# QUALITY ASSURANCE PROJECT PLAN

# Addendum—Adjacent Streets
# Non-Time Critical Removal Action
# PCB Boundary Refinement, Phase 2
# Lower Duwamish Waterway Superfund Site
# Terminal 117 Early Action Area

Prepared for

**City of Seattle**
and
**Port of Seattle**

For submittal to

**U.S. Environmental Protection Agency, Region 10**
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July 21, 2009

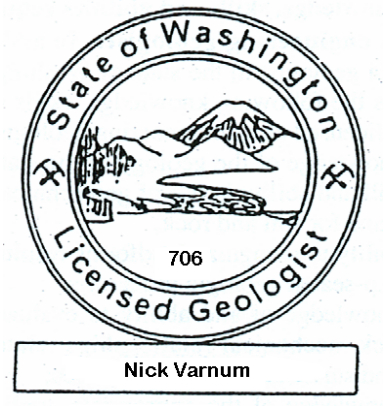
# SECTION A: PROJECT MANAGEMENT

## A1 TITLE AND APPROVAL PAGE

**QUALITY ASSURANCE PROJECT PLAN**
**ADDENDUM – ADJACENT STREETS PCB BOUNDARY REFINEMENT**
**SEATTLE, WASHINGTON**

Quality Assurance Project Plan Approvals

| | | |
|---|---|---|
| **Integral Project Manager** | Nick Varnum, L.G. | July 21, 2009<br>Date |
| **Integral QA Manager** | Kimberly Magruder Carlton | July 21, 2009<br>Date |
| **EPA Project Manager** | Piper Peterson Lee | Date |
| **EPA QA Manager** | Ginna Grepo-Grove | Date |



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## ACRONYMS AND ABBREVIATIONS

| ACRONYM | DEFINITION |
|---|---|
| **ASAOC** | Administrative Settlement Agreement and Order on Consent |
| **CAS** | Columbia Analytical Services, Inc. |
| **CERCLA** | Comprehensive Environmental Response, Compensation and Liability Act |
| **CFR** | Code of Federal Regulations |
| **City** | City of Seattle |
| **COC** | chemical of concern |
| **CSM** | conceptual site model |
| **CUL** | cleanup level |
| **DQI** | data quality indicator |
| **DQO** | data quality objective |
| **DU** | decision unit |
| **EAA** | early action area |
| **EDD** | electronic data deliverable |
| **EE/CA** | engineering evaluation/cost analysis |
| **EPA** | U.S. Environmental Protection Agency |
| **HASP** | health and safety plan |
| **mg/kg** | milligram per kilogram |
| **MIS** | multi-increment sampling |
| **MQO** | measurement quality objective |
| **ng/kg** | nanogram per kilogram |
| **NTCRA** | non-time-critical removal action |
| **PARCC** | precision, accuracy or bias, representativeness, completeness, and comparability |
| **PCB** | polychlorinated biphenyl |
| **PCDDs/PCDFs** | polychlorinated dibenzo-*p*-doixins and polychlorinated dibenzofurans |
| **Port** | Port of Seattle |
| **ppm** | parts per million |
| **ppt** | parts per thousand |
| **QA** | quality assurance |
| **QAPP** | quality assurance project plan |
| **QA/QC** | quality assurance/quality control |
| **ROW** | right-of-way |
| **SOP** | standard operating procedures |
| **Streets and Yards QAPP** | Investigation of Potential PCDD/PCDF Contamination in Soil City Street Rights-of-Way and Residential Yards QAPP (Integral 2008) |
| **T-117** | Terminal 117 |
| **TPH** | petroleum hydrocarbon |
| **WAC** | Washington Administrative Code |

## A3 DISTRIBUTION LIST

| | |
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| Integral QA Coordinator: | Kim Magruder Carlton |
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# A4 BACKGROUND AND PROBLEM DEFINITION

The City of Seattle (City) and the Port of Seattle (Port) are currently performing a non-time-critical removal action (NTCRA) at the Terminal 117 (T-117) Early Action Area (EAA) under the authority of the Administrative Settlement Agreement and Order on Consent (ASAOC) for the T-117 EAA pursuant to the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA) (USEPA 2005). The City is the lead in performing tasks that address the Adjacent Streets portion of the NTCRA EAA (USEPA 2005).

This addendum addresses the Second Phase (Phase 2) of the Adjacent Streets NTCRA PCB Boundary Refinement, Lower Duwamish Waterway Superfund Site Terminal 117 EAA (Integral 2009), an addendum to the T-117 EAA Quality Assurance Project Plan (QAPP; Windward et al. 2003). These documents provide guidance to field and laboratory personnel for the acquisition and analysis of additional soil samples to be collected from areas in the City of Seattle rights-of-way (ROWs) and residential yards outside the Adjacent Streets portion of the T-117 EAA NTCRA boundary.

The purpose of this second phase of the investigation is to determine what areas along 16th Avenue South, South Cloverdale Street, and upper and lower South Donovan Street, if any, should be included in the EAA removal boundary. This work is being performed by the City in cooperation with the U.S. Environmental Protection Agency (EPA), and in coordination with the Port. The results of this investigation may be incorporated into a revision of the 2008 Engineering Evaluation/Cost Analysis (EE/CA) (Windward et al. 2008) and used during design to address exceedances of polychlorinated biphenyls (PCBs) beyond the current EAA boundary.

