The Department of Environmental Quality (DEQ) received an application to amend Operating Permit No. 00122 from CR Kendall Corp. (CR Kendall) on July 25, 2012. The mine is located on private land about eight miles west of Hilger, Montana, and about 25 miles north of Lewistown, Montana. The site is located in Township 18 North, Range 18 East, Sections 29, 30, 31 and 32 and Township 17 North, and Range 18 East, Section 6, in Fergus County.

The permit covers about 1,040 acres, with about 448 acres having been disturbed over the life of the mine. Many of the disturbed acres have been regraded, the soil replaced, and then seeded.

The proposed amendment contains a proposed amended closure plan for water management for the C.R. Kendall Mine, addressing final capping and reseeding of the former process pads, final design of water treatment, and long-term reclamation monitoring and maintenance.

In October of 2011, DEQ approved Minor Revision No. 11-001. It allowed CR Kendall to place growth media on process pads 3 and 4 consisting of 17 inches of soil over the existing basal layer covering the process pads. Because an environmental review had not been conducted placement of the growth media was approved as "no regrets" reclamation. CR Kendall was required to submit additional reclamation bond to DEQ to allow for the possibility that the final approved plan might require temporary removal of the growth media to place a liner on top of the basal layer, or other modification of the capping material.

The amended closure plan for water management (Amendment 007) would allow long-term management of water from spent ore process pads and waste rock repositories including:

1. Capture and temporary storage of process pad and waste rock drainage;
2. Long-term treatment of process pad and waste rock drainage with zeolites to remove thallium;
3. Disposal of spent zeolites in Pond 7;
4. Discharge of treated water to groundwater in the Kendall Pit;
5. Maintenance of ponds, buildings, pipelines and other infrastructure needed to support the water management/treatment system;
6. Monitoring and mitigation plans for water management facilities; and
7. Augmentation of stream flows to supply downgradient water users.

Section 82-4-337, MCA, requires DEQ to review an application for completeness and compliance. When DEQ determines an application is complete and compliant, DEQ is required under Section 82-4-337(1)(d), MCA, to detail in writing the substantive requirements of the MMRA and how the application complies with those requirements. This document sets forth DEQ's determination that CR Kendall's application complies with the substantive requirements of the MMRA.

Section 82-4-336(1), MCA

Section 82-4-336(1), MCA, requires lands disturbed by mining to be reclaimed consistent with the requirements and standards set forth in Section 82-4-336, MCA, taking into consideration the

site-specific conditions and circumstances, including the postmining use of the mine site. The requirements and standards are set forth below.

Section 82-4-336(2), MCA.

Section 82-4-336(2), MCA, requires the reclamation plan to provide that reclamation activities, particularly those relating to the control of erosion, be conducted simultaneously with the operation to the extent feasible and in any case must be initiated promptly after completion or abandonment of the operation on those portions of the complex that will not be subject to further disturbance.

As previously indicated, DEQ approved placement of a 17-inch soil layer on the process pads in October of 2011as an interim reclamation measure pending approval of a final cap design. The purpose of allowing placement of the 17-inch soil layer as an interim reclamation measure was to prevent erosion of the basal layer that had been placed on the process pads to reduce the amount of water infiltrating into the process pads.

CR Kendall is proposing to amend its permit to allow the interim placement of the 17-inch soil layer to serve as the final capping of the process pads. An inspection conducted in September of 2014 revealed that the revegetated interim capping was effective in controlling erosion during a recent 9-inch rain event.

Section 82-4-336(3), MCA.

Section 82-4-336(3), MCA, requires the reclamation plan to provide that reclamation activities be completed not more than two years after completion or abandonment of the operation on that portion of the complex unless DEQ provides a longer period.

The amended closure plan for water management set forth in CR Kendall's application satisfies this requirement, as indicated in Section 1.4 (Summary of Proposed Final Water Management Plan), Section 2.0 (Process Pads Capping and Final Reclamation), Section 6.0 (Proposed Water Treatment System), and Section 7.0 (Operation, Maintenance and Monitoring). See discussion of Section 82-4-336(2), MCA.

Section 82-4-336(4), MCA.

This section requires the reclamation plan to provide that the operator may not depart from an approved plan without previously obtaining from DEQ written approval for the proposed change in the absence of emergency or suddenly threatening or existing catastrophe.

When the final permit amendment is issued, it will include a stipulation expressly stating that CR Kendall may not depart from the approved reclamation plan without first obtaining from DEQ written approval for the proposed change in the absence of emergency or suddenly threatening or existing catastrophe.

