"Healthy environment, healthy people"

Montana Department of
ENVIRONMENTAL QUALITY

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April 12, 2013

Mr. Mike Rowlands
Otter Creek Coal, LLC
P.O. Box 7152
Billings, MT 59103-7152

Permit ID: C2012018
Revision Type: New Permit
Permitting Action: Deficiency
Subject: First Round Acceptability Deficiency; Otter Creek Permit

Dear Mike:

On July 26, 2012, the Department of Environmental Quality (DEQ) received an application for a surface coal mining permit (SMP C2012018) from Otter Creek Coal, LLC (OCC). The revised application was determined to be complete on December 14, 2012. This determination initiated DEQ's formal acceptability review of the application.

Staff from the Coal and Uranium Program have reviewed the application and identified the following deficiencies that must be adequately addressed in order for DEQ to determine the overall acceptability of the application. The deficiencies are listed numerically by Administrative Rules of Montana (ARM) and not in order of importance.

ARM 17.24.Subchapter 3: Due to missing AutoCAD (CAD) data, it is not possible to conduct a thorough review of this Subchapter, nor any Subchapters referenced therein. Please provide a complete set of the CAD associated with the application. See below for the correct formatting required.

ARM 17.24.302(1) – (and pursuant to Submittal Guidelines):

- Rule states that application information must be submitted in "a format acceptable to the department". The format we are currently using is AutoCAD Map 3D 2010. Most of the recently submitted CAD files are missing their associated external reference (XREF) files. Several of the files contain proxy objects that were apparently AEC generated. Review cannot take place until the CAD files and associated XREF files are submitted and functioning properly.

  The XREF files need to open automatically when each CAD file is opened; therefore, they must include the correct path and corresponding file location. Likewise, proxy objects need to be converted to AutoCAD objects.

- Layer Names must be intuitive. Layer names such as "O" are unacceptable. Otter Creek must resubmit all CAD drawings using an intuitive (i.e., plain English) naming convention. Alternatively, OCC may submit a data dictionary that describes each layer name used in all CAD drawings (some drawings are accompanied by a data dictionary, but not all).

- Layer Name Identifiers: each layer in a CAD drawing must indicate the date of last edit (e.g., Permit_Boundary_20120619). Each time a layer is required to be edited (e.g., during a deficiency response cycle) the date must be updated so that various versions of the same layer may be distinguished. Otter Creek must add dates to all CAD layers.

- File Names: CAD drawing file names and accompanying PDF maps must include the date of last edit in the title in order to distinguish between versions of the same file. Otter Creek must add dates to all CAD and PDF map file names. Additionally, maps are referenced in the narrative using the map number first, and map name second; however, the PDF file names are opposite. Otter Creek must rename the maps using the map number first in the file name (e.g. Map 1 Mine Sequence.pdf). This will also cause the maps to fall in the logical order of map number, rather than alphabetically, which does not relate to any other logical ordering of the permit.

- Empty Layers must not be included in CAD drawings. For example, the relatively simple Surface Features map contains 134 layers. Superfluous layers distract the reviewer. Otter Creek must remove all empty layers from CAD drawings and resubmit them.

- Single Layers: distinct features such as the permit boundary must be represented in a single layer. Many drawings contain redundant layers, which causes confusion and slows the review process considerably. Otter Creek must remove all superfluous layers from CAD drawings.

- Layer Geometry Type: layers must be submitted according to their appropriate geometry type (i.e., polygons should be submitted as such, rather than as hatched features). The use of hatching is fine; however, the outside perimeter of the feature must be a polygon. Otter Creek must revise all maps to utilize the appropriate geometry.

- The format of the permit is cumbersome to use. Otter Creek must consult with DEQ on ways to improve the submittal. As an example, the second bullet in Volume 1, ARM 14.24.308...pdf, Exhibit 308A...Operation Plan.pdf, Exhibit 308A...Appendix A.pdf, states, "Construct Road Segment 1 generally parallel to the east flank of the valley bottom to its intersection with Segments 3 and 4. The up-gradient road ditch serves as drainage control for Drainage 1, Drainage 2 and a portion of Drainage 3, and is graded such that overflow from Pond 1 flows to Pond 1A." To verify this statement the reviewer must navigate to and open several tabs:

    1. The logical starting place would be to look at a drainage control map. Maps are found in Volume 4; thus Volume 4, ARM 17.24.305...pdf, Drainage Control Map 11...pdf.

2. Map 11 does not depict roads or designate drainage areas. Road segments are found in Volume 1, ARM 14.24.321...pdf, Exhibit 321A...pdf, Exhibit 321A...Plate 1 Roads.pdf.
3. The drainage basins are found in Volume 1, ARM 17.24.315...pdf, Exhibit 15A...Ponds and Embankments.pdf, Exhibit 315A ...Drainage Control Report.pdf, Exhibit 315A ... Appendix A Pre Mine Drainage Figure 1-1.pdf and the Post Mine is in Figure 3-2.pdf.

In summary, the reviewer must simultaneously access 4 maps that are hidden within 13 open "pdf" tabs. This is not practical. The net result of the above is that Pond 1 flows into Pond 1B not Pond 1A.

ARM 17.24.302: Please remove the language submitted in ARM 17.24.302(2) and (3) and replace it with "OCC complies with provisions of this Rule by supplying accurate, current, clear and concise information which is supported by appropriate reference material."

ARM 17.24.302(7): DEQ does concur with your statement that "[b]ecause maps have been prepared digitally, scale may be adjusted electronically as required for review," all features must be clearly legible at the scale depicted. Problems typically arise in these scenarios when maps are scanned or saved at resolutions that do not capture the details – particularly labels – adequately. One example of this is the contour labeling on Pre Mine Topography Map 7. Otter Creek must resubmit that map, along with any others that do not adequately show necessary detail.

ARM 17.24.303(1)(g)-(h): OCC did not submit the Ownership and Control for their Parent Company(s). Please submit the required organization structure of the ownership.

ARM 17.24.303(1)(t): OCC did not submit the liability insurance. The application states that you will submit the insurance once the permit is issued. DEQ must review the insurance before issuing the permit. Please be advised that the liability insurance must be submitted prior to DEQ issuing a permit.

ARM 17.24.303(1)(i): Please be advised that OCC must submit the Mine Safety and Health Administration Number before a permit can be issued.

ARM 17.24.303(1)(s): The by-rule sequence should be adjusted to coincide with the rules: narrative in the permit application for ARM 17.24.303(1)(r) coincides with ARM 17.24.303(1)(s). In addition, it has been our experience that when mining thick seams, plans do not include any reclamation within the first five or more years. The operator must better evaluate its spoil movement and, if needed, adjust the "anticipated" beginning reclamation date. In addition, the anticipated acres of facilities, coal removal, spoil borrow, and other specific affected areas must be identified. The total number of acres must add up to "4,094 acres".

ARM 17.24.304(1)(a): Please provide additional narrative to identify the anticipated number of acres, tons mined and acres disturbed in Tracts 1 and 3.

ARM 17.24.304(1)(b): Requires a listing, location and description of all archaeological, historical, ethnological and cultural resources and values of the proposed mine plan and adjacent areas. These requirements were met with the submittal of the various baseline cultural reports. However,

to efficiently track the sites and the required mitigation, OCC must prepare a table to be included in the application and reviewed on an annual basis.

Please provide a table listing the site name, description, proposed mitigation, and year of planned mitigation for all archaeological, historical, ethnological and cultural resources and values of the proposed mine plan and adjacent areas.

ARM 17.24.304(1)(c): Steep Slopes. The inventory of premine steep slopes and the discussion of their replacement need to be moved to 17.24.51; it is inappropriate to include in this section. A premine steep slope inventory is included in Baseline Report 304C. This section identifies only two steep slope categories (3:1 to 2:1 and greater than.2:1). This will not be sufficient to address the performance requirements of ARM 17.24.515 and what is operationally feasible. Please add a 2:1 to 1.5:1 and 1.5:1 to 1:1 and 1:1 and steeper category. Steeper slopes, in the bluff category, will likely need to be identified manually due to limitations in the map grid spacing. Please also note that the performance standards in ARM 17.24.515 are applied to all steep slopes, not just those associated with highwall reduction areas and that slope height is another required parameter.

The area of petrified stumps needs to be better inventoried and documented so that the extent and local importance of this area can be determined. Based on the importance and unique value of the stumps, OCC may consider including a mitigation plan to use the petrified wood in reclamation or in a public display. In the conclusion portion of the baseline report narrative, the operator makes the finding that "Petrified wood fragments are common ..." DEQ agrees with this statement, but has not observed standing stumps in numbers depicted in the photographs.

ARM 17.24.304 (1)(c): 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 100-1. Please make these consistent formats between the two documents.

Photo point 1408 does not appear to be located in the correct spot on Plate 2 based on the photos in Appendix A. It appears, in looking at photo descriptions and images from Appendix A, that 1405 should be with 1406 and 1407; 1408 should be where 1409 is shown on the map; 1409 and 1410 should be where 1410 and 1411 are shown. The actual location for 1411 is unknown based on the map.

Photos 1412, 1413 and 1414 are being shown in section 15 with 1515 associated to the same point; this is likely not the case. The numbering system denotes the first two digits being the section the photos are taken in.

Photo 1514 is shown in the center of section 14.

According to the descriptions, 1503 is also mapped improperly and should be close to 1504.

Section 23 has two photos listed in Appendix A as 2310 and none listed as 2311. According to the map there is a 2311 location and there is also a 2312 in the appendix. It seems 2311 is missing or improperly labeled as 2310.

Not all GPS points are included on this map. Photo points 1015, 1125, 1213, 1219, 1405 (this photo appears to be in the same location as 1406), 1505, and 2201 are not mapped.

Please provide the exposure direction for the panoramic clinker photos.
Please correct all mapping issues and ensure that the photos are associated with the correct locations.

ARM 17.24.304 (1)(e) & (1)(f); Hydrology Baseline:

- Values given in the MCL column of the 304E data tables are not appropriate in many cases. Applicable water quality criteria given in these tables should be based on values given in DEQ-7, and reflect the most stringent water quality standard. For instance, 304E tables list an MCL for barium as 2 (2 what?). DEQ-7 does not report an MCL for barium, and lists barium as a non-priority pollutant (NPP) with a human health standard of 1000 ug/L. Likewise, the applicable water quality criteria for cadmium in surface water samples is not the MCL reported in DEQ-7 – it is the chronic aquatic life standard (0.097 ug/L at a hardness of 25 mg/L). Additional instances occur throughout the data tables included in Baseline Report 304E that must be corrected with the appropriate applicable water quality standard. Please update data tables in Baseline Report 304E to include the applicable water quality standard from DEQ-7.

- OCC is strongly encouraged to supplement its baseline hydrologic data with readily available data collected by the MBMG, USGS, EPA, and MDEQ. This data would be especially useful for characterizing the surface water quality and quantity along Otter Creek as well as better defining the groundwater system. All data that are used in baseline characterization must be included in the permit.

- Digital hydrologic baseline data must be submitted, preferably in an Excel format. The digital data should include all individual data points and not the statistical summaries.

- All data discussed in the text or in tables must include units. For example, the water quality summaries in Table 2-4 through 2-12 do not contain units.

- Individual statistical summary tables for surface water and groundwater (Appendices D and E) of the baseline report do not indicate when a concentration represents a non-detect value. Please indicate where the values are non-detect.

- BR304E, Appendix D - Please indicate the location and depth of the three Tarter domestic wells sampled and the source from which the sample was drawn, e.g. was it the well head or the tap? Please indicate if chemical modification (e.g. softening) of the well water takes place before the sample collection point.

- BR304E, Section 2.4.1.2, page 2-12 – DEQ does not agree that the fine-grained alluvial sediments act as a true confining layer. The interpretation of an alluvial confining layer is used repeatedly in baseline and the PHC as a reason that impacts to the stream from mining will be significantly moderated, however it is likely an overstatement for the following reasons: 1) Numerous logs from Otter Creek wells report encountering wet conditions in

the fine sediments at approximately the same depth as the reported water level; 2) In the stream, the sediments are saturated throughout the alluvial profile; and, 3) The presence of coal in some of the alluvial well logs also suggests that the Knobloch may be contributing to the water level observed in the well.

