations for these roads are shown on Drawings 5-35, 5-37, 5-22A, 5-22B, 5-22C, 5-22D, 5-22E, 5-22F and 5-22H.

All other roads planned for construction within the permit area will be classified as ancillary. These will include temporary ramps, benches and equipment travel paths within the active mining area.

### 527.200 Description of Roads

Roads for the Coal Hollow Mine include seven primary roads, a conveyor system, and miscellaneous ancillary/temporary roads. Numerous drawings detail the designs and specifications for each one of the proposed facilities. The following is a description of each facility and a reference for the associated drawings:

- Roads: Two primary mine haul roads are planned within the permit area. The first road extends from the coal unloading area to the first series of pits along the west side of the property. This road will be utilized for access to the pits (pits shown on Drawing 5-10). This road will be approximately 2,800 feet in length and will be utilized throughout mining. There will be three culverts installed along this road all sized for a 100 year, 24 hour storm event. The first culvert will be across a tributary of Lower Robinson Creek and will be a 36 inch corrugated steel pipe. The second culvert is the main crossing over Lower Robinson Creek and is a 96 inch corrugated

steel pipe. Both of these culverts have been sized based on analysis of the Lower Robinson Creek watershed. This analysis can be viewed in Appendix A5-3. The third culvert is crossing over a diversion ditch that will route water mainly from disturbed areas along the south side of Lower Robinson Creek to a sediment impoundment. This culvert will be a 24 inch corrugated steel pipe.

The second road extends from an intersection with the first road, located just south of the Lower Robinson Creek crossing, and proceeds southeast to long term topsoil stockpile 2 and subsoil stockpile 1. This road is approximately 1,300 feet in length. There is one culvert crossing along this road to cross a diversion ditch. This culvert will be a 24 inch culvert sized for maximum anticipated flows in the diversion.

The following specifications apply to these Primary mine haul roads:

- 1) Roads will be approximately 80' in width
- 2) Approximately a 2% crown
- 3) Approximately one foot deep cut ditches along shoulders for controlling storm water
- 4) 18" of crushed rock or gravel for road surfacing
- 5) Cut and fill slopes of 1.5 h:1v
- 6) Minimum fill over each culvert will be 2 times diameter of culvert
- 7) Berms placed as necessary along fills

The ancillary roads will have similar specifications except surfacing will occur only as needed and may be narrowed to a 40 foot road width. A typical cross section for the ancillary roads can be viewed on Drawing 5-24.

The location and details for Primary Mine Haul roads can be viewed on Drawings 5-3 and 5-22 and 5-23.

In addition to the two roads primary Mine Haul roads, the road located within the facilities area is also classified as a primary road. This road is planned to be 24 feet wide with 24 inches of compacted sub base and 8 inches of compacted 1 inch minus gravel as surfacing. This road is referred to as "Facilities Roadway" and more details are described in 527.200 along with Drawings 5-22A and 5-22B.

In addition to the primary roads that will be present during active mining, four additional roads are planned to exist postmining and are also classified as primary roads for this reason.

Roads that will remain postmining are the following:

- Road to Water Well with details shown on Drawing 5-22D
- Road to east C. Burton Pugh property (K3993) with details shown on Drawing 5-22C

- County Road 136 (K3900) with details on Drawing 5-22E, 5-22F and 5-22G. This County road will be reconstructed within the permit area by Kane County. This reconstruction will occur concurrently with the final stage of reclamation as scheduled on Drawing 5-38 and is expected to be completed by the end of Year 4.
- Road to Swapp Ranch (same specification as the Water Well Road)

The location of these roads is shown on Drawings 5-35 and 5-37 along with the post mining topography.

The ramps, benches and equipment travel paths within the active surface mining area are temporary in nature and will be relocated frequently as mining progresses. These temporary travelways are considered part of the pit due to their short term use, and are not individually designed nor engineered. They will be built and maintained to facilitate safe and efficient mine and reclamation operations.

- Conveyors: A conveyor system will be used to stockpile coal and to load highway approved haul trucks for transportation to market. The first conveyor is mainly a stacker system for the coal stockpile which will be located at the coal unloading area and will be approximately 451' in length. This conveyor is estimated to be a 48" solid frame system.

The second conveyor is a coal reclaim belt that will be loaded by an above ground reclaim feeder from the coal stockpile and will convey coal to the loadout chute which will load the highway approved coal haulage trucks. This section will be approximately 290' in length. Similar to the first section, this conveyor is estimated to be a 48" solid frame system.

Drawings of this system can be viewed on Drawings 5-3 through 5-5.

#### 527.220 Alteration or Relocation of Natural Drainageways.

As currently planned, no natural drainageways will be altered or relocated due to road construction, though a temporary diversion of Lower Robinson Creek will be constructed to allow for maximum recovery of coal. This temporary diversion of Lower Robinson Creek is not being constructed to facilitate road construction. If any other alterations or relocations are necessary, appropriate measures will be taken to obtain Division approval for such alterations or relocations.

Mine development work will include a temporary diversion of Lower Robinson Creek away from the mining area. This diversion has been designed for a flow capacity of a 100 year, 24 hour storm event. The sides will be graded to a 3h:1v slope and rip-rap will be appropriately placed to minimize erosion of the channel beyond current channel conditions. All specifications required to meet the requirements for such a diversion have been included in this diversion design. Appendix 5-2 details the analysis/specifications for this diversion and Drawings 5-20 and 5-21 show the details of this design.

As part of the reclamation process, Lower Robinson Creek will be reconstructed to its approximate original location. The design for this reconstruction is shown on Drawings 5-20A and 5-21A. This design includes considerable improvements to the channel compared to the channel's current condition. The current condition is such that less than 25% of the channel within the disturbed area has a flood plain present and most of the slopes are near the angle of repose with fair to poor vegetative cover. The reconstructed channel includes stable slope angles that will be revegetated with a flood plain on both sides of the channel for the entire length reconstructed. Sharp corners in the original alignment have been rounded to sinuous curve shapes and rip-rap will be installed in the bottom section of the channel to minimize erosion. The flood plain will be seeded and covered with erosion matting to control erosion until a natural vegetative condition can be attained.

#### 527.230 Road Maintenance

All roads will be maintained on an as needed basis using motor graders, water trucks for dust suppression, and other equipment as necessary. Crushed stone and/or gravel will be used as a surface course for primary roads outside the active mining area, and may be used as needed for ramps and travelways within the pit. Should the roads be damaged by a catastrophic event, such as an earthquake or a flood, repairs will be made as soon as possible after the damage has occurred or the road will be closed and reclaimed.

#### 527.250. Geotechnical Analysis

No alternative specifications or steep cut slopes associated with roads are anticipated outside the active mine area. A report of appropriate geotechnical analysis will be provided should such alternative specifications or steep cut slopes where approval of the Division is required, become necessary.

## **528. HANDLING AND DISPOSAL OF COAL, OVERBURDEN, EXCESS SPOIL, AND COAL MINE WASTE:**

### **528.100. Coal removal, handling, storage, cleaning, and transportation areas and structures;**

Coal handling activities are confined to the active pit/ Underground Portal, and the coal sizing/loading areas located north of the pit. All areas and facilities will be designed and constructed, utilized and maintained in conformance with industry standards and all applicable regulations. At the conclusion of mining, the facilities will be removed as part of final mine reclamation activities. Material from coal stockpile areas, and other areas of potential coal accumulation will be excavated and the excavated material placed in the final mined out pit.

### **528.200. Overburden;**

Overburden will be excavated after the removal of topsoil and subsoil as defined in Chapter 2. The overburden excavation will be accomplished by utilizing hydraulic excavators with end dump haul trucks and dozers. This process will include excavating this material in a stairstep fashion that will include benches approximately every 40 feet in depth. These benches are planned to be approximately 40 feet in width and will create an overall 2h:1v slope for the highwalls to create a stable and safe working area. This is a conservative approach for initial mining and once mining begins, ongoing geotechnical studies and monitoring will be used to further define the proper slope angle to ensure slope stability while maximizing resource recovery.

Based on the overburden isopach map (Drawing 5-15), the overburden removal has been separated into three major stages. The first stage of overburden removal is the initial mining area, Pits 1-8. These pits have a relatively low strip ratio, approximately 5:1 (refer to Drawing 5-13). In order to efficiently remove overburden for this phase, spoil from the first three pits will be placed in an excess spoil area. This excess spoil structure will hold approximately 2.7 million loose cubic yards (LCY) of material. Once the excess spoil pile is filled, overburden from the next 4 pits can then be used as pit backfill as the mining progresses through Pit 8. The completion of this phase is shown on Drawing 5-17.

Phase 2 requires mining to occur in two areas of the permit alternately. As mining progresses through Pits 9-13, the isopach (Drawing 5-15) shows that the overburden significantly increases. This increase and the shape of the mining boundary for the Permit Area requires a fill above approximate original contour. Material from Pits 9-13 significantly exceeds the backfill capacity available from the preceding pits (Pits 1-8). The fill above approximate original contour blends in with the excess spoil structure from Phase 1 and extends an additional 2,000 feet to the east as the mining sequence proceeds to Pit 15.

Also, mining begins with Pit 28 and proceeds alternately with Pits 9-13, north to Pit 23. The isopach shows that Pits 28 -23 have a relatively low strip ratio, approximately 4.2:1 increasing to 4.9:1 respectively. Overburden from Pit 28 will all be hauled to the excess spoil structure, with overburden from the successive pits to north back filling the previously mined. In this stage, the fill above original contour is approximately 3.0 million LCY. Drawing 5-18 (Phase 2) shows the details of this stage of the overburden removal and resulting landform.

Phase 3 overburden removal begins in Pit 14 and proceeds alternately with Pit 22 coming from the south to meet at Pit 18, the last pit to be mined. During this stage, the strip ratio reduces significantly from Phase 2 as mining progresses to Pit 18. As the strip ratio reduces to the south, significant backfill capacity is available in the preceding pits. This results in the distance between the backfill and the active coal face increasing. At the end of mining, an area will not be completely backfilled that is approximately 1,600 feet in length and 875 feet wide and will require 3.3 million yards of fill to complete reclamation to approximate original contour. The backfill configuration at the end of this stage is shown in Drawing 5-19.

The proposed plan for backfilling these final pits includes acquiring the right to mine the adjacent federal coal reserves, located immediately west of this area. This plan provides an efficient method for transitioning operations into the federal reserves. At the time that this transition occurs, overburden will be removed from the federal reserves and placed in the final pits to approximate original contour. This final landform can be viewed on Drawing 5-35 and 5-36.

In the case that Alton Coal Development is not successful with acquiring the adjacent federal coal reserves, all the fill above approximate original contour and part of the excess spoil structure will be rehandled and placed back in the remaining backfill area. The final landform for this scenario is shown on Drawing 5-37. This step requires rehandle of approximately 2.5 million yards of spoil.

If the alternative highwall mining is selected, highwall mining would begin in Pit 9. Then, once coal is removed from Pit 22, the coal east of Pits 22 and 23 will be mined using the highwall miner while Highwall Trench 1 (HWT1) is excavated utilizing Pit 9 as access. Once mining is complete, the proposed plan for backfilling Pit 9 includes acquiring the right to mine the adjacent federal coal reserves, located immediately southwest or north of Pit 9. In the case that Alton Coal Development is not successful with acquiring the adjacent federal coal reserves, all the fill above approximate original contour and part of the excess spoil structure will be rehandled and placed back in the remaining backfill area. In this method of mining, an unmanned cutter module is driven underground and operated in front of the highwall. The highwall mining machine stands on the pit floor or on a bench, directly in front of the exposed seam and makes long parallel rectangular drives into the coal seam. A remote-operated cutter module is pushed into the seam by a string of push beams (unmanned coal-conveying elements) that transport the mined coal back to the entry of the drive onto a stockpile. Coal is then

removed to the sizing/loading area. The miner is moved along the face making successive pushes into the coal face. Once coal is removed from the Pits/ Highwall Trench, overburden from excavation of the next Highwall Trench is used to backfilled the mined out area continuing with the progression of the trench.

The anticipated coal removal sequence for the Highwall mining is shown on drawing 5-10A As is depicted, each Pit/Highwall Trench consists of Panels, each panel consisting of 10 holes. The spacing between the holes and the spacing between the panels are dictated by the amount of overburden over the panels. The alternate Highwall mining is designed such that subsidence does not occur to the surface with nonyieldable webs and barriers. Specific information concerning these design are found in Appendix 5-8. Highwall mining will have only the disturbance associated with the pit/trench for placement of the highwall miner and will have no impact on the surface above the highwall panels.

The following tables show the material balance during the different phases of overburden removal for each scenario:

Preferred Scenario (Adjacent Federal Reserves Acquired)				
Phase	Overburden (LCY)	Available Backfill (LCY)	Excess Spoil (LCY)	Total Excess Spoil (LCY)
1	7,936,000	5,195,000	2,741,000	2,741,000
2	14,168,000	11,127,000	3,041,000	5,782,000
3	14,631,000	14,631,000	0	5,782,000
4 (Federal)	2,545,000	2,545,000	0	5,782,000
Total	39,280,000	33,498,000	5,782,000	5,782,000

\*Loose Cubic Yards is estimated based on an overall 22% swell factor (Caterpillar Performance Handbook)

Alternate Scenario (Adjacent Federal Reserves Not Acquired)				
Phase	Overburden (LCY)	Available Backfill (LCY)	Excess Spoil (LCY)	Total Excess Spoil (LCY)
1	7,936,000	5,195,000	2,741,000	2,741,000
2	14,168,000	11,127,000	3,041,000	5,782,000
3	14,631,000	14,631,000	0	5,782,000
4 (Rehandle)	0	2,545,000	-2,545,000	3,237,000
Total	36,735,000	33,498,000	3,237,000	3,237,000

\*Loose Cubic Yards is estimated based on an overall 22% swell factor (Caterpillar Performance Handbook)

Alternative Scenario (Highwall mining)				
Phase	Overburden (LCY)	Available Backfill (LCY)	Excess Spoil (LCY)	Total Excess Spoil (LCY)
1	7,936,000	5,195,000	2,741,000	2,741,000
2	7,381,000	7,277,000	104,000	2,845,000
3	5,257,000	5,257,000	0	2,845,000
4 (Federal)	2,545,000	2,545,000	0	2,845,000
Total	23,119,000	20,274,000	2,845,000	2,845,000

\*Loose Cubic Yards is estimated based on an overall 22% swell factor (Caterpillar Performance Handbook)

The Preferred scenario for overburden removal will minimize overall disturbance and maximize resource recovery by providing a transition into the adjacent federal reserves with minimal effect to existing reclamation and backfill in the Permit Area. This scenario will also minimize variances from approximate original contour on the federal lands by eliminating the need for an excess spoil structure from the initial boxcut once operations are transitioned into these reserves.

During the course of mining, some additional excavated overburden may be placed temporarily on mined over and backfilled areas due to operational considerations. This material will be re-excavated and moved to it's final placement location as operations allow.

The underground mining will be accessed through portals in an existing pit. There will be no additional overburden removal associated with the underground mining; however, cross sections of the portal area are show on Drawing 5-3B. Cover or overburden depths for the underground mining are described in Section 627.

All maps related to the overburden removal process can be viewed on Drawings 5-15 through 5-19.

528.300. Spoil, coal processing waste, mine development waste, and noncoal waste removal, handling, storage, transportation, and disposal areas and structures;

528.310. Excess Spoil. Excess spoil will be placed in designated disposal areas within the permit areas, in a controllable manner to ensure mass stability and prevent mass movement during and after construction. Excess spoil will meet the design criteria of R645-301-535. For the purposes of SURFACE COAL MINING AND RECLAMATION ACTIVITIES, the permit application must include a description of the proposed disposal site and the design of the spoil disposal structures according to R645-301-211, R645-301-212, R645-301-412.300, R645-301-512.210, R645-528.310, R645-301-535.100 through R645-301-535.130, R645-301-535.300 through R645-301-535.500, R645-536.300, R645-301-542.720, R645-301-553.240, R645-301-745.100, R645-301-745.100, R645-301-745.300, and R645-301-745.400.

Excess spoil will be placed in the area designated on Drawing 5-3 and 5-35. This fill will be placed in lifts not to exceed 4 feet in thickness. The material will be transported from the overburden removal area to the fill by end dump haul trucks and a dozer(s) will spread the spoil to this lift thickness. The fill will meet at minimum 85% compaction as related to the standard Procter. Final slopes will be regraded to a maximum slope of 3h:1v. The top of the fill will be sloped to approximately 2% to prevent pooling of water and to reestablish drainage similar to original flow patterns. The excess spoil placed on the non-mined areas is approximately 32 acres and varies in height from 35 to 120 feet. The area of excess fill over mined out areas (variance from approximate original contour) is an extension of the fill placed on the non-mined area and is approximately 35 acres. Combined acreage of the excess fill placed on mined and non-mined areas is 67 acres and varies in height from 60 to 100 feet above original contour. Total excess fill is 5.8 million yards. Design of this fill can be viewed in Drawings 5-35 through 5-36 and the geotechnical study can be viewed in Appendix 5-1.

- *R645-301-211: The applicant will present a description of the premining soil resources as specified under R645-301-221. Topsoil and subsoil to be saved under R645-301-232 will be separately removed and segregated from other material.*

The soil resources for the proposed excess spoil disposal area are described in Appendix 2-1. A plan has been developed for removal of topsoil and suitable subsoil based on the soil descriptions in this appendices. The handling plan can be viewed on Drawing 2-2. Topsoil and acceptable subsoil will be separately removed and segregated from other material prior to placement of any spoil.

- *R645-301-212: After removal, topsoil will be immediately redistributed in accordance with R645-301-242, stockpiled pending redistribution under R645-301-234, or if demonstrated that an alternative procedure will provide equal or more protection for the topsoil, the Division may, on a case-by case basis, approve an alternative;*

Excess spoil will have topsoil and subsoil redistributed in an approximately uniform, stable thickness with the approved post mining land use, contours and surface water drainage systems. Material handling practices will prevent excess compaction of these materials. Handling practices will also protect the materials from wind and water erosion before and after seeding and planting. These practices include seeding and grading stockpiles that will exist for more than year to stabilize the soil.

- *R645-301-412.300: Criteria for Alternative Postmining Land Uses.*

The MRP does not contemplate Alternative Postmining Land Uses.

- *R645-301-512.210: Excess Spoil. The professional engineer experienced in the design of earth and rock fills will certify the design according to R645-301-535.100.*

A professional engineer experienced in the design of earth and rock fills with assistance from a geotechnical expert has certified the design according to R645-301-535.100. These certifications can be viewed on Drawings 5-35, 5-36 and 5-17 through 5-19.

- *R645-301-512.220: Durable Rock Fills*

No durable rock fills are planned.

- *R645-301-514.100: Excess Spoil. The professional engineer or specialist will be experienced in the construction of earth and rock fills and will periodically inspect the fill during construction. Regular inspections will also be conducted during placement and compaction of fill materials.*

A professional engineer or specialist that is experienced in the construction of earth and rock fills will inspect the fill during construction and regular inspections will also be conducted during placement and compaction of fill materials.

