March 19, 2015

Sent via electronic mail

Mr. Mike Rowlands
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Permit ID: C2012018
Revision Type: N/A
Permitting Action: Deficiency
Subject: Second Round Acceptability Deficiency

Dear Mike:

The Department of Environmental Quality (DEQ) has completed its second round acceptability review regarding Otter Creek Coal, LLC's (OCC) application submitted on November 19, 2014, for SMP C2012018. The following deficiencies must be adequately addressed in a single deficiency response before DEQ can continue its acceptability review of the application:

ARM 17.24.301(108), 321(1)(a) and 601(1): By definition, a ramp leads from the haul road to the pit. The pit is commonly understood to be the area where coal is removed. The drainage plan (Appendix A, pages2-5 and 7-5) says Ramp 1 will be used to direct water to pond EP-10 and Ramp 3 will direct water to ponds EP-6 an EP-5. Clarify how a ramp which is typically used for haulage will be used for drainage facilities.

The application is confusing in that Exhibit 308A, page 4, explains delayed reclamation because of ramps. This explanation must be supported by drawings so it can be better understood. In addition, it appears as though there are not enough ramps (if they are ramps as defined in ARM). The north pits are serviced by only one ramp and there is no ramp in the south end of the mine. Please clarify how OCC will cycle the dragline, pre-strip, and remove coal with only one ramp.

ARM 17.24.302(1): – (and pursuant to Submittal Guidelines) DEQ is unable to review or consider the following because DEQ is unable to access the information provided, information is omitted, or information is contradictory. Please correct and resubmit (note: individual comments have been given a tracking number):

[1] Plate 2, Report 304C, does not match the CAD data provided. Specifically the photo locations and the shaded slopes are not included in the CAD data.

ARM 17.24.302(1): Continued

[2] The CAD data for Figures 1 thru 26 contained in Baseline Report 304K, Supplement A, were not submitted with this application. The CAD data for Figures 1 thru 26 must be submitted.

[3] The CAD data for Plate 1, 2, and 3, Exhibit 321A, does not match the documents in pdf format provided with this application. The CAD data for Plates 1, 2 and 3 must be resubmitted in your response to this deficiency.

[4] The CAD data for Plate 1 – NRCS Farmland Soil Types of Report 306A- CAD data for Prime Farmlands must be submitted with this application.

[5] Most of the submitted CAD documents link to externally referenced files (xrefs, images, etc.) with an absolute path that is no longer valid once they are moved to a different drive/ folder structure. For many of these we were able to redefine the paths during the preliminary review. We did this by changing paths from absolute to relative (e.g. "I:\Land Projects\OTRCR\dwg\XREF\Reference Boundaries.dwg" was changed to "..\XREF\Reference Boundaries.dwg"). Note that any future updates to these files will need to be submitted with revised and functional paths.

[6] BR 304J Vegetation: Plate 1 Vegetation Community Type Map_2012.dwg – All referenced files have the wrong path or are missing. Plate 2, Ecological Site Map_2012.dwg – All referenced files have the wrong path or are missing.

[7] BR 304K_F&W Resources: Plate 1_OC14_Wild_Habitat.dwg – All referenced files have the wrong path or are missing.

[8] BR 304L_Soils: Plate 1_Soils_Baseline Map-36x52_700.dwg – All referenced files have the wrong path or are missing.

[9] BR 304M_Premining Land Use: Plate 1_OC12_LandUse.dwg – All referenced files have the wrong path or are missing.

[10] BR 325A_AVF Determination: Plate9_OC14_AVF_Soils.dwg – All referenced files have the wrong path or are missing. Plate10_OC14_AVF_Veg.dwg – All referenced files have the wrong path or are missing. Plate11_OC14_AVF_LandUse.dwg – All referenced files have the wrong path or are missing. Plate12_OC14_AVF_Hay.dwg – All referenced files have the wrong path or are missing.

[11] Plate14_OC14_AVF_Tarter.dwg – All referenced files have the wrong path or are missing.

ARM 17.24.302(1): Continued

[12] Exhibit 313C_Backfilling and Grading: Plate2_Reclamation_Sequence_R1_201408 – Missing xref PMT 082014. Since this one will need to be resubmitted to fix the missing xref link, the other xref links need to their paths changed from absolute to relative. (e.g. I:\Land Projects\OTRCR\dwg\XREF\Reference Boundaries.dwg needs to be changed to ..\XREF\Reference Boundaries.dwg)

- Exhibit 313E_Soil Handling: Plate 1_OC14_Soils_Salvage.dwg – All referenced files have the wrong path or are missing.

- Exhibit 313G_Revegetation Plan: OC14_Recl.dwg – All referenced files have the wrong path or are missing.

- Mine Permit: Map13_OC14_Recl.dwg – All referenced files have the wrong path or are missing. MAP 12, POST MINE TOPOGRAPHY: The map includes disturbance lines that are not identified in the legend. Several other maps (e.g., Map 14), also contain a green line that appears to be a disturbance boundary that is not identified in the legend. Please coordinate important map features with the map legend.

- MAP 14, POST MINE DRAINAGE PLAN: There are premine drainages in the northeast corner of Section 23, eastern and southwestern portions of Section 25 that flow in from outside of the disturbance boundary that are not tied in to the postmine drainage plan.

- EXHIBIT 321A, Road Plan View – Design Parameters: Cut and Fill Slopes. There is a discrepancy between Note #3 and Notes #1 and #2. Please resolve.

- MAP 12, POST MINE TOPOGRAPHY: The map includes disturbance lines that are not identified in the legend. Several other maps (e.g., Map 14, also contain a green line that appears to be a disturbance boundary that is not identified in the legend). Please coordinate important map features with the map legend.

- MAP 14, POST MINE DRAINAGE PLAN: There are premine drainages in the northeast corner of Section 23, eastern and southwestern portions of Section 25 that flow in from outside the disturbance boundary that are not tied in to the postmine drainage plan.

- EXHIBIT 321 A, Road Plan View – Design Parameters: Cut and Fill Slopes. There is a discrepancy between Note #3 and Notes #1 and #2. Please resolve.

[13] Inclusion of the "Tract" boundaries and terms make this permit application unclear. Since OCC has adjusted its permit application area to expand into both Tracts 1 and 3 from Tract 2, the boundaries and discussions regarding permit area have become confusing. In some permit material only Tract 2 has been discussed. This omits facilities areas

ARM 17.24.302(1): Continued

associated with the rail loop and soil stockpile 5. Please remove permit language and map boundaries designating "Tracts." This will ensure that the permit application is presented clearly and concisely. Please refer to the permit application area as the "Permit area" as defined by ARM 17.24.301(87).

[14] Figure 25, Amphibian Sightings, and Figure 26, Reptile Sightings, contained in 304K Supplement A, are missing features on pdf maps. OCC must resubmit Figures 25 and 26 depicting all features that are shown on the legend.

[15] The culverts shown on Plate 3, Exhibit 321A, do not match Figure 2-1 or Figure 2-2, Exhibit 315A. This discrepancy must be corrected.

[16] Figures 2-1 and 2-2, Exhibit 315A, must depict all of drainage #7. A map depicting drainage #7 would allow DEQ to verify the drainage area that will contribute runoff and sediment to EP-7.

ARM 17.24.302(1) and ARM 17.24.601: (Section 321) DEQ found two quarters in which proposed mining activities are isolated from development of any haul roads. The quarters of concern are Year 3: 2Q and Year 3: 3Q as shown on Figure 3-15 of Exhibit 314C, Appendix B. Considering that haul road/ramp 1 is over 11,000 feet from haul road/ramp 2, DEQ believes another ramp is needed between Ramp 1 and Ramp 2. The additional ramp could begin near the truck dump and run up the drainage bottom of Section 14. This ramp would facilitate the shortest haul from two isolated quarters to the truck dump. Please correct.

ARM 17.24.304(1)(b): Baseline Report 304J does not include any reference, or discussion, about the presence culturally significant plant species in the permit area. Due to the proximity to tribal lands, an effort must be made to address culturally significant plant species in both baseline discussions, and subsequently, the reclamation plan. Please incorporate this discussion in the appropriate portions of the permit application.

ARM 17.24.304(1)(c):
[1] Requires a comprehensive listing, location, and description of significant or unique scenic and/or geological formations. Baseline Report 304C_Geologic Scenic Topo Appendix A and Plate 2 have two separate formats for the photo identifiers. One uses 10-1 while the other uses 1001. Please use consistent formats between the two documents.

This was corrected in the deficiency response between these two documents, but not with the narrative portion of 304C. These all must have the same formatting. Some photo descriptions still have remnant photo id differences (1108 and 1504). Please format this report consistently.

ARM 17.24.304(1)(c): Continued

Section 4.0 Steep Slopes and Cliff Features, 304C narrative, includes a table of acreages with steep slopes. The numbers in this table do not match the numbers in Plate 2. Please confirm the numbers and correct the appropriate document.

Section 5.0 Erosion Features, 304C narrative, includes a table with cumulative lengths of steep slopes by Section. There is no description of how these numbers were generated, or indication on the map of delineation of these features. Please correct as part of the steep slope analysis.

Both tables listed above are not numbered or labeled. Please label all tables.

[2] OCC's response to the request to better study the petrified wood area is inadequate. OCC needs to commit to inventorying the area before mining, and possibly using some of the material in selected reclamation. Please explain how OCC intends to satisfy this requirement.

[3] In Exhibit 304C some geologic location descriptions still do not match the mapped location. For instance, photo points 2605 and 2607 are described as being located in the southwest quarter of Section 26 while Plate 2 shows them in the northeast quarter. Also, some names still do not match the names on Plate 2, such as photo point 20-6.

ARM 17.24.304(1)(b) and ARM 17.24.305: Please provide a comprehensive map and table that includes all cultural resources sites found in the project area to help ensure that all of sites are covered. The most recent 2014 map provided in January 2015 does not have all the sites that were shown on the previously provided 2013 map. Additionally, Map 6 will need to be updated upon the completion of the cultural resource reports for the remaining sections that have not been provided, which include the state coal sections.

ARM 17.24.304(1)(e):
[1] Baseline hydrologic data has not been submitted in a format suitable for review. Please include all baseline hydrologic data in spreadsheets and/or as raw data for DEQ review. This should include all surface water flow data (continuous, crest gauge, flow meter, staff gauge, etc.); spring/seep flow data; pond water level data; groundwater level data (manual measurements and continuous recorder data); stream, spring/seep, pond, and groundwater quality data (field measurements and laboratory data including results of field blanks and duplicates); and aquifer test data (manual and continuous recorder water levels and all data input required for AQTESOLV analyses).

[2] Additional sources of baseline hydrologic data must be submitted. Please submit copies of all field forms, field notebooks, and laboratory analytical results relating to baseline hydrologic data collection and analysis.

ARM 17.24.304(1)(e): Continued

[3] Field parameters recorded during baseline monitoring of groundwater, streams, ponds, and springs are not reported in the tables of water quality. Please include these data in Exhibit 304E Tables 2-4 through 2-12 and 3-4 through 3-11.

[4] Some baseline hydrologic data is not in the proper format. All baseline hydrologic data should be submitted in the DEQ Annual Hydrology Report Standard, where applicable.

[5] It appears that surface water quality data in the accompanying Baseline Data spreadsheet includes both grab samples and samples collected from passive samplers. Water quality data from passive samplers must be distinguished from grab-sample data.

[6] Alluvial wells A8 and A9, and wells in the B12 battery do not have the required one year of baseline data. This minimum required baseline data collection must be completed before review of Exhibit 304E can be finalized.

[7] The second well battery east of the mine in the Custer National Forest (battery B13) has not yet been installed. OCC must commit to installing this well battery and collecting a minimum of one year of data prior to initiation of the box cut. The proposed location shown for this well battery in Exhibit 314B, Plate 1, is not acceptable. DEQ suggests that this well battery be installed directly east of the northern portion of the mine area, in the vicinity of T4S R46E Section 7. Please consult with DEQ when selecting the location for this well battery.

[8] Tables of water quality in Exhibit 304E include summary statistics for wells in a stratigraphic interval represented by max, min and mean. The tables are based on an unacceptable statistical method as analytical non-detect values are included in the statistical calculation. It is inappropriate for minimum or mean values to be represented by a non-detect value and it appears the detection limit is used as the concentration for non-detect samples when computing the summary statistics. Please correct this to be more representative of the actual statistic, using non-detect values, or describe in the text how the statistics were determined. A median is more representative than a mean when dealing with samples that are non-detect.

[9] Exhibit 304E, OCC claims that there are data sufficient to make a CHIA for Tracts 1 and 3. DEQ will not evaluate the impacts from mining in these tracts under the current application. Please remove all references regarding analysis of impacts from mining in Tracts 1 and 3.

[10] Exhibit 304E, Section 2.1.3, states "Samples were collected, handled and analyzed in accordance with the MDEQ approved Plan of Study." DEQ has not and does not approve plans of study. DEQ may provide comments on plans of study as a courtesy to the applicant. Please remove this sentence.

ARM 17.24.304(1)(e): Continued

[11] Exhibit 304E, Section 2.4: Descriptions of the aquifer properties of transmissivity, hydraulic conductivity, and storativity, are aggregated using an arithmetic mean throughout Section 2.4. Because these properties tend to vary on a log scale over several orders of magnitude, the arithmetic mean is likely not appropriate to describe the aggregate of these properties. Please describe these properties using a geometric mean or median.

[12] Section 2.4.6, Exhibit 304E, describes springs that were in the Surface Water Plan of Study. This section must address all springs identified within the study area, not just the three springs that were in the original plan of study.

[13] Grouping the Exhibit 304E, Table 2-3, aquifer test results by hydrostratigraphic unit rather than in alphabetic order would facilitate review of the application. OCC should also consider a listing the lithology adjacent to the well screen in this table.

[14] It should be noted that the Static Water Levels (SWL) given in Exhibit 304E, Appendix B, are in feet below the monitoring point. Please provide units or reference levels for SWL.

[15] The Date/Time column in Exhibit 304E, Appendix B, is not presented in a convention that is meaningful to the reader. Please remove this column.

[16] In Exhibit 304E, Appendix B, the selected vertical scale on many of the hydrographs is too large and obscures variations in water levels. Please revise the vertical scales used in the hydrographs so that all variations in water level are clearly visible. These hydrographs could also be made larger to improve reviewability of the data.

[17] Exhibit 304E, Appendix B, includes water levels for a well called MBMG which is located next to the B2 battery, but no additional information is given on this well. Please include the well log for this well in Appendix A and show this well on Map 10.

[18] Exhibit 304E, Section 2.4.1.1, describes alluvial lithology as uniformly having an upper fine grained unit made up of silty clay. This is not always the case, such as at A3. Please describe the spatially variable thickness and lithology of the finer grained layers in more detail.

[19] In Exhibit 304E, Section 2.4.1.2, the depth to water discussion describes confined conditions existing in alluvium, but ignores data from the shallow piezometers completed in the finer grained surface layers. As described in Exhibit 325A, these piezometers showed similar water levels as the deeper gravels, which indicate an unconfined aquifer. While the finer grained surface layers of the alluvium are certainly less permeable than the deeper gravels, it does not appear they act as a confining layer. Please correct or explain.

[20] The discussion of groundwater fluxes in Otter Creek alluvium in Exhibit 304E, Section 2.4.1.3, is oversimplified by using average parameters from over 12 miles of stream length.

ARM 17.24.304(1)(e): Continued

More relevant calculations of alluvial aquifer flux for the various reaches of Otter Creek could be made using the specific information gathered at each alluvial cross-section. Later in this section under "Recharge and Discharge," statements are made regarding apparent variations in stream and alluvial flow being related to interactions with clinker deposits; however these statements are not supported by evidence. Calculating alluvial fluxes at several locations along the Otter Creek stream valley would perhaps provide some insight into these apparent alluvium/clinker interactions. Please expand the discussion of Otter

Creek alluvial groundwater fluxes to include more detail on how these fluxes change along the length of the stream.

[21] In Exhibit 304E, Section 2.4.1.3, page 2-16, the meaning of the statement "Overall surface water flows were relatively similar through the Study Area in the fall, but gained in the spring" is unclear. To what are flows similar? Does this mean the flows into the study area are similar to the flows out of the study area? Please clarify this statement. Including a description similar to the response from page 8 and 9 the October 28, 2014, deficiency response letter in the permit application text would be sufficient to address this deficiency.

[22] The final paragraph of Exhibit 304E, Section 2.4.1.3, should also discuss evapotranspiration as a discharge from the alluvium.

[23] In Exhibit 304E, Figures 2-2 and 2-3, the orange labels for clinker well water levels on these figures are illegible where they overlay the red clinker background.

[24] Exhibit 304E, Figures 2-2 through 2-7, mix contour data from 2011 and 2012 with data from 2014. Please use data from consistent time periods at all wells on these figures.

[25] Exhibit 304E, Section 2.4.2.1, compares the thin (3.5ft) coal in which well B10-O is completed to the upper dry coal at the B-7 battery. Based on the 24ft thickness of the dry coal at B7 it is clear this is the main upper Knobloch and not a thin split comparable to the coal at B10-O. Please remove the statements comparing these two unrelated coal units or explain why they should be considered to be the same seam.

[26] In Exhibit 304E, Section 2.4.2.2, page 2-17 describes the disconnected nature of the water bearing zones in the overburden; however, the overburden potentiometric surface is contoured in Figures 2-2 and 2-3 as though a connected aquifer exists. The only nearby wells with potentially connected water bearing zones which would warrant water level contouring appear to be B5-O and B6-O where water is found in a sandy unit 25-30 feet above the Knobloch. The water bearing zone at B11-O is found approximately 90 feet above the Knobloch and should not be contoured with B5-O and B6-O. Please change the overburden contours in Figure 2-2 and 2-3 to dashed near well B11-O to indicate this lack of direct connection. Additionally, this section only refers to Figure 2-3. Please add a reference to Figure 2-2, as this figure also shows overburden water levels.

ARM 17.24.304(1)(e): Continued

[27] In Exhibit 304E, Section 2.4.2.3, attempting to calculate the quantitative groundwater flux through the overburden is likely not warranted, except perhaps in the vicinity of B5-O and B6-O, due to the complex and disconnected nature of the groundwater flow system. Please keep this discussion to a qualitative one to avoid the suggestion of certainty that is unwarranted for quantitative groundwater fluxes.

[28] In Exhibit 304E, Section 2.4.3.1, the complex geology where there are three main Knobloch coal splits in the southern portion of the study area is not explained sufficiently to allow for correlation of geologic units. Additionally, inconsistent assignment of well identifiers at batteries B7, B10, and B12 has added to confusion regarding correlation of geologic units. Please include a summary of well completions in the area to clarify this confusion. DEQ's interpretation of well completions at these batteries, based on review of well and boring logs submitted with this application and logs contained in MBMG's GWIC and COAL databases is as follows:

Upper Knobloch: B10-KU, B12-UK2
Middle Knobloch: B7-KU, B10-KL, B12-UK1
Lower Knobloch: B7-KL, B12-LK

[29] Exhibit 304E, Section 2.4.3.1 page 2-20, states the complete Knobloch is present under three-fourths of Tract 2. It is unclear if this refers to the area of Knobloch coal which has no splits or the area where the coal is not burned or otherwise missing. Please clarify what is meant by complete Knobloch.

[30] In Exhibit 304E, Section 2.4.3.1, the final paragraph on page 2-20 describes the coal underlying the alluvium encountered by drilling as highly weathered; however; it is unclear what boreholes were used to make this conclusion. Based on a review of boreholes which penetrate the coal beneath Otter Creek alluvium, it appears only a thin layer at the top of the coal is typically weathered, and only in some locations. Please provide the supporting evidence for this discussion or revise it.

[31] In Exhibit 304E, Section 2.4.3.2, well OC83-4 is listed as an observation well for the pump test at well K-1, but no additional information is given on this well. Please include the well log for this well in Appendix A and show this well on Map 10.

