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Sampling and Analysis Plan PCB Data Gaps, Concrete and Soil Old Town Phase 1 Demolition

Rev 0

September 2015

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Sampling and Analysis Plan
PCB Data Gaps, Concrete and Soil
Old Town Phase 1 Demolition
Rev 0, September 2015

REGISTERED GEOLOGIST
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Acronyms and Abbreviations

CFR	Code of Federal Regulations
COC	chain of custody
DMS	Dynamic Management Solutions, LLC
EDD	electronic data deliverable
EPA	US Environmental Protection Agency
LBNL	Lawrence Berkeley National Laboratory
LCD	laboratory control duplicate
LCS	laboratory control sample
LOD	limit of detection
LOQ	limit of quantitation
MS	matrix spike
MSD	matrix spike duplicate
PCB	polychlorinated biphenyl
QA	quality assurance
QC	quality control
RPD	relative percent difference
SAP	Sampling and Analysis Plan
TSCA	Toxic Substances Control Act of 1976

1 INTRODUCTION

Lawrence Berkeley National Laboratory (LBNL) is in the process of demolishing buildings and building slabs in an area of the facility called "Old Town," shown as the "Site" on Figure 1. Some of these buildings have already been demolished and those remaining do not provide effective space for LBNL's current research needs. The demolition is being conducted in phases, with the first phase (Phase I) consisting of the demolition of Buildings 5, 16, and 16A, removal of the foundation slabs of these three buildings and the foundation slabs at previously demolished Buildings 40, 41, 52, and 52A, excavation of contaminated soils, and grading of the area (Figure 2). As part of this phase, LBNL will remove underground utilities, pits, sumps, and other subsurface infrastructure associated with the buildings.

Polychlorinated biphenyls (PCBs) have been identified in building materials, concrete, and soil within the Phase 1 project footprint, and most recently in the storm drain system and creeks serving the Old Town area. LBNL is working with the United States Environmental Protection Agency (EPA) Region 9 PCB coordinator to develop a cleanup plan for PCBs in the project footprint per requirements of the Toxic Substances Control Act (TSCA). Additional samples are being collected to close data gaps regarding the presence and extent of PCBs in building materials per the *Sampling and Analysis Plan for PCBs – Above Slab Building Characterization Old Town Phase I Demolitions Rev 4*, August 2015a. The extent of the PCB contamination in the concrete slabs and soils has not been fully characterized. To clean up the contamination or implement controls, such as land use restrictions, to protect human health and ecological receptors, additional characterization is required.

1.1 Objectives and Scope

The objective of this sampling and analysis plan (SAP) is to provide the rationale, approach, and direction for collection of additional data to characterize the extent of PCB contamination in soil and concrete slabs within the Phase I project boundary to support an application for PCB cleanup meeting all applicable requirements of TSCA.

The scope of this plan is the collection of samples in areas where PCBs from oils, building materials or other sources (hereinafter referred to as "PCBs") are of concern, which includes the concrete slabs and soils beneath and around Buildings 16; 16A; former Buildings 52 and 52A; the electrical pad; the former radioactive waste processing yard to the north and northwest of Building 5; and the electrical pad; and in soil to the east of Building 5.

No activities that would have involved PCB use were conducted in Buildings 5, 40, or 41 and available sample data indicate that PCB contamination is not a concern in these buildings; however data gaps exist regarding contamination outside of Building 5, on the east side where a number of vacuum pumps were located.

This SAP conforms to requirements specified in Section 8 of the *Soil Management Plan Old Town Demolition Project Phase One* (LBNL, 2014) including the following minimum requirements:

- A description of the activities that require sampling and analysis;
- Identification of the chemical contaminants of potential concern;
- Sampling design, including specification of the number, locations, and depths where samples will be collected;

- Sampling and analysis approach, including description of the sampling equipment and requirements for collecting, labeling, storing, and transporting samples to the laboratory;
- Sample analysis requirements, including specific reference to the laboratories that will perform the analyses, the analytical methods to be used, holding times, and the required reporting limits.

LBNL has approved this SAP and will oversee DMS's execution of the sampling and analysis specified herein. Any additional sampling not specified in this SAP but required to characterized the extent of the contamination for the purpose of PCB cleanup will be addressed in an application for a risk-based cleanup of PCB remediation wastes (hereafter referred to as the cleanup plan) or in an amendment to this SAP, depending on the requirements of the demolition project schedule. LBNL will provide a copy of this SAP to the EPA for information and will include data collected per this SAP in a cleanup application submitted to the EPA, as discussed in Section 2.

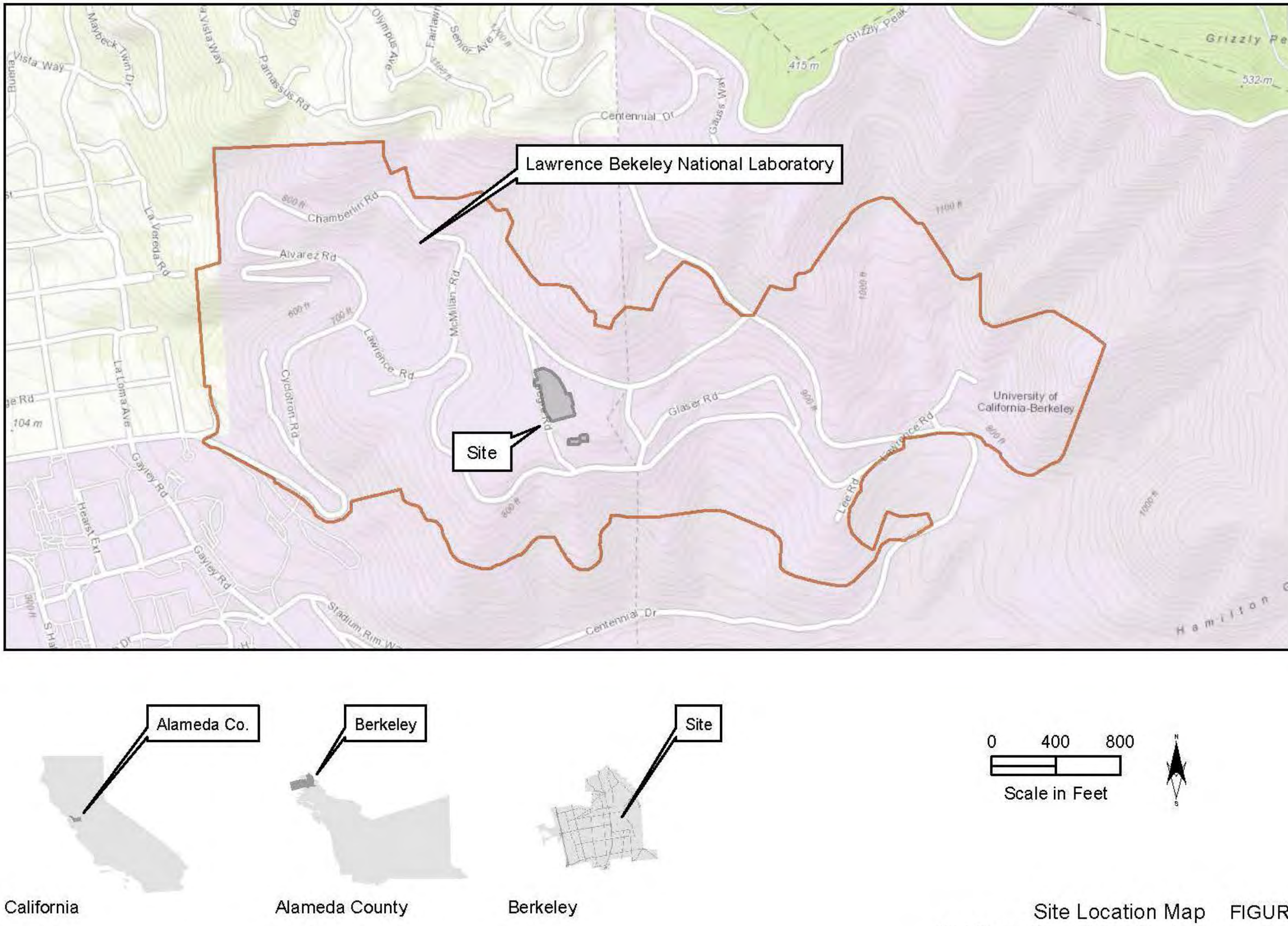
1.2 Site Setting

LBNL is located in Berkeley, California (Figure 1). Approximately half of LBNL is developed and half is open space. The developed areas include buildings that house laboratories, offices, meeting rooms, fabrication, and maintenance shops that support LBNL research activities. LBNL is managed by the University of California (UC) for the U.S. Department of Energy (DOE). The property consists of parcels that are owned by UC and leased to the DOE. In general, the structures at LBNL are owned by the DOE.

LBNL began operations as an accelerator laboratory in 1931 on the campus of UC Berkeley. In 1939 the Laboratory moved to its current location with the groundbreaking for the 184-inch cyclotron (Harvey 2003). The area of the cyclotron building (the original Building 6) and adjacent support shops and laboratories to the north and east of Building 6 formed the core of LBNL's operations throughout the 1940s, and therefore are now commonly referred to as "Old Town" (Figure 2).

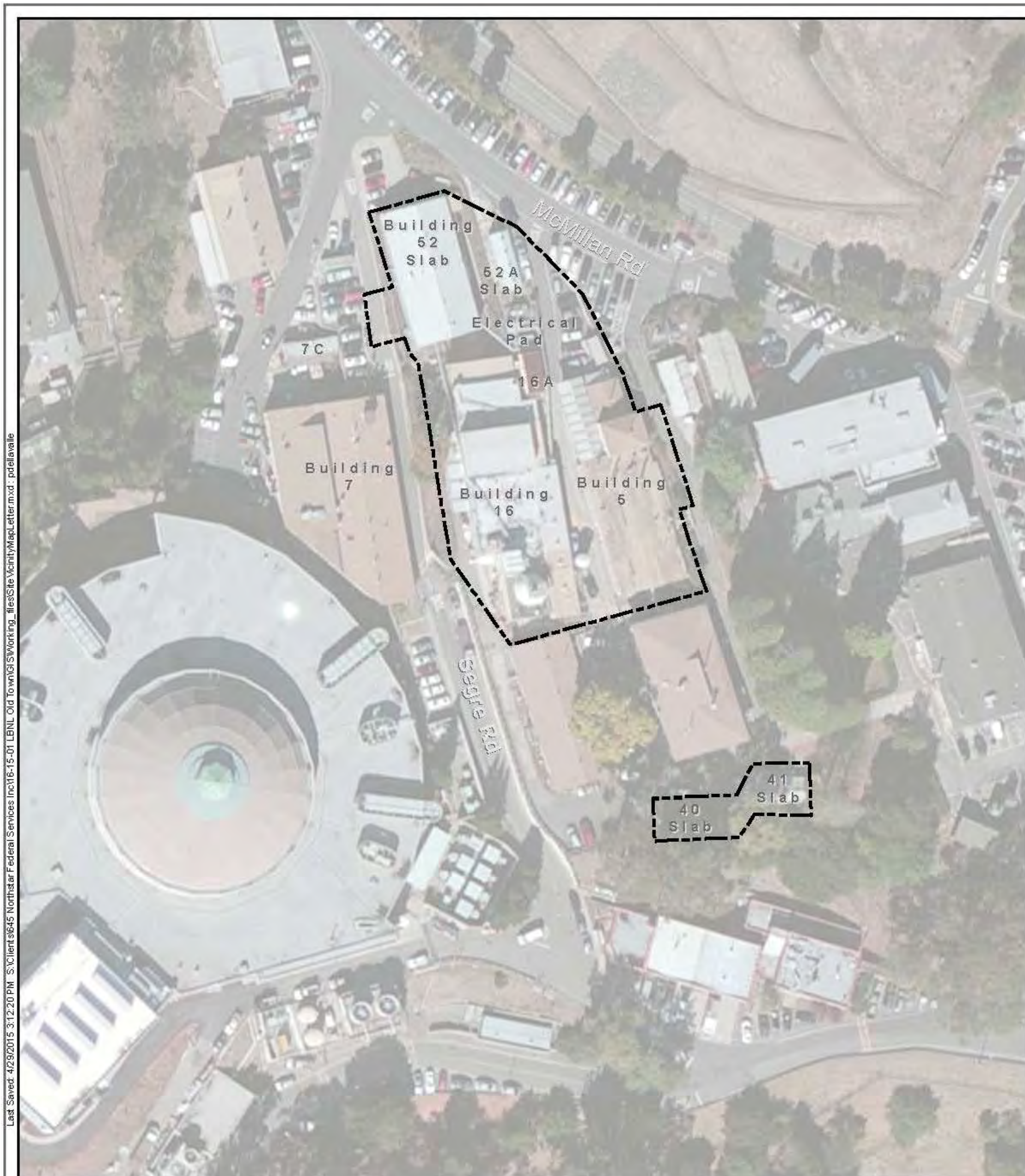
Many of the Laboratory's buildings are over 40 years old, an age at which demolition and replacement often become more cost-effective than continued use. Moreover, many of the Laboratory's buildings were built as temporary facilities. The buildings in Old Town were constructed in the 1940s and 1950s and were not built to current seismic, fire, and other safety standards.

LBNL's Long Range Development Plan includes the following general development zones: 1) Research and Academic, 2) Central Commons, 3) Support Services, and 4) Perimeter Open Space. The "Research and Academic" zone, largely corresponds with, or is adjacent to, the already developed portions of LBNL, including the Old Town area.



