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Technical Analysis and Findings

Utah Coal Regulatory Program

April 28, 2015

PID: C0410002
TaskID: 4809
Mine Name: SUFCO MINE
Title: WASTE ROCK SITE EXPANSION

Summary

Canyon Fuel Company LLC., proposes to expand the area of the waste rock disposal site by approximately 46 acres (thus increasing the permitted area to a total of 87.8 acres). The site shall be developed in phases, to allow the disturbance of the surface to be minimal in each phase. The existing pond is proposed to be sufficient for treatment during the first phase, but will be replaced by a larger pond at some time during the end of the first phase and the beginning of the second.

Ireinhart

Environmental Resource Information

General

Analysis:

The application includes the addition of text within the introduction to meet the requirements of R645-301-510, -511, -521. The text addresses that the following sections within the MRP amendment included the relevant methods, calculations, and plans to describe the operations and reclamation of the waste rock site; however this section does not meet the minimum requirements of R645-301-510

Deficiencies Details:

R645-301-510 requires the engineering section be divided into operation plan, reclamation plan, design criteria, and performance standards. The current application does not clearly detail the operation plan (site preparation, foundation preparation, and construction), the various sections in -521 do not call out the specific design criteria specified for the expanded side of the waste rock (which differs from the old waste rock placement criteria), there is not discussion describing how each phase of construction will be independently reclaimed within the 540 section, and finally there is no verbiage detailing what performance standards (nuclear gauge, aerial photography, or survey) the mine will utilized to verify that the design criteria is met. The permittee will address these points of clarification in regards to each of the proposed phases 2-5 along with how phase 2 ties into the current waste rock.

cparker

Permit Area

Analysis:

An updated Map 1 and Map 2 were provided detailing that disturbance of the waste rock site will increase to 58.5 acres.

The application meets the minimum requirements of R645-301-521 for detailing the permit area.

cparker

Vegetation Resource Information

Analysis:

Information provided in the application meets the minimum requirements of the regulations R645-301-321. Appendix IV(A) is a report of the vegetation and sensitive species of the proposed area. The report was prepared by Mt. Nebo Scientific, Inc in February 2014 and consists of vegetation data from plant communities that may be affected. The report includes raw data along with summaries, photographs, and a map that delineates existing vegetation types. Reference areas were identified to be used to determine success standards when the site is reclaimed in the future.

Ireinhart

Fish and Wildlife Resource Information

Analysis:

The Vegetation & Sensitive Species report prepared by Mt. Nebo Scientific evaluates habitat and potential impacts to Canada lynx, Greater sage-grouse, Utah prairie-dog, and the brown (grizzly) bear. It does not evaluate the Yellow-billed cuckoo which was recently listed as threatened. The Trust Resource List (U.S. Fish and Wildlife Service) identifies the area as proposed critical habitat for the Yellow-Billed Cuckoo.

The disposal site contains no perennial or intermittent streams. The only surface flow in the area is in the form of occasional storm runoff. Therefore, the site does not support habitat for fish or wetland species.

Additional fish and wildlife information for the general area is contained in Volume 3 and remarks the area is used for wintering deer and elk and by several non-game species of birds and mammals.

Deficiencies Details:

Information provided in the plan is not considered adequate to meet the minimum requirements of R645-301-322.210

Prior to approval the permittee must provide information regarding the resources available for the Yellow-Billed cuckoo and the potential impacts to this species.

Ireinhart

Soils Resource Information

Analysis:

Analysis:

The 46 acre expansion site is immediately adjacent to the initial 12.2 acre site in T 22 S, R 4 E, Sec 18 at an elevation of 7,835 - 8183 ft., in a basin surrounded on three sides by the Sevier County road. The Order II soil survey for the expansion area is found in Appendix V(A). Table 3 and Figure 3 describe five soil map units within the survey area. Soil profile descriptions are in Appendix A. Locations of soil profiles are shown on Figure 3 and photographs are provided in Appendix B. Soil pedon displays are in Appendix C. Laboratory Analysis is found in Appendix D. The soil survey references an earlier version of the Utah Guidelines for Topsoil and Overburden, dated 2005. The guidelines were finalized in 2008. There were no substantive changes to the 2008 version and the soil suitability tables are the same. The soil survey omitted the analysis of nitrogen, phosphorus and potassium, all of which were included in all versions of the 'Guidelines.'

The area to be disturbed is located on alluvial valley side slopes, toe slopes and in the concave mountain valley bottom. Within the five mapped soil units, the following Alfisol and Mollisol soil families will be sources of deep topsoil: Chivers family, Crow family, Kunz family, Trag family, Tuntsa family, Veatch family, Zillion family. On the average, between eleven and 50 inches of topsoil will be salvaged from the site (Table 8, App. V(A)). Appendix D analysis show that all the soils in the survey were acceptable for salvage, most were rated "good" as described in Table 4 of the 2008 Guidelines. A few horizons were rated "fair" due to extremely fine texture, water holding capacity or elevated SAR values.

Two calculated K factors calculated were in the poor category, however this calculation based on slope and texture will change with placement of the soil at reclamation and should not therefore be a limiting factor. The existence of high values of total organic carbon in topsoil and subsoil is very good and indicates high organic matter content. The Total Organic

Carbon percentage limitation is not placed on topsoil or subsoil, but is used to exclude high percentages of coal in overburden from placement at the surface in reclamation.

The survey also evaluated the percent cobbles and stone in each horizon to determine suitability for reclamation. This criteria is not one that the Division utilizes, because the rocks, stones and cobbles are desirable on a reclaimed surface where they provide micro-climates for seedling establishment. Rocks and stones can also protect the soil surface from wind and water erosion while vegetation is becoming established. Even where this criteria was applied, the soil salvage depths were still 33 - 46 inches, except in the Veatch and Wiggler soil families where 13 and 17 inches of topsoil will be salvaged due not only to the presence of flagstones, but also low Available Water holding Capacity and depth to sandstone.

Table 9 in Appendix V(A) is very useful as it provides a weighted average topsoil and subsoil depth for each map unit. There will be topsoil salvage in each map unit, but subsoil will not be salvaged from any of the families in map unit 4. Map unit 4 is on the bench top on the east side of the disturbed area and on the southwest corner of the disturbed area adjacent to the County road.

Exhibit E of Volume 3 of the MRP provides a previous prime farmland assessment for the original 8 acres disturbance in the NW1/4 of the NE1/4 of Section 18, dated 1987. This expansion will utilize the entire NW1/4 and extend south into the SE1/4 of the SW 1/4 of Section 18. The expansion will be on extremely deep soils. In the valley bottom, pedon descriptions indicate that the soils are seasonally wet three to six feet below the surface. However, there is no available irrigation water and the soils have not historically been used for farmland. The Division does not view the additional area as prime farmland and will consult with the NRCS for their opinion of the prime farmland status of the additional acreage.

Deficiencies Details:

R645-301-222.400, The soils were sampled and analyzed for the parameters described in Table 2 (page 6 of Appendix V(A)), please include the nutrient status of the topsoil (N:P:K) of the topsoil and salvageable subsoil. Please refer to Table 3 of the Division's January 2008 Guidelines for Topsoil and Overburden.

pburton

Land Use Resource Information

Analysis:

The land under consideration is adjacent to the existing waste rock site. Premining land use is livestock grazing and wildlife habitat. As noted, Section 321 adequately describes the condition and productivity of the land for wildlife and grazing values.

Although a land use map would have limited information due to the size of the site and its proximity to the County Road, R645-301-400.110 requires the application contain a map of the existing use of the land. Figure 1 and Map 1 do not adequately represent land use.

There are no cemeteries, public parks, or units of the National System of Trails or the Wild and Scenic Rivers System located within the site boundary.

SENCO-PHENIX performed an intensive cultural resource survey on the Waste Rock Disposal Areas. Cultural resources were located consisting of one archaeological site, a historic corral (42SV3565) which is not recommended for nomination to the National Register of Historic Places (NRHP). A copy of the report, along with DOGM request for concurrence on the findings was submitted to SHPO and concurrence was received 3/20/15.

CFC is not aware of previous mining activity.

Deficiencies Details:

Information provided in the plan is not considered adequate to meet the minimum requirements of R645-301-411.110.

Prior to approval the permittee must provide a map of the use of the land existing at the time of the filing of the application.

Ireinhart

Probable Hydrologic Consequences Determination

Analysis:

In the update to the PHC for expanding the waste rock site, the Permittee has described road salting activities of the county road next to the site as a possible impact to the hydrologic system. The Permittee should clarify in the MRP that these activities are not operations of the Sufco mine, but of the county.

