



**UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION IV
611 RYAN PLAZA DRIVE, SUITE 400
ARLINGTON, TEXAS 76011-8064**

September 28, 2000

Mr. Paul Handa, Kaiser Site Administrator
Kaiser Aluminum Specialty Products
7311 East 41st Street
Tulsa, Oklahoma 74147

SUBJECT: NRC INSPECTION REPORT 040-02377/00-01

Dear Mr. Handa:

On September 14, 2000, an NRC inspection was completed at the Kaiser Aluminum facility in Tulsa, Oklahoma. The enclosed report presents the scope and results of that inspection.

The purpose of the inspection was to determine whether decommissioning and remediation activities were consistent with NRC requirements that are contained in the NRC approved Adjacent Land Remediation Plan for Kaiser Aluminum & Chemical Corporation in Tulsa, Oklahoma. Inspectors found that project remediation preparation activities such as site characterization, radiological surveys, procedure reviews, and personnel staffing were still in progress. However, the inspection found the Kaiser Aluminum preparation had sufficiently progressed to begin the implementation of the remediation plan.

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

Should you have any questions concerning this inspection, please contact Mr. Louis Carson II at (817) 860-8221 or Dr. Blair Spitzberg at (817) 860-8191.

Sincerely,

/RA/

Dwight D. Chamberlain, Director
Division of Nuclear Materials Safety

Docket No.: 040-02377
License No.: STB-472 (Terminated March 1971)

Enclosure:
NRC Inspection Report
040-02377/00-01

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ENCLOSURE

U.S. NUCLEAR REGULATORY COMMISSION

REGION IV

Docket No.: 40-2377

License No.: STB-472 (terminated March 1971)

Report No.: 40-2377/00-01

Licensee: Kaiser Aluminum Specialty Products

Facility: Kaiser Aluminum

Location: 7311 East 41st Street
Tulsa, Oklahoma 74147

Inspection Dates: September 12-14, 2000

Inspector: Louis C. Carson II, Health Physicist
Fuel Cycle and Decommissioning Branch

Accompanied By: John T. Buckley, Project Manager
Division of Waste Management
Office of Nuclear Materials Safety and Safeguards

Judith L. Walker, Health Physicist (Inspector-In-Training)
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Kristina L. Banovac, Environmental Engineer (Intern)
Division of Waste Management
Office of Nuclear Materials Safety and Safeguards

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

Attachment: Supplemental Information

EXECUTIVE SUMMARY

Kaiser Aluminum Speciality Products NRC Inspection Report 40-2377/00-01

This was an announced inspection of the Kaiser Aluminum Specialty Products facility, formerly occupied as the Standard Magnesium Company. This inspection reviewed the site's readiness to begin the remediation of contaminated soils located outside the property fenceline. The inspectors reviewed management organization and controls, radiation protection, environmental protection, and the radioactive waste management program.

Site Status and Decommissioning Plan

- Kaiser Aluminum was making adequate progress in developing a comprehensive remediation program such that it was determined to be ready to begin implementation of the remediation plan (Section 1).

Management Organization and Controls

- Kaiser's management organization and controls were appropriate for the activities being performed and those which had been approved by the NRC for the Kaiser facility (Section 2).

Radiation Protection

- Radioactive material was secure and radioactive material signs were conspicuously posted around the site as required by 10 CFR Part 20 (Section 3).
- Appropriate controls were in use to prevent the spread of contamination by personnel (Section 3).
- Kaiser's radiation protection program met commitments contained in the remediation plan for the activities being conducted onsite (Section 3).

Environmental Protection and Radioactive Waste Management

- Based on the environmental measurements reviewed, no imminent health or environmental hazard existed at the Kaiser facility (Section 4).

Report Details

1 Site Status and Decommissioning Inspection Procedure for Fuel Cycle Facilities (88104)

a. Background

The Kaiser Aluminum (Kaiser) facility in Tulsa, Oklahoma, formerly called Standard Magnesium, is a formerly NRC-licensed site. On March 18, 1971, the Atomic Energy Commission terminated Source Material License STB-472 at the request of Kaiser. On November 19, 1993, an NRC inspector found that residual radioactivity at the site existed in excess of background levels. In April 1995, Kaiser completed a soil radiological site characterization report which estimated that 127,685 cubic yards of residual thorium contaminated soil was onsite. In August 1995, the NRC declared that the Kaiser facility presented "no imminent health and safety risk to the public."