Site Location Map
Old Town Demolition Project
Berkeley, California

FIGURE
1



LEGEND

Approximate Old Town Demolition Area Boundary; Site Area 1 Acre

N
0 50 100
Scale in Feet

Figure 2

Site Vicinity Map
Old Town Demolition Project

Berkeley, California

1.2.1 Geology and Soils

Soils at the project area form a thin (less than 10-foot-thick) veneer over the underlying bedrock. The soils have been assigned to the Xerorthents-Millsholm complex. The Xerorthents soil consists of loam and silt loam, containing fragments of shale and sandstone. The Millshohm soil consists of silt loam.

Two non-marine bedrock units are present in the project area. The structurally lowest rocks are siltstones and fine-grained sandstones of the Orinda Formation. The Orinda Formation is overlain by volcanic and volcaniclastic rocks of the Moraga Formation. Although some outcrops of Moraga Formation appear to be relatively undisturbed, most outcrops consist of loosely consolidated angular blocks of andesitic volcanic breccia, andesite, thin sandy siltstone layers, volcaniclastic gravelly sandstone, and minor basalt. Rocks found along the contact between the Moraga and Orinda Formations in many places comprise a mixture of rock types common to both the Moraga and Orinda Formations, and have therefore been mapped as the informally named “Mixed Unit.” The Mixed Unit appears to represent structurally interleaved portions of the Moraga and Orinda Formations, and not a separate stratigraphic unit.

The contact between the Orinda Formation and overlying units forms an undulatory surface with the Moraga Formation volcanic rocks and the Mixed Unit generally occupying depressions in this surface. The undulatory upper contact of the Orinda Formation is interpreted to be an eroded paleosurface upon which the overlying volcanic rock masses may have been deposited by downslope landslide movement. Movement of such paleolandslides would have long preceded development of the current topography and therefore has no bearing on current landslide hazards. Colluvium is present throughout much of the project area.

1.2.2 Hydrogeology

Groundwater beneath the project area is primarily present in the bedrock units. The surficial units (i.e. colluvium and artificial fill) are generally above the water table throughout most of the area. Depth to groundwater ranges from approximately 10 to 25 feet below ground surface.

The Orinda Formation and the Mixed Unit rocks have relatively low hydraulic conductivities (on the order of 1 x 10^{-8} meters per second or less) while the Moraga Formation has generally higher hydraulic conductivities (on the order of 1 x 10^{-6} meters per second) in comparison to the underlying units. Since the Moraga Formation volcanic rock masses in the project area either crop out at the surface or are overlain by only a thin veneer of generally unsaturated colluvium or artificial fill, groundwater encountered in the Moraga Formation is interpreted to be unconfined. However, it is possible that deeper horizons within the low permeability Mixed Unit and Orinda Formation contain groundwater under confined conditions.

The groundwater flow direction is strongly influenced by the subsurface geometry of the contact between the Moraga Formation and underlying rocks. Groundwater flows approximately northward and northwestward at the north end of the project area, westwards near the central and southern parts of the area, and southwards in the vicinity of the Buildings 40 and 41 slabs.

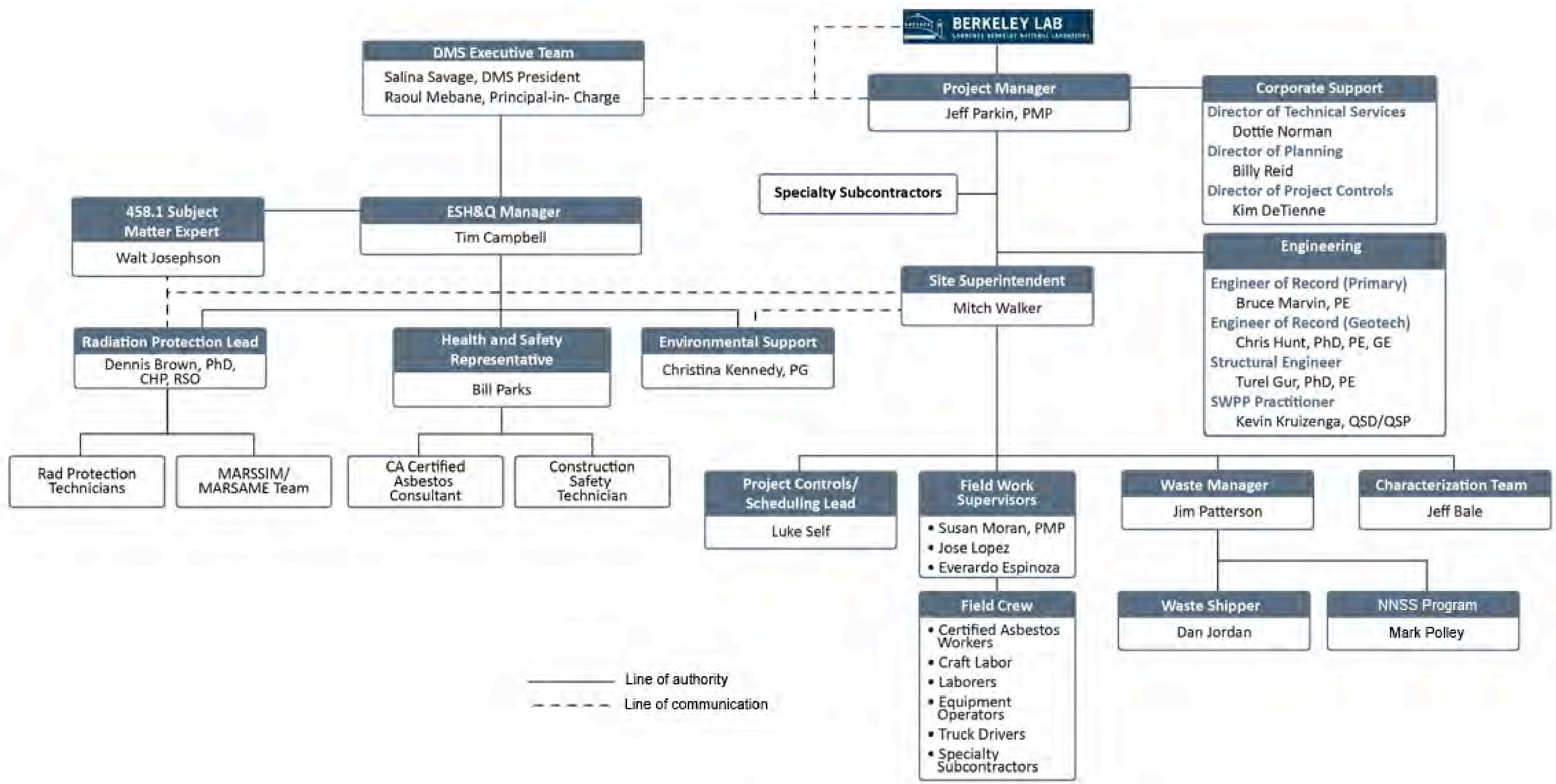
1.3 Project Organization

The key project personnel responsible for the activities described in this SAP are listed in **Table 1,** along with their responsibilities and contact information. An organization chart that shows how these key personnel fit into the overall Old Town demolition project is shown on **Figure 3**.

Table 1. Key Project Personnel Contact Information and Responsibilities

Title	Name	Phone Number Email Address	Responsibilities
Contractor Project Manager	Jeffry Parkin DMS, LLC	707-430-3601 jparkin@dmsmp.com	Oversee project activities
PCB Characterization Technical Manager	Christina Kennedy DMS, LLC	(707) 363-5740 CKennedy@dmsmp.com	Develop technical approach and oversee characterization.
Contractor Quality Assurance Officer	Pamela Jespersen DMS, LLC	925-783-8712 pjespersen@dmsmp.com	Oversee chemical data quality
Contractor Site Superintendent	Mitch Walker DMS, LLC	859-803-0389 mitchellwalker@dmsmp.com	Oversee site activities
Laboratory Quality Assurance Officer	Teresa Morrison Curtis & Tompkins, Ltd.	510-204-2237 Teresa.Morrison@ctberk.com	Oversee laboratory operations and assure control of data quality

Figure 3. Project Organization



1.4 Report Organization

This SAP is organized into the following sections:

- Section 1—Introduction
- Section 2—Regulatory Framework
- Section 3—Background
- Section 4—Project Objectives
- Section 5—Sampling Design and Rationale
- Section 6—Request for Analyses
- Section 7—Field Methods and Procedures
- Section 8—Sample Containers, Preservation and Holding Times
- Section 9—Sample Documentation and Shipment
- Section 10—Quality Control
- Section 11—Field Variances
- Section 12—Field Health and Safety Procedures
- Section 13—Report
- Section 14—References

Tables and figures follow their first reference in the text. The text is followed by appendices, which provide supporting information.

2 REGULATORY FRAMEWORK

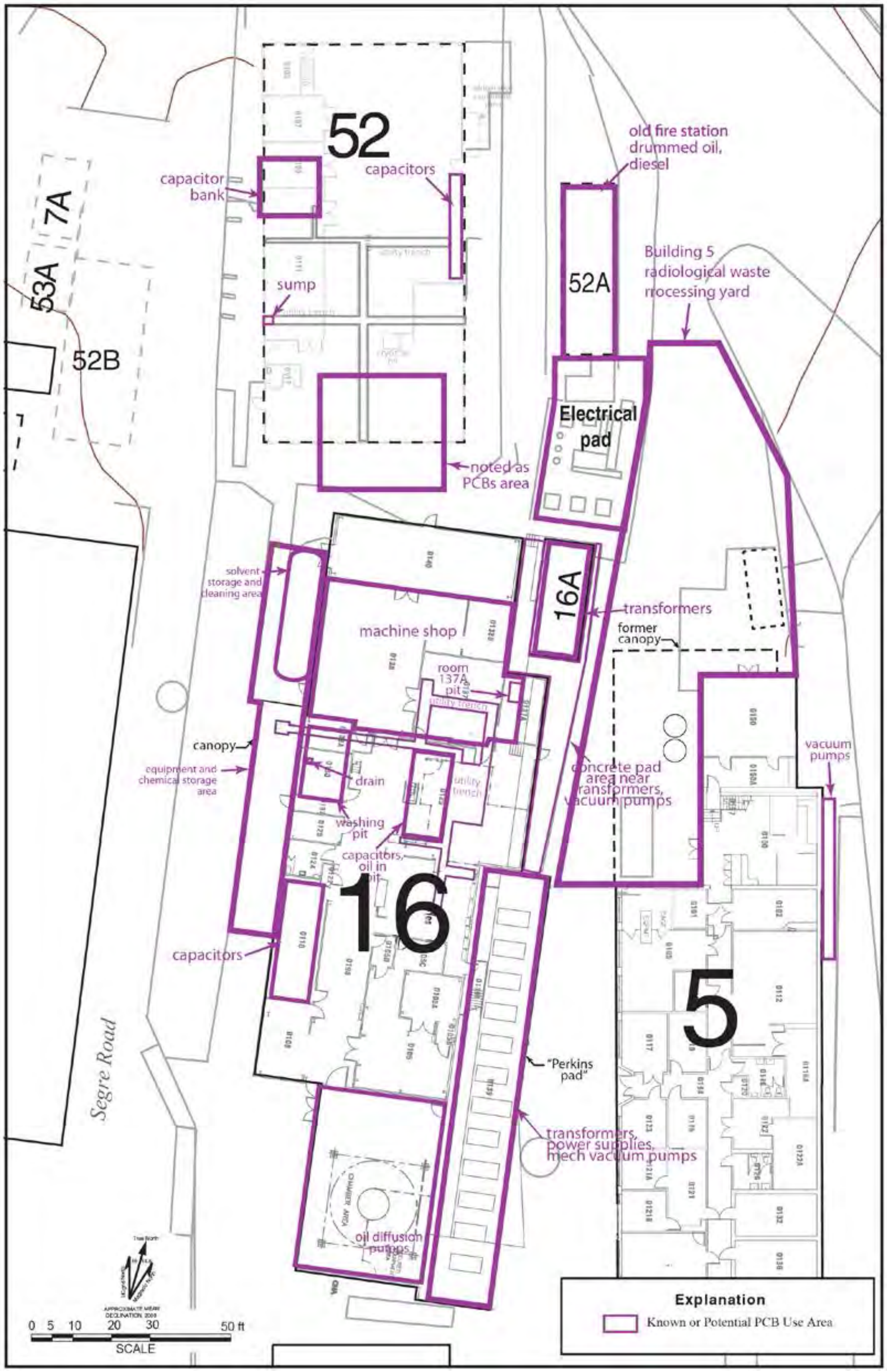
The EPA enforces regulations implementing TSCA, promulgated at 40 Code of Federal Regulations (CFR), Part 761. LBNL is working with the EPA to develop a cleanup plan per the requirements of 40 CFR Section 761.61(c) for risk-based cleanups to remediate releases of PCBs that have occurred in the project area. Per 40 CFR Section 761.3 areas within a cleanup site encompass "...the areal extent of contamination and all suitable areas in very close proximity to the contamination necessary for implementation of a cleanup of PCB remediation waste." To comply with this requirement, LBNL must characterize the project area adequately to be able to provide the information required by paragraph (a)(3) of section 761.61, which includes the nature of the contamination, including kinds of materials contaminated and the location and extent of the identified contaminated area.

For the purposes of this SAP, a presumptive risk-based cleanup goal based on the EPA Region 9 regional screening level for industrial soil of 0.97 mg/kg for the sum of high risk Aroclors (1221, 1232, 1242, 1248, 1254, 1260, and 5460) has been selected. This cleanup goal is subject to refinement in the cleanup plan that will be approved by the EPA.

