

June 30, 2003

Charles Reynolds, Engineering Manager  
Co-Op Mining Company  
P.O. Box 1245  
Huntington, Utah 84528

Re: Findings for Abandoned Equipment, Co-Op Mining Company, Bear Canyon Mines, C/015/025-AM03C, Outgoing File

Dear Mr. Reynolds:

The above referenced amendment has been reviewed and there are deficiencies that must be adequately addressed prior to approval. A copy of our technical analysis is enclosed for your information. Please respond to these deficiencies by September 25, 2003 or the Division will return your application.

The information that was submitted with amendment AM03C is not adequate to evaluate the worst-case scenario relative to the abandoned equipment. The worst-case scenario is considered to be inundation of the abandoned machinery.

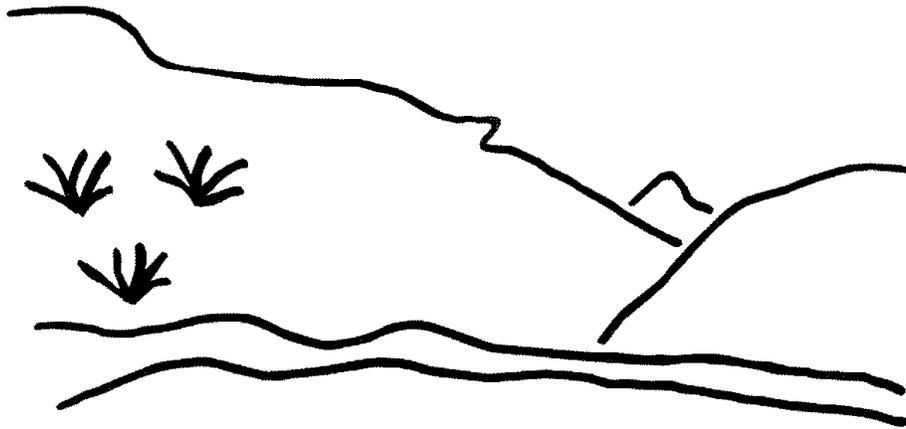
If you have any questions, please call Peter Hess at (435) 613-5622, or me at (801) 538-5325.

Sincerely,

Daron R. Haddock  
Permit Supervisor

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enclosure  
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# State of Utah



## Utah Oil Gas and Mining

### Coal Regulatory Program

Bear Canyon Mine  
Abandoned Equipment  
C/015/025-03C  
Technical Analysis  
June 23, 2003



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## TECHNICAL ANALYSIS

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# TECHNICAL ANALYSIS

The Division regulates the Surface Mining Control and Reclamation Act of 1977 (SMCRA). When mines submit a Permit Application Package or an amendment to their Mining and Reclamation Plan, the Division reviews the proposal for conformance to the R645-Coal Mining Rules. This Technical Analysis is such a review. Regardless of these analyses, the permittee must comply with the minimum regulatory requirements as established by SMCRA.

Readers of this document must be aware that the regulatory requirements are included by reference. A complete and current copy of these regulations and a copy of the Technical Analysis and Findings Review Guide can be found at <http://ogm.utah.gov/coal>

This Technical Analysis (TA) is written as part of the permit review process. It documents the Findings that the Division has made to date regarding the application for a permit and is the basis for permitting decisions with regard to the application. The TA is broken down into logical section headings which comprise the necessary components of an application. Each section is analyzed and specific findings are then provided which indicate whether or not the application is in compliance with the requirements.

Often the first technical review of an application finds that the application contains some deficiencies. The deficiencies are discussed in the body of the TA and are identified by a regulatory reference which describes the minimum requirements. In this Technical Analysis we have summarized the deficiencies at the beginning of the document to aid in responding to them. Once all of the deficiencies have been adequately addressed, the TA will be considered final for the permitting action.

It may be that not every topic or regulatory requirement is discussed in this version of the TA. Generally only those sections are analyzed that pertain to a particular permitting action. TA's may have been completed previously and the revised information has not altered the original findings. Those sections that are not discussed in this document are generally considered to be in compliance.



