



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

May 10, 2018

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

SUBJECT: NUCLEAR REGULATORY COMMISSION STAFF RESPONSE TO THE
HOMESTAKE MINING COMPANY OF CALIFORNIA WELL 943 HYDROLOGIC
TEST REPORT

Dear Mr. Wohlford:

By letter dated April 3, 2018,¹ the Homestake Mining Company of California (HMC) submitted the results of the Well 943 Hydrologic Test Report. This test was requested by letter dated May 10, 2017,² from the New Mexico Environmental Department (NMED). The U.S. Nuclear Regulatory Commission (NRC) staff, in coordination with NMED, and the U.S. Environmental Protection Agency (EPA) reviewed the Test Report and agree that Well 943 should be plugged and abandoned as suggested in HMC's letter. Comments regarding the Test Report and a requested Path Forward are enclosed to this letter.

Specifically, it is request that HMC provide additional supporting information to demonstrate that seepage from the overlying aquifer(s) did not contaminate the San Andres-Glorieta aquifer (SAG). If HMC is unable to demonstrate that seepage could not have impacted the SAG, a work plan should be submitted to determine the impact to the SAG from any seepage that may have occurred. Lastly, the NRC staff requests additional information regarding where the contaminated water from the Well 943 test was disposed.

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 ADAMS. ADAMS is accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html>.

¹ Agencywide Documents Access and Management System (ADAMS) Accession No. ML18117A230.

² ADAMS Accession No. ML18130A584.

T. Wohlford

-2-

If you have any questions, please feel free to contact me at 301-415-4090, or via email at jeffrey.whited@nrc.gov

Sincerely,

/RA/

Jeffrey A. Whited, Project Manager
Materials Decommissioning Branch
Division of Decommissioning, Uranium Recovery
and Waste Programs
Office of Nuclear Material Safety
and Safeguards

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

Enclosure: Review of the Well 943 Hydrologic Test Report

T. Wohlford

-3-

SUBJECT: NUCLEAR REGULATORY COMMISSION STAFF RESPONSE TO THE
HOMESTAKE MINING COMPANY OF CALIFORNIA WELL 943 HYDROLOGIC
TEST REPORT, DATED MAY 10, 2018

DISTRIBUTION: R. Evans, RIV

ADAMS Accession No.: ML18120A331

***via e-mail**

OFFICE	DUWP/NMSS	DUWP/NMSS	DUWP/NMSS	DUWP/NMSS	DUWP/NMSS
NAME	J. Whited	C. Holston	G. Alexander*	S. Koenick	J. Whited
DATE	5/1/18	5/1/18	5/3/18	5/10/18	5/10/18

OFFICIAL RECORD COPY

Review of the Well 943 Hydrologic Test Report

Background

On May 4, 2017, the New Mexico Environment Department (NMED), along with the U.S. Nuclear Regulatory Commission (NRC), the Environmental Protection Agency (EPA), and New Mexico Office of the State Engineer (NM OSE) (collectively “the Agencies”), met with the Homestake Mining Company of California (HMC) regarding the potential for cross-contamination from overlying aquifers into the San Andres-Glorieta aquifer (SAG) through any existing HMC wells completed within the SAG at the Grants Reclamation Project site near Grants, NM. In particular, the Agencies were concerned about the increasing groundwater concentrations of contaminants within the SAG at Well 943. During this meeting, HMC proposed plugging and abandoning Well 943 due to concerns with the integrity of the well casing. By letter dated May 10, 2017,¹ NMED, in coordination with the other Agencies, requested that, prior to plugging and abandonment, HMC:

1. Cease use of Well 943 as a water source, effectively immediately.
2. Install an upgradient monitoring well in the immediate area of Well 943.
3. Conduct a pump test to evaluate hydrologic connectivity between the overlying Chinle and Alluvial wells, as well as hydrologic influence with the adjacent SAG wells.
4. Provide an explanation of the potential sources and pathways of contamination detected in Well 943.

The letter stated that based on an evaluation of the data collected from the pump test and sampling, the Agencies will determine, in consultation with HMC, when Well 943 will be plugged.

In the 2017 Annual Monitoring Report,² HMC stated that pumping from Well 943 ceased on May 18, 2017, and monitoring Well 943M was drilled and completed in the SAG in December 2017, as a near and upgradient well to Well 943. By letter dated April 3, 2018,³ HMC submitted Well 943 Hydrologic Test Report, which investigated: (1) the connectivity between the overlying aquifers and the SAG, (2) the potential for sources and pathways for contamination detected in Well 943, and (3) the need for plugging and abandonment of Well 943.

Aquifer Connectivity

In the Well 943 Hydrologic Test Report, HMC stated that Well 943 showed hydraulic communication with Well 943M. However, HMC did not observe a hydraulic connection between Well 943 and the overlying aquifers⁴ (i.e., the Alluvial, Middle Chinle, and Lower Chinle aquifers). Although HMC did not observe a hydraulic connection between the overlying aquifers and Well 943 during the Well 943 pump test, the licensee concluded that water quality analyses (e.g., uranium and selenium concentrations) from Well 943 are not representative of the SAG at Well 943M. Accordingly, the authors of the report concluded that the source of the contamination has to be leakage from one or more of the overlying aquifers.

¹ Agencywide Documents Access and Management System (ADAMS) Accession No. ML18130A584.

