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*FINAL SAMPLING AND ANALYSIS PLAN  
FOR REMEDIAL INVESTIGATION/  
FEASIBILITY STUDY (RI/FS) WORK PLAN  
ADDENDUM OPERABLE UNIT 2 AND  
RESPONSES TO EPA COMMENTS*

*05/06/93*

*DOE-FN/EPA  
DOE-1916-93  
16  
RESPONSES*



**Department of Energy**  
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MAY 07 1993

MAY 06 1993

DOE-1916-93

Mr. James A. Saric, Remedial Project Director  
U.S. Environmental Protection Agency  
Region V - 5HRE-8J  
77 W. Jackson Boulevard  
Chicago, Illinois 60604-3590

Mr. Graham E. Mitchell, Project Manager  
Ohio Environmental Protection Agency  
40 South Main Street  
Dayton, Ohio 45402-2086

Dear Mr. Saric and Mr. Mitchell:

**FINAL SAMPLING AND ANALYSIS PLAN FOR REMEDIAL INVESTIGATION/FEASIBILITY STUDY  
(RI/FS) WORK PLAN ADDENDUM OPERABLE UNIT 2 AND RESPONSES TO EPA COMMENTS**

This letter transmits the Department of Energy (DOE) Final Sampling and Analysis Plan (SAP) for the Operable Unit (OU) 2 Work Plan Addendum. The Site Wide Comprehensive Environmental Response Compensation and Liability Act (CERCLA) Site-wide CERCLA Quality Assurance Project Plan (SCQ) requires that a Project Specific Plan (PSP) be developed for each project that includes environmental sampling and analysis. The requirements of a PSP have been incorporated into the SAP.

This final version of the SAP was revised based upon comments from the United States Environmental Protection Agency (U.S. EPA) and Ohio Environmental Protection Agency (OEPA) on the Draft SAP. Responses to these comments are included in this transmittal for your review.

If you or your staff have any questions, please contact Rod Warner at 513-648-3156.

Sincerely,

Jack R. Craig  
Fernald Remedial Action  
Project Manager

FN:Reising

Enclosures: As Stated

cc w/enc.:

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Commenting Organization: U.S. EPA  
 Section #: 4.2 Page #: 25 Para. #: 2 Commentor: Gene Jablonowski  
 Original Comment #: 4 Code: C

Comment: Element number 3 (bottom of the page) of the paragraph states that each SAP will be provided to the U.S. EPA and the Ohio EPA for their information before sampling activities are initiated. It is my understanding that this and other SAPs are provided to the regulatory agencies for their review and approval.

Response: DOE agrees with the comment. Based upon presentations and submittal of a draft SAP, field activities have been planned for OU 2.

Action: The statement will be changed to read, "Each SAP will be provided to the U.S. EPA and the Ohio EPA for their review and approval before sampling activities are initiated".

Commenting Organization: U.S. EPA  
 Section #: 6.2 Page #: 31 Para. #: 2 Commentor: Gene Jablonowski  
 Original Comment #: 5 Code: C

Comment: It seems that quality assurance should ensure that project quality objectives, not "objections", are met.

Response: DOE agrees with the comment. The word was inadvertently overlooked during document proof reading and spell checking; no negative connotation to the FEMP QA organization was implied or intended.

Action: The sampling and analysis plan has been changed to delete the word "objections" and add the word "objectives".

Commenting Organization: U.S. EPA  
 Section #: 7.2 Page #: 34 Table #: 7-1 Commentor: Gene Jablonowski  
 Original Comment #: 6 Code: C

Comment: Please clarify what is the reference document for grain size analysis. The reference document is listed as Attachment I, Volume V, Method No. FM GTT-0031, but what document is it an attachment to?

Response: The reference document for the grain size analysis is the "FEMP Sitewide CERCLA Quality Assurance Project Plan" or SCQ. Attachment I refers to "FEMP Laboratory Analytical Methods Manual" and Volume V refers to "Methods for Radiometric and Geotechnical Parameters".

Action: Grain size analysis is now included in Table 7-7 under Geotechnical Analyses. The correct reference (SCQ, Attachment I, Volume V) is cited for these analyses.



