UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION IV
612 EAST LAMAR BLVD, SUITE 400
ARLINGTON, TEXAS 76011-4125

September 8, 2010

Alan D. Cox
Project Manager
Homestake Mining Co.
P.O. Box 98
Grants, NM 87020

SUBJECT: NRC INSPECTION REPORT 040-08903/10-001

Dear Mr. Cox:

This refers to the routine announced inspection conducted on July 15 and a site visit on August 11, 2010, at the Homestake Mining site in Grants, New Mexico. The 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 and representative records, observations of activities, and interviews with personnel. The final inspection results were presented to you by telephone on September 7, 2010. The inspection determined that you were conducting operations in accordance with regulatory and license requirements. No violations were identified, and no response to this letter is required.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," 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 document system (ADAMS), accessible from the NRC website 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.

Should you have any questions concerning this inspection, please contact Ms. Linda M. Gersey, Health Physicist, at (817) 860-8299, or the undersigned at (817) 860-8197.

Sincerely,

/RA/

Jack E. Whitten, Chief
Nuclear Materials Safety Branch B

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

Enclosure:
NRC Inspection Report
040-08903/10-001

cc w/enclosure:
New Mexico State Radiation Control Program Director

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ENCLOSURE

U.S. NUCLEAR REGULATORY COMMISSION
REGION IV

Docket No.:	040-08903
License No.:	SUA-1471
Report No.:	040-08903/10-001
Licensee:	Homestake Mining Co.
Facility:	Former Grants Mill
Location:	Grants, Cibola County, New Mexico
Dates:	July 15 and August 11, 2010
Inspectors:	Linda M. Gersey, Health Physicist Nuclear Materials Safety Branch B Gerald A. Schlapper, Health Physicist Repository and Spent Fuel Safety Branch Robert J. Evans, Senior Health Physicist Repository and Spent Fuel Safety Branch Matthew Meyer, Hydrogeologist Decommissioning and Uranium Recovery Licensing Directorate Division of Waste Management and Environmental Protection Office of Federal and State Materials and Environmental Management Programs
Approved by:	Jack E. Whitten, Chief Nuclear Materials Safety Branch B
Attachment:	Supplemental Inspection Information

EXECUTIVE SUMMARY

Homestake Mining Company's Former Uranium Mill
NRC Inspection Report 040-08903/10-001

This inspection included a review of site status, management organization and controls, radiation protection, operator training, effluent control and environmental protection, and transportation and radioactive waste management. In summary, the licensee was conducting decommissioning operations safely and in accordance with regulatory and license requirements.

Management Organization and Controls

- The organizational structure and staffing levels were sufficient for the work in progress. Site procedures were established and were being maintained up-to-date. Annual audits were being conducted by third-party contractors, and the audits were thorough reviews of site radiation protection activities (Section 1).

Radiation Protection

- 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 results suggested that no individual had experienced an intake of uranium in recent years (Section 2).

Operator Training and Retraining

- Radiation protection training was provided to licensee employees and contractors as required by the license (Section 3).

Effluent Control and Environmental Protection

- The licensee had established groundwater and environmental monitoring programs as required by the license. Doses to members of the public were below the regulatory limit. The environmental and groundwater monitoring reports were submitted to the NRC as required by the license (Section 4).

Inspection of Transportation Activities and Radioactive Waste Management

- The licensee was conducting transportation and waste disposal operations in accordance with license requirements (Section 5).

Report Details

Site Status

The Homestake Mill operated from 1958 until 1990. The mill was decommissioned during 1993-1994. All mill buildings have been removed and the wind-blown tailings cleanup was completed in 1995. Two tailings piles remain onsite. The side slopes of the main tailings pile and the mill yard have a permanent radon barrier and an erosion protection cover. An interim cover is being maintained on top of the large tailings pile 1 and that portion of the small tailings pile that is not covered by the two lined evaporation ponds. In addition, two water collection ponds were installed adjacent to the small tailings pile.

