

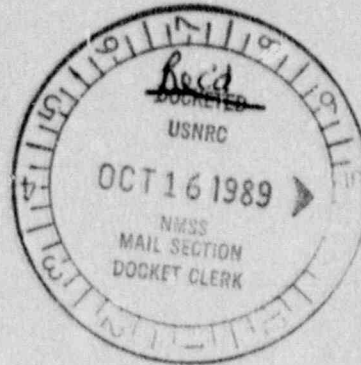
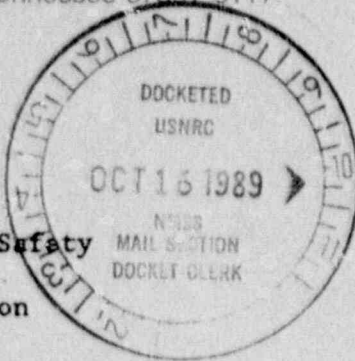


Oak Ridge
Associated Universities
Post Office Box 117
Oak Ridge, Tennessee 37831-0117

Energy/
Environment
Systems Division

October 9, 1989

Mr. Gary Comfort
Office of Nuclear Material Safety
and Safeguards
Nuclear Regulatory Commission
Mail Stop 6H3
Washington, DC 20555



Subject: PROPOSED SURVEY PLAN: MIXED OXIDE FACILITY AT
SEQUOYAH FUELS CORPORATION
CIMARRON PLANT

Dear Mr. Comfort:

Enclosed is the proposed survey plan for the Mixed Oxide Facility at Sequoyah
Fuels Corporation Cimarron Plant, which is to be surveyed October 12-30, 1989.

Contact me at FTS 626-5073 or Jim Berger at FTS 626-3305, if there are any
questions or comments.

Sincerely,

Scott A. Wical
Staff Health Physicist
Environmental Survey and
Site Assessment Program

SAW:jl

- cc: L. Rouse, NRC/6H3
- G. France, NRC/Region III
- D. Tiktinsky, NRC/6A4
- E. Davis, NRC/6A4

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PROPOSED SURVEY PLAN
FOR THE
MIXED OXIDE FACILITY
SEQUOYAH FUELS CORPORATION CIMARRON PLANT
CRESCENT, OKLAHOMA

I. Site History and Description

The Sequoyah Fuels Corporation Cimarron Plant is located on an approximately 450 hectare site in Logan County, Oklahoma, about 10 kilometers south of the town of Crescent. The plant was operated by Kerr-McGee between 1965 and 1975, for the production of enriched (about 3%) uranium and mixed oxide (uranium and plutonium) reactor fuel. There are two main processing buildings on the site - the Uranium Plant and the Plutonium Plant. Kerr-McGee is in the process of decommissioning this site. All equipment has been removed from the Plutonium Plant; the building has been characterized, and decontamination of interior surfaces are complete. Final survey data have been developed by the licensee for all building areas and the fenced-in grounds immediately outside the Plutonium Plant.

Oak Ridge Associated Universities (ORAU) has been requested by the Nuclear Regulatory Commission to perform a confirmatory survey of the plutonium facility and the associated grounds.

II. Purpose

The purpose of the survey is to confirm the decontamination efforts by Kerr-McGee, relative to release of the plutonium facility and the fenced in grounds immediately outside the facility.

Prepared by the Energy/Environment Systems Division of Oak Ridge Associated Universities, Oak Ridge, Tennessee, under NRC Fin. No. A-9076 between the U.S. Nuclear Regulatory Commission and the U.S. Department of Energy.

October 9, 1988

III. Responsibility

Work described in this survey plan will be performed under the supervision of J.D. Berger, Manager, and L.F. Friedman, Assistant Manager, of the Environmental Survey and Site Assessment Program of the Energy/Environment Systems Division of Oak Ridge Associated Universities.

IV. Procedures

A. Document Review

Oak Ridge Associated Universities will review Kerr-McGee's final survey data and supporting documentation concerning decommissioning activities.

