



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

August 15, 2023

Brad R. 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 STAFF REVIEW OF THE
HOMESTAKE MINING COMPANY OF CALIFORNIA'S REQUEST FOR
AMENDMENT TO CHANGE THE BACKGROUND MONITORING LOCATION FOR
RADON AND AMBIENT GAMMA RADIATION, LICENSE SUA-1471,
DOCKET NO. 04008903 (EPID: L-2020-LLA-0066)

Dear Brad Bingham:

By letter dated December 18, 2020, the Homestake Mining Company of California (HMC or the licensee) submitted to the U.S. Nuclear Regulatory Commission (NRC) a license amendment request (LAR) for review and approval (Agencywide Documents Access and Management System [ADAMS] Accession No. package ML20356A287). Specifically, the LAR proposes a change in license condition 10 to eliminate specification of background monitoring station HMC-16 and replace it with stations HMC-1OFF and HMC-6OFF as approved locations for routine monitoring of ambient background radon and gamma radiation levels at the Grants Reclamation Project. By letter dated February 22, 2021, the NRC staff determined the information provided by the licensee contained adequate information for the NRC staff to begin a detailed technical review (ADAMS Accession No. ML21053A325). By email dated March 31, 2021, HMC supplemented the application with data that was unavailable at the time of the December 18, 2020, submission (ADAMS Accession No. ML21092A009).

The NRC staff performed a detailed technical review and issued a request for additional information (RAI) to HMC on September 14, 2021 (ADAMS Accession No. ML21237A454). HMC requested two extensions to reply to NRC RAI (ADAMS Accession Nos. ML21274A737 and ML21344A196). The NRC staff approved those extension requests (ADAMS Accession Nos. ML21278A931 and ML21347A399) and HMC responded to the NRC staff RAI in a letter dated March 11, 2022 (ADAMS Accession No. ML22071A000). The NRC staff responded to HMC's RAI response in a June 10, 2022, letter, requesting clarifying information (ADAMS Accession No. ML22137A097). HMC requested an extension to respond to the request for clarifying information (ADAMS Accession No. ML22191A001) and NRC staff agreed to the extension (ADAMS Accession No. ML22194A873). HMC provided a response to the request for clarifying information on August 9, 2022 (ADAMS Accession No. ML22222A123). After receipt of the HMC response to the NRC staff request for clarifying information, the NRC staff and HMC staff had a public observational meeting on August 25, 2022, and NRC published a summary of the meeting dated September 8, 2022 (ADAMS Accession No. ML22245A065).

For the reasons discussed in the attached Safety Evaluation Report (SER), the NRC staff is denying the licensee's request to use HMC-1OFF and HMC-6OFF for measuring background radon gas (radon-222) and direct (gamma) radiation.

The NRC staff determined that the proposed background monitoring stations do not meet the applicable regulations in Title 10 of the *Code of Federal Regulations* (10 CFR), Part 20, “Standards for Protection Against Radiation.” The NRC staff’s evaluations identified that the proposed background monitoring stations would not make an appropriate survey pursuant to 10 CFR 20.1302(a) and (b), and would not make reasonable survey pursuant to 10 CFR 20.1501(a) to demonstrate compliance with the dose limits for individual members of the public in 10 CFR 20.1301 when reviewed in accordance with the NRC guidance. Specifically,