Deficiencies Details:

R645-301-728.300 The description of road salting activities (page 7-8) taking place on the county road adjacent to the waste rock site, should clearly indicate that these are from county operations and are not operations of the Sufco mine.

adaniels

Maps Affected Area Boundary Maps

Analysis:

Maps 4A and 5A were updated to include the expanded footprint of the waste rock site. References to maps and appendices were updated in section 536.100 to include the additional waste rock volume calculations. The application does not meet the minimum requirements of R645-301-521 due to maps being removed that detail the existing wasterock.

Deficiencies Details:

R645-301-512, and 521 .141 Requires that all boundaries of all areas proposed to be affected over the estimated total life of the mine, with a description of the size, sequence, and timing. The old waste rock site must be labeled similar to the phased on Map 4A detailing the various ""phases"" of placement and reclamation.

cparker

Maps Archeological Site Maps

Analysis:

The cultural resource survey performed and reported by Senco-Phenix contains maps of archeological and cultural resource sites. (Confidential)

lreinhart

Maps Cultural Resource

Analysis:

The cultural resource survey performed and reported by Senco-Phenix contains maps of archaeological and cultural resource sites. (Confidential)

lreinhart

Maps Existing Structures and Facilities

Analysis:

Text was added with section 521 detailing the requirements of R645-301-521.100 that no buildings are located in and within 1000 feet of the refuse pile. No surface or subsurface features are within, passing through or passing over the refuse pile area. The application meets the minimum requirements of R645-301-521 in regards to building facilities located within 1000 feet of the refuse pile.

cparker

Maps Vegetation Reference Area

Analysis:

The Vegetation & Sensitive Species of the Proposed Expansion at the Waste Rock Site report contains a vegetation map indicating plant communities, reference points, and sampling locations.

Operation Plan

Mining Operations and Facilities

Analysis:

Section 523 meets the minimum requirements of the R645 rules in regards to mining as the section contains the relevant details that no mining operations will be performed at the refuse site. Operations at the site will be limited to waste rock being belly or end dumped at the site with lifts placed by a small dozer. Text states the equipment will vary according to the quantity of waste to be processed, hauled and compacted at the site.

The application meets the minimum requirements of section 526 detailing that no buildings or utility installations exist or are proposed at the waste rock site.

Minimal text edits were submitted to section 528 within the amendment removing text detailing waste rock transport up a steep uphill grade and that haulage/compaction activities will be scheduled during the week whenever possible. Maps 4A and 5A were updated to include the expanded footprint of the waste rock site. References to maps and appendices were updated in section 536.100 to include the additional waste rock volume calculations. The application does not meet the minimum requirements of R645-301-528 as it lacks a description of how refuse will be constructed to achieve a factor safety of 1.5, as described in Appendix II(A).

Deficiencies Details:

The minimum requirements of R645-301-528, which states that “the permit application will include a narrative explaining the construction, modification, use, maintenance...” were not met in the current application. R645-301-528.320 and -528.322 also require that coal mine waste and refuse piles be placed according to R645-536.100 through -536.230 which state that the disposal facility will be designed using

- current prudent engineering practice
- attain a minimum long term static safety factor of 1.5 with the foundation and abutments stable under all conditions of construction
- sufficient foundation investigations, as well as any necessary laboratory testing of foundations materials, will be performed in order to determine the analyses of the foundation conditions
- waste placed in a controlled manner, excluding end or side dumping

The Permittee will add descriptions detailing the site preparation, foundation preparation, construction, and reclamation for each of the new phases as outlined on Map 4A and 4B as well as including the current waste rock site information.

R645-301-531 The original waste rock site geotechnical report detailed the estimated settlement at the site due the surcharge weight of the old waste rock site. There is no text describing the potential settlement at the site due to the expanded waste rock site. The Permittee will add a discussion on the expect settlement in relation to each of the new phases and any remediation measure that may be required to prevent slides between each phases construction.

R645-301-532 the application does not meet the minimum requirements of of the code as the application text only vaguely describes the designs for sediment controls that will be specifically used at the respective points of construction associated with each of the new and old waste rock phased areas. Discussions should include how the disturbance area is limited at any given point to the smallest possible footprint and that disturbed areas will be stabilized to reduce the rate and volume of runoff.

The application fails to meet the minimum requirements of R645-301-536 by not describing the design and construction specifications detailed in the Earthfax geotechnical reporting Appendix II(A). Text within this section should detail the sequence as well as the design/construction specifications that are critical to achieve the required 1.5 safety factor for the waste rock piles and the pond. The Permittee will add a description that will describe the site preparation, foundation preparation, and lift construction activists at each of old and new phases of the waste rock site.

cparker

Existing Structures

Analysis:

The application includes a section of text in 521.100 and 526.100 describing how no buildings are located in and within 1000 feet of the refuse pile or are planned for the site. The application meets the minimum requirements of sections 521.100 and 526.

cparker

Air Pollution Control Plan

Analysis:

As noted on page 4-5, "On March 31, 2011 the Division of Air Quality issued a small source exemption registration for the waste rock disposal Site." Documentation of the exemption is not provided with the application and therefore can not be confirmed if it adequately addressed the waste rock size for the proposed 46 acres. In 2011, the site was less than 10 acres in size so that exemption might not apply to the 46 acres expansion.

Deficiencies Details:

Information provided in the application does not meet the minimum requirements of the regulations R645-301-420. The application must include documentation of communication between Canyon Fuel and DAQ for the 2011 small source exemption and the particulars of that exemption. Canyon Fuel must provide documentation of a current NOI provided to DAQ for the current proposed 46 acres expansion of the waste rock site.

Ireinhart

Subsidence Control Plan Slides and Other Damage

Analysis:

The application included the addition of text to call out the individual sub headings of R645-301-515.100 through -.300. The text describes how if an inspection of an impoundment discloses that a potential hazard is associated with that impoundment that could adversely affect the public, proper, health, safety and environment, the Division will be promptly notified. The application does not meet the minimum requirements of R645-301-515 due to a lack of information of expected settlement due to the surcharge of the new waste rock site.

Deficiencies Details:

R645-301-515, -531 The original waste rock site geotechnical report detailed the estimated settlement at the site due the surcharge weight of the old waste rock site. There is no text describing the potential settlement at the site due to the expanded waste rock site. The Permittee will add a discussion on the expect settlement in relation to each of the new phases and any remediation measure that may be required to prevent slides between each phases construction.

cparker

Fish and Wildlife Protection and Enhancement Plan

Analysis:

The plan states "CFC will apply all methods necessary to minimize disturbances or any adverse effects to threatened, endangered or species of special interest. All species and habitats within the permit area will be protected to the best of CFC's ability." This language is vague and provides no specific plans to minimize impacts. It's foreseeable that increased traffic on the haul road has the potential to increase wildlife/vehicle collisions.

The plan also states, "Protective measures include immediate stabilization of the disturbed sites through erosion control. This objective will be achieved through controlled grading practices, proper seedbed preparation to encourage rapid plant establishment, inclusion of rapidly establishing species in the seed mixture to be planted, and mulch application." Interim reclamation provides temporary vegetation and cover for wildlife species that may be using the area. Although it's provided for in other parts of the plan, there should be some language in regards to the timing of interim reclamation and the short term benefits it will provide to wildlife for food and cover.

Deficiencies Details:

Information provided in the plan is not considered adequate to meet the minimum requirements of R645-301-330

301.331- Prior to approval the permittee must provide a description of measures taken to disturb the smallest practicable area at any one time. Although it is indicated in other areas of the plan, there is no description (or reference) of the phased approach to development and reclamation. Interim reclamation may be used to provide food and cover for wildlife in the short term.

333.300- The permittee must include protective measures taken to avoid or minimize impacts to wildlife due to the increased traffic of the haul road. Protective measures may include establishment vehicle speed posting or wildlife crossing signs if warranted.

Ireinhard

Fish and Wildlife Wetlands and Habitats High Value

Analysis:

There are no wetlands or habitats of high value on the land.

Ireinhard

Topsoil and Subsoil

Analysis:

Analysis:

Soil map units to be disturbed are shown on Figure 5 of the application. Table 7 in Appendix V(A) provides the salvageable topsoil and subsoil documented at each representative profile location. During Phase 1 and Phase 2 operations, Soil Map Units 1 and 2 will be disturbed. The volume of recovery for each construction Phase is calculated in Section 222 of the MRP, using reference to the area shown on Maps 4A and 4B. However, an acreage figure for each Phase is not provided on the map, so that these calculations can not be cross-checked. To complicate matters, Figure 5, the soils map is of a different scale than Maps 4A and 4B so that the acreage within each map unit and phase is difficult to interpolate.

