



GARY R. HERBERT
Governor

SPENCER J. COX
Lieutenant Governor

State of Utah

DEPARTMENT OF NATURAL RESOURCES

MICHAEL R. STYLER
Executive Director

Division of Oil, Gas and Mining

JOHN R. BAZA
Division Director

March 9, 2018

John Byars, General Manager
Canyon Fuel Company, LLC
597 South SR24
Salina, Utah 84654

Subject: 3rd Application Review and Deficiencies, Greens Hollow Lease Tract, Canyon Fuel Company, LLC, Sufco Mine, C/041/0002, Task ID #5445

Dear Mr. Byars:

The Division has reviewed your application for permitting the Greens Hollow Lease Tract for the 3rd time. A copy of our Technical Analysis and Findings is enclosed. It appears that progress towards the permit is being made, however, the Division has again identified a few remaining deficiencies in addressing the Utah Coal Mining Rules. The deficiencies are listed and will need to be addressed before further processing can occur. The names of the deficiency's author are provided so that your staff can communicate directly with that individual should questions arise.

Please address the remaining deficiencies and submit your response in order for us to complete the processing of this permit revision.

Thank you for your help during this process. If you have any questions, please feel free to call me at (801) 538-5325.

Sincerely,

Daron R. Haddock
Coal Program Manager

DRH/sqs
Enclosure
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Technical Analysis and Findings

Utah Coal Regulatory Program

PID: C0410002
TaskID: 5445
Mine Name: SUFCO MINE
Title: GREENS HOLLOW LEASE

General Contents

Identification of Interest

Analysis:

The application does not meet the State of Utah R645 requirements for Identification of Interest.

The Permittee submitted a separate application on 5/17/17 to update the Ownership and Control information (Task ID #5455). The Division has identified deficiencies within the application. In an effort to avoid duplicity, the Division will continue to review the application to update the Ownership and Control under a separate task.

Deficiencies Details:

The application does not meet the State of Utah R645 requirements for Identification of Interest.

The Permittee submitted a separate application on 5/17/17 to update the Ownership and Control information (Task ID #5455). The Division has identified deficiencies within the application. In an effort to avoid duplicity, the Division will continue to review the application to update the Ownership and Control under a separate task.

sssteab

Violation Information

Analysis:

The application does not meet the State of Utah R645 requirements for Violation Information.

An AVS Permit Evaluation Report was generated for the SUFCO Mine C/041/0002 on March 9, 2018. The report retrieved 16 violations. Violations 13-15, issued to the permittee, are outstanding (unpaid AML Fees). Violation 16 is outstanding, linking entity is James J. Wolff. The remaining violations are coded "conditional" indicating a settlement, payment plan, or pending challenge, linking entity is John Joseph Siegel.

Deficiencies Details:

The application does not meet the State of Utah R645 requirements for Violation Information.

An AVS Permit Evaluation Report was generated for the SUFCO Mine C/041/0002 on March 9, 2018. The report retrieved 16 violations. Violations 13-15, issued to the permittee, are outstanding (unpaid AML Fees). Violation 16 is outstanding, linking entity is James J. Wolff. The remaining violations are coded "conditional" indicating a settlement,

Legal Description

Analysis:

The amendment meets the State of Utah R645 requirements for providing an accurate legal description of the area to be included in the permit. The legal description provided on pages 1-11 and 1-12 titled Federal Coal Lease UTU-84102 – (6,175.39 acres) matches the legal description found in Appendix 1 of the ROD (p. 22) and the UTU-84102 BLM Coal Lease. The properties listed in the lease match the properties listed on pages 1-11 and 1-12 of the MRP as well as the properties delineated on Plate 5-6 (Land Ownership, Lease, and Permit Area Map).

tmiller

Permit Application Format and Contents

Analysis:

The application does not meet the State of Utah R645 requirements for Permit Application Format and Contents.

The permittee includes Table 1 in Appendix 7-28. It is noted throughout the application that M-SP87 discharges from the Prive River Formation. It is listed on Table 1 twice, once as discharging from the Castlegate Formation and once as discharging from the Price River Formation. Please rectify.

Deficiencies Details:

The application does not meet the State of Utah R645 requirements for Permit Application Format and Contents. The following deficiency must be addressed prior to final approval:

R645-301-121.200: The permittee must rectify Table 1 in Appendix 7-28. M-SP87 is listed twice, once as discharging from the Castlegate Formation and once as discharging from the Price River Formation.

aumarva

Environmental Resource Information

Historic and Archeological Resource Information

Analysis:

The amendment does not meet the State of Utah R645-301-411 requirements for historic and archeological resource information. The map titled "Cultural Resource Sites from the Greens Hollow EIS" in Appendix 4-2 is inconsistent with other maps found in the amendment, notably Plate 5-10C "Potential Subsidence Limits SITLA Muddy & Greens Hollow Tract." According to Plate 5-10C, as well as the approved alternative found in the EIS, the southern boundary of the Greens Hollow Lease bisects sections 13 and 14 of T. 21 S., R. 4 E., SLM. However the Proposed Mine Plan in the Cultural Resource map in Appendix 4-2 shows the southern limit bisecting sections 23 and 24, one full section to the south. This inaccuracy drastically alters the location of subsidence limits relative to the many NRHP-eligible cultural sites in the area.

SHPO concurrence for this project is attained through a Memorandum of Agreement (MOA) between the Manti-La Sal National Forest and the Utah SHPO which was signed in November of 2011. Much of the memorandum was written with consideration to aspects of the mine plan (vent shafts, power lines, road modifications) that have since been removed from the plan. However, certain stipulations and agreements in the MOA still apply to the current plan as presented. Stipulation 2, for example, states: "Underground mining shall only occur under the areas marked "Area of Subsidence Mining" as shown in Attachment B." While Plate 5-10 appears to conform to this stipulation, the cultural resource map found in Appendix 4-2 shows the proposed mine plan entering the Area of No Subsidence Mining. Meanwhile, Stipulation 8 of the MOA describes a plan to monitor potential effects of the project. While much of Stipulation 8's requirements do not apply to the current plan (due to the removal of vent shaft, power lines, and road modifications), there are elements related to subsidence that need to be included in the amendment. Specifically, the fourth goal of Stipulation 8: "to monitor the two sites containing rock shelter sites within the area of no subsidence mining (42SV2584 and 42SV2589) in order to ensure that no effects from subsidence occur." The MOA goes on to describe, in Attachment D, the requirements for identifying and mitigating potential effects from subsidence. In this attachment it says that there are seven sites immediately adjacent to the area of subsidence mining and that two of them, 42SV2584 and 42SV2589, are "good proxies for all of the sites which might be affected." Attachment D describes steps that need to be done to

establish the presence or absence of potential effects to sites from subsidence mining. These steps include creating detailed base-line maps and photographic records of 42SV3224, 42SV2584, and 42SV2589 before subsidence mining begins, monitoring each site once a year while mining is occurring under the area of the sites, and goes on to describe what is to be done if surface cracking or buckling is found: "If cracking or buckling that resulted from subsidence mining is found at any of the rock shelters at sites 42SV2584 and 42SV2589, then this will be considered an adverse effect that requires additional consultation with the Utah SHPO and interested Tribes and amendment of this agreement." None of these stipulations are included in the narrative which lists all NRHP-eligible and other cultural resource sites in the area but concludes that all NRHP-eligible sites fall "outside [the] area of influence by subsidence, no surface disturbance/construction" or are in the "Non Subsidence Zone- If any mining, first mining only, no long wall mining" and are therefore not required to be monitored, mitigated for, or protected.

To effectively implement the monitoring plan, and as directed by the Manti-La Sal National Forest, the monitoring of each site must be done in consultation with, and accompanied by, mine representatives, DOGM representatives, and MLSNF heritage program representatives. The Permittee is to notify DOGM and the Manti-La Sal National Forest heritage program approximately 6 months prior to the completion of mining under the areas adjacent to each of the three sites. This will allow for the mine, DOGM, and the MLSNF to schedule a time for the site visit to occur. Optimally, the monitoring visits will occur after it has been determined that subsidence in the area has stopped. Once it has been determined that subsidence has stopped in the area, and if monitoring indicates there are no effects from the subsidence at the site, further monitoring of the site will not be required. Due to the locations of the sites, monitoring visits to 42SV3224 are likely to occur at a different time, perhaps years apart, from monitoring visits to 42SV2584 and 42SV2589.

Deficiencies Details:

The amendment does not meet the State of Utah R645-301-411 requirements for historic and archeological resource information. The following deficiency must be addressed prior to final approval:

R645-301-411.141: The Permittee must provide a clear map showing the locations of any cultural or historical resources listed or eligible for listing in the National Register of Historic Places and known archeological sites within the permit and adjacent area. This map must include the limits of potential subsidence.

R645-301-411.142: The Permittee must provide, in Chapter 4 of the narrative, a description and a commitment to implement the monitoring plan for the three NRHP-eligible sites listed in Attachment D of the MOA (see Analysis).

tmiller

Climatological Resource Information

Analysis:

The application meets the State of Utah R645 requirements for Climatological Resource Information.

