

**MONTANA DEPARTMENT OF ENVIRONMENTAL QUALITY  
PERMITTING AND COMPLIANCE DIVISION**

**RECORD OF DECISION**

**For CR Kendall Mine  
Amendment 007 to Operating Permit No. 00122  
Fergus County, Montana  
May 2016**

The Final EIS on CR Kendall Mine's proposed amendment to Operating Permit 00122 can be obtained by contacting DEQ MEPA Coordinator Jen Lane at 406-444-4956 or from DEQ's web site (<http://deq.mt.gov/public/eis>). Additional printed or electronic (on compact disc) copies of this ROD and the Final EIS are available upon request. The supporting project record is available for review at the Department of Environmental Quality, Hard Rock Mining Bureau, located at 1520 East Sixth Avenue, PO Box 200901, Helena, MT 59620-0901. For additional information concerning these decisions, contact Jen Lane, Director's Office, DEQ, 1520 E. Sixth Avenue, Helena, MT, 406-444-4956.

*Tom Livers*

*5/18/16*

Tom Livers, Director  
State of Montana  
Department of Environmental Quality

Date

## Section 1 – Background

### 1.1 Introduction

Mining began in the area around the CR Kendall Mine about 1880 and continued until 1942. Tailings from ore milling operations were historically deposited in Mason Canyon, Barnes-King Gulch, and Little Dog Creek, prior to CR Kendall’s modern mining activities. The historic Kendall Mill discharged tailings into Mason Canyon. The Barnes-King Mill discharged tailings into Barnes-King Gulch with some tailings transported as far as 2 miles downstream. The North Moccasin Syndicate Mill deposited tailings in the North Fork of Little Dog Creek.

An environmental impact statement (EIS) on possible reclamation at the CR Kendall Mine was initiated and scoped in 2003. The stakeholders involved in the scoping process agreed that no proposed alternative existed for the Kendall Mine closure because DEQ had denied CR Kendall’s earlier proposed amendment to its closure plan. The stakeholders compiled a list of preliminary reclamation alternative components that addressed water quality, water quantity and improved revegetation and land use.

The stakeholders also believed that early identification of actions that would be common to any reclamation alternative would enable DEQ and CR Kendall to initiate reclamation efforts at the mine site before the EIS was complete. The common actions identified by the stakeholders included reclamation of Leach Pads 3 and 4. The stakeholders agreed that the leach pads would remain in place, would be regraded, and that an appropriate cap would be evaluated and chosen in the EIS process.

By April of 2005, DEQ had prepared a preliminary draft EIS. DEQ suspended work on the EIS later in 2005 when CR Kendall indicated that it would submit a long-term water treatment plan and would fund completion of the EIS. That plan was submitted to DEQ in 2012.

Between 2005 and 2012, CR Kendall requested several minor revisions to its operating permit and conducted reclamation work consistent with all alternatives that were being evaluated in the EIS. These include.

- Recontouring of the leach pads to final grade and construction of perimeter storm water diversion ditches
- Recontouring of backfill in the Kendall and Barnes-King pits and regrading of portions of the Kendall waste rock dump
- Placement of additional topsoil on portions of the pit backfill areas and waste rock dumps
- Placement of an 18” layer of bentonite-amended subsoil (the basal layer) over the recontoured leach pads, and interim seeding of that surface
- Construction of a pilot-scale passive treatment facility in the Process Valley to test the effectiveness of a potential treatment technology
- Construction of a pilot-scale passive biological treatment cell in Barnes-King Gulch to test another potential treatment technology

- Placement of a 17” layer of topsoil over the leach pads and revegetation of the surface
- Construction of collection systems at springs upgradient of the mine and installation of pipelines to divert these springs through the mine site to compensate for impacts to water rights due to operation of mine drainage interception systems in Little Dog Creek and South Fork Last Chance Creek

As previously indicated, in 2012 the CR Kendall Mine submitted an application to amend its operating permit, proposing a final closure plan addressing water management and treatment, final capping and reseeded of the leach pads, and long-term reclamation monitoring and maintenance.

DEQ prepared a Draft and Final EIS to present the analysis of possible environmental consequences of four closure alternatives: the Proposed Action, the Process Pad Drainage Pretreatment Alternative, the Process Pad Barrier Cover Alternative and the No Action Alternative. The two process pad alternatives include additional mitigation measures developed by DEQ.