Figure 3 in the Soil Survey Appendix V(A) provides the recommended salvage depths for topsoil and subsoil in each map unit. For phase 1 and 2 the topsoil will be recovered from the surface down to twenty inches in Map Unit 1 and thirty-five inches in Map Unit 2. An additional thirty-three inches (map unit 2) to thirty eight inches (map unit 1) of subsoil will be salvaged from the area before construction of phase 1 and 2 facilities will begin. Similarly, there will be topsoil removal before construction in Phase 2, Phase 3 and Phase 4.

Section 222 contains references to former topsoil stockpiles and their locations and references Map 2. However, Map 2 shows a single large topsoil stockpile. Please explain how the stockpiles will be combined or if they will continue to exist, at what construction phase will they be consumed. Please provide a map showing the location of all existing stockpiles.

Section 222 of the amendment (p. 2-4) provides a table for topsoil and subsoil volumes recovered by soil map unit during each phase of construction, with a sum of 171,655 cu yds total. Map 2 states that 138,354 cu yds of topsoil and subsoil will be removed, total. Please explain why Map 2 and the table in Section 222 differ by 20% in the volumes of topsoil and subsoil to be removed and stockpiled.

Operations Map 2 and 4A shows a single topsoil stockpile holding 180,000 CY. Section 242.100 also refers to a single stockpile. Topsoil and subsoil must be stockpiled separately, although the piles may be adjacent. According to Map 2, the face of the stockpile will have a 20% (3h:1v) slope. However, according to Section 234.100, the slope may be as steep as 2h:1v. The text should be revised to agree with the drawing.

Section 224 Topsoil Substitutes and Supplements does not apply to the waste rock expansion and should be deleted.

Section 231.100 has been revised to remove the use of silt fences and vegetation to protect the topsoil, except after two years. This is not acceptable. Topsoil will be placed on a stable site, protected from compaction, protected from wind and water erosion with a quick growing, vegetative cover from the outset. Alternatives for protection may be considered, but the protection will be in place at the outset of the pile construction.

Additional information is required as follows:

The acreage of each phase must be stated so that an estimate of topsoil and subsoil volume can be checked.

The text should indicate mulching of the topsoil stockpile as well as seeding for stabilization.

As noted in recent inspection reports, the stockpiles must be protected from grazing, especially during vegetation establishment. Therefore, the application should include a commitment to fence the entire site of fence the stockpiles to

Deficiencies Details:

Findings:

R645-301-121.200 Clear and Concise:

1. The soils chapter operation and reclamation plan is very confusing because old information on the existing waste rock site and new information on the waste rock expansion are not separated by headings. Where there are differences in approach, please try to separate the two with headings under each rule.
2. Section 222 contains references to former topsoil stockpiles and their locations and references Map 2. However, Map 2 shows a single large topsoil stockpile. Please explain how the stockpiles will be combined or if they will continue to exist, at what construction phase will they be consumed. Please provide a map showing the location of all existing stockpiles. Revise Section 234 to reflect current information on the number of stockpiles and reference the topsoil location map in Section 234.
3. Section 222 of the amendment (p. 2-4) provides a table for topsoil and subsoil volumes recovered by soil map unit in each phase, with a sum of 171,655 cu yds total. Map 2 states that 138,354 cu yds of topsoil and subsoil will be removed, total. Please explain why Map 2 and the table in Section 222 differ by 20% in the volumes of topsoil and subsoil to be removed and stockpiled.
4. Section 224 does not apply to the waste rock expansion and should be deleted. Section 231.200 incorrectly references Section 233.200. Section 233.300 does not apply to this expansion operation, since there is an abundance of suitable material to provide four feet of cover over the waste.

R645-301-230, Soils Operation Plan:

1. The acreage of each construction Phase must be stated in the narrative or on Maps 4A and 4B, so that an estimate of topsoil and subsoil volume can be checked.
2. For the same purpose, please provide Figure 5 at the same scale (1 inch = 100 ft.) as the operational maps 4A and 4B.

R645-301-234.230, Operation Plan Topsoil Protection:

1. According to Map 2, the face of the stockpile will have a 20% (3h:1v) slope. However, according to the text, the slope will be no greater than 2h:1v. The text should be revised to agree with the drawing.
2. Topsoil and subsoil must be stockpiled separately, although the piles may be adjacent.
3. The text should indicate mulching of the topsoil stockpile as well as seeding for stabilization.
4. As noted in recent inspection reports, the stockpiles must be protected from grazing, especially during vegetation establishment. Therefore, the application should include a commitment to fence the site or fence the stockpile to prevent grazing.

R645-301-231.100 Operation Plan, Description of Methods for Removing and Storing Topsoil:

1. Section 234.100 describes the use of track equipment to construct the topsoil stockpile in horizontal lifts 1.5 to 2.0 feet. In Section 231.100, specifically describe the equipment to be used to pick up, move, drop and push the salvaged topsoil and subsoil into stockpiles. The goal is to prevent excessive compaction.
2. Describe the method of monitoring salvage depth.
3. Describe the method of monitoring the distinction between topsoil and subsoil. Will the consulting soil scientist be on site?
4. Describe record keeping for soil salvage and replacement volumes and its reporting in the annual report.

R645-301-231.400, Operation Plan Narrative:

1. Please provide a narrative describing the construction of the topsoil and subsoil piles. Information found in Section 234.100 should probably be placed in Section 231.400.
2. Section 231.100 has been revised to remove protection of topsoil stockpiles, except after two years. This is not acceptable. Topsoil will be placed on a stable site, protected from compaction, protected from wind and water erosion with a quick growing, vegetative cover from the outset. Alternatives for protection may be considered, but the protection will be in place at the outset of the pile construction. Since the plan is being re-organized by rule, topsoil protection should be described in Section 234.200.
3. At the scale provided on Map 2, it appears that the face of the stockpile will have a 20% (3h:1v) slope. However, according to Section 234.100, the slope may be as steep as 2h:1v. The text should be revised to agree with the drawing.
4. Section 234.100 describes the in-exact nature of the volume calculations and mapping of the stockpiles. Provide a commitment to update the MRP with as-built drawings and cross sections and volumes of the subsoil and topsoil stockpiles.
5. Section 234.100 describes seeding stockpiles with the interim mix. The location where the mix can be found should be referenced.
6. The interim mix found in Section 341.200 includes grasses, forbes and shrubs. Section 341.200 states that only grasses will be used in the interim mix. This should be corrected to state grasses and forbes. A nitrogen fixing legume should be added to the interim mix under forbes, to optimum topsoil protection.

7. Section 234.200 refers to berms around stockpiles. This statement refers the reader to Chapter 7 for construction information. A more specific reference is requested.

R645-301-232.400, Minor Disturbances.

The option not to remove topsoil is not at the discretion of the operator, but a decision to be made by the Division. please revise all statements found under this section heading accordingly.

R645-301-232.500, There is ample topsoil and no basis for salvaging 8 inches of subsoil with the topsoil. Please delete this statement from Section 232.500.

R645-301-232.700, To demonstrate the existence of adverse conditions, please describe the locations where the Division should be consulted on invoking this rule or if there are no locations in the proposed area, delete the statements from this section of the amendment.

R645-301-233, The use of overburden is not being discussed as a topsoil substitute, but as part of the four feet of cover requirement called for in R645-301-553.252. The information provided under this heading does not apply to the rule cited and should be removed. The use of selected overburden as part of the four feet of cover requirement should be addressed under R645-301-553.252.