[32] The first paragraph of Exhibit 304E, Section 2.4.3.3, mentions "free drainage" from the coal aquifer to the alluvium and clinker aquifers. Free drainage is a term usually associated with gravity driven drainage in unsaturated conditions. It appears to be used here in the context that the higher hydraulic conductivity of the clinker and alluvium will not limit flow from the lower conductivity coal, thus the conductivity of the coal will be the limiting factor in saturated groundwater flow. Please revise this statement to avoid using the term "free drainage" or explain how the term is applicable.

ARM 17.24.304(1)(e): Continued

[33] In Exhibit 304E, Section 2.4.3.3, the discussion of the flow regime is oversimplified for the Knobloch coal where the seam splits. Calculating one flux for the Knobloch coal in this area is inappropriate, as each coal split seam has a unique gradient and transmissivity. Please revise this discussion to better describe the complexities of groundwater flow in the area where the coal is split.

[34] In Exhibit 304E, Section 2.4.3.3, the discussion of recharge and discharge describes that recharge from the Tenmile Creek alluvium would have to flow through clinker to enter the middle Knobloch coal; however, the log for well A4 and the geologic cross-section on Map 16 show the Tenmile Creek alluvium in direct contact with the middle Knobloch. Please correct this statement or explain the inconsistency.

[35] Exhibit 304E, Figures 2-4 and 2-5, contour the potentiometric surface of the middle Knobloch with the upper Knobloch at B7 and B12, and with the lower Knobloch at B10. Please contour each Knobloch coal spilt separately on these figures, or provide separate figures for each Knobloch coal split.

[36] Exhibit 304E, Section 2.4.4.1, states "Clinker surfaces provide conditions for precipitation recharge, particularly in areas where soil formation has not occurred (typically flat hilltops) and coarser materials are at the surface" and Section 2.4.4.3 states "Precipitation would be expected to infiltrate faster through coarse grained slopes, particularly on north facing slopes, and slower on flat hilltops, where surficial grain sizes may be lower." These statements are contradictory. Please revise these sections to be consistent in their descriptions of recharge related to clinker.

[37] The first paragraph of Exhibit 304E, Section 2.4.4.3, states that flow is generally from the clinker to alluvium, except in some areas. Please expand this paragraph to describe the variations in flow. Also in this section, the discussion of recharge and discharge states "Flow from the Knobloch Coal to the alluvium results as the edge of the coal drains into the higher permeability clinker." The meaning of this statement is unclear.

[38] In the first paragraph of Exhibit 304E, Section 2.4.5.3, calculating a flux for the underburden from the average transmissivity of all underburden wells is not relevant as these wells are completed in several different geologic units and the average is noted earlier to be skewed by an outlying data point at B1-U. Also, this calculation does not appropriately account for evidence that the underburden consists of several water bearing strata stacked on top of each other with confining units between. Any attempt to calculate the underburden flux must be a sum of the fluxes in all of these water bearing units. Please revise this paragraph to include a justifiable estimate of groundwater flow in the underburden.

[39] Exhibit 304E, Figure 2-6 and 2-,7 present contoured water levels for all underburden wells, even though these wells are completed in different hydrostratigraphic units. It appears that underburden wells are completed in three general aquifers: sandstones above

ARM 17.24.304(1)(e): Continued

the Flower-Goodale coal, in the Flowers-Goodale coal, and in the deep sandstone. Please contour each of these aquifers separately, or include a separate figure for each aquifer. Additionally, as a result of the conglomeration of water levels from the distinct aquifers, Section 2.4.5.3 discusses discharges from flowing wells to explain the appearance of underburden groundwater discharge under Otter Creek. A simpler explanation is that the bends in the potentiometric contours are an artifact of inappropriate contouring of water levels for wells completed in separate aquifers. Please revise this discussion to consider the potentiometric surfaces created for each aquifer

[40] Throughout Exhibit 304E, Section 2.5, average values for chemical parameters are used, in conjunction with ranges, to describe water quality. Measures of central tendency, such as averages, are based on the basic assumption that all measurements are sampling the same population, which does not appear to be consistently true for the groundwater quality sample groups presented. Based on the wide ranges of parameter values, an average may not be the best measure of the central tendency of the data, even if the assumption of a single population is accepted. Please use a more representative measure of central tendency where generalizations of data are appropriate.

[41] In Exhibit 304E, Section 2.5, maximum contaminant limits (MCLs) are standards set by the USEPA for drinking water quality and indicate the concentration limit of a substance allowed in public water systems under the Safe Drinking Water Act. Montana Circular DEQ-7 sets numeric water quality standards for human health in groundwater. Please refer to the human health standard (HHS) rather than the MCL when discussing groundwater quality limits for a given parameter. As DEQ-7 has no secondary standards, please refer to EPA SMCLs for drinking water when discussing secondary standards. Additionally, when discussing secondary standards, all secondary standards should be considered, not just metals and fluoride.

[42] Discussions in Exhibit 304E, Section 2.5, apply groundwater standards for metals to total recoverable metals analyses. As stated in DEQ-7, footnote 9, standards for metals in groundwater are based on the dissolved portion of the sample. Please remove all comparisons of total recoverable metals analyses to DEQ-7 groundwater standards for metals.

[43] Much of the text describing the stiff diagrams within Exhibit 304E, Plate 1, is illegible at 100%. Please make certain all text is legible on this plate. Additionally, the stiff diagrams for K-3 and K-4 are plotted twice on this plate. Please remove one set of diagrams.

[44] In Exhibit 304E, Section 2.5.1.1, page 2-31, the last paragraph states that dissolved and total recoverable metals were below the standards set in Circular DEQ-7. In twelve analyses from well A-1, arsenic was at or above the human health standard of 0.01 mg/L. Please correct or explain the discrepancy.

ARM 17.24.304(1)(e): Continued

[45] Exhibit 304E, Section 2.5.1.2, states that clinker groundwater is "sodium-sulfate type water with no dominant cation". In sodium-sulfate type water sodium is the dominant cation. Please correct this text.

[46] The final sentence of Exhibit 304E, Section 2.5.1.3, mentions metals exceeding MCL's, but does not specifically identify or discuss these exceedances. Please revise this section to identify which metals exceed standards at what locations.

[47] Exhibit 304E, Section 2.5.1.3: Monitoring well B10-O water quality is anomalous and deserves more discussion because it has arsenic concentrations more than 10 times the human health standard as well as exceedances in lead concentrations.

[48] Exhibit 304E, Section 2.5.1.4, states that elevated concentrations of dissolved arsenic were detected in one sample from B11-K, however the data provided indicate all samples from B11-K as non-detect for arsenic. Please correct or explain this statement.

[49] The second paragraph of Exhibit 304E, Section 2.5.1.5, states that groundwater from the underburden is sodium-bicarbonate type; however, data from B1-U and B12-U are not consistent with this statement. Please revise the text to explain these exceptions.

[50] In Exhibit 304E, Section 2.5.1.5, the presentation of the range of values for SC in the underburden does not discuss that the two maximum values (4290 uS/cm at B7-U and 3320 uS/cm at B9-U) appear to be statistical outliers. The next highest value (2250 uS/cm at B4-U) likely represents the maximum of the true range. Please revise or explain.

[51] The discussion of Fortune Spring in Exhibit 304E, Section 2.5.5, contains very little detail on water quality. Water quality at this spring is geochemically unique with elevated levels of boron and selenium. Please expand this discussion.

[52] Exhibit 304E, Table 2-13 and Plate 2: The wells listed in Table 2-13 do not match those shown on Plate 2. Please ensure all wells listed in Table 2-13 are shown on Plate 2 and all wells shown on Plate 2 are listed in Table 2-13.

[53] Exhibit 304E, Section 2.6.1: The water quality data from the Tarter well that was present in the previous version of the document and that was commented on in the last round of deficiencies could no longer be located. Please either indicate why this data were removed or place it back in the permit application. The deficiency response indicating that the water samples were collected before softening at the domestic well would be appropriate to include under Section 2.6.1.

[54] Exhibit 304E, Section 2.6.2, states that springs and seeps were only identified from maps and aerial photos in some areas, but these areas are not described. Please identify the areas within the study area where springs and seeps have been identified without ground access and explain why in Section 2.6.2 or on Plate 3.

ARM 17.24.304(1)(e): Continued

[55] Exhibit 304E, Appendix G: Please include the dates of observation for each identified spring/seep location.

[56] Exhibit 304E, Appendix G: Specific conductivity is given in units of um, which is not a unit of conductivity.

[57] Exhibit 304E, Appendix G: SSI-11-105 is shown on Plate 3, but not included in Appendix G. Please include information on this location.

[58] Exhibit 304E, Appendix G: The source of SSI-11-103 is listed as suspected to be Gene Spring; however, this site is plotted in the Newell Creek drainage on Plate 3. Please correct this discrepancy.

[59] Exhibit 304E, Appendix G: Review of the maps and aerial photos by DEQ hydrologists identified several areas of interest in Tract 2 which were not identified in the spring/seep inventory. DEQ will coordinate a field visit when permitted by weather and ground conditions to determine additional spring and seeps that need to be sampled.

[60] Some of the surface water features inventoried in Exhibit 304E, Appendix G, and shown on Plate 3 are interpreted in the narrative of Appendix G as ponded runoff features, or are manmade features such as stock tanks. Appendix G should be separated into separate spring and pond features, renamed, or otherwise noted to convey that not all of the features are springs. Baseline data, meeting the requirements under ARM 17.24.304(1)(f)(ii), is required for all surface water features that have the potential to be impacted by mining.

[61] Springs and ponds identified in the Spring and Seep Inventory (Exhibit 304E, Appendix G) that lie within Tract 2, or that have the potential to be impacted by disturbance within Tract 2 must be sampled for water quality and water quantity both for the establishment of baseline conditions, and to assess the quality and quantity of water resources that support the premine land uses.

[62] Exhibit 304E, Section 3.1, should reference a figure showing the full extent of all described drainage basins.

[63] The mine plan shows that mining disturbance extends into the upper Shorty Creek drainage. No baseline data exists for this area. DEQ recommends OCC remove the mining disturbance into Shorty Creek drainage to prevent any discharge from entering the Custer National Forest. If OCC removes this disturbance surface monitoring is not necessary; however, an alluvial well is still needed to monitor draw down on the Custer National Forest.

If OCC chooses to include mining in the upper Shorty Creek drainage, OCC must establish alluvial well and surface water monitoring stations in the arm of upper Shorty Creek to

ARM 17.24.304(1)(e): Continued

establish baseline conditions above and below mining disturbance in Shorty Creek. One year of baseline data is required for DEQ to evaluate mining in this area.

[64] In Exhibit 304E, Section 3.1.5, Gene Creek is not included in the listing of named west side drainages. Please correct or explain this omission.

[65] Exhibit 304E, Table 3-1, incorrectly states Fortune Spring is a "Downgradient Spring near Otter Creek." Fortune Spring is upgradient of the mine area. Please correct this error.

[66] The sampling frequency reported in Exhibit 304E, Table 3-1, does not match the actual sampling frequency for several locations. Please revise the table to accurately represent the actual sampling frequencies.

[67] Discussions of surface water quality in Exhibit 304E, Section 3.2.6, do not compare the data to relevant Montana water quality standards. Please include comparisons of surface water quality to DEQ-7 acute and chronic aquatic life standards.

[68] The data results between Exhibit 304E, Appendix F, cross section/rating curve data, data in Table E-1, and the spreadsheet of data submitted have numerous inconsistencies. For instance, Table E-1 presents 15 individual flow measurements at Station SW-22 collected using a Marsh-McBirney flow meter from August 2011 through May 2014. Only 5 recorded measurements are given in the accompanying baseline spreadsheet for SW-22. The flow measured on 3/15/2012 reads 5.1 CFS in the spreadsheet, but Table E-1 shows the measured flow for that same day to be 14.5 CFS with a note stating that "flow was recorded in the database as 5.1 CFS". Rating curves presented in Appendix F do not appear to incorporate measured flows into the rating curve (only 8 of the 15 measured flows are shown). Site SW-22 is used as an example of the incongruities between these three data presentations; however, more inconsistencies exist. OCC must reconcile the data discrepancies in each of these submittals (Spreadsheet data, Appendix E, Appendix F).

[69] Surface water sites SW-1A and SW-23 are not included in Exhibit 304E, Appendix F. Please include the information for SW-1A and SW-23.

[70] Many of the channel profiles in Exhibit 304E, Appendix F, refer to field visits in Table G-2. Table G-2 could not be found. DEQ suspects that this section should reference Table E-1. Please correct this error.

[71] The lines labeled "ground surface" on hydrographs in Exhibit 304E, Appendix F, do not always correspond to a stage of zero on the left y-axis. Please ensure these reference lines are located correctly.

[72] In Exhibit 304E Appendix F, the hydrographs of continuous recorder data are inconsistent in format and details in some hydrographs are difficult to read. Please reformat for readability. DEQ suggests using a thin line without markers, such as used in

ARM 17.24.304(1)(e): Continued

SW-2 hydrograph, for all of the continuous recorder hydrographs, making them easier to read.

[73] Please ensure that all surface water sites monitored for quantity have an accompanying hydrograph in Exhibit 304E, Appendix F. For instance, SW-25 and SW-3 do not have graphs of flows nor do any of the crest gauge sites. Please correct or explain these omissions.

[74] Exhibit 304E, Appendix F: Multiple surface water stations were down for repairs for long periods of time (6 months or more at a time) which makes using the data from these sites problematic. Please explain if SW-16 was ever reinstated as a surface water site and why the site was inactive for at least 9 months.

[75] There are still discrepancies between the surface water site visit tables in Exhibit 304E, Appendix E, and the tables of laboratory water quality samples from surface water sites. As stated in the first deficiency letter, all water quality samples must be accompanied with an entry in the surface water site visit tables in Appendix E.

[76] The intro paragraph of Exhibit 304E, Section 3.2.2,page 3-7, states Pond P6 is in Tract 2 when it is actually south of Tract 2. The location of this pond is described correctly in the section on Pond 6. Please revise the text.

[77] The discussion of synoptic runs in Exhibit 304E, Section 3.2.5, does not discuss the unusually high flow reported at Trusler Crossing in November 2011. Please revise this discussion to explain the November 2011 flow data.

[78] The discussion of SW-1 in Exhibit 304E, Section 3.2.5, only mentions the stage being recorded above ground at this site in 2012. According to the hydrograph in Appendix F, the stage was also above ground in 2013 and 2014. Please revise, providing a full explanation.

[79] The discussion of SW-9 in Exhibit 304E, Section 3.2.5, attributes frequently observed flows at this site to a spring 1.5 miles upstream. The spring and seep inventory in Appendix G and Plate 3 do not include this spring. Please include the location and information on the spring in Appendix G.

[80] Exhibit 304E, Table 3-5, shows two samples for SW-13 on 6/14/11 which have distinctly different analytical results. Please explain the discrepancy in these results.

[81] Surface water quality and quantity data at some stations are limited. For instance, the farthest downstream surface water monitoring station, SW-25, will be used to evaluate water quality and quantity for material damage and impacts to the hydrologic balance. Surface water quality data at this station is very limited and no continuous flow data was presented in the permit application. DEQ encourages OCC to continue data collection at all

ARM 17.24.304(1)(e): Continued

surface water stations in order to meet the intent of ARM 17.24.304(1)(e). Particular attention should be paid to critical summer low-flow times, and during the growing season.

[82] Exhibit 304E, Section 3.2.6.4, attributes good water quality to snowmelt and runoff on frozen ground. Due to the lack of correlation between season and water quality it appears more likely that the differences in water quality are due to variable mixing of runoff and baseflow contributions. Similarly, the discussion on ephemeral tributaries to Threemile Creek in Section 3.2.6.3 does not discuss the notable differences in water quality at purely ephemeral sites SW-4, SW-6, and SW-7, versus sites partially fed by groundwater sources at SW-8 and SW-9. Please revise and expand these discussions to include the impact of groundwater contributions to surface water.

[83] In Exhibit 304E the baseline water rights inventory (Table 4-1) encompasses a larger area than the hydrologic inventories (Plates 2 and 3). Please reconcile these studies so that they show the same extent. Furthermore, it would be beneficial to have a map of all the water rights locations either incorporated into an existing map or made as a separate map.

[84] Exhibit 304E, Section 4.2.1: Discussions of replacement water should only compare potential replacement sources to water with the potential to be impacted by mining in and near Tract 2. Knobloch water in Tract 2 is generally better in quality than the average cited in this section. Alluvial groundwater quality is not of comparable quality to Tract 2 Knobloch coal water in any location except for Home Creek at AVF Section 5 and Otter Creek at AVF Section 1. If replacement water is needed, it will most likely be needed near the mine; use of alluvial water from at least three miles away is not practical. Also proposing using water from the primary impacted aquifer (Knobloch) as a replacement water source is not reasonable. If the Knobloch aquifer is already partially depressurized, adding additional water withdrawals would only exacerbate any problems. The only reasonable sources for replacement water are deeper sandstone aquifers in the Tongue River Member or lower stratigraphic units. Please revise this section to only include realistic and practical replacement water sources.

[85] In Exhibit 304E, Section 4.2.1, the first bullet, states "water from all Home Creek wells sampled had TDS of 1,285 mg/L with a range of 986 to 1,285 mg/L." The meaning of this statement is unclear, please clarify.

ARM 17.24.304(1)(e) and ARM 17.24.645/646: Exhibit 304E does not include a Sampling and Analysis Plan, or methods or protocols used to collect ground and surface water samples. Please submit a Quality Assurance Summary Report for baseline data collection. In order to facilitate application review DEQ suggests that OCC follow DEQ's guidance regarding Monitoring and Quality Assurance Plans to comply with ARM 17.24.645(6) and 646(6).

ARM 17.24.304(1)(e) & ARM 17.24.646: Exhibit 304E, Section 3.2.6, page 3-19, describes how passive samples were collected and analyzed. Please describe this in more detail,

including the protocols/SOPs for the deployment and operation of passive samplers. This section also describes a process for aliquoting passive samples where an insufficient sample (too small a volume) was collected. Please describe the conditions that may lead to an insufficient sample being collected, and identify these samples; it is DEQ's experience and understanding that unfilled bottles may represent precipitation-dominated samples.

ARM 17.24.304(1)(e)(ii): The deficiency noted in the first deficiency letter regarding identification and a confirmation of the presence or absence of features on the USGS map was not fully addressed. Exhibit 304E, Plate 3, clearly shows ponds on the background USGS maps that were not discussed in the surface water inventory. For instance, in 304E, Appendix G, the pond in T4S R45E S13 was inventoried as spring/seep SSI-10-003 rather than treated as a pond. This pond should be added to the pond monitoring and sampling schedule. Also, SSI-11-20 is described as a groundwater fed oxbow along Otter Creek. It appears that there are other similar features which were not inventoried. Please include all surface water features shown on the USGS topo map in the surface water inventory and collect baseline data for any of these features which have the potential to be impacted by mining.

ARM 17.24.304(1)(g): Baseline report 304H, Overburden Analysis and Suitability (304H), did not arrive as an updated report in the response to the first deficiency letter. What opens when selecting this .pdf is an updated map "Baseline Report 304H Overburden Analysis Near Surface Soil Quality-Plate 1" (Plate1).

Comparing round one 304H Plate 1 to the round two version shows there are missing updates. The map layer identified as "mining area" is an updated boundary line in the new Plate 1. In the 304H report there is a second map called "Baseline Report 304H Projected Spoil Quality-Plate2" (Plate 2). The "mining area" boundary layer in Plate 1 needs to be updated on Plate 2. The boundary change alters the discussion of suitable spoils for both 304H and Exhibit 313E (noted below).

Please provide the following:

- Update baseline report 304H as necessary.
- Update Plate 2 to reflect the "mining area" boundary layer submitted with Plate 1.
- The majority of boreholes used in justification for suitable boxcut spoil in 304H and Exhibit 313E, as discussed below under 17.24.313(g), must fall within mining cuts.

