6078 G-000-1006.98

OPERABLE UNIT 3 PRODUCTION AREA - OCTOBER 1994 - FACTSHEET

10/01/94

DOE-FN PUBLIC
7
FACTSHEET

FERNALD
Environmental Management Project

Remedial Investigation/ Feasibility Study

PROGRESS REPORT | OCTOBER 1994

Operable Unit 3
PRODUCTION AREA

Johnny Reising
DOE Manager,
Operable Unit 3
648-3139

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. The nature and extent of contamination at the Fernald 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 3 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

Operable Unit 3, the former production area and production-associated facilities, is one of the largest and most complex of the Fernald site Operable Units, largely due to the wide variety of former processing and support facilities. When the mission at the Fernald site was production of high-purity uranium metal for U.S. defense programs and the processing of thorium to support other DOE programs, large quantities of radioactive materials and some hazardous chemicals were used in the various plants involved in the process. Operable Unit 3 focuses on cleanup of contamination in the former production area resulting from the 37-year production mission at the Fernald site. The primary contaminant is uranium, and the main focal points of cleanup are buildings, equipment, and support facilities.

RI/FS Activities

RI/FS Work Plan Addendum: Most of the tasks specified by the RI/FS Work Plan Addendum for Operable Unit 3 have been initiated, and some have been completed. Sampling plan preparations and field investigations have been completed. Sample analyses, data validation, treatability studies, and preparation of RI and FS reports, are in progress. The U.S. EPA-approved work plan recognizes the pursuit of a separate Record of Decision for Interim Remedial Action (IROD) for the decontamination and dismantlement of all Operable Unit 3 structures and support facilities.

U.S. EPA recently approved DOE's proposed modifications to the work plan addendum which include: (1) elimination of the Operable Unit stand-alone Baseline Risk Assessment; (2) a reduced field characterization program; (3) revisions in the approach for performing the FS, and (4) a revised RI/FS schedule and milestones. A combined RI and FS report will be submitted with the Proposed Plan to U.S. EPA and Ohio EPA by September 11, 1995, several months ahead of schedule. The submittal date for the Draft Operable Unit 3 Final Action Record of

Decision has been accelerated nine months, from April 2, 1997, to July 25, 1996.

Interim Remedial Action: A Record of Decision for Interim Remedial Action was approved by the U.S. EPA on July 22, 1994, allowing for early remediation of existing structures within the former production area. The plan calls for decontaminating and dismantling buildings and support facilities several years in advance of the final Record of Decision for Operable Unit 3. The plan also provides for temporary on-site storage of the bulk rubble and debris from dismantlement activities as well as final off-site disposition of a limited portion of the debris. A determination on final disposition of rubble and debris from the interim remedial action will await the final Record of Decision for Operable Unit 3.

This interim remedial action could accelerate cleanup of the former production area by up to four years and result in a significant cost savings of approximately $300 million.

The interim cleanup action was pursued as a result of concerns with the increased potential for releases from deteriorating structures in the production area. The action will result in early reduction of potential human health and environmental risks from the deteriorating structures.

Design plans and specifications for performing the interim remedial action are in progress. On September 20, 1994, DOE submitted to EPA the Operable Unit 3 Remedial Design/ Remedial Action (RD/RA) Work Plan for Interim Remedial Action, as well as the initial implementation plan for the dismantling of Plant 4.

The RD/RA Work Plan and Plant 4 Implementation Plan are available for public inspection at Fernald's Public Environmental Information Center.

Remedial Investigation: Field investigation activities for characterization of Operable Unit 3 structures were completed ahead of schedule on August 5, 1994. A total of 992 samples were collected. The samples are being analyzed at off-site independent laboratories. Analytical results will be validated to ensure data quality. The results also will be used to characterize contamination in the former production area, and to support the development of remedial action alternatives for disposal of demolition debris from Operable Unit 3. Results of the field program will be summarized in the Operable Unit 3 Remedial Investigation/Feasibility Study combined report.

