PROJECT SPECIFIC PLAN FOR PRE-DESIGN INVESTIGATION FOR TOTAL URANIUM IN THE SEWAGE TREATMENT PLANT (STP) AREA

FERNALD ENVIRONMENTAL MANAGEMENT PROJECT
FERNALD, OHIO

ORIGINAL

INFORMATION ONLY

AUGUST 1997

U.S. DEPARTMENT OF ENERGY
FERNALD AREA OFFICE

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PROJECT SPECIFIC PLAN
FOR
PRE-DESIGN INVESTIGATION
FOR TOTAL URANIUM
IN THE SEWAGE TREATMENT PLANT (STP) AREA

PROJECT NUMBER 50.03.59.05

AUGUST 28, 1997

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U.S. Department of Energy
Fernald Area Office

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Revision 0

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ACRONYMS AND ABBREVIATIONS

ASCOC	area-specific constituent of concern
ASL	Analytical Support Level
AWWT	Advanced Wastewater Treatment (Facility)
BAL	Borehole Abandonment Log
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
DQO	Data Quality Objective
FACTS	Fernald Analytical Customer Tracking System
FAL	Field Activities Log
FDF	Fluor Daniel Fernald
FEMP	Fernald Environmental Management Project
FRL	Final Remediation Level
GIS	Graphical Information System
LAN	Local Area Network
OU	Operable Unit
PDI	Pre-Design Investigation
PDR	Project Development and Reports
ppm	parts per million
PSP	Project Specific Plan
PWID	Project Waste Identification Document
QA/QC	Quality Assurance/Quality Control
RI/FS	Remedial Investigation/Feasibility Study
ROD	Record of Decision
SCEP	Soils Characterization and Excavation Project
SCL	Sample Collection Log
SCQ	Sitewide CERCLA Quality Assurance Project Plan
SED	Sitewide Environmental Database
SMMP	Soil and Miscellaneous Media Projects
SPT	Standard Penetrating Testing
STP	Sewage Treatment Plan
STPI	Sewage Treatment Plant Incinerator
TAL	Target Analyte List
VR/FCN	Variance Request/Field Change Notice
WAC	Waste Acceptance Criteria
WDSS	Waste Disposition Support Services

1.0 INTRODUCTION

1.1 PURPOSE

This Project Specific Plan (PSP) describes the field sampling activities necessary to bound the excavation in the Sewage Treatment Plant (STP) area. Analytical information collected will be used to develop a design package for Area 1, Phase II. Excavation will be defined for the area-specific final remediation levels (FRLs) and on-site waste acceptance criteria (WAC) defined in the Operable Unit 5 Record of Decision (ROD) for total uranium.

Drilling, sampling, and analysis activities shall be consistent with the Sitewide Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), Quality Assurance Project Plan (SCQ), and Data Quality Objective (DQO) No. SL-036 (Appendix A).

1.2 AREA DESCRIPTION

The STP area (Figure 1-1) is located along the eastern perimeter of the Fernald Environmental Management Project (FEMP) boundary within remediation Area 1, Phase II. The STP, associated facilities, and an abandoned solid waste incinerator are contained within an area on the FEMP property surrounded by a 6 feet high chain-link fence to restrict access. The STP became operational in 1952 for treatment of the FEMP sanitary wastewater. The system was later reconstructed to receive both sanitary and process-related wastewater. The use of the STP to treat process-related wastewater was discontinued with the installation and start-up of the bio-denitrification effluent treatment system. The abandoned-in-place solid waste incinerator is located in the northwest corner of the STP. This incinerator was operated from November 1954 through December 1979, at which time a new solid waste incinerator at Building 39 was put into service. The STP incinerator (STPI) was used to burn uranium and thorium contaminated and uncontaminated combustible trash during its operation.

1.3 PREVIOUS INVESTIGATIONS

Two investigations under the Remedial Investigation/Feasibility Study (RI/FS) and a separate removal action have been conducted in the STP area. The first investigation was the surface soil sampling program conducted in 1988. All of the samples were collected within the upper 18 inches of soil and were analyzed for radiological parameters only. Surface radiological measurements and limited soil samples collected in the vicinity of the STP facilities indicated the presence of localized elevated concentrations of radionuclides. The contamination in the subsurface below the STP is assumed to

have come from the STP by way of leaking pipes and seepage from the sludge drying beds. Subsurface radiologic contamination is also indicated beneath the STP. The soils near the STPI were contaminated with various concentrations of uranium. Airborne deposition (i.e. surficial soil contamination) from the incinerator stack is localized to the northeast of the STP.

The second investigation, conducted in 1990 under the RI/FS, was the installation of six monitoring wells under the Production and Additional Suspect Areas Work Plan. This was augmented by Borings 1492 and 1493 on the west and north sides of the fenced STP area for the geochemical program (Figure 1-1). Subsurface soil samples from selected intervals were analyzed for full radiological parameters. In general, analysis results indicated that total uranium concentrations decreased with depth. Current data and process knowledge indicates that the source of subsurface total uranium was the STP. Although the available data indicate that the perched groundwater under the STP is contaminated, the extent of this contamination in the immediate vicinity of the STP is unknown.

Removal Action 14, "Contaminated Soils Adjacent to the Sewage Treatment Plant Incinerator," was conducted from 1992 through 1994 to remove surface soil contamination in excess of removal criteria (for total uranium: onsite within STP - 300 pCi/g (900 ppm), onsite outside STP - 100 pCi/g (300 ppm), and off-site - 35 pCi/g (105 ppm). Initial excavations were performed within those areas to remove and containerize radiologically contaminated soil, and to verify that excavation had achieved the removal criteria through the collection and analysis of residual soil samples. Verification sampling results indicated that the removal action criteria for total uranium had been met. Fill material was used to regrade the area. The origin of this fill material is being investigated.

1.4 SCOPE

The scope of this project is limited to investigation of the vertical and lateral extent of subsurface total uranium contamination in soil in the vicinity of the STP. The boundaries of this PSP include the anticipated deep excavations in the STP area and the air deposition area of contamination from the STPI located to the north of the STP area. Total uranium will be used as the indicator parameter to define the extent of excavation required to remove soil exceeding the FRL and on-site WAC in this PSP for engineering design needs. Current data and process knowledge indicate that total uranium bounds all other area-specific constituents of concern (ASCOCs) in the area of the STP. Therefore, the soil samples will be analyzed for total uranium. This PSP will be implemented in a phased approach for

some of the borings aligned in parallel to the eastern property line (Figure 1-2). This is being done to determine if total uranium can be bounded at concentrations below the FRL on-property before determining if off-property investigation will be required.

1.5 KEY PROJECT PERSONNEL

The key project personnel include team members of the Soil Characterization and Excavation Project (SCEP), Project Development and Reports (PDR), Soil and Miscellaneous Media Projects (SMMP), and DOE (Table 1-1).

TABLE 1-1
KEY PROJECT PERSONNEL

Title	Name	Alternative
DOE Contact	Kathy Nickel	Rob Janke
Area 1, Phase II Project Manager	Steve Garland	Clifton Blanchard
Characterization and Sampling Manager	Joan White	Mike Frank
Area 1, Phase II Characterization Lead	Alex Duarte	Joan White
Sampling Field Manager	Mike Frank	Tom Buhrlage
Surveying Lead	Jim Schwing	TBD
Data Management Lead	Susan Marsh	Alex Duarte
Laboratory Contact	Al Bacon	Bill Westerman
Waste Disposition Contact	Sue Lorenz	Ken Belgrave
Health and Safety	Jack Patrick	Kevin Tschaenn
Quality Assurance Contact	Reinhard Friske	Harold Swiger
PSP Technical Writer	Clifton Blanchard	NA