Section 82-4-336(5), MCA.

Section 82-4-336(5), MCA, requires the reclamation plan to avoid accumulation of stagnant water in the development area to the extent that it serves as a host or breeding ground for mosquitoes or other disease-bearing or noxious insect life.

The proposed amended closure plan for water management set forth in CR Kendall's application satisfies this requirement. See Section 1.4.1 (Water Management Goals) of the application.

Water from all sources would initially be pumped to Pond 7 where initial mixing, treatment and primary storage of mine water occurs, as well as placement of spent zeolites. See Section 1.4.6 (Water Storage, Treatment and Discharge). Treated water would be discharged through land application to groundwater at the Kendall Pit. An approved storm water management plan exists (Section 1.4.7, Stormwater).

Continued water treatment and use of the lined ponds for storage of water prior to treatment represents a period of continued operation of the mine. During water treatment, the water is not stagnant. It is constantly being pumped into and out of the ponds. When water treatment is no longer necessary, the ponds would be removed and reclaimed, removing the potential for stagnant water.

Section 82-4-336(6), MCA.

Section 82-4-336(6), MCA, requires the reclamation plan to require all final grading to be made with nonnoxious, nonflammable, noncombustible solids unless DEQ grants approval for a supervised sanitary fill.

Under the proposed amendment, CR Kendall would place growth media on process pads 3 and 4 consisting of 17 inches of topsoil over 6 inches of a subsoil layer amended with 5 to 8 percent sodium bentonite over 12 inches of subsoil basal layer material. This growth medium complies with Section 82-4-336(6), MCA.

Section 82-4-336(7), MCA.

When mining has left an open pit exceeding two acres of surface area and the composition of the floor or walls of the pit is likely to cause formation of acid, toxic, or otherwise pollutive solutions on exposure to moisture, Section 82-4-336(7), MCA, requires the reclamation plan to include provisions that adequately provide for items listed under Section 82-4-336(7)(a through e):

1. *Insulation of all faces from moisture or water contact by covering the faces with material or fill not susceptible itself to generation of objectionable effluents in order to mitigate the generation of objectionable effluents;*
2. *Processing of any objectionable effluents in the pit before they are allowed to flow or be pumped out of the pit to reduce toxic or other objectionable ratios to a level considered safe to humans and the environment by DEQ;*

3. *Drainage of any objectionable effluents to settling or treatment basins when the objectionable effluents must be reduced to levels considered safe by DEQ before release from the settling basin;*
4. *Absorption or evaporation of objectionable effluents in the open pit itself; and*
5. *Prevention of entrance into the pit by persons or livestock lawfully upon adjacent lands by fencing, warning signs, and other devices that may reasonably be required by DEQ.*

There are no changes proposed to the approved reclamation plan with regard to pit highwalls.

Section 82-4-336(8), 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 reestablished vegetation cover must meet county standards for noxious weed control.

There are no proposed changes to the approved vegetation or weed control plan. The leach pads currently have a dense vegetative cover that is adequate to control erosion and should be suitable for a permanent cover given additional time.

As previously indicated, under the proposed permit amendment, the interim placement of 17-inches of soil over the basal layer would be the final cap of the process pads. The interim cap of the process pads was seeded and is now revegetated. The vegetation appears to be developing sufficiently to be appropriate for the approved postmine land use of grazing and wildlife.

Section 82-4-336(9)(a), MCA.

With regard to disturbed land other than open pits or rock faces, Section 82-4-336(9)(a), MCA, requires the reclamation plan to return all disturbed areas to comparable utility and stability as that of adjacent areas. If the reclamation plan provides that mine-related facilities will not be removed or that the disturbed land associated with the facilities will not be reclaimed by the permittee, the post-mining land use must be approved by DEQ.

There are no proposed changes to the approved reclamation plan other than what has been addressed above (leach pads 3 and 4). The current vegetative cover is adequate to control erosion and provide utility for wildlife. The cover should achieve comparable utility and stability given additional time.

Section 82-4-336(9)(b), MCA.

With regard to open pits and rock faces, Section 82-4-336(9)(b), MCA, requires the reclamation plan to provide sufficient measures for reclamation to a condition described by 82-4-336(9)(b)(1 through 4). Section 82-4-336(9)(b), MCA, requires the reclamation plan to provide sufficient measures for reclamation to a condition:

1. *Of stability structurally competent to withstand geologic and climatic conditions without significant failure that would be a threat to public safety and the environment;*
2. *That affords some utility to humans or the environment;*
3. *That mitigates postreclamation visual contrasts between reclamation lands and adjacent lands; and*
4. *That mitigates or prevents undesirable offsite environmental impacts.*

The use of backfilling as a reclamation measure is neither required nor prohibited in all cases. DEQ's decision to require backfill must be based on whether and to what extent the backfilling is appropriate to achieve the standards described in (9)(b).

