

STATE OF
COLORADO

Gagnon - DNR, Nikie <nikie.gagnon@state.co.us>

Re: Henderson Mine M-1977342 Inspection Report

1 message

Gagnon - DNR, Nikie <nikie.gagnon@state.co.us>
To: "Hamarat, Miguel" <mhamarat@fmi.com>

Thu, Nov 14, 2024 at 4:02 PM

Hi Miguel.

Rob and I reviewed the clarifications you sent in and we revised the inspection report accordingly. The revised report is attached for your records.

We appreciate your team taking the time to ensure the report is accurate.

Best regards,

Nikie Gagnon

On Thu, Nov 7, 2024 at 12:14 PM Hamarat, Miguel <mhamarat@fmi.com> wrote:

Hello Nikie,

We have reviewed the report and since there is so much technical information included, have provide some clarifications in attached. Would it make sense to update the report based on these comments?

Regards,

Miguel

From: Gagnon - DNR, Nikie <nikie.gagnon@state.co.us>**Sent:** Thursday, October 24, 2024 10:58 AM**To:** Hamarat, Miguel <mhamarat@fmi.com>**Cc:** Gibson - DNR, Amber <amber.gibson@state.co.us>; Zuber - DNR, Rob <rob.zuber@state.co.us>**Subject:** Henderson Mine M-1977342 Inspection Report

Hi Miguel.

Attached for your records is a copy of the Division's report for the September 25, 2024 Tailings Storage Facility inspection at the Henderson Mill site. A hard copy will not be mailed unless requested.

Please reach out to me if you have any questions about the report.

Thank you,

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Nikie Gagnon

Environmental Protection Specialist



COLORADO
Division of Reclamation,
Mining and Safety
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INSP-REPORT_M1977342_Henderson TSF_20240925_Revised.pdf
8132K



MINERALS PROGRAM INSPECTION REPORT
PHONE: (303) 866-3567

The Division of Reclamation, Mining and Safety has conducted an inspection of the mining operation noted below. This report documents observations concerning compliance with the terms of the permit and applicable rules and regulations of the Mined Land Reclamation Board.

MINE NAME: Henderson Mine	MINE/PROSPECTING ID#: M-1977-342	MINERAL: Molybdenum	COUNTY: Clear Creek, Grand
INSPECTION TYPE: Monitoring	WEATHER: Clear	INSP. DATE: September 25, 2024	INSP. TIME: 09:00
OPERATOR: Climax Molybdenum Company	OPERATOR REPRESENTATIVE: Miguel Hamarat	TYPE OF OPERATION: 112d-3 - Designated Mining Operation	
REASON FOR INSPECTION: Normal I&E Program	BOND CALCULATION TYPE: None	BOND AMOUNT: \$143,264,468.00	
DATE OF COMPLAINT: NA	POST INSP. CONTACTS: None	JOINT INSP. AGENCY: None	
INSPECTOR(S): Nikie Gagnon Robert Zuber, P.E. Amber Gibson	INSPECTOR'S SIGNATURE: 	SIGNATURE DATE: November 14, 2024	

GENERAL INSPECTION TOPICS

This list identifies the environmental and permit parameters inspected and gives a categorical evaluation of each. No problems or possible violations were noted during the inspection. The mine operation was found to be in full compliance with Mineral Rules and Regulations of the Colorado Mined Land Reclamation Board for the Extraction of Construction Materials and/or for Hard Rock, Metal and Designated Mining Operations. Any person engaged in any mining operation shall notify the office of any failure or imminent failure, as soon as reasonably practicable after such person has knowledge of such condition or of any impoundment, embankment, or slope that poses a reasonable potential for danger to any persons or property or to the environment; or any environmental protection facility designed to contain or control chemicals or waste which are acid or toxic-forming, as identified in the permit.

(AR) RECORDS----- <u>Y</u>	(FN) FINANCIAL WARRANTY----- <u>N</u>	(RD) ROADS----- <u>N</u>
(HB) HYDROLOGIC BALANCE----- <u>Y</u>	(BG) BACKFILL & GRADING----- <u>N</u>	(EX) EXPLOSIVES----- <u>N</u>
(PW) PROCESSING WASTE/TAILING---- <u>Y</u>	(SF) PROCESSING FACILITIES----- <u>N</u>	(TS) TOPSOIL----- <u>N</u>
(MP) GENL MINE PLAN COMPLIANCE- <u>Y</u>	(FW) FISH & WILDLIFE----- <u>N</u>	(RV) REVEGETATION---- <u>N</u>
(SM) SIGNS AND MARKERS----- <u>N</u>	(SP) STORM WATER MGT PLAN---- <u>N</u>	(RS) RECL PLAN/COMP-- <u>N</u>
(ES) OVERBURDEN/DEV. WASTE----- <u>N</u>	(SC) EROSION/SEDIMENTATION--- <u>Y</u>	(ST) STIPULATIONS----- <u>N</u>
(AT) ACID OR TOXIC MATERIALS----- <u>N</u>	(OD) OFF-SITE DAMAGE----- <u>N</u>	