3 BACKGROUND

The following discussions of historical operations are based on information compiled by LBNL that includes documentation of building uses, interviews with present and past employees, and review of dated historical photographs taken during various stages of construction and use of buildings in the Old Town. Figure 4 presents the locations of known or potential historical PCB use, based on the compiled information.

Figure 4. Areas of Known and Potential PCB Uses



3.1 Site Description

As stated in Section 1 above, LBNL is in the process of demolishing buildings and building slabs in Old Town, and has already demolished the superstructures of buildings 40, 41, 52, and 52A. The remaining buildings–Buildings 5 and 16/16A–will be removed, followed by removal of the slabs of Buildings 5, 16, 16A, 40, 41, 52, 52A, and the slab of the electrical pad south of Building 52A. The associated subsurface infrastructure such as underground utilities, pits, and sumps will be removed, along with contaminated soil in the project area. As shown on Figure 2, the project area is approximately one acre in size.

The Old Town buildings were used primarily as research laboratories or secondary support facilities related to the 184-inch cyclotron, including craft and maintenance shops, storage facilities, and offices. More recently, a number of the buildings were used to support the Advanced Light Source operations (Weiss Associates, 2010).

3.1.1 Building 5

Building 5 is a 7,176 square foot wood-frame and poured concrete building, also known as the “chemistry annex.” The building was constructed in 1947 and was designed for high-level radioactive chemistry work. The central part of the building housed various radioactive work areas and laboratories with high-level radioactive experiments (“hot” labs). The northern part was primarily used as a radioactive decontamination and waste processing facility. The building was also used for development of mercury diffusion pumps, and, for a period, Rooms 150 and 150A at the northern end of the building were used as a machine shop. Offices, counting rooms, and conference rooms were located at the southern end of the building. Vacuum pumps were located outside on the east side of the building.

3.1.2 Building 16

Building 16 is a single story wood-frame and concrete-block, slab-on-grade building constructed in phases between 1943 and the 1980s, with a high bay installed for a crane. It was originally built to house the XC Calutron magnet, a device used for magnetic separation research and uranium isotope separation experiments. The building currently measures 11,771 square feet (Harvey, 2003).

Construction of the building began in 1943 but was not completed until the addition of a high bay in 1947–48 to house the magnet. In May 1947, only the northern third of the current building was present and served as a carpenter shop, later becoming the machine shop. Small shop buildings, storage racks (that have been demolished), and a concrete loading dock were situated where the southern end of Building 16 is currently located. By February 1948, the main building had been constructed at the base of an unpaved slope with an approximately 3-foot tall retaining wall located a few feet to the east.

By March 1950, the part of the retaining wall to the north of what is shown on Figure 4 as the Perkins Pad (added later) had been replaced by a 6- to 8-foot tall retaining wall and a small extension to Building 16 (Room 137A and the adjacent part of Room 125) had been built straddling the wall between the future locations of the Perkins Pad and Building 16A (Figure 4).

In 1959, a large 6-foot-deep pit was excavated beneath the high bay area (Room 125) in the center of the building. In 1960, Room 139 (referred to as the Perkins Pad) and bounding retaining walls and shelter were added on to the southeast part of Building 16 to house electrical equipment (Perkins power supply). At approximately this time, Building 16A, which housed transformers, was added, and the area between the Building 5 roadway and Buildings 16 and 16A was paved. Room 101 was added to the south end of Building 16 in 1975 to accommodate the Horton Sphere, a large vacuum chamber. In the 1981, Room 140 was added to the north end of the building to extend the machine shop. Recently, a control room; an ion-source development area; mercury and oil diffusion pumps; chemical storage areas; electrical shops; and a wet lab occupied the central part of Building 16.

Room 110 contained a capacitor bank. An oil-filled experimental vessel and large capacitors were reportedly present in the sub-floor pit and high-bay area of Room 125. Oil diffusion vacuum pumps were used in Rooms 101 and 137. The Perkins Pad contained transformers, power supplies, and mechanical vacuum pumps.

3.1.3 Building 16A

Building 16A is an approximately 300 square foot, one-story corrugated metal structure. Electrical transformers that contained dielectric insulating oil believed to have contained PCBs were located at Building 16A, an electrical pad constructed adjacent to Room 140. In September 1988 the transformer oil was drained and refilled with non-PCB oil.

3.1.4 Former Building 40

Building 40 was an approximately 1,000 square foot, one-story, wood frame barracks-type warehouse with wood plank walls. The building was constructed in 1947 as a general-purpose warehouse and was converted into an electronics development laboratory in the mid-1950s and was also used for storage of electronic equipment, computers, and books by the Facilities Engineering Division. Building 40 has been demolished and only the concrete slab floor remains. There is no indication of PCB use or spills of PCBs.

3.1.5 Former Building 41

Building 41 was an approximately 1,000 square foot, one-story barracks-type warehouse. It was constructed of wood plank walls built on top of concrete block walls. The building was constructed in 1948 as a chemical storage warehouse, and was later converted into an electronics laboratory and, subsequently, into the LBNL radio shop. Building 41 has been demolished and only the concrete slab floor remains. There is no indication of PCB use or PCB releases.

3.1.6 Former Building 52

Building 52 was a 6,425-square foot structure constructed of corrugated metal panel walls, a metal roof, and a concrete foundation. According to an evaluation of Old Town buildings by D. W. Harvey, (Harvey 2003), it was built in 1943 for use as a warehouse, shop, and a general-purpose laboratory. However, archival photos show construction of the building around 1948, for the proposed chemistry facilities expansion project, which included the installation of the Cyclodrome, a quarter-scale working model of the planned Bevatron particle accelerator. The Cyclodrome reportedly operated over a 5-month period in 1949 and was used for other testing purposes in the 1950s. Photographs of the Cyclodrome show what appear to be several large diffusion pumps located within the storage ring footprint.

During the 1950s, Building 52 housed research associated with the development in Livermore of a prototype accelerator called the Materials Testing Accelerator (MTA), which was designed by the Radiation Laboratory at Berkeley (renamed as LBNL in 1971). By the early 1960s, Building 52 had become a general research and shop facility, and later a cable winding facility supporting research on superconducting cable wire. An approximately 8-foot deep cryostat pit with a sump was located at the center of the location of the former Cyclodrome. A neutron generator was also located within the building and a small machine shop was located in the southwest corner. An area along the east side of Building 52 had been a hazardous materials storage area. Capacitors, which may have contained PCB-oils, were operated in the building and releases of PCBs have been documented as described in Section 3.2.3 (LBNL, 2014).

The superstructure of Building 52 was demolished in 2011 and only the slab remains, (Harvey, 2003).

3.1.7 Building 52A

Building 52A was a small sheet-metal building used as a general storage facility. Historical photos taken in 1950 and 1957 indicate that the concrete pad on which the building was later constructed contained a drum rack that held horizontally stacked drums with dispensing taps. According to historical building plans, at one point, the building housed a large motor generator associated with research in Building 16. The superstructure of Building 52A was demolished in 2011 and only the concrete slab remains. There is no indication of PCB related spills on the concrete slab.

3.2 Previous Investigations

Previous investigations relevant to PCB contamination at the Old Town area of LBNL are described in the following reports:

- *Draft Final RCRA Facility Investigation Report* (LBNL Environmental Restoration Program, 2000)
- *Reconnaissance-Level Characterization Report for Buildings 5, 14, 25A, 40, 41, 44, 44A, 44B, 52, and 52A at the Lawrence Berkeley National Laboratory, Berkeley California* (Weiss Associates, 2010)
- *Non-Radiological Reconnaissance Level Characterization Report University of California, Lawrence Berkeley National Laboratory Buildings 5, 16, 16A and Miscellaneous Equipment, One Cyclotron Road, Berkeley, California* (Northgate Environmental Management, Inc., 2014)
- *Preliminary Subsurface Sampling Report, Old Town Demolition Project: Buildings 5, 16, 16A, 40, 41, 52, and 52A* (LBNL Environmental Restoration Program, 2014)

Information and data from these reports were used to evaluate the need for additional characterization of PCBs in building slabs and soils to support the cleanup application. Relevant PCB data from these characterizations are summarized in Appendix B.

3.2.1 Concrete Slab Characterization

Based on historical uses of the buildings, samples of concrete were collected in areas where PCBs may have been used in Buildings 5 and 52. Available process knowledge indicates that PCBs were not used in Buildings 40 or 41. Samples were collected in these buildings to confirm the process knowledge.

Building 5

Based on historical uses of the building, which included a machine shop in Rooms 150 and 150A; oil diffusion pumps in Room 100; and radiology lab with vacuum equipment in Rooms 105 and 117, samples of concrete were collected to assess whether PCBs could have been used in the building. PCBs were not detected (detection limit of 0.033 mg/kg for each Aroclor) in any of the concrete cores, with the exception of one of the three samples collected in Room 150 in which Aroclor 1254 was reported at 0.0068 mg/kg. This result was qualified by the laboratory as a trace level with poor quantitation and an estimated value.

No PCBs were detected in three other samples of concrete collected from the floor of Room 150 (reported erroneously as 150A [Weiss, 2010]). The locations of these concrete samples are shown on Figure A-1 in Appendix A.

An additional concrete sample is being collected in the location of the one sample in which PCBs were detected as part of characterization of building materials.

Buildings 16, 16A, and the Electrical Pad

No samples of the concrete slab have been collected in Buildings 16 or 16A, or the adjacent electrical pad.

PCBs were detected in three of the five wipe samples collected at locations where the concrete floor was stained in Buildings 16 and 16A. The maximum detection of 5.4 micrograms per 100 square centimeters (µg/100 cm^2) was reported in a sample from Building 16. (Northgate Environmental Management, Inc., 2014). One wipe sample collected in Building 16A was reported at 0.88 µg/100 cm^2 total PCBs.

No wipes samples were collected at the electrical pad.

Former Buildings 40 and 41

No PCBs were detected in concrete samples collected from the slabs in Buildings 40 and 41 (Weiss, 2010)

Former Building 52

After Building 52 was demolished, PCBs were detected in sediment in the transverse concrete-lined utility trenches within the Building 52 slab and in three of ten concrete samples collected from the trench floors. The sediment and a section of the concrete trench floor contaminated with PCBs were excavated in 2012 and disposed of at a facility permitted to accept the waste. Soil beneath the trenches was sampled for PCBs. The analytical results indicated that PCBs were not detected. The trenches were backfilled with low-strength concrete.

In 2014, PCBs were detected at a total concentration of 1,800 mg/kg in sediment from a 5-foot deep concrete-lined sump discovered at the west terminus of one of the utility trenches. The sediment and liquid in the sump were disposed of at a TSCA facility in 2014.

Additionally, PCBs were detected in all seven wipe samples collected from the concrete slab with the maximum concentration of 730 µg/100 cm^2 total PCBs detected in a stained area on the concrete slab below the former transformer in Room 100. One additional wipe sample was reported to have PCBs at 38 µg/100 cm^2 (floor at the former capacitor bank), which exceeded 10 µg/100 cm^2 for total PCBs (PCBs at concentrations greater than 10 µg/100 cm^2 are managed in the same manner as PCBs at concentrations greater than 50 mg/kg per Section § 761.1 of 40 CFR).

PCB concentrations in samples collected from the Building 52 slab are illustrated on Figure A-2 in Appendix A. The maximum total PCB concentration detected in concrete that has not been excavated is 20 mg/kg.

Former Building 52A

No samples of the concrete slab have been collected in Building 52A.

3.2.2 Soil Characterization

From February to August 2014, soil samples were collected from within the project area and analyzed for PCBs by EPA Method 8082. Except for a limited number of samples collected prior to May 12, 2014, all samples were prepared using the Soxhlet extraction method (EPA 3540C). Soil samples had also been collected prior to 2014 as part of facility investigations conducted under RCRA and some of these soil samples had been analyzed for PCBs (relevant soil sample data from these investigations is included on the figures in Appendix A). A complete description of the sampling results is given in the *Preliminary Subsurface Sampling Report–Old Town Demolition Project* (LBNL, 2014).

As shown on Figures A-3 through A-5 in Appendix A, PCBs were detected in the soil at concentrations greater than 0.97 mg/kg in the following areas:

- West of former Building 52
- Near the northwest corner of the former Building 52A foundation slab
- West of Building 16, and
- Below the southern edge of Building 16

Following is a brief summary of the prior soil characterization data for each building.

3.2.2.1 Building 5

PCBs (0.81 mg/kg maximum concentration) were detected in all three surface soil samples collected on the east side of the building (LBNL, 2014). There were no PCBs detected in the subsurface soil samples collected from the same three locations. Concentrations of PCBs detected in soil in the vicinity of Building 5 are illustrated on Figure A-3 in Appendix A.

3.2.2.2 Building 16

As shown on Figure A-4 in Appendix A, PCBs were detected in soil at concentrations greater than 0.97 mg/kg beneath Room 101 at the southern end of the building. The maximum concentration of total PCBs detected was 10.7 mg/kg at 2 feet below the concrete slab. PCBs were also reported at concentrations greater than 0.97 mg/kg on the west side of Building 16. The maximum concentration (135 mg/kg) was reported in a surface sample located adjacent to a concrete pad below the canopy on the west side of the building (outside of Room 110), where capacitors had been located. PCBs were either not detected or detected at concentrations less than 0.97 mg/kg in soil samples collected beneath the Perkins Pad and the mezzanine on the west side of this pad.