Commenting Organization: U.S. EPA  
Section #: 8.2 Table #: 8-2, 8-6, 8-8, and 8-10  
Original Comment #: 10

Commentor: Gene Jablonowski  
Code: C

**Comment:** Section 3.2.2, Development of DQOs, states that all FEMP HSL laboratory analysis and data validation for soil, waste, sediment, surface water, and groundwater samples will be performed at ASL C, with 10% at ASL D for each matrix; and all FEMP radiological laboratory analysis and data validation for soil, waste, sediment, surface water, and groundwater samples will be performed at ASL E, or at a minimum will meet the requirements of ASL C in support of risk assessment. Please clarify why, in the tables listing the new samples and analytes proposed for the various waste units, many of the groundwater and surface water analytes are listed as level B for Full Rad and FEMP HSL.

**Response:** The rotation of A, B, C etc. in the tables refers to footnotes and not ASL levels.

**Action:** Revised tables clearly indicate the proposed analytical target compound. Discussion of ASL levels is provided in Section 3.

Commenting Organization: U.S. EPA  
Section #: 8.2 Table #: 8-7 (IFP Proposed Sampling Summary)  
Original Comment #: 11

Commentor: Gene Jablonowski  
Code: C

**Comment:** For borings, this table should indicate that the number of samples per location and the total number of samples may be greater than the stated numbers if, based on field observations, additional samples will be taken of fill if its thickness exceeds 3 feet, one sample for each 3 foot interval. This additional sampling is stated in section 3.1.4, page 17, of this SAP. Further, neither Table 8-7 nor Table 8-8, List of New Samples & Analytes Proposed for the Inactive Flyash Pile, address the additional 5 samples of flyash that are to be analyzed for leach of metals.

**Response:** DOE agrees with the comment.

**Action:** A footnote will be added to Tables 8-2b, 8-4b, 8-6b, 8-8b, and 8-10b to indicate that additional subsurface samples may be taken if the depth of fill is significantly different than the current estimate. The 5 leach samples for the Inactive Flyash Pile have been included in Table 8-8b of the revised SAP.

Commenting Organization: U.S. EPA  
 Section #: 8.3.3 Page #: 79  
 Original Comment #: 12

Commentor: Gene Jablonowski  
 Para. #: 3 Code: C

**Comment:** Onsite screening by Gamma Spectrometry to determine the presence and relative concentrations of radioisotopes should be performed on samples with field-measured activities greater than 10 times background. Stating that samples of "highly elevated radioactivity" will be candidates for on-site Gamma Spectroscopic screening implies that these samples may never be analyzed. Further, a 100 times background action level seems inappropriately high to ensure complete characterization of the nature and extent of contamination.

**Response:** Agreed. Background readings on field screening instruments are notorious for fluctuating. On occasion there may be a 10 fold change, especially at the low end of the scale. On-site gamma screening will be performed on samples that have significance for achieving the objectives of the program, not every sample that contains over 10 times background.

**Action:** The text is revised to show 10 times background or a threshold level for further scrutiny. If the location is of interest to complete the characterization, the sample will be a candidate for additional quantitative lab analysis.

Commenting Organization: U.S. EPA  
 Section #: 8.6.1 Page #: 95 and 96  
 Original Comment #: 13

Commentor: Gene Jablonowski  
 Para. #: 2 Code: C

**Comment:** Regarding the Health and Safety radiation monitoring equipment, please clarify whether these instruments are calibrated to a known, NIST-traceable standard once a week, or merely undergo a weekly operation check. Also, please state which isotopes are used as calibration standards. The following three additional comments are made:

- 1) On the Ludlum Model 12 Alpha Meter, does the equipped pancake probe incorporate a Geiger-Mueller detector, and if so please indicate how you shield out the betas and gammas to only detect the alphas.
- 2) Please indicate the type of detector used with your Ludlum Model 2 "BetaGamma" Meter and clarify the calibration routine.
- 3) It is stated that these instruments are not to be used if background exceeds 2 cpm for the Ludlum Model 12 and 300 cpm for the Ludlum Model 2; does this include cases when individuals are working in areas of elevated background?

Also, please clarify for the Eberline ESP-1 with the SPA-3 NaI detector, used for field screening and monitoring, whether it's calibrated to a known, NIST-traceable standard daily, or merely undergoes a daily operation check.

