



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

February 3, 2025

Mr. Brad Bingham, Closure Manager
Grants Reclamation Project
Homestake Mining Company of California
P.O. Box 98/Highway 605
Grants, NM 87020

SUBJECT: U.S. NUCLEAR REGULATORY COMMISSION REVIEW OF HOMESTAKE MINING COMPANY OF CALIFORNIA, RESPONSE TO U.S. NUCLEAR REGULATORY COMMISSION REQUEST FOR ADDITIONAL INFORMATION DATED APRIL 25, 2024, FOR THE LARGE TAILING PILE EVAPO-TRANSPIRATION COVER DESIGN LICENSE AMENDMENT REQUEST, DOCKET 040-08903

Dear Mr. Bingham:

By letter dated July 28, 2023, the Homestake Mining Company of California (HMC or the licensee) submitted a license amendment request to the U.S. Nuclear Regulatory Commission (NRC) for review and approval (Agencywide Documents Access and Management System Accession No. package ML23222A171).¹ The NRC accepted the submission for detailed technical review in letter dated October 18, 2023 (ML23283A044). On April 25, 2024, the NRC published a request for additional information (RAI) (ML24089A054). HMC responded to the environmental RAI on July 12, 2024 (ML24197A248) and the safety RAI on October 7, 2024 (ML24283A192).

The NRC staff reviewed the RAI responses and finds that several of the responses do not provide sufficient information needed for the NRC staff to complete the review. The NRC's enclosed review of the RAI responses indicates the RAI that are not sufficient and that require additional information and those that do not require additional information.

Responses to the inadequate RAI should be provided within 60 days from the date of this letter. If HMC is unable to meet this response date, please notify the NRC staff, within two weeks of receipt of this letter, and propose a new submittal date. If the responses do not provide sufficient information for the NRC staff to make its licensing decision, the NRC staff will provide notification to the licensee on the individual RAI responses that do not provide sufficient information and are not acceptable.

The NRC staff is available to discuss the RAI in a public observation meeting with HMC, if requested.

¹ HMC submitted an LAR on March 21, 2022, for an ET cover (ML22080A186); the NRC staff did not accept the request for detailed review on September 28, 2022 (ML22256A283; see also, ML22117A064). The NRC staff attached *Comments* on HMC's Grants Reclamation Project Large Tailings Pile Evapotranspiration Cover License Amendment Request to the non-acceptance letter. The *Comments* identified sections of the LAR that lacked sufficient technical information; the *Comments* were not requests for supplemental information.

If you have any questions regarding this matter, please contact me at 301-415-7777, or via e-mail at Ron.Linton@nrc.gov.

Sincerely,



Signed by Linton, Ron
on 02/03/25

Ron C. Linton, Project Manager
Uranium Recovery and Materials
Decommissioning Branch
Division of Decommissioning, Uranium Recovery,
and Waste Programs
Office of Nuclear Material Safety
and Safeguards

Docket No.: 040-08903
License No.: SUA-1471

Enclosure:
Review of HMC RAI responses

cc: via Listserv
C. Dimond (NMED)
G. Swanson (OSE)
S. Appaji (EPA)
N. Olin (DOE)

U.S. Nuclear Regulatory Commission (NRC), Review of the Homestake Mining Company of California (HMC or licensee) Responses to NRC Request for Additional Information (RAI) dated April 25, 2024, Request for Amendment to License No. SUA-1471 for the Large Tailing Pile Evapotranspiration Cover Design

