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Technical Analysis and Findings

Utah Coal Regulatory Program

May 23, 2017

PID:	**C0150019**
TaskID:	**5444**
Mine Name:	**COTTONWOOD/ WILBERG**
Title:	**REVISE RECLAMATION PLAN**

Summary

Interwest Mining Company (IMC), a subsidiary of PacifiCorp, submitted an amendment to revise the Cottonwood/Wilberg Mine Reclamation Plan. This amendment is the fourth revision. See Tasks 4960, 5096, 5348 for previous revisions and deficiencies.

IMC has incorporated deep gouging techniques on steep slopes in place of the existing design for contour and collection ditches. IMC proposes that using this as BTCA allows the removal of the sediment ponds at reclamation without the additional contributions of sediment to stream flow or outside the permit area.

The intent of this proposed reclamation plan for the Cottonwood/Wilberg Mine is to completely replace the current plan found in Volume 2 Part 4. IMC proposes to remove and replace Part 4 with the newly revised text for the reclamation plan, appendices, and all associated maps.

There are no changes to the Environmental Resource or Operations Plan and therefore no analysis has been made to those sections of the MRP.

Deficiencies Details:

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The amendment revises the Cottonwood/Wilberg Reclamation plan by removing the sediment ponds contemporaneously as the site is backfilled and regraded. Reclamation will begin at the top of the disturbed area in both Left and Right Grimes Wash forks and work towards the base of the watershed until the sediment ponds are removed last. Reclaimed hillslopes will be pocked, hay mulched, and hydro-mulched. The main channel and smaller side channels will be rip-rapped and restored to a natural configuration. The time frame for restoration work in Grimes Wash will likely take three to four months.

Deficiencies Details:

kstorrar

General Contents

Violation Information

Analysis:

Information provided in the application meets the minimum requirements of the regulations.

Interwest Mining Company is a subsidiary of PacifiCorp. An AVS check was performed on May 4, 2017. There were no violations retrieved by the system.

lreinhart

Environmental Resource Information

General

Analysis:

The application proposes no changes to the existing and approved MRP for the Cottonwood/Wilberg Mine and therefore will not affect existing resources or current land use.

lreinhart

Operation Plan

Hydro Surface Water Monitoring

Analysis:

The amendment meets the State of Utah R645 requirements for Surface and Groundwater Monitoring.

The amendment will not change the water monitoring program within MRP.

kstorrar

Hydrologic Discharge Into an Underground Mine

Analysis:

The amendment meets the State of Utah R645 requirements for Discharges into an Underground Mine.

The amendment does not propose any discharges into the sealed mine workings.

kstorrar

Hydrologic Gravity Discharge From Underground Mine

Analysis:

The amendment meets the State of Utah R645 requirements for Gravity Discharges from Underground Mines.

The final design of the portal seal and French drain for the Cottonwood breakout in Cottonwood Canyon is shown on the drawing titled, 'Cottonwood Mine TMA-Intake Portal, Mine Discharge/Drainage Manifold'. The gravity drainage mine water is covered by a UPDES permit and in sampled and reported according to standards set by the Division of Water Quality. The water is very high quality and has been compliant since it began draining from the mine when the portal was sealed. This water issues from a fracture extending to the surface only a few hundred yards inby the sealed portal. From the fracture in the entry it flows on the mine floor down dip to the portal. Since it does not form a mine pool or interact with the coal seam it will never need treatment.

kstorrar

Hydrologic Diversion General

Analysis:

The amendment meets the State of Utah R645 requirements for Diversions.

The amendment includes a narrative, designs, calculations, and maps of the final reclamation for the main and side channel diversions at the site. Appendix D-1 provides the NOAA Atlas 14 Point Precipitation Frequency Estimates at the mine site. These data are used for modeling runoff in the side channels using HydroCAD. The modeling and design for the main channels is already approved in the MRP. The design for the main Left and Right forks are provided in Appendix F. The design and location of the small drainages are provided in Appendix F-2 and Figure 1.

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Hydrologic Sediment Control Measures

Analysis:

The amendment meets the State of Utah R645 requirements for Sediment Control Measures.

The application includes adequate sediment control measures that will be implemented during construction activities and once the site is fully reclaimed.
During construction runoff will be treated prior to exiting the permit area. Runoff from the reclaimed areas up-gradient of the inlet of the bypass culvert will be treated with sediment fences before entering the culvert. This design is shown on the drawing, 'Cottonwood Mine Sequence of Reclamation'. The rest of the runoff at the mine site will report as usual to the sediment ponds.
Reclaimed hillslopes will be pocked to prevent offsite impacts. Appendix D-2 includes designs and calculations for the Deep Gouge Geometry or the large and small pocks that will cover the reclaimed hillslopes. In Appendix D-3, a narrative and calculations show the deep pocks at the contact of reclaimed and undisturbed hillslopes are adequate to capture up-gradient undisturbed surface runoff. Appendix D-4 provides further detail of the adequacy of pocking to prevent sediment runoff from the site after it is reclaimed. Appendix Appendix G outlines the methods that will be taken to quantitatively assure the pocks function as designed, including installing staff gauges and running transects across the reclaimed hillslopes.
The amendment models the effectiveness of pocking at reducing soil erosion rates on the reclaimed hillslopes. In Appendix E, the Revised Universal Soil Loss Equation shows pocking will prevent sediment erosion by capturing and depositing detached sediment particles after transporting only a few feet.

kstorrar

Hydrologic Impoundments

Analysis:

The amendment meets the State of Utah R645 requirements for Siltation Structures.