Treatability Studies: Operable Unit 3 personnel are developing plans for the testing of potentially applicable innovative technologies to support the decontamination, dismantling, and treatment requirements of remedial actions. Technology alternatives will be tested for applicability, effectiveness, cost, waste minimization, secondary waste generation, and other key evaluation criteria. Screening of many technologies has been completed, revealing possible opportunities to reduce costs and minimize short- and long-term risks.

Several technologies to be tested and the particular tests to be conducted are detailed in a Treatability Study Work Plan for Operable Unit 3, which was approved by U.S. EPA in April 1994.

Feasibility Study: The scope of the Operable Unit 3 FS report will be limited to evaluating options for treatment and final disposition of wastes generated by the decontamination and dismantlement of Operable Unit 3 buildings and support structures. The FS scope is limited because the FS report for Operable Unit 3 is being combined with the RI report in a single document, and EPA already has approved a Record of Decision for Interim Remedial Action at Operable Unit 3.

The FS Report was initiated earlier than planned due to the early availability of resources required to develop the report. The limited scope of the document -- combined with the early completion of the Operable Unit 3 field characterization project, the reduced scope of the RI Risk Assessments, and the opportunity to combine RI and FS activities in a parallel mode -- will result in early completion of the effort. EPA has approved this accelerated and combined approach. The revised EPA submittal date is September 11, 1995, approximately 11 months in advance of the previously scheduled date of August 7, 1996.

Removal Actions

Plant 1 Pad Continuing Release (Removal Action 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, the implementation of run-on and run-off control measures and the installation of underground utilities, is complete.

Phase II, the installation of a covered, 80,000 square foot concrete storage pad adjacent to the existing Plant 1 storage pad, also is complete.

Remaining drums of low-level radioactive waste in outdoor storage on the Plant 1 Pad are being moved into the two new covered storage structures, which are equipped with containment facilities for spill control, drainage, and stormwater runoff/run-on control.

Phase III involves activities to upgrade the existing Plant 1 storage pad, including the installation of a polyurethane and epoxy coating over the pad surface to minimize contaminant migration to the environment. Drum movements to clear areas in preparation for Phase III construction were completed in July 1993. Construction activities began in August 1993.

To date, Phase III construction has been completed, including the installation of a new covered storage structure and application of the polyurethane and epoxy coating over the pad. This removal action is on schedule for completion by February 19, 1995.

Removal of Waste Inventories (Removal Action No. 9) This removal action involves the characterization, overpacking, and disposition of low-level radioactive waste materials. The Fernald site has approval from the DOE Nevada Field Office to dispose of general waste streams at the Nevada Test Site (NTS). The wastes include: process area scrap wastes (scrap metal and wood); construction and Removal Action waste (demolition debris); uranium production residues; baled trash; processed metal waste; thorium wastes; and materials for the U.S. Army Depleted Uranium Armor and Munitions Program.

Since the most recent progress report in June 1994, many aspects of the program to remove waste inventories have progressed successfully and some problems have developed. The most notable are:

* The waste shipping goal for Fiscal Year 1994 to dispose of 79,500 drum equivalents (DEs) of low-level radioactive waste (LLRW) at NTS has been exceeded. In achieving this goal, no deviations or quality issues were documented by NTS on these shipments throughout the fiscal year.

* The revised FEMP Application To Ship Low-Level Radioactive Waste To NTS has been accepted, allowing for the shipment of four additional waste streams.

* All of the waste from the U.S. Army Depleted Uranium Armor and Munitions Program at Fernald has been shipped to the NTS.

* Waste from Plant 7 demolition is staged for removal. Much of the structural steel is to be recycled rather than buried at the NTS.

* Scrap metal was melted at the Scientific Ecology Group (SEG) facility in Tennessee to separate reusable metal from waste. The waste from this process was shipped to NTS.