ARM 17.24.304(1)(h): The baseline climate data in Exhibit 304I has not been updated to include more recent data to coincide with the data collection interval used for hydrologic data. Additionally, the climate data in Exhibit 304I noted that on-site precipitation data was suspected to be in error. As such, there is no valid on-site precipitation baseline data included in the application. As precipitation is an integral portion of the hydrologic balance, a comprehensive evaluation of impacts to the hydrologic balance cannot be made

without complete climate data. Please update Exhibit 304I to include data through the same time period as the data presented in Exhibit 304E, and include a discussion of the resolution of the precipitation data inaccuracies.

ARM 17.24.304(1)(i): OCC submitted Baseline Report 304J_Vegetation. This report combines both the 2011 and 2012 reports as requested. There are still issues with how it has been prepared.

The Appendices B-L contains the quantitative data, presented by individual sample sites, broken out be sample year. These Appendices should not be broken out by sample year. Please combine the paired appendices, B with G, C with H, D with J, E with K and F with L. The year sampled can still be identified so year to year comparisons can be examined using other means within individual tables. Any permit material referring to these appendices will also need to be updated.

This report discusses the Facilities and Tract 2 as separate areas. They are both included currently as the application area and should be discussed as such. If at some point they are broken out into separate permit areas, they can be discussed separately at that time, but until that time they should be discussed as the permit application area, study area, or Otter Creek Permit Application Area. Please change this language in Baseline Report 304J_Vegetation.

Plate 1 of Baseline Report 304J includes a legend of baseline community types. The labels of community types 11F and 11G do not match the community types in Baseline Report 304J. Please correct community type labels and confirm that remaining community types match between Plate 1 and Baseline Report 304J.

Baseline Report 304J has no discussion of badlands community types. All community types included have too high of perennial cover to accurately represent these areas. These areas, though small, represent a distinct landform that should also be present postmine. An example of this landform is Photopoint 1124, Baseline Report 304C, Appendix A, described as eroded badlands. Please address this landform in Baseline Report 304J and update appropriate permit application materials.

Page 91 of the Vegetation Baseline Report refers to "about 1.5 tons per acre for typical grass hay yields." This number was calculated as part of the AVF investigation included in Baseline Report 325A. Please use the numbers calculated. Comparisons to county-wide averages and expected values based on soils data may be included, but for the Otter Creek study area, actual numbers have been calculated and should be used. This will need to be updated in all permit materials where this number is referenced.

ARM 17.24.304(1)(i)(ii): Baseline report 304J discusses baseline vegetation for Tract 2. The boundary for Tract 2 has changed since the baseline investigation was initiated. Acreage accounting of this area will not match with pre- and postmine communities as it is currently written. Please add a discussion of these discrepancies to the baseline report. Also ensure that other permit material referencing baseline vegetation

communities have a disclaimer that the baseline study area is not the same as the permit area.

ARM 17.24.304(1)(j)(iii): The comprehensive wetland report has not been submitted to DEQ. Please provide the report sent to the Army Corps of Engineers.

ARM 17.24.304(1)(j)(i): Please include a comprehensive fish and macroinvertebrate report and species counts and full taxa lists for all of the sample years.

ARM 17.24.304(1)(k): Baseline report 304L, Soils Baseline, was consolidated and now includes the facilities and proposed mine plan area. Thank you, this is much easier to evaluate as a single report. However, there remain a few clean up items as follows: **Appendix B, "Table 1 Soils Map Legend,"** is referenced twice as (Table 2) in the text of the baseline report.

- Once on page 5 under Soil Mapping Unit Descriptions, Section 3.2, in the final paragraph,

- A second time on page 20 under Soil Suitability by Soil Series, Section 4.3, last sentence of the first paragraph.

According to Appendix B it is labeled Table 1. Please correct the reference.

Appendix B; Table 2, is titled "Soil Profiles - Field Data" and Table 3 is titled "Soil Profiles – Laboratory Data." In the text they are referenced on page 10, under Soil Physical and Chemical Properties section 3.3, as "Soil Profile Properties (Table 3)" and simply "Table 4" respectively.

In Appendix B the table number (i.e. Table 2 and Table 3) are footnotes with the titles ("Soil Profiles - Field Data" and "Soil Profiles – Laboratory Data) as labels. The table numbers and titles do not match up. In the text they are Table 3 and 4 and in the Appendix they are Tables 2 and 3, and their titles are not the same in each case.

Please make the references and titles consistent.

ARM 17.24.305(1): Map 10 should include all locations where baseline hydrologic data was collected including private wells and springs.

Map 16, Geologic Cross-Sections: Based on review of well and boring logs submitted with this application and logs contained in MBMG's GWIC and COAL databases, cross-section E miscorrelates the lower coal strata at the B10 battery. DEQ interprets the coal at an approximate elevation of 3,040ft as the middle Knobloch, the coal at approximately 2,960ft the lower Knobloch, and the coal at approximately 2,850ft as the Flowers-Goodale. Please revise this cross-section, accordingly. Additionally, the labels for prospecting boreholes used in construction of the cross-sections are barely legible at 100% zoom. Please increase the text size of these labels.

ARM 17.305(1)(d) and ARM 17.24.322(2)(b): (Section 315) The baseline drilling does not indicate a coal outcrop in the area of polygon #8. Please demonstrate how OCC defined the crop line in this area.

ARM 17.24.305(1)(d): Many maps included in the permit application contain "Tract" boundaries. These should not be included as they indicate potential future mining operations. This permit application is for the areas included as the "Permit area" as defined by ARM 17.24.301(87). Any activities outside of these areas are not part of this permit application review and impacts of this permit are only being evaluated on the Permit Area. Including the "Tract" boundaries adds confusion and is not necessary. Please remove these boundaries from all maps included in this permit application.

ARM 17.24.305(1)(u): Plate 1 – NRCS Farmland Soil Types from Report 306A- Prime Farmlands must contain a scale, contour interval, township, range, section numbers and the date the map was prepared.

ARM 17.24.305(2)(b): All maps pursuant to this rule were submitted in OCC's response. At some point in time maps specified by this rule must be certified by a qualified, registered engineer.

ARM 17.24.305(2)(c): Plate 2, Report 304C, contains features that are not legible. Photo locations are not legible in Plate 2. OCC must use a different color for photo locations then what is being used for the major contour, tract boundary, upland plateau boundary, and the foothills badlands boundary.

ARM 17.24.305(2)(c): Exhibit 313D, Plate 1, Post Mine Topography and Drainage Basins, contains features that are indistinguishable from each other. Please submit a separate map for the Pre-Mine Watershed and a separate map for the Post-Mine Watershed to be included in Exhibit 313D.

ARM 17.24.308:

Exhibit 308A Operations plan:

Section 7.5, Signs and Markers, Part (5), speaks of a blast warning sign that will clearly explain the blasting procedures. This sign will be located at all entrances to the permit from a public road. DEQ would like to suggest language that designates a smaller sign for access points at two track and public roads that are not main entrances; however, still penetrate the permit boundary. The following example is from a Western Energy permit.

"Additionally, durable orange signs with a minimum 50 square inches will be posted where the public can access active mine areas via two track ranch roads or public roads that penetrate the mine permit boundary. These requirements satisfy the State of Montana criminal trespass law MCA-45-6-201 and 45-6-203. The signs will also read: No Trespassing / Danger Blasting Area / Western Energy Co. The term active is used here to mean areas where mining is taking place or areas where mining has taken place.

The smaller sign would be more efficient for permit entrances that are not intended for access. If gated, these entrances should also be locked.

Please amend with similar language as described above or explain why the change is not necessary.

Appendix A, Exhibit 308A, designates initial road development for the facilities and a boxcut haul route to use soil storage 1 (SS1). This is acceptable; however, soil storage 2 (SS2) is in a more efficient location for the main access road portion of the soil salvage. Including SS2 in the language will allow for more stockpile availability.

Please evaluate and consider adding SS2 as an option.

Exhibit 308(D) Waste Handling and Management:

Under Section 3.2, Equipment and Supply Wastes, cables would possibly be buried in the backfill. This has been approved at other sites; however, the locations are marked on the field map and in the annual report when they occur.

Please add language to address this item.

ARM 17.24.308(1): In Exhibit 308C, Section 2.2,Page 3, the first paragraph addresses the source of water for mine use and states that the clinker aquifer is an alternate water source for use. However, use of the clinker aquifer for this purpose is not addressed in the PHC. Please reconcile the PHC as necessary or explain why it is not necessary.

ARM 17.24.308(1): Exhibit 308D proposes an on-site Class II solid waste disposal site. Any such site must conform to Class II waste management requirements, as described in ARM Title 17 Chapter 50, including a composite liner and leachate collection systems, daily and intermediate cover, a composite or water balance final cover, and groundwater monitoring. Please revise this section to include all designs and plans necessary for a Class II solid waste disposal site. Alternatively, this section could be revised to propose shipment of all Group II wastes off-site and only dispose of Group III and IV wastes on-site.

ARM 17.24.308(1): Exhibit 308D, Section 3.6: A landfarm on the mine site for the remediation of petroleum contaminated soils/overburden/spoils/road materials requires the development of an operation and maintenance plan as part of an approved mine permit. No license from the Solid Waste Section is needed if the landfarm is within the permit boundary of the mine and receives contaminated soils only from the mine. Please revise this section and submit an operation and maintenance plan for the proposed landfarm.

ARM 17.24.308(1)(b) and 313(1)(g): All facilities must demonstrate compliance with ARM 17.24.609 which includes "minimizing disturbance and adverse impacts". By what has been presented thus far in Appendix A, Exhibit 308A, it appears as though all out-of-pit box cut material could fit in just the south Temporary Storage Area (TOS) if the stockpile is

constructed tall. OCC must either eliminate the north TOS from the plan or add conditions to the permit that will limit disturbance. For example, a commitment could be added to page 1, bullet 6 of the above mentioned exhibit. The additional narrative would commit OCC to limiting soil stripping to that needed for ongoing operations and starting the south TOS area first and maximizing use of this area before starting the north area.

Two more adjustments must be made to the TOS polygons. OCC must reduce the size of the southerly polygon where it overlaps the incised portions of the larger side tributaries to drainage 1A and both TOS areas must be extended to the edge of the Main Haul Road (there is no apparent reason to leave a gap between the haul road and TOS).

ARM 14.24.308(1)(b): Exhibit 308C explains operation of the conveyors and commits the operator to "enclosing" the conveyor where it crosses the highway and railroad. The operator must also commit to enclosing the conveyor where it crosses over Otter Creek.

ARM 17.24.308(1)(d): The application states that a description of the contingency plans which have been developed to extinguish a fire or sustained combustion of materials constituting a fire hazard is included in Section 17.34.311 – Air Pollution Plan. Please include this discussion under this rule.

ARM 17.24.312: The Primary Study Area delineated on the Wildlife Study Area map, Appendix B, Exhibit 312A, Fish and Wildlife Plan, must be expanded to include the rail loop and an appropriate buffer.

ARM 17.24.312(1)(a), 314(1), 321(1): The explanation of the access road crossing of Otter Creek in Appendix A, Exhibit 315A, Page 7-3 is insufficient. Commitments are needed for placing one box culvert (culvert) at the grade of Otter Creek and the other two culverts at grade with the floodplain. Minimum and average flow data through the culvert in Otter Creek must be provided. At a minimum, the flow data must include depth and velocity. An explanation of the possible effects of flow rate on fish passage must be added.

As the bank full channel of Otter Creek is likely not 96" wide (width of a culvert), plans must be included for the channelization into and out of the culvert. If rip-rap is needed, an explanation of sizing must be included.

ARM 17.24.312(1)(b): Exhibit 312A, Section 2.3, explains that WHEF's will be integrated into reclaimed areas as described in Exhibit 313G, Appendix 313G. There is no Appendix 313G in this exhibit. The minimal discussions in Appendix 313G-1, Revegetation Specifications, do not adequately address this rule. Please include an explanation of how and where WHEF's will be integrated into the reclamation plan and properly reference this discussion in the permit material. Ensure that these commitments meet the requirements of ARM 17.24.312(1)(b).

ARM 17.24.313:

EXHIBIT 313D: The design does not address restoration of drainages outside of the mine disturbance area that will be affected by mine-related activities such as stockpile storage and road building. Please address the restoration of all disturbed drainages.

EXHIBIT 313D, Plate 2: Please provide 3D polylines for the drainage lines used to generate the profiles, so that DEQ is able to review this exhibit.

Postmine Drainage 15 is shown as beginning inside of the mine disturbance boundary. It actually begins outside (south of) the disturbance boundary. Please revise the profile to show how the drainage ties into native topography. Also, please revise this drainage as necessary on other applicable exhibits.

EXHIBIT 313D, Plate 3: Four premine drainages are reported as being used to determine meander belt width, but the graphs on Plate 3 show five drainages. The table on Plate 3 also shows Drainage Number 5 rather than drainage 4 as reported in EXHIBIT 313D, section 2.2. Please revise or explain.

EXHIBIT 313D, Plate 3: Drainage 15 uses two measurements near the bottom of the drainage (105 feet and 115 feet) to determine average belt width. These measurements are in, or affected by a dam and pond, so are not representative. Based on the belt width immediately upstream of the pond, it appears that 75 feet would be a better approximation of belt width in these areas. Please propose 75 feet as the width or explain any different belt width you may wish to propose.

EXHIBIT 313D: OCC does not include first-order drainages in reclamation and drainage density considerations. First-order drainages can comprise 50-60% of overall drainage density. Please explain how OCC will restore the drainage density, stability, and topographical diversity provided by the existing first-order drainage network.

EXHIBIT 313D, Plate 1: Premine Drainage Basin 5 is shown as two basins. Please revise this error on Plate 1 and any other applicable map.

EXHIBIT 313D, Plate 1: Significant premine drainages (typically 5 feet or greater depth) that provide important topographical diversity, assure adequate drainage, or connect to drainages flowing into the mine permit area from outside the disturbed area were omitted from Plate 1. DEQ has identified these drainages and can provide an illustrative drawing, or CAD document upon request. They were found using a combination of air photos, premine topography, and runoff modeling techniques. The new drainages amount to an additional 37,700 feet, or 32% increase in premine drainage length. Please incorporate the additional drainage length into drainage basin reclamation planning.

EXHIBIT 313D, Table 1: Some of the drainage areas in this table are derived from drainage basins that extend outside of the projected disturbance area. Since, premine and postmine drainage lengths in Table 1 do not extend outside of the disturbance boundary, exterior

drainage basin areas are not relevant to Table 1 calculations. Drainage density values based on these areas are incorrect. DEQ has recalculated drainage areas based on the proposed disturbance area and determined actual drainage area to be 73%, or 1,290 acres less than the values reported in Table 1. Please correct Table 1.

EXHIBIT 313D, Plate 1 and Table 1: Using the above lengthened drainages and reduced areas, total premine drainage density is increased from 2.97 miles/sq. mile to 5.39 miles/sq. mile. Since, the dendritic drainage pattern characteristic to unconsolidated reclamation material would tend to exhibit a greater drainage density than bedrock controlled premine drainage patterns, postmine drainage density should equal or, preferably, exceed premine density. Please adjust the postmine drainage design to reflect the revised premine drainage density.

EXHIBIT 313D, Plate 1 and Table 1: Several drainage basins in Table 1 do not match those shown in Plate 1 (e.g., 1, 2, 3, 4 should be 1A, 2A, etc.). Please revise any tables or maps as required for consistency.

ARM 17.24.313(1)(a): Exhibit 313G includes a discussion of Pre- and Postmining Land Uses (Section 2.0). Wildlife habitat is not discussed in this section. 82.4.203(30), MCA, states that "Land uses may be identified in combination when joint or seasonal uses occur…" According to Environmental Baseline Report 304K, Fish and Wildlife Habitat is a joint or seasonal use of the entire permit area. Please include a discussion of Fish and Wildlife Habitat as a joint use of the permit area. This will need to be included anywhere that pre- and postmine land uses are discussed.

Land uses are discussed in several sections of the permit yet the same land use types are not included in each portion. Some sections of Exhibit 313G and its appendices refer to two land uses while others have three. The Postmining Land Use map (Map 13) includes nine different "Map Units." The baseline reports discuss two. The permit needs to be consistent on the number and names of the land uses present and to be implemented postmining. The land use labels from Appendix 313G-3 seem to be the most accurate and could be used. Please update permit materials regarding land use to be consistent in both number and name. Additionally, please make sure the terminology used is consistent with ARM 17.24.301.

Map 13 (Post-Mining Land Use / Revegetation Plan Map) has no references to land uses outside of the label. The revegetation types listed can be categorized to denote land use. This will better explain which technical standards will be applied in each area.

Map 13 includes the label of Study Area. This should be changed to Permit Area for clarity. There is no explanation of which set of topo lines are present on this map. This needs to be defined. Please make the above corrections to Map 13.

ARM 17.24.313(1)(a) and ARM 17.24.762: "Fish and wildlife habitat" and "developed water resources" must be included as both premine and postmine land uses. The premine

land use (see Baseline report 304M) and the proposed postmine land uses (see Exhibit 313A) do not include these as a land use.

ARM 17.24.313(1)(d): In Exhibit 313C, Section 2.0 on page 1, the third bullet states spoil will be placed against the low-wall for "sealing of the low-wall to minimize inflow from the Otter Creek alluvium." Please provide additional details on how spoils will be selectively handled and placed to achieve this purpose. Will lower permeability spoil material (silts and clays) be segregated from higher permeability spoils (sands)? How will spoil materials be placed and compacted to achieve optimum compaction? What will be the dimensions (in particular, width) of the low-wall seal and what are its expected hydraulic properties? Additionally, Exhibit 314C should be updated to include details on the effects of this seal on the hydrologic balance both during and after mining.

ARM 17.24.313(1)(d)(iv), 501(4), and 634(1): The revised postmine topography is a great improvement over the first submittal. The following changes must be made before the proposed postmine topography can be found acceptable.

[1] Numerous native drainages in Sections 23, 24, 25, and 26 do not blend with down gradient reclaimed drainages. Convexities were found where the native drainages transitioned into the final pit. Most changes will be easy to make, but some drainages, like the main stem of Drainage 7 and those in Section 24, will require more consideration. For example, Drainage 7 should traverse further north in the final pit: this would not only reduce the convexity but the channel path would be more like premine.

[2] In the interest of creating more east/west slopes (see pre- and postmine aspect table on Map 12) consider more extensive use of the following: incised drainages, improved blending of drainages with native and less final pit backfill.

[3] The profile of Drainage 15 needs to be adjusted. The up gradient tie into native must be steeper from approximately 3,300 feet in elevation to around 3,260 feet in elevation thereby incising most of the drainage by about 30 feet. This would make Drainages 15 look more like premine or even postmine Drainages 1 and 2. The revised profile must also remove the convexity depicted on the PMT at the confluence of Drainage 15 and Threemile Creek: the current PMT depicts an overall convexity in the last 1,000 feet of drainage with a 10-foot vertical drop in the last 100 horizontal feet of drainage.

[4] All side tributaries to Drainage 15, noted on the proposed PMT map (including the side tributary depicted within the final pit in Section 12) will need to be more incised to match the adjustments made with comment 3. Additional side tributaries, like those depicted into the main stem Drainages 1 and 2, would also need to be added. These would be shorter than the side tributaries in 1 and 2 if the main stem of Drainage 15 is shallower.

[5] The linear postmine topography along the Section 12 and 13 final pit highwall and the endwall in Section 26 must include more diversity. The highwall in Section 12 and 13 can be diversified through the use of bluffs along the top bench with offsetting areas of

ARM 17.24.313(1)(d)(iv), 501(4), and 634(1): Continued

additional backfill. Incised second order drainages could be used to diversify the endwall in Section 26.

