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October 31, 2013

Mr. Chris Yde, Supervisor
Coal and Uranium Program
Industrial and Energy Minerals Bureau
Montana Department of Environmental Quality
PO Box 200901
Helena, MT 59620-0901

Permit ID: C1979012
Revision Type: Major Revision Submittal
Permitting Action: Application
Subject: Response to 7-30-13 MR168 Deficiency Comments and Major Revision Determination

Dear Chris:

Spring Creek Mine (SCM) submitted minor revision 168 on March 2, 2012 which included adding LBM I and a LUL in Pit #2. SCM received a June 1, 2012 deficiency letter from the Department which primarily consisted of PMT comments. After several PMT revisions and meetings with MDEQ staff, SCM responded to the June 1, 2012 deficiency comments with a revised PMT on November 7, 2012. SCM meet with MDEQ staff to discuss the PMT comments and major/minor revision categorization on January 9th, 2013. During that meeting the primary concern raised by MDEQ was about methods used for defining minor tributary drainages. Additionally, SCM received another deficiency letter on February 5, 2013 which focused only on methods used for defining minor tributary drainages. SCM responded to the February 5, 2013 deficiency letter addresses on May 4, 2013. SCM received a determination letter stating MR 168 must be resubmitted as a major permit revision on July 30, 2013. SCM also received deficiency comments to the 3rd round submittal on July 30, 2013. The letter serves as a response to those July 30, 2013 letters.

SCM submitted the information used by the department for a major/minor revision determination (additional disturbance acreage and revised bond estimate) in the initial submittal of MR 168 on March 2nd, 2012. The revised bond increase of 9.3% is below the MDEQ guideline of 10%; also the guidance document does not include a reference limit for an increase in the disturbance boundary. SCM recommends the department consider this in their next revision to the guidance document.

Enclosed with this submittal are all of the updated permit materials for a major revision as requested. The attached CD maintains the permit electronic file structure with the live and PDF files in each folder. All text revisions were made with tracked changes and plotted as PDF files for easy review. All AutoCAD files contain a major revision filter so all layers changed can be easily viewed. Also enclosed are copies of the previous rounds of comments/responses listed above for consistency.

We look forward to working with the Department on this permit revision. Please call me at (406) 757-4236 if you have any questions.

Sincerely,

Gabe Johnson

Gabe Johnson
Environmental Engineer

Enclosures – none
cc: CF 5.2.4 (SCM-12)

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FC: 620.403 (TR1)

Response to 3rd Round MDEQ Deficiency Comments to MR168 (Now Major Revision) dated 6-12-13, Spring Creek Mine (SCM), SMP #79012

#1 Comment: *When compared to the CAD data, the Tables on Plate 4 and 4B contain several apparent errors. Some of the drainages areas do not match, for example, and some stream lengths are not consistent. This seems to be more of a problem in pre-mine rather than post-mine documents. On Plate 4B, for example, Drainage Basin PC-1 includes the following discrepancies:*

	Reported	*Actual*
Main Channel Length	*1,542*	*2,751*
Elevation Difference	*105*	*3995-3770=225*
Average Channel Slope	*6.8%*	*8.2%*

#1 Response:

The Tables on Plates 4 and 4B have been updated to match the electronic files submitted to MDEQ. The example drainage basin (PC-1) was incorrectly reported as the stream channels inside of the Permit Boundary only. The values for drainage area, total stream length, channel length, elevation difference and valley length were reviewed and corrected if necessary. The following is a summary of the revisions:

- **Two Drainage Area values were changed which included**
  - **Pre-mine PC-A (reported = 2.608, actual = 2.768) and**
  - **Post-mine SF-0e (reported = 0.058, actual = 0.060).**
- **40 post-mine and 30 pre-mine Total Stream Length values were revised.**
- **15 post-mine and 25 pre-mine Main Channel Length values were revised.**
- **Eight Elevation Difference Values**
  - **Pre-mine ND-5 (reported = 205, actual = 120)**
  - **Pre-mine SC-1c (reported = 120, actual = 40)**
  - **Pre-mine PC-1 (reported = 105, actual = 220)**
  - **Post-mine SF-0d (reported = 40, actual = 50)**
  - **Post-mine SF-0e (reported = 60, actual = 70)**
  - **Post-mine SF-2a (reported = 120, actual = 400)**
  - **Post-mine SF-6 (reported = 390, actual = 460)**
  - **Post-mine SF-6b (reported = 90, actual = 310)**
  - **Post-mine SF-13 (reported = 140, actual = 90)**
- **6 post-mine and 20 pre-mine Valley Length values were revised.**
- **The updates to the aforementioned values affected the calculated values of drainage density (total stream length/drainage area), channel sinuosity (channel length/valley length), channel slope (channel length/elevation difference) and valley slope (valley length/elevation difference).**

The geomorphology values reported on Plates 4 and 4B and the AutoCAD files submitted to MDEQ had primarily two areas that did not match 1) pre-mine data and 2) PMT drainages that were not updated during the current permit revision. Multiple exhibits include the pre-mine and post-mine topography in their respective AutoCAD files. Through the process of preparing exhibits and modifications, various streams may have been deleted, extended, and/or shortened. Also, during the preparation of exhibits showing pre-mine versus post-mine channel profiles, main channel alignments were revised in the undisturbed areas to match each other. It is believed that the geomorphology tables now match the current electronic files.

#2 Comment: *Based on the topography there are several apparent first and second order tributaries of Pearson Creek and South Fork Pearson Creek not identified in Plate 4B. It was noticed that some of these tributaries are shown in Figure 6 of the original submittal so they seem to have been a part of the CAD data at one time.*

#2 Response:

As requested, the missing tributaries were added to Plate 4B and accounted for in the geomorphology analysis discussed previously. The missing tributaries were not channels profiled on Plate J-2. It was also noticed the small and short tributaries are also appear to be missing from the approved Plate 4B. The focus for Plate 4 (PMT) and 4A (Pre-mine) topography is to show the location of the compared/profiled minor tributaries shown on Plate J-2. It is typical practice that smaller minor tributaries are constructed as opportunities aries in the field which significantly increases the as-built drainage density as compared to the density shown on the PMT.

#3 Comment: *One of the primary review goals is to determine that there is adequate post-mine drainage density (and associated topographical diversity). While, it appears that this is the case, there is currently not enough pre-mine data to provide definitive proof. The operator is encouraged to provide more complete and accurate data and to include additional diversity if necessary to ensure that the overall shallower topography inherent in the proposed mining operation is successfully mitigated.*

#3 Response:

This submittal includes updating all hydrological permit materials as discussed above. The PMT in Pit #2 was revised as requested to include additional topographical diversity. Several benches were designed to break up the continuous slopes and add additional steep

terrain facing south to better emulate pre-mine conditions. These areas can be seen on the revegation plan shown on Plate 4A (pink areas are southern facing and green areas are benches).

#4 Comment: *For preliminary surface water modeling analysis, the proposed PMT would meet the requirements in ARM 17.24.634. Peak runoff, timing of runoff, and total runoff volume from the reconstructed Pearson Creek drainage immediately outside of Spring Creek's permit boundary for a range of modeled 24-hour storm events adequately approximates pre-mine values (note the dam on Pearson Creek was not included in the model). The PMT reduces steep terrain and slope diversity within the Pearson Creek channel due to a widening of the main channel's valley. SCC is encouraged to include additional features that will increase topographic diversity, provide for reestablishment of a diverse vegetative community, and increase wildlife habitat.*

#4 Response:

Please see the comment response to #3 above.

#5 Comment: *The proposed PMT is preliminarily acceptable; however a determination as to the classification of this revision as a major or minor revision cannot yet be made. An analysis of changes to the anticipated impacts to surface and groundwater must be submitted to the department to determine how the proposed mine cuts will affect the hydrologic balance. While a preliminary analysis of changes to surface water runoff has already been done by DEQ, SCC must include a description of impacts to the surface water hydrologic balance during mining. Additionally, impacts to groundwater quality and drawdown must be discussed.*

#5 Response:

As requested, Appendix L (PHC) has been updated to reflect the additional mine cuts. Please see the Index of Changes for a summary of the revisions to Appendix L.

INDEX SHEET FOR SPRING CREEK MINE
MAJOR REVISION 9-30-13

Permit Volume Number	Volume Contents	Page, Map or other Permit Entry to be Removed	Page, Map or other Permit Entry to be Added	Description of Change
Volume 1	Text	TOC Page 1 through 2	TOC Page 1 through 2	Update TOC for inclusion of Addendum 303V through 303X.
Volume 1	Text	303 various	303 various	Updated text.
Volume 1	Text	Addendum 303T	Addendum 303T	Update with revised agreement.
Volume 1	Text	–	Addendum 303V	Add new agreement to permit.
Volume 1	Text	–	Addendum 303W	Add new agreement to permit.
Volume 1	Text	–	Addendum 303X	Add new agreement to permit.
Volume 1	Text	304-1 through 304-11	304-1 through 304-11	Revised Figure 304-A with new Life of Mine (LOM) Bndry and updated various text references.
Volume 1	Text	308-3	308-3	Updated anticipated annual and total production and major equipment list.
Volume 1	Text	312-1 through 312-4	312-1 through 312-4	Updated mitigation progress discussion and acreage commitments.
Volume 1	Text	313-1 through 313-3	313-1 through 313-3	Update TOC for pagination and update reclamation dates.
Volume 1	Text	313-5 through 313-9	313-5 through 313-9b	Update demonstration that PMT can be achieved.
Volume 1	Text	313-13	313-13	Update permit reference.
Volume 1	Text	313-15 through 313-16	313-15 through 313-16	Update salvageable soil volumes.
Volume 1	Text	313-18 through 313-19	313-18 through 313-19	Update salvageable soil volumes.
Volume 1	Text	313-23 through 313-25	313-23 through 313-25	Update Tables 313-3 and 313-4.
Volume 1	Text	313A-1	313A-1	Replace addendum with updated topsoil volumes from '12 AMR.
Volume 1	Text	Addendum 313B	Addendum 313B	Replace addendum with updated technical standards addendum.
Volume 1A	Text	318-1 through 318-2	318-1 through 318-2	Added cultural resource requirements from Lease By Modification BLM Decision Record
Volume 1A	Text	322-1	322-1	Remove reference to Pearson Creek Amendment boundary.
Volume 1A	Text	322-4 through 322-6	322-4 through 322-6	Update coal reserves calculations and reference to Pearson Creek Amendment.
Volume 1A	Text	322-9 through 322-12	322-9 through 322-12	Update location and quantity of coal to be left unmined.
Volume 1B	Slope Assess	313 Addendum D Plate 1 Sht 1	313 Addendum D Plate 1	Update disturbance boundary and slope data to match revised disturbance areas.
Volume 1B	Slope Assess	313 Addendum D Plate 1 Sht 2	–	Remove plate from permit, 1000 scale sheet include in place of sheet 1.
Volume 1B	Slope Assess	313 Addendum D Plate 2 Sht 1	313 Addendum D Plate 2	Update PMT, disturbance boundary, and slope data.
Volume 1B	Slope Assess	313 Addendum D Plate 2 Sht 2	–	Remove plate from permit, 1000 scale sheet include in place of sheet 1.
Volume 1B	Slope Assess	313 Addendum D Plate 3 Sht 1	313 Addendum D Plate 3	Update disturbance boundary and slope data to match revised disturbance areas.
Volume 1B	Slope Assess	313 Addendum D Plate 3 Sht 2	–	Remove plate from permit, 1000 scale sheet include in place of sheet 1.
Volume 1B	Slope Assess	313 Addendum D Plate 4 Sht 1	313 Addendum D Plate 4	Update PMT, disturbance boundary, and slope data.
Volume 1B	Slope Assess	313 Addendum D Plate 4 Sht 2	–	Remove plate from permit, 1000 scale sheet include in place of sheet 1.
Volume 3	Plates	Plate 1	Plate 1	Added LBM Lease Boundary
Volume 3	Plates	Plate 2	Plate 2	Updated surface ownership to include Consol Land Purchase (See 303W)
Volume 3	Plates	Plate 3	Plate 3	Updated LBM coal lease boundary
Volume 3	Plates	Plate 4 Sht 1	Plate 4 Sht 1	Update geomorphology tables, disturbance boundary and PMT.
Volume 3	Plates	Plate 4 Sht 2	Plate 4 Sht 2	Update geomorphology tables, disturbance boundary and PMT.
Volume 3	Plates	Plate 4 Sht 3	Plate 4 Sht 3	Update geomorphology tables, disturbance boundary and PMT.
Volume 3	Plates	Plate 4A	Plate 4A	Updated Revegetation Plan based on current reclamation boundaries and additional disturbance.
Volume 3	Plates	Plate 4B Sht 1	Plate 4B Sht 1	Update geomorphology tables and disturbance boundary.

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MAJOR REVISION 9-30-13

Permit Volume Number	Volume Contents	Page, Map or other Permit Entry to be Removed	Page, Map or other Permit Entry to be Added	Description of Change
Volume 3	Plates	Plate 4B Sht 2	Plate 4B Sht 2	Update geomorphology tables and disturbance boundary.
Volume 3	Plates	Plate 4B Sht 3	Plate 4B Sht 3	Update geomorphology tables and disturbance boundary.
Volume 3	Plates	Plate 5	Plate 5	Update mine blocks, topography, disturbance and permit boundary.
Volume 3	Plates	Plate 6	Plate 6	Update PMT, disturbance boundary, and reclamation blocks.
Volume 3	Plates	Plate 7	Plate 7	Update disturbance and permit boundaries.
Volume 3	Plates	Plate 8	Plate 8	Update disturbance boundary, current topography, roads and reclamation.
Volume 4	Plates	Plate 15	Plate 15	Update disturbance boundary and mine blocks.
Volume 4	Plates	Plate 15A	Plate 15A	Update sections per PMT revision and new mine blocks.
Volume 4	Plates	Plate 18 Sht 1	Plate 18	Update haul roads, mine blocks and change to a 1000 scale sheet.
Volume 4	Plates	Plate 18 Sht 2	--	Remove plate from permit, 1000 scale sheet include in place of sheet 1.
Volume 4	Plates	Plate 18 Sht 3	--	Remove plate from permit, 1000 scale sheet include in place of sheet 1.
Volume 4	Plates	Plate 18A Sht 1	Plate 18A	Update haul road profiles and change to a 1000 scale sheet.
Volume 4	Plates	Plate 18A Sht 2	--	Remove plate from permit, 1000 scale sheet include in place of sheet 1.
Volume 4	Plates	Plate 22	Plate 22	Update coal reserves calculations and lease boundary.
Appendix J	Post Hydro	J-5 through J-6	J-5 through J-6	Update pages with revised text values.
Appendix J	Post Hydro	J-12 through J-14	J-12 through J-14	Update pages with revised tables.
Appendix J	Post Hydro	J-17 through J-18	J-17 through J-18	Update pages with revised tables and text values.
Appendix J	Post Hydro	J-1-i through J-1-175	J-1-i through J-1-173	Replace Attachment J-1 in its entirety, updated SEDCAD for revised PMT.
Appendix J	Post Hydro	J-2-i through J-2-69	J-2-i through J-2-69	Replace Attachment J-2 in its entirety, updated HEC-RAS for revised PMT.
Appendix J	Post Hydro	J-3-5 through J-3-7	J-3-5 through J-3-7	Update pages with revised trihydro calculations.
Appendix J	Post Hydro	J-3-17 through J-3-31	J-3-17 through J-3-31	Update pages with revised trihydro calculations.
Appendix J	Post Hydro	J-3-38 through J-3-43	J-3-38 through J-3-43	Update pages with revised trihydro calculations.
Appendix J	Post Hydro	J-3-53 through J-3-55	J-3-53 through J-3-55	Update pages with revised trihydro calculations.
Appendix J	Post Hydro	J-3-84 through J-3-86	J-3-84 through J-3-86	Update pages with revised trihydro calculations.
Appendix J	Post Hydro	J-3-93 through J-3-104	J-3-93 through J-3-104	Update pages with revised trihydro calculations.
Appendix J	Post Hydro	J-3-108 through J-3-113	J-3-108 through J-3-113	Update pages with revised trihydro calculations.
Appendix J	Post Hydro	J-3-117 through J-3-119	J-3-117 through J-3-119	Update pages with revised trihydro calculations.
Appendix J	Post Hydro	J-3-126 through J-3-128	J-3-126 through J-3-128	Update pages with revised trihydro calculations.
Appendix J	Post Hydro	J-3-135 through J-3-140	J-3-135 through J-3-140	Update pages with revised trihydro calculations.
Appendix J	Post Hydro	J-3-144 through J-3-167	J-3-144 through J-3-167	Update pages with revised trihydro calculations.
Appendix J	Post Hydro	J-3-171 through J-3-176	J-3-171 through J-3-176	Update pages with revised trihydro calculations.
Appendix J	Post Hydro	J-3-178 through J-3-183	J-3-178 through J-3-183	Update pages with revised trihydro calculations.
Appendix J	Post Hydro	J-3-187 through J-3-195	J-3-187 through J-3-195	Update pages with revised trihydro calculations.
Appendix J	Post Hydro	Plate J-2 Sheet 1	Plate J-2 Sheet 1	Update profiles for revised PMT.
Appendix J	Post Hydro	Plate J-2 Sheet 2	Plate J-2 Sheet 2	Update profiles for revised PMT.
Appendix J	Post Hydro	Plate J-2 Sheet 3	Plate J-2 Sheet 3	Update profiles for revised PMT.
Appendix J	Post Hydro	Plate J-2 Sheet 4	Plate J-2 Sheet 4	Update profiles for revised PMT.

