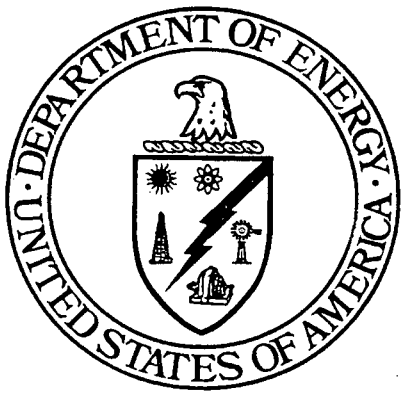
PROJECT SPECIFIC PLAN FOR DIRECT-PUSH GROUNDWATER SAMPLING IN FORMER SOIL EXCAVATION AREAS

FERNALD CLOSURE PROJECT
FERNALD, OHIO



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U.S. DEPARTMENT OF ENERGY

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FINAL

PROJECT SPECIFIC PLAN FOR CONDUCTING DIRECT-PUSH SAMPLING IN FORMER SOIL EXCAVATION AREAS

PROJECT NUMBER 52424-PSP-0004
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FERNALD CLOSURE PROJECT

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amsl	above mean sea level
AR/WM	Aquifer Restoration/Water Management
ASL	analytical support level
bgs	below ground surface
bwt	below the water table
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
DOE	U.S. Department of Energy
DOT	U.S. Department of Transportation
DSDP	Demolition, Soil and Disposal Project
FACTS	Fernald Analytical Computerized Tracking System
FRL	final remediation level
GMA	Great Miami Aquifer
µg/L	micrograms per liter
mg/kg	milligrams per kilogram
pCi/g	picoCuries per gram
OSDF	On-Site Disposal Facility
OU5	Operable Unit 5
PSP	project specific plan
ROD	Record of Decision
QA/QC	Quality Assurance/Quality Control
SCQ	Sitewide CERCLA Quality Assurance Project Plan
TOT	time of travel
V/FCN	Variance/Field Change Notice

1.0 INTRODUCTION

As part of Site remediation, deep soil excavations are being completed at various locations around the Site. For the purposes of this PSP a deep soil excavation is one that comes within 5 feet of the base of the Glacial Overburden. These deep excavation areas are of concern since they are potential pathways for contamination to reach the Great Miami Aquifer (GMA) via infiltrating contaminated storm water or perched water during the excavation and prior to the deep excavations being plugged with compacted clay. The Demolition, Soil and Disposal Project (DSDP) is responsible for installing the infrastructure needed to achieve Groundwater Remediation goals. Determining if excavations have negatively impacted the water quality in the GMA is required for establishing final infrastructure needs for the Aquifer Restoration Design.

Direct-push groundwater sampling in the GMA will be conducted beneath and slightly downgradient of any deep soil excavation/foundation removal (including the removal of perched groundwater) that comes within 5 feet of the base of the Glacial Overburden where above- final remediation levels (FRL) material was identified. This PSP initially focuses on Excavation Areas 3A/4A, which includes the Plant 6 Area, but will later serve as the controlling document for conducting direct-push groundwater sampling beneath all other soil excavation areas (e.g., Waste Storage Area, Areas 3B/4B, etc).

In each former excavation area, locations where deep soil excavation/foundation removal came within 5 feet of the base of the Glacial Overburden will be identified. These deep soil excavations were dug either to remove soil with contamination above FRL, remove building foundations or other structures (e.g., sheet metal, casings), or to remove both above-FRL material and building foundations.