## INTRODUCTION

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# INTRODUCTION

The permittee submitted an amendment to the mining and reclamation plan on May 29, 2003 in response to several concerns aired by the assigned reclamation specialist. The first concern was relative to the abandonment of a coal hauler in the #1 Mine (Hiawatha coal seam). The Division requires all permittees to identify the location of machinery that is left in underground workings, such that a finding can be made relative to the potential for impact to ground water and/or surface water resources. The other issues that have been addressed include an update of violation information and revised surface facilities maps showing the location of explosive and detonator storage facilities (R645-301-521.167).

Mining of the Hiawatha Seam in the 1st North section of the Bear Canyon #1 Mine was abandoned due to a roof fall that occurred on January 14, 2003. The roof fall buried a coal hauler, a distribution box, and a shop trailer, and the buried equipment had to be abandoned in-place. Other equipment was removed and the area sealed. Co-Op Mining Company utilizes the water from the mine for both culinary and mining purposes, so they are concerned about potential contamination.

The section that was sealed included water-monitoring site SBC-11, which monitored floor seeps in the northeast corner of Mine #1. Drainpipes were installed through the seals near SBC-11, and also through the seals near the roof fall at elevations sufficiently low that water should not back-up behind the seals and flood the abandoned equipment. The entry where the roof-fall occurred is elevated enough so that seepage can drain through surrounding entries and around the abandoned equipment.

SBC-9A now monitors flow from the drainpipes through the seals plus water that comes down from the Blind Canyon Seam through a nearby drill-hole. Co-Op Mining anticipates abandoning SBC-9A and the surrounding entries in 2003 or 2004. Pumping will cease and water will rise until it can drain by gravity into the West Mains, but the abandoned equipment will be above this water level. Water is piped from the West Mains to the Co-Op water-supply system, and water quality will be monitored for the life of the mine.

Other than a general description of the abandoned equipment, there is no information on what fluids or other potential pollutants have been left underground. The Permittee has not determined the probable hydrologic consequences of abandoning this equipment –(i.e., the potential and probable impacts on the mine discharge), and whether the water-monitoring plan is adequate to detect materials that may adversely affect water quality or be detrimental to public health and safety.

## INTRODUCTION

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Although the submitted information indicates that the abandoned machinery sits in an area higher than the rest of the section, and that water will report from the 1<sup>st</sup> North section before it could intercept any of the buried lubricant, electrolyte, etc., the Division must evaluate the potential impact to the ground water regime if a cave of roof should block the flow path of water allowing it to back up and inundate the equipment.

**SUMMARY OF DEFICIENCIES**

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**SUMMARY OF DEFICIENCIES**

The Technical analysis of the proposed permit changes cannot be completed at this time. Additional information is requested of the permittee to address deficiencies in the proposal. A summary of deficiencies is provided below. Additional comments and concerns may also be found within the analysis and findings made in this Draft Technical Analysis. Upon finalization of this review, any deficiencies will be evaluated for compliance with the regulatory requirements. Such deficiencies may be conditioned to the requirements of the permit issued by the Division, result in denial of the proposed permit changes, or may result in other executive or enforcement action and deemed necessary by the Division at that time to achieve compliance with the Utah Coal Regulatory Program.

Accordingly, the permittee must address those deficiencies as found within this Draft Technical Analysis and provide the following, prior to approval, in accordance with the requirements of:

***Regulations***

**R645-301-121.300**, Include updated Plate 7-10B on the C1/C2..... 17

**R645-301-528.330**, The Permittee must provide information, such as type and volume, on fluids and other potential pollutants associated with the abandoned equipment. .... 11

**R645-301-731.311**, The Permittee needs to identify the potential contaminants from the abandoned equipment and establish that the proposed monitoring is adequate to detect materials that may adversely affect water quality or be detrimental to public health and safety. .... 14

**R645-301-731.700**, The Permittee needs to include all necessary information on a single map and use that map as the reference for Appendix 7-P. .... 17

