



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

July 24, 2003

Lt. Col. Kali Mather  
Department of the Air Force  
USAF Radioisotope Committee  
HQ AFMOA/SGZR  
110 Luke Ave, Suite 405  
Bolling AFB, DC 20322-7050

**SUBJECT: NRC INSPECTION REPORT 030-28641/2003-003**

Dear Lt. Col. Mather:

An NRC inspection was conducted on May 20-22, 2003, at Kirtland Air Force Base (KAFB), New Mexico. The inspection was limited to a review of decommissioning activities authorized under Master Materials License 42-23539-01AF and Air Force Permit No. NM-03110-01/07AFP for site OT-10. A preliminary exit briefing was conducted with the KAFB staff at the completion of the onsite inspection and during a telephonic conference call on June 3, 2003. A final exit briefing was conducted telephonically on July 17, 2003, with KAFB. The enclosed report presents the results of this inspection. No violations of NRC regulations were identified.

During the inspection, the inspector observed a number of decommissioning tasks being undertaken with no written and approved procedures established and implemented for control of these tasks. Some of the specific tasks identified at the time of the inspection were promptly addressed and corrected, however, there appeared to be no procedural control for other specific tasks underway. In order to resolve this matter, during a telephonic conference held June 3, 2003, we requested that you provide Region IV a list of all major decommissioning tasks that will be performed during the decommissioning of Site OT-10 for which procedures would be established. This list was received in our office on June 25, 2003, and will be reviewed in an upcoming inspection.

In addition, the inspection also covered the work in progress related to the remediation of TS7 in meeting the approved final site-specific derived concentration guideline levels regarding release for unrestricted use. Remediation and soil sampling activities conducted by your staff were observed. Five soil samples from TS7 and one from your background reference area were collected for analysis by the NRC as part of the NRC's confirmatory sampling program. The analytical results of these soil samples were compared with the results of the soil samples collected at the same locations by KAFB. The results of these confirmatory samples are included in this report.

In accordance with 10 CFR 2.790 of the NRC's "Rules of Practice," a copy of this letter, its enclosure, and your response (if any) will be made available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of NRC's document system (ADAMS). ADAMS is accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

Department of the Air Force

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Should you have any questions concerning this inspection, please contact Mr. R. Rick Muñoz at (817) 860-8220 or the undersigned at (817) 860-8191.

Sincerely,

*/RA/*

Jacqueline D. Cook, Acting Chief  
Nuclear Materials Licensing Branch

Docket No.: 030-28641  
License No.: 42-23539-01AF

Enclosure:  
NRC Inspection Report  
030-28641/2003-003

cc w/enclosure:  
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**ENCLOSURE**

U.S. NUCLEAR REGULATORY COMMISSION  
REGION IV

Docket No. 030-28641

License No. 42-23539-01AF

Air Force Permit No. NM-03110-01/07AFP

Report No. 030-28641/2003-003

Licensee: Department of the Air Force

Facility: Installation Restoration Program Site OT-10  
Training Sites TS5, TS6, TS7, and TS8

Location: Kirtland Air Force Base  
Albuquerque, New Mexico

Dates: May 20-22, 2003

Inspector: Rick Muñoz, Health Physicist  
Fuel Cycle and Decommissioning Branch

Approved By: D. Blair Spitzberg, Ph.D., Chief  
Fuel Cycle and Decommissioning Branch

Attachment: Supplemental Information

## **EXECUTIVE SUMMARY**

Department of the Air Force  
NRC Inspection Report 030-28641/2003-003

Kirtland Air Force Base has been conducting site remediation activities at the OT-10 former training sites TS5, TS6, TS7 and TS8 in preparation for the remediation of four sites for unrestricted release. This inspection included a review of the site status, radiation protection, remediation activities, confirmatory samples, sample preparation, in-process review of decommissioning efforts and an examination of transportation and radioactive waste management and waste disposal activities. The inspection included the collection and analysis of soil samples from TS7 former training site.

