



UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION IV
1600 EAST LAMAR BOULEVARD
ARLINGTON, TEXAS 76011-4511

June 12, 2019

EA-16-114

David Pierce
Closure Manager
Homestake Mining Company of California
P.O. Box 98, Hwy 605
Grants, NM 87020

SUBJECT: NRC INSPECTION REPORT 040-08903/2019-001 AND NOTICE OF VIOLATION

Dear Mr. Pierce:

This letter refers to the U.S. Nuclear Regulatory Commission (NRC) inspection conducted from March 18-21, 2019, at your Grants Reclamation Project in Cibola County, New Mexico. This inspection was an examination of activities conducted under your license as they relate to safety and compliance with the Commission's rules and regulations and with the conditions of your license. Within these areas, the inspection consisted of selected examination of procedures, representative records, observations of activities, and interviews with personnel.

The preliminary inspection findings were presented to your staff at the conclusion of the onsite inspection. The final inspection results were presented to your staff by telephone on May 2, 2019, after the NRC had completed its compliance review of the inspection findings. The enclosed report presents the results of the inspection.

Based on the results of this inspection, the NRC has determined that three Severity Level IV violations of NRC requirements occurred. The violations involve your failures to: (1) conduct an environmental evaluation prior to engaging in an activity not previously assessed by the NRC; (2) implement the guidance in Regulatory Guide 8.31 as required by your license, with three examples; and (3) have procedures to evaluate the consequences of an incident/event against reporting requirements. These violations were evaluated in accordance with the NRC Enforcement Policy included on the NRC's Web site at <http://www.nrc.gov/about-nrc/regulatory/enforcement/enforce-pol.html>. The violations are cited in the enclosed Notice of Violation (Notice) and the circumstances surrounding them are described in detail in the subject inspection report. The violations are being cited in the Notice because they were identified by the NRC.

You are required to respond to this letter and should follow the instructions specified in the enclosed Notice when preparing your response. The NRC will use your response, in part, to determine whether further enforcement action is necessary to ensure compliance with regulatory requirements.

In accordance with 10 CFR 2.390 of the NRC's "Agency Rules of Practice and Procedure," a copy of this letter, its enclosures, and your response will be made available electronically for public inspection in the NRC Public Document Room or from the NRC's Agencywide Documents Access and Management System (ADAMS), accessible from the NRC web site at <http://www.nrc.gov/reading-rm/adams.html>. To the extent possible, your response should not include any personal privacy or proprietary information so that it can be made available to the Public without redaction.

Should you have any questions concerning this inspection, please contact Dr. Robert Evans at 817-200-1234 or the undersigned at 817-200-1156.

Sincerely,

/RA/

Heather J. Gepford, PhD, CHP, Chief
Materials Licensing and Decommissioning
Branch
Division of Nuclear Materials Safety

Docket: 040-08903
License: SUA-1471

Enclosures:

1. Notice of Violation
2. NRC Inspection Report 040-08903/2019-001
w/Attachment

cc w/encls:

M. Hunter, New Mexico Environment Department
S. Rodriguez, New Mexico Environment Department
B. Tsosie, U.S. Department of Energy

NOTICE OF VIOLATION

Homestake Mining Co. of California
Grants, New Mexico

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

During an NRC inspection conducted on March 18-21, 2019, three violations of NRC requirements were identified. In accordance with the NRC Enforcement Policy, the violations are listed below:

- A. Title 10 of the *Code of Federal Regulations* (10 CFR) 40.41(c) states that each person licensed by the Commission pursuant to the regulations in this part shall confine his possession and use of source or byproduct material to the locations and purposes authorized in the license. Materials License SUA-1471, Amendment 52, License Condition 16 states, in part, that before engaging in any activity not previously assessed by the NRC, the licensee shall prepare and record an environmental evaluation of such activity.

Contrary to the above, in late-February or early-March 2019, the licensee failed to prepare and record an environmental evaluation before engaging in an activity not previously assessed by the NRC. Specifically, the licensee added approximately 12-15 gallons of an algacide to the microfiltration break tank in the reverse osmosis system over the course of approximately 1.5 days without preparing and recording an environmental evaluation.

This is a Severity Level IV violation (Section 6.3).

- B. Materials License SUA-1471, Amendment 52, License Condition 32 states, in part, that the licensee shall follow the guidance set forth in Regulatory Guide 8.31, "Information Relevant to Ensuring that Occupational Radiation Exposure at Uranium Recovery Facilities will be As Low As is Reasonably Achievable (ALARA)," or NRC-approved equivalent.

Contrary to the above, as of March 21, 2019, the licensee failed to follow the guidance set forth in Regulatory Guide 8.31, "Information Relevant to Ensuring that Occupational Radiation Exposure at Uranium Recovery Facilities will be As Low As is Reasonably Achievable (ALARA)," or NRC-approved equivalent. Specifically, the licensee failed to conduct weekly inspections of all facility areas and daily walk-through inspections of all work and storage areas to observe general radiation practices, provide three months of specialized training to its radiation safety technicians, and conduct fire drills on a semi-annual basis, as required by Sections C.2.3.1, C.2.4.2.2, and C.3.4 of Regulatory Guide 8.31 respectively.

This is a Severity Level IV violation (Section 6.3).

- C. Materials License SUA-1471, Amendment 52, License Condition 41 states, in part, that the licensee shall have procedures which will evaluate the consequences of the spill or incident/event against 10 CFR 20, Subpart M, and 10 CFR 40.60 reporting criteria.

Contrary to the above, as of March 21, 2019, the licensee failed to have procedures which will evaluate the consequences of an incident/event against 10 CFR 20, Subpart M, and 10 CFR 40.60 reporting criteria.

This is a Severity Level IV violation (Section 6.3).

Pursuant to the provisions of 10 CFR 2.201, Homestake Mining Company is hereby required to submit a written statement or explanation to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001, with a copy to the Regional Administrator, Region IV, within 30 days of the date of the letter transmitting this Notice of Violation (Notice). This reply should be clearly marked as a "Reply to a Notice of Violation" and should include for each violation: (1) the reason for the violation, or, if contested, the basis for disputing the violation or severity level; (2) the corrective steps that have been taken and the results achieved; (3) the corrective steps that will be taken; and (4) the date when full compliance will be achieved. Your response may reference or include previous docketed correspondence, if the correspondence adequately addresses the required response. If an adequate reply is not received within the time specified in this Notice, an order or a Demand for Information may be issued requiring information as to why the license should not be modified, suspended, or revoked, or why such other action as may be proper should not be taken. Where good cause is shown, consideration will be given to extending the response time.

If you contest this enforcement action, you should also provide a copy of your response, with the basis for your denial, to the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-0001.

Your response will be made available electronically for public inspection in the NRC Public Document Room or in the NRC's Agencywide Documents Access and Management System (ADAMS), accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html>. To the extent possible, your response should not include any personal privacy, proprietary, or safeguards information so that it can be made available to the public without redaction. If personal privacy or proprietary information is necessary to provide an acceptable response, then please provide a bracketed copy of your response that identifies the information that should be protected and a redacted copy of your response that deletes such information. If you request withholding of such material, you must specifically identify the portions of your response that you seek to have withheld and provide in detail the bases for your claim of withholding (e.g., explain why the disclosure of information will create an unwarranted invasion of personal privacy or provide the information required by 10 CFR 2.390(b) to support a request for withholding confidential commercial or financial information). If safeguards information is necessary to provide an acceptable response, please provide the level of protection described in 10 CFR 73.21.

In accordance with 10 CFR 19.11, you may be required to post this Notice within two working days of receipt.

Dated this 12th day of June 2019

**U.S. NUCLEAR REGULATORY COMMISSION
Region IV**

Docket: 040-08903

License: SUA-1471

Report: 040-08903/2019-001

Licensee: Homestake Mining Company of California

Facility: Grants Reclamation Project

Location: Cibola County, New Mexico

Dates: March 18-21, 2019

Inspectors: Robert Evans, PhD, PE, CHP, Senior Health Physicist
Materials Licensing and Decommissioning Branch
Division of Nuclear Materials Safety
Region IV

Martha Poston, Health Physicist
Materials Licensing and Decommissioning Branch
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Risk and Technical Analysis Branch
Division of Decommissioning, Uranium Recovery and Waste Programs
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Uranium Recovery Branch
Division of Decommissioning, Uranium Recovery and Waste Programs
Office of Nuclear Material Safety and Safeguards

Approved by: Heather J. Gepford, PhD, CHP, Chief
Materials Licensing and Decommissioning Branch
Division of Nuclear Materials Safety
Region IV

Attachment: Supplemental Inspection Information

EXECUTIVE SUMMARY

Homestake Mining Company of California Grants Reclamation Project NRC Inspection Report 040-08903/2019-001

This inspection was a routine, announced U.S. Nuclear Regulatory Commission (NRC) inspection of decommissioning activities being conducted at the former Homestake Mining Company mill in Cibola County, New Mexico. In summary, the licensee was conducting decommissioning activities in accordance with license and regulatory requirements, with exceptions as identified below.