3.2.2.3 Building 16A

As shown on Figure A-4 in Appendix A, PCBs were either not detected or detected at concentrations less than 0.97 mg/kg in soil samples collected beneath and around Building 16A. The maximum concentration of total PCBs was 0.75 mg/kg.

3.2.3 Former Building 52

As shown on Figure A-5 in Appendix A, PCBs were reported at concentrations greater than 0.97 mg/kg in soil samples collected in the unpaved area and beneath the roadway immediately west of the Building 52 slab. The highest concentration of 840 mg/kg was reported at 8 feet below the ground surface approximately 2 feet away from the sump on the west side of the building, where PCBs had been detected in sediment within the sump at a concentration of 1,800 mg/kg. PCBs concentrations in the unpaved areas south and east of the building were less than 0.97 mg/kg.

PCBs have not been detected in soil samples collected beneath the southern end of the slab.

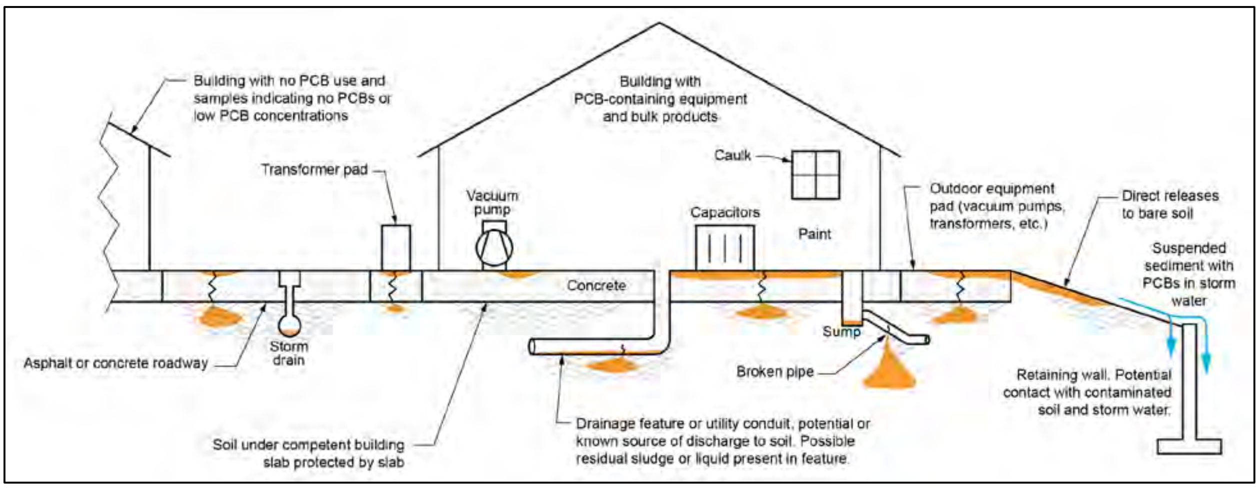
3.2.4 Former Building 52A

Total PCB concentrations were greater than 0.97 mg/kg in soil samples collected northwest of Building 52A and beneath the northwest corner of the building, with the highest concentration of 31.6 mg/kg detected at 1 foot below the ground surface approximately 5 feet northwest of the building. Results of PCBs in soil samples collected in the vicinity of Building 52A are illustrated on Figure A-5 in Appendix A.

3.3 Conceptual Site Model

Sampling of building materials and soil around buildings in the Phase I project area indicates that multiple PCB releases have occurred. Informed by this sampling data, historical photographs from LBNL's archive, building plans, and records of personnel interviews, a conceptual model of potential PCB release pathways has been developed and is illustrated on Figure 5.

Figure 5. Conceptual Site Model of Potential PCB Release Pathways



PCB releases in the project area may have resulted from oil leaks from equipment such as capacitors, vacuum pumps, and transformers, leaks from oil conveyance piping and sumps, and oil spills that occurred during equipment servicing or waste oil transfers in paved and unpaved areas. It is also possible that weathering of building materials containing PCBs may have contributed to contamination of exterior soil and/or concrete.

Equipment that contained PCB oils was located both inside and outside the buildings (Figures 4). Sediment sampling data from some utility trenches indicate that liquids containing PCBs may have flowed to low points in the buildings, such as concrete-lined utility trenches and sumps, and accumulated there. In some cases PCB-containing liquids may have exited the buildings via connections of these low points to drain lines or utility conduits where broken pipes and/or breaks in the concrete could have resulted in releases to underlying soil. Soil sampling data show that PCB releases outside the buildings infiltrated into the subsurface in areas of uncovered soil.

Erosion of soil impacted with PCBs and weathering of exterior building materials containing PCBs (e.g., paint) may have resulted in the migration of suspended sediment containing PCBs to the storm drain system and to areas located topographically below the buildings (as indicated by elevated PCB concentrations downslope from apparent release points). Based on available data showing no detectable PCBs in soil from beneath contaminated slabs in Buildings 16 and 52, it appears that competent concrete slabs act as barriers to downward migration of PCBs to soil.

3.4 Data Gaps

Some of the prior sample collection was conducted in occupied buildings, where access to sampling locations was restricted due to the presence of utilities and equipment. To characterize the building slabs for PCBs, additional concrete sampling is required in the areas where PCBs are known or believed to have been used and may have been released (Figure 5). Additional soil sampling is also required to define the lateral and vertical extent of contamination in areas where releases to soil have occurred and where the extent of PCB contamination at concentrations greater than 0.97 mg/kg has not been fully defined.

3.4.1 Concrete

Based on available process knowledge and sample data described above, concrete in Buildings 5, 40, and 41 is not impacted by PCBs.

Concrete in areas where PCBs were used in and around Buildings 16, 16A, the electrical pad, and Building 52A has not been characterized. Samples of the trenches and some of the slab have been collected in Buildings 52 but not all areas of PCB use have been characterized as shown on Figure A-2 in Appendix A. Additional concrete sampling is required to completely characterize these areas.

3.4.2 Soil

Additional soil sampling is required to close the data gaps listed in Table 2. If concrete sampling completed per this SAP indicates the presence of PCBs at concentrations greater than 0.97 mg/kg, additional soil samples will be collected beneath the concrete to evaluate the soil beneath the impacted concrete.

Table 2. Data Gaps in Characterization of Polychlorinated Biphenyls in Soil

Building	Location	Use of Polychlorinated Biphenyls	Data Gap
5	Along east wall of the building	Vacuum pumps operated along the wall.	Limited samples have been collected in this area but may not be representative of locations where vacuum pumps were operated.
5	Former radiological waste processing yard	Although PCB use is not documented in the area, because it was a waste processing yard there is the potential that PCBs may have been in the wastes.	No samples have been collected and analyzed for PCBs in this area.

Table 2. Data Gaps in Characterization of Polychlorinated Biphenyls in Soil

Building	Location	Use of Polychlorinated Biphenyls	Data Gap
16	West side of building	PCB concentrations in soil greater than 0.97 mg/kg at maximum depths sampled to the west of the building (Samples SS16-14-10A, and 10E, 10F).	Vertical extent of contamination has not been determined at the west side of the building.
16A	East of the 16A building pad adjacent to the retaining wall	Building 16A was known to house transformers	No soil samples have been collected immediately east of Building 16A
Electrical Pad	East of the electrical pad.	The electrical pad housed numerous transformers	No soil samples have been collected beneath or east of the electrical pad.
52	Outside to the south of Room 117	PCB concentrations in soil greater than 0.97 mg/kg to the southeast of the building.	The extent of contamination has not been determined.
52	West of Room 111 and beneath western side of building slab	PCBs were detected at concentrations greater than 0.97 mg/kg in the soil at a number of locations west of Building 52.	The lateral extent was not completely determined.
52	West of Rooms 103, 107, and 109 outside of building	Capacitor bank in Room 109.	No soil data available for this area.
52A	Northwest side of the building	PCBs were detected at concentrations greater than 0.97 mg/kg in soil under the northwest corner of the concrete pad and on the unpaved slope to the northwest.	The lateral extent of the contamination was not completely determined.

4 PROJECT OBJECTIVES

4.1 Project Objectives and Problem Definition

The objective of the sampling described in this SAP is to collect sufficient data regarding PCB contamination to close data gaps that exist in current characterization of PCB contamination in concrete slabs and soil within the project area and use the characterization data to support a cleanup approach to be presented to the EPA in a cleanup application.

4.2 Data Quality Objectives

Data quality objectives (DQOs) that informed the selection of the sampling design presented in this plan follow EPA's *Guidance on Systematic Planning Using the Data Quality Objectives Process* (EPA, 2006). The EPA's DQO process is used to develop performance and acceptance criteria (or data quality objectives) that clarify study objectives, define the appropriate type of data, and specify tolerable levels of potential decision errors that will be used as the basis for establishing the quality and quantity of data needed to support decisions. Use of the DQO process leads to efficient and effective expenditure of resources; consensus on the type, quality, and quantity of data needed to meet the project goals; and the full documentation of actions taken during the development of the project.

STEP 1–STATE THE PROBLEM: *Define the problem that necessitates the study; identify the planning team; and examine budget and schedule.*

Problem: PCBs have been detected in soils beneath and around buildings 5, 16, 16A, and former Buildings 52 and 52A. The extent of the PCB contamination has not been fully characterized in the concrete slabs and soils. To clean up the contamination or implement other controls to protect human health and ecological receptors, additional characterization is required. Additional sampling is required to support an application for PCB cleanup meeting all applicable requirements of TSCA.

Concrete Slabs

PCBs have been used in various areas in Buildings 16, 16A, 52, 52A and on the electrical pad as shown on Figure 4. The concrete slabs in Buildings 16, 16A, 52, and 52A and in the concrete at the outdoor areas around these buildings, including the former radiological waste processing yard north and northwest of Building 5, have not been fully evaluated to assess whether releases of PCBs in and adjacent to the buildings may have resulted in PCB contamination. The presence, and if present, the type, magnitude and extent, of PCB contamination needs to be assessed 1) to determine whether approval from EPA is required for cleanup of PCB remediation waste and 2) to identify any release pathways by which PCBs may have contaminated underlying soil to determine whether additional soil sampling and cleanup may be required. In obtaining additional data for characterization of the concrete from the buildings, a key assumption is that the concrete will be sent off-site for disposal and will not be recycled, hence cleanup goals do not take reuse of the material into consideration.

Soil

PCBs have been detected in soils around the buildings within the project area. The nature and extent of PCB soil contamination that could impact human health and/or the environment have not been fully defined. The magnitude and extent of any such contamination needs to be determined so that the scope of remediation or mitigation measures that might be required to protect human health or environmental receptors can be determined.

Planning Team: Planning is conducted by LBNL and DMS with oversight from DOE and EPA. Robert Cronin leads the LBNL team, and provides overall project oversight and direction. The LBNL Environmental Service Group provides support in matters of environmental compliance and represents LBNL in discussions regarding environmental compliance with the EPA and other regulatory agencies, which may include the California Department of Toxic Substances Control and the California Regional Water Quality Control Board–San Francisco Bay Region. DMS is contractually responsible for demolition of buildings and slabs within the project area shown on Figure 2 and for cleanup of soils in the project area. DMS is also tasked with preparing and implementing this SAP and overseeing the characterization of the project site for PCBs. Christina Kennedy, a California Professional Geologist, is the Technical Manager for the PCB investigation conducted by DMS.

Budget and Schedule: DOE allocated funds to LBNL who contracted with DMS for the demolition of buildings and cleanup of contaminated soils within the project footprint shown on Figure 2.

Approval of this plan by LBNL (taking into account comments from EPA) is anticipated to occur in September 2015. Characterization work will begin upon approval of this plan by LBNL. Characterization of the concrete slabs and soil in the project area is anticipated to be completed by October or November 2015.

STEP 2–IDENTIFY THE GOAL OF THE STUDY. *State how environmental data will be used in meeting objectives and solving the problem; identify study questions; and define alternative outcomes.*

The goal of the study is to determine the nature and extent of PCB contamination in concrete and soil to determine the scope of required cleanup or other controls, such as restrictions on land use that will be protective of human health and the environment. To meet the stated goal, answers to the following questions are required:

Concrete Slabs

- Is PCB contamination present in slab concrete and at what concentrations?
- Is the contamination from PCB bulk products (e.g., paint, PCB-containing sealant), from leaks or spills, or from unknown sources?
- What is the extent of PCB contamination in the building slabs?
- Is PCB contamination present at locations where it could have migrated to underlying soil?

Soil

- What is the lateral and vertical extent of PCBs in soil that exceeds the presumptive cleanup level of 0.97 mg/kg?

The data collected in this study will be compared to a cleanup level of 0.97 mg/kg, which is the presumptive risk-based cleanup level for the project area. The data will support a cleanup application submitted to the EPA per 40 CFR 761.61(c), in which LBNL will propose that areas of soil or concrete where PCB concentrations exceed the cleanup level be removed and disposed of off-site in compliance with TSCA requirements.

STEP 3–IDENTIFY INFORMATION INPUTS. *Identify data and information needed to answer study questions.*

The data and information needed are:

- Available data regarding areas where potential contaminant releases could have occurred (such as building use history, building materials sampling results, and historical photographs)
- Previously collected data regarding PCBs in concrete and soil
- Field assessment of likely migration pathways from potential surface releases into the subsurface (for example, cracks and seams in original floor slabs and paving).
- Analytical results obtained from implementation of this SAP.
- Data gathered while in the field (notes, photos, etc.).
- Validated laboratory analytical results.