Kaiser submitted a remediation plan dated August 17, 1998, for NRC review and approval for the cleanup of radioactive material located outside the main site fenceline on property not owned and controlled by the Kaiser Corporation. Kaiser estimated that approximately 6,111 cubic yards of thorium contaminated soil was buried outside the property fenceline on the eastern and southern boundaries of the site. The NRC had determined that Kaiser's adjacent land remediation plan could not be completed until the following items had been reviewed:

- Characterization report for the properties adjacent to the Kaiser site
- Kaiser Quality Assurance Program
- Site hydrological report

After the NRC's review of the items listed above, the NRC approved the "Adjacent Land Remediation Plan for Kaiser Aluminum & Chemical Corporation" on April 4, 2000. Based on the results of this inspection, Kaiser Aluminum was making adequate progress in developing a comprehensive remediation program such that it was determined to be ready to begin the implementation of the remediation plan.

2 Management Organization and Controls (88005)

2.1 Scope

The inspectors reviewed Kaiser's organization structure and management controls to determine whether functional responsibilities had been established consistent with the remediation plan and if controls were in place to ensure site and public safety.

2.2 Observations and Findings

a. Organization Structure and Staff Duties

The NRC approved remediation plan and Kaiser site organization structure identified a Kaiser corporate project manager as the only Kaiser employee assigned to the Tulsa, Oklahoma, site. Kaiser's remediation project manager at Tulsa, Oklahoma, was also

the Kaiser Corporation's environmental manager based out of Baton Rouge, Louisiana. Other key positions on the organization chart were contractor positions which included a site project manager, health and safety officer, quality assurance (QA) supervisor, field supervisor, operators, and technicians. Kaiser plans to have at least 12 workers assigned to the site during the remediation activities. A description of the duties and responsibilities of the key personnel are described in Section 2.2.2 of the remediation plan. During this inspection, Kaiser's representative revealed the site team included the following:

- Kaiser Site Administrator
- A&M Engineering & Environmental Services
- Earth Sciences Consultants Incorporated

The inspectors noted that Kaiser's decision to use two contractors would represent a proposed change to the organization chart that was originally submitted in the NRC approved remediation plan. During the inspection, Kaiser added the positions of Kaiser radiation safety officer (a contractor), Kaiser site administrator (Kaiser employee), and QA/quality control (QC) technician to the organization. The inspectors found Kaiser's organization structure to be appropriate.

b. Plans and Procedures

The inspectors reviewed Kaiser's plans and procedures that were to be used during the adjacent land remediation. Kaiser's manual for conducting work at the site contained a compilation of procedures and plans that would be used by Kaiser, A&M Engineering & Environmental Services, and Earth Sciences Consultants Incorporated. At the time of this inspection, the plans and procedures manual were still in draft form. The inspectors noted that Kaiser management was reviewing and approving the plan and procedures that were written by the Kaiser Corporation. However, Kaiser management did not have any intentions of reviewing and approving the plans and procedures that their primary contractors were going to use during the remediation project. The inspectors reminded Kaiser management that Section 2.1.3 "Procedures" of the remediation plan states, in part, that:

"The decommissioning activities and tasks will be conducted in accordance with written procedures that have been approved by the project manager. Details of the control system that ensures written procedures are prepared, reviewed, revised, approved, and implemented are provided in the Kaiser QA program."

Section 2.0 "Administration" of the Kaiser QA plan states that the QA plan, all implementing procedures, and subsequent revisions are subject to review and approval by the Kaiser Project Manager prior to use. Based on the inspectors' observations, Kaiser management explained that they would review and approve all the procedures accordingly or have the appropriate section of the remediation and QA plans revised.

The inspectors provided informal comments to Kaiser management concerning the plans and procedures. Although the inspectors reviewed draft plans and procedures, no major problems or deficiencies were identified with Kaiser's proposed program.

2.3 Conclusions

Kaiser's management organization and controls were appropriate for the activities being performed and those approved by the NRC for the Kaiser facility.

3 **Radiation Protection (83822)**

3.1 Scope

The inspectors examined the radiation protection program for consistency with the requirements of 10 CFR Part 20 and the remediation plan.

