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TECHNICAL MEMORANDUM
Utah Coal Regulatory Program

May 12, 2011

TO: Internal File

THRU: Joe Helfrich, Team Lead

FROM: Steve Christensen, Environmental Scientist III SCC

RE: Permit Application, Carbon Resources LLC, Kinney No. 2 Mine, C/007/0047, Task ID #3823

SUMMARY:

On May 10th, 2011, the Division of Oil, Gas and Mining (the Division) received a permit application package (the application) from Carbon Resources, LLC (the Permittee). The application was submitted to address deficiencies identified during the previous technical analysis (deficiency letter sent 05/02/11, Task ID #3779).

The application is for coal-mining activities approximately ½ mile north of Scofield, UT and east of Utah State Highway 96. Previous coal mining operations have occurred within much of the mine plan area. Several mines existed in the area of the proposed surface facilities (Kinney Mine, Columbine Mine and the Jones Mine).

The proposed permit area is 448 acres. Small un-named ephemeral channels convey area drainage from the portal area. Eagles Canyon is located over the ridge to the east of the mine site and Long Canyon is located east of Eagles Canyon. Eagles Canyon has been characterized as ephemeral and Long Canyon contains a perennial stream. All drainages located within the permit area eventually discharge to Scofield Reservoir.

The following is a hydrologic analysis of the permit application package. For the purposes of tracking, this Division review has been assigned a task review number of #3779.

The application should not be approved at this time. The following deficiencies must be addressed prior to Division approval:

R645-301-120: The Permittee must delete the Monitoring Well discussion on pages 7-12 thru 7-14. The previous technical analysis directed the Permittee to address the various water level reading discrepancies. It was the intent of the Division to simply have the well data revised to accurately reflect the characterization of the groundwater system. An explanation of the errors and confusion is not required information for an approved Mining and Reclamation Plan (MRP). Please delete the yellow highlighted section in its entirety. (SC)

R645-301-724.100: The Permittee must address the statements on pages 7-14 and 7-135 that indicate that monitoring well information is provided in Figure 17. The previous technical analysis (Task ID #3779) directed the Permittee to revise statements on page 7-21 and 7-135 that refer to Figure 17, *Field Data* as containing field data for monitoring wells. Figure 17 does not contain any monitoring well data. The references are still within the application now on pages 7-14 and 7-135. (SC)

TECHNICAL ANALYSIS:

GENERAL CONTENTS

PERMIT APPLICATION FORMAT AND CONTENTS

Regulatory Reference: 30 CFR 777.11; R645-301-120.

Analysis:

The application does not meet the Permit Application Format and Contents requirements of the State of Utah R645-Coal Mining Rules.

A previous technical analysis (Task ID #3646) identified a deficiency relative to the table of contents. The table of contents did not accurately represent the page locations. For example, the table of contents indicated that the climatological information was located on page 7-68; however, the information was presented on page 7-74. The table of contents has been revised to accurately present the page number for corresponding Sections.

A previous technical analysis (Task ID #3646) had also identified a deficiency relative to the labeling of tables and figures. The labels of the tables and figures were not in ascending chronological order. For example, Table 8 was located on page 7-130. Table 12 was on page 7-72. Table 13, is on page 7-34. The Permittee has indicated that an inordinate amount of work would be required in order to correct this problem. The Permittee has instead provided an index to all maps, figures, tables and exhibits.

The previous technical analysis (Task ID #3779) directed the Permittee to delete the Monitoring Well discussion on pages 7-12 thru 7-14. The discussion outlined the various errors and confusion that was created due to elevation errors in the monitoring well completion diagrams relative to the field data that was provided. The Permittee's response depicts the discussion highlighted in yellow (not deleted). The Permittee must delete the monitoring well discussion on pages 7-4 and 7-5. An explanation of the errors and confusion that was created due to elevation errors in the monitoring well completion diagrams is not required information for the approved Mining and Reclamation Plan (MRP).

Findings:

The application does not meet the Permit Application Format and Contents requirements of the State of Utah R645-Coal Mining Rules.

R645-301-120, -721: The Permittee must delete the monitoring well discussion on pages 7-4 and 7-5. An explanation of the errors and confusion that was created due to incorrect elevation depictions in the monitoring well completion diagrams is not required information for the approved Mining and Reclamation Plan (MRP). (SC)

COMPLETENESS

Regulatory Reference: 30 CFR 777.15; R645-301-150.

Analysis:

The application meets the Completeness requirements as outlined in the State of Utah R645-Coal Mining Rules.

A previous technical analysis (Task ID #3646) had identified a completeness deficiency. Table 3.7.1, Kinney No. 2 Mine Baseline Monitoring Stations was not included in the previous amendment. The reformatted amendment now contains Table 3.7.1 as Table 6 in Chapter 7 of the application.

Table 6, Kinney #2 Mine Baseline Monitoring Stations, provides a comprehensive list of the baseline monitoring stations and provides a table that shows the sampling dates and available water quality and quantity data available for each of the respective monitoring stations.

Findings:

The application meets the Completeness requirements as outlined in the State of Utah R645-Coal Mining Rules.

ENVIRONMENTAL RESOURCE INFORMATION

Regulatory Reference: Pub. L 95-87 Sections 507(b), 508(a), and 516(b); 30 CFR 783., et. al.

GENERAL

Regulatory Reference: 30 CFR 783.12; R645-301-411, -301-521, -301-721.

Analysis:

The application meets the General Environmental Resource Information requirements as outlined in the State of Utah R645-Coal Mining Rules.

Beginning in Section R645-301-710 of the application, the Permittee provides a general description and references to the ground and surface water resources that may be affected or impacted by the proposed coal mining and reclamation operation.

On pages 7-4 and 7-5 of the application, the Permittee discusses error/confusion that came about in previous attempts to present the baseline hydrology information for the proposed permit and adjacent area. The discussion is neither necessary nor warranted in the mining and reclamation plan (MRP).

Findings:

The application does not meet the General Environmental Resource Information requirements as outlined in the State of Utah R645-Coal Mining Rules. The following deficiency must be addressed prior to final approval:

R645-301-120, -721: The Permittee must delete the monitoring well discussion on pages 7-4 and 7-5. An explanation of the errors and confusion that was created due to incorrect elevation depictions in the monitoring well completion diagrams is not required information for the approved Mining and Reclamation Plan (MRP). (SC)

CLIMATOLOGICAL RESOURCE INFORMATION

Regulatory Reference: 30 CFR 783.18; R645-301-724.

Analysis:

The application meets the Climatological Resource Information requirements as outlined in the State of Utah R645-Coal Mining Rules.

The application provides the climatological information for the proposed permit and adjacent area in Section R645-301-724.400. The Permittee utilized multiple SNOTEL meteorological reporting stations (Clear Creek #1, Clear Creek #2, Scofield Dam and Price, UT) that were close to the proposed permit area. The Clear Creek stations provided the temperature, precipitation and snowfall data. The Price, UT SNOTEL station provided the wind data. Table 13 provides a summary of temperature data. Table 14 provides a summary of precipitation data collected at the Scofield Dam. Table 15 provides a summary of wind data obtained in Price, UT.

Based on the presented climatological data, the region of the proposed permit and adjacent area is semi-arid. Due to significant elevation differences within the proposed permit

and adjacent area, climatic conditions can vary. The area is characterized as temperate with summer high temperatures ranging from 75 to 80 degrees Fahrenheit and corresponding winter temperature ranges from 0 to -5 degrees Fahrenheit. The average annual precipitation for the area is approximately 14.6 inches.

Generally, temperature values are lower on the exposed high plateaus when compared with the lower slope/valley areas. Precipitation amounts also exhibit variation due to changes in topography, exposure and wind direction.

Findings:

The application meets the Climatological Resource Information requirements as outlined in the State of Utah R645-Coal Mining Rules.

ALLUVIAL VALLEY FLOORS

Regulatory Reference: 30 CFR 785.19; 30 CFR 822; R645-302-320.

Analysis:

Alluvial Valley Floor Determination

The application meets the Alluvial Valley Floor (AVF) Determination requirements of the State of Utah R645-Coal Mining Rules.

A previous technical analysis (Task ID #3646) identified a deficiency relative to the Alluvial Valley Floor Determination. The applicant was directed to demonstrate, based on available data or field studies, the presence or absence of an alluvial valley floor (AVF).

In Chapter 9 of the application, the Permittee discusses alluvial valley floors. R645-302-321.300 establishes criteria for an alluvial valley floor. Several determinations must be made before a finding can be made that an alluvial valley floor exists; among them 1) Unconsolidated stream laid deposits holding streams are present; and 2) There is sufficient water to support agricultural activities. Additionally, a sufficient water source must exist that is capable of flood irrigation in the area of question. The area itself must be capable of being flood irrigated and/or sub-irrigated by the groundwater system of the valley floor.

Beginning on page 9-6 of the application, the Permittee discusses alluvial valley floors. Based upon the criteria discussed above, an AVF is located within the adjacent area. In addition, the Permittee also discusses areas that exhibit the traits/characteristics of the second criteria (hydrology aspect), but not the first (geologic aspect).

These two areas are depicted on Map 32, *AVF Evaluation Map* and identified as 'AVF AREA' and 'QUASI AVF AREA'. The 'AVF AREA' depicted on Map 32 meets the two criteria. Figure 4, *Regional Surface Geology Map*, depicts alluvium material directly adjacent to Mud Creek on either side of the stream channel. Map 32, *AVF Evaluation Map*, depicts the location of this alluvial material relative to the proposed permit boundary. The area of the alluvial valley floor is relatively small and appears to be limited to within less than 500 feet of the stream channel for Mud Creek.

The 'QUASI AVF AREA' depicted on Map 32 meets the second criteria in making an AVF determination in that there is sufficient water to support agricultural activities. However; the surface geology and soils found in the 'QUASI AVF AREA' are not unconsolidated stream laid deposits holding streams.

The Permittee discusses the potential for mining related impacts to the identified AVF beginning on page 9-13. In summary, the coal seam to be mined is located well above the regional water table, if one exists (See Ground Water Baseline Discussion). As a result, the possibility that mining activity could interrupt or impact recharge to the identified AVF is minimal. In addition, the irrigation water that supplies the AVF is derived from Mud Creek at a diversion point upstream of the proposed mine site. Based upon a Utah Department of Environmental Quality TMDL analysis of Scofield Reservoir, 87% of the inflow to the Scofield reservoir comes from Fish and Mud Creek. The proposed mining activity poses a minimal potential for interrupting or impacting these drainages due to it's proximity to the drainages and the utilization of first mining practices only (i.e. no planned subsidence).

Findings:

The application meets the Alluvial Valley Floor Determination requirements of the State of Utah R645-Coal Mining Rules.

GEOLOGIC RESOURCE INFORMATION

Regulatory Reference: 30 CFR 784.22; R645-301-623, -301-724.

Analysis:

The application meets the Geologic Resource Information requirements as outlined in the State of Utah R645-Coal Mining Rules.

Detailed geologic information is provided in Chapter 6 of the application. The geologic conditions in the permit and adjacent areas were characterized by utilizing information from

studies/reports as well as from previous and ongoing baseline monitoring activities. The geologic data set includes data from 70 drill holes, with 26 of them located within the proposed permit boundary (See Figure 2, *Drill Hole Locations & X-Section Lines*).

Additionally, the application provides a discussion of the primary regional geologic formations beginning on page 6-1. The Hiawatha Coal seam of the Blackhawk formation is the only mineable coal seam within the permit boundary. The discussion lists and describes these stratigraphic units in order beginning with the lowermost stratigraphic unit and working upward. Figure 10, *Hiawatha Overburden Isopachs & Mining Blocks*, provides the overburden thickness above the Hiawatha coal seam. Figure 3, *Stratigraphic Column Kinney Area*, provides a stratigraphic cross-Section of the geologic units located within and adjacent to the permit area.

Additional information was requested as to how the numerous north-south trending faults located within the permit and adjacent area influenced the groundwater system. The Permittee was directed to address whether the faults serve as confining layers to hydrologic flow or are capable of transmitting water either vertically or laterally.

Beginning on page 6-18 of the application, the Permittee provides a characterization of the material contained within the north-south trending fault systems and the hydrologic properties. The characterization is based upon fault and structural geology in the Eastern Wasatch plateau, specifically the Bear Canyon Graben at the Plateau Mine.

At the Plateau Mine, rock tunnels penetrated and crossed both sides of the graben allowing for close inspection of the fault underground. Moisture differences were observed in the gouge zone underground with more moisture observed on one side only. The Permittee submits that the presence of the moisture was accounted for by downward percolation of terrestrial water and not lateral/horizontal ground water movement into the gouge zone.

