

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



June 23, 2020

David Pierce  
Closure Manager  
Grants Reclamation Project  
Homestake Mining Company of CA  
P.O. Box 98/Highway 605  
Grants, NM 87020

**SUBJECT: U.S. NUCLEAR REGULATORY COMMISSION REVIEW OF HOMESTAKE MINING COMPANY OF CALIFORNIA'S APRIL 21, 2020, REPLY TO NRC REQUEST FOR ADDITIONAL INFORMATION DATED JANUARY 23, 2020, ON THE PROPOSED ADJUSTMENT IN GROUNDWATER MONITORING OF THE SAN ANDRES-GLORIETA AQUIFER NEAR THE GRANTS RECLAMATION PROJECT (WELL 943), DOCKET NO. 040-08903, LICENSE NO. SUA-1471.**

Dear Mr. Pierce:

By letter dated January 23, 2020,<sup>1</sup> the U.S. Nuclear Regulatory Commission (NRC) staff, in coordination with the New Mexico Environment Department (NMED), the New Mexico Office of the State Engineer (OSE), the U.S. Environmental Protection Agency (EPA), and the U.S. Department of Energy (DOE) staff (collectively "the Agencies"), requested additional information regarding the source of the contamination observed at well 943 and that additional monitoring, as proposed by Homestake Mining Company of California (HMC), should be implemented. By letter dated April 21, 2020,<sup>2</sup> HMC provided a response to address the January 23, 2020, request for additional information and monitoring.

The NRC staff, in coordination with the Agencies, has reviewed the information presented in the April 21, 2020, letter and has determined that HMC has adequately responded to the Agencies concerns related to proposed monitoring in the SAG aquifer near well 943. The NRC staff, in coordination with the Agencies, agrees with HMC's approach to obtaining additional data and continued monitoring pertaining to the San Andres-Glorieta aquifer in the vicinity of well 943. Additionally, NRC staff requests that the monitoring data and monitoring results in the vicinity of well 943 be reported to the NRC in the Grants Reclamation Project Annual Report to the Agencies. The NRC staff technical review is enclosed.

In accordance with 10 CFR 2.390 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 Agencywide Documents Access and Management System (ADAMS). ADAMS is accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html>.

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<sup>1</sup> Agencywide Documents Access and Management System (ADAMS) Accession No. ML20016A371

<sup>2</sup> ADAMS Accession No. ML20113E872

If you have any questions regarding this matter, please contact me at 301-415-7777, or via email at [ron.linton@nrc.gov](mailto:ron.linton@nrc.gov).

Sincerely,

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: NRC staff review

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**SUBJECT:** U.S. NUCLEAR REGULATORY COMMISSION REVIEW OF HOMESTAKE MINING COMPANY OF CALIFORNIA'S APRIL 21, 2020, REPLY TO NRC REQUEST FOR ADDITIONAL INFORMATION DATED JANUARY 23, 2020, ON THE PROPOSED ADJUSTMENT IN GROUNDWATER MONITORING OF THE SAN ANDRES-GLORIETA AQUIFER NEAR THE GRANTS RECLAMATION PROJECT (WELL 943), DOCKET NO. 040-08903, LICENSE NO. SUA-1471.  
**DATE: June 23, 2020**

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**ADAMS Accession No.: ML20121A025**

**\*via e-mail**

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<b>DATE</b>	04/29/2020	04/29/2020	06/23/2020	06/23/2020

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## TECHNICAL EVALUATION REPORT

DATE: June 23, 2020

DOCKET: 040-08903

LICENSEE: Homestake Mining Company of California

SITE: Grants Reclamation Project

PROJECT MANAGER: Ron Linton

TECHNICAL REVIEWER: George Alexander

SUBJECT: U.S. Nuclear Regulatory Commission Review of Homestake Mining Company of California's April 21, 2020, Reply To NRC Request for Additional Information dated January 23, 2020, on the Proposed Adjustment in Groundwater Monitoring of the San Andres-Glorieta Aquifer near the Grants Reclamation Project

### 1.0 BACKGROUND

By letter dated May 10, 2018,<sup>1</sup> the U.S. Nuclear Regulatory Commission (NRC) staff, in coordination with the New Mexico Environment Department (NMED), the New Mexico Office of the State Engineer (OSE), the U.S. Environmental Protection Agency (EPA), and the U.S. Department of Energy (DOE) staff (collectively "the Agencies"), stated that well 943 should be plugged and abandoned as recommended by Homestake Mining Company of California (HMC) in their letter dated April 3, 2018.<sup>2</sup> By letter dated July 26, 2018,<sup>3</sup> HMC reported that well 943 was abandoned in July 2018 and proposed additional groundwater monitoring of the San Andres-Glorieta (SAG) Aquifer at wells near well 943. By letter dated January 24, 2019,<sup>4</sup> the NRC staff, in coordination with the Agencies, requested additional information to demonstrate that any contamination from well 943 is not capable of posing a substantial present or potential hazard to human health or the environment. By letter dated May 10, 2019,<sup>5</sup> HMC provided an analysis of predicted uranium concentrations in the SAG Aquifer due to leakage from well 943. By letter dated January 23, 2020,<sup>6</sup> the NRC, in coordination with the Agencies, requested additional information from HMC on their analysis presented in the May 10, 2019, letter. HMC responded to NRC's January 23, 2020, request for information by letter dated April 21, 2020.<sup>7</sup>

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<sup>1</sup> Agencywide Documents Access and Management System (ADAMS) Accession No. ML18120A331.

