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**State of Utah**  
DEPARTMENT OF NATURAL RESOURCES

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**Technical Analysis and Findings**  
**Utah Coal Regulatory Program**

**PID:** C0250005  
**TaskID:** 4444  
**Mine Name:** COAL HOLLOW  
**Title:** IBC & HIGHWALL MINING ALTERNATIVE

**General Contents**

**Violation Information**

*Analysis:*

Five violations (N.O.V.'s 10078, 10079, 10084, 10085, 10092 ) were issued in 2011 and were resolved through tasks 3772, 3773, 3820, 3826 and 3987, respectively. A violation issued June 19, 2013 ( N.O.V. 10123) was vacated and resolved through a Settlement Agreement dated 7/22/2013. There are no outstanding violations, however the information provided in Section 113 of the application is not current and requires updating.

*Deficiencies Details:*

R645-301-121.100, The information provided in Section 113 of the application is not current and requires updating in accordance with R645-301-113.100 and R645-301-113.300.

pburton

**Right of Entry**

*Analysis:*

A mineral lease agreement with Richard Dame, Trustee of the Alecia Swapp Dame Trust, dated 10/23/2013, provides right of entry. The lease is Exhibit 5 in Confidential Appendix 1-2. The name and address given for Richard Dame on p. 1-6 and 1-7 is not clear and should be corrected. The new lease should be included under Right of Entry in Section 114 of the MRP.

*Deficiencies Details:*

R645-301-121.200, 1) Please review the Permit Area Ownership table in Section 112.500 for accuracy, as the total coal acreage does not sum correctly across the row. 2) Please correct the surface & coal ownership citations for Richard Dame on p. 1-6 and 1-7 to include his last name and his complete zip code (89005).

R645-301-114, Please include the new Dame lease in the ROE list on p 1-9 under Section 114 in the application.

## Permit Term

### Analysis:

The Coal Hollow mine application was approved and a Decision Document was signed on October 19, 2009. The permit was issued on November 8, 2010. The mining plan sequence has been amended several times since. The last approval for a mining sequence change was in April 19, 2013 task 4323. This incidental boundary change (IBC) application continues the sequence of mining in the north/south direction as described in April 2013, but also adds auger mining to the east on 85.88 acres of fee coal being added to the eastern boundary of the permit area. The IBC application was received on November 1, 2013.

The information provided in Section 116 is not current and should be revised accordingly. Section 116 Permit Term of the MRP describes three phases of mining each with a one year term. New maps (Ex. 5-10A, Ex 5-38 and 5-38A) provided with the application extend the mining plan to 2017. It is not clear whether the three phases of mining described in Section 116 are equivalent to the three phases of mining (bonding) portrayed on Plates 5-17, 5-18 and 5-19 of the MRP and referred to in Section 830.140 of the application.

### Deficiencies Details:

R645-301-121.100 1) Section 116 Permit Term of the MRP describes three phases of mining each with a one year term. The information provided in Section 116 is not current and should be revised accordingly.

pburton

## Reclamation Plan

### General Requirements

#### Analysis:

The application does not include a description of or provide for the reclamation of the proposed "Highwall Mining" method.

#### Deficiencies Details:

The information in the application is not adequate to meet the requirements of this section of the regulations. Prior to approval the following information must be provided in accordance with R645-301-322, 323, 331, 333, 341, 342 ; The applicant needs to address these sections of the regulations.

jhelfric

## Mine Openings

### Analysis:

The Permittee has submitted a revised Chapter 5, page 5-48, section 529, Management of Mine Openings to address the highwall mining entries left as the extraction progresses along the highwall.

This backfilling of the trench to close off the extraction entries is necessary to keep water from entering or exiting the coal extraction areas, and is done as part of the operation plan rather than a reclamation plan.

Backfilling of the trench must be completed with an impervious, noncombustible material within 72 hours of completion of the extraction entries (See R645-302-245-210, 220, 221 and 222).