**SUMMARY OF DEFICIENCIES**

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## GENERAL CONTENTS

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# GENERAL CONTENTS

## VIOLATION INFORMATION

Regulatory Reference: 30 CFR 773.15(b); 30 CFR 773.23; 30 CFR 778.14; R645-300-132; R645-301-113

### **Analysis:**

The permittee was issued three violations in the month of January 2003. These were N03-46-1-2, 1 of 1 relative to “failure to minimize to the extent possible additional contributions of sediment to stream flow or to flow outside the permit area”, and 2 of 2, “failure to maintain diversions”. The last violation (N03-40-1-1) was issued to the permittee for failure to conduct the requirements of the approved ground water monitoring regime for 2002 for four groundwater-monitoring wells.

The permittee completed the remedial actions necessary to abate each of violations in a timely fashion. All of the violations have been terminated, the last having been completed on May 29, 2003.

The permittee does not have any current State or Federal permits in suspension or revocation.

The permittee has not forfeited a bond or other security in the last five years.

The purpose of submitting the notice of violation information received in this submittal is to disclose that information relevant to the most recent violations of SMCRA such that same will not hinder the future issuance of permits.

### **Findings:**

The application has met the minimum regulatory requirements of this section.

**GENERAL CONTENTS**

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## OPERATION PLAN

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# OPERATION PLAN

## SPOIL AND WASTE MATERIALS

Regulatory Reference: 30 CFR Sec. 701.5, 784.19, 784.25, 817.71, 817.72, 817.73, 817.74, 817.81, 817.83, 817.84, 817.87, 817.89; R645-100-200, -301-210, -301-211, -301-212, -301-412, -301-512, -301-513, -301-514, -301-521, -301-526, -301-528, -301-535, -301-536, -301-542, -301-553, -301-745, -301-746, -301-747.

### Analysis:

#### **Disposal Of Noncoal Mine Wastes**

The permittee experienced an unanticipated roof fall in the 1<sup>st</sup> North section of the Bear Canyon #1 Mine (Hiawatha seam) on January 14, 2003 at approximately 6:45 AM. The coal production from the area was being generated via retreat mining (pillar extraction). The roof fall (130 feet in length X 20 feet in width X 20 feet above the coal seam) buried a coal hauler (battery powered), an electrical distribution box, and a shop trailer. After the investigation of the roof fall by the permittee and MSHA, all remaining equipment was removed from the section and the area was sealed with MSHA approved mine seals.

The permittee notified the Division concerning the incident on January 15, 2003 during the initiation of the regular monthly inspection. At that time, the assigned reclamation specialist informed the permittee that it was necessary to submit a permit amendment to document the location of the abandoned machinery such that the Division can make a finding relative to the potential for the degradation of the ground and/or surface water regimes within the permit area.

The permittee submitted information relative to the roof fall / buried, abandoned equipment on May 29, 2003. Other than a general description of the abandoned equipment submitted as amendment 03C, there is no information on what fluids or other potential pollutants have been left underground.

The submittal contains PLATE 7-10B, which is a map of the #1 Mine workings in the Hiawatha seam. PLATE 7-10B locates the area in the 1<sup>st</sup> North section where the battery powered coal hauler, the electrical distribution box, and the shop car are buried. PLATE 7-10B was P.E. certified by Mr. Charles Reynolds, the permittee's Manager of Engineering Services, on April 24, 2003.

The buried mining apparatus would contain the following liquids, which could potentially impact ground water emanating in the area; gear oil(s) in the wheel units and speed reducers of the coal hauler, and battery electrolyte in the DC power cells of that machine. The shop car may

## OPERATION PLAN

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contain quantities of hydraulic oil, tube grease, and gear oil(s). Generally, shop cars contain tools, hydraulic fittings and hoses, and other miscellaneous machine repair items. The electrical distribution box will contain quantities of copper, aluminum and other assorted metals, and could contain dielectric substances in capacitors, as well as insulating material.

