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**FERNALD PROJECT CLEANUP REPORT
FEBRUARY 1992**

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NEWSLETTER

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Cleanup continues under provisions of 1991 Amended Consent Agreement

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The U.S. Department of Energy (DOE) continues to conduct cleanup activities at the Fernald Environmental Management Project (FEMP) according to schedules and specifications contained in the 1991 Amended Consent Agreement.

This agreement, reached between the DOE and the U.S. Environmental Protection Agency (U.S. EPA) in September 1991, revised the scope and schedule of cleanup activities to be conducted at the FEMP under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) program.

The DOE continues to conduct a Remedial Investigation/Feasibility Study (RI/FS) which has been in progress since 1986 to determine the nature and extent of contamination on and around the FEMP. The RI/FS work includes development of cleanup alternatives for five separate Operable Units, which are areas grouped according to their similarities in terms of environmental concern or likely cleanup alternatives.

Significant changes made in the

1991 Amended Consent Agreement which were not part of the 1990 Consent Agreement include the addition of a Comprehensive Sitewide Operable Unit, establishment of a Technical Support Group, and a substantially increased number of Removal Actions.

The Comprehensive Sitewide Operable Unit was established to provide an evaluation of remedies selected for each of the five Operable Units, including near-term Removal Actions and final Remedial Actions, to ensure that they are protective of human health and the environment on a sitewide basis. Removal Actions are short-term actions designed to reduce risk and work in tandem with Remedial Actions, which are final remedies. Removal Actions and Remedial Actions are coordinated with both the U.S. EPA and the Ohio EPA to ensure that short-term work is consistent with expected long-term corrective actions.

The Technical Support Group will be comprised of technical experts from DOE and the EPA, and independent experts representing organizations or

interests that are external to both DOE and the U.S. EPA. The Technical Support Group charter outlining roles and responsibilities is currently being reviewed by DOE and the U.S. EPA.

The RI/FS involves extensive sampling and analysis of soil, water, and other media to detect and measure levels of chemical and/or radiological contamination present in the Operable Unit areas. Once the nature and extent of the contamination has been defined, analysis of alternatives for removing or immobilizing the contamination is undertaken.

A Record of Decision will be issued by the U.S. EPA to specify the selected remedial alternative for each of the Operable Units. The DOE will implement final cleanup actions as directed by the U.S. EPA in the Records of Decision.

Consistent with the terms of the 1991 Amended Consent Agreement, the first Record of Decision for the five FEMP Operable Units is expected to be issued by U.S. EPA in December 1993 for Operable Unit 2; the last in May 1997 for Operable Unit 3.

The *Fernald Project Cleanup Report* is intended to update the community on activities associated with environmental studies and cleanup efforts at the Fernald Environmental Management Project. The report is designed as a supplement to information provided at regular community meetings and through other communication activities.

The next community meeting is scheduled for Tuesday, February 25, 1992, at the Plantation, 9660 Dry Fork Road, Harrison, Ohio,

45030. Fernald Environmental Management Project technical personnel will be on hand at 6 p.m. to explain exhibits on various cleanup activities. The general meeting will begin at 7 p.m. and will include presentations by the Department of Energy, and statements by the U.S. and Ohio Environmental Protection Agencies, and Fernald Residents for Environment, Safety, and Health (FRESH). A question-and-answer session will follow.

This issue of *Fernald Project*

Cleanup Report offers a brief description of activities which have occurred as part of the RI/FS since the last community meeting was held on October 29, 1991. Additional information, including more detailed reports, records, and other documents, is available at the Public Environmental Information Center located in the JAMTEK Building, 10845 Hamilton-Cleves Highway, just south of the Fernald Environmental Management Project.

In the coming weeks, DOE will receive and begin the process of evaluating proposals from companies for the Environmental Restoration Management Contract (ERMC) at the FEMP. The projected effective date of the ERMC contract award is June 1, 1992. A phase-in period is planned from June 1, 1992,

through August 31, 1992, with the ERMC assuming full contractual responsibility for the FEMP on September 1, 1992.

The current management and operating contractor, Westinghouse Environmental Management Company of Ohio, has opted not to bid on the ERMC for the FEMP. Companies which

have expressed interest in bidding on the five-year contract have been given a tour of the FEMP and were briefed on the requirements of the five-year contract.

The deadline for submitting proposals is February 27, 1992.