Continuing activities at the site since the previous inspection include the operation of a reverse osmosis unit that supports the groundwater restoration program, drilling additional wells on the large tailing pile, operating and maintaining the dewatering system for the large tailings pile, and maintaining the groundwater restoration system. Work continues with flushing the large tailings pile which involves injecting water in to wells and removing water from nearby collection wells. The groundwater restoration consists of pumping the groundwater collection wells, operating the evaporation ponds, injecting clean water into the contaminated aquifer, and operating the reverse osmosis plant. A sprinkler system was in service in the evaporation ponds to enhance the evaporation rate. Enhanced evaporation was being conducted on a seasonal basis.

The licensee is in the process of constructing a third evaporation pond to enhance its water evaporation capabilities. The pond is located north of County Road 63, the main entry road into the site. The NRC approved the construction and operation of the third evaporation pond through amendment of the license on August 7, 2008. The inspectors reviewed engineering drawings of the pond that included cross-sections and liner details and found them satisfactory for construction. The pond is scheduled to be fully operational in the August to September 2010 time frame.

The licensee noted that the groundwater corrective action plan and the decommissioning plan are in revision. The revision is to be submitted to the NRC for approval within approximately one year.

On August 11, 2010, the inspectors conducted a brief site visit to determine if the site had sustained any damage caused by severe rainstorms on July 25, 2010. During the inspection it was determined that the rains caused surface water runoff that resulted in damage to several tailings pile berms and drainage pathways. Prior to the inspection, the licensee repaired some areas but the work was incomplete. For example, some minor erosion was still present on the sides of both the large and small tailing piles. The licensee stated that when the soils dry out, they will use a metal grader to repair the eroded areas. On the small tailings pile, the licensee reconstructed the berm and installed culverts in selected locations to help control the flow of future rains. The licensee also plans to install additional culverts to help prevent recurrence of future damage. The inspectors interviewed licensee staff and confirmed that the evaporation ponds, located on top of the small tailings pile, were not significantly impacted by the rains. The inspectors determined that pond water levels remained below the required freeboard limits during the rain events, and at no time did contaminated water escape from the evaporation ponds as presumed by local residents.

1 Management Organization and Controls (88005)

1.1 Inspection Scope

Determine if the licensee had established an organization to administer the technical programs and a program to perform internal reviews, self-assessments, and audits.

1.2 Observations and Findings

The licensee provided the inspectors with a current site organization chart. Site staffing consisted of nine Homestake employees. Site staffing had not changed since the last inspection. The ranking site manager was the project manager. The project manager also filled the position of radiation protection administrator and was responsible for the implementation of the radiation safety program. Other site workers included the site supervisor, senior project engineer, environmental technician, accountant, the utility operator/radiation manager and three additional utility operators. Contractors were used on an as-needed basis and included dirt movers, drillers, and security staff personnel. The inspectors concluded that the licensee had sufficient staff to conduct the work in progress including license compliance activities.

License Condition 23 requires, in part, that standard operating procedures be established for all operational activities involving radioactive materials. In addition, written procedures must be established for environmental monitoring, bioassay analysis, and instrument calibrations. The inspectors reviewed the licensee's procedures and determined that the procedures had been adequately established and implemented. The radiation protection administrator conducted annual procedure reviews.

A third-party contractor was used to conduct the annual As Low As Reasonably Achievable (ALARA) audits. The inspectors reviewed the ALARA audits for 2008-2009. The auditors reviewed the radiation protection program for trends and for potential non-compliances. The inspectors concluded that the annual ALARA audits were comprehensive, independent reviews of the licensee's radiation protection program.

1.3 Conclusions

The organizational structure and staffing levels were sufficient for the work in progress. Site procedures were established and were being maintained up-to-date. Annual audits were being conducted by third-party contractors, and the audits consisted of thorough reviews of site radiation protection activities.

2 Radiation Protection (83822)

2.1 Inspection Scope

Determine if the licensee's radiation protection program was in compliance with license and 10 CFR Part 20 requirements.