- BR304E, Section 2.4.1.3, page 2-15. The baseline report states "Synoptic runs conducted through the Study Area in the fall and spring have shown that Otter Creek is gaining through the reach from Tenmile Creek to Ashland during the spring but relatively consistent during the fall." Please explain what "relatively consistent during the fall" means. This statement is not the same interpretation offered in the groundwater model which interprets some reaches as gaining and some as losing.

- BR304E, Section 1.3, page 1-3. "groundwater investigations in Tracts 1 and 3 and the adjacent area at a level sufficient to enable projection of cumulative hydrologic impacts for purposes of mine permitting and environmental impact statement preparation." The groundwater data is not sufficient to characterize impacts from Tracts 1 or 3. Please remove this statement and all references to hydrologic data characterizing areas outside of Tract 2.

- BR304E, Section 2.0. There are multiple references to alluvial recharge through surface water (snowmelt, gaining reaches, etc.), but there are also multiple statements about the alluvial aquifer being confined and relatively isolated from interactions with surface water. These appear to be contradictory statements. It is unclear where the recharge areas are, as well as the locations of the stream reaches where the alluvial aquifer is assumed to be confined.

- BR304E, Section 3.2.5, page 3-18. SW-19 and SW-20 are within the mine permit boundary, but outside of the anticipated mine cut area. The statement that they are outside of the mine area is misleading as they could be impacted by mining-related activities. Please clarify this statement.

- BR304E, Appendix A and Table 2-1. There are numerous discrepancies between Table 2-1 and Appendix A. Please review the data presented in these two parts of the application and correct the errors. The following comments highlight some of the errors:

    - The Township and Range in Table 2-1 should list the N/S for the Township and E/W for the Range.

    - The Township, Range, and Section in Table 2-1 do not agree with the well log for A1.

    - The total depth (TD) in Table 2-1 for well A-1 is 17 ft., although the well log indicates a drilled depth of 20 ft. with three feet of slough at the bottom. AVF3-4 also has sloughing at the bottom of the hole, but the TD is reported in Table 2-1 as the total drilled depth. Please be consistent in the approach to reporting the TD in Table 2-1.

- The surface owner for A7 is different in Table 2-1 and on the well log.
- The Section number for well A5 listed in Table 2-1 does not agree with the well log.
- The Section number in Table 2-1 for well AVF2-6 does not agree with the well log.
- AVF3-1 does not have a water level monitoring schedule listed in Table 2-1.
- The screened interval for AVF6-4 is incorrect in Table 2-1 – according to the well log it is 31 – 71 ft., not 15 – 23 ft. The property owner in Table 2-1 does not match the owner on the well log.
- The surface owner for the B2 wells is listed as MT in Table 2-1 and GNP in the well logs.
- The Section number in Table 2-1 for the B5 wells does not agree with the well logs.
- Table 2-1 reports a screen interval of 185 - 360 ft. for B5-K. According to the well log, this should be 185-260 ft.
- The Section number in Table 2-1 for the B8 wells does not agree with the well logs.
- The surface owner for K-3 and K-4 is listed as Denson in Table 2-1 and GNP in the well logs.
- The screened interval for K-5 is listed as 120-186 ft. in Table 2-1 and 126-186 ft. in the well log.
- The screened interval for K-6 is listed as 104-149 ft. in Table 2-1 and 140-149 ft. in the well log.

- Additional issues identified with wells and well logs are listed below:
  - In 2.1, Groundwater Monitoring Report, the statement is made that 77 wells were installed in the study area during the investigation. The monitoring locations map, Map 10, shows and lists 81 monitoring wells. As some of the wells on Map 10 have been plugged and are not monitoring sites according to Table 2-1, please omit them from the monitoring map and table if no data were collected from them.
  - Log B7-O shows that an upper Knobloch coal was screened, not the overburden. This well should not be used in the overburden contouring.
  - Well B-10 was screened in an overburden coal unit. It is unclear if this well can be used to contour the overburden sandstone potentiometric surface. Please provide an explanation in support of using this well for this purpose.
  - B1-C is supposed to be screened in the clinker but is screened mostly in clay and claystone; only 2 ft. of the 10 ft. screen is in clinker. Please explain why the

completion overshot the targeted unit by 8 ft. and how this well is representative of clinker.

- Well logs for water wells Chromo-2, GNP PSW1, and GNP PSW2 are given but are not mentioned in the baseline report. How were these wells used in baseline studies, if at all?

- A number of concerns were noted in the installation of alluvial wells that call into question what is actually measured and sampled in the wells: Please re-evaluate each well.
  - From the well log, it appears that the well A-5 is completed as an open hole in claystone, not the alluvium.
  - Well AVF1-1 is shown with a TD of 36 ft., but Table 2-1 lists a TD of 35 ft. From the well log, it appears that the well is completed as an open hole in claystone and siltstone, not the alluvium.
  - AVF3-4 is installed into a sloughed hole that was drilled six feet into coal, which may be contributing to the water level.
  - AVF4-1 is getting contributions from coal, as it is completed 2 ft. into coal.
  - AVF6-1 is completed in an open hole that was drilled through 3 ft. of coal.

- BR304E, Appendix G. Please clearly list all crest gauge readings, flow measurements, and dates of the readings. It is unclear in the appendix which stages are calculated and which stages are measured because there is no explanation of the stage-flow tables. There is also no description of the location of the crest or staff gauges in relation to the channel thalweg, and consequently it is ambiguous how a crest or staff gauge reading corresponds to a calculated stage-flow relationship for some of the sites. Inclusion of the gauges on the cross-sectional channel diagrams would be very helpful. Please also include a table summarizing the site visits (date, observations, data collected, etc. See the DEQ's Annual Hydrology Report guidelines for an example of a site visit summary table) or the site visit forms. As presented, there is no method of evaluating if the sites were visited on a sufficient frequency to be able to characterize the low and high flow conditions. Additionally, please provide all flow data and measurements in an electronic format.

- BR304E, Appendix G. Some surface water sites do not have a year of data, the minimum amount needed to characterize high and low flow stages. For instance, the recorder at SW-22 only collected data from September 14, 2011 through April 1, 2012. All sites need a year of data. This can consist of a mixture of data sources (i.e. site visits and manual measurements) when frozen conditions preclude the use of continuous recorders. Baseline data should continue to be collected until a mine permit and monitoring plan is approved, and this data should be added to the permit application.

- BR304E, Appendix E and G. There are many unexplained discrepancies between the two appendices with regards to flow measurements correlated with samples. There are some

samples with no measured flow, but there is no explanation why no flow could be measured. There are also samples with a measured flow, but no data is shown from the continuous recorder at the station. These discrepancies must be explained or corrected. All samples should have a corresponding flow unless site conditions precluded flow measurement.

- BR304E, Table 2-1. Footnotes 3 and 4 are not explained. Please explain these footnotes.

- BR304E, Table 2-2. Please list the reporting value (detection value) and analysis method for the analytical parameters in the same format as Table 3-3.

- Table-2-3, Aquifer Testing Results: The text is so small that it is difficult to read when viewed at 100%. Please expand the size of the table and increase the font size so that it is easily readable.

- BR304E, Table 3-1. Please provide the monitoring site coordinates and ground elevation in the same coordinate format as Table 2-1.

- BR304E, Figure 2-1. This figure demonstrates a standard completion method for monitoring well installation and indicates a bottom cap is used. From the well log completion diagrams, it appears that a bottom cap was never used for the installation of the monitoring wells and there was no mention of a bottom cap in the remarks. Please indicate if a bottom cap was used in the screened wells.

- BR304E, Figure 2-2 through 2-5. There are no contours made for clinker. In Appendix A of 314 C, the statement "Greater spacing between potentiometric contours (see figures in Baseline Report 304E) indicates that the hydraulic gradient across clinker in the area of well C3 is very low" implies that there are contours for the clinker aquifer. However, there are no contours drawn for the clinker. Please update the statement to reflect what is shown on the figure.

ARM 17.24.304(1)(e)(ii): This regulation requires "a narrative and graphic account of surface water hydrology within the mine plan area and adjacent areas." The USGS map background on Map 4 depicts 14 perennial or intermittent lakes or ponds that must be accounted for; at a minimum, are they present or not present and a description of each. Please provide a narrative and graphic account of surface water hydrology within the mine plan area and adjacent areas as required.

ARM 17.24.304(1)(f)(iii): BR304E, Section 4.2.1, page 4-2. Alluvial sources for alternative (replacement) water: Specifically identify the locations that could supply adequate water quantity and quality to wells located in the most likely affected aquifer(s). The general discussion of alternative water does not compare specific water quality of the replacement sources to the aquifers most likely affected. Please be more specific on the comparison of production potential of current aquifers based on producing wells and compare measured water quality from the aquifers likely affected and the potentially affected aquifers.

ARM 17.24.304(1)(g); Overburden Baseline:

- The lab data sheets require an additional adobe flash player which is different from all the other adobe documents. It does make it easier to identify the samples data; however, if acquiring the plug-in is not an option, the raw data is not accessible. Please make this document available in the same adobe format as the remainder of the documents.

ARM 17.24.304 (1)(i); Vegetation Baseline:

Requires vegetation surveys be conducted in the proposed permit area. The applicant submitted Baseline Report 304J_Vegetation as well as BR 304J_Otter Creek Mine_Vegetation Facilities to include these vegetation surveys. On page 47, Section 3.6, BR 304J_Otter Creek Mine_Vegetation Facilities, both Tract 2 and the Facilities area are mentioned. This portion is an example of how the two could be modified to include both reports. Please combine these into one baseline vegetation report.

ARM 17.24.304 (1)(i)(ii):

- Requires a narrative description of community types in the proposed permit area. Section 3.2 COMMUNITY TYPE DESCRIPTIONS of Baseline Report 304J_Vegetation appears to have been written twice with multiple paragraphs discussing where things can be found in the appendices and tables. These paragraphs describe the same tables and appendices as well as a similar statement as to how the following community types are going to be presented. Please review this section to determine if these portions need to be repeated as they have been presented.

- The initial paragraph in Baseline Report 304J_Vegetation, Section 3.2.3 Shrub/Grassland - *Artemesia tridentata/Agropyron smithii* states that plots were sampled 66 % on middle and upper slopes while the next sentence states that slopes were mostly gentle with only 3 of the 67 sites on steeper slopes. This appears to be an issue that arises from using the same term, slope, for two separate meanings. Consider changing the wording to resolve this discrepancy. Also, in cross referencing Appendix H Table H-1 only 50% of the sample plots were on the topographical categories of middle and upper slopes instead of the listed 66%. Please review this information on other plots to ensure accurate reporting.

- Section 3.6 SPECIES LIST/MTNHP-LISTED SPECIES of both of the 304J baseline reports contains a table of the Number of Species in the Otter Creek Study area and the Montco study area. This table does not have the same information in the Montco portion of the table between the two documents. As this information hasn't been updated since 1982, this seems like an error in reporting this information. Please ensure that these values have been accurately presented

ARM 17.24.304(1) (j); Wildlife Baseline:

- The initial baseline date report is included. OCC subsequently collected wildlife data as per the approved plan of study during 2012. The report summarizing the data collection effort was recently submitted to DEQ. Please revise this section to incorporate the complete data set (i.e. from the start of data collection until the submittal of the deficiency response).

- Mayfly *(Caenis youngi)* is identified as a Species of Concern (SOC) in Appendix D; however, it is not included in Table 27, Environmental Baseline Report 304 K. Please evaluate which is correct.

- Appendix A, Environmental Baseline Report 304 K footnotes identify bolded taxa as SOC, but SOC brassy minnow *(Hybognathus hankinsoni)* and plains minnow *(H. placitus)* (identified in Table 27 as SOC) were not bolded – a check of the Natural Heritage database shows that these are potential species of concern. Please adjust accordingly.

- **ARM 17.24.304(1)(j)(iv):** Requires a map of wildlife habitat. Plate 1, within BR 304K_Otter Creek Mine_Fish and Wildlife only shows the wildlife habitat for the Tract 2 study area, and does not include the facilities areas. Please include wildlife habitat information according to ARM 17.24.304(1)(j)(iv) for the facilities area, entire mine area, and associated buffer area in the application.

ARM 17.24.304(1)(k); Soils:

- Supplement 1, soil report section 1.0 states the two soil baseline studies will be combined into an executive summary called soil supplement 2. It would be most useful to only have a single consolidated soil baseline report for the entire permit area.

- The Molybdenum table in the tract 2 report is missing soil series names for some of the rows.