Following is a general description of the five Operable Units and the Comprehensive Site-wide Operable Unit, and the timetables set forth in the 1991 Amended Consent Agreement for the DOE to submit Proposed Draft Records of Decision to the U.S. EPA for approval. In issuing a Record of Decision, the U.S. EPA announces the preferred alternative to accomplish final remediation and reasons for its selection:

Operable Unit 1 (Waste Pit Area) includes Waste Pits 1-6, the Burn Pit, the Clearwell, berms, liners, and soil within the Operable Unit 1 boundary. The Proposed Draft Record of Decision is due to U.S. EPA on or before December 6, 1994.

Operable Unit 2 (Other Waste Units) includes the flyash piles, other south field disposal areas, lime sludge ponds, solid waste landfill, berms, liners, and soil within the Operable Unit 2 boundary. The Proposed Draft Record of Decision is due to U.S. EPA on or before December 10, 1993.

Operable Unit 3 (Production Area) includes the production area and production-associated facilities and equipment (includes all above- and below-grade improvements), including, but not limited to, all structures, equipment, utilities, drums, tanks, solid waste, waste, product, thorium, effluent lines, K-65 transfer line, wastewater treatment facilities, fire training facilities, scrap metal piles, feedstock, and coal pile. The Proposed Draft Record of Decision is due to U.S.

EPA on or before May 2, 1997.

Operable Unit 4 (Silos 1-4) includes K-65 silos 1 and 2 which contain radium-bearing radioactive wastes, Silo 3 which contains dried uranium-bearing wastes, Silo 4 which is empty, berms, decant tank system, and soil within the Operable Unit 4 boundary. The Proposed Draft Record of Decision is due to U.S. EPA on or before June 10, 1994.

Operable Unit 5 (Environmental Media) includes groundwater, surface water, soil not included in the definition of Operable Units 1-4, sediments, vegetation and wildlife. The Proposed Draft Record of Decision is due to U.S. EPA on or before August 2, 1995.

Comprehensive Site-Wide Operable Unit: Following U.S. EPA issuance of Records of Decision for the five Operable Units, an evaluation of remedies selected for Operable Units 1-5, including Remedial Actions and Removal Actions, will be conducted to ensure that they are protective of human health and the environment on a site-wide basis as required by CERCLA, the National Contingency Plan and applicable U.S. EPA policy and guidance.

A total of 21 Removal Actions are identified under the terms of the 1991 Amended Consent Agreement, including the original seven Removal Actions which are currently in progress or completed at the FEMP. The Removal Actions are:

- 1) Contaminated Water Beneath FEMP Buildings
- 2) Waste Pit Area Runoff Control
- 3) South Groundwater

- Contamination Plume
- 4) Silos 1 and 2
 - 5) K-65 Decant Sump Tank
 - 6) Waste Pit 6 Residues
 - 7) Plant 1 Pad Continuing Release
 - 8) Inactive Flyash Pile Control
 - 9) Removal of Waste Inventories
 - 10) Active Flyash Pile Controls
 - 11) Pit 5 Experimental Treatment Facility
 - 12) Safe Shutdown
 - 13) Plant 1 Ore Silos
 - 14) Contaminated Soils Adjacent to Sewage Treatment Plant Incinerator
 - 15) Scrap Metal Piles
 - 16) Collect Uncontrolled Production Area Runoff (Northeast)
 - 17) Improved Storage of Soil and Debris
 - 18) Control Exposed Material in Pit 5
 - 19) Plant 7 Dismantling
 - 20) Stabilization of Uranyl Nitrate Inventories
 - 21) Expedited Silo 3 Dust Collector

The 1991 Amended Consent Agreement also establishes a framework for an annual review of the need for additional Removal Actions, which can be initiated at any time during the course of the RI/FS. As required by the agreement, DOE submitted a list of proposed additional Removal Actions to the U.S. EPA on January 14, 1992, along with corresponding schedules for submitting work plans or other appropriate documentation. The U.S. EPA and Ohio EPA are currently reviewing the list of proposed removals and are expected to provide comments or approve the list in February 1992.