## **1.2 Project Area Description**

The CR Kendall Mine is on the eastern flanks of the North Moccasin Mountains in Fergus County, Montana, approximately 8 miles west of Hilger and 25 miles north of Lewistown, Montana.

The major features at CR Kendall Mine include four mine pits (Horseshoe, Muleshoe, Barnes-King, and Kendall), three waste rock dumps (Horseshoe, Muleshoe, and Kendall), two process pads, various ore processing and/or water management facilities including process water ponds, and other disturbances. All of the waste rock dumps and three of the four mine pits have been reclaimed in compliance with the approved reclamation plan. Mine operations disturbed approximately 448 acres of the 1,040 acre permit area. Through December 31, 2014, approximately 395 acres were reclaimed, including the establishment of vegetation. The 53 acres that currently remain unvegetated include the mine office and shops, water treatment plant, main road and access roads, and approximately 8 acres in the Kendall and Muleshoe Pits where limited soil placement has occurred.

## **1.3 DEQ’s Responsibilities and Purpose of the ROD**

DEQ administers the Metal Mine Reclamation Act (MMRA), Title 82, chapter 4, part 3, Montana Code Annotated (MCA) and the administrative rules adopted under the MMRA. DEQ also administers the Montana Water Quality Act (WQA) and the administrative rules adopted under the WQA.

The Montana Environmental Policy Act (MEPA) (Section 75-1-101, *et seq.*, MCA) requires an environmental review of actions taken by the State of Montana that may significantly affect the quality of the human environment. The environmental review culminating in the issuance of the

Final EIS on April 15, 2016 was conducted to fulfill MEPA. DEQ identified the Process Pad Drainage Pretreatment Alternative as its preferred alternative in the Final EIS.

The purpose of this Record of Decision (ROD) is to set forth DEQ's decision on CR Kendall's application to amend its operating permit and the reason for the decision. The ROD documents the alternatives considered, including a discussion of the advantages and disadvantages of the alternatives and DEQ's application of the decision criteria set forth in the Metal Mine Reclamation Act.

## **Section 2 - Public Involvement**

### **2.1 Public Involvement**

Scoping activities were conducted in 2003 as part of the scoping process for the EIS initiated in 2013. These activities included private interviews with interested members of the public, an open house at the Yogo Inn in Lewistown where technical representatives were present to discuss individual topic areas, a public meeting at the Yogo Inn to obtain comments on the proposed permit amendment, and a series of working meetings with technical specialists and stakeholders.

DEQ held an open house in Lewistown on March 31, 2015, to kick off the environmental review process for the proposed amendment to CR Kendall's operating permit.

Members of the public submitted comments on the Draft EIS. Written comments were submitted during a comment period that ran from September 10 through November 10, 2015. Eight letters were received. DEQ also received oral comments on the Draft EIS during a public meeting conducted at the Yogo Inn on September 30, 2016. DEQ reviewed the written and oral comments on the Draft EIS and responded to the comments in the Final EIS.

### **2.2 Issues of Concern**

Based on the public involvement, DEQ identified two issues to be addressed through the alternatives analysis process for the proposed final closure plan - (1) the effects of the mine closure actions on surface water and groundwater quantity and quality; and (2) the effects of the mine closure actions on soils and reclamation. These issues were evaluated in detail to address impacts to resources and to help determine reasonable alternatives for mine closure, including the Proposed Action. The specific components of the two relevant issues are set forth on pages 1-14 and 1-15 of the Final EIS.

### **2.3 Issues Considered but Not Studied in Detail**

An Interdisciplinary Team (IDT) review determined that a number of issues would not be studied in detail through the EIS analysis process. These issues are as follows:

