4390

PROJECT SPECIFIC PLAN FOR INVESTIGATION OF SOIL STAGED IN QUONSET HUT NO. 1

SOIL AND DISPOSAL FACILITY PROJECT

FERNALD ENVIRONMENTAL MANAGEMENT PROJECT
FERNALD, OHIO

JULY 19, 2002

U.S. DEPARTMENT OF ENERGY
FERNALD AREA OFFICE

20803-PSP-0001
REVISION A
DRAFT

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APPROVAL:

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FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

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LIST OF ACRONYMS AND ABBREVIATIONS

ASL	analytical support level
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
DOE	U.S. Department of Energy
DQO	Data Quality Objectives
FACTS	Fernald Analytical Customer Tracking System
FRL	final remediation level
GC	Gas Chromatography
GPS	Global Positioning System
LAN	Local Area Network
mg/kg	milligrams per kilogram
mg/L	milligrams per liter
ml	milliliter
PID	photoionization detector
PSP	Project Specific Plan
QA	Quality Assurance
RCRA	Resource Conservation and Recovery Act
RWP	Radiological Work Permit
SCQ	Sitewide CERCLA Quality Assurance Project Plan
SED	Sitewide Environmental Database
SEP	Sitewide Excavation Plan
TAL	Target Analyte List
TCLP	Toxicity Characteristic Leachate Procedure
V/FCN	Variance/Field Change Notice
VOC	volatile organic compound
WAC	waste acceptance criteria
WAO	Waste Acceptance Organization

1.0 INTRODUCTION

1.1 BACKGROUND

During the predesign investigation for Area 3A/4A, an area of soil located on the north side of the former Maintenance Building (Building 12) was identified as "characteristic" in accordance with the Resource Conservation and Recovery Act (RCRA). This was the result of several trichloroethene analyses failing the Toxicity Characteristic Leachate Procedure (TCLP) [i.e., TCLP results exceeded the regulatory limit of 0.5 milligrams per liter (mg/L)]. In late 2001, approximately 600 cubic yards of soil were excavated from this area and taken to Quonset Hut No. 1 until treatment could be performed. Figure 1-1 shows the location of Quonset Hut No. 1, as well as the area behind the Maintenance Building where this soil originated. More information on this RCRA soil is provided in the Implementation Plan for Area 3A/4A.

The soil is stockpiled in the Quonset Hut in such a manner to allow pedestrian access around the entire perimeter of the pile. Prior to placement of the RCRA soil in the Quonset Hut, concrete "jersey" barriers were placed inside of the north, south and west perimeters of the structure, within approximately four feet of the walls. The soil was transported in through the doors on the eastern side of the building, and placed at the far western end inside of the barriers, continuing eastward. The footprint of the pile occupies an approximately 30-foot by 80-foot area inside of the Hut.

1.2 PURPOSE AND SCOPE

This project specific plan (PSP) has been developed to investigate volatile organic compound concentrations present in the soil staged in Quonset Hut No. 1. The information obtained through this investigation will be used to evaluate potential treatment options and establish baseline volatile organic compound (VOC) concentrations following excavation and prior to treatment. The scope of this PSP includes the collection and field analysis of 12 samples of this soil. Sampling activities conducted under this PSP will be performed in accordance with the Sitewide Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Quality Assurance Project Plan (SCQ), the Sitewide Excavation Plan (SEP), and Data Quality Objectives (DQO) SL-048, Revision 5 (Appendix A).

1.3 KEY PROJECT PERSONNEL

The team members responsible for coordination of work in accordance with this PSP are listed in Table 1-1.

TABLE 1-1
KEY PROJECT PERSONNEL

Title	Primary	Alternate
DOE Contact	Rob Janke	Kathi Nickel
SDFP Project Director	Jyh-Dong Chiou	Tom Beasely
Characterization Manager	Frank Miller	Eric Kroger
Field Sampling Manager	Tom Buhrlage	Jim Hey
Surveying and Mapping	Jim Schwing	Andy Clinton
Waste Acceptance Operations	Linda Barlow	TBD
Analytical Program Manager	Denise Arico	Justin Burke
Data Management Lead	Eric Kroger	Krista Blades
Data Validation Contact	James Chambers	Hobert Jones
FACTS/SED Contact	Cara Sue Schaefer	Susan Marsh
Quality Assurance Contact	Reinhard Friske	Mike Godber
Health and Safety Contact	Gregg Johnson	Pete Bolig/ Jeff Middaugh

FACTS – Fernald Analytical Customer Tracking System
SED – Sitewide Environmental Database
WAO – Waste Acceptance Organization

