2047

LETTER REPORT
FOR
AREA 1 PHASE 2 FIELD SAMPLING
OF MISCELLANEOUS AREAS

FERNALD ENVIRONMENTAL MANAGEMENT PROJECT
FERNALD, OHIO

NOVEMBER 1997

U.S. DEPARTMENT OF ENERGY
FERNALD AREA OFFICE

DRAFT
20710-RP-0007
REVISION A

TABLE OF CONTENTS

1.0 Introduction 1-1
1.1 Purpose 1-1
1.2 Area Description 1-1
1.3 Previous Investigations 1-2
1.4 Scope and Objectives 1-4

2.0 Pre-Design Investigation Program 2-1
2.1 Soil Boring Location Strategy 2-2
2.2 Soil Sampling and Analysis Strategy 2-2
2.2.1 Surveying 2-2
2.2.2 Drilling 2-2
2.2.3 Logging Boreholes 2-3
2.2.4 Soil Sampling 2-4
2.2.5 Sample Identification 2-4
2.2.6 Lab Analysis 2-5
2.3 Borehole Abandonment 2-6

3.0 Quality Assurance/Quality Control Requirements 3-1
3.1 Procedures and Manuals 3-1
3.2 Independent Assessment 3-1
3.3 Implementation of Changes 3-1

4.0 Equipment Decontamination 4-1

5.0 Health and Safety 5-1

6.0 Disposition of Wastes 6-1

7.0 Data Management 7-1

Appendix A Field Data
Appendix B Variance Request/Field Change Notices

LIST OF TABLES

2-1 Sample Depth Identification
2-2 Analytical Requirements

LIST OF FIGURES

2-1 Soil Boring Locations: Pipeline and STP Area
2-2 Soil Boring Locations: Asphalt Road and Fill Area

2047

LIST OF ACRONYMS AND ABBREVIATIONS

A1PII	Area 1 Phase II
ASCOC	area-specific constituent of concern
ASL	analytical support level
AWWT	Advanced Wastewater Treatment Facility
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
COC	constituent of concern
cpm	counts per minute
DOE	US Department of Energy
DQO	Data Quality Objective
FACTS	Fernald Analytical Customer Tracking System
FAL	field activity log
FDF	Fluor Daniel Fernald
FEMP	Fernald Environmental Management Project
FRL	final remediation level
ft	foot
GIS	Graphical Information System
HAMDC	highest allowable minimum detectable concentration
HWMU	Hazardous Waste Management Unit
LAN	local area network
NA	not applicable
NPDES	National Pollutant Discharge Elimination System
OSDF	On-Site Disposal Facility
OU	Operable Unit
pCi/g	picocuries per gram
PCE	perchloroethylene
PDR	Project Developments and Reports
ppm	parts per million

000004

PSP	project specific plan
PWID	Project Waste Identification Document
QA/QC	quality assurance/quality control
RCRA	Resource Conservation and Recovery Act
RI/FS	remedial investigation/feasibility study
SCEP	Soils Characterization and Excavation Project
SCL	Sample Collection Log
SCQ	Sitewide CERCLA Quality Assurance Project Plan
SEP	Sitewide Excavation Plan
SMMP	Soil and Miscellaneous Media Projects
SPT	standard penetration testing
STP	Sewage Treatment Plant
TAL	Target Analyte List
TBD	to be determined
VOC	volatile organic compound
VR/FCN	Variance Request/Field Change Notice
WAC	waste acceptance criteria
WDSS	Waste Disposition Support Services

1.0 INTRODUCTION

1.1 PURPOSE

This Letter Report describes field sampling and testing conducted to investigate miscellaneous areas in and around the Sewage Treatment Plant (STP), a related pipeline, and a road to the STP. This sampling was required to fill data gaps not covered by other Project Specific Plans (PSPs) so the A1PII Integrated Remedial Design Package could be completed.

1.2 AREA DESCRIPTION

The sampling described in this PSP encompasses various features in and around the STP area. The STP is located along the eastern perimeter of the FEMP boundary. Soil within the STP area has been previously excavated as part of a removal action (Removal Action 14, Contaminated Soils Adjacent to the STP Incinerator). Excavations performed during Removal Action 14 were backfilled with fill material.

The STP includes a sludge drying bed unit, which is a regulated Hazardous Waste Management Unit (HWMU #41) because the bed contains low levels of perchloroethylene (PCE), a Resource Conservation and Recovery Act (RCRA)-listed spent solvent. The sludge drying beds are approximately 79 ft x 92 ft in area and grouped into two units. Construction of the western unit was never completed and contains no sludge. The construction of the eastern bed consists of concrete walls, a sand bed, a splash pad, and an underdrain system of vitrified clay pipes. The eastern bed was built in 1952, and the western bed was initiated in 1955. Besides perchloroethylene, the sludge drying beds contain significant uranium contamination, other (non-RCRA) volatile organic compounds, and metals. The uranium contamination within the beds exceeds waste acceptance criteria (WAC) for the On-Site Disposal Facility (OSDF).

Other STP features include old access roads, parking lots, pipeline trenches, structure foundations, and lay-down or walkway areas. An asphalt road leads from the North Access Road (which is the western boundary of A1PII) northeastward to the STP. Gravel associated with these features had not been previously sampled. Contamination from leaks and spills exceeds the FRL for uranium.

This project also includes the sanitary sewer influent and old Advanced Wastewater Treatment (AWWT) effluent lines that cross the entire A1PII area. Soil adjacent to these lines had not been previously sampled,

but investigators expected that the sanitary sewer influent line would have more potential to contaminate the surrounding soil than the treated water effluent line.

An electrical tower standing north and west of the influent line will be dismantled by Operable Unit 3. The surrounding soils, if contaminated, will be excavated during A1PII excavation.

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 and associated areas. Sludge from the STP sludge drying beds has been sampled on several occasions.

The first RI, a surface soil sampling program, was conducted in 1988. All soil samples were collected within the upper 18 inches of soil and 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 and suggested subsurface radiological contamination beneath the sludge drying beds.

The second RI, conducted in 1990, included the installation of monitoring wells under the Production and Additional Suspect Areas Work Plan. Subsurface soil samples from selected intervals were analyzed for full radiological parameters. In general, analytical results from samples collected in the STP area indicated that total uranium concentrations decreased with depth to below FRLs (20 ppm) at 18 inches below the surface. Under this work plan, two additional monitoring wells were installed just south of the sanitary sewer line adjacent to the effluent/storm sewer line. Four soil samples were collected for radiological parameters and volatile organic compounds at the pipeline depth. The results indicated low levels of uranium, radium, and thorium below the soil FRLs for these constituents. The thorium-228 concentrations were 1.02 to 1.40 pCi/g, just below the thorium-228 FRL of 1.70 pCi/g.

Removal Action 14, "Contaminated Soils Adjacent to the Sewage Treatment Plan Incinerator," was conducted from 1992 through 1994 to remove surface soil contamination in excess of removal criteria shown in Table 1-1.

2047

TABLE 1-1
LOCATION-SPECIFIC CRITERIA FOR TOTAL URANIUM IN SOILS

Location	Location- Specific Criteria (pCi/g)	Location- Specific Criteria (ppm)
On-site, within STP	300	446
On-site, outside STP	100	149
Off-site	35	52

Initial excavations were performed within those areas to remove and containerize radiologically contaminated soil and 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.

Neither the RI nor Removal Action 14 included sampling of gravel beneath old access and asphalt roads, below and in parking lots, within pipeline and sewer line trenches, in lay-down or walkway areas, or directly beneath the sludge within the sludge drying beds.

Previous sampling of excavated sludge from the sludge drying beds indicated that the sludge contained RCRA-listed PCE, metals, uranium, and non-RCRA-listed volatile organic compounds. Of all these constituents sampled, only uranium data has exceeded the OSDF WAC. No other constituents exhibit the toxicity characteristic of RCRA waste. In-situ sampling of sludge for total uranium was reported in the July 1997 draft report, "Comparability of In-Situ Gamma Spectrometry and Laboratory Data." The report confirms the results of the waste characterization data.

The following pre-design PSPs addressed other important data gaps:

- Lead Delineation in the A1PII Trap Range (50.03.59.01)
- Pre-Design Investigation of Technetium-99 in Soil in the STP Area (50.03.59.02)
- Perched Water Sampling at the STP (50.03.59.03)
- Pre-Design Investigation for Total Uranium in the STP Area (50.03.59.05)
- A1PII Pre-Design Investigation Survey (50.03.59.06)

000008

1.4 SCOPE AND OBJECTIVES

The primary objective of the PSP was to obtain information to fill data gaps in several various areas within A1PII. This information was used to confirm the expected lack of contamination where no data exist, to estimate the amount of above-WAC material, and to refine the depth and extent of future soil excavation to meet the FRL for total uranium and other Area-Specific Constituents of Concern (ASCOCs). The individual objectives were as follows:

1. Identify the nature of total uranium and volatile organic compound (VOC) (including RCRA-listed perchloroethylene) contamination in the gravel and soil underlying the sludge in the sludge drying beds.

2. Determine the general extent and level of radionuclide, metal, and volatile organic compound contamination in soils due to leakage of the old sanitary sewer influent and effluent pipeline.

3. Identify the presence of total uranium contamination in gravel within the STP area.

4. Identify the presence of total uranium contamination in the gravel underlying the asphalt STP access road.

5. Confirm that off-property fill material used in Removal Action 14 does not contain total uranium and metals contamination.