The Permittee provides a statement of the climatological factors in Chapter 4 and Volume 9 of the MRP

aumarva

Vegetation Resource Information

Analysis:

The amendment meets the State of Utah R645-301-321 requirements for vegetation resource information. Volume 1, Chapter 3, Section 3.2.1, pages 3-3 through 3-5 provide vegetation information. This amendment updates Ch.3 on page 3-5 to include a summary of vegetation in the Greens Hollow Tract. Detailed vegetation information is located in the EIS (Environmental Impact Statement) prepared by the BLM. Plate 3-1 is updated to include the vegetation within the Greens Hollow Lease.

ireinhart

Fish and Wildlife Resource Information

Analysis:

The amendment meets the State of Utah R645-301-322 requirements for fish and wildlife resource information. Volume 1, Chapter 3, Section 3.2.2, pages 3-6 through 3-27 provide fish and wildlife information. Section 3.2.2.3 contains the Fish and Wildlife Service Review. Appendices are located in Volume 5 Appendix 3-1 includes a report of field

investigations from 1983. Appendix 3-2 is an aquatic resource inventory of the permit area. Appendix 3-3 is a wildlife assessment of the permit and adjacent area. Appendix 3-4 discusses raptors and avifauna Appendix 3-5 discusses fauna of the permit and adjacent area. Appendix 3-7 discusses power lines Appendix 3-8 is a bat survey for the SUFCO Mine Appendix 3-9 discusses vegetation and wildlife of the Pines Tract Appendix 3-10 is a monitoring and mitigation plan for mining under the east fork of Box Canyon. Appendix 3-11 discusses wildlife in the Muddy Creek area. Appendix 3-12 is the Mexican Spotted Owl survey for the Muddy Tract Appendix 3-13 discusses vegetation and wildlife of the West Coal Lease Modifications Appendix 3-14 is the Monitoring and Mitigation plan for undermining the south fork of Quitchupah 2R2S Block A and 3R2S Block B. This amendment adds Appendix 3-15 which is the Wildlife Technical Report for Greens Hollow Coal Lease Tract. Federal and State sensitive species within the Greens Hollow Tract were evaluated. As noted on pages 294 and 295 of the FSEIS, the BLM analyzed the impacts of underground coal mining on wildlife and plant species listed under the ESA. None of the potential impacts from the project would be contrary to any of the laws, regulations, and orders included in the ESA of 1973, as amended. A supplemental biological assessment was prepared for the proposed Greens Hollow tract (Cirrus 2014f). That assessment determined there would be no effect on federally-listed threatened and endangered species under the alternatives analyzed. Therefore, consultation with the U.S. Fish and Wildlife Service was not required. There are no known federally listed plant species in the project area. One sensitive plant species (Link Canyon columbine) occurs in the general analysis area but not in the permit area and would not be affected by project. As required by the Migratory Bird Treaty Act, the BLM analyzed the impacts of the project on migratory birds. None of the potential impacts of the project would be contrary to any of the laws, regulations, and orders included in the Migratory Bird Treaty Act of 1918. The level of detail of the information is sufficient to design the protection and enhancement plan under R645-301-333 should one be required. The amended permit area contains habitats of unusually high value for fish and wildlife. However, none of these areas should be adversely affected from underground coal mining. Any surface disturbing activities will be evaluated separately. Pursuant to the Executive Order Implementing the Utah Conservation Plan for Greater Sage-Grouse, consultation with Utah Division of Wildlife occurred on 11/22/2016. DWR did not request any additional mitigation or monitoring at this time. Based on the analysis conducted by the BLM and the Divisions evaluation of the IPac Trust Resource Report generated November 22, 2016 and again on May 18, 2017, Consultation Code: 06E23000-2017-E-00883, the Division determined that approval of this amendment would not affect a listed species or designated critical habitat and therefore did not initiate informal consultation with U.S. Fish and Wildlife Service. Potential water depletions from mining operations that may have an effect on endangered fish species identified in pertinent fish recovery programs of the USFWS have been evaluated by the Windy Gap Process as it applies to existing coal mines in the Upper Colorado River Basin on pages 3-40A-B. Total mining operations net water gain is 5365.2 ac-ft/yr.

ireinhart

Soils Resource Information

Analysis:

Analysis: The R645-301-200 soils environmental regulations do not apply to this application, because it does not describe any surface disturbance. The application adds 6,696.41 acres in BLM Greens Hollow Lease UTU-84102 within T. 20 S., R. 4 E., Sec 36, 14, 23, 24; and T 20 S., R. 5 E. Sec. 19, 20, 21, 28, 29, 30, 31, 32, and Sec 33; and T 21 S, R 4 E Sec 1, 2, 11, 12, 13, and 1; and T 21 S, R 5 E Sec 6. The Greens Hollow lease surface is managed by Fishlake (79 acres) and Manti LaSal National Forests (the remainder). The application revises the total permitted disturbed area boundary (96.416 acres) and the currently disturbed acreage (48.825 acres, pg 1-15) due to the previously permitted waste rock expansion and sink hole disturbance. There is no revision to Chapter 2, Soils, other than a statement that the 2015 FEIS provides background information. A general Order III survey is included as Dwg 2-3, Soil Types SITLA Muddy & Greens Hollow Tract. The potential for a ventilation and escapeway shaft facility is anticipated in Section 5.2.6.1 with a statement that permitting of the potetial shaft will follow the acquisition of the Greens Hollow Lease. Confidential Appendix 4-5 Memorandum of Agreement between USFS and SHPO outline requirements of shaft development.

pburton

Land Use Resource Information

Analysis:

The amendment meets the State of Utah R645-301-411 requirements for land use information. Volume 1, Chapter 4, Section 4.10, pages 4-1 through 4-12A provide information on premining land use. This amendment adds land use information for the Greens Hollow Tract on page 4-7. The land is under USFS management and therefore is managed for multiple use. Recreational use is light and livestock grazing and wildlife are the primary uses. The narrative analyzes the landuse in conjunction with other environmental resources and provides analysis of the capability of the land before any coal mining and reclamation operations to support a variety of uses. Plates 4-1 and 4-1c are land use maps.

Alluvial Valley Floors

Analysis:

The application meets the State of Utah R645 requirements for the Alluvial Valley Floor Determinations.

The Permittee provides sufficient information regarding the absence of alluvial valley floors in the Greens Hollow Lease Area in Chapter 9 of the MRP. The information provided in this section is part of the conceptual mine plan that assumed full extraction mining with maximum associated impacts as determined by the BLM's Final EIS.

The Canyons of Greens Hollow Tract contain a steep gradient and limited narrow deposits of unconsolidated alluvium. The canyon bottoms contain shallow alluvium, with much of the channel resting directly on bedrock. The unconsolidated sediments have not been mapped in detail but are depicted in the Geologic Fence Diagram in Appendix 6-4. Additional information is provided in Chapters 2, 3, 6, and 7, determining that alluvial valley floors are not present in this tract.

aumarva

Geologic Resource Information

Analysis:

The application meets the State of Utah R645-301-600 requirements for Geologic Resource Information. Chapter 6 of the MRP has been updated to include the Greens Hollow Lease tract. A specific geologic report has been added to the MRP which discusses the geology of the tract (Appendix 6-4). This report entitled, "Geology Technical Report Greens Hollow Coal Lease Tract" was prepared by Paul B. Anderson and does contain a Stratigraphic column of the Green's Hollow lease and a map showing a fence diagram using borehole data from the Green's Hollow area. This report was only partially available and was missing most of the pages in the original submittal of the Greens Hollow application. Upon discussing this with the Operator, the missing pages were located and in the October 4, 2017 resubmittal the entire report has been provided and the missing information is now available.

Since this is an extension of an existing mine a lot of the geologic information carries over from the existing mine plan. The formations are essentially the same, although most of the Greens Hollow is a little deeper in the geologic column and is covered by the North Horn formation. The report prepared by Paul Anderson specifically for the Greens Hollow tract is found in Appendix 6-4. The Geology Technical Report (Appendix 6-4) contains a General Stratigraphic column (Figure 1) of the Greens Hollow Coal lease tract. It is accompanied by Plate 2 which is a Geologic Fence Diagram of the tract. These adequately describe the stratigraphy of the area. Plate 6-1 of the MRP is the Geology and drill hole location map and has been updated to include the Greens Hollow lease tract.

Lithologic drill logs are found in Appendix 6-1 which is marked confidential because of the proprietary information contained therein. The logs are done on drill holes that reflect the general geology of the area, and are specific to the Green's Hollow lease. The same is true for the chemical analyses that were done on the drill samples and which are also contained in Appendix 6-1. R645-301-624.300 et. seq. requires samples from test borings or drill cores to provide lithologic characteristics, including physical properties and thickness of each stratum that may be impacted, and location of groundwater where occurring. Chemical analyses for acid or toxic forming materials, including the total sulfur and pyritic sulfur of the coal seam and the strata immediately above and below the coal seam must be provided.

Drill hole logs have now been provided in Appendix 6-1 which characterized the formation and lithology of the Greens Hollow Lease area. The following drill holes were logged and the information is now provided; Well 04-29-3, Well 04-33-1, Well 06-30-1, Well 07-31-1, Well 15-13-1 and Well 16-1-1. The second number in the description corresponds to the section number where the well is located. Wells 04-29-3, 04-33-1, 06-30-1 are also located on Plate 6-1 for reference.

Chemical sampling has been provided for the strata above, through and below the coal seam. This included base to acid ratios and total sulfur and pyritic sulfur. The sulfur is relatively low with samples being generally less than 2%. The base to acid ratios are positive in all the samples provided. This is not surprising given the alkaline nature of most strata in Utah. No toxic or acid forming materials were identified that would present a problem within the Greens Hollow Coal lease.

dhaddock

Hydro Sampling and Analysis

Analysis:

The application meets the State of Utah R645 requirements for Sampling and Analysis.

The Permittee states on page 7-3 in Section 7.2.3 that all water samples collected for use in accordance with this MRP will comply with methods described in "Standard Methods for Examination of Water and Wastewater" of 40 CFR parts 136 and 434.

aumarva

Hydro Baseline Information

Analysis:

The application does not meet the State of Utah R645 requirements for Baseline Information.

