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**PROGRESS REPORT OPERABLE UNIT 3  
PRODUCTION AREA FEBRUARY 1992**

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FACT SHEET**



# Fernald Project

# Remedial Investigation/ Feasibility Study

2934

PROGRESS REPORT

FEBRUARY 1992

## Operable Unit 3 PRODUCTION AREA

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### Introduction

The Remedial Investigation/Feasibility Study (RI/FS) is the blueprint for cleanup at the U.S. Department of Energy's Fernald Environmental Management Project (FEMP). The nature and extent of contamination at the FEMP and surrounding areas is being thoroughly investigated so that appropriate remedial actions can be formulated and implemented.

The FEMP has been divided into five sections, known as Operable Units, for environmental investigation and cleanup. The Operable Units were defined based on their location or the potential for similar technologies to be used in the ultimate cleanup.

During the course of the RI/FS effort, certain conditions are occasionally identified which call for more immediate action. These actions are called "Removal Actions" and are initiated when there is a need to accelerate cleanup activities to address releases or potential releases of hazardous substances. Removal Actions are coordinated with the U.S. EPA and the Ohio EPA.

Following is a progress report on Operable Unit 3 including its history, the current status of RI/FS activities, cleanup alternatives under consideration, and work being done to alleviate near-term concerns.

### Background

Operable Unit 3, the former production area and other suspect areas, is one of the largest and most complex of the FEMP Operable Units, largely due to the wide variety of former processing facilities located in this 136-acre study area. When the mission at the FEMP was production of high-purity uranium metal for U.S. Defense Programs and the processing of quantities of thorium to support other DOE programs, large quantities of radioactive materials and hazardous chemicals were used in the various plants involved in the process. Operable Unit 3 focuses on cleanup of contamination that occurred in the former production area as a result of the 37-year production mission at the FEMP. The primary contaminant is uranium, and the main focal points of cleanup are perched groundwater, buildings, equipment and support facilities.

### RI/FS Activities

**RI/FS Work Plan Addendum:** The 1991 Amended Consent Agreement significantly expanded the definition of Operable Unit 3. A RI/FS Work Plan Addendum is being prepared by a task force comprised of personnel from the DOE Fernald Office, Westinghouse Environmental Management Company of Ohio, Argonne National Laboratory, Radian Corporation, and Advanced Sciences Inc./International Technology Corporation. The team is defining the sampling requirements and technical analyses which must be completed to support the Operable Unit 3 RI/FS process.

The current primary focus for Operable Unit 3 is the development of this RI/FS Work Plan Addendum, which is on schedule to be submitted to the U.S. EPA on or before June 2, 1992. The addendum will define the work activities necessary to complete the RI/FS for Operable Unit 3.

The scope of Operable Unit 3 was modified to include all former process buildings, structures and equipment, and inventoried materials. The original definition for Operable Unit 3, developed while the facility was still in production, examined primarily the contamination associated with soil, perched groundwater, surface water, and suspect areas in the production area. Since production has permanently ceased at the FEMP, soil and groundwater contamination in the former production area was transferred from Operable Unit 3 to Operable Unit 5 (Environmental Media) under the terms of the 1991 Amended Consent Agreement.

Disposition of production buildings and support facilities was not originally considered to be part of Operable Unit 3. The examination of the facilities has now been incorporated into the scope of the 1991 Amended Consent Agreement as part of Operable Unit 3. This involves potential decontamination, decommissioning and/or dismantling of those facilities within the former production area and throughout the site.

To support the preparation of the Work Plan Addendum, long-term FEMP employees and retirees have been interviewed to discuss past process operations and provide insight into the nature and extent of contamination within the production area.

facilities. Historical process knowledge and environmental data are being tabulated to make maximum use of previously collected information as part of the plan to streamline the site characterization phase of the Operable Unit 3 Remedial Investigation.

### Removal Actions

#### Contaminated Water Beneath FEMP Buildings

**(Removal No. 1):** This Removal Action was initiated to minimize the potential for uranium-contaminated groundwater to infiltrate to the underlying aquifer from perched water zones located beneath some former production buildings.