All samples were analyzed for total uranium, which was the primary contaminant driving the excavation design within these areas. With respect to determining the presence of above-WAC material in this PSP, total uranium was the primary contaminant that could have potentially exceeded the OSDF WAC. Additional samples for radionuclide isotopes, metals, and volatile organic compounds were taken for select areas where data for these constituents were sparse. Under the sludge drying beds, gravel and soil were also analyzed for VOCs to determine whether this material also contained RCRA-listed perchloroethylene. This was important for identifying proper waste management if the materials failed OSDF WAC and had to be staged for off-site disposal. Because the sludge (and potentially the underlying gravel and soil) is a RCRA-listed waste, it cannot be mixed with other wastes also exceeding the OSDF WAC for total uranium. The gravel and soil under the sludge drying beds were not analyzed for metals since the sludge does not contain above-WAC levels of metals, and it is unlikely that the underlying gravel and soil would contain higher metals contamination than that in the sludge. Metals and VOCs were analyzed for soil samples in borings adjacent to the pipeline because little (VOCs) or no (metals) analytical data existed for those constituents in this area. Similarly, the fill used for Removal Action 14 was also sampled for metals due

to the lack of such data for the fill. Asphalt was addressed in the OU3 Record of Decision as a waste stream that can be dispositioned in the OSDF and therefore did not need further pre-design sampling.

The sampling matrix included gravel as well as in-situ soil. Because gravel contamination has never been directly investigated in the OU5 RI, the PSP included representative gravel samples to indicate the level of total uranium contamination in gravel (besides the gravel underlying the sludge drying beds). Gravel samples were located to obtain a representative data set across the STP area; no visible staining existed to indicate potential spills or leaks onto the gravel surface.

The pipeline was not sampled within the STP area boundary since it is shallower in the STP area, and the planned excavation for this area is several feet deeper than the pipeline depth. Additionally, given the extent of existing contamination in the STP area, it would have been difficult to discern contamination due only to pipeline leakage. Boring locations along the pipeline outside of the planned STP excavation area helped to define the excavation depth below the pipeline.

The boring sample depth in the PSP ranged from 1 ft to 15 ft. The objective of the deeper borings was to extend below the gravel underlying or surrounding the unit under investigation. Samples were collected at and below the base of the gravel, or in soil at an equivalent depth (in the case of the pipelines). Contamination was expected to be highest at the interface between the more permeable gravel and less permeable underlying soil.

2.0 PRE-DESIGN INVESTIGATION PROGRAM

2.1 SOIL BORING LOCATION STRATEGY

Soil boring and surface soil sampling locations are depicted in Figures 2-1 and 2-2. The individual locations of these sampling points were selected to fulfill data gaps in several areas, as discussed below. The strategy to address these data gaps was as follows:

- Two soil borings (#12327 and #12328) were drilled into the eastern STP sludge drying bed to identify the severity of total uranium contamination and the presence of VOC contamination in the underlying gravel beds and soils. The borings extended below the bottom of the gravel underlying the sludge several feet into the clay. The total depth was estimated to be 12 ft.

- Twelve borings (#12310 through #12321) were placed along the entire length of the STP sanitary sewer influent and effluent pipeline which traverses the A1PII area, to identify the presence of radionuclides, sitewide COC and NPDES permit metals (As, Be, Pb, Mn, Sb, Cd, Ni, Zn, Cr, Cu, Hg), and VOCs in the adjacent soils. The borings extended to 3 ft below the depth of the pipeline trench, to an approximate total depth of 10 to 15 ft. One of the borings was placed adjacent to the electrical tower north of the pipeline, in order to investigate whether any leakage from the pipeline extends laterally into soil surrounding the tower.

- Five borings (#12322 through #12326) were placed at various locations within the STP area to identify the presence of total uranium contamination within gravel. The depth of the borings was approximately 5 ft or less in order to extend into the clay beneath the gravel. Because this information was used to fill a general data gap for gravel, as opposed to determine excavation depth, the boring extended only one foot beneath the base of the gravel.

- Six borings (#12329 through 12334) were drilled along the asphalt access road leading to the STP. The borings extended to approximately 5 ft or less, through the gravel/clay interface underlying the asphalt. Because this information was used to fill a general data gap for total uranium in gravel, as opposed to determine excavation depth, the boring extended only one foot beneath the base of the gravel.

- Three borings (#12335 through #12337) were drilled through Removal Action 14 fill material, to confirm that the material (most likely clay and silt) does not contain total uranium or sitewide COC metals (As, Be, Pb, Mn, Sb, Cd) above the FRLs. The borings extended to the base of the fill material, at approximately 1 to 4 ft depth. The borings were located within the off-property portion of Removal Action 14, where it was anticipated that excavation of the fill and underlying soil would not be necessary. (Fill material within the STP is already planned for excavation, and will be sampled during characterization for WAC attainment.)

The locations and sampling depths summarized above resulted in a total of 28 shallow borings and six surface soil samples, with depths ranging from 1 ft to 15 ft. Appendix A lists the borings with their respective locations and depths, along with each sample interval, the corresponding sample identification and analytical suite.

2.2 SOIL SAMPLING AND ANALYSIS STRATEGY

2.2.1 Surveying

All boreholes and surface sample locations were surveyed and staked prior to drilling. If field conditions required amoving borehole, it could have been moved up to 3 ft without a variance for all locations besides those within the sludge drying beds. If the sludge drying bed borings had to be relocated, the Characterization Lead and PSP technical writer were contacted to suggest an alternate location that will not disrupt the clay piping. If the locations for all other borings had to be moved more than 3 ft, a verbal concurrence was obtained from the signators of the PSP, followed by a written variance within 7 days. A variance from the boring locations or sample intervals identified in the PSP was documented as described in Section 3.3. Boreholes that were moved more than one foot from their original surveyed location were resurveyed upon abandonment of the borings. All final coordinates were forwarded to the Data Management Contact by the Surveying Lead.

2.2.2 Drilling

All borings at or greater than 5 ft depth were drilled using a truck-mounted hollow-stem auger drilling rig or a Geoprobe, whichever was available at the time of sampling. The 1 to 4 ft borings in the off-property Removal Action 14 fill areas were drilled with a hand auger or soil core sampler. A hand auger or soil core sampler was used to avoid disturbance of the property owners' farm field and because of the inaccessibility of this area to the Geoprobe. Hand augering or core sampling were conducted in accordance with procedure SMPL-01, *Solids Sampling*.

If an auger rig were used, all sampling was to have been completed downhole in advance of the auger. Samples shall be collected continuously using split-spoon samplers. Split-spoon samples were 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 was conducted in advance of the drill bit to total depth indicated in Appendix B for each boring.

Perched groundwater could have been encountered in the 12 to 15 ft borings. The boreholes were installed using the Geoprobe dual tube sampling system through the perched water zone. Soil cores from the these borings were scanned with a Photoionization Detector (see Section 3 for procedure reference) and results noted in the lithologic logs. If scanning results indicated volatile organics, the field geologist and project manager evaluated the need to continue to use the Geoprobe dual tube sampling system.

If an auger rig were not used, borings were advanced using of the Geoprobe® Model 5400 in accordance with Procedure EQT-06, *Geoprobe® Model 5400-Operation and Maintenance*. Soil was retrieved using a Geoprobe® Model 5400 with either: 1) a dual tube core sampler designed to minimize downward migration of contaminants from zones of contaminated perched groundwater or 2) a standard core sampler (Macro-Core®) where contaminated perched groundwater was not present. The entire assembly was advanced into the soil as one unit in approximately 18 to 48-inch increments with the soil core sample being retrieved after each increment. A field geologist provided direction on sampler selection and sampler advancement increments to maximize soil core recovery for sampling and lithological descriptions. Borehole collapse was monitored after each core retrieval when using the Macro-Core® sampler to account for possible soil "fall-in" during soil sample selection.

Multiple boreholes within 1 ft of the original location were planned in the event they were necessary to collect the required volume of cores for analysis.

2.2.3 Logging Boreholes

The field geologist prepared a lithological log for each boring greater than 1 ft deep by describing each soil core using the Unified Soil Classification System in accordance with the Sitewide CERCLA Quality Assurance Project Plan (SCQ). Cores from the surface to the target depth were collected and screened every six inches in the field using a beta-gamma frisker and a photoionization detector, with the results noted on the lithologic log. Any interval exhibiting greater than 100 corrected counts per minute (ccpm) was sampled and archived for potential future analysis. Also, any interval exhibiting greater than 5 ppm over background for organic compounds was sampled and sent to the laboratory for VOC analysis. Strip logs were completed by the field geologist for each boring so that the information could be incorporated into the site model. Continuous cores were taken to prepare lithologic logs; only the intervals specified in Appendix B were sent to the laboratory for analysis.

2.2.4 Soil Sampling

A field geologist oversaw drilling activities and confirmed soil sample intervals and collection for all borings greater than 1 ft deep. The designated soil or gravel sample interval in Appendix B was collected and placed in a glass or plastic sampler container as specified in Table 2-1, in accordance with SMPL-01, *Solids Sampling*. Most samples were analyzed for total uranium; select samples at specified depths were also analyzed for other radionuclide isotopes, metals and volatile organic compounds as described in Appendix B. The lowermost sample in each boring was archived for later analysis, if necessary. If the sample recovery were poor or insufficient for laboratory analysis in the selected sample interval, the geologist could designate an adjacent sample interval for sampling and analysis. Some of the sampling intervals were estimates of the depth of the target zone (e.g., gravel/soil interface); actual field observations by the geologist may have led to a field decision to slightly alter the sample depth by 0.5 to 1.0 ft.

Quality control procedures required for samples collected are as follows:

1. 100% of the data will be analyzed per the ASL B requirements.
2. 90% of the data will require only a Certificate of Analysis, the other 10% will require the Certificate and all the associated QA/QC results.
3. The 10% of the data reported with the Certificate and the QA/QC results will be validated to ASL B.

