



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

January 24, 2019

Thomas Wohlford, Closure Manager
Grants Reclamation Project
Homestake Mining Co. of CA
P.O. Box 98/Highway 605
Grants, NM 87020

**SUBJECT: REQUEST FOR ADDITIONAL INFORMATION – NRC REVIEW OF ZEOLITE
WATER TREATMENT SYSTEM LICENSE AMENDMENT REQUEST**

Dear Mr. Wohlford:

By letter dated December 11, 2017,¹ as supplemented by letter dated February 22, 2018,² the Homestake Mining Company of California (HMC) submitted a license amendment request to the U.S. Nuclear Regulatory Commission (NRC) for review and approval. Specifically, HMC proposed to update its license to add the 300 gallons per minute (gpm) and 1200 gpm zeolite water treatment systems to License Condition 35. After its initial review of the application, the NRC staff determined that the enclosed additional information request is necessary to complete its review.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records component of NRC's document system ADAMS. ADAMS is accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

¹ Agencywide Documents Access and Management System (ADAMS) Package Accession No. ML17361A006

² ADAMS Accession No. ML18066A583

If you have any questions regarding this letter, please contact me at (301) 415-7777 or by e-mail to Ron.Linton@nrc.gov.

Sincerely,

/RA/

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

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

Enclosure:
NRC Request for Additional Information

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SUBJECT: REQUEST FOR ADDITIONAL INFORMATION – NRC REVIEW OF
ZEOLITE WATER TREATMENT SYSTEM LICENSE AMENDMENT
REQUEST, **DATE January 24, 2019**

DISTRIBUTION: J. Katanic, RIV; R. Evans, RIV

ADAMS Accession No.: ML18218A560

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REQUEST FOR ADDITIONAL INFORMATION
HOMESTAKE MINING COMPANY OF CALIFORNIA
REVIEW OF ZEOLITE WATER TREATMENT SYSTEM
LICENSE AMENDMENT REQUEST
Docket Number: 040-08903
License Number: SUA-1471

By letter dated December 11, 2017,¹ as supplemented by letter dated February 22, 2018,² the Homestake Mining Company of California (HMC) submitted a license amendment request to the U.S. Nuclear Regulatory Commission (NRC) for review and approval. Specifically, HMC proposed to amend License Condition 35 to include the 300 gallon per minute (gpm) and 1200 gpm zeolite water treatment systems as a method to be used for groundwater remediation.

The licensee is currently working on groundwater restoration activities to mitigate the impacts of seepage from the unlined tailings impoundments into the underlying aquifer that has been ongoing since 1977. The zeolite water treatment systems are single lined facilities located on top of the large tailings pile at the site. Since 2012, the licensee had been pilot testing the 300 gpm and 1200 gpm zeolite water treatment systems prior to requesting they be added to the license. The zeolite system passes uranium contaminated groundwater through a sequence of lined ponds that contain zeolite crystals, which absorb the dissolved uranium onto the zeolite crystals through an exchange process with other cations (e.g., sodium, calcium, and hydrogen).

After its initial review of the license amendment request, the NRC staff determined that the requests for additional information (RAIs) below are necessary to complete its detailed technical review.

RAI 1

Comment: HMC did not submit completed NRC Form 313 for the Groundwater Monitoring Plan License Amendment Request.

Basis: Title 10 of the *Code of Federal Regulations* (10 CFR) Section 40.44, *Amendment of licenses at request of licensees*, states:

Applications for amendment of a license shall be filed on NRC Form 313 in accordance with [10 CFR] 40.31 and shall specify the respects in which the licensee desires the license to be amended and the grounds for such amendment.

Path Forward: Please submit NRC Form 313 for the Groundwater Monitoring Plan License Amendment Request as part of the HMC response to these RAIs.

¹ Agencywide Documents Access and Management System (ADAMS) Package Accession No. ML17361A006

² ADAMS Accession No. ML18066A583

Enclosure

RAI 2

Comment: HMC did not specify how its license should be amended. Specifically, Section 4.0, *Proposed License Amendment*, states that HMC proposes to amend License Condition 35 as proposed in the redline/strikeout in that same section. However, there is no redline or strikeout text in that section.

