



UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION IV
611 RYAN PLAZA DRIVE, SUITE 400
ARLINGTON, TEXAS 76011-4005

September 10, 2007

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

SUBJECT: NRC INSPECTION REPORT 040-08903/07-001

Dear Mr. Cox:

This refers to the non-routine inspection conducted on July 25, 2007, at the Homestake Mining site in Grants, New Mexico. The purpose of the inspection was to conduct a follow up review of a recent voluntary report of a radon flux measurement exceedance on the large tailings pile. 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.

Details of the inspection were presented to your staff at the conclusion of the onsite inspection. In addition, a final exit briefing was held with you telephonically on August 30, 2007. The enclosed report presents the results of this inspection.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter, its enclosures, and your response (if any) 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 Web site at 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 the undersigned at (817) 860-8191 or Mr. Robert J. Evans, Senior Health Physicist, at (817) 860-8234.

Sincerely,

/RA/

D. Blair Spitzberg, PhD, Chief
Fuel Cycle and Decommissioning Branch

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

Enclosure: As stated

Homestake Mining Co.

-2-

cc w/enclosure:

John Parker, Chief
New Mexico Environment Department
Field Operations Division
Radiation Control Bureau
1190 St. Francis Blvd.
Santa Fe, NM 87502-6110

Thomas C. Pauling, Team Leader
U.S. Department of Energy
Office of Legacy Management
2597 B 3/4 Rd.
Grand Junction, CO 81503

bcc w/enclosure (via ADAMS e-mail distribution):

LDWert

WVonTill, FSME/DWMEP/DURLD

DTMandeville, FSME/DWMEP/DURLD

RLinton, FSME/DWMEP/DURLD

DBSpitzberg

JEWhitten

JMRazo

JFKatanic

RJEvans

RITS Coordinator

FCDB File

RIV Nuclear Materials File - 5th Floor

SUNSI Review Completed: RJE ADAMS: ☒ Yes ☐ No Initials: RJE

☒ Publicly Available ☐ Non-Publicly Available ☐ Sensitive ☒ Non-Sensitive

DOCUMENT NAME: s:\dnms\!fcdb\!rje\70890301.wpd

final r:_DNMS\

RIV:DNMS:FCDB	C:FCDB
RJEvans	DBSpitzberg
/RA/	/RA/
08/31/07	09/10/07

OFFICIAL RECORD COPY

T=Telephone

E=E-mail

F=Fax

U.S. NUCLEAR REGULATORY COMMISSION
REGION IV

Docket No.: 040-08903

License No.: SUA-1471

Report No.: 040-08903/07-001

Licensee: Homestake Mining Co.

Facility: Former Grants Mill

Location: Grants, Cibola County, New Mexico

Dates: July 25, 2007

Inspector: Robert Evans, PE, CHP, Senior Health Physicist
Fuel Cycle & Decommissioning Branch

Accompanied by: Jason M. Razo, Health Physicist
Nuclear Materials Inspection Branch

Douglas T. Mandeville, Geotechnical Engineer
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: D. Blair Spitzberg, PhD, Chief
Fuel Cycle & Decommissioning Branch

Attachment: Supplemental Inspection Information

EXECUTIVE SUMMARY

Homestake Mining Company's Former Uranium Mill NRC Inspection Report 040-08903/07-001

This inspection included a review of site status, onsite construction, and radioactive waste management. In particular, the inspector conducted a followup review of the licensee's reporting of the possible exceedance of a licensed radon flux standard.

Onsite Construction & Radioactive Waste Management

- During February 2007, the licensee reported an exceedance of the average radon release rate from the large tailings pile for 2006. The large tailings pile has an interim cover on the top of the pile and a final cover on the side slopes of the pile. Corrective actions taken by the licensee included installation of additional interim cover material which reduced the radon release to below the license and regulatory standard (Section 1).
- The failure to submit the 2004 and 2005 annual radon flux test results to the NRC by the license-required deadline was determined to be a violation of minor significance (Section 1).

Report Details

Site Status

The Homestake Mill operated from 1958 until 1990. The mill was decommissioned during 1993-1994. Two tailings piles remain onsite. The large tailings pile (LTP) was covered with an interim radon barrier cover on top of the pile, and a final cover was installed on the side slopes. The small tailings pond (STP) has two lined water evaporation ponds that were installed on top of the pile. In addition, two water collection ponds were constructed adjacent to the STP.

At the time of the inspection, groundwater remediation was the major activity in progress at the site. The final radon barrier will be constructed on the STP following completion of groundwater remediation and reclamation of the evaporation ponds. The LTP was still being flushed and dewatered during the inspection. The final radon barrier will be constructed on top of the LTP following completion of groundwater remediation within the pile and verification of pile settlement.

1 Onsite Construction and Radioactive Waste Management (88001, 88035)

1.1 Inspection Scope

By letter dated February 23, 2007, the licensee notified the NRC that the 2006 radon flux survey for the LTP averaged 20.6 pCi/m²s, a value slightly above the radon flux standard specified in the license. As a result of this notification, the NRC elected to conduct a detailed, onsite review of the exceedance including review of the corrective actions taken by the licensee in response to the elevated test results.

The purpose of the inspection was to verify that on-site construction and waste management activities were being conducted in accordance with the license application, license conditions, and construction specifications.