A minimum of two direct-push groundwater samples will be collected from each deep soil excavation area being targeted for sampling due to significant sources of contamination existing prior to the excavation (i.e., Plant 6 and Plant 9). The first sample will be collected directly beneath or as close as possible to the deepest excavation location within the area. The second sample will be located approximately 100 feet downgradient of the first sample. Groundwater samples will be analyzed for both uranium and technetium-99 concentrations. Uranium is the principal constituent of concern for the groundwater remedy and an FRL constituent of the Operable Unit 5 (OU5) Record of Decision (ROD). Technetium-99 is also an FRL constituent of the OU5 ROD. Pre-excavation technetium-99 concentrations in the glacial overburden in the 3A/4A Areas had the potential for creating FRL exceedances for technetium-99 in the

aquifer beneath it. Data collected under this PSP will be used to determine if cross contamination occurred between the Glacial Overburden and the underlying GMA due to the soil excavations or from contamination leaching prior to the excavation. Data will also be used to further bolster the GMA data set used for On-Site Disposal Facility (OSDF) leak detection purposes in the GMA. Pre-existing uranium contamination in the GMA is known to be present beneath a portion of Area 4A (i.e., Monitoring Well 2389 in the Plant 6 Area). A Conceptual Design for Remediation of the GMA in the Waste Storage and Plant 6 Areas was issued in May 2000, followed by a Design for Remediation of the GMA in the Waste Storage and Plant 6 Areas that was issued in April 2001. The conclusion of these designs was that uranium concentrations in the GMA beneath Plant 6 had dissipated such that concentrations were below the FRL for uranium. Based on these two design reports no aquifer remediation was planned for the Plant 6 Area. Following the issuance of these two studies, groundwater monitoring continued in the Plant 6 Area. Above-FRL uranium concentrations have been periodically detected at Monitoring Well 2389. Direct-push groundwater sampling to update pre-existing conditions will also be included in this PSP.

Area 3A/4A

The Implementation Plan for Area 3A/4A (20800-PL-0002, Revision 0) provides instructions for mitigating the potential of cross contamination of the GMA during excavation which focused on those excavations of soil, sediment, perched water, and at-and below-grade structures that come within 5 feet of the base of the Glacial Overburden. These instructions state that the thickness of the gray clay must be re-established to 5 feet within 15 working days. Prior to initiating the backfill work, certification samples of gray clay are taken at the design grade. If the samples indicate constituents of concern are present above their soil FRLs, the backfill area is re-excavated to remove the soil failing certification. Figure 1 identifies four locations within the 3A/4A Excavation Area (Plant 5, Plant 6, Boiler Plant, and Plant 9) where excavations came within 5 feet of the base of the Glacial Overburden. Also shown on Figure 1 is the uranium concentration of the soil measured from soil samples collected at the design grade in each of the four deep excavation locations.

As of December 8, 2003, soil samples collected under the PSP for Area 3A/4A Excavation Characterization and Precertification (20200-PSP-0009, Revision 0) indicated that no above soil FRL material remained at any deep excavation location in Excavation Areas 3A and 4A. The deep excavations in both the Boiler Plant and Plant 5 areas resulted from the removal of sheet piling and building foundations. Since no above-FRL material was identified in these two areas during excavation no

groundwater direct push samples will be collected. The deep excavations in the Plant 6 and Plant 9 Areas resulted from the removal of above-FRL material. A minimum of two direct-push groundwater samples will be collected at each of these deep excavation areas.

A total of eight direct push sampling locations (13311, 13312, 13313, 13314, 13315, 13316, 13317, and 13318) are proposed for the 3A/4A Excavation Area (see Figure 1). Locations 13311 and 13312 are located beneath the former Plant 9 Area. Locations 13313, 13314, 13315, and 1226 are located in the former Plant 6 Area. Locations 13317 and 13318 are located slightly upgradient and downgradient of Monitoring Well 2389 where pre-existing uranium contamination has been detected. Additional direct-push sampling locations may be located and sampled pending the data received from the initial eight locations. If the need for an additional location is identified, it will be uniquely numbered, surveyed, and sampled as outlined in this PSP. As future excavation areas are completed, future direct push sampling locations will also be uniquely numbered, surveyed, and sampled as outlined in this PSP. Samples collected from each direct push sampling location will be analyzed for uranium and technetium-99. Results for the sampling will be presented to the U.S. Environmental Protection Agency and Ohio Environmental Protection Agency as they become available.

