

US EPA ARCHIVE DOCUMENT

**STATEMENT OF BASIS/FINAL DECISION AND  
RESPONSE TO COMMENTS SUMMARY**

**REGION V  
ID #**

**U.S. Department of Energy  
Fernald Environmental Management Project  
Operable Unit 1  
Fernald, Ohio  
(Signed March 1, 1995)**

**Facility/Unit Type:** Uranium metal product manufacturer  
**Contaminants:** Cs-137, Th-230, U-235, U-238, Beryllium, Uranium, Tc-99, PCBs  
**Media:** Groundwater, and soil  
**Remedy:** Excavation of the waste pit contents, waste processing and treatment by thermal drying, and off-site disposal at a permitted commercial disposal facility

**FACILITY DESCRIPTION**

The Fernald Environmental Management Project (FEMP) is divided into five operable units, of which Operable Unit 1 (OU1) is one, under investigation pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act, as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA) (hereinafter jointly referred to as CERCLA), and to the extent practical, the National Oil and Hazardous Substances Pollution Contingency Plan, 40 CFR Part 300. OU1 consists of waste pits 1 through 6, the Burn Pit, the Clearwell, and berms, liners, and soil within the operable units boundary.

The FEMP is a government-owned, contractor-operated federal facility that produced high-purity uranium metal products for DOE and its predecessor agencies from 1952 until 1989. Thorium was also processed on-site, however, on a smaller scale. The production operations generated a wide variety of waste materials containing both radiological and chemical constituents. In 1989, the EPA placed the FEMP on the National Priorities List (NPL). Production activities were stopped in 1989, and the production mission of the facility was formally ended in 1991.

The FEMP is located on a 1,050 acre site in a rural agricultural area approximately 18 miles northwest of Cincinnati, Ohio. The site is near the villages of Fernald, New Baltimore, New Haven, Ross, and Shandon, Ohio, located west and south of Ohio State Routes 128 and 126. The land adjacent to the site is primarily devoted to open land use such as agriculture and recreation, however, there is some commercial activity. Industrial usage is concentrated in the areas south of the FEMP in Fernald and in a small industrial park. The elevation slopes slightly toward Paddys Run, a small intermittent stream on the west side of the facility. Natural drainage at the FEMP generally flows from east to west, with the exception of the extreme northeast corner, which drains east toward the Great Miami River. OU1's natural drainage flows toward Paddys Run.

OU1 is a well-defined, 15.3-hectare (37.7-acre) area located in the northwest quadrant of the FEMP site. Large quantities of liquid and solid wastes were generated by various chemical and metallurgical processing operations and these wastes were stored or disposed in six waste pits and the Clearwell, or burned in the Burn Pit. These pits are located in a portion of the FEMP Waste Storage Area and are contained within the boundaries of OU1.

**EXPOSURE PATHWAYS**

The constituents of concern include uranium and thorium and their decay products, beryllium, Cs-137, technetium-99 (Tc-99) and PCBs. The potential exposure pathways of soil are via direct dermal contact by leaching of soil into surface water (Paddys Run) through erosion and via inhalation

from the dust particles that become airborne. The potential exposure pathways for groundwater are via ingestion and direct contact by leaching of contaminants from the waste pits through the vadose (unsaturated) zone to underlying groundwater or infiltration of contaminated surface water from Paddys Run to the Great Miami Aquifer.

**CONTAMINATION DETECTED AND CLEANUP GOALS**

Media	Estimated Volume	Contaminant	Maximum Concentration (/)	Action Level	Cleanup Goal	Point of Compliance
Surface soil	1,283,400	Cs-137+1 progeny	6 pCi/g	Not given	1.8	Not given
		Thorium-230	972 pCi/g		902	
		Uranium-235	51 pCi/g		9.3	
		Uranium-238+2 progeny	1,500 pCi/g		56	
		Beryllium	.77 mg/kg		2.1	
		Uranium	2,100 mg/kg		190	
Subsurface soil	1,283,400	Cs-137 +1 progeny	<0.2 pCi/s	Not given	1.8	Not given
		Thorium-230	3.5 pCi/s		902	
		Uranium-235	3.9 pCi/s		9.3	
		Uranium-238 +2 progeny	104 pCi/s		56	
		Beryllium	N/A		2.1	
		Uranium	309 mg/kg		190	
		Tc-99	Not given		7.5E-01	
		PCBs	Not given		7.8E-01	

**SELECTED REMEDY**

The remedy includes the excavation of the waste pit contents, waste processing and treatment by thermal drying, and off-site disposal at a permitted commercial disposal facility. The remedy consists of the following key components:

Construction of waste processing and loading facilities and equipment.

Removal of water from open waste pits for treatment at the site's wastewater treatment facility.

Removal of waste pit contents, caps and liners, and excavations to verify achievement of remediation levels.

Confirmation sampling of waste pit excavations to verify achievement of remediation levels.

Pretreatment (sorting/crushing/shredding) of waste.

Treatment of the waste by thermal drying as required to meet the waste acceptance criteria of the disposal facility.

Waste sampling and analysis prior to shipment to ensure that the waste acceptance criteria (WAC) of the disposal facility.

Off-site shipment of waste for disposal at a permitted commercial waste disposal facility. It is estimated that over 600,000 cubic yards of waste material will be excavated and disposed as low-level radioactive waste.

As a contingency, shipment of any waste that fails (due to radiological concentrations) to meet the waste acceptance criteria of the permitted commercial waste disposal facility (up to 10 percent of the total waste volume) for disposal at the Nevada Test Site (NTS).

Decommissioning and removal of the drying treatment unit and associated facility, as well as miscellaneous structures and facilities within the operable unit. Oversized material that is amenable to the selected alternative for OU3 would be segregated from OU1 waste, decontaminated, and forwarded to OU3 to be managed to be managed as construction rubble (e.g., shipped off site).

Placement of backfill into excavation and construction for cover systems.

### **INNOVATIVE TECHNOLOGIES CONSIDERED**

None.

### **KEY WORDS:**

groundwater, soil; uranium, thorium, PAHs, Cs-137, beryllium, Tc-99; direct contact, dermal contact, inhalation, ingestion; excavation

### **PUBLIC PARTICIPATION**

DOE has implemented a public participation program at the FEMP site, which aims to involve community members and other interested parties in decision making at the site. The program consists of three elements: 1) public information activities, 2) management involvement, and 3) person-to-person communication. Informational workshops were held on December 7, 1993, March 29, 1994, and August 9, 1994. In addition to the workshops sponsored by DOE, Ohio EPA held a local availability session on August 17, 1994. The Final Remedial Investigation Report for OU1, the Final Feasibility Study for OU1, and the Proposed Plan are available to the public in the Administrative Records locations at EPA Region V offices. A 30-day public comment period was held from August 10, 1994 to September 8, 1994, inclusive. In addition, a public meeting was held on August 23, 1994 in which representatives from the EPA, DOE, and Ohio EPA answered questions about the remedial alternatives under consideration for OU1. Comments were received and considered.

### **NEXT STEPS**

In accordance with CERCLA 121(c) and Section XXX of the Amended Consent Agreement between EPA and DOE, EPA will review the remedial action, from a site-wide perspective, no less often than each five years after the implementation of the final remedial actions.

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