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**ADDENDUM TO THE RI/FS COMMUNITY RELATIONS PLAN FOR
REMOVAL ACTION NO. 24 - PILOT PLANT SUMP**

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TO THE
RI/FS COMMUNITY RELATIONS PLAN
FOR REMOVAL ACTION No. 24
PILOT PLANT SUMP

Fernald Environmental Management Project
Fernald, Ohio

U.S. Department of Energy
Fernald Field Office

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TABLE OF CONTENTS

<u>SECTION</u>	<u>PAGE</u>
List of Acronyms	ii
Introduction	1
Objectives	2
Background	3
Overview of Community Concerns	5
Highlights of Community Relations Activities	5
Timetable	6
References	7

LIST OF ACRONYMS

CERCLA:	Comprehensive Environmental Response, Compensation, and Liability Act [of 1980] (also known as Superfund)
CRP:	Community Relations Plan
DOE:	U.S. Department of Energy
EPA:	U.S. Environmental Protection Agency
EE/CA:	engineering evaluation/cost analysis
FEMP:	Fernald Environmental Management Project (formerly the Feed Materials Production Center)
FFCA:	Federal Facility Compliance Agreement
NCP:	National Oil and Hazardous Substances Pollution Contingency Plan [of 1990]
RI/FS:	remedial investigation and feasibility study
SARA:	Superfund Amendments and Reauthorization Act [of 1986]

Introduction

This document is prepared as an addendum to the Fernald Environmental Management Project (FEMP) Remedial Investigation and Feasibility Study (RI/FS) Community Relations Plan (CRP), dated August 1992. This addendum addresses Removal Action No. 24, Pilot Plant Sump.

This removal action is being conducted pursuant to the laws, regulations and agreements listed below, and will comply with the provisions of each:

- The Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), also known as Superfund, that provides for the investigation and cleanup of uncontrolled hazardous waste sites
- The Superfund Amendments and Reauthorization Act of 1986 (SARA) that renewed and updated CERCLA
- The National Oil and Hazardous Substances Pollution Contingency Plan of 1990 (NCP) that spells out how CERCLA and SARA will be implemented
- The Federal Facility Compliance Agreement of 1986 (FFCA) between the U.S. Department of Energy (DOE) and the U.S. Environmental Protection Agency (EPA) that provides for the investigation and cleanup of environmental impacts from past and present activities at the FEMP
- The Consent Agreement of 1990 that amended the FFCA and fostered consistency among the operable unit concept and the current commitments of the RI/FS program without modifying the underlying objectives
- The Amended Consent Agreement of 1991 that establishes definitions and schedules for completion of RI/FS documents for the five operable units and identifies additional specific removal actions at the FEMP

The 1990 Consent Agreement specified four removal actions and provided for the identification of three more; these seven are now referred to as the Phase One Removal Actions. The Amended Consent Agreement for the FEMP, signed on September 20 and effective on December 19, 1991, specified 11 additional removal actions, referred to as Phase Two Removal Actions.

On January 14, 1992 six more removal actions, known as Phase Three Removal Actions, were approved by EPA and three emergency removal actions were initiated. In all, the three phases total 27 separate, sequentially numbered removal actions. DOE may identify additional removal actions each year by January 15, if needed.

Objectives

The objective of removal actions under CERCLA and the NCP is to "...take appropriate action to abate, stabilize, mitigate, or eliminate the release or threat of release..." of hazardous materials or waste in a manner that reduces or eliminates the threat to public health, welfare, or the environment. Removal actions are emergency or short-term responses to immediate threats. They differ from remedial actions in that they are generally more limited in scope and cost.

Removal actions can be divided into three general categories: emergency, time critical, and non-time-critical. They are as follows:

- Emergency removal actions call for an immediate response. An Administrative Record file must be established and affected citizens must be notified.
- Time-critical removal actions have a planning period of less than six months. If on-site removal actions are expected to extend beyond 120 days, then an addendum to the CRP is required based on interviews with community residents and/or public interest groups to identify their concerns and determine ways in which residents would like to become involved.
- Non-time-critical removal actions usually have a planning period of at least six months and dictate the same community relations activities as discussed above. An added requirement is the preparation of an engineering evaluation/cost analysis (EE/CA). In this case, the addendum to the CRP must be completed before the EE/CA approval memorandum is signed.

