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

October 13, 2021

Ms. Sandra L. Ross, PG Site Manager
Rio Algom Mining LLC
P.O. Box 218
Grants, NM 87020

SUBJECT: RIO ALGOM MINING LLC - NRC INSPECTION REPORT 040-08905/2021-001

Dear Ms. Ross:

This letter refers to the U.S. Nuclear Regulatory Commission (NRC) inspection conducted from September 14-15, 2021, at your Ambrosia Lake facility in McKinley County, New Mexico. This inspection examined activities conducted under your license as they relate to public health and safety, the common defense and security, and to confirm 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 and representative records, interviews with personnel, and a tour of the site.

The NRC inspectors discussed the results of the inspection with you and members of your staff at the conclusion of the onsite inspection on September 15, 2021. The results of the inspection are documented in the enclosure to this letter. No violations were identified, and no response to this letter is required.

In accordance with 10 CFR 2.390 of the NRC's "Agency Rules of Practice and Procedure," a copy of this letter, its enclosure, and your response if you choose to provide one, 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, if you choose to provide one, 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,

Signed by Gepford, Heather
on 10/13/21

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

Docket No. 040-08905
License No. SUA-1473

Enclosure:
NRC Inspection Report 040-08905/2021-001

cc w/enclosure:
M. Hunter, New Mexico Environment Department
S. Rodriquez, New Mexico Environment Department
B. Tsosie, U.S. Department of Energy

RIO ALGOM MINING LLC - NRC INSPECTION REPORT 040-08905/2021-001 - DATED OCTOBER 13, 2021

Distribution:
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TLancaster, NMSS
RFedors, NMSS
SPoy, NMSS
R4DNMS_MLDB

Sandra.Ross@bhp.com
michelle.hunter@state.nm.us
santiago.rodriguez1@state.nm.us
bernadette.tsosie@lm.doe.gov

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NAME	RJEvans	RWFedors	HJGepford
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U.S. NUCLEAR REGULATORY COMMISSION
Region IV

Docket No.:	040-08905
License No.:	SUA-1473
Report No.:	040-08905/2021-001
Licensee:	Rio Algom Mining LLC
Facility:	Former Ambrosia Lake mill
Location:	McKinley County, New Mexico
Inspection Dates:	September 14-15, 2021
Inspectors:	Robert J. Evans, PhD, PE, CHP, Senior Health Physicist Materials Licensing and Decommissioning Branch Division of Nuclear Materials Safety Randall W. Fedors, Senior Hydrogeologist Reactor Decommissioning Branch Division of Decommissioning, Uranium Recovery and Waste Programs Office of Nuclear Material Safety and Safeguards
Accompanied by:	Stephen Poy, Project Manager State Agreement and Liaison Programs Branch Division of Materials Safety, Security, State, and Tribal Programs Office of Nuclear Material Safety and Safeguards Thomas Lancaster, Project Manager Uranium Recovery and Materials Decommissioning Branch Division of Decommissioning, Uranium Recovery and Waste Programs Office of Nuclear Material Safety and Safeguards Mary C. Muessle, Director Division of Nuclear Materials Safety
Approved by:	Heather J. Gepford, PhD, CHP, Chief Materials Licensing and Decommissioning Branch Division of Nuclear Materials Safety
Attachment:	Supplemental Inspection Information

Enclosure

EXECUTIVE SUMMARY

Rio Algom Mining LLC
NRC Inspection Report 040-08905/2021-001

This inspection was a routine, announced inspection of decommissioning activities being conducted at the former Ambrosia Lake mill in McKinley County, New Mexico. In summary, the inspectors concluded that the licensee was conducting site activities in accordance with license and regulatory requirements.

