

TECHNICAL MEMORANDUM

Utah Coal Regulatory Program

March 3, 2004

TO: Internal File

THRU: Joe Helfrich, Team Lead

FROM: James D. Smith, Environmental Scientist

RE: South Crandall Lease Revision, Andalex Resources, Inc., Crandall Canyon Mine, C/015/0032, Task # 1826

SUMMARY:

Little Bear Spring in Little Bear Canyon, located adjacent to the South Crandall Canyon Tract, is an important source of water for the Castle Valley Special Services District (CVSSD), supplying 65 percent of the culinary water to the residents of Huntington, Cleveland, and Elmo. It is probably the largest and most consistently flowing spring in the region, and the only water-treatment required before use is chlorination. CVSSD has great concerns about protecting this important water supply from mining related damage. The South Crandall Canyon Coal Lease Tract was deleted from the Mill Fork Tract because of concerns that were raised regarding Little Bear Spring.

The South Crandall Canyon area was reevaluated and was leased to Andalex in June 2003 (lease UTU-78953). Access to the South Crandall Canyon Tract will be through new portals (under construction in 2003) on the south side of Crandall Canyon in fee coal (often referred to as the "Dellenbach" lease) owned by IPA and Andalex. The South Crandall Canyon Tract covers 880 acres.

The proposed amendment should not be approved at this time. Additional geologic and hydrologic information are needed to meet the requirements of the Coal Mining Rules and for the Division to upgrade of the CHIA.

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TECHNICAL ANALYSIS:

ENVIRONMENTAL RESOURCE INFORMATION

Regulatory Reference: Pub. L 95-87 Sections 507(b), 508(a), and 516(b); 30 CFR 783., et. al.

GEOLOGIC RESOURCE INFORMATION_[sm:]1]

Regulatory Reference: 30 CFR 784.22; R645-301-623, -301-724.

Analysis:

There is geologic information for the permit and adjacent areas in the current MRP, including the proposed South Crandall Canyon Tract. Maps showing geologic information have been updated to include the South Crandall Canyon Tract.

Test borings and coal sampling; coal seams, overburden, and strata

Borehole HC-4 (Appendix 6-6) provides the only information on coal seam thicknesses in the South Crandall Canyon tract. On page 6-5 this borehole is incorrectly identified as DH-4, which is in the area covered by the current Crandall Canyon permit (Crandall Canyon #1 Mine). The log for HC-4 is in Appendix 6-6; however, the title page for this appendix identifies the borehole as DH-4.

The lowest coal seam in the Blackhawk Formation is the Hiawatha, characteristically lying on or just above the Star Point Sandstone. This seam has been mined in the Cottonwood/Wilberg, Deer Creek, Des-Bee-Dove, Huntington #4, and Genwal Mines. The Hiawatha Seam thins to less than 5 feet in the north end of the Cottonwood/Wilberg Mine, but then thickens again to the north. The Hiawatha Seam reaches a thickness of 12 feet in the current Crandall Canyon permit area, located mainly north and west of the #1 Mine pad. For the Hiawatha Seam in the South Crandall Canyon tract, thickness of the coal seam and cover are shown on Plate 5-2 (H), along with the Hiawatha to Blind Canyon interburden thickness. Seam thickness and cover for the Crandall Canyon #1 Mine area are on Plates 6-3 and 6-6.

The Blind Canyon Seam lies approximately 40 to 100 feet above the Hiawatha Seam. The Blind Canyon Seam has been mined in the Deer Creek, Huntington #4, and Des-Bee-Dove Mines, but is too thin to mine economically at the Cottonwood/Wilberg Mines. The Blind Canyon Seam is too thin for economic recovery from the Crandall Canyon #1 Mine, but this seam will be mined in the South Crandall Canyon Tract. For the Blind Canyon Seam in the South Crandall Canyon tract, thickness of the coal seam and cover are shown on Plate 5-2 (H),

along with the Hiawatha to Blind Canyon interburden thickness. Plate 5-2 (BC) shows that the seam is just under 5 feet thick at HC-4 but probably thickens to the west. Blind Canyon Seam thickness for the Crandall Canyon #1 Mine area is on Plate 6-4.

The Bear Canyon Seam is too thin to mine economically in either the Crandall Canyon #1 Mine or South Crandall Canyon Tract. Plate 6-5 is the Bear Canyon Seam thickness isopach map for the #1 Mine area. Borehole HC-4 provides the only information on the Bear Canyon Seam in the South Crandall Canyon tract (Appendix 6-6). On page 6-5, the Bear Canyon Seam thickness is stated to be 2 feet at the South Crandall Canyon Tract: borehole DH-4, rather than HC-4, is identified as the source of this information.