RAI No.	Topic/Issue	RAI response adequacy
1	Clarification of data in Section 4 and Tables 25-27	<p>A) The licensee addressed the inclusion of the erosion protection layer by removing the erosion protection layer from the modeling and adding an additional 1.25 feet to the final radon barrier and updating the modeling for the radon flux. The licensee did not address the inclusion of the growth media layer. Criterion 6(2) of 10 CFR 40 Appendix A requires measurement at the final radon barrier. The growth media layer, which is intended to support growth of the vegetation and protect the tailings from biointrusion from vegetation or animals, should not be included in the modeling for radon flux.</p> <p>The licensee indicated they will continue to use the modeled values for the radon flux rather than the measured data for the portions of the pile where the erosion protection layer was placed in 1995-1996 as they consider it more representative of the radon flux over the lifetime of the cell. NRC does not have sufficient information to evaluate this statement.</p> <p>B) Differences in tailings thickness reported in 1995-1996 and the 2023 model were the result of the licensee using the default value in Regulatory Guide 3.64 rather than the values from the 1995-1996 modeling. This change was reviewed by NRC staff and found to be acceptable.</p> <p>C-E)The licensee averaged the modeled radon flux for the top (Table 25) and the side tie-ins (Table 26), and used the average of those values in Table 27 for the side tie-ins. In Table 27, the licensee used the averaged value to reflect the variation in the side tie-in thickness between 3 and 7 feet of cover. However, as discussed above, the growth media layer, which is above the final radon barrier is included in the 3 to 7 feet of cover. The growth media layer should not be included in the radon flux calculations per the requirements of Criterion 6(2) of 10 CFR 40 Appendix A.</p>
2	Explain and justify radon modeling methods and assumptions	<p>A) The NRC staff does not currently have enough information to complete its review. In the RAI response, the licensee indicated that moisture content input to modeling will be explained in the updated Evapotranspiration (ET) Cover Design Report. If the Design Report provides the analysis and results, and NRC staff finds them sufficient, this will allow NRC staff to complete its review.</p> <p>B) Response is sufficient for NRC staff to complete its review.</p> <p>C-E) The licensee maintains that modeled values for the 1995-1996 data are more representative of the long-term performance of the Large Tailings Pile (LTP) rather than the measured values. The licensee did not provide information to support this statement.</p>

3	Provide details for radon modeling input and output with reallocation of tailings distribution and impact to radon flux results	Response is sufficient for NRC staff to complete its review.
4	Justification of data used for EPA method 115, calculation of weighted average	The phased emplacement site identified by the licensee in its RAI response (the Western Nuclear site in Wyoming) was able to demonstrate that each phase met the radon flux limit of Criterion 6(2) prior to placement of the radon barrier. HMC's modeling for phased emplacement does not meet that same condition as a radon flux that is less than the 6(2) limit is only achieved after a weighted average is applied across all phases rather than each phase being compliant on its own merit.
5	Provide sampling results for radiological content of the borrow area soils	Response is sufficient for NRC staff to complete its review.
6	Include immediate settlement calculations of tailings	The NRC staff does not currently have enough information to complete our review. The licensee has indicated in the RAI responses that additional calculations will be provided in the final ET Cover Design Report. If the Design Report provides the analysis and results, and NRC staff finds them sufficient, this will allow NRC staff to complete its review.
7	Explain changes in pore pressures or water levels within disposal cell and impact on consolidation calculations	The NRC staff does not currently have enough information to complete our review. The RAI response does not describe how pore pressures will be accounted for in the design. There is no mention of methodology or approach in the RAI response, only that it will be consistent with HMC's drain down model for the LTP. The licensee has indicated in the RAI responses that additional information to address this concern will be provided in the final ET Cover Design Report. If the Design Report provides the analysis and results, and NRC staff finds them sufficient, this will allow NRC staff to complete its review.
8	Provide settlement data from annual report in a format that can be incorporated into NRC's analysis	Response is sufficient for NRC staff to complete its review.
9	Clarify the intended rock size that will be used in the upper most layer of the ET cover	The RAI response clarifies the D_{50} is 1.2 inches. The licensee has indicated that this clarification will be reflected in the final ET Cover Design Report. If the Design Report is sufficiently updated, and NRC staff finds the updates sufficient, this will allow NRC staff to complete its review.
10	Identify the source of the rock that will	The RAI response clarifies rock source as existing stockpiles on-site that were obtained when the side slopes were constructed.