The objectives of this investigation are as follows:

- to determine the presence of soil PCB concentrations above the cleanup level in residential yards along the north side of South Donovan Street and south side of South Cloverdale Street between 14th and 16th Avenue South
- to determine the presence of soil PCB concentrations above the CUL along the margins of 16th Avenue South, south of South Cloverdale Street
- to determine the presence of soil PCB concentrations above the CUL on the slope between upper and lower South Donovan Street
- to determine the presence of soil PCB concentrations within the right-of-way areas adjacent to the street areas along upper South Donovan Street
- evaluate the depth of PCB concentrations at the above locations

The scope of this additional work consists of the collection and analysis of discrete samples, and sampling and analysis of portions of residential yards and rights-of-way

areas adjacent to streets using a multi-increment sampling (MIS) methodology. The program described herein is based on the working assumption that a final soil CUL for PCBs will be set at 1 milligram per kilogram (mg/kg) or part per million (ppm).

This T-117 QAPP addendum addresses details that are specific to Phase 2 of the PCB boundary refinement soil investigation. The T-117 QAPP (Windward et al. 2003) and the Investigation of Potential PCDD/PCDF Contamination in Soil City Street Rights-of-Way and Residential Yards QAPP (Streets and Yards QAPP; Integral 2008), and the April 2009 T-117 QAPP Addendum for Adjacent Streets Boundary Refinement (Integral 2009) are referenced, as appropriate, for details that remain unchanged from previous investigations.

### A.4.1 Background

Background information about the site can be found in the 2008 draft EE/CA (Windward et al. 2008) and the Streets and Yards QAPP (Integral 2008).

### A.4.2 Problem definition

This QAPP Addendum has been prepared to describe additional sampling and analysis efforts to be undertaken to determine the presence of, and in some cases, refine the delineation of PCB exceedances on 16th Avenue South, South Cloverdale Street, and South Donovan Street for the purposes of soil cleanup.

## A5 ORGANIZATION AND SCHEDULE

This section presents the organizational structure and schedule for activities associated with this investigation.

### A.5.1 Task organization

Integral is performing this investigation on behalf of the City, in coordination with the Port and EPA. The organizational structure and associated contact information for this investigation is presented below. The organizational structure and associated contact information for this investigation remain the same as described in the QAPP Addendum (Integral 2009) with the following changes: Stefan Wodzicki will replace Susan FitzGerald as both Field Coordinator/Task Manager and MIS Specialist.

### A.5.2 Schedule

A preliminary schedule for this investigation, beginning with the submission of this QAPP through submittal of the draft investigation report to EPA and stakeholders, is outlined in the following table.

| MILESTONE | COMPLETION DATE (APPROXIMATE) |
|---|---|
| Draft QAPP to EPA/Stakeholders | July 10, 2009 |
| EPA/Stakeholder Comments on Draft QAPP | July 14, 2009 |
| Final QAPP to EPA/Stakeholders | July 16, 2009 |
| Begin Field Sampling | July 20, 2009 |
| Sample Analysis | |
| Final Data Package from Laboratory | August 21, 2009 |
| Data Validation | September 4, 2009 |
| Draft Investigation Report to EPA/Stakeholders | September 18, 2009 |

It is anticipated that all samples proposed in this QAPP will be collected during one field event scheduled to occur from approximately July 20 to August 5, 2009. Field sampling will include sample collection from test holes in streets, right-of-ways and residences where owners and tenants have submitted signed access agreements.

## A6 QUALITY OBJECTIVES AND CRITERIA FOR MEASUREMENT DATA

Data quality objectives (DQOs) and quality control criteria are the same as described in the April 2009 QAPP Addendum (Integral 2009).

## A7 SPECIAL TRAINING/CERTIFICATION

Training requirements for personnel participating in sample collection can be found in the T-117 QAPP (Windward et al. 2003). Integral's 2009 site health and safety plan will be used for this sampling effort. The Integral project manager will ensure that the field team receives the final approved version of this QAPP, supporting information from all QAPPs referenced in this document (Windward et al. 2003; Integral 2008, 2009), and the site health and safety plan (HASP) prior to the initiation of field activities.

## A8 DOCUMENTS AND RECORDS

Records will be maintained documenting all activities and data related to field sampling and chemical analyses. Results of data verification and validation activities will also be documented. Procedures for documenting field observations, laboratory records, and data reduction can be found in the T-117 QAPP (Windward et al. 2003). Copies of field sampling forms to be used during this investigation are included as Attachment 1 to the April 2009 QAPP Addendum (Integral 2009).

# SECTION B: DATA GENERATION AND ACQUISITION

This section presents the sampling design and sampling methods. Details regarding decontamination procedures, field-generated waste disposal, sample handling and custody, inspection/acceptance requirements for supplies and consumables, and data management can be found in the T-117 QAPP (Windward et al. 2003).

## B1 SAMPLING DESIGN

The sampling design for this investigation is intended to support the project objectives identified in Section A4, which are based on data gaps that have been identified based on the results of the April 2009 sampling event.