Y = Inspected / N = Not inspected / NA = Not applicable to this operation / PB = Problem cited / PV = Possible violation cited

OBSERVATIONS

The Henderson Mill was inspected by Nikie Gagnon, Amber Gibson, and Rob Zuber with the Division of Reclamation, Mining and Safety (Division/DRMS) as part of the Division's monitoring inspection program. Miguel Hamarat and Ron Hickman with Climax Molybdenum Company (Henderson) were present during the inspection. AECOM engineers were also present, including the Engineer of Record, Lisa Yenne, and Pooya Sheykhloo.

The inspection was focused on the Tailings Storage Facility (TSF), including the deposition of tailings, the condition of the 1-Dam and 3-Dam Tailings Impoundments, and the seepwater collection system. Prior to the inspection, the Division reviewed the Annual Report for the Henderson Mine and Mill, sent March 8, 2024. Attachment D of the annual report is the Tailings Storage Facility Evaluation by the Engineer of Record, AECOM. In the evaluation, Ms. Yenne provides the following key observations:

- Spigot deposition occurred from May 9 to November 14, 2023. Leadoff and cutout deposition occurred before and after these dates in 2023.
- AECOM completed full monthly site inspections of the TSF from May to October 2023. No significant issues were identified during these inspections.
- A major project completed by Henderson in 2023 was an improvement to the 1-Dam right abutment. Deteriorated drainpipes were removed, and subdrains and horizontal drains were directed to a surface channel.
- In the fall of 2023, 12 piezometers were installed. These push-in piezometers replaced old piezometers or were placed in new locations.
- Piezometer levels and inclinometer readings of movement were both found to be in accordance with the design of the TSF.
- The TSF appears to be functioning as designed.
- Continued diligence in the operations and monitoring of the key aspects of this facility are essential for long-term safety and performance of the TSF.

At the onset of the inspection, the following information was provided by Henderson and AECOM.

- The water monitoring system uses approximately 96 piezometers. These instruments are closely watched for performance and the need for replacement. As discussed by Ms. Yenne and Mr. Hickman, observation of phreatic surfaces is considered extremely important for preventing failure of the TSF. The piezometers are calibrated and checked annually.
- Piezometers are also used to assess the conditions of drains. Mr. Hamarat discussed how all aspects of the TSF are closely monitored by Henderson, AECOM, and an independent review board.

Deposition of Tailings

Active tailings deposition was occurring during the inspection with the use of spigots in Cells 6 and 7 (operations in Cell 7 had just been initiated). The beaches appeared to be constructed well, with consistent deposition between the cells. The 6" spigot lines are inspected daily.

The beaches were observed for key performance indicators, as described by Ms. Yenne. The plunge pools were the desired diameter, approximately 6-8 feet. The projection of the slurry exiting spigots was the desired size, approximately 3 – 5 feet. The channels of water and sediment leaving the spigot area were found to be

good, with the meandering channels stretching out several dozen feet before becoming sheet flow. No problems with beach erosion were seen.

Condition of the Dams

The following aspects of the dams were observed during the inspection: dam crests, downstream faces, toes, abutments, starter dams, and buttress. No settlement, cracking, or signs of movement were observed. No ponds were observed on the crest road. Some rills were observed on the faces of the dams. They did not appear to be more than maintenance issues but should be addressed in the fall of 2024. In particular, erosion on the buttress needs to be addressed soon. Some seepage was observed near the toe of 1-Dam but did not appear to be problematic as the horizontal drains were operating nearby. Also, this seepage has been noted during past inspections by Division inspectors. Mr. Hamarat indicated that they typically conduct erosion control repair work across both dams in the fall.

Henderson raised the 1-Dam berm six feet to provide deposition infrastructure (walking platform, spigot rest, etc.) for the next few years. A berm raise is completed ahead of deposition throughout the summer. On average, Henderson raised one cell every two weeks, but this was not a continuous project. The northern-most cell (Cell 9) had been raised prior to the inspection. Mr. Hickman stated the actual tailing raises in 2024 are approximately two feet. Henderson was constructing a leadoff at the northwest end of 1-Dam during the inspection.

