MONTANA DEPARTMENT OF ENVIRONMENTAL QUALITY
HARD ROCK MINING BUREAU
OPERATING PERMIT – FIELD INSPECTION REPORT

Operator: Montana Resources, LLP						Inspection Date: June 7, 2022					
Operating Permit #: 00030			Project: Montana Resources-Continental Mine Complex				County: Silver Bow				
Nearest City or Town(s): Butte											
DEQ Staff: Garrett Smith						Company Representative(s): Mark Thompson, Jeremy Fleege					
Agencies w/overlapping Jurisdiction:		USFS		BLM		Other	×	None			
Minerals: Copper, molybdenum, minor silver											
Status:	×	Active		Inactive		Suspended		Other			
Weather: Partly cloudy, high temp 59°F											

Type of Operation:		Purpose of Inspection:	
×	Open Pit		Initial (Pre-permitting)
	Underground	×	Regular Compliance
	Placer		Amendment #
×	Heap Leach- *Leach pads near HSB no longer receiving solution*		Complaint Received
	Vat Leach		Bond Release
×	Mill		Other
	Other:		NON issued

INSPECTION CHECKLIST
(N/O = Not Observed, N/A = Not Applicable)
Additional notes are italicized

GENERAL:

Yes	No	N/O	N/A	
×				All mining-related disturbances within permitted and bonded areas.
			×	Incremental bonding requirements have been submitted
×				Following approved mining plan and permit conditions
×				Following approved monitoring plans
×				Reclamation concurrent with mining

MATERIAL HANDLING:								
	Yes		No		N/O		N/A	
	×							Soil salvage according to plan
	×							Soil stockpiles properly maintained: *The west side stockpiles were not observed*
	×	and	×					Special handling/stockpiling of materials consistent with plan: *Lunchroom stockpile is providing borrow material for Parrot waste removal. Not a violation, but language in Op/Rec Plan should be updated.*
FACILITIES:								
	Yes		No		N/O		N/A	
	×							Construction reports properly filed.
	×							Acceptable liner integrity
	×							Tailings impoundment/heap leach/dump design as approved
	×							Road construction as approved
WATER CONTROLS:								
	Yes		No		N/O		N/A	
	×							Erosion-control measures (BMPs) concurrent with mining,
	×							Erosion/sedimentation mitigations acceptable: *Reclaimed surfaces should be assessed as revegetation is more established. Maintenance and repairs may be needed in the future, see Erosion Control Plan*
					×			Culverts installed and maintained as approved
					×			Diversions maintained and functioning as approved
	×							Process/storage/settling pond(s) constructed, operating, and maintained.
	×							Acid rock drainage controlled
	×							Adequate freeboard in all solution storage and process facilities
AIR QUALITY:								
	Yes		No		N/O		N/A	
	×							Acceptable air quality.
OTHER:								
	Yes		No		N/O		N/A	
	×							Noxious weeds controlled. *Sterilant has been applied to certain locations. Weed control to continue in upcoming season (e.g. knapweed, toadflax, and henbane on East Dump)*
	×							Wildlife mitigations in place and functioning.
							×	Cultural resource mitigations properly implemented

			×					Water sample(s) taken.
			×					Materials sample(s) taken
	×							Photos taken
	×							Are revisions or amendments anticipated in the next year? *Revision for new Precip Plant, minor amendment for HSB backfill/rock disposal, updated CORP*
			×					Is comprehensive 5-year bond review due in the next year? Date of next 5-year bond review: *Final due in January 2026*
								Other

DISCUSSION:

DEQ staff arrived and signed in at Montana Resources (MR) offices at 9:00 AM. The site inspection focused on areas of recent activity and upcoming permit modifications-- the Continental Pit, Yankee Doodle Tailings Impoundment (YDTI), Horseshoe Bend (HSB) area, and revegetation on the East Dump Complex. **Compliance assistance and recommendations are provided in bold.**

Mining and Related Activities

On the way to the Continental Pit, some recent upgrades to water pipelines were observed (Photo 1). Devices have been installed which release air pressure in the lines, which will improve water conveyance from YDTI to the processing facilities and reduce the need to manually relieve pressure. Mining continues in multiple locations within the Continental Pit, including D East, D North, and C block (Photos 2 and 3). Mining is occurring at elevations above groundwater within the pit, but dewatering occurs in the pit as necessary. Inflow rates are estimated at 0.5 million gallons per day (MGD) or 350 gallons per minute (GPM).