[6] The premine landscape contained numerous knob or hill features out in the flats in Sections 23, 25, and 26. At least three knobs should be depicted on the PMT. The amount of east-facing slopes could be increased if these knobs were created longer in a north/south direction than an east/west direction.

[7] Drainage 3, west of the haul road, is currently not part of the mine plan, but will be disturbed and therefore will need to be reclaimed. The undisturbed ground surface near Otter Creek and immediately adjacent to the proposed ancillary mining disturbance is not stable and is eroding. Finally, the PMT map depicts a significant convexity in Drainage 3 where the disturbed surface area blends into the unstable undisturbed surface (3,090 feet in elevation to native 3,070 feet in elevation). Erosional stability in this area may be further compromised because the application proposes enlarging Drainage 3 by approximately 40%. The topography must depict a more stable profile or changes must be made to the disturbance boundary, Drainage Control Service Road, or the foot print of the soil stockpiles in this area. *The Drainage Control Service Road could follow the north side of Drainage 3 at Station 95 up to the haul road. Runoff could be controlled around SS1 with a ring ditch and trap if needed.* Please execute these changes or explain why they are not appropriate.

ARM 17.24.313(1)(d)(iv): The premine and postmine slope and aspect analysis is difficult to interpret from just the graph. Please include the results in a table.

ARM 17.24.313(1)(d)(iv): From an analysis of premine and postmine slopes in the reclaimed drainage basins, there are insufficient moderate slopes (> 10%) and too many shallow slopes (< 5%). As drawn, the PMT does not approximate premine topography or features. There is also a loss of north-facing slopes in favor of east-facing slopes. This change may result in a reduction of snow retention and faster melting of snow leading to a change in the hydrologic balance and less diversity in postmine vegetative communities. This could be mitigated by increasing drainage density.

ARM 17.24.313(1)(d)(iv): A small, north-south, drainage in the undisturbed area of Section 24 ~770 feet east of the section boundary needs to be tied into the postmine topography.

ARM 17.24.313(1)(e):
[1] Exhibit 313D, Plate 2: The drainage profiles should include a sufficient portion of the drainage above and below the mine area to evaluate the transitions between the native and reclaimed drainage profiles.

[2] There is no reclamation plan presented that details how drainages will be reclaimed. There is no indication how drainage bottom widths and entrenchment beyond the scale of

ARM 17.24.313(1)(e): Continued

the PMT were calculated and how they will be constructed. How will natural riparian vegetation be restored, enhanced, or maintained? Please create a detailed reclamation plan that addresses all aspects of ARM 17.24.313 and 17.24.634.

[3] Plates 3 and 4 show graphs with relationships between belt width, slope, and basin area. However, the explanation in Exhibit 313D as to how the graphs were constructed is unclear. Please elaborate on the method used to create the graphs.

[4] Plate 1. The basins drawn on this map do not agree with the basins drawn on Plate 4 or modeled in 314/315. Please ensure all plates either show the same basins or that the differences are explained when referencing the plates.

ARM 17.24.313(1)(f): Exhibit 315A, Figure 1-1, shows two small unnamed premine basins – one to the immediate south of Drainage 5, and another to the south of Drainage 2A. It is unclear how these drainages are incorporated into drainage plans and/or premine modeling scenarios. Please clarify.

ARM 17.24.313(1)(f) and ARM 17.24.634: Exhibit 313D presents an approach to establishing geomorphic design parameters (see Section 2.2 Drainage Basin Design Factors) for drainage basins. In order for DEQ to verify assumptions and results, OCC must provide all raw data used in establishing relationships of slope and watershed size to meander belt width. Include a table with stations, station basin (meander belt) width, slope, and watershed area above each station. Where appropriate, include baseline data and/or field measurements included in Baseline Report 304E, Appendix F.

ARM 17.24.313(1)(f) and ARM 17.24.634: Exhibit 313D does not provide an explanation of how the results of the geomorphic analysis will be used to direct reclamation of drainages with respect to geomorphic habit, pattern, or other functional characteristics. Please provide a description of how the results of the analysis of slope and drainage area to meander belt width will be used in drainage basin design and reclamation.

ARM 17.24.313(1)(g):
[1] Exhibit 313E,Section 1.0 Introduction, third paragraph, the language states that agricultural soils salvaged from corridors crossing the Otter Creek Floodplain will be segregated from general soils. This is a specific soil type which will have its own soil storage stockpile and sign. The stockpile site may be within one of the already designated storage footprints; however, the soil needs special designation, separate stockpiling, and commitment to do so.

Please add language for a specific soil stockpile and sign designating this as agricultural soil for replacement in the Otter Creek floodplain disturbance.

[2] Exhibit 313E,Section 1.0 Introduction, the last paragraph uses seven spoil sample boreholes for justification of suitable spoil in the boxcut. According to 304H Overburden

Analysis Near Surface Soil Quality-Plate 1, "borehole location," boreholes numbered 1101, 1102, 1118, and 1119 do not fall within the new "mining area" boundary, and borehole 1120 is missing its data set on the map. This is a majority of the boreholes used to justify suitable boxcut spoils. Justification for suitable spoil will not have a majority of the boreholes outside of the planned mine cut disturbance. This is not material that will be mined or be available in the boxcut spoil stockpile.

Please evaluate the borehole locations and spoil suitability and adjust the spoil suitability description appropriately.

[3] Section 2.0 states that spoil sampling results will be reported annually. Current processes used by DEQ are in the form of a soil laydown request. The operator submits a report with spoil sample results along with comparison of premine, as-built, and postmine topography. This creates a preliminary review and sign off of spoils and topography prior to soil laydown. The process has practically eliminated surface re-manipulation due to unsuitable spoil or topography inconsistent with postmine goals. This process also improves Phase I bond release review time frames.

Please consider revising the language to implement the practice of soil laydown approval.

[4] Section 3.0 Pre-Salvage Monitoring was amended to propose conducting pre-salvage soils monitoring as requested. DEQ appreciates implementation of pre-mine soil sampling. This process states that the results will be reported annually. In practice, sample results are submitted with a plan of salvage containing any proposed depth adjustments due to suitability exceedances. The report is reviewed by the state soil scientist for concurrence and approval. Using this sampling process, soil salvage is improved and a better understanding of soil balance is achieved. The sampling and submittal may be completed on large blocks, well in advance of mining. Consider adding the language to have the sampling results go through this review process.

Section 4.0 Monitoring of Replaced Soil has been amended to include a soil depth target range of 20-40 inches covering all the prescribed treatments in the revegetation plan. This depth range does allow for soil depth variability; however, it is too uncertain to allow soil balance accounting. The target depths should be referenced to the Revegetation Specifications, Appendix 313G-1.

Alternatively, if your goal is to use different target depths than indicated in Appendix 313G-1, more specific target depths will need to be set in the soil handling plan. The main purpose is to have a target depth or depths both OCC and DEQ can measure to verify compliance with Phase II bond release requirements. Please consider soil laydown depth in relation to vegetative goals and bond release tracking.

ARM 17.24.313(1)(h)(i): Exhibit 313G includes two tables. Table 2 correlates Premining Community Types with Revegetation Mixtures and Post-Construction Acreage. This table should also include Premining Acreage at least down to physiognomic type. This would allow a comparison of pre- and postmining community distributions. These numbers are

provided in the baseline, but should also be included here. Please add Premine Acreage for comparison to the Post-Construction Acreage in Table 2.

ARM 17.24.313(1)(h)(ii): Requires a schedule of revegetation. Exhibit 313G includes both Seeding and Planting Periods (Section 3.5) as well as a Schedule (Section 6.0). These sections both cover the same topic and should thus be reduced into one so no conflicting statements arise and also to make future permit revisions easier to track. The rules referred to in the heading on Section 6.0 should include ARM 17.24.713. Please combine these sections.

ARM 17.24.313(1)(h)(iv): Exhibit 313G requires a discussion of introduced species to be used and a discussion of the desirability and necessity of using the introduced species to achieve the approved postmining land use(s). Introduced species have been included in the Pastureland/Cropland (Hay) seed mix but there is no discussion related to their use in the permit materials. Please include a discussion and explanation for the need and desire to use introduced species to meet postmining land uses.

ARM 17.24.313(1)(h)(x): ARM 17.24.313_R1 does not appear to correspond to the rule it is citing. This submittal should correspond to ARM 17.24.724 and 17.24.726. Please correct or explain this permit material.

ARM 17.24.313(1)(i):
[1] ARM 17.24.313_R1 does not appear to correspond to the rule it is citing. Please correct or explain this permit material.

[2] ARM 17.24.313_R1 does not appear correspond to the rule it is citing. Please correct this permit material to appropriately reference ARM 17.24.308(1)(b) or explain why the reference is correct.

ARM 17.24.313(1)(j):
Exhibit 308C, Section 2.2, final paragraph, describes a facility designed to use electricity, natural gas or propane to create cooling and heating. The final style of energy generation will be determined through an engineering study.

Exhibit 308D Waste Handling and Management plan section 3.3, paragraph 2 states "Whenever possible, used oils will be burned on-site for energy recovery in space heaters in the maintenance shop…"

The production of cooling and heating in 308C is on a much larger scale than the use of spent oils in space heaters 308D. However, the topic is similar for both 308C and D; therefore, they should reference each other somehow.

Please reference these sections together. Possibly reference 308D in 308C as an alternate heat sources, state it will be included in the engineering study, or something along those lines.

ARM 17.24.314 (PHC):
In section 5.2.1 of the PHC, it is stated, "*Water discharged as a result of high snow melt and/or rainfall runoff will be of short duration and consist of melt or rain water, and will be low in dissolved solids…".* While runoff from smaller watersheds (SW-4, SW-6, SW-7) and from Fortune Coulee contains low dissolved solids values, runoff from several other watersheds (SW-9, SW-13, SW-14, SW-17) contained higher dissolved solids values during runoff conditions. Baseline runoff data from monitoring stations established on ephemeral tributaries do not support the statements made in this section. Please revise this discussion to correct or explain the apparent inconsistencies.

ARM 17.24.314(1): In Exhibit 314A, Section 3.2, Page 3, the second and third bullets state a barrier of unmined coal will be left between alluvium/burn and the mined area. Based on Map 8 it appears that there will be no buffer left in place in the south half of section 10, and the pit will contact clinker. Additionally, clinker is indicated very close to the pit in section 15. Third, the pit may come into contact with alluvial deposits in the southeast quarter of section 23 (alluvium was encountered in drill hole OCC1118 and OCC1138). Please revise this section to accurately account for the presence or absence of the coal buffer in all locations.

ARM 17.24.314(1)(c): Exhibit 322A, Plate 3, depicts polygon #8 as not being mined. According to commitments on Map 1, Mine Sequence Map and Map 8, Mine Plan polygon #8 will be mined. If polygon #8 is proposed to be mined, please add a statement to Exhibit 314A: Protection of the Hydrologic Balance; 3.2 Operational Ground Water Management. Please determine if there is clinker in this area. If there is clinker, then the interaction between the clinker and the mine cuts should be explained. Please explain all measures that may be necessary to protect groundwater quality and quantity if this area is to be mined.

ARM 17.24.314(2)(d):
[1] Exhibit 314B does not conform to DEQ MQAP guidelines. As stated on page 4 of the DEQ MQAP guidelines, the table of contents and all numeric heading and section headings must be maintained. The MQAP submitted with this application has modified the table of contents significantly by eliminating many required sections of the document. To be considered for approval, the MQAP must be submitted in the format required by DEQ and include all sections included in the DEQ MQAP guidelines.

[2] Using SOPs to describe standard monitoring methods in Exhibit 314B is acceptable, however a single general reference to all SOPs is not adequate because you can't tell which SOP applies where. Sections describing methods should contain a summary description of the method with a reference to each of the relevant SOPs for specific details. Sampling methods that do not follow an SOP must be described in detail in the text.

[3] Both the spatial distribution and schedule of the proposed monitoring for both groundwater and surface water sites in Exhibit 314B are inadequate. The monitoring plans must be designed to provide early detection of any potential impacts to the hydrologic balance. Monitoring sites should be located in key locations, particularly between the mine

ARM 17.24.314(2)(d): Continued

disturbance and potentially impacted resources including but not limited to alluvial aquifers, perennial and intermittent streams, and private groundwater wells. It does not appear that the monitoring plan as proposed meets the above objectives. Please consult with DEQ hydrologists, regarding monitoring plan requirements, before submitting an updated monitoring plan.

[4] Monitoring and assessment of inventoried springs and seeps should be included as part of the hydrologic monitoring plan in Exhibit 314B. Please provide a plan to ensure that there are no mine-related impacts to springs outside of the disturbance area.

[5] Exhibit 314B Plate 1 is a map composite of USGS 1:24000 topographic map overlain by current topography within the proposed mine area. Please label the streams and creeks on the map represented by the current topography. The dark contours of the current topography also make it difficult to locate monitoring sites and read labels.

ARM 17.24.314(3):

[1] Exhibit 314C Section 4 discussions are summaries of Exhibit 304E, and as such the same DEQ comments as listed above for that exhibit apply, here. Please ensure all revisions requested in Exhibit 304E are also reflected in Exhibit 314C.

[2] Exhibit 314C describes in several locations how hydrologic consequences are affected by the barrier or buffer of unmined coal between the pits and alluvium/clinker. As discussed in our concerns for Exhibit 314A, above, this buffer appears not exist in some locations. The PHC should include analysis of the potential effects of variable buffer width or the lack of a buffer.

[3] Exhibit 314C, Section 4.3, states that wetland areas were mapped as part of the baseline vegetation study in 304J. Specifically, wetlands are discussed in general in 304J, Section 2.3.8, Delineation of Hydrophytic Vegetation. Locations with hydrophytic vegetation can be found on 304J, Plate 1. However, there is no clear and concise discussion in 304J or Section 4.3 of the locations and nature of wetlands found in the study area or how they function as part of the hydrologic balance. Please include an appropriate discussion in Exhibit 314C.

[4] Exhibit 314C, Section 4.4, should provide a figure showing the locations of the drainage basins numbered in Table 4-1.

[5] Exhibit 314C, Section 4.5, describes the alluvial groundwater in Otter Creek as under confined/semi-confined conditions. However this statement cannot be reconciled with Exhibit 325A, Section 5.1.4, which states that water levels measured in the finer grained upper alluvium were approximately the same as those measured in the deeper coarser grained alluvium. This water level evidence indicates that there is no pressure head on the deeper alluvium and confined conditions do not exist. The finer grained upper alluvium is described in well and piezometer logs typically as a poorly sorted mixture of sand, silt, and clay. Even where there are units dominated by clay, these beds are typically thin,

ARM 17.24.314(3): Continued

heterogeneous, and not laterally extensive. Clay, silty clay, and sandy clay are typically described as loose and non-plastic to moderately plastic. These clay dominated units are rarely described as hard, stiff, or highly plastic. Section 4.5 cites the response of alluvial groundwater levels as further evidence of separation between Otter Creek and the alluvial aquifer; however, review of the alluvial hydrographs provided does not support this conclusion. Water level responses in the alluvium appear to respond rapidly and synchronously with stream flow at A3/SW-22, and also respond moderately well at A6/SW-16. A1 shows almost no response to streamflow changes at SW-2, however, at this location the alluvial aquifer is in direct contact with the adjacent clinker aquifer. The clinker aquifer would be expected to buffer any water level variations from the stream. The buffering effect of the clinker aquifer could also explain the reduced response at A6/SW-16 as this pair lies just upstream from where clinker contacts alluvium. Additionally, based on logs from alluvial wells and piezometers and the depth of the incised channel of Otter Creek it appears that in many locations the base of the Otter Creek channel is likely below the depth of the finer grained alluvial deposits. This relationship is also shown on some of the AVF piezometer cross-sections in Exhibit 325A Plate 15. Please revise the discussions of Otter Creek alluvium to remove references to confined conditions or explain how the information cited in this paragraph supports your conclusion.

[6] The last paragraph of Exhibit 314C, Section 4.5, on page 4-8 states groundwater is found in "porous grained" rocks. Since pores are the spaces between grains, grains cannot be porous. This paragraph also refers to the "Tullock Creek Member" which does not exist in the permit application area. The basal member of the Fort Union Formation is the Tullock Member and the Hell Creek Formation underlies the Fort Union. The Tullock Creek Member is also mentioned in the paragraph describing underburden on page 4-9. Please correct or explain these discrepancies.

[7] In Exhibit 314C, Section 4.5.1, on page 4-9 the final sentence in the paragraph on clinker is confusing. The clinker does not pinch out in the lower portion of the drainage, but rather is located stratigraphically higher than the alluvium (which rests on underburden). Please revise this statement or explain why it is correct.

[8] The paragraph describing overburden in Exhibit 314C, Section 4.5.1, on page 4-9 discusses well B4-O and the B3 battery in conjunction with Tract 2. B4-O and the B3 battery are located in Tract 1. It appears this sentence should refer to Tract 1 instead of Tract 2.

[9] The final sentence of the Exhibit 314C, Section 4.5.1, paragraph on the Knobloch coal on page 4-9 mentions "artesian head" in the Knobloch coal aquifer. While the term artesian head can be used to describe pressure head above the top of an aquifer, it is typically used to describe pressure head above the ground surface. Please refrain from using "artesian" except in the context of flowing wells to avoid confusion by the public.

ARM 17.24.314(3): Continued

[10] Similar to Exhibit 304E the discussion on underburden groundwater flow in Exhibit 314C, Section 4.5.1, page 4-9, which concludes that underburden discharge to the valley bottom, appears to oversimplify a highly complex system. While the conclusion may be true for shallower underburden sands which subcrop in contact with Otter Creek alluvium downstream of the mine area, deeper underburden aquifers likely discharge at the Tongue River. Please revise this section.

[11] Exhibit 314C, Table 5-1, indicates some springs are not being impacted due to their source coming from an unaffected aquifer. However, no list of source aquifers is provided; therefore, the claims cannot be verified. Please provide the spring's source aquifer, if known, in the table or add an explanation of your conclusion.

[12] Exhibit 314C, Section 5. Overall, more elaboration is needed on surface water impacts. Only a few ponds and springs are addressed, while there were more resources accounted for within the permit area during baseline reconnaissance. The PHC should address current overall surface water resources and how the mine will ensure that a similar quality and quantity will be available postmine.

[13] Exhibit 314C, Section 5.1.1, states "Water from designed containment structures will be managed to optimize benefits to the hydrologic system." Please add discussion clarifying what you mean.

[14] Exhibit 314C, Appendix A, shows the results of SEDCAD modeling done for ARM 17.24.315. In the narrative and tables it is stated that the 100-yr, 6-hr storm is modeled. In 17.24.315, the storm is listed as the 100-yr, 24-hr storm. Please revise the text so that the two sections agree and report the correct parameter.

[15] Exhibit 314C, Appendix A. Please state how the stream velocities are calculated from the SEDCAD model. Are these velocities for the outlet of the stream? The velocities in this table indicate that most watersheds will experience an increase in stream velocity for all of the modeled storms. These results are a concern for restoration of the surface water hydrologic balance because an increased stream velocity and decreased sediment load in the postmine landscape may increase scour and erosion outside of the permit. The PHC must address these implications of Table 1 on drainage reclamation, include discussion of all the assumptions, and include a comparison of premine to postmine drainage conditions.

[16] Exhibit 314C, Section 5.2.1. There is a statement that stream velocity in the postmine drainage channels will be similar or slightly less than they were prior to mining. However, Appendix A, Table 1, does not show this statement to be true as the modeled postmine velocity is mostly greater than in the premine condition. Please revise this section.

[17] Exhibit 314C, Appendix A. There is no mention of the watersheds where the rail loop and soil stockpiles are proposed outside of the main mine pit disturbance area.

ARM 17.24.314(3): Continued

Furthermore, these areas are shown on the PMT as essentially unchanged in topography. A realistic change to the PMT and corresponding model output is needed.