R645-301-234, This section of the application describes the use of the interim mix to seed the stockpiles. Please refer to the mix by table number. Please describe the use of mulch on the stockpiles.

pburton

Road Systems Classification

Analysis:

Section 521 and 527 text details that the temporary roads that will be built and maintained during construction of the pile that meet the definition of primary roads. The roads will certified and designed as such, as shown on Map 5A. No permanent road will be built in association with the construction of the refuse pile. The application meets the minimum requirements of R645-301-527 detailing road classification.

cparker

Road System Plans and Drawings

Analysis:

The application includes text updating section 521.100. The application also includes updated figures showing the surface contours of undisturbed areas within the storage area in Map 3A, 3B, 4A, and 4B. The hills surrounding the site range in elevation from 7600 to 8200, therefore the reclaimed elevation of the refuse pile of 7850 to 8000 will blend with the surrounding area. The application meets the minimum requirements of R645-301-521 and -534 detailing all features on the plans.

cparker

Road System Performance Standards

Analysis:

The application includes the addition of text under section 534 that details how temporary roads will be designed as shown in Figure 6 and in accordance with the applicable county and state standards. The roads will be surfaced with compacted native soils which are non-acid and non-toxic forming. The application meets the minimum requirements of R645-301-534 road performance standards.

cparker

Road System Certification

Analysis:

The application includes text in section 512.200 the extension of the access road to the refuse pile and a temporary road in order to construct the refuse pile. Section 521.100 details that temporary road will be built and maintained during construction of the refuse pile, as detailed on Map 5A. The application meets the minimum requirements of R645-301-527 and -534 for primary road design certifications.

cparker

Road System Other Transportation Facilities

Analysis:

Section 521.100 details that a permanent road is not anticipated by CFC within the storage area. During construction of the pile, temporary access roads will be constructed and maintained. The temporary roads will be reclaimed and seeded within the permanent reclamation seed mix, as shown on Map 5A. The application meets the minimum requirements of R645-301-521, -527, and -534 for description of other transportation facilities associated with the waste rock site.

cparker

Spoil Waste Disposals of Noncoal Mine Wastes

Analysis:

Text within the application section 528 details that non coal waste generated at the Sufco Mine and waste rock site will not be deposited at the waste rock site. The non-coal mine waste will be disposed of at an approved sanitary land fill. The application meets the minimum requirements of R645-301-528

cparker

Spoil Waste Coal Mine Waste

Analysis:

The application is missing information detailed in the requirements of the necessary certification required in R645-301-512 by supplying cross section maps 2, 3A, 3B, 4A, and 4B within the submittal. Text in section 536 details that coal mine and underground development waste from the results of mining activities at the Sufco Mine will be disposed of at the refuse pile. Section 536.100 describes the design criteria of the existing piles at the waste rock site from 1996 to 2013. The remaining capacity of the original waste rock pile is 5,000 tons. The proposed expansion of Lift #5 will provide an estimated additional capacity of 40,000 tons. The application meets the minimum requirements of R645-301-512 but does not meet the minimum requirements of R645-301-536.200 due to conflicting information regarding the waste rock lift thickness in the MRP and the Earthfax's Geotechnical Report presented in appendix II(A).

Deficiencies Details:

1. The application does not meet the minimum requirements of R645-301-533.100 through -301.533.220. Section 533.200 vaguely references the geotechnical report in Appendix II(A) but does not discuss any of the design and construction details of how the native soil that will act as the foundation under the pond and refuse pile and how the foundation preparation required for the embankments will be verified.

To meet the requirements detail in R645-301-533 the Permittee will add these clarifying points on the design and construction details to section of R645-301-533.100 through -301.533.220.

The geotechnical report done by Earthfax details the design and construction of the waste rock pile that all lifts:

- will be less than two feet
- will be allowed to drain before compaction or placement of subsequent lifts
- will be graded to drain away from recently placed fill
- will never be placed when the waste rock is frozen
- placement and compaction will be complete after the waste rock has been allowed to drain sufficiently
- containing filter cake will be placed thin and allowed to dry

To verify that the refuse pile, foundation preparation as well as construction, are built to the specifications outlined in Appendix II(A) the Permittee will confirm the existence of and make available to the Division staff the following QA/QC information on the refuse pile construction:

- Clearing and grubbing prior to refuse placement (i.e. photo documentation)

- GPS or some alternative coordinate proof of lift thickness below two feet
- A minimum of one compaction test for the foundation of each subarea phase as labeled on Maps 4A and 4B
- Quarterly compaction tests showing 95% of the Standard Proctor at $\pm 2\%$ optimum water content was achieved

2. Sections 533.300 and 533.400 within the application does not meet the minimum requirements of R645-301-300 through 400 as the sections do not match what is written in the Earthfax geotechnical report in regards to the outslope and inslope design to achieve the required factory of safety 1.3 for the pond embankments.

The Permittee will clarify the text in section 533.300 and 533.400 to detail the design and construction specification detailed in the Earthfax report completed January 2015, which states that:

- Embankments will be keyed into the underlying subgrade and adjacent slopes
- Be compacted to at least 95% of the Standard Proctor maximum dry density at $\pm 2\%$ of the soil's optimum moisture content
- The inside slope of constructed embankments should be armored with at least one foot of protective rock
- Topsoil be placed on the outer slope of constructed embankments and vegetation established in order to reduce the potential for erosion
- Embankments should be regularly inspected

3. R645-301-121.200 The application does not present information in a clear and concise manor as the text within the MRP states conflicting information compared to the Earthfax's geotechnical report presented in appendix II(A). Specifically on page 5-16, Section 536.100 under the first paragraph Stability of Fill, appears to be a reference to the original refuse pile stability analysis and calls out conflicting information, such as a maximum design height of 20 feet, while the new Earthfax geotechnical report referenced in appendix II(A) state a maximum height of 65 feet. Conflicting information between the current Earthfax Geotechnical report completed on January 2015 and text in the MRP on page 5-16 within section 536.100, third paragraph under Stability of fill states that Map 2 shows a slope safety factor of 2.62. Text is needed to clarify where the stated safety factor of 2.62 is referencing. The Permittee will review the text within this section and remove erroneous or conflicting information.

4. R645-301-121.200 the application does not meet the minimum requirements of R645-301-121.200 due to conflicting information in the paragraphs under 3.1.4 and 3.4 that summarize the geotechnical information from SHB's geotechnical report of the waste rock material.

5. R645-301-536.200 the application presents conflicting information between the text within the MRP on page 5-18, section 536.200 first paragraph and Earthfax's geotechnical report located in appendix II(A). The MRP text states that waste rock will be placed in lifts not to exceed three feet in thickness; however, the Earthfax's geotechnical report states that waste rock will be placed in lifts not to exceed two feet in thickness. The Earthfax geotechnical report continues on to state a serious of other design and construction specification that are not listed within this section, see deficiency #2 above for the detailed specification list. The Permittee will review the text within this section and remove erroneous or conflicting information.

6. R645-301-536.200 the application presents conflicting information between the text within the MRP on page 5-18, section 536.200 third paragraph and Earthfax's geotechnical report located in appendix II(A). The section is also missing detail construction sequencing descriptions and how various ditches will be active at each of the different phases. The Permittee will review the text within this section and remove erroneous or conflicting information and add information detailing the sequence on construction activities associated with each phase of the waste rock.

7. R645-301-542.200 does not meet the minimum requirements of the R645 rules as the text does not detail any of the backfilling, compacting, or grading of the individual sub-phases within each phase of the waste rock pile construction. The application is also missing supporting including contour maps or cross sections that show the individual phases as shown on Map 4A and 4B. The permittee will add more descriptive text detailing the sequence of site preparation, backfilling, and compacting for each individual phase that matches the provided Earthfax geotechnical report. The permittee will also provide supporting maps with contour information relevant to the individual phases.

8. R645-301-512 is not met as the application should include cross sections for the existng waste rock site as it currently is detailed in Map 4.

cparker

Spoil Waste Refuse Piles

Analysis:

The application included text describing inspections of the refuse piles to meet R645-301-514.200. Inspections will be conducted quarterly under the direction of a registered professional engineer until final reclamation and bond release on said areas. The inspection reports will be supplied to the Division and discuss the appearance of instability, structural

weakness or other hazardous conditions that may affect the stability of the pile. The application does not meet the minimum requirements of R645-301-514.200 in regards to refuse pile inspections.

Deficiencies Details:

R645-301-514.200-.230 details that a PE will inspect the refuse pile not only quarterly (-514.220) but at critical construction periods. -514.221-.230 requires inspections at site preparations (clearing and grubbing) as well as foundation preparations, placement and compaction, and final reclamation grading. The Permittee will add text to this section clarifying the existing vague statement of "during Construction" inspections to stating inspections at site preparation, foundation preparation, throughout various lifts to show placement and compaction (514.210), and final reclamation. R645-301-514.230 requires such inspection reports to be submitted to the Division promptly after each inspection. The Permittee will clarify in this section that R645-301-514.230 is being met with promptly submitted after the inspections and not held until the annual report.

cparker

Spoil Waste Impounding Structures

Analysis:

The application includes the addition of text in section 512.200 to include a new sedimentation pond to replace the current sedimentation pond when the size of the refuse pile exceeds the design standards of the first pond in late 2015 early 2016.

Text in section 514.300 describes how inspection of the impoundment structures will be conducted quarterly under the supervision of a professional engineer with reports supplied to the Division discussing the appearance of instability, structural weakness or other hazardous conditions that may affect the stability of the impoundments. This does not meet the minimum requirements as it does not clearly detail when inspections will be made during construction.