1. Current background radon-222 conditions at public exposure locations are not reflected at proposed background monitoring stations HMC-1OFF and HMC-6OFF. The current point of compliance (POC) monitoring locations (HMC-4 and HMC-5) are adjacent to and impacted by an area where the remediation work performed by the licensee has lowered the background to levels which are below the background for non-remediated areas. Selection of a background monitoring location that is in an area where remediation has not taken place (a preoperational location), will result in a calculation of an annual public dose that is lower than what is the maximum exposed individual is receiving and therefore the proposed background monitoring locations do not make an appropriate and reasonable survey to demonstrate compliance with public dose limits in 10 CFR 20.1301 (see Section 3.1).
2. Statistical analysis of radon-222 concentrations, provided by HMC, mishandles spatial and temporal data, and therefore does not justify selecting the proposed background monitoring stations HMC-1OFF and HMC-6OFF to make a survey of radiation levels that is appropriate and reasonable to demonstrate compliance with public dose limits in 10 CFR 20.1301. Data handling issues include: (1) the results of the radon study only provide an estimate of the average radon concentration in the study area and cannot be applied to any single location within the study area; (2) the results of the radon study should not have been extrapolated to apply to HMC-1OFF and HMC-6OFF because these locations are outside of the study area; (3) decommissioning criteria are not relevant to the annual requirement in 10 CFR 20.1301 to demonstrate dose to the public in any one year; and (4) the licensee used a mix of long-term (2017 thru 2019) meteorological data and compared it to short-term (2020) radon concentration data rather than comparing data over the same time periods (see Section 3.2).
3. Local topography, geology and soils affect radon-222 concentrations. The NRC staff does not consider the locations of HMC-1OFF and HMC-6OFF as representative of the topography of the POC locations for determining public dose (HMC-4 and HMC 5). The NRC staff determined that additional information on the topographical conditions at the proposed monitoring locations is necessary to ensure the selection of an appropriate background monitoring location is representative of the background conditions for the POC monitoring stations. Therefore, the NRC staff determined the topographical information on proposed monitoring locations does not make an appropriate and reasonable survey on which to demonstrate compliance with public dose limits in 10 CFR 20.1301 (see Section 3.3).
4. HMC seeks to change the location for measuring background gamma radiation in addition to background radon concentrations. However, HMC’s submittal analyzed the proposed radon monitoring stations, but did not provide a technical basis for relocating the background gamma radiation measurement location from HMC-16 to HMC-1OFF and HMC-6OFF (HMC, 2020a). HMC did not provide relevant data that supports using HMC-1OFF or HMC-6OFF, or both, to represent background gamma radiation at the POC monitoring locations (HMC-4 and HMC-5). For these reasons, the NRC staff cannot

determine whether the proposed monitoring locations would make an appropriate and reasonable survey on which to demonstrate compliance with public dose limits in 10 CFR 20.1301 (see Section 3.4).

5. The NRC staff finds the background measurements from the HMC-1OFF or HMC-6OFF monitoring locations would not make an appropriate and reasonable survey that would demonstrate compliance with public dose limits in 10 CFR 20.1301. HMC's proposed monitoring locations do not represent meteorological and air dispersion conditions at the site because: (1) the atmospheric dispersion modeling analyses do not adequately justify the measurements at the proposed locations; (2) the licensee did not demonstrate that the proposed background locations are representative of background conditions at HMC-4 and HMC-5 under all meteorological conditions consistent with the dose limit rather than just under nighttime drainage airflow conditions which is a predominant focus in the conceptual site model; and (3) HMC's analyses do not adequately account for the variation of potential radon-222 increases and/or decreases over the intervening distances between the background locations and the points of compliance (see Section 3.5).

The NRC staff is prepared to meet with HMC to further discuss this review in a public observational meeting, if requested.

In accordance with 10 CFR 2.390, "[Public inspections, exemptions, requests for withholding](#)," of the NRC's "Agency Rules of Practice and Procedure," 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 ADAMS. ADAMS is accessible from the NRC Web site at <https://www.nrc.gov/reading-rm/adams.html>.

If you have any questions regarding this matter, please contact Ron Linton of my staff at 301-415-7777, or via email at Ron.Linton@nrc.gov.

Sincerely,



Signed by Marshall, Jane
on 08/15/23

Jane Marshall, Division Director
Division of Decommissioning, Uranium Recovery
and Waste Programs
Office of Nuclear Material Safety
and Safeguards

Docket No.: 04008903
License No.: SUA-1471

Enclosure: NRC SER

Cc via Homestake ListServ:
Mark Purcell (EPA)
Anne Maurer (NMED)
Nicole Olin (DOE)
Gaige Swanson (NMOSE)

Homestake, NRC Staff Review: Amendment Request to Change the Radon and Gamma Background Monitoring Location DATE August 15, 2023

DISTRIBUTION:

ADAMS Accession No.: ML23186A172; Ltr ML23186A150

OFFICE	NMSS/DUWP /URMDB	R-IV/DNMS/MLDB	NRR/DEX/EXHB	NRR/DEX/EXHB
NAME	RLinton <i>RL</i>	MPoston-Brown <i>MP</i>	MMazaika <i>MM</i>	BHayes <i>BH</i>
DATE	Jul 5, 2023	Jul 6, 2023	Jul 25, 2023	Aug 3, 2023
OFFICE	NMSS/DUWP /URMDB	NMSS/DUWP		
NAME	RVon <i>RV</i>	JMarshall <i>JM</i>		
DATE	Aug 8, 2023	Aug 15, 2023		

OFFICIAL RECORD COPY