[18] Exhibit 314C, Section 5.1.1, only discusses probable hydrologic consequences to runoff from precipitation during mining. Please include an evaluation of postmining probable hydrologic consequences to runoff from precipitation.

[19] Exhibit 314, C Section 5.1, does not discuss potential reductions in surface water quantity due to mine dewatering lowering alluvial groundwater levels. Predictions from the groundwater model in 314C, Appendix B, Figure 5-10, showed potential impacts to water quantity in Otter Creek. While revisions to the groundwater model will likely change the impacts predicted to streamflow, any potential streamflow reduction is worthy of an in depth analysis and discussion. A brief discussion of the water quantity consequences of mine dewatering is included in Section 5.2.2, but because Section 5.2 discusses surface water quality impacts this discussion would be better suited to Section 5.1. The discussion in Section 5.2.2 also lacks detail and supporting evidence to justify the stated potential impact. Please include a detailed discussion of the potential impacts of streamflow reduction in Otter Creek from mine dewatering both short and long term, including how those impacts will affect beneficial uses.

[20] Exhibit 314C, Section 5.2.1. Water quality samples from Fortune Coulee are used to show that there will be an overall improvement in water quality from mine operations. The use of premine Fortune Coulee water quality data for this purpose is unjustified. The values for water quality from this one drainage are not representative of baseline runoff conditions for other drainages, or runoff from disturbed areas. This analysis also does not consider the effects of a discharge from a pond containing a mixture of pit dewatering water and stormwater, even though it is stated in other permit sections that sediment control ponds may be used to store pit water. Please revise this section to include a more detailed discussion.

[21] Exhibit 314C, Section 5.2.1, refers to reductions in sediment load, SC, and SAR values to Otter Creek during mining operations as an improvement in water quality. While a reduction in a parameter may generally be referred to as "improving" water quality a reduction of that sediment load or the reduction of the concentration of dissolved constituents in runoff water will alter the premine geochemical balance. Please remove the term improvement from this discussion.

[22] Exhibit 314C, Section 5.2.1. There is a statement that changes in water quality and quantity in Otter Creek due to mining will be imperceptible. Many subsequent statements about mining impacts rely on this assumption. Please justify this statement.

[23] The paragraph on Pond 5 in Exhibit 314C, Section 5.3, page 5-5, states mining will not enter the Shorty Creek drainage, but the mine plan (Map 8) shows mine cuts in the Shorty Creek drainage in the NE corner of Section 13 and disturbance nearly to the channel of the

ARM 17.24.314(3): Continued

west tributary of Shorty Creek. While this tributary enters Shorty Creek below the reservoir and thus Pond 5 would not be impacted by runoff from this area, the statement that there will be no mining disturbance in the Shorty Creek drainage appears to be an error. Please correct or explain.

[24] Exhibit 314C, Section 5.3. It is stated that the replacement ponds are designed to fill with runoff from the 2-yr, 24-hr storm. Premine ponds P1, P3, and P4 appear to be fed by springs. Please address how ephemeral runoff-filled ponds will be an adequate replacement for spring-fed ponds in terms of quantity and quality.

[25] Exhibit 314C, Section 5.4. More information about wetland reclamation is needed. Please address how many acres of wetlands will be affected, if there will be any pre-disturbance mitigation, how many acres of jurisdictional wetlands will be affected, and how functionality will be replaced and assessed after reclamation.

[26] Exhibit 314C, Section 5.5. Please clarify how drainage lengths were chosen from the premine and postmine topography.

[27] The first paragraph of Exhibit 314C, Section 6.1, describes hydrostratigraphic units including "ephemeral tributaries." Please explain how an ephemeral tributary is a hydrostratigraphic unit.

[28] In Exhibit 314C, Section 6.1, page 6-1, the paragraph on clinker water levels states that the water level decline estimate is conservative. Because the term "conservative" typically means a low estimate in general usage, the average reader will likely interpret this statement to mean drawdown will likely be higher than 2.2 feet, which is the opposite of the true meaning of this statement when considered from a scientific perspective. Please clarify this statement.

[29] In Exhibit 314C, Section 6.1, references to Figure 5-6 of Appendix B are highlighted in yellow on pages 6-2 and 6-3. Please remove these highlights.

[30] The last paragraph in Exhibit 314C, Section 6.1, page 6-2, states that heterogeneities and anisotropic conditions are likely to reduce actual drawdown from model predictions. Please explain why the opposite response (an increase in drawdown from the modeled condition) is not equally likely under these conditions.

[31] The last paragraph of Exhibit 314C, Section 6.1,pages 6-3 and 6-4, describes an analytical estimate of drawdown from the mine water supply well into the underburden, that does not appear to be based on the groundwater model. Please explain why was this analytical solution chosen rather than simulating the effects of the supply well using the groundwater model?

ARM 17.24.314(3): Continued

[32] Exhibit 314C, Section 6.1, Page 6-3 & 6-4. The impact of using the deeper underburden for domestic supply at the mine is estimated in the analytical drawdown shown in Figure 6-1, using underburden wells B5-U and B10-U. The drawdown from the domestic supply well associated with the mine facilities is discussed in this section, but in order to better understand the potential impact to current users please state the saturated heads or pressure heads at these two wells and at other locations where there is hydrologic information about the aquifer. Please indicate how much confining pressure there is in the two wells and how much drawdown is anticipated before they become unconfined. This information will give a more complete understanding of potential impacts to users.

[33] In Exhibit 314C, Section 6.2, the lower end of the range of potential spoil water quality calculated from Van Voast's empirical estimates appears to be incorrect; 1,750 mg/l plus 50% is 2,625 mg/l not 2,650 mg/l. Additionally, Van Voast's 1988 estimates were derived from only approximately 10 years of spoil monitoring data at a limited number of wells. Over the 25 years since that time numerous additional spoil wells have been completed and regularly sampled at Montana coal mines providing additional data which could be used to form a better estimate. Please revise to explain your exclusive reliance on Van Voast's estimates or include additional data.

[34] Exhibit 314C, Section 6.2, lists the range of overburden monitoring well TDS values as 1,030 mg/l to 7,020 mg/l, however Exhibit 304E, Table 2-9, lists the range as 1,310 mg/l to 7,020 mg/l. Fortuitously, the minimum and maximum overburden TDS values both occur in Tract 2 wells thus the range is not impacted by this distinction. Please correct or explain this inconsistency. Additionally, only groundwater from overburden wells in Tract 2 should be considered, not the entire study area.

[35] Exhibit 314C, Section 6.2, compares average pH, SC, and SAR values for overburden paste extracts to average values for Knobloch coal water, but the values presented for the Knobloch coal water quality do not match those presented in 304E, Table 2-10. Please correct or explain this inconsistency. Additionally, the use of an average value for all baseline Knobloch coal water quality is not appropriate for comparison to overburden samples which were collected only in Tract 2. Only Tract 2 Knobloch coal water quality should be used in this comparison.

[36] Exhibit 314C, Appendix C, Table 1, does not show premining ambient Knobloch values for all parameters listed. Please include these values for comparison to the leach tests. Additionally, for this purpose, only the ambient premining water quality in Tract 2 is relevant. Water quality results from outside Tract 2 should not be included.

[37] In Exhibit 314C, Appendix C, Notes 1 and 2, Table 1, and the first paragraph on page 6 state that column tests contained pre-strip material which will not be placed in mine pits. If pre-strip material will not be placed in the mine pits, what is the proposed final disposition of this material? No out of pit spoil disposal areas were proposed in the application.

ARM 17.24.314(3): Continued

Would it be more correct to say that pre-strip material will not be placed in the part of the pit expected to saturate postmine? Or refer the reader to Exhibit 313C where backfilling and grading plans are presented. Please revise this section to clarify where pre-strip material will be placed.

[38] It is unclear from Exhibit 314C, Appendix C, how the values presented in Table 1 were derived. In order to better understand and evaluate the column leach and paste extract results and interpretations, DEQ needs all raw data, including lab sheets, and calculations used in the analyses.

[39] Exhibit 314C, Appendix C Table 1. Water quality information (TDS concentration and SC, at a minimum) for the composite well water used in the column and sequential leach tests was not given, although a concentration for the water is shown on figures in the report and appears to be less than 1,000 mg/L. Please indicate the actual concentration of the water used.

[40] The Exhibit 314C, Appendix C, section on saturated paste leach testing does not discuss the limitations discussed in Van Voast et al., 1978. Of particular relevance is that saturated paste extracts were found to underestimate spoil well cation concentrations, generally by a factor of greater than 2. Table 1 states the estimates based on saturated paste leach tests are the range between the median and weighted average. Please explain why the estimates of spoil water quality based on the saturated paste leach tests do not greatly underestimate the anticipated cation concentrations in spoil wells.

[41] Exhibit 314C, Appendix C, states that "the appropriateness of these techniques…is evaluated and confirmed by comparison with field and laboratory results of Van Voast." The Van Voast (1978 and 1988) papers cited as references in Appendix C do not provide any data to support the assertion that column leach tests of overburden material approximate spoil water quality. Column leach test results are only compared favorably to the paste extract tests, which are themselves noted to underestimate spoil water quality. Rather, the 1978 paper concludes with the statement additional data is needed to refine the methods of spoil water quality estimation proposed in the paper. Please explain why the estimates of spoil water quality based on the saturated paste leach tests do not greatly underestimate the anticipated cation concentrations in spoil wells.

[42] Appendix C, Spoils Water Quality – Metal Parameters, page 14. The MDEQ7 HHS standard for Barium in both groundwater and surface water is 1.0 mg/L, not 0.004 mg/L. Please revise accordingly.

[43] Appendix C, Spoils Water Quality – Metal Parameters, page 14. Please check the statement for lead concentration, as 0.04mg/L is larger than the HHS of 0.015 mg/L, and revise or explain.

ARM 17.24.314(3): Continued

[44] Appendix C, Spoil Water Quality. Spoil composition from West Virginia is not comparable to spoil composition from Montana. The overburden in West Virginia of a different composition and mining techniques, which influence spoil texture, are different. Please remove references to West Virginia spoil or explain how the West Virginia information is probative to this application.

[45] Unlike Van Voast's experiments, the values presented in Exhibit 314C, Appendix C, from column leach tests (at one pore volume) and saturated paste tests from Otter Creek overburden do not correlate well. Appendix C attributes this difference to the different liquid/solid ratios. Please explain in more detail how this discrepancy affects the relevance of the data and analysis.

[46] The mixing calculation in Exhibit 314C, Section 6.2, page 6-7, and illustrated on Figure 6-2 is not explained in sufficient detail to allowreview. Additionally, the input SC values used in the mixing calculation are not credible. For the premine steady state conditions a coal conductivity of 3,265 umhos/cm is shown on Figure 6-2, whereas SC in the Knobloch coal generally falls in the 1,200-1,600 umhos/cm range in Tract 2. It is also unclear as to how the SC values used in the mixing calculation were derived, as they do not match values presented in baseline data. Water quality values for specific locations should be used where available for the mixing calculations; for example C-3 for the first clinker zone, AVF6-3 for Threemile Creek alluvium, etc. Additionally, this evaluation does not consider that the clinker water quality downgradient from the mine is already a result of mixing of Otter Creek alluvial water, overburden water, Knobloch coal water, and precipitation recharge. Please revise the discussion to address these considerations.

[47] The spoil water quality shown in Exhibit 314C, Figure 6-2, (7,500 umhos/cm) is inconsistent with the value listed in Appendix C and in Section 6.2 (7,000 umhos/cm). Please revise or explain.

[48] The table on page 6-7 of Exhibit 314C does not list predicted post mine SC values for Otter Creek alluvium or Otter Creek surface water. Please include this information or explain why it is excluded.

[49] Exhibit 314C, Section 6.2, page 6-8, discusses Clark's 1995 paper on geochemical changes in spoil water as it flows through coal. While Clark's theoretical premise regarding geochemical processes which could occur in the coal aquifer is persuasive, his analysis assumed a steady state plume and did not consider transient effects which could explain some or all of the parameter concentration reductions downgradient from the mine. The results from Big Sky, where groundwater flow directions are relatively constant, showed no measureable effects on spoil water quality as it moved through the undisturbed coal aquifer. The results from Decker are not representative because the groundwater flow directions in the undisturbed coal aquifer between the spoils and the Tongue River Reservoir changes as the water level in the reservoir changes. The groundwater chemistry changes observed at Decker are likely more influenced by mixing of spoil impacted

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groundwater with relatively clean water from the reservoir than by geochemical reactions. Please revise the submittal to address these considerations.

[50] In Exhibit 314C, Section 6.2, the discussion of spoil water quality from Wyoming on pages 6-8 and 6-9 is not necessarily relevant to the Otter Creek mine. The overburden in the southeastern PRB is the Eocene Wasatch Formation, which is millions of years younger than the Paleocene Fort Union Formation and likely geochemically distinct (for example, Ca-SO4 vs. Na-SO4). Please revise the submittal to address this consideration.

[51] Exhibit 314C, Section 6.3, probably hydrological consequences to AVFs cannot be evaluated until an AVF determination is made by DEQ.

[52] Exhibit 314C, Section 6.4.1. There is a statement that seeps visited in 2012 that were dry which indicates that the seeps were sourced by water held in local storage from heavy precipitation in 2011. This conclusion cannot be supported by looking at 2012 and 2011 data alone because 2012 was an extremely dry year. The spring and seep sources may have dried up in 2012, but that does not necessarily mean that the seeps were only present due to unusually high precipitation in 2011. Please revise this statement.

[53] Exhibit 314C, Section 6.4.1. Impacts are projected to occur to springs SSI-11-14 and SSI-11-19 due to mining activities affecting the recharge areas. Please justify this statement by listing the source aquifer for these springs and the evidence used to determine the source.

[54] Exhibit 314C, Section 6.5, page 6-12, states "wells in the overburden near the mine area are not likely to experience significant impacts due to mining since recharge to these wells occurs locally." This statement oversimplifies a complex system. It is likely that drawdowns will be observed in overburden aquifers near the mine area. These drawdowns will likely be smaller than those observed in the Knobloch coal, due to the smaller saturated thickness of the overburden aquifers that are susceptible to mining-related dewatering, and the typical lack of pressure head in the overburden aquifers. However because the static water columns observed in overburden wells are also typically smaller, a smaller drawdown may still have a significant impact on the water use. Overburden wells near the mine should not be categorically excluded from potential drawdown impacts, but should be evaluated individually based on their proximity to the mine, their vertical separation from the Knobloch coal, and the unique hydraulic conditions of the overburden at the well's location. Please revise this section to address these concerns.

[55] The meaning of the green coloring in Exhibit 314C, Table 6-1, is not explained, and is not consistent or clear. Please explain the meaning of the green coloring.

[56] In Exhibit 314C, Table 6-1, GWIC ID 100521, states "potential slight drawdown… will not impact use". This conclusion is not supported by the data. The static water column in this well is reported as 54 feet, and the well appears to be located between the 10 and 15

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foot drawdown contours, which would result in a reduction of the static water column of approximately 20-25%. Because the depth of the pump and the pumping water level are unknown, it is unknown if the predicted drawdown will impact use. Please revise or explain your conclusion.

[57] In Exhibit 314C, Table 6-1, GWIC IDs 100523 and 205088, are likely the same well. Please revise or explain.

[58] In Exhibit 314C, Table 6-1, GWIC ID 7421, states "approx. 20 feet of drawdown is predicted, will not impact use." This conclusion is not supported by the data. The static water column in this well is recorded as 70 feet; therefore, a drawdown of 20 feet would result in approx. a 30% reduction in the static water column. Because the depth of the pump and the pumping water level are unknown, it is unknown if the predicted drawdown would impact use. Please revise or explain your conclusion.

[59] In Exhibit 314C, Table 6-1, GWIC IDs 101955 and 101956, state "no impact for intended use"; however, these wells are located inside the mine area on Figure 6-3, thus will be mined through. Please revise or explain your conclusion.

[60] In Exhibit 314C, Table 6-1, GWIC IDs 101956 and 191348, are likely the same well as they have the same location, depth, and date drilled. Please revise or explain.

[61] In Exhibit 314C, Table 6-1, GWIC ID 197214, states "may be removed by mining." More information is needed to evaluate the potential impacts to this well. Is this the water source for the stock tank identified as SSI-11-21? The location of this well should be field verified to determine if it is within the mine disturbance area. Please revise or explain.

[62] In Exhibit 314C, Table 6-1, GWIC IDs 7600 and 101976, (both IDs likely refer to same well) state "no lithology information, potential slight drawdown if completed in Knobloch coal, will not impact use." This conclusion is not supported by the data. The total depth of this well indicates it is likely completed in the Knobloch coal (TD 196 feet, Knobloch coal interval estimated to be approximately 160-210 feet at this location). The groundwater model predicts approximately 40-45 feet of drawdown at his location in the Knobloch coal, which cannot be categorized as "slight." The static water column in this well is reported as 112 feet; therefore 40-45 feet of drawdown would result in a 35-40% loss of water column. Because the depth of the pump and pumping water level are unknown, it is unknown if this drawdown would impact use. Please revise or explain your conclusion.

[63] In Exhibit 314C, Table 6-1, GWIC ID 231514, states "drawdown expected, screened across shale and coal below, will not impact use." This conclusion is not supported by the data. According to the well log, this well is dual completed in "shaly blue sand" and coal. The static water column was reported as 154 feet, and 54 feet of drawdown was reported after bailing the well at 12 gpm for 2 hours. The groundwater model predicts 40-45 feet of drawdown at this well, which would reduce the static water column by 26-29% and the 12

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gpm pumping water column by 40-45%. Because the depth of the pump is unknown it is unknown if this drawdown would impact use. Please revise or explain your conclusion.

[64] In Exhibit 314C, Table 6-1, GWIC ID 256987, states "drawdown expected…will not impact use." This conclusion is not supported by the data. The static water column for this well was reported as 150 feet and 10 feet of drawdown was reported after bailing the well at 15 gpm for 1 hour. The groundwater model predicts 40-45 feet of drawdown at this well which would reduce the static water column by 27-30% and the 15 gpm pumping water column by 29-32%. Because the depth of the pump is unknown it is unknown if this drawdown would impact use. Please revise or explain your conclusion.

[65] In Exhibit 314C, Table 6-1, GWIC ID 7603, states "TD in sand below Knobloch, no completion information", but provides no prediction of impacts. This conclusion is not supported by the data. The total depth of this well lies 25 feet below the base of the coal in a water bearing sand in direct contact with the coal according to the well log. The static water column in this well is reported as 121 feet. The groundwater model predicts approximately 45 feet of drawdown at this well, which would result in a 37% reduction in the static water column. Because the depth of the pump and the pumping water level it is unknown if this drawdown would impact use. Please revise or explain your conclusion.

[66] In Exhibit 314C, Table 6-1, GWIC ID 101987, is listed in the wrong section. This well is located in Section 6, not Section 27 (see row 6, Location, on scanned well log) and is likely completed in the Knobloch coal (total depth is 34 feet into a coal unit). The table lists the aquifer of completion as "125TGRV (and alluvium)", but there is no evidence from the log that this well is completed or even passes through any alluvium. The table lists the SWL as 85 feet, but GWIC has a static water level of 196 feet. However, the GWIC SWL is likely in error as this is the total depth of the well. The table lists the elevation as 3245 feet, but GWIC has no elevation listed. The groundwater model predicts drawdown of approximately 45 feet at this well, but because static water level information is unreliable, and the depth of the pump and the pumping water level are unknown the potential for impacts are unknown. Please revise your conclusion to address these considerations.

[67] In Exhibit 314C, Table 6-1, GWIC ID 161284, states "no impact – below Knobloch coal," however, the top of the well screen is located only 6 feet below the bottom of the lower Knobloch. This well should be considered to potentially be impacted by drawdown from the lower Knobloch. Please revise your conclusion to address these considerations.

[68] In Exhibit 314C, Table 6-1, GWIC ID 276654, is a MBMG monitoring well in the upper Knobloch (same unit as nearby B12-UK2). This well does not need to be included in Table 6-1 as there is no water use from this well. Please revise your submittal to address this consideration.