Basis: 10 CFR Section 40.44, states:

Applications for amendment of a license shall be filed on NRC Form 313 in accordance with [10 CFR] 40.31 and shall specify the respects in which the licensee desires the license to be amended and the grounds for such amendment.

Path Forward: Please update Section 4.0 of the license amendment request to provide the specific requested changes to License Condition 35 that would be implemented with this license amendment request.

RAI 3

Comment: It is not clear to what extent leakage from the zeolite beds during acidic regeneration could affect contaminant release from the underlying materials in the Large Tailings Pile (LTP).

Basis: License Condition 35C states, in part:

Implement the corrective action program described in the September 15, 1989, submittal, as modified by the reverse osmosis system described in the January 15, 1998, submittal, excluding all sampling and reporting requirements for Sample Point 1, with the objective of achieving the concentrations of all constituents listed in License Condition 35B.

A sulfuric acid solution is used as part of the zeolite water treatment process to periodically regenerate the zeolite. The zeolite beds have a high-density polyethylene liner (HDPE). Although the liner was installed and tested as discussed in Section CS 5 of the Zeolite License Amendment Request documentation, the potential exists for leakage to occur. It is not clear from the documentation to what extent this leakage could affect contaminant release from the underlying materials in the LTP and therefore affect License Conditions 35B and 35C.

Path Forward: HMC should discuss the extent to which leakage of acidic solutions during zeolite regeneration could affect contaminant release from the underlying materials in the LTP. This could include calculations showing that conservative estimates of leakage volumes and contaminant leachate concentrations are not risk significant.

RAI 4

Comment: As discussed in Section 2.3 of the application, effluent from the zeolite units will be monitored at least weekly to ensure that effluent sent to the Post Treatment Tank will not exceed the site standards. The application also states that all effluent is tested and confirmed to be compliant with all license condition standards prior to be discharged to the Post Treatment Tank. In the pilot study performance data tables for the treated water, there are several highlighted exceedances of the site standards for uranium, molybdenum, sulfate, Total Dissolved Solids (TDS), and radium 226 + radium 228. It is not clear if these exceedances are related to the acidic regeneration of the zeolite beds and that these effluent streams go to the Evaporation Ponds or if these exceedances are related to effluent pumped to the Post Treatment Tank for injection.

Basis: License Condition 35C states, in part:

Implement the corrective action program described in the September 15, 1989, submittal, as modified by the reverse osmosis system described in the January 15, 1998, submittal, excluding all sampling and reporting requirements for Sample Point 1, with the objective of achieving the concentrations of all constituents listed in License Condition 35B.

It is not clear if the highlighted exceedances are related to effluent streams going to the Evaporation Ponds or the Post Treatment Tank. If these concentrations are going to the Post Treatment Tank, it is not clear: (1) how these exceedances occurred, (2) to what extent these exceedances may continue in the future, and (3) to what extent these exceedances may impact License Condition 35C.

Path Forward: Clarify whether the exceedances highlighted in the Pilot Study Performance Data spreadsheets are indicative of effluent streams going to the Evaporation Ponds or the Post Treatment Tank. If these effluent streams were transferred to the Post Treatment Tank, HMC should discuss: (1) how these exceedances occurred, (2) the likelihood of these exceedances occurring in the future, and (3) the resultant impact to meeting License Conditions 35B and 35C.

RAI 5

Comment: The NRC staff understands, through periodic discussions with the licensee, that there have been some changes made to the design basis for the Zeolite Water Treatment System that should be provided to the staff for review.

Basis: 10 CFR 40.9(a) states:

Information provided to the Commission by an applicant for a license or by a licensee or information required by statute or by the Commission's regulations, orders, or license conditions to be maintained by the applicant or the licensee shall be complete and accurate in all material respects.

Path Forward: The licensee should provide an update to the license amendment application concerning any changes to the zeolite system that have been made since the application was submitted. Specifically, the licensee had previously stated that larger zeolite rocks would be used in the 1200 gpm system to reduce the amount of wind-blown material from the zeolite pond. Please provide further information regarding this and any other changes that have been made to the systems or system descriptions since the submittal of the request.