B. Facility Survey

1. The existing 1 m x 1 m grid will be used on the floor and lower walls of the laboratory rooms and other areas where potential for contamination is suspect. The ceilings will not be gridded; however, measurements and samples from the ungridded areas and surfaces will be referenced to the floor and wall grid, or to pertinent building surfaces.
2. Building surfaces will be scanned using gas proportional and ZnS scintillation alpha detectors and thin (low energy) NaI gamma scintillation detectors. Floors and lower walls will receive 100% scans; upper walls, ceilings, and other overhead surfaces will be randomly scanned, with efforts concentrated at locations of highest contamination potential and suspect surfaces as determined as the survey progresses. Locations of elevated direct readings will be identified for further investigation.
3. Measurements of total and removable alpha contamination will be performed on a minimum of 10% of the floor and lower wall grid blocks, selected at random. One set of five direct measurements

will be obtained for each survey grid block, and one smear will be taken at the highest reading for each set of five measurements. The direct measurements will be systematically performed at the center and at four points, midway between the center and the block corners. Additional measurements will be performed at locations of elevated radiation levels identified by the surface scan.

4. Direct measurements and smears will be obtained on the upper walls and ceilings. Particular attention will be given to cracks, beams, piping, ledger, ducts, and other surfaces where material might settle or accumulate. These surveys will include the inside surfaces of any drains, exhaust air ducts, or floor penetrations. The number of survey locations will be determined by results as the survey progresses; however, a minimum of 1 measurement will be performed for every 10 m² of surface area.
5. Exposure rate measurements will be made at one meter from the floor at a minimum of 10 locations in the facility. A pressurized ionization chamber and/or NaI detector, cross-calibrated against a pressurized ionization chamber, will be used for these measurements.
6. Samples of residues will be collected from floor cracks or joints, beams, inside and outside of piping, ledges, air ducts, floor penetrations, and other surfaces as appropriate.
7. Samples of paint will be collected, as available, from a minimum of two locations in each room.
8. Excavated areas for piping removal will be gamma scanned and soil samples collected from representative locations. Floor coring for the purpose of subfloor sampling will be performed, if scanning results or other surface measurements indicate the potential for subfloor contamination.

9. Additional sampling and measurements will be performed, as deemed necessary, based on findings as the survey progresses.

C. Outdoor Survey

1. A 10 m grid system will be established and used to reference ORAU measurement and sampling locations.
 2. Walkover scans at one to two meter intervals will be conducted over the area using gamma scintillation detectors and rate meters with audible indicators. Locations of elevated contact radiation levels will be identified for further investigation.
 3. Exposure rate measurements will be made at the surface and at 1 m above the surface at each grid interval and at locations of elevated readings. These measurements will be performed using portable gamma scintillation detectors calibrated onsite against a pressurized ionization chamber.
 4. Surface (0-15 cm) soil samples will be collected at each grid line intersection and from areas of elevated surface contact levels, identified by the walkover scan.
 5. Shallow (1-2 m) boreholes will be drilled to facilitate subsurface sampling, using a post hole digger. A minimum of 10 representative locations will be sampled within the fenced in area.
- D. Any locations of residual contamination, found by direct measurements to exceed the NRC guidelines, will be brought to the immediate attention of the licensee's representatives.
- E. The scope of the survey will decrease or increase based on findings as the survey progresses.

V. Background and Baseline Determinations

Soil samples were collected on a previous site visit from areas within 0.5 to 10 km of the site to provide baseline concentrations of radionuclides for comparison purposes. Direct radiation levels were measured at locations where baseline soil samples were collected.

The background exposure rates for inside the Plutonium facility will be established with the pressurized ionization chamber, in an area that is not radiologically contaminated, outside the restricted area, and of similar construction history and material.

VI. Sample Analysis and Interpretation of Results

Samples and direct measurement data will be returned to Oak Ridge, Tennessee, for analysis and interpretation. Soil, sediment, and residue samples will be analyzed by solid state gamma spectrometry. Radionuclides of primary interest are U-235, U-238, and Th-232; however, spectra will be reviewed for other identifiable photopeaks. Composite and other selected samples will be analyzed for plutonium. Smears will be counted on a low background gas proportional alpha/beta counter. Paint, residue, and soil samples, from the Plutonium Building will be analyzed for isotopic plutonium.

VII. Tentative Schedule

Site Survey	October 10-30, 1989
Complete Sample Analyses	November 30, 1989
Draft Report	December 31, 1989

DOCKET NO. 70-1193
CONTROL NO. 26021
DATE OF DOC. October 9, 1989
DATE RCVD. October 16, 1989
FCUF _____ PDR
FCAF LPDR _____
I & E REF.
SAFEGUARDS
FCTC _____ OTHER _____
DATE 10/17/89 INITIAL SAC