- *R645-301-535.100 through R645-301-130: Disposal of Excess Spoil*

A geotechnical analysis of the excess spoil structure design has been completed by an expert in this field. The long term static safety factor for this structure design is estimated at 1.6 to 1.7. Lifts will be placed in thicknesses not to exceed 4 feet. The lifts will meet 85% compaction by the standard Procter. The fill will be graded to allow for drainage similar to original patterns and to prevent excessive infiltration of water. Fill will be covered with subsoil and topsoil as specified in Chapter 2 to provide conditions suitable for revegetation of the area. The geotechnical study can be viewed in Appendix A5-1.

- *R645-301-535.300 through R645-301-535.500: Disposal of Excess - Spoil Durable Rock Fills.*

No durable rock fills are planned.

- *R645-301-536.300: Disposal of Coal Mine Waste in Excess Spoil*

No coal mine waste is planned in the excess spoil area.

- *R645-301-542.720: Excess spoil will be placed in designated disposal areas within the permit area, in a controlled manner to ensure that the final fill is suitable for reclamation and revegetation compatible with the natural surroundings and the approved postmining land use. Excess spoil that is*

*combustible will be adequately covered with noncombustible material to prevent sustained combustion. The reclamation of excess spoil will comply with the design criteria under R645-301-553.240.*

The excess spoil as shown in Drawing 5-35 and 5-36 will be suitable to the surrounding area and for the postmining land use of primarily grazing. No combustible excess spoil will be placed in the proposed structure. The final reclamation of the spoil does not include any terraces and the slopes will not exceed 3h:1v.

- *R645-301-553.240: The final fill configuration of the fill (excess spoil) will be suitable for the approved postmining land use. Terraces may be constructed on the outslope of the fill if required for stability, control of erosion, to conserve soil moisture, or to facilitate the approved postmining land use. The grade of the outslope between terrace benches will not be steeper than 2h:1v (50 percent).*

The excess spoil as shown in Drawings 5-35 and 5-36 will be suitable to the surrounding area and for the postmining land use of primarily grazing. The reclamation of the spoil does not include any terraces and the slopes will not exceed 3h:1v. The long term static safety factor for these slopes is estimated to be 1.6 to 1.7.

- *R645-301-745.100: General Requirements.*

*745.110: Excess Spoil will be placed in designated disposal areas within the permit area, in a controlled manner to:*

*745.111: Minimize the adverse effects of leaching and surface water runoff from the fill on surface and underground water;*

Reclamation of the excess spoil will include a topsoil cover and subsoil layer. Infiltration through the reclamation is expected to be minimal based on the high clay content of these soils. In addition, laboratory data for the overburden shows that there is minimal potential for leaching of pollutants should infiltration rates become higher than expected.

The foundation of the excess spoil area also has high clay content with minimal potential for infiltration. This will provide an additional, natural barrier to protect ground water present beneath the proposed structure.

*745.112: Ensure permanent impoundments are not located on the completed fill. Small depressions may be allowed by the Division if they are needed to retain moisture or minimize erosion, create and enhance wildlife habitat or assist revegetation, and if they are not incompatible with the stability of the fill; and*

Permanent impoundments are not planned on the excess spoil area. Small depressions may be constructed as allowed by the Division to retain moisture, minimize erosion, create and enhance wildlife habitat or assist revegetation.

*745.113: Adequately cover or treat the excess spoil that is acid- and toxic forming with nonacid nontoxic material to control the impact on the surface and ground water in accordance with R645-301-731.300 and to minimize adverse effects on plant growth and approved postmining land use.*

Laboratory data representative of the overburden planned for disposal in the excess spoil area does not show acid- and toxic forming characteristics.

*745.120: Drainage Control. If the disposal area contains springs, natural or manmade water courses, or wet weather seeps, the fill design will include diversions and underdrains as necessary to control erosion, prevent water infiltration into the fill and ensure stability.*

A spring and seep survey available in Chapter 7 has identified no springs or wet weather seeps in the proposed excess spoil area. The final surface will be regraded to a contour that will route water from snowmelt and rainfall around the excess spoil as shown on the final contours Drawing 5-35. There are no manmade water courses present in the excess spoil area. No underdrains are planned for the excess spoil structure.

*745.121: Diversions will comply with the requirements of R645-301-742.300*

No diversions are planned in the excess spoil area.

*745.122 : Underdrains*

No underdrains are planned in the excess spoil area.

*745.300: Durable Rock Fills*

No durable rock fills are planned.

*745.400: Preexisting Benches*

The MRP does not contemplate disposal of excess spoil on preexisting benches.

#### 528.320. Coal Mine Waste.

The MRP does not contemplate processing coal that would produce coal mine waste.

528.321 Coal Processing Waste

The MRP does not contemplate processing coal that would produce coal processing waste that would be returned to the Underground workings.

528.322. Refuse Piles.

The MRP does not contemplate the construction of any refuse piles,

528.323. Burning and Burned Waste Utilization.

The MRP does not contemplate processing coal that would produce coal mine waste, eliminating the any potential for coal mine waste fires.

528.330. Noncoal Mine Waste.

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 temporarily stored in appropriate containers and removed from the permit area and will be properly disposed of according to applicable State and Federal regulations.

528.332.

Final disposal of noncoal mine wastes will be in a State-approved solid waste disposal site not located within the permit area. One exception to the removal of all noncoal mine waste from the permit area is perforated piping used in the construction of Alluvial Ground Water Drains will be left in place as mining advances. This perforated piping will be covered in place approximately 20' to 30' below the final reclaimed surface. All other waste materials (ie. metal culvert) associated with the Alluvial Ground Water Drains will be removed and disposed of in a State-approved solid waste disposal site.

528.333.

At no time will any noncoal mine waste be deposited in a refuse pile or impounding structure, nor will any excavation for a noncoal mine waste disposal site be located within eight feet of any coal outcrop or coal storage area.

528.334.

Notwithstanding any other provision to the R645 Rules, any noncoal mine waste defined as "hazardous" under 3001 of the Resource Conservation and Recovery Act (RCRA) (Pub. L. 94-580, as amended) and 40 CFR Part 261 will be handled in accordance with the requirements of Subtitle C of RCRA and any implementing regulations.

528.340

As development of the Underground workings originates in the Surface mining Pit, development wastes have been stored in the excess spoils pile. Once all mining is complete spoils will be returned to the mined out Pit following the surface mining regulations.

#### 528.350. Acid-Forming and Toxic Materials

If coal, having qualities that make it unmarketable, are to be left in the pit backfill in quantities greater than 5,000 tons: a minimum of 1 composite sample per 5,000 Tons of coal will be analyzed for the parameters list in Table 3 and 7 of the "Soil and Overburden Guidelines". A record of the volume of coal remaining and laboratory analytical results will be kept onsite. Debris, acid-forming, toxic-forming materials and materials constituting a fire hazard will be identified and disposed of in accordance with R645-301-528.330, R645-301-537.200, R645-301-542.740, R645-301-553.100 through R645-301-553.600, R645-301-553.900, and R645-301-747. Appropriate measures will be implemented to preclude sustained combustion of such materials; and

#### 528.400. Dams, embankments and other impoundments.

Plans do not include using dams, embankments or other impoundments for disposal of coal, overburden, excess spoil or coal mine waste

### **529. MANAGEMENT OF MINE OPENINGS.**

When no longer required, underground mine openings will be closed in accordance with MSHA approved requirements and backfilled. Each entry to the Underground mine if temporarily inactive, but having further projected useful service will be secured by barricades or other covering devices and posted with signs, to prevent access into the entry and identify the hazardous nature of the openings

Alternative highwall mining will produce openings (holes) in the coal at the bottom of trenches specifically constructed for highwall mining. Trench depth to the holes range from 60 feet to 200 feet. After highwall mining is completed in a given trench, that trench will be completely backfilled, burying any openings made by highwall mining.

All wells will be managed to comply with R645-301-748 and R645-301-765. Water monitoring wells will be managed on a temporary basis according to R645-301-738.

Wells constructed for monitoring groundwater conditions in the proposed Coal Hollow Mine permit and adjacent area, including exploration holes and boreholes used for water wells or monitoring wells, will be designed to prevent contamination of groundwater and surface-water resources and to protect the hydrologic balance. A diagram depicting typical monitoring well construction methods is shown in Drawing 7-11. Monitoring wells will include a protective hydraulic seal immediately above the screened interval, an annular seal plugging the borehole above the hydraulic seal to near the ground surface, and a concrete surface seal extending from the top of the hydraulic seal to the ground surface which is sloped away from the well casing to prevent the entrance of surface flows

into the borehole area. Well casings will protrude above the ground surface a sufficient height so as to minimize the potential for the entrance of surface water or other material into the well. A steel surface protector with a locking cover will be installed at monitoring wells to prevent access by unauthorized personnel. Where there is potential for damage to monitoring wells, the wells will be protected through the use of barricades, fences, or other protective devices. These protective devices will be periodically inspected and maintained in good operating conditions. Monitoring wells will be locked in a closed position between uses.

When no longer needed for monitoring or other use approved by the Division upon a finding of no adverse environmental or health and safety effects, or unless approved for transfer as a water well under R645-301-731.100 through R645-301-731.522 and R645-301-731.800, each well will be capped, sealed, backfilled, or otherwise properly managed, as required by the Division in accordance with R645-301-529.400, R645-301-631.100, and R645-301-748. Permanent closure measures will be designed to prevent access to the mine workings by people, livestock, fish and wildlife, machinery and to keep acid or other toxic drainage from entering ground or surface waters.

If a water well is exposed by coal mining and reclamation operations, it will be permanently closed unless otherwise managed in a manner approved by the Division.

Permanent closure and abandonment of water wells greater than 30 feet in depth will be in accordance with the requirements of “Administrative Rules for Water Well Drillers”, State of Utah, Division of Water Rights or other applicable state regulations. Abandonment of wells will be performed by a licensed water well driller. The wells to be abandoned will be completely filled using neat cement grout, sand cement grout, unhydrated bentonite, or bentonite grout, or other materials approved by the Utah State Engineer’s office. Alternatively, the well may be abandoned using a different procedure upon approval from the Utah State Engineer’s office.

Abandonment materials will be introduced at the bottom of the well or required sealing interval and placed progressively upward to the top of the well. The casing will be severed a minimum of 2 feet below the ground surface. A minimum of 2 feet of compacted native material will be placed above the abandoned well upon completion.

Within 30 days of the completion of well abandonment procedures, a report will be submitted to the State Engineer by the responsible licensed driller giving data related to the abandonment of the well. This shall include the name of the licensed driller or other person(s) performing abandonment procedures, name of well owner at the time of abandonment, the address or location of the well by section, township, and range, abandonment materials and equipment used, water right or file number covering the well, the final disposition of the well, and the date of completion.

Exploration holes and boreholes will be backfilled, plugged, cased, capped, sealed, or otherwise managed to prevent acid or toxic contamination of water resources and to minimize disturbance to the prevailing hydrologic balance. Exploration holes and boreholes will be managed to ensure the safety of people, livestock, fish and wildlife, and machinery.

If a water well is exposed by coal mining and reclamation operations, it will be permanently closed unless otherwise managed in a manner approved by the Division.

If any exploration boreholes are to be used as monitoring wells or water wells, these will meet the provisions of R645-301-731

Boreholes will be backfilled to within 1 foot of the land surface with concrete or other materials approved by the Division as necessary to prevent contamination of groundwater or surface-water resources or to protect the prevailing hydrologic balance. The upper approximately 1 foot will be backfilled with native materials to facilitate reclamation (see Drawing 6-11). Exploration holes and boreholes that may be uncovered during mining and reclamation activities will be permanently closed unless approved for water monitoring or otherwise managed in a manner approved by the Division.

## 530 OPERATIONAL DESIGN CRITERIA AND PLANS:

### 531 GENERAL:

There are five sediment impoundments proposed for the permit area. These structures will be constructed using a combination of dozers and backhoes. The structures have been designed to contain the required storm events as specified in Appendix 5-2. The structures will have sediment removed as necessary to ensure the required capacities. Details for these structures can be viewed on Drawings 5-25, 5-26 and 5-28 through 5-32. Calculations and supporting text can be viewed in Appendix 5-2.

There are no other coal processing waste banks, dams or embankments proposed within the permit area.

Underground mining has not occurred within the permit area.

### 532 SEDIMENT CONTROL:

Four diversion ditches along with five sediment impoundments are proposed for the permit area. In addition, miscellaneous controls such as silt fence and berms are also proposed for specific areas. The proposed locations for these structures are shown on Drawing 5-3. Details associated with these structures can be viewed on Drawings 5-25 through 5-34 and Appendix 5-2.

Mulch will be placed on the seedbed surface once soil amendments have been incorporated and seeding has been accomplished in areas that will be reclaimed to native plant communities. The mulch should control erosion by wind and water, decrease evaporation and seed predation, and increase survivability of the seeded species. Like the seeding methods, mulch will be applied with a variety of techniques and materials depending on the reclaimed area.

#### 532.100 Disturbed Area:

The smallest practicable area, consistent with reasonable and safe mine operational practices will be disturbed at any one time during the mining operation and reclamation phases. This will be accomplished through progressive backfilling, grading, and prompt revegetation of disturbed areas. An estimated reclamation schedule is shown on Drawing 5-38 or 5-38A for alternative mining.

#### 532.200 Backfill Stabilization:

The backfilled material will be stabilized by grading to promote a reduction of the rate and volume of runoff in accordance with the applicable requirements. The excess spoil and fill above approximate original contour will be graded to a maximum angle 3h:1v slope and revegetated to minimize erosion. This area is designed with concave slopes

and slope irregularities that will also assist in minimizing erosion. A geotechnical analysis of this configuration has been completed and the factor of safety is estimated at 1.6 to 1.7. This analysis can be viewed in Appendix A5-1. The remaining backfill will be placed in the mined out pit, and thus confined on all sides. The backfill will be inherently stable.

Mulch will be placed on the seedbed surface once soil amendments have been incorporated and seeding has been accomplished in areas that will be reclaimed to native plant communities. The mulch should control erosion by wind and water, decrease evaporation and seed predation, and increase survivability of the seeded species. Like the seeding methods, mulch will be applied with a variety of techniques and materials depending on the reclaimed area.

### 533. IMPOUNDMENTS.

#### 533.100.

No impoundments meeting the NRCS Class B or C criteria for dams in TR-60, or the size or other criteria of 30 CFR Sec. 77.216(a) are planned for the Coal Hollow Mine.

#### 533.110

*Impoundments not included in 533.100, will be designed and constructed with a minimum static safety factor of 1.3 for a normal pool with steady state seepage saturation conditions or meet the requirements of R645-301-733.210.*

The proposed sediment impoundments are expected to impound seasonal water and storms. A geotechnical analysis of these designs has been performed and can be reviewed in Appendix 5-1. Static safety factors for the proposed designs range from 2.2 to 5.3.

#### 533.200. Foundations.

Foundations for temporary and permanent impoundments will be designed so that

- *Foundations and abutments for the impounding structure are stable during all phases of construction and operation. Such foundations for temporary and permanent impoundments will be designed based on adequate and accurate information on the foundation conditions*

Refer to Appendix 5-1 for information related to foundations of the proposed impounding structures. No permanent impoundments are proposed.

- *All vegetative and organic materials will be removed and foundations excavated and prepared to resist failure. Cutoff trenches will be installed if necessary to ensure stability.*

All vegetation, topsoil and subsoil as identified in Chapter 2 will be removed from the impoundment areas prior to construction. Cutoff trenches will not be necessary for stability.

- *Slope protection will be provided to protect against surface erosion at the site and protect against sudden drawdown.*

Slopes of impoundments will be seeded and sloped to protect against erosion at the site. The high clay content and compaction characteristics of the material present at the impoundments will also assist with minimizing erosion of the slopes.

- *Faces of embankments and surrounding areas will be vegetated except that faces where water is impounded may be riprapped or otherwise stabilized in accordance with accepted design practices.*

Faces of embankments will be vegetated to minimize erosion. Standing water in the ponds is expected to be minimal and therefore these faces will also be seeded for erosion control.

- *The vertical portion of any remaining highwall will be located far enough below the low- water line along the full extent of highwall to provide adequate safety and access for the proposed water users.*

All highwalls will be fully covered following active use and backfilling of pits.

### 533.300

A rapid drawdown analysis was completed assuming the spillways are plugged, the basin fills to top of the embankments and then the water is released or pumped down to the base of basins. The soil strengths utilized were based on total stress conditions as determined from the triaxial shear tests completed for this project. It should be noted that rapid drawdown is highly unlikely since spillway and outlet piping will be no more than 4-feet below the top of embankments. The resulting safety factors under these conditions range from 1.2 to 1.9. Based on this analysis, no additional protection measures are needed for the impoundments in relation to rapid drawdown. Details for this analysis are provided in Appendix 5-1, pages 6 through 7 in the main section of the report.

### 533.600.

The MRP does not contemplate construction of impoundments that meet the criteria of MSHA, 30 CFR 77.216(a).

### 533.700 - 714. Plans.

Each detailed design plan for structures not included in 533.610 shall:

- *Be prepared by, or under the direction of, and certified by a qualified, registered, professional engineer, except that all coal processing waste dams and embankments covered by R645-301-536 and R645-301- 746.200 shall be certified by a qualified, registered, professional engineer;*

Designs for the proposed impoundments have been prepared by a qualified, registered, professional engineer, with assistance from a geotechnical expert. These certifications can be viewed on Drawings 5-28 through 5-31.

- *Include any design and construction requirements for the structure, including any required geotechnical information;*

A geotechnical analysis of the impoundments has been prepared by an expert in this field. This analysis can be viewed in Appendix 5-1. Embankments will be constructed in 2 foot lifts as recommended by the analysis.

- *Describe the operation and maintenance requirements for each structure; and*

The proposed impoundments are designed to temporarily store water from storm events and snow melt. Long term standing water in the impoundments is anticipated to be seasonal and sediment will be removed as necessary to provide the required storage capacities. Emergency spillways have been included in the designs to provide a non-destructive discharge route should the capacities ever be exceeded. Surveys of these impoundments will be regularly conducted to ensure that design capacities are available.

- *Describe the timetable and plans to remove each structure, if appropriate.*

All impoundments will be reclaimed at the end of operations. The estimated timeline for removal of these structures are shown on Drawing 5-38. Expected removal is year four of the mining and reclamation process. In areas where soils are not stabilized following the removal of these sediment impoundments, silt fence will be appropriately installed and maintained to provide sediment control until stable conditions are met.

Detailed designs of impoundments can be viewed on Drawings 5-28 through 5-31. Locations can be viewed on Drawing 5-3 and 5-25.