- The cost of the selected alternative.
- An EIS is not necessary

- DEQ will develop the EIS with a predetermined preferred alternative for reclamation and water treatment.
- DEQ and CR Kendall have shown a lack of interest in involving the public on mine-related issues.
- DEQ should ensure the reclamation is effectively implemented and meets legal requirements.
- The overall effect of the Kendall Mine on the local economy should be evaluated.
- The Bureau of Land Management (BLM) should be a co-lead agency in preparing the EIS.
- The land within the permit boundary is privately owned.
- Hazardous wastes should receive special treatment.
- The slopes of the heap leach pad should be terraced to catch surface water until vegetation can use it.
- The buffering capacity of the waste rock should be enough to prevent acid mine drainage.
- Disposal of mine wastes into pits could result in contaminated seepage into the Madison limestone and could affect the Lewistown water supply and Petroleum County.
- The pit floors should be lined with impermeable materials before backfilling.
- Highwall stability should be evaluated.
- Ditches should be constructed on native grounds rather than on disturbed materials.
- Surface water quality monitoring may not adequately identify all exceedances.
- Piping water from Little Dog Creek around the mine instead of letting it go underground may unfairly allocate water to a specific landowner.
- DEQ shows favoritism to CR Kendall and/or specific landowners.
- The compensation to local ranchers by CR Kendall for alleged water losses may be an admission of guilt.
- Existing water rights may be compromised by mining or reclamation activities.
- A water reservoir should be retained for firefighting.
- Noxious weeds from the mine may have spread to exploration roads and neighboring properties.

- Historical tailings in the streambeds below the permit area should be removed to prevent recontamination of treated water discharge.
- Reclamation should protect people and property from long-term effects from the mine.
- Sediment from the mine site has contaminated the Boy Scout Pond.
- Cultural resources
- Fisheries and aquatics
- Threatened and endangered speices
- Air Quality
- Socioeconomics
- Aesthetics

The rationale for not considering these issues in detail is set forth on pages 1-15 through 1-20 of the Final EIS.

### **Section 3 - Alternatives Considered**

Chapter 2 of the Final EIS describes the alternatives analyzed and the alternatives considered but excluded from detailed analysis. The potential environmental impacts of the following alternatives were analyzed in detail in Chapter 3 of the Final EIS.

- No Action Alternative
- Proposed Action
- Process Pad Drainage Pretreatment Alternative
- Process Pad Barrier Cover Alternative

DEQ considered, but dismissed without considering in detail, the following alternatives:

- Process pad removal
- Waste isolation in mine pits
- Geosynthetic clay liner (GCL) cover on process pads
- Other water treatment and water discharge alternatives (biologic treatment, reverse osmosis, and sulfide precipitation through chemical addition)

The rationale for not considering these alternatives in detail is set forth on pages 2-17 through 2-20 of the Final EIS.

## Section 4 - Decisions and Rationale for Decision

DEQ has selected, for permitting, the Proposed Action as modified by the Process Pad Drainage Pretreatment Alternative. Under the Proposed Action, CR Kendall would retain the reclamation of the process pads that has been performed to date. The process pads were regraded to 3:1 slopes with 10-foot benches every 100 feet in 2004. A modified water-balance cover was installed in 2008 and 2012 consisting of 17 inches of growth media over 6 inches of subsoil basal layer material amended with 5 to 8 percent bentonite, over 12 inches of subsoil basal layer material. The process pads were seeded in 2012.

The primary difference between the Process Pad Drainage Pretreatment Alternative and the Proposed Action is in the capture and treatment of process pad drainage water. Arsenic is one of the contaminants in the process pad drainage water and is projected to exceed groundwater standards even after the drainage water and captured groundwater are combined under the Proposed Action. Under the Process Pad Drainage Pretreatment Alternative, a separate piping system will collect the drainage water from process pads 3 and 4 for pretreatment for removal of arsenic prior to blending the drainage water with other mine waters. The pretreatment system could remove other contaminant constituents, if necessary, to comply with discharge criteria. The estimated time for continued water treatment is 10 to 40 years.

The likely pretreatment system would involve the oxidation and adsorption of arsenic onto an adsorbent compound (ferric chloride, iron filings, or other). Adsorptive media would generate a spent medium that is contained in vessels and would likely pass TCLP testing for arsenic. The specific process water pretreatment technology chosen by CR Kendall to remove arsenic could generate a contaminated treatment medium, or byproduct, that requires proper disposal. Because the specific technology has not been chosen or designed, this alternative assumes proper disposal options for the contaminated treatment media. The contaminated treatment media would be 1) shipped back to the manufacturer when exhausted; 2) shipped offsite for disposal, or 3) buried onsite if confirmed as non-hazardous.