<sup>2</sup> ADAMS Accession No. ML18117A230.

<sup>3</sup> ADAMS Accession No. ML18236A552.

<sup>4</sup> ADAMS Accession No. ML19002A503.

<sup>5</sup> ADAMS Accession No. ML19143A097.

<sup>6</sup> ADAMS Accession No. ML20016A371.

<sup>7</sup> ADAMS Accession No. ML20113E872.

## 2.0 NRC STAFF EVALUATION

### *Source of Contamination Observed at Well 943*

In response to the Agencies request for additional information regarding the source of the contamination observed at well 943, HMC discussed that historical contamination in the Middle Chinle aquifer in the area of Felice Acres was the likely source for the contamination observed at well 943. Figure 1 in HMC's response letter shows uranium concentrations between 3 and 4 mg/L in the Middle Chinle aquifer in this area in 1982. HMC's groundwater restoration activities have since reduced the concentration of contaminants. However, Figure 6.3-11A in the 2018 Annual Monitoring Report<sup>8</sup> shows uranium concentrations in Felice Acres that were similar to the uranium concentrations calculated for the leakage into well 943 in HMC's May 10, 2019, letter.<sup>9</sup> Other constituents of concern in the Middle Chinle aquifer that are shown in Table 1 from HMC's June 2, 2017,<sup>10</sup> letter also have concentrations similar to well 943 in the area of Felice Acres. The Agencies agree with HMC's assessment that historical contamination in the area of Felice Acres is likely responsible for the observed concentrations. Although it is not conclusive that leakage from the Middle Chinle aquifer was responsible for the observed well 943 contamination, the Agencies agree with HMC's proposed approach to attempt to monitor San Andreas-Glorieta (SAG) wells not owned by HMC in the vicinity of the Grants Reclamation Project (GRP) (see discussion below). This will help ensure that the SAG aquifer is protected from contamination from overlying aquifers.

### *Cause of Alluvial Water Level Declines*

The Agencies also requested additional information regarding the apparent drawdown in Alluvial aquifer wells after the well 943 pump test to better understand if there are additional pathways from the overlying aquifers into the SAG aquifer. The 2018 Annual Monitoring Report showed drawdown in the Alluvial aquifer at wells 555, 556, 844, 845, which are located up to 1800 ft from well 943. Additionally, wells located in the 100-Acre Center Pivot area (i.e., 881, 882, 884, 886, 893), which are located more than a mile from well 943, also showed drawdown after the conclusion of the well 943 pump test. HMC responded that the drawdown at these wells, as referenced in NRC's request for additional information, was likely erroneous and was an artifact of faulty equipment or technician error. The amount of water calculated from drawdown over these radii of influence would significantly exceed the amount of water that was pumped during the well 943 pump test. The Agencies agree that faulty equipment or technician error is a more likely scenario than delayed well drawn occurring over such a significant distance.

### *Well 943M Pump Test*

The Agencies discussed that a pump test on well 943M could be considered to verify that contamination in the SAG is not occurring in the vicinity or near-upgradient from well 943M. HMC responded that a pump test on well 943M is not likely to produce useful information and testing is not warranted. Based on HMC's proposal to attempt to monitor other SAG wells in the vicinity of the GRP and the information those wells would likely provide, the Agencies agree that a pump test on well 943M is not warranted at this time.

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<sup>8</sup> ADAMS Accession No. ML19101A375

<sup>9</sup> ADAMS Accession No. ML19143A097

<sup>10</sup> ADAMS Accession No. ML17163A342

### *Additional SAG Monitoring*

As the Agencies discussed in the January 23, 2020, letter, there are several SAG wells in the vicinity of the GRP that are not owned by HMC (i.e., 806R, 822, 949, 955, 986, and 991) that should be monitored, as proposed by HMC in their July 26, 2018 letter.<sup>11</sup> In their April 21, 2020, response letter, HMC stated that they have obtained an agreement to sample SAG wells 806R and 991 that are not owned by HMC. HMC also stated that they will attempt to obtain sampling agreements for SAG wells 822, 949, 955, 986, and 987. Although some of these SAG wells are newer, such as 806R, many of these wells were constructed in the 1950s or 1960s and are located in areas where the overlying aquifers exceed the groundwater protection standards. Accordingly, the Agencies agree with HMC's approach to attempt to monitor these wells to verify that the SAG is not being contaminated by overlying aquifers.

