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**PROGRESS REPORT OPERABLE UNIT 4 SILOS  
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PROGRESS REPORT**



## Operable Unit 4 SILOS

### Introduction

The Remedial Investigation/Feasibility Study is the blueprint for cleanup at the U.S. Department of Energy's Fernald Site. The nature and extent of contamination at the site and surrounding areas is being thoroughly investigated so that appropriate remedial actions can be formulated and implemented.

The Fernald Site 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 4 including its history, the current status of RI/FS activities, cleanup alternatives under consideration, and work that is being done to alleviate near-term concerns.

### Background

K-65 Silos 1 and 2 contain radium-bearing radioactive wastes dating back to the Manhattan Project era. The two silos were reinforced with an earthen berm in 1963, and the berm was upgraded in 1983. Other past improvements included a 30-foot cap which was installed on top of the silo domes for added protection, and a polyurethane foam coating that was applied over the domes for weather protection. A Radon Treatment System (RTS) was constructed, and radon gas monitors were installed around the Fernald Site boundary and in the immediate vicinity of Silos 1 and 2.

Silo 3 contains dried uranium-bearing wastes, and Silo 4 is empty.

### RI/FS Activities

- A Treatability Work Plan is being prepared for U.S. EPA approval. The Work Plan will describe the specific testing that will be performed on samples of K-65 and Silo 3 material. Treatability options include: 1) heavy metals separation from the residues by chemical extraction, 2) stabilization of the waste with concrete, and 3) vitrification (transforming the waste into glass). The technologies are being tested to determine which one provides the most environmentally-sound, cost effective and implementable method for treating the wastes prior to final disposal.
- Four vertical borings were completed in June 1991 into the earthen berms surrounding the K-65 silos. Samples were collected from these borings for the purpose of determining if measurable quantities of residue material have leaked from the walls of the silos into the surrounding berms. Analytical results from the collected samples are expected back from the laboratories later this summer. This information is required to support the completion of the Remedial Investigation and Feasibility Study reports for Operable Unit 4.
- Efforts are in progress to complete five low-angle slant borings beneath the K-65 silos for purposes of determining if residue materials have migrated from the tanks or the associated underdrain system into the underlying soils or perched groundwater. Two borings were advanced in the ground until significant quantities of perched groundwater were encountered in the boring. Upon encountering the water, drilling operations were terminated and samples of the groundwater were obtained. Preliminary sample analysis from the on-site laboratory indicates the concentration of radioactive and chemical constituents are within the natural background range. Full chemical and radiological analysis to confirm preliminary findings is being conducted at an off-site laboratory. A third boring has been advanced in the ground beneath the K-65 Decant Sump Tank. A steel casing was installed in the

boring to permit drilling to proceed through any encountered perched groundwater. All slant borings are expected to be completed by the end of August. Analytical results from the collected samples are anticipated to be received from the off-site laboratory by the end of February 1992.

- Planning and pre-mobilization activities continue in support of the proposed resampling of the residues in the K-65 Silos (Silos 1 and 2). A Revised Sampling and Analysis Plan and Health and Safety Plan have been reviewed and approved by the U.S. EPA and the Ohio EPA. Modifications to the K-65 Radon Treatment System (RTS) are complete. RTS modifications include the installation of a new blower motor, minor piping repairs, and the installation of eight electrically activated valves on the K-65 manway covers. Sampling activities are expected to be initiated in mid-July. Resampling is expected to be completed in late August, with sample analysis results tentatively scheduled to be available in January 1992. Resampling of the silo contents is necessary because the amount of material retrieved during previous sampling operations was inadequate to be representative of the entire contents of the silos.
- Other RI/FS documents are on hold pending receipt of the needed characterization and treatability data.

in above-ground tanks near Plant 2/3 at the Fernald Site. The K-65 Decant Sump Tank was used to store liquid that was drained from the K-65 silos after solid material had settled. Removal of this water from the underground sump tank reduces the potential for leakage of contaminated water into surrounding soils. Samples of the liquid removed from the sump tank are being analyzed and characterized to determine proper treatment and final disposition. In addition, samples were recovered in June from a layer of sludge located at the base of the interior of the decant sump tank. These samples are currently being analyzed at an off-site laboratory.

Bentonite clay is scheduled for installation beginning in October in support of the *K-65 Silos 1 and 2 Removal Action*. The clay will be applied over the silo residues to reduce radon levels in the silos, and to provide protection from releases to the environment in the event of silo dome collapse. This removal action is scheduled for completion by December 1991.

More information about Operable Unit 4 is available in the Public Environmental Information Center (PEIC), where Fernald Site 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.

**Cleanup Alternatives**

Several cleanup alternatives have been identified for Operable Unit 4, involving a combination of technologies currently being assessed as part of the RI/FS for the silos. The alternatives include: 1) stabilizing and capping the waste in place; 2) removing and stabilizing/treating the waste with disposal in an engineered facility on Fernald Site property, and 3) removing and stabilizing/treating the waste and shipping it to an off-site disposal facility.

**Removal Actions**

The *K-65 Decant Sump Tank Removal Action* was completed April 16, 1991, when approximately 8,000 gallons of contaminated water was pumped from the K-65 Decant Sump Tank. That water is being stored