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MAJOR REVISION 9-30-13

Permit Volume Number	Volume Contents	Page, Map or other Permit Entry to be Removed	Page, Map or other Permit Entry to be Added	Description of Change
Appendix J	Post Hydro	Plate J-3	Plate J-3	Update for revised PMT.
Appendix J	Post Hydro	Plate J-4	Plate J-4	Update for revised PMT.
Appendix J	Post Hydro	Plate J-5	Plate J-5	Update for revised PMT.
Appendix J	Post Hydro	Plate J-6	Plate J-6	Update for revised PMT.
Appendix K	Drain Cntrl	Exhibit 1 Sht 1	Exhibit 1 Sht 1	Update disturbance boundary, topography, roads, and hydrologic control for revised mine plan.
Appendix K	Drain Cntrl	Exhibit 1 Sht 2	Exhibit 1 Sht 2	Update disturbance boundary, topography, roads, and hydrologic control for revised mine plan.
Appendix K	Drain Cntrl	Exhibit 1 Sht 3	Exhibit 1 Sht 3	Update disturbance boundary, topography, roads, and hydrologic control for revised mine plan.
Appendix K	Drain Cntrl	Exhibit 2 Sht 1	Exhibit 2	Update PMT, disturbance boundary and conceptual structural BMPs.
Appendix K	Drain Cntrl	Exhibit 2 Sht 2	--	Remove plate from permit, 1000 scale sheet include in place of sheet 1.
Appendix L	PHC	L-ii	L-ii	Update page with new attachment.
Appendix L	PHC	L-3 through L-7	L-3 through L-7	Update pages with revised text values and figures.
Appendix L	PHC	L-10	L-10	Update table.
Appendix L	PHC	L-12 through L-20	L-12 through L-20	Update table.
Appendix L	PHC	L-26	L-26	Update page with new groundwater model.
Appendix L	PHC	L-32 through L-34	L-32 through L-34	Update table.
Appendix L	PHC	L-37 through L-38	L-37 through L-38	Update table.
Appendix L	PHC	L-44	L-44	Update Plate reference.
Appendix L	PHC	L-48 through L-49	L-48 through L-49	Update sediment yield and reference to new groundwater model.
Appendix L	PHC	L-51 through L-55	L-51 through L-55	Update tables and add reference to new groundwater model.
Appendix L	PHC	L-57	L-57	Update text with reference to new groundwater model.
Appendix L	PHC	L-60	L-60	Update text for drawdown.
Appendix L	PHC	L-67	L-67	Update with reference for new groundwater model.
Appendix L	PHC	Attachment L-1 Cover	Attachment L-1 Cover	Update cover data.
Appendix L	PHC	L-1-1 through L-1-73	L-1-1 through L-1-24	Replace Attachment L-1 with updated data.
Appendix L	PHC	Attachment L-2 Cover	Attachment L-2 Cover	Update cover data.
Appendix L	PHC	L-2-1 through L-2-70	L-2-1 through L-2-70	Replace Attachment L-2 with updated data.
Appendix L	PHC	Attachment L-3 Cover	Attachment L-3 Cover	Update cover data.
Appendix L	PHC	L-3-1 through L-3-16	L-3-1 through L-3-16	Replace Attachment L-3 with updated data.
Appendix L	PHC	L-5-1 through L-5-4	L-5-1 through L-5-4	Update USLE calculations
Appendix L	PHC	Attachment L-7 Cover	Attachment L-7 Cover	Update title on cover page.
Appendix L	PHC	--	Attachment L-8 Cover	Add cover for new groundwater model update.
Appendix L	PHC	--	L-8-1 through L-8-50	Add attachment for new update to the ground water model
Appendix L	PHC	Plate L-1	Plate L-1	Update wells on plate to correspond with Appendix L table.

1st Submittal of MR 168

March 2, 2012

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March 2, 2012

Mr. Chris Yde, Supervisor
Coal and Uranium Program
Industrial and Energy Minerals Bureau
Montana Department of Environmental Quality
PO Box 200901
Helena, MT 59620-0901

Permit ID: C1979012
Revision Type: Minor Revision
Permitting Action: Application
Subject: MR 168; Add LBM and Land Agreements

Dear Chris:

Spring Creek Coal LLC (SCC) seeks Department approval via a minor revision to Surface Mine Permit C1979012 to add Lease by Modification (LBM) MTM-069782 and Land Agreements to the mining permit.

A. OVERVIEW OF CHANGES

The LBM and land agreements will allow extension of Pits #1 and #2 inside the existing mining permit boundary. The LBM Federal (MTM-069782) was approved June 16, 2010 and adds approximately 51 million tons of recoverable coal by extending the Pit #2 mine blocks to the southeast. The LBM is located in Section 6, T9S, R40E and in Section 31, T8S, R40E.

The new land agreements include BLM Land Use Lease (LUL)-74913 and an overstrip agreement with Consol Energy. The LUL was approved on April 16, 2010 and allows pit layback on the west side of Pit #2. The LUL is located on BLM surface in the E1/2 of Section 35, T8S, R39E. The Consol overstrip agreement was signed on September 21, 2011 and is located in Sections 26, 27, and 25, T8S, R39E and in Sections 1 and 2, T9S, R39E. The land agreements allow for additional mining of existing leases. This results in additional recoverable coal of approximately 17 million tons. As a result, the LBM and Land Agreements add approximately 68 million tons of recoverable coal as shown on Figure 1 below.

Figure 1 (Additional Coal)

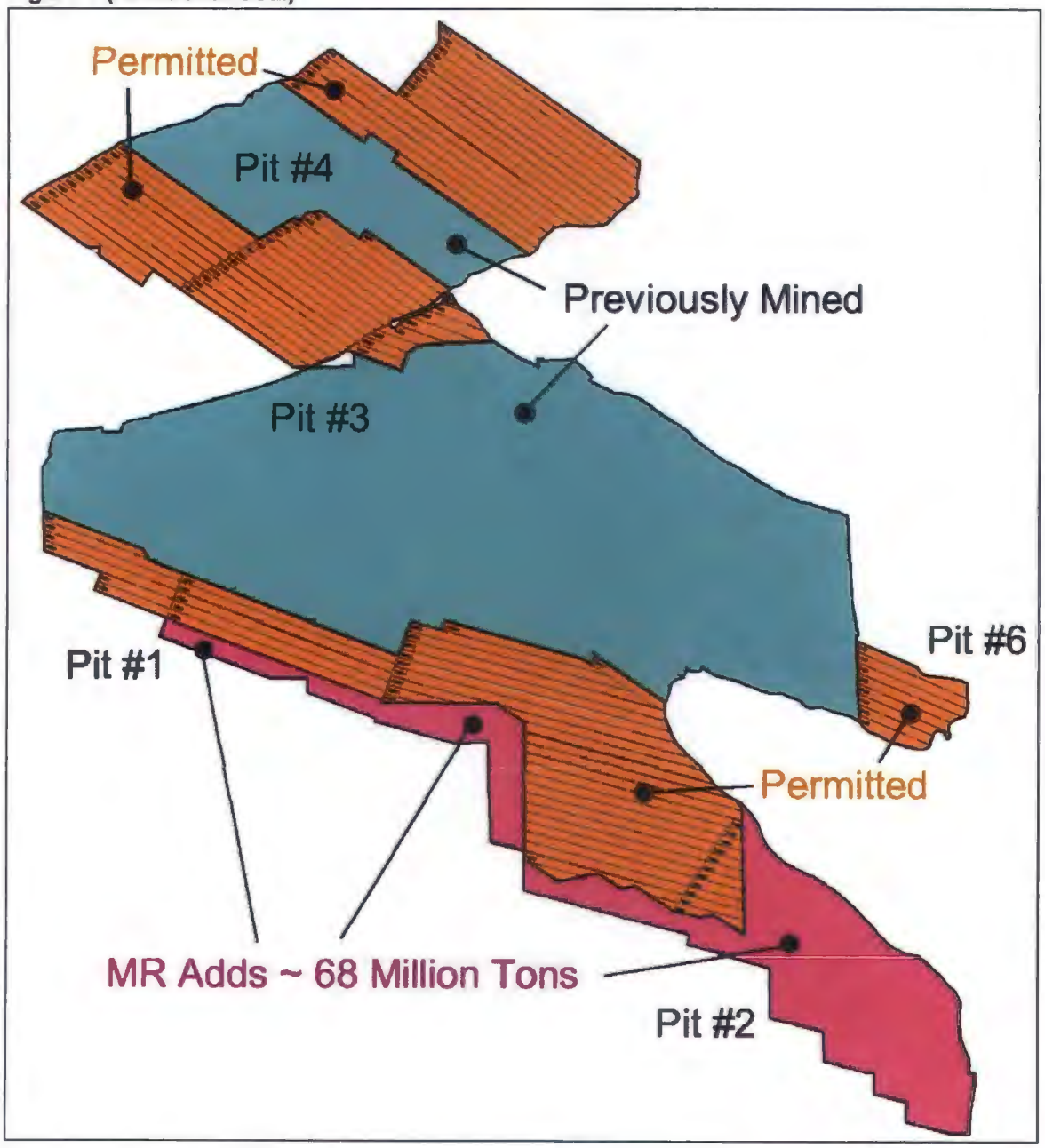
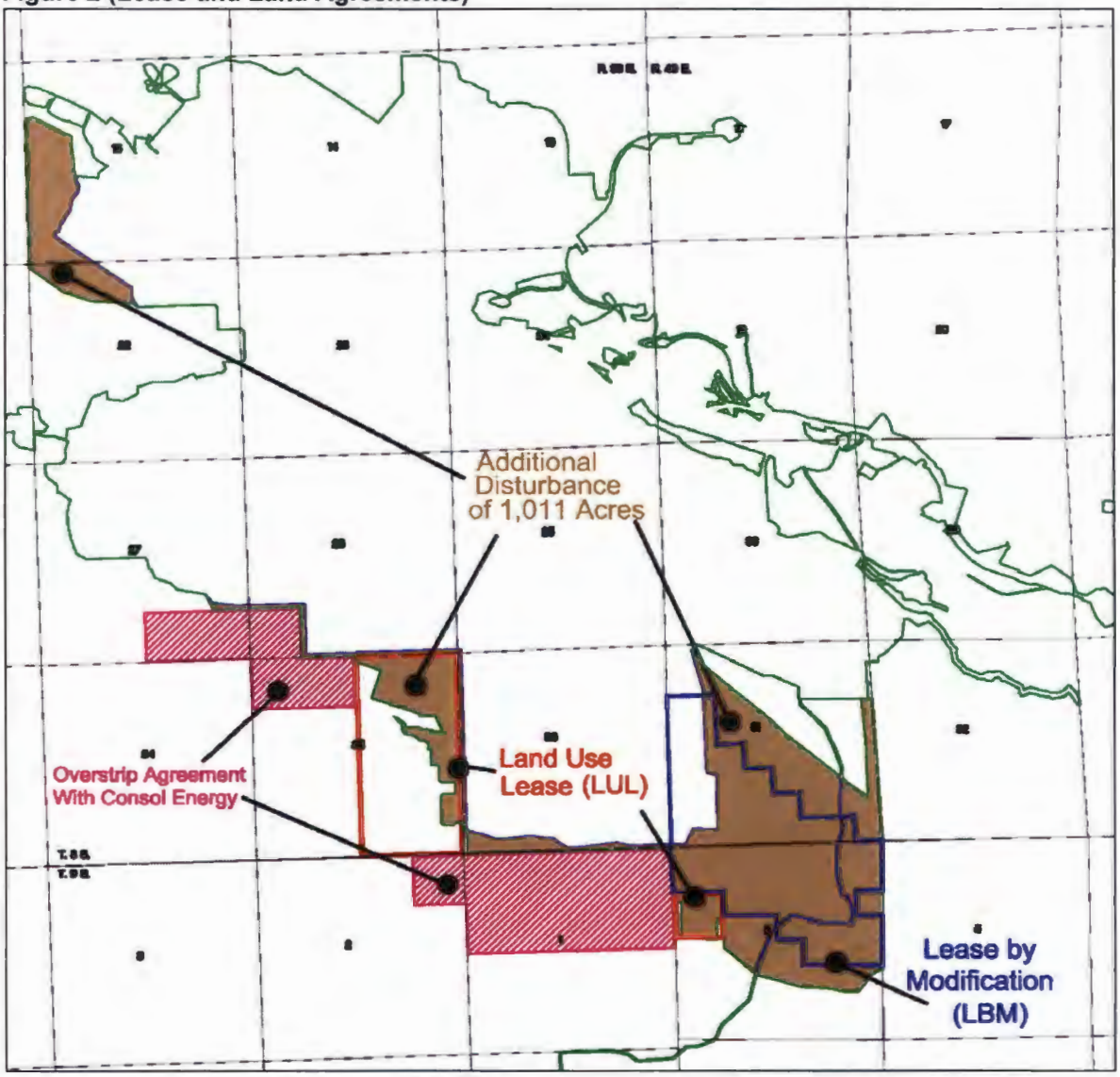


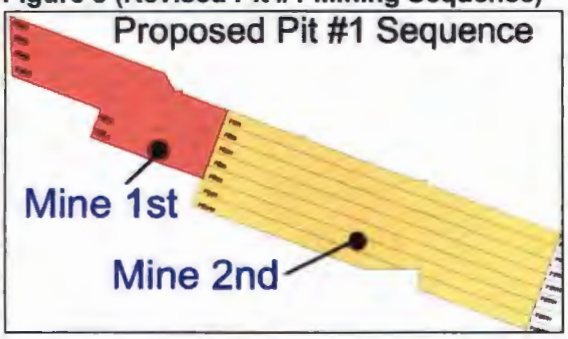
Figure 2 on the next page shows the areas of additional disturbance and land agreement boundaries. The 1,011 acres of additional disturbance are located within the current mining permit boundary. The additional disturbance in Pit #1 and #2 result from additional mine blocks. The additional disturbance in Pit #4 results from the construction of a temporary overburden stockpile as shown on the enclosed mine sequence map (Plate 5).