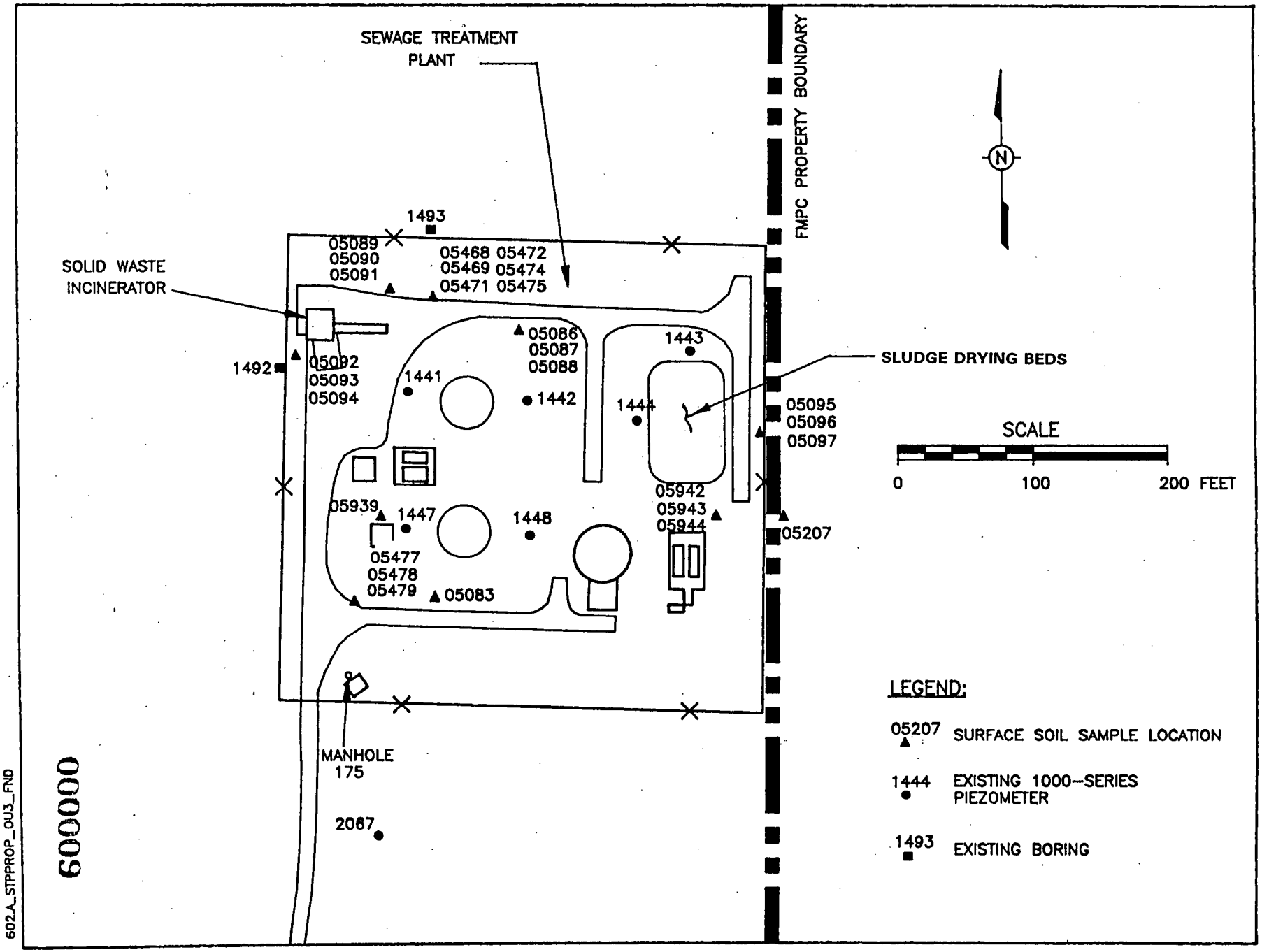
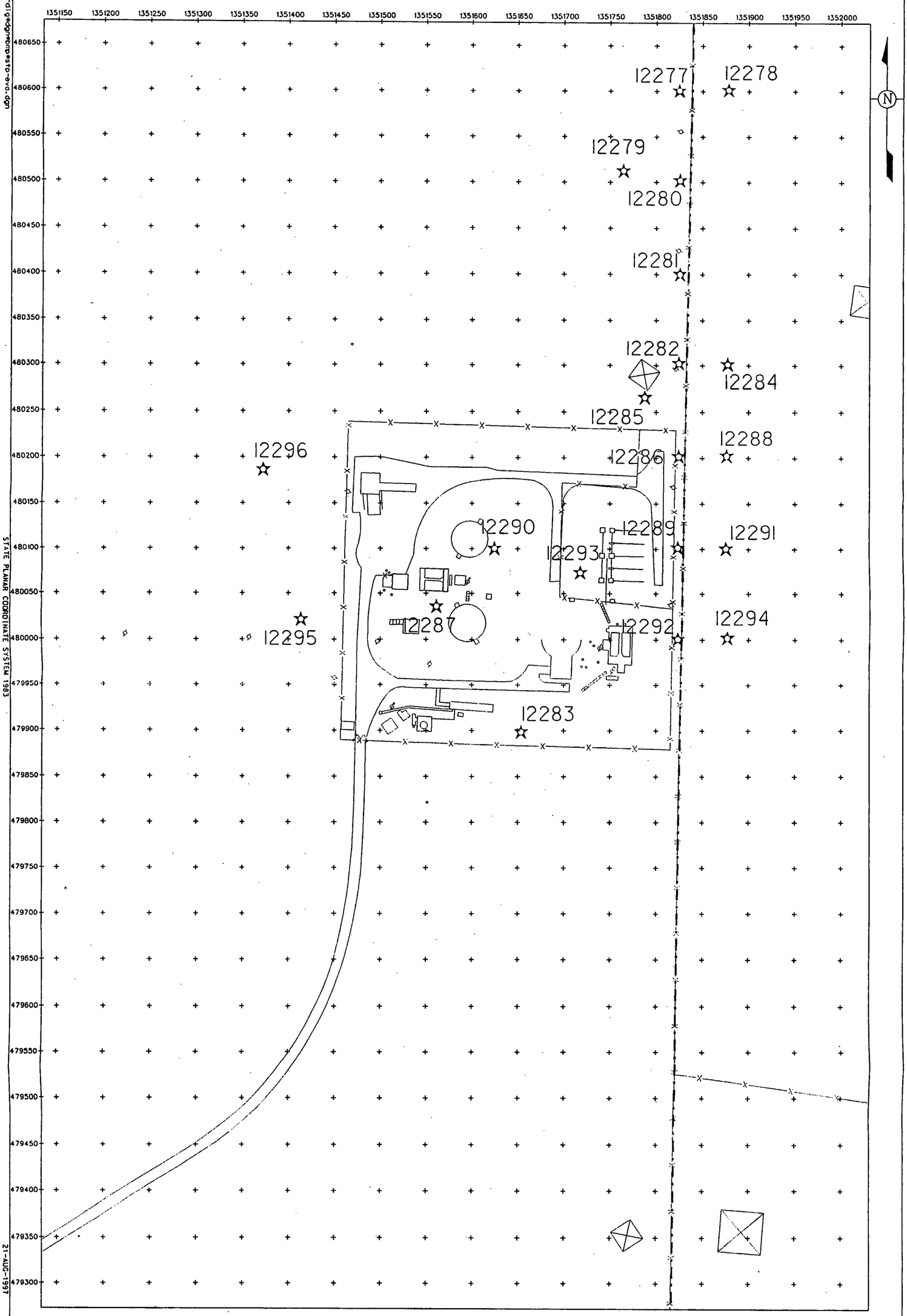


Figure 1-1
Sewage Treatment Plant



LEGEND:

☆ PROPOSED BORING LOCATIONS

-·-·- FEMP BOUNDARY

SCALE 100 50 0 100 FEET

DRAFT

000010

FIGURE 1-2. PROPOSED BORING LOCATIONS FOR THE PRE-DESIGN INVESTIGATION AT THE SEWAGE TREATMENT PLANT AREA AREA 1, PHASE II

APPENDIX A

DATA QUALITY OBJECTIVE
NO. SL-036

Control Number _____

Fernald Environmental Management Project

Data Quality Objectives

Title: Delineating the Extent of Soil Constituents of Concern

Number: SL-036

Revision: 2

Final Draft: August , 1997

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Approval: D Madsen for WD Kelley Date: 8/19/97
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DQO Coordinator

Approval: Steve Garland Date: 8/19/97
Steve Garland
Project Lead

Rev. #	0	1	2				
Effective Date:	05/05/97	07/29/97	8/19/97				

DATA QUALITY OBJECTIVES
Delineating the Extent of Soil Constituents of Concern

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
Soil is considered contaminated if the concentration of a constituent of concern (COC) exceeds the final remediation levels (FRLs). The extent of soil contamination was estimated and published in the Operable Unit 5 Feasibility Study (FS). These estimates were based on kriging analysis of available uranium data for soil collected during the Remedial Investigation (RI) effort and other FEMP environmental characterization studies. Maps outlining contaminated soil boundaries were generated for the Operable Unit 5 FS by overlaying the results of the kriging analysis of uranium 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 soil characterization data. A sequential remediation plan has been presented that subdivides the FEMP into seven construction areas. During the course of remediation, areas of soil may require additional characterization so soil 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 soil as exceeding a target level, such as the FRL or WAC.

1.0 Statement of Problem

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

2.0 Identify the Decision

Delineate the horizontal and/or vertical extent of soil 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 confidence limits for delineation boundaries will be specified in pre-design planning documents.

Action Levels - COCs must be delineated with respect to a specific action level, such as soil FRLs and OSDF WAC concentrations. Soil FRLs are established in the OU2 and OU5 RODs, and the WAC concentrations are published in the OU5 ROD. Soil COCs may also require delineation with respect to other action levels that act as remediation drivers, such as BTVs and ALARA levels.

4.0 The Boundaries of the Situation

Temporal Boundaries - Sampling must be completed within a time frame sufficient to meet the soil 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 soil COC contamination at or above the appropriate action level. This delineation will result in soil contaminant concentration information being incorporated into engineering design, and the attainment of established remediation goals.

Parameters of Interest - The parameters of interest are the desired action levels of soil COCs that have been determined to require additional delineation before soil 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 in additional soil concentration 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 soil 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 soil 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 soil contaminated with COC(s) above the action level(s). This could result in the re-mobilization of excavation equipment and delays in the soil

remediation schedule. Also, this could result in soil 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 soil 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 soil 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 soil 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 soil 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 be carried out for the purpose of delineating 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, when weighed against the reduced uncertainty in the delineation model, will determine the sampling density. Individual PSPs will identify the locations and depths to be sampled, along with the sampling density necessary to obtain the desired accuracy of the delineation. The Geoprobe® technique or an alternate method identified in SMPL-01, *Solids Sampling,* will be used to obtain soil samples at required depth. The PSP will identify the sampling increments to be selectively analyzed for concentrations of the COC(s) of interest, along with field work requirements. As a QC measure, one in ten (10%) of the soil samples collected will be split and submitted to both the on-site and approved off-site laboratories. The split portions analyzed on-site will serve as laboratory duplicate samples for QC purposes. Results obtained from these analyses will also be used as delineation data. Analytical requirements will be listed in the PSP. The chosen analytical methodologies are able to achieve a detection limit capable of resolving the FRL(s).

7.2 COC Delineation

The soil COC delineation will utilize all data collected under the PSP, and if deemed appropriate by the Project Lead, may also include existing soil concentration 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 be utilized, where the boundaries of the contaminated soil are extended to the first known vertical and horizontal sample locations that reveal concentrations below the desired action level.

7.3 QC Considerations

Ninety percent (90%) of the samples collected will be submitted to the on-site laboratory and analyzed for the indicated contaminants at ASL B. Laboratory work will follow the requirements specified in the SCQ. The remaining ten percent (10%) of the samples collected will be split (as a QC duplicate) and analyzed both on-site and sent to an off-site qualified full service laboratory. The ten percent of the samples that are split will be analyzed both on-site and off-site at ASL D. Laboratory quality control measures include a soil prep blank, a laboratory control sample (LCS), matrix duplicates and matrix spike. Field quality control measures for ASL D samples include duplicate samples, equipment rinsates, field blanks, trip blanks, and container blanks. All field QC samples will be analyzed at ASL D. The frequency of field QC sampling is as follows: Duplicate samples will be taken at a minimum of one per 10 samples. Rinsates will be performed at a minimum of one per 20 on all field equipment that is re-used. Trip blanks will be taken at a minimum of one per shipping container when analyzing for volatile organic compounds (VOC's). Container blanks will be taken at a minimum of one per Area and Phase per container type (i.e. stainless steel core liner/ plastic core liner/ Geoprobe tube). Field blanks are not necessary for metals TAL analysis as it is unlikely in ambient field conditions to have metals cross contamination, however, the probability of cross contamination with semi-volatile organic compounds is much higher therefore for samples that will be analyzed for semi-volatile organic compounds (SVOC's) field blanks will be taken at a minimum of one per 20 samples. All data will undergo an evaluation by the Project Team, including a comparison for consistency with historical data.

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. All of the ASL D data will undergo analytical validation by the FEMP validation team. A minimum of ten percent (10%) of field data will be validated by the FEMP QA validation team. The Project Manager will be responsible to determine data usability as it pertains to support the DQO decision of determining delineation of soil COC's.