### **Site Decommissioning Status and Review**

- The Permittee had established a program that was in compliance with the decommissioning plan (DP) requirements, and the program was adequate for the remediation work to be performed. Site decommissioning activities were being conducted in accordance with the applicable license conditions, decommissioning plan and regulatory requirements. Security and control of contaminated material had been maintained by the licensee. No health or safety hazards were identified. Remediation was being conducted in accordance with the decommissioning plan (Section 1).
- The Permittee had sufficient staff to implement the work, including ample staff for the health and safety program. The training program was in compliance with the DP and requirements of 10 CFR 19.12, "Instruction to Workers" (Section 1).
- A radiation protection program had been established with adequate equipment and procedures necessary to implement the health and safety program as stipulated in the decommissioning plan. Site specific procedures for all major tasks associated with decommissioning activities, including construction activities, were not complete. This issue is being tracked as an Inspection Follow-up Item and will be reviewed during a future inspection (Section 1).
- The licensee had effectively monitored and minimized exposure from airborne radioactive material related to current decommissioning activities in TS6 (Section 1).
- The respiratory protection program was effectively implemented to protect workers from potential airborne radiological hazards (Section 1).
- Transportation and waste activities were being conducted in accordance with the decommissioning plan and 10 CFR Part 20, Appendix G, requirements (Section 1).

In-Process Confirmatory Survey

- Five soil samples were collected from TS7 and one from the background reference area. The samples were split for analysis by both the licensee's and NRC's laboratories for confirmatory analysis and comparison of results. The results indicate that thorium-232 and uranium-238 concentrations were below the approved decommissioning plan derived concentration guideline levels (Section 2).
- All six split soil sample results were in agreement with the NRC's test of analytical comparison with the licensee's results (Section 2).

## Report Details

### **Summary of Facility Status**

From 1961 through 1990, four sites seeded with thorium sludge were used by the Air Force for training of radiological response personnel. The four training sites were designated as TS5, TS6, TS7, and TS8. During August 2002, the Air Force submitted a revised decommissioning plan (DP) to the NRC for the remediation of these four sites for release for unrestricted use. NRC subsequently reviewed and approved the DP. NRC Materials License 42-23539-01AF was amended on January 6, 2003, to incorporate the revised DP into License Condition 20.P.

At the time of the onsite inspection, the Air Force Permittee had completed decommissioning activities in TS7 and TS5 but were in the process of assessing whether additional remediation would be required in TS5. The Permittee was actively decommissioning training site TS6. The Permittee planned to complete the remediation of all four training sites by October 2003.

### **1 Decommissioning Inspection Procedure for Materials Licenses (87104)**

#### **1.1 Inspection Scope**

This inspection was performed to determine whether decommissioning activities were being conducted in accordance with NRC requirements and the NRC-approved DP.

#### **1.2 Observations and Findings**

##### **a. Organizational Structure**

The remediation work was being conducted by Montgomery Watson Harza (MWH) Americas, Inc., the prime contractor. MWH Americas also provides project management oversight. A subcontractor, MKM Engineers, provides the operators and heavy equipment for site remediation construction activities. MKM Engineers also serves as a waste broker and is responsible for shipment of the radioactive wastes for permanent disposal. A second subcontractor, Environmental Restoration Group (ERG), implements the site radiation protection program and conducts selected radiological surveys. Following a review of the work scope, the inspector concluded that the Permittee had sufficient staff to conduct decommissioning and implement the health and safety program.

Section 4.1.1 of the DP states that all contractor-performed activities will be monitored by the Air Force to assure compliance with the DP and health and safety plans. The Permittee conducts routine site visits to oversee the remediation activities. During the onsite inspection, the Permittee was conducting a formal audit of the remediation activities. The results of the audit will be reviewed during the next inspection.

b. Radiation Protection Program

The DP requires that general work area monitoring be conducted to assess potential radiation exposures to workers. Personnel monitoring consisted of both external and internal exposure monitoring. The Permittee issued optically stimulated dosimeters to workers for external exposure monitoring, and the Permittee planned to use air samplers to monitor for internal exposures. In accordance with DP commitments, the Permittee planned to exchange and analyze the dosimeters on a quarterly basis during decommissioning.