Figure 2 (Lease and Land Agreements)



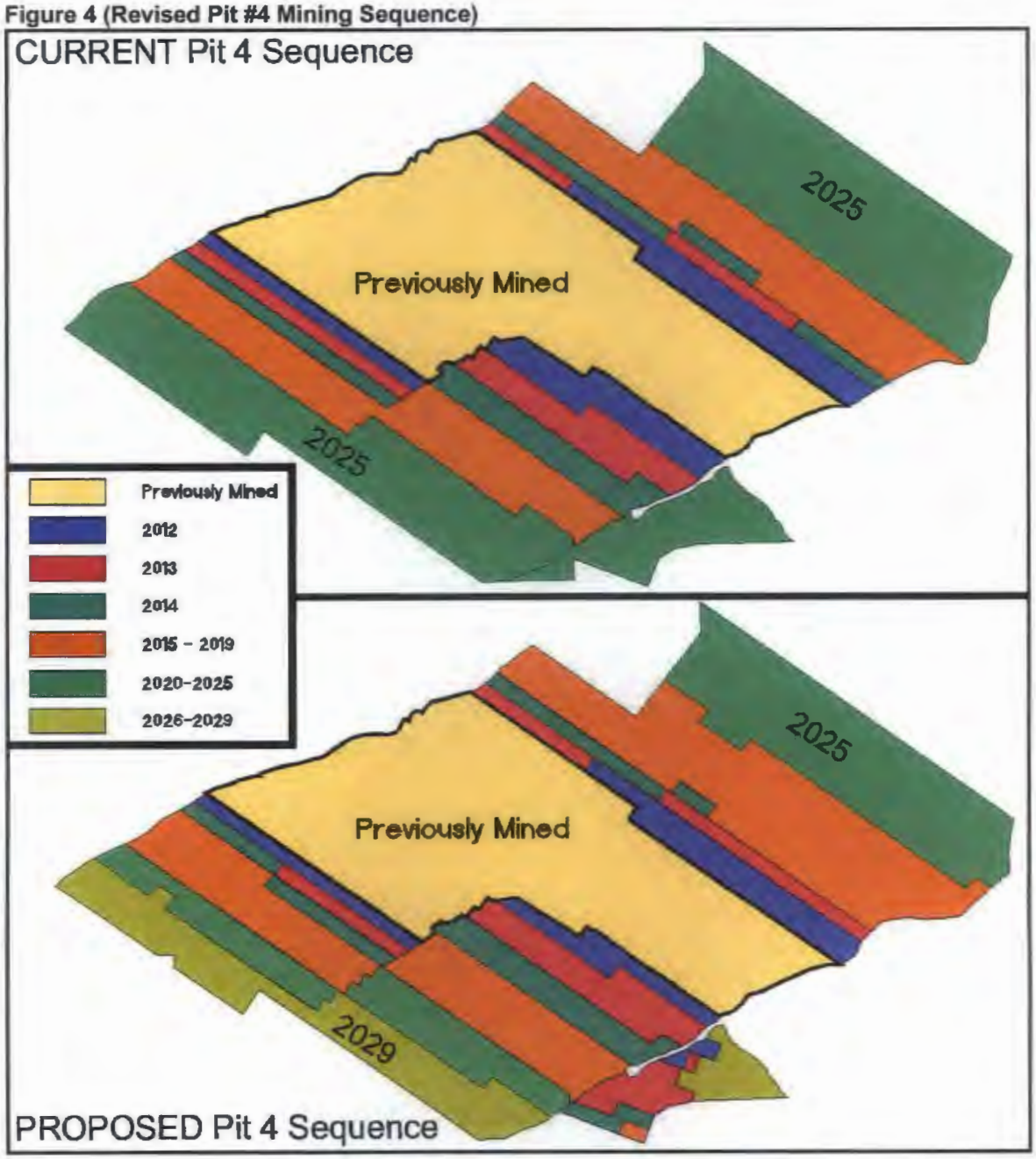
During the process of revising the mining sequence in Pit #1 and #2, SCM also revised mining sequences in other pit areas to improve material movement timing and AOC approximation. For example, the mining sequence in Pit #1 is now divided; the west half of Pit #1 is now mined first which generates room for the east half prestrip material as shown in Figure 3 below. The current Pit #1 mining sequence progresses down the entire pit length as one long pit.

Figure 3 (Revised Pit #1 Mining Sequence)



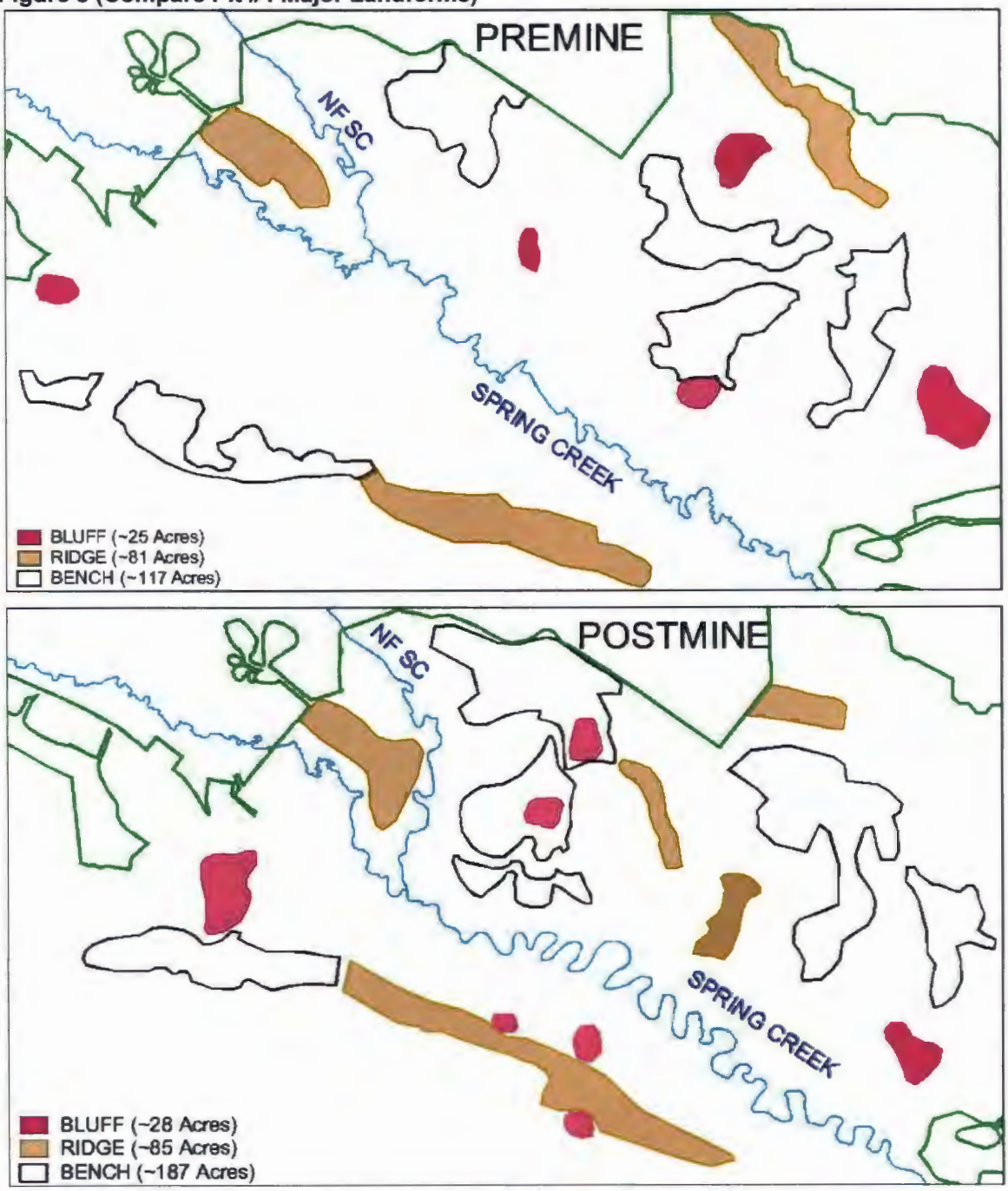
Also the mining sequence on the north side of Pit #4 was accelerated. This accelerated sequence on the north side generates backfill room for the prestrip material from the south side of Pit #4. The coal blocks south of the "Carbone Y" were also moved up to sequence with mining the SE section of Pit #4. This allows for improved contemporaneous reclamation in Pit #4. See Figure 4 below.

Figure 4 (Revised Pit #4 Mining Sequence)



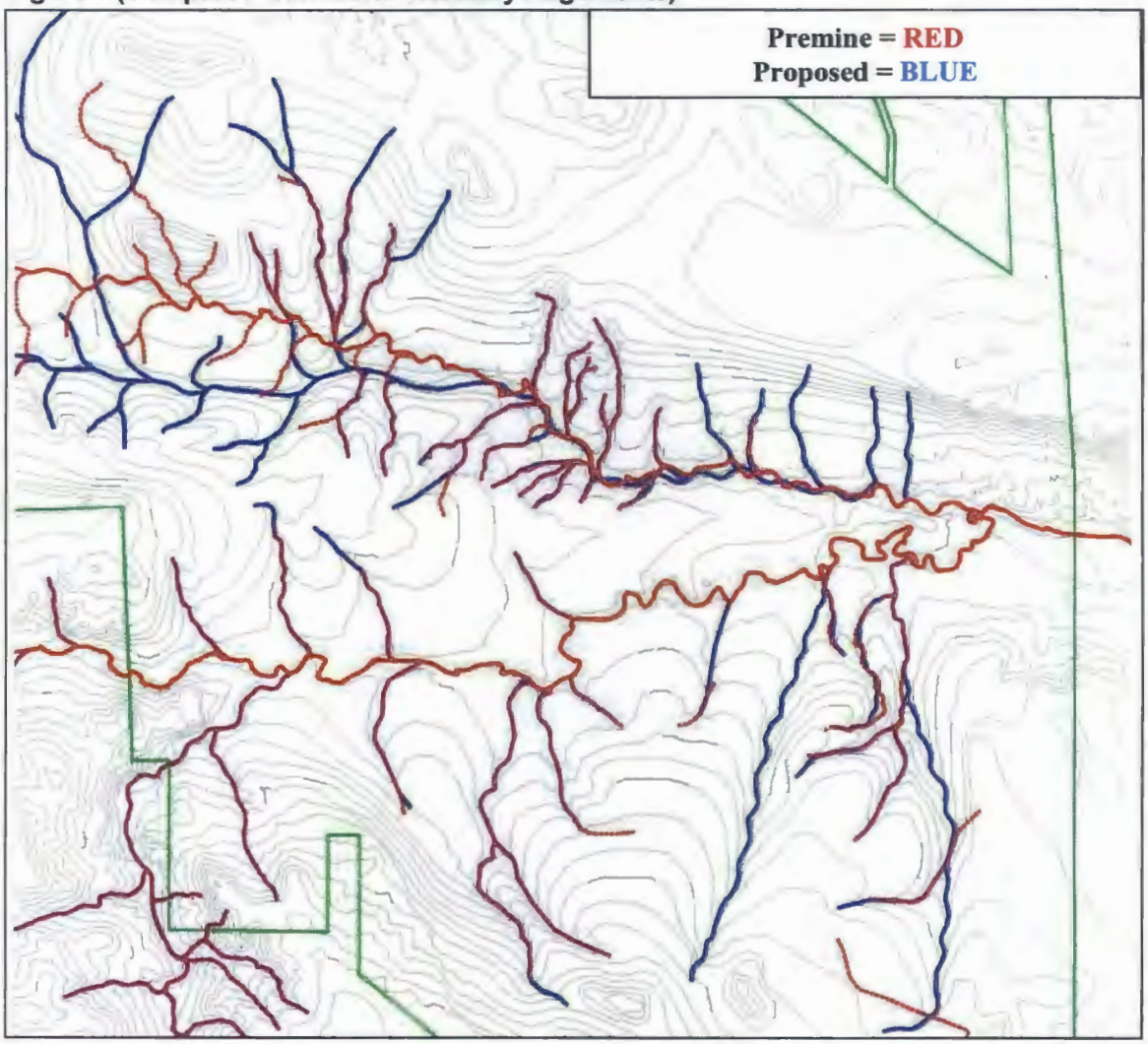
The revised mining sequence in Pit #4 allowed for a wider Spring Creek drainage basin compared to the currently approved PMT. The revised PMT improves wildlife habitat by creating additional bench areas for sage-grouse and mule deer. Figure 5 below compares the major land forms of the premine and proposed postmine topography.