This section presents a brief summary of the remaining data gaps, and a description of the sampling design intended to address those data gaps. Sample types and locations are shown in Figure B1. Samples are summarized in Table B1.

Note that work described below includes borings below DUs and in the street. In most cases, these borings will be completed with push-probe methodology. However, due to the proximity of underground utilities, some of these borings may be moved a few feet or will be completed using hand auger methods. The method will be determined in the field once utilities have been located. The type of boring will be identified in the Investigation Report. Samples from borings beneath DUs will be archived and analyzed if the overlying subsurface DU (0.2 to 0.5 ft) total PCB concentration is greater than the CUL. Sample intervals from street borings will be consistent with historical intervals. Consistent with previous investigations, the surface interval of the street borings will be analyzed, and subsequent depth intervals will be analyzed if the overlying interval's total PCB concentration exceeds the CUL.

Finally, the laboratory will subsample submitted DU samples as described in Integral 2009. The laboratory will also subsample and archive a sample split for potential future analysis (Table B1).

### B.1.1 South Cloverdale Street planting strips

Upon completion of the April 2009 sampling event, no data gaps have been identified along South Cloverdale Street planting strips.

### B.1.2 South Cloverdale Street residential properties

A data gap has been identified at the following residences on the south side of South Cloverdale Street: 1445, 1429, 1425, 1421, and 1417. 2008 and 2009 point samples resulted in detections greater than 1 ppm PCBs in the planting strip at 1425 (sample YC14c surface only) and 1445 (YC100 surface and subsurface). Other point samples collected in 2008 in this area are below the CUL. MI samples will be collected in the front yards of these residences (Figure B1) consistent with the methods described in Integral 2009.

### B.1.3 16th Avenue South rights-of-way

Three remaining data gaps have been identified along the 16th Avenue South right-of-way.

The first data gap is along the eastern shoulder of 16th Avenue South where MIS sampling conducted at DU17 identified PCB concentrations above the CUL in both the 0.0 to 0.2 ft and 0.2 to 0.5 ft sampling intervals. A boring (P118) will be completed near the center of DU17 (Figure B1) to provide an indication of the potential depth of contamination.

The second data gap is along the western shoulder of 16th Avenue South where MI sampling conducted at DU16 identified PCB concentrations above the CUL (1.35 ppm) in the 0.2 to 0.5 ft sampling interval. Boring (P119) samples will be collected near the center of this DU to provide an indication of the potential depth of contamination (Figure B1).

The third data gap is the right-of-way on the west side of 16th Avenue South between the alleyway and South Donovan Street, where limited surface soil data currently exist. Samples proposed include MI sampling (DU20 and DU21) and borings (P120 and P121) near the center of the DUs to provide an indication of the potential depth of contamination. The borings will not be analyzed if the PCB concentrations in overlying DU samples, collected from the 0.2 to 0.5 ft depth interval, are below the CUL.

### B.1.4 Lower South Donovan Street bank slope

Data gaps have been identified on the bank slope between upper and lower South Donovan Street. PCB concentrations were above the CUL in surface and subsurface intervals for MI samples DU18 and DU19 located at the base of the slope. Borings (P108 and P116) will be completed near the center of DU19 and DU18 (Figure B1) to provide an indication of the potential depth of contamination. MI samples (DU27) and borings (P122) will be collected on the slope above DU18 on the western end of slope in the accessible area. MI samples (DU28) will be collected on the slope above DU19 on the eastern end of slope in the accessible area. Samples from borings (P122 and P107) near

the center of the DUs will be collected to evaluate PCB concentrations at depth. These samples will be analyzed if the PCB concentrations in their associated MI samples exceed the CUL.

### B.1.5 Lower South Donovan Street residential properties

There are limited existing soil data from the residential properties along the north side of South Donovan Street. To determine the presence of yard soil PCB concentrations above the CUL, MI samples (DU22 to DU26) will be collected from these properties (Figure B1). The driveway of 1426 South Donovan Street will not be sampled due to its use for access to a heavy equipment and landscape materials storage yard behind the residence. The new residences at the east end of the street will be sampled as a single DU to reflect the recent development of these properties.

### B.1.6 Upper South Donovan Street rights-of-way

There are no existing soil data from the rights-of-way located along upper South Donovan Street. Both MI samples (DU29 to DU31 and DU38) and push probe samples (P113 to P115 and P117) will be collected from the right-of-way locations along Upper South Donovan Street. MI samples will be collected along the southern shoulder of upper South Donovan Street from 17th Avenue South west toward 14th Avenue South. One DU (DU30) will be located just west of the boatyard on South Donovan (the extension of 16th Avenue South). Borings will be located within each DU in order to define the vertical extent of the remedial boundary. The boring samples will be analyzed if corresponding MI samples contain PCB concentrations that exceed the CUL.

### B.1.7 Street borings

Data gaps have been identified in the streets of 16th Avenue South and upper and lower South Donovan Street. Push probe samples will be collected at P104 to P106 and P109 to P112). Note that utility locating may result in moving these locations a few feet from the locations shown on Figure B1. Consistent with previous work, surface samples will be analyzed for the borings, subsequent intervals will be analyzed if the overlying interval is above the CUL.

