FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

Fact Sheet For Operable Unit 5 – Background Subsurface Soil Conditions

January 2001

OVERVIEW

In 1992, the U.S. Department of Energy (DOE) collected and analyzed off-property soil samples during the Operable Unit 5 (OU5) Remedial Investigation/Feasibility Study (RI/FS) process. Sampling results were used to determine representative background conditions, which were used to support development of the soil final remediation levels (FRLs) as well as initial delineation of the extent of soil contamination at the Fernald Environmental Management Project (FEMP) site. This fact sheet documents changes to the background soil concentration database of constituents of concern (COCs).

- Consistent with U.S. Environmental Protection Agency (EPA) guidance, representative data defining background surface and subsurface concentration ranges for naturally occurring substances and those introduced from man made sources are required as benchmarks when delineating the horizontal and vertical extent of soil contamination in remedial actions under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA).

- Subsurface soil data for 12- to 36-inch depth intervals have recently been collected in eleven off-property areas uninfluenced by past FEMP operations. This depth interval was not examined during the 1992 background soil study (DOE 1993) supporting the OU5 RI/FS.

- Soil concentrations significantly higher than those previously reported were detected for inorganic COCs in these lower intervals.

- These new data will need to be considered as representative background subsurface soil conditions and be applied in all ongoing and future clean up evaluation and in the certification process.

- Addenda to the previous background soil study report (DOE 1993) and the Sitewide Excavation Plan (SEP, DOE 1998) will be issued.

These changes have been identified as "non-significant post-Record of Decision (ROD) changes," as they do not alter the remediation goals and technical approach of the clean up evaluation or certification. This fact sheet was prepared in accordance with EPA's Guide to Preparing Superfund Proposed Plans, RODs and other Remedy Selection Decision Documents (OSWER 9200.1-23P, July 30, 1999). Decision documents, which accommodates refinements to the remedy, were discovered to be necessary after ROD signature.

BASIS FOR THE CHANGES

The DOE is implementing remedial actions to address soil contamination introduced by past site operations and certifying on- and off-FEMP property areas to insure that health protective concentrations of COCs have been attained or exist in the soil in these areas. Consistent with the National Contingency Plan and the OU5 ROD (DOE 1996), DOE remedial actions are focused on addressing site-introduced contaminants, which exceed established cleanup levels. Constituent- and media-specific FRLs were defined in the OU5 ROD. These FRLs will be applied to soil that can be confirmed to have been impacted by FEMP-introduced contaminants by comparing to representative background conditions.

General Approach

A 3-step approach consistent with the SEP (DOE 1998) is being followed in off-property areas adjacent to on-property areas where soil remediation is required. The three steps are defined as 1) precertification/predesign investigations, 2) remediation, and 3) certification. Specific plans and results of each step will need to be reviewed and approved by the regulatory agencies.

The first step is to collect concentration data of selected COCs to determine whether soil remediation may be required prior to initiating certification. The decision is based on both qualitative and quantitative estimations of the probability of the area passing certification criteria as is. If soil remediation is

determined necessary, additional data will also be collected to define the extent of necessary soil excavation.

The **second step** is to conduct any necessary soil remediation. Data collection and evaluation similar to Step 1 will be conducted at the end of remediation to confirm the removal of identified soil contamination.

The **third step** is to conduct more intensive soil sampling and analyses in the area. Stringent certification criteria (Appendix G, SEP, DOE 1998) need to be met before the area can be declared certified by the regulatory agencies. These criteria include pre-defined statistical analyses of actual soil concentrations and specific comparisons to the off-property soil FRLs in properly sized certification units that cover the entire area to be certified. If all criteria are not met, certification cannot be completed and the process returns to the second step.