Approximately 300 borings were installed for the purpose of determining the nature and extent of any subsurface contamination existing beneath facilities in the production area as a result of the former production mission. These borings identified a number of "perched" water zones existing beneath the former production area which exhibited elevated concentrations of uranium and other hazardous substances. "Perched" water is isolated pockets of groundwater which reside within the layers of clay-rich glacial soils that exist above the Great Miami Buried Valley Aquifer in the regional area of the FEMP. Perched water zones of concern due to the volume of water present and the concentration of contaminants have been identified at three locations beneath the production area: Plant 6, Plants 2/3 and 8 which are adjacent to each other and considered as one location, and Plant 9.

To minimize the potential for the movement of contaminants in these zones to the underlying aquifer, a series of wells were installed to extract the groundwater for treatment prior to discharge.

Pumping operations are now in progress at all three locations. Pumping of perched groundwater from beneath Plant 2/3 and the adjacent Plant 8 was initiated on October 23, 1991. A treatment system was installed at Plant 8 to remove volatile organic compounds from the extracted water. The new treatment system uses activated carbon filters to remove the organic compounds. The water is then processed through the FEMP's existing treatment system for the removal of uranium and eventually discharged to the Great Miami River. As of February 5, 1992, more than 90,000 gallons of extracted perched groundwater has been processed through the treatment system. Approximately 5,000 gallons are being treated each week at the FEMP.

#### Plant 1 Pad Continuing Release (Removal No. 7):

The purpose of this Removal Action is to protect surface soils and regional groundwater from continuing releases of hazardous materials resulting from waste management activities on the eight-acre Plant 1 storage pad. This Removal Action is being conducted in three phases.

Phase I was completed on January 17, 1992. Phase I work involved the implementation of run-on and run-off control measures and the installation of underground utilities.

Phase II work, scheduled for completion by December 21, 1992, involves the installation of a new covered concrete storage pad (80,000 square feet) to be built adjacent to the existing Plant 1 storage pad.

Phase III involves activities to upgrade the existing Plant 1 storage pad, including the installation of a polyethylene liner and epoxy coating over the pad surface to minimize contaminant migration to the environment.

Covered storage structures planned for the Plant 1 storage pad will be equipped with containment facilities for spill control, drainage, stormwater runoff and run-on control, and fire suppression.

#### Removal of Waste Inventories (Removal No. 9):

Consistent with the terms of the 1991 Amended Consent Agreement, the existing low-level radioactive waste management program was reconfigured into a Removal Action under CERCLA. This Removal Action involves the characterization, overpacking, and disposition of low-level radioactive waste materials. The removal of waste inventories is ongoing at the FEMP.

DOE submitted to the U.S. EPA and the Ohio EPA a document summarizing existing FEMP procedures for the characterization, packaging, storage, and shipment of low-level waste. This document also addressed the management of low-level thorium waste at the FEMP, which is considered in a "ready-to-ship" configuration. A second document, addressing all other low-level thorium waste inventories, also was submitted to U.S. EPA and Ohio EPA.

DOE has incorporated Ohio EPA comments on shipping procedures and practices into the Removal of Waste Inventories Work Plan.

#### Stabilization of Uranyl Nitrate Inventories (Removal No. 20):

Processing of uranyl nitrate inventories into a solid waste form is scheduled to begin in early March 1992. Uranyl nitrate is an intermediate product in the former uranium recovery process at the FEMP. There are about 200,000 gallons of uranyl nitrate stored in 15 tanks in or near the Plant 2/3 Refinery.

In September 1991, an inspection of the tanks revealed that small leaks had developed in the piping system associated with the tanks. While the amount of material was well below quantities which require reporting to regulatory agencies and was contained by a secondary containment/sump system, DOE initiated a Removal Action to process the stored uranyl nitrate through the refinery.