7.6 Applicable Plans/Procedures

Sample collection under the PSP shall follow the requirements outlined within these existing site plans/procedures:

- Sitewide Excavation Plan (SEP)
- Sitewide CERCLA Quality Assurance Project Plan (SCQ).
- SMPL-01, *Solids Sampling*
- SMPL-21, *Collection of Field Quality Control Samples*
- EQT-06, *Geoprobe® Model 5400 Operation and Maintenance*
- EQT-23, *Operation of ADCAM Series Analyzers with Gamma Sensitive Detectors*
- EQT -30, *Operation of Radiation Tracking Vehicle Sodium Iodide Detection System*
- EQT-09, *Spectrace 9000 Field Portable X-Ray Fluorescence Spectrometer - Calibration, Operation, and Maintenance*

Data Quality Objectives
Delineating the Extent of Soil Constituents of Concern

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_vA ☐ OTHER ☐

1.C. DQO No.: SL-036, Rev. 2 DQO Reference No.: SL-043

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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) _____

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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 soil 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	☐	2.	Uranium	☒ *	3.	BTX	☐
	Temperature	☐		Full Radiological	☒ *		TPH	☐
	Specific Conductance	☐		Metals	☒ *		Oil/Grease	☐
	Dissolved Oxygen	☐		Cyanide	☐			
	Technetium-99	☒ *		Silica	☐			

4.	Cations	☐	5.	VOA	☒ *	6. Other (specify)
	Anions	☐		BNA	☒ *	
	TOC	☐		Pesticides	☒ *	
	TCLP	☒ *		PCB	☒ *	
	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 X, RTRAK / HPGe / XRF	SCQ Section: App. B Table 1
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	SCQ Section:

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

Biased	☒	Composite	☐	Environmental	☒	Grab	☒	Grid	☒
Intrusive	☒	Non-Intrusive	☐	Phased	☐	Source	☐		

DQO Number: SL-036, Rev. 2

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, 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.
+ Taken at the discretion of the Project Manager (if warranted by field conditions)
++ One per Area and Phase 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

SAMPLE IDENTIFIERS, PLANNED DEPTHS AND ANALYSIS

APPENDIX B
SAMPLE IDENTIFIERS, PLANNED DEPTHS, AND ANALYSIS

Boring ID	Sample ID	Easting	Northing	Total Depth (ft)	Sample Interval for 8 ft Borings (ft)	Sample Interval for 12 ft and 25 ft Borings (ft)
12277	A1P2STP-12277-4-R	1351825.00	480600.00	8	1.5-2.0	NA
	A1P2STP-12277-8-R	1351825.00	480600.00	8	3.5-4.0	NA
	A1P2STP-12277-12-R	1351825.00	480600.00	8	5.5-6.0	NA
	A1P2STP-12277-16-R	1351825.00	480600.00	8	7.5-8.0	NA
12278	A1P2STP-12278-4-R	1351877.00	480600.00	8	1.5-2.0	NA
	A1P2STP-12278-8-R	1351877.00	480600.00	8	3.5-4.0	NA
	A1P2STP-12278-12-R	1351877.00	480600.00	8	5.5-6.0	NA
	A1P2STP-12278-16-R	1351877.00	480600.00	8	7.5-8.0	NA
12279	A1P2STP-12279-8-R	1351563.00	480510.00	12	NA	3.5-4.0
	A1P2STP-12279-16-R	1351563.00	480510.00	12	NA	7.5-8.0
	A1P2STP-12279-16-R-D	1351563.00	480510.00	12	NA	7.5-8.0
	A1P2STP-12279-24-R	1351563.00	480512.00	12	NA	11.5-12.0
12280	A1P2STP-12280-4-R	1351825.00	480500.00	8	1.5-2.0	NA
	A1P2STP-12280-8-R	1351825.00	480500.00	8	3.5-4.0	NA
	A1P2STP-12280-12-R	1351825.00	480500.00	8	5.5-6.0	NA
	A1P2STP-12280-16-R	1351825.00	480500.00	8	7.5-8.0	NA

APPENDIX B
SAMPLE IDENTIFIERS, PLANNED DEPTHS, AND ANALYSIS
(continued)

Boring ID	Sample ID	Easting	Northing	Total Depth (ft)	Sample Interval for 8 ft Borings (ft)	Sample Interval for 12 ft and 25 ft Borings (ft)
12281	A1P2STP-12281-4-R	1351825.00	480400.00	8	1.5-2.0	NA
	A1P2STP-12281-8-R	1351825.00	480400.00	8	3.5-4.0	NA
	A1P2STP-12281-12-R	1351825.00	480400.00	8	5.5-6.0	NA
	A1P2STP-12281-16-R	1351825.00	480400.00	8	7.5-8.0	NA
12282	A1P2STP-12282-8-R	1351825.00	480300.00	25	NA	3.5-4.0
	A1P2STP-12282-8-R-D	1351825.00	480300.00	25	NA	3.5-4.0
	A1P2STP-12282-16-R	1351825.00	480300.00	25	NA	7.5-8.0
	A1P2STP-12282-24-R	1351825.00	480300.00	25	NA	11.5-12.0
	A1P2STP-12282-32-R	1351825.00	480300.00	25	NA	15.5-16.0
	A1P2STP-12282-40-R	1351825.00	480300.00	25	NA	19.5-20.0
	A1P2STP-12282-50-R	1351825.00	480300.00	25	NA	24.5-25.0

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APPENDIX B
SAMPLE IDENTIFIERS, PLANNED DEPTHS, AND ANALYSIS
(continued)

Boring ID	Sample ID	Easting	Northing	Total Depth (ft)	Sample Interval for 8 ft Borings (ft)	Sample Interval for 12 ft and 25 ft Borings (ft)
12283	A1P2STP-12283-8-R	1351650.00	479900.00	25	NA	3.5-4.0
	A1P2STP-12283-16-R	1351650.00	479900.00	25	NA	7.5-8.0
	A1P2STP-12283-24-R	1351650.00	479900.00	25	NA	11.5-12.0
	A1P2STP-12283-32-R	1351650.00	479900.00	25	NA	15.5-16
	A1P2STP-12283-40-R	1351650.00	479900.00	25	NA	19.5-20.0
	A1P2STP-12283-40-R-D	1351650.00	479900.00	25	NA	19.5-20.0
	A1P2STP-12283-50-R	1351650.00	479900.00	25	NA	24.5-25
12284	A1P2STP-12284-8-R	1351880.00	480300.00	25	NA	3.5-4.0
	A1P2STP-12284-16-R	1351880.00	480300.00	25	NA	7.5-8.0
	A1P2STP-12284-24-R	1351880.00	480300.00	25	NA	11.5-12.0
	A1P2STP-12284-32-R	1351880.00	480300.00	25	NA	15.5-16.0
	A1P2STP-12284-40-R	1351880.00	480300.00	25	NA	19.5-20.0
	A1P2STP-12284-50-R	1351880.00	480300.00	25	NA	24.5-25.0

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APPENDIX B
SAMPLE IDENTIFIERS, PLANNED DEPTHS, AND ANALYSIS
(continued)

Boring ID	Sample ID	Easting	Northing	Total Depth (ft)	Sample Interval for 8 ft Borings (ft)	Sample Interval for 12 ft and 25 ft Borings (ft)
12285	A1P2STP-12285-8-R	1351775.00	480267.00	25	NA	3.5-4.0
	A1P2STP-12285-16-R	1351775.00	480267.00	25	NA	7.5-8.0
	A1P2STP-12285-24-R	1351775.00	480267.00	25	NA	11.5-12.0
	A1P2STP-12285-24-R-D	1351775.00	480267.00	25	NA	11.5-12.0
	A1P2STP-12285-32-R	1351775.00	480267.00	25	NA	15.5-16.0
	A1P2STP-12285-40-R	1351775.00	480267.00	25	NA	19.5-20.0
	A1P2STP-12285-50-R	1351775.00	480267.00	25	NA	24.5-25.0
12286	A1P2STP-12286-8-R	1351830.00	480200.00	25	NA	3.5-4.0
	A1P2STP-12286-16-R	1351830.00	480200.00	25	NA	7.5-8.0
	A1P2STP-12286-24-R	1351830.00	480200.00	25	NA	11.5-12.0
	A1P2STP-12286-32-R	1351830.00	480200.00	25	NA	15.5-16.0
	A1P2STP-12286-40-R	1351830.00	480200.00	25	NA	19.5-20.0
	A1P2STP-12286-50-R	1351830.00	480200.00	25	NA	24.5-25

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APPENDIX B
SAMPLE IDENTIFIERS, PLANNED DEPTHS, AND ANALYSIS
(continued)

Boring ID	Sample ID	Easting	Northing	Total Depth (ft)	Sample Interval for 8 ft Borings (ft)	Sample Interval for 12 ft and 25 ft Borings (ft)
12287	A1P2STP-12287-8-R	1351562.00	480038.00	25	NA	3.5-4.0
	A1P2STP-12287-8-R-D	1351562.00	480038.00	25	NA	3.5-4.0
	A1P2STP-12287-16-R	1351562.00	480038.00	25	NA	7.5-8.0
	A1P2STP-12287-24-R	1351562.00	480038.00	25	NA	11.5-12.0
	A1P2STP-12287-32-R	1351562.00	480038.00	25	NA	15.5-16.0
	A1P2STP-12287-40-R	1351562.00	480038.00	25	NA	19.5-20.0
	A1P2STP-12287-50-R	1351562.00	480038.00	25	NA	24.5-25.0
12288	A1P2STP-12288-8-R	1351875.00	480200.00	25	NA	3.5-4.0
	A1P2STP-12288-16-R	1351875.00	480200.00	25	NA	7.5-8.0
	A1P2STP-12288-24-R	1351875.00	480200.00	25	NA	11.5-12.0
	A1P2STP-12288-32-R	1351875.00	480200.00	25	NA	15.5-16.0
	A1P2STP-12288-40-R	1351875.00	480200.00	25	NA	19.5-20.0
	A1P2STP-12288-40-R-D	1351875.00	480200.00	25	NA	19.5-20.0
	A1P2STP-12288-50-R	1351875.00	480200.00	25	NA	24.5-25.0

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APPENDIX B
SAMPLE IDENTIFIERS, PLANNED DEPTHS, AND ANALYSIS
(continued)

Boring ID	Sample ID	Easting	Northing	Total Depth (ft)	Sample Interval for 8 ft Borings (ft)	Sample Interval for 12 ft and 25 ft Borings (ft)
12289	A1P2STP-12289-8-R	1351822.00	480100.00	25	NA	3.5-4.0
	A1P2STP-12289-16-R	1351822.00	480100.00	25	NA	7.5-8.0
	A1P2STP-12289-24-R	1351822.00	480100.00	25	NA	11.5-12.0
	A1P2STP-12289-32-R	1351822.00	480100.00	25	NA	15.5-16.0
	A1P2STP-12289-40-R	1351822.00	480100.00	25	NA	19.5-20.0
	A1P2STP-12289-50-R	1351822.00	480100.00	25	NA	24.5-25.0
12290	A1P2STP-12290-8-R	1351625.00	480100.00	25	NA	3.5-4.0
	A1P2STP-12290-16-R	1351625.00	480100.00	25	NA	7.5-8.0
	A1P2STP-12290-24-R	1351625.00	480100.00	25	NA	11.5-12.0
	A1P2STP-12290-32-R	1351625.00	480100.00	25	NA	15.5-16.0
	A1P2STP-12290-32-R-D	1351625.00	480100.00	25	NA	15.5-16.0
	A1P2STP-12290-40-R	1351625.00	480100.00	25	NA	19.5-20.0
	A1P2STP-12290-50-R	1351625.00	480100.00	25	NA	24.5-25.0