Management Organization and Controls

- The licensee had sufficient management and support staff for the work in progress at the site. The licensee's use of an algaecide in the reverse osmosis system, prior to conducting the required environmental review, was identified as a violation of the license. The licensee had revised site operational procedures since the previous inspection. The licensee implemented its programs for audits and inspections, with one exception. The licensee's failure to conduct weekly inspections and daily walk-through inspections was the first example of a violation of the license requirement to implement Regulatory Guide 8.31. (Section 1.2)

Radiation Protection/Maintenance and Surveillance

- The licensee implemented a radiation protection program that met the requirements of 10 CFR Part 20 and the license. Occupational exposures were small fractions of the regulatory limits. Bioassay sampling and air sampling was performed as required by radiation work permits. Radiological survey results indicated that the licensee was controlling contamination. The licensee conducted instrument calibrations and source inventory in accordance with the license and site procedures. (Section 2.2)

Training

- The licensee provided radiation protection training to employees and contractors as required by regulations and the license, with one exception. The licensee's failure to provide specialized training to its radiation safety technicians was the second example of a violation of the license requirement to implement Regulatory Guide 8.31. (Section 3.2)

Radioactive Waste Processing, Handling, Storage and Transportation

- The inspectors conducted site tours and concluded that the licensee was operating equipment in accordance with procedural requirements and conducting work with an emphasis on safety. Site fences, gates, and perimeter postings were maintained by the licensee. Independent measurements of ambient radiation levels were observed to be consistent with previous inspection findings. The inspectors reviewed evaporation pond operations with the licensee's staff including current issues and future actions that may be taken to resolve these issues. The inspectors reviewed the licensee's proposed dose estimates for future evaporation pond work; the estimates indicated that occupational and public doses would be small fractions of the regulatory limits. The licensee prepared

environmental samples for shipment in accordance with transportation regulations. A previously identified violation involving the radon flux emanating from the large and small tailings piles remained open pending the licensee's submittal of an exemption request to the NRC. (Section 4.2)

Effluent Control and Environmental Protection

- The licensee implemented its environmental and effluent monitoring program in accordance with license requirements. The licensee also conducted radon flux surveys on the large tailings pile and small tailings pile as required by the license. The licensee implemented a groundwater monitoring and corrective action program as required by the license; although, changes to the program were under NRC review. The licensee conducted an annual land use survey and reported the results to the NRC in the annual monitoring report and performance review as required by the license. (Section 5.2)

Emergency Preparedness

- The licensee's failure to provide semi-annual fire drills was the third example of a violation of the license requirement to implement Regulatory Guide 8.31. The licensee implemented emergency response procedures but failed to establish a procedure for evaluating the reportability of an incident/event against regulations as required by the license. This failure represented a violation of the license. (Section 6.2)

Follow-up of Confirmatory Action Letters or Orders

- Confirmatory Order EA-16-114 Conditions 1, 9, and 11-13 have been evaluated and are determined to be satisfied. Confirmatory Order Conditions 2-8, 10, and 14-16 remain open with pending actions and will continue to be evaluated by the NRC. (Section 7.2)

Report Details

Site Status

The Homestake facility was a conventional uranium mill that operated from 1958-1990. The mill was decommissioned in 1993-1994, and cleanup of the wind-blown tailings was completed in 1995. Tailings generated from milling operations were placed in two impoundments, the large tailings pile (LTP) and the small tailings pile (STP).

The side slopes of the LTP have been covered with a permanent radon barrier and erosion protection layer. An interim cover is being maintained on top of the LTP. Two lined evaporation ponds are situated on top of the STP. The remainder of the STP is covered with an interim cover. In addition, two water collection ponds were constructed adjacent to the STP. A third evaporation pond was constructed in 2011 to the north of the LTP.

At the time of the inspection, the licensee continued to implement its groundwater corrective action program. The licensee operated injection and recovery wells as well as the reverse osmosis and zeolite cleanup systems. The licensee continued to dispose of wastewater in three evaporation ponds. The licensee recently reduced the groundwater flow rate to decrease evaporation pond levels. The licensee plans to drain evaporation pond EP-1 and conduct liner repairs in 2020.

1 Management Organization and Controls (IP 88005)

1.1 Inspection Scope

The inspectors reviewed the licensee's oversight and control of licensed activities.

1.2 Observations and Findings

a. Site Staffing

The inspectors reviewed site staffing to ensure that the licensee had sufficient staff to implement license requirements. At the time of the onsite inspection, site staffing consisted of 13 employees including the closure manager, senior shift supervisor, shift supervisor, compliance manager, project engineer, hydrogeologist, and five technicians. There were no open positions at the time of the inspection. Contractors were used as needed to fill positions such as radiation safety officer (RSO) and alternate RSO. Contractors were also used for construction, electrical, and routine site work.

Immediately after the onsite inspection, the licensee notified the NRC that the compliance manager had assumed the position of interim closure manager. A few weeks later, the licensee notified the NRC that a permanent closure manager had been selected. The inspectors determined the licensee had sufficient management and support staff for the work in progress.

b. Review of Licensee's Change Process

Materials License SUA-1471, Amendment 52, License Condition 16 states, in part, that before engaging in any activity not previously assessed by the NRC, the licensee shall prepare and record an environmental evaluation of such activity. The licensee's

program to evaluate changes was described in Standard Operating Procedure SOP-10, "Procedure for Conducting a Safety and Environmental Review Panel," Revision 5. Since the previous inspection, conducted in September 2018 (Agencywide Documents Access and Management System [ADAMS] Accession No. ML18303A199), the licensee had not conducted any Safety and Environmental Review Panel (SERP) evaluations.

During an informal teleconference on March 6, 2019, the licensee informed the NRC of the use of algaecide in the reverse osmosis system. Over the course of approximately 1.5 days in late February or early March of 2019, the licensee added approximately 12-15 gallons of algaecide to the microfiltration break tank in the reverse osmosis system to try to address an algae problem. During the teleconference the NRC staff requested the Material Safety Data Sheet (MSDS) for the algaecide.

During the onsite inspection, the inspectors reviewed the MSDS and discussed the licensee's addition of the algaecide to the reverse osmosis system. The MSDS included a statement to "[a]void release to the environment." The licensee responded that they had requested additional information from the chemical supplier and manufacturer and were waiting for this additional information prior to conducting a SERP. The manufacturer subsequently informed the licensee that the algaecide was unlikely to make it through the membrane, but that there was a potential for some release of the algaecide to the environment. The manufacturer stated that the chemical was often used in treatment plants and released to the environment, but they did not have specific information on release limits. The licensee subsequently determined that they would stop using the algaecide.

The inspectors concluded that the licensee's use of the algaecide was an activity not previously assessed by the NRC, and the licensee failed to prepare and record an environmental evaluation (i.e. SERP) prior to adding the algaecide to the reverse osmosis system. The licensee's failure to conduct an environmental evaluation prior to adding the algaecide to the reverse osmosis system was determined to be a violation of License Condition 16 requirements (VIO 040-08903/1901-01).

c. Review of Operational Procedures

License Condition 23 states, in part, that standard procedures shall be established for all activities involving radioactive materials that are handled, processed, or stored. The inspectors reviewed selected operating procedures for completeness. The procedures included onsite disposal of wastes, evaporation pond operations, zeolite system operations, and reverse osmosis system operations. The inspectors concluded the licensee had established procedures for these activities, and the procedures had been revised since the last inspection. Revisions included photographs embedded within the procedures to supplement the written text. However, some portions of the procedures required updating. For example, the licensee needed to develop an integrated startup procedure for the reverse osmosis equipment and related support systems and update the reverse osmosis building layout drawing.