Management Organization and Controls

- The licensee's organizational structure met license requirements, and the licensee had sufficient staff for the work in progress. The licensee conducted routine audits and site inspections in accordance with procedural and regulatory requirements. The licensee established and maintained site procedures in compliance with license requirements. The licensee established an emergency response program in accordance with procedure requirements. (Section 1.2)

Radiation Protection

- The licensee implemented its radiation protection and training programs in compliance with license and regulatory requirements. Occupational exposures were small fractions of the annual regulatory limits. (Section 2.2)

Radioactive Waste Processing, Handling, Storage, and Transportation

- The licensee conducted field work and managed waste material in accordance with license requirements and commitments provided in recent letters to the NRC. (Section 3.2)

Effluent Control and Environmental Protection

- The licensee implemented the environmental and groundwater monitoring programs and reported the results to the NRC as required by the license. Public doses were small fractions of the regulatory limit. The licensee continued to implement a work plan to collect and analyze information for a future application to change selected groundwater alternate concentration limits in the bedrock units. The licensee conducted a land use surveys as required by the license. (Section 4.2)

Report Details

Site Status

The Ambrosia Lake mill processed approximately 33 million tons of uranium ore from 1958-1985. Reclamation of the two tailings cells commenced in 1989, and the mill was demolished in 2003-2004. Reclamation activities were completed in May 2016, with a few minor exceptions.

Since 2016, the licensee implemented several work plans. These work plans included the dam safety review, Section 4 supplemental characterization work plan, soil characterization work, and supplemental alternate concentration limit (ACL) work plan. The U.S. Nuclear Regulatory Commission (NRC) inspectors reviewed the status of each work activity conducted since the last inspection. The licensee continued to prepare the construction completion report for future submittal to the NRC. The licensee planned to continue implementing the various work plans, with the goal of submitting the results of these work activities to the NRC under separate correspondence.

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 organizational requirements are provided in License Condition 10 which references the licensee's letter dated January 13, 1998 (Agencywide Documents Access and Management System [ADAMS] Accession No. ML18292A685). Details of the organization were provided in Section 2.0, "Organization and Management," of the licensee's Radiation Protection and Environmental Monitoring Program Manual dated March 2021. The Manual provided the required organizational structure, staff responsibilities, and qualifications for selected positions.

At the time of the inspection, site staffing consisted of a combination of licensee personnel and contractors. The site manager was the highest-ranking individual. Other staff assigned to the project included the site principals, site specialist, principal hydrogeologist, and radiation safety officer (RSO). Contractors and consultants were available as needed to provide radiation protection, environmental, groundwater, and site support services. All management level positions were filled, and the licensee had sufficient staff to maintain compliance with license requirements. The inspectors confirmed that the licensee's organization met the requirements provided in the license and the Radiation Protection and Environmental Monitoring Program Manual.

b. Routine Site Audits, Inspections, Reports and Procedures

Title 10 to the *Code of Federal Regulations* (10 CFR) 20.1101(c) requires licensees to periodically (at least annually) review the radiation protection program content and implementation. In addition, Section 3.3 of the Radiation Protection and Environmental

Monitoring Program Manual states that the RSO shall prepare an annual report summarizing the results of the radiation protection and environmental monitoring programs for the previous calendar year. The inspectors reviewed the licensee's most recent annual As Low As is Reasonably Achievable (ALARA) audit during the inspection.

The annual ALARA audit for calendar year 2020 was conducted on a quarterly basis in 2020. A courtesy copy of the audit was provided to the NRC by letter dated May 27, 2021 (ADAMS Accession No. ML21181A378). The annual audit summarized site activities, occupational doses, public doses, radiation work permits (RWPs), contamination surveys, safety/training activities, and site inspections. The inspectors concluded that the report provided adequate summaries of the radiation protection and environmental programs, as well as applicable trends and corrective actions. The inspectors concluded that the licensee conducted the annual program review as required by regulations and the Radiation Protection and Environmental Monitoring Program Manual.

Section 3.3 of the Health Physics and Environmental Monitoring Program Manual specifies that the licensee's staff shall conduct routine facility inspections. The licensee conducted inspections on a monthly basis during periods of onsite licensed activity; otherwise, the inspections were conducted quarterly. The inspectors reviewed the licensee's site inspection records for 2020-2021. The records included observations of site conditions and work in progress at that time. In summary, the licensee's records indicated that the facility had been inspected in accordance with procedural requirements since the last inspection.