Response: All instruments undergo a weekly operations check using Th 230, Tc 99 and CS 137 standards provided by EMA Eberline Laboratories. A calibration to NIST-traceable standards is conducted once per 6 months.

- 1) The Model 12 Alpha Meter has an alpha detector meter only.
- 2) The Ludlum Beta Gamma Meter has a 44-9 fisher detector.
- 3) Background of 10 cpm is the maximum limit during calibration, not in the field. Background of 300 cpm is a maximum acceptable in the field since 100 cpm at 10% efficiency (1000 cpm) is typically a health and safety threshold value. Larger background values are believed to mask the 100 cpm threshold value.

The Eberline ESP-1 and SPA-3 NaI detectors are used to screen samples for DOT transportation guidelines. These are calibrated weekly using the EMA standards.

Action: None proposed.

U.S. EPA  
GENERAL COMMENTS

Commenting Organization: U.S. EPA

Commentor:

General Comment

Original Comment #: 1

**Comment:** All of the Great Miami Aquifer investigations proposed in the Operable Unit 2 (OU2) remedial investigation/feasibility study (RI/FS) work plan addendum focus on the upper portion of this aquifer (2000-series wells). The work plan proposes no contingency for investigating deeper ground water if the results of the proposed investigations warrant it. DOE should indicate how and when the vertical extent of deep OU 2 ground water will be determined, if such investigation is deemed necessary.

**Response:** DOE recognizes the possible need for further investigation of the deeper groundwater in OU 2. The objective of the additional OU 2 investigation is to establish and quantify the OU 2 subunits impact on perched water and the Great Miami Aquifer. If the results of the investigation reveals further characterization of deeper OU 2 groundwater is warranted it will be carried out as part of the OU 5 Remedial Investigation.

**Action:** DOE proposes no further action in this subject area for OU 2.

Commenting Organization: U.S. EPA

Commentor:

General Comment

Original Comment #: 2

**Comment:** Only one 2000-series well is proposed for the area in the Inactive Flyash Pile not underlain by till, and no wells currently exist in this area. An additional well should be installed between the Inactive Flyash Pile and the South Field to better characterize groundwater in the upper Great Miami Aquifer.

**Response:** The intent of installing 2000-series wells is to identify and characterize areas of regional groundwater contamination. This information combined with the results from soil samples and shallow wells will give an accurate picture of the location and effects of contaminant sources. There are three existing or proposed 2000-series wells in the northern portion of the Inactive Flyash Pile and South Field area (2410, 2945, and 2955), one directly south of the Inactive Flyash Pile (2016), and three existing or proposed wells downgradient of the Inactive Flyash Pile in the South Field (2385, 2943, and 2944). Because the regional aquifer flows through a relatively homogeneous sand and gravel unit beneath those areas, it is expected that any significant regional contamination will be detected by this series of wells. If, however, contamination is found in these wells during the upcoming groundwater sampling that cannot be explained by the results of the shallow borings and hydropunch sampling that was conducted, an additional 2000-series well will be considered for the area between the Inactive Flyash Pile and the South Field.

**Action:** No additional action is proposed at this time.

Commenting Organization: U.S. EPA  
General Comment  
Original Comment #: 3

Commentor:

Comment: The OU 2 RI/FS work plan addendum should more clearly indicate that 16 South Field surface soil samples will be collected from the uppermost intervals of the proposed soil borings.

Response: DOE agrees with the comment with the exception that it is 15 not 16 soil borings.

Action: The sampling and analysis plan will be changed to include more description of the South Field surface soil samples which will be collected.

Commenting Organization: U.S. EPA  
General Comment  
Original Comment #: 4

Commentor:

Comment: An inordinate amount (five) of the proposed hydropunch locations in the South Field are to be located along the upgradient edge of that unit. DOE should relocate several of these hydropunch locations farther downgradient (west) to better characterize potentially contaminated perched ground water.

Response: The purpose of the hydropunch samples is to provide data on ground water quality upgradient of South Field, define the source of groundwater contamination in Well 1433, and to identify groundwater contamination in the south and central area of the South Field. Please see Figure 8-7 for locations of additional hydropunch samples proposed for the region west of the South Field. Additional hydropunch locations may be selected along the till/flyash interface shown in Figure 8-7 based upon saturation and activity detected in soil borings drilled in the South Field.