Based on discussions with site staff, the inspectors concluded that the operations staff understood how to operate the systems despite the procedural weaknesses identified. No system was found to be incorrectly aligned, and all parameters such as flowrates and pressures were within the procedural limits. The licensee planned to continue procedure

revisions and updates as part of its corrective actions in response to the NRC's Confirmatory Order dated March 28, 2017 (ADAMS Accession Nos. ML17060A753 and ML17061A455).

d. Audits, Inspections, and Reviews

An annual radiation protection and as low as reasonably achievable (ALARA) program audit is required by 10 CFR 20.1101(c) and License Condition 32. In addition, License Condition 42 requires the licensee to submit the audit to the NRC as part of the annual report. The most recent ALARA audit was conducted in February 2019 and was included as Appendix C to the Annual Monitoring Report and Performance Review dated March 29, 2019 (ADAMS Accession Nos. ML19101A377 and ML19101A375). The inspectors reviewed the annual audit during the inspection, although it had not been formally submitted to the NRC at the time of the inspection.

The inspectors concluded that the ALARA program auditor conducted a detailed review of the radiation protection program. The auditor did not identify any negative findings or trends. The auditor provided four recommendations, although none were safety significant. The auditor also identified improvement in site procedures. The inspectors concluded the licensee's audit was comprehensive and met license and regulatory requirements.

License Condition 12 states that periodic embankment inspections shall be conducted, and License Condition 42 states that the inspection report shall be included in the annual report. The most recent embankment inspection report was dated February 11, 2019. The report was included as Appendix D to the annual report. The inspectors reviewed the report during the onsite inspection.

The licensee's inspector observed the two tailings impoundments and three evaporation ponds. The licensee's inspector concluded that the impoundments and ponds were generally in stable condition. Two licensee inspection findings were identified as high priority, repair of a sinkhole on the crest of the LTP and repair of rills and gullies on the LTP. At the time of the NRC inspection, both high priority licensee inspection findings had been resolved. In summary, the licensee conducted the annual inspection, the licensee inspection findings were found to be comprehensive, and the results of the licensee inspection were provided in the annual report.

License Condition 32 requires, in part, that the licensee shall follow the guidance set forth in Regulatory Guide 8.31, "Information Relevant to Ensuring that Occupational Radiation Exposure at Uranium Recovery Facilities will be As Low As is Reasonably Achievable (ALARA)," or NRC-approved equivalent. Regulatory Guide 8.31, Section C.2.3.1, states: "The RSO and the facility foreman should conduct a weekly inspection of all facility areas to observe general radiation control practices and review required changes in procedures and equipment. The RSO or designated health physics technician should conduct a daily walk-through (visual) inspection of all work and storage areas of the facility to ensure proper implementation of good radiation safety procedures, including good housekeeping and cleanup practices that would minimize unnecessary contamination."

The NRC inspectors noted that the licensee had not developed a program to complete the daily and weekly inspections of all facility areas to observe general radiation practices.

The licensee's failure to conduct weekly inspections of all facility areas and daily walk-through inspections of all work and storage areas to observe general radiation practices in accordance with Regulatory Guide 8.31 requirements was the first example of a violation of License Condition 32 (VIO 040-08903/1901-02).

1.3 Conclusions

The licensee had sufficient management and support staff for the work in progress at the site. The licensee's use of an algaecide in the reverse osmosis system, prior to conducting the required environmental review, was identified as a violation of the license. The licensee had revised and upgraded site operational procedures since the previous inspection. The licensee implemented its programs for audits and inspections, with one exception. The licensee's failure to conduct weekly inspections and daily walk-through inspections was the first example of a violation of the license requirement to implement Regulatory Guide 8.31.

2 **Radiation Protection/Maintenance and Surveillance (IP 83822/IP 88025)**

2.1 Inspection Scope

The inspectors reviewed the licensee's radiation protection program, including instrument calibrations, to verify compliance with 10 CFR Part 20 and license requirements.

2.2 Observations and Findings

a. Radiation Protection Program

The licensee's Manual of Standard Practices provides instructions for implementing the various aspects of the radiation protection program. At the time of the inspection, the radiation protection program consisted of external occupational dose monitoring, bioassays, contamination surveys, radiation work permits (RWPs), instrument calibrations, and worker training. As required by RWPs, the licensee implemented internal monitoring, respiratory protection and breathing zone air sampling.

Since the previous inspection, the following RWPs were issued:

- RWP 4-2018 Land Application Hotspot Removal
- RWP 5-2018 Sampling and Shipment of Salts in EP-1
- RWP 6-2018 Leveling/Placement of New Media/Sand in 1200 Zeolite System
- RWP 7-2018 Sonic Drilling into LTP and STP
- RWP 8-2018 Fixing Plugged Pipes in 300 Zeolite System
- RWP 9-2018 Drilling and Sampling on EP-1 and STP
- RWP 10-2018 Annual Reverse Osmosis Maintenance
- RWP 11-2018 Cleaning Algae from 1200 Zeolite System

- RWP 12-2018 Installation of Transfer line from EP-2 to EP-3
- RWP 1-2019 Replacing Membrane in Reverse Osmosis System

The inspectors reviewed the RWP documentation, controls, and personnel protective equipment requirements and concluded that the requirements were appropriate for the scope of work described. Required training was documented and all surveys (personnel and materials/equipment) were conducted as specified in the RWPs.

The NRC inspectors reviewed the licensee's personnel monitoring program. During 2018, employees, contractors, and vendors were monitored for external dose using optically stimulated luminescent dosimeters. The maximum dose reported for calendar year 2018 for any individual was 4 millirem, assigned to a drilling vendor.

Bioassay and breathing zone air sampling were used to assess internal dose. At the time of the inspection, 2018 internal dose calculations had not been finalized and were not reviewed by the NRC inspectors. Based on previous radiological sampling and modeling, the majority of dose assigned to staff results from inhalation of airborne particulates. Based on the breathing zone air sampling results and the bioassay results reviewed by the inspectors, doses were expected to be below the criterion requiring occupational monitoring.

The NRC inspectors noted that one bioassay result was above the action level. The RSO's investigation of the incident was documented in a technical memorandum dated January 28, 2019. The RSO concluded that the positive bioassay result was due to sample contamination during the collection process. The NRC inspectors reviewed the technical memorandum and related documentation and noted that the positive bioassay result was not supported by air sampling or bioassay data for other individuals working under the same RWP or subsequent bioassays collected for the individual. The NRC inspectors concluded the bioassay data was likely not indicative of an actual intake.

b. Instrument calibrations

The licensee maintained radiological survey instrumentation to implement its radiation protection program. This equipment was used to measure exposure rates, surface contamination, and removable contamination levels. Instrumentation was calibrated annually. The calibrated instruments in use were appropriate for the type of survey being performed.

The NRC inspectors reviewed the calibration records for the radiation protection survey instruments, high-volume air samplers, and breathing zone monitors. All equipment was maintained and appropriately calibrated. The licensee recently purchased new high-volume air samplers. The NRC inspectors observed the change out of the sample filters for the high-volume samplers in the field. All high-volume air samplers were found to be in calibration and functioning appropriately. Each high-volume air sampling station also had a passive radon monitor and at least one optically stimulated luminescence dosimeter. Radiological survey records were reviewed; surveys reviewed were performed with calibrated instruments and no issues or concerns associated with the surveys were identified by the NRC inspector.

Inventories of the sources in the licensee's possession were performed at the required frequency. The NRC inspectors determined that sources were appropriately stored and labelled.

2.3 Conclusions

The licensee implemented a radiation protection program that met the requirements of 10 CFR Part 20 and the license. Occupational exposures were small fractions of the regulatory limits. Bioassay sampling and air sampling was performed as required by RWPs. Radiological survey results indicated that the licensee was controlling contamination. The licensee conducted instrument calibrations and source inventory in accordance with the license and site procedures.

3 **Training (IP 88010)**

3.1 Inspection Scope

The inspectors evaluated whether the licensee had established a written training program and procedures as required by license and regulatory requirements.

3.2 Observations and Findings

License Condition 32 states, in part, that the licensee shall follow the guidance set forth in Regulatory Guide 8.31, "Information Relevant to Ensuring that Occupational Radiation Exposure at Uranium Recovery Facilities will be As Low As is Reasonably Achievable (ALARA)," or NRC-approved equivalent. Regulatory Guide 8.31, Section C.2.5 states, in part, all new employees should be instructed by means of an established course in the inherent risks of exposure to radiation and the fundamentals of protection against exposure to uranium and its progeny before beginning their jobs.

The licensee currently provides this training via electronic presentation. The presentation included radiation regulations, basics of radiation, radiation measurements, radiation dose to people, and the expected occupational dose. The licensee's records indicated that orientation and initial training was provided to new employees/contractors in calendar years 2018 and 2019. The licensee conducted annual refresher training to site workers in December 2018. Safety meetings were conducted weekly and included discussion of various safety topics and procedure changes.