## 534. ROADS

534.100-200 Roads will be located, designed, constructed, reconstructed, used, maintained, and reclaimed so as to:

- *Prevent or control damage to public or private property;*  
All roads will be reclaimed to approximate original contour as shown on Drawings 5-35, 5-36 and 5-38. These roads are designed to control damage to public and private property.
- *Use nonacid - or nontoxic-forming substances in road surfacing; and*  
There will be no acid or toxic forming substances used in road surfacing.
- *Have, at a minimum, a static safety factor of 1.3 for all embankments.*  
All embankments are designed with static safety factors that exceed 1.3.
- *Have a schedule and plan to remove and reclaim each road that would not be retained under an approved postmining land use.*  
All roads not planned to remain postmining will be removed and reclaimed according to Drawings 5-35 and 5-36. The estimated timetable for removing these roads is shown on Drawing 5-38.
- *Control or prevent erosion, siltation and the air pollution attendant to erosion by vegetating or otherwise stabilizing all exposed surfaces in accordance with current, prudent engineering practices.*  
Cut ditches will be established on the shoulders of all primary roads to control drainage and erosion. Cut and fill slopes along the primary roads will be minimal and are not expected to cause significant erosion. In locations where there are culvert crossings (i.e. Lower Robinson Creek), the fills slopes will be stabilized by utilizing standard methods such as grass matting or straw wattles.
- *To ensure environmental protection and safety appropriate for their planned duration and use, including consideration of the type and size of equipment used, the design and reconstruction of roads will incorporate appropriate limits for grade, width, surface materials, and any necessary design criteria established by the Division.*

The following specifications apply to the Primary Mine Haul roads:

- 1) Roads will be approximately 80' in width
- 2) Approximately a 2% crown
- 3) Approximately one foot deep cut ditches along shoulders for controlling storm water
- 4) 18" of crushed rock or gravel for road surfacing
- 5) Cut and fill slopes of 1.5 h:1v
- 6) Minimum fill over each culvert will be 2 times diameter of culvert
- 7) Berms placed as necessary along fills

The ancillary roads will have similar specifications except surfacing will occur only as needed and may be narrowed to a 40 foot road width. A typical cross section for the ancillary roads can be viewed on Drawing 5-24.

The location and details for Primary Mine Haul roads can be viewed on Drawings 5-3 and 5-22 and 5-23.

In addition to the two roads primary Mine Haul roads, the road located within the facilities area is also classified as a primary road. This road is planned to be 24 feet wide with 24 inches of compacted sub base and 8 inches of compacted 1 inch minus gravel as surfacing. This road is referred to as "Facilities Roadway" and more details are described in 527.200 along with Drawings 5-22A and 5-22B.

In addition to the primary roads that will be present during active mining, four additional roads are planned to exist postmining and are also classified as primary roads for this reason.

Roads that will remain postmining are the following:

- Road to Water Well with details shown on Drawing 5-22D
- Road to east C. Burton Pugh property (K3993) with details shown on Drawing 5-22C
- County Road 136 (K3900) with details on Drawing 5-22E, 5-22F and 5-22G. This County road will be reconstructed within the permit area by Kane County. This reconstruction will occur concurrently with the final stage of reclamation as scheduled on Drawing 5-38 and is expected to be completed by the end of Year 4.
- Road to Swapp Ranch (same specification as the Water Well Road)

The location of these roads is shown on Drawings 5-35 and 5-37 along with the post mining topography.

The ramps, benches and equipment travel paths within the active surface mining area are temporary in nature and will be relocated frequently as mining progresses. These temporary travelways are considered part of the pit due to their short term use, and are not individually designed nor engineered. They will be built and maintained to facilitate safe and efficient mine and reclamation operations.

#### 534.300-340. Primary Roads.

Primary roads will:

- *Be located, insofar as practical, on the most stable available surfaces;*  
These roads are designed on the most practicable, stable surfaces.
- *Be surfaced with rock, crushed gravel, asphalt, or other material approved by the Division as being sufficiently durable for the anticipated volume of traffic and the weight and speed of vehicles using the road;*

Primary roads haul roads will be surfaced with approximately 18” of crushed rock or gravel to provide a durable surface for the anticipated volume of traffic and equipment.

- *Be routinely maintained to include repairs to the road surface, blading, filling potholes and adding replacement gravel or asphalt. It will also include revegetation, brush removal, and minor reconstruction of road segments as necessary; and*

All roads will be maintained on an as needed basis using motor graders, water trucks for dust suppression, and other equipment as necessary. Crushed stone and/or gravel will be used as a surface course for primary roads outside the active mining area, and may be used as needed for ramps and travelways within the pit. Should the roads be damaged by a catastrophic event, such as an earthquake or a flood, repairs will be made as soon as possible after the damage has occurred or the road will be closed and reclaimed. Roads will be reclaimed once they are no longer needed for their intended use.

- *Have culverts that are designed, installed, and maintained to sustain the vertical soil pressure, the passive resistance of the foundation, and the weight of vehicles using the road.*

Road fill over culverts will be at minimum two times the diameter of the culvert. This is a conservative standard that has been effectively utilized at mining operations with similar equipment and mining practices.

## 535. SPOIL

535.100 -150 Disposal of Excess Spoil. *Excess spoil will be placed in designated disposal areas within the permit area in a controlled manner. The fill and appurtenant structures will be designed using current, prudent engineering practices and will meet any design criteria established by the Division.*

- *The fill will be designed to attain a minimum long-term static safety factor of 1.5. The foundation and abutments of the fill must be stable under all conditions of construction.*

A geotechnical analysis has been completed for the proposed excess spoil structure. This analysis estimates the long-term safety factor to be 1.6 to 1.7 based on the proposed design. Following proper construction practices of building the structure in maximum four foot lifts and meeting 85% compaction based on the standard Proctor will ensure that the structure will be stable under all conditions of construction. The following earthwork specifications will be followed:

- 1) Areas to receive fill will be stripped of all vegetation, organic material, and debris. Any existing undocumented or non-structural fill/backfill materials and other unsuitable materials will be excavated in their entirety. All areas that are to receive fill will be observed by a professional engineer experienced in the design of earth and rock fills prior to placement of fill.
- 2) Fill will be compacted to 85% of the maximum density as compared to ASTM D 698 (standard proctor) for the spoil.
- 3) Individual lift thickness will not exceed 4 feet, unless approved by both the Division and the professional engineer based on compaction test results during field verification.
- 4) Saturated soils will be placed in an area that will have minimal effect on the performance of slopes.
- 5) A qualified professional engineer with experience in the design of earth and rock fills will periodically observe the placement of fill and conduct in-place field density tests on the fill to check for adequate moisture and relative compaction. The compaction tests will be conducted as part of the periodic inspections required in R645-301-514.100, 514.311, and R645-301-514.120. These compaction tests will be conducted using nuclear density (ASTM D2292-9) or equivalent method. If less than the specified relative compaction is obtained, additional compactive effort will be applied and the fill moisture-conditioned as necessary until the specified relative compaction is attained.

6) Wherever, in the opinion of the ACD's representatives, an unstable condition is being created, the work will not proceed in that area until an evaluation has been made and the grading operations revised, if necessary.

7) During unfavorable weather conditions, construction of the fill will not proceed without confirmation from the professional engineer experienced in the design of earth and rock fills.

This construction will occur only in the designated excess spoil area as shown on Drawing 5-3 and 5-35. The fill will be placed with end dump haul trucks and lifts will be constructed using dozers. High precision GPS systems will be regularly utilized to check grades and appropriate lift thickness. The geotechnical analysis for this structure can be viewed in Appendix 5-1.

- *Be located on the most moderately sloping and naturally stable areas available, as approved by the Division, and placed, where possible, upon or above a natural terrace, bench or berm, if such placement provides additional stability and prevents mass movement;*

The excess spoil is planned to be placed in an area where natural grades range from 0 to 5%. This is one of the most moderately sloping locations in the Permit Area. Stability of this structure is estimated to be 1.6 to 1.7 based on the Appendix 5-1.

- *Be subject of sufficient foundation investigations. Any necessary laboratory testing of foundation material, will be performed in order to determine the design requirements for foundation stability. The analyses of foundation conditions will take into consideration the effect of underground mine workings, if any, upon the stability of the fill and appurtenant structures; and*

Geotechnical borings were completed in the foundation of the proposed disposal area. Laboratory analysis of these borings has also been completed. Details of this analysis can be viewed in Appendix 5-1.

- *Incorporate keyway cuts (excavations to bedrock) or rock buttresses to ensure stability where the slope in the disposal area is in excess of 2.8h:1v (36 percent), or such lesser slope as may be designated by the Division based on local conditions. Where the toe of the spoil rests on a downslope, stability analyses will be performed in accordance with R645-301-535.150 to determine the size of rock toe buttresses and keyway cuts*

Permanent slopes for the proposed excess spoil will not exceed 3h:1v (33 percent), therefore no keyway cuts have been proposed in the design. Appendix 5-1 details the stability analysis for the proposed structure.

- *Excess spoil may be disposed of in underground mine workings...*

Excess spoil will not be disposed of in underground mine workings.

- *Placement of Excess Spoil. Excess spoil will be transported and placed in a controlled manner in horizontal lifts not exceeding four feet in thickness; concurrently compacted as necessary to ensure mass stability and to prevent mass movement during and after construction; graded so that surface and subsurface drainage is compatible with the natural surroundings; and covered with topsoil or substitute material in accordance with R645-301-232.100 through R645-301-232.600, R645-301-234, R645-301-242, and R645-301-243. The Division may approve a design which incorporates placement of excess spoil in horizontal lifts other than four feet in thickness when it is demonstrated by the operator and certified by a professional engineer that the design will ensure the stability of the fill and will meet all other applicable requirements.*

Horizontal lifts will not exceed four feet in thickness unless otherwise approved by the Division. The lifts will be concurrently compacted to meet 85% of the standard Procter. The geotechnical analysis (Appendix 5-1), provides information showing that these construction standards will provide mass stability and will prevent mass movement during and after construction. The excess spoil will be graded to provide drainage similar to original flow patterns. Topsoil and subsoil as designated in Chapter 2 will be removed and separated from other materials prior to placement of spoil.

- *For the purposes of SURFACE COAL MINING AND RECLMATION ACTIVITIES the design of the spoil disposal structures will include the results of geotechnical investigations as follows:*

- 1) *The Character of the bedrock and any adverse geologic conditions in the disposal area;*

Refer to Appendix 5-1.

- 2) *A survey identifying all springs, seepage, and ground water flow observed or anticipated during wet periods in the area of the disposal site;*

Spring and seep survey information is provided on Drawing 7-1. There are no springs or seeps identified in the excess spoil area.

- 3) *A survey of the potential effects of subsidence of the subsurface strata due to past and future mining operations;*

There no historical underground mining operations in the proposed excess spoil area. There are also no future underground operations proposed.

- 4) *A technical description of the rock material to be utilized in the construction of those disposal structures containing rock chimney cores or underlain by a rock drainage blanket; and*

There are no rock chimneys or drainage blankets proposed.

- 5) *A stability analysis including, but not limited to, strength parameters, pore pressures and long-term seepage conditions. These data will be accompanied by a description of all engineering design assumptions and calculations and the alternative considered in selecting the specific design specifications and methods.*

The stability analysis and all supporting data are available in Appendix 5-1.

- *If for the purposes of SURFACE COAL MINING AND RECLAMATION ACTIVITIES, under R645-301-535.112 and R645-301-535.113, rock-toe buttresses or key-way cuts are required, they will include the following:*

Neither rock-toe buttresses or key-way cuts are required under R645-301-535.112 or R645-301-535.113.

535.200. Disposal of Excess Spoil: Valley Fills/Head-of-Hollow Fills.

The MRP does not contemplate disposal of excess spoil as valley fill or head-of-hollow fills.

535.300. Disposal of Excess Spoil: Durable Rock Fills.

The MRP does not contemplate disposal of excess spoil as durable rock fill.

535.400. Disposal of Excess Spoil: Preexisting Benches.

The MRP does not contemplate disposal of excess spoil on preexisting benches.

535.500 Disposal of Excess Spoil: At Drift Entries.

The MRP does not contemplate disposal of spoils resulting from face-up operations at the drift entries. Drift entries will originate from the existing Pit, excess spoil for which are stored in the approved Excess Spoils Pile.

536. Coal Mine Waste.

The MRP does not contemplate processing of coal that would produce coal mine waste.

## 537 **REGRADED SLOPES:**

### 537.100 Geotechnical Analysis:

The excess spoil structure and fill above approximate original contour are the only alternative specifications proposed. A geotechnical analysis has been completed for this proposal and can be viewed in Appendix 5-1. All other mined areas, for surface or underground will be restored to approximate original contour.

## 540 **RECLAMATION PLAN:**

### 541.100 - 400 General

When coal mining is completed, all pits will be backfilled and reclaimed in accordance with the R645 rules and this permit. All equipment, structures, and other facilities, unless approved by the Division as suitable for the postmining land use or environmental monitoring, will be removed and the affected land reclaimed.

Underground mine portals will be closed in accordance with approved MSHA plans and backfilled.

When no longer needed for monitoring or other use approved by the Division upon a finding of no adverse environmental or health and safety effects, or unless approved for transfer as a water well under R645-301-731.100 through R645-301-731.522 and R645-301-731.800, each well will be capped, sealed, backfilled, or otherwise properly managed, as required by the Division in accordance with R645-301-529.400, R645-301-631.100, and R645-301-748. Permanent closure measures will be designed to prevent access to the mine workings by people, livestock, fish and wildlife, machinery and to keep acid or other toxic drainage from entering ground or surface waters.

If a water well is exposed by coal mining and reclamation operations, it will be permanently closed unless otherwise managed in a manner approved by the Division.

Permanent closure and abandonment of water wells greater than 30 feet in depth will be in accordance with the requirements of "Administrative Rules for Water Well Drillers", State of Utah, Division of Water Rights or other applicable state regulations. Abandonment of wells will be performed by a licensed water well driller. The wells to be abandoned will be completely filled using neat cement grout, sand cement grout, unhydrated bentonite, or bentonite grout, or other materials approved by the Utah State Engineer's office. Alternatively, the well may be abandoned using a different procedure upon approval from the Utah State Engineer's office.

Abandonment materials will be introduced at the bottom of the well or required sealing interval and placed progressively upward to the top of the well. The casing will be severed a minimum of 2 feet below the ground surface. A minimum of 2 feet of compacted native material will be placed above the abandoned well upon completion.

Within 30 days of the completion of well abandonment procedures, a report will be submitted to the State Engineer by the responsible licensed driller giving data related to the abandonment of the well. This shall include the name of the licensed driller or other person(s) performing abandonment procedures, name of well owner at the time of abandonment, the address or location of the well by section, township, and range, abandonment materials and equipment used, water right or file number covering the well, the final disposition of the well, and the date of completion.

Exploration holes and boreholes will be backfilled, plugged, cased, capped, sealed, or otherwise managed to prevent acid or toxic contamination of water resources and to minimize disturbance to the prevailing hydrologic balance. Exploration holes and boreholes will be managed to ensure the safety of people, livestock, fish and wildlife, and machinery.

If a water well is exposed by coal mining and reclamation operations, it will be permanently closed unless otherwise managed in a manner approved by the Division.

If any exploration boreholes are to be used as monitoring wells or water wells, these will meet the provisions of R645-301-731

Boreholes will be backfilled to within 1 foot of the land surface with concrete or other materials approved by the Division as necessary to prevent contamination of groundwater or surface-water resources or to protect the prevailing hydrologic balance. The upper approximately 1 foot will be backfilled with native materials to facilitate reclamation (see Drawing 6-11). Exploration holes and boreholes that may be uncovered during mining and reclamation activities will be permanently closed unless approved for water monitoring or otherwise managed in a manner approved by the Division.

## 542 NARRATIVE, DRAWINGS AND PLANS:

### 542-100 through 600 Plan and Timetable.

Reclamation at the Coal Hollow Mine includes both ongoing reclamation and final reclamation activities. Ongoing reclamation will follow mining operations as closely as practicable during the mine production phase. Major steps in the ongoing reclamation process are:

- **Backfilling and Grading.** The planned backfilling and grading operations are described more fully under section 553 below.
- **Topsoil and Subsoil Replacement.** Following grading, suitable topsoil and subsoil will be replaced on the regraded area. Topsoil may be direct placed from areas ahead of the mine, or may be taken from available stockpiled material. The planned topsoil operation will have topsoil ahead of the operation dozed into windrows, and loaded into trucks by a front end loader. The trucks will haul the topsoil to the regraded area, or to a temporary topsoil stockpile. Subsoil will be handled similar to topsoil. Once dumped on the regraded area, topsoil and subsoil layers will be dozed to a consistent thickness. Approximately 8 inches of topsoil is expected to be removed ahead of mining and replaced over the regraded area. Subsoil removed and replaced will average 40 inches thick and will be placed between the topsoil layer and run of mine spoil. The total profile thickness of topsoil and subsoil in mined areas will average 48 inches. Once in place, the area will be fine graded to remove small erosion features and depressions.
- **Revegetation.** Following replacement of topsoil the area will be revegetated by seeding. Mulch will be placed on the seedbed surface once soil amendments have been incorporated and seeding has been accomplished in areas that will be reclaimed to native plant communities. The mulch should control erosion by wind and water, decrease evaporation and seed predation, and increase survivability of the seeded species. Like the seeding methods, mulch will be applied with a variety of techniques and materials depending on the reclaimed area.

Generally, mined areas will be backfilled and graded within approximately 180 days following coal removal, or 1,500 feet of the active coal removal face. One exception to this standard is during mining and backfilling of the Highwall Trench south of Pit 9. During this phase of mining, Pit 9 will be left open for access to the Highwall Trench and underground mine. A detailed description of the reason for this variation are fully described in section 528 (Overburden) and the major steps can be viewed on Drawings 5-17 through 5-19. Areas needed for in-pit roads, ramps, drainage controls or areas which must be left open temporarily for operational reasons will be backfilled and graded when they are no longer needed. The rate of backfilling will depend on the availability of mined out pit areas for backfilling, and the rate of production at the mine. Based on anticipated production rates, Drawing 5-38, or Drawing 5-38A if the alternative highwall mining is selected, provides an estimated sequence and timing for reclamation.

Topsoil will be replaced on the graded areas as soon as operationally practicable. This work will depend on weather and soil conditions in the removal and replacement areas, but is generally anticipated to occur within 90 days of completion of regrading.

Revegetation activities will be seasonal in nature. As currently planned, initial seeding will occur at the first planting opportunity following replacement of topsoil. Supplemental seeding may be done subsequently as needed.

Some delay is unavoidable in reclamation of the initial mining areas due to the time required to establish the initial working pit and backfill area, and to achieve a steady state excavation/backfill operation. As currently planned the initial mining areas will be backfilled to the planned post mining contour, graded, and the topsoil replaced by late in the first year or in the first half of the second year of mining. Reclamation activities will proceed at the regular planned rate thereafter. Proposed final reclamation contours and cross sections can be viewed on Drawings 5-35 and 5-36.

The sequence and timing of reclamation activities is dependent on the coal production rate. Should that rate differ significantly from the current plan, the reclamation schedule will also vary.

Final reclamation includes the following:

- **Backfilling and Grading.** Backfilling of all final pits will commence at the conclusion of coal production. All highwalls, spoil piles, and depressions will be removed, except that small depressions may be constructed if they are needed to retain moisture, minimize erosion, create and enhance wildlife habitat, or assist revegetation. No permanent final pit impoundments are currently planned. The excess spoil structure will remain. All exposed coal seams, and acidic or toxic-forming strata will be covered with at least five feet of noncombustible material.
- **Topsoil and Subsoil Replacement.** 8 inches of topsoil underlain by 40 inches of subsoil will be placed on the backfilled pits and excess spoil. Other disturbed areas will have topsoil replaced (including facilities sites, roads etc.).
- **Removal of Structures.** Before abandoning the permit area or seeking bond release, all structures not needed for the approved post mining land use will be removed and reclaimed. The Lower Robinson Creek diversion is proposed to be temporary. Material from the coal stockpile base area and other areas where coal spillage may accumulate will be excavated and placed in a controlled manner in the final pit and covered with noncombustible material to prevent sustained combustion. The only structure planned to exist postmining is the water well with details shown in Drawing 5-8C and location shown on 5-3, 5-35 and 5-37.
- **Removal of Roads.** Roads not retained for use under an approved postmining land use will be reclaimed immediately after they are no longer needed for mining and reclamation operations. Roads that are not listed as postmining roads in this

section, will be closed to traffic; and all bridges and culverts removed. Prior to reclamation, surface material that is incompatible with the postmining land use and revegetation requirements will be removed from the roads and properly disposed of at the mine site. The roadbeds will be scarified or ripped to break up the surface. Topsoil will be replaced on the roadbed and the surface revegetated in accordance with the standards set forth in R645.