Information on Test Borings and Coal Sampling (section 6.22.1, page 6-4) discusses only the Crandall Canyon #1 Mine area, does not mention the South Crandall Canyon Tract, and only mentions the Blind Canyon Seam to say it is not mineable. There is no reference made to Plates 5-2 (H) and 5-2 (BC) for information on thickness and extent of the coal seams.

The first and last paragraphs on page 6-5 and the first paragraph on page 6-6 are still contradictory and confusing, indicating the Blind Canyon Seam is not sufficiently thick for economic recovery and will not be mined in the South Crandall Canyon Tract. Reference is made to Plate 5-2, but not 5-2 (H) and 5-2 (BC).

Drill-hole locations for the South Crandall Canyon Tract are shown on Plates 5-2 (BC) and 5-2 (H).

Acid- and toxic-forming materials

For the Crandall Canyon #1 Mine, acid- and toxic-forming characteristics for strata immediately over and under the Hiawatha and Blind Canyon Seams in the #1 Mine area are discussed on pages 6-8 and 6-9. Analysis results for the Hiawatha coal also are discussed on page 6-9. The Permittee has not provided analyses for acid- and toxic-forming characteristics for the Blind Canyon Seam, in either the #1 Mine area or the South Crandall Canyon Tract. The Permittee states on page 6-9 of the proposed amendment that there is currently no access to unweathered Blind Canyon materials (the cores taken in 1981 at HC-4 are apparently not available for analysis); however, coal and adjacent strata will be analyzed when the rock tunnels reach the Blind Canyon Seam.

Engineering properties - clays and soft rock

According to section 6.24.34 on page 6-9, strata immediately above and below the “seam to be mined” do not contain clays or soft rock. Those statements are based on information in Appendices 6-1 and 6-5 and apply to the Hiawatha Seam only.

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Engineering properties of strata above and below the Blind Canyon Seam have not been evaluated in the current MRP or the proposed amendment. The lithology log of HC-4 in Appendix 6-6 shows claystone and shale immediately above and below the Blind Canyon Seam. Mining will be done by both longwall and standard room-and-pillar methods. Also, the Blind Canyon Seam is not thick enough to allow the leaving of thick layers of coal on the roof and floor, and soft rock in the roof and floor increases the probability that there will be waste rock that will need to be disposed of. The Permittee needs to provide data on the thickness and engineering properties of clays or soft rock in the roof and floor of the Blind Canyon Seam in the South Crandall Canyon Tract, particularly for areas where coal recovery will be by standard room and pillar mining operations.

Geologic information pertaining to hydrology (Little Bear Spring in particular)

Little Bear Spring is located adjacent to the South Crandall Canyon Tract, and CVSSD has great concerns about protecting this important water supply from mining related damage. Information on how geology may affect the occurrence, availability, movement, quantity and quality of potentially impacted surface and ground water in the South Crandall Canyon Tract and adjacent areas was studied extensively before the South Crandall Canyon lease was issued. Using these studies, the BLM and the Manti-La Sal National Forest concluded that mining in the South Crandall Canyon Tract has a low potential to disrupt Little Bear Spring, and they signed a FONSI in February 2003. Copies of the reports prepared from these studies are included in the proposed amendment as appendices to Chapter 7, and the appendices number and title are listed on page 6-7a.

Findings:

Geologic Resource Information is not sufficient to meet the requirements of the Coal Mining Rules. Before the proposed amendment can be approved, the Permittee needs to provide the following information:

R645-301-121.220, In the paragraph about drill hole and geological information for the South Crandall Canyon Tract that was added to page 6-5, the Permittee needs to refer to borehole HC-4 rather than DH-4.

R645-301-121.220, The Permittee needs to correct the title page of Appendix 6-6 so that it refers to the drillers log for HC-4 rather than DH-4.

R645-301-121.220, The Permittee needs to include the South Crandall Canyon Tract in the information on Test Borings and Coal Sampling (section 6.22.1) on page 6-4. Include a discussion of the minability of Blind Canyon Seam in the South Crandall Canyon Tract, and borehole HC-4 and Plates 5-2 (H) and 5-2 (BC) for information on thickness and extent of the coal seams.

R645-301-121.220, The Permittee still needs to clarify the first and last paragraphs on page 6-5 and the first paragraph on page 6-6. They indicate that the Blind Canyon Seam is not sufficiently thick for economic recovery and will not be mined in the South Crandall Canyon Tract: these paragraphs are confusing and directly contradictory of other statements on the same pages. Reference is made to Plate 5-2, but not 5-2 (H) and 5-2 (BC). Statements are made that were true without the South Crandall Canyon Tract but are not representative of the proposed mining plan.