2.2 Observations and Findings

Occupational exposures were monitored using optically stimulated dosimeters that were exchanged quarterly. The dosimeters provided a record of external radiation exposures.

The inspectors reviewed the licensee's records for 2008 through the first quarter of 2010. During this time frame, the highest annual deep dose equivalent exposure was 25 millirems with a regulatory limit of 5,000 millirems. The inspectors found that actual external exposures were small fractions of the regulatory limit.

The licensee did not conduct internal dose assessments because there was no dry, exposed tailings material. In addition, routine air sampling was not required because there was no exposed tailing material. However, the licensee voluntarily operated a high volume air sampler on top of the main tailings pile. The air was sampled for concentrations of airborne natural uranium, radium-226, and thorium-230. The air sample results were consistently below one percent of the respective derived air concentration values specified in Appendix B to 10 CFR Part 20. This is an indication that the average airborne particulate concentrations during work activities on top of the large tailings pile are low.

The bioassay program requirements are specified in License Conditions 10, 23, and 32. Urine bioassays were conducted to monitor for potential intakes of uranium. The samples collected included baseline, termination, and semi-annual samples. Special samples were collected as required by radiation work permits (RWPs). The bioassay results for 2008 through the first quarter of 2010 were reviewed. No sample result exceeded the detection limit of 5 micrograms of uranium per liter of urine. These low bioassay sample results suggest that site workers' intake of uranium was effectively controlled by the licensee.

License Condition 14 specifies the criteria for release of equipment and packages from the restricted area. The inspectors reviewed the equipment release survey records from 2008 through the first quarter of 2010. To ensure consistency, the radiation manager conducted most of the equipment release surveys. Based on the licensee's records, nothing was released from the radiologically restricted area with contamination greater than the NRC-approved contamination limits.

Routine surface contamination surveys of clean areas are not required by the license. However, the licensee conducted area spot checks once a year. No contamination control problems were identified in 2008 or 2009.

All work involving tailings material, such as drilling into the large tailings pile, required an RWP. During this work, spot checks were performed to verify contamination control and to measure actual exposure rates. The inspectors reviewed the RWPs issued during 2008 through the first quarter of 2010. The RWPs provided sufficient guidance for protection of personnel from potential exposures to radioactive tailings material.

Ambient gamma radiation levels were measured by the inspectors during site tours. The radiation levels were measured using a Ludlum Model 19 microRoentgen (μR) survey meter (NRC No. 015540, calibration due date 04/06/11). With a background of 8-10 μR per hr (μR/hr), the conference room in the administration building read 8 μR/hr. Measurements during a walkover of the area where components of the old mill are buried in trenches resulted in readings in the range of background. Measurements were made at locations near evaporation pond number one and ranged from a maximum reading of 130 μR/hr at the edge of the pond to values in the 20-30 μR/hr range along the road that circles the pond. The inspectors also toured the reverse osmosis building, finding that radiation levels in the general area of the building were in the 8-12 μR/hr range.

The inspectors observed drilling activity into the large tailings pile. An RWP was used for this activity. Workers were observed to follow requirements of the RWP with emphasis on contamination control procedures. Drilling equipment remained within the restricted area of the site and will be surveyed out on completion of drilling activities. Radiation levels in the drilling area were in the 30-40 µR/hr range while samples of the drilling slurry read a maximum of 120 µR/hr. Readings along roads crossing the large tailings pile were approximately 10 µR/hr. In summary, no area was identified with ambient gamma exposure levels that met the definition of a radiation area (5000 µR/hr).

License Conditions 22 and 23 require, in part, that written instrument calibration procedures and calibration records be maintained. The inspectors reviewed the licensee's records and determined that survey instruments were being routinely calibrated. The licensee used a calibration schedule to keep track of instrument calibration due dates. The inspectors reviewed survey meters in service during the inspection, and the survey meters appeared operable with up-to-date calibrations. As part of the annual ALARA audit, the auditor reviewed the maintenance and calibration records. No compliance problems were identified during the annual ALARA audits for calendar years 2008 and 2009

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 limit. Bioassay sampling results suggested that no individual had experienced an intake of uranium in recent years.