Internal exposure monitoring consisted of air sampling. The Permittee used an intermediate volume air sampler to obtain grab samples of the work environment. Lapel air samplers were also being issued to selected workers to supplement the general work area air sampling data. The inspector noted that the Permittee's air sampling program had been implemented in accordance with DP requirements. Filters were being counted for gross alpha at the on-site counting laboratory, after the filters were aged for radon progeny decay. If an individual were exposed to an average gross alpha concentration exceeding 10 percent of the derived air concentration (DAC) in 10 CFR Part 20 Appendix A for respirator use, the sample would be sent to an off-site laboratory for analysis. No individual exposures initiated off-site analysis to assess committed effective dose equivalent calculation.

Initial whole body counts were conducted on all site workers, with three exceptions. All workers submitted baseline urine samples. Future bioassay samples will be conducted at the discretion of the site radiation safety officer based on work conditions or in response to incidents.

The DP states that radon monitoring would be performed prior to beginning work and periodically thereafter. Prior to commencement of work, the Permittee conducted radon progeny sampling. The sample results were zero, although the site radiation safety officer acknowledged that the samples had been collected on a windy day. The site radiation safety officer stated that radon progeny sampling would be conducted weekly to fulfill the DP commitment of periodic monitoring. The results of future weekly samples would be used to ascertain whether additional work controls will be necessary to protect workers from radon progeny exposures. Respiratory protection is required for work within the TS sites to protect workers from potential for airborne radiological exposure.

The inspector observed the Permittee's radiological survey instruments being used to implement the radiation protection program. The inspector noted that all instruments in use had been checked for calibration before use. The DP states that the response of survey instruments will be compared periodically to check sources to confirm constancy. The Permittee had appropriate check sources available for use in instrument response checks.

The Permittee created a contamination reduction zone between the restricted area and the project support zone. An exercise was performed to verify the adequacy of contamination reduction zone procedures and processes. Several procedures were updated to implement lessons learned by the Permittee's staff observing and



participating in the exercise. Procedure updates included re-zoning the contamination reduction area to better accommodate employees entering and exiting the radiologically restricted area as well as updating the process of donning and doffing personal protective equipment.

The DP states that facilities within the support zone will be monitored for surface contamination. The Permittee had developed a program to ensure that facilities, including lunchrooms, offices, and the contamination reduction zone, would be routinely surveyed for contamination. The Permittee was conducting these surveys at least weekly in accordance with the DP. The Permittee had the procedures and equipment available during the inspection to conduct these weekly contamination surveys.

The Permittee established and implemented an environmental monitoring program that included use of four sampling stations, three site perimeter stations and one background station. Air filters were routinely exchanged and counted for gross alpha activity. These sample results were then compared to the most restrictive action level (thorium-232) of 6E-15  $\mu\text{Ci/ml}$ . Sample results reviewed demonstrated that monitoring stations reflected airborne radioactivity at levels near or at background for the site.

The Permittee used radiation work permits to control worker health and safety. The Permittee issued three radiation work permits. The inspector reviewed the permits and noted that all three provided sufficient personal protective equipment requirements. Workers were required to sign the respective radiation work permit to ensure their understanding of work requirements. Based on observation of workers entering and exiting the radiologically restricted area, the inspector noted that each worker had complied with the personal protective equipment requirements of the radiation work permits.

Section 4.1.5 of the DP lists the standard operating procedure requirements for radiation protection. It states, in part, that written standard operating procedures will be required for performing all major tasks associated with the DP. Section 3.2.1, states, that detailed construction procedures are currently being prepared for OT-10 decommissioning associated with excavating and loading contaminated soil. The inspector briefly reviewed site procedures and noted that procedures were limited and did not include procedures for some major tasks related to construction activities. For example, the intermodal waste sample collection activities did not have written procedures. Composite sampling from one intermodal container to the next was not consistent. The inspector discussed the lack of site specific procedures to assure quality and procedural control of decommissioning activities. The Permittee stated it would reconsider several procedures and processes and write procedures for all major tasks associated with the decommissioning activities. Procedure 4-01, "Waste Sampling Procedures," was generated and presented to the inspector after discussions with the Permittee. In addition, the Permittee did not have procedural controls for preparing intermodals, and no written procedures were in place for returning intermodals found to exceed transportation weight limits.