Operable Unit 1 - Waste Pit Area

RI/FS Activities

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Pit Berm Evaluation: Regular monitoring of soil continues in the berms around Pit 3, Pit 5, and the Clearwell, to ascertain their strength and consistency and to measure any movement or shifting of soils. Geotechnical analyses of soil samples taken from the berms around Pit 3, Pit 5, and the Clearwell, are being conducted to determine the structural integrity of the berms. A stability analysis was conducted on the pit berms which concluded that berm failure was unlikely.

Pit 5 Liner Repair: Repairs to the Pit 5 liner, a synthetic flexible membrane, are complete. Repairs to the liner were made by placing patches of the material over torn areas and sealing them with adhesives.

Waste Characterization and Treatability: Analyses of samples taken from materials in Waste Pits 1-4 and the burn pit are nearing completion. This information is required to complete the Operable Unit 1 Remedial Investigation Report and treatability studies. A number of shallow wells were installed in Waste Pits 1-4 and the burn pit to collect required samples.

The waste material samples are currently being analyzed at a U.S. EPA-approved laboratory to determine the concentration of radiological and chemical constituents in Operable Unit 1. Data generated from sample analyses will provide information about the chemical form and characteristics of the various materials in the waste pits, so predictions can be made about the potential for migration of contaminants into the environment.

Following receipt of analytical data expected in March 1992, the data will be subjected to a

validation process to ensure the quality of data prior to its use in RI/FS documents.

Samples of materials in the pits are now being used to conduct tests and develop potential stabilization plans for waste treatment technologies currently under consideration, including cementation (stabilizing the waste with cement) and vitrification (transforming the waste into glass).

Waste stabilization studies are now in progress at the IT Environmental Technology Development Center in Oak Ridge, Tenn. These studies involve mixing quantities of waste pit materials with differing amounts of cement and cement additives. Each of the solidified waste forms from the treatability studies are subjected to a series of physical and chemical tests, including leaching the waste in acid, to arrive at the mix design which exhibits the optimal properties for retaining the physical form and stabilizing the waste materials. DOE is now in Stage I of a three-stage process with an expected completion date of July 1993.

Vitrification studies also have been initiated. Representative samples from each of the waste units are being mixed with a range of materials, including flyash, and placed into high-temperature furnaces with the intent of forming glass. The study is intended to establish the optimal mix design which supports vitrification. While vitrification typically represents an expensive technology to implement, it provides many benefits such as improved immobilization of hazardous contaminants within a glass matrix and a possible reduction in waste volume. DOE expects that vitrification studies on Operable Unit 1 wastes will be completed in July 1993.

Samples of additional waste materials from Pits 5 and 6 and the Clearwell are now being obtained to support treatability analysis. Up to eight 55-gallon drums of sludge from each waste unit are being collected with the use of a clamshell attachment suspended from a crane. This sampling activity, initiated in December 1991, is expected to be completed in February 1992. Some of the samples will be transported to an off-site laboratory for treatability analysis. Remaining sample volumes will be archived at the FEMP for the purpose of supporting further treatability analysis in support of remedial design.

Radon Sampling Program: Consistent with the terms of the 1991 Amended Consent Agreement, a sampling program was initiated in the waste pit area to measure the level of radon being released. The program involved a one-time measurement of radon release using Large Area Activated Charcoal Collectors (LAACC). Approximately 100 LAACCs were placed on Waste Pits 1, 2 and 3. The LAACCs were left on the pits for 24 hours, removed and then sent to an off-site laboratory for analysis. The collected samples are presently being analyzed. Analytical results are expected to be available by April 1992.

Reports: The U.S. EPA approved the Treatability Study Work Plan for Operable Unit 1 on November 25, 1991. The compilation of other Operable Unit 1 RI/FS reports, including the Remedial Investigation Report and the Feasibility Study Report, is proceeding consistent with the schedules set forth in the 1991 Amended Consent Agreement.

Operable Unit 1

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Removal Actions

Waste Pit Area Runoff Control

(Removal No. 2): The first five of eight construction phases on the Waste Pit Area Runoff Control Removal Action are finished and this project was approximately 70 percent complete as of February 7, 1992. The objective of this Removal Action is to collect and treat potentially contaminated stormwater runoff from the waste pit area to prevent it from reaching Paddy's Run Creek.

An existing culvert has been upgraded and expanded to be capable of handling more water (Phase 1). A 30-inch storm sewer pipe 750 feet long has been installed (Phase 2). An existing 48-inch culvert has been plugged to reverse the flow of water to the upgraded culvert and the completed 30-inch storm sewer pipe (Phase 3). A new inlet control structure has been constructed on the east side of the waste pit area (Phase 4). A temporary access road has been provided northeast of the waste pit area (Phase 5).