The licensee refers to its health physics technicians as radiation safety technicians (RSTs). The licensee currently has two qualified RSTs. Regulatory Guide 8.31, Section C.2.4.2.2, provides the requirements for education, training, and experience for the RSO and health physics technicians. Upon review of the RSTs' qualifications, at their level of education and experience, the NRC inspectors noted that the RSTs do not meet the training requirements of at least 3 months of specialized training (up to 1 month may be on-the-job training) in radiation health protection relevant to U.S. facilities, as required by Regulatory Guide 8.31. The licensee's failure to ensure that the RSTs had the specialized training requirements specified in Regulatory Guide 8.31 prior to assigning the individuals to the positions was the second example of a violation of License Condition 32 (VIO 040-08903/1901-02).

3.3 Conclusions

The licensee provided radiation protection training to employees and contractors as required by regulations and the license, with one exception. The licensee's failure to provide specialized training to its radiation safety technicians was the second example of a violation of license requirements to implement Regulatory Guide 8.31.

4 Radioactive Waste Processing, Handling, Storage, and Transportation (IP 88035)

4.1 Inspection Scope

The inspectors interviewed licensee representatives, toured the site, and reviewed applicable records to determine if the licensee had established and maintained an effective program for managing radioactive wastes.

4.2 Observations and Findings

a. Site Tours

The NRC inspectors toured the site and observed the LTP, STP, evaporation ponds, collection ponds, zeolite systems, exterior and interior storage tanks, and reverse osmosis equipment. No significant erosion problems were identified on the tailings cells or evaporation ponds. Site fences, gates, and perimeter postings were being maintained by the licensee. The inspectors also reviewed system parameters, including flow rates and pressures, and concluded that no parameter exceeded its procedural limit. The licensee appeared to be conducting site activities with an emphasis on safety.

During site tours, the NRC inspectors conducted independent radiological surveys using a Ludlum Model 19 survey meter (NRC No. 015518, calibrated to radium-226, calibration due date of 11/09/19). With a background of approximately 10 microrentgen per hour ($\mu\text{R/hr}$), the ambient gamma radiation levels on top of the LTP in the vicinity of the 1,200 gallons per minute (gpm) zeolite ponds were observed to be 12-15 $\mu\text{R/hr}$. The area on the LTP near the 300 gpm zeolite ponds was observed to be 12-20 $\mu\text{R/hr}$. The trash pit area on top of the STP was measured to be 25-30 $\mu\text{R/hr}$. The inspectors measured an exposure rate of about 420 $\mu\text{R/hr}$ at the embankment of evaporation pond EP-1. This elevated measurement was attributed to sediments on the embankment as a result of the reduced pond level. The exposure rates within the reverse osmosis building were 6-8 $\mu\text{R/hr}$. The various tanks inside and outside of the reverse osmosis building ranged from 2-12 $\mu\text{R/hr}$. No area was identified that was required to be posted as a radiation area (5,000 $\mu\text{R/hr}$).

b. Status of Evaporation Ponds

During previous NRC inspections (ADAMS Accession Nos. ML18115A480 and ML18303A199), the inspectors reviewed the licensee's plans to resolve pond leakage. Leakage was identified in evaporation pond EP-1, which has a single liner, and through the primary liners of evaporation ponds EP-2 and EP-3, both of which have secondary liners. According to the licensee, there was no evidence of leakage through either of the secondary liners in EP-2 or EP-3.

At the time of inspection, the licensee planned for its contractor to start relining EP-1 at the end of May 2019. The licensee planned to complete the relining of this pond by December 2019. In addition, the State of New Mexico State Engineer's office changed the requirements for evaporation pond freeboard from 2 feet to 3 feet. The licensee had previously considered raising the berm of EP-1 to maintain or increase the capacity of EP-1 and to account for the change in freeboard requirements. However, the licensee decided to not raise the berm, and as a result, will lose approximately 5-10 percent storage capacity in the pond. Although the storage capacity will be lower, the licensee expects the evaporative losses to be comparable to previous years' evaporation rates because the surface area of the pond will be essentially the same as before relining.

Prior to the inspection, contractors found two tears in the primary liner of EP-2 and reported the liner tear and leak to the NRC (ADAMS Accession No. ML19080A062). The licensee's staff lowered the water level in the pond, and the contractors repaired the liner. After the repairs had been completed, the licensee noted that pumping of fluid from the leak detection sumps had decreased, suggesting that the repairs were effective. There is currently no schedule for relining of ponds EP-2 or EP-3.

The NRC inspectors inquired about the causes of the increasing concentrations of sulfates, total dissolved solids, and nitrates at wells DD and DD2. These wells are located near evaporation pond EP-3. The licensee stated that they believe that upgradient mine water was responsible for these trends, and the increase in concentrations in the monitor wells was not associated with evaporation pond EP-3. The NRC inspectors will continue to closely monitor these wells over time, in part, to ensure that evaporation pond EP-3 had not developed a leak through its secondary liner.

c. Review of Evaporation Pond EP-1 Dose Estimates

By letter dated January 9, 2019 (ADAMS Accession No. ML19022A265), the licensee submitted a radiological dose assessment for the planned relining of evaporation pond EP-1. To reline the pond, the licensee and its contractor plan to drain the pond, an activity that will result in the exposure of workers and members of the public to radioactive sediments at the bottom of the pond. The licensee conducted both public and occupational dose assessments and concluded that potential exposures to the radioactive sediments were unlikely to result in significant radiological doses to either workers or members of the public.

The licensee's occupational dose assessment considered several potential exposure pathways including: (1) direct exposure to the radiation, (2) inhalation of radioactive particulates, and (3) inhalation of radon-222 and its short-lived progeny. Ingestion of radioactivity was determined to not be a credible exposure pathway, provided workers followed procedural requirements for personal protective equipment and hygiene. The licensee's analysis determined that the maximum estimated dose to an occupational worker was 65 millirem per year, primarily from external exposure to the radioactive sediments. This calculated dose was well below the 5,000 millirem per year annual dose limit specified in 10 CFR 20.1201 for occupational workers.

The exposure pathways for members of the public included the soil ingestion pathway and the three pathways described above. The maximum estimated dose to a member of the public was less than 1 millirem per year, primarily from radon and its short-lived

progeny. This calculated dose was well below the 100 millirem per year dose limit specified in 10 CFR 20.1301 for members of the public.

In summary, the estimated doses for the proposed relining of pond EP-1 will not result in exposures greater than regulatory limits. The licensee plans to control the work using procedures, including radiation work permits, which should further reduce worker and public exposures to radioactive material.

d. Shipment of Environmental Samples

The NRC inspectors reviewed the licensee's program for shipment of environmental samples. Shipments of the quarterly environmental and groundwater monitoring samples were prepared by the RSTs using coolers, sample bottles, chain of custody seals and forms, and shipping documentation (paperwork and address labels) provided by the analytical laboratory. The analytical laboratory also provided a shipping and packaging checklist that the licensee used to ensure that the shipments were packaged and shipped in accordance with the laboratory's requirements. The NRC inspectors reviewed the documentation provided for representative shipments and concluded that the environmental samples were being shipped in accordance with transportation requirements.

However, the NRC inspectors identified that the licensee did not always completely fill out the chain of custody form provided by the analytical laboratory. The instructions for the chain of custody form required the licensee to identify if the material being shipped was one of the following: (1) NOT source or byproduct material; (2) source/processed ore; or (3) 11e.(2) byproduct material. The inspectors observed that for the first few uses of this new chain of custody form, the licensee was not completing this section on the chain of custody form. The NRC inspectors concluded that the environmental samples were best described as material containing 11e.(2) byproduct material, in part, because regulations in 10 CFR Part 40 do not specify a "de minimis" quantity of 11e.(2) byproduct material. Since the licensee was not always completing the chain of custody form as required by the analytical laboratory, the licensee was placing the laboratory at risk by not allowing the receiving laboratory to appropriately possess, process, store, and dispose of the samples containing byproduct material. The licensee's staff subsequently agreed to complete the chain of custody form as requested by the laboratory.

e. (Discussed) Violation 040-08903/1601-01; Exceedance of radon flux limit

License Condition 36.E requires the licensee to demonstrate compliance with the radon flux standard by performing radon flux surveys at the LTP and STP on an annual basis. As documented in NRC Inspection Report 040-08903/2016-001 dated April 20, 2017 (ADAMS Accession No. ML17088A761), the licensee was cited for the failure to collect a sufficient number of radon flux samples, to correctly calculate the radon flux average value, and to maintain the radon flux emanating from the LTP below the standard specified in the license and regulations.

