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DRAFT FINAL  
EXPLANATION OF SIGNIFICANT DIFFERENCES  
For  
OPERABLE UNIT 5

UNITED STATES DEPARTMENT OF ENERGY  
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT  
FERNALD, OHIO

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## 1.0 INTRODUCTION TO THE SITE AND STATEMENT OF PURPOSE

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### 1.1 Background

The Fernald Environmental Management Project (FEMP) is a former uranium processing facility located in Hamilton and Butler Counties, Ohio approximately 18 miles northwest of Cincinnati, Ohio. The FEMP is owned by the United States Department of Energy (DOE). In November 1989, the FEMP site (formerly the Feed Materials Production Center [FMPC]) was included on the National Priorities List (NPL) of the U.S. Environmental Protection Agency (U.S. EPA). As the owner of the FEMP, DOE is the lead agency for remediation of the FEMP pursuant to the Consent Agreement as Amended (ACA) under Comprehensive Environmental Response Compensation and Liability Act (CERCLA) Sections 120 and 106(a) signed with U.S. EPA in September 1991. The Ohio Environmental Protection Agency (OEPA) is also participating in the cleanup process at the site.

Operable Unit 5 (OU5) is one of the five operable units identified in the ACA and encompasses all environmental media, both on and off the FEMP property. A Record of Decision (ROD) for OU5 was signed on January 31, 1996.

### 1.2 Circumstances Giving Rise to Preparation of an Explanation of Significant Differences (ESD) for Operable Unit 5

A final Maximum Contaminant Level (MCL) for uranium has recently been promulgated under the Safe Drinking Water Act (SDWA) (National Primary Drinking Water Regulations; Federal Register Volume 65, Number 236; December 7, 2000; Pages 76707-76753). The changes addressed under this ESD involve aligning the groundwater final remediation levels (FRL) for uranium and the FEMP wastewater treatment requirements stipulated in Section 9 of the OU5 ROD with the recently promulgated MCL.

Under the original ROD, the FRL for uranium in the Great Miami Aquifer was established as 20 µg/L, based on the proposed MCL under the SDWA (Federal Register Volume 58, Number 138, pages 33050 and following, July 18, 1991). In addition, the treated effluent discharges (storm water, remediation wastewater, sanitary wastewater, and groundwater) to the Great Miami River were required to meet a monthly average of 20 µg/L. However, the final MCL for uranium in drinking water has been established at 30 µg/L.

### 1.3 Regulatory Basis

Pursuant to Section 117 of CERCLA as amended and the National Contingency Plan at 40 CFR 300.435(c)(2)(II), an ESD document should be published when "differences in the remedial or enforcement action, settlement, or consent decree significantly change but do not fundamentally alter the remedy selected in the ROD with respect to scope performance and cost." U. S. EPA guidance (A Guide to Preparing Superfund Proposed Plans, Records of Decision, and Other Remedy Selection Decision Documents, EPA 540-R-98-031, dated July 1999) categorizes a new applicable or relevant and appropriate requirement (ARAR) promulgation with impacts on cleanup levels to be a significant

change and appropriately addressed through an ESD document. The changes addressed under this ESD involve aligning the groundwater FRL for uranium and the FEMP treatment requirements stipulated in Section 9 of the OU5 ROD with the recently promulgated MCL for uranium under the SDWA.

#### 1.4 Administrative Record

This ESD will become part of the Administrative Record pursuant to 40 CFR 300.825(a)(2) and will be available at the Public Environmental Information Center (PEIC), 10995 Hamilton-Cleves Highway, Harrison, Ohio. The PEIC is open from 8:00 am to 4:00 pm Monday through Friday and may be contacted at (513) 648-7480.

## 2.0 SITE HISTORY, CONTAMINATION, AND SELECTED REMEDY

### 2.1 Summary of Site Operating History and Extent of Contamination

The FEMP is owned by the U.S. Department of Energy. Operating as the FMPC between 1951 and 1989, the site produced high purity uranium metal products in support of national defense programs. The site consists of approximately 1050 acres encompassing three primary areas: the former production area, the waste storage area, and adjacent forest/pasture land. The former production area is a 136-acre tract at the center of the site. The waste storage area is located west of the former production area. Contaminants from material processing and related activities were released into the environment through air emissions, wastewater discharges, storm water runoff, and leaks and spills. In 1989, operations ceased and efforts were focused on environmental restoration and waste management activities. In 1991, the site name changed to the FEMP to recognize this new emphasis.

The cleanup activities for the site were organized into five operable units. Operable Units 1 through 4 are considered source operable units. OU5 encompasses all environmental media, both on and off FEMP property. OU5 has no operating history of its own but reflects the impacts of the four source operable units on the soil, surface water and sediment, groundwater, plants and animals in the affected area.

### 2.2 Operable Unit 5 Selected Remedy

The OU5 ROD was signed and effective on January 31, 1996. The selected remedy in the ROD provides for:

- the excavation of contaminated soils and sediment that exceeds ROD established final remediation levels;
- placement of excavated materials in an on-property above grade disposal facility subject to physical and chemical waste acceptance criteria;
- extraction and treatment of Great Miami Aquifer groundwater containing concentrations of contaminants above established or proposed maximum contaminant levels; and

- treatment of collected storm water and process wastewater generated through remedial activities to the extent necessary to ensure discharge limitations are met and final remediation levels in receiving waters are not exceeded.