A buttress has been built below the 3-Dam. Henderson and AECOM representatives discussed that this includes a step-back, north toe, and south toe components. These structures were built to provide an extra layer of protection for the TSF.

Seepage Collection System

Water in the return pipe for the seepage system was flowing into the TSF during the inspection. Per Henderson representatives, there are 112 horizontal drains, and almost all (105) are at 1 Dam. They all appear to have P traps to prevent air from entering the pipes. Many of the horizontal drains were flowing during the inspection; flow rates varied. Ms. Yenne pointed out the ability to see the phreatic surface by observing the soil near these drains. She also noted that a small number of seeps, in between the horizontal drains, are not problematic. Per Ms. Yenne, horizontal drains are cleaned twice per year.

Some of the foundation drains were flowing (e.g., #3) and some were not (e.g., #2). Mr. Hamarat indicated that these drains are not cleaned because they are fragile and nearing the end of their life. A French drain system has been constructed at the south end of 1 Dam where it abuts the natural ground. This structure appeared to be functioning.

Other Observations and Discussion Points

The impoundment water pool location is monitored continuously via the pond elevation (transducer). A minimum 1,400-foot beach offset from the crest of the impoundment is the goal of the operator. The beach distance was reported by Mr. Hickman at approximately 2,500 feet during the inspection. Per Division observation, this looked accurate.

Prior to the inspection, the Division reviewed the Mill Tailing Impoundment Flood Storage Capacity Analysis (Attachment B of the Annual Report) by W.W. Wheeler. The waterline shown in this report (Figure 1) in the fall of 2023 appears to be close to the condition in September 2024 (based on distance from the dam), and the

reported water level was 8875.1 feet above mean sea level. Per the information in this report, this corresponds to available capacity of 10,313 acre-feet. The flood storage requirement for the TSF is 3,582 acre-feet. It appears that the TSF contains the capacity to contain the Probable Maximum Precipitation event.

The Ultimate Canal contained a small amount of water and appeared to be operating as designed. Mr. Hickman stated the canal fills in the spring with snow runoff from the upper basin above the TSF, but the flow has never overtopped the bank. In the fall, there is little flow outside of significant storm events.

The use of Coherex for dust suppression was apparent in many locations, including the beach, where tire tracks were seen. The use of this material is constant during dry weather conditions per Henderson representatives. Mr. Hickman stated that the Coherex creates a layer of cohesive soil cover on the top of the tailings to prevent fugitive dusting. When additional tailings are added, the Coherex crust easily breaks apart and does not create an impermeable layer within the tailings matrix.

A drill rig was onsite for the installation of Extraction Well 6 in Ute Park.

The Division observed vegetation test plots near the north end of the impounded water of the TSF. From afar, the vegetation growth did not appear to be good. Mr. Hamarat indicated that the plots are only in their second year of observation.

This concludes the Division's report. A subset of the photographs taken during inspection are attached. Any questions or comments regarding this inspection report should be forwarded to Nikie Gagnon at the Colorado Division of Reclamation, Mining and Safety at 720-527-1640, or email at nikie.gagnon@state.co.us.

PHOTOGRAPHS



Photo 1: Looking northwest across the 3-Dam deposition area within the tailings impoundment.



Photo 2: Looking north down the 30" tailings delivery pipeline on the east side of 3-Dam. The 6" spigot lines deliver the slurry over the raised dam to the deposition area.



Photo 3: Looking southwest at monitoring instrumentation within the 3-Dam Cell. Equipment tracks are from the application of Cohex dust suppressant on top of the tailings.



Photo 4: Looking northwest at 24" lead-off tailings delivery pipeline in the 3-Dam area. The lead-off pipes are used predominantly in the winter months.



Photo 5: Looking north at the 30" tailings pipeline and 6" spigot lines on 1-Dam.



Photo 6: Looking south at tailings deposition within Cell 6 of 1-Dam. Deposition is almost complete here.



Photo 7: Closeup of plunge pool created by deposition within Cell 6 of 1-Dam.



Photo 8: North end of 1-Dam. Looking north at tailings deposition starting within Cell 7.



Photo 9: Looking northwest across Cell 7 on 1-Dam.



Photo 10: Looking south across Cell 9 in 1-Dam. Deposition berm was recently raised here. Henderson was constructing a leadoff at the northwest end of 1-Dam during the inspection (recent disturbance in the foreground).



Photo 11: Looking southeast at revegetation test plots on the northwest end of 1-Dam.