Certification of on-property areas along the entire FEMP property line is almost complete. According to the SEP (DOE 1998) requirements, the only major off-property area identified to be certified is adjacent to the areas along the eastern property line where on-property soil excavation for remediation took place. This off-property area is downwind from the Fernald site and may have been impacted by FEMP-introduced airborne contamination. Excavation under a Removal Action to remove impacted soil in the southern portion of this area near the former Sewage Treatment Plant was conducted in 1992. These off-property areas of concern include two private properties, and therefore, will undergo the clean up evaluation and certification process in two separate phases. A significant portion of these two properties is cultivated. Evaluations of subsurface soil concentrations of selected COCs in these areas are required to determine whether cultivation had any influence on the distribution of COCs.

Supplemental Background Soil Study

The background study conducted in 1992 (DOE 1993) provided data for depth intervals of 0 to 6 inches, 36 to 42 inches and 48 to 54 inches from areas uninfluenced by past FEMP emissions. However, the 6- to 36-inch interval in cultivated off-property areas is also of concern during clean up evaluation and certification. Since background soil conditions in this interval were not obtained in the 1992 study, a supplemental background soil study was initiated in the summer of 2000 to determine the appropriateness of the previously developed representative background soil concentrations that were based on data from very limited depth intervals.

The sampling was designed to assess the concentrations of all COCs analyzed in the 1992 background study in farm fields having soil characteristics and past land uses similar to the two properties to be certified. Analyzing for all COCs provided a complete set of new data for comparison purposes, and a complete analysis of the 12- to 36-inch interval, which was not provided in the 1992 study.

Eleven cultivated areas of the 30 properties evaluated under the 1992 study were sampled in this supplemental program. A total of 44 borings were advanced to a depth of 36 inches (four borings per property). One of the four borings was located as close as possible to the former 1992 boring location, and the other three were evenly spread on the property at locations representative of each crop field. Samples from each boring were collected in 6-inch intervals from 0 to 36 inches. The 6- to 12-inch interval from each boring was archived. The 0- to 6-inch interval was used to compare the results of the 1992 study to this supplemental study.

In general, the new background surface (0 to 6 inches) concentrations are consistent with the 1992 results. Subsurface soil concentrations of inorganic COCs such as arsenic and beryllium are significantly higher than surface concentrations and peak at the 12- to 24-inch interval. Uranium surface concentrations are slightly higher than subsurface concentrations. Based on the new data, DOE concludes that the previously developed representative background soil concentrations are not appropriate as benchmarks for all depth intervals when determining vertical extent of FEMP-introduced soil contamination, especially for the 12- to 36-inch depth interval.

CONCLUSION

The updated background subsurface soil database allows better delineation of the extent of FEMP-introduced contamination in the off-property area. All the new background soil data will be presented in an addendum to the CERCLA/RCRA Background Soil Study (DOE 1993) which will be issued in the spring of 2001. The FRLs defined in the OU5 ROD will still be applied to soils impacted by the past FEMP production activities. Therefore, the same level of protectiveness will still be achieved for soil impacted by past FEMP operations with these changes. The general certification process in

off-property cultivated areas including consideration of the updated background soil conditions will be documented in an addendum to the SEP (DOE 1998) also to be issued in the spring of 2001.

For additional information concerning these changes please contact Mr. Gary Stegner, DOE FEMP Public Affairs at (513) 648-3153 or refer to the referenced reports. These reports are located at the FEMP Public Environmental Information Center, Delta Building, 10995 Hamilton-Cleves Highway, Harrison, Ohio 45030, Telephone: (513) 648-7480.

REFERENCES

U.S. Department of Energy, 1993, "CERCLA/RCRA Background Soil Study," Final, Fernald Environmental Management Project, DOE, Fernald Area Office, Cincinnati, OH.

U.S. Department of Energy, 1996, "Record of Decision for Remedial Actions at Operable Unit 5," Final, Fernald Environmental Management Project, DOE, Fernald Area Office, Cincinnati, OH.

U.S. Department of Energy, 1998, "Sitewide Excavation Plan," Final, Fernald Environmental Management Project, DOE, Fernald Area Office, Cincinnati, OH.