The revision on page 5-48 and its associated commitment meets the requirements of R645-302-245.210,220,221,222.

phess

## Revegetation Timing

### Analysis:

## Bonding and Insurance General

### Analysis:

The Permittee has posted a \$ 10,000,000 bond with the Division to ensure the 329 acres of surface disturbance which are relative to coal recovery by the surface mining method. Task ID # 4444 proposes to recover the coal beneath the exposed highwalls within the south end of the property by highwall mining methods, which recovers coal without requiring the massive amount of surface disturbance. The \$ 10,000,000 bond is more than adequate to reclaim any subsidence impacts created by highwall mining.

The Permittee maintains general liability insurance which has annual renewable coverage and meets the requirements of R645-301-890.

phess

## Bonding Form of Bond

### Analysis:

The bond posted by Alton Coal Development, LLC to ensure the reclamation of the Mine is a surety bond issued by the Lexon Insurance Company, which has an A.M. Best rating of B++. The Division has notified the Permittee that it must re-post the bond with an insurance company having an A.M. Best rating of "A-" or better. The 120 day grace period to address this requirement is February 1, 2014.

phess

## Bonding Determination of Amount

### Analysis:

The Permittee submitted a permit amendment application Task ID # 4323, Change in Mining Sequence to change the pit sequence / coal recovery timing which was approved on April 19, 2013. During the review of that submittal, new bond calculations were submitted and a new reclamation cost estimate for Phases 1 and 2 was calculated at \$ 10,554,521. The Permittee posted a \$ 10,000,000 bond, under the stipulation that the total amount of disturbance for Phase 2 be reduced by 18.26 acres. The Division has accepted this disturbed acreage reduction, until the additional \$ 555,000 is posted or the coal in the 18.26 acres is left in place.

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## Environmental Resource Information

### General

### Analysis:

Sink Valley Wash (runs north south on the east of the permit area). There area several springs and agricultural ponds on eastern boundary of the proposed permit area. The current and post mining land use is undeveloped rangeland (wildlife) and livestock pasture (grazing). Dame lands are actively flood irrigated or subirrigated. The information provided indicates a substantial area of subirrigated meadow and potentially irrigated pastureland within east of the Tropic Shale Ridge (in the permit area and IBC).

The information on groundwater depths is summarized in Figures 13 and 14 of App. 7-7. Depth to groundwater in wells in the IBC area is between 3.5 feet below the surface to -9 ft above the surface, above ground, indicating artesian flow (Fig. 13, App. 7-7). Immediately east of the IBC area, artesian water rises an average of -15 ft. (above ground). Minimal seasonal variation in wells within the permit area and in the artesian flow is presented in Fig. 14, App. 7-7.

pburton

## Permit Area

*Analysis:*

New maps (Ex. 5-10A, Ex 5-38 and 5-38A) provided with the application extend the mining plan to 2017. Three phases of mining are described under bonding Section 830.140 of the application and shown on Plates 5-17, 5-18 and 5-19 of the MRP. The bonded acreage information on Plates 5-17, 5-18, and 5-19 is not current and should be revised accordingly.

*Deficiencies Details:*

R645-301-121.100 The bonded acreage information and permit boundary shown on Plates 5-17, 5-18, and 5-19 is not current and should be revised accordingly.

pburton

## **Climatological Resource Information**

*Analysis:*

The MRP addresses climatic information and the change in drainage does not affect this information. However, climate is again addressed on page 3 of Appendix 7-14. The main factor of climate at the site is a total precipitation average of 16.4 inches. Temperatures average from 15.1 degrees Fahrenheit to 82.6 degrees Fahrenheit.

khoffman

## **Soils Resource Information**

*Analysis:*

Soils within the Incidental Boundary Change (Task 4444) were surveyed by Bob Long in 2007. Soil location SP 52 was classified as an Aquic Calcicustept. SP53 was classified as Aeric Epiaquept. SP 54 was classified as a Fluvaquentic Epiaquept. The important descriptors in all classifications are "Aqic", "Fluva" and "aquept" denoting a seasonal presence of water in the profile. i.e. subirrigation. The profile descriptions confirm gleying and color change at 24 inches in SP 52 near the quarter quarter section corner. At SP53, there is decomposing peat at a depth of 27 inches in the vicinity of a spring.