[69] In Exhibit 314C, Table 6-1, GWIC ID 101993 states "no impact, completed above Knobloch coal". This conclusion is not supported by the data. This well is listed as 60 feet

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deep and the estimated depth to the upper Knobloch coal at this location is approximately 45 feet, therefore it is possible this well is completed in the upper Knobloch. Please revise or explain your conclusion.

[70] In Exhibit 314C, Table 6-1, GWIC ID 149840 states "no impact, completed above the Knobloch coal"; however, a coal seam which is likely the upper Knobloch is reported in the well log from 82-104 feet. The estimated depth to the middle Knobloch at this location is approximately 200 feet, therefore this well is likely completed in the interburden between the upper and middle Knobloch and should be evaluated for potential impacts from drawdown (modeled as ~30ft in layer 1 at this location). Please revise or explain your conclusion.

[71] In Exhibit 314C, Table 6-1, GWIC ID 102001 states "no impact to intended use." This conclusion is not supported by the data. The estimated depth to the base of the lower Knobloch coal at this location is approximately 390 feet, thus it is possible this well is completed in the coal. The groundwater model estimates approximately 15 feet of drawdown at this location. This well is reported as artesian with a flow rate of 1.5gpm, thus it is likely that 15 feet of drawdown would stop the flow at this well, which would be a major impact to the water user. Please revise or explain your conclusion.

[72] In Exhibit 314C, Table 6-1, GWIC ID 103179 states "no lithology information available, likely completed above Knobloch coal, no impacts." This conclusion is not supported by the data. The Knobloch coal splits are estimated to occur between approximately 140 and 310 feet of depth at this location, therefore this well (total depth 200 feet) is likely completed in Knobloch coal and/or interburden. The static water column reported for this well is 100 feet and the groundwater model predicts approximately 15 to 20 feet of drawdown in layer one at this location. Please revise or explain your conclusion.

[73] In Exhibit 314C, Table 6-1, GWIC ID 103180 states "no lithology information available." This conclusion is not supported by the data. The Knobloch coal splits are estimated to occur between approximately 90 and 262 feet of depth at this location; therefore, this well (total depth 200 feet) is likely completed in Knobloch coal and/or interburden. The static water column reported for this well is 100 feet and the groundwater model predicts approximately 20 feet of drawdown in layer one at this location. Please revise or explain your conclusion.

[74] In Exhibit 314C, Table 6-1, GWIC ID 217431 states "potential drawdown, may be completed in top of Knobloch, no expected impacts to intended use." This conclusion is not supported by the data. This well appears to be mislocated by GWIC due to the quarter section descriptions being entered in reverse order. Based on the well log and estimated elevations for the Knobloch coal splits at this location, this well is likely completed in an interburden sandstone between the middle and lower Knobloch. The log from this well is poor, see nearby GWIC ID 224810 for a better log. Please revise or explain your conclusion.

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[75] In Exhibit 314C, Table 6-1, GWIC ID 103183 (7794 is likely the same well) states "no impacts completed above the Knobloch coal." This conclusion is not supported by the data. Based on the well log and the estimated elevations of the Knobloch coal splits at this location, this well appears to be completed in a clinker of the upper Knobloch. Please revise or explain your conclusion.

[76] In Exhibit 314C, Table 6-1, GWIC ID 103197 states "no expected impacts, completed above Knobloch coal." This conclusion is not supported by the data. The estimated depths of the Knobloch coal splits at this location are between 190 and 300 feet; therefore, this well is likely completed in or slightly below the lower Knobloch. Please revise or explain your conclusion.

[77] GWIC ID 149839 is shown in T4S R46E S2 in Exhibit 314C, Figure 6-3, but listed in S11 in Table 6-1 and in the GWIC database. This is the same well as GWIC ID 101982, and the location of well 101982 in Figure 6-3 appears to be the correct location. Please correct or explain this inconsistency.

[78] GWIC IDs 101990, 101991, and 101992 are mistakenly shown in T4S R46E S27 on Exhibit 314C, Figure 6-3. These wells are located in S31 per Table 6-1 and the GWIC database. Please correct or explain this inconsistency.

[79] GWIC ID 102002 shown in T4S R47E S18 in Exhibit 314C, Figure 6-3 is listed as being in S25 in Table 6-1 and the GWIC database. Please correct or explain this inconsistency.

[80] GWIC ID 224810 shown in Exhibit 314C, Figure 6-3 in T5S R46E S4 is not included in Table 6-1. This well is mistakenly identified as being in R56E in the GWIC database. The log from this well is useful as it clarifies the poorly described stratigraphy in the GWIC ID 217431 log. Please correct or explain this inconsistency.

[81] GWIC ID 103185 in T5S R46E S10 is not labeled in Exhibit 314C, Figure 6-3. Please revise, accordingly.

[82] Exhibit 314C, Figure 6-3 shows GWIC ID 159928 in T5S R46E S17, but this well is not included in Table 6-1. The well is listed as abandoned in the GWIC database. Please revise, accordingly.

[83] In general Exhibit 314C, Section 6.5 tends to minimize the potential impacts of the predicted groundwater drawdown from mine dewatering on domestic supply wells. Even though a reduction in water level in a supply well with sufficient water column may not preclude use, it could make that use more costly for the user by requiring additional electricity costs to pump water from a deeper depth. Additionally, the well user may need to lower a pump (to prevent pump damage from drawing air) or install a higher horsepower pump (to maintain desired flow rates) due to lowered water levels in a well,

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both of which could represent a significant financial impact to that user. Please revise your submittal to address this consideration.

[84] The final paragraph of Exhibit 314C, Section 6.5, page 6-13, discusses Tract 1 and Tract 3. This PHC should not discuss impacts from Tract 1 or Tract 3 mining as only mining in Tract 2 is proposed in this application.

[85] Exhibit 314C, Section 8.0. Results from the column leach and paste extract analyses suggest selenium and nitrate are likely to exceed Circular DEQ-7 standards in spoil water and therefore, may create a potential for material damage. As the DEQ must address this potential for material damage in the CHIA, the operator must discuss it in the PHC.

[86] As described in ARM 17.24.314(5), the cumulative hydrologic impact assessment is the responsibility of DEQ. The TMDL related discussions in Section 9 would be better placed in Section 4.1. Please remove Section 9.0 from the PHC document.

[87] There are multiple fields within the Otter Creek floodplain that have been identified as receiving inflow flood irrigation from side tributaries. The reclamation plan states that traps will be left in place to fill in naturally. These traps may not allow for reestablishment of inflow irrigation onto the fields. Please discuss in Exhibit 314C how these fields will be affected during and after mining.

[88] Exhibit 314C, Appendix B: Please include copies of all MODFLOW input and output files for the calibrated steady state model and the transient mine dewatering and recovery models for DEQ review.

[89] Exhibit 314C, Appendix B: Section 2.1.1 on page 2-3 states water levels from October 2011 were used to construct the conceptual model of groundwater levels. Due to the abnormally high precipitation in 2011, these water levels may not be the best values to represent steady state conditions in aquifers which are responsive to recharge such as alluvium and clinker. DEQ suggests using water levels from 2013 because it represents closer to an average precipitation year, and is a better representation of steady state baseline conditions. Please revise or explain your analysis.

[90] Exhibit 314C, Appendix B: Section 2.1.1 discusses estimates of groundwater flux through the Knobloch coal, alluvium, and underburden. These fluxes are based on similar assumptions as the fluxes presented in Exhibit 304E, and the comments made by DEQ on calculation of groundwater fluxes in that Exhibit also apply to the flux estimations presented here. However, the flux estimates presented in this section and Tables 2-1 through 2-4 do not match the flux estimates in Exhibit 304E, Section 2.4. Please ensure that the flux estimates presented in Exhibit 304E and in Exhibit 314C, Appendix B are in agreement.

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[91] Exhibit 314C, Appendix B: Section 2.1.1 under the heading "Otter Creek Alluvium" on page 2-7 describes drainage between coal and alluvium, and alluvium and clinker as though solely controlled by the relative permeability of the materials. The controlling factor in the direction of groundwater movement is the difference in head with groundwater flowing from higher head to lower. Permeability affects the rate of groundwater movement. Water can move either from lower permeability to higher, or vice versa, depending on the head in each unit and both scenarios have been observed in the interactions between water bearing units in the Otter Creek area. Please revise this section to more fully describe the factors affecting groundwater movement.

[92] Exhibit 314C, Appendix B: Not all wells shown on Figure 2-2 and used to create the potentiometric surface for the Knobloch coal are completed in the Knobloch coal. Well 7409 is completed in the overburden. Well 100472 is likely completed in the underburden. Well 100476 is completed in the underburden and a remnant of unburned Knobloch under clinker. Well 187111 is completed below the Knobloch, possibly in the Flowers-Goodale or a local coal. Similarly, not all wells shown on Figure 2-5 and used to create the potentiometric surface for the Flowers-Goodale underburden unit are completed in or near the Flowers-Goodale coal. Wells B1-U, B4-U, B11-U, and B12-U are completed in shallower sandstone units, and GNP-PSW2 is completed in the deeper sandstone. Wells 103164 and 175228 are likely completed in the interburden. Please review the wells used in these figures to ensure all water levels are used appropriately in the conceptual model.

[93] Exhibit 314C, Appendix B: The discussion of Tongue River gains and losses in Section 2.1.2 on pages 2-14 and 2-15 does not account for the gains from Otter Creek stream flow. Please include Otter Creek streamflow in the calculation of gain/loss for the Tongue River and revise this section to reflect the changes.

[94] Exhibit 314C, Appendix B: Figure 2-9 is referred to in the text as showing "an abridged version of the mine plan." However, Figures 2-9 and 2-10 are identical and both display the results of the analytical mine dewatering calculation. The CAD data submitted for Figure 2-9 shows the intended mine plan data. Please include the pdf version of the correct Figure 2-9.

[95] Exhibit 314C, Appendix B: Section 2.2.2 refers to the buffer of coal between clinker or alluvium and the mine area. As noted in earlier DEQ comments, the existence of this buffer in all locations is in question. Please revise the model as necessary for consistency the proposed presence or absence of the coal buffer described elsewhere in the application.

[96] Exhibit 314C, Appendix B: Section 3.3 on page 3-7 discusses creation of the geologic framework for vertical discretization of the model domain, but does not contain enough supporting data for DEQ to evaluate the suitability of this discretization. Please include all well and boring logs used to create the geologic framework in an attachment. Please also include figures showing each of the 11 fence diagrams.

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[97] Exhibit 314C, Appendix B: The model cross-sections presented in Figure 3-2 are too small to allow evaluation of the model structure. Please reformat to provide larger cross-sections and ensure all text labels in cross-sections are legible at 100%.

[98] Exhibit 314C, Appendix B: The model layering inaccurately simulates a horizontal connection between the Knobloch/clinker layers and the alluvium of the Tongue River and Otter Creek below Willow Crossing. The elevation in the Tongue River valley lies below Knobloch/clinker throughout much of the model domain. Similarly, the elevation of the Otter Creek valley below Willow Crossing and the adjoining lower reaches of Home and East Fork Otter creeks lie below the Knobloch/clinker. Simulating a horizontal connection where none exists may exacerbate dry cell issues which were noted as a "challenge" in calibrating the model. Please revise the model layering to better simulate the actual connectivity or lack thereof between hydrostratigraphic units.

[99] Exhibit 314C, Appendix B: In Section 3.4 page 3-9 the value used in the transient model for specific storage of the Knobloch coal is the minimum value calculated from aquifer tests of baseline monitoring wells. Storage coefficients calculated from aquifer tests have a tendency to be underestimated relative to values that produce realistic drawdown responses in modeled systems. Because of the probable low bias inherent in the aquifer test storage coefficients, choosing the minimum value from these tests is likely overly conservative. Please consider using a higher specific storage value in the revised model.

[100] Exhibit 314C, Appendix B: Coal hydraulic properties are assigned too many clinker areas in the model. This is explained in Section 3.4 under the bullet "Clinker" as necessary to achieve model stability. Because of the orders of magnitude difference in hydraulic properties between coal and clinker, simulating these clinker areas as coal likely significantly affects the amount and extent of the simulated drawdown from mining, particularly north of the mine area. Please revise the model hydraulic properties to better simulate actual hydraulic properties in the clinker areas.

[101] Exhibit 314C, Appendix B: The representative lithology for some zones in Tables 3-3 through 3-5 do not match the modeled geologic unit displayed on Figures 3-4 through 3-6. Additionally, there are zones listed in the tables which do not appear on the figures, and zones displayed on the figures which are not listed in the tables. Please ensure the information presented in these tables and figures match.

[102] Exhibit 314C, Appendix B: Section 3.5 on page 3-15 states, "Well A9 is approximately 5,000 feet downgradient from GHB D." Well A9 is upgradient from GHB D. Please correct this error.

[103] Exhibit 314C, Appendix B: The conductance (C) and head (H_{ext})values listed in Tables 3-6 through 3-10 do not always match the values shown on Figures 3-4 through 3-11. Please ensure these Tables and Figures agree.

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[104] Exhibit 314C, Appendix B: The recharge values used in the model for clinker and alluvium are generally slightly lower than values typically used in models of the Tongue River Formation, and compared to the literature values presented in Section 2.1.3.

Additionally, the potential for contributions of additional Knobloch recharge from alluvium and clinker units in contact with the overburden is not simulated. When revising the model to address previous comments, please consider using additional recharge in some areas. Selected use of higher recharge values in appropriate areas may alleviate some issues with dry cells.

[105] Exhibit 314C, Appendix B: Based on Figure 3-15, it appears that the quarterly breakdown of the drains used to simulate mine dewatering are not in the logical order expected from the proposed mine plan. The mine plan proposes mine cuts progressing from west to east separately in the north and south halves of the mine. Typically, one mine cut will be mined completely before moving on to the next. Therefore individual quarterly mining blocks should also progress from west to east, not in blocks 2-3 cuts wide progressing north and south. Practically, this deviation from the expected mine sequence will have little impact on simulated water levels as long as the net effect of the drains is that a continuous pit is open from the north to south boundaries of the mine over the life of the mine (excluding the central high cover area after year 10). Based on the description presented in Section 3.9.3 it appears this is not the case, and each two year simulation begins with only one quarter's worth of mine cut drains active. Please clarify this section and ensure that the transient model runs simulate the presence of the full open mine pit at all times.

[106] Exhibit 314C, Appendix B: Table 4-2 displays calibration statistics for all targets. Please include calibrations statistics broken down by model layer and by hydrostratigraphic unit.

[107] Exhibit 314C, Appendix B: Section 4.2 on page 4-4 and 4-5 discusses difficulties in modeling the observed difference in head between the upper and lower Knobloch at well battery B8. The interburden at this location is simulated with a vertical anisotropy ratio of 10 resulting in a vertical conductivity of 0.0005ft/d. Other models have successfully used higher vertical anisotropy ratios and lower vertical permeability to simulate the large vertical head gradients sometimes encountered in the layered geology of the Fort Union Formation. Section 4.2.2 also discusses that the model simulated gradients and flow directions in the lower Knobloch (layer 3) that are nearly identical to the upper Knobloch (layer 1). Using a higher vertical anisotropy ratio and lower permeability for the interburden may improve model calibration in the area where the coal is split. Please consider using a higher vertical anisotropy ratio for interburden and underburden units in the revised model.

[108] Exhibit 314C, Appendix B: Section 4.2 on page 4-7 states Figure 4-3 is a plot of residual versus observed heads. The pdf file of Figure 4-3 contains Figures 2-4, 2-8, 4-1, 4-

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2, 4-3, 5-1, 5-10, 6-9, and an unnumbered plot of particle tracks. Please include only the correct figure.

[109] Exhibit 314C, Appendix B: Section 4.2.3 discusses the discrepancies between the conceptual and simulated potentiometric surfaces for the Flowers-Goodale horizon (layer 6). The incorrect assignment of some target wells to this layer may be influencing the conceptual potentiometric surface. Assuring all calibration targets are assigned to the correct model layers may improve the correlation of these potentiometric surfaces.

[110] Exhibit 314C, Appendix B: Section 4.4 compares estimated groundwater fluxes to model calculated fluxes. DEQ made earlier comments regarding estimations of fluxes for the conceptual model. DEQ cannot evaluate this section until conceptual flux estimates are revised.

[111] Exhibit 314C, Appendix B: Section 5.2 does not include figures showing simulated head and drawdown in layers 2 and 3. Please include simulated head and drawdown figures for these layers.

[112] Exhibit 314C, Appendix B: The simulated maximum extent of the 5-foot drawdown contour shown in Figure 5-4 does not correspond to the drawdown contours provided for the end of each two-year transient model simulation. Please ensure this figure shows the maximum extent of the five-foot drawdown contour at any time.

[113] Exhibit 314C, Appendix B: The maximum extent of drawdown reaches the model boundaries. As a result the true maximum areal extent of drawdown is unknown. Please ensure the revised model describes all areas indicating simulated drawdown (>5ft) within the model domain.

[114] Exhibit 314C, Appendix B: The hydrographs presented on Figure 5-6 are difficult to interpret because the horizontal time axis is presented in log scale. Please use a normal time scale for the horizontal axis of these hydrographs. Additionally, the model report should present hydrographs for all model targets.

[115] Exhibit 314C, Appendix B: The particle tracks shown in Figure 5-9 follow an unlikely path based on observed groundwater levels. Water levels in AVF6 wells are similar to water levels in well C-3, while water levels in well A8 are much lower. Based on the observed water levels, water from the clinker should discharge to Otter Creek alluvium near its confluence with Threemile Creek. Additionally, the presence of a direct connection between the clinker and Otter Creek alluvium where the particle tracks leave zone 9 is questionable based on the DEQ evaluation of the geology of the area. Without evidence that water levels in the clinker north of Threemile Creek are lower than water levels in Otter Creek alluvium at A8, the particle tracks north of the mine cannot be supported. Similarly, water levels measured at K-6 and the AVF4 wells indicate that the Knobloch likely discharges to Otter Creek alluvium in this vicinity, thus the particle tracks showing

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flow in the Knobloch parallel to the creek are considered unlikely. Please take these concerns into consideration when revising the model.

[116] Exhibit 314C, Appendix B: Section 5.3 evaluates streamflow interaction with groundwater based on three reaches; however, additional surface water sites exist to refine this analysis. Please evaluate the reaches from SW-16 to SW-2, SW-2 to SW-25, and SW-25 to the USGS station separately.

[117] Exhibit 314C, Appendix B: In Section 6.0 the sensitivity analyses conducted does not include a comprehensive evaluation of all relevant model parameters. Presentation of model sensitivity scenarios, such as those described in Section 6.0 are useful tools for explaining how the model generally responds to variations in parameters, but do not replace a comprehensive sensitivity analysis. Sensitivity analyses for the calibrated model should include at a minimum two higher values and two lower values for each parameter tested. All zones for all parameters used for model calibration should be tested. Please include results of a comprehensive sensitivity analysis in an attachment to the model report.

ARM 17.24.315:

[1] Routing of water and sediment from service roads, haul roads, out-of-pit spoil piles, and soil stockpiles is not provided on the Operational Drainage Control Map. For instance, soil stockpile SS1-36a is placed over two individual drainages that drain to two sediment ponds (EP-4, EP-3). How will runoff from this stockpile be routed? To which ponds? Please show all ditches and conveyance structures on Map 11 – Operational Drainage Control.

[2] CAD files show two separate EP-10 ponds for Phase 1 and Phase 2 - one below the haul road (Phase 1) and one above the haul road (Phase 2). If two separate ponds are proposed, please provide distinct names for these two separate ponds.

[3] Please address temporary runoff routing/hydro control for the dragline construction area in the permit and appropriate maps.