These inputs will be used to determine the scope of sampling and analysis required to address the questions listed in Step 2.

STEP 4–DEFINE THE BOUNDARIES OF THE STUDY. *Specify the target population and characteristics of interest, define spatial and temporal limits, scale of inference*.

Based on the conceptual site model discussed in Section 3.3, two populations are of interest: concrete and soil media within the project area.

The physical boundary of the study area includes the area shown on Figure 2 as the project area. The study area extends beyond the project boundary shown on Figure 2 in limited locations, where PCB contamination may have migrated from the project area to the west along Segre Road (see Figure A-11 in Appendix A).

The study area excludes building superstructures above the concrete slab and pipes within and below the concrete slabs. Buildings 40 and 41 are also excluded, as no PCB contamination is known or suspected to be present in and around the buildings slabs. The concrete slab and soil beneath and around the northern, western, and southern sides of Building 5 are excluded from the study as well, as process knowledge and existing sample data indicate that PCB contamination is not present in and around the building, except at the eastern side and the former radiological waste processing yard, where vacuum pumps that may have contained PCB oils were located.

Concrete samples will be collected from decision units described in Section 5. The scale of inference will be the concrete slab within each decision unit. Samples will also be collected where distinct oil stains are visible within the decision units, as well as in oil-stained areas with no known history of PCB releases and therefore outside of the decisions units. For these samples, the extent of the stain will be the area of inference.

For soil samples collected to define the extent of previously detected contamination, the scale of inference will be the area between the sample collected and the nearest previously collected samples in the lateral direction. Vertically, the sample will be used to represent the soil in the sample interval in which the soil was collected (e.g., 0-0.5 feet below ground surface).

STEP 5–DEVELOP THE ANALYTICAL APPROACH. *Define the parameter of interest, specify the type of inference, and develop the logic for drawing conclusions from findings.*

Soil and concrete samples will be collected based on the information inputs described in Step 3 and analyzed for the following PCB Aroclors: 1016, 1221, 1232, 1242, 1248, 1254, 1260, and 1268. If PCBs are detected in concrete and/or soil at concentrations greater than the cleanup level, those concrete and soils will be considered PCB remediation waste subject to cleanup in conformance with the requirements of 40 CFR 761.61.

Concentrations of PCBs less than the industrial regional screening level are considered to not represent significant threats to health human or ecological receptors and therefore will support a decision not to conduct further investigation or cleanup.

If samples collected in accordance with this SAP yield insufficient data to delineate the lateral and/or vertical extent of PCB contamination (at concentrations greater than 0.97 mg/kg) within the project boundary, additional samples will be collected to delineate the extent of the contamination within the project area. The number and locations of these samples will be specified by the sampling team and incorporated into the cleanup plan or this SAP as an amendment.

STEP 6–SPECIFY PERFORMANCE OR ACCEPTANCE CRITERIA. *Develop performance criteria for new data being collected, or acceptance criteria for existing data being considered for use.*

Data will be collected in accordance with this SAP. If modifications to the sample collection or analytical procedures described herein are necessary, these will be evaluated for their impact on usability of the data.

Samples of concrete will be considered for use if collected in accordance with the guidance in the EPA Region 1 document titled *Standard Operating Procedure for Sampling Porous Surfaces for Polychlorinated Biphenyls* (EPA, 2011). Soil samples will be considered useable if collected in accordance with procedures provided in this SAP.

Data will be accepted if collected and analyzed according to the EPA Method 8082A (gas chromatography), with manual Soxhlet extraction per EPA Method 3540C, with PCB concentrations reported for individual Aroclors on a dry weight basis validated as described in Section 4.3 below. The analytical laboratory's reporting will be low enough to allow for comparison of the sample data to the cleanup level of 0.97 mg/kg. The industrial regional cleanup level for soil will also be used as the cleanup level for the concrete, as none of the concrete will be recycled. Recycling would trigger the need for agency approval of a more conservative cleanup level that takes into account reuse of the material in a residential setting. The analytical laboratory's method detection limit should be no higher than 10 percent of the cleanup level (0.097 mg/kg[3]) –accounting for the multiple Aroclors being analyzed–to provide an adequate margin of error should the cleanup levels approved by EPA be lower than those presumed herein.

Two types of decision errors are possible for concrete: a decision that the concrete does not contain PCBs at concentrations greater than 0.97 mg/kg when it actually does (Type I error), or alternatively, a decision that the concrete does contain PCBs at concentrations greater than 0.97 mg/kg when it does not (Type II error).

For concrete, the probability of Type I error will be minimized by conducting systematic sampling within decision units identified based on known or potential historical PCB use. The consequence of making a Type II error is that extra costs are incurred for cleanup and disposal of PCB remediation waste. These costs are considered tolerable.

Two types of decision errors are possible for soil: a decision that no action is necessary because an area has contaminant concentrations lower than the presumed cleanup level when they actually exceed that level (Type I error), or alternatively; a decision that further investigation, mitigation, or remediation is necessary when contaminant concentrations do not actually exceed the cleanup level (Type II error).

For soil, the potential consequence of making a Type I error is a threat to human health or the environment. The probability of this type of error will be minimized by using cleanup levels based on cancer risks that are at the lowest level (10^{-6}) within the EPA target range for risk managers. Although a cancer risk anywhere within the target range (between 10^{-4} and 10^{-6}) is considered by the EPA to be safe and protective of public health, the conservative approach of using levels at the bottom of the target range rather than at the highest level with the range (10^{-4}) to generate the screening levels limits potential threats to human health resulting from Type I errors. In addition, regional screening levels are calculated by the EPA using conservative default assumptions based on tier 1 risk assessment scenarios. The conservative nature of these default assumptions also serves to reduce the likelihood of making a Type I error. .

The major ramification of a Type II error is likely to be the extra cost of remediating soil that does not constitute a significant risk to human health and the environment. This type of error is considered tolerable.

STEP 7–DEVELOP THE PLAN FOR OBTAINING DATA. *Select the resource-effective sampling and analysis plan that meets the performance criteria.*

A detailed sampling and analysis design is provided in Section 5, Sampling Design and Rationale.

4.3 Data Quality Indicators (DQIs)

The purpose of quality assurance (QA)/quality control (QC) procedures is to produce data of known and expected quality by satisfying certain DQIs relative to precision, accuracy, representativeness, comparability, and completeness. The performance criteria for laboratory analysis of PCBs are found in the EPA Region 9 *DQI table for Organochlorine Pesticides and Polychlorinated Biphenyls* (EPA, 1999).

Indicators of data quality are summarized in Table 3 and described in the following sections.

Table 3. Data Quality Indicators

Matrix	Sample Preparation Method	Analysis Method	Analytical Instrumentation	Maximum Reporting Limit	Precision	Accuracy
Concrete/Soil	EPA Method 3540C	EPA Method 8082A	Gas Chromatography with Electron Capture Detectors	0.097 mg/kg	±30% RPD	40-150%

Notes:
Results to be reported on a dry-weight basis
% percent
EPA US Environmental Protection Agency
mg/kg milligrams per kilogram
RPD relative percent difference

4.3.1 Precision

Precision is the degree to which the analytical measurement is reproducible (i.e. that there is agreement between replicate measurements made under similar conditions for the same property). This is a measure of random error and can result from problems with sampling procedures, preservation, storage, shipment, preparation or analysis. Reproducibility among duplicate samples provides a determination of precision, which can be expressed as the relative percent difference in the amount of detected compounds between the original and duplicate samples. Relative percent difference (RPD) is quantified by the following equation:

$$RPD = \frac{(C_1 - C_2)}{(C_1 + C_2)/2} x100$$

where:

RPD = Relative percent difference
C1 = Larger of the two observed values
C2 = Smaller of the two observed values

Precision will be evaluated using laboratory control sample and laboratory control duplicate results.

4.3.2 Accuracy

Accuracy is the evaluation of how close the analytical measurement is to the true value. Accuracy is a combination of random error (precision) and systematic error (bias). Accuracy for laboratory analytes is determined by comparing measured concentrations in a sample matrix against the measured concentration in a matrix spiked with a known amount. The formula for determining accuracy is:

$$\text{Percent Recovery (\%)} = \frac{(B - A) \times 100}{T}$$

where:

B = measured concentration of spiked samples
A = measured concentration of unspiked samples
T = true spiked concentration

Accuracy will be evaluated based on the percent recovery results for laboratory control samples and laboratory control duplicates. Accuracy will also be evaluated based on the recovery for surrogate spike standards.

4.3.3 Representativeness

Representativeness is a qualitative term describing the degree to which sample data typifies the characteristic of interest at the point of interest accurately and precisely. Representativeness of data from field sites is a function of the sampling process design and the sampling procedures, which are designed to optimize the potential for obtaining samples that reflect the true state of the environment while maintaining practicability. Sampling methods are described in Section 7. Analytical results will be verified or validated to ensure representativeness. If during the verification or validation it is determined that results are not representative, reanalysis of the original sample or collection of additional samples for analysis may be required.

4.3.4 Comparability

Comparability is a qualitative term to describe the ability and appropriateness of taking two or more data sets to make collective conclusions. Issues to be considered include variables that could affect the descriptive value of the data for specific parameters at specific times using specific methods.

Considerations include:

- Variables of interest included
- Common units used
- Similarity of methods and QA
- Time frames
- Equipment used

4.4 Data Review

Level 3 data packages are required for concrete samples. Level 4 data packages are required for soil samples. All analytical data generated by the laboratory will be reviewed prior to reporting to assure their validity. This internal laboratory data review process will consist of data reduction, several levels of documented review, and reporting. Review processes will be documented using appropriate checklist forms, or logbooks, that will be signed and dated by the reviewer. Any analytical issues will be documented in the data package narrative.

All Level 3 data will be reviewed and validated by a qualified DMS associate to ensure that sample collection and analyses conform to the relevant performance criteria. This review will include, but not be limited to sample preparation and analysis procedures, compositing procedures, chain-of-custody, holding time, method reporting and detection limits, surrogate standard recoveries, instrument calibration, and precision, accuracy, representativeness, and comparability. A data usability summary will be prepared to document reviewed data. Level 4 data will be validated based on the evaluation and review provided in the *National Functional Guidelines for Superfund Organic Methods Data Review* (EPA, 2014). Specific precision and accuracy requirements for PCBs requirements in this SAP and the *Quality Systems for Analytical Services Version 3.0* (DOE, 2013) will be used to conduct the validation. A data usability summary will be prepared to document the validation.

Analytical results will be verified or reviewed to ensure representativeness. The data review should ensure that findings are based on verified results.

4.5 Data Management

Hardcopy Deliverables—All raw data and documentation, including (but not limited to) logbooks, data sheets, electronic files, final reports, *etc.*, will be maintained by the analytical laboratory for at least three years. Data packages will be provided as Level 3 deliverables for concrete samples and Level 4 for soil samples.

Electronic Deliverables—The electronic data deliverable (EDD) will be in the specific file format required for upload by LBNL database personnel described in Appendix C. The analytical laboratory will certify that the EDD and the hard copy reports are identical. A complete listing of the data from the LBNL database will be compared to the hardcopy data following data entry.

Hardcopy deliverables, data packages in the Adobe Acrobat format and EDDs will be catalogued and kept on file at the project site. Hardcopy and EDD deliverables will be transmitted to LBNL.

4.6 Records Management

All records created during inspections, inventory or sampling will be kept in the DMS project file for a minimum of 10 years per DMS *QIP 4.2 Records Management, 2015b.* The results and conclusions of such sampling will be summarized in a brief technical letter or memorandum to be submitted to LBNL for their use and records. These documents will include copies of field observation forms, and photographs.

5 SAMPLING DESIGN AND RATIONALE

The sampling design presented in this plan is based on the conceptual model described in *Section 3.3 above* and builds on previously collected PCB data. The sampling is intended to close data gaps regarding PCB contamination in the project area summarized in Section 3.4 above.

The sampling design includes collection of additional concrete and soil samples in the project area, as described in Sections 5.1 and 5.2, respectively; and collection of limited soil samples beyond the project boundary, as discussed in Section 5.3. If PCBs are detected in concrete samples at concentrations greater than 0.97 mg/kg, soil samples will be collected at the locations of those concrete samples. If PCBs are detected at concentrations greater than 0.97 mg/kg in soil samples, additional sampling to delineate the PCB contamination will be addressed in a cleanup plan submitted to the EPA per 40 CFR 761.61c, or in an addendum to this SAP depending on the requirements of the demolition project schedule. Because concrete and soil samples are proposed in the vicinity of Building 5 and there is the potential to encounter radioactive materials, these samples will be collected after samples from other areas are collected to avoid potentially spreading radioactive contamination.

5.1 Concrete Slab Sampling

The sampling team, informed by available process knowledge, has identified distinct areas (decision units) where PCB-containing equipment is known (or likely) to have been used, stored, or serviced. The PCB uses and available information for these decision units are listed in Table 4 and shown on Figure 6. Available process knowledge, supported by analytical results for samples of concrete slabs collected in 2010 (Appendix B), indicates that no significant PCB use occurred inside Building 5.

Within each decision unit, samples will be collected at locations chosen by the sampling team to represent areas with the highest potential for impacts from PCB releases, such as sumps, low points in trenches, and areas beneath oil-containing equipment. A minimum of three samples will be collected in each decision unit, as shown on Figure 6. Previously collected samples may be used to satisfy the minimum number of samples in a unit. In addition, at least one sample will be collected from any apparently oil-stained areas, whether they lie within the decision units or in areas that have not been designated as decision units. Proposed locations of concrete sample are shown on Figures A-6 and A-7 in Appendix A. If substantial amounts of sediment or sludge are found in trenches in which collection of concrete samples is proposed, a sample of the sediment and/or sludge will be collected in addition to the concrete sample.