This Removal Action is designed to process the uranyl nitrate to a stable form. Refinery systems integrity testing is nearing completion. Water is being

filtered through the system to identify any leaks. The uranyl nitrate inventory will be neutralized and converted to a solid form which can be drummed and properly stored in warehouses pending final disposition. Processing is expected to be completed in late April 1992.

**Safe Shutdown (Removal No. 12):** This Removal Action was initiated to ensure the safe and permanent shutdown of production facilities including the removal of uranium and other process/raw materials from equipment and lines in the former production area. Initial radiological contamination surveys on capital equipment were completed in December 1991.

Disposition of uranium products and recoverable residues is an integral part of Safe Shutdown activities. So far approximately 2.6 million pounds of uranium products have been transferred from the FEMP under the Safe Shutdown program since the production mission ended.

**Plant 1 Ore Silos (Removal No. 13):** The work plan for this Removal Action was submitted to the U.S. EPA on January 9, 1992. The project will involve the dismantling of the Plant 1 Ore Silos and their support structure. In February 1991, deteriorated valves caused the silos to leak material onto a concrete pad. The material, cold raffinate, is the waste residue from the processing of uranium ore after uranium is removed. Remaining material in the silos will be removed, containerized and placed in safe storage pending final disposition. All 14 silos and support structures will be dismantled and demolished under this Removal Action.

**Contaminated Soils Adjacent to Sewage Treatment Plant Incinerator (Removal No. 14):** The scope of this Removal Action will include the isolation or removal and disposition of contaminated soils with elevated levels of uranium in the vicinity of an out-of-service solid waste incinerator at the sewage treatment plant. The project is designed to mitigate the potential for contaminant migration. Activities will include characterization, removal, containerization, storage and disposal of materials. The work plan for this Removal Action was submitted to U.S. EPA on January 23, 1992.

**Scrap Metal Piles (Removal No. 15):** This Removal Action will address the stabilization and disposition of low-level radioactive waste scrap metal currently stockpiled outdoors at the FEMP. The project is designed to eliminate the potential threat of material

releases to the environment due to wind or rain from 1,300 tons of scrap copper and about 3,000 tons of recoverable scrap metals. The work plan for this Removal Action was submitted to U.S. EPA on January 30, 1992. Non-recoverable scrap metal is presently being packaged into appropriate containers and shipped off site for disposal under Removal Action No. 9.

**Improved Storage of Soil and Debris (Removal No. 17):** Appropriate storage for soils contaminated with low-level radioactive materials or petroleum products, and appropriate storage for contaminated debris, will be managed under this Removal Action. Activities under this Removal Action will include characterization, interim storage, and management of contaminated soils and debris until their final remediation under Operable Unit 3. Preparation of the work plan for this Removal Action is on schedule for submittal to U.S. EPA on or before March 25, 1992.

**Plant 7 Dismantling (Removal No. 19):** A proposed schedule for submitting the work plan and other appropriate documentation for this Removal Action was submitted to the U.S. EPA on January 15, 1992. Plant 7 was originally built to convert uranium hexafluoride (UF<sub>6</sub>) to uranium tetrafluoride (UF<sub>4</sub>). Plant 7 has been idle since the mid-1950s, when it was replaced by operations in the Pilot Plant. All process equipment was removed from Plant 7 in the late 1950s. Plant 7 is presently being used for storage of empty cans and drums. Activities under this Removal Action will involve decontamination and dismantling of the building.

#### **Cleanup Alternatives**

Several cleanup alternatives have been identified for Operable Unit 3. All of these options include regular maintenance and monitoring. Much of the cleanup work involves disposition of materials, treating and eventual decontaminating and decommissioning, and disposal in approved, engineered facilities either at the FEMP or off site. More definitive descriptions of viable alternatives will be provided in subsequent reports, pending the completion of the Work Plan Addendum.

More information about Operable Unit 3 is available in the Public Environmental Information Center (PEIC), where Fernald Project cleanup documents are kept in the Administrative Record. The PEIC is located in the JAMTEK building, 10845 Hamilton-Cleves Highway, Harrison, Ohio, 45030. The telephone number is (513) 738-0164.