- The electrical conductivity table in the supplemental report is missing the soil series for the first row noted in the table.

- There are a few other minor typos and errors in the baseline report. They do not change the substance of the report. If the reports are to be combined these should be changed. Please request the notes on the PDF documents and DEQ will furnish the documents.

- General Soils Map: Please provide the disturbance boundary for mine pits and facilities on the baseline soils maps.

- Page 16 of the Baseline Soils Report 304L contains a discussion of suitability criteria for saturation percentage. There is no discussion of whether any soils were below the minimum threshold value of 25% (by looking at the appendix, there doesn't appear to be, but a clarifying statement is needed.). Please provide a clarifying statement.

17.24.304(1)(l); Premine Land Use:

- Baseline report 304M, "Pre-Mining Land Use Otter Creek Mine Powder River County, Montana" only addresses the pit area. A supplement report addresses the entire mine and facilities area, updates numbers, and the language; however, tables from the baseline report are not updated or included in the supplement. Table 1 and Table 2 are referenced under section 4.0 in the supplement. However, these tables are not attached to the supplement

and are not updated in the pit area land use document. Please update the tables and combine the documents into a single premine land use report.

ARM 17.24.304(1)(l)(ii)(C): The narrative in Baseline Report 304M must include a statement of whether the proposed permit area has been previously mined. Please provide a statement. If it was mined, please address all associated subsections of this rule.

ARM 17.24.305: Due to missing CAD data, it is not possible to conduct a full review of either the submitted maps or associated documents that reference maps. Please provide all applicable CAD data for this section. Following OCC's response to this deficiency, DEQ will complete a more comprehensive review of the proposed post mine topography (PMT).

The following deficiencies, however, were noted; please address them as well as providing all remaining CAD data.

- All data on maps must be readable when viewed at 100%. The USGS topo backgrounds contain unreadable data such as contour intervals. Please provide readable maps to allow the review process to continue.

- Map 8. Please include an anticipated life of mine disturbance boundary.

- Map 7. Premine Topography Map. Elevations are unreadable. Contour lines in areas unaffected by mining do not sufficiently match the lines drawn on the PMT (Map 12) to allow for a comparison of the two maps. The map appears to be a scan of a USGS map, but a map drawn in CAD would produce a cleaner and more legible map. The 2011 USGS topo map for the area would be a more legible basemap. Please note that this map contains drainages that are drawn in a very different manner than those presented in the OCC permit application. The digitized contours are also needed for analysis of the reclamation plan. ARM 17.24.313, 17.24.314, 17.24.315 cannot be fully evaluated until digitized contours and a more legible map are provided.

- Map 14. Postmine drainage plan. While the permit states that the map will be submitted upon approval of the PMT, the map is included under 17.24.313D, Plate 1.

- Overall, the CAD is difficult to use and interpret due to the way that objects are labeled. For instance, multiple wells share the same point on the environmental monitoring map and contour lines are interrupted by annotation so that they are not contiguous. These wells should be drawn with their geographic coordinates so that the data can be used by DEQ to plot true well locations. Drainage basins on the premine and postmine drainage basin map are ambiguously labeled; it is unclear which drainage basin is associated with each drainage basin name. The CAD should be thoroughly reviewed and redrawn to accurately show all objects with measured coordinates as well as remove ambiguity.

ARM 17.24.305(1)(a) and (b) and ARM 17.24.303(1)(o): Map 4 does not clearly identify who controls what surface or coal mineral rights. More explanation in the title block or different shading and cross hatching is required. An explanation of how two separate entities can occupy the same area on the map requires explanation or to be depicted separately.

ARM 17.24.305(1)(d): Pursuant to 314(1)(a) and 17.24.643(1), DEQ requests reconsideration of the inclusion of the Mobile Equipment Cuts A-J into the mine plan. The close proximity and connection of the clinker and Knobloch coal to Otter Creek and associated alluvium are of particular concern.

ARM 17.24.305(1)(e): The application seems to suggest that all of the listed features (e.g., oil and gas wells) exist within the area; however, not all features are shown on the corresponding Surface Features Map. Please clarify by clearly stating that each of those features does not exist, or by showing them on the map.

Furthermore, the occupied dwellings should be labeled with the owners' names.

ARM 17.24.305(1)(g): The application seems to suggest that Surface Water Intakes exist within the area; however, no such features are shown on the corresponding Surface Features Map. Please clarify this either by clearly stating that no Surface Water Intakes exist, or by showing them on the map.

ARM 17.24.305 (1) (u): The date/revision date for each individual maps must be added before final approval.

ARM 17.24.305 (2) (a): The revision date for the individual maps must be added to the affidavit before final approval.

Map 11, Drainage Control Plan:

- In general this map must be much more detailed and comprehensive. The map should provide sufficient information to determine the course and fate of any surface runoff. The map should indicate flow direction in all haul road borrow ditches, symbols should be used to indicate the location of sediment control measures such as silt fence, minor traps, rock checks and berms. The map should serve as a plan for placement of all sediment control measures.

- The pond designations must be changed to something that clearly identifies the label as referring to a pond, such as Pond-1, PO-1 or Pond EP-1. Also, please make the individual pond labels more visible on Map 11. Also noted:

  No flow path and culvert shown between Ponds EP5 and EP4. (per text in EX 315A 2.0)
  No contiguous flow path shown between Ponds EP6 and EP4. (per text in EX 315A 2.0)
  No contiguous flow path shown into Ponds EP6. (per text in EX 315A 2.0)

ARM 17.24.305(2)(c): "All detail on maps must be clearly legible." This includes:

1. Topographic annotation. The contour elevation is not legible on maps addressing engineering concerns associated with ARM 17.24.308, 313, 314, 315, 321, and 322. Additional technical comments may arise once the maps are changed.
2. Pond identification should be darker and consistent with terminology in the narrative: EP1 verses Pond 1.

3. Road profile station identification and a defined start and end point must be depicted on the plan view map.

ARM 17.24.306, Prime Farmland:

- The prime farmlands investigation is not complete. According to the report the investigation covers Tract 2. Based on the soil survey map the facilities area does not fall within the Tract 2 boundary. Conceivably the majority of candidate prime farmland soils that would meet prime farmland criteria fall within the facilities area. There is no map included in the prime farmlands report to represent the area of study. A map is not required by rule; however, a map would clarify the intended area of investigation as well as make it possible to highlight the soils identified in the discussion.

  Please expand the prime farmland investigation to include the facilities area and represent this area and soil polygons discussed.

- Section 2.3 of the prime farmlands investigation mentions concurrence with NRCS through a site visit following supplemental data gathering. There is conflicting contact information as to which office of the NRCS was contacted for the determination. The supplemental soil report lists the Miles City office, but the Tract 2 soil survey and prime farmlands documents list the Broadus office.

- Complete the NRCS prime farmland concurrence portion of the determination. If two NRCS offices were used this is fine; however, if only one was used correct the language.

ARM 17.24.308, Operations Plan:

- Exhibit 308(A), section 2.8 describes soil substitution; however, under 313(1)(g) it states soil substitution will not be used. Please make these two sections consistent.

- Mine Plan, Map 8 designates spoil storage; however, in Exhibit 308 A, Appendix A, bullet #7 the spoil storage is referred to as temporary overburden storage (TOS). Reconcile to use consistent language.

- Bullet 20, Appendix A says, "If the dragline is not yet operational, strip dragline passes 2 through 5 using mobile equipment until the dragline is deployed." This statement leaves the several cuts, in their entirety from north to south open to soil stripping. Soils may not be the focus of this stripping statement; however, soil would have to be stripped ahead of any other material movement. If stripping is to occur for the sake of keeping equipment busy while the dragline is completed, this is not acceptable. Rule 17.24.638(2)(a) states: "disturbing the smallest practicable area at any one time during the mining operation ..." Thus soils stripped ahead of mining must be kept to a minimum, normally one operational pit, plus one to two additional cuts for operations associated with mining. Please clarify the intended stripping area.

- Exhibit 308(D) "waste handling", under 308 general, refers to 308C for an on-site waste disposal location which in turn mentions a location at the north end of the boxcut. The

waste disposal site is referenced to be represented on surface features Map 5; however, there is not a location marked on this map. Map 5 does not appear to have any locations for any mining facilities. The only elements pertaining to the permit are the planned boundary, tract locations, and what exists prior to mining. Please adjust this language to ensure the proper map is referenced.

- Section 3.8 sump waste does not indicate how a material will be determined to require land farming. Please indicate a determination method or reference a testing plan.

ARM 17.24.308(1)(b)(iii):

- No coal stockpile areas are depicted on any maps. The narrative must include a provision for open coal stockpiles at the truck dump area and/or depict coal stockpile areas on appropriate maps.

- Access/Haul Road Segment 1 appears to have no use as a transportation facility. This segment of road must be justified, removed or put into a category of ancillary roads.

ARM 17.24.308 (1)(f):

- Requires a plan to address noxious weeds. Section 3.0, Exhibit 308E_Otter Creek Mine_Noxious Weeds, refers to baseline vegetation inventories. This section only has the baseline information from Tract 2 and does not include the facilities area. Attachment B within this exhibit shows the weed distribution by community type. This only includes the Tract 2 Baseline information and not the facilities areas. The noxious weed plan locations need to address the entire mine; currently the facilities area has been left out.

- Please be advised that a noxious weed plan approved by Powder River County will need to be submitted to DEQ and submitted into the permit prior to approval of the mine permit application.

ARM 17.24.312, Fish and Wildlife Plan:

- Requires a Fish and Wildlife Plan. Please include a wildlife conservation plan to address species of concern and threatened and endangered species as part of the Fish and Wildlife plan.

ARM 17.24.312(1)(d): Requires annual wildlife monitoring methods to be discussed. The application states that monitoring will be conducted, but does not provide a description of the methods to be used. Please include a complete wildlife monitoring plan.

ARM 17.24.312(1)(d)(iii): Requires an explanation of how habitat of unusually high value will be protected or enhanced. There is a brief description of this included in Appendix, Exhibit 313G, but there is no explanation of where or how these will be implemented. Please include a map containing locations of existing habitats of high value as well as a description of how these will be protected and/or enhanced through the mining and reclamation process. Please provide a replacement commitment of these habitats of 1:1 or better.

ARM 17.24.313, Reclamation Plan:

- Overall, 17.24.313 cannot be reviewed until additional information on the reclamation plan and impacts to the surface water hydrologic balance (see comments under 17.24.314) are provided. CAD data that accurately shows the premine and postmine topography, drainage basins, and drainages is needed. The PMT must also show changes to the topography due to mine operations outside of the mine cut area (i.e. high wall reduction, spoil stockpile recontouring, etc). Comments in 17.24.313, 17.24.314, and 17.24.315 detail some of the deficiencies that must be addressed before a thorough review of the PMT and reclamation plan can be made.

- The PMT does not adequately approximate the premine topography or premine drainage basin distribution. Drainage designs are not geomorphically similar to premine; premine drainages were dendritic and some postmine drainages (drainage in EP4) are proposed to be orthogonal with 90 degree junctions of tributaries. Steep 'badlands' areas are replaced with broad valleys without any indication of how/if the steep slopes would be replaced in another area of the permit.

- Many drainages in the PMT show sinuosity at a level of detail greater than the contour lines. It is unclear from the permit how this drainage sinuosity will be reclaimed; will pilot channels be constructed in the topography? It is also unclear how the amount of sinuosity was determined. Postmine drainage characteristics such as sinuosity should be estimated using appropriate geomorphic reclamation techniques. These techniques include finding analogous premine drainages that resemble the proposed postmine drainage basin attributes, measuring the drainage characteristics, and using these to establish appropriate geomorphic attributes. Other techniques that relate drainage basin properties through empirically derived equations (for instance, relating slope and basin size to sinuosity) can be used to create appropriate drainages. These relationships should be based on data collected from local or regional drainages.

- The PMT has shallower slopes in the upland areas, and the SEDCAD models included in ARM 17.24.315 show a large reduction in sediment after the establishment of vegetation in reclamation (only 53% of the premine sediment yield for the 10-yr, 24-hr storm by year 3 of vegetative reclamation). Postmine sediment yields must more closely match premine conditions.