An additional example was provided approximately one mile west of the west boundary fault of the Bear Canyon Graben where the southern extension of the Pleasant Valley Graben is exposed on the north wall of Tie Fork Canyon. At this location, the Tie Fork Spring discharges from the east side breccia zone of the Pleasant Valley Graben eastern boundary fault. The spring is perennial, but exhibits seasonal variation with high flows in the spring but reducing significantly by fall. It was determined that a large spring/seep complex from the upper Price River Formation provided the recharge to Tie Fork Spring. The water from the Price River springs/seeps migrated down dip until it encountered the Pleasant Valley Graben east boundary fault and then percolated down the fault and southward to where it discharged at Tie Fork Spring. In this instance, the gouge zone created by the fault served as a vertical conduit for overlying groundwater migration.

The Permittee provides a third example from a fault located off the Pleasant Valley Graben (approximately five miles north of Tie Fork Canyon and 12 miles south of the proposed

mine site). A picture of the excavated fault zone depicts rust staining (evidence of oxidized water passing through the zone) inside the breccia/gouge zone and not adjacent to it. The lack of oxidation on either side would suggest that the breccia/gouge zone was transmitting water vertically and not laterally.

The extensive fault system located within the permit and adjacent area impact the ground water system and its characteristics. Due to relatively low permeabilities of the stratigraphy, the steep topography and relatively low amounts of precipitation, vertical ground water movement and recharge is limited. In Section R645-301-724.100, the Permittee discusses that the north-south fault system is suspected of providing vertical conduits for recharge (as observed at the previously discussed examples). Faults in the Wasatch Plateau can act as aquitards that limit horizontal movement of ground through the fault. Based upon the information presented in the application, the faults allow for the vertical migration of water through the breccia zones of the faults, yet due to relatively short lengths of the faults, water is able to flow around the fault zones where they terminate. As a result, the Permittee discusses the presence of a regional ground water table (See Discussion below). The faults, though impeding the lateral/horizontal flow of ground water, it does not appear that they produce a complete partitioning of the ground water. The impeding characteristics of the faults to horizontal ground water flow would be expected to produce irregularities (spikes/troughs) in the regional piezometric surface of the regional ground water table, but would not compartmentalize the regional aquifer to a great extent.

Based upon conversations with Carbon Resources representative Greg Hunt, the source of information utilized in depicting the fault system in the permit and adjacent area comes from a variety of sources. Old mine work maps from the area were utilized in mapping various fault and geologic features in the area. Additionally, according to Mr. Hunt, data collected from 35 drill holes in the permit and adjacent area were also utilized in mapping the fault system.

Findings:

The application meets the Geologic Resource Information requirements as outlined in the State of Utah R645-Coal Mining Rules.

HYDROLOGIC RESOURCE INFORMATION

Regulatory Reference: 30 CFR Sec. 701.5, 784.14; R645-100-200, -301-724.

Analysis:

Sampling and Analysis

The application meets the Sampling and Analysis requirements as outlined in the State of Utah R645-Coal Mining Rules.

The previous technical analysis identified a deficiency relative to the collection and analysis of water monitoring data/samples. The Permittee was directed to provide a commitment to conduct all water quality analyses according to the methodology in the current edition of "Standard Methods for the Examination of Water and Wastewater" or the methodology in 40 CFR Parts 136 and 434.

In Section R645-301-723 of the application, the Permittee states, "*All water quality samples will be analyzed according to the most current copy of the Standard Methods for the Examination of Water and Wastewater, a joint publication of the American Public health Association, the American Water Works Association and the Water Pollution Control Federation.*"

Additionally, the Permittee was previously directed to provide a commitment to submit water quality data electronically to the Division's Utah Coal Mining Water Quality Database. In Table 20, *Hydrologic Monitoring Schedule*, the Permittee indicates that quarterly lab water quality results will be submitted to the Division within 90 days of the end of the quarter and that an annual hydrologic review and summary of data will be submitted on or before June 1st.

Baseline Information

The application does not meet the baseline information requirements as required by the State of Utah R645-Coal Mining Rules.

The application presents baseline ground and surface water information in Chapter 7 of the application beginning in Section R645-301-724.100. The hydrologic characterizations are based on available regional information as well as ongoing water monitoring. Exhibit 9 contains a spring and seep survey conducted in the permit and adjacent area. Exhibit 10 contains field measurements obtained from both ground and surface water resources in the permit and adjacent area. Exhibit 12 contains the analytical lab reports generated from the baseline data collection.

A previous technical analysis (Task ID #3646) had directed the Permittee to provide paper copies of the analytical reports generated from all ground and surface water monitoring activities. The analytical reports generated from the baseline data collection process are provided in Exhibit 12 in Volume 3 of the application.

Groundwater

Beginning in Section R645-301-724.100 of the application, the Permittee presents the baseline information utilized in characterizing the nature of the groundwater systems in the permit and adjacent area.

Based upon the presented baseline groundwater data there are limited groundwater resources within the permit and adjacent area. The information in the application indicates that the general lack of groundwater is due to the semi-arid conditions of the area, limited outcrop exposures for direct infiltration and steep slopes that produce accelerated runoff volumes thus limiting the amount of direct infiltration. The characterization is a result of a spring and seep survey (Exhibit 9). Additionally, the Permittee completed 11 monitoring wells to evaluate the groundwater systems in the permit and adjacent area:

Above the Seam:

- CR 06-02 ABV
- CR 06-03 ABV
- CR 06-09
- CR 10-11
- CR 10-12

In Seam:

- CR 06-01
- CR 06-02
- CR 06-05A
- CR 06-09

Below Seam:

- CR 06-01 BLW
- CR 06-09 BLW

Water levels were only obtained from four of the eleven wells (CR 06-03 ABV, CR 06-09, CR 10-11 and CR 10-12).

The Permittee provides a discussion of the regional stratigraphy of the permit and adjacent area in Section R645-301-724.100 of the application. The geologic formations in the permit and adjacent area are contained within the Blackhawk Formation. Figure 3, *Stratigraphic Column Kinney Area*, provides a cross-Sectional view of the local geology. The geology is an important factor in determining the characteristics of the groundwater systems in the area. The Blackhawk formation is a characterized by a sequence of alternating sandstone, mudstone and coal units. In ascending order, the major units of the Blackhawk Formation include the Panther Sandstone, Flat Canyon coal seam, Spring Canyon sandstone, Hiawatha coal seam, McKinnon coal seam and Haley Coal Seam. The sandstones are characterized as fine to medium-grained

and are typically well cemented resulting in relatively low permeabilities. Groundwater can be present in all of the major straigraphic units in the permit and adjacent area; however, all are considered to be poor to moderate aquifers.

In Section R645-301-724.100 of the application, the Permittee identifies four aquifer systems within the proposed permit and adjacent area. The four-aquifer systems that define the groundwater environment include the: alluvial/colluvial aquifer system, perched/isolated ground water systems, stored mine water system and the regional ground water system and provides a discussion of each as they relate to the proposed permit and adjacent area.

The Permittee is basing their groundwater characterization upon the completion of a seep and spring survey in June of 2006 (See Exhibit 9), exploratory well drilling and baseline data collection and field observations. Table 6, *Kinney #2 Mine Baseline Monitoring Stations*, provides a depiction of the monitoring/sampling events conducted at the groundwater monitoring sites. Table 20, *Hydrologic Monitoring Schedule*, provides a list of the water quality parameters that were analyzed during the baseline data collection period.

The seep and spring survey identified limited groundwater resources within the permit and adjacent area. Six active seeps and 27 active springs were identified within the permit and adjacent area. Map 7, *Regional Hydrology*, depicts the locations of these groundwater resources. Table 9, *Seep and Spring Flow Summary,* provides a flow summary from the June 2006 spring and seep survey. The Seep and Spring survey (the Survey) identified very few springs and seeps within the permit boundary. Eagle Springs 1, 1A, 2 and 3 as well as Aspen spring are the only springs identified within the permit boundary. However, the Survey identified many seeps and springs within Long Canyon (approximately ¾ of a mile from the eastern permit boundary), Miller Canyon and the UP Canyon moving east to west from the proposed permit area.

As part of the baseline data collection process, four springs were monitored (Angle Spring, Aspen Spring, Eagle Spring and Sulfur Spring). Figure 17 provides flow and conductivity graphs for each of the baseline springs that were monitored. The springs exhibit seasonal flow characteristics indicative of discharges from perched groundwater systems in that the maximum discharges were recorded following spring snowmelt followed by a decline in discharge. The exception to this is Sulfur Spring which flows year round. The source of recharge to Sulfur Spring is unknown at this point. One explanation is that the historic mine works that underlie the Hiawatha Seam may be flooded and supplying the recharge to Sulfur Spring. The Permittee has provided adequate baseline data for Sulfur Spring that characterizes the seasonal variation in water quantify and flow.

The three previous technical analyses (Task ID # 2989, #3646 and #3779) had identified a deficiency relative to baseline data for the springs/seeps located within the permit and adjacent area (specifically Aspen Spring, Eagle Springs 1, 1A 2 and 3). The initial analysis had identified a deficiency relative to baseline data collection for Eagle Springs 1A, 2 and 3 (Task ID #2989).

Specifically, the Permittee was asked to discuss why the minimum groundwater quality samples were not obtained for the springs. The second analysis again identified a deficiency relative to the aforementioned springs (Task ID #3646). The Permittee was directed to revise the application to clearly demonstrate the frequency and dates of monitoring visits that were conducted at Eagle Springs 1, 1A, 2 and 3 and provide the data obtained. The third analysis (Task ID #3779), again directed the Permittee to provide adequate baseline data to characterize the nature of the springs located within the permit and adjacent area.

The Permittee has addressed the baseline deficiencies relative to the springs/seeps within the permit and adjacent area. Initially, Angle Spring was selected as a representative of the springs identified within the permit and adjacent area (namely Aspen Spring, Eagle 1, Eagle 1A, Eagle 2 and Eagle 3). Angle Spring was selected as a representative spring issuing from the Upper Eagle Canyon graben and associated fault system. Angle Spring was sampled 11 times from September of 2005 to September of 2006 (See Exhibit 10, *Surface and Ground Water Field Measurements*) at which time, access to the spring was denied by the land owner. The data obtained from Angle Spring is presented in Exhibit 10, Figure 17 and with the analytical data provided in Exhibit 12 and water quality summary provided in Table 10.

Monitoring of Angle Spring ended in September of 2006 due to access issues with the private land owner. As a result, the Permittee selected Aspen Spring (within the permit area, See Map 7, Regional Hydrology). Aspen Spring has been visited 9 times with 5 of those visits producing measurable data (See Exhibit 10, Exhibit 12, Table 10 and Figure 17). Data collection at Aspen Spring was interrupted during 2009 due to lack of funding. No flow measurements were obtained from Aspen Spring. A previous technical analysis (Task ID #3779) determined that Aspen Spring is a pond with no outlet capable of obtaining flow information. Prior to the Task ID #3779 application, it was not possible to determine that Aspen Spring (AKA Eagle Pond 1) was as pond. At the bottom of Table 9, the Permittee indicates that flow measurements of Aspen Spring *"have never been possible* to measure".

Per R645-301-724.100, the Permittee is required to, at minimum, approximate rates of discharge or usage for groundwater resources. To that end, the Permittee has provided an estimate of Aspen Springs flow in Exhibit 10. The approximation is based on a pan evaporation method that takes into account the size of the pond and utilizes a basic water balance approach. Based upon the estimates, the flow range of Aspen Spring is approximately 2-5 gpm. The Permittee has indicated that additional water monitoring will be conducted on Aspen Spring as well as Eagle Springs 1, 1A, 2 and 3 to more accurately assess the quantity of flow from these resources (See Table 7, *Kinney Mine Operational Monitoring Stations*). The Permittee commits to collecting an additional 2 years of data from the aforementioned springs.

Based up on the approximation that the maximum flow from Aspen Spring is 5 gpm, and that Aspen Spring is representative of Eagle Springs 1, 1A, 2 and 3, the Permittee provides a

commitment in Section R645-301-731.800 that "if the springs in the graben area are affected by mining, CR commits to replace the estimate quantity of Aspen Spring and the total of the flow measurements for the other springs in the graben area". Based upon the maximum estimate of flow from Aspen Spring (i.e. 5 gpm), the Permittee would be required to replace 25 gpm in the event that mining impacts these resources.