Photo 12: Looking southwest down the starter dam at the base of 1-Dam. Seep water is collected in channel and drains through culverts to the Ute Park collection area. Water observed discharging from horizontal drain noted by arrow.

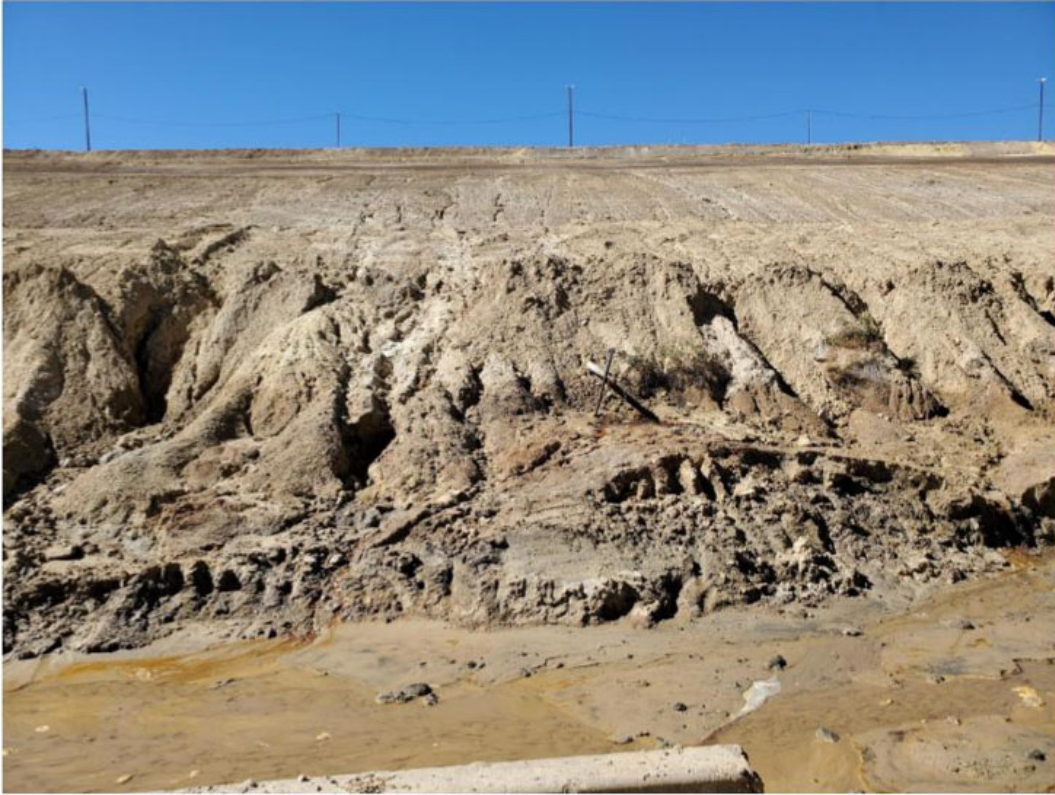


Photo 13: Looking at erosion rills along the eastern slope of 1-Dam. Attached map indicates location.



Photo 14: Looking at 1-Dam from the Ute Park collection area. Seepage channel in the foreground. Erosion rills observed along the base of the dam. Berm indicated by red arrow is the location of the foundation drain #3 as indicated by sign.



Photo 15: South end of 1-Dam. French drain system recently installed here to minimize erosion where the base of 1-Dam abuts the natural ground.



Photo 16: Looking north from the south end of 1-Dam, erosion rills on the dam recently repaired in this area. Erosion at base is being addressed by the installation of the adjacent French drain.



Photo 17: Looking at the east side of 3-Dam. Seepage collection area noted by arrow.



Photo 18: Looking at area where north buttress is installed below 3-Dam. Monitoring instrumentation noted by red arrow.



Photo 19: Seepage collection canal below 3-Dam.



Photo 20: Step back drain discharge below 3-Dam.



Photo 21: Foundation drain below 3-Dam



Photo 22: Seepage collection canal on the constructed south buttress below 3-Dam.



Photo 23: Erosion rill observed on south toe of 3-Dam buttress. Operator indicated the rill will be promptly repaired on the engineered structure.



Photo 24: Seepage collection/erosion control area below 3-Dam (north side). Attached map indicates location.

Inspection Contact Address

Miguel Hamarat
Climax Molybdenum Company
P.O. Box 68
Empire, CO 80438

Enclosure: 2024 Inspection Map

CC: Jared Ebert, DRMS
Rob Zuber, DRMS
Amber Gibson, DRMS