Text added to section 531 details that sediment removed from the runoff control structures will be placed within the refuse pile. The application updated section 531 and 532 to included sediment control measures for the site are described in detail in section 732 and 742. Section 533.100 includes text describing how the proposed sediment pond was engineered using a slope-stability analysis and meets the Division minimum requirements of a safety factor of 1.3 for pond embankments and 1.5 for the refuse pile. Section 533.200 details the foundation conditions at the proposed site for the sedimentation pond were evaluated but does not list the design recommendations or construction specifications detailed in the Earthfax geotechnical report in appendix II (A). The application does not meet the minimum requirements of R645-301-533.100 through -301.533.220 in regards to impounding structures due to conflicting information about the design in the MRP compared to Earthfax's geotechnical report in Appendix II(A).

Deficiencies Details:

R645-301-514.300-.312 Requires that impoundment have certified inspections by a PE will promptly, after each inspection, during the construction, completion of construction, quarterly, and at removal. To meet R645-301-533.200 requirements inspections will included site preparation (-533.220), foundation preparation (-533.210), construction (-514.312), and at reclamation. The Permittee will add text to this section detailing the above specific periods for inspections to be promptly supplied to the Division.

Section 533.100 does not meet the minimum requirements of the code due to a limited discussion of only the new pond. The existing pond details need to be discussed here as well since it will be utilized during the beginning phases of the expansion and there will be additional flow from the new phases. All of the relevant design calculations for the old pond relevant to the new phases that will have drainage reporting to it need to be included.

Section 533.200 does not meet the minimum requirements of the code due to no discussion of the detail points outlined in R645-301-533.210 (Foundations and construction) and -.220 (site preparation). There is no discussion of the site preparation and foundation design criteria outlined within the geotechnical report for either the existing or proposed pond. Design criteria as well as reference to where and how performance compliance will be documented should be detailed within this section.

Sections 533.300 and 533.400 within the application does not meet the minimum requirements of R645-301-300 through 400 as the sections do not match what is written in the Earthfax geotechnical report in regards to the outslope and inslope design to achieve the required factory of safety 1.3 for the pond embankments.

The Permittee will clarify the text in section 533.300 and 533.400 to detail the design and construction specification detailed in the Earthfax report completed January 2015, which states that:

- Embankments will be keyed into the underlying subgrade and adjacent slopes
- Be compacted to at least 95% of the Standard Proctor maximum dry density at $\pm 2\%$ of the soil's optimum moisture content
- The inside slope of constructed embankments should be armored with at least one foot of protective rock
- Topsoil be placed on the outer slope of constructed embankments and vegetation established in order to reduce the potential for erosion
- Embankments should be regularly inspected

R645-301-542.500 minimum requirements are not met as the application does not contain any narrative detailing the timetable and plans to remove the sediment pond. The permittee will update this section to clarify the timetable and reclamation of the pond.

cparker

Hydrologic Ground Water Monitoring

Analysis:

The Sufco waste rock site has 5 ground water monitoring wells in and around the area where waste is placed. These wells have been monitored for depth to water level and a suite of water quality parameters since the late 1980s. With the expansion of the waste rock site, these wells will continue to be monitored under the Sufco water monitoring program, with data reported to the Division every quarter. These well locations were shown previously on Map 2 of the approved MRP. With the revision of the waste rock maps, it appears that the well locations are no longer shown on this map. Well locations can now be found on Figure 5. The groundwater monitoring program can be found on page 7-11 of Volume 3 of the MRP.

Text was added on page 7-13 to indicate that the monitoring wells will be reclaimed/abandoned as contemporaneously as possible once they are covered with refuse. The Permittee should add a commitment that the wells will be extended as waste is placed so that they can continue monitoring the groundwater through reclamation.

The information provided is not sufficient to meet the requirements of R645-301-731.210.

Deficiencies Details:

R645-301-731.210 The text added on page 7-13 should be clarified to indicate that the monitoring wells will continue to be extended as waste is placed so that monitoring can continue throughout the reclamation of the site.

adaniels

Hydro Surface Water Monitoring

Analysis:

There is not any operational surface water monitoring for the waste rock site since there are no intermittent or perennial streams in the permitted area. The pond is designed to contain and treat all runoff. The Permittee should add a commitment that if the pond were to ever discharge, water quality samples would be taken, and DOGM and the Division Water Quality will be notified within 24 hours.

The information provided is not sufficient to meet the requirements of R645-301-731.220.

Deficiencies Details:

R645-301-731 There should be a commitment added that if the new sediment pond were to discharge, water quality samples would be taken, and within 24 hours, DOGM and the Division of Water Quality will be notified.

adaniels

Hydrologic Acid and Toxic forming Materials

Analysis:

Page 7-14 of the amendment to the MRP states that acid or toxic forming materials are not expected to be produced from the mine. Sufco does monitor and analyze materials produced and copies of the toxicity/acid-base results from samples collected are incorporated into the mine's annual report each year.

Any drainage from any acid and toxic forming material will handled through the storm water collection system and treated in the proposed sediment pond.

The information provided meets the requirements of R645-301-731.300

adaniels

Hydrologic Diversion General

Analysis:

During the various phases of the waste rock placement, diversions will be established to route runoff from the disturbed area into the sediment pond. The design of these diversions is describe in detail in Appendix VII. The diversions were designed for a 10-year 24-hour storm event, and any lining was sized for the required storm event as well. Each diversion ditch will be added as needed for each phase. Phase 2 will require the construction of ditch DD-1, DD-2, DD-3, DD-4 and DD-5. Phase 3 will require the addition of ditch DD-6, phase 4 will require the addition of ditch DD-7 and DD-8. Berm UD-2 will divert undisturbed runoff away from the waste rock site.

There is a lack of information that specifies how waste will be placed in each phase, and how long some the temporary drainage ditches (DD-1 and DD-6) will need to remain in place during waste placement. This will depend on where waste placement begins in each phase and how each phase will be tied in to the previous phase. This should be clarified.

Deficiencies Details:

R645-301-742.300 There should be an expanded description of the specific waste placement operations within each phase. The length of time each diversion stays in place, such as DD-1 and DD-6, depends on the method of waste placement in each phase and how each phase is tied into the previous phase.

adaniels

Hydrologic Impoundments

Analysis:

With the expansion of the Waste Rock site permit area by 46 acres, there is a need to move the pond and increase its size. The new pond will be built as part of "Phase 1" of the expansion process. The existing pond will remain in place and receive drainage from the upper portion of "Phase 1" while the new pond is being built. Once the new pond is constructed, the existing pond will be removed.

The new pond is designed to contain run-off from a 10-year 24-hour storm event and store the maximum annual sediment yield from the area contributing to its drainage. The required pond volume (the combination of annual sediment yield and the design storm event) is 7.52 acre-feet. The total design capacity of the pond is 10.01 acre-feet.

This pond is not anticipated to discharge, and so there is no additional outfall to the UPDES permit held by the mine. The storm water discharge peak flows were estimated using the SCS method and modeled with HEC-HMS. The inputs and results of these methods/models were provided in the "Sufco Waste Rock Pile Hydrology" report, in Appendix VII, prepared by Jones & DeMille Engineering.

The pond does not meet the size requirements defined in 30 CFR 77.216.

Section 742.200 of the amendment indicates that sediment will be removed from the pond when the sediment level reaches the 60% clean-out level. The sediment will be disposed of in the refuse pile. The Permittee should add to their operation plan that a clean out marker will be placed in the pond that clearly marks this 60% level.

As indicated on Map 7, the pond will have a combination of a primary outlet and an emergency outlet structure. The primary outlet is a pipe riser, and the emergency outlet structure is a rock lined spillway and are engineered to handle the design storm event. Pond layout, cross-sections and design elevation are displayed on Map 7.

The information provided is not sufficient to meet the requirements of R645-301-742.220.