### B.1.8 MIS triplicate sampling locations

Triplicate samples will be collected at several DUs to establish the statistical basis to evaluate the MI sampling results. The procedures for evaluating the results will be addressed under separate cover.

A key component of the statistical approach currently under discussion is the collection of triplicates for multiple DUs, for each of streets and yards, at both depth intervals, and over the

maximum extent of the range of PCB concentrations as possible. To accomplish this goal, four yard DUs and four street DUs (surface and subsurface) have been selected based on the rationale below. The triplicate DUs are highlighted on Figure B1.

### Yard triplicates

DU14. This existing triplicate DU has PCB concentrations near the CUL (Phase 1) and is the highest concentration expected to be seen in the yards. Existing data will be used to represent this DU.

DU01. The PCB concentration for the surface sample at this location is about 0.7 mg/kg (Phase 1) and represents a known point that is intermediate between DU14 and lower detections seen in most yards. Surface and subsurface duplicate and triplicate samples will be collected at DU01.

DU33. This new location is near and south of DU14 and is expected to represent intermediate PCB concentrations, if detected. Surface and subsurface triplicates will be collected at this location.

DU23. This new location on Donovan is expected to represent low PCB concentrations, if detected, and completes an area-wide distribution of triplicates. Surface and subsurface triplicates will be collected at this location.

### Street triplicates

DU17. This existing DU has PCB concentrations near the CUL (Phase 1). Surface and subsurface duplicate and a triplicate samples will be collected at DU17.

DU21. Based on observed concentration gradients, DU21 should represent intermediate PCB concentrations below the CUL, if detected, and appears to have experienced less disturbance due to recent construction than adjacent DU20. Surface and subsurface triplicates will be collected at this location.

DU27. Also based on observed concentration gradients, this DU should represent low PCB concentrations, if detected. Surface and subsurface triplicates will be collected at this location.

DU28. This DU is located just upslope of the DU with the highest PCB concentrations observed to date (Phase 1) and is assumed to represent high PCB concentrations for purposes of the statistical evaluation. Surface and subsurface triplicates will be collected at this location.

## B2 SAMPLING METHODS

All sampling methods, sample identification and chemical analyses will follow procedures presented in Section B of the April 2009 QAPP Addendum (Integral 2009), with the exception that soil borings and hand augers will be collected from locations associated with DUs. These borings will have sample intervals of 0.5 to 1.0 ft, 1.0 to 2.0 ft, and 2.0 to 4.0 ft. The methodology for hand auger sampling is described below. Sample intervals and submittal for analysis or archiving will follow Table B1.

### B.2.1 Hand auger sample collection

Hand auger sampling techniques will be used to collect boring samples, and possibly, MI samples, in locations where underground utilities are too close to employ the use of the push probe or pick axe. For borings, samples will be collected using a stainless steel 3.25-in. diameter hand auger from three discrete intervals (0.5 to 1.0 ft, 1.0 to 2.0 ft, and 2.0 to 4.0 ft) to the extent practicable. Samples will be processed following the same procedures for push probe sampling, with the exception that no effort will be made to exclude soil material in contact with the sides of the sampler.

If it is necessary to use hand auger methods at MI sample locations, MI samples at these locations will be collected from the sidewall of the hand auger boring.

## B3 QUALITY CONTROL

Quality control procedures, field QA/QC sampling, and sample identification will follow the April 2009 QAPP addendum (Integral 2009). QA/QC samples are identified on Table B1.

## B4 INSTRUMENT/EQUIPMENT TESTING, INSPECTION, AND MAINTENANCE

Detailed information regarding instrument/equipment testing, inspection and maintenance is presented in Section B6 of the Streets and Yards QAPP (Integral 2008).

## B5 INSTRUMENT/EQUIPMENT CALIBRATION AND FREQUENCY

Detailed information regarding instrument calibration and frequency is presented in Section B7 of the Streets and Yards QAPP (Integral 2008).

## B6 INSPECTION/ACCEPTANCE OF SUPPLIES AND CONSUMABLES

Detailed information regarding the inspection/acceptance requirements for supplies and consumables is presented in Section B8 of the Streets and Yards QAPP (Integral 2008).

## B7 DATA MANAGEMENT

Detailed information regarding data management requirements is presented in Section B10 of the Streets and Yards QAPP (Integral 2008).

# SECTION C: ASSESSMENT AND OVERSIGHT

Details of project assessment and oversight are presented in the original QAPP (Windward et al. 2003).

# SECTION D: DATA VALIDATION AND USABILITY

EcoChem will perform a full validation of all results as described in the Streets and Yards QAPP (Integral 2008).

# SECTION E: REFERENCES

Integral. 2008. City of Seattle streets and residential yards T-117 Early Action Area, investigation of potential PCDD/PCDF contamination in soil – quality assurance project plan. Prepared for City of Seattle. Integral Consulting, Inc., Mercer Island, WA. August 14, 2008.

Integral. 2009. Lower Duwamish Waterway Superfund Site, Terminal 117 Early Action Area. Quality Assurance Project Plan Addendum – Adjacent Streets PCB Boundary Refinement. Prepared for the City of Seattle and Port of Seattle. Integral Consulting Inc., Seattle, WA. April 17, 2009.