Where concentrations of PCBs are found to be greater than 0.97 mg/kg in the concrete, soil samples will be collected as discussed in Section 5.2

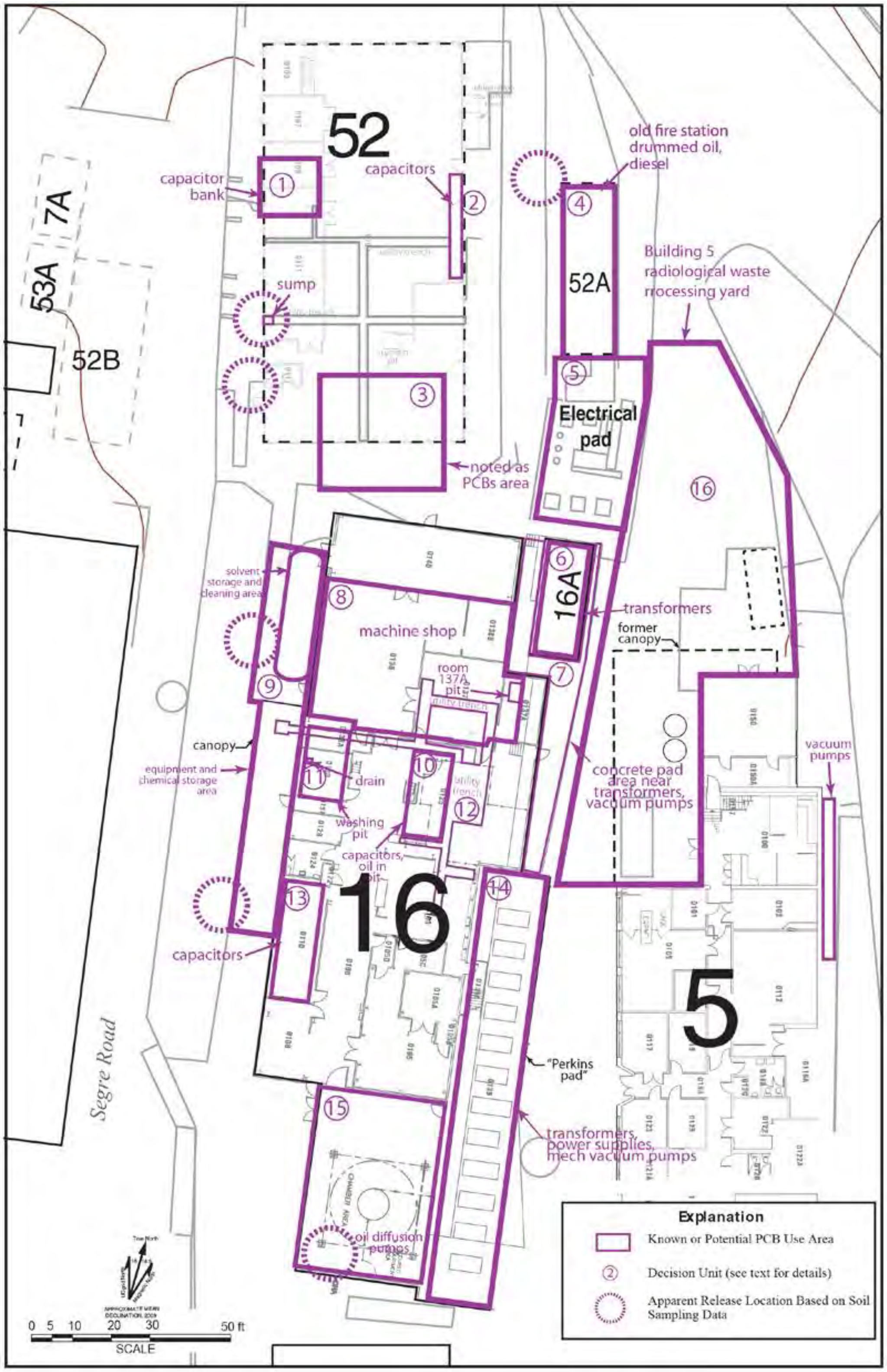
Table 4. Summary of PCB Uses, Data Gaps in Characterization of Concrete Slabs, and Recommendations for Additional Sampling

Building or Area	Decision Unit	Location	PCB Use / Data Gap	Proposed Sampling for PCB Analysis
52	1	Room 109	Capacitor bank. One sample collected in Room 109.	Collect two additional samples representative of the area where capacitor bank was located. Sample oil stained areas, if present.
52	2	East wall and mid-section of building.	Capacitors. No concrete samples collected.	Collect samples of slab from east wall. Sample oil-stained areas, if present.
52	3	Southern portion of building.	PCB use. Samples in trench only. No samples on slab.	Collect one additional sample from slab. Sample oil stained area, if present.
52	NA	Sump on the west side of the building.	Concrete is presumed to be contaminated with PCBs;	Collect a single sample from the PCB-impacted sump.

Building or Area	Decision Unit	Location	PCB Use / Data Gap	Proposed Sampling for PCB Analysis
			however, it is not known if concentration may be greater than 500 mg/kg.	
52A	4	Building slab	Historical storage of drummed oil. Possible releases from electrical equipment on pad. No concrete samples collected.	Collect samples of pad and in trench. Sample oil stained areas, if present.
None	5	Electrical pad south of 52 A (referred to as the Building 16 or Old Town Electrical Pad)	Transformers. No concrete samples collected.	Collect samples beneath transformers, sumps, and cable trenches. Sample oil stained areas, if present.
16A	6	Building slab	Transformers and insulation that may contain PCBs (sample results pending). No concrete samples collected.	Collect samples representative of the concrete slab. Sample oil stained areas, if present.
16	7	Along east side of building; between east side of building and Building 16A	Near transformer in 16A; vacuum pumps. No concrete samples collected.	Collect samples representative of the concrete slab. Sample oil stained areas, if present.
16	8	Rooms 138 (machine shop) and 138B (lab), trench in Room 137, pit 137A	Machine shop (Room 138), pit, utility trench. No concrete samples collected.	Collect samples of machine shop floor. Collect one sample from floor of pit. Collect samples at low point(s) in trench.
	9	West side of building: equipment and chemical storage area; solvent storage and cleaning area	PCB contamination beneath portions of the pad. No concrete samples collected.	Collect samples representative of the concrete slab. Sample oil stained areas, if present.
	10	Room 125	Capacitors in oils inside pit. Oil may have spilled or splashed into the pit and affected the walls and floors, then collected in the sump.	Collect samples of pit floor including from base of sump.
	11	Rooms 130 and 138A	Former washing pit and sump. Subsequently filled and resurfaced.	Collect samples of original slab beneath the resurfaced area if such slab is present.
	12	Utility trench (Rooms 138A, 125, 137, 109)	Oil from capacitors.	Collect samples along the length of trench.
	13	Room 110	Capacitors.	Collect concrete samples. Sample oil

Building or Area	Decision Unit	Location	PCB Use / Data Gap	Proposed Sampling for PCB Analysis
				stained areas, if present after tile is removed.
	14	Room 139 ("Perkins Pad") and 139A ("dungeon")	Perkins electrical units, transformers, mechanical vacuum pumps	Collect concrete samples representative of the concrete slab.
	15	Room 101	Oil from diffusion pumps and vacuum piping. Sump at northern end of room. PCB contamination in soil beneath southern end of room.	Collect samples of slab from southern section and at the sump. Sample oil-stained areas, if present.
	NA	Room 140	Room added in 1980. No PCB use that could have impacted concrete.	Sample oil stained areas, if present.
5	16	Former radiological	Although no PCB use is documented, because it was a waste processing yard, the wastes may have contained PCBs.	Collect concrete samples at locations of highest radiological concentrations, and in a random grid at approximate 20-foot intervals in the yard.
Within the project boundary	NA	Paved area on west side of Building 16	PCBs detected in soil (Samples SS16-14-10A, and 10E, 10F). PCBs detected in downstream storm drains.	Collect samples representative of the paved area. Sample oil stained areas, if present.
Within the project boundary	NA	Visible leaks on concrete from vacuum and liquid cooling system pipes	Vacuum and liquid cooling piping may have conveyed PCB-containing fluids.	Sample oil stained areas, if present.
Within the project boundary	NA	Areas not designated as a decision unit	Where visual inspection indicates apparent oil stains or where cracks with the potential to provide a pathway to soil are observed.	Collect one sample from each stained location.

Figure 6. Areas of PCB Uses, Releases, and Decision Units for Sampling in the Project Area



5.2 Soil Sampling

As discussed in *Section 3.2 above*, 411 soil samples have been collected in the project area and analyzed for PCBs; however, data gaps remain regarding the horizontal and vertical extent of PCB contamination at concentrations greater than 0.97 mg/kg. To close these data gaps, soil sampling will be conducted where either the lateral or vertical extent of PCB contamination exceeding 0.97 mg/kg has not been defined or PCB contamination is suspected, but no sampling has been conducted. The sampling is designed to avoid Type I errors discussed in Section 4.2, by generating sufficient additional data to characterize the extent of PCBs in the soils in the project area. Type II errors may occur if more soil is deemed contaminated and consequently removed than is necessary, but the potential extra cost associated with this type of error is considered acceptable.

To delineate the lateral extent of known contamination, additional soil samples will be collected (typically) within approximately 10 feet of samples that show PCBs concentrations greater than 0.97 mg/kg. Where the vertical extent has not been delineated, additional samples will be collected within 1-5 feet horizontally away from samples with PCB concentrations greater than 0.97 mg/kg.

Soil samples will also be collected in areas not previously investigated, which, based on historical process knowledge, visual observations, or other indications of potential contaminant sources, are suspected of being contaminated with PCBs. These samples will be collected in the areas that are most likely to be contaminated (e.g., where oil from transformers or vacuum pumps may have spilled). Where results of sampling completed per Table 4 indicate that PCBs are present in concrete at concentration greater than 0.97 mg/kg, soil samples will also be collected in the locations of the concrete samples.

At each location discussed above, soil samples will be collected from the following depth intervals below ground surface: 0 to 3 inches, 1 foot to 1.5 feet, 2 to 2.5 feet, and 3 to 3.5 and 4 to 4.5 feet. Except at the locations noted below, all samples collected from 0 to 3 inches and 1 foot to 1.5 feet will be analyzed for PCBs. If PCB concentrations exceed 0.97 mg/kg in samples collected from 1 foot to 1.5 feet below ground surface, then the remaining samples will be analyzed. In locations at which the vertical extent of PCB contamination is not known (near borings, SS16-14-10A, SS16-14-10E, SS16-14-10F, SS16-14-63, and SS16-14-81 shown on Figure A-4), samples from all depth intervals will be analyzed for PCBs.

Samples of exposed soils adjacent to the buildings will also be collected to determine if these soils may have become contaminated from weathering and shedding of building materials that contain PCBs. These soil samples will be collected at 0 to 3 inches below ground surface every 20 linear feet along external building surfaces that contain PCBs exceeding 50 mg/kg. The sampling will be limited to within 5 feet of the building. Shallow soil samples (0 to 3 inches below ground surface) will also be collected at points at which runoff from slabs adjacent to such buildings reaches soil if surface soil samples have not been previously collected to determine if PCB contamination may have been transported via surface storm water flow.

Proposed sampling locations selected by the sampling team based on process knowledge, the conceptual site model, and available data, are listed in **Table 5** and shown on Figures A-8 through A-10 in Appendix A.

Table 5. Summary of PCB Uses, Data Gaps in Characterization of Soils Outside of Buildings, and Recommendations for Additional Sampling

Building	Decision Unit	Location	PCB Use / Data Gap	Proposed Sampling for PCB Analysis
5	14	Outside the east wall of the building	Vacuum pumps operated along the wall. No soil samples have been collected in this area.	Collect soil samples immediately adjacent to the vacuum pumps and at additional points along the building wall.
5	16	Former radiological waste processing yard	Although no PCB use is documented, because it was a waste processing yard, the wastes may have contained PCBs.	Collect soil samples at 11 locations in the yard and beneath concrete in which PCBs exceed 0.97 mg/kg if concrete samples are in locations other that the 11 proposed samples shown on Figure A-8
16	None	West side of building	PCB concentrations in soil greater than t 0.97 mg/kg at maximum depths sampled to the west of the building (Samples SS16-14-10A, and 10E, 10F). Vertical extent of contamination has not been determined in some locations at the west side of the building.	Collect soil samples to the west of the building and beneath the adjacent slab where indicated, to determine the extent of PCB contamination.
16A	None	Immediately east of the Building 16A building pad, in the walkway between the pad and the retaining wall to the east.	Building 16A had been used to house transformers, and no soil data has been collected east of the building.	Collect soil samples at two locations east of the building to assess the potential presence and distribution of PCB contamination.
52	None	Outside to the south of Room 117	PCB concentrations in soil greater than 0.97 mg/kg to the southeast of the building.	Collect soil samples to the south of Room 117 in Building 52
52	None	West of Room 111 and building beneath the slab along western side of building	PCBs were detected at concentrations greater than 0.97 mg/kg in the soil at a number of locations west of Building 52 but the lateral extent was not completely determined.	Collect additional soil samples beneath slab on west side, to the north and east of the area sampled and beneath the road (Sally’s Alley) to the west to determine the extent of PCB contamination above 0.97 mg/kg.