3 Operator Training and Retraining (88010)

3.1 Inspection Scope

Determine whether the licensee was complying with regulations and license requirements related to the training of employees.

3.2 Observations and Findings

Site worker training requirements are provided in License Conditions 10, 22, and 32. Initial and annual refresher training is required for people working with groundwater or physical work with tailings material. Training for licensee employees was conducted by a third-party contractor in conjunction with the annual ALARA audit. The licensee's records indicated that refresher training was conducted during November 2008 and December 2009. Training for contractors is provided by the radiation protection administrator or the radiation manager and includes videotapes and an examination. In addition, the radiation protection administrator attended refresher training at an offsite location during March 2009. Although the radiation protection administrator's U.S. Department of Transportation training had expired, the licensee has not shipped any radioactive material in several years.

3.3 Conclusions

Radiation protection training was provided to licensee employees and contractors as required by the license.

4 Effluent Control and Environmental Protection (88045)

4.1 Inspection Scope

Determine if the environmental and effluent monitoring programs were effective to monitor the impacts of site activities on the local environment.

4.2 Observations and Findings

a. Environmental Monitoring

License Conditions 10, 15, and 23 specify, in part, the environmental monitoring program requirements. The program consists of air particulate, radon gas, and direct radiation sampling. The inspectors compared the program in operation at the time of the inspection to the requirements specified in the license. The inspectors confirmed that the licensee was implementing the environmental monitoring program as required by the license.

The inspectors reviewed the dose calculations to members of the public, as required by 10 CFR 20.1301. The licensee sums the airborne particulates (uranium-238, uranium - 234, radium-226, and thorium-260), radon gas, and direct gamma monitoring results from a monitoring station located within 100 yards from the nearest resident. For calendar year 2008, the total effective dose equivalent for a member of the public was shown to be 73.6 millirem. For calendar year 2009, the total effective dose equivalent for a member of the public was shown to be 46.8 millirem. The NRC annual limit for an individual member of the public from a licensee's operation is 100 millirem.

License Condition 36E states, in part, that the licensee is to verify compliance with the radon flux standard of 20 picoCuries per meter squared second (pCi/m^2-sec) by performing an annual radon flux survey on tailings piles. The inspectors reviewed the report for 2009 and noted an average flux for the small tailings pile of 5.6 pCi/m^2-sec and of 16.8 pCi/m^2-sec for the large tailings pile, confirming that the licensee is in compliance with the standard.

b. Environmental Groundwater and Surface Water Sampling

License Condition 15 states that the results of all effluent and environmental monitoring required by the license shall be reported to the NRC. The inspectors conducted random reviews of the licensee's groundwater monitoring program. The Semi-Annual Environmental Monitoring Report; Period – July through December 2009, submitted by letter dated February 25, 2010, was reviewed during the inspection. The licensee was found to be sampling and reporting the data from point of compliance (POC) wells D1, X, S4 and background well P as required by the license. The POC wells will be used in the future to demonstrate compliance with values set forth in License Condition 35B. The inspectors compared actual environmental groundwater data, as reported by a commercial analytical laboratory, to the data included in the reports being submitted to the NRC. The licensee was accurately reporting the groundwater data to the NRC in these routine reports.

c. Groundwater Restoration Program

License Condition 35 requires, in part, that groundwater compliance monitoring be implemented to assess the performance of the groundwater restoration program. The inspectors reviewed the procedures for the corrective action program and the annual report required under License Condition 35E. The 2009 annual report was submitted by letter dated March 31, 2010.