Roads that will remain postmining are the following:

- Road to Water Well with details shown on Drawing 5-22D
- Road to east C. Burton Pugh property (K3993) with details shown on Drawing 5-22C
- County Road 136 (K3900) with details on Drawing 5-22E, 5-22F and 5-22G. This County road will be reconstructed within the permit area by Kane County. This reconstruction will occur concurrently with the final stage of reclamation as scheduled on Drawing 5-38 and is expected to be completed by 2017.
- Road to Swapp Ranch (same specification as the Water Well Road)

The location of these roads is shown on Drawings 5-35 and 5-37 along with the post mining topography.

- Removal of Water Control Structures. All sedimentation control structures, including ditches, berms and sedimentation ponds not retained as part of the approved post-mining land use will be removed, the areas regraded, topsoiled, and revegetated. All water control structures will be removed at final reclamation.

Final pit backfilling, removal of buildings, roads and other facilities, along with replacement of topsoil is expected to require approximately 15 months after the last coal is removed. In the alternate reclamation scenario (Drawing 5-37), the bulk of this period will be required to backfill the final pits.

#### 542.700. Final Abandonment of Mine Openings and Disposal Areas.

Final abandonment of alternative mined highwall panels will be at the time when completed panels are backfilled as described in Section 529.

Underground mine openings will be closed in accordance with approved MSHA requirements and backfilled.

When no longer needed for monitoring or other use approved by the Division upon a finding of no adverse environmental or health and safety effects, or unless approved for transfer as a water well under R645-301-731.100 through R645-301-731.522 and R645-301-731.800, each well will be capped, sealed, backfilled, or otherwise properly managed, as required by the Division in accordance with R645-301-529.400, R645-301-631.100, and R645-301-748. Permanent closure measures will be designed to prevent access to the mine workings by people, livestock, fish and wildlife, machinery and to keep acid or other toxic drainage from entering ground or surface waters.

If a water well is exposed by coal mining and reclamation operations, it will be permanently closed unless otherwise managed in a manner approved by the Division.

Permanent closure and abandonment of water wells greater than 30 feet in depth will be in accordance with the requirements of “Administrative Rules for Water Well Drillers”, State of Utah, Division of Water Rights or other applicable state regulations. Abandonment of wells will be performed by a licensed water well driller. The wells to be abandoned will be completely filled using neat cement grout, sand cement grout, unhydrated bentonite, or bentonite grout, or other materials approved by the Utah State Engineer’s office. Alternatively, the well may be abandoned using a different procedure upon approval from the Utah State Engineer’s office.

Abandonment materials will be introduced at the bottom of the well or required sealing interval and placed progressively upward to the top of the well. The casing will be severed a minimum of 2 feet below the ground surface. A minimum of 2 feet of compacted native material will be placed above the abandoned well upon completion.

Within 30 days of the completion of well abandonment procedures, a report will be submitted to the State Engineer by the responsible licensed driller giving data related to the abandonment of the well. This shall include the name of the licensed driller or other person(s) performing abandonment procedures, name of well owner at the time of abandonment, the address or location of the well by section, township, and range, abandonment materials and equipment used, water right or file number covering the well, the final disposition of the well, and the date of completion.

Exploration holes and boreholes will be backfilled, plugged, cased, capped, sealed, or otherwise managed to prevent acid or toxic contamination of water resources and to minimize disturbance to the prevailing hydrologic balance. Exploration holes and boreholes will be managed to ensure the safety of people, livestock, fish and wildlife, and machinery.

If a water well is exposed by coal mining and reclamation operations, it will be permanently closed unless otherwise managed in a manner approved by the Division.

If any exploration boreholes are to be used as monitoring wells or water wells, these will meet the provisions of R645-301-731

Boreholes will be backfilled to within 1 foot of the land surface with concrete or other materials approved by the Division as necessary to prevent contamination of groundwater or surface-water resources or to protect the prevailing hydrologic balance. The upper approximately 1 foot will be backfilled with native materials to facilitate reclamation (see Drawing 6-11). Exploration holes and boreholes that may be uncovered during mining and reclamation activities will be permanently closed unless approved for water monitoring or otherwise managed in a manner approved by the Division.

542.720. Disposal of Excess Spoil.

A geotechnical analysis has been completed for the proposed excess spoil structure. This analysis estimates the long-term safety factor to be 1.6 to 1.7 based on the proposed design. Following proper construction practices of building the structure in maximum four foot lifts and meeting 85% compaction based on the standard Procter will ensure that the structure will be stable under all conditions of construction. This construction will occur only in the designated excess spoil area as shown on Drawing 5-3 and 5-35. The fill will be placed with end dump haul trucks and lifts will be constructed using dozers. High precision GPS systems will be regularly utilized to check grades and appropriate lift thickness. The geotechnical analysis for this structure can be viewed in Appendix 5-1.

Excess spoil that is combustible will be adequately covered with noncombustible material to prevent sustained combustion.

542.730. Disposal of Coal Mine Waste.

The MRP does not contemplate processing of coal that would produce coal mine waste.

542.740. Disposal of Noncoal Mine Wastes.

Noncoal mine waste 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 temporarily stored in a controlled manner in a designated portion of the permit area and hauled offsite to a state approved recycling or solid waste disposal site. Final disposal of noncoal mine waste will not take place within the permit area. With the exception of removal of perforated piping used in the construction of Alluvial Ground Water Drains that will be left in place as mining advances. This perforated piping will be covered in place approximately 20' to 30' below the final reclaimed surface. All other waste materials (ie. metal culvert) associated with the Alluvial Ground Water Drains will be removed and disposed of in a State-approved solid waste disposal site.

542.800. Reclamation Cost.

The amount of the bond will depend upon the requirements of the *approved* permit and reclamation plan (R645-830.120).

A preliminary estimate of reclamation costs is included in Appendix 8-1. This estimate is based upon the proposed plan of open pit mining. The cost for the alternative plan of highwall mining will be considerably less because of reduced surface disturbance with this mining operation. Therefore the cost estimate will remain based on the proposed plan of open pit mining. A final bond estimate will be provided by the applicant to the Division upon completion of the approved permit and reclamation plan.

## **550. RECLAMATION DESIGN CRITERIA AND PLANS**

### **551. SEALING AND CASING OF UNDERGROUND OPENINGS**

When no longer required, underground mine openings will be closed in accordance with MSHA approved requirements and backfilled. When no longer needed for monitoring or other use approved by the Division upon a finding of no adverse environmental or health and safety effects, or unless approved for transfer as a water well under R645-301-731.100 through R645-301-731.522 and R645-301-731.800, each well will be capped, sealed, backfilled, or otherwise properly managed, as required by the Division in accordance with R645-301-529.400, R645-301-631.100, and R645-301-748. Permanent closure measures will be designed to prevent access to the mine workings by people, livestock, fish and wildlife, machinery and to keep acid or other toxic drainage from entering ground or surface waters.

If a water well is exposed by coal mining and reclamation operations, it will be permanently closed unless otherwise managed in a manner approved by the Division.

Permanent closure and abandonment of water wells greater than 30 feet in depth will be in accordance with the requirements of “Administrative Rules for Water Well Drillers”, State of Utah, Division of Water Rights or other applicable state regulations. Abandonment of wells will be performed by a licensed water well driller. The wells to be abandoned will be completely filled using neat cement grout, sand cement grout, unhydrated bentonite, or bentonite grout, or other materials approved by the Utah State Engineer’s office. Alternatively, the well may be abandoned using a different procedure upon approval from the Utah State Engineer’s office.

Abandonment materials will be introduced at the bottom of the well or required sealing interval and placed progressively upward to the top of the well. The casing will be severed a minimum of 2 feet below the ground surface. A minimum of 2 feet of compacted native material will be placed above the abandoned well upon completion.

Within 30 days of the completion of well abandonment procedures, a report will be submitted to the State Engineer by the responsible licensed driller giving data related to the abandonment of the well. This shall include the name of the licensed driller or other person(s) performing abandonment procedures, name of well owner at the time of abandonment, the address or location of the well by section, township, and range, abandonment materials and equipment used, water right or file number covering the well, the final disposition of the well, and the date of completion.

Exploration holes and boreholes will be backfilled, plugged, cased, capped, sealed, or otherwise managed to prevent acid or toxic contamination of water resources and to minimize disturbance to the prevailing hydrologic balance. Exploration holes and boreholes will be managed to ensure the safety of people, livestock, fish and wildlife, and machinery.

If a water well is exposed by coal mining and reclamation operations, it will be permanently closed unless otherwise managed in a manner approved by the Division. If any exploration boreholes are to be used as monitoring wells or water wells, these will meet the provisions of R645-301-731

Boreholes will be backfilled to within 1 foot of the land surface with concrete or other materials approved by the Division as necessary to prevent contamination of groundwater or surface-water resources or to protect the prevailing hydrologic balance. The upper approximately 1 foot will be backfilled with native materials to facilitate reclamation (see Drawing 6-11). Exploration holes and boreholes that may be uncovered during mining and reclamation activities will be permanently closed unless approved for water monitoring or otherwise managed in a manner approved by the Division.

## **552. PERMANENT FEATURES.**

### **552.100**

Small depressions may be constructed if they are needed to retain moisture, minimize erosion, create and enhance wildlife habitat, or assist revegetation.

### **552.200**

All impoundments will be reclaimed, no permanent impoundments are proposed.

## 553 BACKFILLING AND GRADING:

Backfilling and Grading of the mined area will proceed in conjunction with coal recovery operations.

The planned mine will recover approximately 4.64 million tons of coal, and remove approximately 30.1 million Bank Cubic Yards (BCY) of overburden. The following is a description of the overburden removal and backfilling process:

Based on the overburden isopach map (Drawing 5-15), the overburden removal and backfilling process has been separated into three major stages. The first stage of this process is for the initial mining area, Pits 1-8. These pits have a relatively low strip ratio, approximately 5:1 (refer to Drawing 5-13). In order to efficiently remove overburden for this phase, spoil from the first three pits will be placed in an excess spoil area located immediately west of Pit 1. This excess spoil structure will hold approximately 2.7 million loose cubic yards (LCY) of material and is shown on Drawing 5-17. Once the excess spoil pile is filled, overburden from the next 4 pits can then be used as pit backfill as the mining progresses through Pit 8. The completion of this phase is shown on Drawing 5-17.

Phase 2 requires mining to occur in two areas of the permit alternately. As mining progresses through Pits 9-13, the isopach (Drawing 5-15) shows that the overburden significantly increases. This increase and the shape of the mining boundary for the Permit Area require a fill above approximate original contour that is an extension of the excess spoil pile. Material from Pits 9-13 significantly exceeds the backfill capacity available from the preceding pits (Pits 1-8). The fill above approximate original contour blends in with the excess spoil structure from Phase 1 and extends an additional 2,000 feet to the east as the mining sequence proceeds to Pit 15.

Also, mining begins with Pit 28 and proceeds alternately with Pits 9-13, north to Pit 23. The isopach shows that Pits 28 -23 have a relatively low strip ratio, approximately 4.2:1 increasing to 4.9:1 respectively. Overburden from Pit 28 will all be hauled to the excess spoil structure, with overburden from the successive pits to north back filling the previously mined. In this stage, the fill above original contour is approximately 5.8 million LCY. Drawing 5-18 (Stage 2) shows the details of this stage of the overburden removal and resulting landform.

Phase 3 overburden removal begins in Pit 14 and proceeds alternately with Pit 22 coming from the south to meet at Pit 18, the last pit to be mined. During this stage, the strip ratio reduces significantly from Stage 2 as mining progresses to Pit 18. As the strip ratio reduces to the south, significant backfill capacity is available in the preceding Pit 15. This results in the distance between the backfill and the active coal face increasing because there is a lack of spoil in the lower ratio pits as mining proceeds south to fill the preceding higher ratio area. At the end of mining this phase, an area will not be completely backfilled that is approximately 1,600 feet in length and 875 feet wide and will require 3.3 million yards of fill to complete reclamation to approximate original contour. This remaining pit provides an open pit adjacent to the federal coal reserves for backfilling of overburden so that a smooth transition can be made without developing another boxcut and an excess spoil area. The backfill configuration at the end of this stage is shown in Drawing 5-19.

The proposed plan (Preferred Scenario) for backfilling the final pits is based on the assumption that Alton Coal Development, LLC will be successful with acquiring the adjacent federal coal reserves, located immediately to the west of the project area. This

Preferred scenario for backfilling will minimize overall disturbance, and maximize resource recovery by providing a transition into the adjacent federal reserves with minimal effect to existing reclamation and backfill in the Permit Area. This scenario will also minimize variances from approximate original contour on the federal lands by eliminating the need for an excess spoil structure from the initial box cut as operations are transitioned into these reserves. In addition, this scenario provides a method for implementing concurrent reclamation during the project by eliminating temporary stockpiles of spoil that can not be reclaimed and have to be placed in backfilled areas at a later time. Use of temporary spoil stockpiles significantly delay reclamation and this plan eliminates the need for these type of temporary structures.

At the time that the transition occurs into the federal reserves, overburden will be removed from the federal reserves and placed in the final pits to approximate original contour. This final landform can be viewed on Drawings 5-35 and 5-36.

The following is an overburden and backfill balance for this scenario:

Preferred Scenario (Adjacent Federal Reserves Acquired)				
Phase	Overburden (LCY)	Available Backfill (LCY)	Excess Spoil (LCY)	Total Excess Spoil (LCY)
1	7,936,000	5,195,000	2,741,000	2,741,000
2	14,168,000	11,127,000	3,041,000	5,782,000
3	14,631,000	14,631,000	0	5,782,000
4 (Federal)	2,545,000	2,545,000	0	5,782,000
Total	39,280,000	33,498,000	5,782,000	5,782,000

\*Loose Cubic Yards is estimated based on an overall 22% swell factor (Caterpillar Performance Handbook)

In the case that Alton Coal Development is not successful with acquiring the adjacent federal coal reserves, an alternate scenario has been developed. The Alternate scenario requires that all fill above approximate original contour and part of the excess spoil structure will be rehandled and placed in the remaining backfill area. The final landform for this scenario is shown on Drawing 5-37. This step requires rehandle of approximately 2.5 million yards of spoil. In this scenario, reclamation of the project area will be significantly delayed and the transition into adjacent federal coal reserves at a later date will disturb additional backfill along the west permit boundary approximately 2,000 feet in length by 230 feet wide (10 acres). An additional excess spoil structure would then need to be constructed on the federal lands to place spoil from the initial boxcut. Part of the excess spoil would likely be material removed from the Permit Area to access the coal beneath the Permit Area highwalls and provide the proper layback of the backfill material along the Permit boundary.

As alternative highwall mining is selected, highwall mining would begin in Pit 9. Then, once coal is removed from Pit 22, the coal east of Pits 22 and 23 will be mined using the highwall miner while Highwall Trench 1 (HWT1) is excavated. In this method of mining, an unmanned cutter module is driven underground and operated in front of the

highwall. The highwall mining machine stands on the pit floor or on a bench, directly in front of the exposed seam and makes long parallel rectangular drives into the coal seam. A remote-operated cutter module is pushed into the seam by a string of push beams (unmanned coal-conveying elements) that transport the mined coal back to the entry of the drive onto a stockpile. Coal is then removed to the sizing/loading area. The miner is moved along the face making successive pushes into the coal face. Once coal is removed from the Pits/Highwall Trench, overburden from excavation of the next Highwall Trench is used to backfilled the mined out area continuing with the progression of the trench.

The anticipated coal removal sequence for the Highwall mining is shown on drawing 5-10A. As is depicted, each Pit/Highwall Trench consists of Panels, each panel consisting of 10 holes. The spacing between the holes and the spacing between the panels are dictated by the amount of overburden over the panels. The alternate Highwall mining is designed such that subsidence does not occur to the surface with nonyieldable webs and barriers. Specific information concerning these design are found in Appendix 5-8. Highwall mining will have only the disturbance associated with the pit/trench for placement of the highwall miner and will have no impact on the surface above the highwall panels.

The following tables summarizes the overburden and backfill balance for these two scenarios:

Alternate Scenario (Adjacent Federal Reserves Not Acquired)				
Phase	Overburden (LCY)	Available Backfill (LCY)	Excess Spoil (LCY)	Total Excess Spoil (LCY)
1	7,936,000	5,195,000	2,741,000	2,741,000
2	14,168,000	11,127,000	3,041,000	5,782,000
3	14,631,000	14,631,000	0	5,782,000
4 (Rehandle)	0	2,545,000	-2,545,000	3,237,000
Total	36,735,000	33,498,000	3,237,000	3,237,000

Alternate Scenario (Highwall mining)				
Phase	Overburden (LCY)	Available Backfill (LCY)	Excess Spoil (LCY)	Total Excess Spoil (LCY)
1	7,936,000	5,195,000	2,741,000	2,741,000
2	7,381,000	7,277,000	104,000	2,845,000
3	5,257,000	5,257,000	0	2,845,000
4 (Federal)	2,545,000	2,545,000	0	2,845,000
Total	23,119,000	20,274,000	2,845,000	2,845,000

In both scenarios (Preferred and Alternate), Rough backfilling and grading operations will follow coal removal by not more than 60 days or 1500 linear feet except for the exemption Pit 9. Pit 9 will be utilized for access to the Highwall Trench. Once mining is complete, the proposed plan for backfilling Pit 9 includes acquiring the right to mine the adjacent federal coal reserves, located immediately southwest or north of Pit 9. In the case that Alton Coal Development is not successful with acquiring the adjacent federal coal reserves, all the fill above approximate original contour and part of the excess spoil structure will be rehandled and placed back in the remaining backfill area. The underground mining will be accessed through portals in an existing pit. There will be no additional overburden removal associated with the underground mining.

Major steps in the backfilling and grading process are:

- **Backfilling of the Mined Out Pit.** Material from active pits will be used to backfill mined out pits as mining progresses. Material will be placed in the in-pit backfill in lifts, until the approximate planned final elevation is reached. Working stability in the backfill will be achieved by placement of the material, and control of the overall spoil face slope at stable angles. The mined out area will be filled to its planned post-mining elevation, which approximates the pre-mining land contour. The backfill will be inherently stable because the exposed surface will have shallow slopes, and the backfill surface will not be significantly higher than the surrounding undisturbed ground with the exception of the variance shown on Drawing 5-3.
- **Backfilling of Ramps.** Ramps and travelways within the active mining will be moved as necessary for safe operation and efficient hauling of overburden and coal. When a particular ramp or travelway is no longer needed, it will be backfilled with excavated overburden from the advancing pit.
- **Grading.** After backfilling is complete in each mined out area, the area will be graded using dozers and motor graders to achieve the planned post-mining contour, facilitate stable positive drainage patterns, and to blend in with the surrounding topography. Postmining slopes will not exceed either the angle of repose or such lesser slope as is necessary to achieve a minimum long-term static safety factor of 1.3 and prevent slides. A geotechnical analysis has been completed for the excess spoil structure and can be found in Appendix 5-1.