Deficiencies Details:

R645-301-742.220 Please indicate in the MRP that a clean-out marker will be established in the sediment pond that clearly marks the 60% clean out level.

adaniels

Support Facilites and Utility Installations

Analysis:

Section 521.100 details that surface facilities associated with the refuse pile include the refuse pile, temporary material/snow storage areas, soil stockpiles, access road, sedimentation pond(s), and drainage controls structures. All these features are shown on Maps 2, 4A, 4B, 5 and 7. Section 526.100-200 of the application describes how no buildings or utility installations currently exist or are proposed in the future to be built at the waste rock site. The application meets the minimum requirements of R645-301-521 and R645-301-526 detailing support facilities.

cparker

Signs and Markers

Analysis:

Section 521.200 was added to detail that the mine and permit identification sign will be displayed at the refuse pile site. The sign will be a design that can be easily seen and read, made out of durable material, and conform to local regulations. The signs will be inspected on a regular basis and will be maintained until bond release. Perimeter markers will clearly mark the beginning of mining activities at the refuse pile. There are no streams through the refuse site, therefore no buffer zone markers are required. Topsoil and subsoil markers will be placed at the respective stockpiles. The application meets the minimum requirements of R645-301-521 in regards to signs and markers.

cparker

Maps Affected Area

Analysis:

The application includes the addition of Maps 2, 3A, 3B, 4A, 4B showing the affected area for each phase of construction of the refuse pile. The application does not meet the minimum requirements of R645-301-512, -301-521, and -301-542 as the figures only detail the new phases and has no discussion of the current waste rock site.

Deficiencies Details:

R645-301--521 and -301-542 The drawings associated with the current waste rock site can not be removed. Map 4 needs to be resubmitted to show the current waste rock site as-builts and pond. All drawings associated with the current pond also need to be resubmitted as the pond will be the active pond for portions the new phases.

cparker

Maps Facilities

Analysis:

The application includes the addition of Map 4A and 4B which show the temporary access roads which are the only support facilities associated with the refuse pile. The application does not meet the minimum requirements of R645-301-521 as the current waste rock site roads are not shown.

Deficiencies Details:

R645-301-521 and -301-542 The drawings associated with the current waste rock site can not be removed. Map 4 needs to be resubmitted to show the current waste rock site as builts. All drawings associated with the current waste rock site (Map 2, Map 4, and Map 6) also need to be resubmitted as the current waste rock site is part of the operations.

cparker

Maps Certification Requirements

Analysis:

The application included the addition of text in section 512 to address the certification requirements in R645-301-512. Cross section maps of the waste rock pile are located on Map 2, 3A, 3B, 4A, and 4B of the submittal. The application states that plans and engineering designs presented in the application were prepared by or under the direction of a qualified professional engineer.

cparker

Reclamation Plan

General Requirements

Analysis:

The Permittee updated text throughout the MRP to reflect the increased size and location of the waste rock pile. Text was added to section 512.100 and 512.200 to address the new profile maps and cross sections of the expanded waste rock pile. The text states that the plans and engineering designs presented in this submittal were prepared by or under the direction of and certified by a qualified professional engineer.

Text added to section 513 details how no coal processing waste dams, embankments, or ponds will exist within the permit area that meet the size criteria of 30CFR 77.216(a). Any underground development waste and coal processing waste will be stored at the refuse pile which will be designed to meet the MSHA and R645-301-536.900 requirements.

Section 527 and 534 detail that only temporary roads required to build the refuse pile will be designed and will be designed as described in section 527.200 and 534. Text was added to section 525 stating that no underground mining activity has occurred beneath the waste rock site, however, due to the over consolidation of the surface soils and elastic compression of the underlying bedrock the area is expected to have total settlement on the order of 0.5 to 1.0 inch.

Text within section 526 describes how there are no buildings or utility installations present at the waste rock site and that no future plans exist for any mining or support facilities to exist. Text was removed in section 528 regarding coal waste transportation and the maps were updated to reflect the new footprint of the waste rock site being considered in this application. An introduction was added to section 531 detailing the general plans for construction of sediment controls and the refuse pile. R645-301-529 was addressed in the application by stating that no mine openings will be built in the area.

The application meets the minimum requirements of R645-301-520, R645-301-530, and R645-301-540.

Deficiencies Details:

R645-301-525, -531 are not met due to only having a description of the settlement due to the current waste rock site and no discussion of the the settlement due to each of the new phases of the expanded waste rock site. The Permittee will edit this section to included settlements relevant to each new phase of the expanded waste rock site.

R645-301-528 is not met as the type of equipment utilized at the during the loading, transport, and placement is not clear. Text was removed from this section detailing any hauling and compaction activities schedules that must be added back in so that the Division can understand the basic sequencing of events at the expanded site. Map 4 needs to be re-added to the application as it details relevant information, such as as-builts, of the current waste rock site.

R645-301-536 is not met in the current application due to no discussion of the sequencing of the site preparation, foundation preparation, constructing, and reclamation of the old and new waste rock phases and how the operations will blend between the different phases. Nor is there any reference to R645-301-536.100 detailing what establish engineering guidelines will be followed to establish the success of construction at the various phases.

R645-301-536.900 does not meet the minimum requirements due to a lack of text detailing where each the required code information can be found within the application. The Permittee will detail where the various sections are within the application that meet the requirements of R645-301-536.900.

R645-301-542.200 is not met due to missing discussions on the backfilling and grading of the existing waste rock pile and how the different phases will be backfilled and blended together. There is also no discussion of how and when the current pond will be removed within this section.

cparker

PostMining Land Use

Analysis:

Information provided in the application meets the minimum requirements of the regulations R645-301-412

CFC owns the surface and intends the postmining land use to be wildlife habitat and livestock grazing. The proposed reclamation will restore the land and vegetation to as near a natural and productive condition as possible.

Ireinhardt

WildLife Protection

Analysis:

The proposed final seed mix consists of plant species that should provide sufficient food and cover for the wildlife of the area.

Page 3-11, 342.100, the plan simply states “No enhancements are planned other than those described in the approved M&RP”.

Deficiencies Details:

Pursuant to R645-301-342.100 “Where the plan does not include enhancement measures, a statement will be given explaining why enhancement is not practicable.” The reference to the approved M&RP is vague and should be clearly defined. The permittee shall provide an explanation as to why enhancement is not practicable.

Ireinhart

Approximate Original Contour Restoration

Analysis:

The application includes the addition of text that states that CFC does not need a request for variance from approximate original contour (AOC) at the waste rock site to meet R645-301-512.260. The application meets the minimum requirements of R645-301-512.260 for approximate original contour.

A general introduction was added to section 531 within the application stating that sediment removed from the runoff control structures at the waste rock site will be stored in the refuse pile. Runoff control structures include diversion ditches, berms, sediment pond, and silt fences/straw bales. The application meets the minimum requirements of R645-301-531.

cparker

Backfill and Grading General

Analysis:

The application included text additions to section 553 detailing that the waste rock site was previously disturbed and that a portion of the existing ground surface will be raised by the construction of the refuse pile. Section 553.100 details that the final slopes of the refuse pile will have a similar shape to the slopes in the surrounding area. The reclaimed area will be constructed in a manner that supports the approved post mining land use. Grading activities will remove all temporary roads and ponds at final reclamation of the site. The final slope of the waste rock pile will be graded to drain and in a stable manner to prevent erosion. The application does not meet the minimum requirements of R645-301—553.221 and -553.252 as there is no discussion of the minimum four feet of cover required and removal vegetative material.

Deficiencies Details:

R645-301-553.221 is not meet as there is no discussion within the permittee that all vegetative and organic material will be removed from the area. The geotechnical report also calls for clearing and grubbing activities prior to any waste placement; however, there is no discussion in any of the relevant sections detailing such activities. The Permittee will add the description of clearing and grubbing activities to the relevant construction sequence for all the phase of the waste rock site as well as making proof of such activities available to the Division staff upon requests.

R645-301-553.252 is not met in the current application as there is no discussion of the thickness of the cover material placed on the final lift of the waste rock pile. The permittee will add descriptive text detailing the thickness of the top and sub soil to be places at final reclamation of the various phases of the waste rock pile.

R645-301-553.800 The Permittee is placing waste in such a manor that they meet the scenario described in the rules of this section and must detail how the site will meet R645-301-553.810 through -553.820.

cparker

Mine Openings

Analysis:

R645-301-542.710 is not met due to missing the required description, including appropriate cross section and maps, of the measure to be used to seal or manage, and to plug, case or manage well openings within the proposed permit area. The permittee will address sealing and plugging any existing or future wells with relevant cross sections.

Deficiencies Details:

R645-301-542.710 is not met due to missing the required description, including appropriate cross section and maps, of the measure to be used to seal or manage, and to plug, case or manage well openings within the proposed permit area. The permittee will address sealing and plugging any existing or future wells with relevant cross sections.

cparker

Topsoil and Subsoil

Analysis:

Analysis:

Contemporaneous reclamation is referred to in Section 542.100 and 553.100, although no specifics are provided.

In Sections 233 and 240, and Section 242.100, Section 541 and Section 542.100, the application describes replacement of "growth medium" (cover other than subsoil) over the roughened surface of the waste rock. The source of growth medium was not identified. Since there is ample subsoil and topsoil available on site, the use of a replacement growth medium can not be justified under R645-301-233.100.