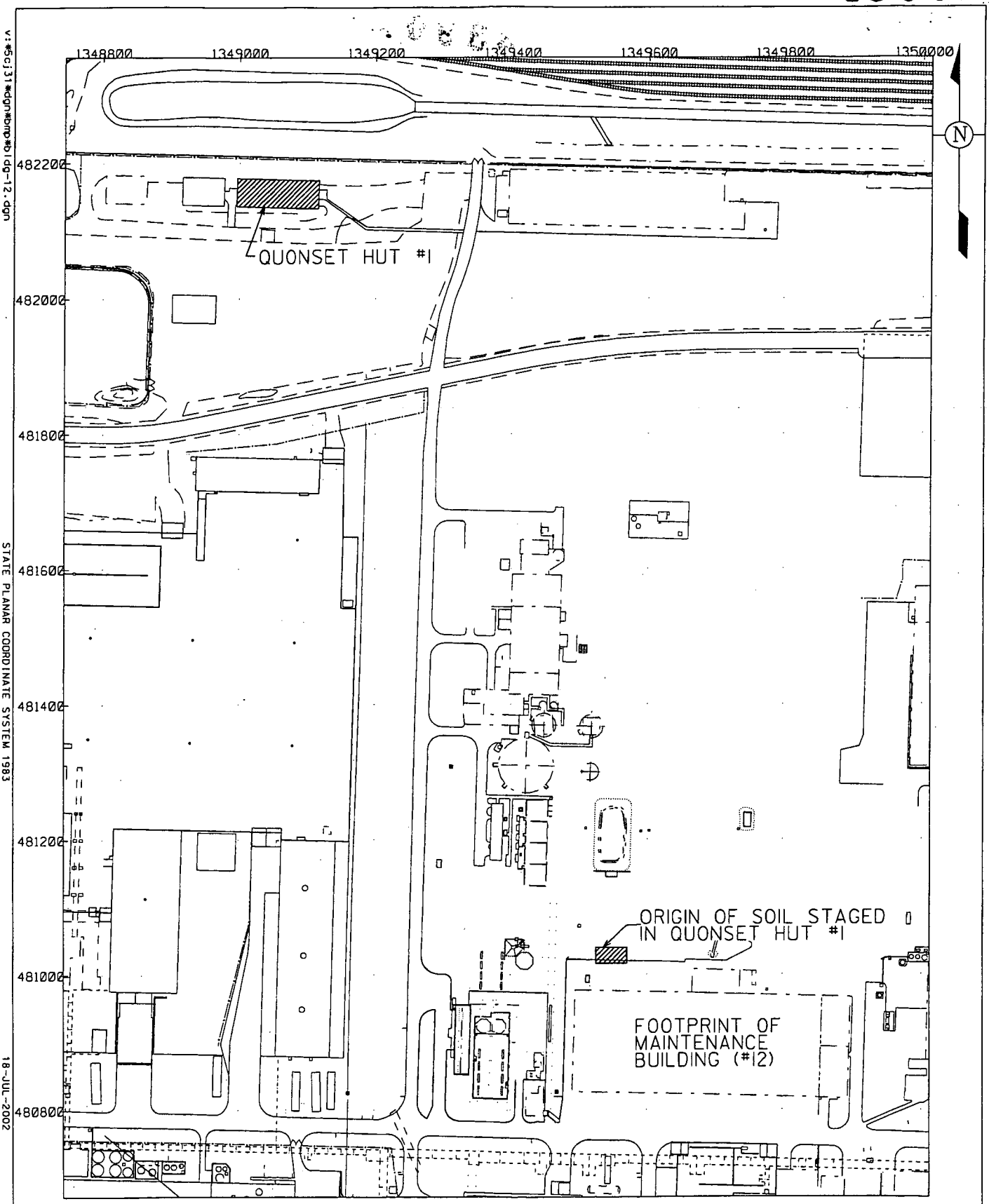

FIGURE 1-1. LOCATION OF QUONSET HUT #1 AND ORIGIN OF RCRA CHARACTERISTIC SOIL STAGED THERE

2.0 SAMPLING STRATEGY

2.1 SAMPLING STRATEGY

The goal of sampling under this PSP is to obtain samples that are representative of the conditions throughout the soil staged in Quonset Hut No. 1. This means that samples will need to be collected from several locations laterally and at depth. Because sample collection will be limited as a result of sampling within a structure, this can be best accomplished according to the following protocol:

- The soil footprint has been divided into quarters along the north-south and east-west lines, thus establishing northeast, southeast, southwest and northwest quarters (see Figure 2-1)
- While accounting for sample collection limitations, the field sampling lead will field-locate one sampling location within each quarter. The selected locations should be placed at the deeper portions of the pile to the extent practical in order to obtain samples of the most deeply buried soil
- At each location, identify and collect three samples vertically at depth, as follows:
  - A sample at approximately 1 foot below the surface (the shallowest sample)
  - A sample at approximately 1 foot above the floor (the deepest sample)
  - A sample (the middle sample) at the approximate mid-point between the shallowest and deepest samples.

The list of samples collected under this PSP is provided in Appendix B. Samples can be collected performing one vertical, direct push per location; or by angling the Geoprobe® to collect each sample increment individually. This will be left to the discretion of the field sampling lead. The actual field-selected sampling locations should be documented at the time of collection by identifying them, as accurately as possible, on a copy of Figure 2-1. This documentation should be included with the Sample Collection Logs.

All samples collected under this PSP will be analyzed in the field on the Portable Gas Chromatograph (GC). Target analytes include trichloroethene, tetrachloroethene, 1,1-dichloroethene, and 1,2-dichloroethene, the four VOCs identified as area-specific constituents of concern in Area 3A where the soil originated. The target analyte list (TAL) is included in Appendix C.

2.1.1 Sample Collection Methods

All samples will be collected in accordance with SMPL-01, Solids Sampling. While the soil samples would most easily be obtained by Geoprobe® boring, limitations resulting from working within the Quonset Hut will likely limit the ability of the Geoprobe®. If this is the case, samples should instead by collected by slam hammer or other methods as identified in SMPL-01. The sampling method will be left to the discretion of the field sampling lead.

When the Geoprobe® is used, borehole collapse will be monitored during core sampling to ensure minor sidewall slough is accounted for during coring and sample collection. If significant borehole collapse occurs, a Geoprobe® Macro-Core should be used to collect the discrete interval of interest. The Macro-Core sampling method will utilize a disposable plastic liner insert in which the soil core is recovered. If Geoprobe® accessibility is not possible, soil samples will be collected using a slam hammer or other methods specified in SMPL-01, Solids Sampling. Borehole collapse will be monitored during core sampling to ensure sidewall slough is accounted for during sample collection. Regardless of sample collection method, multiple cores may be collected at each sampling location (not to exceed 3 feet apart), if necessary to obtain sufficient sample volume for analysis. All borehole will be manually collapsed following sample collection. Borehole abandonment and Borehole abandonment logs are not required.