In addition to the above required QC procedures, one rinsate sample was 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; one trip blank was analyzed for VOCs for each cooler transmitting soil samples for VOC analysis; and one field blank for VOCs/analysis for each day of sampling was collected for VOC analysis.

2.2.5 Sample Identification

Sample identifiers (Appendix A) and Fernald Analytical Computerized Tracking System (FACTS) identification numbers were assigned to each sample. The sample labels were completed to sample collection information and technicians completed a Field Activity Log (FAL), Sample Collection Log (SCL), and Chain-of-Custody/Request for Analysis. A separate chain-of-custody was used for ASL B onsite and ASL B offsite samples. Each sample was assigned a unique sample identification number, consisting of less than 20 characters, as follows:

A1P2MIS - Sample Location - Depth ID - Suite - QC

Where:

A1P2MIS = sample collected for the Area 1, Phase II, Miscellaneous Areas investigation

Sample Location = location number (see Figures 2-1 and 2-2)

Sample Depth ID = Sample depth identification (see Table 2-2)

Suite = Analytical Suite. "R" = radionuclides; "L" = VOCs; "M" = metals; "V" = archives.

QC = Quality control sample. "D" = duplicate sample, where applicable; "X" = rinsate sample and "T" = trip blank, as assigned by SMMP personnel; "F" = field blank.

For example, a 4.0' - 4.5' duplicate sample for metals from location #12310 will be identified as A1P2MIS-12310-9-M-D, and the 7.0'-7.5' normal sample for radionuclides from location 12310 will be identified as A1P2MIS-12310-15-R.

Examples for field blanks, trip blanks, and rinsates are:

A1P2MIS-1-L-F	(First field blank for VOCs)
A1P2MIS-2-L-T	(Second trip blank collected for VOCs)
A1P2MIS-3-R-X	(Third rinsate collected for radiological parameters)

2.2.6 Lab Analysis

All samples will be analyzed at ASL B. The onsite laboratory will be used for all analytes besides VOCs. If capacity is not available at the on-site laboratory, total uranium samples analyzed by the BromoPADAP or ICPMS methods will be sent to an off-site laboratory. The highest allowable minimum detectable concentration (HAMDC) for total uranium will be 10 ppm. All analytical requirements are shown in Table 2-1 and the analytes are presented in Appendix A. The turnaround time for the on-site laboratory is three days. The Characterization Lead will provide guidance to the laboratory for preparation of gravel samples.

2.3 BOREHOLE ABANDONMENT

Bentonite pellets will 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 ft intervals, and hydrated with potable water. Boreholes less than 1 ft depth will not require abandonment.

If bentonite pellets are not feasible, each borehole 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. Auger boreholes will be abandoned in accordance with methods described in Appendix J of the SCQ. 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.

TABLE 2-1
ANALYTICAL REQUIREMENTS

Lab	Analyte	Sample Matrix	ASL	Holding Time/ Preservative	Analytical Method (TAL)	Container
On-Site[1]	Total Uranium	Solid	B	6 months/ none	BromoPADAP or ICMPS (TAL A)	500 ml Glass or Plastic
On-Site	Total Uranium, Radium and Thorium Isotopes	Solid	B	6 months/ none	Alpha and Gamma Spectroscopy (TAL B)	500 ml Glass or Plastic
On-Site	Metals	Solid	B	6 months[2]/4° C	ICP/GFAA (TAL C and D)	250 ml Glass or Plastic
Off-Site	VOCs	Solid	B	7 days/4° C	GC/MS (TAL E)	3 x 40 ml Amber Glass
QC Samples						
On-Site	Total Uranium	DI Water (Rinsates)	B	6 months/ HNO_3 pH < 2	BromoPADAP or ICPMS TAL A	1 liter Plastic
On-Site	Total Uranium, Radium and Thorium Isotopes	DI Water (Rinsates)	B	6 months/ HNO_3 pH < 2	Alpha and Gamma Spectroscopy TAL B	1 gallon Glass or Plastic
On-Site	Metals	DI Water (Rinsates)	B	6 months/ HNO_3 pH < 2	ICP/GFAA TAL C and D	1 liter Plastic
Off-Site	VOCs	DI Water (Trip and Field Blanks)	B	14 days/ HCl pH < 2 and 4° C	GC/MS TAL E	3 x 40 ml Amber Glass

1 Analysis may be sent off-site if on-site laboratory capacity is not available. Alpha/beta screening samples must be collected for samples sent to off-site laboratories. Soil volume required is 100 ml.

2 Holding time for Hg is 28 days.

TABLE 2-2
SAMPLE DEPTH IDENTIFICATION

Depth Interval	Number	Depth Interval	Number
0.0 - 0.5	1	7.5 - 8.0	16
0.5 - 1.0	2	8.0 - 8.5	17
1.0 - 1.5	3	8.5 - 9.0	18
1.5 - 2.0	4	9.0 - 9.5	19
2.0 - 2.5	5	9.5 - 10.0	20
2.5 - 3.0	6	10.0 - 10.5	21
3.0 - 3.5	7	10.5 - 11.0	22
3.5 - 4.0	8	11.0 - 11.5	23
4.0 - 4.5	9	11.5 - 12.0	24
4.5 - 5.0	10	12.0 - 12.5	25
5.0 - 5.5	11	12.5 - 13.0	26
5.5 - 6.0	12	13.0 - 13.5	27
6.0 - 6.5	13	13.5 - 14.0	28
6.5 - 7.0	14	14.0-14.5	29
7.0 - 7.5	15	14.5-15.0	30

