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ORISE

OAK RIDGE INSTITUTE FOR SCIENCE AND EDUCATION

September 23, 1996

Ms. Elaine Brummett
Division of Waste Management - NMSS
U.S. Nuclear Regulatory Commission
Two White Flint North T7-J09
11555 Rockville Pike
Rockville, MD 20852

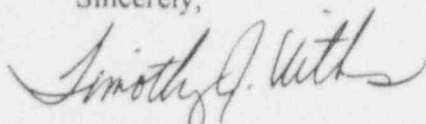
**SUBJECT: FINAL SITE-SPECIFIC DECOMMISSIONING INSPECTION PLAN FOR
HOMESTAKE MINING COMPANY OF CALIFORNIA, GRANTS, NEW
MEXICO (RFTA NO. 96-16)**

Dear Ms. Brummett:

Enclosed is the final site-specific decommissioning inspection plan for the Homestake Mining Company of California facility in Grants, New Mexico. This site-specific plan was based on the draft generic inspection plan for uranium mills and a review of the licensee's documentation. Attachment A contains the spending plan for this project.

If you have any questions, please direct them to me at (423) 576-5073 or Eric Abelquist at (423) 576-3740.

Sincerely,



Timothy J. Vitkus
Survey Projects Manager
Environmental Survey and
Site Assessment Program

TJV:dka

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Enclosure

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**REVISED SITE-SPECIFIC DECOMMISSIONING INSPECTION PLAN FOR
HOMESTAKE MINING COMPANY OF CALIFORNIA
GRANTS, NEW MEXICO**

Provided is the inspection plan for the Homestake Mining Company of California in Grants, New Mexico. This plan should be used as a checklist. The major elements of this site-specific inspection plan include the following six areas:

- 1.0 GENERAL**
- 2.0 IDENTIFICATION OF CONTAMINANTS AND GUIDELINES**
- 3.0 FINAL STATUS SURVEY PROCEDURES AND INSTRUMENTATION**
- 4.0 ANALYTICAL PROCEDURES FOR SOIL SAMPLES**
- 5.0 FINAL STATUS SURVEY RESULTS**
- 6.0 MISCELLANEOUS**

The following NRC Inspection Procedures may be used for guidance, in part, during this inspection:

- MC 1230 Quality Assurance Program for Radiological Confirmatory Measurements
- MC 2560 Decommissioning Inspection Program
- MC 2602 Decommissioning Inspection Program for Fuel Cycle Facilities and Materials Licensees
- MC 2801 11e.(2) Byproduct Material Disposal Site and Facility Inspection Program
- Procedure 83890 Closeout and Inspection Survey

Portions of the following documents will be used for guidance during this inspection:

- NUREG/CR-5849 Manual for Conducting Radiological Surveys in Support of License Termination
- Homestake Mining Company of California Completion Report for the Reclamation of the Off-Pile Areas

1.0 GENERAL

- 1.1 Review the past operational radiological surveys that were used to demonstrate radiological control of the uranium mill. Are there any records of spills or other releases of yellowcake other than the February 1977 occurrence? If so, do the records adequately document the cleanup of these releases of material?
- 1.2 Review the results of characterization surveys for justification of the classification of uranium mill areas—specifically, the delineation of the Inner and Outer Area boundary.
- 1.3 Review the specific procedures that were used to remediate windblown contamination. Consider the potential for incomplete remediation based on these remedial action techniques—particularly the potential for the remedial actions to produce areas of localized contamination. What was the procedure for performing and documenting these remedial action support (excavation control) surveys?
- 1.4 Review the transportation routes for moving the windblown materials to the tailings piles. Has the licensee documented that these transportation routes have been adequately surveyed?

2.0 IDENTIFICATION OF CONTAMINANTS AND GUIDELINES

- 2.1 Review the past analytical results to confirm the nature of the contaminants throughout the Outer Area. Has uranium ore contamination been adequately characterized and distinguished from the tailings contamination?
- 2.2 Evaluate how the licensee has addressed the potential for residual Th-230 contamination. Determine whether additional analysis of samples is necessary to perform this evaluation.
- 2.3 The soil guideline for Ra-226 is in terms of depth distribution—i.e., 5 pCi/g averaged over the top 15 cm and 15 pCi/g for any 15 cm layer below the top 15 cm. Has the gamma correlation to Ra-226 concentration adequately accounted for the depth dependency of the Ra-226 guideline? Determine whether post-remedial action surveys identified additional Ra-226 contamination at depths greater than the surficial 15 cm.

3.0 FINAL STATUS SURVEY PROCEDURES AND INSTRUMENTATION

- 3.1 Review situations where an area's classification was changed based on accumulated survey data from scoping and characterization surveys. Were these reclassifications clearly documented?

- 3.2 Determine whether the licensee has performed sufficient background soil sample analyses to adequately assess the true Ra-226 background level and its variability to ensure that there are no potential problems relative to health and safety. Evaluate appropriateness of locations selected for background sampling.
- 3.3 Evaluate the correlation data for correcting gamma radiation data from NaI scintillation detectors to soil concentration; particularly the number of analytical samples that were used to verify these correlations. In addition, were these correlation factors reexamined by the licensee as the surveys progressed and additional data became available. Determine the magnitude of the uncertainty in the correlation factor—evaluate the impact of the correlation factor uncertainty on the uncertainty in the calculated Ra-226 concentration.
- 3.4 Determine the use of investigation levels for gamma measurements using the gamma walkover method and GPS survey methods. Determine if the change in the distance of the detector to the ground surface between the two methods affected the gamma correlation factors.
- 3.5 Did the licensee perform appropriate follow-up actions based on gamma measurements that exceeded the Ra-226/gamma correlation action levels?
- 3.6 Evaluate the methodologies used for soil sampling and compositing. By reviewing grid coordinates for selected grid blocks where potential residual contamination was detected during surface scans, determine if sample locations were appropriately selected that would provide an accurate representation of the average residual activity within selected 100 m² areas.