Following collection, the soil cores will be laid out on clean plastic and the appropriate sample intervals (as defined in Appendix B) will be separated to obtain the necessary soil samples and volumes. Any debris contained in a sample interval will be removed from the sample in the field and described on the Field Activity Log. Sampling and analytical requirements are summarized in Table 2-1.

A chain of custody form is not required for GC samples since the field analyst operating the portable GC unit is considered part of the field team, and the sample remains in physical possession of the team until it is exhausted or disposed. If the sample must be transferred to a person who is not part of the field team (e.g., on-site laboratory, radiological technician, etc.) then a chain of custody must be generated per Procedure EW-0002.

2.2 SAMPLE IDENTIFICATION

All soil samples will be assigned a unique sample identifier, as follows:

1. Area Designator: The identifier "QHUT" will be used to identify a sample collected from soil staged in Quonset Hut No. 1.

2. Location Designator: This will be an abbreviation for the quarter division of the pile where the sample was collected, where NE = northeast, SE = southeast, SW = southwest, and NW = northwest.

3. Depth Interval Designator: This will initially be a sequential letter (a, b, or c; where "a" is the shallowest sample) to denote the sample depths. This letter will be replaced in the field with a number designating the actual depth below pile surface that the sample is collected, once known. This number is equal to *two-times the bottom depth (ft)* of the interval *below surface.*

4. Measurement Designator: L = Volatile Organic Analysis

For example, the deepest interval collected from the location identified in the southeast quarter of the soil pile staged in Quonset Hut No. 1 would be identified as "QHUT-SE-c-L". Then, if it were determined in the field that the pile is 8 feet deep at that point, and the sample is collected 7-feet below the surface of the pile, the "c" would be replaced by the number "14". If angled borings are used to collect individual samples, the sample identification scheme would remain the same (i.e., there is no need to individually identify multiple pushes for one location). Note that when samples are collected by angling the Geoprobe®, the depth increment will still be assigned based on vertical depth from pile surface - not based on the distance into the side of the pile that the Geoprobe is angled.

2.3 EQUIPMENT DECONTAMINATION

Sampling equipment will be decontaminated (Level II) before transporting to the sampling site. Additionally, all equipment that comes into contact with the soil core and is re-used will be decontaminated in the field. If used, the core barrel portion of the core sampler will be wiped down between sample intervals and locations to remove visible soil or material.

TABLE 2-1
SAMPLING AND ANALYTICAL REQUIREMENTS

Analyte	Sample Matrix	Lab	ASL	Preservative	Holding Time	Container	Sample Mass (minimum)
Trichloroethene Tetrachloroethene 1,1-Dichloroethene 1,2-Dichloroethene (cis- and trans-) (TAL A)	Solid	Field GC	B	Cool 2°-6° C*	7 days	2 - 40-ml glass with Teflon-lined septa	80 ml

ASL – analytical support level

* Analysis to be performed in the field utilizing the portable GC. When this is the case the preservation and containerization is not required; however, the sample volume should not be collected/separated until the instrumentation is ready for the analysis, and the analysis should take place immediately upon collection.