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APPENDIX B
SAMPLE IDENTIFIERS, PLANNED DEPTHS, AND ANALYSIS
(continued)

Boring ID	Sample ID	Easting	Northing	Total Depth (ft)	Sample Interval for 8 ft Borings (ft)	Sample Interval for 12 ft and 25 ft Borings (ft)
12291	A1P2STP-12291-8-R	1351875.00	480100.00	25	NA	3.5-4.0
	A1P2STP-12291-16-R	1351875.00	480100.00	25	NA	7.5-8.0
	A1P2STP-12291-24-R	1351875.00	480100.00	25	NA	11.5-12.0
	A1P2STP-12291-32-R	1351875.00	480100.00	25	NA	15.5 -16.0
	A1P2STP-12291-40-R	1351875.00	480100.00	25	NA	19.5-20.0
	A1P2STP-12291-50-R	1351875.00	480100.00	25	NA	24.5-25
12292	A1P2STP-12292-8-R	1351820.00	480000.00	25	NA	3.5-4.0
	A1P2STP-12292-16-R	1351820.00	480000.00	25	NA	7.5-8.0
	A1P2STP-12292-16-R-D	1351820.00	480000.00	25	NA	7.5-8.0
	A1P2STP-12292-24-R	1351820.00	480000.00	25	NA	11.5-12.0
	A1P2STP-12292-32-R	1351820.00	480000.00	25	NA	15.5-16.0
	A1P2STP-12292-40-R	1351820.00	480000.00	25	NA	19.5-20.0
	A1P2STP-12292-50-R	1351820.00	480000.00	25	NA	24.5-25.0

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APPENDIX B
SAMPLE IDENTIFIERS, PLANNED DEPTHS, AND ANALYSIS
(continued)

Boring ID	Sample ID	Easting	Northing	Total Depth (ft)	Sample Interval for 8 ft Borings (ft)	Sample Interval for 12 ft and 25 ft Borings (ft)
12293	A1P2STP-12293-8-R	1351719.00	480074.00	25	NA	3.5-4.0
	A1P2STP-12293-16-R	1351719.00	480074.00	25	NA	7.5-8.0
	A1P2STP-12293-24-R	1351719.00	480074.00	25	NA	11.5-12.0
	A1P2STP-12293-32-R	1351719.00	480074.00	25	NA	15.5-16.0
	A1P2STP-12293-40-R	1351719.00	480074.00	25	NA	19.5-20.0
	A1P2STP-12293-50-R	1351719.00	480074.00	25	NA	24.5-25.0
	A1P2STP-12293-50-R-D	1351719.00	480074.00	25	NA	24.5-25.0
12294	A1P2STP-12294-8-R	1351876.00	480000.00	25	NA	3.5-4.0
	A1P2STP-12294-16-R	1351876.00	480000.00	25	NA	7.5-8.0
	A1P2STP-12294-24-R	1351876.00	480000.00	25	NA	11.5-12.0
	A1P2STP-12294-32-R	1351876.00	480000.00	25	NA	15.5-16.0
	A1P2STP-12294-40-R	1351876.00	480000.00	25	NA	19.5-20.0
	A1P2STP-12294-50-R	1351876.00	480000.00	25	NA	24.5-25.0

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APPENDIX B
SAMPLE IDENTIFIERS, PLANNED DEPTHS, AND ANALYSIS
(continued)

Boring ID	Sample ID	Easting	Northing	Total Depth (ft)	Sample Interval for 8 ft Borings (ft)	Sample Interval for 12 ft and 25 ft Borings (ft)
12295	A1P2STP-12295-8-R	1351413.00	480025.00	25	NA	3.5-4.0
	A1P2STP-12295-16-R	1351413.00	480025.00	25	NA	7.5-8.0
	A1P2STP-12295-24-R	1351413.00	480025.00	25	NA	11.5-12.0
	A1P2STP-12295-32-R	1351413.00	480025.00	25	NA	15.5-16.0
	A1P2STP-12295-32-R-D	1351413.00	480025.00	25	NA	15.5-16.0
	A1P2STP-12295-40-R	1351413.00	480025.00	25	NA	19.5-20.0
	A1P2STP-12295-50-R	1351413.00	480025.00	25	NA	24.5-25.0
12296	A1P2STP-12296-8-R	1351375.00	480180.00	25	NA	3.5-4.0
	A1P2STP-12296-16-R	1351375.00	480180.00	25	NA	7.5-8.0
	A1P2STP-12296-24-R	1351375.00	480180.00	25	NA	11.5-12.0
	A1P2STP-12296-32-R	1351375.00	480180.00	25	NA	15.5-16.0
	A1P2STP-12296-40-R	1351375.00	480180.00	25	NA	19.5-20.0
	A1P2STP-12296-40-R-D	1351375.00	480180.00	25	NA	19.5-20.0
	A1P2STP-12296-50-R	1351375.00	480180.00	25	NA	24.5-25.0

Note: Rinsates samples will be identified as A1P2STP-X-1-R, A1P2STP-X-2-R, A1P2STP-X-3-R, etc.

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2.0 PRE-DESIGN INVESTIGATION PROGRAM

2.1 SOIL BORING LOCATION AND DEPTH STRATEGY

Soil excavation will be required in the STP area to meet the Operable Unit 5 (OU5) final remediation levels (FRLs). Excavation contour maps showing lateral and vertical extent of soil contaminated above the total uranium FRL were generated using existing data and a kriging model. As anticipated, excavation volumes generated by the kriging model were observed to increase significantly in areas where data gaps (uncertainties) are present. Sampling locations and depths are biased based on those kriged excavation limits. Current data shows that total uranium, an area-specific contaminant of concern (ASCOC), will bound the majority of ASCOCs in the excavation boundaries modeled for the STP area. Boring depths are to be advanced 3 feet below the modeled depths. The 25 foot deep borings are to be sampled at 4 to 5 foot intervals and are based on known kriging model sensitivity. Several other considerations led to the rationale for selecting the soil boring locations, as follows:

- Twenty soil borings will be performed in two phases. Phase 1 will be limited to 15 on-property locations. If laboratory analyses indicate that uranium cannot be bounded with the Phase 1 borings, then up to 5 additional off-property locations will be placed in Phase 2 as shown in Figure 1-2. In summary, Phase 2 borings will only be pursued if analyses from the Phase 1 borings fail to bound total uranium above the FRL in the STP and adjacent areas. The Area Project Manager will review Phase 1 analytical results and direct the performance of Phase 2 borings as necessary.

- Phase 1 borings 12277, 12280, and 12281 and Phase 2 boring 12278 are proposed to bound the extent of on-property/off-property airborne deposited contamination assumed to originate from the STPI (incinerator). These borings will be 8 feet deep. Sample intervals are to be taken at regular 2 foot intervals. The absence of data in the area of the 8 foot borings requires a smaller sampling interval for model input.

- Boring 12279 will be bored and sampled to a depth of 12 feet to confirm the presence or absence of total uranium at depth. Past analytical data taken for litigation purposes indicates that total uranium concentrations exceed the FRL at approximately 5 feet in depth. Sample intervals are to be taken at regular 4 foot intervals. Boring depth is based on the need to test soil 3 feet below the modeled depth at this location.

- Boring 12285 will be bored to a depth of 25 feet to bound the excavation and determine if the transformer tower and power lines must be relocated based on projected extent of excavation. The tower foundation extends 16 to 20 feet below grade.

- Soil borings 12282, 12286, 12289, and 12292 (Phase 1) will be limited to on-property locations. If laboratory analyses indicate that uranium cannot be bounded in these Phase 1 borings, then additional off-property (Phase 2) locations will be placed as shown on Figure 1-2 for borings 12284, 12288, 12291, and 12294. These on and off-property borings will be 25 feet deep.

- Analyses of samples from borings 12287, 12290, and 12293 will be used to refine the vertical extent of excavation from total uranium within the STP for FRLs. These borings will be 25 feet deep.

- Analyses of samples from borings 12295 and 12296 and boring 12283 will be used to refine the extent of excavation from total uranium to the west and south, respectively, for FRLs. These borings will be 25 feet deep.

TABLE 2-1
PROPOSED BORING LOCATIONS AND DEPTHS (NAD83 STATE PLANAR)

Boring ID	Easting	Northing	Depth (ft)	Boring ID	Easting	Northing	Depth (ft)
12277	1351825.00	480600.00	8	12287	1351562.00	480038.00	25
12278	1351877.00	480600.00	8	12288	1351875.00	480200.00	25
12279	1351563.00	480512.00	12	12289	1351822.00	480100.00	25
12280	1351825.00	480500.00	8	12290	1351625.00	480100.00	25
12281	1351825.00	480400.00	8	12291	1351875.00	480100.00	25
12282	1351825.00	480300.00	25	12292	1351820.00	480000.00	25
12283	1351650.00	479900.00	25	12293	1351719.00	480074.00	25
12284	1351880.00	480300.00	25	12294	1351876.00	480000.00	25
12285	1351775.00	480267.00	25	12295	1351413.00	480020.00	25
12286	1351830.00	480200.00	25	12296	1351375.00	480187.00	25

2.2 SOIL SAMPLING AND ANALYSES STRATEGY

Up to 20 borings (see Table 2-1) shall be completed to depths ranging from 8 to 25 feet. Borehole locations will be surveyed and staked prior to conducting drilling investigations for this pre-design investigation. If a borehole must be moved from the locations identified in Table 2-1, then the project lead must concur with the new location and the change must be documented in accordance with Section 7.0 of this PSP. Boreholes that are moved from their original surveyed location will be resurveyed

upon abandonment of the borings. All final coordinates shall be forwarded to the Data Management Contact by the Surveying Lead.

Phase 2 sampling will be conducted off-property and there exists a possibility of encountering unexpected cultural resources. If during off-property boring activities unexpected cultural resources are encountered, such as bone fragments, charcoal, or pottery fragments, boring advancement must be stopped immediately. The lead geologist will contact Cultural Resource Management and the Area 1, Phase II Project Manager.

