

EXECUTIVE SUMMARY

This Remedial Design Report (RDR) has been prepared for the *In Situ* Source Treatment Using Deep Soil Mixing with Interim Land Use Controls (LUCs) Remedial Action (RA) for the Southwest Plume volatile organic compound (VOC) source area, Solid Waste Management Unit 1 at the Paducah Gaseous Diffusion Plant (PGDP) in Paducah, Kentucky. This remedial design report was prepared in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act and is the response action selected in the *Record of Decision for Solid Waste Management Units 1, 211-A, 211-B, and Part of 102 Volatile Organic Compound Sources for the Southwest Groundwater Plume at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky*, DOE/LX/07-0365&D2/R1 (ROD) (DOE 2012a).

The response action for VOCs selected in the ROD is required to address the release of hazardous substances into the environment that are sources of groundwater contamination and present unacceptable risk from direct exposure to residual VOCs and non-VOCs. Removal of VOCs, like trichloroethene, from the soils in the Southwest Plume source areas will contribute to the final cleanup of the Groundwater Operable Unit at PGDP.

The ROD specified an *in situ* source treatment using deep soil mixing with interim LUCs. The RA also will include the implementation of interim LUCs consisting of the Excavation/Penetration Permit Program and the posting of warning signs at the source area(s).

This report contains information regarding the design of the *in situ* source treatment using deep soil mixing remediation system, including discussions of the following:

- Mixing soil using large diameter augers;
- Injecting hot air and steam to volatilize targeted contaminants;
- Injecting zero-valent iron as a polishing step for treating residual VOCs;
- Treating recovered vapor through a vapor conditioning/treatment system;
- Treating condensate via localized air stripping and/or granular activated carbon;
- Excavating 2 ft of surface soil, stockpiling, and respreading after the completion of mixing; and
- Collecting data and monitoring.

This D2 RDR incorporates responses to comments provided by the U.S. Environmental Protection Agency and the Commonwealth of Kentucky based on their reviews of the D1 (90%) RDR and in agreements developed in parallel discussions among the Federal Facility Agreement parties regarding optimization of the D1 design.