After the on-site inspection, a telephonic conference was held with the Permittee on June 3, 2003. The NRC requested that the Permittee provide Region IV a list of all major

decommissioning tasks that will be performed during the decommissioning of Site OT-10 for which procedures would be established. This list was received in the Region IV office on June 25, 2003, and will be reviewed in an upcoming inspection. Although some of the specific tasks identified at the time of the inspection were promptly addressed and corrected, there appeared to be no procedural control for other specific tasks underway. The finding related to not having established procedures for a number of major decommissioning tasks being undertaken is considered an Inspection Follow-up Item (30-28641/0303-01) and will be reviewed during a future inspection.

c. Worker Training

The Permittee's radiological safety training was reviewed for compliance with Section 4.2 of the DP. All personnel working in potentially contaminated areas were required to undergo formal radiological safety training. In addition, documentation of training completion was required in the form of a written examination for each employee. The training program was determined to meet all requirements of the DP. Records of all employees' radiological safety training were included in their respective personnel files.

Respirator training was also reviewed. Respirator use training was given on March 3, 2003, for all applicable workers and was documented on a sign-in sheet for the course. Furthermore, fit tests were observed during the onsite inspection for several employees. The employees were given an irritant smoke test to ensure that respirator seals were leak tight.

d. Remediation Activities

The Permittee began remediation of training sites TS5 and TS7 on March 5, 2003, and completed this work in April 2003. At the time of the inspection, the preliminary indication by the Permittee was that remediation of TS7 was complete. The Permittee completed 161 intermodal shipments equaling 3046.44 cubic yards for off-site disposal from TS5 and TS7. Pending soil sample analytical results and additional gamma scan surveys, more excavation might be necessary in TS5 but was not anticipated. There was no activity at these sites at the time of the inspection.

During remediation of TS5 and TS7, the Permittee conducted remedial action support surveys to ensure removal of contaminated soils. The remedial action surveys consisted of measurement of local gamma radiation levels. Any survey measurement above the action level (13,000 counts per minute) indicated that additional remediation was necessary. The Permittee also collected soil samples for onsite analysis to supplement the remedial action support surveys. The combination of in-situ gamma radiation levels and onsite analysis of soil samples were used to guide excavation work.

At the time of the inspection, training site TS6 was undergoing remediation, and 201 intermodal shipments equaling 3878.38 cubic yards of waste had been completed and shipped for off-site disposal. The decommissioning work included excavation and packaging of contaminated soils, vegetation, and surface debris (if any) because there were no buildings located within TS6 that required remediation. The construction work consisted of scraping the ground surface in nominal 6-inch lifts, transferring the

potentially contaminated soils to an intermodal container, and packaging of the intermodal for shipment. The site was approximately 80 percent complete. Although site specific procedures to assure procedural control had not been written and implemented, discussions with the Permittee on this matter resulted in the generation of Procedure 4-02, "Excavation Control Procedures," which was written and presented to the inspector during the inspection.

Training site TS6 included a discrete area referred to as corrective action unit SS-69, a 50-foot by 50-foot area that previously contained drums of thorium oxide sludge and waste fuels. During a 1997 Air Force investigation, elevated concentrations of petroleum hydrocarbon and radioactive compounds were identified in area SS-69. Remediation of the non-radioactive wastes occurred during 1998 by the Air Force under its Resource Conservation and Recovery Act Part B Permit. At the time of this inspection, area SS-69 still contained residual radioactive contamination. After removal of the thorium contaminated soils, the Air Force plans to pursue a "No Further Action" proposal for this corrective action unit.

e. Transportation/Waste Disposal Activities

During site remediation, the Permittee and its waste broker, packaged and shipped the wastes to a commercial low-level waste facility in Utah for permanent disposal. Intermodal containers were loaded at the site, shipped by truck to a local rail yard, and then shipped by rail to the disposal facility. The Permittee plans to use about 240 intermodal containers for the project, and the total number of shipments is expected to be about 1200 shipments.