4.0 ANALYTICAL PROCEDURES FOR SOIL SAMPLES

- 4.1 Review both the licensee's and their contract laboratory analytical procedures for radiological analyses—particularly the analysis of soil samples by gamma spectrometry. Specifically:
 - Evaluate the lab's sample preparation techniques—geometries used for gamma spectrometry on soil samples, ingrowth period for Ra-226 progeny, etc.
 - Review the protocol the lab uses to interpret the gamma spectrometry results, particularly the radionuclide photopeaks used to identify various contaminants.
 - Review the laboratory QA/QC procedures, including duplicates, blanks, and matrix spikes. Determine the frequency of analysis for each of the QC checks.
 - Determine whether the lab participates in some sort of cross-check or performance evaluation program, such as that offered by EML and EPA.

- 4.2 Review the interlaboratory QA results for analysis of Ra-226 in soil samples. Have appropriate acceptance criteria been implemented for the comparison of sample data? Have any discrepancies in sample data been investigated and resolved, and adequately documented?

5.0 FINAL STATUS SURVEY RESULTS

- 5.1 Review survey results for those areas where investigations have been conducted. If initial survey data has been replaced or supplemented as a result of the investigation, ensure that the replacement data is annotated in the final report. The annotation is intended to alert the reviewer that the initial data has been replaced and that follow-up activities such as additional remediation were performed.
- 5.2 Select completed survey data and review data for compliance with procedures and final survey plan. In particular, determine how area-weighted averages over 100 m² were performed and documented.
- 5.3 Review survey results to ensure compliance with guidelines and conditions and determine that averaging was adequately performed—such as for soil concentrations.
- 5.4 Review the documentation for scan surveys. How were technicians instructed to identify and investigate any elevated readings while scanning—were locations of elevated measurements properly documented? Does documentation indicate how the hot spots were treated—e.g., either remediated or averaged over 100 m²?
- 5.5 Review survey results from the raffinate line removal—does the data indicate compliance with guidelines? Were the number and quality of data sufficient to demonstrate compliance with guidelines?
- 5.6 For the windblown areas (Outer Zones) contiguous with the inner most portion of the Outer Zone, were there any locations of positive levels of contamination that justified the use of a greater sampling frequency similar to that used for the inner most portion?

6.0 MISCELLANEOUS

- 6.1 Identify any decommissioning program-specific observations concerning the overall performance of the licensee's decommissioning and final survey program.
- 6.2 Verify that any commitments made by the licensee were incorporated into the plan and implemented into the procedures.

- 6.3 Review the qualifications and training for survey technicians and other project personnel. Qualifications should include, in part, specific training on performing the survey tasks described in the final status survey procedures, data reduction procedures, and training on QA/QC procedures related to the final status survey.
- 6.5 Perform gamma readings with μ R meter at random and suspect locations, in windblown areas and on cell covers.
- 6.6 Select archived soil samples so that independent laboratory analysis for Ra-226 and Th-230 may be performed.

Attachment A

FY 96 - 97 SPENDING PLAN	PERFORMANCE PERIOD	
	From	To
Name of Laboratory: Oak Ridge Institute for Science and Education	Sep-96	Sep-96
	RFTA	Est. Project Cost
Title of Project: #658 Homestake Site Specific Inspection Training, Grants, NM	96-11	\$8,000.00
	NRC Fin Number	ORISE Number
TAC Number:	A9093	1286.01

COST ELEMENTS	Aug-96	Sep-96	Oct-96	Nov-96
Direct Costs	\$0.00	\$6,061.00	\$0.00	\$0.00
Indirect Costs- (G&A, DOE Factor)	\$0.00	\$1,939.00	\$0.00	\$0.00
Total Estimate Costs	\$0.00	\$8,000.00	\$0.00	\$0.00
Project Completion	0.00%	100.00%	100.00%	100.00%
COST ELEMENTS	Dec-96	Jan-97	Feb-97	Mar-97
Direct Costs	\$0.00	\$0.00	\$0.00	\$0.00
Indirect Costs- (G&A, DOE Factor)	\$0.00	\$0.00	\$0.00	\$0.00
Total Estimate Costs	\$0.00	\$0.00	\$0.00	\$0.00
Project Completion	100.00%	100.00%	100.00%	100.00%
COST ELEMENTS	Apr-97	May-97	Jun-97	Jul-97
Direct Costs	\$0.00	\$0.00	\$0.00	\$0.00
Indirect Costs- (G&A, DOE Factor)	\$0.00	\$0.00	\$0.00	\$0.00
Total Estimate Costs	\$0.00	\$0.00	\$0.00	\$0.00
Project Completion	100.00%	100.00%	100.00%	100.00%

ACTIVITY INFORMATION	Hours	Estimated Cost
Site Visit	0.0	\$0.00
Document Review	0.0	\$0.00
Presurvey	8.0	\$1,100.00
Travel- Labor	18.0	\$2,300.00
Travel- Other Expenses		\$2,300.00
Survey Activities	18.0	\$2,300.00
Report Preparation	0.0	\$0.00
Sample Analysis	0.0	\$0.00
Other	0.0	\$0.00
Total	44.0	\$8,000.00