The licensee responded to the violation by letter dated May 16, 2017 (ADAMS Accession No. ML17143A271). In its letter, the licensee stated that additional interim cover material had been placed onto the LTP to reduce the radon flux emanation rate.

The licensee also stated that additional reviews would be necessary to determine the required cover thickness and proposed corrective actions based on these additional reviews.

By letter dated September 13, 2017 (ADAMS Accession No. ML17264A070), the licensee provided the results of the additional reviews to the NRC. Due to technical and physical constraints on placement of the final radon barrier on top of the LTP, the licensee requested an exemption from 10 CFR Part 40, Appendix A, Criterion 6 and License Condition 36.E requirements for compliance with the radon flux standard for the LTP until completion of groundwater restoration. By letter dated October 19, 2017 (ADAMS Accession No. ML17292A953), the NRC advised the licensee to resubmit the request for an exemption with sufficient detail to enable the NRC staff to conduct a technical review of the request.

The NRC inspectors discussed the licensee's outstanding exemption request during the inspection. Before submitting the exemption request, the licensee was waiting on NRC approval of its proposed methodology for conducting public dose assessments. Specifically, the licensee was waiting on the NRC's response to its letter dated August 20, 2018 (ADAMS Accession No. ML18240A143), regarding its proposed methodology for estimating public doses from radon. When the NRC formally responds to the August 20, 2018, letter, the licensee will finalize and submit its proposed exemption from compliance with the radon flux standard emanating from the LTP. Accordingly, Violation 040-08903/1601-01 remains open.

4.3 Conclusions

The NRC inspectors conducted site tours and concluded that the licensee was operating equipment in accordance with procedural requirements and conducting work with an emphasis on safety. Site fences, gates, and perimeter postings were maintained by the licensee. Independent measurements of ambient radiation levels were observed to be consistent with previous inspection findings. The NRC inspectors reviewed evaporation pond operations with the licensee's staff including current issues and future actions that may be taken to resolve these issues. The NRC inspectors reviewed the licensee's proposed dose estimates for future evaporation pond work; estimates indicated that occupational and public doses would be small fractions of the regulatory limits. The licensee prepared environmental samples for shipment in accordance with transportation regulations. A previously identified violation involving the radon flux emanating from the large and small tailings piles remained open pending the licensee's submittal of an exemption request to the NRC.

5 **Effluent Control and Environmental Protection (IP 88045)**

5.1 Inspection Scope

The inspectors reviewed the licensee's effluent monitoring, environmental protection, and groundwater monitoring and corrective action programs to ensure compliance with license and regulatory requirements.

5.2 Observations and Findings

a. Effluent and Environmental Monitoring Program

License Condition 10 provides the effluent and environmental monitoring program requirements, while License Condition 15 specifies that the results of all effluent and environmental monitoring required by this license and regulations shall be reported semi-annually to the NRC. In accordance with License Condition 23, details about program implementation are provided in the licensee's Manual of Standard Practices. The program consisted of air particulate, radon gas, and direct radiation sampling. The NRC inspectors compared the program in operation during 2018 to the requirements specified in the license. The inspectors concluded the licensee implemented the environmental monitoring program as required by the license.

License Condition 15 requires the licensee to report the results of the effluent and environmental monitoring program on a semi-annual basis to the NRC. The NRC inspectors reviewed the two semi-annual reports for 2018 dated August 20, 2018 (ADAMS Accession No. ML18240A228) and March 5, 2019 (ADAMS Accession No. ML19064B127) and the data used in the development of the reports. The inspectors concluded the licensee collected the required number of samples and reported the sample results. None of the results exceeded license or regulatory limits.

The licensee conducted air particulate sampling at seven locations including the two nearest residences and one background station. The licensee continuously sampled the air for concentrations of natural uranium, radium-226, and thorium-230. The licensee's records indicated that air particulates remained at or below 2 percent of the applicable effluent concentration limits in 2018.

The licensee also measured ambient gamma radiation levels at eight locations and ambient radon gas concentrations at nine locations. The semi-annual direct radiation measurements ranged from 54-61 millirem, background included. The maximum semi-annual radon-222 measurement was 1.1E-9 microcuries per milliliter at the northeast perimeter station HMC-2.

At the end of each calendar year, the licensee calculated the estimated dose to a member of the public using the environmental monitoring program sample results. This information was provided in Attachment 4 of the semi-annual report for the second half of 2018. The licensee calculated doses of 52 and 50 millirem per year at stations HMC-4 (south of property) and HMC-5 (southwest of LTP), respectively, using an occupancy factor of 0.75. Both calculated doses were approximately half the public dose limit of 100 millirem per year as specified in 10 CFR 20.1301(a).

By letter dated December 16, 2015 (ADAMS Accession No. ML15264B052), the NRC staff requested additional information about the licensee's 2014 public dose assessment methodology. The licensee responded by letter dated January 19, 2016 (ADAMS Accession No. ML16033A407). The NRC issued a second request for additional information by letter dated July 31, 2018 (ADAMS Accession No. ML18159A366), and the licensee responded to this second request by letter dated August 20, 2018 (ADAMS Accession No. ML18240A143). Because the NRC staff continues to evaluate the licensee's methodology for calculating public doses, the inspectors did not assess the adequacy of the licensee's 2018 public dose assessment.

b. Annual Radon Flux Measurements

License Condition 36.E requires the licensee to conduct radon flux surveys on the LTP and STP on an annual basis. By letter dated September 13, 2017 (ADAMS Accession No. 17264A070), in response to NRC Notice of Violation 040-08903/1601-01, the licensee submitted a proposed procedure to the NRC for measuring the radon flux emanation rates from the STP and LTP. By letter dated October 19, 2017 (ADAMS Accession No. 17292A953), the NRC concluded that the procedure was acceptable on an interim basis, until the NRC and licensee agreed on longer-term solutions to the radon flux exceedances (see Section 4.2.e of this Inspection Report).

The licensee implemented the new procedure during the September-October 2017 sampling event. The results of the sampling event were presented to the NRC in Attachment 3 of the semi-annual environmental monitoring report for the second half of 2017 dated February 22, 2018 (ADAMS Accession No. ML18066A088). The radon flux emanating from the LTP averaged 46.6 picocuries per meter-squared second, exceeding the limit of 20 picocuries per meter-squared second specified in 10 CFR Part 40, Appendix A, Criterion 6. The radon flux emanating from the STP averaged 3.5 picocuries per meter-squared second, a result that was below the flux standard.

The licensee conducted the 2018 sampling event in May 2018. The results of the sampling event were presented in Attachment 3 of the semi-annual environmental monitoring report for the first half of 2018 dated August 20, 2018 (ADAMS Accession No. ML18240A228). The radon flux emanating from the LTP averaged 51.3 picocuries per meter-squared second, while the radon flux emanating from the STP averaged 12.7 picocuries per meter-squared second. The 2018 results for the LTP were similar to the 2017 results, but the 2018 results for the STP was notably higher than the 2017 results. The licensee's staff speculated that the STP results were possibly higher due to erosion of the interim cover. However, the STP continued to meet the regulatory limit for emanation rate. The licensee conducted repairs of the cover in November 2018. The effectiveness of these repairs will be evaluated during the 2019 sampling event.

c. Groundwater Monitoring and Corrective Action Program

License Condition 35 states that the licensee shall implement a groundwater compliance monitoring program to assess the performance of the groundwater restoration program. The inspectors reviewed the licensee's control and operation of various site systems used to implement the groundwater corrective action program.

The licensee continued to operate a number of extraction and injection wells. The discharge from offsite extraction wells was routed to the zeolite system for filtration of uranium from the water, while the discharge from onsite extraction wells was routed to the reverse osmosis system for cleanup. The treated water from the zeolite and reverse osmosis systems was mixed with fresh water from the San Andres aquifer in the post treatment tank and injected into the subsurface aquifers, as shown in Figure 2.1-6 from the 2018 annual report.

As described in Section 2.1 of the 2018 Annual Environmental Monitoring Report, the zeolite systems operated at an average flow rate of 267 gpm, and the reverse osmosis system operated at an average of 350 gpm on an annualized basis for 2018. These flow

rates were well below the total (maximum) design capacity of 2,700 gpm. The licensee explained that the reduced flow rates were a result of several issues including evaporation pond limitations and equipment problems.