RAI 6

Comment: The NRC staff needs additional information to complete its environmental review of HMC's amendment request. Pages 3-3 through 3-7 of NUREG-1748, "Environmental Review Guidance for Licensing Actions Associated with NMSS Programs,"³ provide a discussion of the information that is needed for the development of an Environmental Assessment (EA) for a simple licensing action.

Basis: 10 CFR 51.30, *Environmental assessment*, outlines the information that should be provided by HMC for the NRC staff to assess the environmental impacts of the proposed action and prepare an EA.

Path Forward: In Section 3.0 of the December 11, 2017, license amendment application, HMC references "Environmental Report for the Construction of Evaporation Pond # 3 and Associated Boundary Expansion (NRC, 2007)" as an NRC document. The NRC staff has determined that the document identified by this title was developed for HMC by Kleinfelder, Inc. Please verify that this is the document HMC is intending to reference, or correct the reference, as needed.

RAI 7

Comment: The NRC staff needs additional information to complete its environmental review of the licensee's amendment request. Pages 3-3 through 3-7 of NUREG-1748, provide a discussion of the information that is needed for the development of an EA for a simple licensing action. Additionally, pages 5-9 through 5-25 of NUREG-1748 provide a detailed discussion of the information needed for each of the resource areas listed below.

Basis: 10 CFR 51.30, *Environmental assessment*, outlines the information that should be provided by the licensee for the NRC staff to assess the environmental impacts of the proposed action and prepare an EA.

Path Forward: The Environmental Report (ER) for the Zeolite System License Amendment should be supplemented in accordance with the guidance in NUREG-1748. Specifically, the ER should include relevant information regarding the following resource areas and any changes that have occurred since the January 30, 2007, Environmental Report for the Construction of Evaporation Pond # 3 and Associated Boundary Expansion⁴:

³ ADAMS Accession No. ML032450279

⁴ ADAMS Accession No. ML070850561

A. Water Resources

- 1) Please provide a description of impacts to surface and groundwater due to the proposed action, including water use and water quality. These can be both positive and negative impacts.
- 2) On page 16 of the December 2017 license amendment request, it is stated that the zeolite systems are isolated from the hydrologic system and there is reasonable assurance that no significant adverse impact to the hydrologic resources is anticipated. Please provide a more detailed explanation of how the systems are isolated and why that gives reasonable assurance there will be no significant adverse impacts to the resource.

B. Public and Occupational Health

- 1) Please discuss any changes, growth, or reduction in the number of residences and residents in the nearby housing communities identified in the January 2007 ER.
- 2) Please discuss any changes in radiological monitoring for public and occupational dose since the January 2007 ER.

C. Air Quality

- 1) Please describe impacts on the local and nearby communities due to windblown zeolite.
- 2) Please also include any mitigation measures being taken and their demonstrated and anticipated effectiveness. If there is not a concern, please state that and explain why.

D. Cumulative Impacts

- 1) In Section 2.1.2 of the license amendment request, HMC introduces a potential future action of pumping water from contained on-site wells to the zeolite treatment systems. Cumulative impacts include any past, present or reasonably foreseeable future actions which could result in cumulative impacts when combined with the proposed action. Please address this potential future action and any other cumulative impacts.
- 2) In the New Mexico Department of Game and Fish (NMDGF) response to NRC consultation, the NMDGF indicated that in 2016 HMC reported to the FWS approximately 12 water bird fatalities at one of the HMC evaporation

ponds⁵. The NMDGF is concerned that the water quality of the evaporation ponds presents a hazard to migratory water birds. Please address the following:

- a.) Please list the species, if known, and explain the reasons identified for the bird deaths.
- b.) Please explain mitigation measures, or changes to mitigation measures, being implemented at the site to prevent or limit future deaths of birds and bats.
- c.) Have the changes or mitigation been successful, please describe your conclusions.
- d.) Include water quality standards being followed and if they are being met.

⁵ ADAMS Accession No. ML18347A851