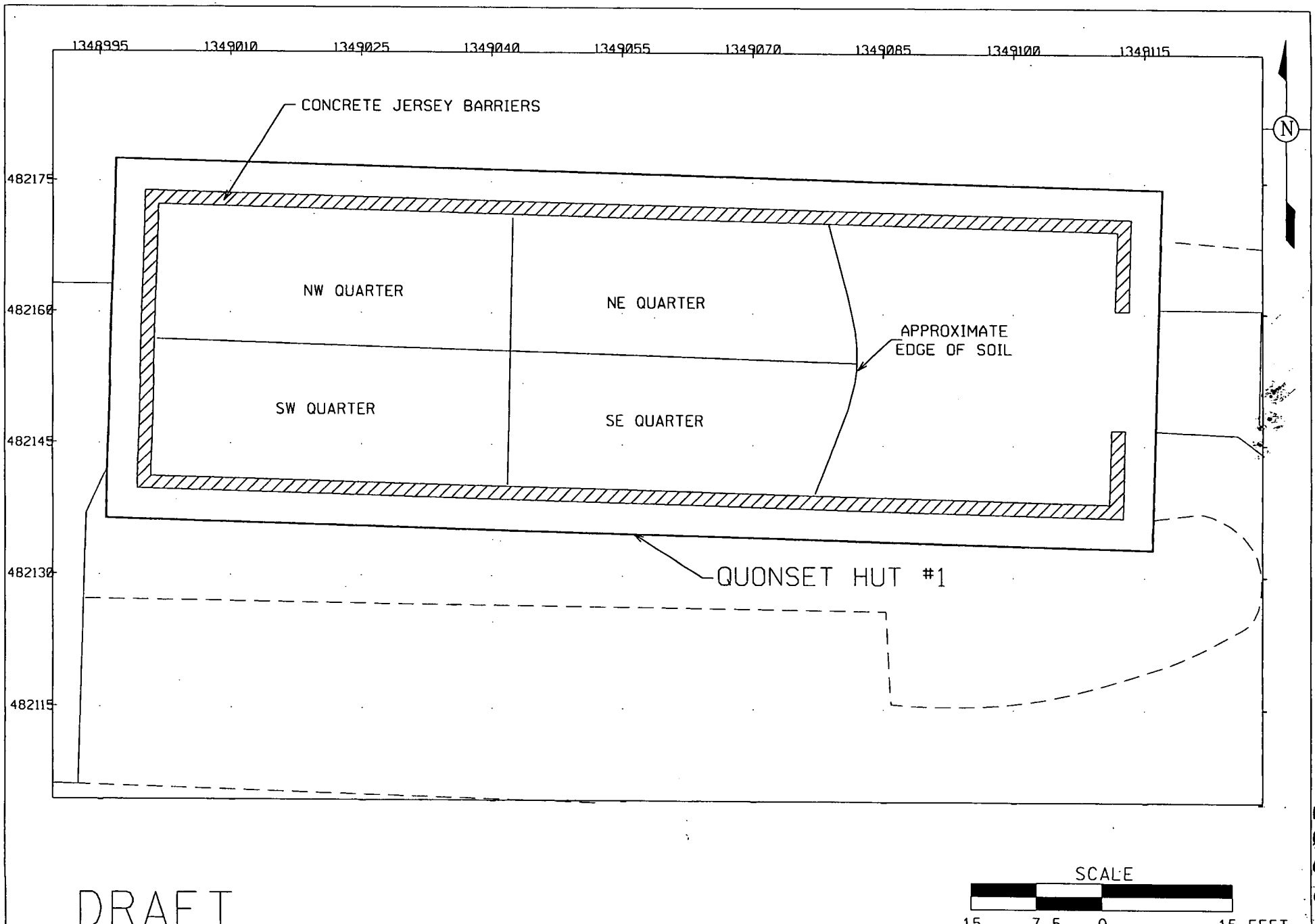

FIGURE 2-1. APPROXIMATE SIZE AND LOCATION OF SOIL STAGED IN QUONSET HUT #1 AND QUARTER DIVISIONS FOR SAMPLING

3.0 QUALITY ASSURANCE/QUALITY CONTROL REQUIREMENTS

3.1 FIELD QUALITY CONTROL SAMPLES, ANALYTICAL REQUIREMENTS, AND DATA VALIDATION

In accordance with the requirements of DQO SL-048, Revision 5, the field quality control, analytical, and data validation requirements are as follows:

- All analyses will be performed at ASL B
- All analytical data will require a certificate of analysis and 10 percent of the analytical data will also require the associated quality assurance/quality control results. A minimum of 10 percent of the analytical data from each laboratory will be validated to ASL B. All field data forms will be validated
- No field quality control samples are required for this PSP.

If any sample collection or analysis methods are used that are not in accordance with the SCQ, the Project Manager and Characterization Lead must determine if the qualitative data from the samples will be beneficial decision-making. If the data will be beneficial, the Project Manager and Characterization Lead will ensure that:

- The PSP is revised through a Variance/Field Change Notice (V/FCN) to include references confirming that the new method is sufficient to support data needs,
- Variations from the SCQ methodology are documented in the PSP, or
- Data validation of the affected samples is requested or qualifier codes of J (estimated) and R (rejected) be attached to detected and non-detected results, respectively.

3.2 PROJECT-SPECIFIC PROCEDURES, MANUALS AND DOCUMENTS

To assure consistency and data integrity, field activities in support of this PSP will follow the requirements and responsibilities outlined in controlled procedures and manufacturer operational manuals. Applicable procedures and manuals include the following:

- SMPL-01, Solids Sampling
- EW-1023, Management of Stockpiles
- ALS Method 6549, Analysis of VOCs in Field Samples by Manual Headspace using a Field Portable GC

- Sitewide CERCLA Quality Assurance Project Plan (SCQ)
- Sitewide Excavation Plan (SEP)
- DQO SLO-048, Rev. 5
- 602-5004, "Industrial Hygiene Instrument Repair, Calibration, and Tracking System"
- 602-5024, "Industrial Hygiene Air Sampling Program"
- ToxiRAE Pocket Photoionization Detector (PID) Operation and Maintenance Manual (Document No. 007-4001 Rev. B), RAE Systems Inc.
- Single Gas Monitor T82 Instruction Manual, Rev. 0, Industrial Scientific Corporation

3.3 PROJECT REQUIREMENTS FOR INDEPENDENT ASSESSMENTS

Project management has ultimate responsibility for the quality of the work processes and the results of the sampling activities covered by this PSP. Project management can schedule independent assessments of the work processes or operations to assure quality of performance. Assessment will encompass project requirements as defined in this PSP and the SCQ.

3.4 IMPLEMENTATION OF FIELD CHANGES

If field conditions require changes or variances, the Characterization Lead must prepare a V/FCN. The completed V/FCN must contain the signatures of all affected organizations, which at a minimum includes the Project Manager, Characterization Manager, WAO, and Quality Assurance (QA) but may also include Field Sampling and/or the Analytical Program Manager, as appropriate. A time-critical variance may be obtained in cases where expedited approval is needed to avoid costly project delays. In the case of a time-critical variance, verbal or written approval (electronic mail is acceptable) must be received from the Characterization Lead and from QA prior to implementing the variance. The completed approved V/FCN form must be completed within five working days after the time-critical variance is approved. All significant field changes to the PSP will require regulatory agency approval.

4.0 HEALTH AND SAFETY

The Health and Safety Lead, Field Sampling Leads, and team members will assess the safety of performing sampling activities in the vicinity of each boring location. This will include vehicle/equipment positioning limitations and fall hazards.