A previous technical analysis (Task ID #3779) had identified a deficiency relative to Aspen Spring. The Permittee made a statement that Aspen Spring "*is named Eagle Pond 1 in the Spring and Seep Survey*". However, upon review of the Spring and Seep Survey in Exhibit 9, it did not appear that Aspen Spring nor Eagle Pond 1 was identified nor discussed. The Permittee has since shown that Eagle Pond 1 is shown on the map provided in Exhibit 9. A previous technical analysis (Task ID #2989) had identified a deficiency relative to the spring and seep inventory and the figure that depicted the findings of the study. Due to the scale of the figure in the spring and seep survey, it was not possible to read/identify the springs. The font was unreadable. The Permittee addressed the deficiency by providing the locations of the springs and seeps on Map 7, *Regional Hydrology* and Map 8, *Works-Wells-Springs-Faults*. The Permittee has placed a footnote on the figure within the Seep and Spring Survey directing the reader to Map 7.

In Section R645-301-724.100 on page 7-24, the Permittee discusses the groundwater quality within the permit and adjacent area. Map 10, *Regional Water Quality* provides water quality diagrams obtained from the various monitoring well and spring monitoring locations. Additionally, field and laboratory water quality data is provided in Exhibit 10, *Surface and Ground Water Field Measurements* and Exhibit 12, *Surface and Ground Water Quality Data.*

The data indicate that the general water chemistry of the groundwater in the permit and adjacent area is a calcium bicarbonate type with some variations. Water quality from Angle and Sulfur Springs as well as from monitoring well CR 06-03ABV show a strongly calcium bicarbonate type water. Miller Outlet, Mud Creek and Res-1 are composed of slightly lower concentrations indicative of this water type. Mud Creek also contains higher concentrations of sodium potassium, magnesium and sulfate. An additional anomaly has been identified with Eagle Spring which shows distinctly higher quality sodium-calcium bicarbonate type water. As a result, it appears that there is a distinct difference between the water quality of Eagle Spring when compared to the water chemistry data obtained from the other groundwater monitoring sites.

WELLS

In preparing the groundwater baseline characterization of the area, the Permittee installed eleven monitoring wells at eight different locations within and adjacent to the permit area. The monitoring wells were completed above, within and below the Hiawatha coal seam:

- *Above the coal seam:* CR-06-02 ABV, CR 06-03 ABV, CR-06-09 ABV, CR 10-11 and CR 10-12
- *Within the coal seam:* CR 06-01, CR 06-02, CR 06-05A and CR 06-09
- *Below the coal seam:* R 06-01-BLW and CR 06-09 BLW

Based upon groundwater availability discussion in the application, the Hiawatha coal seam is "*high and dry*" with measurable groundwater encountered only within monitoring wells CR 06-03 ABV, CR 06-09 ABV, CR 06-09, CR 06-09 BLW, CR 10-11 and CR 10-12. Wells CR 10-11 and CR-12 are installed within the Pleasant Valley Graben. As a result, the Hiawatha Seam is approximately 600' below the monitoring wells due to the extensive displacement of the fault in this area. As this Section of the coal seam is not slated for mining, there is no potential for groundwater interception/impacts in this location.

Monitoring wells CR 06-03 ABV, CR 06-09 ABV, CR 06-09 and CR 06-09 BLW require further consideration. Based upon Map 7A, *W-E Section A-A'*, the water levels obtained at these wells indicates that the Hiawatha Coal Seam is potentially within the water table. However; based upon discussions with the Carbon Resources, LLC representative Mr. Greg Hunt, the Permittee has no plans of mining into the Eagle Canyon Graben where monitoring wells CR 06-03 ABV, CR 06-09 ABV, CR 06-09 and CR 06-09 BLW are located. In addition, Map 15, *Mine Plan Layout and Production Schedule*, depicts the eastern most extent of mine workings stopping west of the Eagles Canyon Graben where monitoring well CR 06-03 ABV is located.

Due to the vertical displacement produced by the fault at the western boundary of the Eagle Canyon Graben and the subsequent lowering of the Hiawatha Seam in this area, it's not economical for mining activity to occur in this area. As a result, the potential for impact of the groundwater table in this location is minimal. However; in the future if mining activity is to be conducted east of the Eagle Canyon Graben, additional monitoring well installation and baseline data collection will be required. Monitoring well CR 06-03 ABV was completed within the Eagle Canyon Graben (See Map 7A, *W-E X-Section A-A'*). As the currently proposed mining does not intersect/encounter the Eagle Canyon Graben, the potential for groundwater interception is considered to be low.

A previous technical analysis (Task ID #3779) had identified a deficiency with Figure 17, *Field Data*. The Permittee was asked to explain why field data that had been previously supplied in Figure 17 for Eagle Spring, Sulfur Spring, Aspen Spring and Res-1 had been removed from the application. Figure 17 had previously provided flow, conductivity and pH field measurements for these resources. The Permittee has reinserted the field data into Figure 17.

R645-301-724.100: The Permittee must address the statements on pages 7-14 and 7-135 that indicate that monitoring well information is provided in Figure 17. The previous technical analysis (Task ID #3779) directed the Permittee to revise statements on page 7-21 and 7-135 that

refer to Figure 17, *Field Data* as containing field data for monitoring wells. Figure 17 does not contain any monitoring well data. The references are still within the application now on pages 7-14 and 7-135.

The initial technical analysis (Task ID #2989) identified a deficiency relative to baseline data collection from the water monitoring wells. The deficiency directed the Permittee to address why the minimum groundwater quality samples were not obtained from all monitoring wells that reported a water level (with the exception of CR 06-03ABV). The application had provided documentation of several field visits to these wells where water levels were depicted as obtained from below, within and above the coal seam. Based upon discussions with the Permittee, '*false positive*' water level readings were recorded in several of the monitoring wells. The readings were a result of residual drilling water within the blank Section of the monitoring wells. The monitoring wells were completed with a 10' blank Section below the screened interval. The blanks serve as a receptacle for sediment and debris that can accumulate in the wells. As the wells are to be monitored over the life of the mine, the blanks provide extended longevity and usage.

A previous technical analysis (Task ID #3646) identified several deficiencies relative to the water levels that were reported in Exhibit 10, *Surface and Ground Water Field Measurements* and compared with Exhibit 11, *Monitoring Well Completion Details.* The Permittee maintained that with the exception of CR -06-03 ABV, CR06-09 ABV, CR 06-09 CR-06-BLW and CR 10-11 and CR 10-12, the remaining monitoring well completions were dry (i.e. did not encounter groundwater).

The Permittee was directed to address discrepancies obtained from monitoring wells CR 06-01 BLW and CR 06-02. Based upon a review of the data presented in Exhibit 10, *Surface and Ground Water Field Measurements* and the figures in Exhibit 11, *Monitoring Well Completion Details*, it appeared that 11 water level readings from CR 06-01 BLW and 7 water level readings from CR 06-02 were obtained from within the screened interval indicating the presence of groundwater. Based up on the discussion within the text of the application that indicated that these monitoring wells were dry, the Permittee was directed to address this.

The application addresses the discrepancies associated with monitoring well CR 06-01 BLW in Section R645-301-761 as well as in Exhibit 10. The Permittee discussed how due to the construction of monitoring well CR 06-01 BLW, confusion was created and false positive water levels were recorded. CR 06-01 BLW was completed with a 4" fiberglass casing that terminates at a reducer that connects the casing to a 2"stainless steel well screen and blank assembly. The well deviates from vertical within the bottom 50 feet. When a water level probe was lowered down the well, it came into contact with the reducer component that connects the well casing to the screened interval. As a result, the water level probe was unable to be positioned within the screened interval. The false water levels were obtained as water had condensed on the inside wall of the well tubing which caused the water level probe to produce a false positive water level

reading. The Permittee verified the condition of the well by lowering a color, LED lighted, borehole camera into the monitoring well. The camera produced a digital video that was reviewed by the Division. The video demonstrates the absence of water within the screened interval and shows that water is only located within the blank Section (over 10 feet beneath the false positive readings that were recorded and presented in Exhibit 10 and over 165 feet below the coal seam). The eleven water level readings provided in Exhibit 10 were obtained from within the monitoring wells blank interval.

The application discusses the false positive water level readings obtained CR 06-02 beginning on page 7-12. Several errors in elevation relative to the vertical position of the well screen and blank assembly were discovered. The result was that the "busts" in elevation data produced water level readings that appeared to be within the screened interval of the monitoring well. The screened interval depth was determined to be 422.7' to 432.7' rather than 427.0' to 437.0'. As a result, the seven water level measurements were obtained from within the blank Section of the monitoring well. The Permittee verified this with the use of a water level indicator and a down-hole video camera to record the absence of water within the screened interval. The video was reviewed by Division staff.

A previous technical analysis (Task ID #3779) identified a deficiency with the monitoring well completion diagram in Exhibit 11 for monitoring well CR 06-02. Based upon the monitoring well completion diagram in Exhibit 11, *Monitoring Well Completion Details*, all depths are measured from the ground surface elevation of 8,336.7'. The diagram for CR 06-02 however depicted a depth to the top of the screen as 422.7'. 8,336.7' – 422.7'= 7,914'. However, the data in Exhibit 10 showed the top of the screen to be 7,894.0' (a difference of 20'). The Permittee has corrected the arithmetic error in Exhibit 10.

A previous technical analysis (Task ID 3646) identified a deficiency relative to the datum elevations presented in Exhibit 10, *Surface and Ground Water Field Measurements*. It appeared that the datum elevations utilized to calculate the screened interval elevations and Hiawatha Seam interval elevations were obtained from the top of the PVC riser of the monitoring wells. However; according to the information presented in Exhibit 11, *Monitoring Well Completion Details,* it appeared that the elevation of the ground was utilized to calculate these intervals. The Permittee has revised the information presented in Exhibit 10 to clearly demonstrate that the depths utilized to calculate the elevations of the screen interval, coal seam interval and blank interval. The water level elevation data was obtained by measuring from the top of the PVC.

The Permittee was directed to address water level readings obtained at monitoring well CR 06-01 (Task ID #3646). Based upon a review of the data presented in Exhibit 10, *Surface and Ground Water Field Measurements* and the figures in Exhibit 11, *Monitoring Well Completion Details*, it appeared that 5 water level readings were obtained from below the bottom elevation of the monitoring well's blank. The Permittee identified an error relative to the elevation data for the CR 06-01 and CR 06-01 BLW monitoring wells. An elevation error of

approximately 2.9 feet resulted in inaccurate water level readings. As discussed above, the Permittee verified the condition of the well by lowering a color, LED lighted, borehole camera into the monitoring well. The camera produced a digital video that was reviewed by the Division.

From the previous technical analysis (Task ID #3646), the Permittee was directed to address the '*static water levels*' reported in Exhibit 10, *Surface and Ground Water Field Measurements* for monitoring wells CR 06-02, CR 06-02 ABV and CR 06-05A. Based upon a review of the data presented in Exhibit 10, *Surface and Ground Water Field Measurements* and the figures in Exhibit 11, *Monitoring Well Completion Details*, it appeared that numerous water level measurements were obtained from the blank Section of the monitoring well; however, the Permittee represented these values as "Static Water Level Elevations" in Exhibit 10. As the readings obtained within the blank Section of the monitoring well do not represent a static water level, the Permittee has revised Exhibit 10 and changed the "Static Water Level Elevation" column header to simply "Water Level Elevation". Additionally, the Permittee discusses how these water level readings were obtained from within the blank Section of the monitoring wells on pages 7-12, 7-13, 7-135 and 7-136. As discussed above, the blank Sections immediately below the screen interval are designed to capture sediment and other materials that could potentially shorten the life and effectiveness of the monitoring wells. The water contained in the blanks is remnant water from the installation process of the monitoring wells and not regional groundwater.

The Permittee was also asked to address the lack of baseline data obtained from monitoring wells CR 10-11 and CR 10-12. Based upon negotiations/discussions with the Permittee, it was agreed that the purpose for installing the two monitoring wells (installed at the request of the Division) was to provide future detection of potential coal mining related impacts to the regional water table. Exhibit 10 provides 8 water level measurements over the course of a continuous 7 month period. It is highly likely that by the time the Permittee begins active coal recovery; well over a year of monitoring data will have been obtained.

A deficiency was identified relative to Table 6, *Kinney #2 Baseline Monitoring Stations* (Task ID #3646). The Permittee was directed to revise the table to reflect the number of sampling events at each of the monitoring stations based on the information contained in Exhibit 10, *Surface and Ground Water Field Measurements*. For example, Table 6 depicted Eagle Spring as having been monitored four times. However; upon review of the field measurement information in Exhibit 10, the site was visited approximately 30 times. The Permittee has updated Table 6 to reflect the number of sampling events/site visits for the respective monitoring points.