Phase 6, which involves construction of a new sump station and underground piping, is nearing completion. Phase 7, the remainder of construction work including trench drains, storm sewers and a control structure on the north side of the waste pit area, is in progress. Phase 8 will involve construction of a new standpipe overflow.

This Removal Action will provide

runoff control, as well as a collection system, designed to collect stormwater runoff from the waste pit area and allow it to pass through the site's Bionitrification Surge Lagoon and the effluent treatment system prior to discharge from the site to the Great Miami River.

Completion of this project and the continued operation of stormwater retention basins will result in the capturing of a significant amount of additional stormwater runoff from the FEMP, thus minimizing the potential for release of contaminants to the environment. Project construction is on schedule for completion by July 1992, when the system is expected to be placed into full operation.

Pit 5 Experimental Treatment Facility (Removal No. 11):

On December 13, 1991, workers began dismantling the Experimental Treatment Facility which was built in 1984 to test the feasibility of thermal drying for sludge material from Waste Pit 5. The Removal Action involves dismantling the facility and packaging the building materials and sludge for storage pending final disposition.

The project also involves installation of berms, as well as sampling and removal of surrounding soils as necessary to ensure against any potential spread of contamination beyond the

immediate area. The original design included a sand and gravel filter bed installed over a plastic liner. Six-foot wooden walls surrounded the filter bed and the structure was covered with a greenhouse-type enclosure. The drying experiment entailed spreading the wet material on the filter bed to facilitate drainage and evaporation.

In February 1988, high winds removed the plastic roof from the facility and some of the sludge material was deposited on nearby surrounding soil. As an interim measure, water was applied to the remaining residues and a tarpaulin was placed over the filter bed to prevent further escape of the material. This project is scheduled for completion in April 1992.

Control Exposed Material in Pit 5 (Removal No. 18):

Evaluation of alternatives is in progress. The objective of this Removal Action is to eliminate the possibility of airborne contamination resulting from exposed materials in the pit. Information obtained from Pit 5 liner repair activities, and the pit berm investigation which is addressing the pit's overall structural integrity, will be considered in developing the work plan. Preparation of the work plan for this Removal Action is on schedule for submittal to the U.S. EPA and Ohio EPA on or before March 30, 1992.

<p><i>Fernald Project Cleanup Report</i> is prepared by Westinghouse Environmental Management Company of Ohio periodically for the U.S. Department of Energy, to inform the community about cleanup progress at the Fernald Environmental Management Project.</p>	<p>Address all inquiries regarding the <i>Fernald Project Cleanup Report</i> to :</p> <p>Teressa Kwiatkowski U.S. DOE Public Information Officer U.S. Department of Energy Fernald Office P.O. Box 398705 Cincinnati, OH 45239-8705</p> <p>Telephone: (513) 738-6004</p> <p>Fernald Office R. E. Tiller, Manager</p>
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Operable Unit 2 - Other Waste Units

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RI/FS Activities

Sampling: Samples to support the Operable Unit 2 RI/FS have been obtained from all of the waste facilities. These samples were collected to supplement existing characterization data available for these facilities. The samples have been analyzed for radiological and chemical constituents. Data results will be used to support waste treatment studies and ongoing modeling efforts.

Analytical data from the off-site laboratory is presently undergoing validation prior to use in RI/FS documents. Data validation is expected to be completed in February 1992.

An investigation is in progress to determine the extent of lead in soils at the Firing Range, an isolated area formerly used by site armed security personnel for weapons qualifications. Soil sampling at the Firing Range was initiated on January 29, 1992. Results from

sampling analyses will be used to support the RI/FS and determine whether a Removal Action is required at the Firing Range.

Reports: The U.S. EPA approved the Operable Unit 2 Treatability Study Work Plan on November 25, 1991. Treatability studies are performed during the RI/FS to establish whether identified waste treatment technologies are effective when applied to FEMP waste material. Data generated by the study will be used to support Operable Unit 2 treatment technology selection and remedy implementation.

Operable Unit 2 treatability investigations are focused on the application of cement-based solidification to Operable Unit 2 waste material. A three-stage treatability study is in progress at the IT Environmental Technology Development Center. The final

stage of treatability has been initiated, and samples are undergoing leachate analysis and permeability testing.