Technicians will conform to precautionary surveys performed by Radiological Control, Safety, and Industrial Hygiene personnel. All work on this project will be performed in accordance with applicable Environmental Monitoring procedures, RM-0020 (Radiological Control Requirements Manual), RM-0021 (Safety Performance Requirements Manual), Fluor Fernald work permit, Radiological Work Permit (RWP), penetration permit and other applicable permits. Concurrence with applicable safety permits (as indicated by the signature of each field team member assigned to this project) is required by each team member in the performance of their assigned duties.

The Field Sampling Lead will ensure that each technician performing work related to this project has been trained to the relevant sampling procedures including safety precautions. Technicians who do not sign project safety and technical briefing forms will not participate in any activities related to the completion of assigned project responsibilities. A copy of applicable safety permits/surveys issued for worker safety and health will be posted in the affected area during field activities.

A safety briefing will be conducted prior to the initiation of field activities. All emergencies will be reported immediately to the site communication center at 648-6511 by cell phone, 911 on-site phone, or by contacting "control" on the radio.

4.1 Project-Specific Health and Safety Measures

Because this sampling will take place inside a closed building, several measures must be taken to minimize exposure to airborne contaminants. During the entire sampling event, the double doors at both ends of the Quonset Hut should be fully opened to maximize ventilation. In addition, one member of the field team should wear a personal PID (with the alarm set to go off at an action level of 25 parts per million). If gas or diesel powered equipment are used, carbon monoxide should also be monitored for during sampling activities.

5.0 DATA MANAGEMENT

A data management process will be implemented so information collected during the investigation will be properly managed to satisfy data end use requirements after completion of the field activities. As specified in Section 5.1 of the SCQ, sampling teams will describe daily activities on a Field Activity Log, which should be sufficient for accurate reconstruction of the events without reliance on memory. Sample Collection Logs will be completed according to protocol specified in Appendix B of the SCQ and in applicable procedures. These forms will be maintained in loose-leaf form and uniquely numbered following the sampling event. At least weekly, a copy of all field logs will be sent to the Characterization Lead.

All field measurements, observations, and sample collection information associated with physical sample collection will be recorded, as applicable, on the Sample Collection Log, the Field Activity Log, and the Chain of Custody/Request for Analysis Form, as required. The method of sample collection will be specified in the Field Activity Log. The PSP number will be on all documentation associated with these sampling activities.

Samples will be assigned a unique sample number as explained in Section 2.2 and listed in Appendix B. This unique sample identifier will appear on the Sample Collection Log and will be used to identify the samples during analysis, data entry, and data management. Technicians will review all field data for completeness and accuracy and then forward the data package to the Field Data Validation Contact for final review. The field data package will be filed in the records of the Environmental Monitoring Project.

The analyst operating the field GC will provide hard copy printouts of the Site Chart Analysis Report and spreadsheet printouts to the Data Management Contact or designee. All Field GC data will be collected and reported at ASL B.

The Field GC Checklist will be completed by the analyst operating the field GC after each data collection event. Electronically recorded data from the field GC system will be downloaded on a daily basis to disks or to a designated directory LAN. Electronic data will consist of data files to be loaded into the SED and electronic images of printouts in specified format (.pdf). The Characterization Lead or

designee will be informed by analyst, if the Field GC equipment measurements do not meet Field GC Checklist criteria. The Characterization Lead or designee will determine whether additional measurements are required.

Associated Global Positioning System (GPS) or survey data for each sample location will be collected by the Survey Lead or designee. Electronic files containing survey data will be placed in a designated directory on the LAN. This survey data will be linked to the GC results prior to being loaded into the SED.

Once the electronic data (data files, electronic images of printouts, and associated GPS or survey data for each sample location) has been placed on the LAN it will be loaded into the SED. Data Management Contact or designee will perform an evaluation of the data. The evaluation may involve a comparison check between electronic data, hard copy and summary reports for accuracy and completeness. The evaluation will be documented by the Data Management Contact or designee by completion of the Data Group Form.

Field data packages for Field GC data will consist of field activity logs and sample collection logs. All field data packages associated with field GC sampling will be independently validated. The original field data packages will be filed and controlled by the Sample and Data Management department.

The original completed Data Group Form, hard copy printouts of the SiteChart Analysis Report and associated spreadsheet printouts will be forwarded to WAO for placement in the WAO project files. The Survey Lead or designee will maintain survey data. All records associated with this PSP should reference the PSP number and eventually be forwarded to Engineering/Construction Document Control to be placed in the project file.

APPENDIX A

DATA QUALITY OBJECTIVES SL-048, REV. 5

4390

Control Number _____

Fernald Environmental Management Project

Data Quality Objectives

Title: Delineating the Extent of Constituents of Concern During Remediation Sampling

Number: SL-048

Revision: 5

Effective Date: February 26, 1999

Contact Name: Eric Kroger

Approval: (signature on file) Date: 2/25/99
James E. Chambers
DQO Coordinator

Approval: (signature on file) Date: 2/26/99
J.D. Chiou
SCEP Project Director

Rev. #	0	1	2	3	4	5	6
Effective Date:	9/19/97	10/3/97	4/15/98	6/17/98	7/14/98	2/26/99	

DATA QUALITY OBJECTIVES
Delineating the Extent of Constituents of Concern During Remediation Sampling

Members of Data Quality Objectives (DQO) Scoping Team

The members of the DQO team include a project lead, a project engineer, a field lead, a statistician, a lead chemist, a sampling supervisor, and a data management lead.