Building	Decision Unit	Location	PCB Use / Data Gap	Proposed Sampling for PCB Analysis
52	None	West of Rooms 103, 107, and 109 outside of building	Capacitor bank in Room 109. No soil data available for this area.	Collect soil samples to the east and west to confirm no PCB contamination above 0.97 mg/kg.
52A	1	Northwest side of the building	PCBs were detected at concentrations greater than 0.97 mg/kg in soil under the northwest corner of the concrete pad and on the unpaved slope to the northwest but the lateral extent of the contamination was not completely determined.	Collect additional soil samples to the northwest of the building pad to determine the extent of PCB contamination.
Electrical pad	NA	Beneath and east of electrical pad	Transformer oil had been observed in trenches on the electrical pad. No soil data is available beneath or on the east side of the pad.	Collect soil samples at six locations beneath the electrical pad and at two locations to the east of the pad.
All areas	NA	Beneath subsurface pipes, if encountered during project demolition	Subsurface piping may have conveyed PCB-containing fluids.	Collect soil samples where visual observations indicate potential releases.
All area	NA	Shallow soil adjacent to buildings and in areas where runoff from buildings may have transported PCBs	Exterior building materials may contain PCBs and may have contaminated adjacent surface soils	If PCB concentrations exceed 50 mg/kg in exterior building materials, collect surface soil samples no more than 5 feet from the exterior of the building at 20 linear feet intervals, and at runoff points from concrete slabs adjacent to the building.

Any additional soil sampling required to further delineate PCB contamination in response to new data obtained by implementing this SAP will be specified in the cleanup plan or in an amendment to this SAP. This includes soil samples that may need to be collected beneath pipes discovered beneath the building slabs during demolition, at which, based on visual observation, releases appear to have occurred (e.g., via holes or cracks in pipes; or visible soil staining).

5.3 Soil Sampling beyond Project Boundary

Additional soil samples will be collected to the west beyond the project area shown on Figure 2 where PCBs may have migrated from the project area. The proposed locations of these samples are shown on Figure A-12 in Appendix A.

6 REQUEST FOR ANALYSES

6.1 Analytical Laboratory

Analytical services will be performed by Curtis and Tompkins Ltd. in Berkeley, California. Curtis and Tompkins is certified by the American Association for Laboratory Accreditation to perform PCB analysis by EPA Method 8082A. The analytical laboratory is also certified under the Department of Defense National Environmental Laboratory Accreditation Program. The certification meets the requirements of the Department of Defense and Department of Energy *Quality Systems for Analytical Services* (DOE, 2013). The certificate (number 2943.01), expiring February 9, 2016, is provided in Appendix D. The laboratory is also accredited by California State Environmental Laboratory Accreditation Program. The state certificate (number 2896) with a renewal required on January 31, 2017 is also included in Appendix D. Although samples will not collected for radiological analyses per this SAP, samples will be collected in the former radiological waste processing yard to the north and northeast of Building 5 where sample are expected to contain radiological constituents.

Curtis and Tompkins is capable of providing the required turnaround time and data deliverables required in this SAP and is capable of accepting and analyzing samples that may contain radiological constituents. The designated project manager for analytical services required per this plan is Isabelle Choy.

The analytical laboratory will receive a copy of the final SAP including any revisions and amendments. At the analytical laboratory, the project manager is responsible for its implementation.

6.2 Analytical Methods

Sample preparation and analysis will be performed using the following promulgated methods provided in the *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods* (EPA, 1996):

Sample preparation:

The soil sample will be thoroughly homogenized by the analytical laboratory. Immediately after homogenization the sample will be sieved in accordance with the Soxhlet extraction method and an aliquot of sample will be collected for Soxhlet extraction.

- EPA Method 3540C—Soxhlet Extraction
- EPA Method 3665A—Cleanup of extracts with sulfuric acid
- EPA Method 3660B—Sulfur cleanup with copper option

Sample analysis:

- Polychlorinated biphenyls—EPA Method 8082A (reported on a dry-weight basis)

7 FIELD METHODS AND PROCEDURES

The following supplies will be required for concrete and soil sample collection:

- Pre-cleaned containers (4-ounce jar Teflon-lined cap [wide-mouth jars are preferred]
- Sample labels (pre-printed preferred)
- Phosphate-free detergent
- Tap water
- Distilled or deionized water
- Hexane for decontamination to be provided by the laboratory in a squeeze bottle
- Chain-of-Custody (COC) forms (Example in **Figure 7**)
- Disposable sampling gloves, nitrile gloves are recommended. Latex gloves must not be used due to possible phthalate contamination.
- Safety glasses, hearing protection, respirator, and other appropriate personal protective equipment
- Paper towels
- Permanent marker, wax pencils, and pens
- Stakes for marking soil sample locations
- Sample packaging and shipping supplies
- Bagged ice and coolers
- Field log book
- Maps of building slabs being sampled
- Camera

For concrete sample collection, the following additional equipment is required:

- Rotary impact hammer variable speed drill
- 1-inch or other suitable (1/2, 3/4, etc.) diameter carbide tip drill bits
- Brush and cloths to clean area
- Aluminum foil to collect the powder sample
- 1-quart Cubitainer with the top cut out to collect the powder sample
- Aluminum weighing pans to collect the powder sample
- Cleaned glass container (3 oz. or 60 mL) with Teflon lined cap
- Dedicated vacuum cleaner with a disposable filter or a vacuum pump with a dust filter

7.1 Concrete Sampling

Concrete samples will be collected consistent with the *Standard Operating Procedure for Sampling Porous Surfaces for PCBs* (EPA, 2011). An impact hammer drill or similar tool will be used to will be used to collect approximately 30 grams of concrete as recommended by Curtis and Tompkins Laboratory. Collection of concrete samples will be performed as follows:

1. Organize the sampling supplies in a clean area in the vicinity of the sampling point.
2. Wear disposable gloves, safety glasses, a respirator, and other appropriate personal protective equipment while sampling.
3. Identify the area to be sampled. For easy identification, sample locations may be pre-marked using a marker or paint. (Note: the actual drilling point must not be marked.)

4. Using a decontaminated hammer drill or similar tool remove approximately 30 grams of concrete and place into a 4-ounce sample container.
    a. Lock a 1-inch or another size diameter carbide drill bit into the impact hammer drill and plug the drill into an appropriate power source.
    b. Remove any debris with a clean brush or cloth prior to drilling. Noted in the sampling logbook.
    c. Use a Cubitainer with the top cut off or aluminum foil to contain the powdered sample.
    d. Begin drilling in the designated location. Apply steady even pressure and let the drill do the work. Applying too much pressure will generate excessive heat and dull the drill bit prematurely. The drill will provide a finely ground powder that can be easily collected.
    e. Samples should be collected at ½-inch depth intervals. Thus, the initial surface sample should be collected from 0 - 0.5 inches. A ½- inch deep hole generates about 30 grams (60 mL) of powder. Multiple holes located closely adjacent to each other, may be needed to generate sufficient sample volumes for a PCB determination.
5. Seal the container with the lid, label it, and place it in a resealable bag inside a cooler with ice.
6. Mark the centroid of the sample location and mark the location with a sample ID number
7. To collect another sample, change gloves, decontaminate drill with a paper towel moistened with hexane, and repeat steps 3 through 6.
8. Complete sampling records in the field log book and fill out the Chain-of-Custody (COC) Form.
9. Pack the samples for courier service to Curtis and Tompkins.

Figure 7. Example Chain-of-Custody Form

Chain-of-Custody Form

Project Number:

Project Name: Old Town Demolition Phase 1

Request for Analysis

Chain-of-Custody No.:

Sampler's Name

Page _ of _

Field Sample ID	Date	Time	Comp.	Grab	Matrix	No. of Containers								Additional Requirements

Relinquished by: *(Signature and affiliation)* | Date and Time: | Received by: (Signature and affiliation) | Date and Time:

Relinquished by: *(Signature and affiliation)* | Date and Time: | Received by: (Signature and affiliation) | Date and Time:

Relinquished by: *(Signature and affiliation)* | Date and Time: | Received by: (Signature and affiliation) | Date and Time:

Notes:

Data package: Level III

Turnaround time:

For Laboratory Use Only

7.2 Soil Sampling

Soil samples will be collected consistent with the Field Sampling Guidance Document No. 1205, Soil Sampling (EPA, 1999). Soil samples will be collected using a direct-push method to collect a continuous soil core.

Samples collected in the former radiological waste processing yard and any other location where radioactive contamination may be identified prior to or during the implementation of this plan but is not currently known or suspected, will be collected and handled in conformance with the following:

- DMS RP-004, Radiological Survey Procedure;
- DMS RP-005, Radiological Clearance of Materials and Equipment, and
- DMS RP-010, Radiation Protection Posting, Labeling, and Access Control.

A work package specifying in detail the work steps required to implement this SAP will include steps for radiological controls in conformance with these procedures.

Collection of soil samples will be performed as follows:

1. Organize the sampling supplies in a clean area in the vicinity of the sampling point.
2. Wear disposable gloves, safety glasses, and other appropriate personal protective equipment while sampling.
3. Identify the area to be sampled.
4. Using a decontaminated rod lined with an acetate sleeve, push or drive the sampling rod to the desired soil interval and extract the sampling rod from the ground.
5. Extract the acetate sleeve from the sampling rod and cut the desired sample intervals using a decontaminated hacksaw or other cutting tool. The size of the sample will be sufficient to provide 30 to 50 grams of soil (approximately 2-inch length of acetate sleeve).
6. Place precut polyethylene liners and plastic caps on both ends of the sample interval, label it, and place it in a resealable bag inside a cooler with ice.
7. Mark the sample location with a stake with the sample ID number.
8. To collect another sample, change gloves, decontaminate sampling rod using a detergent wash and triple rinse procedure described below, and repeat steps 3 through 6.
9. Complete sampling records in the field log book and fill out the Chain-of-Custody (COC) Form.
10. Pack the samples for courier service to Curtis and Tompkins.

7.3 Records of Sample Locations

A table of all sample identification numbers and a figure indicating approximate locations of the samples will be provided to the surveyor. All sample locations and depths for soil samples will be surveyed. The coordinates of each sample will be recorded.

7.4 Decontamination Procedure

All non-disposable equipment that comes into contact with potentially contaminated materials will be decontaminated. Decontamination will occur prior to and after each use of a piece of non-disposable equipment. Disposable equipment intended for one-time use will not be decontaminated, but will be packaged for appropriate disposal. Sampling equipment decontamination will be performed in accordance with 40 CFR § 761.79 (c)(2).

Lightly contaminated tools may be decontaminated by swabbing surfaces with a hexane, provided by the laboratory in a squeeze bottle. A paper towel moistened with hexane will be used for cleaning equipment surfaces that came into contact with potential PCB-containing material.

Decontamination of heavily contaminated equipment, such as drill bits use for concrete sampling will be decontaminated as follows:

1. Assemble two decontamination buckets. The first bucket contains a detergent and potable water solution, and the second bucket is for rinsate.
2. Place all used drill bits, hose for the vacuum cleaner, and utensils in the detergent and water bucket.
3. Scrub each piece thoroughly using the scrub brush. Note, the powder does cling to the metal surfaces, so care should be taken during this step, especially with the twists and curves of the drill bits.
4. Next, rinse each piece with water and hexane.
5. Place the rinsed pieces on clean paper towels and individually dry and inspect each piece. Note: all pieces should be dry prior to reuse.

Because of the potential for radioactive contamination during sample collection at the former radiological waste processing yard, all sampling equipment used at this yard will be left at the Building 5 to be disposed with the demolition waste, concrete slabs, or soil from this Building depending on when samples are collected.

7.5 Investigation Derived Waste

Disposable equipment intended for one-time use and filters from vacuum used during sample collection will not be decontaminated, but will be placed in a double lined plastic trash bag with sample gloves and other personal protective equipment for appropriate disposal following use. The bag will be dated and labeled with a completed “Pending Analysis” label and stored in a water-tight container at a location preselected at each building. This waste will be treated as PCB waste if the samples are positive for PCBs. Wastewater from decontamination activities will be accumulated in a holding vessel and analyzed for disposal.

Waste management will meet all requirements of LBNL’s *Waste Management Plan* (LBNL, 2014). Disposal will be in conformance with Subpart D—Storage and Disposal of 40 CFR 761 and all applicable requirements for handling and disposal of radioactive waste.

Information obtained during sample collection that may be relevant to waste characterization or waste disposal will be provided to LBNL’s waste management personnel. Such information may include the composition and percentages of different constituents in the waste stream, physical state and/or other characteristics collected in the field.

Excess material from samples provided to Curtis and Tompkins will be disposed of appropriately by the analytical laboratory in conformance with the analytical laboratory's waste management program.

8 SAMPLE CONTAINERS, PRESERVATION AND HOLDING TIME

The containers provided by the analytical laboratory will be pre-cleaned by the manufacturer according to the EPA requirements. Sample temperature requirements will include storage and transportation at ≤6 Celsius. Table 6 the preservation and holding times for PCB samples.

Table 6. Analytical Methods, Containers, Preservation, and Holding Time Requirements

Analytical Parameter	Analytical Method Number	Sample Containers	Preservation Requirements	Holding Times
PCBs	EPA Method 8082A	4-ounce jar Teflon-lined cap (wide-mouth jars are preferred) / acetate sleeve	Cool to ≤ 6ºCelsius	None for extraction; 40 days for analysis

Notes:
EPA United States Environmental Protection Agency
PCB polychlorinated biphenyl

9 SAMPLE DOCUMENTATION AND SHIPMENT

9.1 Field Notes

Field documentation will include, at a minimum, a Field Logbook, buildings floor plans, and preprinted COC forms (Example in **Figure 7**).