The Parrot waste removal project is ongoing near the Butte Civic Center, so waste material continues to be hauled into the mine permit area and placed around the Pittsmont Dump. Water encountered at the Parrot site is being pumped to the Dredge Pond in the southwest end of the mine. The DEQ Director, Deputy Director, and AEM Division Administrator recently toured the Parrot waste removal site and learned that alluvium from the Lunchroom Stockpile is being taken from MR to be used as borrow material for the Parrot project. This was not previously brought to the attention of the Hard Rock Mining Section. The current permit conditions state that the stockpiles would be used for onsite reclamation until they're exhausted, and the majority of reclamation cover material would be sourced from deep excavations in the Central Zone borrow area. DEQ acknowledges the voluntary assistance that MR has provided to the Parrot project and the benefits of having suitable borrow material near the project site. **However, the permit does not include the offsite use of stockpiled alluvium and this activity decreases the volume of readily accessible material that would be needed for reclamation at mine closure. DEQ requests early communication about future projects like this, which may alter the site conditions during operation and/ or closure. If this alternate use for the stockpiled alluvium will continue in the future, the Operations and Reclamation Plans should be updated to include these details and material balance accounting should be updated accordingly within each applicable Annual Progress Report.**

YDTI Embankments and Water Management

Waste rock is being used as construction material to expand the capacity of the Yankee Doodle TSF by raising the embankment crests to 6,450 feet (Amendment 010). The tailings pipeline ramp was relocated and raised to a higher elevation along the southern face of the central (E-W) embankment. The downstream (outer) face of the N-S Embankment is also being raised in 50-feet lifts. This downstream construction or "step-out" method increases the embankment footprint before building the crest upwards (Photo 4). There are still a few areas along the crest that have not yet reached the elevation of 6,450 feet (Photo 5).

A wide beach area is important to separate the tailings pond from the embankments, thus contributing to the safety and stability of the impoundment. The beach area has increased along the N-S Embankment, with the addition of tailings discharge at this location (Photo 6). As the beach surface area increases, additional measures are needed to reduce the potential for blowing dust. MR has installed storage bladders for magnesium chloride around the YDTI, to speed up the process to deploy and refill tracked vehicles onto the beach. Some portions of the tailings beach closest to the E-W Embankment are being covered in rock as a "surcharge" or "pre-loading" step to help densify and remove pore water from the underlying tailings mass. An access road to the pond/barge has been constructed on the slope adjacent to the eastern margin of the N-S Embankment, as approved in permit revision MR20-002 (Photos 7 and 8). Segments of pipe have been placed along this route for future water conveyance, but additional road preparation will occur before the pipe is joined. Through the BMFOU water treatment pilot project, a portion of the supernatant water that is pumped out of the YDTI pond is being diverted for treatment at a "Polishing Plant" facility operated by Atlantic Richfield Co. (AR).

The West Embankment crest has been constructed to an elevation of 6,450 feet and tailings discharge along this side of YDTI continues to develop a wide beach between the West Embankment and the supernatant pond (Photo 9). **Based on project scheduling and material availability, the reclamation of the downstream (outer) slope of the West Embankment should proceed as approved in Amendment 010:** "The West Embankment will be constructed at its final slope of 3H:1V, with the exception of a small segment near the WED extraction pond where the final slope will be graded to 2.5H:1V. Capping will be distributed on the 3H:1V portion of the West Embankment concurrently with lift completion. Six inches of soil will be placed over 36 inches of non-acid generating alluvium (D2 Zone)."

At the south end of the West Embankment, the lined extraction pond continues to receive the outflow from the West Embankment Drain (WED) installed within the embankment's foundation. The drain also collects a lesser amount of groundwater, which generally follows topography and flows eastward from the West Ridge to the West Embankment. The flow rate into the WED extraction pond was typically between 300 and 450 GPM during 2019-2021, but the rate has increased from 450 to 575 GPM in the first quarter of 2022 (Photo 10). This increase is likely due to additional tailings discharge along the West Embankment and rapid/direct infiltration of water into the coarse tailings that are adjacent to the WED. The measured flows remain below the design capacity of the WED (4,500 GPM).