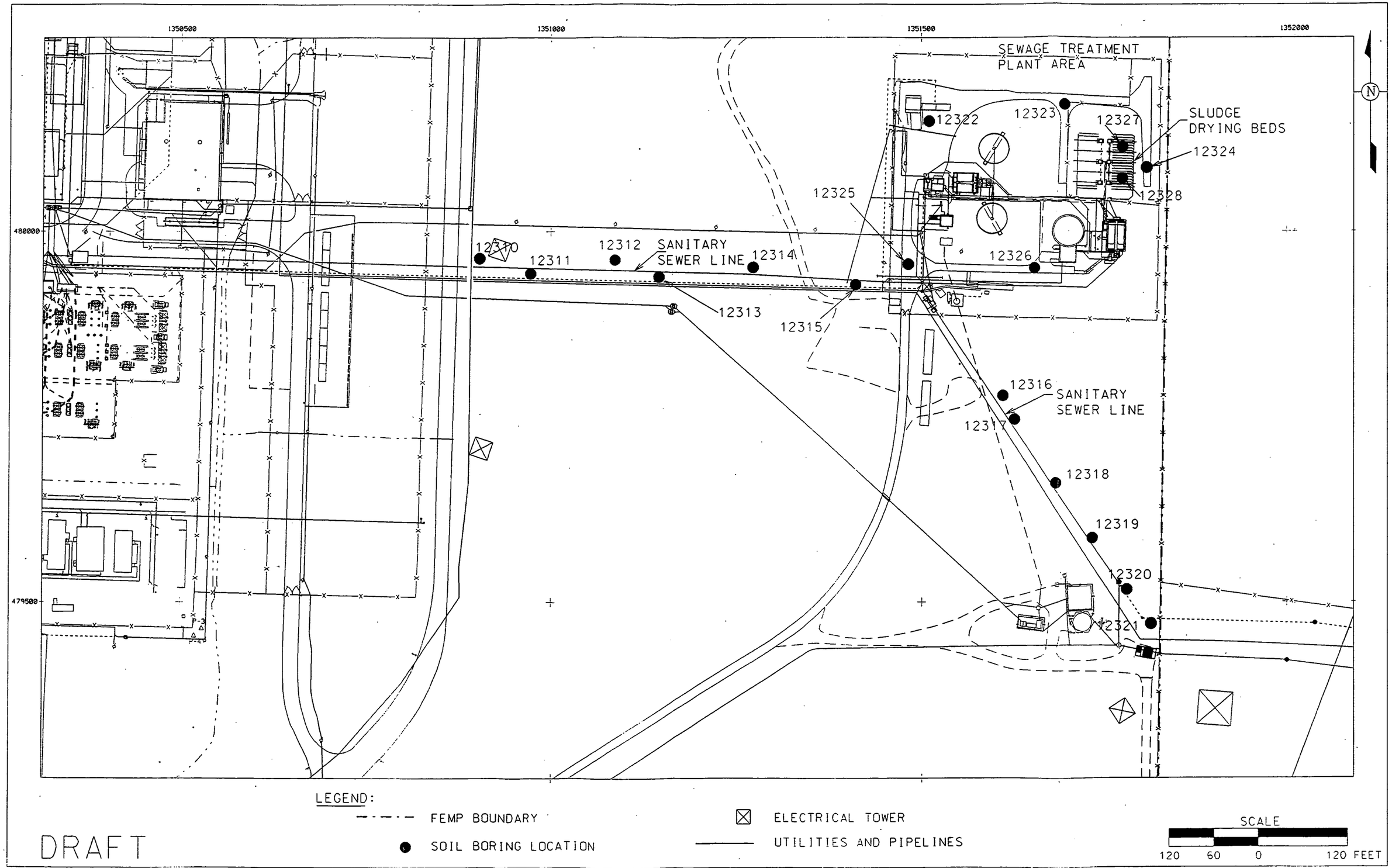

FIGURE 2-1. SOIL BORING LOCATIONS: PIPELINE AND STP AREA

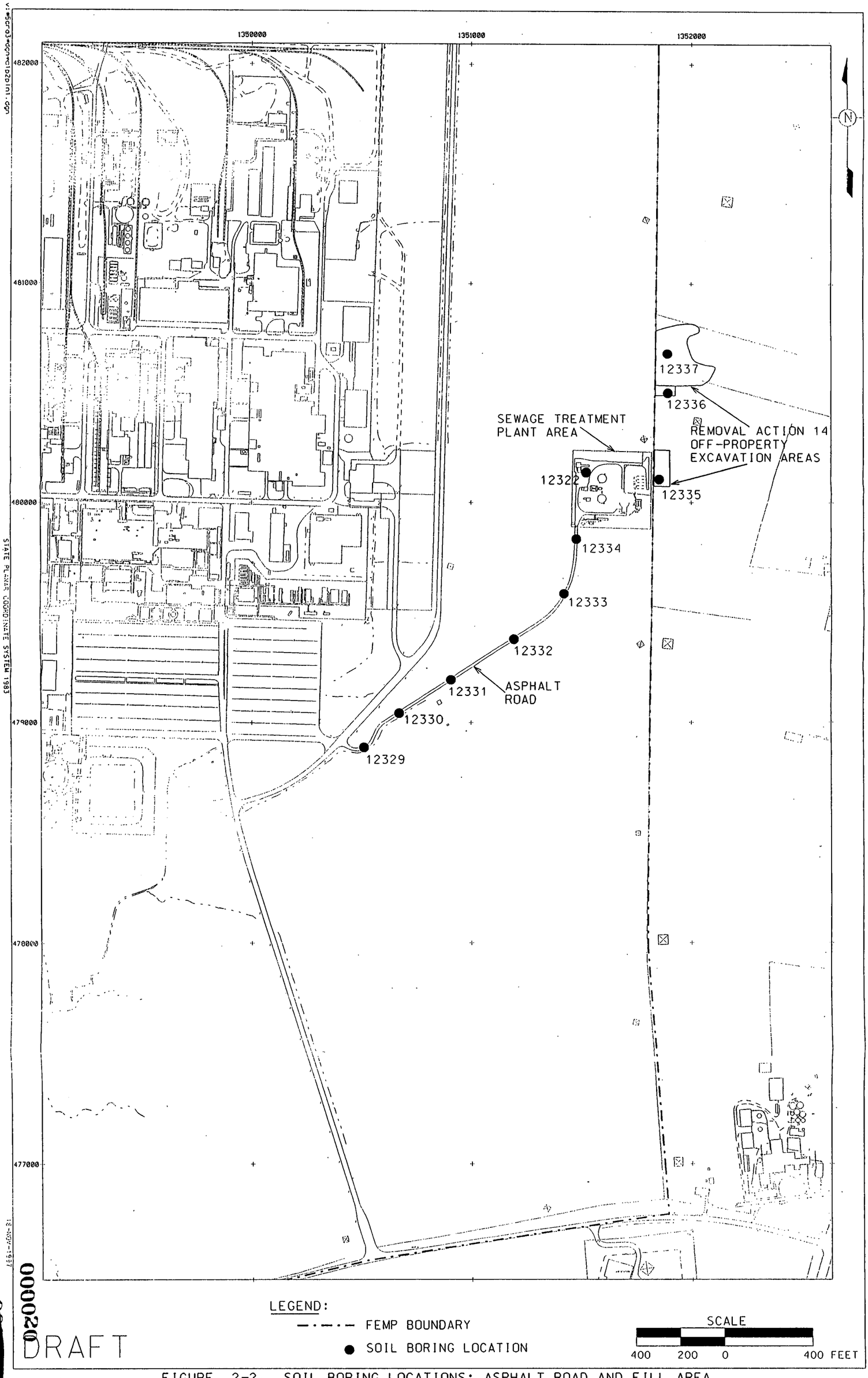

FIGURE 2-2. SOIL BORING LOCATIONS: ASPHALT ROAD AND FILL AREA

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 followed 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 Off-site Laboratories
Trimble Pathfinder Pro-XL GPS Operation Manual
Sitewide CERCLA Quality Assurance Plan (SCQ)
Sitewide Excavation Plan (SEP)

3.2 INDEPENDENT ASSESSMENT

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

3.3 IMPLEMENTATION OF CHANGES

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

4.0 EQUIPMENT DECONTAMINATION

Sampling equipment was 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 was completed to limit the introduction of contaminants from equipment to sample media and protection of worker safety and health. Equipment that came into contact with the sample was decontaminated at Level II in the field. Other equipment that did not contact media to be sampled was decontaminated at Level I, or wiped down using disposable towels. This included the core sampler casing, probe rods, etc.

5.0 HEALTH AND SAFETY

All work was performed in accordance with applicable Environmental Monitoring Project Procedures. RM-0021, Safety Performance Requirements Manual, Fluor Daniel Fernald (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 was indicated by signing the briefing record.

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

The Field Safety Contact ensured that each team member performing sampling related to this project was briefed on the applicable permits and the Project Specific Health and Safety Matrix, as applicable. Additionally, team members were trained to applicable procedures listed in Section 3.1. Personnel who did not sign the Health and Safety documents or who were not trained to the applicable procedures did not participate in the execution of sampling activities related to the completion of assigned project responsibilities. Personnel not trained to the field operating procedures could perform the procedure under the direction of a trained team member. A copy of the applicable safety permits/surveys issued for worker safety and health was available at each sample location area.

Any emergencies were to have been reported immediately to the site communication center at 648-6511 or by contacting "control" on the radio.

6.0 DISPOSITION OF WASTES

During sampling activities, the field sampling team generated contact waste and decontamination waste. These waste streams were managed in accordance with SCEP Waste Disposition Support Services (WDSS) through the Project Waste Identification Document (PWID) process. Generation of decontamination waters were minimized in the field; wherever possible, equipment was decontaminated at a facility that discharges to the AWWT, either directly or indirectly through the stormwater collection system. Contact waste generation was minimized by limiting contact with the sample media, and by using only necessary disposable materials. This waste stream was evaluated against dumpster criteria using the PWID process. If the materials did not meet dumpster criteria, an alternative disposal option was identified. The Waste Disposition Contact was 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 was implemented during the PSP to properly manage collected information upon completion of the field activities and to supplement existing information that was used for remedial design and remedial action. As specified in Section 5.1 of the SCQ, sampling teams described daily activities on the Field Activity Log (FAL) in sufficient detail so that the sampling team could reconstruct a particular situation without reliance on memory. Sample Collection Logs, Lithologic Logs, and Borehole Abandonment Records were completed according to instructions specified in Appendix B of the SCQ and applicable procedures.

Electronically recorded data (e.g. Geodimeter) were downloaded to disks as soon as schedules permitted. Team members reviewed the data for completeness and accuracy, and then forwarded the data to the surveying lead, who downloaded the data to the FEMP local area network (LAN). When the data were on the LAN, the Data Management Lead evaluated the data and produced an error file and a compressed archive data file. Once complete, the data were sent to a loader where they were loaded out on the Oracle system and an error log was generated. The data were made available to users through both the Graphical Information System (GIS) and Microsoft Access software.

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

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

APPENDIX A

ANALYTICAL DATA

TABLE A-1
SOIL SAMPLING LOCATIONS AND PARAMETERS FOR A1PII MISCELLANEOUS AREAS INVESTIGATION

Boring Number	Northing Coordinate	Easting Coordinate	Sample Depth	Sample ID Number	Target Analytes
Pipeline					
12310	1350903.86	479963.88	2.5-3.0	A1P2MIS-12310-6-R	Total Uranium
			4.0-4.5	A1P2MIS-12310-9-R A1P2MIS-12310-9-M A1P2MIS-12310-9-L	Total Uranium, Radium and Thorium Isotopes, NPDES and Sitewide COC Metals, VOCs
			5.5-6.0	A1P2MIS-12310-12-R A1P2MIS-12310-12-M A1P2MIS-12310-12-L	Total Uranium, Radium and Thorium Isotopes, NPDES and Sitewide COC Metals, VOCs
			7.0-7.5	A1P2MIS-12310-15-R	Total Uranium
			8.5-9.0	A1P2MIS-12310-18-R	Total Uranium
			9.5-10.0	A1P2MIS-12310-20-V	Archive (Total Uranium)
12311	1350972.86	479943.36	4.5-5.0	A1P2MIS-12311-10-R	Total Uranium
			6.0-6.5	A1P2MIS-12311-13-R A1P2MIS-12311-13-M A1P2MIS-12311-13-L	Total Uranium, Radium and Thorium Isotopes, NPDES and Sitewide COC Metals, VOCs
			7.5-8.0	A1P2MIS-12311-16-R A1P2MIS-12311-16-M A1P2MIS-12311-16-L	Total Uranium, Radium and Thorium Isotopes, NPDES and Sitewide COC Metals, VOCs
			9.0-9.5	A1P2MIS-12311-19-R	Total Uranium
			10.5-11.0	A1P2MIS-12311-22-R	Total Uranium
			11.5-12.0	A1P2MIS-12311-24-V	Archive (Total Uranium)

TABLE A-1
(continued)