Sampling locations were based in part on time of travel (TOT) estimates in the GMA made for uranium assuming that uranium contamination emanating from the floor of a deep excavation would reach the water table in the GMA in less than a year through some type of short circuit pathway (e.g., fracture through 5 feet of gray clay and 30 feet of unsaturated GMA sediments). Sampling under this PSP will verify that such a short circuit contaminant pathway was not utilized by uranium contamination to reach the water table of the aquifer in less than 1 year.

Too many uncertainties exist to determine how long it might take for uranium to reach the GMA water table if a short circuit pathway is not utilized. Calculations indicate that it could take as long as 28 years for uranium to migrate vertically through 5 feet of gray clay (seepage velocity of 2.15 feet/year and a retardation of 12, OU5 Remedial Investigation, Section 3.6.1). Contamination could become fixed to unsaturated sediments in the top of the GMA and perhaps never reach the water table.

Assuming then that uranium contamination reaches the GMA water table in less than 1 year, TOT calculations indicate that in the course of one year uranium is not expected to travel farther than 18 feet from it's point of entry. This assumes, a seepage velocity of 0.6 feet/day in the GMA beneath Excavation

Areas 3A and 4A, a K_h of 452 feet/day (Pumping Test Report for the Pilot Plant Drainage Ditch Uranium Plume Aquifer Restoration and Waste Water Project, 52424-RP-0002, Revision 0), a gradient of 0.0004 (average gradient calculated between Well 83123 and 2054 during the first three quarters of 2003), and a porosity of 30 percent. Water would therefore move approximately 219 feet/year, and uranium would move approximately 18 feet per year (retardation of 12). Technetium-99 is much more mobile than uranium, so in areas where above-FRL material was present a sample approximately 100 feet downgradient of the deepest soil excavation point will also be collected in addition to the sample collected beneath the deepest point.

2.0 MANAGEMENT AND ORGANIZATION

The DSDP Manager is responsible for:

- Providing overall project management and technical guidance
- Ensuring the necessary resources are allocated to the project for the efficient and safe completion of PSP activities
- Overseeing and auditing PSP activities to ensure that the work is being performed efficiently and in accordance with all regulatory requirements and commitments, DOE Orders, site policies and procedures, and safe working practices
- Obtaining the necessary funding to complete the sampling and data analysis activities.

The Aquifer Restoration/Water Management (AR/WM) Manager is responsible for:

- The safe and prompt completion of work as outlined in the PSP
- Oversight and programmatic direction of sampling activities
- Providing a technical lead for the collection and interpretation of sampling data
- Establishing and maintaining the scope, schedule, and cost baseline
- Reporting to the DSDP Manager on the status of PSP activities and on the identification of any problems encountered in the accomplishment of the PSP.

The AR/WM Technical Lead is responsible for:

- Reporting to the AR/WM Manager on the progress of PSP activities and on the identification of any problems encountered in the accomplishment of the PSP
- Providing technical guidance and assisting field personnel as required to complete work described in this PSP
- Interpretation of data collected in the field.

The Soil Sampling Manager is responsible for:

- Managing and conducting direct-push sampling activities
- Safety walkdowns of the work areas, ensuring personnel are trained to safety and technical requirements, procuring applicable work permits, and ensuring that safety and PSP requirements are being adhered to during field implementation
- Reporting field progress to the AR/WM Manager and Technical Lead.

PSP personnel contacts are listed below:

KEY PROJECT PERSONNEL

Title	Primary	Secondary
DSDP Manager	Jyh-Dong Chiou	
AR/WM Manager	Bill Hertel	Ken Broberg
AR/WM Technical Lead	Ken Broberg	Bill Hertel
Soil Sampling Lead	Tom Buhrlage	Jim Hey
Laboratory Contact	Charles White	
Safety and Health Contact	Gregg Johnson	Jeff Middaugh
QA/QC Contact	Mike Hoge	

QA/QC - Quality Assurance/Quality Control

3.0 DIRECT-PUSH SAMPLING

Analysis of groundwater samples obtained with a direct-push sampling tool will be used to measure uranium and technetium-99 concentrations at select locations downgradient from and/or within areas where soil excavation/foundation removal activities have come within 5 feet of the base of the glacial overburden. The direct-push sampling tool will be used to collect groundwater samples from different vertical depths within the aquifer, rather than at a fixed monitoring depth.