3.2 Observations and findings

a. Site Tours

The inspectors conducted site tours and made observations regarding radioactive material signs, potential for exposures to workers, and the potential loss of radioactive material control. The inspectors toured the site ponds, Fulton Creek, and property adjacent to the Kaiser site. The inspectors observed that radioactive material signs were conspicuously posted around the site as required by 10 CFR 20.1902, and the Kaiser property fenceline was in adequate condition. Inspectors found Kaiser's posting of radioactivity signs around the fenceline to be appropriate.

b. Exposure Rate Surveys

Inspectors surveyed the site with a Ludlum, Model 19 microRoentgen meter. The ambient background radiation away from the Kaiser site measured 7-10 microRoentgen/hour ($\mu\text{R/hr}$). Radiation exposure rates on adjacent properties along the eastern fenceline, the southern fence, and on the south side of 41st Street measured consistent with past NRC survey results. During the inspection, inspectors surveyed portions of the retention/sludge pond. Exposure rates measured 250-500 $\mu\text{R/hr}$ at 1 meter above the surface. The inspectors determined that exposure rate measurements taken were consistent with past NRC survey results.

c. Site Work with Radioactive Material

No work was in progress in the radioactive material areas during this inspection. Kaiser maintained access control to the radioactive materials area. Prior to the tour and entry into the radioactive material area, each person was issued protective boots to reduce the potential spread of contamination. Prior to exiting the radioactive material area, each person was required to wash their protective boots at an equipment decontamination zone. The inspectors noted that the potential for personnel spreading contamination was limited given the current site status and the controls implemented.

Kaiser and contract personnel continued to collect groundwater samples from monitoring wells, collected soil samples onsite and offsite, collected surface water samples, and mowed the grass within the fenceline. Kaiser had issued all persons who entered the controlled area a thermoluminescent dosimeter (TLD). In reviewing the TLD results, inspectors found that no worker had received any measurable external dose in 1999 and so far during 2000. Kaiser's dosimetry vendor processed the TLDs on a quarterly basis. The inspectors noted that Kaiser had not established an internal dose program, but was developing procedures for conducting personnel air samples. The potential for airborne radioactivity was limited given the site status in 1999 and currently in 2000. The inspectors noted that all personnel involved in Kaiser's remediation work had received appropriate radiological training in 1999. However, Kaiser was not planning to implement the personnel training program that is in Sections 2.3, 4.2.4, and 4.6.5 of the remediation plan until the end of September 2000.

3.3 Conclusion

Radioactive material signs were conspicuously posted around the site as required by 10 CFR 20.1902. The Kaiser property fenceline was in adequate condition to reasonably assure radioactive material security as required by 10 CFR 20.1802. Appropriate controls were in use to prevent the spread of contamination by personnel. Kaiser's radiation protection program was appropriate for the activities being conducted onsite.

4 Radioactive Waste Management and Environmental Protection (88035)(88045)

4.1 Scope

The inspectors examined Kaiser's radioactive waste management and environmental protection programs for consistency with the requirements of 10 CFR Part 20 and the remediation plan.

4.2 Observations and findings

a. Radioactive Waste Storage and Management

The retention/sludge pond remained mostly dry throughout the summer. Inspectors had been concerned that the dry (dross/slag) material in the pond could be carried offsite by the wind. Kaiser had determined that an environmental air sampling program was needed to monitor the retention/sludge pond and to consider if a dust suppression program was needed. Property erosion beyond the property fenceline had not increased since the last inspection. The berms around the retention/sludge pond and reserve pond were in adequate condition.

Section 3.5 of the remediation plan describes Kaiser's waste management program to include the types of waste that are expected to be generated during the adjacent land remediation project. As part of the adjacent land remediation plan, Kaiser plans to recover the contaminated soil and store it just southwest of the retention/sludge pond.

The inspectors noted that Kaiser had not fully developed plans and procedures for each element of the waste management program. However, Kaiser representatives planned to have the necessary procedures in place by October 2000.

b. Environmental Radiation Measurements and Air Sample Analyses

At the time of this inspection, Kaiser personnel were continuing to develop environmental monitoring procedures for the site. Since the last inspection, Kaiser had collected environmental air samples on a periodic basis to establish the background levels around the site. Inspectors noted that Kaiser was building new environmental monitoring stations and had ordered new air sampling equipment. On July 18, 2000, Kaiser sent the NRC the results of pre-remediation air sampling data that will be used as environmental background data. A local laboratory had been contracted for analyses services and the inspectors reviewed the results of samples that were analyzed by Kaiser. The following table shows the radioisotopes analyzed and the average concentrations measured around the Kaiser site and Fenceline:

Air Sample Analysis	
Radioisotope	Average Concentration ($\mu\text{Ci/ml}$)
Radium-228	7.0E-16
Thorium-228	7.0E-16
Thorium-230	2.4E-15
Thorium-232	7.0E-16