Figure 5 (Compare Pit #4 Major Landforms)



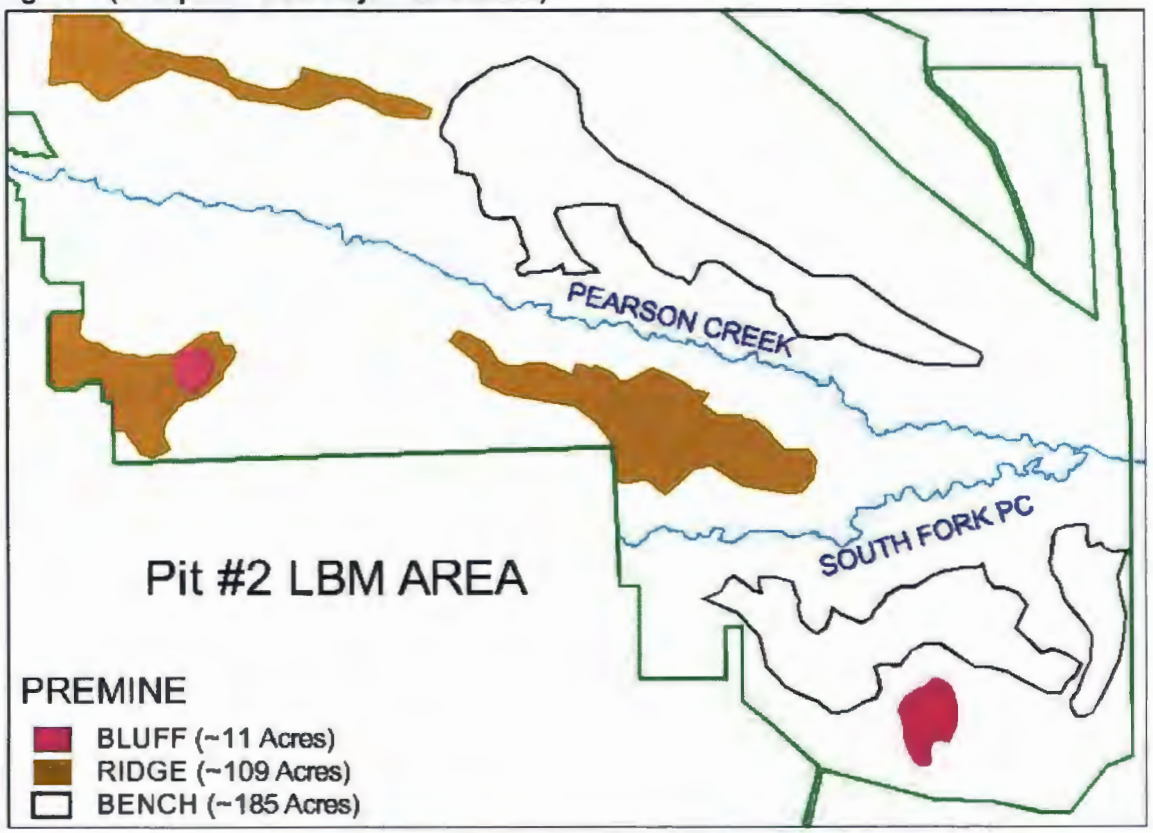
SCM matched the premine minor tributary alignments as much as possible in the new disturbance LBM area. Some deviations result from aligning drainages with final pit ramps and pit locations. Figure 6 below shows the proposed PMT with the premine minor tributary alignments on top of the postmine alignments located in Section 6, T9S, R40E and in Section 31,T8S, R40E.

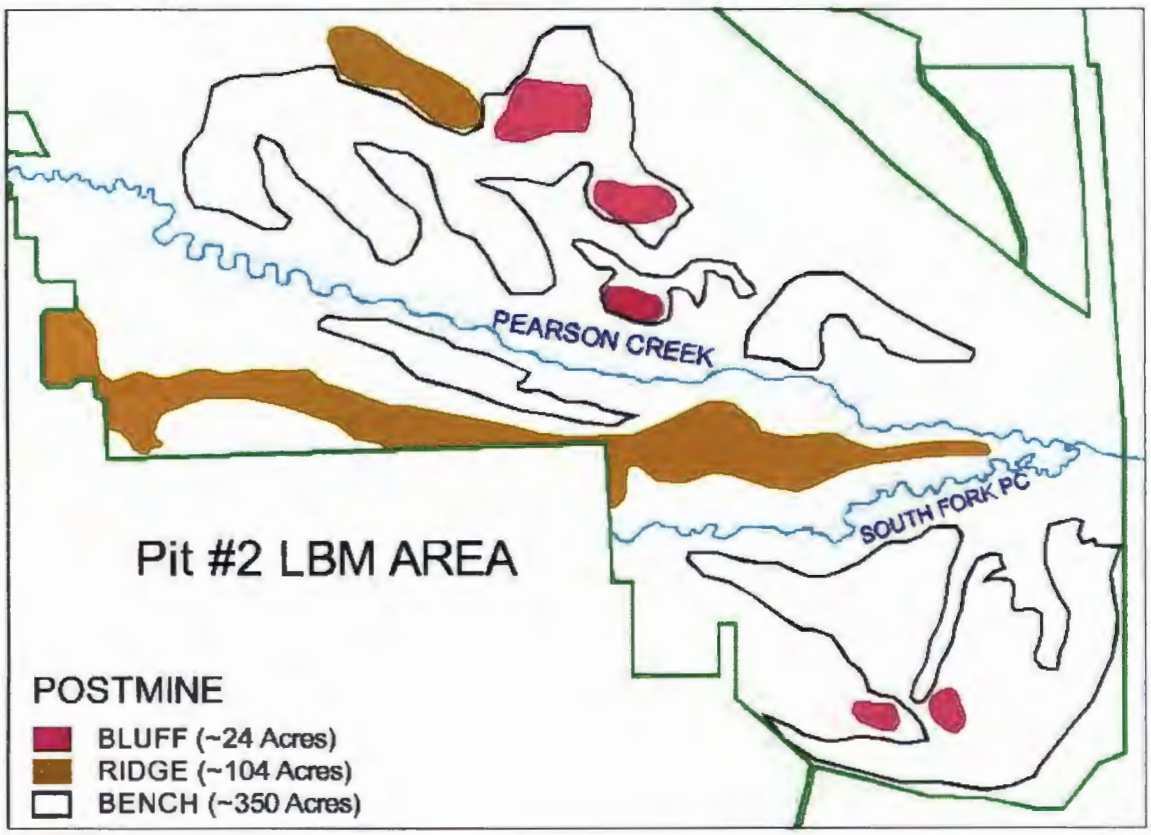
Figure 6 (Compare Pit #2 Minor Tributary Alignments)



Similar to Pit #4, the PMT design in Pit #2 focused on enhancing postmine topography by increasing bench areas for sage-grouse and mule deer habitat. Figure 7 below compares the major land forms of the premine and proposed postmine topography for Pit #2.

Figure 7 (Compare Pit #2 Major Landforms)





B. MINOR REVISION REQUIREMENTS

SCM requests this revision be processed as a minor revision. The following section reviews how this revision meets each minor revision requirement.

(1) ARM 17.24.301(65)(a) says a revision does not qualify as a minor revision if it "results in a significant change in the postmining drainage plan". SCM compared the key drainage characteristics (drainage area, flow rate, and runoff volume) for each of the major ephemeral drainages (Table 1 below).

Table 1. Compare Approved Vs. Proposed Drainage Characteristics

SEDCAD Structure Designations	Drainage Area		100-yr, 6-hr Storm Event			
	Cumulative (ac)	% Difference Proposed vs. Approved	Peak Discharge [1] (cfs)	% Difference Proposed vs. Approved	Runoff Volume [1] (ac-ft)	% Difference Proposed vs. Approved
Spring Creek Structures						
Approved Postmine	14,600.43	**0.0**	425.66	**0.9**	380.26	**0.1**
Proposed Postmine	14,599.08		429.52		380.04	
South Fork Spring Creek Structure						
Approved Postmine	8,910.05	**0.1**	335.85	**0.1**	314.94	**0.0**
Proposed Postmine	8,899.59		336.35		315.01	
Pearson Creek Structures						
Approved Postmine	4,600.99	**0.5**	740.15	**2.7**	309.39	**0.5**
Proposed Postmine	4,622.33		760.46		310.83	

[1]Runoff volumes and peak discharges were computed by the rainfall/runoff program SEDCAD using the SCS Type II precipitation distribution.

Maximum % change =	**2.7**
Average % Change =	**0.5**

Because the percent change in key drainage characteristics only changed by an average of 0.5% with a maximum change of 2.7%, this revision will not result in a significant change to the postmining drainage plan.

(2) ARM 17.24.301(65)(b) says a revision does not qualify as a minor revision if it "results in a change in the post mining land use". EA MT-DOI-BLM-MT-020-2010-29 for the LBM stipulates the LBM area be reclaimed as wildlife habitat due to the sage-grouse designations. Additionally Application 183 added a wildlife habitat reclamation requirement to state lease (C-1088-05) in Section 36, T8S, R39E. Figure 8 below shows the additional disturbance area in relation to the sage-grouse designations.

Figure 8 (Land Use Designations)

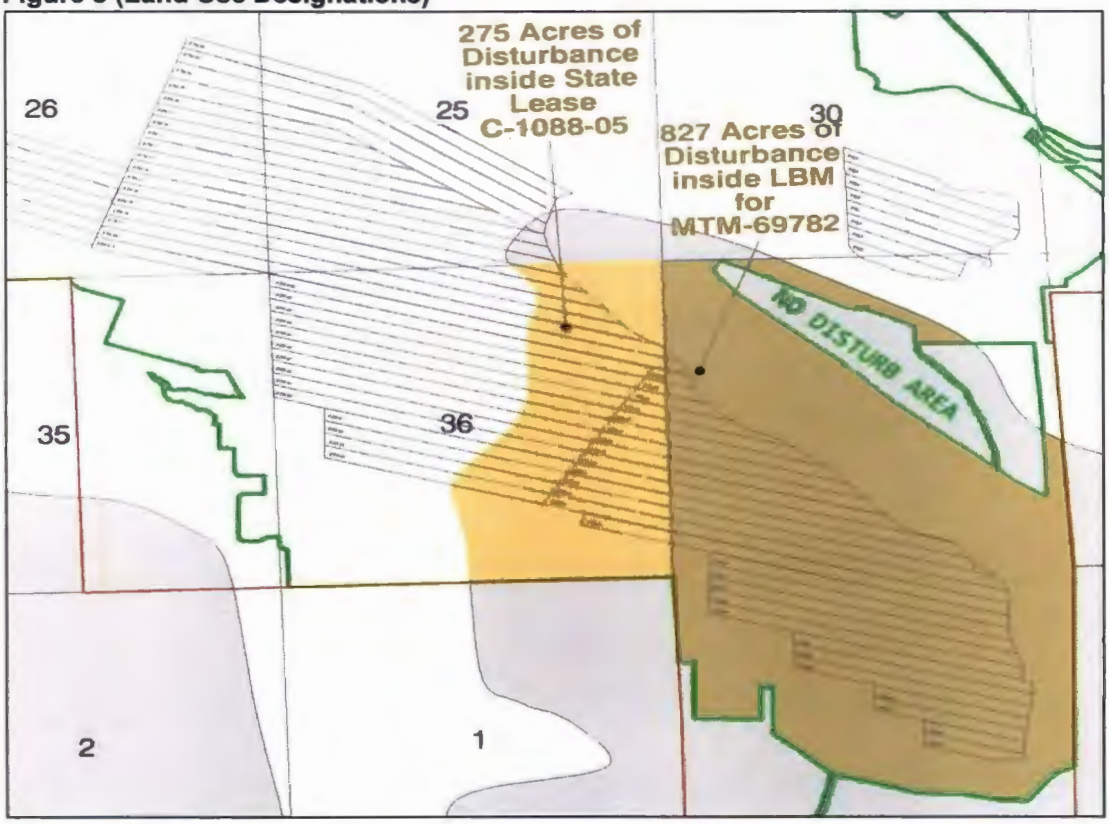


Table 2 below shows how the premine land use designations will not change. As a result, this revision will not result in a change in the post mining land use.

Table 2. Pre and Postmine Land Use Comparison

Coal Lease	**Approved** Sage-Grouse Habitat Disturbance (acres)	**Proposed** Sage-Grouse Habitat Disturbance (acres)	Additional Disturbance (acres)
State (C-1088-05)	265	275	10
LBM Federal (MTM-069782)	108	827	719
		Total	**729**

Approved LOM Disturbance	6,022	acres
Proposed LOM Disturbance	7,033	acres
Additional Disturbance	1,011	acres

Land Use	**Premine** (acres)	**Postmine** (acres)	Difference (acres)
Grazing Land	282	282	0
Wildlife Habitat	**729**	**729**	0
Total	1,011	1,011	**0**

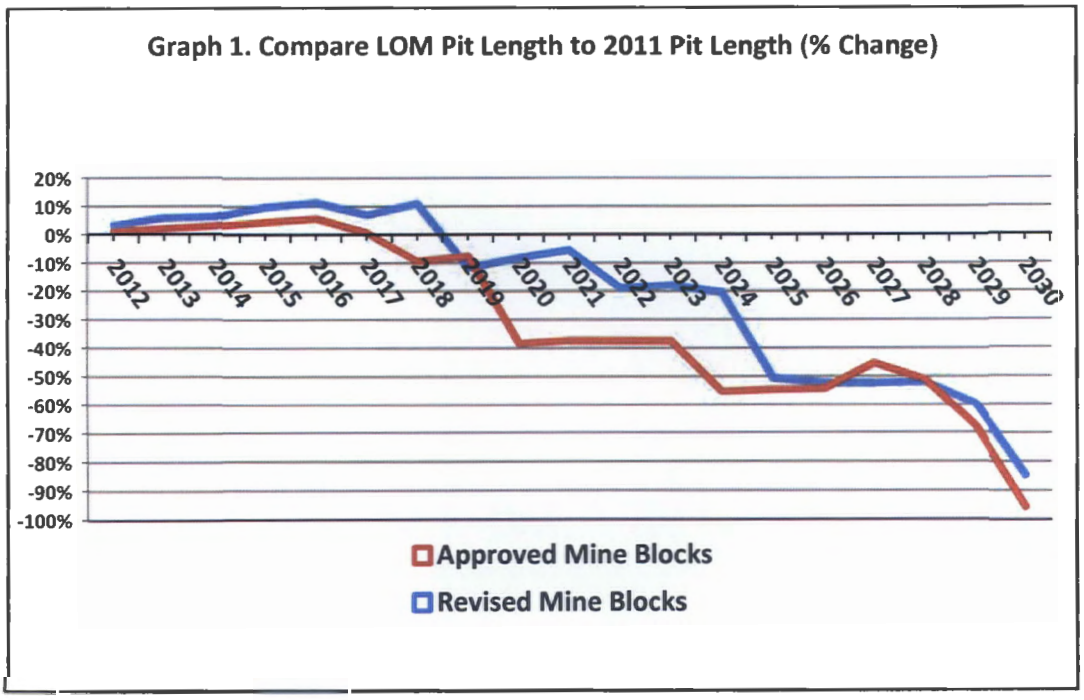
(3) ARM 17.24.301(65)(c) says a revision does not qualify as a minor revision if it "results in a significant change in the bonding level within the permitted area". As shown above, this revision adds mine blocks in Pit #1 and #2 and increases pit length of the blocks in Pit #2 to the southeast. Adding mine blocks in Pit #1 is not expected to affect the future bonding level because the pit length is not increased. Increasing the pit length in Pit #2 has the potential to increase the bonding level by requiring more overburden volume for backfilling the final pit void. The backfill costs are calculated in the Overburden Grading Costs category. Table 3 below shows the major categories and costs for the recently approved reclamation bond approved under MR 164.

Table 3. Current Bond Cost Summary

	Category	Cost	% of Bond
A.	**Overburden Grading Costs**	**$ 71,208,956**	**60%**
B.	Facilities Removal & Long-Term Monitoring Costs	$ 7,821,382	7%
C.	Topsoil Replacement Costs	$ 10,650,132	9%
D.	Revegetation	$ 2,657,812	2%
E.	Administration, Profit, Overhead and Contingencies	$ 21,237,805	18%
F.	Lands Reclaimed without Phase II Bond Release	$ 253,722	0%
G.	Lease Cost of 58 CY Shovel	$ 4,251,240	4%
		$ 118,081,049	100%

As Table 3 above shows the Overburden Grading Costs (Category A) requires the majority (60%) of the total reclamation cost. Categories C, D, and F have the potential to be affected by an increase in pit length if the reclamation sequence is delayed. As shown below in Table 6 below, the contemporaneous reclamation plan will result in very small changes. As a result, the costs for categories C, D, and F are not expected to be affected by this revision. The remaining categories, A, E, and G are not affected by pit length. As a result, this analysis of bonding level change will only focus on the Overburden Grading Costs in relation to the current bond of 2011.