Action: Data will be evaluated to define useful locations for additional hydropunch sampling.

Commenting Organization: U.S. EPA  
General Comment  
Original Comment #: 5

Commentor:

Comment: DOE should indicate whether the Pulsed Laser Fluorescence analysis for hydropunch samples has been approved by the U.S. Environmental Protection Agency (EPA).

Response: DOE is under the impression that U.S. EPA is in the process of reviewing the Pulsed Laser Fluorescence analysis procedure and that this review will be completed in April 1993.

Action: Awaiting U.S. EPA procedure review and approval.

Commenting Organization: U.S. EPA

Commentor:

General Comment

Original Comment #: 6

Comment: DOE should indicate why all groundwater samples are being analyzed according to analytical support level B standard. This appears to be inconsistent with earlier SCQ discussions.

Response: Please see the response to Original Comment 10 by commentor Gene Jablonowski. The reference to A, B, C on the tables refers to the footnotes of the table and not ASL support levels.

Action: The tables have been changed to directly indicate which TAL is referenced. Analytical support levels are discussed in Section 3.

**U.S. EPA  
SPECIFIC COMMENTS**

Commenting Organization: U.S. EPA Commentor:  
 Section #: 3.1.1 Page #: 11 Para. #: 4 Sentence #: 1  
 Original Comment #: 1

**Comment:** The text states that two 1000-series wells will be installed at the Solid Waste Landfill. However, Figure 8-2 indicates that three 1000-series wells will be installed. DOE should install at least three 1000-series wells to adequately determine if the Solid Waste Landfill is effecting perched ground-water quality. Also, it is unlikely that the proposed 100-series well (SWL-MW1-03) will detect releases at the proposed location. This well (SWL-MW1-03) should be relocated farther downgradient (east) along the southwest perimeter of the Solid Waste Landfill.

**Response:** It is not clear how the perched groundwater gradient has been calculated since only three wells (1035, 1719 and 1038) are unambiguously monitoring the water table, and these are in a north south alignment. Upon field inspection of the proposed location, it was concluded that well 1950 (old number MW 1-03) should be relocated south approximately 30 feet to avoid possible influences from the drainage canal. The well cannot be relocated east without being placed in the landfill, and it is believed that the two wells along the south boundary (MW 1038 and 1952) are sufficient.

**Action:** The location of well 1950 (old number MW 1-03) will be field-relocated approximately 50 feet south of the position shown in figure 8-2.

Commenting Organization: U.S. EPA Commentor:  
 Section #: 3.1.1 Page #: 12 Para. #: 1 Sentence #: 5  
 Original Comment #: 2

**Comment:** The text states that the eight existing wells at the Solid Waste Landfill will be sampled. However, Table 8-1 indicates that six existing wells will be sampled, and the footnote on Table 8-2 states that seven existing wells will be sampled. These discrepancies should be addressed, and the OU 2 RI/FS work plan addendum should specify which existing wells will be sampled.

**Response:** DOE refers the U.S. EPA to its response to U.S. EPA Region 5, Radiation Section Original Comment # 9. The table and sampling and analysis plan text will be changed to clarify this discrepancy.

**Action:** The sampling and analysis plan text and narrative will be changed to provide a better description of these well installations.

Commenting Organization: U.S. EPA  
 Section #: 3.1.1 Page #: 12 Para. #: 1  
 Original Comment #: 3

Commentor:

Comment: The text states that a fourth 2000-series monitoring well will be completed south of the Solid Waste Landfill if ground-water flow data indicated a southerly flow. DOE should indicate whether this fourth 2000-series well will be installed east of the Solid Waste Landfill in the event that an easterly flow direction is determined.

Response: It is believed that the direction of groundwater flow in the Great Miami Aquifer in the vicinity of the SWL is mainly toward the east. As part of the sampling program, a 2000-series monitoring well is planned to be installed on the east side of the SWL. If no component of flow is detected in the southern direction, the contingent well on the southern edge of the waste unit will not be moved to the east side, since a new 2000-series well is already proposed for this location.

Action: None proposed.

Commenting Organization: U.S. EPA  
 Section #: 3.1.2 Page #: 14 Para. #: 4 Sentence #: 4  
 Original Comment #: 4

Commentor:

Comment: The text states that existing wells at the Lime Sludge Ponds will be sampled. DOE should specify which existing wells will be sampled.