Conceptual Model of the Site

Media is considered contaminated if the concentration of a constituent of concern (COC) exceeds the final remediation levels (FRLs). The extent of specific media contamination was estimated and published in the Operable Unit 5 Feasibility Study (FS). These estimates were based on kriging analysis of available data for media collected during the Remedial Investigation (RI) effort and other FEMP environmental characterization studies. Maps outlining contaminated media boundaries were generated for the Operable Unit 5 FS by overlaying the results of the kriging analysis data with isoconcentration maps of the other constituents of concern (COCs), as presented in the Operable Unit 5 RI report, and further modified by spatial analysis of maps reflecting the most current media characterization data. A sequential remediation plan has been presented that subdivides the FEMP into seven construction areas. During the course of remediation, areas of specific media may require additional characterization so remediation can be carried out as thoroughly and efficiently as possible. As a result, additional sampling may be necessary to accurately delineate a volume of specific media as exceeding a target level, such as the FRL or the Waste Attainment Criterion (WAC). Each individual Project-Specific Plan (PSP) will identify and describe the particular media to be sampled. This DQO covers all physical sampling activities associated with Pre-design Investigations, precertification sampling, WAC attainment sampling or regulatory monitoring that is required during site remediation.

1.0 Statement of Problem

If the extent (depth and/or area) of the media COC contamination is unknown, then it must be defined with respect to the appropriate target level (FRL, WAC, or other specified media concentration).

2.0 Identify the Decision

Delineate the horizontal and/or vertical extent of media COC contamination in an area with respect to the appropriate target level.

3.0 Inputs That Affect the Decision

Informational Inputs - Historical data, process history knowledge, the modeled extent of COC contamination, and the origins of contamination will be required to

establish a sampling plan to delineate the extent of COC contamination. The desired precision of the delineation must be weighed against the cost of collecting and analyzing additional samples in order to determine the optimal sampling density. The project-specific plan will identify the optimal sampling density.

Action Levels - COCs must be delineated with respect to a specific action level, such as FRLs and On-Site Disposal Facility (OSDF) WAC concentrations. Specific media FRLs are established in the OU2 and OU5 RODs, and the WAC concentrations are published in the OU5 ROD. Media COCs may also require delineation with respect to other action levels that act as remediation drivers, such as Benchmark Toxicity Values (BTVs).

4.0 The Boundaries of the Situation

Temporal Boundaries - Sampling must be completed within a time frame sufficient to meet the remediation schedule. Time frames must allow for the scheduling of sampling and analytical activities, the collection of samples, analysis of samples and the processing of analytical data when received.

Scale of Decision Making - The decision made based upon the data collected in this investigation will be the extent of COC contamination at or above the appropriate action level. This delineation will result in media contaminant concentration information being incorporated into engineering design, and the attainment of established remediation goals.

Parameters of Interest - The parameters of interest are the COCs that have been determined to require additional delineation before remediation design can be finalized with the optimal degree of accuracy.

5.0 Decision Rule

If existing data provide an unacceptable level of uncertainty in the COC delineation model, then additional sampling will take place to decrease the model uncertainty. When deciding what additional data is needed, the costs of additional sampling and analysis must be weighed against the benefit of reduced uncertainty in the delineation model, which will eventually be used for assigning excavation, or for other purposes.

6.0 Limits on Decision Errors

In order to be useful, data must be collected with sufficient areal and depth coverage, and at sufficient density to ensure an accurate delineation of COC concentrations. Analytical sensitivity and reproducibility must be sufficient to differentiate the COC concentrations below their respective target levels.

Types of Decision Errors and Consequences

Decision Error 1 - This decision error occurs when the decision maker determines that the extent of media contaminated with COCs above action levels is not as extensive as it actually is. This error can result in a remediation design that fails to incorporate media contaminated with COC(s) above the action level(s). This could result in the re-mobilization of excavation equipment and delays in the remediation schedule. Also, this could result in media contaminated above action levels remaining after remediation is considered complete, posing a potential threat to human health and the environment.

Decision Error 2 - This decision error occurs when the decision maker determines that the extent of media contaminated above COC action levels is more extensive than it actually is. This error could result in more excavation than necessary, and this excess volume of materials being transferred to the OSDF, or an off-site disposal facility if contamination levels exceed the OSDF WAC.

True State of Nature for the Decision Errors - The true state of nature for Decision Error 1 is that the maximum extent of contamination above the FRL is more extensive than was determined. The true state of nature for Decision Error 2 is that the maximum extent of contamination above the FRL is not as extensive as was determined. Decision Error 1 is the more severe error.

7.0 Optimizing Design for Useable Data

7.1 Sample Collection

A sampling and analytical testing program will delineate the extent of COC contamination in a given area with respect to the action level of interest. Existing data, process knowledge, modeled concentration data, and the origins of contamination will be considered when determining the lateral and vertical extent of sample collection. The cost of collecting and analyzing additional samples will be weighed against the benefit of reduced uncertainty in the delineation model. This will determine the sampling density. Individual PSPs will identify the locations and depths to be sampled, the sampling density necessary to obtain the desired accuracy of the delineation, and if samples will be analyzed by the on-site or off-site laboratory. The PSP will also identify the sampling increments to be selectively analyzed for concentrations of the COC(s) of interest, along with field work requirements. Analytical requirements will be listed in the PSP. The chosen analytical methodologies are able to achieve a detection limit capable of resolving the COC action level. Sampling of groundwater monitoring wells may require different purge requirements than those stated in the SCQ (i.e., dry well definitions or small purge volumes). In order to accommodate sampling of wells that go dry prior to completing the purge of the necessary well volume, attempts to sample the

monitoring wells will be made 24 hours after purging the well dry. If, after the 24 hour period, the well does not yield the required volume, the analytes will be collected in the order stated in the applicable PSP until the well goes dry. Any remaining analytes will not be collected. In some instances, after the 24 hour wait the well may not yield any water. For these cases, the well will be considered dry and will not be sampled.