At each direct-push sampling location, groundwater samples will be collected at the following depths below the water table: 1 foot, 10 feet, and at subsequent depth intervals of 10 feet down to a depth of 60 feet below the water table or until it can be verified that the entire vertical thickness of any ≥30 micrograms per liter (μg/L) total uranium plume or any ≥94 picoCuries per liter (pCi/L) technetium-99 plume that might be discovered has been sampled. Groundwater samples will be filtered using a 5-micron filter and analyzed for total uranium and technetium-99.

3.1 SURVEYING AND STAKING DIRECT-PUSH SAMPLING LOCATIONS

The ground elevation and location of each direct-push sampling location will be surveyed. A survey stake will be driven into the ground at each location and labeled. Prior to penetrating the ground surface, field crews shall conform to the requirements stated in procedure SH-0018, Penetration Permits. The corresponding sampling location number for the sampling location will be written on the survey stake. A unique number will identify each sampling location.

3.2 DIRECT PUSH REQUIREMENTS

Field crews shall conform to the requirements stated in procedure SH-0018, Penetration Permits, prior to penetrating the ground surface. Collection of groundwater samples using a direct push-sampling tool is described in Data Quality Objective GW-030, Revision 0, Collection of Groundwater Samples Using a Direct-Push Sampling Tool.

A Geoprobe™ mill-slotted sampler will be used to collect groundwater samples using direct push techniques as outlined in procedure EQT-06, Geoprobe™ Model 5400 Operation and Maintenance. The slot size of the sampler will be 0.02 inches and the length of the slotted section will be 2 feet. The well point will be advanced with a 1.50-inch outside diameter probe rod. A 1.25-inch outside diameter probe rod may be used on shallow holes with written permission (i.e., email) from the AR/WM Manager or

Technical Lead. Samples will be collected through 3/8 or 1/2-inch outside diameter polyethylene tubing equipped with a foot valve (ball check valve). New tubing will be used at each sampling depth for sample collection. The middle of the mill-slotted screen in the push rods will be positioned at the desired sampling depth.

Table 1 is a copy of a Geoprobe™ Aquifer Sampling Depth Form (Table 1). A unique Geoprobe™ Aquifer Sampling Depth Form will be prepared for each direct-push sampling event as discussed below:

- The location number will identify the direct-push sampling location on the Geoprobe™ Aquifer Sampling Depth Form.
- The surveyed surface elevation of the direct-push hole (refer to Section 3.1) will be recorded on the Geoprobe™ Aquifer Sampling Depth Form.
- The depth to water will be measured using a water level indicator to the nearest 0.1 foot. The depth to water will be recorded on the Geoprobe™ Aquifer Sampling Depth Form.
- A groundwater sample will be collected from a depth of 1 foot below the water table. If water is not collectible at 1 foot below the water table, then the sampling screen will be positioned 2 or 3 feet below the water table for the first sample depth.
- The sampler rods will be advanced to a depth that will position the middle of the sampling screen at the required sampling depth of 10 feet below the water table. The depth to water will be re-measured using a water level indicator. Past experience with direct-push sampling at the site has shown that sometimes the water table within the direct-push hole has not totally stabilized when the first sample is collected (1 foot below the water table), but will have stabilized by the time the second sample is collected. The second water level will be recorded on the Geoprobe™ Aquifer Sampling Depth Form.

  Note: The sample at 10 feet below the water table may be collected first if there is a need to remove clay from the mill-slots of the sampler rod (refer to the procedure outlined below).

- Using the water level measured when the sampling tool is at a depth of 10 feet below the water table, the sampling depth for the rest of the samples (e.g., 20 feet, 30 feet, 40 feet, 50 feet, and 60 feet below the water table) will be recorded on the Geoprobe™ Aquifer Sampling Depth Form.
- The next step is to proceed with collecting groundwater samples at the rest of the sampling depths by positioning the middle of the sampling screen at the required sampling depths. If clay should enter the sampler rods, then the clay should be removed through the addition of water into the sampler rods above the clay as well as advancing the rods 10 feet below the water table to loosen the compacted clay in the rods. The procedure that will be followed is outlined below:

  - Using polyethylene tubing, push the tubing into the rods and attempt to force the clay up into the tubing.