Water quality monitoring results from the extraction pond are provided in the 2021 Annual Progress Report. Although the TSF pond had an average pH of 10.3, the water reporting to the extraction pond had an average pH of 3.31 and the concentration of sulfate and some metals (Al, Cd, Cu, Fe, Mn, Pb, U, Zn) are enriched in the extraction pond as compared to the tailings pond. This indicates the current level of reactivity of the materials that are encountered by water entering the WED. **Monitoring the WED water quality and flow rates should continue as specified in the Operating Plan. The monitoring results should also be compared to the modeling assumptions that were included in Amendment 010. This information will further inform the development of future plans to expand the TSF, with respect to evaluating the performance of the WED and the potential options to manage the long-term outflow. (See stipulation for Amendment 010, due September 30, 2022).**

HSB and Berkeley Pit- Superfund Interactions

The Superfund water treatment pilot project continues to perform well and the offsite discharge to surface water (from the AR Polishing Plant) continues to meet applicable water quality standards. Pumping water from the Berkeley Pit has successfully prevented an increase in water elevation since September 2019. The HSB Water Treatment Plant can be used to treat water from Berkeley Pit dewatering and/or seepage collected around the HSB area. The treated water from this facility is then conveyed back into the concentrator and process water balance. Whichever flow source is not going to treatment is instead directed to a capture return system, which discharges into YDTI. The flow rates in HSB have been decreasing since the leach pad operations ceased in 2021. As noted above, the source water for the Polishing Plant is the supernatant pond within YDTI. A portion of this flow is still conveyed to the concentrator facilities and is incorporated back into the process water balance.

Designs have been developed to create a new rock disposal site (RDS) within the HSB area (Photo 11), as discussed in multiple meetings with the Engineer of Record (EOR) and Independent Review Panel (IRP). DEQ provided additional guidance about the options for permitting actions in a meeting with MR on January 14, 2022. The RDS would consist of rockfill at the toe of the E-W Embankment, which would provide additional foundation support for YDTI. This would require demolition of the existing Precipitation Plant facilities, containment/management of ongoing seepage, and the construction of rock drain features that can convey all future seepage and infiltration out of the current HSB footprint (from underneath the RDS). The rock drains would be constructed with similar materials and methods as the WED within the West Embankment. **MR will soon submit an application for this permit modification, which DEQ will process as a minor amendment and evaluate the potential significance of impacts through an Environmental Assessment (EA). Further agreements/authorizations may also be required from Superfund parties in order to proceed with the project.**

Following the guidance that was provided by DEQ, MR submitted a request for permit revision MR22-001 on April 13, 2022 to construct a new Precipitation Plant, approximately 0.5 mile to the south of the existing plant within HSB. DEQ provided a deficiency letter on May 3, 2022 with questions about the construction, operation, and reclamation of the plant, as well as the location of the plant in relation to pre-1974 disturbance areas. **MR has not responded to the deficiency comments at the time of this inspection, although early ground preparation (e.g. grading, fill/gravel placement) is taking place in an area to the north of the HSB Water Treatment Plant (Photo 12). DEQ brought this to MR's attention and advised that further construction should not proceed until the pending revision has been approved and bonded (based on the pre-1974 determination).**

East Dump Complex Reclamation

The inspection continued to the reclaimed slopes of the East Dump Complex. Portions of the complex were reclaimed between 2017 and 2020 and the methods included grading, placement of capping material/soil, and revegetation. A permit revision (MR21-004) was submitted on November 2, 2021, to resolve a stipulation from 2007 for regrading the Hillcrest RDS without an intermediate bench (MR07-001) and to provide an Erosion Control Plan for the entire East Dump Complex. DEQ approved MR21-004 and resolved the stipulation on November 19, 2021.

The relatively cool and wet weather during April through June 2022 has been a benefit to vegetation and the reclaimed slopes are looking very green. Some of the reclaimed slopes are showing good vegetation density and relatively little erosion (Photos 13, 14, and 16). Some of the areas that were seeded more recently are showing a few bare patches, minor rills, and tracks (presumably from the seeding equipment). The southern end of the dump complex was reclaimed in 2017-2018 and the vegetation is noticeably denser compared to areas that were seeded in 2019 or 2020 (Photos 15 and 17). **In addition to implementing the monitoring and maintenance activities in the Erosion Control Plan for these areas, DEQ recommends continued weed control in the upcoming season. Some of the noxious weed species that were observed on the East Dump Complex include knapweed, Dalmatian toadflax, and henbane.**

Permit Actions (Pending)

- Site-Wide Reclamation Plan- As part of the approval of the permit consolidation (MR21-002) on June 11, 2021, DEQ requested that MR submit the updated site-wide Operations and Reclamation Plans within 6 months from the authorization (December 11, 2021). MR submitted an updated Plan that includes minor conceptual changes to the existing Plan. In the January 14, 2022 meeting, DEQ explained that the Plan should be submitted as a permit revision.
- Precipitation Plant Relocation- Application for permit revision MR22-001 was submitted on April 13, 2022. Responses are pending from MR to the deficiency comments DEQ provided on May 3, 2022.