Section 411.140 states that the additional 85.88 acres of surface, Dame property will not be impacted by operations and will not be affected by mining. therefore, there will be no soil salvage from this area.

The prime farmland soil survey is required for all applications, please refer to the Prime Farmland requirements R645-302-313.

*Deficiencies Details:*

R645-301-222.100 Soil delineations on Soil Survey Dwg 2-1 must be extended into the IBC area.

pburton

## **Land Use Resource Information**

*Analysis:*

Grazing lands supported by numerous seeps and springs exist in the proposed IBC area as shown in Dwg 7-7 and described in Section 321.100. At the time of permit issuance, the Division estimated that there was 261 acres of meadow and pasture and that there was 69 subirrigated meadow acres .

Drawing 7-1 shows the total number of seeps and springs in the permit area available for grazing animals. Drawing 7-7 and Plate 5 show the ponds and ditches developed to support agriculture. Both Pugh and Dame own pastureland or subirrigated meadow lands within the permit area that have been leased to Alton Coal Development (Dwg. 3-1 and 7-7). These subirrigated lands are grazed to produce cattle, but are not cultivated to produce crops (Appendix 7-1, pg. 48). Pasture lands extend further south in Sink Valley, but these lands in Section 32 have not been mapped.

Pasture lands in the west and central portions of the permit area, dominated by introduced grass species, rely on precipitation and stored soil moisture for growth (average approximately 16 in/yr) and not on irrigation or subirrigation (App. 7-7, pg. 12; App. 7-1, pg. 48). On the east side of the permit area, Dame retains water for flood irrigation by the active water rights on Pond 29-3 and 29-5 (Dwg 7-7). Much of the Dame property is subirrigated and apparently needs no supplemental irrigation.

Most spring and surface-diversion rights in the W/2 of Sec. 29, E/2 of Sec 30, and W/2 of Sec. 32, T. 39 S., R. 5 W., along Sink Valley Wash around and downstream of the Swapp Ranch, either cover both stockwatering and irrigation or are for irrigation only. Ponds are used for stockwatering and irrigation systems (App. 7-7, pg. 14).

Within the permit area there is one spring (SP-7) with a domestic water right (Pugh, water right 85-215), located right along the fence between Pugh's and Dame's properties (Dwg. 7-3). Adjacent to the permit area, there are two springs (SP-3 and SP-10B) with a domestic water right: Sorensen, water right 85-373 and Johnson, water right 85-1011, respectively.

pburton

## Prime Farmland

### Analysis:

The Natural Resources Conservation Service evaluated the soils of the permit area for prime farmland status in the fall of 2006. The NRCS concluded that there were no prime farmland soils in the permit area, however soils on slopes less than 14 percent could qualify as Soils of Statewide Importance, if irrigated (Appendix 2-1, Tab 6 and M:0250005\2006\Incoming\0011.pdf).

The MRP indicates that the terrain is suitable for irrigation, but that irrigation is not required to produce meadowlands and pasture. When available, irrigation doubles yield. Water quality data indicate that there may be enough water to flood irrigate; that the quality of water from shallow alluvial groundwater is sufficient to raise alfalfa or other grasses for hay crops and pasture. Groundwater from the deeper portions of Sink Valley to the east in Section 32 are part of a larger, more continuous groundwater system" that is of better quality than the shallow groundwater (Pg. 7-8 Chapter 7.)