- Add up to 1 liter of deionized water to the probe rods in 250-ml increments with surging following each addition. The surging should be performed with polyethylene tubing with a ball check valve installed. The surging will convert the clay into a slurry that can be pumped to the surface by oscillating the tubing.

- In addition to the standard purge volume for 10 feet below the water table (0.6 liters), five times the volume of water added to the sampler rods will be collected prior to collecting the 10 feet below the water table sample.

- Following collection of the 10 feet below the water table sample, the sampler rods will be raised to 1 foot below the water table depth for sample collection. A total of 1 liter of water should be purged from 1 foot below the water table prior to sample collection to ensure a representative sample is collected.

Water sampling will continue at depth increments of 10 feet until the lower limit of any discovered ≥30 µg/L total uranium plume or ≥94 pCi/L technetium-99 plume has been located, or a depth of 60 feet below the water table has been reached. If obstructions are encountered or equipment complications prevent the sampler rods from extending to desired depths, then a different method for obtaining the sample may need to be used. The AR/WM Manager and/or technical lead will approve any alternate methods.

3.3 GROUNDWATER SAMPLE COLLECTION

One rod volume of groundwater will be purged at each sampling depth prior to collecting groundwater samples. The sampler rods will be purged from near the top of the water column or as close to the top (within 10 feet) to ensure representative samples are collected. Groundwater samples will be collected from as close to the screened interval as possible, taking care to avoid any clogging within the sampling tube due to accumulated silt/sand that has entered the mill slots. The same polyethylene tubing used to collect the groundwater sample from a particular interval or a dedicated purge tube will be used to purge the next sample interval. Purge volumes are based on the sample's depth below the water table. Estimated purge volumes are provided on the Geoprobe™ Aquifer Sampling Depth Form.

All samples will be filtered through a five-micron in-line filter attached to the discharge end of a peristaltic pump. These samples will be listed as 5 micron filtered on the Chain-of-Custody.

Groundwater samples collected using a direct-push tool are turbid and require filtering. The objective with filtering has been to collect a sample that undergoes the least amount of filtering but will still yield a representative sample. In past direct-push projects, both 5-micron filtered and 0.45-micron filtered

samples were collected and analyzed for total uranium. The 5-micron filtered samples were identified as "unfiltered" on the Chain-of-Custody, and the 0.45-filtered samples were identified as "filtered" on the Chain-of-Custody. Analytical results have been consistently similar regardless of whether or not the filter was 5-micron or 0.45-micron. The 5-micron filtered sample results were therefore used, and will continue to be used, in plume interpretations.

Because past experience has shown that the extra filtering, above and beyond the 5-micron filtering, is not required, 0.45-micron filtered samples will no longer be routinely collected. If turbidity problems are ever encountered with the 5-micron filtered samples, then 0.45 micron filtered samples may also be collected again, but this would be on a case-by-case specific basis only.

Table 2 lists the preservation requirement, holding time, optimum/minimum sample volumes, and container type that will be used to collect the water sample. Estimated preservative volumes are listed for both optimum and minimum volumes. Minimal preservative volumes should be used to obtain a pH of <2 in order to prevent dissolution of solids in the sample. If more than 1.5 times the amount of nitric acid specified in Table 2 is required for lowering the pH to <2, then the AR/WM Technical Lead will be contacted for direction. Analyses will be at Analytical Support Level (ASL) B and samples will be analyzed on site.

Table 3-3 lists the required quality assurance/quality control samples to be collected. One rinsate sample for total uranium and technetium-99 analysis shall be collected prior to the start of each direct-push sampling location by rinsing a clean mill-slotted sampler rod. A duplicate sample will be collected at each location at a depth of 1 foot below the water table.