Ground Water Information

The application includes baseline hydrologic locations on Plate 7-3. To characterize the Greens Hollow Tract and adjacent areas, baseline monitoring was conducted to identify springs, wells, and streams in the area. The sampling frequency, sampling parameters, and UTM coordinate locations are listed in Table 1 of Appendix 7-28. The Permittee must update Table 1 to include the 15 stream monitoring sites located above and below longwall panels. The sampling analysis results for all the baseline sites is presented in Table 2A and 2B.

A spring and seep survey was performed by Cirrus Ecological Solutions for the Greens Hollow Tract in 2000-2004. A narrative describing the spring and seep survey can be found on 7-26. A summary for selected streams and springs, including a discharge hydrograph, temperature, pH, specific conductance, and Palmer Hydrologic Drought Index, are presented in Attachment A (springs) and B (streams). Water level hydrographs are shown for selected wells in Attachment C. When mining commences, the survey will be approximately 20 years old. However, as summarized on page 7-26, Petersen Hydrologic has traversed all major surface water drainages quarterly since 2000, in order to coincide with sampling requirements. Peterson Hydrologic observed the hydrologic conditions and spring discharge locations within and adjacent to the tract. In addition, baseline monitoring activities were conducted specifically for the Greens Hollow Tract from 2014-2017. It was during the course of these visits that surveyers identified a new spring, USP-2. The Permittee states no additional springs or seeps have been identified over the course of numerous field investigations between 2000 - 2017, and all springs identified during the 2000-2004 spring and seep survey have been "routinely visited and observed by Mr. Peterson."

The Division requests the narrative to be updated to include specifics of site visits or references to data tables in the MRP where the dates of site visits are identified. The permittee uses the word "recent" to describe when field conditions were observed, however, this is not of sufficient detail and a precise time frame in the narrative is requested.

Overall, the current baseline monitoring includes 63 springs. Forty springs have been monitored as recently as 2014 or sooner. Twenty-one sites were last monitored in 2004. Two additional sites were monitored once in 2009. The 40 springs that were monitored most recently includes the most significant springs. All springs and seeps found in the Tract emit from the North Horn or Price River Formation. Though the hydrology of the region is climatology/recharge driven and significant time has passed since the last survey, the Permittee has accessed and traversed the area at least quarterly, and has provided a confirmation from the principal professional hydrologist in the region, that no new significant springs, other than USP-2, have been observed since the 2001 spring and seep survey.

Appendix 7-27 includes tables of water quality analysis from 2015 and 2016. The data is marked for removal that says "Removed and Incorporated into PHC tables" or "Removed not pertinent to Greens Hollow." Similarly, a map entitled "Greens Hollow Tract Adjacent Area, Underground Water Sampling Analysis and Age Dating 2015 and 2016" is located in this section. The map contains hand-written comments that it was removed on October 1, 2017 and a new Figure is available in the PHC, Appendix 7-28. Please clarify why this information is present in Appendix 7-27, and whether this data will be removed in the clean copies. Please indicate page numbers and Plate number of the new location of the material in Appendix 7-28.

Surface Water Information

The major surface water drainages in the Greens Hollow Tract include the Muddy Creek and Quitcupah Creek. The

Muddy Creek Drainage includes the central and northern portions of the tract. This drainage includes the Cowboy Creek Drainage, the Greens Hollow Drainage, and the South Fork of Muddy Creek Drainage, as well as, a series of unnamed drainages that drain directly to Muddy Creek to the North.

The Cowboy Creek sub-drainage flows into the Castlegate Escarpment and across the Blackhawk Formation. This portion of the stream is monitored using M-STR04, with monitoring beginning in 2001. In the past five years of quarterly monitoring the stream has recorded flow only once, in July 2015. The Greens Hollow sub-drainage flows in the North Horn Formation in the northwestern most reaches of the drainage, then along the Castlegate Sandstone for 0.5 miles. This portion of the stream is monitored using M-STR06. Inflows to Greens Hollow Creek, according to the Cirrus 2001 survey and the quarterly monitoring in 2015-2016, is predominantly spring driven from M-SP04, M-SP05, and M-SP06. M-STR06 is used to monitor the composite stream flow. In the past 5 years of quarterly monitoring, M-STR06 has recorded flow only once, in June 2015. The stream is usually dry to the confluence with Cowboy Creek in Greens Canyon.

The adjacent drainage, Box Canyon Creek, should not experience influences from mining in the Greens Hollow Tract due to isolation from the Big Ridge uplands and Greens Canyon.

Muddy Creek is a major drainage with flows that vary climatically, with peaks in May or June from springtime snowmelt, and baselow conditions in the late fall and winter. Discharge typically ranges >100 cfs to <10 cfs. Flows can exceed 500 cfs during wet years. Releases from reservoirs in the headwaters can impact discharge rates. The Permittee discusses the gain/loss study on Muddy Creek on page 52 and Figure 8 in Appendix 7-28. Station 1 is in the headwaters of Muddy Creek, just outside the Greens Hollow Tract, Station 2 is just within the eastern boundary of the Tract, and Station 3 is downstream, near monitoring location Pines 405. No appreciable or statistically significant change in discharge rates occurred between Station 1 and 2, which is the portion of the tract overlying Greens Hollow Tract. Between Station 2 and 3, no appreciable or statistically significant change. Overall, no loss or gain in flow in Muddy Creek has been noted.

Quitcupah Creek Drainage is in the southern portions of the Greens Hollow Tract, with most of drainage within the North Fork of Quitcupah. Monitoring of the North Fork of Quitcupah occurs at SUFCO 007, and has been ongoing quarterly since 1979. Discharge at Sufco 007 is seasonally variable with peaks during spring snowmelt and baseflow in late fall. The North Fork of Quitcupah creeks flows across the Flagstaff Limestone, North Horn Formation, and Price River Formation within the Tract. Monitoring of the South Fork of Quitcupah creek, which covers only a small southern portion of the Tract, is monitored at SUFCO 006, and has been monitored quarterly since 1979. The South Fork of Quitcupah creek flows across the Castlegate Formation and Blackhawk Formation. Discharge at Sufco 006 is seasonally variable with peaks during spring snowmelt and baseflow in late fall. Typically, discharge rates in the South Fork is less than that flowing at the same time in the North Fork. Baseflow discharge rates in the South Fork can be zero. A diversion exists upstream of South Fork that may contribute to low or no flow. The diversion is used to divert water from the South Fork into the Skutumpah drainage. An additional USFS maintained diversion exists higher in the drainage.

All discharge hydrograph information for the springs and seeps associated with the Greens Hollow Tract addition is presented in Attachment A of Appendix 7-28. Water Quality data is presented in Table 2A and 2B. Baseline monitoring of streams, including when they have been monitored and analyzed for water quality, is presented in Table 1. The baseline monitoring occurred beginning in 2001 by Cirrus Ecological Solutions.

Geologic Information

The permittee discusses structural information for the Greens Hollow Tract in Appendix 7-28, on page 15.

The permittee states that no major faulting has been identified in the Greens Hollow Tract, though displacement faults, of three feet or less, have been encountered in the SUFCO mine. The application states that both minor faults and joints are likely to exist in the Greens Hollow Tract, especially in the Castlegate Sandstone. The faults in the SUFCO Mine area most commonly strike approximately N10 degree to 15 degrees W and are inclined nearly vertical. Joints are both parallel and normal to the fault trend. Joints in the Castlegate are common. On page 60 of the PHC description, the Permittee states that groundwater inflows along fault zones that are intercepted by the mine workings in the Greens Hollow Tract may occur. However, the application states the due to the geologic similarity to the existing SUFCO mine, it is likely the Greens Hollow Tract will behave similarly. Therefore, it is likely any water that is encountered will be minimal and short-lived. Appendix 6-4 provides more detailed information on structural geology.

Deficiencies Details:

The application does not meet the State of Utah R645 requirements for Baseline Information. The following deficiencies must be addressed prior to final approval:

R645-301-722.200, 728.100, 121.200: The Permittee must update language regarding the spring and seep survey narrative on page 7-26. The language must provide specifics such as the methodology used, how transects or quarterly sampling events are completed, how is data collected and recorded, and how is it ensured that the whole area is covered.

R645-301-121.200: The Permittee in Appendix 7-27 includes information regarding sampling locations for 2015 and 2016. The data is marked for "Removed and Incorporated into PHC tables" or "Removed not pertinent to Greens Hollow." Please clarify why this information is present in the submittal and whether this data will be removed in the clean copies. Please indicate page numbers and Plate number of the new locations in Appendix 7-28.

R645-301-121.200: Please update tables to reflect the correct discharge formation for USP-2. Table 1 and Table 5 show conflicting information.

aumarva

Hydro Baseline Cumulative Impact Area

Analysis:

The amendment does not meet the State of Utah R645 requirements for Cumulative Hydrologic Impact Assessment (CHIA).

The Permittee must provide the additional hydrologic information to address the outstanding hydrologic deficiencies in order to complete the CHIA.

Deficiencies Details:

The application does not meet hte State of Utah R645 requirements for Cumulative Hydrologic Impact Assessment (CHIA).

R645-301-729: The Permittee must address the outstanding hydrologic deficiencies in order to complete the CHIA.

aumarva

Probable Hydrologic Consequences Determination

Analysis:

The application meets the State of Utah R645 requirements for Probable Hydrologic Consequences Determination.