Based on the radiological data obtained from the numerous samples, the Permittee has, to date, shipped the waste as U.S. Department of Transportation (DOT) exempt material. All shipments to date have not exceeded concentrations greater than 54.5 pCi/g of thorium-232. The inspector reviewed the data and determined that the licensee's documentation and records of activities have been established and were being maintained to ensure that all radioactive waste shipments were properly classified. The Permittee properly characterized the waste. If all radioactive waste shipments for the OT-10 project are maintained at concentrations less than 2000 pCi/g, DOT regulations for radioactive material will not apply to any shipment. If any package exceeds these levels, it will be designated for special handling and may not be shipped as non-DOT regulated.

Although the waste material that has been shipped has been classified as non-DOT regulated, the intermodal containers have been labeled as "Class A Unstable" which is required by Envirocare to meet a state requirement for radioactive waste shipments. The intermodal containers satisfied DOT requirements as industrial packages IP-1. The intermodals have been transported to the rail yard by dedicated trucks. The waste broker used four primary drivers but also provided training to six backup/alternate drivers. The training included function specific training stipulated by 49 CFR 172.704.

The wastes were being manifested and shipped by an NRC-licensed waste broker, MKM Engineers. The inspector confirmed that the waste broker had established a program for

sampling the waste material as it was being loaded, surveying the intermodals for compliance with DOT's radiological limits, and preparing shipping papers and manifests based on waste sample results. The inspector conducted a review of the shipping papers. The papers were in agreement with requirements established in 10 CFR Part 20, Appendix G, "Requirements for Transfers of Low-Level Radioactive Waste Intended For Disposal at Licensed Land Disposal Facilities and Manifests." As of May 16, 2003, the Permittee had shipped a total of 3525.71 cubic yards in 362 intermodals for disposal. Thirty loaded containers were staged on site waiting shipment.

f. Followup of Open Issues Identified in Safety Evaluation Report

Section 14.6 of the Safety Evaluation Report dated January 6, 2003, provided a list of open issues identified during the NRC's review of the DP. Several of the issues were reviewed with the Permittee during the last onsite inspection. Most had not been completed at the conclusion of the onsite inspection and will be reviewed by the NRC at a later date.

One issue that was reviewed involved the determination of background concentrations of uranium-238. The licensee initially determined the thorium-230 background concentration as being 0.93 pCi/g, yet assumed that the uranium-238 concentration would be similar. The DP states that the actual background concentration of uranium-238 will be determined during project mobilization. During the inspection, the site radiation safety officer stated that soil samples had been collected from the reference land area located adjacent to training site TS7. These samples would be submitted to an offsite laboratory for chemical separation analysis. The chemical separation analysis would be used to determine the uranium isotopic content of the samples. These sample results would then be used to establish the uranium-238 background concentration.

1.3 Conclusions

Overall, the Permittee had established a program that was in compliance with the DP requirements, and the program was adequate for the remediation work to be performed. The Permittee had sufficient staff to implement the work, including ample staff for the health and safety program. A radiation protection program had been established with adequate equipment.

Site specific procedures for all major tasks associated with decommissioning activities, including construction activities, were not complete. After a telephonic conference was held with the Permittee, a list of all major decommissioning tasks that will be performed during the decommissioning of Site OT-10 for which procedures would be established, was provided. The finding related to not having established procedures for a number of major decommissioning tasks being undertaken is considered an Inspection Follow-up Item (30-28641/0303-01) and will be reviewed during a future inspection.

The training program was in compliance with the DP and requirements of 10 CFR 19.12, "Instruction to Workers." Remediation was being conducted in accordance with the DP and the implementing procedures presented at the time of the inspection. Transportation and waste activities were being conducted in accordance with applicable requirements.

Selected open issues identified in Section 14.6 of the NRC's Safety Evaluation Report, were reviewed during the inspection. All issues remained open at the end of the onsite inspection and will be reviewed by the NRC at a later date.

## **2 Closeout Inspection and Survey (83890)**

### **2.1 Scope**

The objectives of this portion of the inspection were to verify that the facility has been decontaminated to acceptable levels and to assure that the facility will not present a radiation hazard to future occupants. The DP contains the licensee's considerations for developing their derived concentration guideline levels (DCGLs). As part of the NRC confirmatory surveys process, five soil samples from TS7 and one soil sample from the Kirtland Air Force Base (KAFB) reference area was collected by the NRC for analysis. The samples were analyzed for total uranium and total thorium in soil. Additionally, the inspector observed the licensee's sample preparation and quality control practices.