- Two large spoil stockpile areas are proposed outside of the mine cut area on top of clinker. The two areas are shown to not change on the PMT (they are outside the match line perimeter) which is highly unlikely. It is unclear in the mine plan if any of the spoil pile is proposed to remain on the storage area, although the narrative under ARM 17.24.520 states that all spoil will be utilized to construct the PMT. Please adjust the PMT to show any changes to contours from the final grading of the out-of-pit spoils or from the alteration of the topography due to reclamation of the spoils storage piles.

Exhibit 313D, Plate 1: Does not include premining drainage information or comparisons of drainage profiles as stated. Please provide the premining drainage information or comparisons of drainage profiles information as stated in Exhibit 313D.

Exhibit 313D, Page 1: The statement "There are no channels that contain critical hydrologic, ecologic or land use functions such as alluvial valley floors, wetlands, steep erosive upland drainages, drainages named on USGS topographic maps, or intermittent or perennial streams" needs to be removed or modified, as that determination has not yet taken place.

Exhibit 313D, Page 2: More detailed and variable drainage channel designs are needed. These could be based on determinant factors such as slope, floodplain, drainage area, sinuosity, etc. and should address the required approximation of premine drainages (and/or similar drainages occurring throughout the Otter Creek area). Without this backup justification the proposed 15 feet minimum floodplain width for first order drainages is too wide and unnaturally uniform.

ARM 17.24.313(1): OCC must commit to plans and actions, not state what is required. Please change the statement to "Each reclamation plan contains a description of the reclamation operations proposed, including the following information:"

ARM 17.24.313(1)(b): A timetable estimating major steps in the reclamation plan is required. Coal mining and reclamation are concurrent in nature, but estimations of major steps in reclamation can still be made. The following is an acceptable example: *A generalization of what is found within the Reclamation Plan is soil salvage – overburden removal (including blasting), uncovering of coal reserve – coal removal – backfilling – contouring – soil laydown – seeding – reclamation management – bond release. A generalized time schedule for each of these items should also be included (e.g. year one, year 3, etc.). A detailed description and estimated completion of each major step in the mining and reclamation sequence is as follows:*

- *Soil Salvage – Please refer to ARM 17.24.313...*
- *Overburden Removal – Please refer to ARM 17.24...*
- *Mining – Please refer to ARM 17.24...*
- *Backfilling and Grading – Please refer to ARM 17.24.313(1)(d)*
- *Redistribution of Soil – Please refer to ARM 17.24.313(1)(g)*
- *Revegetation/Seeding – Please refer to ARM 17.24.313(1)(h)*
- *Bond Release – Please refer to ARM 17.24.313...*

Special cases, such as haul roads, ramp roads, mine plant facilities, water treatment facilities, or temporary diversion structures are addressed separately as follows:

Haul roads – include how and when haul roads will be removed
Ramp roads –
Etc. -

- The pond designs should be based on the worse-case inflow scenario which requires a reclamation schedule map to indicate the expected state of vegetation reestablishment.

ARM 17.24.313(1)(c): Exhibit 313B States: "Bond Calculation will be submitted upon permit issuance." The bond calculation must be approved prior to permit issuance; therefore, OCC is reminded that a bond calculation must be submitted and approved, with bonding in place prior to DEQ issuing a permit. It is, however, not appropriate to calculate the reclamation bond until such time that the mine plan, reclamation plan (including PMT and revegetation plan), facilities, and other major factors effecting the bond calculation are at least preliminarily approvable.

ARM 17.24.313(1)(d), Postmine Topography:

- At least three representative cross sections depicting the removal and "final location of all overburden and parting material in the fill" must be submitted. These cross sections must differentiate between dragline and truck shovel material. Separate pre- and postmine, by cut, overburden removal and spoil placement cross sections may be needed to adequately describe the operation.

- The operator must submit digital data of pre- and postmine surfaces and a pit shell surface so DEQ can independently verify the overall spoil balance.

- To demonstrate the possibility of creating the proposed PMT, the operator must submit a yearly estimation of cubic yards of boxcut spoil, prestrip, and borrow spoil for the five year permit term and then the same information in five-year increments through the life- of-mine. Along with this information, a map must be submitted that sequentially depicts areas where the boxcut, prestrip, and borrow spoil material will be deposited.

- Exhibit 313C, Appendix A, CDG report, Page Appendix A-13 says Map 12 contains a pre- and post-slope and aspect comparison. No Map 12 was found. Slope histograms and an aspect wire diagram depicting pre- and postmine surfaces must be submitted.

- Section 3.0(2) of Exhibit 313C (Backfilling and Grading) states that overburden materials not conducive to revegetation techniques, "have not been identified in the Otter Creek Mine area." This appears to be at odds with the overburden analysis Baseline Report 304H, which identifies materials that require special handling or mitigation due to elevated levels of nitrate, saturation percentage, and SAR. Please correct this statement and submit a diagram illustrating the final location for these materials.

ARM 17.24.313(1)(d)(iv): Without pre- and postmine drainage profiles, legible annotated premine topography, and prestrip spoil placement, DEQ has only cursory PMT comments at this time; upon receipt of a revised submittal, DEQ will conduct a complete review of the PMT and associated topics (e.g. drainage profiles, spoil placement, etc.). The applicant must address the following:

- The PMT map must extend into the rail loop.

- Move the south edge of the hill blocking EP5 and allow the large drainage to flow through as it did in the premine landscape. This spoil material could be used to create a divide between EP5 and EP4.

- The office area cut is proposed to be backfilled and used as part of a prestrip spoil dump. This does not appear to be possible while maintaining contemporaneous reclamation.

- There is no apparent reason for the hill immediately northwest of the center of Section 23. Prestrip spoil used to create this hill should be used to raise EP6 drainage and create more flat topography that is dissected with smaller (less wide) incised features like the premine topography.

- Pass 26 is the last continuous pit. The middle ~4,500 feet of Pass 26 is final pit and ready for reclamation approximately six years before the north and south passes are finished. The spoil balance for the mined area, as a whole, includes 7,690,000 cubic yards of borrow materials. The applicant must reduce the amount of borrow in the Pass 26 highwall reduction area: i.e. leave the native finger ridge/bluff features in-place. Replacement backfill for this area could be found by implementing the following changes to the PMT plan:

    - Use more prestrip from the north half of the pit to backfill Pass 26. The PMT plan includes a hill in the SE ¼ of Section 11 (headwaters of drainages EP1 and EP12). As an unlikely scenario, this hill also crosses Ramp1. The PMT would replicate premine topography if the ramp was not backfilled into a hill and an incised drainage was created instead of the hill.

    - Reclamation of the spoil dump near the center of Section 14 could be delayed as an additional source of backfill.

    - The native valley on the highwall side of the pit east of Ramp 2 could be excavated back to the steeper headwaters of the drainage. This would eliminate borrow in the ridges and add diversity to the highwall reduction zone.

ARM 17.24.313(1)(e), Postmine Drainage Basins:

- The first paragraph in Exhibit 313D states, "Plate 1 shows a comparison of pre- and post-mining drainage ..." and the fifth paragraph states, "Plate 1 shows comparisons of drainage profiles for both pre-mining and post mining topographies." Plate 1 depicts no pre-mining information. A premine plate and appropriate information must be included.

- An objective and consistent method for determining the length and grade of premine and postmine drainages must be established. The method must be fully demonstrated to allow for DEQ verification of the results.

- Due to missing CAD data, it is not possible to conduct a full review of the surface drainage plan, however, the proposed drainages do not appear to be consistent with the approximate original contour. Also, the overall drainage pattern does not exhibit dendritic characteristics that would be expected of a drainage network through unconsolidated material.

ARM 17.24.313(1)(e)(ii)(a): The application does not discuss how the plan for protection of the hydrologic balance meets the performance standards of ARM 17.24.634. While Exhibit 313D lists these requirements, there is no discussion. For example, ARM 17.24.634 requires the reclamation of an approximate geomorphic habit or pattern. There is no discussion of such patterns in either pre- or post-mine drainages. Also, Exhibit 313D describes that overall drainage relief will be lowered post-mining, with no discussion of how that affects blending with drainage systems above and below the mine per ARM 17.24.634. Please provide a discussion relating to ARM 17.24.634.

ARM 17.24.313(1)(e); Exhibit 313D:

- Please reference where the premine drainage map can be found. Basins referred to Exhibit 313D Table 1 are not shown on any maps associated with Exhibit 313D and Table 1 cannot be verified. 17.24.313(1)(e) cannot be reviewed until all relevant data is included and correctly referenced in the permit.

- Exhibit 313D, Section 1.0, page 1. Plate 1 is incorrectly reported to show a comparison of pre- and postmining drainage divides.

- Exhibit 313D, Section 1.0, page 2. "Where bankfull channels are present ... may provide similar designs based on the 2-year, 24-hr storm event". The 2-yr, 24-hr storm event is not equivalent to the bank full flow (approx. equal to the 2-yr recurrence interval flow). This statement should be rewritten to commit to the 2-yr flow recurrence interval flow instead, and this will likely require detailed channel surveying prior to disturbance to establish the channel characteristics.

- Exhibit 313D, Section 1.0, page 2. "first order drainages will ...[have] a minimum floodplain width of 15 ft". A floodplain width of 15 ft is far too large for 1st order drainages. DEQ guidelines on stream reclamation suggest only mapping and reclaiming 2nd order or higher drainages in eastern Montana due to the difficulty in delineating 1st order drainages. More detail is required on stream reclamation plans and procedures.

- Exhibit 313D, Table 1. It appears that the drainages on the premine map used to calculate the drainage density came directly from the USGS topo map. To be consistent when comparing drainage characteristics, the same algorithm used to calculate and draw the postmine drainage density should be used to draw the premine drainage density. For example, if drainage lines are drawn for any contributing area greater than 10 acres in the postmine topography, then the same 10 acre criteria should be used with the premine topography regardless of what was drawn on the USGS topo map.

- Please submit longitudinal drainage profiles for the major tributaries to Otter Creek in the mine permit area per ARM 17.24.313(1)(e)(i).

ARM 17.24.313(1)(f): This rule was not adequately addressed and a more detailed reclamation plan is required. Among the many considerations, the plan should include considerations for floodplain sizing, drainage density, and the geomorphic habit. OCC is encouraged to contact DEQ when designing the drainage reclamation plan.

ARM 17.24.313(1)(f): Please provide detailed drainage designs which includes pre- and postmine profiles.

ARM 17.24.313(1)(f)(i): Segments of channels of both Otter Creek and Threemile Creek, named USGS drainages, are within the permit area. While these creeks are currently not within the mine area, they could be indirectly disturbed by mine-related activities. Long-term monitoring of their hydrologic functions and geomorphic characteristics would be appropriate to determine if impacts to the creek segments are occurring due to changes in sediment loads and runoff volumes. If the

disturbance boundary increases to include a named drainage, or indirect impacts are anticipated, OCC will need to develop a reclamation design and plan for these creeks.

ARM 17.24.313(1)(f)(ii): No typical designs or general fluvial and geomorphic habit and pattern were presented besides a statement about 4h:1v trapezoidal channels that will be properly sized. There is no indication how drainages will be reclaimed, how appropriately sized channels will be determined, how channels will be reclaimed, and how belt widths will be used during grading. A more detailed description and methodology for channel reclamation is needed. This may include a detailed baseline geomorphic study to determine premine channel features that have formed naturally in the area, channel cross-sections, and a justification of reclamation methodologies used to create channels in the postmine landscape.

ARM 17.24.313(1)(g), Soil Handling:

- Exhibit 313E soil handling plan does not include the facilities area. Even though there will not be mining in the facilities area, disturbance associated with facility development requires soil removal. Expand Exhibit 313E to include all surface disturbance areas.

- Exhibit 313E uses a swell factor in the soil volume calculation. Due to soil pore space, plant root voids, animal burrowing and environmental factors soil is more likely to shrink than swell during re-application. Since soil balance is a projection of what area salvaged soil might cover, the soil balance figures will be calculated without a swell factor. Please recalculate without using a swell factor.

- Exhibit 313 E, the third paragraph on page 1 discusses spoil quality through soil testing. On line 3 it mentions spoil unsuitability will be identified through soil testing. It would seem that one would need to test the spoil for spoil suitability not the soil. Please clarify or revise the language to refer to the intended test matrix.

- Exhibit 313F, Section 2.0 Nitrate Testing, may be removed from the spoil sample analysis.

