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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

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REPLY TO THE ATTENTION OF: SRF-5J

Mr. Johnny W. Reising
United States Department of Energy
Feed Materials Production Center
P.O. Box 398705
Cincinnati, Ohio 45239-8705

Subject: Technical Review Comments on "RTRAK Applicability Study, Rev. 1"

Dear Mr. Reising:

The United States Environmental Protection Agency (U.S. EPA) has reviewed the above-referenced documents as part of its oversight activities for the Fernald Environmental Management Project (FEMP). The document, which is dated May 1998, was prepared by Fluor Daniel Fernald for the U.S. Department of Energy. The document describes the results of a study conducted to assess the usefulness and applicability of the radiation tracking system to support soil remediation.

U.S. EPA's review of the document focused on assessing its technical adequacy and completeness. Because of the extensive number of changes and additions to the previous version of the document dated July 1997, Tetra Tech reviewed this document as if it were an original rather than a revised submittal. U.S. EPA identified deficiencies in the document that are discussed in the enclosed general and specific review comments. Please contact me at (312) 886-4591 if you have any questions.

Sincerely,

Gene Jablonowski
Remedial Project Manager
Federal Facilities Section
SFD Remedial Response Branch #2

Enclosure

- cc: Tom Schneider, OEPA-SWDO
- Bill Murphie, U.S. DOE-HDQ
- John Bradburne, FERMCO
- Terry Hagen, FERMCO
- Tom Walsh, FERMCO

ENCLOSURE

TECHNICAL REVIEW COMMENTS ON
"RTRAK APPLICABILITY STUDY, REVISION 1"
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

(Four Pages)

TECHNICAL REVIEW COMMENTS ON
"RTRAK APPLICABILITY STUDY, REVISION 1"

FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

GENERAL COMMENTS

Commenting Organization: U.S. EPA
Section #: Not Applicable (NA) Page #: NA
Original General Comment #: 1

Commentor: Jablonowski
Line #: NA

Comment: The most significant uncertainty in the applicability of the radiation tracking system (RTRAK) at the site is the upper end of the concentration range for total uranium. Only 4 of the 18 data points used for calibration of the RTRAK system exceed the highest final remediation level (FRL) of 82 milligrams per kilogram (mg/kg), and none of these 4 points exceed 600 mg/kg. Therefore, the calibration for RTRAK measurements above the FRL is relatively uncertain. All calibrations for points near the On-Site Disposal Facility waste acceptance criterion (WAC) of 1,030 mg/kg for total uranium are extrapolations rather than interpolations; therefore, these calibrations contain additional, undefinable uncertainty. Because the WAC is a "not to exceed" limit and the primary use of RTRAK is to determine compliance with the WAC, the U.S. Department of Energy (DOE) must use trigger levels for WAC exceedance that have a generous allowance for this uncertainty. If additional calibration points can be added in the range of 500 to 1,500 mg/kg of total uranium, these uncertainties would decrease or be better defined. A similar but less significant problem exists for the radium 226 measurements. The text should be revised to address these issues.

Commenting Organization: U.S. EPA
Section #: NA
Original General Comment #: 2

Page #: NA

Commentor: Jablonowski
Line #: NA

Comment: Part of the applicability study discusses efficiency calibration. The RTRAK efficiency calibration was performed by taking comparable RTRAK and high-purity germanium (HPGe) measurements at different soil locations containing "known" concentrations of radionuclides and performing linear regression analysis on the data. Although RTRAK and HPGe measurements were taken at a 1-foot detector height, the instruments' total field of views may not be comparable. According to the user guidelines for in situ gamma spectrometry dated April 1998, at a 1-foot height, the HPGe system has a total field of view of 19.6 square meters (m²). However, the RTRAK instrument has a field of view of only 4.5 m². Although the difference between RTRAK and HPGe measurements is not appreciable in areas that exhibit uniform homogeneous contamination, the difference could be substantial when measurements are taken at radiologically heterogeneous locations. For the efficiency calibrations in the original applicability study, these measurements were taken in areas indicative of homogeneous contamination. In this version of the applicability study, an additional eight measurements were made at locations corresponding to the Drum Bailing Area, South Field, and the

calibration points and necessary extrapolation for points near the WAC.

Commenting Organization: U.S. EPA
Section #: 4.3
Original Specific Comment #: 5

Commentor: Jablonowski
Line #: 19

Page #: 4-20

Comment: The text states that previous comparability documents demonstrate that in situ HPGe measurements and laboratory results agree within 20 percent. However, it is not clear whether the same conclusion can be drawn with regard to RTRAK measurements. If RTRAK data duplicate HPGe system data and the HPGe data agree with laboratory data to within 20 percent, then the 20 percent assumption may be valid for RTRAK data also. The text should be revised to include an assessment of the comparability of RTRAK data to laboratory results. Without this assessment of RTRAK data, the assumed 20 percent systematic uncertainties may not be valid.

Commenting Organization: U.S. EPA
Table #: 4-13
Original Specific Comment #: 6

Commentor: Jablonowski
Line #: NA

Page #: NA

Comment: This table presents estimated minimal detectable concentrations (MDC) for various combinations of RTRAK system speed and acquisition time. However, the primary recommended combination of 1 mph and 4 seconds is not included. MDCs for all target radionuclides under these operating conditions should be estimated and included in the table.

Commenting Organization: U.S. EPA
Section #: A.3.2
Original Specific Comment #: 7

Commentor: Jablonowski
Line #: 28

Page #: A-6

Comment: The text here and on following pages presents original and revised regression equations used for calibration of the RTRAK system. The text should be revised to include correlation coefficients for these equations to show how the additional calibration data used to create the revised equations have affected the apparent precision of the calibration.

Commenting Organization: U.S. EPA
Section #: A.5
Original Specific Comment #: 8

Commentor: Jablonowski
Line #: 23

Page #: A-9

Comment: The text states that standard mobile operating parameters for the RTRAK system are 2 mph over ground with a 2-second acquisition time. However, the text from line 20 on page ES-1 specifies preferred operating conditions of 1 mph and a 4-second acquisition time. The text should be amended to consistently discuss RTRAK system operation at the preferred conditions.

Commenting Organization: U.S. EPA
Figure #: B-1
Original Specific Comment #: 9

Commentor: Jablonowski
Line #: NA

Page #: NA

Comment: This figure omits mean data for the 0.5 mph, 8-second runs, although standard deviations for these data appear in Figure B-2. Figure B-1 should be revised to present the mean data for these runs. The same comment applies to Figures B-3, B-10, and B-12.