Relative to the ground water regime in the 1<sup>st</sup> North area, PLATE 7-10B depicts a floor seep in the northwest corner of the section generating four gallons of water per minute (SBC-11). A roof dripper located 700 feet west of the buried machinery is noted as generating less than one-tenth of a gallon per minute. A vertical borehole connects the Hiawatha seam with the overlying Blind Canyon seam. A second vertical drill hole reports forty gallons per minute to SBC9. Water is shown to collect in at least two areas of the 1<sup>st</sup> North section.

The permittee has included text relative to the abandoned equipment portion of the submittal that is included as Appendix 7-P. Page 2 of Appendix 7-P (page 7P-2) indicates that the floor elevation where the equipment is buried is higher than the surrounding area. Thus, the equipment should be close to or be the last to intercept accumulated ground water as the area floods.

The permittee has included Figure 7P-1, Hiawatha Seam Mine Water that depicts the anticipated flow path that any ground water accumulating in the sealed area should follow to the surface. "P" traps have been installed in the #1 and #5 seals, (numbered from left to right as if looking toward the northern boundary of the permit area) which will allow ground water to flow from the sealed area toward the vertical drill hole to SBC-9.

A maximum level of water accumulation elevation line is depicted on Figure 7P-1. The approximate elevation of the Hiawatha seam floor where the machinery was buried has been calculated to be 7442 feet. Water will begin discharging out of entry 26 at elevation 7434 feet. Thus the floor elevation upon where the machinery is located is approximately eight feet higher than the elevation at which water will begin discharging from the abandoned area.

PLATE 7-10B depicts two mine water discharge lines emanating from the Hiawatha portal area; a two inch culinary line and a four inch mine water discharge line. The route that these lines take once they reach the surface is not known.

The permittee has not included the following items that are felt to be necessary in order for the Division to make the necessary finding relative to a potential effect on the ground water regime in the Bear Canyon area:

- 1) The volume of battery electrolyte contained in the two batteries that supplied direct current for the operation of the battery powered coal hauler.

## OPERATION PLAN

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- 2) The volume (approximate, if any) of any greases, gear oils, or hydraulic oils associated with the “shop car” that was buried beneath the cave. MSDS sheets need to be submitted for each of the lubricants that were buried with the shop car, should there be any. If the shop car contained no lubricants, this should be so stated.
- 3) The manufacturer and model of the electrical distribution box, as well as a letter from the manufacturer of the electrical distribution box indicating whether the box contained any internal components utilizing chemicals (dielectrics, or other similar substances) that could have a potential impact on ground water.

### Findings:

The submitted information is not adequate such that the Division can make a finding relative to the potential for impact to the ground and/or surface water regimes within the Bear Canyon permit area. The permittee must provide the following, prior to approval, in accordance with the requirements of:

**R645-301-528.330**, The Permittee must provide information, such as type and volume, on fluids and other potential pollutants associated with the abandoned equipment.

## HYDROLOGIC INFORMATION

Regulatory Reference: 30 CFR Sec. 773.17, 774.13, 784.14, 784.16, 784.29, 817.41, 817.42, 817.43, 817.45, 817.49, 817.56, 817.57; R645-300-140, -300-141, -300-142, -300-143, -300-144, -300-145, -300-146, -300-147, -300-147, -300-148, -301-512, -301-514, -301-521, -301-531, -301-532, -301-533, -301-536, -301-542, -301-720, -301-731, -301-732, -301-733, -301-742, -301-743, -301-750, -301-761, -301-764.

### Analysis:

#### General

The section that was sealed included water-monitoring site SBC-11, which monitored floor seeps in the northeast corner of Mine #1. Drainpipes were placed through seals near SBC-11, and also near the roof fall at elevations sufficiently low that water should not back-up behind the seals and flood the abandoned equipment. The entry where the roof fall occurred is elevated enough so that seepage can drain through surrounding entries and around the abandoned equipment.