R645-301-624.340, the Permittee needs to include a discussion of engineering properties of roof and floor rock for the Blind Canyon Seam in the South Crandall Canyon Tract.

HYDROLOGIC RESOURCE INFORMATION

Regulatory Reference: 30 CFR Sec. 701.5, 784.14; R645-100-200, -301-724.

Analysis:

Baseline Cumulative Impact Area Information [sm:]2

The Division needs to update the East Mountain CHIA to incorporate the expansion of the Crandall Canyon Mine into the South Crandall Canyon Lease Tract. Additional geologic and hydrologic information, as described in Findings of other sections of this document, are needed before the Division can complete this update.

Findings:

Baseline cumulative impact information is not sufficient to meet the requirements of the Coal Mining Rules. Before the proposed amendment can be approved, the Permittee needs to provide the following information:

R645-301-725.100, the Permittee needs to provide geologic and hydrologic information as described in the Findings of other sections.

MAPS, PLANS, AND CROSS SECTIONS OF RESOURCE INFORMATION [sm:]3

Regulatory Reference: 30 CFR 783.24, 783.25; R645-301-323, -301-411, -301-521, -301-622, -301-722, -301-731.

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Analysis:

Affected Area Boundary Maps[sm:]4

Maps showing the geologic characteristics of the permit and adjacent areas have been amended or augmented to include the boundary for the South Crandall Canyon Tract.

Coal Resource and Geologic Information Maps[sm:]5

Subsidence projections for the South Crandall Canyon Tract are on Plates 5-2 (H) and 5-2 (BC).

The Hiawatha Seam thickness isopach (Plate 6-3), the Blind Canyon Seam thickness isopach (Plate 6-4), and Bear Canyon Seam thickness isopach (Plate 6-5), Hiawatha Seam overburden thickness isopach (Plate 6-6), and structure contour map of the top of the Hiawatha Seam (Plate 6-7) do not include the South Crandall Canyon Tract. Hiawatha and Blind Canyon Seam thickness isopachs for the South Crandall Canyon Tract are on Plates 5-2 (H) and 5-2 (BC), and information on interburden is also listed on these maps. The Bear Canyon Seam is 2 feet thick at borehole HC-4 (page 6-5 and Appendix 6-6), which is the only information on the Bear Canyon Seam in or adjacent to the South Crandall Canyon tract.

Overburden thickness is shown on Plates 5-2 (H) and 5-2 (BC). Taking into consideration the inherent inaccuracy in the large contour interval needed to map the overburden thickness because of the steep topography, the difference between the Hiawatha and Bear Canyon overburden thicknesses is not significant. Similarly, a structure map of the Blind Canyon Seam is not needed.

Monitoring and Sampling Location Maps[sm:]6

Drill-hole locations are shown on Plates 5-2 (BC) and 5-2 (H).

Findings:

Maps, plans, and cross sections of resource information are sufficient to meet the requirements of the Coal Mining Rules.

OPERATION PLAN

SUBSIDENCE CONTROL PLAN

Regulatory Reference: 30 CFR 784.20, 817.121, 817.122; R645-301-521, -301-525, -301-724.

Analysis:

Subsidence Control Plan_[sm:]7]

Subsidence projections for the South Crandall Canyon Tract are on Plates 5-2 (H) and 5-2 (BC).

Findings:

Subsidence Control information is sufficient to meet the requirements of the Coal Mining Rules.

RECLAMATION PLAN

MINE OPENINGS_[sm:]8]

Regulatory Reference: 30 CFR Sec. 817.13, 817.14, 817.15; R645-301-513, -301-529, -301-551, -301-631, -301-748, -301-765, -301-748.

Analysis:

Plans for casing and sealing holes are covered in the current MRP. Drill-hole locations are shown on Plates 5-2 (BC) and 5-2 (H).

Findings:

Reclamation Mine Opening information is sufficient to meet the requirements of the Coal Mining Rules.

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CUMULATIVE HYDROLOGIC IMPACT ASSESSMENT^[sm:]9]

Regulatory Reference: 30 CFR Sec. 784.14; R645-301-730.

Analysis:

The Division needs to update the East Mountain CHIA to incorporate the expansion of the Crandall Canyon Mine into the South Crandall Canyon Lease Tract. Additional geologic and hydrologic information, as described in the Findings of other sections of this document, are needed before the Division can complete this update.

Findings:

The Division cannot complete the CHIA at this time.

R645-301-725.100, the Permittee needs to provide geologic and hydrologic information as described in the Findings of other sections.

RECOMMENDATIONS:

The proposed amendment should not be approved at this time. Additional geologic and hydrologic information are needed to meet the requirements of the Coal Mining Rules.