[4] Exhibit 315A, Section 2.1 states that ditches will convey Haul Road runoff to Ponds EP-10 and EP-6. It is not clear whether Appendix A runoff calculations incorporate routing of service and haul road runoff to ponds. OCC must provide a more thorough description and include sediment and runoff from roads in its flow and sediment modeling.

[5] Exhibit 315A, Section 2.1 states that pit water from the south end of the mine will be routed to EP-3 via EP-5 or EP-6. The exhibit does not explain whether pit water will be piped to Pond EP-3 or allowed to flow overland through or around the SSP above EP-3. Please explain this further. Routing from these ponds to EP-3 is not provided in CAD or on maps.

ARM 17.24.315: Continued

[6] Exhibit 315A, Appendix A provides runoff and sediment modeling for pre- and postmine ponds and watersheds. It is unclear from the modeling results whether the routing of water from service and haul roads to ponds was included in the modeling results. OCC must clarify and revise modeling discussions to address the routing of runoff from service and haul roads and incorporate drainage control water routing into modeling outputs.

[7] Exhibit 315A, Appendix A provides runoff and sediment modeling for pre- and postmine ponds and watersheds. It appears that that the location of Pond EP-6 does not correspond to the watershed runoff from Watershed 6 (i.e. nearly half of watershed 6 is downgradient from the pond). Please revise modeling scenarios as appropriate.

[8] Exhibit 315A, Appendix A, Section 2.2.2, states that "Implementing the operational drainage controls described will result in zero discharge from the coal removal area unless the 100-year, 24-hour storm runoff volume is exceeded". If the ponds are sized to contain the 100 yr/24 hr event, this statement implies that all ponds must be pumped dry at all times. Please revise and/or clarify this permit language as appropriate, or commit to managing so that the stated capacity is maintained.

[9] Exhibit 315A, Appendix A, Section 6.1, states that "First phase operational sediment traps capture all runoff and sediment during a 10-year, 24-hour storm, making the sediment trap efficiency 100% and preventing any discharge for storms up to the 10-year, 24-hour event." If the ponds are sized to contain the 10-yr/24-hr event, this statement implies that all ponds must be pumped dry at all times in order to meet the capacity requirements of ARM 17.24.639. Please revise and/or clarify this permit language as appropriate or commit to managing so that the stated capacity is maintained.

[10] Exhibit 315A, Appendix A, Section 6.2, uses the terms sediment ponds and sediment traps interchangeably. Traps and ponds are different control features and are typically treated differently from a regulatory standpoint. Please clarify and provide language in the permit that distinguishes and defines traps, sumps, and ponds.

[11] Exhibit 315A, Appendix A, Section 6.2, describes how water will be routed through and stored in ponds, and acknowledges that Ponds EP-5 and EP-6 will be used to store pit water. This section states that "Second phase operational sediment traps capture all runoff and sediment during a 100-year, 24-hour storm, making the sediment trap efficiency 100% and preventing any discharge for storms up to the 100-year, 24-hour event." If pit water is stored in these ponds, they will not have the capacity to retain the 100-yr/24-hour event as stated. Please revise this section as appropriate or commit to dewatering ponds after any precipitation events that result in ponding.

[12] Exhibit 315A, Appendix A, Table 6-2, includes "Required Pond Volume" in the last column. This value is not a "required" pond volume, but the 100-yr/24-hour volume plus

ARM 17.24.315: Continued

sediment storage. Required pond volumes are provided in ARM 17.24.639. Please revise this column heading as appropriate.

[13] Exhibit 315A, Appendix A, Table 8-2, includes "Required Pond Volume" in the last column. This value is not a "required" pond volume, but the 2-yr/24-hour volume plus sediment storage. Requirements for permanent impoundments are given in ARM 17.24.642. OCC must demonstrate that the quality and quantity of water in permanent impoundments is suitable for the postmine land uses.

[14] More description is needed with the SEDCAD output in Exhibit 315A, Appendix A. While multiple storms were stated to be modeled, there is no indication of which storm the output is showing for the some of the scenarios. Also, it is unclear what the structures and substructures correspond to; therefore, the validity of the modeling cannot be fully checked. Substructures and structures should be shown on a map. DEQ cannot review the SEDCAD model until the results are clarified. DEQ suggests grouping models, map of the subbasins being modeled, and the design by pond. Consequently DEQ cannot complete its review of 17.24.313 and 17.24.634 (restoration of surface water hydrology) or 17.24.315.

[15] While Exhibit 315A, Appendix A, commits to sizing ponds to store 3 times the average annual sediment yield plus runoff from the 100-yr, 24-hr storm, EP-15 in the 2nd phase worst case scenario only stores 2 times the sediment yield. Please adjust the pond volume to hold 3 times the sediment yield.

[16] EP-10 is shown in Exhibit 315A, Appendix A, Table 6-2, as being modeled with a drainage area of 426.7 acres, but the model for the 2nd phase pond model shows a total drainage of 395.6 acres. Please reconcile the model with the table.

[17] There is no discussion in Exhibit 315A of how water will be controlled from coming into the pits from upstream drainages. Flood control impoundments are usually required upstream as well as downstream of mine pits, and these ponds are part of the hydrologic control plan.

[18] The multi-phase approach to downstream hydrologic control and pond sizing in Exhibit 315A relies on many assumptions about the timing of operations and reclamation. These assumptions, especially as mining progresses, do not anticipate a delay in reclamation, failure of reclamation to establish within the necessary timeframe, a delay in the timing of mining and stripping, or an adjustment to the placement of structures meant to facilitate mining such as roads and stockpiles. DEQ recommends that pond sizing for runoff and sediment be sized to accommodate a worst-case scenario of all drainage areas within the permit in a disturbed condition. A curve number of at least 92 is recommended to simulate frozen conditions on bare spoil or soil.

[19] It is unclear if the modeled sediment yield shown in Exhibit 315A, Appendix A, Table 6-2, takes into account all of sources of sediment that are shown on the hydrologic control

ARM 17.24.315: Continued

map. For instance, a considerable source of sediment will come from the routing of water in a ditch alongside the haul road.

[20] As described in Exhibit 315A, Appendix A, the final traps left in all of the drainages may not meet the requirements of ARM 17.24.634 because they would restrict surface water flow from leaving the mine area after reclamation. Small depressions left in the postmine landscape must be less than 1 ac-ft in size at the time of bond release to be allowed to remain. Also, the trap above EP-15P1 would prevent the permanent pond from filling and providing a postmine water source. Please either remove the discussion of leaving traps or qualify these statements to comply with all of the reclamation rules.

[21] Permanent ponds, as stated in Exhibit 315A, are to be constructed as incised ponds. This will result in upstream drainage down-cutting, and these ponds will likely not meet the requirements of a concave longitudinal profile for the drainage. Please revise or provide further explanation of the proposal.

[22] The plan in Exhibit 315A to store pit water in EP-5 and EP-6 relies on not storing more than 32 ac-ft total in ponds EP-3A, EP-5, and EP-6. Please commit to some method of determining total volume for these ponds so that adequate capacity can be verified during onsite inspections.

[23] Exhibit 315A, Appendix A, Figure B-31, is labeled as showing Pond E-15, but the name of the pond is EP-6 on the table in this figure. Please make appropriate adjustments.

ARM 17.24.315(1): Plans to control run-off onto the Custer National Forest must be presented for where mining related disturbance crosses the drainage divide in Section 13. DEQ recommends mine disturbances be revised to not cross over the drainage divide.

ARM 17.24.315(1)(a)(iii): The hydrologic information presented in the SEDCAD data does not include a label tying it to a specific pond. The SEDCAD output data must be labeled.

ARM 17.24.315(1)(a)(v): This rule requires a certified statement setting forth the dates for submittal of detailed pond designs. Please add narrative time frame commitments for submittal of detailed pond designs. For your information, future detailed pond designs need to include elevations, cross sections through the spillways up to the road culvert, and adjustments to the CN as appropriated with any changes to the mine plan.

ARM 17.24.319(1): Exhibit 321, Cross section F-F', must be extended to the edge of public road 484. The toe of fill for the railroad appears to be within 100 feet of the centerline of the road itself; therefore, additional clarification/justification is needed.

ARM 17.24.321(1)(a), 321(1)(e), 605(1), 605(6) and 639(28)(a): The access road alignment must be moved south between Stations 45 and 60 to allow for a greater distance

between the culvert outlet and the sharp curve in Otter Creek and to allow for a larger buffer between the road fill and Otter Creek at ~57+00 (See Plate 1, Exhibit 321 A).

The road plan commits to "Temporary Erosion Control BMP's" at the toe of all road fills and "Erosion Control Note 4". If ditches along areas of road cut do not transition to road ditches controlled by berms on fill, then additional long term sediment control must be specified in the plan where there are long stretches of inclining road cuts that transition to fill slopes; for example:

- Between Stations 00 and 35+00 on the Main Haul Road, there is 1,400 feet of road ditch north of EP-1A at a 7.24% grade that joins 2,200 feet of ditch from the south at a 1% grade. Both ditches would flow off adjacent to a 20-foot tall 3:1 road fill down into a 45-foot deep pond that is excavated with 3:1 side slopes. Additional sediment control must be specified as this appears to be an unstable condition or a lot more hydraulic calculations with specifications are needed on the proposed in ditch check dams. In addition, there are ditches on each side of the road cut: additional culverts may need to be added to the plan to get road run-off to the up gradient side of the road fill.

- The Access Road has over 2,000 feet of ditch at a 2.9% grade which outlets onto a native hillside 80 feet above the valley floor.

Map 11 needs to have the box culverts under the access road put onto the map.

ARM 17.24.321(1)(a): The rail road cross sections must depict the rail loop service road. In addition, if a road is needed to the Conveyor Transfer Station and Secondary Crusher building, then that road must also be depicted on all applicable maps.

A cross-section depicting fills must be added for each road on Plate 2. These cross-sections must identify berms, ditches, and "Erosion Control Note 4" as applicable.

ARM 17.24.322(2)(b) and 313(1)(d)(v): There is no justification for the 90% recovery. Additional explanation must be added to Exhibit 322A, Section 3.0 (for example: the percent of loss associated with cleaning the top of coal, bottom loss, rib loss, etc.). The outcome of this may change some numbers in the overburden mass balance tables in Exhibit 308.

ARM 17.24.325:

[1] ARM 17.24.325_R1 does not follow the requirements of the rule. Included in this document are a number of conclusions and assumptions. There are also instances which reference the Baseline Report 325A. Due to the number of issues with Baseline Report 325A as noted in other deficiencies and the number of conclusions and assumptions included in this document, this will need to be re-written. Please re-address this rule and associated permit materials.

ARM 17.24.325: Continued

[2] Please provide all raw data, map layers, and data dictionaries for all information presented for this rule.

[3] In general, Exhibit 325A contains a considerable amount of unnecessary explanation and analysis. The AVF baseline report should present the data in a factual manner and without interpretation (e.g. include study plans, sources, and raw data, but no interpretation of the data collected under ARM 17.24.325(2)(a)). It is the role of DEQ to interpret that data presented and determine the extent and significance of any alluvial valley floors.

[4] All of the Exhibit 325A Plates were combined in one very large pdf file (631MB). As a result of this very large file size, opening and scrolling through the Plates is extremely cumbersome. Please submit each individual Plate as a separate pdf file.

[5] If data are included elsewhere in the permit and not changed, the location of the data can be referenced in Exhibit 325A instead of duplicated. This will reduce the work needed to update sections and reduce the chance for errors between multiple copies. For instance, the alluvial well logs and surface water station information are addressed in 17.24.304(1)(e).

[6] In Exhibit 325A, Table 1-1, the annual total does not match the sum of the monthly totals for 1977, 1984, 1994, 1996, 1997, 2000, and 2011. Please correct this table.

[7] Exhibit 325A, Sections 1.4 and 1.5, are unnecessary. DEQ will include all necessary definitions and regulations regarding alluvial valley floors in its written findings. Please remove Sections 1.4 and 1.5 from this document and revise or remove all sections that reference Section 1.

[8] The rules cited in the final bullet of Exhibit 325A, Section 2.0, are incorrect. Please change ARM 17.24.325(d) and ARM 17.24.325(e) to read ARM 17.24.325(2)(d) and ARM 17.24.325(2)(e).

[9] Exhibit 325A, Plates 1 and 6, label the East Fork Otter Creek drainage as the Home Creek drainage. Please correct this error.

[10] The A1 Section on Exhibit 325A, Plate 3, is not accurate. The well log for A1 shows clinker starting at 15 feet and extending to the total depth of 20 feet; however, the A1 Section shows approximately 50 feet of alluvium below the bottom of the A1 well. Please correct this cross-section to accurately display the lithology based on the A1 well log.

[11] The contour interval of 20 feet used in Exhibit 325A, Plate 4, is too large to show the details of floodplain and terrace morphology. Please use a maximum contour interval of 5 feet for the valleys of Tenmile Creek, Threemile Creek, and Otter Creek from Tenmile Creek

ARM 17.24.325: Continued

to Home Creek. It will likely be necessary to present this data in multiple plates to ensure all details of floodplain and terrace morphology are visible.

[12] In Exhibit 325A, Section 2.2, page 2-5, the first paragraph indicates that terraces are not evident on Tenmile, Threemile, Home, and East Fork Otter creeks; however, DEQ hydrologists have observed apparent terraces on Threemile Creek in the northwest corner of Tract 2 in Section 12. Please revise this statement or provide evidence to support it.

[13] The values reported for annual mean and median daily flow in the second paragraph of Exhibit 325A, Section 2.3.1.1, do not match the values in Table 2-1A. Please correct this discrepancy.

[14] Exhibit 325A, Section 2.3.1.1, page 2-7, refers to Table C-2, which does not exist. It appears the referenced information is contained in Table B-2. Please correct this error.

[15] In Exhibit 325A, Section 2.3.1.2, the first paragraph on page 2-8 compares SAR data from the USGS Ashland gauging station to SC. SAR at this site will always follow the same trends as SC because the SAR reported by the USGS is calculated from the SC data using a regression equation as noted on Table 2-3B. "True" SAR is a ratio of concentrations of cations, which are not measured at this site. Please revise this section to clarify that SAR is not an independently measured parameter at this site. This comparison is repeated in Section 2.7.2 and should be clarified in that location as well.

[16] Exhibit 325A, Plate 7, presents water levels from wells primarily from August 2011, but also includes some data from 2014. Please use water levels from the same time period for all wells to draw potentiometric surfaces. Additionally, this plate contours Knobloch water levels based on the naming convention used for the wells rather than the actual hydrostratigraphic unit the well is completed in. Therefore, the middle Knobloch is contoured with the upper Knobloch at B7, but with the lower Knobloch at B10. Please provide separate contours for each Knobloch coal split.

[17] In Exhibit 325A, Section 2.3.2.2, the discussion of wells A1 and SW-2 on page 2-12 refers to cross-section B on Plate 3. The cross-sections on Plate 3 are not labeled with letters, thus the meaning of this reference is unclear. Please clarify this reference.

[18] In Exhibit 325A, Appendix C, the water level variations on some hydrographs are difficult to ascertain due to the large vertical scale used. Please ensure that the vertical scale selected for each hydrograph does not obscure the details of water level changes.

[19] Exhibit 325A, Plate 8, does not provide enough detail of depth to alluvial groundwater by only displaying one water depth class. Please revise this plate to display multiple depth ranges of alluvial groundwater. Please also provide DEQ with the digital datasets used to generate the depth to the water layer.

ARM 17.24.325: Continued

[20] Please check and correct all tables and text in Exhibit 325A which reference static water level (SWL) to show depth from ground surface. SWL in Appendix I reports SWL as depth from monitoring point, and some appendices (See Appendix J comments below) have used incorrect calculations of depth-to-groundwater.

[21] In multiple places in Exhibit 325A, Section 2.3.2.2, eight feet is used as the benchmark for alluvial water level, but it is not explained in this section why eight feet is an appropriate value. Please use the more detailed discussions of groundwater depth relating to subirrigation which occur later in this document.

[22] Exhibit 325A, Section 2.3.2.3, implies that alluvial groundwater quality is adversely affected by contributions from the Knobloch coal aquifer in the reach near AVF3 and AVF4. This implication is not supported as the Knobloch coal water quality (~1,500 umhos/cm) near this location is much better than that of the alluvium (~5,500 umhos/cm). Please revise this section.

[23] The photos contained in Exhibit 325A, Appendix D and Appendix E, would be more useful if their locations were identified on a map.

[24] The final paragraph of Exhibit 325A, Section 2.8.2, contradicts itself by saying the Otter Creek floodplain is not functionally subirrigated because uptake of groundwater by plants has increased salinity. If uptake of groundwater by plants is occurring then subirrigation is occurring. Please revise this section to remove the contradictory statements.

[25] Exhibit 325A, Section 2.9.1, first bullet point: The narrative implies that an AVF can only occur on a floodplain. An AVF may be present on terraces above the floodplain. Please revise this bullet.

[26] In Exhibit 325A, Section 2.9.1, the second bullet implies that the term "streams" in the AVF rules excludes ephemeral streams. This is not true. Please revise this bullet.

[27] The field labels on Exhibit 325A, Plate 12, are illegible at 100%. Please increase the size of these labels to comply with ARM 17.24.302(7).

[28] Exhibit 325A, Section 3.0, is unnecessary. It is the responsibility of DEQ to determine the applicability of the statutory exclusions. Please remove this section.

[29] Throughout Exhibit 325A, Section 4, the arithmetic average production calculated from the per field yields is presented, but discounted as less reliable than the weighted averages calculated from total acreages and yields. Please use only the more representative weighted averages in both the text and associated tables in this section. Also, please explain the methodology for calculating the weighted averages.

ARM 17.24.325: Continued

[30] As noted in Exhibit 325A, Section 4.1.2, legibility of the FSA maps included in Appendix H is a problem. As reproduced in Appendix H the majority of these maps are completely illegible. Please provide a map showing the locations and identification of the FSA fields for correlation with the data in Tables 4-1 through 4-4.

[31] Exhibit 325A, Section 4.3, includes analysis on the bale count data and Section 4.4 discusses AVF importance to ranching operations. This analysis will be completed by DEQ and should not be addressed in Baseline Report 325A.

[32] Exhibit 325A, Table 4-4, reports production data for the Denson ranch for Threemile Creek. The Denson ranch is not located in the Threemile Creek drainage. It appears this data are for fields in the Tenmile Creek drainage. Please correct this error.

[33] Exhibit 325A, Table 4-7, has the surname Gaskill misspelled as Gatskill. Please ensure the proper names have been included on all permit material.

[34] Exhibit 325A, Appendix I, Appendix J, and Appendix K all contain their own appendices which create confusion with references. For example, it is unclear in the text of Appendix I if references to Appendix B mean "325A, Appendix B" or "325A, Appendix I, Appendix B". Please rename all appendices of appendices to avoid confusion and update any references to these appendices in the permit.

[35] Exhibit 325A, Appendix J, Section 3.1 Root Analysis, states that "Groundwater was detected at all piezometer sites within the floodplain sites, ranging in depth from 45 to 84 inches at these sites". Piezometer data shows GW depths down to 27 inches for these sites. It appears that depth to GW in Appendix J was calculated from the well or piezometer measuring point, and not the ground surface. All depth to GW values cited should be checked for accuracy.

[36] Exhibit 325A, Appendix J, Section 4.0, states "Furthermore, the average rooting depth of plants within the floodplain was shallower than the average depth of the groundwater; indicating that floodplain vegetation is not actively utilizing groundwater." Average groundwater depth presented in Table 3 must be reevaluated based on the previous comment. Also, comparing average groundwater depth with maximum rooting depth is not an appropriate way to evaluate the relationship between groundwater depth and rooting depth. This statement ignores the importance of the capillary fringe in groundwater utilization by plants. Please revise this statement and Table 3 as appropriate.

[37] Exhibit 325A, Appendix K, Section 3.0, includes comparisons of production between sites in the floodplain and out of the floodplain. This interpretation may be misleading as depth to groundwater is not also evaluated. This analysis will be completed by DEQ and should not be addressed in Appendix K.