Boring Number	Northing Coordinate	Easting Coordinate	Sample Depth	Sample ID Number	Target Analytes
12312	1351087.10	479961.56	6.5-7.0	A1P2MIS-12312-14-R	Total Uranium
			8.0-8.5	A1P2MIS-12312-17-R	Total Uranium
			9.5-10.0	A1P2MIS-12312-20-R A1P2MIS-12312-20-M A1P2MIS-12312-20-L	Total Uranium, Radium and Thorium Isotopes, NPDES and Sitewide COC Metals, VOCs
			11.0-11.5	A1P2MIS-12312-23-R A1P2MIS-12312-23-M A1P2MIS-12312-23-L	Total Uranium, Radium and Thorium Isotopes, NPDES and Sitewide COC Metals, VOCs
			12.5-13.0	A1P2MIS-12312-26-R	Total Uranium
			14.0-14.5	A1P2MIS-12312-29-R	Total Uranium
			14.5-15.0	A1P2MIS-12312-30-V	Archive (Total Uranium)
12313	1351146.32	479938.70	7.5-8.0	A1P2MIS-12313-16-R	Total Uranium
			9.0-9.5	A1P2MIS-12313-19-R	Total Uranium
			10.5-11.0	A1P2MIS-12313-22-R A1P2MIS-12313-22-M A1P2MIS-12313-22-L	Total Uranium, Radium and Thorium Isotopes, NPDES and Sitewide COC Metals, VOCs
			12.0-12.5	A1P2MIS-12313-25-R A1P2MIS-12313-25-M A1P2MIS-12313-25-L	Total Uranium, Radium and Thorium Isotopes, NPDES and Sitewide COC Metals, VOCs
			13.5-14.0	A1P2MIS-12313-28-R	Total Uranium
			14.5-15.0	A1P2MIS-12313-30-V	Archive (Total Uranium)

TABLE A-1
(continued)

Boring Number	Northing Coordinate	Easting Coordinate	Sample Depth	Sample ID Number	Target Analytes
12314	1351273.16	479951.76	5.0-5.5	A1P2MIS-12314-11-R	Total Uranium
			6.5-7.0	A1P2MIS-12314-14-R A1P2MIS-12314-14-M A1P2MIS-12314-14-L	Total Uranium, Radium and Thorium Isotopes, NPDES and Sitewide COC Metals, VOCs
			8.0-8.5	A1P2MIS-12314-17-R A1P2MIS-12314-17-M A1P2MIS-12314-17-L	Total Uranium, Radium and Thorium Isotopes, NPDES and Sitewide COC Metals, VOCs
			9.5-10.0	A1P2MIS-12314-20-R	Total Uranium
			11.0-11.5	A1P2MIS-12314-23-R	Total Uranium
			11.5-12.0	A1P2MIS-12314-24-V	Archive (Total Uranium)
12315	1351412.00	479928.38	3.0-3.5	A1P2MIS-12315-7-R	Total Uranium
			4.5-5.0	A1P2MIS-12315-10-R A1P2MIS-12315-10-M A1P2MIS-12315-10-L	Total Uranium, Radium and Thorium Isotopes, NPDES and Sitewide COC Metals, VOCs
			6.0-6.5	A1P2MIS-12315-13-R A1P2MIS-12315-13-M A1P2MIS-12315-13-L	Total Uranium, Radium and Thorium Isotopes, NPDES and Sitewide COC Metals, VOCs
			7.5-8.0	A1P2MIS-12315-16-R	Total Uranium
			9.0-9.5	A1P2MIS-12315-19-R	Total Uranium
			9.5-10.0	A1P2MIS-12315-20-V	Archive (Total Uranium)
12316	1351609.33	479778.87	5.0-5.5	A1P2MIS-12316-11-R	Total Uranium
			6.5-7.0	A1P2MIS-12316-14-R	Total Uranium
			8.0-8.5	A1P2MIS-12316-17-R A1P2MIS-12316-17-M A1P2MIS-12316-17-L	Total Uranium, Radium and Thorium Isotopes, NPDES and Sitewide COC Metals, VOCs
			9.5-10.0	A1P2MIS-12316-20-R A1P2MIS-12316-20-M A1P2MIS-12316-20-L	Total Uranium, Radium and Thorium Isotopes, NPDES and Sitewide COC Metals, VOCs
			11.0-11.5	A1P2MIS-12316-23-R	Total Uranium
			11.5-12.0	A1P2MIS-12316-24-V	Archive (Total Uranium)

TABLE A-1
(continued)

Boring Number	Northing Coordinate	Easting Coordinate	Sample Depth	Sample ID Number	Target Analytes
12317	1351624.85	479746.60	7.0-7.5	A1P2MIS-12317-15-R	Total Uranium
			8.5-9.0	A1P2MIS-12317-18-R	Total Uranium
			10.0-10.5	A1P2MIS-12317-21-R A1P2MIS-12317-21-M A1P2MIS-12317-21-L	Total Uranium, Radium and Thorium Isotopes, NPDES and Sitewide COC Metals, VOCs
			11.5-12.0	A1P2MIS-12317-24-R A1P2MIS-12317-24-M A1P2MIS-12317-24-L	Total Uranium, Radium and Thorium Isotopes, NPDES and Sitewide COC Metals, VOCs
			13.0-13.5	A1P2MIS-12317-27-R	Total Uranium
			14.5-15.0	A1P2MIS-12317-30-V	Archive (Total Uranium)
12318	1351680.91	479660.61	5.0-5.5	A1P2MIS-12318-11-R	Total Uranium
			6.5-7.0	A1P2MIS-12318-14-R	Total Uranium
			8.0-8.5	A1P2MIS-12318-17-R A1P2MIS-12318-17-M A1P2MIS-12318-17-L	Total Uranium, Radium and Thorium Isotopes, NPDES and Sitewide COC Metals, VOCs
			9.5-10.0	A1P2MIS-12318-20-R A1P2MIS-12318-20-M A1P2MIS-12318-20-L	Total Uranium, Radium and Thorium Isotopes, NPDES and Sitewide COC Metals, VOCs
			11.0-11.5	A1P2MIS-12318-23-R	Total Uranium
			11.5-12.0	A1P2MIS-12318-24-V	Archive (Total Uranium)
12319	1351730.07	479586.32	3.0-3.5	A1P2MIS-12319-7-R	Total Uranium
			4.5-5.0	A1P2MIS-12319-10-R A1P2MIS-12319-10-M A1P2MIS-12319-10-L	Total Uranium, Radium and Thorium Isotopes, NPDES and Sitewide COC Metals, VOCs
			6.0-6.5	A1P2MIS-12319-13-R A1P2MIS-12319-13-M A1P2MIS-12319-13-L	Total Uranium, Radium and Thorium Isotopes, NPDES and Sitewide COC Metals, VOCs
			7.5-8.0	A1P2MIS-12319-16-R	Total Uranium
			9.0-9.5	A1P2MIS-12319-19-R	Total Uranium
			9.5-10.0	A1P2MIS-12319-20-V	Archive (Total Uranium)

TABLE A-1
(continued)

Boring Number	Northing Coordinate	Easting Coordinate	Sample Depth	Sample ID Number	Target Analytes
12320	1351775.183	479516.87	3.0-3.5	A1P2MIS-12320-7-R	Total Uranium
			4.5-5.0	A1P2MIS-12320-10-R A1P2MIS-12320-10-M A1P2MIS-12320-10-L	Total Uranium, Radium and Thorium Isotopes, NPDES and Sitewide COC Metals, VOCs
			6.0-6.5	A1P2MIS-12320-13-R A1P2MIS-12320-13-M A1P2MIS-12320-13-L	Total Uranium, Radium and Thorium Isotopes, NPDES and Sitewide COC Metals, VOCs
			7.5-8.0	A1P2MIS-12320-16-R	Total Uranium
			9.0-9.5	A1P2MIS-12320-19-R	Total Uranium
			9.5-10.0	A1P2MIS-12320-20-V	Archive (Total Uranium)
12321	1351807.31	479470.58	3.0-3.5	A1P2MIS-12321-7-R	Total Uranium
			4.5-5.0	A1P2MIS-12321-10-R A1P2MIS-12321-10-M A1P2MIS-12321-10-L	Total Uranium, Radium and Thorium Isotopes, NPDES and Sitewide COC Metals, VOCs
			6.0-6.5	A1P2MIS-12321-13-R A1P2MIS-12321-13-M A1P2MIS-12321-13-L	Total Uranium, Radium and Thorium Isotopes, NPDES and Sitewide COC Metals, VOCs
			7.5-8.0	A1P2MIS-12321-16-R	Total Uranium
			9.0-9.5	A1P2MIS-12321-19-R	Total Uranium
			9.5-10.0	A1P2MIS-12321-20-V	Archive (Total Uranium)
Gravel in STP Area					
12322	1351523.90	480123.38	0.0-0.5 (gravel)	A1P2MIS-12322-1-R	Total Uranium
			0.5-1.0	A1P2MIS-12322-2-R	Total Uranium
			(4.5-5.0)	(A1P2MIS-12322-10-R)	(Not Sampled)
12323	1351693.30	480169.48	0.0-0.5 (gravel)	A1P2MIS-12323-1-R	Total Uranium
			0.5-1.0	A1P2MIS-12323-3-R	Total Uranium
			(4.5-5.0)	(A1P2MIS-12323-10-R)	(Not Sampled)

000031

[redacted]

TABLE A-1
(continued)

Boring Number	Northing Coordinate	Easting Coordinate	Sample Depth	Sample ID Number	Target Analytes
12324	1351801.95	480085.51	0.0-0.5 (gravel)	A1P2MIS-12324-1-R	Total Uranium
			1.0-1.5	A1P2MIS-12324-3-R	Total Uranium
			(4.5-5.0)	(A1P2MIS-12324-10-R)	(Not Sampled)
12325	1351482.30	479955.49	0.0-0.5 (gravel)	A1P2MIS-12325-1-R	Total Uranium
			0.5-1.0 (gravel)	A1P2MIS-12325-2-R	Total Uranium
			1.0-1.5	A1P2MIS-12325-3-R	Total Uranium
12326	1351652.04	479950.83	0.0-0.5 (gravel)	A1P2MIS-12326-1-R	Total Uranium
			1.0-1.5 (gravel)	A1P2MIS-12326-2-R	Total Uranium
			1.5-2.0	A1P2MIS-12326-3-R A1P2MIS-12326-3-L	Total Uranium, VOCs
Sludge Drying Beds					
12327	1351770.24	480113.50	0.0-0.5 (sand)	A1P2MIS-12327-1-R A1P2MIS-12327-1-L	Total Uranium, VOCs
			2.5-3.0	A1P2MIS-12327-6-R A1P2MIS-12327-6-L	Total Uranium, VOCs
			4.0-4.5	A1P2MIS-12327-9-R A1P2MIS-12327-9-L	Total Uranium, VOCs
			5.5-6.0	A1P2MIS-12327-12-R A1P2MIS-12327-12-L	Total Uranium, VOCs
			7.0-7.5	A1P2MIS-12327-15-R A1P2MIS-12327-15-L	Total Uranium, VOCs
			8.5-9.0	A1P2MIS-12327-18-R A1P2MIS-12327-18-L	Total Uranium, VOCs
			10.0-10.5	A1P2MIS-12327-21-R A1P2MIS-12327-21-L	Total Uranium, VOCs
			11.5-12.0	A1P2MIS-12327-24-V	Archive (Total Uranium, VOCs)