A Reverse Osmosis (RO) plant is authorized for groundwater remediation under License Condition 35C. The RO plant was constructed in 1999 and is used to treat water from the large tailings pile and the alluvial aquifer. The RO plant was operating at a capacity of 550 gallons per minutes (gpm) during the inspection of the facility. The RO plant processed an average of 231 gpm while producing an average of 171 gpm of product water that was used for re-injection during the operating period from January through December 2009. The RO plant is projected to operate at an average rate of approximately 350 gpm for 2010.

License Condition 35D authorizes the licensee to operate evaporation ponds EP1, EP2 and EP3, including the enhanced evaporation systems located in each pond. During the inspection, evaporation ponds EP1 and EP2 were in service, including the enhanced evaporation systems. Construction of evaporation pond EP3 commenced on June 7, 2010, and construction activities are expected to be completed during the fall of 2010. Construction activities were observed during the inspection.

During the inspection it was also determined that the evaporation ponds are inspected by a third party contractor on an annual basis. The annual inspections were most recently performed during November 2008 and November 2009. These reports stated that EP1 and EP2 were generally in good condition, although liner repairs were needed in certain areas. The northern portion of EP1 was repaired by the licensee during February 2010. At the time of this inspection, the southern end of EP1 still had liner underlayment problems that needed correcting. Although the liner was not apparently leaking at the time of the inspection, the repairs of foundation soils were necessary to prevent future damage to the liner material. The licensee could not conduct these repairs because the areas of concern were located underwater. Because the licensee has to lower the water level in EP1 before it could complete these repairs, EP3 has to be placed into service before the licensee can repair the liner in EP1.

4.3 Conclusions

The licensee had established groundwater and environmental monitoring programs as required by the license. Doses to members of the public were below the regulatory limit. The environmental and groundwater monitoring reports were submitted to the NRC as required by the license.

5 Inspection of Transportation Activities and Radioactive Waste Management (86740 and 88035)

5.1 Inspection Scope

Determine if transportation and waste disposal activities were being conducted in compliance with license requirements.

5.2 Observations and Findings

The licensee continued to dispose of radioactive wastes in a portion of the small tailings pile that was not covered by evaporation pond EP1. The disposed material included inoperative pumps, reverse osmosis filters, and reverse osmosis membranes.

License Condition 26 specifies, in part, that the licensee shall keep records of transfers of all mill tailings. The licensee stated that, since the previous inspection, there were no outgoing shipments of tailings material and no incoming shipments of waste material for disposal. Further, the licensee does not expect to ship any mill tailings or to receive material for disposal at any time in the future.

License Condition 41 specifies, in part, the reporting and documentation requirements for unplanned releases, spills, leaks, and excursions. Based on the licensee's records and employee interviews, the inspectors determined that no spills, leaks, or excursions have occurred since the last inspection.

5.3 Conclusions

The licensee was conducting transportation and waste disposal operations in accordance with license requirements.

6 Exit Meeting Summary

The inspectors presented the preliminary inspection results to the licensee's representatives at the conclusion of the onsite inspection on August 11, 2010. The final inspection results were presented to licensee management by telephone on September 7, 2010. During the inspection, the licensee did not identify any information reviewed by the inspectors as proprietary.

ATTACHMENT

PARTIAL LIST OF PERSONS CONTACTED

Licensee

A. Cox, Project Manager, Radiation Protection Administrator
D. Kump, Senior Project Engineer
A. Venable, Radiation Manager

ITEMS OPENED, CLOSED, AND DISCUSSED

Open

None

Closed

None

Discussed

None

INSPECTION PROCEDURES USED

IP 88005	Management Organization and Control
IP 83822	Radiation Protection
IP 88010	Operator Training and Retraining
IP 88045	Effluent Control and Environmental Protection
IP 86740	Inspection of Transportation Activities
IP 88035	Radioactive Waste Management

LIST OF ACRONYMS USED

ALARA	as low as is reasonably achievable
gpm	gallons per minute
NRC	Nuclear Regulatory Commission
pCi/m^2s	picoCuries per meter squared second
POC	point of compliance
RO	reverse osmosis
RWP	Radiation Work Permit
µR/hr	microRoentgens per hour