Timing of backfilling and grading operations will depend on the rate of mine advance and the availability of backfill space and material. It is planned that mined areas will be backfilled and graded within approximately 60 days following coal removal, or 1,500 feet of the active coal removal face. As described in the previous text and shown on Drawing 5-19, there will be a variance from this standard in the final pits. Areas needed for in-pit roads, ramps, drainage controls or areas which must be left open temporarily for operational reasons will be backfilled and graded as they become available.

In the initial mining area, pits 1 through 8 (spoil from pit 2 and 3 will be permanently placed in the excess spoil area and pit 1. Part of Pit 3 is placed in the previous pit. All of the 4th pit is placed in the pit 3, beginning the sequential pit backfilling process. By the time coal recovery is complete, rough backfilling and grading will be complete through 7 pits. Rough backfilling and grading will continue and be completed through pit 8. Pits 1, 2, and 3 are defined on drawing 5-10. Pits 4 through 8 will be determined during the mining of pits 1, 2, and 3. At that time, an amendment to this permit reflecting the number and sequence of pits 4 through 8 will be submitted to the division.

#### 553.110

All areas except for the excess spoil pile and the variance from AOC (approximately 85 acres), will be restored to approximate original contour as shown on Drawing 5-35. R645-301-553.800 (Thick Overburden) does apply to this surface mine. In areas where excess spoil and variance from approximate original contour occur, the slopes will be regraded to a maximum angle of 3h:1v and most slopes are flatter as shown on Drawing 5-35 and 5-36. A geotechnical analysis has been completed to verify that the spoil material will be stable long term. This analysis can be viewed in Appendix 5-1.

#### 553.120

All highwalls will be eliminated in the final landform. Small depressions may be constructed as needed to retain moisture, minimize erosion, create and enhance wildlife habitat or assist vegetation. All spoil piles will be eliminated with the exception of the planned excess spoil and variance from original contour as shown on Drawing 5-35.

#### 553.130

Postmining slopes will not exceed the angle of repose which is expected to be approximately 1.5h:1v as described in Appendix 5-5. This appendix is an analysis by Dr. Ben Seegmiller addressing the safety factor for the post mining slope with the lowest safety factor outside the excess spoil area. This analysis concludes that a minimum safety factor of these slopes will be 1.7 which exceeds the requirement of 1.3. The excess spoil slopes have been analyzed by Alan Taylor, P.E., an expert in geotechnical engineering. These slopes also significantly exceed the required 1.3 safety factor. Details for this analysis by Mr. Taylor can be viewed in Appendix 5-1.

#### 553.140

Slopes will be regraded and vegetated to minimize erosion and water pollution on and off the site.

#### 553.150

Backfilling and grading will be conducted to support the approved post mining land use.

#### 553.200 Spoil and Waste.

Spoil located in the excess spoil area and the variance from approximate original contour will be compacted to 85% of the standard Procter to provide long term stability of these

structures. Remaining backfill in mined out areas will be confined and regraded to approximate original contour and will therefore not require compaction for long term stability. Subsoil will be placed over spoils and waste prior to placement of topsoil. This subsoil layer will provide a covering with minimal infiltration rate to prevent leaching of toxic materials.

#### 553.210

Excess spoil from surface mining activities will be disposed of according to R645-301-211, R645-301-212, R645-301-412.300, R645-301-512.210, R645-528.310, R645-301-535.100 through R645-301-535.130, R645-301-535.300 through R645-301-535.500, R645-536.300, R645-301-542.720, R645-301-553.240, R645-301-745.100, R645-301-745.100, R645-301-745.300, and R645-301-745.400. Detail for meeting these standards can be reviewed in the corresponding sections.

#### 553.220

The MRP does not contemplate placing spoil on areas outside the mined-out surface area for the purposes of restoring the approximate original contour.

#### 553.300. Covering of Exposed Coal Seams, and Acid- and Toxic-Forming Materials.

Exposed coal seams, acid- and toxic-forming materials, and combustible materials exposed, used, or produced during mining will be adequately covered with nontoxic and noncombustible materials, or treated, to control the impact on surface and ground water in accordance with R645-301-731.100 through R645-301-731.522 and R645-301-731.800, to prevent sustained combustion, and to minimize adverse effects on plant growth and on the approved postmining land use.

#### 553.400. Cut and Fill Terraces

The MRP does not contemplate constructing cut and fill terraces.

#### 553.500. Previously Mined Areas (PMA's) and Continuously Mined Areas (CMA's).

The MRP does not contemplate operations associated with PMA's, CMA's, or areas with remaining highwalls.

#### 553.600. Highwall Management

The MRP does not contemplate operations associated with PMA's, CMA's, or areas with remaining highwalls.

#### 553.700. Backfilling and Grading: Thin Overburden.

The Coal Hollow project is expected to have approximately 1.8 million loose cubic yards of excess spoil; therefore R645-301-800 applies rather than R645-301-553.700.

553.800. Backfilling and Grading: Thick Overburden.

553.810

The spoil will be placed to attain the lowest practicable grade, and will not exceed the angle of repose for the material. A sequence of the steps for practicable movement of the excess spoil is shown on Drawings 5-17 through 5-19. The slopes on the excess spoil and variance from the approximate original contour will not exceed 3h:1v or flatter, which will provide a long-term, stable structure. The general design of the tall (60'+ vertically) excess spoil slopes is 5h:1v to 4h:1v to 3h:1v, bottom to top. This design creates a concave shape slope that resembles naturally occurring hills in the area and will minimize erosion. In addition, irregularities (flatter areas) have been added to break up long slopes. The overall shape of the pile is also irregular to be similar to hills in the surrounding area. The final configuration of this excess spoil can be viewed in Drawings 5-35 and 5-36. The rough grading of the excess spoil outsoles will follow by not more than 60 days after completed construction. The angle of repose for the spoil material is expected to be 1.5h:1v as provided in Appendix 5-5 in the Introductory Overview (page 1) by Dr. Ben Seegmiller, an expert in the field of rock mechanics and slope stability. The design slopes are significantly flatter than the angle of repose expected for the spoil.

553.820 - 553.830

Backfilling and Grading of thick overburden will meet the following requirements:

- *R645-301-211: The applicant will present a description of the premining soil resources as specified under R645-301-221. Topsoil and subsoil to be saved under R645-301-232 will be separately removed and segregated from other material.*

The soil resources for the proposed excess spoil disposal area are described in 2-1. A plan has been developed for removal of topsoil and suitable subsoil based on the soil descriptions in this appendices. The handling plan can be viewed on Drawing 2-2. Topsoil and acceptable subsoil will be separately removed and segregated from other material prior to placement of any spoil.

- *R645-301-212: After removal, topsoil will be immediately redistributed in accordance with R645-301-242, stockpiled pending redistribution under R645-301-234, or if demonstrated that an alternative procedure will provide equal or more protection for the topsoil, the Division may, on a case-by case basis, approve an alternative;*

Excess spoil will have topsoil and subsoil redistributed in an approximately uniform, stable thickness with the approved post mining land use, contours and

surface water drainage systems. Material handling practices will prevent excess compaction of these materials. Handling practices will also protect the materials from wind and water erosion before and after seeding and planting.

- *R645-301-412.300: Criteria for Alternative Postmining Land Uses.*

Not Applicable

- *R645-301-512.210: Excess Spoil. The professional engineer experienced in the design of earth and rock fills will certify the design according to R645-301-535.100.*

A professional engineer experienced in the design of earth and rock fills with assistance from a geotechnical expert has certified the design according to R645-301-535.100. These certifications can be viewed on Drawings 5-35, 5-36 and 5-17 through 5-19.

- *R645-301-512.220: Durable Rock Fills*

No durable rock fills are planned.

- *R645-301-514.100: Excess Spoil. The professional engineer or specialist will be experienced in the construction of earth and rock fills and will periodically inspect the fill during construction. Regular inspections will also be conducted during placement and compaction of fill materials.*

A professional engineer or specialist that is experienced in the construction of earth and rock fills will inspect the fill during construction and regular inspections will also be conducted during placement and compaction of fill materials.

- *R645-301-528.310: Excess spoil will be placed in designated disposal areas within the permit areas within the permit area, in a controllable manner to ensure mass stability and prevent mass movement during and after construction. Excess spoil will meet the design criteria of R645-301-535. For the purposes of SURFACE COAL MINING AND RECLAMATION ACTIVITIES, the permit application must include a description of the proposed disposal site and the design of the spoil disposal structures according to R645-301-211, R645-301-212, R645-301-412.300, R645-301-512.210, R645-528.310, R645-301-535.100 through R645-301-535.130, R645-301-535.300 through R645-301-535.500, R645-536.300, R645-301-542.720, R645-301-553.240, R645-301-745.100, R645-301-745.100, R645-301-745.300, and R645-301-745.400.*

Excess spoil will be placed in the area designated on Drawing 5-3 and 5-35. This fill will be placed in lifts not to exceed 4 feet. The material will be transported from the overburden removal area to the fill by end dump haul trucks and a dozer(s) will spread the spoil to this lift thickness. The fill will meet at minimum

85% compaction as related to the standard Procter. Final slopes will be regraded to a maximum slope of 3h:1v. The top of the fill will sloped to approximately 2% to prevent pooling of water and to reestablish drainage similar to the original flow patterns. The excess spoil placed on the non-mined areas is approximately 32 acres and varies in height from 35 to 110 feet. The area of excess fill over mined out areas (variance from approximate original contour) is an extension of the fill placed on the non-mined area and is approximately 55 acres. Combined acreage of the excess fill placed on mined and non-mined areas is 87 acres and varies in height from 60 to 100 feet above original contour. Total excess fill is 8.6 million yards. Design of this fill can be viewed in Drawings 5-35 through 5-36 and the geotechnical study can be viewed in Appendix 5-1.

- *R645-301-535.100 through R645-301-130: Disposal of Excess Spoil*

A geotechnical analysis of the excess spoil structure design has been completed by an expert in this field. The long term static safety factor for this structure design is estimated at 1.6 to 1.7. Lifts will be placed in thicknesses not to exceed 4 feet. The lifts will meet 85% compaction by the standard Procter. The fill will be graded to allow for drainage similar to original patterns and to prevent excessive infiltration of water. Fill will be covered with subsoil and topsoil as specified in Chapter 2 to provide conditions suitable for revegetation of the area. The geotechnical study can be viewed in Appendix A5-1.

- *R645-301-535.300 through R645-301-535.500: Disposal of Excess - Spoil Durable Rock Fills.*

Not Applicable

- *R645-301-536.300: Disposal of Coal Mine Waste in Excess Spoil*

No coal mine waste is planned in the excess spoil area.

- *R645-301-542.720: Excess spoil will be placed in designated disposal areas within the permit area, in a controlled manner to ensure that the final fill is suitable for reclamation and revegetation compatible with the natural surroundings and the approved postmining land use. Excess spoil that is combustible will be adequately covered with noncombustible material to prevent sustained combustion. The reclamation of excess spoil will comply with the design criteria under R645-301-553.240.*

The excess spoil as shown in Drawing 5-35 and 5-36 will be suitable to the surrounding area and for the postmining land use of primarily grazing. No combustible excess spoil will be placed in the proposed structure. The reclamation of the spoil does not include any terraces and the slopes will not exceed 3h:1v.

- *R645-301-553.240: The final fill configuration of the fill (excess spoil) will be suitable for the approved postmining land use. Terraces may be constructed on the outslope of the fill if required for stability, control of erosion, to conserve soil moisture, or to facilitate the approved postmining land use. The grade of the outslope between terrace benches will not be steeper than 2h:1v (50 percent).*

The excess spoil as shown in Drawings 5-35 and 5-36 will be suitable to the surrounding area and for the postmining land use of primarily grazing. The reclamation of the spoil does not include any terraces and the slopes will not exceed 3h:1v. This slope angle has been utilized at similar mining operations and found to be suitable for erosion control and revegetation of reclaim slopes. The long term static safety factor for these slopes is estimated to be 1.6 to 1.7.

- *R645-301-745.100: General Requirements.*

*745.110: Excess Spoil will be placed in designated disposal areas within the permit area, in a controlled manner to:*

*745.111: Minimize the adverse effects of leaching and surface water runoff from the fill on surface and underground water;*

Reclamation of the excess spoil will include a topsoil cover and subsoil layer. Infiltration through the reclamation is expected to be minimal based on the high clay content of these soils. In addition, laboratory data for the overburden shows that there is minimal potential for leaching of pollutants should infiltration rates become higher than expected.

The foundation of the excess spoil area also has high clay content with minimal potential for infiltration. This will provide an additional, natural barrier to protect ground water present beneath the proposed structure.

*745.112: Ensure permanent impoundments are not located on the completed fill. Small depressions may be allowed by the Division if they are needed to retain moisture or minimize erosion, create and enhance wildlife habitat or assist revegetation, and if they are not incompatible with the stability of the fill; and*

Permanent impoundments are not planned on the excess spoil area. Small depressions are also not planned in the excess spoil and are not viewed as a necessary enhancement to final reclamation based on average annual moisture data and the proposed slope configuration of the pile.

*745.113: Adequately cover or treat the excess spoil that is acid- and toxic forming with nonacid nontoxic material to control the impact on the surface and ground water in accordance with R645-301-731.300 and to minimize adverse effects on plant growth and approved postmining land use.*

Laboratory data representative of the overburden planned for disposal in the excess spoil area does not show acid- and toxic forming characteristics.

*745.120: Drainage Control. If the disposal area contains springs, natural or manmade water courses, or wet weather seeps, the fill design will include diversions and underdrains as necessary to control erosion, prevent water infiltration into the fill and ensure stability.*

A spring and seep survey available in Chapter 7 has identified no springs or wet weather seeps in the proposed excess spoil area. The final surface will be appropriately regraded to a contour that will route natural water from snowmelt and rainfall around the excess spoil as shown on the final contours Drawing 5-35. There are no manmade water courses present in the excess spoil area. No underdrains are planned for the excess spoil structure.

*745.121: Diversions will comply with the requirements of R645-301-742.300*

No diversions are planned in the excess spoil area.

*745.122 : Underdrains*

No underdrains are planned in the excess spoil area.

*745.300: Durable Rock Fills*

No Durable Rock fills are planned.

*745.400: Preexisting Benches*

The MRP does not contemplate disposal of excess spoil on preexisting benches.

Alton Coal Development, LLC will provide the Division, as part of the annual report for each calendar year, Drawing 5-38 or if the alternate highwall method is selected Drawing 538-A. The Drawing will provide an as-built of the reclamation sequence, depicting the acres of open pit and /or trench, the acres backfilled, the acres fully reclaimed (topsoiled and seeded) and revisions to the reclamation timetable. This information will be submitted by March 28th of each calendar year with the appropriate C1/C2.

#### 560. Performance Standards

Coal mining and reclamation operations will be conducted in accordance with the approved permit and requirements of R645-301-510 through R645-301-553.



# Appendix 5-9

Norwest Corporation Underground  
Letter Report.

## Pillar Sizing ROW 7-Entry

**John C. Lewis**  
Manager, Underground Mining

March 19, 2013

File No. 593-2

Mr. Larry W. Johnson  
Manager  
Alton Coal Development, LLC  
463 North 200 West  
Cedar City, Utah 84721

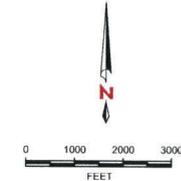
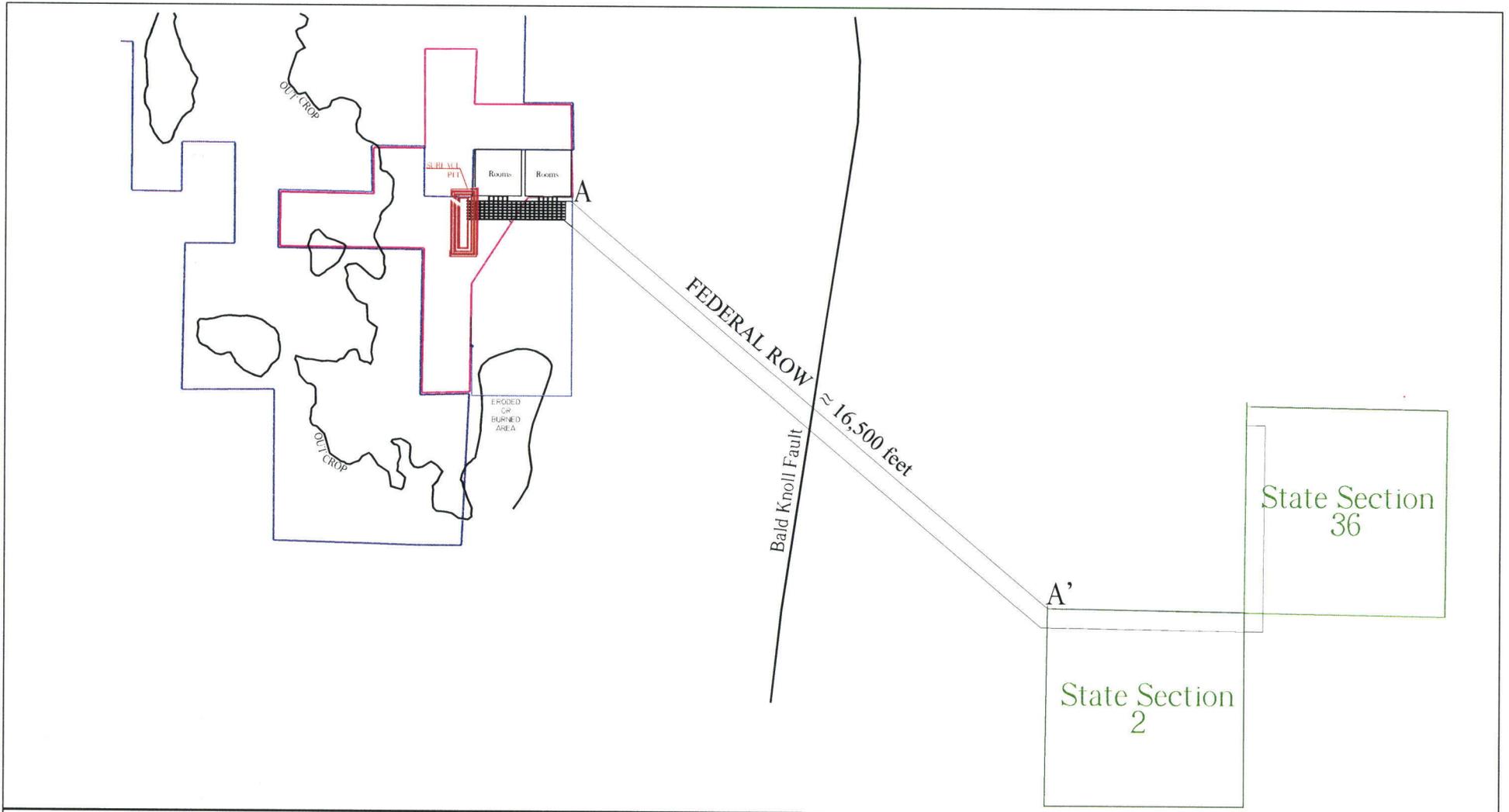
**Subject: Pillar Dimensions for Federal ROW**

Dear Mr. Johnson:

This letter addresses your inquiry regarding recommended conceptual pillar designs for underground mining areas of the Coal Hollow Project along the proposed Federal Right-of-Way (ROW) as illustrated in Figure 1. Norwest has utilized overburden depth information along the proposed Federal ROW provided by Alton Coal Development (Alton) to develop conceptual pillar designs. The discussions and recommendations below are not based upon site-specific geological/geotechnical information and/or conditions.