Prime Farmland rules have not been addressed for the IBC. Dame holds water rights from springs to irrigate 93 acres. Much of the Dame property is subirrigated and no supplemental irrigation system has been noted. Table 2, App. 7-7 indicates depth to ground water in soil pits was between one and six feet on the eastern side of the permit area allowing for sub-irrigation of Dame's meadows and pastures. Both subirrigated and flood irrigated areas are outlined on Plate 7-7.

Pond 29-3 on Richard Dame's property is fed by groundwater from an alluvial spring. Surface water collects downstream in pond 29-5, also on the Dame property (pg. 14, Sec. 4.2, App. 7-7). App. 7-7 Sec. 4.1 relates that ponds 29-1 and 29-2, as well as the ponds 29-6, 29-4, 29-7, 29-8, 29-9 [that function as a series of overflow ponds down the Sink Valley drainage] and pond 32-1 are all on Sorenson property.

A discussion of the infrared imagery taken in July 15, 2006 and November 15, 2007 is provided in Section 8.1 of the Peterson Report included as an Appendix to Chapter 7. The Division has compared the infrared imagery in Plates 3 and 4 and concludes that adequate soil moisture is present during the growing season to provide subirrigation for pasture in R. 5 W. T. 39 S. Sections 20 and 29. The growing season at this 6,900 ft. elevation averages 110 frost free days, with the last frost occurring on or about June 5 and the first frost occurring on or about September 24, according to Kevin Heaton, USU Extension Service (personal communication on 10/15/2009).

East of the permit area, the flows from Right Hand Wash, Swapp Canyon Creek, and Sink Valley Wash provide the Sorensens with the water rights to irrigate approximately 143 acres in the W ½ of Sections 29 and 32 and stockwater for 300 units. (App. 7-3, Water Rights). However, Ex. 4-1 no longer illustrates crop land. Exhibit 4-1 has been revised to show the new permit area. In so doing, former crop land has been changed to grazing land, consequently there is no acreage of crop land to be reported on the exhibit, however the heading for the missing table still remains and is confusing. Ex. 4.1 lacks a scale in the legend.

R645-302-313 specifies that the Division in consultation with the NRCS will determine the nature and extent of the reconnaissance inspection required for the IBC. Three soil survey locations were in the IBC area (SP 52, SP53, and SP54). The soil boundary delineations do not continue into the IBC area however. The Division will require that the soil survey delineations on DWG 2-1 extend into the IBC area. The Division will contact the NRCS for a prime farmland determination specific to the IBC area.

*Deficiencies Details:*

R645-302-113 and R645-301-411, Ex. 4-1 has been revised to show that land adjacent to the new lease has changed from crop land to grazing land, consequently there is no longer any acreage of crop land reported on the exhibit, however the heading for the missing table still remains and is confusing. Please verify the acreage of crop land under production and provide a supporting narrative as required by R645-301-411 and revise or remove the table on Ex. 4.1 accordingly. Ex. 4.1 lacks a scale in the legend.

pburton

## **Hydro Baseline Information**

*Analysis:*

The Dame lease is included within the existing MRP's baseline information. In addition, the Coal Hollow Mines operational monitoring locations include many of the sights within the Dame Lease area so a good foundation of data exists for the area.

khoffman

## **Hydro Baseline Cumulative Impact Area**

*Analysis:*

The Dame lease is within the original baseline cumulative impact area of the MRP.

khoffman

## **Hydro Probable Consequences Determination**

*Analysis:*

The amendment includes Appendix 7-14 PHC of Coal Mining in the 85.88-acre New Dame Lease IBC at the Alton Coal Development, LLC Coal Hollow Mine (Dame PHC). The Dame PHC describes the geology of the area, from top to bottom, as the Quaternary Deposits (alluvium), Tropic Shale, and Dakota Formation. The alluvium contains the groundwater of the area while the Tropic Shale acts as a confining layer. The Dakota Formation contains the economic coal seam.