The Permittee was directed to revise discrepancies that were identified on page 7-83. The Permittee had stated that, "*Water measured on May 29th, 2007 within wells CR 06-01, CR 06-01 BLW and CR 06-02 during and after drilling has noted at a maximum water elevation of*

7,898 feet msl, over 100 feet below the lowermost spring elevation." Based upon the discussion in Chapter 7, monitoring wells CR 06-01, CR 06-01 BLW and CR 06-02 are characterized as being "*dry holes*". As a result, the sentence was misleading in that a water elevation of 7,898 feet msl at that location would appear to place the coal seam within the piezometric surface of the regional aquifer system. The Permittee has revised the sentence (now on page 7-84). As discussed above, several elevation errors were identified during the last technical analyses relative to the monitoring wells CR 06-01, CR 06-01 BLW and CR 06-02. The Permittee has corrected those measurements. In doing so, it provides a clearer picture as to the potential elevation of a regional groundwater system.

As it has now been established that monitoring wells CR 06-01, CR 06-01 BLW and CR 06-02 are dry holes, a reasonable assumption can be made as to a maximum water elevation. The base of the lowermost well screen is found in monitoring well CR 06-01 BLW at 7,697.1' msl (dry monitoring well). As a result, the maximum water elevation would be approximately 200 feet below the lowermost spring elevation (i.e. Aspen Spring which is located at approximately 7,940' msl). As the well completions are so much lower than the springs, the evidence indicating that the wells are dry and that the springs are located in the Eagle Canyon Graben (where mining activity is not proposed), the potential impacts to groundwater interception appear to be minimal.

REGIONAL AQUIFER:

The initial technical analysis (Task ID #2989) had identified a deficiency relative to the presentation of a regional aquifer system within the permit and adjacent area. The Permittee was directed to provide a more clear and concise presentation as to the groundwater characterization relative to the regional aquifer.

In Section R645-301-724.100, the Permittee discusses the presence of a regional groundwater aquifer that displays an "*east to west movement towards Mud Creek and Scofield Reservoir*". The Permittee utilized the perennial portions of Long and Miller Canyon as points in developing a water table surface projection for the regional aquifer. Points along Mud Creek and Scofield Reservoir were also used as additional points of contact in defining the western boundary of the regional aquifer. Additionally, the static water levels obtained from monitoring wells CR 06-03 ABV, CR 06-09, CR 10-11 and CR 10-12 were utilized.

The application discusses how the regional aquifer system consists of a water table or aquifer where all units below it have sufficient permeability to transmit water. Based upon the data collected thus far from the aforementioned monitoring points, the Permittee indicates that the piezometric surface includes deeper portions of the Blackhawk Formation and extends into the underlying Star Point and Mancos Shale formations. Map 7, *Regional Hydrology* depicts the present understanding of the piezometric surface. Map 8, *Works-Wells-Springs-Faults*, also depicts the piezometric surface as well as the fault network and spring locations.

Map 7A, *W-E Section A-A'*, depicts the piezometric surface of the regional groundwater aquifer and it's proximity to the coal seam. Due to the faulting within the permit area, local irregularities in the piezometric surface are likely to exist in areas adjacent to the faults. A previous technical analysis (Task ID #3646) directed the Permittee to provide additional information/clarification as to the regional aquifer, associated water level and its position relative to the coal seam.

Upon comparison of Map 15, *Mine Plan Layout and Production Schedule*, with Map 7A, it was unclear as to whether the proposed mine works were above or below the regional groundwater table. The Permittee was directed to:

- Clearly depict the western extent of the Eagle Canyon Graben on Map 7A and Map 15.
- Modify Map 7A or provide another cross-Section that depicts the extent of the mine works relative to the piezometric surface.
- Discuss within the text of the application the extent of mine workings (i.e. no mining planned within the Eagle Canyon Graben).
- Adjust the piezometric surface line on Map 7A to account for the lack of encountered groundwater in Monitoring Well CR 06-05A.

The revised Map 7A now clearly denotes the eastern extent of mining as well as the western extent of the Eagles Canyon Graben. Map 15 now clearly shows that the proposed mine works terminate west of the Eagles Canyon Graben. On page 7-86, the Permittee explicitly indicates that mining is not proposed within the Eagle Canyon Graben. Additionally, the piezometric surface has been revised to take into account the lack of groundwater encountered within monitoring well CR 06-05.

The Permittee was directed to provide further discussion as to the groundwater flow direction of the regional groundwater system. On page 7-20, the Permittee explores two possible interpretations based upon data collected from Scofield Reservoir, the perennial reaches of Mud and Miller Creeks as well as the monitoring well information. One interpretation of groundwater flow direction is in a general east to west pathway towards Scofield Reservoir. The Permittee bases this interpretation on the "*universal influence of gravity*". The Permittee further bases the west to east groundwater flow direction on the interpretation of the data obtained from the four monitoring wells that encountered the regional water table (CR 06-03 ABV, CR 06-09, CR 10-11 and CR 10-12). Data from these monitoring wells coupled with data from the two perennial streams (Mud Creek and Miller Creek) and elevation data from Scofield Reservoir, have been interpreted to indicate a regional groundwater table with a piezometric surface dipping westward with a east to west flow of groundwater.

The second possible interpretation is that the regional groundwater table follows the stratigraphic units dip to the north, north-east. Additional groundwater monitoring will be

necessary in order to accurately determine which interpretation/scenario is correct. As future mining is planned east of the Eagle Canyon Graben, the Permittee will conduct additional groundwater monitoring and well installations for baseline data collection. At that point, the additional groundwater data will provide a clearer understanding as to the extent of the regional groundwater table and its flow direction.

The initial technical analysis (Task ID #2989) had identified a deficiency as to the origin of recharge to seeps and springs identified within the permit and adjacent area. Beginning in Section R645-301-724.100, the application discusses the recharge to the perched groundwater systems that the seeps and springs discharge from. Recharge to these systems occurs primarily at higher elevation areas where outcrops are exposed to direct precipitation and surface infiltration of snowmelt. However, due to steep slopes and relatively small outcrop areas, the recharge to these springs is limited. The flow data presented for the springs in the permit and adjacent area supports this. With the exception of Sulfur Spring, the seeps and springs exhibit their greatest flows in late spring early summer during snowmelt. By mid to late summer, the discharges from these springs has either reduced significantly or stopped completely.

The initial technical analysis (Task ID #2989) identified a deficiency relative to groundwater rights within and adjacent to the permit area. The previous application did not provide a listing or map identifying groundwater rights within the permit and adjacent area. The Permittee discusses groundwater rights on page 7-35. Map 30, *Ground Water Rights* depicts the location of the groundwater rights. Table 11, *Ground Water Rights*, lists the groundwater rights depicted on Map 30.

The Permittee provides surface water right information beginning on page 7-53. Map 31, *Surface Water Rights* depicts the locations of the water rights listed in Table 12, Surface Water Rights.

Based upon a consultation with Marc Stillson of the Division of Water Rights (DWRi) Price Field Office, deficiencies were identified during a previous technical analysis (Task ID #3646) for both ground and surface water rights.

As a result of that analysis, the Permittee was directed to consult with the Price Division of Water Rights (DWRi) to produce a more accurate listing/depiction of the surface and ground water resources within the permit and adjacent area. Upon consultation with the Division of Water Rights, Price Field Office, it was determined that ground and surface water resources within 2 miles of the permit boundary were omitted/missed from the information in the application. The Permittee worked with Mr. Stillson of DWRi to address the ground and surface water rights within the permit and adjacent area. Maps 30 and 31 were revised to depict a 2 mile radius from the permit area. The text has been revised as well to accurately reflect the coverage of the ground and surface water right maps. Additionally, the Permittee (as advised by Mr. Stillson of DWRi) has revised Map 31 to depict the point to point diversions on Map 31.

The initial analysis (Task ID # 2989) had identified a deficiency relative to seeps and springs. The previous application had indicated that "*No seeps and springs were found within the permit area itself*". However; Eagle and Aspen spring are located within the permit area. The discrepancy has been addressed. Eagle Spring and Aspen Spring are located within the permit boundary and Map 7, *Regional Hydrology* has been revised to reflect that.

R645-301-724.100 establishes the minimum water quality descriptions required for baseline data. At a minimum, the water quality descriptions will include total dissolved solids or specific conductance, pH, total iron and total manganese. Table 10, *Surface and Ground Water Quality Summary*, provides a summary of the water quality data obtained during the baseline data collection operation. A previous technical analysis (Task ID #3646) directed the Permittee to provide the analytical results for total iron and total manganese for Angle Spring, Aspen Spring, Eagle Spring, Sulfur Spring, Miller Outlet, Mud Creek and Res-1 in Table 10. Table 10 has been revised to reflect the analytical results for total iron and total manganese for Angle Spring, Aspen Spring, Eagle Spring, Sulfur Spring, Miller Outlet, Mud Creek and Res-1. Additionally, Exhibit 12, *Surface and Ground Water Quality Data.*

Surface Water

Beginning on page 7-37, the Permittee provides the surface water information for the permit and adjacent area. Figure 7, *Regional Hydrology* depicts the surface water resources within the permit and adjacent area. Map 31, *Surface Water Rights*, depicts the locations of the surface water rights within the permit and adjacent area. Exhibit 13, *Water Rights*, provides the written documentation of the water rights as provided by the Utah Division of Water Rights. Table 10, *Surface and Ground Water Quality Summary,* provides a basic statistical summary of the water quality information obtained during the baseline data collection. The permit and adjacent areas are located within the Upper Price River basin.

Surface water in the permit and adjacent areas is limited to Scofield Reservoir, perennial flows within Mud Creek, Miller and Long Canyon and ephemeral flows from various side drainages and Eagle Canyon. The permit and adjacent area fall within the Upper Price River watershed. Perennial streams within the area adjacent to the mine site are Mud Creek and Miller Canyon. These drainages are tributary to Scofield Reservoir. The perennial streams within the permit and adjacent area include Mud Creek and Long/Miller Canyon. All of the other drainages within the permit and adjacent area are characterized as ephemeral (Monay Draw, Blue seal Draw, Kinney Draw, Columbine Draw, Jones Draw, UP Canyon and Eagle Canyon).

Baseline data was collected at three surface water monitoring points: Miller Outlet, Mud Creek and Res-1. Figure 7, *Regional Hydrology* depicts the location of these surface water monitoring points. Map 10, *Regional Water Quality* provides a depiction of the permit and

adjacent area with corresponding water quality diagrams for the baseline water monitoring stations.

Perennial Streams

No perennial streams are located within the permit boundary. Miller Canyon and Mud Creek are the only perennial streams located in the adjacent area of the permit boundary. Significant variation in flows has been recorded within these drainages. The baseline data presented in the application for Miller Canyon has noted variability from zero flow (in winter months when the stream is frozen) to 1.21 cubic feet per second (cfs) in the spring. Similarly, Mud Creek has produced flow variability's ranging from 11.0 cfs to 131.1 cfs.

The water quality data for these two drainages is presented in Table 10, *Surface and Ground Water Quality Summary, Exhibit* 12, *Surface and Ground Water Quality Data* and Figure 17, *Field Data.*

Intermittent Streams

A previous technical analysis (Task ID #3646) identified a deficiency relative to the characterization of intermittent streams within the permit and adjacent area. Page 33 of the previous application stated, "*Several small intermittent and ephemeral tributaries are located within and adjacent to the permit area, including UP Canyon to the south and Eagle Canyon to the North.*" No discussion of "*intermittent streams*" was provided in the previous application. The statement very clearly indicated that "*intermittent*" streams were present; however, no discussion or evidence was supplied with the application.

Upon discussing the statement with the Permittee, it was determined that the use of the term 'intermittent' was used erroneously. The Permittee has provided information in Exhibit 20, *Ephemeral Drainage Information* that discusses the drainages (other than the perennial area drainages of Mud Creek and Miller Outlet) located within the permit and adjacent area. Based upon that information as well as monitoring well information, the seven drainages located within or adjacent to the permit area (with the exception of Mud Creek and Miller Outlet) are ephemeral (See Ephemeral Streams discussion below). The Permittee has revised the application to remove all erroneous references to 'intermittent streams'.

Ephemeral Streams

A previous technical analysis (Task ID #3646) identified a deficiency relative to the characterization of the ephemeral drainages within and adjacent to the permit area. The previous application had discussed how when runoff occurs, it is either sheet flow or small concentrated flow within '*ephemeral channels*'. The Permittee was directed to clearly identify and characterize the drainages that intersect the surface facilities and additionally, provide additional

baseline information to address all drainages within and adjacent to the permit area (i.e. ephemeral, intermittent and perennial).