**PILLAR  
STABILITY**

Pillar stability design was conducted using an industry standard program developed by the National Institute for Occupational Safety and Health (NIOSH) in the United States. The stability program Analysis of Retreat Mining Pillar Stability (ARMPS) version 6.2.01 calculates stability factors based on estimates of the loads applied to, and the load bearing capacities of, pillars during the development and retreat mining operations. The ARMPS method has been verified through back analysis of pillar recovery case histories. To date, more than 600 case histories have been obtained from 10 states. These case histories cover an extensive range of geologic conditions, roof rock cavability characteristics, extraction methods, depths of cover, and pillar geometries. ARMPS is used as a basis for initial feasibility reviews where no previous mining history is available. This analysis program is a single seam analysis package and helpful in determining pillar size requirements based on depth, mining height, mine opening dimensions, pillar width, and pillar length.



**FIGURE 1**  
**COAL HOLLOW PROJECT**  
**FEDERAL ROW OVERVIEW**  
**WITH CROSSSECTION A - A' LOCATION**

DATE: 03/18/2013 SCALE: **NORWEST**  
 FILE: 593-2\ROW 1:1500 CORPORATION

The lack of coal strength testing results does not prevent single seam pillar size evaluation. U.S. researchers have found that Uniaxial Compressive Strength (UCS) of coal specimens was of no value in predicting the strength of coal pillars as laboratory tests do not measure the geologic features (like bedding planes and rock partings). The ARMPS program uses a default coal strength of 900 psi determined from historical analysis throughout U.S. coal mines.

In the case of the proposed Federal ROW, where subsidence is not permitted, Norwest has indicated pillar designs which make the possibility of collapse extremely unlikely. This is accomplished by maintaining pillar stability at 2.0 or greater, an aerial extraction of 50% or less, and a pillar w/h ratio in excess of 4.0.

**SURFACE  
TOPOGRAPHY AND  
OVERBURDEN DEPTH**

Norwest has reviewed the cross section along the approximate 16,500 ft Federal ROW provided by Alton and divided it into four distinct areas based upon overburden depth as illustrated in Figure 2. Areas #1 through #4, represent areas for which Norwest has indicated specific pillar design widths for long-term stability.

**ASSUMPTIONS  
& ANALYSES**

Alton has initially indicated that a 7-entry configuration is required to meet ventilation requirements for the mining planned on the State Sections. Alton has also indicated that a 3-entry rock slope will be required across the Bald Knoll Fault which is estimated to possess a 200ft. vertical displacement. Norwest has not conducted stability analyses for the Bald Knoll Fault crossing, however since rock is typically much stronger than coal, pillar stability for the 3-entry rock slope is not expected to present stability issues that cannot be managed.

Alton has indicated that the maximum mining height and width for all coal development will be limited to 12ft and 20ft, respectively. Norwest has utilized a maximum mining height of 12ft, a maximum mining width of 20ft, an average coal pillar strength of 900 psi., and a crosscut angle of 90 degrees for all ARMPS calculations. All area extraction percentages were calculated using Carlson Software™ Underground Mining Module's "Advanced Projections" capability.

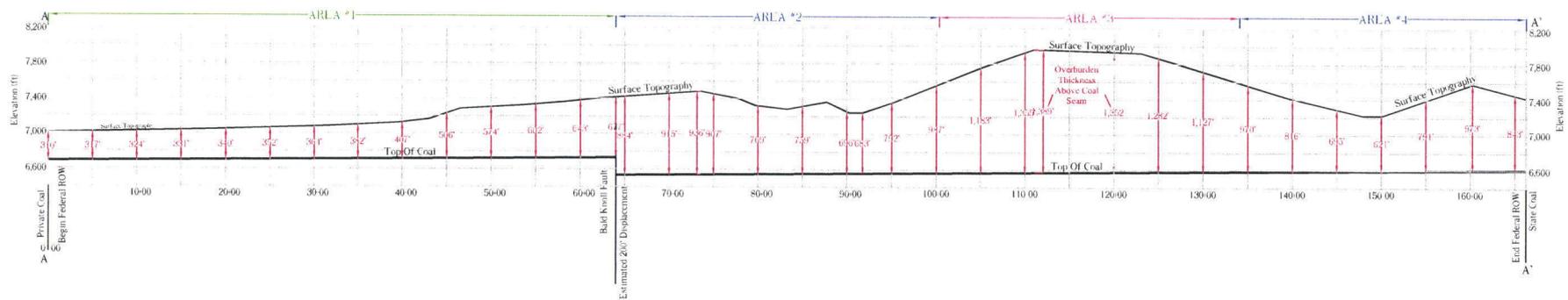


FIGURE 2

COAL HOLLOW PROJECT  
 FEDERAL ROW  
 CROSS SECTION A - A'

DATE: 03/18/2013  
 FILE: 593-2\ROW

SCALE:  
 1:1200



**7-Entry Configuration Area #1**

Area #1 ranges in overburden depth from 310ft to 677ft. In order to assure that the risk of subsidence in Area #1 is remote, Norwest has selected pillar dimensions which result in less than 50% extraction by area. Norwest has selected a minimum pillar dimension of 60ft x 60ft (80ft x 80ft c-c) which results in 47.1% area extraction. Table 1 shows ARMPS Stability Factors (SF) for selected overburden depths and pillar configurations for Area #1.

**Table 1 Area #1 7-Entry ARMPS SF for Selected Overburden Depths and Pillar Configurations**

Overburden Depth (ft)	Entry Width (ft)	Mining Height (ft)	Entry Centers (ft)	Crosscut Centers (ft)	Stability Factor	Area Extraction %
310	20	12	80*	80	3.54	47.1%
400	20	12	80*	80	2.74	47.1%
550	20	12	80*	80	2.00	47.1%
600	20	12	80*	83	2.00	45.4%
700	20	12	80*	96	2.00	43.0%
700	20	12	85	91	2.00	42.6%
700	20	12	90	90	2.04	41.7%

\*Norwest recommended entry centers.

It is noted, from Table 1, that as the overburden depth reaches 550ft, the crosscut spacing must be increased beyond 80ft centers to maintain a SF above 2.0, such that at a depth of 700ft, a 96ft crosscut center spacing is required. From Table 1 it can be concluded that a 60ft pillar width is adequate for Area #1 and that by increasing the crosscut spacing beyond 80ft centers, pillar SFs above 2.0 can readily be achieved. Increasing pillar widths beyond 60ft (80ft centers) allows for pillars that are more square than rectangular at depths above 550ft and may be selected to accommodate operational preferences.

**7-Entry Configuration Area #2**

Area #2 ranges in overburden depth from 683ft to 1,000ft and would begin at the bottom of the proposed 3-entry rock slopes across the Bald Knoll Fault. Table 2 shows ARMPS SFs at selected overburden depths and pillar configurations for Area #2.

**Table 2 Area #2 7-Entry ARMPS SF for Selected Overburden Depth and Pillar Configurations**

Overburden Depth (ft)	Entry Width (ft)	Mining Height (ft)	Entry Centers (ft)	Crosscut Centers (ft)	Stability Factor	Area Extraction %
1,000	20	12	80	170	2.00	36.5%
1,000	20	12	85	147	2.00	36.4%
1,000	20	12	90	133	2.00	36.3%
1,000	20	12	95	121	2.00	36.3%
700	20	12	100*	100	2.32	38.1%
800	20	12	100*	100	2.11	38.1%
875	20	12	100*	100	2.00	38.1%
900	20	12	100*	104	2.00	37.5%
1,000	20	12	100*	116	2.00	35.9%
1,000	20	12	105	111	2.00	35.7%
1,000	20	12	110	110	2.03	35.0%
1,000	20	12	115	115	2.12	33.7%

\*Norwest recommended entry centers.

From Table 2, it can be observed that several pillar widths may be selected that provide adequate pillar stability. Norwest recommends a pillar width of 80ft (100ft centers) for Area #2 that will allow flexibility to develop square or near square pillars in lieu of pillar widths which require larger crosscut distances (rectangular pillars). The actual pillar width to be developed is a decision which must be made by Alton to accommodate operational constraints, however a SF factor of 2.0 or greater should be maintained for any row of pillars developed. An 80ft x 80ft (100ft x 100ft c-c) has a SF of 2.32 at an overburden depth of 700ft, but as the overburden depth increases to 875ft, the dimension of the pillar must be increased to maintain a SF of 2.0 or greater.

**7-Entry Configuration Area #3**

Area #3 ranges in overburden depth from 1,000ft to 1,389ft. Table 3 shows ARMPS SFs for selected overburden depths pillar configurations for Area #3.

**Table 3 Area #3 7-entry ARMPS SF for Selected Overburden Depth and Pillar Configurations**

Overburden Depth (ft)	Entry Width (ft)	Mining Height (ft)	Entry Centers (ft)	Crosscut Centers (ft)	Stability Factor	Area Extraction %
1,400	20	12	100	198	2.00	30.4%
1,400	20	12	105	180	2.00	30.1%
1,400	20	12	110	165	2.00	30.2%
1,400	20	12	115	153	2.00	30.2%
1,000	20	12	120*	120	2.22	32.4%
1,100	20	12	120*	120	2.09	32.4%
1,175	20	12	120*	120	2.00	32.4%
1,200	20	12	120*	124	2.00	32.0%
1,300	20	12	120*	133	2.00	31.1%
1,400	20	12	120*	145	2.00	30.1%

\*Norwest recommended entry centers.

From Table 3, it can be observed that several pillar widths could provide adequate pillar stability. Norwest recommends a pillar width of 100ft (120ft centers) for Area #3 that will allow flexibility to develop square or near square pillars in lieu of pillar widths which require larger crosscut distances (rectangular pillars), while maintaining a pillar width that is still operationally manageable. The actual pillar width to be developed is a decision which must be made by Alton to accommodate operational constraints, however a SF factor of 2.0 or greater should be maintained for any row of pillars developed.

**7-Entry Configuration Area #4**

Area #4 ranges in overburden depth from 621ft to 1,000ft. Norwest recommends a pillar width of 80ft (100ft centers) for Area #4 as the overburden depth range is similar to that of Area #2. Crosscut distances of 100ft or greater are indicated as applicable to the overburden depth as it changes to maintain a SF of 2.0 or greater.

**ARMPS GRAPHS**

Norwest has prepared several ARMPS output graphs (attached) for informational purposes that illustrate how pillar SF varies with overburden depth and crosscuts spacing. Graphs #1 - #3 illustrate how pillar stability varies with crosscut spacing at a mining height of 12ft for selected pillar widths, and maximum overburden depths for Areas #1 - #4 of Figure 2. Graphs #4 - #6 illustrate how pillar stability varies with overburden depth and mining height for selected pillar sizes for Areas #1 - #4 of Figure 2.

Sincerely,

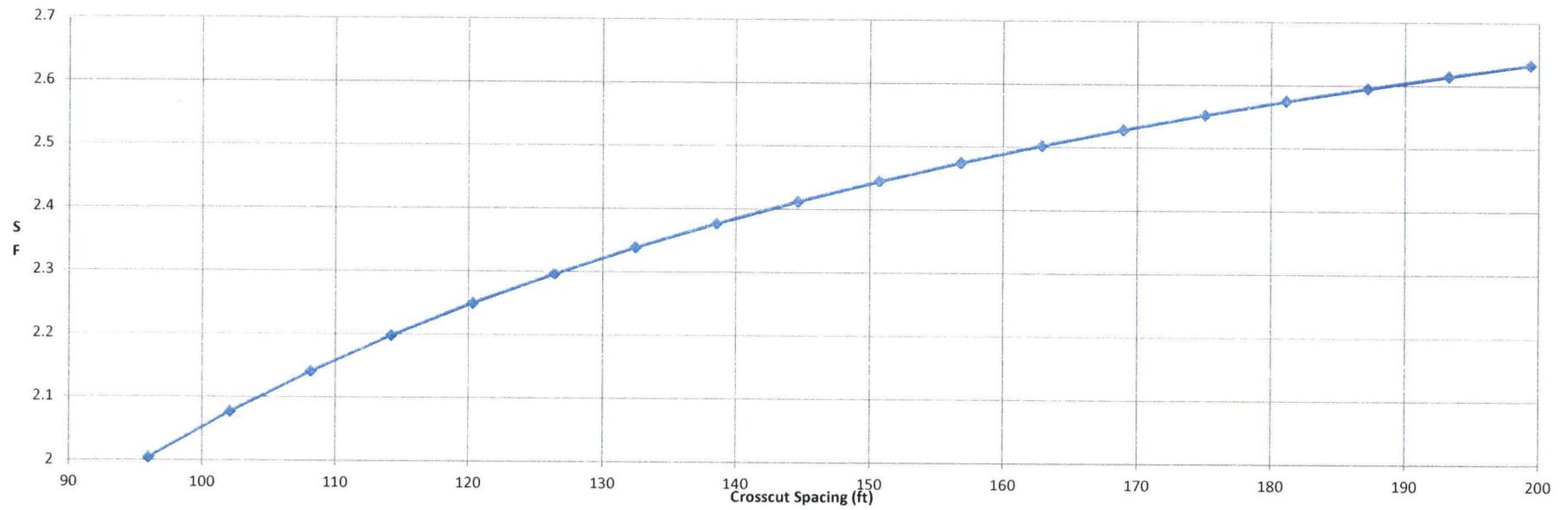
**NORWEST CORPORATION**

A handwritten signature in blue ink that reads "John C. Lewis". The signature is written in a cursive style with a long horizontal stroke at the end.

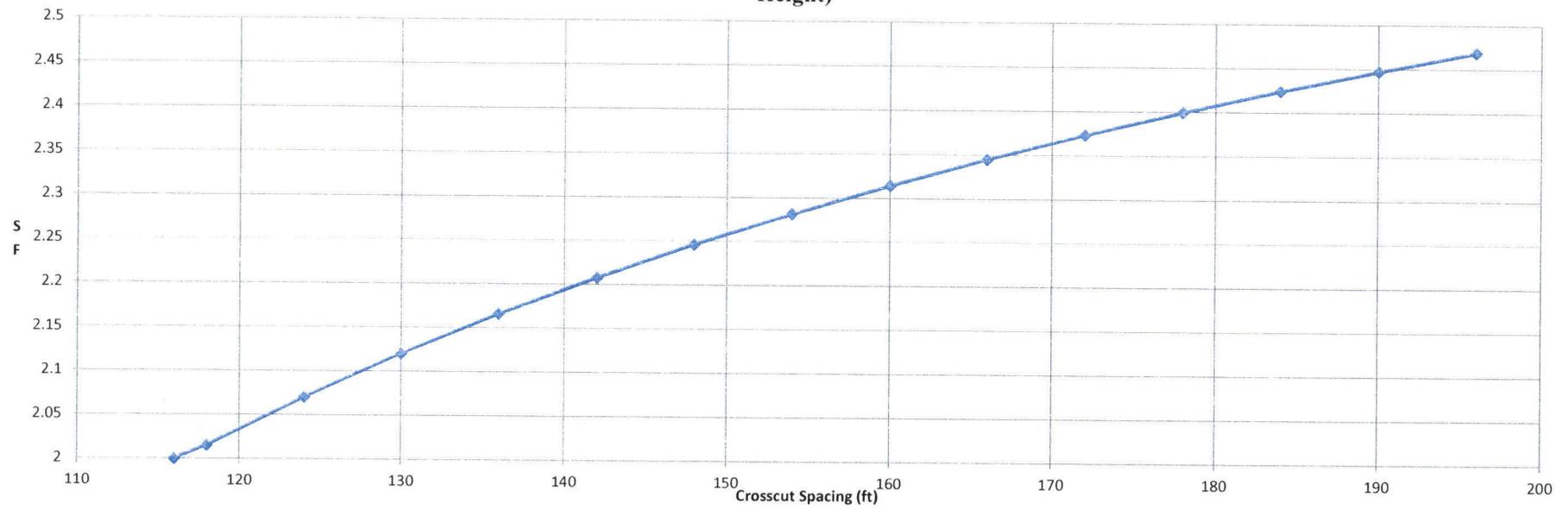
John C. Lewis, P.E.