The specific objective of Removal Action No. 24, Pilot Plant Sump, a time-critical removal action, is to protect human health and the environment by eliminating the potential threat of release of contaminants from the Pilot Plant Sump. The liquid level in the sump has been rising and falling, which was reported to regulatory authorities as a potential release to the environment. Although there is no direct evidence of leakage from the sump, a sampling and analysis program was performed on the sump contents. The surrounding soils and groundwater were reviewed as well.

Two grab samples of sump liquid revealed that it contains heavy metals and radioactive uranium and thorium. These samples also exceed the toxicity characteristic leaching procedure level for lead, barium, benzene and mercury. There also are indications of appreciable levels of 1,1,1-Trichloroethane (200 ppm maximum), carbon tetrachloride (30 ppm maximum) and o-xylene (21 ppm maximum). These constituents are consistent with the by-products from operations known to have occurred in the Pilot Plant.

The results of analysis of soil samples collected during the installation of monitoring wells in the vicinity of the sump were also examined. Three of these wells are 15 to 30 feet from the sump. The analytical results from these samples indicate elevated levels, relative to background, of radioactive or nonradioactive contaminants that also are found in the sump.

The scope of the pilot plant sump removal action encompasses: 1) physical removal of the sump, including liquid and some solid contents and hardware components, 2) exploration of the inlet drain line, 3) capping the floor drain system line that is to be left in place, and 4) removal of contaminated soil, if applicable, from a zone surrounding the sump and inlet line. Any contaminated soil that may exist beyond this area will be addressed in the final remediation of Operable Unit 5. Following the removal of the sump, the Pilot Plant floor drain piping will be internally examined in an effort to characterize its contents and physical condition. Because the piping is an integral part of the Pilot Plant's concrete and brick floor, it cannot be externally accessed prior to demolition of the facility. For this reason, removal of the floor drain system will be limited to the section of piping that is connected to the sump outside the facility.

Background

The Pilot Plant is located in the southwest corner of the FEMP production area, which is Operable Unit 3, while the Pilot Plant Sump is located approximately 15 feet west outside of the southwest corner of the Pilot Plant. Pilot Plant operations began in October 1951. Initial activities centered on training operators for machining operations to be set up in the fabrication plant, known as Plant 6. The Pilot Plant operated as a general use facility for testing and for smaller operations, and the processes employed ranged from pilot to full scale. Often tests of new processes were run in the Pilot Plant before they were implemented at full scale in the main plants.

Over the years of operation, Pilot Plant processes included aqueous/organic extractions of uranium and thorium, calcining, vacuum furnace casting, reduction of uranium hexafluoride, reduction of uranium tetrafluoride to uranium metal, briquetting, heat treating, centrifugal casting, reject core reclamation and various wet tankage techniques. A series of thorium processing operations also were undertaken in the Pilot Plant equipment. Pilot Plant processes could produce purified thorium nitrate, oxalate, hydroxide

or metal. The following are brief summaries of the several processes that were conducted within the Pilot Plant:

- Solvent Extraction, conducted from 1964 to 1980. Purification of thorium or uranium digested liquors by liquid-liquid countercurrent extraction in perforated plate pulse columns. Diamyl-amyl phosphonate in kerosene and di-secbutyl phenyl phosphonate in kerosene made up the extractants for thorium. Raffinate was neutralized and filtered; filter cake was drummed and effluent went into the general sump. Solvent was recovered by nitric acid and soda ash treatment and centrifuging.
- Sump Process. All effluent from the floor sumps was collected in two outside tanks and treated in two neutralizing tanks, then filtered.
- Thorium Digestion, conducted from 1964 to 1980. Thorium ores, thorium oxalate and other thorium metals were dissolved in a single digester for extraction feed, then vented to an outside scrubber.
- Thorium Oxalate, conducted from 1971 to 1976. Thorium nitrate tetrahydrate was precipitated with oxalic acid to form a wet thorium oxalate, which was filtered. The oxalate was calcined at another location.
- Thoria Gel (hydrated oxide), conducted from 1964 to 1970 and 1977 to 1979. A thorium nitrate tetrahydrate solution was precipitated with carbon dioxide and ammonia to form thorium hydroxide. This was slurried with water and ammonia, filtered, dried and sent to another location for calcining to thorium oxide.
- Thorium Tetrafluoride Precipitation, conducted from 1969 to 1971. Thorium tetrafluoride was precipitated by adding hydrofluoric acid to thorium nitrate tetrahydrate solution. The thorium tetrafluoride was filtered and dried twice.
- Zinc Precipitation, conducted from 1969 to 1971. Zinc fluoride was precipitated by dumping bags of zinc oxide into dilute hydrofluoric acid. The zinc fluoride was filtered and dried twice for use in thorium metal production. This process used the same equipment used for the thorium tetrafluoride precipitation.
- Pot Liner Preparation. Calcium fluoride from thorium derby breakout was prepared for pot liner material by crushing and ball milling.