* A transportation accident occurred October 1, 1994, when a truck enroute to the NTS overturned on a Missouri highway. The truck was carrying a metal container filled with Fernald low-level radioactive waste. The container withstood the impact and was not breached. The incident resulted in no injuries, spillage or environmental damage. The container was returned to Fernald on October 5, 1994. A critique of the incident is in progress.

Safe Shutdown (Removal Action 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. Disposition

of uranium products and recoverable residues is an integral part of Safe Shutdown activities.

Assessments of equipment and materials is ongoing. Verification of the production equipment in all process plants, except for the Plant 2/3 Refinery, has been completed. The anticipated completion date for the verification of Refinery equipment is August 1996.

The effort to relocate excess production equipment is ongoing, although private-sector disposition is currently on hold by order of the Secretary of Energy for policy review. Eleven pieces of new, excess equipment were removed from Plant 5 and transferred to a U.S. Army facility in Tennessee. The equipment had a book value of $1.6 million. Approximately $800 would have been received for this equipment if it had been sold as scrap metal. However, due to strict radiological controls maintained at Fernald, this equipment may have required disposal at waste, which would have cost approximately $100,000. The Army's contractor will utilize the excess equipment for its designed purpose, with a cost avoidance of approximately $1.8 million to the U.S. Government and taxpayers. Fernald also has successfully relocated dust collector components to a Martin Marietta Energy Systems facility in Oak Ridge, Tennessee. The equipment will be used to provide air filtration for five separate projects at DOE's Y-12 Plant. The Fernald acquisition cost of the components was $1.1 million, and the scrap metal value was approximately $1,000. It would have cost approximately $100,000 to disposal of the material as waste. The relocation results in an overall cost savings to the government of approximately $1.5 million.

Manufacturing Sciences Corporation (MSC) of Oak Ridge, the successful bidder for the purchase of 973,651 net pounds of depleted uranium metal derbies, has received 239,471 net pounds to date. The remaining shipments will be made at the rate specified by MSC of one truckload per month until shipments are completed in December 1996. MSC also has received 158 excessed metal derby skids, which were purchased from Fernald to facilitate MSC materials handling and maximize MSC warehouse space.

All U.S. Army-owned uranium metal previously stored at Fernald has been shipped to NTS for disposal. This project is now complete. Phase I of this project involved the successful removal of 4,077,075 net pounds, which was completed in November 1992. Phase II involved the removal of 2,265,554 net pounds in 70 shipments and was completed two weeks ahead of schedule.

The total amount of uranium products shipped from the Fernald site since the production mission ended in July 1989 is 13.5 million net pounds.

Plant 1 Ore Silos (Removal Action No. 13): This removal action involves the dismantling of the Plant 1 Ore Silos and their support structures. Due to deteriorated valves, materials leaked from the silos onto an elevated concrete pad in February 1991. The material, known as cold raffinate, is the waste residue from the processing of uranium ore after uranium is removed. Remaining material in the silos has been removed, containerized and placed in safe storage pending final disposition. All 14 silos and support structures are being dismantled under this removal action.

Demolition of the concrete silos began in October 1993. In December 1993, two of the six concrete silos were dismantled. However, the subcontractor performing this work was terminated in December due to unsatisfactory schedule performance. Options were evaluated to replace the subcontractor. In March 1994, Wise Construction was awarded the contract.

To date, all concrete silos and six of the eight tile silos have been dismantled. The final two tile silos along with the remaining structural steel are on schedule to be dismantled by the end of November 1994. This removal action is on schedule for completion by December 18, 1994.

Contaminated Soils Adjacent to Sewage Treatment Plant Incinerator (Removal Action No. 14): The scope of this removal action includes 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. Current activities include characterization, re-

moval, storage and disposal of materials.

The first phase of the removal action (characterization) discovered a larger area of contamination than previous sampling had indicated. A Work Plan Addendum detailing the need for additional excavations based on analytical results from the initial sampling was approved by the U.S. EPA and Ohio EPA in August 1993. Additional excavations identified in the approved Work Plan Addendum have been completed.