License Conditions 10, 14, and 16 require the licensee to establish certain procedures. The inspectors conducted a limited review of the licensee's procedures that were active at the time of the inspection. All active procedures had been updated in March 2021 and were found to be acceptable for the work in progress.

c. Emergency Preparedness

The licensee is not required by the license to establish a formal emergency response program based on current site conditions. However, the licensee maintained an emergency response program through its corporate incident response plan. The inspectors reviewed the status of the licensee's emergency preparedness program.

The licensee maintained an emergency contact list to be used in the event of an emergency. The licensee conducted desktop drills for emergency scenarios and planned to conduct a real-time field drill in the future. The licensee stated that the primary risks were vehicular interactions due to the site's remote location with limited cell phone reception. Other hazards included interactions with wildlife, lightning strikes, and excessive heat or cold conditions. First aid kits were available at the site and in each company vehicle. In summary, the licensee maintained an emergency preparedness program in accordance with site procedures.

1.3 Conclusions

The licensee's organizational structure met license requirements, and the licensee had sufficient staff for the work in progress. The licensee conducted routine audits and site inspections in accordance with procedural and regulatory requirements. The licensee

established and maintained site procedures in compliance with license requirements. The licensee established an emergency response program in accordance with procedure requirements.

2 Radiation Protection (IP 83822)

2.1 Inspection Scope

The inspectors reviewed the licensee's radiation protection and training programs to verify compliance with 10 CFR Part 20 and license requirements.

2.2 Observations and Findings

License Condition 10 requires, in part, that the licensee maintain a health physics program. Details about the program are provided in the licensee's Radiation Protection and Environmental Monitoring Program Manual. The inspectors reviewed the licensee's implementation of its occupational exposure, RWPs, contamination control, training, and instrument calibration programs. The licensee eliminated its bioassay and respiratory protection programs in 2016 due to a reduction in onsite activities.

The inspectors reviewed personnel dosimetry records for 2020 through the second quarter of 2021. The licensee monitored workers to demonstrate that occupational exposures were ALARA. The licensee measured occupational radiation exposures using optically stimulated dosimeters. In 2020, the licensee monitored 22 staff and contractors, and the maximum radiation exposure was 1 millirem. In 2021, the licensee monitored 16 individuals and the maximum exposure was 1 millirem. These results were well below the regulatory limit of 5,000 millirem per year for total effective dose equivalent exposures.

The licensee conducted air sampling during non-routine work to ensure that no worker received an internal exposure greater than 10-percent of the regulatory limits specified in 10 CFR 20.1201. Breathing zone air sampling was conducted twice in 2020. Since the results of air sampling were well below the 10-percent of the limit for the most restrictive radionuclide, the licensee did not assign internal doses to any worker as allowed by 10 CFR 20.1202.

The licensee continued to implement a contamination control program. Personnel monitoring records created since the previous inspection indicated that no individual left the site with contamination above the licensee's action level. Equipment release records created since the previous inspection indicated that no component was released with contamination above the respective action level specified in License Condition 25. The equipment release records included empty waste containers that were released from the site in 2020.

License Condition 15 provides the RWP requirements. Details of this program are provided in Section 3.8 of the licensee's Radiation Protection and Environmental Monitoring Program Manual. Since the previous inspection, the licensee issued one RWP involving transfer of radioactive wastes from one container to another. The work included breathing zone sampling. The RWP provided comprehensive information about radiological conditions, dosimetry and air sampling requirements, and job-specific hazards.

The Radiation Protection and Environmental Monitoring Program Manual does not require routine external radiation surveys unless site conditions change. Since the previous inspection, the licensee's staff elected to conduct external radiation surveys of the waste storage area as part of the quarterly site inspections, in part, to verify that radiation protection practices were being followed.

License Condition 10 provides the training requirements. Details about training are provided in Section 3.1 of the licensee's Radiation Protection and Environmental Monitoring Program Manual. The training included visitor orientation, initial site training, on-the-job training, safety training, and daily job safety training as needed. The inspectors reviewed the licensee's training records for visitor orientation and radiation protection training for site workers. Annual refresher training was provided remotely to site workers in January-February 2021. Initial site access training was also provided remotely as needed. A written test was administered after completion of radiation protection training for both routine and project-based site workers. The RSO tracked training of site workers using a spreadsheet. All training records were found to be complete, and the system for ensuring annual completion of required training for all onsite workers was found to be adequate.