CR Kendall may submit treatment system designs other than the adsorptive media pretreatment system described above, which DEQ would evaluate for consistency with the impacts disclosed in the Final EIS. If the treatment system design submitted by CR Kendall may result in materially different impacts as disclosed in the Final EIS, DEQ would conduct further MEPA review.

After pretreatment, the water would be combined with the other captured groundwater for thallium removal through the current method of zeolite adsorption. The spent zeolites would be disposed of in Pond 7, where additional adsorption of thallium and other contaminants may occur (same as the Proposed Action). Treated water would be discharged to groundwater through the Kendall Pit. The land application system would still be available for use, but only if

necessary to prevent direct discharges to surface water in response to extreme precipitation events.

In addition, the Process Pad Drainage Pretreatment Alternative requires the reseeded of the lower slopes of the Kendall and Muleshoe Pits where there has been poor vegetation establishment. The areas would also be amended with an organic amendment if equipment can be safely mobilized into the pit bottoms. Improving the vegetation in the Kendall and Muleshoe Pits in this fashion reserves the limited stockpiled topsoil for use in reclaiming the ponds after completion of water treatment. The No Action Alternative would spread the limited stockpiled topsoil in the Kendall and Muleshoe Pits, reserving no stockpiled topsoil for use in reclaiming the ponds.

### **Rationale for the Preferred Alternative**

Under the Proposed Action, the capping currently in place on process pads 3 and 4 would be the final capping. The reclaimed process pad covers on these facilities appears to be stable. Plant roots are able to penetrate the entire soil profile and may extend into the underlying spent ore. The vegetation should be more tolerant of drought than under the Process Pad Barrier Cover Alternative. The current vegetation on pads 3 and 4 is robust and appears to be successfully established. Furthermore, the reclaimed process pad covers have shown no significant sign of erosion or slumping, even from the large rain event in 2014 in which the area received 9 inches of rain in 24 hours. The 10-year, 24-hour event for this area is 2.6 inches. It is reasonable to conclude that the process pad covers currently in place will continue to adequately function.

DEQ is not selecting the Process Pad Barrier Cover Alternative. The redistribution of the process pads under this alternative would set back the established vegetation, increase the potential for erosion until new vegetation becomes established, result in some soil loss and increased soil compaction, and increase the potential for soil slumping. In addition, The Process Pad Barrier Cover Alternative would restrict plant roots to the upper 17 inches of soil, resulting in the vegetation being more susceptible to drought.

Mixing models developed for the Proposed Action predict the combined drainage water and captured groundwater would not meet groundwater standards for thallium and arsenic. Only treatment for thallium, however, is included in the Proposed Action. The Process Pad Drainage Pretreatment Alternative is the only alternative that ensures treated water will achieve all groundwater standards prior to being discharged. A separate piping system will collect the drainage water from process pads 3 and 4 for pretreatment to remove arsenic prior to blending the drainage water with other mine waters. The system will be modified as necessary to include treatment for additional elements, such as selenium, which may require treatment in the future to comply with groundwater discharge standards.

DEQ does not believe that the Process Pad Barrier Cover Alternative would assure compliance with all groundwater standards. The reclamation of process pads using barrier covers at other mine sites has not reduced seepage to levels where treatment is no longer required. In some cases, higher concentrations of contaminants in the residual seepage have resulted. Therefore, the Process Pads Barrier Cover Alternative does not provide assurance that it would eliminate the

need for additional water treatment steps in order to achieve compliance with groundwater quality standards.

## **Section 5 - Findings Required by Laws and Policies**

### **Montana Environmental Policy Act (MEPA)**

MEPA requires State agencies to conduct an environmental review when making decisions or planning activities that may have a significant impact on the environment. MEPA and the administrative rules promulgated under MEPA define the process to be followed when conducting an environmental review. The Draft and Final EIS that DEQ prepared in regard to CR Kendall's proposed amendment complies with the procedural requirements of MEPA.

### **Metal Mine Reclamation Act (MMRA)**

#### **1. Procedural Compliance**

The procedure for DEQ's review of an application for a major amendment to an operating permit is the same as that applicable to an application for an operating permit and is set forth in Section 82-4-337, MCA. Pursuant to Section 82-4-337(1)(d), MCA, when DEQ determines that an application is complete and compliant, it is required to declare in writing that the application is complete and compliant and issue a draft permit amendment. Under Section 82-4-337(1)(f), MCA, issuance of the draft permit as a final permit is the proposed state action that is subject to review under MEPA.