The Dame PHC is important as the Dame Lease contains substantially different groundwater characteristics than the existing Coal Hollow Mine. The differentiating characteristic of the Dame Lease is the presence of artesian flow as described on page 7 of the Dame PHC:

"By this mechanism, artesian flow conditions are created in the deep, coarse-grained alluvial groundwater systems present in portions of Sink Valley. Artesian flow conditions are not present in regions further to the west where only thin, predominantly fine-grained alluvial deposits are present. Within those portions of Sink Valley where the deeper, coarse-grained sediments support artesian groundwater flow conditions, flowing artesian wells are present (including wells near the new Dame Lease IBC including Y-I02, Y-61, C5-130, and the Coal Hollow Mine water production well). Springs and seeps are also supported by discharge from the alluvial groundwater system (including monitored springs near the new Dame Lease IBC area including SP-8, SP-14, SP-I6, SP-I9, SP-20, SP-22, SP-23, and Sorensen Spring)"

This area is displayed on Figure 16 of Appendix 7-1 of the MRP. In addition, the Dame Lease has documented the flowing of groundwater (Drawing 7-13), and the presence of surface ponds and irrigation ditches (Drawing 7-7).

The Dame PHC determines "Appreciable adverse impacts to the hydrologic balance either on or off the permit area are not expected to occur as a result of the proposed highwall mining at the Coal Hollow Mine (including the 85.88 acre new Dame Lease IBC)." This determination is supported by evidence that surface disturbance is not anticipated and that subsidence will be prevented. In addition, the considerable thickness of low-permeability Tropic Shale bedrock could likely stop hydraulic communication with the permeable overlying alluvial groundwater system.

The Dame PHC does acknowledge that it is possible groundwater will enter the highwall mining holes. The Dame PHC describes that groundwater at Y-36 and Y-48 may be in hydraulic communication with overlying alluvial groundwater. It also describes that if highwall mining holes intersect an open borehole or improperly abandoned well there would be potential for flow from the overlying groundwater.

These potentials for groundwater impacts are described as by the PHC author as being temporary as any draining of groundwater would deplete the quantity of water present in the alluvial groundwater system. The Dame PHC also says impacts could be minimized by backfilling mining holes with low-permeability materials and avoiding mining where historic borehole locations are present. Last, highwall mining holes excavated within the new Dame Lease will slope downward so unless a large volume of water were intercepted (enough to fill the entire void of the highwall hole), then gravity mine water discharge would not occur.

The Dame PHC then discusses utilizing the monitoring data to detect or quantify potential mining-related impacts and it is necessary to evaluate all factors relevant to prevailing hydrologic conditions in particular climatic variability. In addition, other factors such as grazing practices, land use and range conditions should be evaluated.

The Dame PHC also examines impacts to surface water quality but because there will not be surface disturbances in the Dame Lease these are minimized.

The Dame PHC only addresses highwall mining and does not address in any form strip mining or underground mining in the Dame Lease area. In addition, Appendix 1-2 Exhibit 5 in the right of entry expresses: "However, Mining Operations involve only the coal that can be mined by the underground or auger method of coal mining. No surface mining may take place on the Leased premises." For these reasons the amendment must expressly state that only highwall mining is permitted in the Dame Lease.

*Deficiencies Details:*

R645.301.728 The Dame PHC only addresses highwall mining and does not address in any form strip mining or underground mining in the Dame Lease area. In addition, Appendix 1-2 Exhibit 5 in the right of entry expresses: "However, Mining Operations involve only the coal that can be mined by the underground or auger method of coal mining. No surface mining may take place on the Leased premises." For these reasons the amendment must expressly state that only highwall mining is permitted in the Dame Lease.

khoffman

## **Hydro GroundWater Monitoring Plan**

*Analysis:*

The MRP groundwater baseline monitoring plan was sufficient to establish baseline monitoring data in the original MRP.

khoffman

## **Hydro SurfaceWater Monitoring Plan**

*Analysis:*

The MRP surface water baseline monitoring plan was sufficient to establish baseline monitoring data in the original MRP.

khoffman

## **Maps Monitoring and Sampling Locations**

*Analysis:*

Baseline monitoring locations are shown on Drawing 7-2.

khoffman

## **Maps Permit Area Boundary**

*Analysis:*

Drawing 3-6, Raptor Survey Map, needs to included in the application delineating the revised permit area boundary.