Borings will be drilled using a truck-mounted hollow-stem auger drilling rig. All sampling will be completed downhole in advance of the auger or probe tip. A field geologist will oversee all drilling activities and confirm all soil sample intervals and collection. Samples shall be collected continuously using split-spoon samplers. Split-spoon samples will be collected during Standard Penetrating Testing (SPT) using standard 2-inch diameter, 2.0 foot long split-spoon samplers driven 1.5 feet with a 140-pound sampling hammer falling 30-inches in accordance with Procedure DRL-02, "Solids Sampling in Drilled Boreholes". Split-spoon sampling will be conducted in advance of the drill bit to total depth indicated in Table 2-1 for each boring.

TABLE 2-2
REPRESENTATIVE SAMPLE INTERVAL*

Sample Interval for 8 ft Borings (ft)	Sample Interval for 12 ft Borings (ft)	Sample Interval for 25 ft Borings (ft)	Laboratory Analysis
1.5 - 2.0	3.5 - 4.0	3.5 - 4.0	Total Uranium
3.5 - 4.0	7.5 - 8.0	7.5 - 8.0	Total Uranium
5.5 - 6.0	11.5 - 12.0	11.5 - 12.0	Total Uranium
7.5 - 8.0		15.5 - 16.0	Total Uranium
		19.5 - 20.0	Total Uranium
		24.5 - 25.0	Total Uranium

*Note: Soil sampling must be continuous for lithologic log preparation

If an auger rig is not used, borings may be advanced using of the Geoprobe® Model 5400 in accordance with Procedure EQT-06, *Geoprobe® Model 5400-Operation and Maintenance*. Soil will be retrieved using a Geoprobe® Model 5400 with either: 1) a dual tube core sampler designed to minimize downward migration of contaminants from zones of perched groundwater or 2) a standard core sampler (Macro-Core®) where perched groundwater is not present. The entire assembly will be advanced into the soil as one unit in approximately 18 to 36-inch increments with the soil core sample being retrieved after each increment. A field geologist will provide direction on sampler selection and the sampler advancement increments to maximize soil core recovery for sampling and lithological descriptions. Borehole collapse will be monitored after each core retrieval when using the Macro-Core® sampler to account for possible soil "fall-in" during soil sample selection.

Contaminated perched groundwater may be encountered in borings 12289, 12290, and 12293. These boreholes will be installed using an 8.25-inch ID through the zone of contamination. The auger string will be raised approximately one foot to vacate the bottom of the augers. Bentonite slurry shall be pumped into the bottom of the boring to approximately 3 feet above the perched water zone. One hour after placement of the bentonite seal, the 8.25-inch auger shall be used as a temporary casing for the contaminated section of the boring. Work stoppages will be minimized or eliminated during the sample collection process and final borehole abandonment to prevent potential migration in areas where contaminated perched groundwater is expected. Additionally, sampling and abandonment of any individual borehole within these areas will be completed on the same work day, if possible. Soil cores from the borings 12289, 12290, and 12293 will be scanned with a Photoionization Detector (see Section 3 for procedure reference) and results noted in the lithologic logs. If scanning results indicate volatile contamination, the field geologist will evaluate the need to use the above procedure for sampling adjacent borings.

The field geologist will prepare a lithological log by describing each soil core using the Unified Soil Classification System in accordance with the SCQ. Cores from the surface to the target depth will be collected and screened in the field using a beta-gamma frisker and the results noted on the lithologic log. Any interval exhibiting greater than 100 cpm will be sampled and archived for potential future analysis. Strip logs will be completed by the field geologist for each boring so that the information can be incorporated into the site model. The field geologist will confirm any field decisions that are not defined in this PSP with the Project Lead or the designee before implementing action. In addition, each

phase of the investigation will be confirmed with the Project Lead before continuing or stopping each phase of the investigation.

The designated soil sample interval in Table 2-2 will be collected and placed in a 500-milliliter glass or plastic sampler container as specified in Table 2-4, in accordance with *Solids Sampling*, SMPL-01. The sample will be submitted for total uranium analyses. If the soil sample recovery is poor or insufficient for laboratory analysis in the selected sample interval, the geologist may designate an adjacent sample interval for sampling and analysis. If a borehole cannot be placed at the designated location, it may be moved 3 feet. A variance from the boring location in Table 2-1, or sample intervals as identified in Table 2-2 and Table 2-3 will be documented on a Field Change Notice/Variance Request Form as specified in Section 3.0.

Quality control procedures required for samples collected at the intervals identified in Table 2-2 are, as follows:

- Nine of every ten samples (see Appendix B) will be sent to the on-site (or offsite) laboratory for Bromo PADAP or ICPMS analysis of total uranium at Analytical Support Level (ASL) B. Validation is not required.
- The tenth sample (identified in Appendix B) will be homogenized and split in the field for duplicate analyses.
- One split will be submitted to the on-site laboratory for Alpha Spectroscopy analysis and reported at ASL D. The samples going on-site get a "D" code on the sample identification.
- The other split will be submitted to an offsite laboratory for Alpha Spectroscopy analysis and reported at ASL D.
- Field QC sample (duplicates and rinsate) data will receive ASL D validation.

In addition, one rinsate sample will be collected from the entire split-spoon or cutting shoe (dependent on boring method) at a frequency of 1 in 20 spoons or shoes that are decontaminated.

Sample identifiers (Appendix B) and Fernald Analytical Computerized Tracking System (FACTS) identification numbers will be assigned to each sample. The sample labels will be completed with sample collection information and technicians will complete a Field Activity Log (FAL), Sample Collection Log (SCL), and Chain-of-Custody/Request for Analysis. A separate chain-of-custody will

be used for ASL B onsite, ASL D onsite, and ASL D offsite samples. Each sample will be assigned a unique sample identification number as follows:

A1P2STP - Sample Location - Depth ID - Suite - QC

Where:

A1P2STP = sample collected for the Area 1, Phase II Sewage Treatment Plant investigation
Sample Location = location number (see Figure 2-1)
Sample Depth ID = Sample depth identification (also see Table 2-2)
Suite = Analytical Suite. "R" = radionuclides.
QC = Quality control sample. A "D" indicates a duplicate sample, where applicable. "X" will be used to indicate a rinsate sample, as assigned by EM personnel.

Therefore, the 3.5' - 4.0' duplicate sample from location 12279 will be identified as A1P2STP-12279-8-R-D, and the 7.5' - 8.0' normal sample from location 12279 will be identified as A1P2STP-12279-16-R.

Samples collected at the intervals identified in Table 2-2 will be sent to the on-site laboratory analysis of total uranium at Analytical Support Level (ASL) B. The method detection limit for total uranium must be below the FRL of 20 ppm for total uranium. Analytical requirements are shown in Table 2-4 and the Target Analyte List is presented in Table 2-5. If on-site laboratory capacity is exceeded, offsite laboratories will be utilized.

TABLE 2-3
SAMPLE DEPTH IDENTIFICATION

Depth Interval	Number	Depth Interval	Number
0.0 - 0.5	1	12.5 - 13.0	26
0.5 - 1.0	2	13.0 - 13.5	27
1.0 - 1.5	3	13.5 - 14.0	28
1.5 - 2.0	4	14.0 - 14.5	29
2.0 - 2.5	5	14.5 - 15.0	30
2.5 - 3.0	6	15.0 - 15.5	31
3.0 - 3.5	7	15.5 - 16.0	32
3.5 - 4.0	8	16.0 - 16.5	33
4.0 - 4.5	9	16.5 - 17.0	34
4.5 - 5.0	10	17.0 - 17.5	35
5.0 - 5.5	11	17.5 - 18.0	36
5.5 - 6.0	12	18.0 - 18.5	37
6.0 - 6.5	13	18.5 - 19.0	38
6.5 - 7.0	14	19.0 - 19.5	39
7.0 - 7.5	15	19.5 - 20.0	40
7.5 - 8.0	16	20.0 - 20.5	41
8.0 - 8.5	17	20.5 - 21.0	42
8.5 - 9.0	18	21.0 - 21.5	43
9.0 - 9.5	19	21.5 - 22.0	44
9.5 - 10.0	20	22.0 - 22.5	45
10.0 - 10.5	21	22.5 - 23.0	46
10.5 - 11.0	22	23.0 - 23.5	47
11.0 - 11.5	23	23.5 - 24.0	48
11.5 - 12.0	24	24.0 - 24.5	49
12.0 - 12.5	25	24.5 - 25.0	50

TABLE 2-4
TOTAL URANIUM ANALYTICAL REQUIREMENTS

Lab	Analyte	Sample Matrix	ASL	Holding Time	Analytical Method (TAL)	Container
On-Site	Total Uranium	Solid	B	6 months	BromoPADAP or ICMPS (TAL A)	500 ml Glass or Plastic
On-Site	Total Uranium	Solid	D	6 months	Alpha Spectroscopy (TAL B)	500 ml Glass or Plastic
Off-Site	Total Uranium	Solid	D	6 months	Alpha Spectroscopy (TAL B)	500 ml Glass or Plastic

TABLE 2-5
TARGET ANALYTE LIST
AREA 1, PHASE II REMEDIAL ACTION WORK PLAN SAMPLING
Project Number 50.03.59.05

TAL 50.03.59.05 - A

(On-site Laboratory Analysis Only)

BromoPADAP or ICPMS Method
Total Uranium ASL B

TAL 50.03.59.05 - B

(Split samples On-site or Off-site Laboratory Analysis.
ASL D samples are to be validated.)

Alpha Spectroscopy Method
Total Uranium ASL D

Note: Analytical Project Manager will provide guidance to the laboratory on sample drying methods.

2.3 BOREHOLE ABANDONMENT

A Borehole Abandonment Log (BAL) will be completed for each borehole abandoned. Auger boreholes will be abandoned in accordance with methods described in the SCQ, Appendix J. Geoprobe boreholes will be plugged using a volclay grout slurry with an approximate density of 9.4 lbs/gallon, immediately following completion of sampling. After reaching the target depth the outer casing will remain in place (if used) and the grout slurry will be pumped using a 3/8-inch outside diameter tubing starting from the bottom of the borehole. As grout is pumped into the casing, the casing will be removed from the borehole while maintaining a grout level inside the probe rods or augers. The top 6 inches of the borehole will be filled with concrete. The project geologist will oversee the grouting operation and document the grout volume, density, depth intervals and other required information of the Borehole Abandonment Log (BAL).

Bentonite pellets may be used to abandon shallow borings with stable sidewalls (i.e., no fall-in) at the direction of the geologist. Pellets will be placed in the borehole in 2 foot intervals, and hydrated with deionized water.

3.0 QUALITY ASSURANCE/QUALITY CONTROL REQUIREMENTS

3.1 PROCEDURES AND MANUALS

To ensure consistency and data integrity, field activities in support of the PSP will follow the requirements and responsibilities outlined in the procedures and guidance documents referenced below.