SCM compared the annual pit lengths of the current and proposed mine blocks. Graph 1 below graphs the annual % change in pit length for the approved and revised mine blocks.



Graph 1 above shows the approved and revised mine block pit lengths are longer than the 2011 pit length through the year 2019. Beyond 2019, the pit length decreases resulting in a smaller volume needed to fill in the final pit void; resulting in a bond level below 2011. As a result, SCM evaluated the period when the pit lengths are longer than 2011 (% change is positive). Graph 1 above shows the largest difference in pit length between the years 2016 – 2018. SCM utilized the shifted spoil surface and the PMT (finished ground) to calculate the final pit volumes for each year. Figure 9 below shows a typical cross section of how the open pit volumes were calculated.

Figure 9 (Open Pit Volume Diagram)

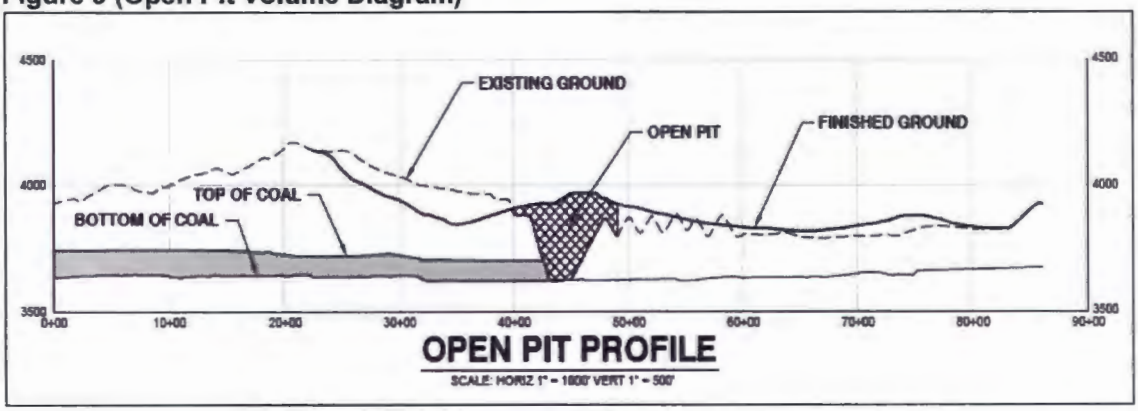


Table 4 below shows the results of the calculations. The maximum increase (15.4%) in open pit volume occurred in 2018 which corresponds to largest difference in pit lengths as shown in Graph 1 above.

Table 4. Compare Approved to Revised Open Pit Volumes

Year	APPROVED Open Pit Volume (Million cubic yards)	REVISED Open Pit Volume (Million cubic yards)	Percent Change
2011	90	90	0.0%
2016	120	128	6.4%
2017	124	130	4.9%
2018	124	143	**15.4%**

Utilizing the current bond costs as the basis for the model, Table 5 below projects a 15.4% increase in Overburden Grading Costs.

Table 5. Projected Bond Cost Summary

	Category	Cost	% of Bond	Projected Cost	% Increase
A.	**Overburden Grading Costs**	**$ 71,208,956**	**60%**	**$ 82,175,135**	**15.4%**
B.	Facilities Removal & Long-Term Monitoring Costs	$ 7,821,382	7%	$ 7,821,382	0.0%
C.	Topsoil Replacement Costs	$ 10,650,132	9%	$ 10,650,132	0.0%
D.	Revegetation	$ 2,657,812	2%	$ 2,657,812	0.0%
E.	Administration, Profit, Overhead and Contingencies	$ 21,237,805	18%	$ 21,237,805	0.0%
F.	Lands Reclaimed without Phase II Bond Release	$ 253,722	0%	$ 253,722	0.0%
G.	Lease Cost of 58 CY Shovel	$ 4,251,240	4%	$ 4,251,240	0.0%
		$ 118,081,049	100%	**$ 129,047,228**	**9.3%**

As discussed above the only category expected to be affected by this revision is Overburden Grading Costs. Table 5 above shows an overall increase in bonding level of only 9.3%. In summary, the increase in pit lengths associated with this revision will not result in a significant change in the bonding level within the permitted area.

(4) ARM 17.24.301(65)(d) says a revision does not qualify as a minor revision if it "results in a change that may affect the reclaimability of the area or the hydrologic balance on or off the permitted area". This revision is an extension of existing mine blocks into similar terrain; thus the reclamation sequence is not affected. Table 6 below compares the currently approved and proposed reclamation/disturbance ratios.

Table 6. Compare Proposed vs. Current Reclamation to Disturbance Ratio

	Reclamation		Disturbance		% Reclaimed = Cumulative RECLAIMED / DISTURBED	
Period	PROPOSED	APPROVED	PROPOSED	APPROVED	PROPOSED	APPROVED
1980-2009	872	809	3,449	3,422	25%	24%
2010	8	9	253	234	24%	22%
2011	157	136	146	120	27%	25%
2012	20	37	273	140	26%	25%
2013	51	47	258	123	25%	26%
2014	48	72	178	210	25%	26%
2015	121	150	151	150	27%	29%
2016-2020	797	742	969	577	37%	40%
2021-2025	1,157	1,964	477	254	53%	76%
2026-2030	1,667	2,056	879	792	70%	100%
2031-2035	2,135	n/a	0	n/a	100%	n/a
Total	**7,033**	**6,022**	**7,033**	**6,022**		
				Average Period Reclamation/Disturbance Ratio	**40%**	**39%**

As shown in Table 6 above the LOM contemporaneous reclamation ratio average is improved by 1% by this revision. The baseline studies in the revision areas indicate favorable reclamation characteristics such as archeology, vegetation, and overburden suitability. The surface water hydrologic balance will have minimal changes as shown in Table 1 above. Extending the mine blocks in Pit #1 and Pit #2 will cause continued diminished water levels of the Anderson-Dietz coal zone in the mine vicinity. The lack of a hydrologic boundary in Pit #1 and Pit #2 will lessen the severity of the drawdown impacts expected to occur beyond the mine permit boundary. As a result, the overall groundwater hydrologic balance impact is expected to be minimal. In summary, this revision will not result in a change that affects the reclaimability of the area or the hydrologic balance on or off the permitted area.

C. CONCURRENCE AND APPROVAL

Enclosed for review is the revised PMT (Plate 4), mining sequence (Plate 5), and reclamation sequence (Plate 6) located in SCM Permit Volume 3. Upon concurrence of these maps, SCM will update and submit for review the following permit materials (Table 7 below) to the Department for final approval of this revision:

Table 7. Revised Permit Materials to be Submitted

Permit Volume	Section/ Plate	Description	Reason
Vol1	303	Legal & Financial	Add LBM & Land Agreements
Vol1	304	Baseline	Revise discussion and figure for crucial sage-grouse habitat
Vol1	308	Operations Plan	Update reserves discussion
Vol1	312	Fish & Wildlife Plan	Update mitigation acreage discussion
Vol1	313	Reclamation Plan	Update PMT demonstration discussion and land use balance tables
Vol1	Addendum 313A	Soil Balance	Update soil balance table with new disturbance areas
Vol1A	318	Archeology	Add discussion about mitigating site 24BH3392 in Sec 31 T8S R39E
Vol1A	322	Coal Conservation	Revise Table and text to include LBM reserves
Vol3	Plate 1	Coal Leases	Add LBM lease boundary
Vol3	Plate 4A	Revegetation	Revise to include new areas
Vol3	Plate 4B	Pre mine topo	Revise LOM disturbance boundary
Vol3	Plate 7	Archeology	Revise LOM disturbance boundary
Vol3	Plate 8	Field Map	Revise LOM disturbance boundary
Vol4	Plate 15	Typical Dragline Sequence	Revise Mine Blocks
Vol4	Plate 18	Road Centerline	Revise transportation plan
Vol4	Plate 18A	Road Profiles	Update road profiles
Vol4	Plate 22	Mining Progression	Update mining progression and table
App J Vol1	Text	Post Mining Hydrology Plan	Update text and tables as necessary
App J Vol 1	Plate J-1	Drainage Profiles	Update Drainage profiles as necessary
App J Vol 1	Plate J-2	Drainage Profiles	Update Drainage profiles as necessary
App J Vol 1	Plate J-3	Post mine Drainage Basin	Update Drainage Basin
App J Vol 1	Plate J-4	HEC-RAS Cross Sections	Update Cross Sections
App J Vol 1	Plate J-5	HEC-RAS Longitudinal Profiles	Update Longitudinal Profiles
App J Vol 1	Plate J-5	HEC-RAS Longitudinal Profiles	Update Longitudinal Profiles
App J Vol 1	Plate J-6	SF SC Channel	Update Topography and Disturbance Boundary
App J Vol 2	Att J-1	SEDCAD Results	Update SEDCAD Results
App J Vol 2	Att J-2	HECRAS Results	Update HEC-RAS Results
App J Vol 2	Att J-3	Minor Tributary Hydrology	Update Minor Tributary Hydrology
App K	Exhibit 1	Hydrologic Control Plan (During)	Update LOM Disturbance Boundary
App K	Exhibit 2	Hydrologic Control Plan (Prior to Final Sediment Release)	Update LOM Disturbance Boundary and BMPs

Due to format changes, the majority of the layers in Plates 4, 5, and 6 were changed with this revision. As a result, SCM submits the following list of layers which did not change as a result of this revision.

Plate 4
Boundary-Permit
Defpoints

Plate 5
0509-Cntr-Txt
0509-Lakeshore
0509-Stream
1980_1989-Blocks
1980_1989-Blocks H
1989_2004-Blocks
1989_2004-Blocks H
2004-2007-Blocks
2004-2007-Blocks H
Boundary-Lease-C-1088-05
Boundary-Lease-C-1099-00
Boundary-Lease-C-1100-00
Boundary-Lease-C-1101-00
Boundary-Lease-Fee-Htch
Boundary-Lease-MTM-088405
Boundary-Lease-MTM-94378
Boundary-Lease-Scrutchfield
Boundary-Lease-State-Htch
Boundary-NO-DISTURB
Boundary-NO-DISTURB-HTCH
Boundary-Permit

Plate 6
Boundary-Permit
Facilities_Reclamation_H
NOPLOT-Temp

We look forward to working with the Department on this permit revision. Please call me at (406) 757-4236 if you have any questions.

Sincerely,

Gabe Johnson
Environmental Engineer

Enclosures –
-Plates 4, 5, and 6 on CD (PDF and AutoCAD Files)
cc: CF 5.2.5 (SCM-11)

2nd Submittal of MR 168

November 7, 2012

CLOUD PEAK
ENERGY®

November 7, 2012

Mr. Chris Yde, Supervisor
Coal and Uranium Program
Industrial and Energy Minerals Bureau
Montana Department of Environmental Quality
PO Box 200901
Helena, MT 59620-0901

Permit ID: C1979012
Revision Type: Minor Revision
Permitting Action: Application
Subject: MR 168; Add LBM and Land Agreements - Response to June 1, 2012 Deficiency Comments

Dear Chris:

Spring Creek Mine (SCM) submitted minor revision 168 on March 2, 2012. SCM received a June 1, 2012 deficiency letter from the Department. SCM greatly appreciates the detail and specificity of the PMT comments received. This submittal addresses deficiencies raised in the 6-1-12 letter with the exception of providing an updated Probable Hydrologic Consequences (PHC), because of its inherent reliance on the PMT. Therefore, SCM requests review of this letter and enclosed materials without a review of the PHC. Upon receiving approval of the PMT, SCM will provide an updated PHC for review. SCM understands an updated PHC is needed before the Department can make a final determination of how this revision needs to be processed (see deficiency comment 2A & B below). The Tables on the following pages include the deficiency and response comments. The map-referenced deficiency comments were renumbered 3-11 to aid review.

We look forward to working with the Department on this permit revision. Please call me at (406) 757-4236 if you have any questions.

Sincerely,

Gabe Johnson
Environmental Engineer

Enclosures – in PDF and AutoCAD format
-Addendum D Plates 1-4 (Pre and Post Slope Assessments)
-Plate 4 (Postmine Topography with Drainage Basin Statistics)
-Plate 4B (Premine Topography with Drainage Basin Statistics)
-Plate 5 (Mine Plan)
-Plate 6 (Reclamation Sequence – not included as no change from March 2, 2012 submittal)
-Plate J-2 (Stream Channel Profiles)
-Plate J-5 (Postmine HEC-RAS Longitudinal Profiles)
cc: CF 5.2.4 (SCM-12)

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Table 1: Comments and Responses

#		Deficiency Comment	Response
1	A	With the exception of the map-referenced comments listed below, the revision appears to be on the right track, but additional information is required in order to conduct a full review. Upon receipt of the Revised Permit Materials, DEQ can conduct a full review. Some specific items expected in the Revised Permit Materials include the following: (See B-G Below)	SCM is providing all revised materials for interim review, except for the updated PHC needed to address deficiency 2A & B below. The PHC will be submitted separately upon agreement the PMT is acceptable.
	B	Slope and Aspect Diagrams	Enclosed are Addendum D Plates 1 and 2 which show the premine and postmine slope aspect diagrams.
	C	Steep Slope Comparison	Enclosed are Addendum D Plates 3 and 4 which show the premine and postmine steep slope comparison.
	D	Description and Definition of Bluff, Ridge and Bench Landforms	In an effort to aid PMT review, SCM provided images to highlight the major landforms of the topography. SCM categorized the major landforms as bluffs, ridges, and benches. Although choosing the location for each feature is subjective, the following definitions are provided to help differentiate between the different landforms. Bluff: A blunt peak or a projection/high point in the topography surrounded 360 degrees by topography which is at least ten feet lower in elevation. Typically these features are added to diversify a contiguous slope, better emulate the premine topography, and provide wildlife habitat for mule deer. Ridge: A projection/high elongated portion of the topography which is at least ten feet lower in elevation on opposite sides. Typically these features are parallel to the major drainages and provide wildlife habitat for mule deer and sage-grouse. Bench: A flatter portion of the topography preceded and followed by steeper topography. Typically these features are added to diversify a contiguous slope, better emulate the premine topography, and provide wildlife habitat for mule deer and sage-grouse.
	E	Channel Profiles	Drawings Plate J-2 (4 sheets) and Plate J-5 (1 sheet) from Appendix J are included for review. The following were the main drainages changed with this revision. Spring Creek: Spring Creek, ND 1B, ND 1C, ND 2, ND 3, ND 4, ND 5, SD 2, SD 3, SD 4, SC 1G, SC 3 and SC 5 South Fork Spring Creek: SF 0C, SF 10, SF 11, SF 14, SF 14B and SF 16 Pearson Creek: Pearson Creek, South Fork Pearson Creek, PC 1, PC 4, PC 5, PC 6
	F	Drainage Basin Table Comparisons	The PMT (Plate 4) and the post-mining topography (Plate 4B) have been updated with this revision and include tables showing the drainage basin statistics for comparison as requested. The March 2, 2012 initial submittal of MR 168 included "Table 1" which compared the drainage characteristics of the approved PMT vs. the proposed PMT. This table was provided to demonstrate compliance with ARM 17.24.301(65)(a) showing this revision does not result in a significant change in the postmining drainage plan. Comparable geomorphology drainage basin statistics were used from the tables in Plates 4 and 4B to update "Table 1". The revised table is included on the next page as Table A. With a maximum and average percent difference of 3.6% and 0.1% respectively, this revision does not result in a significant change in the postmining drainage plan.
	G	Drainage Density and Pattern Comparisons	Updated tables on Plate 4 and 4B show the drainage basin statistics for comparison.