Finally, Section 82-4-337(2)(b), MCA, requires DEQ to consult with the applicant before placing stipulations in a draft or final permit. Permit stipulations in a draft or final permit may address only compliance issues within the substantive requirements of the Metal Mine Reclamation Act, unless the applicant consents to additional stipulations. For a stipulation imposed without the applicant's consent, DEQ is required to provide the applicant in writing the reason for the stipulation, and, for a stipulation imposed in the final permit that was not contained in the draft permit, the reason that the stipulation was not contained in the draft permit.

On March 9, 2015, DEQ issued a written declaration that determined CR Kendall's permit amendment application was complete and issued a draft permit amendment. In determining that the closure plan proposed by CR Kendall complied with the Metal Mine Reclamation Act, DEQ accepted CR Kendall's representation that all water would be treated to meet Montana groundwater quality standards prior to being released.

While preparing the EIS, DEQ determined that the proposed treatment plan was not likely to achieve Montana groundwater quality standards for arsenic and that no elevated background concentration for arsenic in the local Madison Aquifer had been established. As a result, DEQ developed the Process Pad Drainage Pretreatment Alternative to provide certainty that the standard could be achieved.

As indicated above, Section 82-4-337(2), MCA, gives DEQ the authority to include stipulations in a final permit that were not included in the draft permit. Pursuant to this authority, DEQ is selecting for inclusion in the final permit the Process Pad Drainage Pretreatment Alternative, although provisions for the pretreatment of arsenic were not included in the draft permit. The more thorough analysis that DEQ performed in preparing the EIS did not support CR Kendall's assertion that the treatment of mine impacted water proposed by CR Kendall would meet groundwater quality standards for arsenic prior to discharge. Selection of the Process Pad Drainage Pretreatment Alternative is necessary to achieve compliance with Section 82-4-336(10), MCA. That provision requires a reclamation plan to provide, in part, sufficient measures to prevent the pollution of water. The Montana Water Quality Act defines "state water" to include surface and underground water. Section 75-5-103(34), MCA.

## **2. Substantive Compliance**

DEQ may not approve a reclamation plan unless it is consistent with the requirements and standards set forth in Section 82-4-336, MCA. The reclamation standards relevant to DEQ's consideration of CR Kendall's application to amend its closure plan for final design of water management and treatment, final capping and reseeded of the former process pads, and long-term monitoring and maintenance are set forth in Sections 82-4-336(8), (9)(a),(10), and (12), MCA.

Section 82-4-336(8), MCA, requires a reclamation plan to provide for vegetative cover if appropriate to the future use of the land as specified in the reclamation plan. The primary post-mining reclamation land use is to provide habitat for wildlife and grazing for livestock. The current capping of process pads 3 and 4 would become the final capping of those facilities. Vegetation has been successfully established on process pads 3 and 4, providing wildlife habitat. Stockpiled topsoil would be retained until groundwater quality standards are met and the need for treatment has been eliminated. After completion of water treatment, the ponds would be regraded, soil placed on the surfaces, and reseeded. Some existing reclaimed areas with limited vegetation growth in the Kendall and Muleshoe Pit would be reseeded with a modified seed mix and amended after seeding with an agency-approved organic amendment if equipment can safely be mobilized into the areas. CR Kendall and Stillwater Mining Company have used an organic amendment called BIOSOL in the past and an organic amendment like BIOSOL would provide acceptable results. Some facilities and access roads would remain after mine closure; these areas would not be revegetated.

Section 82-4-336(9)(a) requires a reclamation plan to require disturbed land other than open pits and rock faces to be reclaimed to comparable utility and stability as that of adjacent areas. The capping of the process ponds 3 and 4 that is currently in place and that is retained as the final capping under the Proposed Action results in comparable utility and stability as that of adjacent areas. The process pads have been regraded to 3:1 slopes with 10-foot benches every 100 feet. Vegetation has successfully been established on the regraded slopes. The reclaimed and revegetated slopes show no sign of erosion or slumping and provide habitat and forage for wildlife. The wildlife species observed on and adjacent to the mine site are typical species in Central Montana that occupy mountain ranges and habitats. After completion of water treatment,

the ponds would be regraded, soil placed on the surfaces, and reseeded, providing comparable utility and stability as that of adjacent areas.