### **Groundwater Monitoring**

SBC-9A now monitors flow from the drainpipes that were installed in the seals plus water that comes down from the Blind Canyon Seam through a nearby drill-hole. Co-Op Mining anticipates abandoning SBC-9A and the surrounding entries in 2003 or 2004. Pumping will cease and water will rise until it can drain by gravity into the West Mains, but the abandoned equipment should be above this water level. Water is and will continue to be piped from the West Mains to the Co-Op water-supply system, and water quality will be monitored for the life of the mine.

A roof fall in the Hiawatha level of #1 Mine has left SBC-11 inaccessible; therefore, SBC-11 has been removed from the Water Monitoring Matrix in Table 7.1-8. Table 7.1-9 (Past and Existing Monitoring Sites) has also been updated to include this information.

### **Acid- and Toxic-Forming Materials and Underground Development Waste**

The roof fall in the 1st North section of the Bear Canyon #1 Mine (January 14, 2003) buried a coal hauler, a distribution box, and a shop trailer, and the buried equipment had to be abandoned in-place. Other equipment was removed and the area sealed. Except for a general description of the abandoned equipment, there is no information on lubricants, hydraulic fluids, and other potential pollutants that have been left underground.

UDOGM prepared a CHIA for Gentry Mountain in 2001 (which is currently being updated). Underground abandonment of equipment was not covered in that CHIA. Consequences from abandoned mining equipment were not included in the Probable Hydrologic Consequences (PHC) determination in the Bear Canyon Mine MRP.

The main materials in the abandoned equipment are metals, mainly steel. A considerable tonnage of ferrous materials - such as steel roof bolts, wire mesh, and cans used in support pillars - is routinely abandoned in underground coal mines because the materials cannot be removed without endangering the lives of miners. The amount of steel in the abandoned equipment is probably on the order of several tons, but this additional steel is not significant considering the amount routinely abandoned during underground mining operations during the life of a mine: based on information from the Genwal Crandall Canyon Mine, room-and-pillar mining requires that approximately 400 tons of steel be placed and abandoned underground for each million tons of coal produced, and in 2000 and 2001, production at the Bear Canyon Mine was a little over 1 million tons/year.

Water encountered in the mine has had little or no recent communication with the surface and is not subject to annual recharge events.

## OPERATION PLAN

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Conditions in the abandoned areas of the mine are not conducive to oxidation or other chemical reactions:

- C Recorded pH values for ground waters entering the Bear Canyon Mine range from 6.6 to 8.3, but are typically neutral to slightly alkaline;
- C Oxygen will typically be absent or at low concentration both in the air and waters of the abandoned mine. Other oxidizing agents will typically not be found in an abandoned mine.
- C Cool temperatures in the abandoned mine will tend to retard rather than accelerate most chemical reactions.

Figure 7P-1 on page 7P-3 shows locations of the equipment, the main inflows to the mine, the seals and drains, and the anticipated water level when drainage to the West Mains begins. Based on information in the amendment, it is not likely that the areas where the equipment is to be abandoned will be flooded.

Assuming the mine were to flood and the abandoned equipment were to be covered with water, several probable results and impacts can be evaluated:

- C Flooding of the abandoned mine might be relatively rapid, but once flooded, flow of ground water into, through, and out-of the void spaces of the mine should be slow;
- C If steel or other metals were to oxidize, it would be at a very slow rate and the amount of iron and other metals added to the ground water at any one time would be very small;
- C Oxides of most metals are insoluble or slightly soluble in water (anions in solution in the water could increase solubility, but this is not anticipated based on typical ground-water chemistries of the region), especially at temperatures expected in the mine, so once formed, metal oxides would tend to precipitate as solids within the mine rather than flow in solution in the ground water. If any metal were to go into solution, concentrations would be highest near the abandoned equipment, but the volume of water in the flooded mine would dilute concentrations outside the immediate vicinity of the abandoned equipment;

- C Because of dilution and dispersion, natural seasonal fluctuations, and the limits of accuracy of analytical methods, changes in water quality would not be expected to be large enough to be detected at the surface at springs or in ground-water base flow to streams. However, because of the relatively short and direct flow path from the equipment to the point of mine discharge, materials from the equipment might be detectable in the mine discharge.