728.300: Hydrologic Balance

Continuously saturated groundwater systems generally do not exist in the geologic formations overlying or immediately below the coal seams to be mined in the Greens Hollow Lease area. The formations are largely heterogeneous in nature and groundwater is typically present in fracture systems or isolated strata i.e. sandstone paleochannels. Furthermore, waters in the Castlegate Sandstone and Starpoint Sandstone, immediately above and below the coal strata, respectively, do not discharge within the Greens Hollow Tract. The R645 definition of "aquifer" means "a zone, stratum, or group of strata that can store and transmit water in sufficient quantities for a specific use." As no specific use for the waters above and below the coal strata could be identified within and adjacent to the Greens Hollow Tract, the Division does not qualify the Star Point and Castlegate as aquifers. In addition, the geology does not lend itself to communication between surface and subsurface water, the details of which are outlined below.

Formation specifics:

North Horn Formation consists of groundwater flow within shallow sandstone paleochannels. Due to the presence of low-permeability shales throughout the formation, groundwater flow is restricted to the sinuous nature of the sandstone paleochannels and does not widely flow throughout the formation with lateral and vertical flow largely constrained. Based on these characteristics, the North Horn formation does not meet the definition of "aquifer" per R645-100-200 rules.

Price River Formation consists of mudstone drapes separated by fluvial sandstones. Vertical flow of groundwater is restricted causing perched zones and springs to appear at higher topographic positions.

Castlegate Sandstone overlying the coal seam is a massive sandstone unit with groundwater flow occurring primarily

through fractures, joint systems, and along bedding planes. However, the interbedded mudstone drapes limit groundwater flow in the formation. The typical direction is controlled by local stratigraphic dip, typically toward the north-northwest direction. The Castlegate Sandstone unit is discontinuous due to the presence of shale layers and permeable sandstone strata are not continuous over significant, long, regional-type flow systems. All water flow is typically local in nature with small to moderate quantities discharged. The only surface exposure of the Castlegate is along the rims of the North Fork of Quitchupah, South Fork of Quitchupah, Box Canyon, and Muddy Creek Canyon. No water rights exist on the Castlegate within the tract and no surface expression is observed. Therefore, the Castlegate Formation does not meet the R645-100-200 definition for "aquifer" as this unit does not transmit water in sufficient quantities for a specific use.

There is no surface expression for the Star point Sandstone Formation within the Tract, therefore the water is not put to a specific use as required by R645-100-200 to qualify as an aquifer. Further, flow within the Star Point Sandstone occurs primarily through joints, fractures, and faults. The Permittee provides information on the bounding impermeable layer below the Blackhawk that separates the Star Point formation, as well as, isotopic evidence to show surface water and groundwater are not in communication. Therefore, the Star Point Formation does not meet the R645-100-200 definition for "aquifer" as this unit does not transmit water for a specific use within the areas expected to be impacted by mining.

Furthermore, there is limited potential for communication between these formations naturally. Active mining within the Greens Hollow Tract has potential to increase subsurface connectivity between formations, however, it is unlikely that this will substantially affect surface water resources. However, there is potential for groundwater discharging as springs to migrate from the original spring location where near-surface tension cracking is extensive. All of the Greens Hollow Tract has an overburden exceeding 800 feet. The Permittee outlines on pages 60-61 several reasons why groundwater systems in the near-surface Price River and North Horn Formations will unlikely be impacted by mining operations and water resources are unlikely to migrate downward. To summarize, the presence of clays in the subsurface will likely impede the development of cracks due to the plasticity, or heal any cracks that do form in short periods of time from infilling or swelling.

In the Sufco Mine, Pines Tract, the surface formation was the Castlegate Sandstone. This formation is a brittle sandstone with dominant joints and fractures. The near-surface fracturing allows for substantial groundwater recharge (unlike the North Horn or Price River formations). When undermining occurred beneath springs discharging from near-surface fractured sandstone perches, discharge ceased at locations where joints and/or fractures dilated in response to subsidence, compromising the clay-rich perching layers causing the groundwater to migrate deeper. Because not all undermined springs in the area were affected by subsidence, it is likely the spring loss was a localized, not regional effect. As compared to the Pines Tract, the hydrogeologic features in the Greens Hollow Tract are different. These differences include:

- The Greens Hollow Tract is overlain by the North Horn and Price River Formation for the majority of the surface. In these formations, the groundwater flow is in interbedded sequences of sandstone and low-permeability shale that deform plastically, instead of brittly like the Castlegate.
- Developing no-subsidence mining buffer zones underlying all perennial streams where the Castlegate Sandstone is exposed at the surface or is within 50-feet of the surface. This means no longwall mining and the accompanying subsidence is proposed in these areas: portions of lower Cowboy Creek, lower Greens Hollow, and Muddy Creek. Furthermore, the permittee has developed preventive measures to protect the hydrologic balance and has proposed a plan that learns from the spring loss experienced in the Pines Tract.

The decrease in discharge from the spring (Pines 303) in the Pines tract overlies the mined coal seam by only 100 feet. By contrast, springs discharging in the Greens Hollow Tract overlie the mined seam by several hundred feet, discharging from the North Horn and Price River Formations. It is not expected that this type of hydrologic impact occurs in the Greens Hollow Tract.

Inside the mine, the Permittee uses evidence from previous SUFCO mining activity to predict water intercepted in the Greens Hollow Tract will likely be from the Blackhawk formation, perched groundwater systems in sandstone channels, in the mine roof. Actual flow rates and quantities of water to be encountered cannot be inferred until mining commences. It is expected, however, the mining will dewater these perched groundwater systems immediately above the mining. Furthermore, subsidence-related changes to the subsurface will occur in longwalled areas, altering pre-mining hydrogeology. Deformation of strata above longwall panel mined areas will be in line with what is expected in most coal mines, as outlined on Page 67-68 in Appendix 7-28. The Permittee uses the Mining Engineers Handbook to conclude that upwardly propagating fracturing will likely extend 60 times the mining height, or 600 feet. The mining height in Greens Hollow is 10-15 feet. In the Greens Hollow Tract, all overburden in subsidence mining areas exceeds 800 feet. The overburden in non-subsidence mining areas exceeds 500 feet. Also, in Appendix 7-28, page 41, the Permittee states that discharge from an old sealed longwall gob area and other abandoned long wall areas consistently decrease

with time especially from inactive-zone mine inflows. The Permittee suggests that reduced discharge is one indicator of poor hydrologic communication between systems overlying the mine and shallow groundwater. The Permittee provides the data to support this in Appendix 7-17, using the contents of Mayo and Associates literature. Overall, due to the amount of overburden, the poor hydrologic communication between the surface and groundwater, the plastic nature of the subsurface due to the presence of hydrophyllic clays, the lack of surface expression of the Starpoint Sandstone and Blackhawk Formation within the Tract, the isolation of the coal seam from the Star Point Sandstone due to shaley lagoonal deposits, it is unlikely that shallow active hydrologic systems will be impacted by mining as several hundred feet is expected to exist between the surface and the top of the fractured zone.

728.320: Acid-forming and toxic-formation materials

Sufco Mine discharge waters have routinely been within permitted discharge limits. Though small quantities of sulfide minerals are known to exist, no significant acid-or-toxic forming materials are believed to be present in the Greens Hollow Tract. Rocks in the Wasatch Plateau typically act to neutralize any acid produced. Acid forming or toxic forming materials have seldom been of concern in past Sufco mining operations and it is believed little to no potential exists within the Greens Hollow Tract.

728.331: Sediment Yield

No new surface facilities are planned for the Greens Hollow Tract as mining will enter through existing channels. Therefore, any potential for additional sedimentation impact will come from subsidence-induced changes in the stream channels. All perennial streams within the Tract will be undermined using no-subsidence mining techniques, the potential for sedimentation impacts in these channels is negligible. Any subsidence-induced gradient changes in streams with longwall undermining may experience short-lived sediment yield increases due to gradient changes from differential subsidence.

728.332: Water Quality

The water quality information for the Greens Hollow Tract is presented in Attachment A of Appendix 7-28 with the water quality data tabulated in Table 2A and 2B. No adverse impacts to water quality are expected. The Permittee has recommended a monitoring plan for Greens Hollow in Table 8 - 11 in Appendix 7-28, including parameters to be sampled, and site specific monitoring. According to the Monitoring Plan on Page 7-51 in the MRP, Table 7-2, all PHC recommended sites except USP-2 have been incorporated into the monitoring plan. However, the division requests sampling frequency for 15 surface monitoring sites to be changed from on-off, to be monitored until final reclamation.

Probable hydrologic consequences from equipment and facilities is considered minimal because the Greens Hollow Tract will be accessed through the existing mains in Sufco Mine and no new surface facilities are to be developed.

728.333: Flooding or streamflow alteration

Due to the geologic similarity between Sufco Mine and the Greens Hollow Tract, flooding and streamflow alteration potential is not expected to increase above what is already observed at the Quitchupah Creek discharge.

728.334: Ground-water and surface-water availability; 728.350 State-appropriated water rights

It is likely that groundwaters in the inactive Blackhawk Formation will be encountered and dewatered during mining. Inflows will likely decrease over time as these groundwaters perched and not replenished. However, there are no known uses or State appropriated water rights on these waters. The Permittee presents Plate 7-2 to show the state-appropriated water supply locations within and adjacent to the Greens Hollow Tract. Additional information on water rights is provided in Appendix 7-1. All state-appropriated water rights within the Greens Hollow Tract belong to the USFS.