² ADAMS Package Accession No. ML18102A955

³ ADAMS Accession No. ML18117A230.

⁴ In Section 2.1.2 of the Well 943 Hydrologic Test Report, HMC noted that the Upper Chinle aquifer does not exist near Well 943.

Potential Sources and Pathways of Well 943 Contamination

In the Well 943 Hydrologic Test Report, HMC provided several lines of evidence supporting the conclusion that one or more of the overlying aquifers is the source of contamination observed in Well 943, including:

- As discussed in Section 3.1 of the Hydrologic Test Report, Well 943 is a former irrigation supply well that was open-hole completed in the SAG aquifer, which has been used by HMC as a fresh water supply well.
- The water-table elevations in the three overlying aquifers are higher than the SAG aquifer water level and therefore have the potential to leak into Well 943.
- Contaminant concentrations in Well 943 are significantly elevated above the concentrations in SAG Well 943M, which is located 217 feet upgradient from Well 943.
- Contaminant concentrations in Well 943 are more similar to contaminant concentrations in the overlying aquifers than Well 943M.

Although HMC concluded that one or more of the overlying aquifers are the source of contamination at Well 943, the authors of the report were unable to determine specifically which aquifer(s) was the source of seepage.

Abandonment of Well 943

Based on the results of the pump test and sample analysis, HMC recommended abandonment of Well 943. HMC also concluded that leakage into Well 943 would not have been able to impact water quality in the SAG when the well was being pumped continuously. However, the authors of the report stated that seepage from the overlying aquifers may be affecting SAG water quality now that Well 943 is not being used as a fresh source for fresh water supply. Lastly, HMC stated that Well 943M will be used as a monitoring well for the SAG in the area of Well 943.

Evaluation and Recommendations

As requested in the letter dated May 10, 2017, HMC ceased pumping from Well 943 and installed Well 943M, which is near and upgradient of Well 943. The licensee also conducted a pump test and sample analyses to evaluate hydrologic connectivity between the SAG and the overlying aquifers at Well 943, as well as hydrologic influence with an adjacent SAG well (i.e., Well 943M). The results from that study indicated that contamination at Well 943 is due to seepage from one or more of the overlying aquifers. However, it is not clear which aquifer(s) are responsible for that contamination. The NRC staff in coordination with the other Agencies agree that Well 943 should be plugged and abandoned immediately to stop any ongoing contamination of the SAG from the overlying aquifers. It is requested that plugging and abandonment of Well 943 be coordinated with the NM OSE, to ensure that seepage from the overlying aquifers do not continue to seep into Well 943. However, the Agencies have several additional concerns.

In the Well 943 Hydrologic Test Report, HMC stated that Well 943 would not have been able to affect the water quality in the SAG when it was being pumped continuously. Specifically, it was noted that contamination could be occurring now that Well 943 is no longer being used as a source for fresh-water supply. However, it is not clear that Well 943 did not impact the water quality of the SAG while in operation as a fresh water supply source in addition to the time period after pumping of Well 943 ceased on May 18, 2017.

The well 943 Hydrologic test was conducted at an average of 272 gallons per minute (gpm). As shown in Figure 6.3 in the Hydrologic Test Report, uranium and selenium concentrations did decrease slightly but not to concentrations comparable to those from Well 943M during pumping. Accordingly, it is not clear that a well pumping rate of 272 gpm is sufficient to capture all of the seepage from the overlying aquifer(s). NRC staff reviewed the 2017 Annual Monitoring Report to determine if pumping rates during operation of the fresh water supply system were significantly greater than during the pump test. Section 2.1.8 listed an average total groundwater collection rate from the SAG of 440 gpm for 2017. Section 8.1 of the 2017 Annual Monitoring Report indicates that this fresh water was produced from wells Deep #1R, Deep #2, 951R, and 943 in 2017.⁵ As the flowrate from the pump test, which may have been insufficient to capture all of the seepage from the overlying aquifer(s), is similar to the total flowrate from all of the SAG fresh water supply wells, it is not clear to NRC staff that pumping during operations was sufficient to capture all of the seepage from the overlying aquifer(s).

In the 943 Hydrologic Test Report, HMC stated that Well 943M would be used as a monitoring well. Although monitoring in Well 943M may provide additional insight into potential sources of contamination into the SAG, Well 943M may not be able to detect contamination from Well 943, itself. Although the specific water table elevation of Well 943 is greater than Well 943M, as shown in Figure 8.1-1 of HMC's 2017 Annual Monitoring Report, HMC considers Well 943M to be upgradient from Well 943. Water quality analyses from Well 943M were consistent with the determination that Well 943M is upgradient from Well 943 as Well 943M has not shown impacts of contamination from overlying aquifer(s).

Path Forward

The NRC staff in coordination with the other Agencies agree that Well 943 should be plugged and abandoned in coordination with NM OSE. In addition, HMC should provide additional supporting information to demonstrate that seepage from the overlying aquifer(s) did not contaminate the SAG. If HMC is unable to demonstrate that seepage could not have impacted the SAG, a plan should be submitted to determine the impact on the SAG of any seepage that may have occurred. Lastly, the NRC staff requests additional information regarding where the contaminated water from the Well 943 pump test was disposed.

⁵ Deep #1 was not used in 2017 and Deep #1R was used in late 2017. Well 943 was only operated until May 18, 2017.