The off-property soil was excavated and verification soil samples were collected. The excavated soil was brought on site and stockpiled in accordance with Removal Action No. 17 (Improved Storage of Soil and Debris). Isolated locations have been identified within the off-property excavation area that require additional excavation.

The offsite excavation was completed in June 1994. Verification soil samples were collected and sent to an off-site laboratory for analysis. Analytical results are expected in October 1994. The final report for this removal action was scheduled to be submitted to the U.S. EPA and Ohio EPA by September 24, 1994. A three month extension for delivery of the final report was approved by DOE and U.S. EPA in August 1994.

Upon validation of analytical data and incorporation of DOE comments, the final report will be revised and submitted to U.S. EPA no later than December 5, 1994, in accordance with the revised submittal date.

Scrap Metal Piles (Removal Action No. 15): This removal action is addressing the stabilization and disposition of low-level radioactive waste scrap metal currently stockpiled outdoors at Fernald. 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 2,210 tons of recoverable ferrous and nonferrous scrap metal.

The recycling of the recoverable ferrous and nonferrous scrap metal was completed in March 1994, under a contract that emphasized recycling or other beneficial reuse. The ferrous metal has been reprocessed for restricted reuse in DOE high-energy physics programs. A portion of the nonferrous metal has been recycled. FERMCO submitted the final report to DOE on September 27, 1994, for review.

Plans are being finalized for the removal and off-site processing of the containerized scrap copper pile. Bids have been evaluated and a determination has been made to perform pilot testing on the copper to ensure achievable goals to process the material for unrestricted reuse.

Non-recoverable scrap metal at Fernald has been packaged into appropriate containers and shipped off site for disposal under Removal Action No. 9 (Removal of Waste Inventories).

Improved Storage of Soil and Debris (Removal Action No. 17): This removal action was initiated to address contaminated soil and debris generated as a result of continued construction and maintenance projects, removal actions, and remedial actions at Fernald. Field implementation activities originally included four separate actions: the construction of three temporary interim storage structures (similar to those currently being used on Fernald's Plant 1 Pad), and the in-place containment of one existing large soil and rubble pile. These four field actions were to be implemented to improve interim storage and management of contaminated soils and debris to mitigate the potential spread of contamination until their final disposition is determined under the Operable Unit 3 and Operable Unit 5 Records of Decision.

The U.S. EPA and Ohio EPA have approved the proposed plan to install an in-place vegetative cover (to serve as the in-place containment) over the existing large soil and rubble pile located north of Third Street within Fernald's former production area. Field activities in support of this regrading and seeding activity were initiated in September 1994, and are planned for completion in the summer of 1995.

Fernald has requested EPA approval to cancel construction of the three planned temporary covered storage structures. These proposed changes are the result of a re-evaluation of evolving waste and debris management methodologies and public concerns regarding the construction of additional storage structures at Fernald -- a Superfund site planned for total remediation.

DOE and FERMCO cited reasons for requesting work scope changes for improving the storage of soil and debris during a meeting with the U.S. EPA and Ohio EPA in August 1994. The agencies initial responses to the proposed changes were favorable. U.S. EPA and Ohio EPA are evaluating the request. EPA approval to cancel the planned construction and pursue more viable alternatives is anticipated in December 1994.

Plant 7 Dismantling (Removal Action No. 19): Activities under this removal action include characterization, decontamination, removal, containerization and disposal or reuse of materials in the building, and decontamination and dismantling of the building itself.

Steel, concrete and other materials including approximately 700 tons of structural steel will be recycled for beneficial reuse.

Following the successful removal of interior contents, piping and equipment and all interior and exterior transite siding, the structural steel frame of Plant 7 was successfully imploded on September 17, 1994, on the second attempt using linear-shaped explosive charges. The final takedown completed an effort which began September 10, when explosive charges failed to take the building down completely. The first two floors of the building collapsed as planned on the first attempt. However, splice plates that had been pre-cut on the third and fifth floors did not separate as anticipated. The building dropped approximately 30-35 feet instead of the planned 60 feet.