Table A : Comparison of Drainage Basin Characteristics

SEDCAD Structure Designations	Drainage Area		100-yr, 6-hr Storm Event		Geomorphology Inside Permit Boundary Only (Plate 4)	
	Cumulative Area[1] (Plate J3 - acres)	Inside Permit Boundary Only (Plate 4 - square miles)	Cumulative Area Peak Discharge[2] (cfs)	Cumulative Area Runoff Volume[1] (ac-ft)	Main Channel Length (ft)	Channel Sinuosity (ft/ft)
Spring Creek Structures						
Approved Postmine	14,600	6.1	426	380	143,258	1.2
Proposed Postmine	14,599	5.9	422	380	140,897	1.2
% Difference	0%	-2%	-1%	0%	-2%	1%
South Fork Spring Creek Structure						
Approved Postmine	8,910	6.5	336	315	151,792	1.2
Proposed Postmine	8,903	6.5	336	315	152,624	1.2
% Difference	0%	-1%	0%	0%	1%	-1%
Pearson Creek Structures						
Approved Postmine	4,601	7.2	740	309	73,003	1.2
Proposed Postmine	4,620	7.2	767	311	73,718	1.2
% Difference	0%	0%	4%	0%	1%	2%

[1]Cumulative Area is the cumulative area of the drainage inside and outside the mining permit boundary.

[2]Runoff volumes and peak discharges were computed by the rainfall/runoff program SEDCAD using the SCS Type II precipitation distribution.

Maximum % Change	**3.6%**
Average % Change	**0.1%**

Table 1: Continued

#		Deficiency Comment	Response
2	A	As part of the justification for categorizing the proposed mining changes as a Minor Revision, Spring Creek Mine must demonstrate how the proposed changes to mining will not change the hydrologic balance on or off the permitted area. Potential changes to the groundwater and surface water hydrologic balance must be addressed, especially if these changes are unaccounted for in the current PHC.	SCM requests review of the revised PMT and the other enclosed materials before the PHC is updated. Upon concurrence of the PMT, SCM will update the PHC and respond to this comment in a subsequent submittal.
	B	For *groundwater;* changes in the expected drawdown, water quality, recharge area, and recovery time in the local aquifers must be addressed. For *surface water;* changes in the timing and volume of water and sediment from a variety of storm events must be addressed. A comparison of premine, during mining operations with sediment control structures, and postmine discharge and sediment yields would help identify any changes to the surface water hydrologic balance. Submittal of detailed SEDCAD modeling results may be needed to demonstrate the predicted changes to the hydrologic balance.	Please see comment response for 2A.
3		The up-gradient native portion of Pearson Creek does not blend into the disturbed portion of the drainage. It has a convex profile. There might be some additional cut and fill between the native and disturbance (within the drainage itself), unless drop structures are approved and constructed. Additional fill is needed in the final pit (-2700' of pit) to flatten the gradient.	SCM conducted a detailed analysis of the stream lengths at ten foot contour intervals along the Pearson Creek drainage in an effort to identify any sections of convex profiles. Table B on the following page lists the stream length between ten foot contours. The table indicates there will be no sections of convexity for the postmine profile of the Pearson Creek drainage. Additionally, the enclosed Plate J-5 shows the stream profile maintaining a concave longitudinal profile. The disturbance on the west end of Pearson Creek (up-gradient) will result from construction of a flood control impoundment. The back water outline of the life of mine disturbance in this area results from the projected water accumulation up-gradient of the impoundment. Table B shows how the stream channel lengths will change up to contour 3810. SCM does not anticipate the need to disturb further up-gradient into the Pearson Creek channel and/or raise the Pearson Creek drainage in the PMT to fix the natural convexity of the up-gradient native stream channel.

Table B: Comparison of Pearson Creek Channel Length Between 10' Contours, Proposed vs. Premine

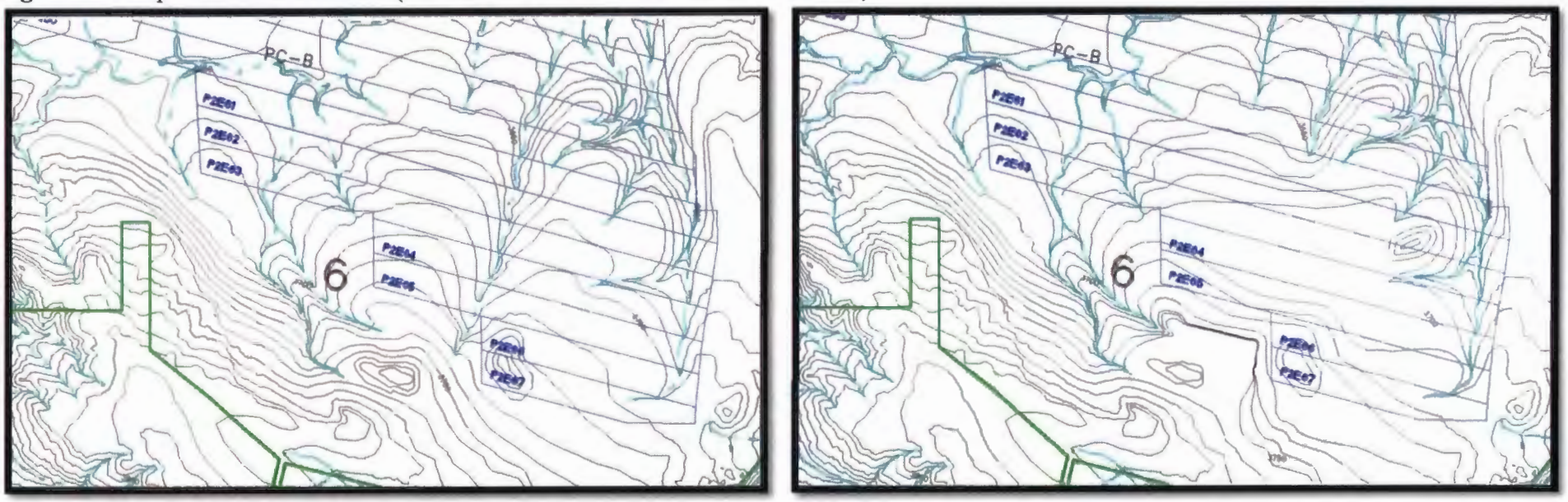
	Elevation	Stream Channel Length **Proposed PMT** (+ / - 0.5 Foot)	Concave Profile?	Stream Channel Length **PRE MINE** (+ / - 0.5 Foot)	Concave Profile?	Notes
	3550					
East End of Drainage	3560	1371		1371		
	3570	945	no	945	no	
	3580	942	no	889	no	Disturbance Boundary Between 3580 and 3590
	3590	942	no	703	no	
	3600	942	no	679	no	
	3610	942	no	807	yes	
	3620	942	no	637	no	
	3630	942	no	747	yes	
	3640	942	no	771	yes	
	3650	942	no	792	yes	
	3660	942	no	831	yes	
	3670	942	no	668	no	
	3680	751	no	618	no	
	3690	751	no	527	no	
	3700	751	no	357	no	
	3710	435	no	20	no	
	3720	435	no	1627	yes	Pre Mine Impoundment
	3730	435	no	440	no	
	3740	435	no	551	yes	
	3750	435	no	727	yes	
	3760	435	no	474	no	
	3770	435	no	780	yes	
	3780	435	no	435	no	
	3790	435	no	452	yes	
	3800	435	no	451	no	
	3810	435	no	616	yes	
	3820	221	no	221	no	Disturbance Boundary Between 3820 and 3830
	3830	550	yes	550	yes	
West end of Drainage	3840	398	no	398	no	
	3850					

Total Stream Length Between Disturbance Boundaries	17,229	Difference = 859 Feet	16,370	First version of the PMT indicated the stream length to be 18,335 between these contours which is a difference of 1,965 feet compared to premine. The shortened meanders and revised channel location reduced the stream length by 1,106 feet from the first PMT version.

Table 1: Continued

#	Deficiency Comment	Response
4	The Section 6 area in general does not appear to retain the primary characteristics of pre- mine topography. A closer approximation to original contour could be achieved through the creation of replacement bluffs within the end walls and final pit south of the South Fork of Pearson Creek. This may also minimize the amount of overall grading work.	SCM appreciates the idea of creating replacement bluffs in the end wall which also helps reduce the amount of borrow needed to fill in the final pit. After discussions with Department staff, SCM reevaluated the mine and backfill plan in this area and concluded some of the final highwall can be used to create replacement bluffs as suggested. The result is a PMT which better emulates the premine topography and helps reduce borrow volume by approximately three million cubic yards. Figure 1 below show a side by side comparison of the first and second versions of the PMT.

Figure 1. Compare PMT in Section 6 (1st Version Vs. 2nd Version with Mine Blocks)

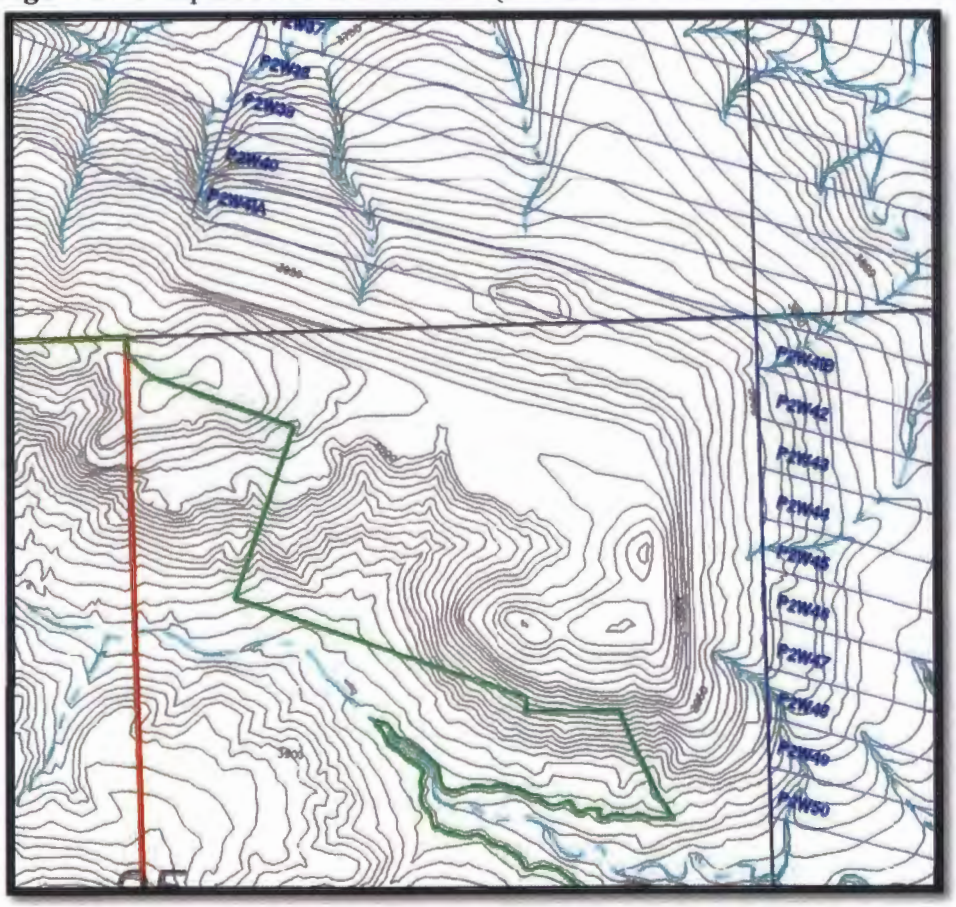


'PMT

Table 1: Continued

#	Deficiency Comment	Response
5	The NE 1/4 of Section 35 includes an approximately 90 degree turn in the reclaimed high wall. These straight, uniform slopes do not resemble premine topography and would not blend into or compliment the postmine landscape as required. The proposed PMT must be designed to blend these features with the adjacent topography.	The recently acquired Land Use Lease (LUL) in Section 35 is being added with this revision. This LUL allows mining the western edge of the leased state coal reserve in Section 36. As a result, the western ends of the highwall in Pit #2 moved further west where the strip ratio increased. This resulted in limited availability of borrow material for blending the final highwall into the adjacent topography. In an effort to better blend this transition, approximately three million cubic yards of fill material was added. Figure 2 below compares the first and second versions of the PMT. As recommended by the Department, the revised PMT improves slope diversity and better emulates the premine topography by removing the abrupt turn in the reclaimed high wall.

Figure 2. Compare PMT in Section 35 (1st Version Vs. 2nd Version with Mine Blocks)



?MT

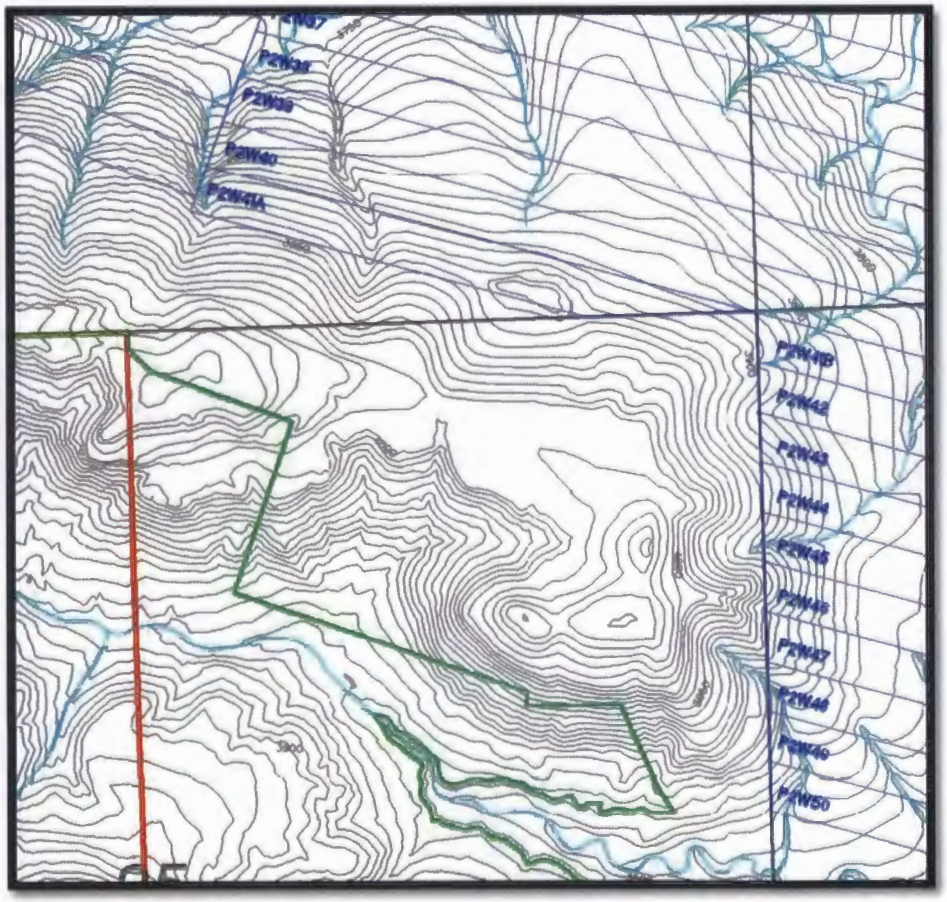


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Table 1: Continued

#	Deficiency Comment	Response
6	17.24.308(I)(b)(ii): There is a large amount of disturbance adjacent to the NE edge of the mining passes in Section 31 (Pearson Creek). Part of the disturbance is associated with OB2-2. DEQ needs an explanation for the placement of this temporary storage pile and why it could not be placed within the borrow area along the SW edge of the final cuts. In addition, there is a large amount of area along the NE edge in which there appears to be no reason at all for disturbance and some justification must be made for this area. If the reason for this additional area of disturbance is merely buffer and therefore the area might not ever be disturbed, the operator should explain this fact and estimate a quantity so DEQ can make a finding in the EA, or the disturbance line should be adjusted.	The currently approved mine plan (Plate 5) shows an overburden stockpile OB-F located south of the final pit in Section 36 which is on leased coal. This revision relocates this pile (now called OB2-2) to the north side of Pit #2 off of coal. The projected disturbance on the north side of Pit #2 will be necessary to maintain access around the pit and also to access OB2-2. Additionally, an MPDES pond will be required as shown. Adequate room for topsoil stockpile construction is a continuous challenge as mining progresses south. SCM will likely seek Department approval for multiple topsoil stockpile locations in this area as mining progresses. As a result, the majority of the disturbance projected in the area will likely be necessary; however, disturbance will be minimized to the area necessary to provide an adequate buffer.