The amendment proposes to incorporate the sediment ponds as backup treatment structures during active reclamation operations. The Permittee will accomplish this by routing all runoff from the disturbed area and the Left and Right forks of Grimes wash through the sediment ponds prior to exiting the permit area. The 90 inch undisturbed by-pass culvert will be excavated above the ponds and all water will be conveyed from the culvert in hardened Channel A to the North Pond. Runoff will be routed through the sediment ponds as designed with the addition of a 36 inch backup culvert in the south pond to handle excess overflow.
The narrative should discuss whether this sediment control measure will provide enough settling time to adequately treat a 10-year 24-hour event to meet required effluent limitations. A timeline for installing this additional sediment control measure should be included as well.

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Reclamation Plan

General Requirements

Analysis:

The amendment meets the State of Utah R645 requirements for General Environmental reclamation in terms of engineering.

jeatchel

PostMining Land Use

Analysis:

The amendment meets the State of Utah R645-301-412 requirements for postmining land use.

The description of the PMLU is located in Section 412 on pages 18-20. The PMLU is livestock grazing and wildlife habitat and managed for multiple uses under the Bureau of Land Management and US Forest Service (with the exception of the 1.86 acres of disturbance at the Cottonwood Fan Portal which is fee land).

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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 Permittee will continue to monitor for Golden Eagles and if one is found to have selected a nest in close proximity to the mine site, consultation with the Division and USFS will occur to determine appropriate protection measures to ensure chick survival.

Protected wildlife in the area includes Golden Eagles as the escarpments surrounding the mine site provide known nesting locations. The escarpment face is inaccessible so the only disturbance to the birds is from noise and line of site. Any nest initiated adjacent to the existing facilities during reclamation operations would signify acceptance of the present situation, as was the case of dismantling the building facilities. All raptor nests will be reported to UDWR in Price.

The plant species provided in the final reclamation seed mix provides nutritional value and cover for fish or wildlife.

With raptor protections in place, the proposed operation 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.

lreinhart

Approximate Original Contour Restoration

Analysis:

The amendment meets the State of Utah R645 requirements for Approximate Original Contour Restoration.

Drawings that were inadvertently omitted have been included in Appendix B.

jeatchel

Backfill and Grading General

Analysis:

The amendment meets the State of Utah R645 requirements for General Backfill and Grading.

Permittee commits to retain a geotechnical engineer to oversee the construction and compaction of backfilled areas.

jeatchel

Mine Openings

Analysis:

The amendment meets the State of Utah R645 requirements for Mine Openings.

jeatchel

Topsoil and Subsoil

Analysis:

The application meets the requirements of R645-301-233 substitute topsoil, because substitute topsoil locations shown on Plate 4C were sampled to a depth of 18 inches for analysis of pH, EC, SAR and other criteria used to measure suitability, as described in Section 233, para. 1. The ten samples were sent to Intermountain Laboratory on May 3, 2017 (personal communication with Dennis Oakley, 5/22/2017). After grading, measurement of EC and pH will be recorded as described in App. C2. Ideally, sample locations will also be recorded.

Electrical conductivity measurement cannot be directly correlated to SAR and will not reveal the ratio of sodium in relation to other cations. Regression models for the relationship between electrical conductivity and SAR have been proposed, but they are specific to soil type (Seilsepour, M and M. Rashidi, 2008. ARPN Journal of Agricultural and Biological Science, V. 3, No. 586, p. 27 – 31). The Division evaluated the regression relationship proposed by Seilsepour and Rashidi using data provided in Appendix A1 and A2 from the Cottonwood site, without success. While electrical conductivity will provide a measure of salinity, it will not reveal the sodicity of the soil. i.e. the ratio of sodium in relation to other cations. Therefore the analytical results from the May 3rd sampling of substitute topsoil will be used to determine whether the soil may require a gypsum amendment prior to surface roughening or should be buried in the fill (personal communication with Dennis Oakley, 5/22/2017).