USEPA. 2005. Administrative settlement agreement and order on consent for removal action, Lower Duwamish Waterway Superfund Site Terminal 117 Early Action Area, Seattle, Washington. US EPA CERCLA Docket No. 10-2006-0103. December 22, 2005. US Environmental Protection Agency, Region 10, Seattle, WA.

Windward, DOF, and Onsite. 2003. Lower Duwamish Waterway Superfund Site, Terminal 117 Early Action Area. Quality assurance project plan. Prepared for the Port of Seattle. Windward Environmental LLC, Dalton, Olmsted & Fuglevand, Inc., and Onsite Enterprises, Inc., Seattle, WA.

Windward, ENSR|AECOM, Integral, and DOF. 2008. Terminal 117 Early Action Area. Revised engineering evaluation/cost analysis. Draft. Prepared for the Port of Seattle and the City of Seattle. Windward Environmental LLC, Seattle, WA; ENSR|AECOM, Seattle, WA; Integral Consulting, Inc., Mercer Island, WA; and Dalton, Olmsted & Fuglevand, Inc., Seattle, WA.

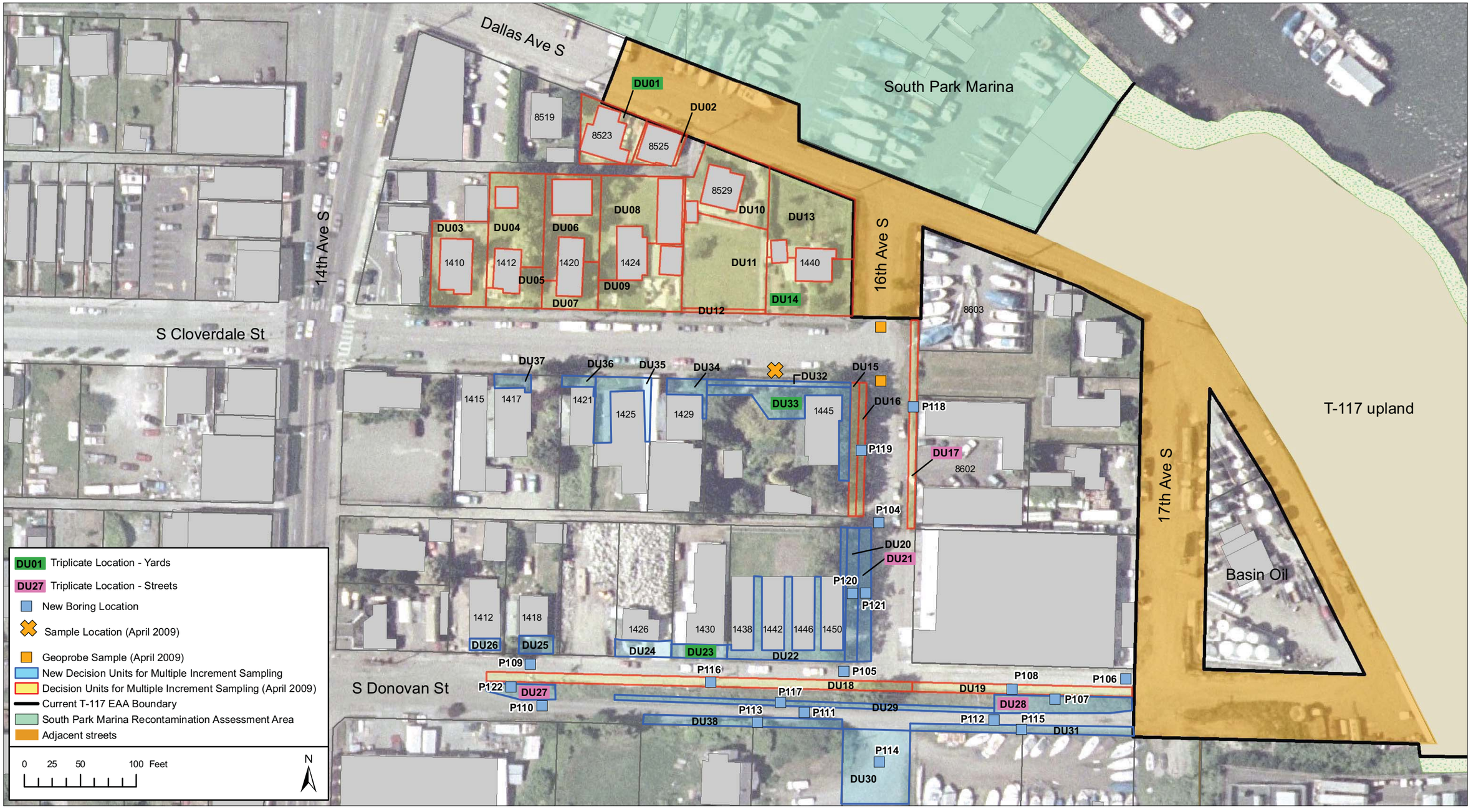


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**Figure B1.**
Adjacent Streets PCB Boundary Refinement
Sample Types and Locations

Table B1. Soil Sample Rationale, Identification, and Sampling Scheme for Adjacent Streets Boundary Refinement.