### **3.2 Observations and Findings**

The inspector was briefed by health physics technicians on the path that soil samples follow when received from the field. During the inspection, the inspector observed laboratory personnel prepare and process all soil samples collected and split with the NRC. Technicians demonstrated a good working knowledge of the tasks involved in sample collection despite not having a written procedure for control. The sample chain-of-custody process was reviewed. The process, as described, met requirements, however, the Permittee did not have written procedures for "Sample Identification and Control," or "Receipt of Samples from the Field".

The inspector observed the licensee collect biased soil samples from NRC designated locations within TS7 for independent and confirmatory analysis. One soil sample was collected from the Permittee's background reference area and five soil samples were collected from TS7 by Permittee contractor staff under the direct observation of the NRC inspector. Section 4.1.5 of the DP states that written standard operating procedures will be required for performing all major tasks associated with the DP. The Permittee did not have a written procedure for "Collecting Soil Samples". This major task was not included in the list provided with the DP.

The samples were processed in the field by the Permittee contractor. The samples were homogenized by placing the composite samples into a stainless steel bowl and mixed, using a stainless steel spoon. To the extent practical, the samples were ground down to 1/4-inch size or less. None of the samples contained obvious amounts of moisture. The samples were scanned with a sodium iodide gamma detector at the time of collection and no radiation levels were detected above ambient background levels. The Permittee did not have written procedures for "Soil Sample Preparation". Samples were packaged using NRC-supplied plastic containers and shipped to Oak Ridge Institute for Science and Education (ORISE) for analysis on behalf of the NRC. Kirtland Air Force Base soil

samples are analyzed by an independent commercial laboratory by gamma spectroscopy using 640 gram aliquot samples.

The samples were analyzed by ORISE using gamma spectroscopy to identify concentrations of uranium and thorium, their decay progeny, and other man-made gamma-emitting radionuclides.

Table 1 presents the uranium-238 concentrations analytical comparisons obtained by gamma spectroscopy, and Table 2 presents the thorium-232 sample analytical comparison results obtained by gamma spectroscopy. All results are expressed as dry weight (pCi/g) and include background concentrations of uranium and thorium present in the soils.

**TABLE 1**  
**Soil Sample Comparison - Gamma Spectroscopy Analysis**  
**Uranium 238 by Lead 210**

OT-10/TS7 Sample Location <sup>a</sup>	NRC Analysis <sup>b,c</sup> pCi/g	KAFB Analysis <sup>b,c</sup> pCi/g	NRC/Licensee Agreement? <sup>d</sup>
Background Reference Area	0.86 ± 0.41	0.34 ± 0.59	Yes
TS7 Northeast Corner, NRC-1	1.06 ± 0.60	1.70 ± 1.6	Yes
TS7 North Center, NRC-2	1.56 ± 0.51	2.40 ± 1.20	Yes
TS7 Southeast Area, NRC-3	0.68 ± 0.44	1.16 ± 0.65	Yes
TS7 South Middle Area, NRC-4	0.84 ± 0.46	1.19 ± 0.72	Yes
TS7 Southwest Corner, NRC-5	1.20 ± 0.65	1.92 ± 0.58	Yes

<sup>a</sup> Sample ID are designated locations on the licensee's global positioning system grid.

<sup>b</sup> Background was not subtracted from these values.

<sup>c</sup> Uncertainty represents the 95 percent confidence level, based on total propagated uncertainties.

<sup>d</sup> Agreement status was determined using NRC Inspection Procedure 84525.