Inactive zone groundwater intercepted within the mine will discharge into Quitchupah Creek at Sufco 047. As described previously, the deep, inactive zone groundwater has minimal hydrologic communication with active zone, shallow groundwater and surface water systems. Also, no surface expression of the Blackhawk Formation groundwaters exists within or adjacent to the Greens Hollow Tract. Consequently, the water intercepted within the mine and discharging into Quitchupah Creek is likely not resulting in diminution of surface water resources in the overlying drainage basin. Conversely, the mine water discharge is likely making previously inaccessible, ancient groundwater available for use to downstream users.

aumarva

Hydro GroundWater Monitoring Plan

Analysis:

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The application meets the State of Utah R645 requirements for hydrologic groundwater monitoring plan.

In 2001, a spring and seep survey and baseline monitoring program was performed, in conjunction with NEPA analysis, for the Greens Hollow Tract and adjacent areas by Cirrus Ecological Solutions, LLC. The Permittee describes the groundwater monitoring plan for baseline characterization in Appendix 7-28, page 3. The information collected included discharge rates, field water quality parameters, locations collected via handheld GPS, and baseline monitoring of selected sites for laboratory water quality parameters. The information gathered is tabulated in Table 1, including monitoring site geographic coordinates, elevations, associated geologic formations, monitoring periods, baseline monitoring parameters, and information on water usage. The monitoring locations are plotted on Figure 2 and included on Plate 7-3. Discharge and water-quality data for springs and seeps, including field and laboratory chemical and field parameters are presented in Table 2a. Discharge hydrographs for springs in the study area are shown in Attachment A. Geochemistry is summarized via stiff diagrams on Figure 6 and 7, compiled using the chemical composition listed in Table 5.

Groundwater was characterized, as applicable, for each of the geologic formations present at SUFCO mine. The North Horn Formation was be monitored using 33 springs and 2 streams. The Price River Formation was monitored using 29 springs and 4 streams. In the Greens Hollow Tract, no springs discharge from the Castlegate Sandstone, Blackhawk Formation, or Starpoint Sandstone. The Permittee monitored the Castlegate Sandstone using MW-15-5-2, however, the well has been consistently dry. In the past, Pines 303 spring discharging from the Castlegate has experienced a diminution of flow, likely attributable to the Sufco Mining Operations in the area. Because of this history, the monitoring plan includes no-subsidence buffer zones in areas where the Castlegate Sandstone is known to occur within 50 feet or less of the surface. The Castlegate Sandstone is not considered to be regional aquifer. The groundwater occurs within the Castlegate Sandstone occurs as isolated, perched zones, does not outcrop within the mining or adjacent areas, and is not transmitted, nor is it transmitted or stored within the Tract for a specific use. Consequently, the the Castlegate Formation does not meet the R645-100-200 criteria for "aquifer." Therefore, additional baseline monitoring locations for the Castlegate are not required by the Division.

The Blackhawk Formation, underlying the Castlegate, will be mined by Sufco as it contains the Upper Hiawatha coal seam. The Blackhawk Formation does not discharge within the Greens Hollow Tract area and no monitoring locations exist. Water encountered in the mine, through working faces, or faults, fractures and roof bolts, will likely be from the Blackhawk Formation and/or the overlying Castlegate Formation. SUFCO Mine has four wells screened in the Blackhawk, and six springs, which can be used to characterize the water quality in the region. However, as no surface expression or specific use for the Blackhawk Formation groundwaters exist in the Greens Hollow Tract, additional monitoring within the Tract was not required.

The Starpoint Sandstone is beneath the mineable coal seam. In the Greens Hollow Tract, the Starpoint Sandstone does not discharge. Furthermore, the water is not put to a specific use and therefore does not qualify as an aquifer under R645-100-200. However, due to its proximity to mining and adjacent discharge areas, the Division has requested monitoring. The Permittee has proposed an in-mine well, to be screened in the Star Point Formation. The well will be drilled once Sufco has advanced close enough access to the Greens Hollow Tract. The estimated time for well completion will be Fall/Winter 2018. All information relevant to the new well, including drilling logs, will be provided to the Division. Once completed, water level monitoring will occur quarterly. Further characterization of the Starpoint Sandstone.

Overall, the springs and wells monitored in the Greens Hollow Tract for water quality and quantity provide sufficient information to characterize the groundwater resources within and adjacent to the tract.

aumarva

Hydro SurfaceWater Monitoring Plan

Analysis:

The application meets the State of Utah R645 requirements for Surface Water Monitoring Plan.

Surface water monitoring in the Greens Hollow Tract for baseline characterization are located within the major drainages of the Greens Hollow Tract. Monitoring occurred in Cowboy Creek, Greens Hollow Creek, Muddy Creek, South Form of Quitchupah Creek, and North Fork of Quitchupah Creek. The baseline monitoring information collected included discharge rates, field water quality parameters, locations collected via handheld GPS, and baseline monitoring of selected sites for laboratory water quality parameters. The information gathered is tabulated in Table 1, including monitoring site geographic coordinates, elevations, associated geologic formations, monitoring periods, baseline

monitoring parameters, and information on water usage. The locations of monitoring locations are presented on Plate 7-3. Baseline information for the is available in Table 2A, Appendix 7-28. Surface water resources are described in detail beginning on page 46.

In 2015, Peterson Hydrologic performed a gain/loss study on Muddy Creek. The results of that study are described on page 50, tabulated in Table 7, and plotted on Figure 9. The results indicate that no appreciable flow loss had been noted, and water quality measurements do not indicate appreciable groundwater/surface water interaction.

Quitcupah Drainage is described beginning on page 53. In 2012, a gain/loss study was performed on South Fork of Quitcupah Creek. South Fork of Quitcupah extends mostly in the area adjacent to the Greens Hollow Tract. During this evaluation, discharge was low or non-existent, likely due to drought conditions.

Overall, the surface water monitored in the Greens Hollow Tract for water quality and quantity provide sufficient information to characterize the surface water resources within and adjacent to the tract.

aumarva

Maps Affected Area Boundary Maps

Analysis:

The amendment meets the State of Utah R645-301-323 requirements for maps and aerial photographs. This amendment updates Plate 3-1 (plant communities and reference areas), 3-2 (elk range), 3-3 (deer range and raptor nests) and 4-b1(land use) to include the Greens Hollow tract.

reinhart

Maps Affected Area Boundary Maps

Analysis:

The amendment meets State of Utah R645 requirements for Affected Area Boundary Maps.

A previous deficiency outlined the need for the Permittee to amend all drawings and maps to show only approved Sufco leases and pending Green's Hollow lease boundaries. All maps now only include relevant Sufco leases and Green's Hollow lease boundaries, and therefore adequately address this requirement.

jeatchel

Maps Monitoring and Sampling Locations

Analysis:

The application does not meet the State of Utah R645 requirements for Maps Monitoring and Sampling Locations.

Maps of Historic Hydrologic Monitoring Stations, including all baseline monitoring locations for Sufco Mine, is presented on Plate 7-3. This plate includes the current operational monitoring locations as well. The labels for the 15 surface water monitoring locations on Plate 7-3 do not match the legend. Because the Division is requesting these locations to become permanent monitoring sites, therefore, the labels must be changed from the asterisk symbol to the triangular symbol in order to match the legend for stream monitoring.

Deficiencies Details:

The application does not meet the State of Utah R645 requirements for Monitoring and Sampling Location Maps. The follow deficiencies must be addressed prior to final approval:

R645-301-722: The Permittee must update Plate 7-3. The Permittee must change the symbology for all stream monitoring sites to that which is depicted in the legend. Currently, 15 sites are depicted with an asterisk - the sites the Permittee proposes to turn on and off in relation to mining area. However, the Division requests all 15 sites become continuous, to be monitored quarterly regardless of mining area. Therefore, the symbology must be updated from the asterisk to the triangle symbology used to depict stream monitoring locations.

aumarva

Maps Subsurface Water Resources

Analysis:

The application meets the State of Utah R645 requirements for Subsurface Water Resources Maps.

According to R645-301-722, Cross Sections and Maps, the Permittee must provide depictions of locations and extent of subsurface water, with aerial and vertical extent distribution of aquifers and and portrayal of seasonal difference of head in different aquifers on cross-sections and contour maps. However, the formations within the Greens Hollow Tract do not qualify a "aquifers" under R645-100-200 rules. The definition of aquifer means "a zone, stratum, or group of strata that can store and transmit water in sufficient quantities for a specific use." Details of formation characteristics that support these claims are provided in Appendix 7-27 in Section 3.1.1 Groundwater Aquifers and Springs, Appendix 7-28 of the MRP, and portions of Appendix 7-17 provides a summary of the groundwater systems.

Further, the Permittee states on page 29 of the PHC that continuously saturated groundwater systems generally do not exist in the geologic formations overlying or immediately below the coal seams to be mined in the Greens Hollow Lease area. The formations are largely heterogeneous in nature and groundwater is typically present in fracture systems or isolated strata i.e. sandstone paleochannels. Furthermore, waters in the Castlegate Sandstone and Starpoint Sandstone, immediately above and below the coal strata, respectively, do not discharge within the Greens Hollow Tract. As described previously, the R645 definition of "aquifer" is that which is "sufficient quantities for a specific use." As no specific use for the waters above and below the coal strata could be identified within and adjacent to the Greens Hollow Tract, the Division does not request additional subsurface water resource maps.

The Permittee provides a generalized conceptual cross-section as Figure 38 in the Cirrus Surface and Groundwater Technical Report for the Greens Hollow Tract.

Formation specifics:

North Horn Formation consists of groundwater flow within shallow sandstone paleochannels. Due to the presence of low-permeability shales throughout the formation, groundwater flow is restricted to the sinuous nature of the sandstone paleochannels and does not widely flow throughout the formation. Based on these characteristics, the North Horn formation does not meet the definition of "aquifer" per R645-100-200 rules.