ARM 17.24.325: Continued

[38] The data tables presented on Exhibit 325A, Figure 5-1, do not identify the piezometer in each row of data. Please include the piezometer names in the tables on Figure 5-1.

[39] Most text in the piezometer log insets on Exhibit 325A, Plate 15, is illegible at 100%. Please increase the size of this text or the overall size of these inserts.

[40] Exhibit 325A, Table 5-2: It is unclear if the evaporation number is from pan evaporation or is an evapotranspiration number. If the number is from pan evaporation, it must be corrected to evapotranspiration via a pan coefficient.

[41] The water balance described in Exhibit 325A, Section 5.2, is out of balance by over 30% and is not useful. This indicates that there are fundamental flaws in the assumptions used to estimate the fluxes which make up the water balance. Issues with fluxes have been addressed in earlier DEQ comments on Exhibit 304E. The water balance does not consider groundwater inputs from clinker or underburden. Additionally, the value presented in Table 5-2 for overburden only represents flow through the northern part of Tract 2, and the Knobloch value only represents Tract 2. These exclusions and limitations likely result in an underestimation of groundwater input. Section 5.2 also makes the assumption that there are no surface water inputs from ephemeral streams. Even though ephemeral streams typically have no flow, during the time period from March through June it is likely they would contribute some flow following precipitation events. Additionally, Section 5.2 states potential evaporation "is assumed to represent evapotranspiration." This assumption is invalid. Potential evaporation, based on pan evaporation rates, only accounts for meteorological factors such as temperature, humidity, and wind. Evapotranspiration is also dependent on many other factors including soil conditions, water availability, and vegetation type and health. Please revise this section using revised fluxes which rely on valid assumptions for all potential inputs and outputs to the system.

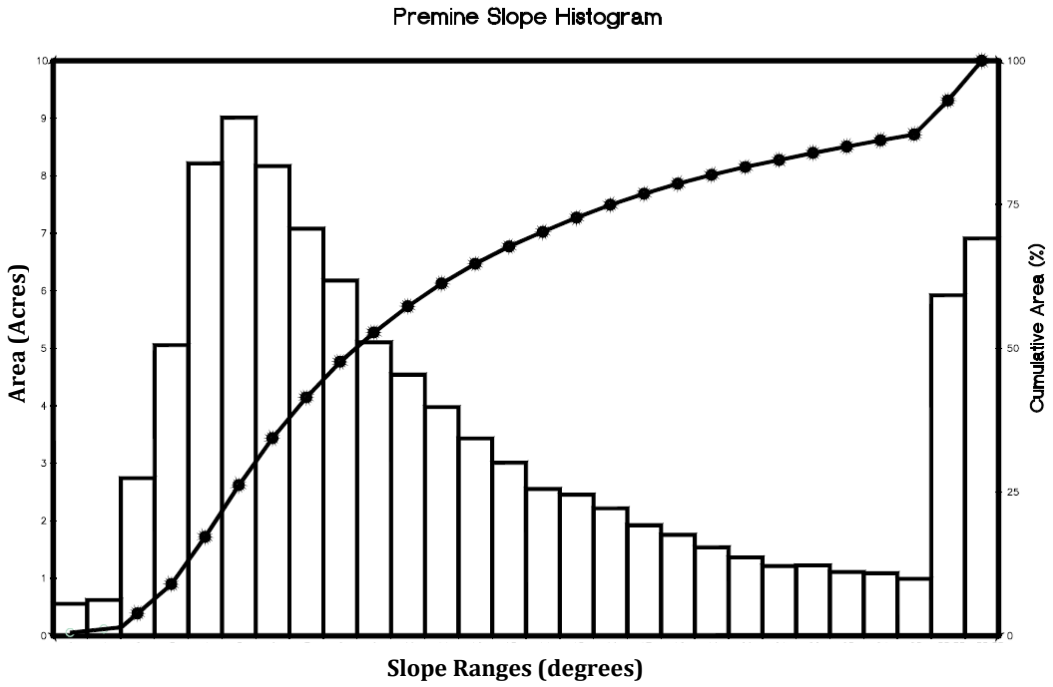
[42] Exhibit 325A, Figure 5-2: Explain why this figure plots March water levels versus May or April water quality. Why was not a plot of water quality and quantity from the same month shown instead?

[43] The discussions in Exhibit 325A, Section 5.0 and 6.0, are not germane at this time as no AVF determination has been made by DEQ. DEQ will not review plans for the protection of alluvial valley floors or essential hydrologic functions until a determination of the presence and significance of an AVF is made.

ARM 17.24.501: The restoration of most of the disturbed areas outside of the "Projected Mine Area Disturbance" appears to be fairly close to the original topography, but there are several exceptions where proposed PMT varies by 10 to 20 feet, or more. As many of these areas contain diverse premine features, it is not clear if this is just a drafting oversight, or part of the actual proposal. The purpose for the changes is unclear. Please reexamine the proposed PMT in these areas and revise them to more closely match premine conditions, or explain the reasoning behind each change.

There are PMT topographical errors in Section 13, at the southeast corner of the Projected Mine Area Disturbance. Please correct these errors on all applicable maps and check for additional PMT errors at the outer boundary of the PMT TIN to ensure that PMT contour lines correctly tie into premine topography.

ARM 17.24.501(4): (Section 313) The Pre vs. Postmine Slope Comparison chart on Map 12, Postmine Topography uses a log scale for area (acres). The area for slope range 0-5% is not legible on the chart. The applicant must resubmit the Pre vs. Postmine Slope Comparison chart without using a log scale. An example of an acceptable histogram is shown below. The pre- and postmine slopes could be depicted on a single chart.



ARM 17.24.501(4): (Section 313) OCC must verify that the Pre vs. Postmine Aspect Comparison chart on Map 12 uses an azimuth for aspect ranges (degrees). DEQ would prefer North, South, East, and West were added to the chart.

ARM 17.24.515: OCC chose to quantify pre-mine steep slopes by acre. Steep slope acres are mentioned in three different locations including the "Geologic, Scenic, and Topographic Features" map. The "by acre" results must be consistent between all three locations.
The steep slope category of greater than 1:1 should be lumped into the preceding category and the second sentence on page 5, Section 4.0 of Baseline Report 304C should be changed. DEQ suggests, "The slopes summarized below include some cliff features but these are very steep and thus less quantifiable in plan view acre units." Once these changes are made, the last sentence of this section should be deleted.

Section 5.0 (Erosion Features) of Baseline Report 304C limits the maximum depth of erosion features to "as much as 25 feet." This is inconsistent with information that some

features in Sections 11 and 14 are as much as 40 feet deep. Please revise or change this statement to rectify this inconsistency.

The second sentence of Section 2.3 of Exhibit 313C limits steep slope creation to a steepness of 1h:1v. This limitation is inconsistent with data indicating a steeper approximate original contour. The sentence must be change to "… slope ranging from 5:1 to 1:1 or steeper as appropriate …"

ARM 17.24.601(3) and ARM 17.24.601(6): (Section 321) Exhibit 321A, Transportation Facilities; states that the cut and fill slopes along the roads are designed as 3(H):1(V). The rules allow for steeper cut and fill slopes then 3(H):1(V). Steeper embankments and cut slopes would reduce the amount of earthwork needed to construct the road. Furthermore, steeper embankment slopes would disturb less area than flatter slopes and reduce the amount of disturbance. Pursuant to ARM 17.24.601(6), to the extent possible roads be constructed using the best technology currently available to minimize disturbance.

ARM 17.24.605(1) and 305(2)(c): Figure 2-2, the Phase Two Operational Drainage Control map does not depict culvert CV-1A being aligned with the drainage and must be revised as follows: Culvert CV-1A must be aligned with the drainage as explained in the pond designs or a new Pond EP-1A must be submitted.

Many of the culverts placements are not adequately depicted on the maps and a symbol for CV-9 may have been left off completely. DEQ suggests a darker more standardized symbol for the culverts.

ARM 17.24.605(2): Ditch flow arrows must be added to all appropriate maps at the outlet to culvert CV-3A. The culvert currently outlets directly into soil stockpile area SS1.

ARM 17.24.605(3): DEQ suggests addition of another culvert to handle the storm water in drainage R5, located on the southeast side of the railroad at 45°29'53"N, 106°11'10"W. A culvert in this location would facilitate a drainage area which is greater than 3 other railroad culverts. Either accept this suggestion or explain why the change is not necessary.

ARM 17.24.605(4): (Section 315) Exhibit 315A, Appendix A, 7.1, Culverts, states "headwater elevations of the culverts are at least three feet below the road elevation." Headwater elevations at least three feet below the road elevation are not required under ARM 17.24.605. The headwater requirement may be removed from the application. If OCC would prefer the statement to remain in the permit, please resubmit the culvert design data for culverts CV-4, CV-R1 and CV-R6 to adhere to permit commitments. DEQ calculated the headwater elevations for the Culverts CV-4, CV-R1 and CV-R6 and determined the headwater elevations are less than three feet from the road elevation or railroad elevation.

ARM 17.24.605(4): (Section 315) DEQ calculated that the water would overtop the road during the 10-yr, 24-hr precipitation event for Culvert CV-R1. Pursuant to ARM 17.24.605(4) water-control structures must be designed with a discharge capacity capable

of safely passing the peak runoff from a 10-yr, 24-hr precipitation event. Please resubmit culvert design data for Culvert CV-R1 or explain how the design is adequate.

ARM 17.24.605(4) and ARM 17.24.305(1)(w): (Section 315) Exhibit 315A, Appendix A, 7.1 Culverts states, "Required culvert capacity was based on the largest peak 10-year, 24-hour storm water flow from either the first phase (pre-mine watershed configuration) or second phase (post-mine watershed configuration) watershed modeling. Table 7-1 compares peak flows for the two design scenarios, including routing runoff from multiple watersheds where applicable." Please show the volume of storm water runoff that is being routed from each watershed. This information is required for DEQ to verify that the culverts are designed with a discharge capacity capable of safely passing the peak runoff from a 10-yr, 24-hr precipitation event.

ARM 17.24.605(4): (Section 315) DEQ is unable to evaluate Table 7-1, Culvert Design Data within Exhibit 315A, Appendix A, against the requirements of the rule. Please add a column listing the drainage area used for each culvert.

17.24.632; 17.24.1005; 31.21.670(2): The rules clearly state that cuttings must not be placed in the hole. Please eliminate the statement in Exhibit 313H regarding drill holes that states "the remaining two feet will be filled with drill cuttings..." Additionally, ARM 31.21.670(2) requires that the remaining hole be filled with naturally occurring soils.

ARM 17.24.638(1): The drainage control plan for Drainage 15 includes the construction of a 100-yr, 24-hr incised pond (EP-15) during final grading. A large incised hole in the bottom of a reclaimed drainage is generally not a stable condition. BTCA for this area should include a properly sized pond with an embankment and spillway. The surrounding topography yields itself well for a pond with an embankment.

There are some small blue squares on the drainage control maps that likely represent some sort of alternate sediment control. These squares must be labeled in the legend on all applicable maps.

ARM 17.24.639(1)(a): Exhibit 308A of Appendix A contains bullet 16. It states; "As overburden stripping and mining progress southward, construct excavated ponds EP6 and EP7 **as** each divide is crossed." Pursuant to ARM 17.24.639(1)(a) Sediment ponds must be constructed **before** and disturbance of an area that will drain into the pond takes place. Please change the narrative of Exhibit 308A to adhere to ARM 17.24.693(a).

ARM 17.24.639(1)(a): (Section 315)Exhibit 315A, Appendix A, 2.2.1 First Phase Operational Drainage Control, states "that operational drainage control will begin **upon** disturbance of each watershed, including the construction of roads, the rail loop, and mine facilities or soil stripping." Pursuant to ARM 17.24.639(1)(a) Sediment ponds must be constructed **before** and disturbance of an area that will drain into the pond takes place. Please change the narrative of Exhibit 308A to adhere to 17.24.693(a).

ARM 17.24.639(2): (Section 315) DEQ is unable to verify that sedimentation ponds provide adequate storage volume. Please submit a map showing the drainage area used for each pond design.

ARM 17.24.639(2): ARM 17.24.639(2) states that "Sedimentation ponds must provide the required theoretical detention time adequate to meet effluent limitations described in ARM 17.24.633 and for the water inflow or runoff entering the pond from a 10-year, 24-hour precipitation event (design event)…" OCC states that theoretical detention time requirements are not applicable. This appears to contradict the rule. Please revise to conform to the rule or explain why the rule does not apply.

ARM 17.24.639(3): ARM 17.24.639(3) states that, "The water storage resulting from inflow must be removed by a nonclogging dewatering device or a conduit spillway approved by DEQ and must have a discharge rate to achieve and maintain the required theoretical detention time. The inlet to the dewatering device must not be located at a lower elevation than the maximum elevation of the sediment storage volume." OCC states that incised ponds will not have dewatering devices. This statement appears to contradict the rule. Please explain how OCC will comply with this rule (through mobile pumps or other devices…). If 10-yr and 100-year runoff volume capacities are to be maintained as described in the proposed plan, OCC must commit to dewatering of ponds after any precipitation events that result in reduction of the required capacities.

ARM 17.24.639(4): Whether short-circuiting of ponds are a concern of OCC or not, OCC must still "design, construct, and maintain sedimentation ponds to prevent short-circuiting to the extent possible." Please demonstrate how compliance with this rule will be achieved.

ARM 17.24.642(1) Permanent Impoundments: Exhibit 315A, Appendix A, Section 2.4 Permanent Ponds, states that "Pond storage volume is based on the runoff from the 2-year, 24-hour storm in the reclaimed hydrologic condition." How does the postmine water availability (volume and distribution) provided by permanent ponds compare to the availability of water in the premine condition? Please explain the rationale for this storage volume and how it maintains the quality and quantity of water necessary to support post-mine land uses.

ARM 17.24.700: Subchapter 7 refers to other permit materials for compliance with each rule. This also includes any references to these rules in permit material. These references to permit materials that do not aid in the definition of the specific rule should be removed from this portion for clarity. Only include cross references to permit materials that help define how OCC will meet compliance of a rule and not cross references to when you will meet compliance of a rule.

For example, ARM 17.24.711 has Exhibit 315A, Section 3.0 (25) included in this section. This permit material states that "[…] affected land will be graded and revegetated in accordance with ARM 17.24.711, 17.24.713, 17.24.714 […]" This does not address any part of ARM17.24.711 but merely states it will follow 17.24.711. Please remove any cross

references to unnecessary permit materials and explain how OCC intends to comply with the specific rule.

ARM 17.24.711: Subchapter 7 cross references to Section 3.0 of Exhibit 313G for ARM 17.24.711. This section includes a reference to 17.24.711(1)(a) and (b). ARM 17.24.711(1) does not have an (a) or (b). Please confirm all referenced permit material is accurate.

Section 3.0 of Exhibit 313G and Section 2.3 of Exhibit 313A do not adequately address ARM 17.24.711(2) or (3). Please include permit material to address these provisions of this rule.

ARM 17.24.718: Subchapter 7 does not address soil amendments [ARM 17.24.718(1)]. Section 4.3 of Exhibit 313G discusses fertilization. Please add discussion of soil amendments to this Section and include a cross reference to this Section in Subchapter 7.

ARM 17.24.724: Exhibit 313G, Section 8.0, claims to address ARM 17.24.724 in Appendix 313G-3. The Woody Plant Densities included in the technical standards (Table 1) do not accurately reflect baseline communities. Shrubs were measured in each of the listed land uses and will need to be present in all postmine communities. Trees were present in the Shrub Enhanced Grazing Land & WHEF communities premine. The Woody Plant Density listed for Shrub Enhanced Grazing Land & WHEF is not representative of these premine communities and trees are not properly represented. Please re-address Woody Plant Densities for postmine land uses and create a tree specific standard for the Shrub Enhanced Grazing Land & WHEF land use.

The maximum contribution of introduced perennial cool season grass species is set at 20% of relative cover. This number is high considering these species are not included in any seed mixes except for Pastureland. Please reduce this component of reclamation to a maximum contribution of 10% in non-pastureland land uses.

Non-stratified Cover numbers for Pastureland do not accurately reflect baseline communities and this postmine land use. Please increase the total and perennial Non-stratified Cover for Pastureland.

The Wildlife Habitat Enhancement Features (WHEF's) from Table 1, Appendix 313G-3, are not discussed elsewhere in the reclamation plan. WHEF's need to be addressed in Exhibit 313G. To meet the postmine land uses associated with wildlife, WHEF's will need to be incorporated into all land uses. DEQ may approve increased numbers of Woody Plant Density in place of WHEF's in some instances. WHEF's may also be defined as areas of little to no vegetation in some instances. Please better explain the implementation and distribution of WHEF's in reclamation and subsequent reclamation standards.

ARM 17.24.725: Exhibit 313G, Section 8.0, claims to address ARM 17.24.725 in Appendix 313G-3. This rule is not addressed in this appendix. Please describe how OCC intends to meet all of the requirements of ARM 17.24.725.

ARM 17.24.726: Exhibit 313G, Section 8.0, claims to address ARM 17.24.726 in Appendix 313G-3. Though some of the portions of this rule are addressed, there is insufficient information in this appendix to meet the requirements of the rule. The heading at the top of the narrative description should include all rules explained. ARM 17.24.726 should be included in this heading. Please describe how OCC intends to meet all of the requirements of ARM 17.24.726 and label the appropriate sections accordingly.

The Reverse Null Hypothesis is the only test included in the permit. A statement to the effect of "Any tests included in DEQ's Vegetation Guidelines will be utilized." will allow for other tests to be used in instances where they may be needed.

ARM 17.24.751: The information provided in not sufficient to determine whether wetlands will be restored or disturbance avoided as required by ARM 17.24.751(2)(f). A more detailed wetlands reclamation plan is needed. How will the postmine quality of wetlands be evaluated to premine functionality and ecology? How does the postmine wetland acreage and placement compare to premine wetland acreage and placement? Many of the premine wetlands within the permit are sourced from intermittent to permanent water sources that are likely fed by springs. How will ponds fed by ephemeral drainages be able to provide similar habitat and ecological function?

ARM 17.24.762(1): All premine ponds could be categorized as a developed water resource land use (82-4-203, MCA). The permit includes a description of postmine pond replacement features Appendix A, Exhibit 315A, Table 8-2 and various maps show the general location of postmine ponds. Please include additional quantifiable data (i.e.: surface acres) so a pre- and postmine comparison of land use can be made.

ARM 17.24.763: This rule has been repealed. Please remove ARM17.24.763 from Subchapter 7.

ARM17.24.801-802, 17.24.804-806: These rules are included in ARM 17.24.325_R1. This section of permit material is meant to address ARM17.24.325. Please remove these rules from this location. The ARM 17.24.800 rules should be addressed in Subchapter 8. Please move these rule definitions to this subchapter as they are not part of rule 17.24.325.

ARM17.24.1001 thru 1019: These rules are not included in this permit application. If OCC anticipates any prospecting drilling within the permit area, these rules will need to be included. Please address these rules in the permit materials as needed.

ARM 17.24.1101 thru 17.24.1148: With the exception of ARM 17.24.1131 (Protection of Parks, Historic Sites and Other Lands) and 17.24.1134 (Areas upon which coal mining is prohibited: permission to mine near a public road) these rules have not been addressed. All though these rules do not require OCC to provide any additional data, OCC is required to acknowledge these rules and provide statements that the rules will be complied with. For example: **ARM 17.24.1129 (1) Filing of Annual Reports Until Full Bond Release**, OCC will file copies of an annual report with DEQ by April 1until full bond release is obtained.

Please feel free to contact Robert D. Smith at 406-444-7444 with questions regarding this letter.

Sincerely,

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C: Jeff Fleischman, Office of Surface Mining
Lauren Mitchell, Office of Surface Mining

FC: 630.0