The licensee continued to maintain radiation detection instrumentation for routine and non-routine activities being conducted at the site. The licensee established a program to ensure that survey instruments were calibration checked at the intervals specified in site procedures. Portable radiological survey instruments and equipment were functionally examined to verify operability, response, and proper settings. The inspectors confirmed that the licensee's instrument calibration program followed license requirements and site procedures.

2.3 Conclusions

The licensee implemented its radiation protection and training programs in compliance with license and regulatory requirements. Occupational exposures were small fractions of the annual regulatory limits.

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

3.1 Inspection Scope

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

3.2 Observations and Findings

The inspectors reviewed the status of several work projects recently completed or in progress at the site. The first project was the dam safety review. By letter dated February 9, 2018 (ADAMS Accession Nos. ML18044A111 and ML18044A112), the licensee notified the NRC that it intended to implement a work plan to review dam safety and tailings characterization for the two tailings impoundments and Pond 3, a pond located adjacent to the impoundments. The licensee conducted the work in response to a request for additional information by the licensee's parent company. The information gained will be used for dam safety, groundwater balancing, and groundwater modeling.

The licensee planned to submit the results of its review to the NRC in a geotechnical investigation report prior to the end of calendar year 2021.

The inspectors reviewed the status of the Section 4 pond area. The licensee submitted a request in 2017 to release the Section 4 area for unrestricted use (ADAMS Accession No. ML17340A482). In August 2019, the licensee notified the NRC that it planned to implement a work plan to gather additional subsurface information (ADAMS Accession No. ML19232A082). The licensee subsequently submitted the work plan to the NRC by letter dated November 1, 2019 (ADAMS Accession No. ML19311C535). However, by letter dated October 20, 2020, the licensee subsequently retracted the 2017 license amendment request and 2019 work plan (ADAMS Accession No. ML20321A194). Instead of requesting an unrestricted release of the Section 4 pond area, the licensee indicated in the letter that it would consider requesting a conditional release of the property.

During the site tour, the inspectors observed the Section 4 pond area. The licensee's staff described the impacts of a recent monsoonal rain event that occurred upgradient of the property. The event resulted in heavy rainwater runoff flow through the radiologically impacted area. Although the event was not reportable to the NRC, the licensee's staff provided a courtesy notification to the NRC project manager. The licensee's proposed corrective actions were not final at the time of the inspection, but the licensee indicated that it may choose to conduct radiological surveys and sampling in the downstream pathways, in part, to verify that licensed material had not been transported offsite.

The inspectors reviewed the status of the licensee's soils characterization work. In 2017, the licensee attempted to implement a final status survey using the methodology described in the Soil Decommissioning Plan (ADAMS Accession No. ML18166A182). The preliminary results were found to be problematic due to high error rates and poor correlation between ambient gamma count rates and radionuclide concentrations in the soil. In 2018, the licensee conducted a pilot study to identify possible methods to improve the correlation. In addition, in April 2019, the licensee submitted a proposed final status survey work plan for NRC consideration for the windblown tailings affected areas (ADAMS Accession No. ML19099A196). The objective of this work plan was to provide information to support a future revision to the Soil Decommissioning Plan. The licensee initially proposed to modify the current final status survey integrated survey approach from unshielded gamma surveys and 5-point composite sampling to a shielded gamma survey and ranked-set sampling approach.

The NRC inspectors discussed the status of the licensee's soils characterization work. In 2019, the licensee conducted a shielded gamma survey in areas designated as affected by windblown tailings. In 2020, additional field data were collected for analysis of the extent of windblown tailings and estimated soil cleanup volume. This field work included expanded shield gamma surveys, rank-set sampling pilot study, and an investigation of the depth of windblown tailings. A goal of the 2018-2020 studies was to determine how the contaminated material can be excavated in a cost-efficient manner.

The licensee subsequently submitted the shielded gamma survey data to the NRC by letters dated March 22, 2021 (ADAMS Accession No. ML21085A569) and July 14, 2021 (ADAMS Accession No. ML21203A050). To supplement the shielded gamma surveys, the licensee planned to conduct surface and subsurface soil sampling in 2021-2022, in

part, to help evaluate the magnitude and usefulness of a site-wide gamma guideline value for use during future reclamation activities.