The compilation of other Operable Unit 2 RI/FS reports, including the Remedial Investigation Report and the Feasibility Study Report, are proceeding consistent with the schedules set forth in the 1991 Amended Consent Agreement.

Remedial Design: In order to provide for the prompt implementation of remedial action following issuance of the Record of Decision for Operable Unit 2, conceptual design engineering has been initiated to examine remedial candidates for each Operable Unit 2 waste unit. Conceptual engineering was initiated for purposes of establishing preliminary design parameters and cost estimates.

Removal Actions

Inactive Flyash Pile Control (Removal No. 8): This Removal Action focuses on radiological surface contamination in the Inactive Flyash Pile/Other South Field Disposal Areas. The objective of this Removal Action is to limit access to the area. U.S. EPA approved the work plan for this Removal Action on November 19, 1991. As part of this Removal Action, warning signs have been erected around the area, and the installation of a chain-link barrier around the perimeter of the

Inactive Flyash Pile/Other South Field Disposal Areas was completed on December 23, 1991, to restrict access.

Active Flyash Pile Controls (Removal No. 10): The objective of this Removal Action is to mitigate potential wind and water erosion at the Active Flyash Pile. As an intermediate step, water is being applied to the Active Flyash Pile as needed during dry weather to reduce fugitive emissions. A report summarizing the results of a

technical review of current utility industry practices for disposing of flyash was submitted to the U.S. EPA. The report was completed consistent with the terms of the 1991 Amended Consent Agreement to examine viable technologies for possible application to the Active Flyash Pile Control Removal Action. Preparation of the work plan for this Removal Action is on schedule for submittal to the U.S. EPA on or before March 2, 1992.

Operable Unit 3 - Production Area

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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 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 in 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

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Operable Unit 3

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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

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Operable Unit 3

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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 (UF₆) to uranium tetrafluoride (UF₄). 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.

Operable Unit 4 - Silos 1-4

RI/FS Activities

K-65 Vertical (Berm) Borings:

Samples were collected from four vertical borings into the earthen berm surrounding the K-65 silos for the purpose of determining whether measurable quantities of residual materials have leaked through the walls of the silos into the surrounding berms. Preliminary results have been received from the independent laboratory. Validation of these results will be initiated in February 1992. This information is required to support the completion of the Remedial Investigation and Feasibility Study reports for Operable Unit 4.

K-65 Low-Angle (Slant) Borings:

Soil samples were collected from five borings advanced beneath the K-65 silos to determine whether residual materials may have migrated from the tanks or the associated underdrain system into the underlying soils or perched groundwater. Perched groundwater was encountered in each of the five borings and samples were taken of the groundwater. Preliminary sample analyses from the on-site laboratory indicates the presence of low concentrations of

radionuclides in the soils and perched water underlying the silos. Preliminary sample analyses results have been received from the off-site independent laboratory. Validation of these results will be initiated in February 1992. Full chemical and radiological analyses were conducted by the independent laboratory.

Resampling of K-65 Residues:

Analyses of samples taken from residue material in K-65 Silos 1 and 2 have been completed by the independent laboratory. The data was compiled by the laboratory and transmitted to the FEMP for validation. Sample results will be used to establish the physical, chemical, and radiological characteristics of the waste materials for purposes of determining appropriate treatment methods for K-65 contents.

Reports: Two Treatability Study Work Plans have been completed to support Operable Unit 4 activities. A Treatability Work Plan has been approved by the U.S. EPA for the evaluation of solidification and chemical extraction technology for Operable Unit 4

wastes. This Treatability Work Plan describes a five-stage process for evaluating the applicability of these technologies. The solidification study being conducted under this work plan involves the evaluation of different cement and additives, focused on producing the optimal mix design which retards contaminant migration and provides acceptable physical properties such as weight and strength.

The chemical extraction portion of the study is focused specifically on the potential for removing certain radionuclides and heavy metals from the K-65 residues through acid/solvent digestion and extraction techniques. The purpose of this portion of the study is to examine the feasibility of removing certain contaminants of concern to levels which would reduce the volume requiring eventual disposal, or reduce the design requirements for the ultimate disposal facility. Studies, being conducted under this plan at the IT Environmental Technology Development Center, are expected to be completed in September 1992.