Attachments

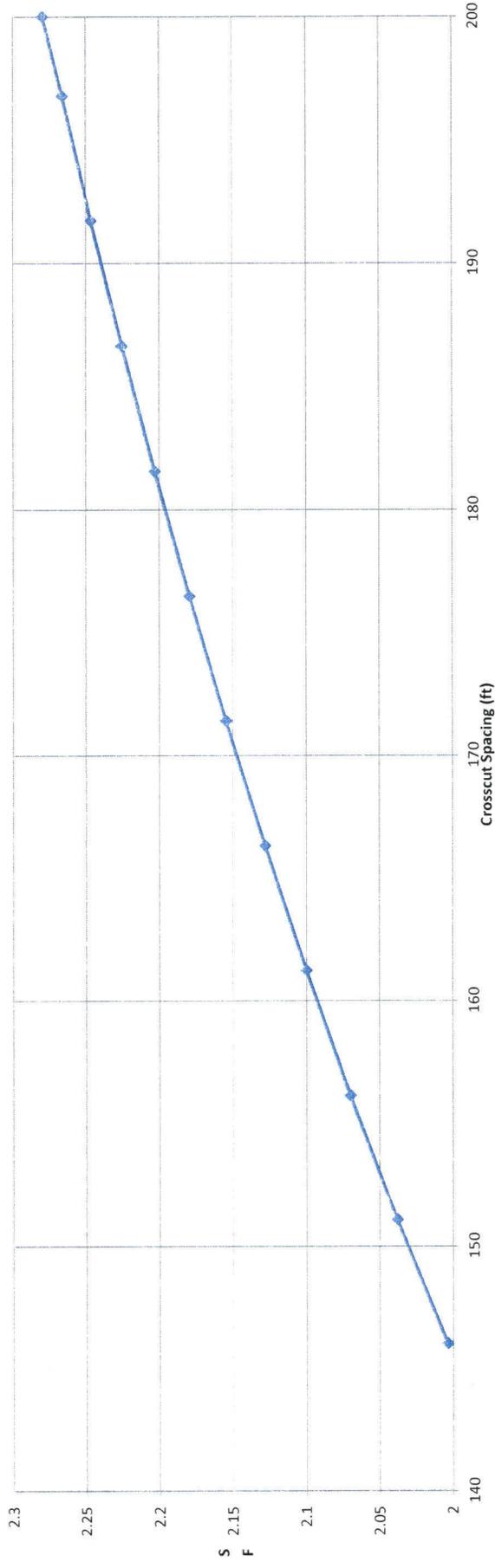
**Graph # 1 Area #1: 7- Entry 1SF vs. XC Spacing for 80 ft. c-c Pillar Width @ 700 ft. Overburden Depth (12 ft. Mining Height)**



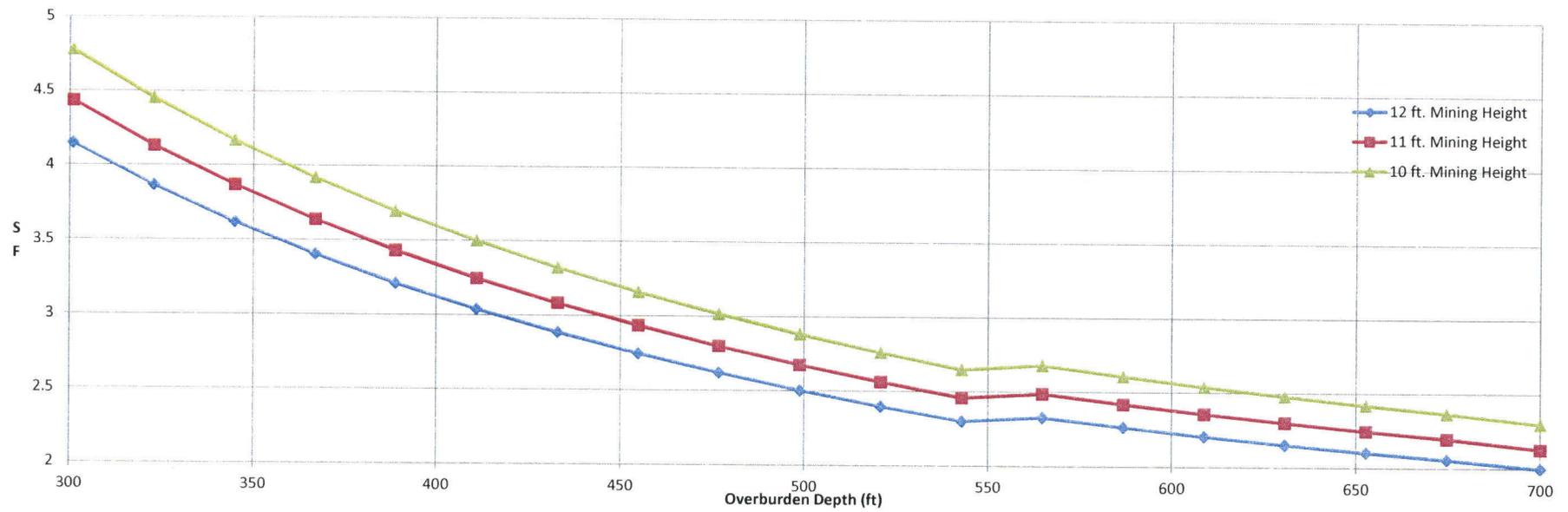
**Graph # 2 Areas #2 & #4: 7- Entry SF vs. XC Spacing for 100 ft. c-c Pillar Width @ 1,000 ft. Overburden Depth (12 ft. Mining Height)**



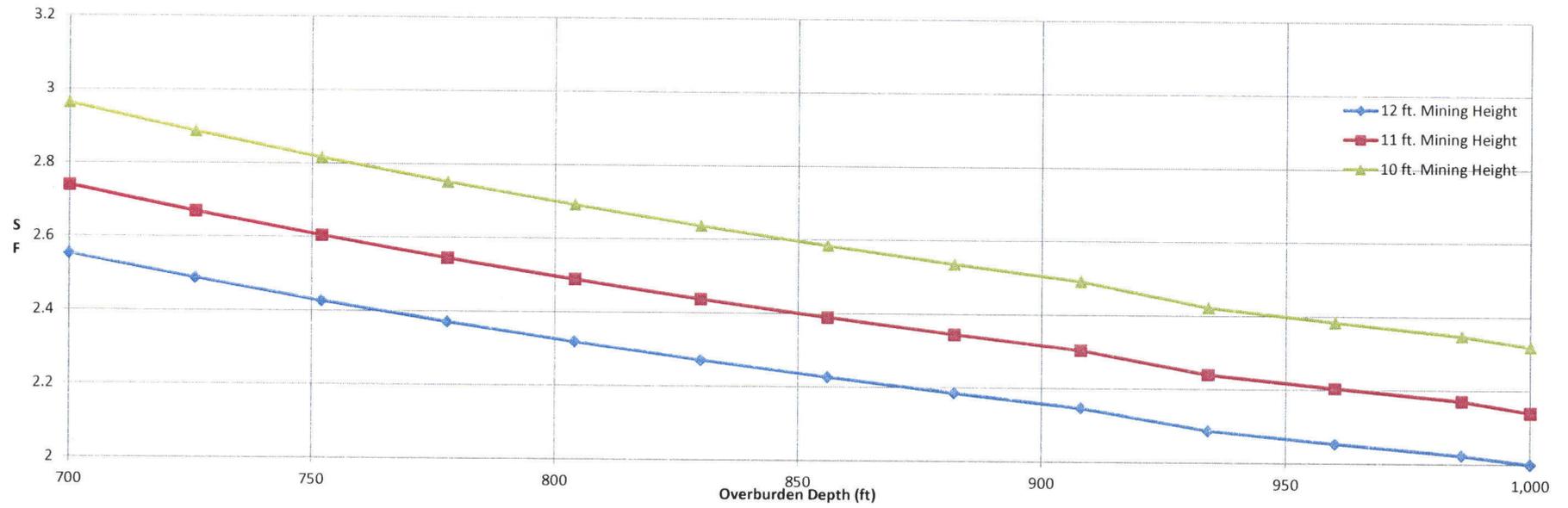
Graph # 3 Area #3: 7- Entry SF vs. XC Spacing for 120 ft. c-c Pillar Width @ 1,400 ft. Overburden Depth (12 ft. Mining Height)



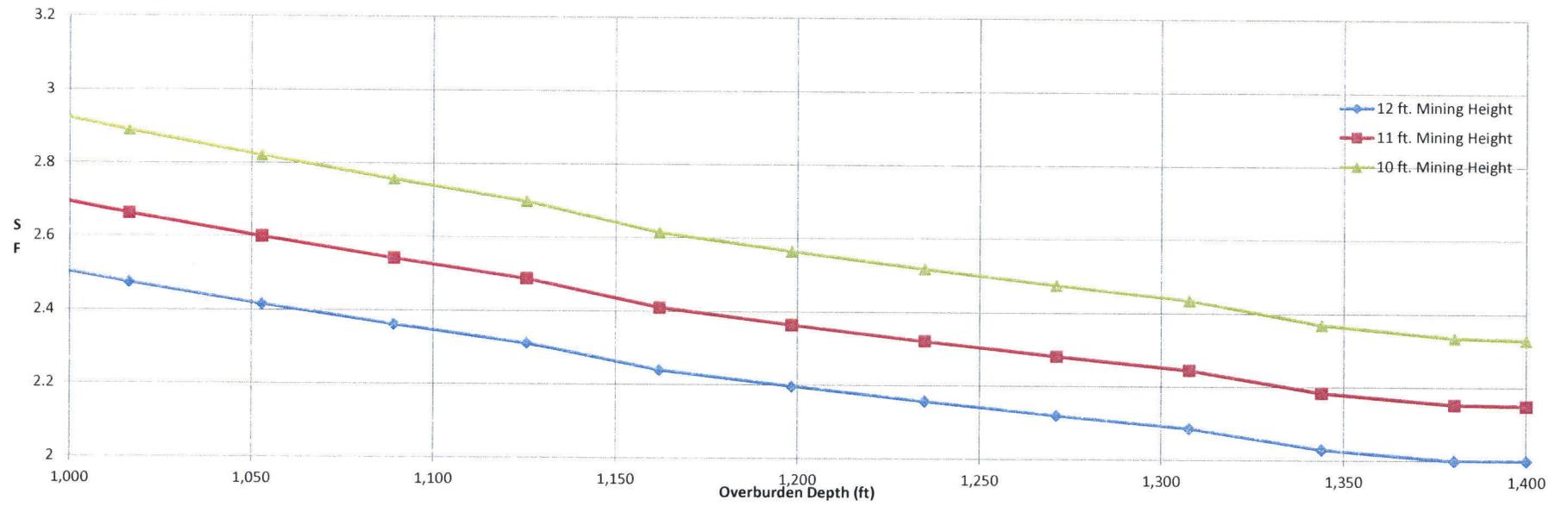
**Graph # 4 Area #1: 7- Entry Overburden Depth vs. 80 ft. x 96 ft. c-c Pillar SF**



Graph # 5 Areas #2 & #4: 7- Entry Overburden Depth vs. 100 ft. x 116 ft. c-c Pillar SF



Graph # 6 Area #3: 7- Entry Overburden Depth vs. 120 ft. x 145 ft. c-c Pillar SF



the extraction to 50%. For a 5-entry configuration a square pillar of 55ft x 55ft (75ft x 75ft c-c) or a rectangular pillar of 48ft x 64ft (68ft x 84ft c-c) is required to reduce the extraction ratio to 50%. There are of course a number of rectangular pillar configurations for the 7-entry and 5-entry configurations that are capable of achieving a 50% extraction ratio.

**MINING WIDTH  
& HEIGHT  
SENSITIVITY**

Mining widths for entries and crosscuts should be maintained at less than 20ft to help maintain the integrity of the roof which in turn maintains pillar stability. Note that the ARMPs pillar stability factor for a 55ft x 55ft (75ft x 75ft c-c), entry pillar configuration at an overburden depth of 300ft falls from 3.28 to 2.97(a decrease of 9.5%) when the mining width is increased from 20ft to 22ft This increase in mining width also increases percentage extraction from 50% to 52.6%.

Mining heights should be maintained at a maximum of 12ft for a 48ft wide pillar in order to maintain the suggested w/h ratio of 4.0. A mining height of 14ft would indicate a pillar width of 56ft and given that the seam thickness is typically in the range of 14ft, it may be prudent to develop pillar widths of at least 55ft to insure that any failures of the planned roof coal over the long term does not result in pillar w/h ratios in excess of 4.0, which may eventually lead to pillar failure and subsequent surface subsidence at these shallow depths.

**MINIMUM  
OVERBURDEN  
DEPTH**

Norwest recommends that mining in areas less than 120ft (10 times the height of mining) of overburden thickness be avoided. Mining at such shallow depths increases the risks of subsidence due to void migration should failure of the mine openings (entry roof) occur, such failures could eventually result in "sink holes". This risk is compounded in areas of unconsolidated and/or weak overburden that are susceptible to flow in the presence of water.

Sincerely,

**NORWEST CORPORATION**



John C. Lewis, P.E.



(materials with elevated SAR ratios or other physical or chemical characteristics that could cause appreciable adverse impacts on vegetation).

Several investigations involving reclamation of surface disturbed areas in the vicinity have been performed by other entities. These included the use of test plots to measure reclamation feasibility and success. The results of these investigations have been presented in published documents (Ferguson and Frischknecht 1985; USDI 1975). These investigations have demonstrated the feasibility of successful reclamation in the area.

#### 623-300 Subsidence Control Plan

The underground mining has limited exaction with no subsidence. Refer to Appendix 5-9 (Norwest Report) for geotechnical and design information. Do to the design and mining method of underground mining in this plan, no subsidence is projected and no monitoring is planned.

### **624 GEOLOGIC DESCRIPTION**

#### 624.100 Regional and Structural Geology

The coal to be mined in the proposed Coal Hollow Mine permit area is of Cretaceous age and resides in the Alton Coal Field of southwestern Utah. The Alton Coal Field is a roughly horseshoe-shaped region that is situated between the Kaiparowits Coal Field to the east, and the Kolob Coal Field to the west.

The topography in the Alton Coal Field is marked by bench and slope topography. Topographic relief in the region is approximately 2,800 feet, with elevations ranging from about 9,300 feet on top of the Paunsaugunt Plateau, to about 6,500 feet in the valley bottoms. The economic coal seams are located primarily along the western and southern flanks of the Paunsaugunt Plateau.

The geologic history, geology, stratigraphy, and structure of the Alton Coal Field have been described by Doelling (1972) and Tilton (Appendix 6-3; 2001) and are summarized below. A map of geologic formations exposed at the surface in the proposed Coal Hollow Mine permit area is shown in Drawing 6-1. Cross-sections showing the regional geologic conditions in the Alton Coal Field are presented in Drawings 6-3 and 6-9.

#### *Stratigraphy*

Stratigraphic units present in the Alton Coal Field area are described in ascending order below. A stratigraphic column showing these geologic formations is shown in Drawing 6-3. A diagrammatic correlation of Cretaceous units in southern and south-central Utah is shown in Drawing 6-4.

Chemical analyses of the Smirl coal seam for acid- or toxic-forming materials including total sulfur and pyritic sulfur are presented in Appendix 6-1 (confidential binder).

624.300

Logs of drill holes are presented in Appendix 6-1. Chemical analysis of strata overlying and immediately below the coal seam are shown in Appendix 6-2. Chemical analysis of the coal seam for acid or toxic forming materials including total sulfur and pyritic sulfur are presented in Appendix 6-1 (confidential binder).

624.400

Physical properties of the stratum immediately above and below the coal seam are shown in Appendix 6-1 (confidential Binder).

## **627 OVERBURDEN THICKNESS AND LITHOLOGY**

The planned mining in the proposed Coal Hollow Mine permit area does include underground coal mining activities. Overburden thickness and lithology are shown in Appendix 6-1, and Drawing 5-15 and 6-3.

Overburden in planned mining areas in the proposed Coal Hollow Mine permit area consists of the following.

### Alluvium

Alluvial sediments are present at the surface in most areas proposed for mining. These sediments consist primarily of clays, silts, and fine-grained sands. The thickness of the alluvium in proposed mining areas ranges from a thin veneer to about 50 feet. The alluvial sediments in most areas are not well sorted and are derived largely from weathering of the Tropic Shale in adjacent upland areas.

### Tropic Shale

In all proposed mining areas, the lower portion of the Tropic Shale overlies the Dakota Formation Smirl coal zone to be mined. The thickness of the Tropic Shale overlying the coal seam in proposed mining areas ranges from a few feet up to about 200 feet. The lower Tropic Shale consists predominantly of soft shales, silty shales, and claystones, with occasional thin layers of siltstone and bentonite-like clay layers up to about 1 foot in thickness. Strong, competent rock strata were not encountered in exploration boreholes drilled during 2005 in the proposed Coal Hollow Mine permit area. Well logs graphically depicting this information are presented in Appendix 6-1. Cross-sections prepared from geologic logs of drillholes in the proposed permit and adjacent area are provided in Drawing 6-3. Additional geologic logs are presented in Appendix 5-1 and Appendix 7-4. Additional lithologic characterization is provided in Appendix 7-1.

## 630 OPERATION PLAN

### 631 PLAN FOR CASING AND SEALING EXPLORATION HOLES

Exploration holes and boreholes will be backfilled, plugged, cased, capped, sealed, or otherwise managed to prevent acid or toxic contamination of water resources and to minimize disturbance to the prevailing hydrologic balance. Exploration holes and boreholes will be managed to ensure the safety of people, livestock, fish and wildlife, and machinery.

If any exploration boreholes are to be used as monitoring wells or water wells, these will meet the provisions of R645-301-731

Wells constructed for monitoring groundwater conditions in the proposed Coal Hollow Mine permit and adjacent area, including exploration holes and boreholes used for water wells or monitoring wells, will be designed to prevent contamination of groundwater and surface-water resources and to protect the hydrologic balance. A diagram depicting typical monitoring well construction methods is shown in Drawing 7-11. Monitoring wells will include a protective hydraulic seal immediately above the screened interval, an annular seal plugging the borehole above the hydraulic seal to near the ground surface, and a concrete surface seal extending from the top of the hydraulic seal to the ground surface which is sloped away from the well casing to prevent the entrance of surface flows into the borehole area. Well casings will protrude above the ground surface a sufficient height so as to minimize the potential for the entrance of surface water or other material into the well. A steel surface protector with a locking cover will be installed at monitoring wells to prevent access by unauthorized personnel. Where there is potential for damage to monitoring wells, the wells will be protected through the use of barricades, fences, or other protective devices. These protective devices will be periodically inspected and maintained in good operating conditions. Monitoring wells will be locked in a closed position between uses.

When no longer needed for monitoring or other use approved by the Division upon a finding of no adverse environmental or health and safety effects, or unless approved for transfer as a water well under R645-301-731.100 through R645-301-731.522 and R645-301-731.800, each well will be capped, sealed, backfilled, or otherwise properly managed, as required by the Division in accordance with R645-301-529.400, R645-301-631.100, and R645-301-748. Permanent closure measures will be designed to prevent access to the mine workings by people, livestock, fish and wildlife, machinery and to keep acid or other toxic drainage from entering ground or surface waters.

Permanent closure and abandonment of water wells greater than 30 feet in depth will be in accordance with the requirements of “Administrative Rules for Water Well Drillers”, State of Utah, Division of Water Rights or other applicable state regulations. Abandonment of wells will be performed by a licensed water well driller. The wells to be abandoned will be completely filled using neat cement grout, sand cement grout, unhydrated bentonite, or bentonite grout, or other materials approved by the Utah State Engineer’s office. Alternatively, the well may be abandoned using a different procedure upon approval from the Utah State Engineer’s office.

Abandonment materials will be introduced at the bottom of the well or required sealing interval and placed progressively upward to the top of the well. The casing will be severed a minimum of 2 feet below the ground surface. A minimum of 2 feet of compacted native material will be placed above the abandoned well upon completion.

Within 30 days of the completion of well abandonment procedures, a report will be submitted to the State Engineer by the responsible licensed driller giving data related to the abandonment of the well. This shall include the name of the licensed driller or other person(s) performing abandonment procedures, name of well owner at the time of abandonment, the address or location of the well by section, township, and range, abandonment materials and equipment used, water right or file number covering the well, the final disposition of the well, and the date of completion.

Exploration holes and boreholes will be backfilled, plugged, cased, capped, sealed, or otherwise managed to prevent acid or toxic contamination of water resources and to minimize disturbance to the prevailing hydrologic balance. Exploration holes and boreholes will be managed to ensure the safety of people, livestock, fish and wildlife, and machinery.

If a water well is exposed by coal mining and reclamation operations, it will be permanently closed unless otherwise managed in a manner approved by the Division.

Boreholes will be backfilled to within 1 foot of the land surface with concrete or other materials approved by the Division as necessary to prevent contamination of groundwater or surface-water resources or to protect the prevailing hydrologic balance. The upper approximately 1 foot will be backfilled with native materials to facilitate reclamation (see Drawing 6-11). Exploration holes and boreholes that may be uncovered during mining and reclamation activities will be permanently closed unless approved for water monitoring or otherwise managed in a manner approved by the Division.

## **632 SUBSIDENCE MONITORING**

The underground mining has limited extraction with no subsidence. Refer to Appendix 5-9 (Norwest Report) for geotechnical and design information. Do to the design and mining method of underground mining in this plan, no subsidence is projected and no monitoring is planned.



permit (which is considered unlikely), Alton Coal Development, LLC may when necessary and with the approval of the Utah Division of Oil, Gas and Mining construct supplemental containment and settlement ponds in which mine discharge waters may be held for treatment (where necessary) and subsequent discharge through UPDES discharge points in compliance with the UPDES discharge permit.

Mining in the Coal Hollow project area will be a combination of surface mining, either open pit or highwall mining, and underground mining. Both the highwall mining and underground mining are designed such that subsidence is not expected to occur or have a negative impact on renewable resources lands.