The final takedown involved strategic placement and detonation of additional explosive charges at key structural supporting columns. The specialized steel-cutting charges were detonated sequentially to cut columns and to use the weight and configuration of the building to cause it to fall toward a pre-determined open area.

Contractors are completing the dismantling process by using crane-mounted mechanical shears to cut the steel into sizes permitting shipment off site for recycling. This effort is expected to be completed in late 1994.

Neutralization of Uranyl Nitrate Inventories (Removal Action No. 20): Neutralization of Fernald's inventory of uranyl nitrate hexahydrate (UNH) is tentatively scheduled to begin in January 1995 and be completed by mid-summer 1995.

Installation of dedicated pipelines and pumps designed to ensure worker safety and health during the project is approximately 90% complete. These construction activities are expected to be completed in October 1994, followed by FERMCO and DOE assessments of UNH systems operability.

The purpose of this project is to safely neutralize and dispose of approximately 200,000 gallons of UNH, which essentially is uranium dissolved in nitric acid. The UNH is stored in 19 tanks in and around Plant 2/3. It will be diluted, neutralized, and filtered. There will be two by-products.

The solid filter cake is expected to meet non-hazardous requirements of the Resource Conservation and Recovery Act (RCRA). The solid filter cake will be drummed and shipped to the Nevada Test Site for disposal as non-hazardous low-level radioactive waste.

The liquid filtrate will be tested to confirm its acceptability for discharge to the Great Miami River under Fernald's current National Pollutant Discharge Elimination System (NPDES) permit. Uranium will be removed from the liquid filtrate prior to treatment of the liquid filtrate through the site's normal wastewater treatment systems. Following treatment, the liquid waste will be sampled for uranium and other metals, acid content, etc., to ensure that it meets NPDES regulations for toxic pollutants prior to discharge to the river.

Uranyl nitrate hexahydrate is an intermediate product in the former uranium recovery process at Fernald. UNH became a RCRA issue due to its low pH (high acid content) when the material was declared waste by DOE in 1991. RCRA is a federal law designed to ensure safe handling, storage, treatment and disposal of hazardous waste.

Asbestos Removals (Removal Action No. 26): This removal action documents the ongoing asbestos abatement activities at Fernald to manage asbestos in-place and mitigate the potential for asbestos fiber release and migration.

Abatement activities within the ongoing Asbestos Program include repairs, encasement, encapsulation or removal of asbestos containing materials which exist in many buildings on the Fernald site. Abatements to date include small-scale in-situ repairs, encasement, encapsulation, removals, and the completion of the large-scale asbestos abatement and demolition of Plant 7. Field activities involving support of asbestos abatement are continuing, including removal of asbestos-bearing thermal insulation in pipes, tanks, and valves throughout the Fernald site.

Fire Training Facility (Removal Action No. 28): This removal action was initiated to address an area historically used to simulate fire and emergency response conditions for training purposes. The Fire Training Facility is located just north of the former production area on the old North Access Road. Work activities include the removal, decontamination, disposal, treatment or storage of all buildings, structures, tanks, and equipment in the area.

The concrete building at the Fire Training Facility was demolished on September 12, 1994. Samples of the surface waters and sediments at the Fire Training Facility have been collected and shipped to off-site laboratories for analyses. These analyses will be used for waste characterization of the water and sediment.

The open-top tank used as a burn trough has been removed from the ground. Waste water and sludges that were in this tank have been removed and containerized for disposal. The tank has been cut into pieces and containerized for disposal. The metal will be included in recycling program for restricted use of scrap metal.

Other activities include excavation of contaminated soils, sampling of excavated areas, and containerization or stockpiling of the removed soils depending on analytical results.

For More Information

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.