As part of the soil characterization work, the licensee conducted an interlaboratory comparison to determine if the laboratory results for soil samples were comparable or biased. The licensee's study indicated that a bias was present with the results provided by one commercial laboratory, and as a result, the licensee may discard some of the data for soil samples collected in 2017-2018 and analyzed by this laboratory.

Rank-set sampling was conducted in 2020, in part, to demonstrate compliance with the sampling requirements provided in 10 CFR Part 40, Appendix A, and to help formulate the gamma guideline value. However, this sampling data could not demonstrate compliance with Appendix A requirements. Later in calendar year 2021, the licensee plans to collect up to 600 soil samples in areas known to have variable radionuclide concentrations. This data will be used to optimize the gamma guideline value and to identify areas where the value cannot be applied.

In addition, the licensee conducted a soil depth profile study in 2020, to determine the depth of the radionuclides at different locations. The licensee plans to collect additional soil samples in the fall of 2021. The information may be used, in part, to help identify the best location for Cell 4 and eventually propose changes to the Soil Decommissioning Plan.

The licensee discussed its recent installation of a telemetric network on the tailings storage facility. The monitoring system was installed due to an internal company requirement, and the system was not required by the NRC license. At the time of the inspection, two units were installed to monitor subsurface water levels and pore pressures. The network included a weather station. In the fall of 2021, the licensee plans to install a seismic monitor as part of the telemetric network.

Other projects in various stages of completion included a geophysical work plan which will include modeling and field measurements to help identify future soil borrow and disposal areas, and to analyze the site geology, groundwater, and stability conditions. Field work was expected to be conducted in 2022 in support of the work plan. In addition, the licensee planned to conduct a review of its diversion channel in 2021-2022 to reevaluate the size and capacity relative to the projected rainfall events, current design, and construction of the existing channel.

The inspectors also reviewed the licensee's plans to construct a new, onsite disposal Cell 4 for permanent disposal of byproduct material that will be recovered during future remediation activities. The licensee identified three areas for further consideration. The licensee does not plan to start reclamation activities until the location of the future disposal cell has been selected and prepared for use. The proposed repository Cell 4 will require NRC review and approval prior to construction and use.

During the previous inspection, the licensee informed the inspectors that it had performed a cultural resource survey during March-July 2020. The licensee conducted the survey as required by Section 106 of the National Historic Preservation Act and 36 CFR 800, "Protection of Historic Properties." The objective of the survey was to prepare for the windblown tailings cleanup work. The work consisted of a literature

search and archeological survey. The licensee plans to present a high-level summary of the results to the NRC staff when the analysis is completed.

Finally, the inspectors reviewed the status of the licensee's construction completion report. The NRC suspended its review of the licensee's construction records in 2016 to allow the licensee to organize the records and to assemble the associated records into a single construction completion report. The inspectors discussed the status of the report with licensee staff.

The licensee conducted its review of the construction records in phases. The first two phases included a license requirement review and data acquisition and information review. These two phases were completed in 2020. The third phase was a data deficiency review. The licensee reported that it had identified data gaps in the records. For example, it could not locate copies of older NRC licensing technical evaluation reports. The licensee may request NRC support in its efforts to locate these missing licensing records. The licensee plans to identify all data gaps in the construction completion report by the end of 2022.

The inspectors conducted a site tour, in part, to observe the status of the facility including site security. The areas visited included the Section 4 pond area, two tailings cells, and proposed locations of the future Cell 4. The NRC staff noted that the licensee's site security measures were effective. The property was enclosed by a fence, and gates were locked and posted with signs as required by License Condition 28.

3.3 Conclusions

The licensee conducted field work and managed waste material in accordance with license requirements and commitments provided in recent letters to the NRC.