The licensee continued to experience problems with algae growth in the zeolite beds. The licensee noted that the periodic acidic regeneration process, used to backflush the zeolite beds, temporarily resolved the algae problem. The licensee discussed that algae was being removed prior to the regeneration cycle after drying out. The zeolite cobbles placed on the zeolite beds have reduced wind-blown scour, although the larger cobbles have begun to settle into the finer, underlying zeolite grains.

The licensee had previously experienced pressure excursions in the microfiltration system upgradient of the reverse osmosis system, resulting in a reduced operating capacity. To address the pressure excursions, the licensee replaced the membranes in all three of the low-pressure units and the two high-pressure units. The licensee planned to implement a pilot study to inject a polymer to promote flocculation prior to the water entering the reverse osmosis units. The polymer was expected to improve system operability.

As discussed in NRC Inspection Report 040-08903/2018-002 dated November 26, 2018 (ADAMS Accession No. ML18303A199), the licensee experienced several unplanned releases into groundwater involving the re-injection of water with concentrations of uranium and molybdenum above the groundwater protection standards specified in License Condition 35.B. After the releases, the licensee implemented enhanced sampling. The enhanced sampling included daily conductivity measurements, weekly measurements using a kinetic phosphorescence analyzer to detect uranium, and a Hach meter to monitor molybdenum concentrations. The licensee also reviewed preliminary laboratory results to identify any potential exceedances more quickly. During this inspection, the licensee stated they continued to conduct the enhanced sampling routine and had not observed any exceedances of the groundwater protection standards with re-injection water since the March-April 2018 time frame. The NRC staff are currently reviewing the licensee's submittal dated June 4, 2018 (ADAMS Accession No. ML18159A037) on the impact of the exceedance of groundwater protection standards in the injection water.

d. Land Use Survey

License Condition 42 specifies that a land use survey be conducted and submitted in the annual report to the NRC. The most recent land use survey was included as Appendix E to the annual report dated March 29, 2019 (ADAMS Accession Nos. ML19101A377 and ML19101A375). The inspectors reviewed the final draft version of the land use survey during the onsite inspection. The land use survey summarized current land uses and identified changes to land use in proximity to the site.

For licensee-owned properties, the land uses included livestock grazing and residential uses. The land uses for properties not owned by the licensee were mainly residential. All residential properties had municipal water supplies, with one exception. This property owner had a domestic well but planned to connect to the municipal water supply in the near future. The inspectors concluded the licensee conducted an annual land use survey and reported the results to the NRC in the annual monitoring report and performance review as required by the license.

5.3 Conclusions

The licensee implemented its environmental and effluent monitoring program in accordance with license requirements. The licensee conducted radon flux surveys on the large tailings pile and the small tailings pile as required by the license. The licensee implemented a groundwater monitoring and corrective action program as required by the license, although changes to the program are under NRC review. The licensee conducted an annual land use survey and reported the results to the NRC in the annual monitoring report and performance review as required by the license.

6 **Emergency Preparedness (IP 88050)**

6.1 Inspection Scope

The inspectors evaluated the licensee's emergency preparedness program to determine whether it was adequate to protect the safety and health of employees, members of the public, and the environment.

6.2 Observations and Findings

The licensee's emergency response procedures were outlined in licensee procedure SOP-1, "Emergency Response Procedure," Revision 1. The procedure instructed workers to not put themselves in jeopardy, call for help, and in the event of an environmental spill, follow the SWIMS procedure. The SWIMS procedure instructed workers to stop the leak, warn others, isolate the area, minimize exposure, and standby for help to arrive. The licensee also maintained a procedure for evacuations, SOP-7, "Evacuation Procedure," Revision 1. Firefighting instructions were provided in SOP-6, "Firefighting Procedure," Revision 1. The licensee stated in interviews with NRC inspectors that they had practiced the evacuation procedure.

License Condition 32 requires, in part, that the licensee shall follow the guidance set forth in Regulatory Guide 8.31, "Information Relevant to Ensuring that Occupational Radiation Exposure at Uranium Recovery Facilities will be As Low As is Reasonably Achievable (ALARA)," or NRC-approved equivalent. Regulatory Guide 8.31, Section 3.4, Fire Control, states, in part, that fire drills should be performed at least semi-annually. The licensee had no records of when they previously performed a fire drill, suggesting that the licensee had not conducted a fire drill in the last few years. The licensee's failure to conduct a fire drill was identified as a third example of a violation of License Condition 32 (VIO 040-08903/1901-02).

Immediately after the onsite inspection, the licensee conducted a fire drill. The licensee submitted documentation to the NRC inspectors indicating that the fire drill had been completed and the training documented.

License Condition 41 requires, in part, that the licensee have procedures which will evaluate the consequences of the spill or incident/event against 10 CFR 20, Subpart M, and 10 CFR 40.60 reporting criteria. The inspectors identified that the licensee did not have a procedure to evaluate the consequences of an incident/event against the regulations. The licensee had a draft procedure to evaluate a spill against the regulations, but not an incident/event. The licensee's failure to have a procedure in

place for evaluation of the reportability of an incident/event was identified as a violation of License Condition 41 (VIO 040-08903/1901-03).

Immediately after the onsite inspection, the licensee developed a procedure for evaluating and reporting of an incident/event. The licensee forwarded this procedure to the inspectors for review. The procedure, SOP-1, "Emergency Response Procedure," Revision 2, included the incident/event reporting instructions as required by License Condition 41.

6.3 Conclusions

The licensee's failure to provide semi-annual fire drills was the third example of a violation of license requirements to implement Regulatory Guide 8.31. The licensee implemented emergency response procedures but failed to establish a procedure for evaluating the reportability of an incident/event against regulations as required by the license. This represented a violation of the license.

7 **Follow-up of Confirmatory Action Letters or Orders (IP 92703)**

7.1 Inspection Scope

On March 28, 2017, the licensee agreed to, and was issued, Order EA-16-114 (ADAMS Accession Package No. ML17060A752) as a result of alternative dispute resolution mediation. Section V of the Order includes 16 conditions with actions the licensee is required to implement. Provided below is a summary of the status of the 16 conditions.

7.2 Observations and Findings

a. Condition 1

Condition 1 requires, in part, that the licensee submit its root cause protocol (RCP) to an independent third-party consultant with expertise in root cause analysis (RCA) and provide a copy of the independent third party reviewed analysis protocol to the NRC within 120 days of issuance of the Order. The RCP submitted to the NRC will identify any changes made by the independent third-party reviewer and include a qualification statement for the third-party reviewer. This protocol will be used to complete Conditions 2, 3, and 4 of the Order.

On July 26, 2017, the licensee submitted a RCP containing edits from an independent third-party consultant, and a qualification statement from the consultant (ADAMS Accession No. ML17212A026). The licensee and its third-party consultant stated that they will use the "Five Whys Method" to determine the underlying factor or condition contributing to a non-compliance or other identified problem. During the September 2017 inspection, documented in NRC Inspection Report 040-08903/2017-002 dated December 20, 2017 (ADAMS Accession No. ML17353A414), the inspectors determined that the "Five Whys Method" was adequate for use as the RCP.

Condition 1 of the Order is considered to be satisfied.

b. Condition 2

Condition 2 requires, in part, that within 30 days of submitting the RCP to the NRC, the licensee will use the RCP to analyze the reasons for the five apparent violations documented in the NRC's October 4, 2016, letter (ADAMS Accession No. ML16251A526). In addition, the licensee will submit any proposed corrective actions to the NRC for review and approval within 60 days of completing the RCA.

The licensee requested an extension in submission of the RCA of the five apparent violations by letter dated August 23, 2017 (ADAMS Accession No. ML17237C046). The NRC granted approval to extend the submittal due date to September 15, 2017, by email dated August 24, 2017 (ADAMS Accession No. ML17243A234). The NRC subsequently provided formal approval of the extension request by letter dated October 19, 2017 (ADAMS Accession No. ML17241A299). The October 19, 2017, letter also acknowledged receipt of the licensee's September 15, 2017, RCA of the five apparent violations (ADAMS Accession No. ML17263A125). The licensee concluded that the common root cause for each of the five apparent violations was lack of communication by licensee management to other licensee staff and corporate managers, and a lack of understanding of regulatory compliance by the licensee's management.

The licensee submitted the corrective action plan for the five apparent violations to the NRC by letter dated November 14, 2017 (ADAMS Accession Package No. ML17320A118). The licensee also provided an update for the corrective action plan by letter dated July 17, 2018 (ADAMS Accession No. ML18200A068).