Price River Formation consists of mudstone drapes separated by fluvial sandstones. Vertical flow of groundwater is restricted causing perched zones and springs to appear at higher topographic positions. Due to the discontinuous and perched nature of groundwater in this formation, mapping is not feasible.

Castlegate Sandstone overlying the coal seam is a massive sandstone unit with groundwater flow occurring primarily through fractures, joint systems, and along bedding planes. However, the interbedded mudstone drapes limit groundwater flow in the formation. The typical direction is controlled by local stratigraphic dip, typically toward the north-northwest direction. The Castlegate Sandstone unit is discontinuous due to the presence of shale layers and permeable sandstone strata are not continuous over significant, long, regional-type flow systems. All water flow is typically local in nature with small to moderate quantities discharged. The only surface exposure of the Castlegate is along the rims of the North Fork of Quitcupah, South Fork of Quitcupah, Box Canyon, and Muddy Creek Canyon. Due to the discontinuous nature of this formation, mapping is not feasible. Further, no water rights exist on the Castlegate within the tract and no surface expression is observed. Therefore, the Castlegate Formation does not meet the R645-100-200 definition for "aquifer" as this unit does not transmit water in sufficient quantities for a specific use.

There is no surface expression for the Star point Sandstone Formation within the Tract, therefore the water is not put to a specific use as required by R645-100-200 to qualify as an aquifer. Further, flow within the Star Point Sandstone occurs primarily through joints, fractures, and faults. The internal fifth-order bounding surface restricts horizontal and vertical flow. The Permittee provides information on the bounding impermeable layer below the Blackhawk that separates the Star Point formation, as well as, isotopic evidence to show surface water and groundwater are not in communication. Therefore, the Star Point Formation does not meet the R645-100-200 definition for "aquifer" as this unit does not transmit water for a specific use within the areas expected to be impacted by mining.

aumarva

Maps Surface and Subsurface Ownshiip

Analysis:

The amendment meets State of Utah R645 requirements for Surface and Subsurface Ownership Maps.

A previous deficiency outlined the need for the Permittee to amend all plates to show only approved Sufco leases and pending Green's Hollow lease boundaries. All plates now only include relevant Sufco leases and Green's Hollow lease boundaries, and therefore adequately address this requirement.

jeatchel

Maps Surface Water Resource

Analysis:

The application meets the State of Utah R645 requirements for Surface Water Resource Maps.

The Permittee provides in Plate 7-2 and Plate 7-3 a location of all water resources and water monitoring locations, historic and operational, that are within and adjacent to the Greens Hollow Tract.

aumarva

Operation Plan

Mining Operations and Facilities

Analysis:

The amendment meets State of Utah R645 requirements for Mining Operations and Facilities.

A previous deficiency outlined the need for the Permittee to include a detailed description of proposed mining methods and procedures, including anticipated annual and total coal production within the Green's Hollow Lease. Amendments to section 5.2.3 describe the use of continuous miners and longwall mining techniques to recover coal within the Green's Hollow Lease. Anticipated annual coal production throughout the life of the Green's Hollow Lease is projected to be between 5.5 - 6.3 Million tons.

jeatchel

Air Pollution Control Plan

Analysis:

The amendment meets the State of Utah R645-301-420 requirements for Air Quality. The approved MRP references DAQ Permit Approval Order DAQE-AN0106650013-11 dated March 30, 2011 and DAQEEN0106590004-11. With the addition of the Greens Hollow Lease, Sufco will continue to be considered a "Minor Source" by the Utah Department of Environmental Quality and the mining of the Greens Hollow Lease is not a significant acid rain source (FSEIS, 2015). The demand for coal from the Sufco mine is established, the addition of the coal in the Greens Hollow Lease extends the supply of coal for years. Coal production and therefore trucking is intended to remain within the limits of the existing Air Quality Approval Order (Review production quantities in Section 5.2.3). Should mining changes require a revision; the Air Quality Approval Order will be updated at that time.

ireinhart

Coal Recovery

Analysis:

The amendment meets State of Utah R645 requirements for Coal Recovery.

A previous deficiency outlined the need for the Permittee to include a narrative describing sequencing of operations, measures used to maximize use and conservation of coal resource, expected recovery, and R2P2 details for the Greens Hollow Lease. As outlined in section 5.2.3, anticipated annual coal production throughout the life of the Greens Hollow Lease is projected to be between 5.5 - 6.3 Million tons and will be extracted using a longwall, thus ensuring the maximum amount of coal will be extracted using best available technology. Section 5.1.2 and appendix 1-1 includes a discussion about the R2P2, although the details haven't yet been finalized but will be sent to the BLM once it is complete.

jeatchel

Subsidence Control Plan Renewable Resource

Analysis:

The amendment meets the State of Utah R645-301-332 requirements for describing impacts of subsidence to fish, wildlife, and vegetative resources. Volume 1, Chapter 3, Section 3.3.3 provides a description of the anticipated impacts of subsidence. Subsidence associated with the Greens Hollow Lease is consistent with information in the approved MRP. As noted on pages 3-43 and 3-45A, the permittee has implemented a program to monitor the effect of subsidence on the vegetative communities. The applicant uses color infrared photography (CIR) to document changes in vegetation. This CIR coverage began in 1987 and will be updated at least every 5 years. Because of the depth and type of cover, Sufco anticipates there will be little impact to upland vegetation due to the subsidence. Subsidence cracks that form that are determined to be a safety hazard will be mitigated as discussed in section 3.3.3.

ireinhart

Subsidence Control Plan Renewable Resource

Analysis:

The amendment meets State of Utah R645 requirements for Renewable Resource Subsidence Control Plan.

A previous deficiency outlined the need for the Permittee to clarify whether the stock troughs and man-made ponds within the permit area are state-appropriated water supplies. Narrative in section 5.2.5.1 states that according to water right records, no man-made ponds or troughs are assigned state appropriated water supplies.

jeatchel

Subsidence Control Plan Subsidence

Analysis:

The application meets the State of Utah R645-301-623.300 requirements for a subsidence Control plan.

Subsidence mining has the potential to be excluded from areas identified for protection such as stream segments where the overburden is insufficient in thickness or rock types to facilitate healing of surface tensile cracks. Mining may also be excluded along cliff escarpments where subsidence would impact cultural features or raptor habitat. Each exclusion will be evaluated on a case by case basis and permitted as required. Prior to mining the Greens Hollow Lease, the subsidence monitoring points will be located and the site surveyed for baseline information.

dhaddock

Subsidence Control Plan Subsidence

Analysis:

The amendment meets the State of Utah R645 requirements for Subsidence Control Plan.

R645-301-521, R645-301-525.420 - A previous deficiency stated that Permittee must provide a map that illustrates projected subsidence throughout the Greens Hollow Lease in addition to addressing subsidence control measures to prevent damage to sensitive areas such as archaeological sites or raptor nests.

Narrative in sections 5.2.5.1 and 5.2.5.2 state that a buffer zone will be designed and built into the mine plan to protect areas such as cultural resource sites and other areas designated as No Subsidence. Buffer zones consist of barrier pillars that are left in place a sufficient distance from sensitive surface resources meant to be protected.

Plates 5-10 and 5-10C illustrate the limits of expected subsidence that is anticipated within the Greens Hollow Lease. The potential subsidence limits disturb a wider surface area in areas where the overburden is thicker. A comparison between the potential subsidence limits on Plates 5-10 and 5-10C against the overburden isopach contours on Plate 5-11 confirms this relationship.

jeatchel

Subsidence Control Plan Performance STD

Analysis:

The amendment does not meet State of Utah R645 requirements for Subsidence Control Plan Performance STD. The following deficiency must be addressed prior to final approval:

R645-301-525.440 - In January of 2017, a deficiency was written by Cheryl Parker outlining a need for additional subsidence monitoring points within the Greens Hollow Lease. This request was addressed in April by follow up narrative in section 5.2.5.1 which stated that subsidence monitoring points will be located and the site surveyed for baseline information sometime in 2017.

Deficiencies Details:

R645-301-525.440 - Pursuant to a commitment in April 2017, Permittee must provide results of on-site baseline survey for subsidence monitoring points within the Green's Hollow lease.

jeatchel

Subsidence Control Plan Notification

Analysis:

The amendment meets State of Utah R645 requirements for Subsidence Control Plan Notification.

A previous deficiency outlined the need for the Permittee to define a clear plan of specific areas to be protected from subsidence and a notification sent to the appropriate surface owners affected by said subsidence. Narrative in section 5.2.5.1 states that mining may be excluded along cliff escarpments where subsidence would impact cultural features or raptor habitat, but will be evaluated on a case by case basis and permitted as required. There is no private surface ownership as the surface rights for the entirety of the Greens Hollow tract is owned by the USFS.

jeatchel

Fish and Wildlife Protection and Enhancement Plan

Analysis:

The amendment meets the State of Utah R645-301-333 requirements to describe how using best technology currently available to minimize adverse impacts to fish and wildlife, including compliance with the Endangered Species Act. Volume 1, Chapter 3, Section 3.3.3 provides a plan to minimize disturbance and adverse impacts to fish and wildlife. Since this amendment does not include additional surface disturbance, the approved MRP is adequate. Appendix 3-15 contains a sound monitoring report conducted by Tetra Tech, Inc from 2008. The monitoring was conducted to collect baseline data in association with the potential development and operation of a ventilation shaft near Quitchupah Canyon. The data was collected around an existing ventilation fan and at selected sensitive resource location such as Forest System Roads, and Greater Sage-grouse leks. The collected sound level data will be used to determine measures which could reduce sound related impacts associated with the operation of the proposed ventilation fan.

ireinhart

Vegetation

Analysis:

The amendment meets the State of Utah R645-301-331 requirements for protection of vegetation. Volume 1, Chapter 3, Section 3.3.1 provides protection measures for vegetation. Potential impacts to vegetative, fish and wildlife resources and the associated mitigation plans are presented in Sections 3.30 and 3.40 of the approved MRP. Since this amendment is an expansion of underground mine workings with no additional surface disturbance, the existing protection measures are adequate. However, this amendment includes Appendix 3-15, a sound monitoring report in association with the potential development and operation of a vent shaft near Quitchupah Canyon. The collected sound level data will be used to determine measures which could reduce sound related impacts associated with the operation of the proposed ventilation fan. Additional monitoring information for the upper reaches of Quitchupah Creek is provided on page 3-34.

ireinhart

Hydrologic Ground Water Monitoring

Analysis:

The application does not meet the State of Utah R645 requirements for hydrologic groundwater monitoring plan.