| SAMPLE LOCATION | SAMPLE ID | APPROXIMATE SAMPLE INTERVAL (ft bgs) | PCB AROCLORS | SUBSAMPLE AND ARCHIVE | QA/Comment |
|---|---|---|---|---|---|
| **Dallas Ave. S.** | | | | | |
| DU01 | DU51-0.0-0.2 | 0.0-0.2 | X | X | DU01 field duplicate (parent sample collected Apr 2009) |
| | DU51-0.2-0.5 | 0.2-0.5 | X | X | DU01 field duplicate (parent sample collected Apr 2009) |
| | DU61-0.0-0.2 | 0.0-0.2 | X | X | DU01 field triplicate (parent sample collected Apr 2009) |
| | DU61-0.2-0.5 | 0.2-0.5 | X | X | DU01 field triplicate (parent sample collected Apr 2009) |
| **MIS 16th Ave S** | | | | | |
| DU17 | DU67-0.0-0.2 | 0.0-0.2 | X | X | DU17 field duplicate (parent sample collected Apr 2009) |
| | DU67-0.2-0.5 | 0.2-0.5 | X | X | DU17 field duplicate (parent sample collected Apr 2009) |
| | DU77-0.0-0.2 | 0.0-0.2 | X | X | DU17 field triplicate (parent sample collected Apr 2009) |
| | DU77-0.2-0.5 | 0.2-0.5 | X | X | DU17 field triplicate (parent sample collected Apr 2009) |
| DU20 | DU20-0.0-0.2 | 0.0-0.2 | X | X | LDUP |
| | DU20-0.2-0.5 | 0.2-0.5 | X | X | LDUP |
| DU21 | DU21-0.0-0.2 | 0.0-0.2 | X | X | |
| | DU21-0.2-0.5 | 0.2-0.5 | X | X | |
| | DU71-0.0-0.2 | 0.0-0.2 | X | X | DU21 field duplicate |
| | DU71-0.2-0.5 | 0.2-0.5 | X | X | DU21 field duplicate |
| | DU81-0.0-0.2 | 0.0-0.2 | X | X | DU21 field triplicate |
| | DU81-0.2-0.5 | 0.2-0.5 | X | X | DU21 field triplicate |
| **MIS S Donovan St Yards** | | | | | |
| DU22 | DU22-0.0-0.2 | 0.0-0.2 | X | X | LDUP |
| | DU22-0.2-0.5 | 0.2-0.5 | X | X | LDUP |
| DU23 | DU23-0.0-0.2 | 0.0-0.2 | X | X | |
| | DU23-0.2-0.5 | 0.2-0.5 | X | X | |
| | DU173-0.0-0.2 | 0.0-0.2 | X | X | DU23 field duplicate |
| | DU173-0.2-0.5 | 0.2-0.5 | X | X | DU23 field duplicate |
| | DU183-0.0-0.2 | 0.0-0.2 | X | X | DU23 field triplicate |
| | DU183-0.2-0.5 | 0.2-0.5 | X | X | DU23 field triplicate |
| DU24 | DU24-0.0-0.2 | 0.0-0.2 | X | X | |
| | DU24-0.2-0.5 | 0.2-0.5 | X | X | |
| DU25 | DU25-0.0-0.2 | 0.0-0.2 | X | X | |
| | DU25-0.2-0.5 | 0.2-0.5 | X | X | |
| DU26 | DU26-0.0-0.2 | 0.0-0.2 | X | X | |
| | DU26-0.2-0.5 | 0.2-0.5 | X | X | |
| **MIS S Cloverdale St Yards** | | | | | |
| DU32 | DU32-0.0-0.2 | 0.0-0.2 | X | X | |
| | DU32-0.2-0.5 | 0.2-0.5 | X | X | |
| DU33 | DU33-0.0-0.2 | 0.0-0.2 | X | X | |
| | DU33-0.2-0.5 | 0.2-0.5 | X | X | |
| | DU83-0.0-0.2 | 0.0-0.2 | X | X | DU33 field duplicate |
| | DU83-0.2-0.5 | 0.2-0.5 | X | X | DU33 field duplicate |
| | DU93-0.0-0.2 | 0.0-0.2 | X | X | DU33 field triplicate |
| | DU93-0.2-0.5 | 0.2-0.5 | X | X | DU33 field triplicate |
| DU34 | DU34-0.0-0.2 | 0.0-0.2 | X | X | LDUP |
| | DU34-0.2-0.5 | 0.2-0.5 | X | X | LDUP |
| DU35 | DU35-0.0-0.2 | 0.0-0.2 | X | X | |
| | DU35-0.2-0.5 | 0.2-0.5 | X | X | |
| DU36 | DU36-0.0-0.2 | 0.0-0.2 | X | X | |
| | DU36-0.2-0.5 | 0.2-0.5 | X | X | |
| DU37 | DU37-0.0-0.2 | 0.0-0.2 | X | X | |
| | DU37-0.2-0.5 | 0.2-0.5 | X | X | |

Table B1. Soil Sample Rationale, Identification, and Sampling Scheme for Adjacent Streets Boundary Refinement.