1.2 Observations and Findings

Regulation 10 CFR Part 40, Criterion 6A(2) states, in part, that the NRC may approve a licensee's request to extend the time for performance of milestones related to emplacement of the final radon barrier if the NRC finds that the licensee has adequately demonstrated that releases of radon-222 do not exceed an average of 20 pCi/m²s. If the delay is approved on the basis that the radon releases do not exceed 20 pCi/m²s, a verification of radon levels must be made annually during the period of delay.

By letter dated October 28, 2003, the licensee requested an extension for selected reclamation milestones. The licensee proposed an extension from December 2003 until December 2012 for placement of the final radon barrier on top of the LTP. The licensee justified the request with results from a radon flux test that was conducted during 2003. The NRC accepted the licensee's request and issued Amendment 36 to the license on February 6, 2004, which included the requested time extension in License Condition 36.E.

In accordance with License Condition 36.E, the licensee is required to verify compliance with the radon flux standard by performing radon flux surveys on the LTP and the STP on

an annual basis, until the final radon barriers are installed on the two piles. Further, the license condition requires that an annual report detailing the results of these surveys be submitted to the NRC no later than March 31st of each year.

As noted earlier, the baseline radon flux measurements were collected in October 2003. The test consisted of measurement of the radon flux at 100 or more different locations as required by Criterion 6(2). The licensee has tested both piles on an annual basis since 2003. The sample results for calendar years 2003-2006 are provided below:

Average Radon Flux Measurements, pCi/m ² s		
Year	LTP	STP
2003	14	5.58
2004	20.3 (retest results-19.1)	7.7
2005	15.3	8.21
2006	20.6 (retest results-18.1)	6.9

The licensee stated that the average radon flux measurements varied from year to year because of dryness of the surface during testing, changes in water levels within the LTP, and erosion of interim cover material on top of the LTP.

As noted in the Table above, two average radon flux measurements (2004 and 2006) initially exceeded the 20 pCi/m²s standard. After identification of each exceedance, the licensee installed additional interim cover material on the LTP. A retest was conducted after installation of additional cover material, and the resulting average radon flux measurements were subsequently below the 20 pCi/m²s standard.

License Condition 37 provides the reclamation requirements for the LTP and STP. Reclamation Technical Specification B4 provides the tailings impoundment soil cover requirements. Specification B4, Section B.3 states that the top surface of the large impoundment will be covered with 1 foot of uncontaminated soil as an interim cover. The licensee stated that the interim cover material varied between 12-18 inches before the exceedances and that at least 6 inches of cover material was added to certain locations after discovery of the exceedances. The total soil thickness (interim cover plus additional cover) varied from 18-24 inches in areas where the additional cover material was installed.

The inspectors toured the areas where the additional cover material had been installed. The licensee reworked about 8 acres of the LTP during 2004 and about 5.4 acres during 2007 in response to the 2006 test results. The licensee stated that the soil used in 2004 came from a borrow area located north of the site. About 5,770 cubic yards of borrow material was added to the LTP. Approximately 6,600 cubic yards of material was added to the LTP in 2007. This soil was collected from nearby land being irrigated with groundwater.

Finally, the inspector noted that the licensee submitted the 2004 and 2005 test results to the NRC by email dated May 10, 2006. The failure to submit the 2004 and 2005 reports to

the NRC by the March 31st deadline specified in the license was a violation of License Condition 36.E. However, this failure constitutes a violation of minor significance and is not subject to formal enforcement action. Although the reports were not submitted to the NRC in a timely manner, the licensee identified this administrative error and subsequently submitted the reports to the NRC. The licensee subsequently changed its reporting methodology, and the licensee reported the 2006 results in a timely manner.

The inspector concluded that installation of the final radon barrier on the LTP should permanently eliminate the potential for future radon flux exceedances. As noted earlier, the target date for the installation of the final radon barrier on the LTP is December 2012. The target date for the final radon barrier on the STP is December 2013.

1.3 Conclusions

During February 2007, the licensee reported an exceedance of the average radon release rate from the LTP for 2006. The LTP has an interim cover on the top of the pile and a final cover on the side slopes of the pile. Corrective actions taken by the licensee included installation of additional interim cover material which reduced the radon release to below the license and regulatory standard.

The failure to submit the 2004 and 2005 annual radon flux test results to the NRC by the license-required deadline was determined to be a violation of minor significance.

2 **Exit Meeting Summary**

The inspector presented the preliminary inspection results to the licensee's representatives at the conclusion of the onsite inspection on July 25, 2007. A final exit briefing was held with the licensee on August 30, 2007. The licensee did not identify any information reviewed by the inspectors as propriety.

PARTIAL LIST OF PERSONS CONTACTED

Licensee

K. Baker, Consultant, Environmental Restoration Group
D. Kump, Utility Operator
A. Venable, Senior Radiation Safety Technician

ITEMS OPENED, CLOSED, AND DISCUSSED

Open

None

Closed

None

Discussed

None

INSPECTION PROCEDURES USED

IP 88001	Onsite Construction
IP 88035	Radioactive Waste Management

LIST OF ACRONYMS USED

LTP	large tailings pile
IP	NRC Inspection Procedure
NRC	Nuclear Regulatory Commission
pCi/m ² s	picocuries per meter-squared second
STP	small tailings pile