Figure 3. Pit #2 Facilities (Section 31)

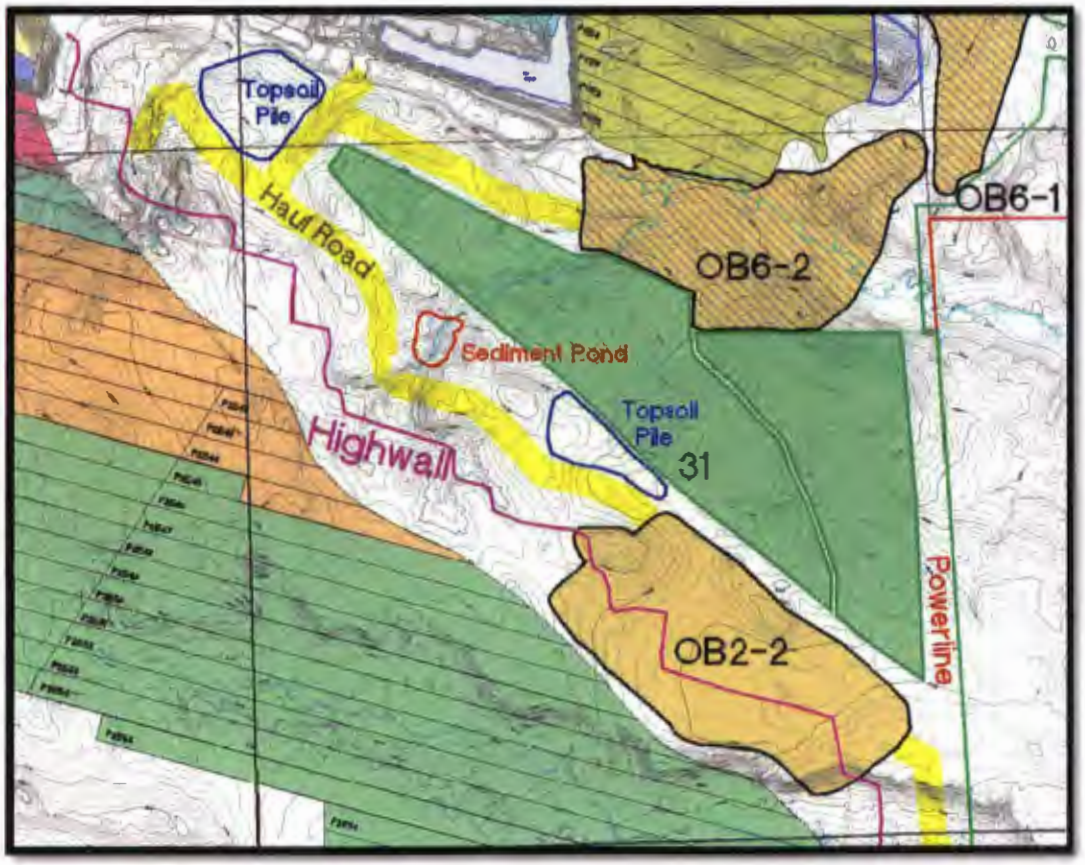
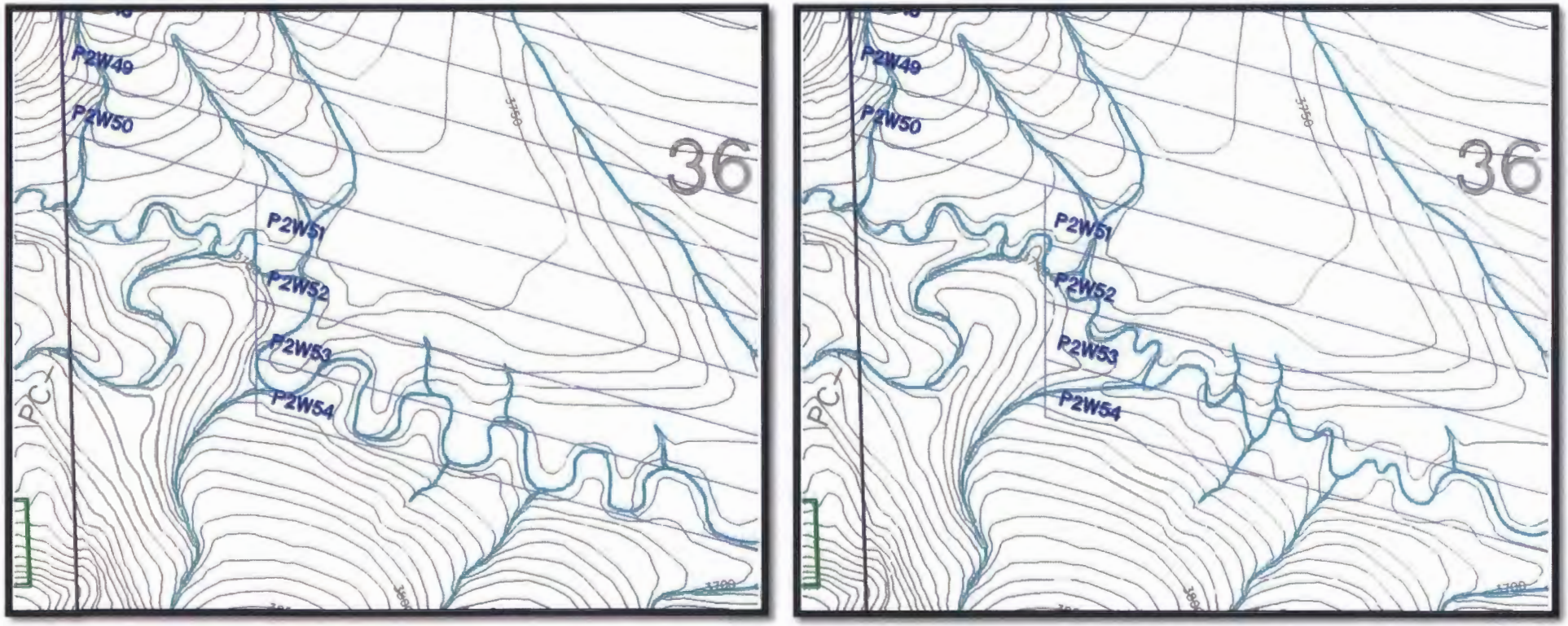


Table 1: Continued

#	Deficiency Comment	Response
7	In the PMT, Pearson Creek (0.6 miles east of western permit edge) takes a sharp turn to the south and commences to regularly meander for 0.4 miles. The current design on this reach is not representative of a natural stream system. DEQ requests that the sharp turn and the meander wavelength of this stretch be redesigned to create a more natural stream system: a less abrupt turn to the south with less or longer meander lengths and more random meanders. Reducing the meander wavelength would also more closely approximate the original stream length. In the proposed PMT, the mapped stream length of Pearson Creek has increased by over 1400 ft from the premine stream length.	This revision adds approximately two cuts in Section 36 andresults in the final pit moving further south. The first version of the PMT directed the Pearson Creek drainage to follow the final pit void. After discussions with Department staff, the second version of the PMT shows a more natural trajectory of the Pearson Creek drainage to better emulate the premine topography. Figure 4 below compares the first and second versions of the PMT showing shorter meander wavelengths and a realigned stream channel. As suggested, the shorter meaner wavelengths and realigned stream channel reduced the stream length by 1,106 feet as shown in Table B above.

Figure 4. Compare PMT in Section 36 (1st Version Vs. 2nd Version with Mine Blocks)



of PMT

of PMT

Table 1: Continued

#	Deficiency Comment	Response
8	In the PMT, Spring Creek through the Pit 4 area also has a large belt width and short wavelength meanders in the channel design. DEQ requests that the PMT be evaluated in this area to determine if the belt width could be decreased (the proposed beltwidth is -300ft while the premine belt width was -100ft).	As suggested, the second version of the PMT reduces the belt width for Spring Creek for a better approximation of the pre mine topography. Figure 5 below compares the Spring Creek alignment for the first (**Blue**) and second (**Red**) PMT versions. The second version shows a much shorter meander wavelength and much narrower belt width. The revised belt width ranges from 55 feet to 270 feet with an average of approximately 120 feet.

Figure 5. Compare Pit #4 Stream Meanders (Sections 14 and 23)

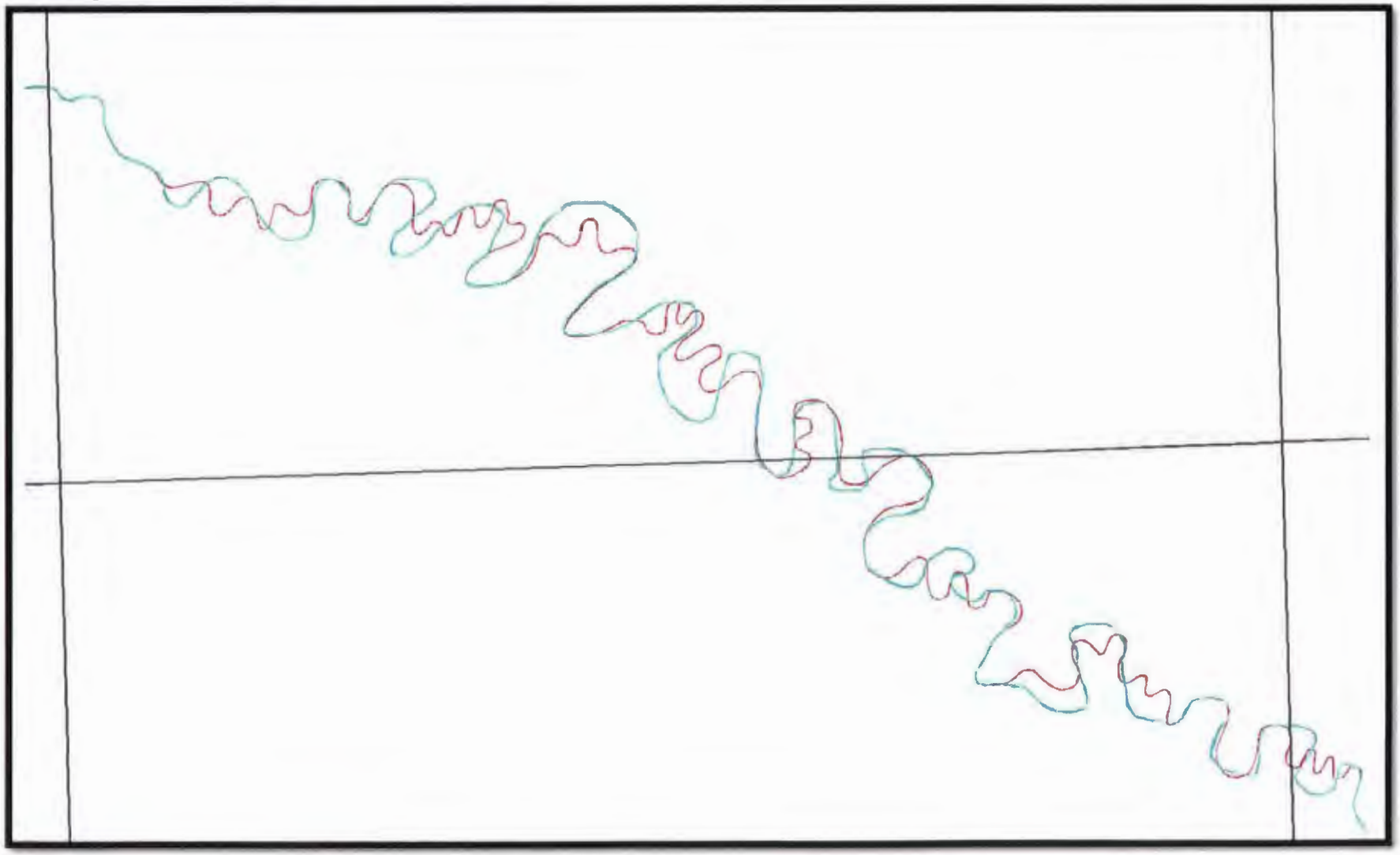


Table 1: Continued

#	Deficiency Comment	Response
9	17.24.301(65)(a): The proposed PMT for the Pearson Creek drainage results in a large increase in the area covered by shallow slopes (approx. 820 acres with slopes< 10% in the postmine drainage compared to 575 acres premine) and a change from steep and narrow to broad valleys. Both of these changes may measurably affect the amount and timing of runoff and infiltration as well as the postmine vegetation communities.	The revegetation plan and post-mining topography are primarily designed to provide wildlife habitat for mule deer and sage-grouse. Sage-grouse prefer flat to gentle slope areas with a gradient < 5% as documented by numerous studies. The March 2, 2012 initial submittal of MR 168 included "Figure 7". This figure showed a 165 acre increase in bench areas in the Pearson Creek area. Increasing the size of the gentle slope areas was intentional done to improve the opportunities for sage-grouse. Table C below compares the currently approved premine vs. the currently approved postmine area with a slope of 10% or less. The table also shows the area with a slope of 10% or less for the proposed PMT vs. premine. The revised PMT results in an increase of 6% vs. the currently approved difference of 8% comparing pre- to postmine slopes 10% or less.