Condition 2 of the Order will remain open until the NRC has reviewed and approved the licensee's proposed corrective actions.

c. Condition 3

Condition 3 of the Order requires, in part, the licensee to complete an assessment of all activities to determine whether the activities are authorized and are being conducted in compliance with NRC requirements. By letter dated November 17, 2017 (ADAMS Accession No. ML17325B023), the licensee requested an extension until September 3, 2018, for the submittal of the self-assessment. The NRC granted the extension request by letter dated December 26, 2017 (ADAMS Accession No. ML17340B340). By letter dated August 31, 2018 (ADAMS Accession No. ML18248A265), the licensee submitted its self-assessment to the NRC. The licensee's self-assessment is currently being reviewed by the NRC.

Condition 3 of the Order will remain open until the NRC has completed its review of the licensee's self-assessment and has determined that it includes the required information.

d. Condition 4

Condition 4 of the Order requires, in part, the licensee to engage an independent third-party consultant to review and evaluate the self-assessment as described in Condition 3 of the Order. Condition 4a states that the licensee must submit the name and qualifications of the consultant for NRC approval within 30 days of issuance of the Order; Condition 4b requires the licensee to provide the consultant with a copy of the self-assessment within 120 days of the self-assessment; and Condition 4c requires the

licensee to provide the consultant's review of the self-assessment within 120 days of when the consultant received it for review. Condition 4d states that the NRC will perform an audit of the assessment and the consultant's report. The licensee will be required to incorporate any NRC audit findings. Finally, Condition 4e states that the licensee will maintain copies of all reports at the site for NRC inspection.

The licensee submitted correspondence dated April 14, 18, and 24, 2017, to provide the names and qualifications of the third-party consultant for NRC approval (ADAMS Accession Nos. ML17108A258, ML17110A207, and ML17115A424). The NRC approved the consultants by correspondence dated April 19 and May 3, 2017 (ADAMS Accession Nos. ML17114A106 and ML17138A303). The inspectors verified that Condition 4a has been satisfied and is considered complete.

By letter dated August 31, 2018 (ADAMS Accession Nos. ML18248A259 and ML18248A260), the licensee submitted its self-assessment to the NRC for review. This satisfies Conditions 4b and 4c; however, Condition 4d will remain open and cannot be completed until the self-assessment has been audited by the NRC. The licensee continued to maintain copies of the reports at the site for NRC review in accordance with Condition 4e.

Conditions 4a, 4b, and 4c of the Order have been satisfied. Condition 4d of the Order remains open pending NRC review of the self-assessment.

e. Condition 5

Condition 5 of the Order requires, in part, that any changes or additions to the license or procedures resulting from this Order will be submitted to the NRC as a license amendment request for NRC approval or an update to the appropriate licensee procedure after notification of the NRC. All license amendment requests will be submitted to the NRC within 60 days of receiving the results of the NRC's audit.

The NRC's review of the RCA and the audit of the self-assessment is not complete; therefore, the licensee has not submitted any license amendments as a result of the RCA or the self-assessment. The licensee submitted a license amendment request on December 5, 2018, related to radiation safety titled, "Homestake Mining Company of California - Grants Reclamation Project- Request for Amendments to License No. SUA-1471 to Clarify and Update Current License Conditions and Commitments" (ADAMS Accession No. ML18346A085). On April 12, 2019, the licensee withdrew the amendment request (ADAMS Accession No. ML19109A110). The licensee has not submitted any requests or notified the NRC of any proposed updates to the procedures beyond the updated procedures directly required by the Order.

Condition 5 of the Order remains open.

f. Condition 6

Condition 6 of the Order requires, in part, the licensee to submit a revised groundwater corrective action program to the NRC by the end of calendar year 2018, including amendments to the license approved by that date. The licensee's November 17, 2017, letter (see Condition 3 above) expressed uncertainty in meeting the current due date of

December 31, 2018, for submission of the revised corrective action program due to the extended time frame needed to complete the self-assessment discussed in Condition 3 of the Order.

On October 11, 2018, the licensee requested that the due date for the revised groundwater corrective action program be extended from January 1, 2019, to December 18, 2019 (ADAMS Accession No. ML18289A400). Based on review of the information provided by the licensee, the NRC granted the extension request to allow the groundwater corrective action program to be submitted on or before December 18, 2019 (ADAMS Accession No. ML18355A893).

Condition 6 of the Order remains open pending submittal of the revised groundwater corrective action program to the NRC, and the NRC's review of the submittal.

g. Condition 7

Condition 7 of the Order requires, in part, that the licensee conduct initial and annual refresher training for all individuals (employees and vendors, commensurate with their duties) engaged in licensed activities. Section (a) of this condition required initial and annual training to address awareness and understanding of regulatory and license requirements, including but not limited to informing licensee employees of the jurisdiction of the NRC, the U.S. Environmental Protection Agency, and the New Mexico Environment Department over the Grants Reclamation Project site. Section (b) of this condition required the licensee to maintain documentation for each training session conducted, which will include a summary of the contents of the training and individual attendance.

During the inspection, the licensee's representatives stated that some regulatory training had occurred within the last year. The licensee provided attendee lists and training materials for selected training sessions conducted in 2018. However, the records don't always clearly demonstrate compliance with the documentation requirements specified in this Condition. The inspectors discussed with licensee representatives the need to ensure that training is adequately documented to support future closure of this Condition.

Condition 7 of the Order remains open since the licensee will continue to provide initial and refresher training until the Confirmatory Order has been terminated by the NRC.

h. Condition 8

Condition 8 of the Order requires, in part, the licensee to use the mass balance methodology described in the revised 2012 groundwater corrective action program submittal to complete an analysis of the re-injection system's impact to the time estimate for completion of the groundwater corrective action program. The analysis was required to be completed within 120 days of issuance of the Order, and the licensee was required to discuss the methodology, data, and analysis with the NRC, no less than 30 days prior to its finalization of the re-injection analysis.

The licensee and the NRC discussed the methodology, data, and analysis during a teleconference on June 26, 2017, and during a follow-up teleconference on June 27, 2017. Notes summarizing the discussions during the teleconferences on June 26

and 27, 2017, as well as the licensee's presentations are publicly available (ADAMS Accession No. ML17352B067).

The licensee submitted the impact analysis for the re-injection system and exceedance apparent violations by letter dated July 26, 2017 (ADAMS Accession Package No. ML17212A010). The NRC is currently performing an audit of the licensee's submitted analysis, and the NRC will provide the review findings to the licensee once they are complete.

Condition 8 of the Order remains open pending NRC review of the analysis.

i. Condition 9

Condition 9 of the Order requires, in part, that within 30 days from issuance of the Order, the licensee will perform adjustments to the operations of the reverse osmosis plant to ensure compliance with the groundwater protection standards. The licensee was also required to evaluate the procedure required by License Condition 23 to ensure the process is adequate to reduce constituent concentrations to values below the groundwater protection standards listed in License Condition 35.B before discharge.

The licensee notified the NRC by letter dated April 27, 2017 (ADAMS Accession No. ML17121A311), that adjustments were made to the treatment system to better ensure license compliance. The letter further stated that the requirements prescribed by License Condition 23 were evaluated during the development of the adjustment, and the adjustment was determined to be effective at the reverse osmosis plant by increasing the fresh water used for blending. The inspectors reviewed the revised procedure and determined that the operational adjustments made at the reverse osmosis plant were adequate for reducing effluent discharge to below the groundwater protection standards. As documented in Inspection Report 040-08903/2017-002 (ADAMS Accession No. ML17353A414), the requirement under Condition 9 of the Order to perform adjustments to the operations of the reverse osmosis plant and evaluate the procedure required by License Condition 23 was satisfied.

Condition 9 of the Order is considered to be satisfied.

j. Condition 10

Condition 10 of the Order requires, in part, an analysis by the licensee using the methodology described in NUREG-1620, "Standard Review Plan for the Review of a Reclamation Plan for Mill Tailings Sites Under Title II of the Uranium Mill Tailings Radiation Control Act of 1978," to determine the impact of exceedances discharged from the reverse osmosis plant as documented in the NRC's October 4, 2016, letter (ADAMS Accession No. ML16251A526). The analysis was to be completed within 120 days of issuance of the Order, and the licensee was required to discuss the methodology, data, and analysis with the NRC, no less than 30 days prior to its finalization of the re-injection analysis. The NRC will then perform an audit of the analysis, and provide the licensee with the audit results, including any recommended changes. The licensee will incorporate NRC audit results as described in Condition 5 of the Order.