| SAMPLE LOCATION | SAMPLE ID | APPROXIMATE SAMPLE INTERVAL (ft bgs) | PCB AROCLORS | SUBSAMPLE AND ARCHIVE | QA/Comment |
|---|---|---|---|---|---|
| **MIS S Donovan St Right-of-Way Samples** | | | | | |
| DU27 | DU27-0.0-0.2 | 0.0-0.2 | X | X | LDUP |
| | DU27-0.2-0.5 | 0.2-0.5 | X | X | LDUP |
| | DU177-0.0-0.2 | 0.0-0.2 | X | X | DU27 field duplicate |
| | DU177-0.2-0.5 | 0.2-0.5 | X | X | DU27 field duplicate |
| | DU187-0.0-0.2 | 0.0-0.2 | X | X | DU27 field triplicate |
| | DU187-0.2-0.5 | 0.2-0.5 | X | X | DU27 field triplicate |
| DU28 | DU28-0.0-0.2 | 0.0-0.2 | X | X | |
| | DU28-0.2-0.5 | 0.2-0.5 | X | X | |
| | DU78-0.0-0.2 | 0.0-0.2 | X | X | DU28 field duplicate |
| | DU78-0.2-0.5 | 0.2-0.5 | X | X | DU28 field duplicate |
| | DU88-0.0-0.2 | 0.0-0.2 | X | X | DU28 field triplicate |
| | DU88-0.2-0.5 | 0.2-0.5 | X | X | DU28 field triplicate |
| DU29 | DU29-0.0-0.2 | 0.0-0.2 | X | X | |
| | DU29-0.2-0.5 | 0.2-0.5 | X | X | |
| DU30 | DU30-0.0-0.2 | 0.0-0.2 | X | X | |
| | DU30-0.2-0.5 | 0.2-0.5 | X | X | |
| DU31 | DU31-0.0-0.2 | 0.0-0.2 | X | X | |
| | DU31-0.2-0.5 | 0.2-0.5 | X | X | |
| DU38 | DU38-0.0-0.2 | 0.0-0.2 | X | X | |
| | DU38-0.2-0.5 | 0.2-0.5 | X | X | |
| **Street Borings** | | | | | |
| P104 | P104-0.0-1.0 | 0.0-1.0 | X | | |
| | P154-0.0-1.0 | 0.0-1.0 | | | Field duplicate of P104-0.0-1.0 |
| | P104-1.0-2.0 | 1.0-2.0 | Archive | | Analyze if P104-0.0-1.0 > CUL |
| | P154-1.0-2.0 | 1.0-2.0 | Archive | | Field duplicate of P104-1.0-2.0 |
| | P104-2.0-4.0 | 2.0-4.0 | Archive | | Analyze if P104-1.0-2.0 > CUL |
| | P154-2.0-4.0 | 2.0-4.0 | Archive | | Field duplicate of P104-2.0-4.0 |
| P105 | P105-0.0-1.0 | 0.0-1.0 | X | | |
| | P105-1.0-2.0 | 1.0-2.0 | Archive | | Analyze if P105-0.0-1.0 > CUL |
| | P105-2.0-4.0 | 2.0-4.0 | Archive | | Analyze if P105-1.0-2.0 > CUL |
| P106 | P106-0.0-1.0 | 0.0-1.0 | X | | |
| | P106-1.0-2.0 | 1.0-2.0 | Archive | | Analyze if P106-0.0-1.0 > CUL |
| | P106-2.0-4.0 | 2.0-4.0 | Archive | | Analyze if P106-1.0-2.0 > CUL |
| P109 | P109-0.0-1.0 | 0.0-1.0 | X | | |
| | P109-1.0-2.0 | 1.0-2.0 | Archive | | Analyze if P109-0.0-1.0 > CUL |
| | P109-2.0-4.0 | 2.0-4.0 | Archive | | Analyze if P109-1.0-2.0 > CUL |
| P110 | P110-0.0-1.0 | 0.0-1.0 | X | | |
| | P110-1.0-2.0 | 1.0-2.0 | Archive | | Analyze if P110-0.0-1.0 > CUL |
| | P110-2.0-4.0 | 2.0-4.0 | Archive | | Analyze if P110-1.0-2.0 > CUL |
| P111 | P111-0.0-1.0 | 0.0-1.0 | X | | |
| | P111-1.0-2.0 | 1.0-2.0 | Archive | | Analyze if P111-0.0-1.0 > CUL |
| | P111-2.0-4.0 | 2.0-4.0 | Archive | | Analyze if P111-1.0-2.0 > CUL |
| P112 | P112-0.0-1.0 | 0.0-1.0 | X | | |
| | P112-1.0-2.0 | 1.0-2.0 | Archive | | Analyze if P112-0.0-1.0 > CUL |
| | P112-2.0-4.0 | 2.0-4.0 | Archive | | Analyze if P112-1.0-2.0 > CUL |

Table B1. Soil Sample Rationale, Identification, and Sampling Scheme for Adjacent Streets Boundary Refinement.