- Exhibit 313F, Section 3.0, discusses sampling of replaced soils with suitability parameters. This could be done prior to soil salvage and is a current practice at Decker and Spring Creek coal mines. By sampling ahead of stripping, post soil laydown the only sampling required is depth. Consider revising the sequence to sample quality ahead of stripping. In this same section, replace Nitrate analysis with SAR in the list of parameters.
- Exhibit 313F, Section 3.0, in the first sentence the narrative states, "Direct placed soil will not require sampling." By the rest of the paragraph it appears this statement could be speaking of soil depth and suitability or only suitability. Clarify what type of sampling suitability or depth will be withheld upon direct placement of soil.

- Exhibit 313F, Section 3.0, the practice of soil depth staking adds precision to regrade work. Depth staking is ok to use for a general depth target; however, soil depths should be variable around a general target. Amend the language to reflect variable soil depths.

- Soil depth replacement requires a target depth. Based on ARM 17.24.313(1)(g)(iii)(B) there will be an anticipated soil replacement depth. If the plan is not designated in Exhibit 313E or F an appropriate reference will need to be cited.

- Please contact the DEQ soil scientist to discuss the soil handling plan. Some efficiency could be achieved while simplifying implementation in the field.

ARM 17.24.313(1)(h), Revegetation:

- In Exhibit 313 G, Appendix 313G is referred to as Appendix 313G-1. The Appendix is titled as 313G in its text and simply as Appendix in the bookmark table of contents. Make all labels and references consistent.

- Exhibit 313G_Otter Creek Mine_Table 2 Correlation includes a listing of each pre-mine community type with proposed revegetation mixtures. This table does not include the community types that were only present in the Facilities areas from the baseline information. Please update this table to denote which revegetation mixtures will be best suited to all premine community types.

- Appendix of 313G refers to Plate 1 of 313G. This plate has not been included in the application. Please include this plate to show post-mine land use locations as described.

ARM 17.24.313(1)(h)(i): Requires acreage of each reclamation type. Appendix, Exhibit 313G, includes reclamation types to be used, but does not include the estimated acreage of each of the reclamation types. Table 2, Exhibit 313 G, includes premine community types and the reclamation seed mixes correlated to each. Please include a table that includes each of the premine communities, reclamation types, and their associated acreages.

ARM 17.24.313(1)(h)(iii): Species and amounts per acre of seeds to be used are required. The seed mixes included in Exhibit 313G for Grazing Land do not contain any shrub components. In order to establish a diverse vegetative cover, shrubs will need to make up some component of these seed mixes (Cool Season Grassland and Warm Season Grassland). Please update these seed mixes to include a shrub component.

ARM 17.24.313(1)(h)(iv): 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 post mining land use is required.

- Introduced species have been included in the Pastureland/Cropland (Hay) seed mix but there is no discussion related to their use. Please include a discussion and explanation for the need and desire to use introduced species to meet postmining land uses.

- The Pastureland/Cropland (Hay) seed mix is predominantly comprised of introduced species. According to a regional source, Broadus NRCS, smooth brome and crested wheatgrass are not common species being used in the region for hay production. Smooth brome has been found to be less productive than intermediate wheatgrass and has limited nutritional value. Crested is utilized occasionally when spring grazing is the target. Tall

wheatgrass is often used as it is easy to establish and produces high biomass. Basin wildrye and western wheatgrass are two native species occasionally used in hay production. Please amend this seed mix to utilize wheatgrasses and alfalfa and remove smooth brome and reduce the use of crested wheat.

ARM 17.24.313 (1)(h)(ix): Requires a narrative of the method of revegetation including vegetation monitoring to be implemented during the period of liability. The vegetation monitoring plan in Exhibit 313G_Otter Creek Mine_Reveg Plan is inadequate and does not meet the standards of ARM 17.24.723. Please include a comprehensive vegetation monitoring plan.

ARM 17.24.313(1)(h)(x): Requires measures to determine revegetation success. The application states in Section 8.0, Exhibit 313G, Revegetation Plan, that technical standards for reclamation will be determined. Please provide these technical standards as part of the application. As additional monitoring data is collected, these will be reviewed and updated as necessary.

ARM 17.24.313(1)(i); Exhibit 313H: Not all aspects of rules ARM 17.24.1005 through 17.24.1018 were addressed in Exhibit 313H. Please review these rules and change the abandonment procedures to match. Additionally, prospecting outside the permit boundary is not allowed under the surface mine permit and will require a separate prospecting permit. Please remove this language from the application.

ARM 17.24.313(1)(j): Under 313 general, 313(1)(j) refers to Exhibit 308C as the section to explain reclamation of facilities. Exhibit 308C addresses facilities; however, there is not a discussion of reclamation techniques. Correct the reference to direct the reader to the location of the facility reclamation plan, add the proper discussion to Exhibit 308C, or include the facility reclamation plan in 17.24.313(1)(j).

ARM 17.24.314; Exhibit 314A:

- Section 3.1 will need to be revised if decisions made in respect to the MPDES permit result in changes to surface water drainage and control.

- It is unclear which ponds are being described in this Exhibit as the Drainage Control Map, Map 11, uses a different naming convention for the ponds (e.g. Pond 1 vs EP1 vs MPDS 1). Until the pond names are rectified, the drainage control plan cannot be fully reviewed.

- Section 3.1 Surface Water Drainage Control, page 2. "ponds will be sized to contain a 10-yr, 24-hr event ... in the pre-mining configuration." Per ARM 17.24.633 and 639, ponds must be sized to contain the 10-yr, 24-hr event at all times they are in use (worst-case scenario). Additionally, this statement conflicts with the statement made in response to ARM 17.24.639 where OCC states that ponds will be sized using the postmining configuration.
- Section 3.1 Surface Water Drainage Control, page 2. "ponds 1B and 7 are two potential discharge points along Otter Creek". Map 11 shows EP4 / MPDS 3 as a third discharge point to Otter Creek and should be included in the list of potential discharge points to Otter Creek.

- Section 3.1 Surface Water Drainage Control, page 2. "depressions in the spoils sized to contain 10-yr, 24-hr runoff from the post-mining drainage configuration". Per ARM 17.24.633 and 639, ponds must be sized to contain the 10-yr, 24-hr event at all times they are in use.

- In Section 4.0, ARM 17.24.631, General Hydrology Requirements, (3)(a) the application states that "Where feasible, clean water diversions of drainages will be used in preference to the use of water treatment facilities." In this case OCC has added the qualifier, 'where feasible' to the applicable rule. ARM 17.24.631 (3)(a) states that "Diversions of drainages must be used in preference to the use of water treatment facilities." OCC has again added the qualifier, 'where feasible' to the permit language in the following paragraph (17.24.631(3)(b). OCC's version of ARM 17.24.631 is not acceptable and must be modified: there is no 'where feasible' provision in the rule.

- Section 5.0, ARM 17.24.633. Water Quality Performance Standards, OCC again has selectively omitted or altered the language in rule (ARM 17.24.633). In Section 5.0 (1) OCC recites ARM 17.24.633(1), but changes the word 'required' to 'implemented' (see page 4). In Section 5.0 (1) OCC recites ARM 17.24.633(2), but omits the qualifying phrases, "until the disturbed area has been restored", and "evidence is provided that demonstrates...". It appears that in some instances, OCC recites the applicable rule verbatim, and in other instances, modifies or omits rule language. In order to maintain consistency and ensure that commitments are not eliminated or modified from the rule's intent, OCC must cite and address the applicable rule in its entirety.

- Section 6.0, ARM 17.24.638, Sediment Control Measures, OCC again has selectively omitted or altered the language in rule (ARM 17.24.638). In Section 6.0 (2) OCC states that "Sediment control methods to be utilized may include but are not limited to:" The rule (17.24.638(2)) does not include the qualifier, 'may'. This qualifier acts to potentially lessen the commitment required in the rule and must be removed.

- Section 9.0, ARM 17.24.644 Protection of Ground Water Recharge, OCC has altered the language in rule (ARM 17.24.644). In Section 9.0 (2) OCC states that "OCC will collect data and conduct studies *in consultation* with MDEQ to determine whether the recharge capacity of the mined lands can be restored to the approximate premining recharge capacity." As written in the Administrative Rules of Montana, ARM 17.24.644 states that "The permittee shall collect data and conduct studies *as requested* by the department to determine whether the recharge capacity of the mined lands can be restored to the approximate premining recharge capacity." Please revise the narrative to accurately reflect the rule.

- Section 11.0, ARM 17.24.651 Stream Channel Disturbances and Buffer Zones, OCC has altered the language in rule (ARM 17.24.651). OCC implies that Otter Creek will only be disturbed where transportation corridors cross, and that stream function will be restored only where stream crossings occur. Rules regarding channel disturbances and buffer zones as addressed in 17.24.651 are not limited to impacts resultant from transportation facilities. Stream function may be disturbed by alterations to the hydrologic condition, through interruption of flow, sediment loading, or other impacts caused by alteration to

local hydrologic systems, and may not be limited to areas of transportation infrastructure or facilities. The narrative must be revised to demonstrate how OCC will comply with rule 17.24.651 as written, and not limit compliance with the rule solely to stream crossings.

ARM 17.24.314: Exhibit 314B:

- Table 4-1. It is unclear what basins were used in the calculations; postmine drainage basin maps do not show 16 sub-basins while Table 4-1 provides calculations for 16 sub-basins. Please provide or refer to a map with the premine and postmine basins shown and labeled. The adequacy of the drainage characteristics to address 17.24.313, 17.24.314, and 17.24.315 cannot be evaluated until the additional information is provided.

ARM 17.24.314: Exhibit 314C:

- The PHC is too general in prediction of impacts.. Many of the predictions are qualitative where more empirical information is needed. For example, as stated on pages 5-3 and 5-4 of the PHC, water routed to the proposed infiltration ponds is anticipated to enter clinker and flow downgradient toward Otter Creek alluvium; some of the water will be removed by evapotranspiration and a "small fraction" will enter Otter Creek as surface water. What is a "small fraction" and how was it determined? As another example, on page 4-7, the statement "It appears the interchange of water between the creek and clinker is limited..." needs further explanation using quantitative information.

  The PHC will need to be modified to reflect results from the revised groundwater model. As changes to the quantified estimates of changes to water levels and water quality from mining may be changed, water quality projections will be reviewed for comment after modification of the model.

  Using empirical data, estimates of impacts to the Tongue River must be included in the PHC.

  The PHC analysis would greatly benefit from incorporating research from other scientists on the hydrogeology of the Otter Creek area. For instance, a 2012 paper by Meredith and Kuzara in *Groundwater* indicates that the Knobloch coal provides baseflow to Otter Creek near the permit area. MBMG annual reports on coalbed methane also include Otter Creek alluvial data.
  DEQ agrees that leaving a coal buffer to slow infiltration to and from the coal into adjacent lithologies and surface water will benefit the hydrologic balance. Text on page 5-3 in the PHC refers to the 500 foot buffer of unmined coal that "will provide a constant hydraulic conductivity to limit flow into and out of the Otter Creek Mine" in order "to maintain current hydrologic conditions between the active mining and spoil...and weathered coal...near Otter Creek". This discussion is somewhat misleading in that it ignores the fact that hydraulic head differential will contribute to the movement (flow) of water between the groundwater units (and surface water) and suggests that "current hydrologic conditions" will be maintained despite the substantial changes to the hydrologic balance during mining.

Although Figure 5-11 in Appendix A suggests there will be impacts to stream flow during initial development of the boxcuts, the impacts to Otter Creek from reduced stream flow are not discussed in the PHC. Please discuss the impacts and change in gradient between alluvium, Knobloch coal and resulting changes in surface flow. Also address the impact of any reduction in alluvial water levels on the ability of the Otter Creek alluvium to support sub-irrigation.

- Section 3.0, page 3-1. The Climatological Report is incorrectly referenced in Exhibit 3141. It is in 3041.

- Section 3.3, page 3-1. Please provide justification for why the evaporation measurement at the Yellowtail Dam should be similar to evaporation at the proposed Otter Creek mine area.

- Section 4.1.1, page 4-2. Please list all surface water users and rights holders from the DNRC database and discuss impacts to the users in the area. The list should include stream, pond, and spring water sources.