The licensee and the NRC discussed the methodology, data, and analysis with the NRC during a teleconference on June 26, 2017, and during a follow-on teleconference

on June 27, 2017. Notes summarizing the discussions during the teleconferences on June 26 and 27, 2017, as well as the licensee's presentations are publicly available (ADAMS Accession No. ML17352B067). The licensee submitted the impact analysis for the re-injection system and exceedance apparent violations by letter dated July 26, 2017 (ADAMS Accession Package No. ML17212A010). The NRC is currently performing an audit of the analysis and will provide the review results in writing once completed.

Condition 10 of the Order remains open pending NRC review of the analysis.

k. Condition 11

Condition 11 of the Order directly modified License Condition 35.C when the Order was issued on March 28, 2017.

Condition 11 of the Order is considered to be satisfied.

l. Condition 12

Condition 12 of the Order requires, in part, that the licensee develop written procedures to ensure that monthly composite samples are obtained from Sampling Point 2 (SP2), and to ensure that results of those monthly composite samples are reported in the semi-annual and annual reports as required by License Conditions 15 and 42. The licensee was required to submit these procedures to the NRC within 120 days of issuance of the Order.

Written procedures for monthly sampling of Sampling Point SP2 were submitted to the NRC by letter dated July 26, 2017 (ADAMS Accession No. ML17212A025). The inspectors previously reviewed the revised procedure and determined that it was adequate to ensure that monthly composite samples will be obtained from Sample Point SP2. Further, the inspectors noted that the results of the monthly samples were reported in the most recent semi-annual report dated March 5, 2019 (ADAMS Accession No. ML19064B127).

Condition 12 of the Order is considered to be satisfied.

m. Condition 13

Condition 13 of the Order directly modified License Condition 15 when the Order was issued on March 28, 2017. This change provided clarifying language for when the semi-annual effluent and environmental monitoring reports are due.

Condition 13 of the Order is considered to be satisfied.

n. Condition 14

Condition 14 of the Order requires, in part, that the licensee identify sources of supply water, soil and groundwater data, and associated reports, and use those data to develop a land application assessment of any impacts due to the use of the irrigation water containing byproduct material to past, current, or foreseeable future uses of the land application areas.

The land application assessment will establish background concentrations, remedial action levels (radiological dose and non-radiological risk), and current concentrations of the contaminants of concern in its license at all areas used for land application. The land application assessment will also identify and assess impacts from soil pore water data at the land application areas. Additionally, the licensee was required to take immediate action to ensure that the land application areas were not being used to produce crops for human consumption. The land application assessment was required to be submitted within 180 days of issuance of the Confirmatory Order.

As described in Section 4.2 of NRC Inspection Report 040-08903/2018-002 dated November 26, 2018 (ADAMS Accession No. ML18303A199), the licensee submitted the land application assessment to the NRC by letter dated September 25, 2017 (ADAMS Accession No. ML17270A066). By memorandum dated June 16, 2017 (ADAMS Accession No. ML17328A507), the licensee provided verification that they were not using the former irrigation areas to produce crops for human consumption. A proposed final status survey plan for release of the former land application areas was submitted by letter dated November 14, 2017 (ADAMS Accession No. ML17340A406). The data obtained for the final status survey was intended to augment the existing soil data within the land application impact assessment that was submitted on September 25, 2017. The licensee subsequently submitted the final status survey report, documenting the results of the final status survey, to the NRC by letter dated July 2, 2018 (ADAMS Accession Nos. ML18186A567 and ML18186A568).

However, the NRC issued a request for additional information by letter dated August 17, 2018 (ADAMS Accession No. ML18205A460), in part, to ask the licensee about the radiological status of the piping and equipment used to support the irrigation activities. The licensee responded to the NRC request by letter dated September 20, 2018 (ADAMS Accession No. ML18269A123).

During the week of August 27, 2018, an NRC inspector and contractors from the Oak Ridge Institute of Science and Education performed a confirmatory survey of the land application areas. The results from this survey were provided to NRC staff in a report dated February 12, 2019 (ADAMS Accession No. ML19046A072). The NRC staff is currently reviewing the licensee's land application assessment reports and the confirmatory survey report submitted by the NRC's contractor.

Condition 14 of the Order remains open pending NRC review of the licensee's submittals, the results of the final status survey, and the results of the NRC's confirmatory survey.

o. Condition 15

Condition 15 of the Order requires, in part, that if the results of the analysis discussed in Condition 14 of the Order indicate that radiological doses and non-radiological risks are in excess of the NRC-approved remedial action levels, the licensee will propose appropriate measures to control both use and access to the impacted areas, a corrective action plan if necessary to achieve the NRC-approved remedial action levels, and final status survey plans to demonstrate that the radiological doses and non-radiological risks are below NRC-approved remedial action levels.

Condition 15 of the Order remains open pending NRC review of the licensee's submittals, the results of the final status survey, and the results of the NRC's confirmatory survey.

p. Condition 16

Condition 16 of the Order requires the licensee to provide an integrated table that sets forth all actions taken pursuant to the Order. An updated integrated table will be provided semi-annually, until all license and procedure changes under the Order are completed. The most recent integrated table was submitted to the NRC by letter dated January 30, 2019 (ADAMS Accession No. ML19032A026).

Condition 16 of the Order will remain open until all license and procedure changes under the Order are completed.

7.3 Conclusions

Confirmatory Order EA-16-114 Conditions 1, 9, and 11-13 have been evaluated and are determined to be satisfied. Confirmatory Order Conditions 2-8, 10, and 14-16 remain open with pending actions and will continue to be evaluated by the NRC.

8 Exit Meeting Summary

The inspectors presented the preliminary inspection results to the licensee's representatives at the conclusion of the onsite inspection on March 21, 2019. The final inspection results were presented to the licensee's representatives by telephone on May 2, 2019, after the NRC had completed its compliance review of the inspection findings. During the inspection, the licensee did not identify any information reviewed by the inspectors as proprietary that was included in the report.

SUPPLEMENTAL INSPECTION INFORMATION

Partial List of Persons Contacted

Licensee

W. Archuleta, Senior Shift Supervisor, Homestake Mining Co.
A. Arguello, Hydrologist, Homestake Mining Co.
B. Bingham, Site Compliance Manager, Homestake Mining Co.
C. Burton, Director of Closure, Barrick
C. Farr, Assistant Radiation Safety Officer, Environmental Restoration Group, Inc.
G. Hoffman, Hydrogeologist, Hydro-Engineering
R. Shirley, Project Engineer, Homestake Mining Co.
R. Whicker, Radiation Protection Administrator, Environmental Restoration Group, Inc.

New Mexico Environment Department

A. Winton, Environmental Scientist

Inspection Procedures (IPs) Used

IP 83822	Radiation Protection
IP 88005	Management Organization and Controls
IP 88010	Training
IP 88025	Maintenance and Surveillance
IP 88035	Radioactive Waste Processing, Handling, Storage, and Transportation
IP 88045	Effluent Control and Environmental Protection
IP 88050	Emergency Preparedness
IP 92703	Follow-up of Confirmatory Action Letters or Orders

Items Opened, Closed and Discussed

Opened

040-08903/1901-01	VIO	Failure to conduct environmental evaluation
040-08903/1901-02	VIO	Failure to implement Regulatory Guide requirements
040-08903/1901-03	VIO	Failure to have procedure for incident/event reporting

Closed

None

Discussed

040-08903/1601-01	VIO	Exceedance of radon flux limit from LTP
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List of Acronyms Used

ADAMS	Agencywide Documents Access and Management System
ALARA	As Low As Reasonably Achievable
CFR	Code of Federal Regulations
gpm	gallons per minute
IP	Inspection Procedure
LTP	large tailings pile
μR/hr	microRoentgen per hour
NRC	U.S. Nuclear Regulatory Commission
RCA	root cause analysis
RCP	root cause protocol
RSO	Radiation Safety Officer
RST	Radiation Safety Technician
RWP	radiation work permit
SERP	Safety and Environmental Review Panel
STP	small tailings pile
VIO	violation

NRC INSPECTION REPORT 040-08903/2019-001 AND NOTICE OF VIOLATION – DATED
JUNE 12, 2019

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<input checked="" type="checkbox"/> SUNSI Review by: RJE		ADAMS: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		<input checked="" type="checkbox"/> Non-Sensitive <input type="checkbox"/> Sensitive		<input checked="" type="checkbox"/> Publicly Available <input type="checkbox"/> Non-Publicly Available		Keyword: NRC-002
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SIGNATURE	/RA/	/RA/	/RA/	/RA/via email	/RA/via email	/RA/		
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