The Permittee includes a groundwater monitoring plan based upon the PHC determination and the analysis of baseline hydrologic and geologic information in the permit application. Groundwater Plan is outlined in Table 7-2, beginning on page 7-50. The locations are depicted on Plate 7-10. All PHC monitoring recommendations were incorporated into the monitoring program. The Permittee commits to monitoring 27 springs and 2 wells specifically associated with the Greens Hollow Tract. The North Horn Formation will be monitored using 22 springs and the Price River Formation will be monitored using 5 springs. The springs will be monitored quarterly, as access permits, for field parameters, TDS, total iron, and total manganese. In the Greens Hollow Tract, no springs discharge from the Castlegate Sandstone, Blackhawk Formation, or Starpoint Sandstone. The Permittee monitors the Castlegate Sandstone using MW-15-5-2, however, the well has been consistently dry. In the past, Pines 303 spring discharging from the Castlegate has experienced a diminution of flow, likely attributable to the Sufco Mining Operations in the area. Because of this history, the monitoring plan includes no-subsidence buffer zones in areas where the Castlegate Sandstone is known to occur within 50 feet or less of the surface. The Castlegate Sandstone is not considered to be regional aquifer. The groundwater occurs within the Castlegate Sandstone occurs as isolated, perched zones, does not outcrop within the mining or adjacent areas, and is not transmitted, nor is it transmitted or stored within the Tract for a specific use. Consequently, the the Castlegate Formation does not meet the R645-100-200 criteria for "aquifer." Therefore, additional monitoring locations for the Castlegate will not be required by the Division.

The Blackhawk Formation, underlying the Castlegate, will be mined by Sufco as it contains the Upper Hiawatha coal seam. The Blackhawk Formation does not discharge within the Greens Hollow Tract area and no monitoring locations exist. Water encountered in the mine, through working faces, or faults, fractures and roof bolts, will likely be from the Blackhawk Formation and/or the overlying Castlegate Formation. Within the groundwater monitoring plan for Sufco Mine, there are four wells screened in the Blackhawk, and six springs. However, as no surface expression or specific use for the Blackhawk Formation groundwaters exist in the Greens Hollow Tract, additional monitoring is not required at this time.

The Starpoint Sandstone is beneath the mineable coal seam. In the Greens Hollow Tract, the Starpoint Sandstone does not discharge. Furthermore, the water is not put to a specific use and therefore does not qualify as an aquifer under R645-100-200. However, due to its proximity to mining and adjacent discharge areas, the Division has requested monitoring. The Permittee has proposed an in-mine well, to be screened in the Star Point Formation. The well will be drilled once Sufco has advanced close enough access to the Greens Hollow Tract. The estimated time for well completion will be Fall/Winter 2018. All information relevant to the new well, including drilling logs, will be provided to the Division. Plate 7-3 and 7-10 will also be updated to reflect the well location. Once completed, water level monitoring will occur quarterly.

Furthermore, there is limited potential for communication between these formations naturally. Active mining within the Greens Hollow Tract has potential to increase subsurface connectivity between formations. There is potential for groundwater discharging as springs to migrate from the original spring location where near-surface tension cracking is extensive. However, all of the Greens Hollow Tract has an overburden exceeding 800 feet. The Permittee uses the Mining Engineers Handbook to conclude that upwardly propagating fracturing will likely extend 60 times the mining height, or 600 feet. The Permittee outlines on pages 60-61 several reasons why groundwater systems in the near-surface Price River and North Horn Formations will unlikely be impacted by mining operations and water resources are unlikely to migrate downward. The presence of clays in the subsurface will likely impede the development of cracks due to the plasticity, or heal any cracks that do form in shorts periods of time from infilling or swelling.

However, the Division requests the Permittee to provide a commitment to notify the Division within 30 days of monitoring if any spring is believed to have moved locations. The Permittee will provide this information with a location map to the division via e-mail to ogmcoal@utah.gov.

Overall, the springs and wells to be monitored in the Greens Hollow Tract will be monitored for water quality and quantity, with quarterly reports sent to the Division. The groundwater monitoring plan is sufficient to determine the impacts of the operation upon the hydrologic balance.

During operation, the mine water management system is used to pump water to and from mining districts underground. The permittee commits, in the event water is encountered in-mine at a rate of 1 cfs, continuously flowing for 30 days, to collect a sample for lab analysis. The commitment is provided on page 7-12. The permittee writes "should water underground be encountered due to faulting that if flowing greater than 1 cfs, which continually flows for 30 days, a

sample will be collected for lab analysis." The Division requests the language "due to faulting" to be removed from the commitment, ensuring that all flows over 1 CFS for 30 days will be reported to the Division. Further, the sample will be analyzed according to Table 7-2, subcategory D9 which includes C14, C13, and Tritium analysis. The analysis for tritium will occur once during the 30 day sampling period. Flow measurements will be taken weekly until access is no longer available and/or flow stabilizes/stops. The Permittee must include a commitment to provide lab analysis and weekly flow data to the Division, as well as, a map showing an approximate location (approximate means which panel and ballpark area within panel) of where the flows have been encountered.

Deficiencies Details:

The application does not meet the State of Utah R645 requirements for Groundwater Monitoring. The following deficiencies must be addressed prior to final approval:

R645-301-731.211, 724.100: The Permittee must update the monitoring plan to include USP-2, as it is recommended to be monitored according to the PHC, Table 9. All maps already include USP-2 as a operational monitoring site, including Plate 7-3, Plate 7-10, and Figure 9 in Appendix 7-28. The update is therefore only needed in the monitoring plan and recommended monitoring plan tables.

R645-301-731.211: The Permittee must write a commitment to provide maps for all mine in-flows > 1 cfs, if encountered, for 30 days, and the weekly flow measurement until access ceases or flow stabilizes. The map will show an approximate location meaning which panel and a ballpark location within the panel. The Permittee must remove language "due to faulting" from the commitment on page 7-12 of the MRP, ensuring that all flows over 1 CFS for 30 days will be reported to the Division.

R645-301-731.700: The permittee must change the language on page 7-3 in the MRP for the in-mine monitoring well. The Permittee must state they will update plate 7-10 and Plate 7-3 with the well location.

R645-301-731, -121.200: The Permittee must update the Ground Water Monitoring Plan to include USP-2. It is currently displayed on all maps depicting monitoring locations including Plate 7-3, Plate 7-10, and Figure 9 in Appendix 7-28.

R645-301-731.200: The Permittee must provide a commitment to notify the Division within 30 days of monitoring if any spring is believed to have moved locations. The Permittee will provide this information with a location map to the division via e-mail to ogmcoal@utah.gov.

aumarva

Hydro Surface Water Monitoring

Analysis:

The application does not meet the State of Utah R645 requirements for Surface Water Monitoring.

Operations in the Greens Hollow Tract have potential to impact surface water resources and therefore, a surface water monitoring plan will be implemented. Surface water monitoring plan is outlined in Table 7-2, beginning on page 7-50. The locations are depicted on Plate 7-10. All PHC monitoring recommendations were incorporated into the monitoring program. Monitoring is proposed to be conducted in the Greens Hollow Tract in two parts. First, the Permittee commits to quarterly monitoring of six surface locations. The surface locations are located within major drainages of the Greens Hollow Tract. Monitoring will occur at Cowboy Creek (M-STR04, discharge and field parameters), Greens Hollow Creek (M-STR06, discharge and field parameters), Muddy Creek (U-Mud, discharge and field parameters), Muddy Creek below the Tract (Pines 405, discharge and field parameters), South Form of Quitchupah Creek (Sufco 006, discharge, field and lab parameters), and North Fork of Quitchupah Creek (Sufco 007, discharge, field and lab parameters.)

The major drainages includes a no-subsidence buffer zones in areas where the Castlegate Sandstone is known to occur within 50 feet or less of the surface. The buffer zone provides extra protection for the surface water resources. The no subsidence zones are depicted on Appendix 7-27, Figure 4.4. Furthermore, there is limited potential for communication between these formations naturally. Active mining within the Greens Hollow Tract has potential to increase subsurface connectivity between formations, however, it is unlikely that this will substantially affect surface water resources. All of the Greens Hollow Tract has an overburden exceeding 800 feet. The presence of clays in the subsurface will likely impede the development of cracks due to the plasticity, or heal any cracks that do form in shorts periods of time from infilling or swelling, preventing downward migration of surface water resources.