There are no proposed changes to the approved reclamation plan for highwalls.

Section 82-4-336(10), MCA.

Section 82-4-336(10), MCA, requires the reclamation plan to provide sufficient measures to ensure public safety and to prevent the pollution of air or water and the degradation of adjacent lands.

Under the proposed permit amendment, all process pad drainage and captured groundwater would be pumped through a series of storage ponds prior to treatment and discharge. Parameters of concern in mine water include thallium, cyanide, nitrate, antimony, arsenic, and selenium.

Water from all sources would initially be pumped to Pond 7 where initial mixing and primary storage of mine water would occur, as well as placement of spent zeolites. If water from all mine sources at the anticipated flow rates is blended together, then the resulting mixed water will meet water quality standards, or background groundwater concentrations in the areas of the Kendall Pit, with the exception of thallium. Water would then be pumped to Ponds 2B and 3B prior to treatment at the zeolite treatment system located at the existing process plant/mine building. The proposed amended closure plan for water management is a slightly modified version of the zeolite adsorption system that CR Kendall has used to effectively treat mine water for the removal of thallium since 1998. Treated water would be discharged to groundwater at the Kendall Pit using existing pipelines. Treated water would be tested monthly to confirm treatment of effectiveness.

An existing permitted land application area would be retained as a contingency component of the water management system. It could be used as a supplemental water treatment method for removal of nitrogen compounds (nitrate, nitrite, ammonia, cyanide) by vegetative uptake.

Water treatment will cease once water quality standards and/or background levels are met. Water treatment is not expected to be needed beyond approximately 10 to 40 years.

Section 82-4-336(12), MCA.

Section 82-4-336(12), MCA requires a reclamation plan to provide for permanent landscaping and contouring to minimize the amount of precipitation that infiltrates into disturbed areas that are to be graded, covered, or vegetated, including but not limited to tailings impoundments and waste rock dumps. The plan must also provide measures to prevent objectionable postmining ground water discharges.

Hydraulic performance of the proposed final cap for process pads 3 and 4 was evaluated with the HELP (Hydrologic Evaluation of Landfill Performance) Model (version 3.07). Steady state conditions were not attained until approximately year 35 of the simulation. Prior to year 35, seepage from the proposed final cover would be retained by the spent ore rather than freely draining, thus underestimating long-term drainage from the pad. Results for the long-term portion of the simulation (years 35-100) predicted that pad drainage would be approximately 4-5 percent of precipitation, equating to less than 5 gpm of pad drainage.

Estimates of the performance of the proposed final cap in reducing pad drainage can also be derived from empirical evidence of flow reductions resulting from placement of the partial cap. The partial cap was completed in 2008 and was comprised of an 18-inch subsoil basal layer. Prior to capping the leach pad, drainage flows averaged 32 gpm annually. After partial capping, the pad drainage flows declined to 11.5 gpm, even with increased precipitation. Taking into account the increased precipitation, original drainage flows represented 45 percent of precipitation, while after partial capping drainage flows represented only 13 percent of precipitation. As discussed above, it is expected that drainage flows will be reduced to less than 5 gpm over time with the full cover (Section 2.2.2, p. 2-6, Observed Constructed Partial Cap Drainage and Section 2.2.3, p. 2-8, Predicted Complete Cap Drainage).

In regard to prevention of objectionable postmining ground water discharges, all water in the leach pads drains via gravity into Pond 7, which is essentially the primary capture system. Pond 7 has a "solution collection and recovery system" from which solution can be extracted from beneath the upper pond liner (ponds are essentially double-lined with a leak detection system). In addition to these capture systems, there is an underdrain beneath the leach pads and Ponds 7 and 8, which discharges to TMW-26, a collection sump from which collected water is pumped back for treatment.

Routine monitoring would continue under the approved monitoring plan. The plan provides for monitoring of surface and groundwater throughout the mine site (Section 7.6, p. 7-3, Monitoring). Operation, maintenance and monitoring of the treatment, pumpback, and piping systems have been conducted over the last 15 years and would continue throughout the water management plan (Section 7.1, p. 7-1, Support Facilities).