*Deficiencies Details:*

The information in the application is not adequate to meet the requirements of this section of the regulations. Prior to approval the following information must be provided in accordance with R645-301-323; Drawing 3-6, the Raptor Survey Map, needs to included in the application delineating the revised permit area boundary.

## Maps Subsurface Water Resources

*Analysis:*

Subsurface water rights are shown on Drawing 7-3, seeps and springs are shown on Drawing 7-1, well locations are shown on Drawing 7-12, and potentiometric levels in the alluvial groundwater system are shown in Drawing 7-13.

khoffman

## Maps Surface Water Resource

*Analysis:*

Surface water rights are shown on Drawing 7-3. Ponds and irrigation areas are shown on Drawing 7-7.

khoffman

## Maps Vegetation Reference Area

*Analysis:*

The meadow reference area appears to be within the IBC permit area. The meadow reference area should be relocated in consultation with the Division.

*Deficiencies Details:*

R645-301-356.210, The meadow reference area should be relocated in consultation with the Division.

pburton

## Operation Plan

### Air Pollution Control Plan

*Analysis:*

The applicant needs to address this section of the regulations.

*Deficiencies Details:*

The information in the application is not adequate to meet the requirements of this section of the regulations. Prior to approval the following information must be provided in accordance with R645-301-420 The applicant needs to address this section of the regulations.

jhelfric

### Air Pollution Control Plan

*Analysis:*

Changes to the mining method and related equipment changes should be reported to the Division of Air Quality.

*Deficiencies Details:*

R645-301-422, The application will contain a description of the coordination and compliance efforts which have been undertaken by the applicant with the Utah Division of Air Quality for the change in mining method.

pburton

## Coal Recovery

*Analysis:*

Appendix 5-8, which is included in Task ID # 4444 is a geo-technical analysis prepared by Dr. David E. Newman, PhD, PE, Appalachian Mining and Engineering, provides three possible highwall ground control plans for burden depths of < 100 feet, < 150 feet, and > 150 feet. Should Alton Coal Development, LLC choose to extract coal from beneath the exposed highwall shown on Drawing 5-10A, one of the three plans should be capable of controlling the ground conditions above the highwall mining areas.

phess

## **Subsidence Control Plan Subsidence**

*Analysis:*

The pages which have been revised in the Chapter 5 Engineering section of the Coal Hollow Mine MRP (Page 3-42, section 332, Subsidence from Highwall Mining, 3-58A, page 5-11, page 5-31, page 5-41) make the statement that indicate "no effects of subsidence will occur above the highwall mined area." A second statement says that the pillars or "WEB" designs and the barrier pillars are of the non-yielding design type, therefore there will be no subsidence of the surface ground.

The submitted designs for the highwall ground control scenarios are theoretical designs only and will need to be field verified before extensive mining of the highwall areas can be safely carried out.

The Division does not believe that the web pillars will not yield over time.

phess

## **Subsidence Control Plan Performance STD**

*Analysis:*

The Task ID # 4444 application does not address the requirements for a R645-301-525.100, Pre-Subsidence survey, "Each application for underground coal mining and reclamation activities will include:

525.120, "a narrative indicating whether subsidence, if it occurred, could cause material damage, or reasonably foreseeable use of such structures...

525.130, "a survey of all non-commercial buildings or occupied residential dwellings or structures related thereto...encompassed by the applicable angle of draw...the operator must pay for any evaluation used to determine the pre-mining condition...