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Operable Unit 4

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Another Operable Unit 4 Treatability Study Work Plan examining vitrification has been prepared and the first revision to the document is currently being reviewed by the U.S. EPA. This plan specifically examines the technical feasibility of removing the waste materials from Silos 1, 2, and

Removal Actions

K-65 Decant Sump Tank (Removal No. 5): The majority of sample analysis results have been received from the independent laboratory. Samples of liquid removed from the K-65 Decant Sump Tank, and sludge removed from the base of the tank, were analyzed and characterized to determine proper treatment and final disposition. Removal of this liquid from the underground sump tank reduces the potential for leakage of contaminants into surrounding soils. This Removal Action was completed in April 1991, when approximately 8,000 gallons of contaminated water was pumped from the K-65 Decant Sump Tank. The removed water is now stored in above-ground tanks in Plant 2/3. Upon final receipt and validation of the analytical results, treatment of the liquid will be initiated. The K-65 Decant Sump Tank was used to collect and store liquid that drained from the K-65 silos as the slurried material settled.

Silos 1 and 2 (Removal No. 4): The installation of bentonite clay over radium-bearing radioactive waste material in the K-65 silos was completed November 28, 1991, reducing the potential for releases to the environment from the two waste storage silos.

Covering the silo contents with a layer of bentonite clay accomplished two key objectives. It

3 and transforming them to glass in a high-temperature furnace. Following U.S. EPA approval of the revised work plan, samples of materials in the silos will be transferred to the DOE Pacific Northwest Laboratory in Richland, Washington, to perform the tests. Results from this study are expected to be received in September 1992.

These technologies are being tested to provide valuable information to support the

substantially reduces the accumulation of radon in the silo headspace—between the surface of the residues and the dome—thereby reducing radon emissions to the environment. Secondly, it provides protection from potential releases to the environment in the event of a silo dome collapse.

To complete the K-65 Silos 1 and 2 Removal Action, approximately 800 tons of bentonite and water were mixed to a desired consistency and pumped into the two silos in approximately 1,000 separate batches. The effectiveness of this Removal Action is determined by comparing the concentration of radon in the silo headspace before and after the placement of bentonite.

Such a comparison indicates the bentonite has resulted in an effective 99.5 percent reduction of radon accumulation in the silo headspace. The DOE and the U.S. EPA concurred that the added volume of waste due to the installation of bentonite—which became waste itself upon being applied over the surface of the residues—is greatly outweighed by the significant reduction in radon emissions.

Expedited Silo 3 Dust Collector (Removal No. 21): Removal of an out-of-service dust collector and hopper assembly from the dome of Silo 3 was completed January 8,

determination of which technology provides the most environmentally sound, cost effective and implementable method for treating the wastes prior to final disposal. The compilation of other Operable Unit 4 RI/FS reports, including the Remedial Investigation Report and the Feasibility Study Report, are proceeding consistent with the schedules as set forth in the 1991 Amended Consent Agreement.

1992, eliminating the potential for release of radioactive material to the environment.

The Expedited Silo 3 Removal Action was initiated after an inspection revealed that the condition of this equipment had deteriorated over the years. The dust collector was originally installed to capture dust generated by the placement of production residues in Silo 3 between 1953 and 1957.

The contaminant of concern is Thorium 230, a uranium daughter product resulting from refinery processes in Plant 2/3. The dust collector captured particulates and allowed them to settle into a hopper beneath it. From the hopper the particulates passed through a rotary valve and into the silo.

The task was accomplished by removing the three-piece assembly from the silo dome as a single unit and placing it directly into an appropriate container for disposal. Piping and associated equipment originally used to place the waste material into Silo 3 during the 1950s were also removed and prepared for disposal.

All pathways were permanently sealed to prevent the release of silo contents to the atmosphere. Disposition of dried metal oxides in Silo 3 is being addressed under the Operable Unit 4 RI/FS.