TABLE A-1
(continued)

Boring Number	Northing Coordinate	Easting Coordinate	Sample Depth	Sample ID Number	Target Analytes
12328	1351769.78	480071.05	0.0-0.5 (sand)	A1P2MIS-12328-1-R A1P2MIS-12328-1-L	Total Uranium, VOCs
			2.5-3.0	A1P2MIS-12328-6-R A1P2MIS-12328-6-L	Total Uranium, VOCs
			4.0-4.5	A1P2MIS-12328-9-R A1P2MIS-12328-9-L	Total Uranium, VOCs
			5.5-6.0	A1P2MIS-12328-12-R A1P2MIS-12328-12-L	Total Uranium, VOCs
			7.0-7.5	A1P2MIS-12328-15-R A1P2MIS-12328-15-L	Total Uranium, VOCs
			8.5-9.0	A1P2MIS-12328-18-R A1P2MIS-12328-18-L	Total Uranium, VOCs
			10.0-10.5	A1P2MIS-12328-21-R A1P2MIS-12328-21-L	Total Uranium, VOCs
			11.5-12.0	A1P2MIS-12328-24-V	Archive (Total Uranium, VOCs)
Asphalt Road					
12329	1350510.45	478889.03	0.0-0.5 (gravel)	A1P2MIS-12329-1-R	Total Uranium
			0.5-1.0	A1P2MIS-12329-2-R	Total Uranium
			(4.5-5.0)	(A1P2MIS-12329-10-R)	(Not Sampled)
12330	1350671.22	479042.95	0.0-0.5 (gravel)	A1P2MIS-12330-1-R	Total Uranium
			0.5-1.0	A1P2MIS-12330-2-R	Total Uranium
			(4.5-5.0)	(A1P2MIS-12330-10-R)	(Not Sampled)
12331	1350908.06	479193.40	0.0-0.5 (gravel)	A1P2MIS-12331-1-R	Total Uranium
			0.5-1.0	A1P2MIS-12331-2-R	Total Uranium
			(4.5-5.0)	(A1P2MIS-12331-10-R)	(Not Sampled)

000033

TABLE A-1
(continued)

Boring Number	Northing Coordinate	Easting Coordinate	Sample Depth	Sample ID Number	Target Analytes
12332	1351195.03	479376.71	0.0-0.5 (gravel)	A1P2MIS-12332-1-R	Total Uranium
			0.5-1.0	A1P2MIS-12332-2-R	Total Uranium
			(4.5-5.0)	(A1P2MIS-12332-10-R)	(Not Sampled)
12333	1351423.22	479582.50	0.0-0.5 (gravel)	A1P2MIS-12333-1-R	Total Uranium
			0.5-1.0	A1P2MIS-12333-2-R	Total Uranium
			(4.5-5.0)	A1P2MIS-12333-10-R	(Not Sampled)
12334	1351478.54	479833.26	0.0-0.5	A1P2MIS-12334-1-R	Total Uranium
			0.5-1.0	A1P2MIS-12334-2-R	Total Uranium
			(4.5-5.0)	(A1P2MIS-12334-10-R)	(Not Sampled)
Removal Action 14 Fill					
12335	1351855.30	480106.65	2.5-3.0	A1P2MIS-12335-6-R A1P2MIS-12335-6-M	Total Uranium, Sitewide COC Metals
			3.0-3.5	A1P2MIS-12335-7-V	Archive (Total Uranium, Sitewide COC Metals)
12336	1351893.67	480499.47	0.0 - 0.5	A1P2MIS-12336-1-R A1P2MIS-12336-1-M	Total Uranium, Sitewide COC Metals
			0.5 - 1.0	A1P2MIS-12336-2-V	Archive (Total Uranium, Sitewide COC Metals)
12337	1351891.81	480678.34	0.0 - 0.5	A1P2MIS-12337-1-R A1P2MIS-12337-1-M	Total Uranium, Sitewide COC Metals
			0.5 - 1.0	A1P2MIS-12337-2-V	Archive (Total Uranium, Sitewide COC Metals)

Note: Shading denotes change from PSP.

TABLE A-2
SOIL SAMPLE ANALYTICAL DATA FOR A1PII MISCELLANEOUS AREAS INVESTIGATION

Sample ID Number	Total U ppm (dry)	Ra-226 pCi/g	Ra-228 pCi/g	Th-228 pCi/g	Th-230 pCi/g	Th-232 pCi/g	As mg/kg	Be mg/kg	Pb mg/kg	Mn mg/kg	Sb mg/kg	Cd mg/kg	Zn mg/kg	Cr mg/kg	Cu mg/kg	Hg mg/kg	Ni mg/kg	VOCs µg/kg
PIPELINE																		
A1P2MIS-12310-6	1.56	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A1P2MIS-12310-9	ND[1]	0.93	0.69	0.51	0.46	0.45	4.1	1.2	13.4	441	<18	<0.3	42.7	14.4	19.7	0.04	22.4	<12
A1P2MIS-12310-12	3.4[1]	0.77	0.69	0.41	0.34	0.37	3.3	1.0	<7.0	398	<18	0.5	39.5	13	19.6	0.02	18.5	<12
A1P2MIS-12310-15	1.55	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A1P2MIS-12310-18	1.35	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A1P2MIS-12311-10	1.57	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A1P2MIS-12311-13	3.0[1]	0.88	0.81	0.51	0.49	0.49	4.1	1.0	7.8	540	<18	0.5	42.9	14.4	18.7	0.02	16.9	<12
A1P2MIS-12311-16	3.1[1]	0.78	0.85	0.53	0.51	0.51	3.0	1.2	11.2	472	<18	0.6	44.1	15.8	18.1	0.02	20.1	<11
A1P2MIS-12311-19	1.52	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A1P2MIS-12311-22	1.83	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A1P2MIS-12312-14	1.51	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A1P2MIS-12312-17	1.75	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A1P2MIS-12312-20	4.0[1]	1.1	0.80	0.60	0.49	0.53	3.26	1.0	15.6	420	<16	<1	39.5	12.3	14.8	0.03	18.0	<12
A1P2MIS-12312-23	2.6[1]	0.95	0.84	0.53	0.48	0.49	3.45	<1.0	12.5	405	<16	<1	36.4	11.4	14.8	0.02	18.0	<11
A1P2MIS-12312-26	1.38	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A1P2MIS-12312-29	1.44	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

000035

TABLE A-2
(Continued)

Sample ID Number	Total U ppm (dry)	Ra-226 pCi/g	Ra-228 pCi/g	Th-228 pCi/g	Th-230 pCi/g	Th-232 pCi/g	As mg/kg	Be mg/kg	Pb mg/kg	Mn mg/kg	Sb mg/kg	Cd mg/kg	Zn mg/kg	Cr mg/kg	Cu mg/kg	Hg mg/kg	Ni mg/kg	VOCs µg/kg
A1P2MIS-12313-16	1.77	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A1P2MIS-12313-19	1.34	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A1P2MIS-12313-22	2.8[1]	0.97	0.83	0.54	0.49	0.47	2.48	<1	10.8	419	<16	<1	36.4	12.0	14.3	0.02	16.6	acetone 11 all others <12
A1P2MIS-12313-25	ND[1]	0.81	1.1	0.55	0.46	0.49	4.49	<1	10.2	486	<16	<1	37.4	11.9	14.7	0.02	19.7	acetone 10 all others <11
A1P2MIS-12313-28	1.30	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A1P2MIS-12314-11	1.48	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A1P2MIS-12314-14	ND[1]	0.94	0.75	0.49	0.46	0.43	4.31	<1	9.3	298	<16	<1	32.4	10.0	14.0	-	14.4	toluene 1 all others <11.0
A1P2MIS-12314-17	ND[1]	0.74	0.84	0.51	0.46	0.51	3.64	<1	12.6	341	<16	<1	35.2	11.2	14.7	0.02	17.1	<11.0
A1P2MIS-12314-20	1.49	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A1P2MIS-12314-23	1.77	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A1P2MIS-12315-7	2.10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A1P2MIS-12315-10	2.8[1]	0.72	0.64	0.47	0.45	0.43	2.9	1.0	10.7	487	<18	0.5	38.6	13.9	19.6	0.03	18.5	<11
A1P2MIS-12315-13	2.6[1]	0.82	0.68	0.35	0.33	0.34	3.5	1.0	11.3	430	<18	0.4	39.2	14.4	20.8	0.02	17.3	<11
A1P2MIS-12315-16	1.20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A1P2MIS-12315-19	1.17	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A1P2MIS-12316-11		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A1P2MIS-12316-14		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

TABLE A-2
(Continued)