The Task ID # 4444 application does not address the requirements of R645-301-525.312, Mining Technology that Provides for Planned Subsidence in a Predictable and Controlled Manner, "the Permittee must take necessary and prudent measures, consistent with the mining method employed, to minimize material damage to the extent economically and technologically feasible to non-commercial buildings and residential occupied dwellings and structures related thereto except that measures required to minimize material damage to such structures are not required if:

525.312.1, the Permittee has the written consent of the owners;

525.312.2, unless the anticipated damage would constitute a threat to health or safety, the costs of such measures exceed the anticipated costs of repair". The Permittee must develop a mining plan which provides adequate protection for the Swapp Ranch dwelling, ranch buildings, water impoundment, and well.

*Deficiencies Details:*

The Task ID # 4444 amendment must develop a subsidence monitoring and control plan and revise the mining plan for the highwall coal extraction area beneath the Swapp Ranch so adequate coal is left to protect the Ranch home, facilities, impoundment and well.

The Permittee must address all requirements of R645-301-525.400 through 525.600.

phess

## **Subsidence Control Plan Notification**

*Analysis:*

The Task ID # 4444 application did not discuss the requirement to notify the owners and occupants of surface property and structures above the proposed areas of underground workings at least six months in advance of the mining extraction sequence which could affect their properties or structures (See R645-301-525.700). Examination of Drawing 1-4, 1-5 and 5-10A reveals that the Swapp Ranch (an occupied dwelling) is directly over highwall extraction panel #5.

*Deficiencies Details:*

In accordance with the requirement of R645-301-525.700, Public Notice of Proposed Mining, "at least six months prior to mining, the underground mine operator will main a notification to the water conservancy district in which the Mine is located and to all owners and occupants of surface property and structures above the underground workings (proposed / PHH). The notification will include at a minimum, identification of specific areas in which mining will take place, dates that specific areas will be undermined, and the location or locations where the operators subsidence control plan may be examined".

phess

## **Fish and Wildlife Protection and Enhancement Plan**

*Analysis:*

The proposed addition of 85.88 acres is substantial year -long Black Bear, high summer elk, high summer deer, Sage Grouse brood rearing and breeding (established lek) habitat. The proposed mining methods, (Highwall Auger), could potentially impact the ground water that currently feeds the wet meadows located in the parcel of land and in turn the species that utilize the area. The most critical impact would be to the sage grouse chicks that are 100 % dependent on insects which the wet meadows provide. The vegetation of the meadow reference area located in this parcel could also be impacted by the depletion of ground water. The applicant needs to submit a protection and enhancement plan for the addition of the 85.88 acre parcel and relocate the reference area that is located in the proposed acreage addition. The current plan was intended to have the mining activities pass through the lek during the second year of mining outside the active lekking period. Mining through the lek occurred at the peak of the lekking period during the third year of mining. The original plan was also intended to mine in one direction passing through the lek and complete reclamation prior to the following lekking period. Mining is now occurring in two directions towards the active lek and is proposed to be at, near or in the lek for seven years. The long term impacts to wildlife from the extended mining activities are not addressed in the current Mining and REclamation Plan, (MRP).

*Deficiencies Details:*

The information in the application is not adequate to meet the requirements of this section of the regulations. Prior to approval the following information must be provided in accordance with R645-301-322, 333, 341, 342 and 358; The applicant needs to submit a protection and enhancement plan for the addition of the 85.88 acre parcel and relocate the reference area that is located in the proposed acreage addition. The plan should include at a minimum how the habitat will be restored in the event of water diminution to vegetation and how rsprings SP-8, SP-14, SP-20, SP-22, SP-40 and wells C4, C2, C3, C5, and Y-61 will be protected.

jhelfric

## **Topsoil and Subsoil**

*Analysis:*

Section 411.140 states that the additional 85.88 acres of surface, Dame property willnot be impacted by operations and will not be affected by mining. Therefore, no soils will be disturbed.