Operable Unit 5 - Environmental Media

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RI/FS Activities

Paddy's Run Seepage Investigation

Study: An investigation continues to determine how Paddy's Run Creek interfaces with the Great Miami Buried Valley Aquifer. The study is evaluating the impact that leakage of surface water through the bed of Paddy's Run Creek might be having on local groundwater flow. A series of wells have been installed along Paddy's Run Creek, and sampling activities are in progress to determine the extent of any contamination in the aquifer at that location. Additional studies of the flow of the creek itself are under way to help determine what, if any, relationship exists between any identified

contaminants in the aquifer at that location and the intermittent surface water flow conditions in the creek. This information is important to determine if, and what type, of response action may be warranted. Collected samples will be analyzed and resulting data will be included in the final Remedial Investigation and Feasibility Study reports for Operable Unit 5.

Reports: A Soil Washing Treatability Study Work Plan was submitted to U.S. EPA on December 10, 1991. Comments received from U.S. EPA in mid-January are being addressed by DOE. A revised work plan is due

back to U.S. EPA by February 18, 1992. The work plan is designed to examine physical and chemical separation of uranium from soils. Significant cost and schedule improvements could be realized in the implementation of final remedial actions if an implementable soil washing treatment technology can be identified. Data generated from the study will be used to support the completion of the Operable Unit 5 Feasibility Study. The preparation of other Operable Unit 5 RI/FS reports is proceeding consistent with the schedules set forth in the 1991 Amended Consent Agreement.

Removal Actions

South Groundwater Contamination Plume (Removal No. 3):

The purpose of this Removal Action is to protect public health by limiting access to the use of uranium-contaminated groundwater in an area south of the FEMP. This Removal Action is broken into five parts.

Part 1 includes installation of an alternate water source to an industry affected by the contamination plume. The drawings and specifications for supplying the industry with the large volume of water it requires have been completed. This portion of Part 1 was issued for bids on February 7, 1992. Construction is expected to begin in late March 1992, pending acquisition of required easements. This portion of the project involves the installation of production wells outside the plume area and a water distribution system to the industry. Analysis of samples taken from the selected well site, to determine adequacy of the quality and quantity of the extracted water, showed the groundwater in the well field area is within natural background levels for uranium. This portion of Part 1

of the Removal Action is scheduled to be operational by July 14, 1992.

Another industry, which requires only a small volume of water, will be provided with an alternate water supply by being tied into the proposed public water system.

Part 2 involves the installation of a groundwater recovery well system to pump groundwater from the South Plume through a force main and back to the FEMP for monitoring and discharge to the Great Miami River. As a result of information obtained from a separate remedial investigation that is being performed at the Paddy's Run Road Site (PRRS), additional concerns have been identified in the South Plume area.

The PRRS consists of several industries that in past years have reportedly released both organics and inorganics into the environment which have now found their way to the Great Miami Buried Valley Aquifer. The PRRS plume extends to very near the location of the proposed Part 2 well field as described in the November 1990 South Plume Engineering Evaluation/Cost Analysis (EE/CA). Operation of a uranium recovery

well field at the location originally described in the EE/CA could result in the spreading and/or extraction and discharge of contaminants from this other plume to the Great Miami River.

As a result of these conditions, the Part 2 well field was relocated to an area north of the plume being investigated by PRRS. An addendum to the EE/CA entitled "Explanation of Significant Differences" was prepared to reflect the relocation of the well field. That document is available for review in the Public Environmental Information Center.

The FEMP's current effluent outfall pipeline to the Great Miami River will be discontinued due to its age and limited capacity to handle future flow. A new effluent outfall pipeline will be installed under Part 2 of this Removal Action. The new outfall pipeline will parallel the existing outfall pipeline to the Great Miami River.

Part 2 work also includes increasing the pump-out capacity at the Stormwater Retention Basin to reduce the potential for future

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Operable Unit 5

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overflow of the basin. The drawings and specifications for the force main, the new outfall pipeline, and for providing increased pump-out capacity at the Stormwater Retention Basin, are complete.

Construction on this portion of the project is expected to begin in April 1992. The groundwater recovery well system is expected to be operational by January 1993.

Part 3 involves construction of an Interim Advanced Wastewater Treatment (IAWWT) system. The IAWWT system will remove uranium from site wastewater streams and, by doing so, will reduce the amount of uranium discharged to the Great Miami River. The design of the IAWWT system was modified to incorporate the additional treatment capacity required to address the relocation of the Part 2 well field. The new location is in an area of higher uranium concentration which means that more uranium will have to be removed from wastewater streams to achieve the desired reduction of uranium discharges to the river.