ADM-02, Field Project Prerequisites

DRL-02, "Solids Sampling in Drilled Boreholes"

EQT-04, Photovac MicroTIP Photoionization Detector - Calibration, Operation, and Maintenance

EQT-05, Geodimeter 4000 Surveying System - Operation, Maintenance, and Calibration

EQT-06, Geoprobe Model 5400 - Operation and Maintenance

SMPL-01, Solids Sampling

SMPL-21, Collection of Field Quality Control Samples

SDP 766-S-1000, Shipping Samples to offsite Laboratories

Trimble Pathfinder Pro-XL GPS Operation Manual

Sidewide CERCLA Quality Assurance Plan (SCQ)

3.2 INDEPENDENT ASSESSMENT

Independent assessment will be performed by the FEMP Quality Assurance (QA) organization by conducting a surveillance. At a minimum, one surveillance will be conducted, consisting of monitoring/observing on-going project activity and work areas to verify conformance to specified requirements. Surveillance will be planned and documented in accordance with Section 12.3 of the SCQ.

3.3 IMPLEMENTATION OF CHANGES

Before the implementation of changes, the Characterization and Sampling Manager will be informed of the proposed changes. Once the Characterization and Sampling Manager has obtained written or verbal approval (electronic mail is acceptable) from the Area Project Manager and QA for the changes to the PSP, the changes may be implemented. Changes to the PSP will noted in the applicable field activity logs and on a Variance Request/Field Change Notice Form (VR/FCN). QA must receive the completed VR/FCN, which includes the signatures of the Characterization and Sampling Manager, Area Project Manager, and QA within 7 days of implementation of the change.

4.0 EQUIPMENT DECONTAMINATION

Sampling equipment will be decontaminated at Level II per Procedure SMPL-01 (Section 6.11) "Solids Sampling" prior to transport to the field, between sample intervals, and again, after all sampling is completed to limit the introduction of contaminants from equipment to sample media and protection of worker safety and health. Equipment that comes into contact with the sample will be decontaminated at Level II in the field. Other equipment that does not contact media to be sampled may be decontaminated at Level I, or wiped down using disposable towels. This includes the core sampler casing, probe rods, etc.

5.0 HEALTH AND SAFETY

All work will be performed in accordance with applicable Environmental Monitoring Project Procedures. RM-0021, Safety Performance Requirements Manual, FDF Work Permit, Radiation Work Permit, Penetration Permit, and other applicable permits. Concurrence with applicable safety permits by each team member assigned to this project and will be indicated by signing the briefing record.

All FDF and subcontract personnel working on any portion of the project that utilizes a subcontractor drilling company will be briefed on and comply with the Project Specific Health and Safety Matrix.

The Field Safety Contact will ensure that each team member performing sampling related to this project has been briefed on the applicable permits and the Project Specific Health and Safety Matrix, as applicable. Additionally, team members must be trained to applicable procedures listed in Section 3.1. Personnel who do not sign the Health and Safety documents or who are not trained to the applicable procedures will not participate in the execution of sampling activities related to the completion of assigned project responsibilities. A copy of the applicable safety permits/surveys issued for worker safety and health will be available at each sample location area.

All emergencies shall be reported immediately to the site communication center at 648-6511 or contact "control" on the radio.

6.0 DISPOSITION OF WASTES

During sampling activities, the field sampling team may generate contact waste and decontamination waste. These waste streams will be managed in accordance with SCEP Waste Disposition Support Services (WDSS) through the Project Waste Identification Document (PWID) process. Generation of decontamination waters will be minimized in the field; wherever possible, equipment will be decontaminated at a facility that discharges to the AWWT, either directly or indirectly through the stormwater collection system. Contact waste generation will be minimized by limiting contact with the sample media, and by using only necessary disposable materials. This waste stream will be evaluated against dumpster criteria using the PWID process. If the materials do not meet dumpster criteria, an alternative disposal option will be identified. The Waste Disposition Contact will be contacted by the Area Project Manager prior (one week if possible) to the start of boring activities to initiate the PWID process.

7.0 DATA MANAGEMENT

A data management process will be implemented during the PSP to properly manage collected information upon completion of the field activities and to supplement existing information that will be used for remedial design and remedial action. As specified in Section 5.1 of the SCQ, sampling teams will describe daily activities on the Field Activity Log (FAL) in sufficient detail so that the sampling team may reconstruct a particular situation without reliance on memory. Sample Collection Logs, Lithologic Logs, and Borehole Abandonment Records will be completed according to instructions specified in Appendix B of the SCQ and applicable procedures.

Electronically recorded data (e.g. Geodimeter) will be downloaded to disks as soon as schedules permit. Team members will review the data for completeness and accuracy, and then download the data to the FEMP local area network (LAN). When the data are on the LAN, the Data Management Lead will perform an evaluation of the data and produce an error file and a compressed archive data file. Once complete, the data will be sent to a loader where it will be loaded out on the Oracle system and an error log will be generated. The data will be made available to users through both the Graphical Information System (GIS) and Microsoft Access software.

Field documentation, such as the FAL, will undergo an internal QA/QC review by field team members. Copies will be delivered to the Data Management Contact, who will evaluate the data and create the appropriate links between electronic and paper data. The paper data will then be sent to data entry personnel who will input it into the Oracle system. Field packages will be validated by the QA validation team.

Analytical data from on-site and off-site laboratories will be reported in preliminary form to the Area Project Manager by the laboratory contact as soon as the data are available in the FACTS database. Following validation of the data for each sample release, the data for that release will be reported to the Project Characterization Lead in the final data report format. All ASL D data packages will be validated by the QA validation team. Qualified data will be entered into the Sitewide Environmental Database.

2023

VARIANCE / FIELD CHANGE NOTICE

V/F No. 50.03.59.05-1

WBS NO.: 50.03.59.05 55200-PSP-0001

Page 1 of 1

PROJECT TITLE: A1PII Pre-Design Investigation for Total Uranium at STP Area (Rev. 0)

Date:9/3/97

VARIANCE / FIELD CHANGE NOTICE (Include justification):

This variance addresses three issues of the PSP that require modification or clarification:

1) The PSP section describing the use of the dual hollow-stem auger method at locations 12289, 12290 and 12293 requires a correction. The following method will be applied on these boring locations and supersedes the related text of the PSP:

A standard size auger (approx. 4.25-inch ID) will initially be used to collect the required sample intervals until perched groundwater is encountered and core samples are collected to estimate the bottom of the perched groundwater zone. The standard auger will be removed from the borehole and an 8.25-inch ID auger will be advanced to two feet below the bottom of the perched groundwater zone. The auger will then be raised or retracted one foot and a bentonite grout slurry will be pumped to the bottom of the augers. Sufficient volume will be added to create a minimum five-foot bentonite seal across the perched groundwater zone when the 8.25-inch auger is retracted an additional four-feet (minimum). The bentonite seal will be allowed to cure for a minimum of one hour before advancing the standard size auger through the 8.25-inch auger for deeper sample collection below the perched groundwater zone.

Justification:

The method described above describes additional specifications that are not addressed in the PSP and will provide a more effective seal to prevent downward migration of perched groundwater.

2) The PSP specifies that a rinsate sample will be collected for every 20 split spoons or cutting shoes that are decontaminated. For clarification, the split spoon count will include only those split spoons used to collect an actual analytical sample for total uranium.

INFORMATION ONLY

Justification:

This method sufficiently provides a measure of the effectiveness of the decontamination procedure used on split spoon samplers to ensure cross-contamination is eliminated.

3) The PSP states that sample intervals will be archived if the activity exceeds 100 cpm. This should read >100 corrected counts per minute (ccpm) to account for a subtracted background.

Justification:

The original text stating 100 cpm in the PSP was an error. Background radiation levels in the STP area averages approximately 50-80 cpm.

REQUESTED BY: Mike Frank Date: September 3, 1997

X IF REQD	VARIANCE/FCN APPROVAL	DATE	X IF REQD	VARIANCE/FCN APPROVAL	DATE
X	QUALITY ASSURANCE R Anske	9-4-97	X	PROJECT MANAGER AR Dunn	9/4/97
	DATA QUALITY MANAGEMENT		X	SCEP SAMPLING & CHARACTERIZ. MGR. J H White	9/4/97
	ANALYTICAL CUSTOMER SUPPORT		X	OTHER QA	
	OTHER			OTHER	

VARIANCE/FCN APPROVED [X]YES [ ]NO

REVISION REQUIRED: [ ]YES [x]NO

DISTRIBUTION

PROJECT MANAGER:	DOCUMENT CONTROL: Michelle Tudor	OTHER:
QUALITY ASSURANCE:	OTHER:	OTHER:
FIELD MANAGER:	OTHER:	OTHER:

VARIANCE / FIELD CHANGE NOTICE

V/F No. 50.03.59.05-2

WBS NO.: 50.03.59.05 55200-PSP-0001

Page 1 of 1

PROJECT TITLE: A1PII Pre-Design Investigation for Total Uranium at STP Area (Rev. 0)

Date:9/17/97

VARIANCE / FIELD CHANGE NOTICE (Include justification):

2023

1) This variance documents the change in two sampling intervals from the original PSP requirement due to poor soil core recovery during drilling. The project geologist selected the following sample intervals in lieu of the unavailable intervals:

	Planned Sample Interval (ft.)	Actual Sample Interval (ft.)
Boring 12285:	11.5-12.0 (interval #24)	12.0-12.5 (interval #25)
Boring 12285:	15.5-16.0 (interval #32)	15.0-15.5 (interval #31)
Boring 12296:	3.5-4.0 (interval #8)	4.5-5.0 (interval #10)
Boring 12296:	7.5-8.0 (interval #16)	9.0-9.5 (interval #19)
Boring 12282:	24.5-25.0 (interval #50)	23.5-24 (interval #48)

Justification:
The planned sample six-inch interval was not available due to poor sample recovery from the split barrel sampler.

2) Borings 12285, 12295 and 12296 were relocated for the following reasons:

Boring	Relocated Coordinates / Reason for Move
12285	N 480247.00, E 1351775.00: Too close to overhead utility line - moved south.
12295*	N 480038.42, E 1351421.73: Encountered utilities on two boring attempts - moved location 10' north.
12296	N 480176.52, E 1351362.63; Area was too wet and unstable for rig - moved west approximately 13'.

*Note: Possible utility pipe was encountered during attempts at the following coordinates for location 12295: N 480034.44, E 1351422.06 and N 480032.05, E 1351422.35.

Justification:

Justification is provided above.