### 3.0 Description of Significant Differences and the Basis for the Change

#### 3.1 Summary of Differences and Basis for Change

The final remediation levels for the Great Miami Aquifer adopted in the Operable Unit 5 ROD are designed to achieve Safe Drinking Water Act MCLs or, in the absence of MCLs, the  $1 \times 10^{-5}$  Incremental Lifetime Cancer Risk (ILCR) or 0.2 Hazard Quotient (HQ) values for individual constituents through the drinking water pathway (Operable Unit 5 ROD, page 9-33). At the time of ROD signature (December 15, 1995), EPA had not yet promulgated a final MCL for uranium in drinking water. The 20  $\mu\text{g/L}$  proposed uranium MCL (Federal Register Volume 58, Number 138, pages 33050 and following, July 18, 1991) was therefore utilized as the representative uranium MCL in the ROD pending the outcome of EPA's actions in setting the final MCL. The final MCL for uranium in drinking water was recently established at 30  $\mu\text{g/L}$  (National Primary Drinking Water Regulations, Federal Register, Volume 65, Number 236, pages 76707 and following, December 7, 2000) and the proposed MCL has been superceded. Therefore, the final remediation level for uranium in the Great Miami Aquifer is being changed from the proposed standard (20  $\mu\text{g/L}$ ) to the final standard (30  $\mu\text{g/L}$ ) to be consistent with EPA's December 7, 2000 rulemaking.

Both the proposed MCL and the final MCL compare favorably to the  $1 \times 10^{-5}$  ILCR value for uranium in the Great Miami Aquifer (27  $\mu\text{g/L}$ ) identified in the Operable Unit 5 Feasibility Study, page 4-19 (DOE, 1995). Adoption of the new final standard will not change the conclusions of the risk assessments used to support the remedy decision making process at the FEMP, and remains consistent with the fundamental groundwater remedial action objective of attaining Safe Drinking Water Act MCLs throughout the affected portions of the aquifer.

The treated effluent discharges to the Great Miami River were required to meet a monthly average of 20  $\mu\text{g/L}$  (OU5 ROD, Section 9.1.5 "Treatment of Discharges"). Therefore, this monthly average concentration for uranium in discharges to the Great Miami River is also being changed to 30  $\mu\text{g/L}$  to be consistent with the MCL. This change in the treated effluent discharges will remain protective as the concentration of uranium in the Great Miami River (outside the mixing zone) to ensure protection of human health under applicable use designations was determined to be 530  $\mu\text{g/L}$  (the surface water FRL).

The OU5 ROD also established a maximum annual mass loading of uranium of 600 lbs. discharged to the Great Miami River. This mass-based limit will remain in effect and unchanged.

As identified, the primary basis for the change is the promulgated final MCL for uranium in drinking water. In promulgating the final MCL, U.S. EPA stated that:

- "EPA, thus, believes that the difference in kidney toxicity risk for exposures at 20 µg/L versus 30 µg/L is insignificant."
- "EPA believes that 30 µg/L is protective of the general population, including children and the elderly."
- "...[t]he Administrator has determined that an MCL of 30 µg/L maximizes the health risk reduction benefits at a cost justified by the benefits."

Making the change is consistent with DOE's Stewardship Role in the commitment of public funding to ensure that public funds are committed only to remedial activities which yield a commensurate environmental or human health related benefit. Making the change is consistent with U.S. EPA initiatives to align past decisions with the current state of knowledge (OSWER Directive 9200.0-22, "Superfund Reforms: Updating Remedy Decisions, US EPA, September 1996.)

### 3.2 Benefits Resulting from Change

The change has the potential of yielding significant cost savings while retaining the protectiveness of the overall groundwater remedy. Estimated benefits include:

- Preliminary estimates indicate the southern contamination plume is reduced by about 51 acres or a 27% reduction when using 30 µg/L as the final remediation level (in conjunction with recent design data).
- Preliminary estimates indicate a 30% reduction in the aquifer volume requiring remediation when the 30 µg/L uranium MCL is used.
- By increasing the aquifer cleanup level to 30 µg/L, savings will be realized because it will take less time to reach 30 µg/L than it will to reach 20 µg/L. This means less operating time for the pump and treat infrastructure required to remediate the aquifer. Groundwater modeling indicates it will take 4 to 5 years less time to reach 30 µg/L than it will to reach 20 µg/L.

### 4.0 STATUTORY DETERMINATIONS

The modified remedy is protective of human health and the environment, complies with federal and state requirements that are legally applicable or relevant and appropriate to the remedial action and is cost effective. The modified remedy satisfies CERCLA 121 which requires remedial actions attain a degree of cleanup that assures protection of human health and the environment.

### 5.0 PUBLIC PARTICIPATION

A draft ESD was submitted to both U.S. EPA and OEPA for review. Their comments were incorporated into the draft-final revision of the ESD. This draft final ESD is being made available for public inspection. Per 40 CFR 300.435 (c)(2)(I) notification of this draft final ESD will be published in a newspaper of general circulation including a brief description of the changes being considered. In addition to newspaper notification, Fernald stakeholders will be invited to review and comment on the draft final ESD. After review of public

comments, a final revision of the ESD will be issued for U.S. DOE Ohio Field Office and U.S. EPA Regional Administrator signature. The final ESD will contain the key dates documenting the aforementioned review and public participation process.