	be used in the erosion protection layer	The licensee has indicated that this clarification will be reflected in the final ET Cover Design Report. If the Design Report is sufficiently updated, and NRC staff finds the updates sufficient, this will allow NRC staff to complete its review.
11	Justify aspects of design with respect to erosion protection	<p>The NRC staff does not currently have enough information to complete our review. Four of the six RAI responses refer to updates to the ET Cover Design Report or technical specifications, which are forthcoming. The licensee has indicated in the RAI responses that additional information to address this concern will be provided in the final ET Cover Design Report. If the Design Report provides the analysis and results, and NRC staff finds them sufficient, this will allow NRC staff to complete its review.</p> <p>The NRC staff notes that if HMC chooses to incorporate experiences from performance of existing cover designs, those need to be comparable to the Gants Reclamation Project (GRP) site. The performance features would include, but not be limited to: design life; maintenance assumptions; climate, and type and extent of vegetation.</p>
12	Explain the selection of the 2-hour Probable Maximum Precipitation and accompanying rainfall intensity	Response is sufficient for NRC staff to complete its review.
13	Clarify the runoff coefficient used in the erosion protection design	The licensee has provided the information requested. The NRC staff notes that HMC clarifies and explains the use of 0.5 runoff coefficient in its RAI response. However, that value is less than what NRC guidance recommends (0.8 to 1). The licensee has indicated that this clarification will be reflected in the final ET Cover Design Report. If the Design Report is sufficiently updated, and NRC staff finds the updates sufficient, this will allow NRC staff to complete its review.
14	Explain how vegetation is accounted for in erosion resistance	Response is sufficient for NRC staff to complete its review.
15	Clarify the equation used to calculate the retardance curve index in Section 4.5.2 of the Design Report	Response is sufficient for NRC staff to complete its review.
16	Provide information on lysimeter use to verify hydraulic performance of the cover system	Response is sufficient for NRC staff to complete its review. NRC staff notes that the installation and use of lysimeters, sensors, or other tools could help validate the very low infiltration rates that Homestake has assumed in their modeling.

17	Provide additional information on how macropores are accounted for in the infiltration modeling	Response is sufficient for NRC staff to complete its review.
18	Provide information of temporal and spatial discretization of the infiltration modeling	Response is sufficient for NRC staff to complete its review.
19	Clarify why the long-term LTP seepage used in the 2022 Groundwater Flow and Transport Model was chosen as the net infiltration criterion	Response is sufficient for NRC staff to complete its review.
20	Justify why two test pits are sufficient to represent the 99-acre North Borrow Area.	Response is sufficient for NRC staff to complete its review.
21	Provide details on infiltration modeling, holding capacity, and soil-water characteristic curve	Response is sufficient for NRC staff to complete its review. NRC staff notes that although the water storage appears to be sufficient for typical conditions, it is not clear if there will be sufficient storage for wetter periods or episodic events during winters. A thicker growth media layer could decrease infiltration by providing additional storage during these periods and events. In addition, lysimeters or sensors could reduce uncertainty and add confidence in the assumed infiltration rates. Otherwise, higher infiltration rates may need to be assumed for modeling.
22	Provide an explanation of water budget components	Response is sufficient for NRC staff to complete its review.
23	Provide basis for soil properties for erosion protection layer	Response is sufficient for NRC staff to complete its review.
24	Provide information on West borrow area soils, 7 to 9 ft.	Response is sufficient for NRC staff to complete its review.
25	Provide information on West borrow area soils, 5 to 7 ft.	Response is sufficient for NRC staff to complete its review.
26	Provide properties of compacted tailings layer	Response is sufficient for NRC staff to complete its review.

27	Provide assumptions for infiltration modeling	Response is sufficient for NRC staff to complete its review.
28	Description of the conceptual model for the base and sensitivity cases	Response is sufficient for NRC staff to complete its review.
29	Provide clarification on how daily precipitation rates were generated	Response is sufficient for NRC staff to complete its review.
30	Provide number of residents potentially impacted	Response is sufficient for NRC staff to complete its review..
31	Clarify livestock drinking ponds	Response is sufficient for NRC staff to complete its review.
32	Provide threatened and endangered species impacts	Response is sufficient for NRC staff to complete its review.
33	Discuss tree removal	Response is sufficient for NRC staff to complete its review.
34	Waste disposal	Response is sufficient for NRC staff to complete its review.
35	Cumulative impacts	Response is sufficient for NRC staff to complete its review.

Homestake Mining Company (HMC), Grants Reclamation Project, NRC Review of HMC Response to NRC Request for Additional Information Dated 4/25/24 for the Large Tailing Pile Evapotranspiration Cover Design Amendment Request DATE February 3, 2025

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