Sample ID Number	Total U ppm (dry)	Ra-226 pCi/g	Ra-228 pCi/g	Th-228 pCi/g	Th-230 pCi/g	Th-232 pCi/g	As mg/kg	Be mg/kg	Pb mg/kg	Mn mg/kg	Sb mg/kg	Cd mg/kg	Zn mg/kg	Cr mg/kg	Cu mg/kg	Hg mg/kg	Ni mg/kg	VOCs µg/kg
A1P2MIS-12316-17	5.4[1]	0.75	0.79	0.58	0.48	0.58	2.9	1.1	13.51	542	<18	0.82	45.9	13.2	16.5	0.02	17.1	<11.0
A1P2MIS-12316-20	2.9[1]	0.68	0.53	0.51	0.48	0.47	3.7	0.93	<6.3	387	<18	0.56	36.4	12.5	16.7	0.01	14.5	methyl chloride 6 1,1-dichloroethane 4 1,1,1-trichloroethane 19 all others <12.0
A1P2MIS-12316-23	1.16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A1P2MIS-12317-15	1.14	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A1P2MIS-12317-18	1.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A1P2MIS-12317-21	6.6[1]	0.86	0.66	0.63	0.57	0.55	4.1	1.16	18.5	461	<18	0.6	49.8	16.2	18.7	0.02	22.2	<11.0
A1P2MIS-12317-24	ND[1]	0.69	0.61	0.47	0.45	0.43	2.0	0.79	<6.3	427	<18	0.54	25.6	11.0	14.8	0.02	9.85	<11.0
A1P2MIS-12317-27	1.17	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A1P2MIS-12318-11	1.42	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A1P2MIS-12318-14	1.33	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A1P2MIS-12318-17	11[1]	1.2	1.1	0.70	0.60	0.62	4.7	1.69	17.4	444	<18	0.83	73.7	18.5	26.2	0.03	30.5	acetone 10 all others <13.0
A1P2MIS-12318-20	13[1]	1.2	1.3	0.77	0.65	0.73	3.3	1.22	15.1	647	<18	0.43	54.0	13.3	18.0	0.04	23.9	acetone 17 all others <13.0
A1P2MIS-12318-23	1.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A1P2MIS-12319-7	1.06	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A1P2MIS-12319-10	4.9[1]	1.1	1.2	0.76	0.70	0.69	4.5	1.94	24.4	665	<18	0.92	67.1	17.9	23.2	0.04	32.3	toluene 2 all others <11.0
A1P2MIS-12319-13	5.8[1]	1.2	1.6	0.82	0.71	0.78	8.7	1.63	11.6	595	<18	0.80	72.9	19.7	18.8	0.04	23.7	

000037

TABLE A-2
(Continued)

Sample ID Number	Total U ppm (dry)	Ra-226 pCi/g	Ra-228 pCi/g	Th-228 pCi/g	Th-230 pCi/g	Th-232 pCi/g	As mg/kg	Be mg/kg	Pb mg/kg	Mn mg/kg	Sb mg/kg	Cd mg/kg	Zn mg/kg	Cr mg/kg	Cu mg/kg	Hg mg/kg	Ni mg/kg	VOCs µg/kg
A1P2MIS-12319-16	1.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A1P2MIS-12319-19	1.22	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A1P2MIS-12320-7	5.86	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A1P2MIS-12320-10	4.3[1]	0.79	0.96	0.54	0.54	0.47	3.9	1.34	24.4	465	<16	0.51	64.2	12.1	15.4	0.04	13.3	acetone 34 all others < 12.0
A1P2MIS-12320-13	3.2[1]	0.91	0.78	0.55	0.62	0.52	4.2	0.89	17.1	938	<16	0.32	48.1	11.6	15.2	0.04	13.1	acetone 48 all others < 13.0
A1P2MIS-12320-16	2.24	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A1P2MIS-12320-19	1.62	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A1P2MIS-12321-7	1.47	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A1P2MIS-12321-10	5.0[1]	1.2	1.3	0.87	0.09	0.82	6.6	2.04	22.7	1400	<16	1.08	73.6	20.1	20.6	0.04	28	toluene 3 all others < 12
A1P2MIS-12321-13	3.0[1]	0.89	1.3	0.71	0.72	0.81	3.6	1.19	14.7	718	<16	0.40	48.7	15.3	20.4	0.02	19.2	<12
A1P2MIS-12321-16	1.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A1P2MIS-12321-19	1.14	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GRAVEL IN STP AREA																		
A1P2MIS-12322-1	7.53	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A1P2MIS-12322-2	1.84	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A1P2MIS-12323-1	12.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A1P2MIS-12323-3	1.66	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A1P2MIS-12324-1	5.22	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

TABLE A-2
(Continued)

Sample ID Number	Total U ppm (dry)	Ra-226 pCi/g	Ra-228 pCi/g	Th-228 pCi/g	Th-230 pCi/g	Th-232 pCi/g	As mg/kg	Be mg/kg	Pb mg/kg	Mn mg/kg	Sb mg/kg	Cd mg/kg	Zn mg/kg	Cr mg/kg	Cu mg/kg	Hg mg/kg	Ni mg/kg	VOCs µg/kg
A1P2MIS-12324-3	2.09	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A1P2MIS-12325-1	2.28	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A1P2MIS-12325-2	1.44	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A1P2MIS-12325-3	1.10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A1P2MIS-12326-1	11.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A1P2MIS-12326-2	18.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A1P2MIS-12326-3	2.25	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SLUDGE DRYING BEDS																		
A1P2MIS-12327-1	69.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<11
A1P2MIS-12327-6	3.46	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<10
A1P2MIS-12327-9	5.67	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<13
A1P2MIS-12327-12	1.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	acetone 9 all others <12
A1P2MIS-12327-15	1.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	perchloroethylene 5 all others <12
A1P2MIS-12327-18	1.24	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<11
A1P2MIS-12327-21	1.27	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<11
A1P2MIS-12328-1	32.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<11
A1P2MIS-12328-6	3.35	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<10
																		acetone 39 all others <12

000039

TABLE A-2
(Continued)

Sample ID Number	Total U ppm (dry)	Ra-226 pCi/g	Ra-228 pCi/g	Th-228 pCi/g	Th-230 pCi/g	Th-232 pCi/g	As mg/kg	Be mg/kg	Pb mg/kg	Mn mg/kg	Sb mg/kg	Cd mg/kg	Zn mg/kg	Cr mg/kg	Cu mg/kg	Hg mg/kg	Ni mg/kg	VOCs µg/kg
A1P2MIS-12328-9	3.25	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	toluene 2 all others < 12
A1P2MIS-12328-12	2.08	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	< 12
A1P2MIS-12328-15	1.35	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	< 12
A1P2MIS-12328-18	1.36	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1,2-dichloroethene 16 all others < 11
A1P2MIS-12328-21	1.21	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND
ASPHALT ROAD																		
A1P2MIS-12329-1	1.07	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A1P2MIS-12329-2	1.75	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A1P2MIS-12330-1	1.12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A1P2MIS-12330-2	1.71	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A1P2MIS-12331-1	1.06	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A1P2MIS-12331-2	1.57	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A1P2MIS-12332-1	1.56	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A1P2MIS-12332-2	0.955	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A1P2MIS-12333-1	2.05	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A1P2MIS-12333-2	1.48	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A1P2MIS-12334-1	2.06	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A1P2MIS-12334-2	1.73	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

000040

2047

TABLE A-2
(Continued)

Sample ID Number	Total U ppm (dry)	Ra-226 pCi/g	Ra-228 pCi/g	Th-228 pCi/g	Th-230 pCi/g	Th-232 pCi/g	As mg/kg	Be mg/kg	Pb mg/kg	Mn mg/kg	Sb mg/kg	Cd mg/kg	Zn mg/kg	Cr mg/kg	Cu mg/kg	Hg mg/kg	Ni mg/kg	VOCs µg/kg
REMOVAL ACTION 14 OFF-SITE BACKFILL																		
A1P2MIS-12335-6	3.95	-	-	-	-	-	5.8	0.91	24.4	580	<44.2	1.1	65.71	19.27	21.65	0.022	24.4	-
A1P2MIS-12336-1	17.8	-	-	-	-	-	4.4	0.69	20.12	460	<44.2	0.74	33.5	8.71	8.55	0.014	7.97	-
A1P2MIS-12337-1	1.39	-	-	-	-	-	4.4	0.23	15.16	318	<39.8	0.31	26.27	7.53	11.7	0.02	8.83	-

nalysis was completed uising Gamma Spectroscopy. All other analyses for total uranium were completed using ICP/MS or BromoPADAP methods.

000041

TABLE A-3
VOC ANALYTES

Analytes	
Chloromethane	Trichloroethene
Vinyl Choride	1,2-Dichloropropane
Bromomethane	Bromodichloromethane
Chloroethane	cis-1,3-Dichloropropene
1,1-Dichloroethene	4-Methyl-2-pentanone
Carbon Disulfide	Toluene
Acetone	trans-1,3-Dichloropropene
Methylene Chloride	1,1,2-Trichloroethane
1,1-Dichloroethane	Tetrachloroethene
1,2-Dichloroethene (total)	2-Hexanone
2-Butanone	Dibromochloromethane
Chloroform	Chlorobenzene
1,1,1-Trichloroethane	Ethylbenzene
Carbon Tetrachloride	Xylene (Total)
Benzene	Styrene
1,2-Dichloroethane	Bromoform
1,1,2,2-Tetrachloroethane	

APPENDIX B

VARIANCE REQUEST/FIELD CHANGE NOTICES

[redacted]

VARIANCE / FIELD CHANGE NOTICE

V/F No. 50.03.59.04-1

PROJECT TITLE: A1PII PSP for Field Sampling of Miscellaneous Areas (Rev. 0)

Date: 10/2/97

VARIANCE / FIELD CHANGE NOTICE (Include justification): 55200-PSP-0004 2047

Variance:

This variance changes the sample container used for collection of soil samples for VOC analysis. In lieu of three, 40-mL vials, a single 120 mL (4 .oz) glass wide-mouth container with a teflon lined lid will be used. Minimal head space and immediate cooling to 4°C will be applied for sample integrity.