Section 242.100 states that topsoil will be replaced over the disturbed area shown on Map 8. Map 8 outlines the entire disturbed area, but the acreage is not mentioned. Please describe in the text or on the map the total disturbed area of Map 8. Please also distinguish the area to receive only a foot of topsoil.

Section 242.200 describes surface roughening to a depth of 1.5 to 2 ft. prior to topsoil placement on roads and perimeter ditches. The statement should indicate ripping on all operational areas.

Replacement depth of topsoil over the disturbed area is described in Section 242.100. Replacement depths for subsoil and topsoil over the waste are vague: Section 234.200 states "a limited quantity of stockpiled soil may be redistributed." Section 242.100 states 15 inches of subsoil and 15 inches of subsoil with 48 inches applied if the waste is found to be acid/toxic forming. R645-301-553.252 requires the assumption of four feet of cover, unless the waste is proved non-acid and non-toxic.

Section 242.200 says no surface roughening will occur on the waste pile, which will be left in a roughened state. This section also refers to Section 341.200 for more information on surface roughening methods; Section 341.200 could not be found. Utah coal rule R645-301-242.200 requires that the land be treated if necessary to reduce slippage prior to application of stockpiled soils. Please include such a statement in the plan and provide the correct citation for surface roughening information. Section 242.200 describes surface roughening as the creation of microbasins with a depth of 18 inches and a width of the backhoe. Further clarification on the size of hoe to be used should be stated, as very large buckets are not desirable.

In Sections 231, 233, and 242.100, the application mentions the use of a demonstration plot to reduce the required four feet of cover over waste. Two rules govern this situation are R645-301-233.100 which requires use of the best available material in the permit area and R645-301-553.252 which allows less than four feet of cover based upon physical and chemical analysis. Sampling and analysis of the waste was not mentioned in Section 240, Section 536.200 (which was cited in Section 233 as the source of sampling information), Section 553 or Section 731.300.

Section 231.300, states nutrient testing of the reclaimed site was conducted once and pending results will no longer be necessary. Section 243 states that nutrient analysis will be conducted on the stockpiled soils prior to final reclamation. These two sections are conflicting. In accordance with R645-301-243, the Division requests that the topsoil should be sampled after grading. The rate of sampling should be one sample/acre. The depth of sampling should be the surface 6 inches. The parameters to be sampled should be plant available nitrogen, phosphorus and potassium. Please amend the plan in Section 243 and 231.300 accordingly.

Section 244.100 refers to the possible use of ""mulch or surface roughening or other appropriate methods"" at final reclamation. Section 244.200 cites earlier discussions of mulch in the 200 Chapter, however no further discussion of mulch was found in this chapter. Section 542.200 refers to mulching without providing specifics. Utah Coal Rule

R645-301-244.100 requires the stabilization of all disturbed, exposed surface areas. This includes during operations and reclamation. Please provide a plan for stabilization of exposed areas during operations. Similarly, R645-301-244.200 requires the use of mulch on all reclaimed areas. Please describe the type of mulch, the rate of application, and the method of mulch application to all reclaimed areas.

Section 244.300 describes the repair of rills and gullies using hand tools to avoid excessive compaction. In the Division's experience, rills and gullies may suddenly appear on reclaimed waste rock sites that are too large to be handled with hand equipment. It is recommended that the plan not limit the approach to be taken, rather the repair should be in consultation with the Division.

Deficiencies Details:

Findings:

R645-301-121.100, Clear and Concise and R645-301-233.100 Topsoil Substitutes and Supplements::

In Section 234.100, 240, Section 242.100, Section 541 and 542.100 the use of growth medium is stated. The source of growth medium was not identified. R645-301-233.100 requires use of the best available material in the permit area. There is ample available topsoil and subsoil to cover the waste as required. Please strike the word growth medium from the plan.

R645-301-234.200 and -234.300, Soil stockpile relocation is touched upon in this section, but no proposal is advanced. Please clearly state your intentions. What stockpiles will be moved? Where will they be moved? Will they be used in reclamation of Lift 5?

R645-301-242, Soil Redistribution

1. Clearly state that there will be a combined depth of subsoil and topsoil cover equal to four feet applied to the waste at final reclamation, pending the results of acid/toxic waste analyses of the surface four feet of the waste to be completed at final reclamation.
2. Section 242.100 states that topsoil will be replaced over the disturbed area shown on Map 8. Map 8 outlines the entire disturbed area, but the acreage is not mentioned. Please describe in the text or on the map the total disturbed area of Map 8. Please also distinguish the area to receive only a foot of topsoil.
3. Section 242.200 says no surface roughening will occur on the waste pile, which will be left in a roughened state. Please include a statement that the surface will be inspected and ripped if necessary to reduce slippage prior to application of stockpiled soils.
4. Section 242.200 describes surface roughening to a depth of 1.5 to 2 ft. prior to topsoil placement on roads and perimeter ditches. This statement should indicate ripping on all operational areas surrounding the waste rock pile.
5. Section 242.200 refers to Section 341.200 for more information on surface roughening methods; Section 341.200 could not be found. Please provide the correct citation.
6. Section 242.200 describes surface roughening as the creation of microbasins with a depth of 18 inches and a width of the backhoe. Further clarification on the size of hoe to be used should be stated, as very large buckets are not desirable.
7. Please provide more details on the contemporaneous reclamation that is mentioned in Section 542.100 and 553.100.

R645-301-243 Soil Nutrients

Section 231.300, states nutrient testing of the reclaimed site was conducted once and pending results will no longer be necessary. Section 243 states that nutrient analysis will be conducted on the stockpiled soils prior to final reclamation. These two sections are conflicting. The redistributed topsoil should be sampled after grading. The rate of sampling should be one sample/acre. The depth of sampling should be the surface 6 inches. The parameters to be sampled should be plant available nitrogen, phosphorus and potassium. Please amend the plan in Section 243 and 231.300 accordingly.

R645-301-244.100 Stabilization of exposed surface areas.

Please provide a plan for stabilization of exposed areas during operations.

R645-301-244.200 Suitable Mulch.

Please describe the use of mulch, the type of mulch, the rate of application, and the method of mulch application to all reclaimed areas.

R645-301-553.252 Refuse Piles.

A reference to field trials was suggested in Sections 231, 233, and 242.100 to reduce the amount of soil cover to be placed on the waste is stated in Section 233, 234.200 under the heading Topsoil Redistribution. The idea of reducing the required four feet of cover is further touched upon in Section 240. coal rule R645-301-553.252 allows less than four feet of cover based upon physical and chemical analysis. Sampling and analysis of the waste was not mentioned in Section 240, Section 536.200 (which was cited in Section 233 as the source of sampling information), Section 553 or Section 731.300. The Permittee should propose a sampling plan for the final graded surface of the waste at final reclamation to show the

chemical characteristics of the waste are non-acid/non-toxic and will be suitable for vegetation growth.

Section 244.300 describes the repair of rills and gullies using hand tools to avoid excessive compaction. In the Division's experience, rills and gullies may suddenly appear on reclaimed waste rock sites that are too large to be handled with hand equipment. It is recommended that the plan not limit the approach to be taken, rather the repair should be in consultation with the Division.

pburton

Road System Reclamation

Analysis:

Section 527.200 details the description of the roads within the refuse pile. The road will gently slope toward the existing Ditch no2. The road will be approximately 16 feet wide and constructed out of compacted subsoil. The road will be built to maintain a less than 3% within the site, thus allowing runoff from the road to flow into the drainage ditches. Accidental spillage of coal mine waste during haulage from the mine site to the refuse pile will be cleaned up and transported to the refuse pile in a timely manner. The application does not meet the minimum requirements of R645-301-527 for road reclamation.

cparker

Road System Retention

Analysis:

Text in section 527.100 states that no permanent roads are to be built in association with the construction of the refuse pile. The application meets the minimum requirements of R645-301-527.100.

cparker

Hydrological Information Reclamation Plan

Analysis:

Section 542.200 indicates that the sedimentation pond "will be retained for as long as practical during reclamation." Per R645-301-763.100 the pond must be retained until 2 years after the last augmented seeding, this should be clearly stated in the reclamation timetable.

Page 7-7 of the amendment removes a section of the plan that required the water monitoring wells be abandoned in compliance with the rules of the Division of Water Rights. This section should remain in the plan.