If the abandoned equipment is not covered with water as the mine floods, which is the expected scenario at Bear canyon, the metals might oxidize at a faster rate. The probable impacts would be small because of the relative immobility of metals and similar contaminants.

Whether the equipment were flooded or not, more mobile materials such as acids, lubricants, and hydraulic fluids could escape from the equipment and contaminate the hydrologic system. The Permittee does not identify these other potential contaminants in the abandoned equipment.

### **Water-Quality Standards And Effluent Limitations**

The potential of contamination in water discharging from the mine is a special concern at the Bear Canyon Mine because Co-Op Mining Company utilizes the water from the mine for both culinary and mining purposes. Water not consumed in culinary and mine operations is discharged to the stream in Bear Canyon under a UPDES permit.

Monitoring of the mine discharge will continue for the life of the mine, but as there is no further information on this monitoring, it is assumed to be the operational monitoring regime described in the MRP. Because the potential contaminants from the abandoned equipment are not identified, the Division cannot determine that the routine monitoring described in the MRP is sufficient. The Permittee needs to identify the potential contaminants and establish that the proposed monitoring is adequate to detect materials that may adversely affect water quality or be detrimental to public health and safety.

### **Findings:**

**R645-301-731.311**, The Permittee needs to identify the potential contaminants from the abandoned equipment and establish that the proposed monitoring is adequate to detect materials that may adversely affect water quality or be detrimental to public health and safety.

## OPERATION PLAN

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### MAPS, PLANS, AND CROSS SECTIONS OF MINING OPERATIONS

Regulatory Reference: 30 CFR Sec. 784.23; R645-301-512, -301-521, -301-542, -301-632, -301-731, -302-323.

#### **Analysis:**

##### **Mining Facilities Maps**

The requirements of R645-301-512.120 are that the surface facilities and operations maps included within the permit must be P.E. certified by a Utah registered professional engineer. The requirements of R645-301-521.167 are that the location of each explosive storage and handling facility must be depicted on those P.E. certified surface facilities maps.

The permittee has completed the mining activities in the #1 and #2 Mines located on the west side of Bear Canyon and has developed the new #3 Mine in the Wild Horse Ridge addition. As of the date of this tech memo, the access road to the #4 Mine is still being developed. As such the permittee felt it necessary to relocate the dynamite and the detonator storage magazines to the local of the new #3 Mine area. Dynamite is often used underground for construction processes, as well as on the surface for boulder size reduction and other surface construction activities.

The dynamite and detonator storage magazines were previously located west of the electrical substation associated with the #1 Mine (Hiawatha portals). These were depicted on PLATE 2-4C. The new location of the dynamite and detonator storage magazines is adjacent to the #3 Mine access road, approximately eight hundred and thirty feet up the Canyon from the major topsoil storage pile in the area. The new explosives storage facilities locations are depicted on PLATE 2-4F.

The permittee has submitted revised PLATES 2-4C and 2-4F deleting the old locations and identifying the new locations for the explosives and detonator storage magazines. Both maps are P.E. certified by Mr. Charles Reynolds, Utah registered professional engineer.

##### **Mine Workings Maps**

The updated Plate 7-10B is not listed on the C2 form.

Figure 7P-1 on page 7P-3, which is similar to Plate 7-10B, shows elevations for the #1 Mine, the water level anticipated when drainage to the West Mains begins, and locations of the roof-fall, abandoned equipment, the main inflows to the mine, and the seals and drains. Updated Plate 7-10B is similar except it does not show the mine elevations and anticipated water level. The text of Appendix 7-P refers to Plate 7-10B, so this map should show all pertinent information.

**Findings:**

The submittal meets the minimum regulatory requirements of R645-301-512.120 and R645-301-521.167 for explosives storage facilities.

**R645-301-121.300**, Include updated Plate 7-10B on the C1/C2.

**R645-301-731.700**, The Permittee needs to include all necessary information on a single map and use that map as the reference for Appendix 7-P.