- Stage 1 HSB RDS- MR will soon submit an application for this permit modification, which DEQ will process as a minor amendment and evaluate the potential significance of impacts through an Environmental Assessment (EA). Further agreements/authorizations may also be required from Superfund parties in order to proceed with the project.

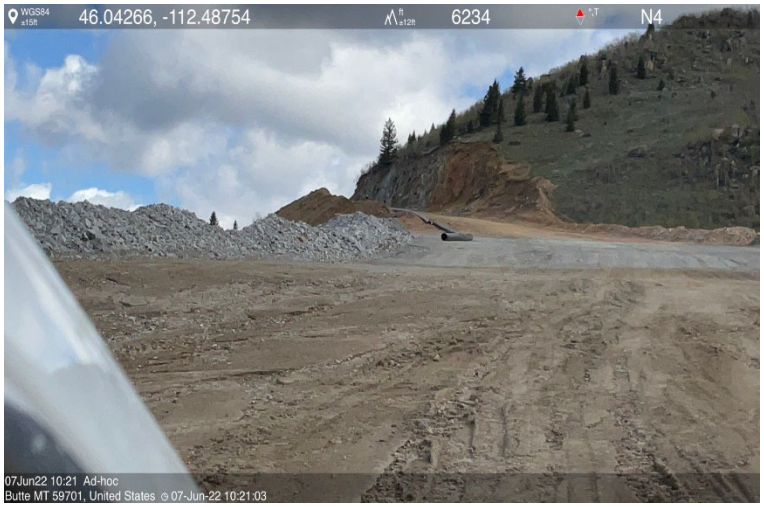
The site inspection concluded by 1:00 pm. Recommendations and action items are shown in bold above.

Signature of Inspector(s):		Date:	7/26/2022
Signature of Reviewer:		Date:	7/28/2022
Copy reports to:	Permittee (c/o Mark Thompson, Montana Resources); eFile 00030.3		

Photo 1- Devices have been installed which release air pressure in the lines, which will improve water conveyance from YDTI to the processing facilities and reduce the need to manually relieve pressure. **Photo 2**- Mining continues within the Continental Pit (as seen from the north), dewatering occurs as needed and the inflow rates are presumed to be around 0.5 MGD.

Photo 3- Mining continues within the Continental Pit (as seen from the north), dewatering occurs as needed and the inflow rates are presumed to be around 0.5 MGD. **Photo 4-** The downstream slope of the N-S Embankment (center) has been constructed in sequential lifts to support a crest elevation of 6,450 feet.

Photo 5- The crest of the N-S Embankment has been widened and construction to the 6,450 ft elevation continues. **Photo 6-** The tailings beach has been widened adjacent to the N-S Embankment and the pond is being pushed further to the northeast.



Photos 7 and 8- The new access road to the tailings bond barge (above the N-S Embankment) has been constructed. Segments of pipe have been placed along this route for future water conveyance, but additional road preparation will occur before the pipe is joined.

Photo 9- The interior/upstream face of the West Embankment, with tailings discharge lines across the slope. **Photo 10-** The extraction pond at the south end of the WED, where a pump barge is used to circulate water back into the YDTI.

Photo 11- Looking south over the HSB area: copper precipitation plant in the lower center, leach pad seepage ponds to the left, mechanic shops and equipment storage in the center, HSB Water Treatment Plant in the upper/distant center, and Berkeley Pit to the distant right. **Photo 12-** Ground preparation has started for the relocated Precipitation Plant, directly to the north of the HSB Water Treatment Plant.

Photos 13 and 14: Looking across slopes on the east side of the East Dump Complex, this area was reclaimed in 2019-2020. Although not as old as the vegetation in Photos 16 and 17, the density of grass species is improving with time.

Photo 15- Looking west across the southern end of the East Dump Complex (Hillcrest RDS). This area was reclaimed in 2017-2018.

Photo 16- A closer view of the vegetation density at the location in Photo 14.

Photo 17- A closer view of the vegetation density at the location in Photo 15. Compare this location to younger growth in Photo 16.