Additionally, Kaiser has four environmental TLD stations. According to data that Kaiser provided the NRC for 1999, the highest radiation exposure level was at the south site fenceline TLD monitoring station, 133 millirem. According to 10 CFR 20.1301(a)(1), the radiation exposure limit for members of the public by a licensed NRC operation is 100 millirem/year. The area around the Kaiser fenceline is an industrial complex and members of the public do not live around the site. Therefore, Kaiser determined that the annual dose to members of the public living around the site when occupancy factors are considered, would be less than 100 millirem/year.

c. Surface Water Monitoring

Kaiser did not have requirements to perform radiochemical analysis or implement an effluent and environmental monitoring program before the implementation of the remediation plan. However, the inspectors examined data from surface water sample locations. According to a Kaiser report dated August 29, 2000, surface water samples were collected from three locations: (1) the inlet to the fresh water pond, (2) the site effluent into Fulton Creek, and (3) southeast corner. Generally, Kaiser had analyzed surface water for gross alpha and gross beta radioactivity on a bi-monthly basis since November 1997. Analysis of the site's effluent revealed a slight increase in radioactivity being discharged into Fulton Creek. Since the previous inspection in October 1998,

gross alpha activity measured 0 -150 picocuries/liter (pCi/l), and gross beta activity measure 0 -131 pCi/l. Kaiser performed radioisotopic analyses of surface water and measured trace amounts of radium-228. Kaiser representatives did not have an explanation for the source of radium-228 in the surface water in the southeast corner. However, Kaiser representatives stated that more samples would be analyzed during the remediation activities. The inspectors concluded that water was not being released offsite in excess of the 10 CFR Part 20, Appendix B, Column II, Effluent Concentration Levels for the site specific contaminants.

d. Wastewater Collection, Processing, and Monitoring

On July 24, 2000, the NRC approved Kaisers' request to discharge wastewater collected during the adjacent remediation project into the Tulsa, Oklahoma, municipal wastewater and treatment system. Under the provisions of the agreement, Kaiser will collect an estimated 70,000 gallons of wastewater during excavations. The wastewater will be placed into 3-4 tanks with a capacity of 20,000 gallon per tank. After a settling period, the appropriate tank will be sampled and analyzed to make sure that the concentration of radioactivity in each tank meets the discharge limits that are in 10 CFR Part 20, Appendix B, Table 3. During this inspection, the draft "Radioactive Liquid Handling" procedure was reviewed. Additionally, a meeting was held between the NRC, Oklahoma Department of Environmental Quality (ODEQ), City of Tulsa, and Kaiser representatives to discuss Kaiser's plans and procedures for disposing of the wastewater. Several suggestions were made during the meeting that would enhance Kaiser's procedure for handling wastewater. Kaiser management agreed to consider the suggestions.

4.3 Conclusion

Based on the environmental measurements reviewed, no imminent health or environmental hazard existed at the Kaiser facility.

5 Exit Meeting Summary

An exit meeting was conducted on September 14, 2000, at the Kaiser facility in Tulsa, Oklahoma. During this meeting, the inspectors reviewed the scope and findings of the inspection. The participants did not identify as proprietary any information provided to, or reviewed by, the inspectors.

ATTACHMENT

PARTIAL LIST OF PERSONS CONTACTED

Kaiser Corporation

P. Handa, Site Project Manager and Administrator
W. Vinzant, Corporate Project and Safety, Health, and Environmental Manager

Contractor Personnel

T. Ertugrul, Site Supervisor, A&M Engineering
A. Lombardo, Earth Sciences Consultants
P. Schultze, Radiation Safety Officer/Geologist, A&M Engineering
M. Scott, Health Physicist, ADA Consultants
A. Shuckrow, Earth Sciences Consultants
M. Tourdot, Earth Sciences Consultants

State of Oklahoma Department of Environmental Quality

P. Bishop, Radiation Management Section
P. King, Water Quality Division
C. Parrot, Water Quality Division

City of Tulsa Environmental Services

L. Bruning, Environmental Compliance Officer
F. Durham, Environmental Services Supervisor
D. Wilson, Environmental Services Manager

INSPECTION PROCEDURES USED

IP 88005	Management Organization and Controls
IP 83822	Radiation Protection
IP 88035	Radioactive Waste Management
IP 88045	Environmental Protection
IP 88104	Decommissioning Inspection Procedure for Fuel Facilities

ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

None

Closed

None

Discussed

None

LIST OF ACRONYMS

CFR	Code of Federal Regulations
μCi/ml	microcuries/milliliter
μR/hr	microRoentgen/hour
ODEQ	Oklahoma Department of Environmental Quality
QA	quality assurance
QC	quality control
pCi/g	picocuries/gram
pCi/l	picocuries/liter
TLD	thermoluminescent dosimeter