INFORMATION ONLY

3) Refusal (rock) was encountered at boring 12290 at 19 feet in the STP area near the trickling filters. The planned depth was 25 feet. Two samples could not be collected, 19.5-20 and 24.5-25 feet. The last sample collected was 15.5-16.0 feet. The soil consisted of grey clay from about 15' to 19'. The total uranium results of the last sample (15.5'-16') will be evaluated to determine if the deeper samples are necessary. If so, the Geoprobe will be re-mobilized to the location (offset by approximately two feet) and collect the deeper samples.

Justification: Collection of the deeper samples would not be necessary if the total uranium results from the 15.5'-16' interval are below the FRL.

000046

REQUESTED BY: Mike Frank Date: September 17, 1997

X IF REQD	VARIANCE/FCN APPROVAL	DATE	X IF REQD	VARIANCE/FCN APPROVAL	DATE
X	QUALITY ASSURANCE	9-18-97	X	PROJECT MANAGER	9/17/97
	DATA QUALITY MANAGEMENT		X	SCEP SAMPLING & CHARACTERIZ. MGR	9/17/97
	ANALYTICAL CUSTOMER SUPPORT			OTHER	
	OTHER			OTHER	

VARIANCE/FCN APPROVED [X]YES [ ]NO

REVISION REQUIRED: [ ]YES [x]NO

DISTRIBUTION

PROJECT MANAGER:	DOCUMENT CONTROL: Michelle Tudor	OTHER:
QUALITY ASSURANCE:	OTHER:	OTHER:
FIELD MANAGER:	OTHER:	OTHER:

VARIANCE / FIELD CHANGE NOTICE

V/F No. 50.03.59.~~02~~ 05-03

PROJECT TITLE: A1PII Pre-Design Investigation for Total Uranium at the STP (Rev. 0)

PROJECT 50.03.59.~~02~~ 05, ECDC 55200-PSP-001 (Rev 0)

Date: 9/14/98

PG 1 OF ~~34~~ 24

2023

VARIANCE / FIELD CHANGE NOTICE (Include justification):

This variance provides justification for collection of additional samples in the STP Incinerator area. Samples will be collected from six different borings in the locations. The attached figure shows the location of the borings and the following table lists the boring number and coordinates.

Map ID	Boring Number	Easting	Northing
1	12384	1351479.65	480195.48
2	12385	1351513.97	480185.60
3	12386	1351489.50	480171.53
4	12387	1351475.99	480159.48
5	12388	1351510.32	480167.31
6	12389	1351510.60	480150.48

ORIGINAL

Locations may be changed depending on field conditions up 3 feet.

Each boring will be advanced to a depth of 5.5 feet, with samples taken and submitted for analysis at the following intervals: 0 – 0.5', 0.5 – 1.0', 1.0 – 1.5'. The following intervals will be collected and archived: 1.5 – 2.0', 2.0 – 2.5', 3.0 – 3.5', 4.0 –4.5', 5.0 – 5.5'. Note that the 0 – 0.5' interval begins below the existing concrete pad. These samples may be submitted for analysis if the analyses of the above intervals show contamination. Samples will be analyzed for Total Uranium and technetium-99. The attached table lists the sample ID and coordinates. Field QC (duplicates and rinsates) are identified in the attached table. A rinsate will be collected at the beginning of the sampling event and at the end.

The Geoprobe® Macro-core sampler will be used to collect a 1.5 inch diameter by 6 inch core. The duplicate samples will be created by homogenizing a single 6 inch core and splitting it into two samples per SMPL 2-1 (Section 6.5). The rinsates will require ~~1~~ 2 liter of sample preserved with HNO_3 to a pH<2.

Boreholes will be plugged and abandoned using bentonite pellets or granular bentonite. Bentonite will be placed in the borehole in 2-foot increments followed by hydration with one liter of water.

Justification:

The above grade D&D is now complete in the STP area and the incinerator area is now accessible. These samples are necessary to characterize the soil below the incinerator area.

INFORMATION ONLY

000047

REQUESTED BY: Alex Duarte Date: September 23, 1998

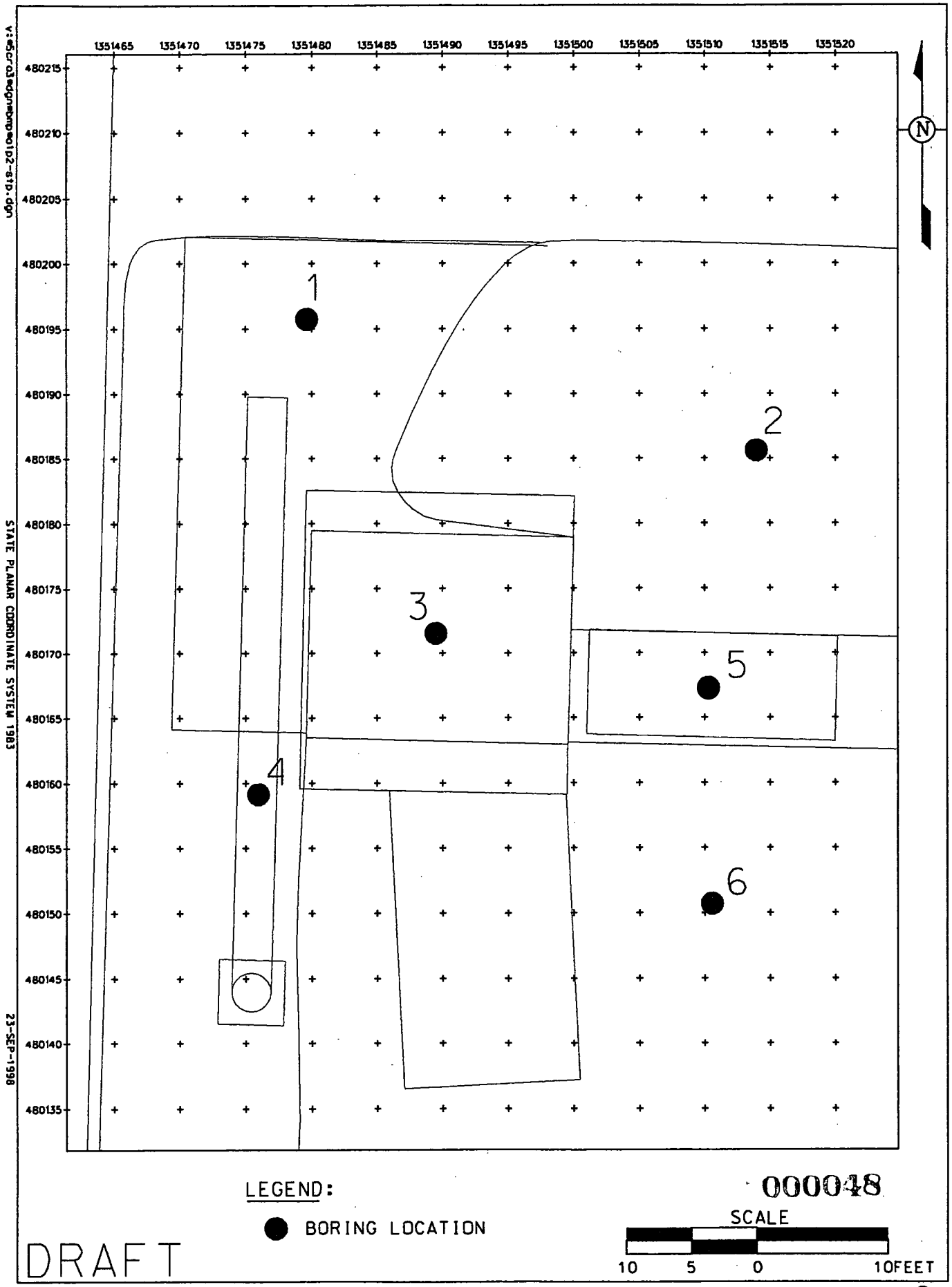
X IF REQD	VARIANCE/FCN APPROVAL	DATE	X IF REQD	VARIANCE/FCN APPROVAL	DATE
X	QUALITY ASSURANCE	9-24-98	X	PROJECT MANAGER	9/24/98
	DATA QUALITY MANAGEMENT		X	CHARACTERIZATION. MANAGER	9/24/98
	ANALYTICAL CUSTOMER SUPPORT		X	FIELD SAMPLING MANAGER	9/24/98
	OTHER			OTHER	

VARIANCE/FCN APPROVED [X]YES [ ]NO

REVISION REQUIRED: [ ]YES [x]NO

DISTRIBUTION

PROJECT MANAGER:	DOCUMENT CONTROL: Michelle Tudor	OTHER:
QUALITY ASSURANCE:	OTHER:	OTHER:



000048

FIGURE 2-X. STP INCINERATOR BORING LOCATIONS Page 2 of 4

50.03.59.05-03

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Attachment to Variance 50.05.59.02-03
Sample Ids, Coordinates and Analyses

Sample ID	Easting	Northing	Depth (ft)	Analysis
A1P2STP-12384-1	1351479.65	480195.48	0 - 0.5	Total U, Tc99
A1P2STP-12384-1-D	1351479.65	480195.48	0 - 0.5	Total U, Tc99
A1P2STP-12384-2	1351479.65	480195.48	0.5 - 1.0	Total U, Tc99
A1P2STP-12384-3	1351479.65	480195.48	1.0 - 1.5	Total U, Tc99
A1P2STP-12384-4	1351479.65	480195.48	1.5 - 2.0	Archive
A1P2STP-12384-5	1351479.65	480195.48	2.0 - 2.5	Archive
A1P2STP-12384-7	1351479.65	480195.48	3.0 - 3.5	Archive
A1P2STP-12384-9	1351479.65	480195.48	4.0 - 4.5	Archive
A1P2STP-12384-11	1351479.65	480195.48	5.0 - 5.5	Archive
A1P2STP-12385-1	1351513.97	480185.6	0 - 0.5	Total U, Tc99
A1P2STP-12385-2	1351513.97	480185.6	0.5 - 1.0	Total U, Tc99
A1P2STP-12385-3	1351513.97	480185.6	1.0 - 1.5	Total U, Tc99
A1P2STP-12385-4	1351513.97	480185.6	1.5 - 2.0	Archive
A1P2STP-12385-5	1351513.97	480185.6	2.0 - 2.5	Archive
A1P2STP-12385-7	1351513.97	480185.6	3.0 - 3.5	Archive
A1P2STP-12385-9	1351513.97	480185.6	4.0 - 4.5	Archive
A1P2STP-12385-11	1351513.97	480185.6	5.0 - 5.5	Archive
A1P2STP-12386-1	1351489.5	480171.53	0 - 0.5	Total U, Tc99
A1P2STP-12386-2	1351489.5	480171.53	0.5 - 1.0	Total U, Tc99
A1P2STP-12386-3	1351489.5	480171.53	1.0 - 1.5	Total U, Tc99
A1P2STP-12386-4	1351489.5	480171.53	1.5 - 2.0	Archive
A1P2STP-12386-5	1351489.5	480171.53	2.0 - 2.5	Archive
A1P2STP-12386-7	1351489.5	480171.53	3.0 - 3.5	Archive
A1P2STP-12386-9	1351489.5	480171.53	4.0 - 4.5	Archive
A1P2STP-12386-11	1351489.5	480171.53	5.0 - 5.5	Archive
A1P2STP-12387-1	1351475.99	480159.48	0 - 0.5	Total U, Tc99
A1P2STP-12387-1-D	1351475.99	480159.48	0 - 0.5	Total U, Tc99
A1P2STP-12387-2	1351475.99	480159.48	0.5 - 1.0	Total U, Tc99
A1P2STP-12387-3	1351475.99	480159.48	1.0 - 1.5	Total U, Tc99
A1P2STP-12387-4	1351475.99	480159.48	1.5 - 2.0	Archive
A1P2STP-12387-5	1351475.99	480159.48	2.0 - 2.5	Archive
A1P2STP-12387-7	1351475.99	480159.48	3.0 - 3.5	Archive
A1P2STP-12387-9	1351475.99	480159.48	4.0 - 4.5	Archive
A1P2STP-12387-11	1351475.99	480159.48	5.0 - 5.5	Archive
A1P2STP-12388-1	1351510.32	480167.31	0 - 0.5	Total U, Tc99
A1P2STP-12388-2	1351510.32	480167.31	0.5 - 1.0	Total U, Tc99
A1P2STP-12388-3	1351510.32	480167.31	1.0 - 1.5	Total U, Tc99
A1P2STP-12388-4	1351510.32	480167.31	1.5 - 2.0	Archive
A1P2STP-12388-5	1351510.32	480167.31	2.0 - 2.5	Archive