### *Integrity of SAG Wells*

The Agencies stated that HMC should evaluate well integrity for the SAG wells that have not previously been tested, to the extent practicable. In response, HMC discussed that the most practicable and most effective well-integrity test on these SAG wells not owned by HMC is the collection and analysis of a series of water samples during a sampling event. HMC further discussed that a multiple sample pump test is a more direct indication of potential leakage as well logging or video techniques can miss minor well damage. Lastly, HMC discussed that they are more likely to obtain an agreement to perform the multiple sample pump tests versus other testing procedures that could be more intrusive, disruptive, and potentially damaging. The Agencies determined that HMC's proposed approach to attempt to perform multiple sample pump tests is reasonable and agree with this path forward.

### *Contaminant Levels in the SAG near Well 943*

In addition to the Agencies' request for additional information dated January 23, 2020, which HMC responded to on April 21, 2020, the Agencies had previously requested additional information on January 24, 2019.<sup>12</sup> In the letter dated January 24, 2019, the Agencies requested: (1) additional information to demonstrate that any contamination from well 943 was not capable of posing a substantial present or potential hazard to human health or the environment and (2) additional information regarding where the contaminated water from the well 943 pump test was disposed. The Agencies further discussed that the demonstration that the contamination from well 943 does not pose a substantial hazard could be demonstrated by additional monitoring of the SAG downgradient from well 943 and/or an analysis demonstrating that contamination from well 943 was not risk significant.

By letter dated May 10, 2019, HMC provided an analysis that calculated a uranium concentration of approximately 0.3 mg/L leaking from the Middle Chinle aquifer into the SAG. The resultant concentration in the SAG from this leakage was then calculated to be 0.04 mg/L near well 943. HMC discussed that this concentration only slightly exceeded the EPA's uranium drinking water maximum contaminant level of 0.03 mg/L. HMC concluded that the impact from the leakage at well 943 was not expected to pose a substantial present or potential hazard to human health or the environment due to mixing of the contamination with SAG water and therefore declining concentrations since the abandonment of well 943. HMC did not propose installing additional monitoring downgradient of well 943.

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<sup>11</sup> ADAMS Accession No. ML18236A552

<sup>12</sup> ADAMS Accession No. ML19002A503

The Agencies determined that HMC's conclusion that the uranium concentrations in the vicinity of well 943 during the period of no pumping would have been approximately 0.04 mg/L is reasonable. The Agencies also agree that uranium concentrations in the SAG due to leakage from well 943 would quickly decrease to less than the EPA's uranium drinking water maximum contaminant level of 0.03 mg/L due to the transmissivity of the SAG Aquifer and the time since leakage. Accordingly, the Agencies agree with HMC's assessment that the leakage into well 943 does not pose a substantial present or potential hazard to human health or the environment. The Agencies also determined that the potential benefits of installing additional monitoring wells downgradient of well 943 at this time do not outweigh the potential risks. First, the installation of additional wells in the SAG is unlikely to detect elevated contaminant concentrations due to the mixing of the leakage with SAG water based on the transmissivity of the SAG and the time since the leakage occurred. Second, the karst features of the SAG and the time since leakage occurred make it difficult to determine where wells should be located and the number of wells that would be required to have confidence that any contamination was not missed. Lastly, the installation of additional wells into the SAG across contaminated overlying aquifers could provide additional contaminant pathways for the SAG to be impacted.

#### *Disposal of Well 943 Pump Test Water*

In response to the Agencies' request for additional information regarding where the contaminated water from the well 943 pump test was disposed, HMC stated that the well 943 pump water was pumped into the South injection pipeline which runs from the post-treatment tank to the South Off-site area. Based on the flowrates and concentrations for January 2018, HMC calculated that the average uranium concentration of the combination of pump test discharge and the treated water going to the South injection system would have been 0.065 mg/L. Figure 2.1-6 of the 2018 Annual Monitoring Report, shows that water from the post-treatment tank was pumped to the Alluvial, Upper Chinle, and Middle Chinle aquifers. The Agencies determined that the calculated concentration of uranium is reasonable and that the concentration was less than the groundwater protection standards for these aquifers. The Agencies also evaluated other contaminants of concern (i.e., selenium, molybdenum, total dissolved solids, sulfate, and chloride) and the concentrations of these contaminants injected into the South injection pipeline also met the groundwater protection standards.

### **3.0 PATH FORWARD**

The Agencies determined that the potential benefits of installing additional monitoring wells near well 943 at this time do not outweigh the potential risks. Therefore, no additional monitoring wells in the SAG near well 943 are required at this time.

The Agencies agree with HMC's approach to attempt to monitor SAG wells to verify that the SAG is not being contaminated by overlying aquifers. The Agencies request that HMC provide an annual update in the HMC Annual Report as to the progress of obtaining samples and sample results from the SAG wells not owned by HMC (i.e., 806R, 822, 949, 955, 986, and 991).

The Agencies determined that HMC's proposed approach to attempt to perform multiple sample pump tests is reasonable and agree with this path forward. Additionally, the annual update in the HMC Annual Report should include HMC's progress in obtaining permission to conduct pump tests on these SAG well not owned by HMC and results of any pump tests conducted during the reporting period.