Two trailer-mounted IAWWT facilities are currently being fabricated off site. These facilities

will comprise the IAWWT unit to be located near the Stormwater Retention Basin. Construction activities are scheduled to begin in February 1992.

Drawings and specifications are complete for a second IAWWT unit to be installed in the FEMP's existing Bionitrification Effluent Treatment building. The IAWWT system, which includes the unit at the Stormwater Retention Basin and at the Bionitrification Effluent Treatment building, is scheduled to be operational by July 30, 1992.

Part 4 of the removal action involves groundwater monitoring and institutional controls to prevent the use of contaminated groundwater. This activity is being implemented through the existing FEMP Groundwater Monitoring Program. The program has been expanded to include more frequent monitoring of private wells located near areas of known contamination.

Part 5 involves additional groundwater investigations in the vicinity of the South Plume. Additional investigations will be performed under Part 5 to identify the location and extent of any remaining contamination attributable to the FEMP remaining in the groundwater south (downgradient) of the recovery wells to be installed under Part 2.

The Part 5 investigation will include hydropunch sampling, a soil vapor survey, sampling of existing monitoring wells, and groundwater modeling activities. Hydropunching is an efficient method for extracting groundwater samples without the expense of installing wells. A soil vapor survey is used to help determine the presence of volatile organic compounds in subsurface soils and groundwater.

Because the U.S. EPA has issued a proposed limit of 20 parts per billion (ppb) for uranium in drinking water, the investigation will attempt to identify the location of the contamination in the aquifer exceeding the 20 ppb level. The information obtained will be used to allow the FEMP to limit access to this water until additional response actions for this area can be implemented.

Collect Uncontrolled Production Area Runoff - Northeast (Removal No. 16): The scope of this Removal Action is to collect stormwater runoff from perimeter areas of the 136-acre production area which are not presently draining into the Stormwater Retention Basin. The work plan for this Removal Action is on schedule to be submitted to U.S. EPA on or before March 2, 1992.

Additional RI/FS Activities

RI/FS Work Plan Addendum: An addendum to the RI/FS Work Plan, defining methodologies to be employed at the FEMP for completion of required risk assessments which support each of the five Operable Units, was submitted to the U.S. EPA in October 1991. A revised Work Plan Addendum incorporating U.S. EPA comments was submitted to U.S. EPA in February 1992 for review.

Engineered Waste Management Facility Study: As part of the RI/FS, an investigation is in progress examining the geotechnical and geochemical properties of the soils on the FEMP. The purpose of this investigation is to determine the technical feasibility of siting an above-ground storage/disposal facility at the FEMP to accommodate waste materials derived from remedial activities. The investigation involves the

installation of a number of monitoring wells and the completion of a series of subsurface borings along the northern and eastern portions of the FEMP. This study, scheduled for completion in January 1993, will support the evaluation of alternatives in the Feasibility Study reports for each of the Operable Units.

FERNALD PROJECT CLEANUP REPORT

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U.S. Department of Energy
Fernald Office
P.O. Box 398705
Cincinnati, OH 45239-8705

Administrative Record RI/FS Additions

The following documents are among those which have been added to the Administrative Record since the last community meeting

took place on October 29, 1991. The FEMP's Administrative Record is located in the Public Environmental Information Center, JAMTEK

Building, 10845 Hamilton-Cleves Highway, Harrison, Ohio, 45030. The telephone number is (513) 738-0164.

- South Plume Engineering Evaluation/Cost Analysis Addendum
- RI/FS Risk Assessment Work Plan Addendum
- Consent Agreement as amended under CERCLA Sections 120 and 106(a)
- RI/FS Schedules Supporting the Revised Consent Agreement Fernald Environmental Management Project
- Updated Community Relations Plan
- Treatability Study Work Plan for Operable Unit 4
- Silos 1 & 2 (K-65 Silos) Removal Action Work Plan
- Pit 5 Experimental Treatment Facility (ETF) Removal Action Work Plan
- Documentation Supporting Fernald Environmental Management Project Safe Shutdown Removal Action No. 12 Parts 1 and 2
- Fernald Environmental Management Project Background Sampling Plan
- Engineered Waste Management Facility Sampling and Analysis Plan
- Ohio EPA comments on Engineered Waste Management Facility Sampling and Analysis Plan
- Milestone Dates for the Plant 1 Pad Continuing Release Removal Action
- Additional Groundwater Assessment Work in the Waste Pit Area