000049

50.0359.05-03

Attachment to Variance 50.05.59.02-03
Sample Ids, Coordinates and Analyses

Sample ID	Easting	Northing	Depth (ft)	Analysis
A1P2STP-12388-7	1351510.32	480167.31	3.0 - 3.5	Archive
A1P2STP-12388-9	1351510.32	480167.31	4.0 - 4.5	Archive
A1P2STP-12388-11	1351510.32	480167.31	5.0 - 5.5	Archive
A1P2STP-12389-1	1351510.6	480150.48	0 - 0.5	Total U, Tc99
A1P2STP-12389-2	1351510.6	480150.48	0.5 - 1.0	Total U, Tc99
A1P2STP-12389-3	1351510.6	480150.48	1.0 - 1.5	Total U, Tc99
A1P2STP-12389-4	1351510.6	480150.48	1.5 - 2.0	Archive
A1P2STP-12389-5	1351510.6	480150.48	2.0 - 2.5	Archive
A1P2STP-12389-7	1351510.6	480150.48	3.0 - 3.5	Archive
A1P2STP-12389-9	1351510.6	480150.48	4.0 - 4.5	Archive
A1P2STP-12389-11	1351510.6	480150.48	5.0 - 5.5	Archive
A1P2STP-X-1	N/A	N/A	N/A	Rinsate
A1P2STP-X-2	N/A	N/A	N/A	Rinsate

D - Denotes Duplicate
X - Denotes Rinsate

VARIANCE / FIELD CHANGE NOTICE

2023

V/F No. 50.03.59.05-04

Date: 11/13/1998

PROJECT TITLE: A1PII Pre-Design Investigation for Total Uranium at the STP (Rev. 0)
PROJECT 50.03.59.05, ECDC 55200-PSP-001 (Rev 0)

VARIANCE / FIELD CHANGE NOTICE (Include justification):

This variance provides justification for collection and analysis of additional sample material encountered during the borings performed in the STP Incinerator area. This variance includes the following actions:

1. Archived samples A1P2STP-12388-9 and A1P2STP-12388-11 will be submitted for Total Uranium and technetium 99 analysis.

2. Screenpoint Installation and Sampling of Perched Groundwater

A Geoprobe® Screen Point 15 Sampler will be installed near Boring 12388 for collection of perched groundwater for the purpose of characterizing the oily material encountered during previous investigations. This location will be labeled 12399 and will be about 6" off of 12388. Installation will be completed in accordance with procedure EQT-06, Geoprobe Model 5400 - Operation and Maintenance. Development of the Screen Point 15 after installation will not be necessary due to the potential for non-aqueous waste liquid (oil) to exist in the perched water zone and the need to determine the waste constituents. Groundwater will be collected using a tubing bottom check-valve method or a peristaltic pump as outlined in SMPL-01, Liquids and Sludge Sampling . The volume of the Screen Point 15 screen and probe rods is 0.02 gallons/foot. A geologist will oversee and document the abandonment operation.

Prior to sampling or removing groundwater, polyethylene tubing (equipped with a tubing bottom check valve) will be inserted into the bottom of the sampler screen and removed to determine the non-aqueous phase liquid (NAPL) (or oil layer) thickness, if present. A water level reading will be taken prior to each sampling or groundwater removal event. Sampling will be performed in accordance with procedure SMPL-02, Liquids and Sludge Sampling. If possible the NAPL fraction will be separated from the groundwater and submitted for analysis. The samples (oil and groundwater) will be collected and submitted for the following analyses: Total Uranium, Technetium 99, Diesel Range Organics, Volatiles, and Total PCBs for ASL B. Field QC (Duplicates, trip blanks, and rinsates) are identified in the attached table.

Sample volumes for the analyses are as follows:

Analysis	Oil Sample	Water Sample
Total U, Tc99	500 ml	1 liter
Volatiles*	4 40 ml containers	3 40 ml containers
DRO	500 mls	3 liters
Total PCBs	200 mls	3 liters

ORIGINAL

* Volatiles are cooled to 4 degrees C.

The screenpoint sampler may also be utilized to extract the NAPL from the perched water zone to the extent possible. This determination and direction will be provided by the Characterization Lead after installation of the screenpoint. This purging will be conducted at the top of the perched water table to maximize the removal of the NAPL during the purge.

The use of polyethylene sample tubing and a PVC screen or stainless steel is adequate in this situation due to 1) the significant amount of NAPL previously encountered and 2) the short duration planned for the screenpoint installation.

Soil samples will also be collected from this location from every six inch interval above the perched water zone, then from the next two six intervals below the perched water zone. These samples will be collected for Total Uranium, Technetium 99, Diesel Range Organics, Volatiles, and Total PCBs for ASL B.

- 150 g for the radiological analyses
- 50g cooled to 4 degrees Celsius for Volatiles
- 50 g sample for Diesel Range Organics
- 50 g sample for Total PCBs

INFORMATION ONLY

The borehole remaining after removal of the screenpoint will be grouted with bentonite pellets since the borehole will not extend below the perched water zone (bottom estimated to be approximately four feet below the surface). A borehole abandonment log will be completed by the geologist.

3. Four additional borings will be placed approximately ~~6~~ 7.5 AND feet due north, south, east, and west from location 12388. Final locations will be finalized in the field and then surveyed. The borings will be labeled: 12400 - Due North of 12388, 12401 – Due West, 12402 - Due South, and 12403 – Due East. Each boring will be advanced to a depth of 5.0 ft. Samples will be collected at submitted for Total Uranium and Technetium 99 at the following intervals: 1.5' – 2..0', 2.0 – 2.5', and 2.5' –3.0' the remaining core will be discarded. The top 0.0' - 1.5' is asphalt and fill material. If water is encountered in any of these locations, water samples will be collected and submitted for: Total Uranium, Technetium 99, Diesel Range Organics, Volatiles, and Total PCBs. A complete lithology log will be recorded for these borings.

The soil borings will be plugged with bentonite pellets in two-foot intervals with water added for hydration after each interval of pellets. If a significant perched water zone is encountered and it will be penetrated, the geologist may direct the sampling team to abandon the hole using casing and a wet grout mix (9.4 lbs/gallon density).

Justification:

The oil material encountered needs to be characterize to determine its disposition. Since the volatiles were not collected per SCQ requirements the data will be used for information purposes.

ORIGINAL

REQUESTED BY: Alex Duarte Date: November 13, 1998

X IF REQD	VARIANCE/FCN APPROVAL	DATE	X IF REQD	VARIANCE/FCN APPROVAL	DATE
X	QUALITY ASSURANCE	11-16-98	X	PROJECT MANAGER Klimek BYAS	11/16/98
	DATA QUALITY MANAGEMENT		X	CHARACTERIZATION. MANAGER	11/16/98
	ANALYTICAL CUSTOMER SUPPORT		X	FIELD SAMPLING MANAGER	11/16/98
	OTHER			OTHER	

VARIANCE/FCN APPROVED [X]YES [ ]NO

REVISION REQUIRED: [ ]YES [x]NO

DISTRIBUTION

PROJECT MANAGER:	DOCUMENT CONTROL: Michelle Tudor	OTHER:
QUALITY ASSURANCE:	OTHER:	OTHER:
FIELD MANAGER:	OTHER:	OTHER:

Attachment to Variance 50.05.59.05-04
Sample Ids and Analyses

Sample ID	Matrix	Depth (ft)	Analysis
A1P2STP-12399-GW	Water	Field	Total U, Tc99, DRO, VOAs, PCBs
A1P2STP-12399-OL	Oil	Field	Total U, Tc99, DRO, VOAs, PCBs
A1P2STP-12399-TB	Water	QC	VOA
A1P2STP-12404-1	Soil	0.0 - 0.5	Total U, Tc99
A1P2STP-12404-2	Soil	0.5 -1.0	Total U, Tc99
A1P2STP-12404-7	Soil	3.0 - 3.5	Total U, Tc99
A1P2STP-12404-8	Soil	3.5 - 4.0	Total U, Tc99
A1P2STP-12400-4	Soil	1.5 - 2.0	Total U, Tc99
A1P2STP-12400-4-D	Soil	1.5 - 2.0	Total U, Tc99
A1P2STP-12400-5	Soil	2.0 - 2.5	Total U, Tc99
A1P2STP-12400-6	Soil	3.0 - 3.5	Total U, Tc99
A1P2STP-12401-4	Soil	1.5 - 2.0	Total U, Tc99
A1P2STP-12401-5	Soil	2.0 - 2.5	Total U, Tc99
A1P2STP-12401-7	Soil	3.0 - 3.5	Total U, Tc99
A1P2STP-12402-4	Soil	1.5 - 2.0	Total U, Tc99
A1P2STP-12402-5	Soil	2.0 - 2.5	Total U, Tc99
A1P2STP-12402-7	Soil	3.0 - 3.5	Total U, Tc99
A1P2STP-12403-4	Soil	1.5 - 2.0	Total U, Tc99
A1P2STP-12403-5	Soil	2.0 - 2.5	Total U, Tc99
A1P2STP-12403-7	Soil	3.0 - 3.5	Total U, Tc99