4 Effluent Control and Environmental Protection (IP 88045)

4.1 Inspection Scope

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

4.2 Observations and Findings

a. Effluent and Environmental Monitoring

The effluent and environmental monitoring program requirements are specified in License Condition 10. In December 2016, the NRC authorized the licensee to discontinue environmental gamma, surface soil, vegetation, and sediment sampling (ADAMS Accession No. ML16344A027). In December 2017, the NRC agreed with the license's request to terminate the environmental air particulate sampling program (ADAMS Accession No. ML17293A342). Beginning January 1, 2018, the licensee monitored only for gaseous radon-222, in addition to groundwater sampling. Clarification information about the radon sampling program was provided in the licensee's letter dated January 20, 2019 (ADAMS Accession No. ML19028A155). In addition, Section 4.0 of the Radiation Protection and Environmental Program Manual provided detailed instructions for the environmental monitoring program.

The inspectors reviewed the licensee's environmental and effluent monitoring results for 2020 and the first half of 2021 (ADAMS Accession Nos. ML20248H485, ML21067A236, and ML21244A355). The licensee collected radon-222 samples at seven sample stations. The licensee also collected duplicate samples at three locations for quality control reasons. The inspectors concluded that the radon-222 samples were collected and reported to the NRC in accordance with License Condition 10 requirements. No sample result exceeded the effluent concentration limit provided in Appendix B to 10 CFR Part 20 (1E-08 microcuries per milliliter).

The licensee conducted public dose assessments as part of its annual ALARA program review. The inspectors reviewed the licensee's dose assessment for calendar year 2020. The licensee's assessment concluded that annual doses to the nearest resident, delivery person, and visitor from licensed operations were 7.2 millirem or less. These calculated doses were well below the regulatory limit of 100 millirem per year as specified in 10 CFR 20.1301(a).

b. Groundwater Compliance Monitoring – Routine Program

License Condition 34 states that the licensee shall implement a groundwater compliance monitoring program. The program includes semi-annual sampling of 23 wells in four geological layers: Dakota Formation (KD); Tres Hermanos A (TRA) and Tres Hermanos B (TRB) in the Mancos Formation; and Alluvium. Four of the 23 wells are designated as background wells. License Condition 34.A requires that the samples be analyzed for lead-210, radium-226 plus radium-228, thorium-230, natural uranium, several non-radiological chemical constituents, and as-found water conditions (water level, pH, and electrical conductivity). The inspectors reviewed the licensee's implementation of the groundwater compliance monitoring program for 2020-2021.

The licensee requested a license amendment in February 2020 (ADAMS Accession No. ML20054B747) to exempt gross alpha measurements from the groundwater compliance monitoring program and correct the nickel alternate concentration limit (ACL) for the Dakota Formation. The request was subsequently approved by the NRC on September 1, 2020, as License Amendment 62 (ADAMS Accession Nos. ML20218A586 and ML20218A570). The third quarter of 2020 was the last sampling round to include gross alpha measurements.

License Condition 34.D requires the licensee to submit semi-annual groundwater monitoring reports to the NRC. For wells requiring monthly measurements under License Condition 34.F due to exceedances of the groundwater protection standards (GPSs), the licensee submitted the first and third quarter monthly results in the first and third quarter groundwater reports. Monthly results for the second and fourth quarters were provided in the semi-annual submissions to the NRC. The inspectors reviewed the quarterly reports for the third quarter of 2020 and first quarter of 2021 (ADAMS Accession Nos. ML20157A103 and ML21162A118). The inspectors also reviewed the semi-annual reports for the second half of 2020 and the first half of 2021 (ADAMS Accession Nos. ML21048A174 and ML21223A251).

License Condition 34.D requires that the semi-annual reports include specific minimum information. The inspectors confirmed that the semi-annual reports included potentiometric surfaces and estimates of groundwater gradients for each unit,

hydrographs for the groundwater levels at each well, and tabular and graphical analytical results for alternate concentration limit (ACL) constituents. The inspectors also concluded that the licensee collected all required samples and reported the sample results in the quarterly and semi-annual reports for wells and constituents as specified in License Condition 34.B.