- Section 4.4.1, page 4-8. The statement "Groundwater flow patterns do not indicate discharge to Tenmile Creek or Threemile Creek alluvium" is misleading. The potentiometric surface reflects insufficient monitoring points for determination of flow into alluvium in these tributaries. Cross-section F shows the connectedness of coal via clinker into Threemile Creek alluvium. In cross-section H, coal is shown underlying alluvium in Tenmile Creek. Please re-evaluate the above statement.

- Section 4.4, page 4-5. "Otter Creek alluvium exhibits evidence of recharge from the creek, although the magnitude is relatively small and response times longer than would be observed if there were direct contact with the creek." This seems contradictory to statements made in the groundwater model that Otter Creek is gaining from alluvium within the study area. Please re-evaluate the above statement.

- Section 4.5, page 4-9. Please specify the database used to identify springs.

- Section 5.0, page 5-1. This section does not adequately address the impacts to surface water quantity during mining and postmine. Please provide a surface water model showing the following conditions: premine, during mining with retention ponds in place, and postmine after pond removal. The model should be used to show the expected changes to the surface water system from mining. Include the hydrograph, sediment graph, and a table showing the peak flow, time of concentration, volume of flow, and volume of sediment for each given storm event for all of the modeled basins. At minimum, use the basins defined on the premine and postmine drainage basin maps. Model at least the 2-yr, 24-hr, 10-yr, 24-hr, and 100-yr, 6-hr storm events. Provide all model inputs and output reports and graphs. Justify and explain all model inputs. The model used in ARM 17.24.315 may meet most of this request. Discuss the results in relation to the hydrologic balance in the PHC.

- Section 5.0. The PHC should address impacts to aquatic life and aquatic life habitat as part of the surface water hydrology assessment; aquatic habitat is a beneficial use of the river. Particular attention should be given to the effect on the brassy minnow and plains minnow as they are potential species of concern and the mayfly, *caenis youngi*, as it is a species of concern.

- Section 5.2.1, page 5-2. This section implies that there are no downstream consequences to lower TSS discharge water and postmine runoff entering native channels. This assumption may not be correct as low-sediment water may create impacts from increased downstream erosion due to 'hungry water'. The implications of low sediment water should be investigated and discussed.

- Section 5.2.1, page 5-2. This section does not attempt to quantify the consequences to surface water from mining. For example, how much lower of a stream velocity is expected in the postmine channels? What is the expected difference in sediment load for various sized events due to ponds and the postmine landscape? Please use the results of a surface water model to justify and roughly quantify the impacts.

- Section 5.2.1, page 5-2. Using baseline data and the anticipated changes in soil composition please discuss the potential for changes to major ion or trace metal concentrations due to runoff after reclamation.

- Section 5.2.2, page 5-4. The proposed ponds built on clinker adjacent to the stream will result in infiltration into Otter Creek. Assuming the flow budget from the groundwater model is correct, the estimated contribution to baseflow would be significant (with 0.2 cfs baseflow and 0.11 cfs groundwater this is a 55% increase in flow). Baseflow characterizes the flow for much of the year. Please identify the surface and groundwater quantity and quality impacts from the proposed ponds including during low flow and high flow conditions. Please also consider if infiltration will result in a rise in the water level of sub-irrigated land adjacent to the stream and the implications for a rise in stored salts. Due to the downgradient position of these ponds in relationship to areas affected by mining and their position below monitoring, they will need to be monitored for water quality. Please propose a plan for monitoring these ponds.

- Section 5.3, page 5-5. ARM 17.24.648 should be cited to commit to the replacement of ponds P1 and P2 if needed. If pond P4 is designated to be replaced with a sediment control pond, this pond will need to meet the requirements for permanent impoundments.
- Section 6.0. The water source for the wells to be developed for domestic or industrial use at the mine must be included in the groundwater impact analysis.

- Section 6.1, page 6-2. "No changes in groundwater levels at the permit boundary are expected." This statement is incorrect. The groundwater model predicts drawdown outside of the Tract 2 permit boundary in alluvial wells A-3 and A-7. Please re-evaluate this statement and make it consistent with the ground water model.

- Section 6.1, page 6-2. The PHC states that underburden aquifers are hydrologically isolated from the coal unit by confining shale layers, but little evidence besides lithology

from well logs is presented. Please expand on the justification for assuming the underburden is hydrologically isolated. If there is a possibility that underburden aquifers could be impacted, even if the impact is small, the potential effects should be explored via a groundwater model and discussed. "Similar observations and assumptions regarding the significance of underburden in the Otter Creek Flow model are quoted as follows (Cannon, 1985): ..." Cannon was referring to the lack of influence of the deeper units on the stream-alluvial aquifer system, and the quotation was not a comment on the deep aquifer's significance with respect to the removal of the coal or in relation to a spoils aquifer. This statement and reference should be removed or revised.

- Section 6.2. Overburden samples submitted for chemical analysis of saturated paste extracts were used to provide an estimate of initial spoils groundwater quality after the methodology of Van Voast et al (1978). Given the disparity of EC and SAR between the top 30 to 50 feet of the overburden and the lower overburden sections from the boreholes, this approach may not be representative of water quality. The more mineralized top of the overburden is cast into the bottom of the pit and will likely create greater ionic concentrations in the recovering groundwater than would be expected from the average for the entire borehole length. When available, please include the results of the column leach tests in the discussion of the postmine groundwater quality. Additionally, please indicate the location/number of the four exploration boreholes chosen for the column tests.

- Section 6.2. The discussion of water quality in the PHC needs to include the results of the modeled water quality estimates (Appendix A, Table 5-2).

- Section 6.4.1, page 6-8. Springs are incorrectly referenced as shown on Plate 2.

- Section 6.4.1. Not all of the springs within the permit boundary were addressed in this section (SSI-11-18, SSI-10-002, etc.). Please address all springs within the permit boundary or outside the permit that could be affected by mining operations and regional drawdown.

- Section 6.5. A number of wells in Table 6-1 list "no lithologic information" for the potential impact. Please indicate whether or not wells without lithologic information were eliminated from consideration of impacts. The applicant must use other methods to gain information (e.g. depth) about wells that were not identified from publically available sources.
- Section 6.5. Modeled drawdown extends beyond the private well inventory. Well inventory must be expanded to show all wells within the affected area and analyzed for the potential degree of impact.

- Section 6.5, page 6-10. "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." If this is the case please do not draw an overburden potentiometric map that would suggest that the overburden was hydrologically connected.

- Section 9.0. This section is unnecessary in the PHC. The Cumulative Hydrologic Impact Assessment is written by DEQ.

- Appendix A. A number of concerns were identified during review of the groundwater model and DEQ determined that the groundwater model is insufficient to model impacts from the proposed Tract 2 mining operations. DEQ identified some of the same concerns as the third party contractor that reviewed the model and concurs with the comments, concerns and questions presented in that review. The model review is attached at the end of the comments in this letter. Please address the comments within the attachment letter titled Preliminary Comments on Otter Creek Mine Groundwater Flow Model presented in Appendix A of Exhibit 314C, Probably Hydrologic Consequences, SMP C2012018 provided by Mr. Terry Grotbo of New Fields, dated February 20, 2013. These comments were provided to DEQ by our contractor in charge of preparing the EIS for the Otter Creek Project. The comments were generated during the review of the baseline data in advance of preparing portions of the EIS. DEQ has reviewed and is in agreement with the comments.

- Despite the depth to the underburden below the coal and the low conductivity of the intervening strata, the underburden is expected to show some response to mining. On Table 6-1, approximately 17 private wells were identified to be potentially completed in the productive sandstone unit of the underburden, and this list does not include all of the wells within the area impacted by drawdown. In similar coal mine settings throughout southeastern Montana, the underburden has been observed to show a physical response to mining. As the productive sandstone approximately 100 feet below the coal is used by local residents, it must be included in the drawdown model. Monitoring wells that are completed in this unit include B10-U, B8-U, B7-U, B5-U, and B2-U. The application states that "reported declines (in this unit) could be a function of water management practices, which allow unrestricted flow from the wells, thus depressurizing the system." It is important to predict (and monitor) the impacts from mining to differentiate between depressurization from local use practices verses mining. This is also important if a well for domestic use at the mine is to be completed in the sandstone underburden unit.

- "Similar observations and assumptions regarding the significance of underburden in the Otter Creek Flow model are quoted as follows (Cannon, 1985): ..." Cannon was referring to the lack of influence of the deeper units on the stream-alluvial aquifer system, and the quotation was not a comment on the deep aquifer's significance with respect to the removal of the coal or in relation to a spoils aquifer. This statement and reference should be removed or revised.

- A fundamental assumption used in the modeling process is the use of dewatering wells and injection wells. The injection wells are modeled in a line across a large region of clinker. In the mine plan, this area is designated as a spoils stockpile. It is unlikely that the wells will be placed on top of the spoils pile. The location and number of injection wells, dewatering wells, and other major hydrologic controls needs to be ascertained and correctly modeled. The impacts to the alluvium and other downgradient aquifers may change with major changes to the hydrologic control plan.

- Due to current restrictions on discharge into Otter Creek, the plan for dewatering and injection into the clinker may not be an acceptable option for dewatering or managing pit inflow. Please propose other options for management of the water. In revising the model, please include an analysis that does not include the injection wells.

- When available, please incorporate the results of the column leach tests into the water quality model for spoil water quality (Appendix A, Table 5-2).

- The groundwater flow model shows recovery at 10 and 100 years. At 100 years, recovery is shown as being complete. Please show recovery at time intervals between 10 and 100 years, based on time to modeled total recovery.

- It would be very helpful on the potentiometric surfaces and drawdown maps of figures 5-3 through 5-10 if the area of mined cuts were shaded in or otherwise indicated. Scale bars and north arrows are also needed.

- The maps of simulated potentiometric surfaces and drawdown are difficult to read on the USGS background. Please use the base maps submitted with the application.

- The method for predicting water quality shown in tables 5-1 and 5-2 has caused confusion for some reviewers. In Table 5-1, Step 1, why is "Q- clinker out" not used as the input for flow from clinker to Threemile Creek alluvium? Subsequently, why is the resulting flow from Threemile alluvium, not added to the input from Threemile Creek alluvium to Otter Creek alluvium and from this alluvium to Otter Creek? Please explain under 5.4.1 why cumulative flows and associated concentrations are not used to predict the water quality.

ARM 17.24.314: Pursuant to ARM 17.24.638(2)(a), the operator must minimize disturbance at any one time. The temporary spoil storage area is extensive and scheduled to remain until final backfill of the pits. The applicant needs to consider using the top of this stockpile area for other stockpiles like scoria or soil.

ARM 17.24.315 Plan for Ponds and Embankments:

- Map 11 located within ARM17.24.305. There is no sediment / runoff control plan for the side of the road closest to Otter Creek. There is also no control for soil piles on the west and north sides of the main haul road. Sediment is not routed to an MPDES site or other control structure. Please provide additional information pertaining to these comments.

- There is no specific plan for the dewatering and injection wells. The proposed location, quantity, and anticipated pumping rate must be included in the permit. The dewatering plan cannot be evaluated until this information is submitted.

- Exhibit 315A, Appendix A, Attachment A. The SEDCAD results cannot be analyzed without knowing where the SEDCAD basins are and the sequence they are networked together. Please provide networking diagrams and a map showing the location and size of the SEDCAD basins.

- Appendix A, Figure 3-2, Figure 1-1. The drainages in the premine and postmine maps are not drawn using the same basin criteria; the premine basins are drawn to show the catchment area for proposed mine ponds and the postmine basins are drawn to encompass the entire sub-drainage. It is unclear which basins are being referred to in the runoff models and drainage geomorphic comparison tables located in 17.24.304. Please show the entire sub-drainage on the premine map for Figure 1-1 or include an additional map in the permit that shows the sub-drainages. The permit cannot be reviewed for its adherence to 17.24.313, 17.24.314, and 17.24.315 until the drainage basins are clearly delineated.

- Appendix A, Figure 1-1. Drainage basins EP2A, EP3A, and EP4A are not labeled on the map. Please label these basins appropriately.

Exhibit 315A, Section 2.0,

- Page 1. The language in the first paragraph implies that Pond 5 will be used to collect surface runoff only. In the third paragraph it is stated that Pond 4 will receive pit water from dewatering operations. Please clarify which ponds will receive surface water runoff only and which ponds will receive a combination of surface water and groundwater. In addition, please note if the additional water volume required in ponds that receive pit water was calculated into the pond volumes.