The application meets with the requirements of R645-301-243 soil nutrients and amendments, because the analytical results from the May 3rd sampling of substitute topsoil will be used to determine whether the soil may require a gypsum amendment prior to surface roughening or should be buried in the fill (personal communication with Dennis Oakley, 5/22/2017). Two tons/acre alfalfa hay and soil nutrients [(NH4NO3 and P2O5] will be applied as described in Sections 242.200 , 243 and 342.220. The seed mix described in Table 3-3 will be applied. Yellow sweet clover was removed from the mix because it is non-native and Utah sweetvetch was removed from the mix to protect adjacent populations of sensitive vetch species (email communication between the Division biologist Lisa Reinhart and Kyle Beagley, USFS, 6/24/2015). Therefore, the seed mix no longer contains a nitrogen fixing species. Adding a N-fixing species is a best management practice and soil building would be enhanced by a nitrogen fixing species (Appendix A-2). Cliffrose or bitterbrush, both Purshia species were recommended by the USFS (email correspondence from Kim Anderson, USFS, 9/21/2015).

pburton

Hydrological Information Reclamation Plan

Analysis:

The amendment meets the State of Utah R645 requirements for Hydrologic Reclamation.

The reclamation operations are designed to minimize disturbance to the hydrologic balance within and adjacent to the permit area. The reclamation is designed and will be maintained through bond release to prevent material damage.

kstorrar

Revegetation General Requirements

Analysis:

The amendment meets the State of Utah R645-301-341 requirements for a revegetation plan.

The reclamation plan for final revegetation is located in Part 4, Section 340, starting on page 5 of the amendment. The plan describes how all lands disturbed by mining and operations (except water areas and surface of roads approved as part of the postmining land use) comply with the biological protection performance standards. The plan includes a detailed schedule and timetable for each major step (Tables 3-1 and 3-2 on page 7), seed mix (Tables 3-3 through 3-5 pages 8-10), planting methods, and mulching. Measures proposed to determine the success of revegetation are identified in Section 341.250 on pages 13-15 and include the use of monitoring methods approved in Appendix A of the Divisions Vegetation Information Guidelines.

The amendment meets the State of Utah R645-301-357 requirements for extended responsibility period. The extended responsibility period will be 10 years.

Page 12 of Part 4 discusses the maintenance and monitoring of revegetated sites to monitor the progression of reclamation

success during the liability period.

lreinhart

Revegetation Standards for Success

Analysis:

The amendment meets the State of Utah R645-301-356.231 requirements for revegetation success standards.

Success standards are identified in Section 341.250 on pages 13-15. Standards for success, statistically valid sampling techniques for measuring success and approved methods are identified in the Division's Vegetation Information Guidelines. The PMLU is livestock grazing and wildlife habitat and managed for multiple use under the Bureau of Land Management and US Forest Service. Therefore, as required by R645-301-356.210 and 356.230, success standards will be measured by production, cover, and shrub/tree density. Woody plant densities will be established at the time of reclamation by consultation with USFS, UDWR, and the Division.

lreinhart

Stabilization of Surface Areas

Analysis:

The amendment meets the State of Utah R645-301-353 requirements for vegetative cover.

The seed mix is comprised of a diverse mix of species native to the area that should provide quality wildlife habitat, forage production and promote soil stability. The seed mix was modified based on consultation with the Division and U.S. Forest Service (land management agency) in 2015.
The amendment meets the State of Utah R645-301-355 requirements for mulching and soil stabilizing.

Mulching and soil stabilizing practices are identified in Section 342.220 on pages 11-12. The plan is to start at the highest point of the slope and continuously move down. The process is to remove fill, stockpile existing topsoil, backfill and/or grade to a natural slope, pock and mix straw mulch (weed free hay 2000 lbs/acre), apply fertilizer (30-50 lbs/acre or as recommended), and broadcast seed using a hydroseeder. Sections will be done one at a time so that machinery will not backtrack onto regraded slopes. Seeding will occur in the late fall or spring if conditions are right (timing and climate). A tackifier will be added to the mulch and after the seed is applied.

lreinhart

Stabilization of Surface Areas

Analysis:

The application meets the requirements of R645-301-240, soil stabilization. Following seeding, Section 244 states that wood fiber mulch will be applied at a minimum of 2,000 lbs/ac. The reclaimed slopes shown on Plate 4E are 34.4% ((3h:1v) to 51.2% (slightly steeper than 2h:1v). Most bonded-fiber mulch products have a recommended application rate of 3,000 lbs/ac on slopes 2h:1v. However, the 1988 seeding of the interim slopes were protected with 2,000 lbs/ac hydromulch.

Surface pocking (6 ft x 6 ft x 3 ft deep) will be used along the perimeter of the disturbed area to slow flow from the undisturbed area onto the disturbed area (Plate 4E). Surface pocking within the disturbed area will be 3 ft x 3 ft x 1.5 ft to contain and allow infiltration of runoff.

pburton

Bonding Determination of Amount

Analysis:

The amendment meets the State of Utah R645 requirements for Determination of Bond Amount.

Detailed bond calculations included in Appendix H.

jeatchel