On page 7-40, the Permittee discusses the ephemeral drainages within the permit and adjacent area. Seven ephemeral drainages were identified. Of the seven, four are within or cross a portion of the permit boundary (from North to South): Eagle Canyon, Kinney Draw, Columbine Draw and Jones Draw. The remaining three ephemeral drainages are located outside the permit boundary (from North to South): Monay Draw, Blue Seal Draw and UP Canyon.

In Exhibit 20, the Permittee characterizes the ephemeral nature of these drainages by utilizing photographs, analyses of the drainages 3D geometry, alluvial and vegetative material as well as their position relative to the water table. Monitoring well CR 06-01 BLW is located directly adjacent to the Jones Draw. Measurable groundwater was not detected/encountered within this monitoring well. The bottom of the well screen is approximately 120 feet below Jones Draw. As a result, it's unlikely that the drainage receives any recharge from a groundwater system thus characterizing it an ephemeral (as opposed to intermittent) drainage.

Additionally, Exhibit 20 discusses how the 7 drainages outlined above are ephemeral based on the following observations:

- Relatively small drainage basins for these drainages,
- Low sinuosity,
- Absence of a defined channel,
- Minimal amounts of alluvium in the channel
- No noticeable difference between in channel vegetation and surrounding drainage basin vegetation.
- Virtual absence of bank and bed storage material.

A previous technical analysis (#3646) identified a deficiency regarding the ephemeral drainage presentation. In the first sentence of the last paragraph of page 1 of Exhibit 20, *Ephemeral Drainage Determination*, the Permittee states, "*The documented lack of running water alone, at any point in the year, disqualifies all four of these drainages from being classified as Perennial, a stream that flows year round.*" The Permittee was directed to document the number of times/frequency when zero flow was observed in the ephemeral drainages during the baseline data collection period. Exhibit 10, *Surface and Ground Water Field Measurements* and Figure 17, *Field Data* documents 21 observations of no flow for Eagle Canyon, Kinney Draw, Columbine Draw, Jones Draw, Monay Draw, Blue Seal Draw and the UP Canyon drainage. The field visits were documented by Carbon Resources, LLC representative Benjamin Grimes. The field visits began in May of 2006 and with the exception of 2008 (based upon discussions with the Permittee, lack of funding at this time terminated active field work), extended to October of 2010.

A previous technical analysis (Task ID #3779) had identified a deficiency in Exhibit 20, *Ephemeral Drainage Determination.* The Permittee was directed to revise the 1st sentence of paragraph three in Exhibit 20. In discussing the ephemeral drainages within the permit and adjacent area, the Permittee states, "*The reason these drainages were excluded from the baseline monitoring suite is simply because flowing water never observed in any of them during the baseline monitoring period.*" The application had been revised to document 21 field visits where flow was not observed in the 7 ephemeral drainages discussed in Exhibit 20 (See Exhibit 10 and Figure 17). The recorded field observations constitute baseline monitoring of these drainages. Additionally, the Permittee was directed to revise the last paragraph of page 8 of Exhibit 20 to reflect the number of site visits (21 visits, not 22) documented in Figure 17 and Exhibit 10. The Permittee has revised the statements.

Baseline Cumulative Impact Area Information

The application meets the Baseline Cumulative Impact Area Information requirements of the State of Utah R645-Coal Mining Rules.

The Permittee has provided the necessary hydrologic and geologic information to determine the cumulative impact area that will be utilized in the formulation of the Cumulative Hydrologic Impact Assessment (CHIA).

Modeling

The application meets the Modeling requirements of the State of Utah R645-Coal Mining Rules.

A previous technical analysis (Task ID #3646) identified a deficiency relative to the groundwater modeling that was conducted in analyzing the regional aquifer system. The Permittee was directed to provide a discussion as to how the model was constructed (i.e. assumptions, data points utilized, limitations etc) and to provide any summary reports or outputs from the model that can be reviewed in determining how the model was applied and constructed.

On page 7-79 of the application, the Permittee discusses the regional aquifer water modeling that was conducted. The Permittee utilized SERVCAD software with a triangulation interpellator and a 500 ft. grid size. Static water level data obtained from CR 06-09, CR 06-03ABV, CR 10-11 and CR 10-12 were utilized in constructing the model. Additionally, limiting data provided by the screened interval elevation in dry monitoring wells CR 06-01BLW and CR 06-05A was data input for the model. The perennial reaches of Mud Creek and Miller Creek were also utilized in constructing a 3D image of the regional aquifer system.

In order to the design the collection system ditches and culverts, the Permittee utilized Hydrologic Modeling Software (HEC-HMS) 3.1.0 developed by the Army Corps of Engineers using the Soil Conservation Service (SCS) curve number loss method and the SCS unit hydrograph transform method.

Drainage basins were delineated in AutoCAD by utilizing existing and proposed elevation contour data and the location of proposed pads and storm drainage facilities. Drainage basins were modeled in HEC-HMS using the SCS unit hydrograph transform method.

Probable Hydrologic Consequences Determination

The application meets the Probable Hydrologic Consequences (PHC) requirements of the State of Utah R645-Coal Mining Rules.

The Permittee provides a thorough discussion of the Probable Hydrologic Consequences of the proposed mining activity beginning on page 7-80 in Section R645-301-728.

Groundwater Impacts

Based upon the installation of eleven monitoring wells during the baseline data collection period, five of the wells did not produce appreciable water. All but three of the wells within the proposed portal block are dry.

- Potential impacts to groundwater resources include:
- Alterations of local ground water flow patterns
- Drainage of seeps/spring
- Alteration of recharge/storage/discharge relations
- Localized increases in concentrations of TDS.

Based upon the overall lack of groundwater encountered during the baseline data collection, the potential for mining related consequences to groundwater within the permit and adjacent area is limited. Monitoring wells CR 06-01, CR 06-01BLW and CR 06-02 are dry. The base of the well screen in the lowermost of these monitoring wells (CR 06-01 BLW) is 7,697.1'. This elevation is approximately 200' below the elevation of Aspen Spring.

Surface Water Impacts

The Permittee discusses surface water impacts beginning on page 7-87. The amount of surface water resources within the permit and adjacent are limited. No perennial or intermittent streams are located within the permit area. Mud Creek and the lower portions of Long Canyon are the only perennial drainages in the area.

There are 5 ephemeral drainages located within the permit and adjacent area. Based upon the lack of water encountered during the extensive monitoring well installations, the Permittee has demonstrated that these drainages are ephemeral in nature. Given that the proposed mining does not include secondary mining or planned subsidence, the potential for impacts to these drainages is considered minimal.

Scofield Reservoir is located within the adjacent area of the proposed mining. Potential water quality impacts to the reservoir will be negated by the sediment control plan. The generated stormwater runoff will be routed through a series of diversions and ultimately report to the primary sediment pond. The sediment pond has been sized to the performance standards outlined in the State of Utah R645-Coal Mining Rules. Additionally the Permittee has obtained a UPDES Clean Water Act permit that establishes compliance limits for the sediment pond discharge that will report to Scofield Reservoir.

Water Monitoring Plan

The application meets the Groundwater Monitoring Plan requirements of the State of Utah R645-Coal Mining Rules.

On page 7-108 of the application, the Permittee discusses the water monitoring plan. Table 20, *Hydrologic Monitoring Schedule*, lists the water quality parameters that will be analyzed for the operational and post-mining phases. The table notes that lab water quality results will be submitted within 90 days following the end of the quarter. Additionally, a hydrologic review and summary of data will be submitted on or before June 1st. Table 7, *Kinney Mine Operational Monitoring Stations*, lists the sites that will be monitored during the operational phase. Map 28, *Surface & Ground Water Monitoring Sites*, depicts the locations of the proposed monitoring sites.

The initial technical analysis (Task ID #2989) had identified deficiencies relative to the water monitoring plan. The Permittee was directed to provide a table that clearly identified the monitoring schedule and sample parameters for each individual water-monitoring site. Additionally, the Permittee was directed to provide a clear presentation as to what sites are to be monitored. The initial application had identified CR 06-03 ABV and Angle Spring as water monitoring sites. However; due to access issues and well sealing, these sites could not be monitored. The aforementioned tables and maps have been revised to address those deficiencies.

The initial technical analysis (Task ID #2989) had also identified a deficiency relative to monitoring well CR 06-03 ABV. The Permittee had stated, "*The first of these wells is located in Eagle Canyon and has been ordered to be abandoned by DOGM.*" The Permittee has removed this sentence as it was not the Division who ordered the abandoning of the well, but rather the landowners.

A deficiency had also been identified relative to the sampling of Eagle and UP Canyons. Based upon the Ephemeral Drainage Determination information presented in Exhibit 20, these drainages are ephemeral and flow only in response to direct precipitation and snowmelt events. As such, sampling these drainages would not provide useful data.

Findings:

The application does not meet the Hydrologic Resource Information Requirements as required by the State of Utah R645-Coal Mining Rules. The following deficiencies must be addressed prior to Division approval:

R645-301-724.100: The Permittee must address the statements on pages 7-14 and 7-135 that indicate that monitoring well information is provided in Figure 17. The previous technical analysis (Task ID #3779) directed the Permittee to revise statements on page 7-21 and 7-135 that refer to Figure 17, *Field Data* as containing field data for monitoring wells. Figure 17 does not contain any monitoring well data. The references remain within the application now on pages 7-14 and 7-135.

MAPS, PLANS, AND CROSS SECTIONS OF RESOURCE INFORMATION

Regulatory Reference: 30 CFR 783.24, 783.25; R645-301-323, -301-411, -301-521, -301-622, -301-722, -301-731.

Analysis:

Monitoring and Sampling Location Maps

The application meets the Monitoring and Sampling Location Maps requirements of the State of Utah R645-Coal Mining Rules. Map 7, *Regional Hydrology*, depicts the ground and surface water monitoring locations that were utilized obtaining baseline ground and surface water data.

Subsurface Water Resource Maps

The application meets the Subsurface Water Resource map requirements of the State of Utah R645-Coal Mining Rules.

A previous technical analysis (Task ID # identified a deficiency with the Spring and Seep Survey map. Due to the scale of the map, it was not possible to identify the seeps and springs identified in the survey. The Permittee has placed the seeps and springs identified in the survey (See Exhibit 9) on Map 7, Regional Hydrology and provided a footnote in the Spring and Seep Survey directing the reader to Map 7.

A previous technical analysis (#3646) identified a deficiency relative to groundwater rights located within the permit and adjacent area. A map depicting the location of the groundwater rights had not been included with the previous application. The Permittee has provided the requested information in Map 30, *Ground Water Rights Locations*.

A previous technical analysis (#3646) had also identified a deficiency relative to a cross-Sectional map that depicted the relationship between the coal seam to be mined and the groundwater levels encountered during the baseline data collection period. The Permittee has provided the information on Map 7A, *W-E Section A-A'*.

Surface Water Resource Maps

The application meets the Surface Water Resource maps requirements of the State of Utah R645-Coal Mining Rules.

Map 7, *Regional Hydrology*, depicts the surface water resources within the permit and adjacent area. In addition, Map 31, *Surface Water Right Locations,* depicts the surface water rights located within the permit and adjacent area.

The initial technical analysis (Task ID #2989) identified a deficiency relative to the depiction of the ephemeral and perennial streams on Map 7, *Regional Hydrology*. The Permittee was directed to depict the ephemeral drainages within the permit and adjacent area (specifically the UP and Eagle Canyon drainages). Additionally, it was requested that the perennial drainages be depicted as such with a continuous blue line.

The Permittee has revised Map 7, *Regional Hydrology* to depict both the ephemeral and intermittent drainages.

Well Maps

The application meets the Well Maps requirements of the State of Utah R645-Coal Mining Rules.

A previous initial technical analysis (#2989) identified a deficiency relative to the depiction of water wells within the permit and adjacent area. Map 30, *Ground Water Rights Locations* depicts the locations of the wells with associated water rights within the permit and adjacent area. Based upon a consultation with Division of Water Right staff in the Price Field Office, there were water wells that were missed/omitted from the application. The Permittee has consulted with the Division of Water Rights and revised the water right information relative to wells.

Exhibit 13, *Water Rights*, provides the information associated with the identified ground and surface water rights located within the permit and adjacent area. The water right information contains the locations and depths of the water wells in the area.

Findings:

The application meets the Maps, Plans and Cross Sections of Resource Information requirements of the State of Utah R645-Coal Mining Rules.

OPERATION PLAN

SUBSIDENCE CONTROL PLAN

Regulatory Reference: 30 CFR 784.20, 817.121, 817.122; R645-301-521, -301-525, -301-724.

Analysis:

Renewable Resources Survey

The application meets the Renewable Resources Survey requirements of the State of Utah R645-Coal Mining Rules.