7.2 COC Delineation

The media COC delineation will use all data collected under the PSP, and if deemed appropriate by the Project Lead, may also include existing data obtained from physical samples, and if applicable, information obtained through real-time screening. The delineation may be accomplished through modeling (e.g. kriging) of the COC concentration data with a confidence limit specific to project needs that will reduce the potential for Decision Error 1. A very conservative approach to delineation may also be utilized where the boundaries of the contaminated media are extended to the first known vertical and horizontal sample locations that reveal concentrations below the desired action level.

7.3 QC Considerations

Laboratory work will follow the requirements specified in the SCQ. If analysis is to be carried out by an off-site laboratory, it will be a Fluor Daniel Fernald approved full service laboratory. Laboratory quality control measures include a media prep blank, a laboratory control sample (LCS), matrix duplicates and matrix spike. Typical Field QC samples are not required for ASL B analysis. However the PSPs may specify appropriate field QC samples for the media type with respect to the ASL in accordance with the SCQ, such as field blanks, trip blanks, and container blanks. All field QC samples will be analyzed at the associated field sample ASL. Data will be validated per project requirements, which must meet the requirements specified in the SCQ. Project-specific validation requirements will be listed in the PSP.

Per the Sitewide Excavation Plan, the following ASL and data validation requirements apply to all **soil and soil field QC samples** collected in association with this DQO:

- If samples are analyzed for Pre-design Investigations and/or Precertification, 100% of the data will be analyzed per ASL B requirements. For each laboratory used for a project, 90% of the data will require only a Certificate of Analysis, the other 10% will require the Certificate of Analysis and all associated QA/QC results, and will be validated to ASL B. Per Appendix H of the SEP, the minimum detection level (MDL) for these analyses will be established at approximately 10% of the action level (the action level for precertification is the

FRL; the action level for pre-design investigations can be several different action levels, including the FRL, the WAC, RCRA levels, ALARA levels, etc.). If this MDL is different from the SCQ-specified MDL, the ASL will default to ASL E, though other analytical requirements will remain as specified for ASL B.

- If samples are analyzed for WAC Attainment and/or RCRA Characteristic Areas Delineation, 100% of the data will be analyzed and reported to ASL B with 10% validated. The ASL B package will include a Certificate of Analysis along with all associated QA/QC results. Total uranium analyses using a higher detection limit than is required for ASL B (10 mg/kg) may be appropriate for WAC attainment purposes since the WAC limit for total uranium is 1,030 mg/kg. In this case, an ASL E designation will apply to the analysis and reporting to be performed under the following conditions:

    - all of the ASL B laboratory QA/QC methods and reporting criteria will apply with the exception of the total uranium detection limit

    - the detection limit will be ≤10% of the WAC limit (e.g., ≤103 mg/kg for total uranium).

- If delineation data are also to be used for certification, the data must meet the data quality objectives specified in the Certification DQO (SL-043).

- Validation will include field validation of field packages for ASL B or ASL D data.

All data will undergo an evaluation by the Project Team, including a comparison for consistency with historical data. Deviations from QC considerations resulting from evaluating inputs to the decision from Section 3, must be justified in the PSP such that the objectives of the decision rule in Section 5 are met.

7.4 Independent Assessment

Independent assessment shall be performed by the FEMP QA organization by conducting surveillances. Surveillances will be planned and documented in accordance with Section 12.3 of the SCQ.

7.5 Data Management

Upon receipt from the laboratory, all results will be entered into the SED as qualified data using standard data entry protocol. The required ASL B, D or E data will undergo analytical validation by the FEMP validation team, as required (see Section 7.3). The Project Manager will be responsible to determine data usability as it pertains to supporting the DQO decision of determining delineation of media

COC's.

7.6 Applicable Procedures

Sample collection will be described in the PSP with a listing of applicable procedures. Typical related plans and procedures are the following:

- Sitewide Excavation Plan (SEP)
- Sitewide CERCLA Quality Assurance Project Plan (SCQ).
- SMPL-01, *Solids Sampling*
- SMPL-02, *Liquids and Sludge Sampling*
- SMPL-21, *Collection of Field Quality Control Samples*
- EQT-06, *Geoprobe® Model 5400 Operation and Maintenance*
- EQT-23, *Operation of High Purity Germanium Detectors*
- EQT-30, *Operation of Radiation Tracking Vehicle Sodium Iodide Detection System*

Data Quality Objectives
Delineating the Extent of Constituents of Concern During Remediation Sampling

1A. Task/Description: Delineating the extent of contamination above the FRLs

1.B. Project Phase: (Put an X in the appropriate selection.)

RI ☐ FS ☐ RD ☒ RA ☐ R,A ☐ OTHER ☐

1.C. DQO No.: SL-048, Rev. 5 DQO Reference No.:_____

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2. Media Characterization: (Put an X in the appropriate selection.)

Air ☐ Biological ☐ Groundwater ☒ Sediment ☒ Soil ☒

Waste ☒ Wastewater ☐ Surface water ☐ Other (specify) _____

---

3. Data Use with Analytical Support Level (A-E): (Put an X in the appropriate Analytical Support Level selection(s) beside each applicable Data Use.)

Site Characterization A ☐ B ☒ C ☐ D ☒ E ☒	Risk Assessment A ☐ B ☐ C ☐ D ☐ E ☐
Evaluation of Alternatives A ☐ B ☐ C ☐ D ☐ E ☐	Engineering Design A ☐ B ☒ C ☐ D ☒ E ☒
Monitoring during remediation A ☒ B ☒ C ☐ D ☒ E ☒	Other A ☐ B ☐ C ☐ D ☐ E ☐

4.A. Drivers: Remedial Action Work Plans, Applicable or Relevant and Appropriate Requirements (ARARs) and the OU2 and/or OU5 Record of Decision (ROD).