The information provided is not sufficient to meet the requirements of R645-301-763.100

Deficiencies Details:

R645-301-763.100 Section 542.200 of the amendment, as referenced in chapter 7, indicates that the "sedimentation pond will be retained for as long as practical during reclamation". Please insert language that the pond will be retained until at least 2 years after the last augmented seeding, as required in the rule cited above.

R645-301-748 The plan should still reference the Division of Water Rights rules when discussing the abandonment and sealing of the water monitoring wells.

adaniels

Contemporaneous Reclamation General

Analysis:

The application includes a general description stating that the first phase consists of regarding the remaining site disturbance, but the majority of the site will have already received contemporaneous reclamation. The minimum requirements of R645-301-553 are not met as there is no clear text detailing the sequencing or location of the contemporaneous reclamation specific to each phase of the waste rock pile construction.

Deficiencies Details:

The minimum requirements of R645-301-553 are not met as there is no clear text detailing the sequencing or location of the contemporaneous reclamation specific to each phase of the waste rock pile construction. The permittee will update text throughout the application detailing the various points, design, and construction of the contemporaneous reclamation areas associated with each phase of the waste rock pile phases.

cparker

Contemporaneous Reclamation General

Analysis:

Analysis:

The SUFCO waste rock expansion area (46 acres) is immediately adjacent to the initial 12.2 acre site in T 22 S, R 4 E, Sec 18. The initial cells (or lifts) numbered 1 through 5 are almost completed, but have not been fully reclaimed as of April 2015. It appears from the application that reclamation of lift 5 may be delayed until the final reclamation of the site, after all four phases have been filled (Map 2). Delay in completion of Lift 5 would delay replacement of temporarily stockpiled topsoil that is currently stored on Lift #4.

In accordance with R645-301-121.100 , R645-301-121.200, R645-301-244.100, and R645-301-352: Prior to approval, the expansion plans must include a timetable for the stabilization or completion of reclamation of Lift 5; and the stabilization or completion of reclamation of the topsoil stored on Lift 4; and the proposed reclamation timetable for each of the four phases of the proposed waste rock expansion.

The final topography maps and cross-sections for the approved waste rock site (and the remaining Lift #5 and Lift #4) have been removed from the plan and references to a final topography map for the approved site have been deleted from the plan. Therefore, a commitment to provide as built topography and cross sections for the contemporaneous reclamation of Lift 5 and Lift #4 is requested. As built topography maps and final volume of coal mine waste stored in the existing approved facility should remain in the plan. As additional areas are contemporaneously reclaimed the final as built can be modified to show the changed nature of the site.

Deficiencies Details:

Findings:

In accordance with R645-301-121.100 , R645-301-121.200, R645-301-244.100, and R645-301-352: Prior to approval, the expansion plans must include a timetable for either the stabilization or the completion of reclamation of Lift 5; and either the stabilization or the completion of reclamation of the topsoil stored on Lift 4; and a proposed reclamation timetable for each of the four phases of the proposed waste rock expansion.

R645-301-536, Coal Mine Waste and R645-301-512.100 Cross Sections and Maps.

1. The final topography maps and cross sections of the existing, approved coal mine waste facility should remain in the plan.
2. A commitment in the plan is requested to provide as built topography and cross sections for the contemporaneous reclamation of Lift 5 and Lift #4 and each subsequent phase of the expanded waste rock site.

pburton

Revegetation General Requirements

Analysis:

Information provided in the application meets the minimum requirements of the regulations R645-301-341

Section 341.200 describes the seed mixes to be used in final reclamation and interim reclamation. The interim seed mix (grasses only) will be planted to stabilize all areas not actively being utilized on the waste rock pile site. The practice will continue until final reclamation grading begins.

The Recommended Seed Mix for the disposal site was evaluated and the incorporation of slender wheatgrass could also be considered. Slender wheatgrass seedlings are vigorous and provide good initial plant cover in seed mixtures. Plants tend to be short-lived, thus giving other plants a chance to become established.

The seed mix proposed for revegetation is appropriate for the site to provide vegetative cover that will be diverse, effective, and permanent. The permittee commits to purchasing from suppliers who will certify their percentages of purity, germination, hard seed, and percentages of maximum weed seed content. As noted on page 3-14, seeding for final reclamation will occur during fall months as that is the most favorable time for seeding in the area.

The final reclamation plan includes a schedule and timetable, appropriate final seed mix, seeding method, maps with sequence and construction of contemporaneous reclamation, and mulching techniques.

Ireinhart

Cessation of Operations

Analysis:

The application included the addition of text to section 515.300 stating that prior to temporary cessation that will last for a period of 30 days or more, CFC will submit to the Division a notice of intention to cease or abandon operations. The notice will detail that affected mining area, operations, and will not release the permittee of the other environmental obligations such as reclamation and monitoring commitments. The application meets the minimum requirements of R645-301-515 and -301-541.

cparker

Maps Affected Area Boundary

Analysis:

The application included an updated Map 2, and Map 8 showing the affected area at final reclamation. The application does not meet the minimum requirements of R645-301-542 detailing the foot print of the affected area associated with each of the individual phases of the waste rock pile at the various stages.

Deficiencies Details:

. The application does not meet the minimum requirements of R645-301-542 detailing the foot print of the affected area associated with each of the individual phases of the waste rock pile at the various stages as Map 4 detailing the existing waste rock as built is missing

cparker

Maps Bonded Area

Analysis:

The application included an updated Plate 2 showing the disturbed area at final reclamation. The application meets the minimum requirements of R645-301-542 detailing the foot print of the affected area to be bonded for and associated with each of the individual phases of the waste rock pile at the various stages.

cparker

Maps Reclamation BackFilling and Grading

Analysis:

The application included an updated Map 2, and Map 8 showing the affected area at final reclamation. The application does not meet the minimum requirements of R645-301-542 detailing the contours of the individual phases of the waste rock pile at the various stages.

Deficiencies Details:

The application does not meet the minimum requirements of R645-301-542 detailing the contours of the individual phases of the waste rock pile at the various stages. The Permittee will provide a series of maps with cross sections detailing how the waste rock pile will look at each of the additional phases outlined on Map 4A and Map 4B.

cparker

Maps Reclamation Final Surface Configuration

Analysis:

Section 521.100 contains text detailing that the surface contours are provided on Maps 2, 3A, 3B, 4A, and 4B of the application at the various stages of the refuse pile, including final reclamation. The application does not meet the minimum requirements of R645-301-542.

Deficiencies Details:

The application does not meet the minimum requirements of R645-301-542 due to no included Map 4 of the existing waste rock site.

cparker

Maps Reclamation Certification Requirments

Analysis:

The application states that all drawings were prepared by or under the supervision of a professional engineer meeting the R645 required rules.

cparker

Bonding and Insurance General

Analysis:

Text was added to section 810 detailing that CFC will file with the Division a bond or bonds made payable to the Division for performance of all the requirements of the State Program associated with 58.5 acres covered by waste rock site. The application does not meet the minimum requirements of R645-301-810.

Deficiencies Details:

R645-301-542.800 and R645-301-810 was not met in the current application as there is no line item detail included with the application in regards to the increase disturbed area relative to earthwork and seeding costs. There is no discussion on the sequence of construction and the relevant line items needed for reclamation of each sequence. The permittee will include line item details of the cost to reclaim the expanded site with details on how and the timing of reclamation for each of the phases. These details will include how and when sub and top soil will be spread along with the seeding timing.

cparker

Bonding Form of Bond

Analysis:

Text was added to section 820 to detail that the performance bond period is for the duration of the coal mining and reclamation operations and will be held in the form of a surety bond. The application meets the minimum requirements of R645-301-820 describing the form of bond.

cparker

Bonding Determination of Amount

Analysis:

Text was added to section 830 detailing that the reclamation bond for the waste rock site is found in appendix 5-9 of the MRP. The details of updated appendix 5-9 were not supplied with this amendment, therefore, the application does not meet the minimum requirements of R645-301-830.140.

Deficiencies Details:

R645-301-830.140 The Permittee must provide updated information for estimated bond costs with supporting calculations for the estimates. This includes updated unit costs for relevant line items of reclamation. The updates should be provided using the 2014 data from RS Mean Heavy Construction Cost data manual and the Caterpillar Handbook or other appropriate resources. The bond summary and corresponding bond calculations sheets in the MRP need to be updated and appropriately escalated to 2019 dollars using the Division's approved 1.9% and 5 year escalation.

cparker

Bonding Terms and Conditions Liability Insurance

Analysis:

Text was added to section 840 through 890 detailing that pertinent general terms and conditions of the bond as well as the terms and conditions for the liability insurance can be found in Chapter 8 of the Sufco MRP.

cparker