Section 82-4-336(10), MCA, requires reclamation plans to require, in part, sufficient measures to prevent the pollution of water. The water quality mixing model performed by Hydrometrics (2015) indicates that under the Proposed Action the blended and treated water would exceed the groundwater human health standards for arsenic of 0.010 mg/L. The effluent arsenic concentration under the Proposed Action is projected to range between 0.012 mg/L and 0.022 mg/L. No data has been presented documenting naturally elevated arsenic concentrations within the Madison Limestone Aquifer to which the treated water is proposed to be discharged.

The process pad drainage is the primary source of arsenic and the cause of most potential exceedances in the blended water. Under the Process Pad Drainage Pretreatment Alternative, drainage from the process pads would be pretreated for the removal of arsenic before being combined at the central water treatment facility with waters from the groundwater capture pumpback systems. The combined water would be treated with particulate filtration and zeolite adsorption, and discharged to groundwater through the Kendall Pit. The addition of pretreatment for arsenic would produce water treatment effluent that meets all human health groundwater standards prior to discharge.

Section 82-4-336(12), MCA, requires a reclamation plan to require permanent landscaping and contouring to minimize the amount of precipitation that infiltrates into disturbed areas that are to be graded, covered, or vegetated. The process pads have been regraded to 3:1 slopes with 10-foot benches every 100 feet. Vegetation has successfully established itself on the regraded slopes. After completion of water treatment, the ponds would be regraded, soil placed on the surfaces, and reseeded. Thus, the infiltration of precipitation falling upon the reclaimed process pads and ponds will be minimized. Section 82-4-336(12), MCA, also requires a reclamation plan to provide measures to prevent objectionable postmining ground water discharges. See discussion of Section 82-4-336(10), MCA.

### **Water Quality Act**

As indicated above, under the Proposed Action the blended and treated water from the CR Kendall mine would exceed the groundwater human health standard for arsenic of 0.010 mg/L. The process pad drainage is the primary source of arsenic in the blended water. Under the Process Pad Drainage Pretreatment Alternative, drainage from the process pads would be pretreated for the removal of arsenic before being combined at the central water treatment facility with waters from the groundwater capture pumpback systems. The combined water would be treated with particulate filtration and zeolite adsorption, and discharged to groundwater through the Kendall Pit. The addition of pretreatment for arsenic would produce water treatment effluent that meets all human health groundwater standards prior to discharge.

### **Clean Air Act of Montana**

CR Kendall is in compliance with the Clean Air Act of Montana and no permits are required for mine closure or water treatment. There would not be significant changes to air quality under Amendment 007 as there would be no new emission sources.

### **Montana Hard Rock Impact Act**

The CR Kendall Mine was originally permitted before passage of the Hard Rock Impact Act. Thus, CR Kendall is not required to have a Hard Rock Impact Plan.

### **MEPA Cumulative Effects Assessment**

Chapter 4 of the Final EIS provides a cumulative effects analysis. There are no related future actions under concurrent consideration, and no reasonably foreseeable future actions that, when considered in conjunction with past and present actions, are likely to result in additional significant impacts. Should future actions be proposed that have or may have cumulative effects, additional analysis pursuant to the applicable requirements of MEPA will be conducted.

### **Private Property Assessment Act**

Selection of the Agency Modified Alternative does not have taking or damaging implications. See Section 4.4 of the FEIS.

## **Section 6 – Appeal of DEQ’s Decision**

This decision is subject to a court appeal by the applicant and other parties for 90 days after issuance of the Record of Decision under Section 82-4-349(1), MCA. Any action or proceeding challenging a final agency decision alleging failure by DEQ to comply with or inadequate compliance with a requirement of MEPA must be brought within 60 days after issuance of the Record of Decision pursuant to Section 75-1-201(5)(a)(ii), MCA. An applicant for a permit amendment may request an administrative hearing on a denial of the application by submitting a written request for a hearing within 30 days of receipt of this Record of Decision pursuant to Section 82-4-353(2), MCA. The request must state the reason that the hearing is requested.