4.B. Objective: Delineate the extent of media contaminated with a COC (or COCs) with respect to the action level(s) of interest.

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5. Site Information (Description):

6.A. Data Types with appropriate Analytical Support Level Equipment Selection and SCQ Reference: (Place an "X" to the right of the appropriate box or boxes selecting the type of analysis or analyses required. Then select the type of equipment to perform the analysis if appropriate. Please include a reference to the SCQ Section.)

1. pH	[X] *	2. Uranium	[X] *	3. BTX	[ ]		
Temperature	[X] *	Full Radiological	[X] *	TPH	[ ]		
Specific Conductance	[X] *	Metals	[X] *	Oil/Grease	[ ]		
Dissolved Oxygen	[X] *	Cyanide	[ ]				
Technetium-99	[X] *	Silica	[ ]				

4. Cations	[ ]	5. VOA	[X] *	6. Other (specify)
Anions	[ ]	BNA	[X] *	
TOC	[ ]	Pesticides	[X] *	
TCLP	[X] *	PCB	[X] *	
CEC	[ ]	COD	[ ]	

*If constituent is identified for delineation in the individual PSP.

6.B. Equipment Selection and SCQ Reference:

Equipment Selection	Refer to SCQ Section
ASL A _____	SCQ Section: _____
ASL B X _____	SCQ Section: App. G Tables G-1&G-3
ASL C _____	SCQ Section: _____
ASL D X _____	SCQ Section: App. G Tables G-1&G-3
ASL E X (See sect. 7.3, pg. 6)	SCQ Section: App. G Tables G-1&G-3

7.A. Sampling Methods: (Put an X in the appropriate selection.)

Biased [X] Composite [ ] Environmental [X] Grab [X] Grid [X]

Intrusive [X] Non-Intrusive [ ] Phased [ ] Source [ ]

DQO Number: SL-048, Rev. 5

7.B. Sample Work Plan Reference: This DQO is being written prior to the PSPs.

Background samples: OU5 RI

7.C. Sample Collection Reference:

Sample Collection Reference: SMPL-01, SMPL-02, EQT-06

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8. Quality Control Samples: (Place an "X" in the appropriate selection box.)

8.A. Field Quality Control Samples:

Trip Blanks	[X] *	Container Blanks	[X] + +
Field Blanks	[X] +	Duplicate Samples	[X] * * *
Equipment Rinsate Samples	[X] * * *	Split Samples	[X] * *
Preservative Blanks	[ ]	Performance Evaluation Samples	[ ]

Other (specify)

* For volatile organics only
** Split samples will be collected where required by EPA or OEPA.
*** If specified in PSP.
\+ Collected at the discretion of the Project Manager (if warranted by field conditions)
\+ \+ One per Area and Phase Area per container type (i.e. stainless steel core liner/plastic core liner/Geoprobe tube).

8.B. Laboratory Quality Control Samples:

Method Blank	[X]	Matrix Duplicate/Replicate	[X]
Matrix Spike	[X]	Surrogate Spikes	[ ]
Tracer Spike	[ ]		

Other (specify) Per SCQ

9. Other: Please provide any other germane information that may impact the data quality or gathering of this particular objective, task or data use.

APPENDIX B

SAMPLES COLLECTED FOR THE INVESTIGATION OF SOIL STAGED IN QUONSET HUT NO. 1

APPENDIX B

SAMPLES COLLECTED FOR THE INVESTIGATION OF SOIL STAGED IN QUONSET HUT NO. 1

Pile Quarter	Location ID*	Depth	Depth ID	Analysis	Sample ID
Northeast	QHUT-NE	Shallowest	a	TAL A	QHUT-NE-a-L
		Middle	b	TAL A	QHUT-NE-b-L
		Deepest	c	TAL A	QHUT-NE-c-L
Southeast	QHUT-SE	Shallowest	a	TAL A	QHUT-SE-a-L
		Middle	b	TAL A	QHUT-SE-b-L
		Deepest	c	TAL A	QHUT-SE-c-L
Southwest	QHUT-SW	Shallowest	a	TAL A	QHUT-SW-a-L
		Middle	b	TAL A	QHUT-SW-b-L
		Deepest	c	TAL A	QHUT-SW-c-L
Northwest	QHUT-NW	Shallowest	a	TAL A	QHUT-NW-a-L
		Middle	b	TAL A	QHUT-NW-b-L
		Deepest	c	TAL A	QHUT-NW-c-L

*Sample locations will be field-located, and will not need to be tied to Northing/Easting coordinates

APPENDIX C

TARGET ANALYTE LIST

APPENDIX C
TARGET ANALYTE LIST

TAL A
20803-PSP-0001-A

Field Analysis, Portable Gas Chromatography, 12 Samples Specified in the PSP

Analyte	ASL	FRL	WAC Limit	Requested MDC
Trichloroethene	B	25 mg/kg	128 mg/kg	0.09 mg/kg
Tetrachloroethene	B	3.6 mg/kg	128 mg/kg	0.09 mg/kg
1,1-Dichloroethene	B	0.41 mg/kg	11.4 mg/kg	0.13 mg/kg
1,2-Dichloroethene (total)	B	0.16 mg/kg	11.4 mg/kg	(see below)
cis-1,2-Dichloroethene	B	--	--	0.10 mg/kg
trans-1,2-Dichloroethene	B	--	--	0.17 mg/kg

FRL – final remediation level
MDC – minimum detectable concentrations
mg/kg – milligrams per kilogram
WAC – waste acceptance criteria