Response: Table 3-4 lists the eight existing wells to be sampled. These wells are 1039, 1041, 1042, 1134, 1176, 1210, 1229, and 2042.

Action: In addition to being in the tables, the existing wells to be sampled will be specified in the text for each subunit.

Commenting Organization: U.S. EPA  
 Figure #: 8-6  
 Original Comment #: 5

Commentor:

Comment: The figure shows proposed sampling locations for the Inactive Flyash Pile. Surface water and sediment sample location IFP-02 should be relocated farther downstream (south) to better assess the effect the Inactive Flyash Pile may have on surface water and sediment.

**Response:** DOE wishes to demonstrate the effects of Inactive Flyash Pile runoff on surface water and sediment also; that is why location IFP-02 was placed at that location. DOE is of the opinion that locations IFP-03 and IFP-04 will provide adequate downstream surface water and sediment quality for characterization purposes. IFP-02 was placed at its location to provide upstream surface water and sediment quality for comparison to the two downstream locations. If DOE moved the IFP-02 location downstream, then there would be no need to sample at IFP-03. DOE is of the opinion that an upstream location is vital to the study for comparison purposes.

**Action:** With concurrence by U.S. EPA of DOE's sampling location selection criteria, no further action will be necessary. If U.S. EPA does not concur, then the sampling location is question will be relocated further downstream.

**Commenting Organization:** U.S. EPA

**Commentor:**

**Section #:** 3.1.4      **Page #:** 19      **Para. #:** 3      **Sentence #:** 4

**Original Comment #:** 6

**Comment:** The text states that a 2000-series well will be installed adjacent to Well 1711; however, Figure 8-6 indicates that a 1000-series well will be installed at that location. The OU 2 RI/FS work plan addendum should clearly indicate that a 2000-series well will be installed adjacent to Well 1711.

**Response:** The text is correct but there was an error in the symbology of Figure 8-6. The 2000-series well adjacent to Well 1711 was mislabeled as a 1000-series well.

**Action:** This error has been corrected and Figure 8-6 now reflects the text of Section 3.2.4.

**OEPA  
GENERAL COMMENTS**

Commenting Organization: OEPA  
General Comment  
Original Comment #: 1

Commentor:

**Comment:** The SAP fails to relate that the Lime Sludge Ponds are Hazardous Waste Management Units. DOE must recognize the implications of this fact and ensure that adequate sampling is conducted to complete the Remedial Investigation and Feasibility Study for these units.

**Response:** DOE agrees with this comment. As RCRA is an ARAR for the Lime Sludge Ponds, we have structured the SAP to meet the requirements of these regulations.

**Action:** The SAP will be changed to identify the Lime Sludge Ponds as a Hazardous Waste Management Unit.

**OEPA  
SPECIFIC COMMENTS**

Commenting Organization: OEPA  
Section #: 3.1.5  
Original Comment #: 1

Commentor:

**Comment:** Section 3.1.5: Additional detail should be provided as to the methodology of collecting wipe samples for full HSL and full RAD (e.g., volume of sample/wipes required, surface area to be wiped, etc.).

**Response:** DOE agrees with this comment. There was also an error in the analyses that will be performed on the wipe samples. They will only be analyzed for Full Rad. and not for Full HSL.

**Action:** Additional detail on the method of collecting wipe samples and the correct analyses will be included in the revised SAP.

Commenting Organization: OEPA  
Section #: Table 8-10  
Original Comment #: 2

Commentor:

**Comment:** Table 8-10: The table fails to describe wipe samples that are to be collected in the South Field. The table should be revised to include wipe samples.

Response: DOE agrees with this comment.

Action: Table 8-10b will be revised to include the South Field wipe samples.

Commenting Organization: OEPA

Commentor:

Section #: 8.3.4, 8.3.5

Original Comment #: 3

Comment: Section 8.3.4, 8.3.5: These sections describe the homogenization of soil samples prior to placement in sample jars. It is unacceptable to homogenize VOC soil samples. VOC sample containers should be filled prior to any mixing of soils. DOE must correct the text and halt such activities in the field, if ongoing.

Response: DOE agrees with this comment.

Action: The text will be clarified to indicate that VOC samples will be taken prior to the mixing of soils.