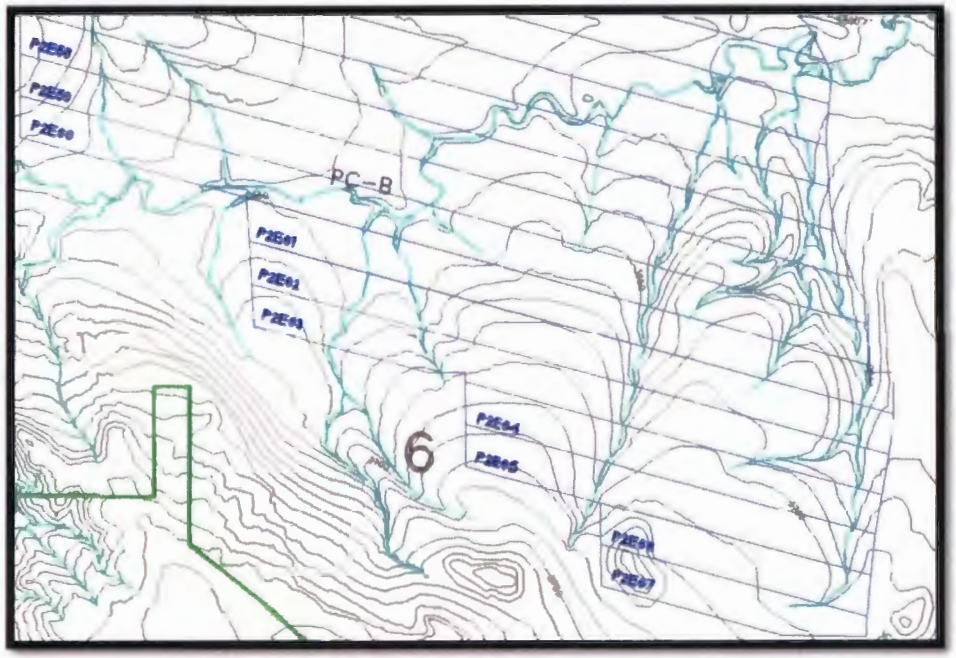
Table C: Cumulative Area with 10% slope (From Addendum D Plates)

	Slope Zone (%)	Area (acres)	Percent of Total (%)
Current Approved Premine	< 10	3,306	57
Current Approved Postmine	< 10	3,560	62
% Difference Current Premine to Current Postmine		8%	
Proposed Premine	< 10	3,801	57
Proposed Postmine	< 10	4,032	60
% Difference Premine to Postmine		6%	

Table 1: Continued

#	Deficiency Comment	Response
10	The straight and uniform drainage in this area is inconsistent with premine topography and AOC requirements.	The March 2, 2012 initial submittal of MR 168 included "Figure 6" which overlays the pre- and post-mining drainages in Section 6. This figure shows how the premine alignments were used almost exclusively for the post-mining alignments to better emulate pre-mining topography. SCM placed the postmine minor and major drainage locations at the same location as the premine drainage locations where possible. After additional discussions with MDEQ staff, it is understood the long minor tributary which projects south needed to be relocated and/or shortened to meet AOC requirements. This minor tributary was initially designed to follow a final haul ramp. As suggested, the revised PMT shortens this minor tributary and adds a bench for improved wildlife habitat. Figure 6 below compares the first and second version of the PMT.

Figure 6. Compare drainages in Section 6 (1st Version vs. 2nd Version with Mine Blocks)



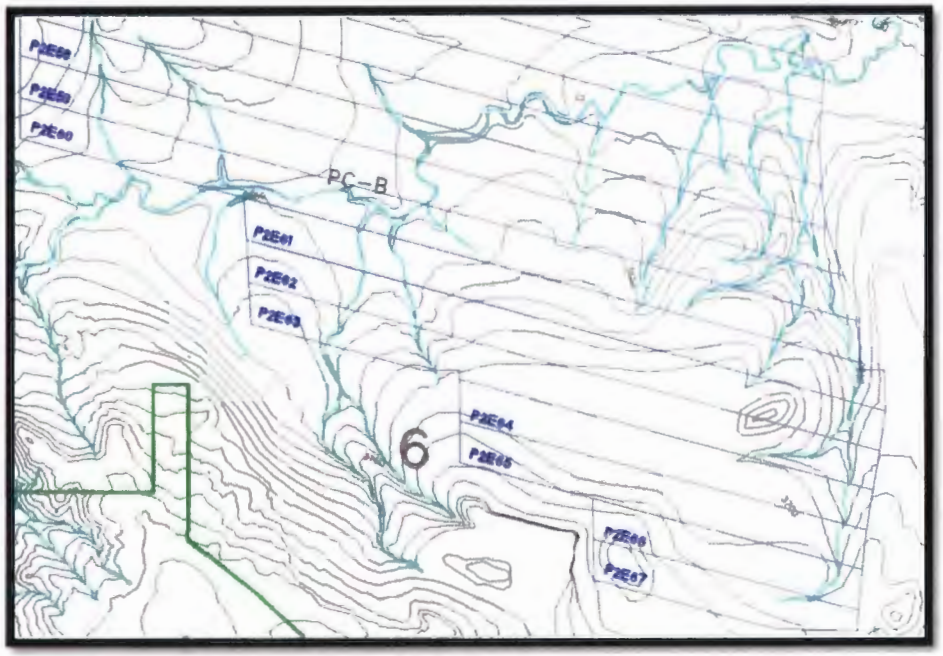
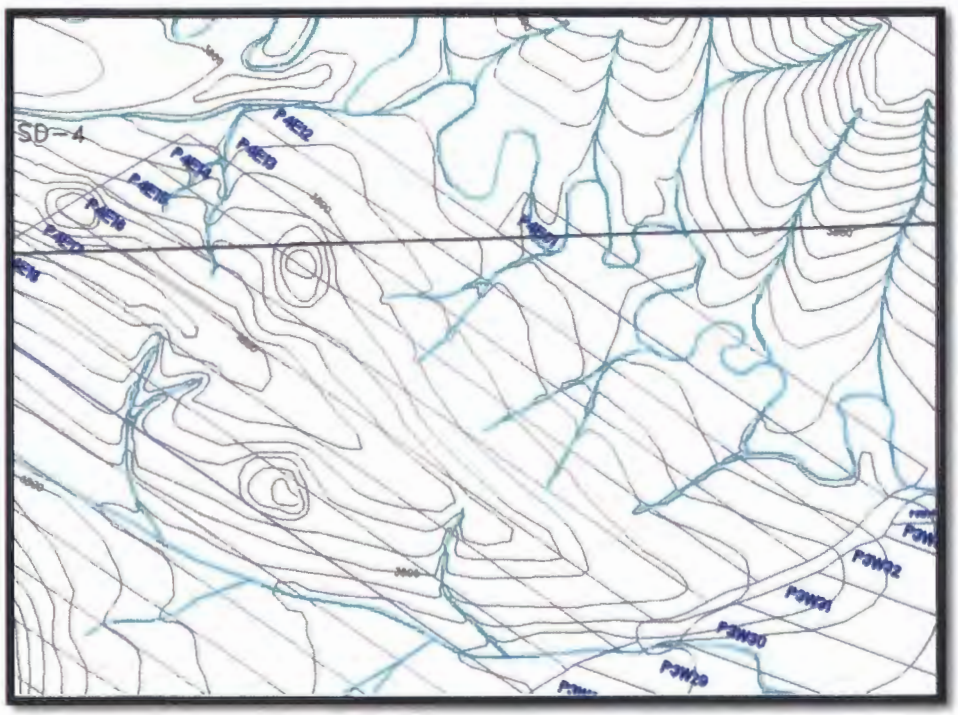


Table 1: Continued

#	Deficiency Comment	Response
11	Drainages in this area are less incised than in the approved PMT. Greater diversity could be had with more pronounced ridges and drainages.	SCM revised the mining sequence in Pit #4 to improve material movement, availability of low sodium coal, and AOC approximation. These changes resulted in less material available for constructing this ridge feature resulting in fewer opportunities for incised drainages. As suggested, the second version of the PMT includes additional minor tributaries, more topographic diversity, and incised drainages along the ridge. Figure 7 below compares the first and second version of the PMT. Figure 7 also shows the changes in shorter wavelength meanders in response to deficiency #8 above.

Figure 7. Compare drainages of the Pit #4 Ridge Feature (1st Version Vs. 2nd Version with Mine Blocks)



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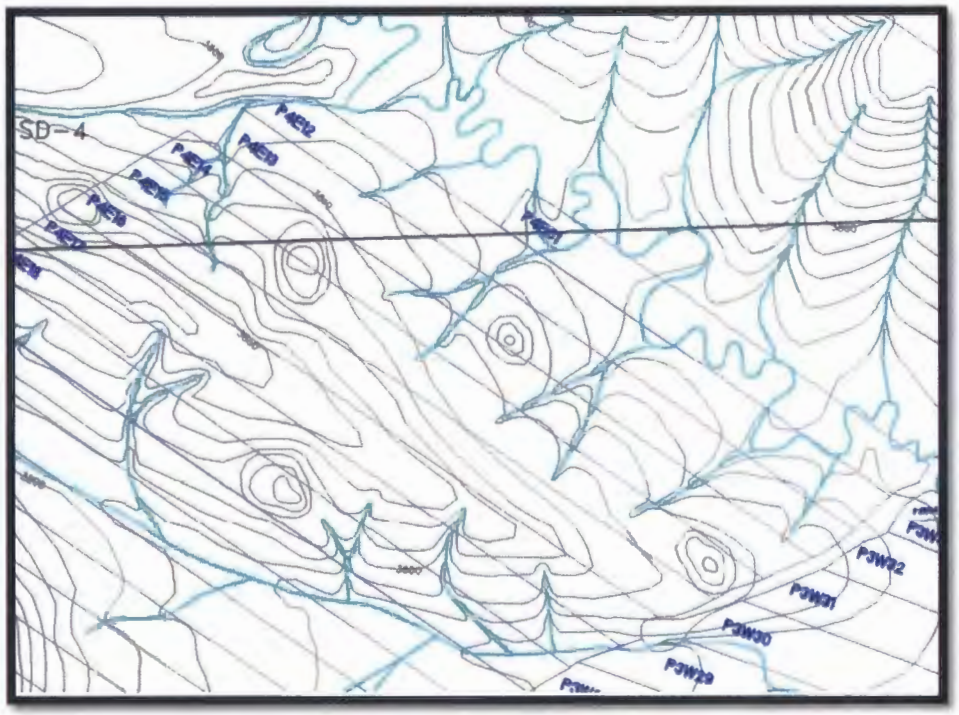

PMT

3rd Submittal of MR 168

May 14, 2013

CLOUD PEAK
ENERGY®

May 14, 2013

Mr. Chris Yde, Supervisor
Coal and Uranium Program
Industrial and Energy Minerals Bureau
Montana Department of Environmental Quality
PO Box 200901
Helena, MT 59620-0901

Permit ID: C1979012
Revision Type: Minor Revision
Permitting Action: Application
Subject: MR 168; Add LBM and Land Agreements - Response to February 5, 2013 Deficiency Comments

Dear Chris:

Spring Creek Mine (SCM) submitted minor revision 168 on March 2, 2012 which included adding LBM I and a LUL in Pit #2. SCM received a June 1, 2012 deficiency letter from the Department which primarily consisted of PMT comments. After several PMT revisions and meetings with MDEQ staff, SCM responded to the June 1, 2012 deficiency comments with a revised PMT on November 7, 2012. SCM meet with MDEQ staff to discuss the PMT comments and major/minor revision categorization on January 9th, 2013. During that meeting the primary concern raised by MDEQ was about methods used for defining minor tributary drainages. Additionally, SCM received another deficiency letter on February 5, 2013 which focused only on methods used for defining minor tributary drainages. This letter addresses the deficiency comments received in the February 5th, 2013 letter in Table 1 below.

We look forward to working with the Department on this permit revision. Please call me at (406) 757-4236 if you have any questions.

Sincerely,

Gabe Johnson
Environmental Engineer

Enclosures – none
cc: CF 5.2.4 (SCM-12)

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Table 1: Comments and Responses

	Deficiency Comment	Response
1	(a) It is not clear how the drainages in the premine and postmine drainage maps were identified, and there doesn't seem to be an entirely consistent approach between premine and postmine methodology. DEQ requests SCM revisit these documents and determine if a more detailed and objective method of drainage designation can be developed. (b) As an example, the attached drawing (Exhibit #1) shows the result of an AutoCAD/Carlson watershed analysis routine that designated drainages based on thirty foot grid and a one acre minimum drainage area. A one acre drainage area was chosen for consistency with the permit (Table J, Stream Reclamation Standards). (c) Plates 4 & 4B also contain tables describing Premining Basin Statistics. Some of the categories in these tables are not exactly clear (i.e., Total Stream Length, Channel Sinuosity, Elevation Difference, Average Channel Slope, Valley Length and Average Valley Slope). A description of how these values were derived would be helpful.	(a) ARM 17.34.313(1)(e)(i) states, "a comparison of premining and postmining drainage basin size, drainage density, and drainage profiles as necessary to identify characteristics not distinguishable on the premining and postmining topographic maps". The methods used for defining where a premine minor tributary is located stems from the drainages shown on the USGS baseline maps. When the mine was flown for aerial topography the technician drawing in the minor tributary drainages used the USGS topo and other available maps to draw the minor tributary locations into the AutoCAD map. Plate J-2 shows a side by side comparison of each minor tributary to meet the requirements of the rule. Plate J-2 was developed in response to comments received during the review of Application 184. Previous to Application 184, the profile of each minor tributary was shown; however a side by side comparison was not required. During the iterative process of determining which pre and post minor tributary to display as a side by side profile for Application 184; sometimes pre mine minor tributaries were removed from the post mine topography drawing so a more suitable pre mine minor tributary could be chosen for a "better" match. Thus the methods used for determining where a pre or post mine minor tributary is drawn is iterative with the goal being the ability to display a side by side comparison on Plate J-2. (b) The Tables shown on Plate 4 and 4B were specifically developed to compare the pre and post mining drainage characteristics as required above. They are not used for construction purposes. As a result, there is not a minimum acreage used to define a minor tributary. The smallest acreages shown on each range between 5-6 acres. The Table J-7 provides a guideline for construction of post mine drainages based on slope and drainage area. One acre is simply a starting point for the table. Thus where a minor tributary starts or branches off and becomes another minor tributary (own drainage boundary/area) is based on professional interpretation with the goal of having a pre and post mining match for Plate J-2. Typically additional diversity is added to the post mine topography which results in an increase in drainage density compared to the pre mine topography. (c) The Tables shown on Plate 4 and 4B were done to specifically identify characteristics not distinguishable on the topography maps as required in the rule above. The terms and methods used are as follows: **Total stream length** represents the total discernible channel length within the individual drainage, as determined from base and postmine topography interpretation. **Drainage density** = (total stream length) / (drainage area). **Channel length** represents the length of the main channel from its start to the basin mouth, including meanders. **Valley length** represents the length of the main channel from its head to the basin mouth, excluding meanders. **Channel sinuosity** = (channel length) / (valley length). **Elevation difference** represents the change in elevation of the main channel from the start of the main channel to the basin mouth. **Average channel slope** represents the overall slope of the main channel as determined by: Average channel slope = (elevation difference) / (channel length). **Average valley slope** represents the overall slope of the main valley as determined by: Average valley slope = (elevation difference) / (valley length).