No secondary mining, or pillar extraction, or longwall mining that would result in subsidence is planned for the Kinney No. 2 Mine. With the absence of such methods, no subsidence is anticipated. As a result, a renewable resources survey is not required at this time.

If at some point in the future, the Permittee proposes to implement any form of secondary mining/pillar extraction, a renewable resources survey will be required at that time.

The application provides ground and surface water right information in Exhibit 13, *Water Rights*. In addition, the application provides maps that depict the ground and surface water rights in the permit and adjacent area on Maps 30 and 31 respectively.

Subsidence Control Plan

The application meets the Subsidence Control Plan requirements of the State of Utah R645-Coal Mining Rules.

In chapter 5 of the application, the Permittee discusses the mining techniques to be utilized. No secondary mining, or pillar extraction, or longwall mining that would result in subsidence is planned for the Kinney No. 2 Mine. With the absence of such methods, no subsidence is anticipated.

The mine plan is based on the retention of barrier pillars and first mining only, with no pillar extraction. This design, combined with the mining depth, should minimize fracture propagation at or near the ground surface in areas overlying the underground workings. As a result, the potential for drainage of overlying perched aquifer systems and alteration of surface infiltration characteristics is minimal.

Findings:

The application meets the Subsidence Control Plan requirements of the State of Utah R645-Coal Mining Rules.

ROAD SYSTEMS AND OTHER TRANSPORTATION FACILITIES

Regulatory Reference: 30 CFR Sec. 784.24, 817.150, 817.151; R645-301-521, -301-527, -301-534, -301-732.

Analysis:

Plans and Drawings

The application meets the Plans and Drawings requirements of the State of Utah R645-Coal Mining Rules for Road Systems and Other Transportation Facilities.

The application discusses the roads to be constructed on page 7-126 of the hydrology chapter. Maps 20, 21 and 22 provide the profile views for the proposed roads to be utilized during the operational phase of mining.

Map 13, *Surface Facilities*, depicts the locations of all 7 roads to be utilized. The locations for all associated drainage ditches are provided on Map 24, *Drainage and Sediment Control Plan Disturbed Drainage Areas.* Map 27, *Runoff Control Details* provides detailed design and installation information for the components of the road drainage system. Table 18, *Ditch Design Details*, provides a table of the dimensions and design criteria for all diversion ditches. Table 19, *Culvert Design Details* provides the design information/criteria for all disturbed and undisturbed drainage culverts to be constructed on the site. Exhibit 16, *Runoff Control Design Details*, provides the hydrologic and hydraulic calculations that were utilized in designing and sizing the surface runoff control plan and associated components. Figure 25, *Typical Primary Road Configuration*, provides a cross-Sectional view of the road design to be implemented for all roads (PR1-PR-7).

The application provides detailed road construction and design on page 5-49 of the application. The application proposes the utilization of 7 primary roads.

- PR-1 Primary mine access road for the proposed surface facilities area
- PR-2 Primary mine Access road to Mine Office Pad
- PR-3 Primary mine access road to the Portal Pad
- PR-4 Primary mine access road to the Storage Area Pad
- PR-5 Primary mine access road to the Loadout Pad
- PR-6 Primary mine access road to the Sedimentation Pond No. 1

- PR-7 Primary mine access road to the North Access Road.

Utah Highway SR 96 will require modifications prior to coal mining activity. The Utah Department of Transportation (UDOT) requires a standard interSection design that provides turn lanes into the mine site from both directions as well as through lanes and acceleration and deceleration lanes. UDOT approval has not yet been provided, but will be included in Exhibit 4 once obtained.

A previous technical analysis (Task ID #3779) requested additional design information for the post-mining-land-use roads (PMLU). The Permittee has provided the additional design information. Figure 25A, *Primary Roads P8 and P9*, provides a cross-Sectional view of the two PMLU roads P8 and P9. The figure denotes that water bars will be placed at grade changes and/or at 300' spacing or per US Forest Services Standards, whichever is less. Both P8 and P9 will be graded towards the in-slope where a diversion ditch (UDD-1) will convey flow to the primary sediment pond during the interim reclamation phase. During the final reclamation phase, the runoff will be diverted to PMLU culvert UDC-2 (for PMLU Road P9) or to the existing UDOT culvert at the main access road (PMLU Road P8). As required by R645-301-742.323, the diversion ditches for both PMLU roads P8 and P9 have been designed to safely convey the 100-year, 6-hour rainfall event. PMLU culvert UDC-2 has also been designed to safely convey the runoff from a 100-year, 6-hour event. Map 22, *Mine Surface Facilities Road Profiles*, provides the profiles for PMLU roads P8 and P9. Section R645-301-527, Transportation Facilities, has been updated to list both PMLU roads PR-8 and PR-9 as primary roads.

Table 18, *Ditch Design Details*, provides the criteria that were utilized in designing permanent diversion ditches UDD-1 and UDD-2. Exhibit 16, *Runoff Control Design Details*, provides the calculations for the sizing of both the permanent diversion ditches to be utilized for PMLU roads P8 and P9, and also for permanent culvert UDC-2. For both the permanent diversion ditches and the culvert, a 100-year, 6-hour design storm event was utilized in sizing those drainage features.

Performance Standards

The application meets the Performance Standards for Road Systems as required by the State of Utah R645-Coal Mining Rules.

As required by R645-301-742.423.1, the primary roads have been designed to safely pass the 10-year, 6-hour storm event. Exhibit 16, *Runoff Control Design Details*, provides the hydrologic and hydraulic calculations that were utilized in designing and sizing the surface runoff control plan and associated components.

In order to the design the collection system ditches and culverts, the Permittee utilized Hydrologic Modeling Software (HEC-HMS) 3.1.0 developed by the Army Corps of Engineers using the Soil Conservation Service (SCS) curve number loss method and the SCS unit hydrograph transform method. Drainage basins were delineated in AutoCAD by utilizing existing and proposed elevation contour data and the location of proposed pads and storm drainage facilities. Drainage basins were modeled in HEC-HMS using the SCS unit hydrograph transform method. The sub-basins peak flows were then calculated in order to properly size the culverts and diversion ditches.

Findings:

The application meets the Road Systems and Other Transportation Facilities requirements of the State of Utah R645-Coal Mining Rules.

SPOIL AND WASTE MATERIALS

Regulatory Reference: 30 CFR Sec. 701.5, 784.19, 784.25, 817.71, 817.72, 817.73, 817.74, 817.81, 817.83, 817.84, 817.87, 817.89; R645-100-200, -301-210, -301-211, -301-212, -301-412, -301-512, -301-513, -301-514, -301-521, -301-526, -301-528, -301-535, -301-536, -301-542, -301-553, -301-745, -301-746, -301-747.

Analysis:

Disposal of Noncoal Mine Wastes

The application meets the Disposal of Noncoal Mine Wastes as required by the State of Utah R645-Coal Mining Rules.

On page 5-75 and 7-120, the Permittee discusses the generation and disposal of noncoal waste. The application discusses that used oil and lubricants, garbage, paper waste, machinery parts, tires, cable, wood waste and other miscellaneous debris will be generated by the proposed mining activity. Smaller sized noncoal solid wastes will be stored in dumpsters. Larger solid waste materials (i.e. used equipment, machinery parts, tires etc.) will be temporarily stored in designated storage yards as located on Map 13, *Surface Facilities*.

A contract disposal service will regularly collect and haul the smaller noncoal solid wastes from the dumpsters to the permitted Carbon County municipal landfill, or to the East Carbon Development Corporation facility.

Depending on market conditions for used machinery, scarp, metal etc., the larger noncoal solid waste will be collected periodically either by a salvage contractor or by a contract disposal firm which will haul these materials off-site to a permitted disposal site.

Any waste other than used oil/lubricants that don't meet applicable EPA requirements will be collected and stored in either closed drums or in the waste oil storage tank located in the maintenance shop building. The temporary storage areas for this waste will provide for full containment in order to prevent an accidental release of petroleum products to flow into the sites surface drainage system.

Coal Mine Waste, Refuse Piles, Return of Coal Processing Waste to Abandoned Underground Workings

The application meets the Coal Mine Waste requirements of the State of Utah R645-Coal Mining Rules.

The initial technical analysis (Task ID #2989) and previous technical analysis (Task ID #3646) identified a deficiency relative to the potential coal mine waste. Surface facility item number 9 on Map 13, *Surface Facilities*, is listed as a screening and crushing building. If screening is to occur at the mine site, it was assumed that some form of residual material (i.e. coal mine waste) will be produced as a result of that process.

A previous application submittal (Task ID #3646) had utilized the term '*mine development rock*' which is not a defined term per the State of Utah R645-Coal Mining Rules. The Permittee discussed how during mine development, mining operations and ancillary operations, 'mine development rock' will be produced. The application discussed how, when feasible, the material will be separated and handled separately from the coal.

The Permittee was directed to provide a clear and concise discussion as to how generated coal mine waste will be handled. Depending on the nature of the material, specific hydrologic design criteria must be addressed.

On page 5-70 of the application, the Permittee discusses three potential classes or categories of generated material that could be classified as coal mine waste.

1) Rock with no coal
2) A mixture of coal and rock
3) Dirty coal (high ash or high sulfur content)

The Permittee has revised the application to refer to coal mine waste, underground development waste or coal processing waste as opposed to "underground development rock" or "mine development rock". A coal waste handling schematic is provided in Figure 41.

The coal processing waste (Items 2 and 3 above) that is generated will be placed on a "non-spec coal pile" (See Map 13, *Surface Facilities*, Item 7 and Figure 41). The Permittee discusses how the material that is placed on this pile will either be blended into the saleable coal

product, or if the volume of this coal processing waste becomes too great, it will be moved to a temporary coal processing waste storage pile (See map 13, *Surface Facilities*, Item 38 and Figure 41). The Permittee indicates that "*When sufficient volume of coal processing waste is accumulated on this temporary pad, it will then be sold, as "distressed coal", to the Arch Coal Washing Facility on Ridge Road south of Price, UT.*" In each instance, the coal processing waste will be sold and removed from the property. The Permittee has committed to providing a copy of the contract with the Arch Coal Washing Facility. Additionally, the Permittee has indicated that the Covol Facility in Wellington would receive the coal processing waste.

The underground development waste (Item 3 above) is also discussed. The application discusses how the material will returned to designated areas of the underground mine workings. As the underground development waste is generated, it will be temporarily stock-piled on the off-spec coal pile (See Map 13, *Surface Facilities*, Item 7 and Figure 41) until it's possible to return the material underground. Map 15, *Mine Plan Layout & Production Schedule Map* depicts the areas where this material will be permanently stored.

Each of the generated wastes discussed above (i.e. coal processing waste and underground development waste) will be temporarily stored on the surface facility. As a result, the materials are not considered refuse and the performance standards required for a refuse pile are not applicable at this time. However, if the either of these wastes is stored at the site for a period longer than 2 years, the Division could deem the material to be refuse. If that occurs, then all applicable performance standards and design criteria relative to refuse piles would need to be addressed and complied with.

Impounding Structures

The application meets the Impounding Structures requirements of the State of Utah R645-Coal Mining Rules. The application does not propose constructing an impound structure out of coalmine waste.

Excess Spoil:

The application meets the Excess Spoil requirements of the State of Utah R645-Coal Mining Rules.

The State of Utah R645-Coal Mining Rules define 'spoil' as overburden that has been removed during coal mining and reclamation operations. This material is generally associated with surface mining operations. As the proposed Kinney No. 2 mine site is an underground operation, the excess spoil regulations don't apply.

Acid and Toxic Forming Materials:

The application meets the Acid and Toxic forming materials regulations of the State of Utah R645-Coal Mining Rules.

Section 528.320 states that the maximum time the temporary waste pile will remain on the surface is two years. Section 515.300 of the MRP states that during periods of temporary cessation lasting 30 days or more, one composite waste sample will be drawn from the temporary waste pile. The Permittee indicates on page 5-4, that the sample(s) will be "*analyzed for parameters listed on Tables 3 and 7 in the UDOGM January 2008 Guidelines for Management of Topsoil and Overburden*". The Permittee indicates on page 5-4 that the sampling would be conducted for each 5,000 tons of material that is generated and placed on the temporary coal processing waste pile.

Findings:

The application meets the Spoil and Waste Materials and Acid and Toxic Forming Materials requirements of the State of Utah R645-Coal Mining Rules.

HYDROLOGIC INFORMATION

Regulatory Reference: 30 CFR Sec. 773.17, 774.13, 784.14, 784.16, 784.29, 817.41, 817.42, 817.43, 817.45, 817.49, 817.56, 817.57; R645-300-140, -300-141, -300-142, -300-143, -300-144, -300-145, -300-146, -300-147, -300-147, -300-148, -301-512, -301-514, -301-521, -301-531, -301-532, -301-533, -301-536, -301-542, -301-720, -301-731, -301-732, -301-733, -301-742, -301-743, -301-750, -301-761, -301-764.