Liquid QC samples will still be collected in accordance with the PSP.

Justification:

Containerization of the soil using a wide mouth container is more feasible and is completed in shorter time (packing soil into container) thereby yielding a better quality and higher integrity sample in terms of VOC contaminant recovery. The FEMP SCQ also specifies the container for VOC anlaysis of soil.

EDC CONTROLLED
COPY NO.
8544

REQUESTED BY: Mike Frank JHW for MF Date: October 10, 1997

X IF REQD	VARIANCE/FCN APPROVAL	DATE	X IF REQD	VARIANCE/FCN APPROVAL	DATE
X	QUALITY ASSURANCE R. Fuhe	5-13-97	X	PROJECT MANAGER S. T. Garland	10/10/97
	DATA QUALITY MANAGEMENT		X	SCEP SAMPLING & CHARACTERIZATION MGR J H White	10/10/97
X	ANALYTICAL CUSTOMER SUPPORT Bill Ahsterman	10/13/97		OTHER Char. Lead A. Duarte	10/10/97
	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:

000044

[redacted]

VARIANCE / FIELD CHANGE NOTICE

V/F No. 50.03.59.04-2

PROJECT TITLE: A1/PII PSP for Field Sampling of Miscellaneous Areas (Rev. 0)

Date: 10/10/97

VARIANCE / FIELD CHANGE NOTICE (Include justification): Document 55200-PSP-0004)

1) This variance clarifies the sampling objectives and depth intervals for boring locations that are intended to characterize the road base gravel/soil in the A1/P2 areas.

Appendix B of the PSP specifies that gravel and soil will be collected at selected intervals based on the gravel being four feet thick. For clarification purposes, the following criteria will be used to guide the sample selection:

- The top 6 inches of gravel will be collected after the asphalt is removed and will be referenced as the 0-6"interval.
- If the gravel base is sufficiently thick, a 6-inch gravel sample will be collected immediatley above the underlying soil base.
- The first 6-inch interval of soil below the gravel will also be collected.
- The sample identifiers applied to the samples will include the most appropriate depth interval code (2 = 6"-12", 3 = 12"-16", etc.).

Justification:

This variance provides clarification for the field team on the objectives of the sampling program in order to select the depth intervals to most effectively meet the analytical characterization needs.

EDC CONTROLLED COPY NO. 8544

REQUESTED BY: Mike Frank MF

Date: October 10, 1997

X IF REQD	VARIANCE/FCN APPROVAL	DATE	X IF REQD	VARIANCE/FCN APPROVAL	DATE
X	QUALITY ASSURANCE	10-13-97	X	PROJECT MANAGER	10/13/97
	DATA QUALITY MANAGEMENT		X	ECSP SAMPLING & CHARACTERIZ. MGR.	10/10/97
X	ANALYTICAL CUSTOMER SUPPORT			OTHER	10/13/97
	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. 50.03.59.04-3

PROJECT TITLE: A1/PII PSP for Field Sampling of Miscellaneous Areas (Rev. 0)

Date: 10/10/97

VARIANCE / FIELD CHANGE NOTICE (Include justification): Document 55200-PSP-0004) 2047

1) This variance provides for the collection of samples for VOC analysis at the boring locations within the STP at locations on the asphalt roadways. The core sample collected from Boring 12326 indicated VOCs at the 1.0-1.5 ft. interval (gravel/sand/soil) based on photoionization detector (Microtip PID) readings. The PID instrument response was as high as 120 ppm on direct contact with the material (based on reference calibration standard of isobutylene gas).

An adjacent boring within one foot of the original borehole will be cored to collect a VOC sample from the highest PID response interval. Since the material is granular, some head space will exist in the VOC sample container; the sampling technician will attempt to minimize head space to the extent practical (e.g., removing the larger gravel) using minimal time. A trip blank and field blank will also be collected for the VOC solid samples collected for the day. The applicable TAL is 50.03.59.04-E. An alpha/beta screen sample is also required.

VOC samples may be collected from other asphalt boring locations if contamination is indicated by the PID instrument. The action level for collection of samples will be established by the Project Manager and documented in the Field Activity Log.

The samples will be identified in accordance with other VOC samples in the PSP including the appropriate depth interval code.

Justification:

The potential for VOC contamination in the gravel roadbase at selected locations must be confirmed to determine the path forward for remediation and disposition of the material.

2) Location 12322 was moved approximately 18 feet southeast due to a radiological contamination area surrounding the STP incinerator. The location will be re-surveyed to establish the revised coordinates.

Justification:

The boring location was originally selected on a random basis for characterizing the roadbase materials. The new location will provide the same quality of information on contaminants.

EDC CONTROLLED COPY NO. 8544

REQUESTED BY: Mike Frank Date: October 23, 1997

X IF REQD	VARIANCE/FCN APPROVAL	DATE	X IF REQD	VARIANCE/FCN APPROVAL	DATE
X	QUALITY ASSURANCE	10-24-97	X	PROJECT MANAGER	10/23/97
	DATA QUALITY MANAGEMENT		X	SCEP SAMPLING & CHARACTERIZ. MGR	10/23/97
X	ANALYTICAL CUSTOMER SUPPORT Bill Westerman	10/24/97	X	OTHER	10/23/97
	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:

000046

VARIANCE / FIELD CHANGE NOTICE

V/F No. 50.03.59.04-4

PROJECT TITLE: A1/PII PSP for Field Sampling of Miscellaneous Areas (Rev. 0)

Date: 10/20/97

VARIANCE / FIELD CHANGE NOTICE (Include justification): Document 55200-PSP-0004)

This variance clarifies the sampling objectives and depth intervals for boring locations that are intended to characterize the sand/gravel components of the Sludge Drying Beds and the underlying soil.

Appendix B of the PSP specifies that gravel (sand) will be collected from 1.5-2.0 feet based on the gravel(sand) being 2 feet thick. This gravel/sand interval as well as other soil intervals are simply estimates. For clarification purposes, the following criteria will be used to guide the sample selection:

- The sand/gravel component of the sludge drying bed will be sampled immediately above the soil interface underlying the sand beds.
- The first soil sample interval to be collected will start at one foot below the sand and soil interface. Subsequent soil samples will be collected every 1.5 feet below the top of the first soil sample interval.
- The sample interval thickness will be dependent on the volume required to collect the A/B screen (5 to 20 mL), Total U (120 mL) and VOC samples (120 mL). Anticipated interval is one foot in length. (Note the reduction in Total U volume from the PSP).
- The sample identifiers applied to the samples will include the most appropriate depth interval code (2 = 6"-12", 3 = 12"-18", etc.; See Table 2-2 of the PSP).
- The boring should terminate at approximately 12 feet below ground with the last sample collected as an archive for potential radiological analysis, not VOCs as stated in the PSP.

Justification:

This variance provides clarification for the field team on the objectives of the two boring/sampling locations in the Sludge Drying Beds in order to select the depth intervals to most effectively meet the analytical characterization needs. Also, the increase in the sampling intervals from six inches to approximately 12 inches does not impact the pre-design process.

ECDC CONTROLLED
COPY NO.
8544

REQUESTED BY: Mike Frank Date: October 20, 1997

X IF REQD	VARIANCE/FCN APPROVAL	DATE	X IF REQD	VARIANCE/FCN APPROVAL	DATE
X	QUALITY ASSURANCE	10-20-97	X	PROJECT MANAGER	10/20/97
	DATA QUALITY MANAGEMENT		X	SCEP SAMPLING & CHARACTERIZ. MGR	10/20/97
X	ANALYTICAL CUSTOMER SUPPORT			OTHER	10-20-97
	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:

000047

VARIANCE / FIELD CHANGE NOTICE

V/F No. 50.03.59.04-6

PROJECT TITLE: A1PII PSP for Field Sampling of Miscellaneous Areas (Rev. 0)

Date: 11/~~4~~13/97

VARIANCE / FIELD CHANGE NOTICE (Include justification): (Doc. # 55200-PSP-0004)

2047

This variance documents borings that were relocated to avoid underground utilities or trailers, etc. staged on the proposed boring areas along the effluent pipeline from the STP. The planned and revised coordinates are as follows:

Boring No.	Planned Coordinates (Northing/Easting)	Final Coordinates (N/E)
12316	479803.9/1351590.5	479778.9/1351609.3
12317	479719.3/1351628.0	479746.6/1351624.9
12318	479662.4/1351684.9	479660.6/1351680.9
12319	479579.4/1351720.4	479586.3/1351730.1
12320	479523.4/1351780.0	479516.9/1351775.2
12321	479465.6/1351804.3	479470.6/1351807.3

Justification:

The original borings were located too close to underground wastewater piping or were positioned near office/storage trailers. The new locations were confirmed with SCEP project personnel prior to initiating field sampling and meet the characterization objectives of the PSP.

ECDC CONTROLLED
COPY NO.
8544

REQUESTED BY: Mike Frank Date: November 13, 1997

X IF REQD	VARIANCE/FCN APPROVAL	DATE	X IF REQD	VARIANCE/FCN APPROVAL	DATE
X	QUALITY ASSURANCE R Frisk	11-18-97	X	PROJECT MANAGER [signature]	
	DATA QUALITY MANAGEMENT		X	~~SCEP SAMPLING & CHARACTERIZATION~~ Smmf Mgr. Mike Frank	11/13/97
	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:

ORIGINAL

000048