pburton

## **Hydrologic Ground Water Monitoring**

*Analysis:*

The MRP addresses a groundwater monitoring and proposes monitoring springs SP-8, SP-14, SP-20, SP-22, SP-40; wells C4, C2, C3, C5, and Y-61; and surface water locations SW-6 and SW-9 all on a quarterly basis. The Division finds that given the potentials for dewatering of the alluvial groundwater system that quarterly monitoring is not a robust dataset to detect or quantify impacts. Due to the high value of the groundwater system in the Dame Lease area the permittee will need a robust dataset. For this reason the Division recommends the springs and wells listed above be monitored for flow or water level weekly starting one month prior to undermining and continuing until one month after undermining at which time they will be monitored monthly for six months before returning back to their normal monitoring schedule. This monitoring methodology is in use at other coal mines (Bear Canyon Mine) with high value water systems in Utah. In addition, the Division recommends any water flowing from the high wall mine holes be monitored daily at each hole. Last, the cumulative volume of water removed from the pits should be totalized. Any accelerated monitoring data, daily cumulative pit pumping volume, and each daily highwall mine hole flow data will be sent to the Division as a spreadsheet via email at the end of each month.

*Deficiencies Details:*

R645.301.731.211 Due to the high value of the groundwater system in the Dame Lease area the permittee needs to collect a robust dataset. The Division requires when the Dame Lease is going to be mined that springs SP-8, SP-14, SP-20, SP-22, SP-40 and wells C4, C2, C3, C5, and Y-61 should be monitored for flow or water level weekly starting one month prior to undermining and continuing until one month after undermining at which time they will be monitored monthly for six months before returning back to their normal monitoring schedule. The flow and water level data generated during accelerated monitoring shall be sent to the Division as a spreadsheet via email at the end of each month.

R645.301.731.211 The Division requires any water flowing from a high wall mine hole be monitored daily at each hole for the flow rate. The flow data for each hole shall be sent to the Division as a spreadsheet via email at the end of each month.

R645.301.731.211 The Division requires the cumulative pumping volume of water removed from the pits should be totaled daily. The water volume removed from pits shall be sent to the Division as a spreadsheet via email at the end of each month.

khoffman

## Hydro Surface Water Monitoring

*Analysis:*

The MRP addresses a groundwater monitoring and proposes monitoring surface water locations SW-6 and SW-9 all on a quarterly basis. The PHC does not find substantial threats to the surface water so this monitoring is found to be sufficient.

khoffman

## Hydrologic Gravity Discharge From Underground Mine

*Analysis:*

The Dame PHC describes, although unlikely, the potential for gravity discharge from the highwall mining holes. However, if it does the Division is requiring a daily flow measurement as part of the groundwater monitoring plan.

khoffman

## Maps Monitoring and Sampling Locations

*Analysis:*

Water monitoring locations are shown on Drawing 7-10.

khoffman

## Maps Certification Requirements

*Analysis:*

All of the maps and drawings submitted as part of Task ID # 4444 have been P.E. certified by Mr. Dan W. Guy, Utah registered professional engineer. The P.E. stamp on each map/drawing meets the requirements of R156-22-601, (1) (a-f).

phess

## Special Categories

### Auger Mining

*Analysis:*

The Coal Hollow mine application was approved and a Decision Document was signed on October 19, 2009. The permit was issued on November 8, 2010. The mining plan sequence has been amended several times since. The last approval for a mining sequence change was in April 19, 2013 task 4323. This incidental boundary change (IBC) application continues the sequence of mining in the north/south direction as described in April 2013, but also adds an auger mining alternative scenario that includes an additional 85.88 acres of fee coal added to the eastern boundary of the permit area.

The IBC application was received on November 1, 2013. The application was reviewed in accordance with the R645-302-240 Auger Mining Rules .

pburton

## **CHIA**

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*Analysis:*

The permit boundary for the CHIA will need to be updated in Plates 1-3 before approval. As well the CHIA will need to be updated to incorporate the possibility of highwall mining being conducted.

khoffman