The inspectors noted that four wells were redeveloped in the third quarter of 2020: 32-59 ALL; 5-04 ALL; 36-06 KD; and 32-01 TRB. Three of these wells are listed as compliance wells in License Condition 34. The redevelopment included a combination of bailing, swabbing, and brushing to remove sediment and precipitates from the wells, which is intended to improve connection to the aquifer and extend the life of the monitoring well. The inspectors reviewed the methodology the licensee used to redevelop the wells. The licensee provided a standard operating procedure from INTERA (the licensee's contractor) that followed the American Society for Testing and Materials (ASTM) D5521/D5521M-13 methodology (Standard Guide for Development of Groundwater Monitoring Wells in Granular Aquifers, 2013). The NRC staff considered the ASTM methodology to be acceptable for use.

The licensee monitored the water levels in 41 wells in the alluvium located in and surrounding the site, of which eight were sampled for compliance with License Condition 34.B requirements. The licensee stated that water levels in the alluvium continued to slowly decline in the past year, which is consistent with the long-term trend. The licensee attributed the decline in water levels to the discontinuance of the alluvium corrective action program in 2006 that previously maintained an artificial groundwater mound in the vicinity of the site. Approximately one-fourth of the 41 wells installed in the alluvium unit continued to be dry. Of the eight wells designated for chemical analysis of groundwater in the alluvium in License Condition 34, two wells could not be sampled in past years due to insufficient volumes of water in the wellbore. However, after redevelopment of one of the previously dry compliance wells in the third quarter of 2020, water levels increased sufficiently to allow collection of a water sample from Well 32-59 ALL in the first quarter of 2021. The inspectors confirmed that water samples from all alluvial compliance wells met, as appropriate, the ACLs specified in License Condition 34.B.

The inspectors reviewed the evolution of exceedances from prior years at Wells 36-06 KD (cadmium, beryllium, gross alpha), 32-45 KD-R (molybdenum), and 31-02 TRB-R (gross alpha). Since gross alpha measurement was removed as a requirement of the license after approval of License Amendment 62 on September 1, 2020 (ADAMS Accession No. ML20218A586), the last gross alpha measurement for any compliance well was collected in the third quarter of 2020. The inspectors confirmed that all three of compliance wells remained in the monthly sampling program during the third quarter of 2020. Only two wells remained in the monthly sampling program after the third quarter of 2020. Because compliance Well 31-02 TRB was previously in the monthly sampling program solely due to exceedance of gross alpha, the well was removed from the monthly program starting the fourth quarter of 2020. For compliance Well 36-06 KD, the licensee discontinued monthly monitoring for beryllium and cadmium in the first quarter of 2020 because the concentrations had not exceeded GPSs since 2016 and 2017, respectively. However, beryllium in Well 36-06 KD exceeded the GPS in the August 2020 sampling event. The result was confirmed in September 2020 and was reconfirmed in October 2020. The inspectors verified that the licensee followed the process for addressing exceedances specified in License 34.F. Henceforth, Well 36-06

KD rejoined the monthly sampling program due to renewed exceedances of beryllium in August 2020. Compliance Well 32-45 KD remains in the monthly sampling program due to continued exceedances of molybdenum. The licensee stated that both wells will remain in monthly sampling and quarterly reporting until concentrations are consistently below the GPSs, the GPSs are revised, or ACLs are developed.

In summary, the licensee continued to implement its routine groundwater compliance monitoring program in accordance with license requirements.

c. Groundwater Compliance Monitoring - Non-Routine Program

A supplemental ACL work plan (ADAMS Accession No. ML17340A826) was provided to the NRC in 2017 to support preparation of a license amendment request for supplemental ACLs. The licensee began implementing the supplemental ACL work plan in 2018. As part of the work plan, eight additional monitoring wells were installed within the site boundary. Aquifer testing, groundwater chemical analysis, and core mineralogical analysis occurred in 2019 and continued into 2021. The 2-year well stabilization period for quarterly sampling of the eight additional monitoring wells will end in the fourth quarter of 2021. The licensee anticipates documentation of borehole construction, testing, and analysis will be included as an appendix or cited report in the future supplemental ACL application.

Based on exceedances in prior years, the program described in the 2017 supplemental ACL work plan was designed to support a request to the NRC to revise the limits for beryllium, cadmium, and molybdenum in the Dakota sandstone unit and gross alpha in the three upper bedrock units. As noted above in Section 4.2.b, cadmium no longer exceeds GPSs and was removed from monthly testing in the first quarter of 2020. Also, gross alpha measurements were removed from License Condition 32.B in a license amendment approved by NRC on September 1, 2020 (ADAMS Accession No. ML20218A586). Only exceedances in the Dakota Formation for molybdenum and beryllium remain. A proposed license amendment for supplemental ACLs, if approved by the NRC, may eliminate the remaining groundwater exceedances.