3.4 PLUGGING OF DIRECT-PUSH SAMPLING HOLES

The sampler rods used for groundwater sampling will be completely removed from the borehole and the aquifer material will be allowed to collapse naturally up to the water table. Each direct-push sampling hole will be plugged with a sand interval followed by a bentonite slurry to the ground surface. The aquifer material will be allowed to collapse naturally up to the water table. After driving the rods to a depth of 3 feet above the water table, a 3-foot thick interval of clean silica sand will be placed into the base of the borehole above the water table. Bentonite slurry will be mixed to Sitewide Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Quality Assurance Project Plan (SCQ) specifications (approximately 9.4 pounds per gallon) and pumped through the rods to the bottom of the

rods as the rods are removed. Plugging the hole with bentonite slurry will begin 3 feet above the sand and continue to the ground surface. Procedure EQT-06, Geoprobe™ Model 5400 Operation and Maintenance, will be followed for grout pump assembly and preparation of the grout mixture. For the grout pumping method, the procedure outlined in Geoprobe™ Owner's Manual - GS-1000 Grout Machine/Operating Instructions (Section C- Secondary Tool String-Grout Pull Cap) will be followed.

The volume of bentonite slurry used in the plugging process will be monitored and recorded on a Borehole Abandonment Record. The direct-push sampling hole will be inspected two to three days following grouting and, if necessary, bentonite pellets will be placed into the hole up to the ground surface. In this event, the Borehole Abandonment Record will be revised with the additional volume information.

Grout volumes have been estimated for each direct-push sampling location using preliminary survey elevations, depth to water elevations, and the following formula [volume (gallons) = depth to water level in feet multiplied by 0.13] assuming 1.50-inch rods are used and the final direct-push sampling hole diameter is roughly 2.0 inches.

3.5 SAMPLE IDENTIFICATION

All groundwater samples collected for laboratory analysis will be assigned a unique sample identification number, also known as a Fernald Analytical Computerized Tracking System (FACTS) identification number. Each sample will also have a unique identifier consisting of the direct-push sampling location number and the depth (feet below the water table) at which the sample was collected. For example, the sample identifier for a sample collected at location 13311 at a depth of 1 foot below the water table would be "13311-01". The sample identifier for a duplicate sample collected at a depth of 20 feet below the water table would be "13311-20-D".

A rinsate from each direct-push sampling location will be collected and identified using the location number and letter "X". The "X" designates it as a rinsate sample. For example, the sample identifier for a rinsate sample collected at location 13311 would be "13311-X". Duplicate samples will be collected at each direct-push sampling location from the depth of 20 feet below the water table. The duplicate samples will be analyzed for total uranium.

4.0 EQUIPMENT DECONTAMINATION

Probe rods and sampling equipment will be decontaminated to at least Level I prior to initiating probing at the first location and between direct-push sampling locations using a high-pressure spray wash as per procedure SMPL-02, Liquid Sampling for Waste Management.

5.0 DISPOSITION OF WASTES

Any contact wastes generated during field activities will be managed per the area-specific Project Waste Identification Document. The Waste Acceptance Organization will be contacted for specific direction on a waste-stream by waste-stream basis. Any small amount of groundwater and/or decontamination water generated will be managed according to the Wastewater Discharge Request Form, FS-F-4045.

6.0 HEALTH AND SAFETY

A walkdown of the area by representatives from the Soil Sampling Group, or other involved groups, prior to the start of fieldwork shall be conducted to identify any hazards. Hazards must be corrected/controlled prior to the start of work. Concurrence to applicable safety permits (indicated by the signature of personnel assigned to this project) is expected from all project personnel in the performance of their assigned duties. The Soil Sampling Manager will ensure that all Soil Sampling personnel performing project-related activities have read or been trained to the Soil Sampling procedures applicable to this work. Soil Sampling managers and supervisors are responsible for ensuring that all field activities comply with the environmental Safety and Health requirements and for ensuring compliance with this PSP. All personnel have stop-work authority for imminent safety hazards resulting from noncompliance with the applicable Safety and Health practices. The radiological work requirements for activities will be detailed in activity-specific Radiation Worker Permits. Personnel performing work under a Radiation Worker Permit will be briefed on the specific hazards and task requirements before work begins. In addition to the applicable surveys that protect worker safety and health is an acknowledgment of understanding the PSP requirements and safety precautions outlined in the procedures and permits. A copy of applicable safety permits/surveys issued for worker safety and health shall be available for reference/review at each direct-push sampling location, and at the completion of the project, the completed forms shall be submitted for incorporation into the project files.