| SAMPLE LOCATION | SAMPLE ID | APPROXIMATE SAMPLE INTERVAL (ft bgs) | PCB AROCLORS | SUBSAMPLE AND ARCHIVE | QA/Comment |
|---|---|---|---|---|---|
| **DU Borings** | | | | | |
| P107 | P107-0.5-1.0 | 0.5-1.0 | Archive | | Analyze if DU28-0.2-0.5 > CUL |
| | P107-1.0-2.0 | 1.0-2.0 | Archive | | Analyze if P107-0.5-1.0 > CUL |
| | P107-2.0-4.0 | 2.0-4.0 | Archive | | Analyze if P107-1.0-2.0 > CUL |
| P108 | P108-0.5-1.0 | 0.5-1.0 | **X** | | DU19 > CUL |
| | P108-1.0-2.0 | 1.0-2.0 | Archive | | Analyze if P108-0.5-1.0 > CUL |
| | P108-2.0-4.0 | 2.0-4.0 | Archive | | Analyze if P108-1.0-2.0 > CUL |
| P113 | P113-0.5-1.0 | 0.5-1.0 | Archive | | Analyze if DU38-0.2-0.5 > CUL |
| | P113-1.0-2.0 | 1.0-2.0 | Archive | | Analyze if P113-0.5-1.0 > CUL |
| | P113-2.0-4.0 | 2.0-4.0 | Archive | | Analyze if P113-1.0-2.0 > CUL |
| P114 | P114-0.5-1.0 | 0.5-1.0 | Archive | | Analyze if DU30-0.2-0.5 > CUL |
| | P114-1.0-2.0 | 1.0-2.0 | Archive | | Analyze if P114-0.5-1.0 > CUL |
| | P114-2.0-4.0 | 2.0-4.0 | Archive | | Analyze if P114-1.0-2.0 > CUL |
| P115 | P115-0.5-1.0 | 0.5-1.0 | Archive | | Analyze if DU31-0.2-0.5 > CUL |
| | P115-1.0-2.0 | 1.0-2.0 | Archive | | Analyze if P115-0.5-1.0 > CUL |
| | P115-2.0-4.0 | 2.0-4.0 | Archive | | Analyze if P115-1.0-2.0 > CUL |
| P116 | P116-0.5-1.0 | 0.5-1.0 | **X** | | DU18 > CUL |
| | P116-1.0-2.0 | 1.0-2.0 | Archive | | Analyze if P116-1.0-2.0 > CUL |
| | P116-2.0-4.0 | 2.0-4.0 | Archive | | Analyze if P116-1.0-2.0 > CUL |
| P117 | P117-0.5-1.0 | 0.5-1.0 | Archive | | Analyze if DU29-0.2-0.5 > CUL |
| | P117-1.0-2.0 | 1.0-2.0 | Archive | | Analyze if P117-1.0-2.0 > CUL |
| | P117-2.0-4.0 | 2.0-4.0 | Archive | | Analyze if P117-1.0-2.0 > CUL |
| P118 | P118-0.5-1.0 | 0.5-1.0 | **X** | | DU17 > CUL |
| | P168-0.5-1.0 | 0.5-1.0 | **X** | | Field duplicate of P118-0.5-1.0 |
| | P118-1.0-2.0 | 1.0-2.0 | Archive | | Analyze if P118-0.5-1.0 > CUL |
| | P118-2.0-4.0 | 2.0-4.0 | Archive | | Analyze if P118-1.0-2.0 > CUL |
| P119 | P119-0.5-1.0 | 0.5-1.0 | **X** | | DU16 > CUL |
| | P119-1.0-2.0 | 1.0-2.0 | Archive | | Analyze if P119-0.5-1.0 > CUL |
| | P119-2.0-4.0 | 2.0-4.0 | Archive | | Analyze if P119-1.0-2.0 > CUL |
| P120 | P120-0.5-1.0 | 0.5-1.0 | Archive | | Analyze if DU20-0.2-0.5 > CUL |
| | P120-1.0-2.0 | 1.0-2.0 | Archive | | Analyze if P120-0.5-1.0 > CUL |
| | P120-2.0-4.0 | 2.0-4.0 | Archive | | Analyze if P120-1.0-2.0 > CUL |
| P121 | P121-0.5-1.0 | 0.5-1.0 | Archive | | Analyze if DU21-0.2-0.5 > CUL |
| | P121-1.0-2.0 | 1.0-2.0 | Archive | | Analyze if P121-0.5-1.0 > CUL |
| | P121-2.0-4.0 | 2.0-4.0 | Archive | | Analyze if P121-1.0-2.0 > CUL |
| P122 | P122-0.5-1.0 | 0.5-1.0 | Archive | | Analyze if DU27-0.2-0.5 > CUL |
| | P122-1.0-2.0 | 1.0-2.0 | Archive | | Analyze if P122-0.5-1.0 > CUL |
| | P122-2.0-4.0 | 2.0-4.0 | Archive | | Analyze if P122-1.0-2.0 > CUL |

**Notes**

See Figure B1 for sample locations.

Shaded cells indicate anticipated lab (for MI samples only) or field QA duplicate/triplicate samples. Actual sample locations and intervals may vary based on field conditions.

The sample IDs and sample intervals may be modified as discussed in Section B of the QAPP.

Archive - The sample will be collected and submitted to the analytical laboratory for archival storage, pending the results of analyzed samples.

Hand auger and push probe samples will be anaylzed only if DU results exceed the CUL, lower depth intervals will be analyzed only if the higher interval exceeds the CUL.

bgs - below

ft - feet.

LDUP - laboratory MIS processing duplicate sample.

MIS - multi-incremental sampling.

NA - not applicable

X - Sample to be analyzed.