- **Decladding Fuel Elements.** Aluminum-clad, nickel-plated uranium fuel elements were declad by placing in a stainless steel ventilated trough and circulating sodium hydroxide and nitric acid. Declad elements were returned to the production stream in Plant 5 and the spent solution went to Plant 8.
- **Enriched Oxidation Furnace,** conducted from 1956 to 1985. A small single hearth, gas-fired furnace used to process enriched scrap uranium oxide, uranium metal and other residues.
- **Barium Chloride Conversion.** Barium chloride heat treating salts from the uranium extrusion operation were converted to barium sulfate.

The Pilot Plant Sump is a temporary sump constructed and connected to the floor drain system for use from 1968 to 1970. During this time, the main sump was refurbished and the facility floor and floor drain system were replaced. The sump is 9 feet long and 2 feet in diameter, and is made of stainless steel pipe, buried vertically in the ground. Floor drain liquids flowed by gravity to the sump, where they accumulated until pumped to a processing system for uranium and thorium recovery. The current condition of the sump walls, the welded bottom plate and the inlet line are not known; however, they may be actual or potential pathways for release to the environment because of their age and the corrosive nature of the sump contents.

Overview of Community Concerns

In preparing this addendum, transcripts of community meetings held on: January 31, 1989; May 15, 1989; October 24, 1989; February 20, 1990; May 22, 1990; September 25, 1990; December 11, 1990; March 19, 1991; July 16, 1991; and October 29, 1991; February 25, 1992; July 21, 1992, and November 9, 1992 were reviewed. Also reviewed were transcripts from the RI/FS Environmental Impact Statement scoping meetings held on June 12 and 13, 1990.

A 45-day public comment period for the Pilot Plant Sump Removal Action was held from November 4 - December 18, 1992. The announcement ran in three local newspapers. There were no oral or written comments submitted.

Highlights of Community Relations Activities

Community concerns regarding the Pilot Plant Sump Removal Action suggest an active FEMP community relations effort with the following objective:

- **Maintain an active effort to keep interested community members informed throughout the implementation of the Pilot Plant Sump Removal Action.**

The following specific activities have been identified to support the community relations objective for this removal action:

1. **Prepare one or more fact sheets or updates for the purpose of providing information about the removal action and answering key concerns about the Pilot Plant Sump at the FEMP and distribute them at the quarterly public meetings.**
2. **Devote some portion of future community meetings to this issue; update the RI/FS exhibit to include new information as it becomes available. (Community meetings are held at regular intervals on dates selected by DOE.)**
3. **Include coverage about the Pilot Plant Sump Removal Action in the Fernald Project Cleanup Report as needed during the removal action.**
4. **Offer a roundtable presentation on the Pilot Plant Sump.**
5. **Provide a 24-hour phone line at the FEMP so concerned citizens can contact a FEMP representative during a time of alarm. The number is 513-738-6295, which is FEMP Security.**
6. **Make appropriate additions to the Administrative Record and publicize their availability at the Public Environmental Information Center, JAMTEK Building, 10845 Hamilton-Cleves Highway, Harrison, Ohio, 45030.**

Timetable

The preparation of materials for all community relations activities will be tied to the removal action schedules. For a complete list of schedule dates and activities, please see the Pilot Plant Sump Work Plan, which is in the Administrative Record, located at the Public Environmental Information Center. The activities will be scheduled to provide the maximum flexibility and information to the public. The work plan for this removal action has been approved by EPA. Discussions and updates on the status of the removal action will be given at future public meetings.

REFERENCES

1. U.S. Department of Energy, "Fernald Environmental Management Project Pilot Plant Sump Removal Action Number 24 Work Plan," October 1992.