The inspectors discussed with the licensee's staff ongoing analysis of the eight new wells developed in the supplemental ACL program. The hydrologic conditions of the water levels, estimates of saturated hydraulic conductivity, and water quality mostly fall within expected ranges for the locations of the new wells. One exception was high total dissolved solids and high concentrations of other constituents in the new Well 31-02 TRB-R. A second exception is the new Well 36-07 KD, which was intended to be a confirmation of, or replacement of, compliance Well 36-06 KD.

During the inspection, the inspectors visited the drill platform where wells 36-07 KD and 36-06 KD are located in close proximity. The wells differ markedly in hydrologic conditions and water quality, and the wells do not appear to be hydraulically connected even though they are physically close to each other. The inspectors noted that the site conceptual model was not consistent with the marked differences between these wells. The licensee expects the evaluation of these differences to continue. The inspectors noted that compliance Well 36-06 KD was an important focus of the supplemental ACL work plan (ADAMS Accession No. ML17340A826) because it exhibited extremely low pH values and exceedances of GPSs. The well is immediately north of the area of reclaimed Ponds 7 and 8.

The licensee expects to continue the analysis of data for both exceptions and expects to document all the results of supplemental ACL program in a future report that may be cited or directly appended to a license amendment request for supplemental ACLs. This license amendment request is currently expected to be submitted in 2023.

d. Annual Land Use Survey

License Condition 39 requires the licensee conduct an annual survey of land use. This license condition also requires the licensee to submit the results of the annual land use survey to the NRC by the first of July of each year. The licensee submitted the 2020 land use survey to the NRC by letter dated June 11, 2021 (ADAMS Accession No. ML21182A348).

The land use within two miles of the mill site included livestock grazing and utility distribution. The report noted that the nearest resident was located approximately three miles north-northeast of the mill site. This residence was occupied at the time of the inspection. There were no new land features or structures identified in 2020. In summary, the licensee conducted and submitted a land use land survey for 2020 in accordance with the requirements specified in License Condition 39.

4.3 Conclusions

The licensee implemented the environmental and groundwater monitoring programs and reported the results to the NRC as required by the license. Public doses were small fractions of the regulatory limit. The licensee continued to implement a work plan to collect and analyze information for a future application to change selected groundwater ACLs in the bedrock units. The licensee conducted a land use surveys as required by the license.

5 Exit Meeting Summary

The inspectors presented the inspection results to the licensee's representatives at the conclusion of the remote inspection on September 15, 2021. During the inspection, the licensee did not identify any information reviewed by the inspectors as proprietary.

SUPPLEMENTAL INSPECTION INFORMATION

PARTIAL LIST OF PERSONS CONTACTED

Licensee

C. Ardito, Principal Hydrogeologist, INTERA
K. Applegate, Site Principal
J. Bauman, Principal Hydrogeologist
M. Gorospe, Site Specialist
A. Persico, Environmental Scientist, INTERA
E. Ruedig, Senior Health Physicist
S. Ross, Site Manager
M. Schierman, Radiation Safety Officer, H3 Environmental
C. Short, INTERA
E. Woolsey, Hydrogeologist/Engineer, INTERA

U.S. Department of Energy, Office of Land Management

J. Glascock, Director, Office of Site Operations
M. Morse, Hydrogeologist, RSI
D. Ravelojaona, Site Lead, Navarro
D. Traub, Transition Manager, RSI
B. Tsosie, Site Project Manager

New Mexico Environment Department

A. Rheubottom, Geologist

INSPECTION PROCEDURES (IPs) USED

IP 83822	Radiation Protection
IP 88005	Management Organization and Controls
IP 88035	Radioactive Waste Processing, Handling, Storage, and Transportation
IP 88045	Effluent Control and Environmental Protection

ITEMS OPENED, CLOSED AND DISCUSSED

Opened

None

Closed

None

Discussed

None