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U.S. Nuclear Regulatory Commission
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RE: Response to RAI on proposed license amendment to remove well CF4 from monitoring program, Materials License SUA-1471, Docket No. 040-08903

Mr. Linton:

On April 22, 2021, Homestake Mining Company of California (HMC) submitted a license amendment request for review and approval (ML2112A266). NRC accepted the request for technical review and responded with a request for additional information (RAI) on the license amendment request on June 15, 2021 (ML21160A216). The response to the RAI is enclosed within.

Thank you for your time and attention on this matter. If you have any questions, please contact me via e-mail at bbingham@homestakeminingcoca.com or via phone at 505.290.8019.

Respectfully,

Brad R. Bingham
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BRB/ada

Enclosure

cc: B. Tsosie, DOE, Grand Junction, Colorado (w/encl.)
M. Purcell, Region VI EPA, Dallas, Texas (w/encl.)
A. Maurer, NMED, Santa Fe, New Mexico (w/encl.)
M. McCarthy, Barrick, Salt Lake City, Utah (electronic copy)
D. Lattin, Barrick, Elko, Nevada (electronic copy)
R. Whicker, Environmental Restoration Group, Albuquerque, New Mexico (electronic copy)

NRC Request for Additional Information 1:

Propose an alternate well(s) that adequately demonstrates the effectiveness of the corrective actions in the Upper Chinle aquifer beneath the Large Tailings Pile (LTP) and provides comparable risk information (i.e., groundwater quality data in the areas of highest impact).

HMC Response:

HMC proposes using the existing CE series wells already incorporated into the license (CE2, CE8, and CE15) as they will adequately demonstrate the effectiveness of the corrective actions in the Upper Chinle aquifer beneath the LTP and provide comparable risk information. Furthermore, HMC proposes that well CF4 is not replaced by an additional well in the monitoring program. Given the lack of proposed pumping in the vicinity of CF4, any future restoration progress of the Upper Chinle is more appropriately assessed utilizing wells within the area where active pumping is occurring. CE series wells CE2, CE8, and CE15, located south (hydraulically downgradient) of the LTP, will adequately demonstrate the effectiveness of the corrective actions in the Upper Chinle aquifer. The CE series of wells are located within the mixing zone (as is CF4) and are downgradient of CF4 and the tailings piles, providing monitoring coverage along the potential transport pathway from the tailings piles to the site's control boundary. In addition to the aforementioned wells incorporated into the monitoring plan, wells directly adjacent to the LTP such as CE7, CE13, and CE17 are routinely monitored and provide comparable risk information to CF4 without the issues associated with well completions that penetrate the tailings.

In the June 15, 2021 correspondence, the NRC indicated that it was unclear if the water quality present at well CF4 was not representative of the aquifer in that location based on increases since 1999 in the Upper Chinle aquifer. The recent Ra-228 and Th-230 values in well CF4 far exceed anything observed in the Upper Chinle or in the alluvium underneath the LTP over the monitoring period of record. There are two potential transport pathways for these constituents: one, casing leakage to the location of CF4 and two, vertical drainage from the tailings pile, through the alluvium, downward into the Upper Chinle subcrop and eastward to the well. The extensive monitoring and well density on the site does not support the second theoretical transport pathway for these constituents, and thus the most plausible interpretation is that increases are due to the compromised CF4 well casing.

In addition, these observed increases are not indicative of an increase in concentration underneath the LTP but rather an increase in the available data utilized to delineate the plume's footprint. Figure 1.1-18 (1999 data) in the 2020 Annual Performance Report does not have a monitoring point (wells sampled denoted by black circles in the figure) present underneath the footprint of the pile and the concentration contours appropriately do not speculate beyond the data presented. Given the direct contact of the alluvium and Upper Chinle underneath the LTP, the plume footprint in 1999 was likely similar to what is presented in 2009 and 2019 (Figures 1.1-19 and 1.1-20) but could not be evaluated until additional wells were installed and sampled.

The NRC also points to wells T15, T27, T28, and T30 as indicators of water quality within the Upper Chinle. These four wells are all completed in both the alluvial aquifer and the Upper Chinle subcrop and thus are representative of some combination of the water present in both formations rather than indicative of the Upper Chinle alone.