Analysis:

General

The application meets the General Hydrologic Information requirements of the State of Utah R645-Coal Mining Rules. Chapter 7 of the application provides an extensive discussion and presentation of ground and surface water resources within the permit and adjacent area.

Groundwater Monitoring

The application meets the Groundwater Monitoring requirements of the State of Utah R645-Coal Mining Rules.

Table 20, *Hydrologic Monitoring Schedule* provides a list of the water quality parameters that will be analyzed during the operational and post-mining phases of the project. Table 7, Kinney Mine Operational Monitoring Stations provides a comprehensive list of the surface, ground and monitoring well sites that will be monitored. Eagle Springs and Seeps 1, 1A, 2 and 3

have been added to the monitoring program to further evaluate/quantify the flows of these resources.

Surface Water Monitoring

The application meets the Surface Water Monitoring requirements of the State of Utah R645-Coal Mining Rules.

The application discusses the surface water monitoring plan in Section R645-301-731.200. The Permittee will monitor Mud Creek, Miller Outlet and Scofield Reservoir as part of the operational surface water monitoring plan.

The locations of the surface water monitoring points are show on Map 7, *Regional Hydrology* as well as Map 28, *Surface and Ground Water Monitoring Sites*. Table 20, *Hydrologic Monitoring Schedule,* provides the list of parameters that will be analyzed for the surface water monitoring points. The Permittee commits to providing copies of both field data and laboratory analysis sheets to the Division on a quarterly basis. Additionally, the Permittee indicates that an annual water quality summary will be submitted to the Division on or before June 1st. Table 7, Kinney Mine Operational Monitoring Stations provides a list of the surface water points that will be monitored.

Transfer of Wells

The application meets the Transfer of Wells requirements of the State of Utah R645-Coal Mining Rules.

In Section R645-301-748 of the application, the casing and sealing of wells is discussed. The Permittee commits to plugging and sealing all exploration boreholes and any boreholes which have been converted to monitoring wells during mining reclamation.

In Section R645-301-755, the Permittee outlines the methods to be utilized in plugging any water monitoring wells/boreholes. The boreholes or casing will be sealed with cement to form a plug from the bottom of the hole to at least 20 feet above any zone of completion or water bearing rock strata. The remainder of the hole will be filled with concrete to within 20 feet of the ground surface and then filling the remainder of the hole to the ground surface with cement to form a surface plug. In addition, the Permittee commits to placing a steel fence post in the center of the surface plug before the cement sets up in order to provide a permanent marker of the hole location.

Discharges Into an Underground Mine

The application meets the Discharges into Underground Mine requirements of the State of Utah R645-Coal Mining Rules.

The initial technical analysis (#2989) identified a deficiency regarding the potential for discharges into the underground mine Per R645-301-731.510. On page 5-102, the application discusses the mine portal area where surface water could potentially enter into the mine. Map 17, *Mine Surface Facilities Area Pre-Mining, Mining & Post Mining Cross Sections*, shows a typical cross Section of the portals. The portal pad will be graded to prevent surface runoff water from entering the mine.

Gravity Discharges from Underground Mines

The application meets the Gravity Discharges From Underground Mines requirements of the State of Utah R645-Coal Mining Rules.

On page 5-41 of the application, the Permittee states, "*potential mine inflows are expected to be minimal and there will be sufficient storage capacity in both the existing abandoned underground mine workings and in inactive working areas*".

A previous technical analysis (Task ID #3646) had identified a deficiency regarding inflows of groundwater to the underground workings. The Permittee was directed to provide a commitment that if significant amounts of groundwater are encountered underground; a water right will be obtained or an existing water right altered by the Utah Division of Water Rights prior to utilizing in-mine ground water encountered during active coal operations.

The Permittee indicates in Section R645-301-731.800 that Carbon Resources is the owner of two shares of Scofield Reservoir water and is reserving this water right in the event of any potential mitigation that may be required due to coal mining activity. The Permittee indicates that per a discussion with Mr. Marc Stillson of Division of Water Rights, two shares of Scofield Water is an ample volume to cover any potential water loss.

A previous technical analysis (Task ID #3646) identified a deficiency regarding the potential for the discharge of mine-water. The initial application had proposed methods for the disposal/handling of any in-mine water. The previous application had deleted several components that were included previously. The Permittee discusses the proposed methods of dealing with encountered groundwater on page 7087. They include: discharging the water to abandoned Sections of the mine works, shallow or deep well injection, treatment and discharge to Mud Creek and discharge to holding/evaporation ponds. The Permittee indicates that prior to either discharging the water to Mud Creek or utilizing evaporation ponds, the requisite plans and permits will be obtained from the appropriate regulatory agencies.

Upon completion of mining activity, the Permittee commits to sealing and backfilling all mine openings to prevent any potential for ground water discharge or surface water inflows in mine portal areas or boreholes.

Water-Quality Standards and Effluent Limitations

The application meets the Water-Quality Standards and Effluent Limitations requirements of the State of Utah R645-Coal Mining Rules.

The Permittee has obtained a Utah Pollutant Discharge Elimination System (UPDES) permit. The Utah Division of Water Quality issued the Permittee a UPDES permit on June 15th, 2010. Exhibit 4 contains the UPDES permit.

The UPDES permit authorizes the Permittee to discharge from Outfall 001 (lone sedimentation pond) to Mud Creek and Scofield Reservoir. The permit expires on April 30th, 2013. The Permittee will be required to sample for flow, oil and grease, total iron, total suspended solids and pH every month.

Diversions: General

The application meets the Diversions: General requirements of the State of Utah R645-Coal Mining Rules.

The Permittee discusses the diversions to be utilized at the site in Section R645-301-742.300. Map 23, *Drainage and Sediment Control Plan* depicts the undisturbed drainage areas. Map 24, *Drainage and Sediment Control Plan* depicts the disturbed drainage areas and all temporary diversions. Map 25, *Sedimentation Pond 1 Sections and Details*, depicts the diversions from the primary detention pond. Map 26, *Drainage and Sediment control Plan Disturbed Drainage Sub-Basins* depicts the sub-watersheds utilized to calculate the peak storm flow and sizing of the disturbed area diversions. Map 29, *Mine Surface Facilities Area Post Mining Topography and Interim Drainage Control* depicts the diversions to be utilized following reclamation. Design calculations for temporary and permanent diversions are provided in Exhibit 16, *Runoff Control Design Details*. The surface facilities will be constructed to intercept and divert surface runoff flows from undisturbed up gradient areas around the mine surface facilities areas.

Diverting the undisturbed drainage around the mine-site will greatly minimize the potential for erosion and sedimentation impacts and also significantly reduce the requirements for retention and treatment of surface runoff from the disturbed area. The application discusses how the diversion structures to be utilized will include both temporary diversions (used to control undisturbed runoff during the operational phase of mining and reclamation) as well as

permanent diversions (used to restore effective surface drainage following the completion of mining activity).

A previous technical analysis (Task ID #3545) had identified a deficiency relative to the post-mining topography. The Permittee was direct to clarify the diversion language in Section R645-301-742.300. In the third paragraph of the Section, the previous application stated, "*As can be seen on Map 29, Mine Surface Facilities Area-Post Mining Topography, the reclaimed channel is in reality short, and thus has little potential for significant alignment variation.*" Additionally, the paragraph referred to "*culverted chancel USC-1*". It appeared that this was a typo as no drainage feature was identified/labeled as "USC-1". The Permittee has corrected the typo by changing the reference of USC-1 to UDC-1. Additionally, the language now clearly discusses that UDC-1 will be utilized as a diversion of undisturbed drainage through the permit/disturbed area. During reclamation, culvert UDC-1 will be removed and pre-mining topography restored.

The previous technical analysis had identified a deficiency relative to permanent diversion ditches UDD-1 and UDD-2. The ditches were identified as "permanent structures". However, upon review of Map 29, the diversion ditches were not depicted as part of the permanent topography/drainage network. The Permittee has revised Map 29 and included Map 29A to clearly depict the diversion ditches as permanent features.

The Permittee has revised Map 29, Post Mining Topography & Interim Drainage Control and provided Map 29A, Post Mining Topography to depict the interim and final drainage control features.

A previous technical analysis (Task ID #3779) had directed the Permittee to revise the 4th paragraph on page 7-126. The application indicates that ditch DE-2 is a component of the interim drainage control. However; Map 29 does not depict DE-2 as part of the interim drainage control. It appears that the text incorrectly references ditch DE-2 rather than ditch DE-4. The Permittee has corrected the typo and correctly referenced DE-4.

Diversions: Perennial, Intermittent Streams and Miscellaneous Flows

The application meets the Diversions: Perennial and Intermittent Streams requirements of the State of Utah R645-Coal Mining Rules.

The initial technical analysis (Task ID #2989) identified a deficiency relative to the diversions proposed at the site. The Permittee was directed to provide more information to characterize the drainages that intersect the site. The Permittee has indicated that several small ephemeral drainages intersect the permit area. The drainages are characterized and discussed in Exhibit 20. Map 24, *Drainage and Sediment Control Plan Disturbed Drainage* areas depicts the drainage control plan for the surface facility. Undisturbed drainage will be routed around the site

with culvers (UDC-1 and UDC-2 respectively). The drainages reporting to these culverts have been characterized as ephemeral.

No perennial or intermittent streams are located within the area of the proposed surface facility.

Stream Buffer Zones

The application meets the Stream Buffer Zone requirements of the State of Utah R645-Coal Mining Rules.

A stream buffer zone will not be required with the proposed mining operation. No intermittent or perennial streams are located within the proposed disturbed area.

Sediment Control Measures

The application meets the Sediment Control Measure requirements of the State of Utah R645-Coal Mining Rules.

Erosion and sediment control measures are discussed in Section R645-301-732. Runoff generated on the site during mining operations will be contained and controlled by utilizing a network of ditches, culverts, a sedimentation pond and alternate sediment control methods. The network will be comprised of diversion ditches which route undisturbed runoff around or through the disturbed area, collection ditches which intercept disturbed area runoff and route it to the sedimentation pond and the sediment pond.

The Permittee commits to utilizing various drainage control measures to prevent or mitigate excessive erosion and sediment transport. These measures include: the placement of straw bales, sediment fence, erosion netting, mulch berms, stilling basins, sumps and other small structures to control and surface runoff and limit erosion.

Map 27, *Runoff Control Details*, provides the design drawings for various components of the sediment control measures to be implemented at the site. The drawings include typical silt fence and straw bale installations, headwall protection measures, channel designs and drainage berm details.

Siltation Structures: Sedimentation Ponds

The application meets the Siltation Structures: Sedimentation Ponds requirements of the State of Utah R645-Coal Mining Rules.

The primary sediment control measure to be implemented at the mine site is a sole sediment pond. Map 25, *Sedimentation Pond 1 Section & Details*, provides the design drawings for Sediment Pond 1. Map 24, *Drainage And Sediment Control Plan Disturbed Drainage Areas* depicts the location of the sediment pond relative to the undisturbed drainage areas east of the mine site.

Exhibit16, *Runoff Control Design Details*, provide the design calculations and methodology utilized in designing the sediment pond. As required by R645-301-742.221.33, the sediment pond has been designed to retain the surface runoff volume produced a 10-year, 24-hour storm event. The runoff generated from the adjacent undisturbed areas is to be diverted around the mine site and as such, were not considered in the sediment pond design.

Technical analysis Task ID #3779 directed the Permittee to discuss how it will be determined when the sediment pond no longer has the capacity to adequately treat/retain the design storm. The Permittee commits to installing a staff gage in the sediment pond that will be clearly marked so it can be visually monitored. Marks will be established at an elevation of 7,683.80 (5.3 year sediment level) and at each 0.5' level below that. This will allow the mine and Division inspectors to clearly identify when the sediment needs to be removed.

In Section 526.300, the application discusses the sediment pond maintenance procedures. The sediment pond maintenance procedures include: ongoing sampling and discharge monitoring under applicable provisions of the UPDES permit, quarterly inspections of pond embankments, impoundment areas, discharge structures and inlet/outlet structures as well as reporting any hazardous conditions, maintenance and repair of any problems noted during the inspections as well as the periodic removal of accumulated sediment. Control of potential water quality impacts from pond discharge will be monitored through the compliance with the UPDES permit. During the quarterly inspections, the depth and elevation of any impounded water will be measured and based on those measurements; the storage capacity will be estimated as well. If the inspections identify any potential public hazard, the Permittee will promptly notify the Division.