**TABLE 2**  
**Soil Sample Comparison - Gamma Spectroscopy Analysis**  
**Thorium 232 by Actinium 228**

OT-10/TS7 Sample Location <sup>a</sup>	NRC Analysis <sup>b,c</sup> pCi/g	KAFB Analysis <sup>b,c</sup> pCi/g	NRC/Licensee Agreement? <sup>d</sup>
Background Reference Area	1.05 ± 0.14	1.38 ± 0.49	Yes
TS7 Northeast Corner, NRC-1	4.42 ± 0.43	4.70 ± 1.50	Yes
TS7 North Center, NRC-2	3.28 ± 0.31	4.20 ± 1.30	Yes
TS7 Southeast Area, NRC-3	2.29 ± 0.24	2.21 ± 0.73	Yes
TS7 South Middle Area, NRC-4	3.23 ± 0.32	3.50 ± 1.10	Yes
TS7 Southwest Corner, NRC-5	3.17 ± 0.32	2.45 ± 0.79	Yes

<sup>a</sup> Sample ID are designated locations on the licensee's global positioning system grid.

<sup>b</sup> Background was not subtracted from these values.

<sup>c</sup> Uncertainty represents the 95 percent confidence level, based on total propagated uncertainties.

<sup>d</sup> Agreement status was determined using NRC Inspection Procedure 84525.

NRC results for U-238 concentrations in soil ranged from 0.68 to 1.56 pCi/g. For Th-232, concentrations ranged from 0.34 to 2.40 pCi/g. The analytical agreement test provided in NRC Inspection Procedure 84525, "Quality Assurance and Confirmatory Measurements for In-Plant Radiochemical Analysis," was used to compare the licensee's and NRC's soil sample results. As noted in the tables above, all results were in agreement.

License Condition 20.P authorizes the licensee to remediate the OT-10 site in accordance with methods and criteria described in the licensee's SDP. Section 5 of the approved DP lists the thorium-232 and uranium-238 concentrations above background that would pose a dose of 25 mRem/year to a site resident in various areas. The "modifying area only" is the most conservative and has been adopted for the OT-10 site decommissioning for the smallest elevated areas (1 to 110 square meters). The approved modified thorium-232 DCGL is 5.9 pCi/g. The limit for an area of 1-square meter using the area factor of 3.65 (multiple of the DCGL) is 21.7 pCi/g thorium-232 and 1.2 pCi/g uranium-238.

### 3.3 Conclusions

Five soil samples were collected from TS7 and one from the background reference area. The samples were split for analysis by both the licensee's and NRC's laboratories for confirmatory analysis and comparison of results. The laboratory quality assurance and quality control requirements were being met through adequate controls. The results indicate that thorium-232 and uranium-238 concentrations were within Permittee limits. Using the analytical agreement test provided in NRC Inspection Procedure 84525, "Quality Assurance and Confirmatory Measurements for In-Plant Radiochemical Analysis," to compare the licensee's and NRC's soil sample results, all results were in agreement. All six samples were below the release criteria.

## **3 Exit Meeting Summary**

The inspection results were presented to representatives of KAFB staff at the conclusion of the onsite inspection through a preliminary exit briefing, and also through a telephonic conference call on June 3, 2003. A final exit briefing was conducted telephonically on July 17, 2003. Permittee representatives acknowledged the findings as presented. The representatives did not identify any information reviewed by the NRC inspector as being proprietary information.

**ATTACHMENT**

**SUPPLEMENTAL INFORMATION**

**PARTIAL LIST OF PERSONS CONTACTED**

Department of the Air Force, Kirtland Air Force Base

S. Calvert, Supervisory Industrial Hygienist  
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J. Poland, Director, Environmental Management  
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J. Volza, Alternate Base Radiation Safety Officer  
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ERG

K. Baker, Site Radiation Safety Officer, ERG  
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C. Timm



ITEMS OPENED, CLOSED AND DISCUSSED

Opened

30-28641/0303-01 IFI Although some of the specific tasks identified at the time of the inspection were promptly addressed and corrected, there appeared to be no procedural control for other specific tasks underway. A list of all major decommissioning tasks that will be performed during the decommissioning of Site OT-10 for which procedures would be established was provided and received in the Region IV office on June 25, 2003. The list of major tasks and associated procedures will be reviewed in an upcoming inspection.

Closed

None.

Discussed

None.

LIST OF ACRONYMS USED

DP	Decommissioning Plan
DOT	Department of Transportation
DCGS	Derived Concentration Guideline Levels
pCi/g	picocuries per gram
TS	training site
KAFB	Kirtland Air Force Base
SDP	Site Decommissioning Plan