Prior to entry into an excavation area, the Competent Person for Excavations shall be contacted to assure that the daily inspection has been completed and the excavation is safe to enter. Sampling personnel must be briefed to the SDFP Integrated Health and Safety Plan (20100-HS-0002, Revision 0). In addition to permits, procedures, and the requirements of this document, Fluor Fernald and any subcontractors will comply with all federal, state, and local requirements (e.g., Occupational Safety and Health Administration). No operating heavy-duty equipment within a 50-foot buffer zone will be permitted during this sampling effort. Personnel are to demarcate a minimum of a 50-foot safe work zone for sampling locations in the field using a sufficient number of traffic cones to clearly demarcate the work zone.

All emergencies shall be reported immediately per the following.

- Cellular phone: 648-6511 to the site Communications Center
- Radio: Channel 2 by calling "CONTROL"
- Site phone: 911 to the Site Communications Center

7.0 QUALITY ASSURANCE/QUALITY CONTROL REQUIREMENTS

7.1 PROJECT REQUIREMENTS FOR SELF-ASSESSMENTS AND SURVEILLANCES

Self-assessment of work processes and operations may be undertaken to assure quality of performance. Self-assessment may be performed by the Soil Sampling Manager and will encompass technical and procedural requirements. Such self-assessments may be conducted at any point in the project.

Independent assessment may be performed by the Fluor Fernald Quality Assurance organization by conducting surveillances. At a minimum the surveillance will consist of monitoring/observing ongoing project activities and work areas to verify conformance to specified requirements. Surveillances shall be planned and documented in accordance with Section 12.3 of the SCQ.

7.2 VARIANCES TO THE PROJECT SPECIFIC PLAN

Variances shall be performed and documented in accordance with the requirements of Section 15.3 of the SCQ. They shall be documented on the Variance/Field Change Notice (V/FCN) Form, FD-F-4162. If the variance is time-critical, then the requirements of Section 15.3.1 shall be followed, which allows approval of the variance by hard copy, electronic mail, or fax with the original V/FCN to follow and be completed within five working days. Verbal approval is not allowed for variances; some form of documentation is required as stated in Section 15.3.1 of the SCQ. However, a location movement of less than 10 feet will not require a variance.

8.0 DATA MANAGEMENT

A data management process will be implemented so information collected during the direct-push sampling activity will be properly managed following completion of the field activities. As specified in Section 5.1 of the SCQ, sampling teams will describe daily activities on the Field Activity Log with sufficient detail so that the sampling team can reconstruct a particular situation without reliance on memory. Sample Collection Logs will be completed according to instructions specified in Section 6.1 of the SCQ.

All field measurements, observations, and sample collection information will be recorded as required and applicable on the Sample Collection Log, the Field Activity Log, and the Chain of Custody/Request for Analysis Form, the Borehole Abandonment Record, and the Geoprobe™ Aquifer Sampling Depth Form. The method of sample collection will be specified in the Field Activity Log. A unique sample identification number will appear on the Chain of Custody/Request for Analysis and will be used to identify the sample during analysis, data entry, and data management.

Technicians will review all field data for completeness and accuracy and then forward the data package to the Sample and Data Management organization for final review. The field data package will be filed in the Soil Sampling's project records.

The Sample and Data Management organization will perform data entry into the Sitewide Environmental Database. Field logs will be maintained in loose-leaf form during the field recording activities. Analytical data will be reviewed by the AR/WM Hydrogeology Project Lead prior to entry or transfer of the data into the Sitewide Environmental Database from FACTS.