- Exhibit 315A, Section 2.0, page 1. "Preliminary pond sizing is summarized in Table 1." Table 1 could not be found. Please provide Table 1 or directions to find Table 1.

- Exhibit 315 A- Appendix A Ponds and Embankments Hydrology and Sedimentology Report:

- The Administrative Rules make a distinction between Sedimentation Ponds and Sediment Traps (see ARM 17.24.301 (110) and ARM 17.24.638). The impoundments being described in this report meet the definition of Sediment Ponds; please correct the terminology throughout the report.
- Section 2.0 Paragraph 4 reads: "These 10-year, 24-hour sediment traps will be based on post-mining drainage acreage and configuration, SEDCAD modeling of runoff volume in a 30% bare and 70% vegetated soil condition, and three times the average annual sediment volume based on SEDCAD modeling of this condition unless otherwise noted." Please delete this sentence.

- For the purpose of sizing Sediment Ponds, an assumption of 30% bare and 70% vegetated is too general to provide a reliable estimate for some basins (i.e. Basin 15). The vegetative cover parameter should be based on the Reclamation Schedule Map which will indicate the maturity of vegetation.

- The Report, Tables, and Figures 1 and 2 must be changed so the basins and acreages are consistent or more explanatory text must be added. The basin labels, acreages, areas and subareas are difficult to follow, i.e. Table 3-1: the table references Basins EP 1A, EP1 B but these are not labeled on the pre mine drainage basin map, the pre mine acreages in

Table 3-1 should sum to that of the pre mine Basin EP1 if they are just sub areas. Table 7-1 acreages do not appear consistent with either Table 3-1 or the figures.

- Pond Designs: An individual design sheet must be provided for each pond. The pond design requirements are set forth in 17.24.639 (28) (a) and parts 1, 2, 4, 6, 18, 22(a), 24, and 27. Once the pond is constructed, the design sheet can then be updated and certified as an As-Built to meet the requirements of ARM 17.24.640(28)(b) and 17.24.639(1)(d).

  The design sheet should include: a plan view, several cross sections, a table of elevation versus storage, sediment storage requirement calculations, a map of the specific drainage basin with the maturity of vegetation delineated, a table providing the acreage weighted average CN number calculation, a table of the SedCad parameters used along with output results and any other information of importance in the design and construction of the pond. The output results will include the peak pond inflow rate and the volume for the 10-year, 24-hour and 25-year, 24-hour event. The elevation versus storage table should indicate the maximum storage pool elevation at which the storage volume for the 10-year, 24-hour storage volume plus 40 percent of sediment storage volume still remains. This is the water elevation above which the pond must be pumped and/or sediment cleaned out. Storage available below the elevation required to provide runoff and 100 percent of sediment containment can be labeled and used as supplemental water/sediment storage. Also, any ditch that is needed to meet the 10-yr, 24-hour event storage requirement must have design calculation i.e. the ditch between Pond EP-1 and Pond EP.

ARM 17.24.318 (1): Requires for any public parks, historic places, or other significant cultural resources identified in ARM 17.24.304(1)(b) that may be adversely affected by the proposed operations, each plan must describe the measures to be used to minimize or prevent these impacts, the timing and tracking of these measures relative to the disturbance schedule, and how the applicant will obtain approval of the department and other agencies as required in ARM 17.24.1131.

Exhibit 318 A states the "Cultural Resources Mitigation Plan will be submitted at a later date." Please provide the required information to comply with ARM 17.24.318 (1).

ARM 17.24.321, Transportation Facilities Plan:

- All roads are required to have a design. Unless the access road is to be 100' wide, Exhibit 321A, Plate 1 must include a cross section for the access roads.

- Design information for ancillary roads, roads other than the access and haul roads, must be addressed. A discussion for these roads must include appropriate map information and a discussion about soil handling, maintenance, width, and use and be depicted on a plan view map. Ancillary roads would include dragline walkways through native ground or those which would delay reclamation and roads used to access the dragline erection site, stockpiles, and monitoring sites.

- According to ARM 17.24.321, appropriate road designs must meet the requirements of ARM 17.24.605. Pursuant to ARM 17.24.605, road water control structures must handle

the 10-yr, 24-hr storm event. The permit must include appropriately sized culverts and ditches. The location of culverts must also be depicted on Exhibit 321A, Plate1, Plate 2, and Map 8. Additional culverts may need to be installed: the applicant must address crossing Otter Creek and the drainage between the shop building and waste disposal area.

- A commitment for submittal of design information, prior to construction, on haul road segments 4, 5, and 6 should be added to the permit if no design information is included at this point in time.

- Pursuant to ARM 17.24.602(2), DEQ cannot approve the at grade native crossings at Ponds 1B, 2, 3, and 4 on Access/Haul Road Segments 1 and 2. Culverts must be designed and fill compacted across these drainages.

- OCC must justify a need to construct Segment 1. It is not a haul road and does not meet the definition of an access road.

- Due to missing CAD data, it is not possible to conduct a full review of the Transportation Facilities Plan. A thorough review will be completed upon submittal of the necessary CAD data.

ARM 17.24.321 Transportation Plan

ARM 17.24.321 (1) Exhibit 321 A

Plate 1:

- All bridges and culverts must be shown on road profiles and on the plan.
- There are a number of inconsistencies between this and Map 8 Mine Plan that need to be corrected.
- Road Segment 6 is not shown on the plan and no profile is provided.
- Haul roads must be shown on Exhibit 321 per ARM 17.24.321 (4).
- No culvert is shown under Rail loop access road at station 10+00. Is this an oversight?

ARM 17.24.605 (4), Rail Loops and Roads:

- A Culvert Table is needed to demonstrate adequate conveyance. The table columns should indicate the Culvert ID, culvert type, number of pipes and sizes (i.e. 1- 36", 2 - 24"), minimum roadway elevation, length, culvert inlet and outlet invert elevation, design discharge, headwater elevation at the design discharge.

- Hydraulic calculations must be provided that show that the culvert/bridge used in the Otter Creek crossing can safely pass the 10-yr, 24-hr event and will meet the requirements of ARM 17.24.605.

ARM 17.24.322: Due to missing CAD data, it is not possible to conduct a full review of the Geologic Information and Coal Conservation Plan. Please provide the appropriate CAD data for the geologic information and Coal Conservation Plan.

ARM 17.24.325, Alluvial Valley Floors:

- An AVF determination by the DEQ cannot be undertaken until first round hydrology comments are addressed and all information regarding water levels, wells, flow budgets, water quality data and vegetative production is updated and complete.

- Piezometers must be installed at appropriate rooting depths for agricultural crops grown in the lowlands adjacent to Otter Creek in order to monitor water level and water quality prior to and during mining. Please propose locations and depths for the piezometers. Placing piezometers adjacent to the existing AVF alluvial wells would seem to be appropriate, but locations upgradient and downgradient of the current AVF sections should also be considered.

- BR325, Plate 9. The color infrared aerial cannot be interpreted over the Tract 1, 2, and 3 areas due to excessive shading of the photo. Please revise the map so that the infrared imagery can be seen and submit the photo used for the map. Per ARM 17.24.325 (2)(vi), a series of photographs showing the late summer and fall differences in vegetative growth must be submitted.

- Impacts to sub-irrigation from mining due to changes in water quantity and quality may occur downstream, off the permit area. The AVF study area outlined on Plate 1 extends to Ashland. Please expand the entire AVF data set including crop production data, geologic map, depth to groundwater and sub-irrigated farmland to Ashland, MT. Agricultural production information must be collected specific to each individual farm/ranch operation – this is needed to determine the significance of any identified AVF.

- The map unit numbers on Vegetation Plate 6 are illegible. Please correct this map.

ARM 17.24.325(2)(a)(ii), AVF Vegetative Productivity:

- Mapping of all lands included in the area and accompanied by vegetative productivity and type is required. BR325A_Otter Creek Mine_Appendix A Vegetative Cover Data contains vegetative cover information from Tract 2 for sites within the AVF study area. This Appendix does not include vegetation sample sites within the facilities area that also including those that fall within the AVF study area. Please ensure all vegetation sample sites within the AVF study area are included in this Appendix.
- Baseline Report 325B_Otter Creek Mine_Ag Production, Section 4.1 Thane Thomas Ranch, includes hay production summaries from the attached tables. The range for hay production of individual fields for 2010 is listed as 0.69 to 2.16 t/ac when the actual range is 0.69 to 2.72 t/ac according to the attached tables. Please correct this information and ensure other values are corrected and consistent as well.

- Section 4.2, Ross and Dennis Denson Ranch includes hay production summaries from the attached tables. The range for hay production of individual fields for 2006 is listed as 0.62 to 1.52 t/ac when the actual range is 0.16 to 1.52 t/ac according to the attached tables. The range for hay production of individual fields for 2010 is listed as 0.75 to 2.62

t/ac when the actual range is 0.75 to 2.70 t/ac according to the attached tables. Please correct this information and ensure other values are corrected and consistent as well.

- Mapping of croplands and undeveloped rangelands accompanied by measurements of vegetative productivity and type is required. Baseline Report 325B_Otter Creek Mine_Ag Production contains information related to hay production on portions of the AVF study area. To make a determination of significance on vegetation, the department will need to compare production values within the AVF study area to production on lands not within the study area based on individual landowner operations. This production data will need to be broken out into vegetation types including floodplain, bench, and upland. All fields affected by flood irrigation need to be separated out or specially denoted. Please include this information in the application.

ARM 17.24.325(2)(a)(iv), AVF Soils:

- Measurements of rooting depth are required. BR325A_Otter Creek Mine_Table 3, Tract2, Soil Data, contains soils data from the Tract 2 study area within the AVF study area. The table has AVF Vegetation Classes listed for each sample site. There are two vegetation class values, 5 and 6, that are not included in the key. Please include all of the vegetation classes in the key to explain which sample is in which AVF vegetation class.

- Table 3 and Table 1 both reference vegetation classes, but are not consistent between the two. Please use consistent vegetation classes within the application.

- Table 3 only includes soil samples from the Tract 2 study area. There were numerous soil samples in the facilities area of Tract 2 that fall within the AVF study area. Please include these soil samples in this table. Also, as this table is referenced in Baseline Report 325A, these additional soil sites need to be taken into consideration in this report.

ARM 17.24.325(2)(b)(ii)(B): Addresses whether or not there is sufficient water to support agricultural production based on stream-flow. BR325A_Otter Creek Mine_Table 4 Ashland Discharge has the "annual" and monthly means for Otter Creek discharge at Ashland. There are discrepancies in the "annual" discharge in comparison to the monthly discharges for a number of years. It appears as if the information has been transposed to differing years when the two separate tables were combined by the applicant. Please correct this table to ensure accurate information is being presented. While updating this table, please include the most up to-date information available.
"Annual" is being mis-represented in this table. The actual data being presented is the average for the water year ending in that year based on daily values. The way the information is presented directs the reader to believe that the "annual" data is the average for that calendar year. Please make this table more clear or break the data into two tables to avoid confusion.

ARM 17.24.501(4): All final grading must be to the approximate original contour. Due to missing CAD data, DEQ is not able to conduct a full review; however, the currently submitted documents do not appear to be in compliance with this rule.

ARM 17.24.501(4)(c): Postmining graded slopes must approximate the premining natural slopes in the area. Remove "to the extent practicable consistent with material availability and minimization of erosion".

ARM 17.24.501(6): OCC must consider the following findings.

- Exhibit 313C proposes a scenario where more than 4 spoil ridges may be required near the end of mining and more than 2 years may be required before grading is complete if coal sales are less than 20 Million Tons/year. Adequate written justification and documentation provided by the operator has not been submitted in regard to deviating from the performance standards located in ARM 17.24.501(6)(a)

- In addition to the above two situations, page 2 of Exhibit 308A, Appendix A, describes a mine sequence where the dragline must strip through Pass 15 before there is sufficient area to receive spoil from northern boxcut. Pass 15 is not scheduled for mining until Year 6 (see Map 1) and backfilling to the postmine topographic grade will just begin at this point in time. Once backfilled, additional time will then be required to grade the truck dump to the final postmine contours.

  It is DEQ's opinion that after eight years of mining at 20 million tons per year, OCC will have a large area of disturbance and little or no reclamation. The disturbed area will include: roads, shop, out-of-pit soil and spoil stockpiles, ponds, boxcut spoil and other mined spoil areas that are being held ready to received pre-strip, active pit, pre-strip areas that may include multiple benches due to height, and soil removal in advance of mining.