724.700      Alluvial Valley Floor Determination

A field investigation has been performed in the proposed Coal Hollow Mine permit and adjacent area to provide to the Division the information required to make an evaluation regarding the existence of a probable alluvial valley floor in the proposed Coal Hollow Mine permit and adjacent area. The results of this field investigation and related information is provided in Appendix 7-1. Additional information regarding potential alluvial valley floors in the area is provided in Appendix 7-7.

A report detailing the findings of a previous field investigation performed by Water Engineering & Technology, Inc., entitled “Geomorphological and sedimentological characteristics of Sink Valley, Kane County, Utah” is included as Appendix 7-4.

**725      BASELINE CUMULATIVE IMPACT AREA INFORMATION**

Appendix 7-1 contains the results of a comprehensive investigation of groundwater and surface-water systems in the proposed Coal Hollow Mine permit and adjacent area (including the 85.88-acre Dame Lease IBC area). Appendix 7-1 also includes information regarding the probable hydrologic consequences of coal mining in the proposed Coal Hollow Mine permit area and recommendations for hydrologic monitoring. Appendix 7-1 also includes the results of a field investigation performed in the proposed Coal Hollow Mine permit and adjacent area to provide to the Division of Oil, Gas and Mining the information required to make an evaluation regarding the existence of a probable alluvial valley floor in the proposed Coal Hollow Mine permit and adjacent area. This information together with the information submitted herein can be used to assess the probable cumulative hydrologic impacts of coal mining and reclamation operations in the proposed Coal Hollow Mine permit and adjacent area (including the 85.88-acre Dame Lease IBC area) as required by R645-301-729.

R645-301-726      Modeling

No numerical models have been created for the permit area nor are any planned.

## 730 OPERATION PLAN

Coal mining in the proposed Coal Hollow Mine permit area will occur using surface and underground mining techniques. All coal mining and reclamation operations will be conducted to minimize disturbance to the hydrologic balance within the permit and adjacent areas, to prevent material damage to the hydrologic balance outside the permit area and support approved postmining land uses in accordance with the terms and conditions of the approved permit and the performance standards of R645-301 and R645-302. Operations will be conducted to assure the protection or replacement of water rights in accordance with the terms and conditions of the approved permit and the performance standards of R645-301 and R645-302.

In order to maximize the use and conservation of the coal resource, coal will be recovered using a combination of large hydraulic backhoes or front end loaders and off-road trucks, highwall mining and underground mining. Mined coal will be hauled to a central coal processing area for crushing and placement into a stockpile. Coal from the stockpile will be transferred into a bin and loaded into over the road trucks for transport.

The plan, with Drawings, cross sections, narrative, descriptions, and calculations indicates how the relevant requirements will be met. The lands subject to coal mining and reclamation operations over the estimated life of the operations are identified and briefly described. All appropriate information is located in the subsequent sections and Drawings 5-1 through 5-39 and Appendices A5-1 through A5-3.

## 731 GENERAL REQUIREMENTS

Operations will be conducted to assure protection or replacement of water rights in accordance with the terms and conditions of the approved permit and the performance standards of R645-301 and R645-302.

### Groundwater and Surface-Water Protection

To protect the hydrologic balance, coal mining and reclamation operations will be conducted to handle earth materials and runoff in a manner that minimizes acid, toxic, or other harmful infiltration to the groundwater system. Additionally, excavations, and disturbances will be managed to prevent or control discharges of pollutants to the groundwater.

Products including chemicals, fuels, and oils used in the mining process will be stored and used in a manner that minimizes the potential for these products entering groundwater systems. Concrete oil and fuel containments will be constructed as shown on Drawings 5-3 and 5-8.

mining promulgated by the U.S. Environmental Protection Agency set forth in 40 CFR part 434. Discharge of mine waters will be regulated by a Utah UPDES discharge permit.

Water pollution associated with mining and reclamation activities within the permit areas will be controlled by:

- Construction of berms and/or diversion ditches to control runoff from all facilities areas.
- Roads will be constructed with ditches to capture runoff
- Diversion ditches will be constructed as necessary around active mining and reclamation areas to capture runoff from those areas.
- Sedimentation impoundments will be constructed to control discharges
- In areas where impoundments or diversions are not suitable to the surrounding terrain, silt fence or straw bales will be utilized to control sediment discharge from the permit area.

In order to accomplish these objectives, watershed analysis of the permit and adjacent areas has been completed and specific designs are established for each water pollution control structure. Primary control structures include four sediment impoundments, four diversion ditches and miscellaneous berms. The locations of these structures can be viewed on Drawing 5-3. The detailed analysis for these structures and specific designs can be viewed on Drawings 5-25 through 5-34. In addition, a geotechnical analysis of the impoundments to ensure stability can be viewed in Appendix 5-1. The watershed and structure sizing analysis can be viewed in Appendix 5-2. In addition to these primary structures, temporary diversions and impoundments may also be implemented, as necessary, in mining areas to further enhance pollution controls.

Sediment control measures will be located, maintained, constructed and reclaimed according to plans and designs given under R645-301-732, R645-301-742 and R645-301-760. Siltation structures and diversions will be located, maintained, constructed and reclaimed according to plans and designs given under R645-301-732, R645-301-742 and R645-301-763. Storm water and snow melt that occurs within the facilities area will be routed to an impoundment that will contain sediment. This impoundment will have a drop-pipe spillway installed that will allow removal of any oil sheens that may result from parking lots or maintenance activities by using absorbent materials to remove the sheen. Details for this impoundment can be viewed on Drawings 5-28.

There are five sediment impoundments proposed for the permit area. These structures will be constructed using a combination of dozers and backhoes. The structures have been designed to contain the required storm events as specified in Appendix 5-2. The structures will have sediment removed as necessary to ensure the required capacities. Details for these structures can be viewed on Drawings 5-25, 5-26 and 5-28 through 5-32. Calculations and supporting text can be viewed in Appendix 5-2.

## 732 Sediment Control Measures

Sediment control measures have been designed, constructed and maintained to prevent additional contributions of sediment to streamflow or to runoff outside the permit area.

### 732.100 Siltation Structures

Siltation structures within the permit area are described in Section 732.200

### 732.200 Sedimentation Ponds

Four diversion ditches along with five sediment impoundments are proposed for the permit area. In addition, miscellaneous controls such as silt fence and berms are also proposed for specific areas. The proposed locations for these structures are shown on Drawing 5-3. Details associated with these structures can be viewed on Drawings 5-25 through 5-34 and Appendix 5-2.

Sedimentation ponds have been designed in compliance with the requirements of R645-301-356.300, R645-301-356.400, R645-301-513.200, R645-301-742.200 through R645-301-742.240, and R645-301-763.

No sedimentation ponds or earthen structures that will remain open are planned.

The sedimentation plan has been designed to comply with the MSHA requirements given under R645-301-513.100 and R645-301-513.200.

### 732.300 Diversions

The runoff control plan is designed to isolate, to the maximum degree possible, runoff from disturbed areas from that of undisturbed areas. Where possible, this has been accomplished by allowing up-stream runoff to bypass the disturbed area, and routing any runoff from undisturbed areas that enter the disturbed area into a sediment control system.

Four diversion ditches along with five sediment impoundments are proposed for the permit area. In addition, miscellaneous controls such as silt fence, berms and temporary diversion ditches are also proposed for specific areas. The proposed locations for these structures are shown on Drawing 5-3. Details associated with these structures can be viewed on Drawings 5-25 through 5-34 and Appendix 5-2. All temporary ditches will meet the design requirements of Diversion Ditch 4 (designed for the 100-year, 24 hour storm) and will be adjusted within the permitted active mining area in relation to the active pit, current spoils pile configuration and reclamation.

The excess spoil is planned to be placed in an area where natural grades range from 0 to 5%. This is one of the most moderately sloping locations in the Permit Area. Stability of this structure is estimated to be 1.6 to 1.7 based on the Appendix 5-1.

Geotechnical borings were completed in the foundation of the proposed disposal area. Laboratory analysis of these borings has also been completed. Details of this analysis can be viewed in Appendix 5-1.

Permanent slopes for the proposed excess spoil will not exceed 3h:1v (33 percent), therefore no keyway cuts have been proposed in the design. Appendix 5-1 details the stability analysis for the proposed structure.

Excess spoil will not be disposed of in underground mine workings.

Horizontal lifts will not exceed four feet in thickness unless otherwise approved by the Division. The lifts will be concurrently compacted to meet 85% of the standard Procter. The geotechnical analysis (Appendix 5-1), provides information showing that these construction standards will provide mass stability and will prevent mass movement during and after construction. The excess spoil will be graded to provide drainage similar to original flow patterns. Topsoil and subsoil as designated in Chapter 2 will be removed and separated from other materials prior to placement of spoil.

A description of the character of the bedrock and any adverse geologic conditions in presented in Appendix 5-1.

Spring and seep survey information is provided on Drawing 7-1. There are no springs or seeps identified in the excess spoil area.

There are no historical underground mining operations in the proposed excess spoil area. There are future underground operations proposed.

There are no rock chimneys or drainage blankets proposed.

A stability analysis including strength parameters, pore pressures and long-term seepage conditions is presented together with all supporting data in Appendix 5-1.

Neither rock-toe buttresses nor key-way cuts are required under R645-301-535.112 or R645-301-535.113.

No valley fills or head-of-hollow fills are proposed.

No durable rock fills are proposed.

No disposal of waste on preexisting benches is planned

The diversions ditches will be utilized to direct runoff from disturbed areas to the sediment impoundments. The channel sizing for the four proposed diversion ditches has been evaluated using the TR-55 method to determine peak flows and the Manning's Equation (ME) to determine appropriate dimensions. The TR-55 method of analysis is the same method used to size impoundments and was utilized in this case to provide a peak flow for each diversion during a 100 year, 24 hour storm event. This peak flow was then input into the ME to determine an appropriate open channel design for minimizing the effects of erosion during peak flows. Similar to the impoundment sizing, the Carlson Software Hydrology module was utilized to perform these calculations. The ditch locations, designs and cross sections can be viewed on Drawings 5-33 and 5-34.

The following table summarizes the inputs and results for each diversion based on flows during a 100 year, 24 hour storm event:

Diversion Ditch Summary							
Ditch	*Base (ft)	Manning's n	Average Slope (%)	Peak Flow (cfs)	Flow Depth (ft)	Velocity (fps)	Freeboard (ft)
1	3.0	0.020	2.8	14.8	0.5	6.8	0.3
2	2.5	0.020	3.5	6.9	0.4	6.0	0.3
3	4.5	0.020	2.4	16.7	0.5	6.3	0.3
4	5.0	0.020	1.8	19.8	0.6	5.4	0.3

\*All side slopes are 2h:1v

The sedimentation plan has been designed to comply with the MSHA requirements given under R645-301-513.100 and R645-301-513.200.

These structures will retain sediment within the disturbed area. The diversion ditches are designed in manner that will minimize erosion of the channels and will divert runoff from disturbed areas to the impoundments. These sediment control measures are designed to meet the effluent limitations under R645-301-751.

742.126

Water encountered underground will be stored and treated as needed in underground sumps. It is anticipated most or all of such water would be utilized in the underground mining operation. Excess water would only be discharged after meeting applicable UPDES standards.

742.200            Siltation Structures

Siltation structures have been designed in compliance with the requirements of R645-301-742.

Miscellaneous controls such as silt fence and berms are proposed for specific areas. The proposed locations for these structures are shown on Drawing 5-26. Details associated with these structures can be viewed on Drawings 5-25 through 5-34 and Appendix 5-2.

742.210            General Requirements

Additional contributions of suspended solids and sediment to streamflow or runoff outside the permit area will be prevented to the extent possible using the best technology currently available. Siltation structures for an area will be constructed before beginning any coal mining and

reclamation operations in that area and, upon construction, will be certified by a qualified registered professional engineer to be constructed as designed and as approved in the reclamation plan. Any siltation structures which impounds water will be designed, constructed and maintained in accordance with R645-301-512.240, R645-301-514.300, R645-301-515.200, R645-301-533.100 through R645-301-533.600, R645-301-733.220 through R645-301-733.224, and R645-301-743.

The primary controls for limiting suspended solids and sediment to stream flow and runoff outside the permit area is sediment impoundments and diversions ditches. The proposed system described in section 742.110 is designed to control storm water/runoff discharges from the disturbed areas. Discharges from this system are expected to be minimal and infrequent. Discharges that may occur will comply with R645-301-751.

The impoundment and ditch system will be inspected regularly and discharges will be sampled for water quality purposes.

742.214

Water encountered underground will be stored and treated as needed in underground sumps. It is anticipated most or all of such water would be utilized in the underground mining operation. Excess water would only be discharged after meeting applicable UPDES standards.

742.220 Sedimentation Ponds.

742.221.1 The proposed sediment ponds are designed to be used individually

742.221.2 The locations for the sediment ponds were selected to be as near as possible to the disturbed areas and are not located in perennial streams

742.221.3 The ponds are designed and will be constructed and maintained to:

742.221.31 The ponds have been designed with excess capacity by at least 15% to allow for adequate sediment storage volume. The following table provides the design capacities in relation to a 24 hour duration, 100 year storm event:

<b>Sedimentation Impoundment Capacities</b>				
Structure	Storage Required (ac/ft)	Design Storage* (ac/ft)	Percent of requirement	Additional Storage (ac/ft)
1	2.6	3.1	119	0.5
2	1.7	2.3	135	0.6
3	6.3	10.9	173	4.6
4	2.1	5.5	261	3.4
1B	0.5	0.8	160	0.3

These sedimentation ponds will be surveyed at least annually to ensure that sufficient sediment storage is available in the impoundment. Sediment will be removed from the ponds as required based on results from the surveys. Calculations related to these design capacities can be viewed in Appendix 5-2. Stage-Storage curves for each pond can be viewed on Drawings 5-28 through 5-31.

Geotechnical borings were completed in the foundation of the proposed disposal area. Laboratory analysis of these borings has also been completed. Details of this analysis can be viewed in Appendix 5-1.

Permanent slopes for the proposed excess spoil will not exceed 3h:1v (33 percent), therefore no keyway cuts have been proposed in the design. Appendix 5-1 details the stability analysis for the proposed structure.

Excess spoil will not be disposed of in underground mine workings.

Horizontal lifts will not exceed four feet in thickness unless otherwise approved by the Division. The lifts will be concurrently compacted to meet 85% of the standard Procter. The geotechnical analysis (Appendix 5-1), provides information showing that these construction standards will provide mass stability and will prevent mass movement during and after construction. The excess spoil will be graded to provide drainage similar to original flow patterns. Topsoil and subsoil as designated in Chapter 2 will be removed and separated from other materials prior to placement of spoil.

A description of the character of the bedrock and any adverse geologic conditions in presented in Appendix 5-1.

Spring and seep survey information is provided on Drawing 7-1. There are no springs or seeps identified in the excess spoil area.

There are no historical underground mining operations in the proposed excess spoil area. There are future underground operations proposed.

There are no rock chimneys or drainage blankets proposed.

A stability analysis including strength parameters, pore pressures and long-term seepage conditions is presented together with all supporting data in Appendix 5-1.

Neither rock-toe buttresses nor key-way cuts are required under R645-301-535.112 or R645-301-535.113.

No valley fills or head-of-hollow fills are proposed.

No durable rock fills are proposed.

No disposal of waste on preexisting benches is planned

The excess spoil structure and fill above approximate original contour are the only alternative specifications proposed. A geotechnical analysis has been completed for this proposal and can be viewed in Appendix 5-1. All other mined areas will be restored to approximate original contour.

747. **DISPOSAL OF NONCOAL WASTE**

747.100

Noncoal mine waste, including but not limited to grease, lubricants, paints, flammable liquids, garbage, machinery, lumber and other non combustible materials generated during coal mining and reclamation operations will be temporarily placed in covered dumpsters. This waste will be regularly removed from the project area and disposed of at a state approved solid waste disposal site outside the project area.

747.200

Noncoal mine waste will be stored in a metal, covered dumpster which will prevent storm precipitation or runoff from coming in contact with the waste.

747.300

No noncoal mine waste will be disposed of within the permit area with the exception perforated piping used in the construction of Alluvial Ground Water Drains. This will be left in place as mining advances. This perforated piping will be covered in place approximately 20' to 30' below the final reclaimed surface. All other waste materials (ie. metal culvert) associated with the Alluvial Ground Water Drains will be removed and disposed of in a State-approved solid waste disposal site.

748. Casing and Sealing of Wells.

Wells constructed for monitoring groundwater conditions in the proposed Coal Hollow Mine permit and adjacent area, including exploration holes and boreholes used for water wells or monitoring wells, will be designed to prevent contamination of groundwater and surface-water resources and to protect the hydrologic balance. A diagram depicting typical monitoring well construction methods is shown in Drawing 7-11. Monitoring wells will include a protective hydraulic seal immediately above the screened interval, an annular seal plugging the borehole above the hydraulic seal to near the ground surface, and a concrete surface seal extending from the top of the hydraulic seal to the ground surface which is sloped away from the well casing to prevent the entrance of surface flows into the borehole area. Well casings will protrude above the ground surface a sufficient height so as to minimize the potential for the entrance of surface water or other material into the well. A steel surface protector with a locking cover will be installed at monitoring wells to prevent access by unauthorized personnel. Where there is potential for damage to monitoring wells, the wells will be protected through the use of barricades, fences, or other protective devices. These protective devices will be periodically inspected and maintained in good operating conditions. Monitoring wells will be locked in a closed position between uses.

When no longer needed for monitoring or other use approved by the Division upon a finding of no adverse environmental or health and safety effects, or unless approved for transfer as a water well under R645-301-731.100 through R645-301-731.522 and R645-301-731.800,



830.140 Detailed Estimated Costs

The bonding amount for final reclamation will depend upon the approved permit and reclamation plan (R645-301-830.120). The alternative highwall mining and underground mining will reduce surface disturbance. Mining disturbance to the surface will be reduced along with reclamation needs. Thus, estimates have been completed for the individual mining phases shown in Drawings 5-17, 5-18 and 5-19, the mining that will generate the largest disturbance and require the larger bond. These estimates are provided as Appendix 8-1. These cost calculations are based on the specific details shown on these drawings. As requested by the Division, a separate bond estimate is completed for all three phases shown in the drawings and in general, each stage is representative of the expected reclamation liability for Phase 1, 2 and 3, respectively. Based on the existing highwall mining and proposed underground mining, which reduce the disturbed area, the present posted bond is more than adequate. The bond estimate by Phase, escalated for the 2017 (anticipated end of mining) is the following:

Phase 1:	\$5,346,000
Phase 2:	\$9,888,000
Phase 3:	\$6,624,000

A summary and supporting calculations for these cost estimates is provided in Appendix 8-1.

840. GENERAL TERMS AND CONDITIONS OF THE BOND

General terms and conditions of the bond as stated at R645-301-840 through R645-301-840.520 will be met by Alton Coal Development, LLC

850. BOND REQUIREMENTS FOR UNDERGROUND COAL MINING

Not Applicable

860. FORM OF BOND

860.100 Surety Bond

The applicant will submit a surety bond as defined under R645-100-200 and meet all the requirements under R645-301-860.110 to .120.

870. REPLACEMENT OF BONDS

Equivalent bond coverage will be provided if Alton Coal Development, LLC replaces the surety bond.

880. REQUIREMENT TO RELEASE PERFORMANCE BONDS

Upon completion of reclamation operations, the applicant will apply for bond release and meet the requirements of R645-301-880.