The surface water monitoring plan is not sufficient. The streams chosen to be monitored are within the no-subsidence

mining zones. It is therefore important to also monitor surface water in areas where subsidence mining will occur. The Permittee acknowledges the lack of surface streams in the monitoring plan and proposes to incorporate one year quarterly monitoring before, during, and after longwall mining of surface streams above and below proposed mining at additional surface water monitoring locations throughout the Tract. The plan would add an additional 15 sites for surface water monitoring. These sites are listed in Table 7-2, beginning on page 7-51. The locations are depicted on Table 7-10. In order for the Division to determine the impacts of the mining operation upon the hydrologic balance, the Permittee must incorporate all 15 sites into the continuous operational surface water monitoring plan. The sites must be monitored quarterly, until reclamation. The Division will not approve monitoring locations that will be turned on and off. The Permittee must update the monitoring plan, sampling protocol, and narrative. The mine progress map, to be submitted to the Division quarterly- coinciding with water monitoring, is described on page 7-69. These maps will be provided to the Division via e-mail, sent to ogmcoal@utah.gov.

The Division requests all stock water ponds within the Greens Hollow Tract be monitored and a monitoring plan be developed. This will include a commitment from SUFCO to visit the ponds within the Greens Hollow Tract as soon as they are accessible in the spring of each year (typically late April to early May), photographing the condition of each pond, observe the pond for evidence of cracking, estimate the depth and surface area of water contained in the pond, inspect the immediate drainage area for evidence of surface cracking, note general soil moisture conditions, and note the general condition of the pond. Additional monitoring visits will be made in the late summer (late July or early August) and again in the Fall (late September to early October) of each year. The plan will also include a determination of the functionality and water holding capacity of each pond and the determination of the watershed area for each pond. This information will be submitted quarterly to the Division, at ogmcoal@utah.gov.

The monitoring plan for all surface sites includes a commitment to submit discharge and field parameter measurements to the Division, quarterly.

Deficiencies Details:

The amendment does not meet the State of Utah R645 requirements for Surface Water Monitoring. The following deficiencies must be addressed prior to final approval:

R645-301-731.220, -731.221, -731.222: The Permittee must incorporate the 15 surface water monitoring locations that are proposed to be turned on-off as mining advances into the surface water monitoring plan as permanent locations. The operational monitoring plan currently states it will be sampled at sampling frequency Protocol C, as defined in Table 7-3 of the Monitoring Plan on Page 7-44a, and the laboratory monitoring protocol for surface sites is Protocol 2. The Division requests the asterisk be removed, and the language "cease at an appropriate time when the sites will no longer be impacted by mining" be removed.

R645-301-731.224.1; -752.240; -752.250: The Division requests a stock water monitoring plan be developed for all ponds and catchments within the Greens Hollow Tract. The following data will be provided quarterly to the Division at ogmcoal@utah.gov: A commitment from SUFCO to visit the ponds within the Greens Hollow Tract as soon as they are accessible in the spring of each year (typically late April to early May), photographing the condition of each pond, observe the pond for evidence of cracking, estimate the depth and surface area of water contained in the pond, inspect the immediate drainage area for evidence of surface cracking, note general soil moisture conditions, and note the general condition of the pond. Additional monitoring visits will be made in the late summer (late July or early August) and again in the Fall (late September to early October) of each year. The plan will also include a determination of the functionality and water holding capacity of each pond and the determination of the watershed area for each pond.

aumarva

Maps Affected Area

Analysis:

The amendment meets State of Utah R645 requirements for Affected Area Boundary Maps.

A previous deficiency outlined the need for the Permittee to amend all drawings and maps to show only approved Sufco leases and pending Green's Hollow lease boundaries. All maps now only include relevant Sufco leases and Green's Hollow lease boundaries, and therefore adequately address this requirement.

jeatchel

Maps Mine Workings

Analysis:

The application does not meet the State of Utah R645 requirements for Maps Mine Workings.

The Permittee provides a commitment to provide a longwall progress map to coincide with quarterly water monitoring data. The maps will be submitted confidentially to the ogmcoal@utah.gov e-mail address and will have most recent quarters longwall advancement highlighted with completion dates. The commitment is provided on page 7-69. The Division requests the quarterly maps to include a monthly marker indicating how far the longwall has advanced each month of the quarter.

Deficiencies Details:

The application does not meet the State of Utah R645 requirements of Maps Mine Workings.

R645-731.760: The Division requests that the quarterly map for mine workings will include a monthly marker indicating how far the longwall has advanced each month of the quarter.

aumarva

Maps Monitoring and Sampling Locations

Analysis:

The application does not meet the State of Utah R645 requirements for Maps Monitoring and Sampling Locations.

Map of Operational Hydrologic Monitoring Stations, including only current monitoring plan locations for Sufco Mine, is present on Plate 7-10. The labels for the 15 surface water monitoring locations on Plate 7-10 do not match the legend. Because the Division is requesting these locations to become permanent monitoring sites, therefore, the labels must be changed from the asterisk symbol to the triangular symbol in order to match the legend for stream monitoring.

Also, Plate 7-10 includes a location that is not listed on the Monitoring Plan. The Permittee must remove the Broad Hollow site from the map.

Deficiencies Details:

The application does not meet the State of Utah R645 requirements for Monitoring and Sampling Location Maps. The follow deficiencies must be addressed prior to final approval:

R645-301-722: The Permittee must update Plate 7-10 by removing Broad Hollow because it is not listed as part of the monitoring plan. Also, the Permittee must change the symbology in Plate 7-10 for all stream monitoring sites to that which is depicted in the legend. Currently, 15 sites are depicted with an asterisk - the sites the Permittee proposes to turn on and off in relation to mining area. However, as previously noted, the Division requests all 15 sites become continuous, to be monitored quarterly regardless of mining area. Therefore, the symbology must be updated from the asterisk to the triangle symbology used to depict stream monitoring locations.

aumarva

Reclamation Plan

PostMining Land Use

Analysis:

The amendment meets the State of Utah R645-301-412 requirements for postmining land use. Volume 1, Chapter 4, Section 4.1.2 pages 4-16 through 4-16 provide the post-mining land use plan. The Greens Hollow mining area is managed by U.S. Forest Service under the multiple use under the Federal Land Policy and Management Act. Present management emphasizes livestock grazing, wildlife, timber and watershed development. The postmining land uses will be consistent with the land use plans prepared by the Forest Service. Final reclamation activities such as grading and seeding as detailed within the MRP will be completed in a manner to provide uses of the lands consistent with those uses required by the U.S. Forest Service land use plans. Retention of pre-SMCRA highwalls is discussed in Section 5.5.3.6. Volume 1, Chapter 4, Section 4.1.3 pages 4-19 through 4-20 provide the postmining land use plan which is the

same as the premining land use.

Ireinhart

WildLife Protection

Analysis:

The amendment meets the State of Utah R645-301-342 requirements for a fish and wildlife plan for the reclamation and postmining phase of operation. The amendment does not propose any additional surface disturbance and therefore the existing MRP adequately meets the requirements. Volume 1, Chapter 3, Section 3.4.2 provides a wildlife enhancement plan. Enhancement measures include range improvements within the lease area and reclamation seed mixes are designed to provide nutritional value and cover to wildlife. Table 3-1 (pg. 3-15) provides information on federally protected threatened, endangered, and listed species. Table 3-2 (pg 3-27/28) provides a list of Utah species that are protected. Table 3-3 (pg 3-29/30) provides a list of USDA-FS Region 4 Sensitive species. The proposed amendment will not affect the continued existence of endangered or threatened species or result in the destruction or adverse modification of their critical habitats, as determined under the Endangered Species Act.

Ireinhart

Mine Openings

Analysis:

The application meets the State of Utah R645 301-631 requirements for managing mine openings and sealing exploration holes had boreholes.. Since this application is for an extension of an existing underground mine, there are no plans for additional or new portals in the Greens Hollow tract. Reclamation of exploration boreholes has been addressed. The plan for casing and sealing of wells is found in section 7.6.5 of the MRP. When no longer needed for monitoring or approved for transfer as a water well, each well will be sealed and backfilled by placing a concrete plug from TD to the surface.

dhaddock

Contemporaneous Reclamation General

Analysis:

The amendment meets the State of Utah R645-301-352 requirements for contemporaneous reclamation. Volume 1, Chapter 3, Section 3.5.2 page 3-52 provides the contemporaneous reclamation plan. The amendment does not contemplate any surface disturbance and therefore, the approved MRP meets the regulations.

Ireinhart

Revegetation General Requirements

Analysis:

The amendment meets the State of Utah R645-301-341 requirements for a revegetation plan. Volume 1, Chapter 3, Section 3.40 provides the revegetation plan which covers all lands disturbed by coal mining and reclamation operations. Nothing has been added to the existing reclamation plan with this amendment since additional surface disturbance is not proposed at this time.

Ireinhart

Revegetation Mulching and Other Soil Stabilization

Analysis:

The amendment meets the State of Utah R645-301-353 requirements for vegetative cover. Volume 1, Chapter 3, Section 3.5.3 page 3-53 through 3-58 provides general requirements for revegetation. The amendment does not contemplate any surface disturbance and therefore, the approved MRP meets the regulations.

Ireinhart

Maps Affected Area Boundary

Analysis:

The amendment meets State of Utah R645 requirements for Affected Area Boundary Maps.

A previous deficiency outlined the need for the Permittee to amend all drawings and maps to show only approved Sufco leases and pending Green's Hollow lease boundaries. All maps now only include relevant Sufco leases and Green's Hollow lease boundaries, and therefore adequately address this requirement.

jeatchel

CHIA

CHIA

Analysis:

The application does not meet the State of Utah R645 requirements for Cumulative Hydrologic Impact Assessment (CHIA).

Deficiencies Details:

R645-301-729: The Permittee must address the outstanding hydrologic deficiencies in order for the Division to be able to complete the CHIA.

aumarva