  The application is deficient in addressing the above issues. Pursuant to ARM 17.24.313(1)(b) and (d), the volume of yearly boxcut and prestrip cubic yards must be estimated and a reclamation sequence map and table estimating yearly disturbance and reclamation acres for the first five years and then five-year increments there after must be submitted.

ARM 17.24.501(6)(b): OCC must commit to completing backfilling and grading within 2 years after coal removal from each pit.

ARM 17.24.507: Due to the possibility that infiltration and runoff may reach surface or shallow groundwater on or adjacent to the mine, on-site solid waste disposal must be in a lined facility, away from clinker, or the waste must be hauled off-site for disposal. Tires, wood waste, concrete, fencing, culvert, pipes and other non-reactive waste without oil or grease residue may be deposited in the pit securely above the postmine water table and at least eight feet below the postmine surface.

In the Waste Disposal Plan 308D, the following sections must be addressed:

- Section 3.6, Impacted Earthen Materials, describes the intended methods for handling and treatment of petroleum contaminated materials. Unless the affected material is taken off site, DEQ requires development and operation of a landfarm according to DEQ guidelines that are not addressed in Section 3.6. Please consult with DEQ for further guidance.

- Section 3.7, Containers and Maintenance Waste, must clearly state that all petroleum contaminated waste such as oil filters, oil-soaked rags, solvent rags and used sorbent material will be contained for disposal offsite and not placed in an on-site waste disposal area.

- Please describe the type and location of the containment facility that will be used to store hazardous and other containerized waste stored for shipment off-site.

- Section 3.8, Sump Waste: Sump waste may not be placed in the backfill prior to sampling and treatment in the landfarm/land treatment unit until remediation goals are met.

ARM 17.24.515: Please show the highwall reduction area on a map and include the area in an anticipated life-of-mine disturbance area. Additionally, include a map showing steep slopes, bluffs, etc. that will be committed to in the PMT reclamation plan.

ARM 17.24.515: A map and table depicting premine steep slope features is included in Volume 2, Baseline Report 304C. Exhibit 313C, page 7, refers to leaving steep slope features in the post mine landscape: this exhibit should include a specific reference to the map and tables in Volume 2.

ARM 17.24.601(9): Magnesium Chloride is proposed for haul road dust control. The applicant is strongly encouraged to propose an alternative dust suppression material.

ARM 17.24.609: Exhibit 308C, 2.2 Support Facilities, references the shop area wash bay. Please ensure that the wash facility meets BTCA and recycles rather than releases wash water. Wash water must not be released into the mine drainage system. Please submit designs for the wash bay and fueling stations.

ARM 17.24.609(3): Several facilities common to surface mining are not depicted on the map. The operator should designate a bone yard, scoria pit, and fueling station on a map. Additional detail or at least a commitment to submit additional information on the conveyor system must be submitted prior to construction. In addition, all Montana Department of Transportation requirements must be addressed prior to construction of the conveyor crossing and construction of any access to the highway.

ARM 17.24.624(6): This rule requires periodic airblast monitoring. Exhibit 310A, Mine Blasting Plan, Section 6.0, third paragraph must be changed to commit OCC to compliance with this rule and monitoring at least one time a year for all types of blasting (pre-strip, overburden, coal).

ARM 17.24.626(1): Additional commitments must be added to Exhibit 310A, Mine Blasting Plan, Section 8.0. Please add a commitment to complete and accurate records at the time of inspection and a record with all pertinent information contained in this rule.

ARM 17.24.633, Water Quality:

- Section 5.0, Exhibit 314A, will need to be revised if decisions made in respect to the MPDES permit result in changes to surface water drainage and control.

- Drainage Control Map 11 does not include any sediment control on the west side of the access road parallel to Otter Creek. Also, large soil stockpiles located between the access road and Otter Creek require some type of drainage control. The application must demonstrate that stockpile runoff will be kept from entering Otter Creek.

- Exhibit 314A describes the mine as having "zero discharge" to surface water. There is no discussion of how water routed to infiltration Pond 1B may impact nearby Otter Creek. As the pond is constructed on scoria, there is a probable hydrologic connection to the creek. If so, water infiltration through Pond 1B must be considered a discharge to surface water and DEQ will require additional information on the quantity and quality of this effluent and impacts to receiving water quality.

- Exhibit 314A refers to ponds as Pond 1, Pond 6, etc. while the Drainage Control Map refers to ponds as EP1, EP6, etc. Please keep naming conventions the same or provide clarification to avoid confusion.

- Exhibit 314A refers to Ponds 1B (MPDS 1) and 7 (MPDS 4) as potential discharges to Otter Creek. However, Drainage Control Map 11 shows additional discharge points at Pond 2 (MPDS 2) and Pond 7 (MPDS 4). If these are also potential discharge points to Otter Creek, please include them in the discussion. Please provide clarification whether these outfalls discharge directly to Otter Creek, or to an ephemeral tributary.

- Injection wells described in Exhibit 314A are not shown on Drainage Control Map 11. Please include the injection well on Map 11.

ARM 17.24.634: Due to missing CAD data, it is not possible to conduct a full review of the Reclamation of Drainage Basins, however, the proposed drainages do not appear to be consistent with the approximate original contour.

ARM 17.24.639: Exhibit 315A, Appendix A, page 2-2. "10-year, 24-hour sediment traps will be based on post-mining drainage acreage and configuration, SEDCAD modeling of runoff volume in a 30% bare and 70% vegetated soil condition, and three times the average annual sediment volume based on SEDCAD modeling of this condition unless otherwise noted." Per 17.24.639, the ponds must be designed for the worst-case scenario of drainage basin size and sediment runoff.

ARM 17.24.643(2): Due to the sensitivity of the setting in relation to Otter Creek, DEQ is seeking methods to minimize adverse effects on groundwater and surface water. One method to reduce the mineralization of spoil groundwater would be implementation of a plan for special handling of overburden identified as high in electrical conductivity (EC) to keep it out of the postmine zone of saturation. Pursuant to this rule as well as 17.24.313(1)(d)(i), 17.24.314(1)(a), 17.24.501(3)(a) and 17.24.631(3)(a), please propose handling methods for overburden high in electrical conductivity to keep the affected spoil above the postmine groundwater saturation zone.

ARM 17.24.644: The highly transmissive and widespread clinker areas represent recharge areas. Please indicate the percentage of clinker that will be covered by soil, spoil, or ponds during mining and the postmining potential for permanent loss or diminution of recharge on a longer or permanent basis due to compaction of fine grained material over the more transmissive clinker.

ARM 17.24.645: The application indicates that two batteries of wells (in the overburden, Knobloch Coal and underburden) will be installed on the Custer National Forest, east of the permit boundary. Please make sure that the underburden wells reach the productive sandstone layer used for local water supply and at least one of the underburden wells is located in or near the area where the greatest amount of drawdown in the Knobloch is anticipated.

Pursuant to 17.24.314(1)(a) and 17.24.645(1), OCC must commit to installation of monitoring wells in boxcut spoil at locations sufficient to monitor water quality across the length of the cut as soon as backfill is completed.

ARM 17.24.645 & 646, Water Monitoring:

- In order to confirm surface and groundwater quality changes that may result in material damage, OCC must establish a paired ground water and surface water monitoring site at the same location along Otter Creek downstream of the confluence with Three Mile Creek.

- **Exhibit 314B, Section 3.3.3, Surface Water Quality Sampling:** For surface water samples, all trace metals should be run for dissolved and total recoverable, as stated in the footnotes of Table 3-2.

- **Exhibit 314B, Table 3-2.** The following parameters must be added to the surface water monitoring plan as listed in the DEQ MQAP guidelines: hardness, total anions, total cations, cation / anion balance, oil and grease, total persulfate nitrogen, total phosphorus, and total ammonia. Reporting values for the following analytes must be adjusted to meet DEQ-7 RRVs unless OCC specifically requests a deviation for their monitoring plan. DEQ acknowledges that some RRVs may not be able to be met by all laboratories. The reporting limits used by OCC appear to be from an earlier version of DEQ-7 and have not been updated to the 2012 DEQ-7.

Analyte	OCC RRV (mg/L)	DEQ-7 RRV (mg/L)
Aluminum	0.1	0.009
Arsenic	0.003	0.001
Barium	0.005	0.003
Beryllium	0.001	0.0008
Cadmium	0.00008	0.00003
Iron	0.05	0.02
Lead	0.0005	0.0003
Mercury	0.00005	0.000005
Nickel	0.01	0.002
Vanadium	0.1	0.01 *
Zinc	0.01	0.008

*Not in DEQ-7. Value from MQAP guidelines.

- Exhibit 314B, Table 3-1. Please specify the frequency that sites will be visited for flow measurements and/or checks of the gauges. Sites should be visited at least monthly. Additionally, specify the frequency that passive samplers are checked. These should also

be checked monthly and after a precipitation event. A sampling frequency of semi-annual is assumed to apply to grab sample collection. In the monitoring plan, the time of year scheduled for sampling should be stated. At intermittent and perennial sites, samples should be collected during a high flow and low flow condition. At ephemeral sites, samples should be collected during a spring snowmelt and summer storm condition. Finally, coordinates and channel bottom elevations should be listed in the table. See the templates in the MQAP guidelines for more details on the information that should be submitted.

- Exhibit 314B, Table 3-2. "If insufficient water collected, the following analyses hierarchy should be adhered to: 1) Metals and physical parameters; 2) Non-Metals; 3) TDS, TSS, SC; 4) Nutrients and Turbidity." Note that while this statement may be followed as a sample analysis protocol, reporting of an incomplete analysis suite for a sampling may be interpreted by DEQ as a failure to follow the hydrologic monitoring plan. Notification of DEQ of a deviation from the monitoring plan, such as an incomplete sample, must be made as soon as a deviation is known. This language should be removed from the permit.

- Please submit the monitoring plan, SOP, and monitoring schedule in the format outlined in the MQAP guidelines. Once all of the information requested in the MQAP guidelines is presented, the MQAP and ARM 17.25.645 / 17.24.646 will be more thoroughly reviewed for technical adequacy.

- **Exhibit 314B, Table 4-2**: Please list the reporting limit and analytical method for each parameter. Use the reporting limits in the DEQ-7 and MQAP guidelines. The following parameters must be added to the groundwater monitoring plan as listed in the DEQ MQAP guidelines: field EC, field pH, field temperature, hardness, total anions, total cations, cation/anion balance, SAR, and total ammonia.

ARM 17.24.726(1): Specific field and lab methods to be used for vegetation measurements are required. Section 8.0, Exhibit 313G, Revegetation Plan, states that standard field and lab methods will be used. Please include the plan of study contained in the SOP of the NOI in the application to address these methods.

ARM 17.24.1005:

- Exhibit 313H, and 3.0 Abandonment of Exploration Wells: As exploration drill holes are not wells, please change the title of this section to "Abandonment of Exploration Holes."

- The proposed drill hole abandonment procedures (p. 3) do not conform with 17.24.1005(1)(c). The rule does not provide for abandonment based on the location of the drill hole in relation to advancing mining operations. As indicated in the application, Exhibit 308A, General Operations Plan, mining operations and plans are "affected by market fluctuations, shifts in mining areas necessary to maintain specific coal quality requirements, pit turns, and necessary operating changes identified by short range and long range planning." Therefore, abandonment of drill holes promptly after prospecting

is completed according the requirements of the rule is required unless otherwise approved by the DEQ.

ARM 17.24.1131: Section ARM 17.24.318 references ARM 17.24.1131; however, there is no explanation of how OCC will comply with this rule. Please address the rule.

General Comments:

- Although there is a cross reference table, please address all rules individually.
- The permit acreage breakdown is incorrect. The total acreage for the mineral is 7,639 and the total for the surface is 7,638. Please adjust the acreage to match.
- DEQ has noted that OCC has changed the language of the rules throughout the application to lessen the commitment required by the rules. As a reminder, OCC will be held to the standards set forth in the ARM 17.24.XXXX first and foremost, before the commitments in the permit application.

Please feel free to contact Bob Smith at 444-7444 or me with questions regarding this deficiency letter.

Sincerely,

Chris A. Yde, Supervisor
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Attachment

Cc: Jeff Fleischman, OSM Casper Office
Gene Hay, OSM Denver Office
Trevor Taylor, DNRC

FC: 630.0