Discharge Structures

The application meets the Discharge Structure requirements of the State of Utah R645-Coal Mining Rules.

The pond has been designed with vertical risers for both the primary and emergency spillways. The primary spillway is set at an elevation of 7,683.80 feet. The primary spillway will be used to dewater the pond and discharge stormwater inflows. The invert of the emergency spillway will be set at an elevation of 7,686.9 feet. The spillways have been over-designed to safely pass the 100-year, 6-hour event (as opposed to the 25-year, 6-hour event as required by

rule). The principal and emergency spillways were over designed to provide additional safety due to the proximity of the sediment pond to SR 96.

Findings:

The application meets the Hydrologic Information requirements of the State of Utah R645-Coal Mining Rules. The following deficiencies must be addressed prior to Division approval:

MAPS, PLANS, AND CROSS SECTIONS OF MINING OPERATIONS

Regulatory Reference: 30 CFR Sec. 784.23; R645-301-512, -301-521, -301-542, -301-632, -301-731, -302-323.

Analysis:

Monitoring and Sampling Location Maps

The application meets the Monitoring and Sampling Location Maps requirements of the State of Utah R645-Coal Mining Rules.

Map 28, *Surface & Ground Water Monitoring Sites*, depicts the locations of the ground and surface water monitoring sites.

Findings:

The application meets the Monitoring and Sampling Location Maps requirements of the State of Utah R645-Coal Mining Rules.

RECLAMATION PLAN

MINE OPENINGS

Regulatory Reference: 30 CFR Sec. 817.13, 817.14, 817.15; R645-301-513, -301-529, -301-551, -301-631, -301-748, -301-765, -301-748.

Analysis:

The application meets the Mine Opening requirements of the State of Utah R645-Coal Mining Rules.

In Section R645-301-551 of the application, the Permittee discusses the sealing all mine openings. On completion of mining and related activities, all mine openings including portals, shafts, raises, boreholes and wells will be stabilized and sealed unless they are utilized for ongoing monitoring. The portals will be sealed by constructing a concrete block wall a minimum of 25' in-by the portal openings (See Figure 37).

In Section R645-301-765, the Permittee discusses the casing and sealing of wells. The Permittee commits to sealing and backfilling the monitoring wells once the Division has made a finding that they are no longer needed for monitoring. The application discusses how the monitoring wells will be sealed. The boreholes or well casings will be sealed by filling them with cement to form a plug from the bottom of the hole to at least 20 feet above any zone of completion or water-bearing zone. The remainder of the hole will be filled with cement to within 20 feet of the ground surface and then the remainder of the hole will be filled with cement to the ground surface to form a surface plug. A steel fence post will be placed in the center of the surface plug in order to provide a permanent marker of the hole location.

Findings:

The application meets the Mine Opening requirements of the State of Utah R645-Coal Mining Rules.

ROAD SYSTEMS AND OTHER TRANSPORTATION FACILITIES

Regulatory Reference: 30 CFR Sec. 701.5, 784.24, 817.150, 817.151; R645-100-200, -301-513, -301-521, -301-527, -301-534, -301-537, -301-732.

Analysis:

Reclamation

The application meets the Roads Systems and Other Transportation Facilities requirements of the State of Utah R645-Coal Mining Rules.

In Section R645-301-762 of the application, the Permittee states, "*Roads that will not be retained for use under an approved postmining land use will be reclaimed immediately after they are no longer needed for coal mining and reclamation activities*". The reclamation of the roads will be accomplished by reshaping all cut and fill slopes to be compatible with the post-mining land use and to compliment the drainage pattern of the surrounding topography.

Map 29, *Mine Surface Facilities Area Post Mining Topography & Interim Drainage Control* and Map 29A, *Mine Surface Facilities Area Post Mining Topography* depict the mine site post-mining and reclamation. As depicted on Maps 29 and 29A Sections of road will remain

on the site permanently after reclamation efforts. As directed by the landowners, the post-mining land use roads will provide access to private property in the mining area and the area east of the mining area as well as to private property north of the mine area.

Findings:

The application meets the Road Reclamation requirements of the State of Utah R645-Coal Mining Rules.

HYDROLOGIC INFORMATION

Regulatory Reference: 30 CFR Sec. 784.14, 784.29, 817.41, 817.42, 817.43, 817.45, 817.49, 817.56, 817.57; R645-301-512, -301-513, -301-514, -301-515, -301-532, -301-533, -301-542, -301-723, -301-724, -301-725, -301-726, -301-728, -301-729, -301-731, -301-733, -301-742, -301-743, -301-750, -301-751, -301-760, -301-761.

Analysis:

Hydrologic Reclamation Plan

The application meets the General Reclamation Plan requirements of the State of Utah R645-Coal Mining Rules.

In Section R645-301-760 the application discusses the hydrologic restoration plans to be implemented during the reclamation phase of the mining operation. On page 7-128, the application states, "CR has incorporated specific control and mitigation measures in mining, processing and reclamation plans in order to prevent any significant impacts on surface or ground water quality." The reclamation plan involves backfilling and regarding disturbed areas, replacement of soil, re-establishment of pre-mining drainage patterns and establishing a vegetative community. A component of the reclamation plan includes the removal of some temporary operational drainage structures, establish designed permanent post-mining drainage structures, and modify some of the existing temporary drainage structures to provide for effective drainage and sediment control.

When no longer needed for sediment control, all temporary diversions will be removed and the affected lands reclaimed. The Permittee proposes to fill the diversion ditches with material from adjacent areas. Grading will blend the temporary ditch areas with the surrounding topography. Map 29 and 29A, depict diversion ditches UDD-1 and UDD-2 as permanent diversions. The ditches have been designed to handle the 100-year, 6-hour event as required by R645-301-742.323.

Sediment pond reclamation will include the removal of the man-made discharge structures, removal and disposal of any riprap, concrete and bedding materials which will not be

utilized in conjunction with the reestablishment of post-mining drainages. The application states, "*CR will continue to operate and maintain sedimentation ponds and associated drainage structures until contributing drainage areas are effectively restored through application of the reclamation activities.*" Effective restoration will be established once re-vegetation success has been accomplished and the surface drainage has been restored such that contributions of suspended solids from untreated disturbed area runoff are within applicable water quality standards.

The Permittee proposes to control erosion and sediment transport during reclamation of the interim drainage and sediment control structures with a combination of silt fences, hay bales and other appropriate alternative sediment control measures. The Permittee commits to installing these temporary controls prior to "any reclamation activities." The alternative sediment controls are to remain in place during backfill/regarding operations, placement of soil material, reseeding and re-establishment of vegetation. The structures will be removed once vegetation has been reestablished on the site.

The Permittee discusses the restoration of drainage patterns at the mine site. The application states, "In conjunction with final backfilling and regarding activities, permanent drainage features, designed to pass the peak flows from the 100-year, 6-hour event, will be established to effectively pass natural drainage through the reclaimed areas and provide for effective control of runoff from reclaimed areas while minimizing the potential for any significant erosion." The application continues that "some temporary drainage structures may be retained and modified as necessary to carry disturbed area drainage flows from permanent drainages to the sedimentation pond which will also be retained to provide ongoing sediment control through the extended liability period." The Permittee must provide additional detail as to what drainage features are part of what phase of the hydrologic reclamation plan (i.e temporary, interim or permanent).

In order to demonstrate that pre-mining drainage patterns have been restored, the Permittee will provide documentation to the Division with one of two methods or by a combination of: 1) Comparing pre- and post-mining water monitoring data as well as analyzing applicable effluent standards and 2) Providing runoff and sedimentation modeling results by utilizing measured reclamation vegetation cover values and calculated sediment contributions with that of modeling results developed using baseline pre-mining vegetative cover values.

Findings:

The application meets the Hydrologic Reclamation Plan requirements of the State of Utah R645-Coal Mining Rules.

MAPS, PLANS, AND CROSS SECTIONS OF RECLAMATION OPERATIONS

Regulatory Reference: 30 CFR Sec. 784.23; R645-301-323, -301-512, -301-521, -301-542, -301-632, -301-731.

Analysis:

Reclamation Monitoring and Sampling Location Maps

The application meets the Reclamation Monitoring and Sampling Location Map requirements of the State of Utah R645-Coal Mining Rules.

Table 20, *Hydrologic Monitoring Schedule* provides the parameters to be analyzed for during post-mining. Map 28, *Surface and Ground Water Monitoring Sites* depicts the water monitoring sites that will be monitored during the reclamation liability period.

Reclamation Plan Maps

The previous technical analysis had directed the Permittee to revise Map 29, *Mine Surface Facilities Area-Post Mining Topography* to depict diversion ditches UDD-1 and UDD-2. Map 29 as well as Map 29A now depict the drainage ditches/hydrologic components as being permanent features post-reclamation.

Findings:

The application meets the Maps, Plans and Cross Sections of Reclamation Operations requirements of the State of Utah R645-Coal Mining Rules.

REQUIREMENTS FOR PERMITS FOR SPECIAL CATEGORIES OF MINING

OPERATIONS IN ALLUVIAL VALLEY FLOORS

Regulatory Reference: 30 CFR Sec. 822; R645-302-324.

Analysis:

Essential Hydrologic Functions

The application meets the Operations in Alluvial Valley Floors requirements of the State of Utah R645-Coal Mining Rules.

The application meets the Alluvial Valley Floor (AVF) Determination requirements of the State of Utah R645-Coal Mining Rules.

The previous technical analysis identified a deficiency relative to the Alluvial Valley Floor Determination. The applicant was directed to demonstrate, based on available data or field studies, the presence or absence of an alluvial valley floor (AVF).

In Chapter 9 of the application, the Permittee discusses alluvial valley floors. R645-302-321.300 establishes criteria for an alluvial valley floor. Two determinations must be made before a finding can be made that an alluvial valley floor exists: 1) Unconsolidated stream laid deposits holding streams are present; and 2) There is sufficient water to support agricultural activities. A sufficient water source is evidenced by the existence of flood irrigation in the area of question or its historical use; the capability of an area to be flood irrigated and sub-irrigation of the lands in question, derived from the groundwater system of the valley floor.

Beginning on page 9-6 of the application, the Permittee discusses alluvial valley floors. Based upon the two criteria discussed above, an AVF is located within the adjacent area. In addition, the Permittee also discusses areas that exhibit the traits/characteristics of the second criteria (hydrology aspect), but not the first (geologic aspect).

These two areas are depicted on Map 32, *AVF Evaluation Map* and identified as 'AVF AREA' and 'QUASI AVF AREA'. The 'AVF AREA' depicted on Map 32 meets the two criteria. Figure 4, *Regional Surface Geology Map*, depicts alluvium material directly adjacent to Mud Creek on either side of the stream channel. Map 32, *AVF Evaluation Map*, depicts the location of this alluvial material relative to the proposed permit boundary. The area of the alluvial valley floor is relatively small and appears to be limited to within less than 500 feet of the stream channel for Mud Creek.

The 'QUASI AVF AREA' depicted on Map 32 meets the second criteria in making an AVF determination in that there is sufficient water to support agricultural activities. However; the surface geology and soils found in the 'QUASI AVF AREA' are not unconsolidated stream laid deposits holding streams.

In summary, the coal seam to be mined is located well above the regional water table. As a result, the possibility that mining activity could interrupt or impact recharge to the identified AVF is minimal. In addition, the irrigation water that supplies the AVF is derived from Mud Creek at a diversion point upstream of the proposed mine site. Based upon a Utah Department of

Environmental Quality TMDL analysis of Scofield Reservoir, 87% of the inflow to the Scofield reservoir comes from Fish and Mud Creek. The proposed mining activity poses a minimal potential for interrupting or impacting these drainages due to it's proximity to the drainages and the utilization of first mining practices only (i.e. no planned subsidence).

Findings:

The application meets the Operations in Alluvial Valley Floors requirements of the State of Utah R645-Coal Mining Rules. The following deficiency must be addressed prior to Division approval:

CUMULATIVE HYDROLOGIC IMPACT ASSESSMENT

Regulatory Reference: 30 CFR Sec. 784.14; R645-301-730.

Analysis:

The application meets the Cumulative Hydrologic Impact Assessment requirements of the State of Utah R645-Coal Mining Rules. The Permittee has provided the hydrologic and geologic information and baseline data necessary to demonstrate the proposed mine plan has been designed to prevent material damage to the hydrologic balance outside the permit area. T

Findings:

The application meets the Cumulative Hydrologic Impact Assessment requirements of the State of Utah R645-Coal Mining Rules.

RECOMMENDATIONS:

The application should not be approved at this time.

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