9.1.1 Field Logbooks

A Field Logbook with consecutively numbered pages will be assigned to this project. All entries will be recorded in indelible ink. At the end of each workday, the responsible sampler will cross out, sign, and date any unused portions of the logbook page last used. If it is necessary to transfer the logbook to another person, the person relinquishing the logbook will sign and date the last page used, and the person receiving the logbook will sign and date the next page to be used. At a minimum, the Field Logbook will contain the following information:

- Sample location and description
- Site or sampling area sketch showing sample location and measured distances
- Sampler's name(s)
- Date and time of sample collection
- Designation of sample as composite or grab
- Type of sample
- Type of sampling equipment used

- Field observations and details related to analysis or integrity of samples (e.g., weather conditions, noticeable odors, colors, etc.)
- Shipping arrangements (overnight air bill number)
- Name(s) of recipient laboratory(ies), which is Curtis and Tompkins

In addition to the sampling information, the following specific information will also be recorded in the field logbook for each day of sampling:

- Team members and their responsibilities
- Time of arrival/entry on site and time of site departure
- Other personnel on site
- Summary of any meetings or discussions with contractor or federal agency personnel
- Deviations from sampling plans, site safety plans, and/or SOPs
- Changes in personnel and responsibilities with reasons for the changes
- Levels of safety protection
- Calibration readings for any equipment used and equipment model and serial number

9.1.2 Building Floor Plans

Building floor plans and/or other site drawings as appropriate are invaluable for establishing and recording the location of sample collection, or making notations for field observations. Building floor plans will be used to identify previous sample locations and areas for sampling to address data gaps.

9.1.3 Photographs

Photographs will be taken at areas of interest and sample locations. They will serve to verify information entered in the field logbook. For each photograph taken, the following information will be written in the logbook or recorded in the field photography log:

- Time, date, location, and weather conditions
- Description of the subject photographed
- Name of person taking the photograph

9.2 Sample Numbering and Labeling

Samples will be uniquely designated with a sample identification number conforming to the requirements of *RP-006 Sample Collection Procedure, DMS-7209030-RIP-45 Rev. 0, April 2015c* (Appendix D). Relevant sample prefixes that will apply to samples collected per this SAP are:

- SC Concrete sample
- DT Soil/similar debris
- SE Sediment/sludge sample

> EXAMPLE OF SAMPLE IDENTIFICATION NUMBER: B16-SC-YY where B-16 indicates Building 16, SC stands for concrete and YY is the consecutive sample number for that type of sample media for the entire project.

The following information shall be listed on each sample containers:

- Sample Identification Number

- Date and time sample was obtained
- Sampler's initials

The information will be marked with an indelible marker on a sample label or a tag affixed to each sample container.

A Sample Tracking Log will be maintained by the sampling personnel to track all collected samples.

9.3 Sample Locations

The sampling locations will be accurately located either a survey or other appropriate method approved by the LBNL Project Manager."

Sample Custody

Sampling personnel will complete the COC form prior to transferring samples to the laboratory either by courier service or by overnight delivery service. A sample is under custody, if one or more of the following criteria are met:

- It is in the sampler's possession
- It is in the sampler's view after being in possession
- It is in a designated secure area

In addition to providing a custody exchange record for the samples, the COC form serves as a formal request for sample analyses. **Figure 7** includes an example of a COC form. At a minimum, each sample, the required analyses, sample collection date/time, and the individuals or organizations performing the sample collection, shipment, and receipt will be listed on the COC. Sample custody is the responsibility of the field crew from the time of sample collection until the samples are accepted by the laboratory courier service for delivery to the laboratory, or until the samples are accepted for shipment by a commercial courier. Thereafter, the laboratory performing the analysis will maintain custody.

The COC form will be the controlling document to assure that sample custody is maintained. Each time the sample custody is transferred to a different organization, the former custodian will sign the COC on the "Relinquished By" line, and the new custodian will sign the COC on the "Received By" line. The date, time and company affiliation will accompany each signature. The laboratory will immediately notify project personnel if the event the COC is broken. A decision will be made as to the fate of the sample(s) in question on a case-by-case basis. The sample(s) will either be processed "as-is" with custody failure noted along with the analytical data or rejected with resampling scheduled, if necessary. Any non-conformance associated with the samples will be noted on the appropriate certificate or analysis or in a case narrative.

The COC forms will be completed, signed, and distributed as follows:

- One copy retained by the sample coordinator
- The original sent to the analytical laboratory with the sample shipment

After the laboratory receives the samples, the laboratory sample custodian will inventory each shipment before signing for it and note on the Cooler Receipt Form any discrepancy in the number of samples, temperature of the cooler or broken samples. The laboratory will immediately notify project personnel of any problems identified with the shipped samples in order to determine the appropriate course of action.

9.4 Sample Packaging and Shipment

Samples will be placed in sample coolers. A temperature blank will be placed in every cooler. All sample containers will be protected with bubble wrap. Ice, double-bagged in resealing bags, will be added to the cooler in sufficient quantity to keep the samples at ≤6 degrees Celsius for the duration of the shipment to the laboratory. Sample cooler drain spouts will be taped from the inside and outside of the cooler to prevent any leakage.

When samples are picked up by the analytical laboratory's courier service. The COC form will be completed and signed by sampler and the analytical laboratory's courier.

10 QUALITY CONTROL

QC procedures discussed below will followed to ensure the representativeness and integrity of the samples that are collected, as well as the integrity and accuracy of the analytical process.

10.1 Field Quality Control Samples

Concrete samples and soil samples are being analyzed to characterize the project area and to support a cleanup application submitted to the EPA. Field duplicates will be collected at a minimum frequency of 1 per 20 samples.

10.1.1 Matrix Spike and Matrix Spike Duplicates

Although soil is heterogeneous, matrix spike and matrix spike duplicates will be analyzed to evaluate the effects of sample matrix on the performance of the PCB analysis. Soil samples submitted for matrix spike and matrix spike duplicate (MS/MSD) analysis will be composited at the laboratory before preparation and analysis. The matrix spike will evaluate the potential bias and the matrix spike duplicate will evaluate the precision of the preparation and analysis procedures. The MS/MSD will be collected at a frequency of five percent of the total soil samples. The soil sample will be noted for MS/MSD on the COC form.

10.1.2 Equipment Blanks

Equipment blanks will be collected during soil sampling to evaluate potential sources of contamination as a result of the decontamination process. To collect the equipment blank, a sample of analyte free water will be poured through decontaminated field sample equipment prior to the use of the equipment. The equipment blank will be collected into a 1 liter amber bottle for analysis of PCBs by EPA method 3520C/8082A. Equipment blanks will be collected at a frequency of one per day for each type of equipment used to collect soil samples.

10.2 Laboratory Quality Control Checks

The recovery of known additions is a part of laboratory analytical protocols. The use of additives at known concentrations allows detection of matrix interferences and estimating the impact of these interferences when present. It also allows evaluation of the efficiency of extraction procedures and overall accuracy of analysis. The following laboratory internal QC checks will be included as applicable and appropriate per the analytical method:

- Laboratory control sample (LCS)
- Laboratory control duplicate (LCD)

- Surrogate standards
- Method and instrument blanks

All decisions related to data quality will be made based on laboratory QC samples described in the following sections.

10.2.1 Laboratory Control Samples

Laboratory control samples are matrix-equivalent QC check samples (such as analyte-free sand) spiked with a known quantity of specific analytes that are carried through the entire sample preparation and analysis process. The spiking solution used for LCS/LCD preparation is of a source different from the stock that was used to prepare calibration standards.

Analytical accuracy will be represented by the recovery of the spiked compound in the LCS/LCD. As a general rule, the recovery of most compounds spiked into samples is expected to fall within a range of 40 to 150 percent. The laboratory will have statistically-based control limits for recovery for each method and matrix.

Analytical precision will be evaluated based on the RPD of the LCS/LCD pair. The laboratory will have statistically-based control limits for RPD established for PCB analysis of solid samples.

10.2.2 Surrogate Standards

Organic compound analyses include the addition, quantitation, and recovery calculation of surrogate standards. Compounds selected to serve as surrogate standards must meet all of the following requirements:

- Are not the target analytes
- Do not interfere with the determination of target analytes
- Are not naturally occurring, yet are chemically similar to the target analytes
- Are compounds exhibiting similar response to target analytes

Surrogate standards are added to every analytical and QC check sample at the beginning of the sample preparation. The surrogate standard recovery is used to monitor matrix effects and losses during sample preparation. Surrogate standard control criteria are applied to all analytical and QC check samples, and if surrogate criteria are not met, re-extraction and reanalysis may be performed.

Analytical accuracy will be also evaluated based on the surrogate standard recovery. The laboratory will have statistically-based control limits for RPD established for each method of analysis and sample matrix. The surrogate standard control limits typically range from 40 to 150 percent for PCB analysis.

10.2.3 Method Blanks

A method blank is used to monitor the laboratory preparation and analysis process for interferences and contamination from glassware, reagents, sample handling, and from the general laboratory environment. A method blank is carried through the entire sample preparation and analysis process, and is included with each batch of samples.

10.2.4 Reporting Limits

The laboratory will determine the detection limits for each Aroclor and matrix by using the procedure described in 40 CFR Part 136, Appendix B or another scientifically valid and documented procedure. The detection limit is defined as the smallest analyte concentration that can be demonstrated to be different from zero or a blank concentration at the 99 percent level of confidence.

The limit of detection (LOD) is the smallest amount or concentration that must be present in a sample in order to be detected at a 99 percent confidence level. The LOD is typically two to four times the detection limit. The limit of quantitation (LOQ) is the lowest concentration of a substance that produces quantitative result within specified limit of precision and accuracy; usually set at or above the concentration of the lowest calibration standard.

Once the LOQs have been established, laboratories routinely use them as reporting limits in the analysis of interference-free, undiluted samples. The LOQs, however, are highly matrix-dependent and their values increase with sample dilution. Higher reporting limits are expected for samples with matrix interferences such as paint, oil, and hydraulic fluids. The LOQs provided by the laboratory will be reviewed to determine whether they are sufficiently low to support project decisions.

Reporting limits established by Curtis & Tompkins for Aroclors in solid samples are provided below. These reporting limits are based on a 30-gram sample prepared by Soxhlet extraction with no dilution. All solid samples will be reported on a dry weight basis, therefore this is the lowest reporting limit for the project samples.

Aroclor 1016	0.012 mg/kg	Aroclor 1248	0.012 mg/kg
Aroclor 1221	0.024 mg/kg	Aroclor 1254	0.012 mg/kg
Aroclor 1232	0.012 mg/kg	Aroclor 1260	0.012 mg/kg
Aroclor 1242	0.012 mg/kg		

11 FIELD VARIANCES

This SAP provides the basis for sampling activities to be performed in order to address PCB data gaps. Field conditions at the time of sampling may dictate that the actual samples be collected from a matrix, using techniques not described in this SAP, or otherwise not in conformance with the approach described. Any potential deviations from this SAP will be performed in coordination with the LBNL Environmental Services Group.

12 FIELD HEALTH AND SAFETY PROCEDURES

All activities performed in support of this SAP will be conducted in accordance with the *DMS Site-Specific Health and Safety Plan* (DMS, 2015d) and .

For concrete sample collection, eye, respiratory, and hearing protection are required at all times during sample drilling. A properly fitted respirator is required for concrete sampling.

13 REPORT

A soil and concrete sampling report will be prepared and provided to LBNL for review and approval. The reports must be signed and stamped by the PCB Characterization Technical Manager listed as Christina Kennedy, PG in Table 1, or if necessary, another qualified engineer or geologist licensed by and in good standing with the California Board of Professional Engineer and Land Surveyors with environmental experience in soil sampling and familiar with the project. The reports will include the following information, at a minimum:

- Documentation with maps, tables, and text of the locations, concentrations, and depths (for soil samples) where samples were collected and the extent of contamination at concentrations greater than the presumptive cleanup level
- Previous results will be included as necessary to show that the nature and extent of contamination has been adequately characterized;
- Copies of all laboratory analytical reports including Chain of Custody (COC) records;
- Tables with analytical results, including detection limits;
- Photo-documentation (photograph and date) of soil and concrete sample locations.
- Discussion of data gaps that will require additional investigation to be addressed in the cleanup plan or an amendment to this plan.

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Weiss Associates. 2010. Reconnaissance-Level Characterization Report for Buildings 5, 14, 25A, 40, 41, 44, 44A, 44B, 52, and 52A at the Lawrence Berkeley National Laboratory, Berkeley, California. Rev. 0. December.

Appendix A. Figures A-1 through A-12

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EXPLANATION

- Project Area
- Area of PCB Use
- Dungeon
- Pit/Trench/Vault
- Historical Pit
- Perkins East Sampling Area
- Building 5 Radiological Waste Processing Yard
- Perkins Pad

Total PCB Concentration

- 0 - 0.979 mg/kg
- 0.98 - 49.99 mg/kg
- 50 - 499.99 mg/kg
- > 500 mg/kg

NOTE:
1. "ND < RL" = Non-Detectable, Below Reporting Limit
2. Aerial Imagery © 2014 Pictometry

0 8 16
Scale in Feet

Figure A-1

Building 5
Total PCB Concentrations in Concrete

Dynamic Management Solutions, LLC
LBNL Old Town

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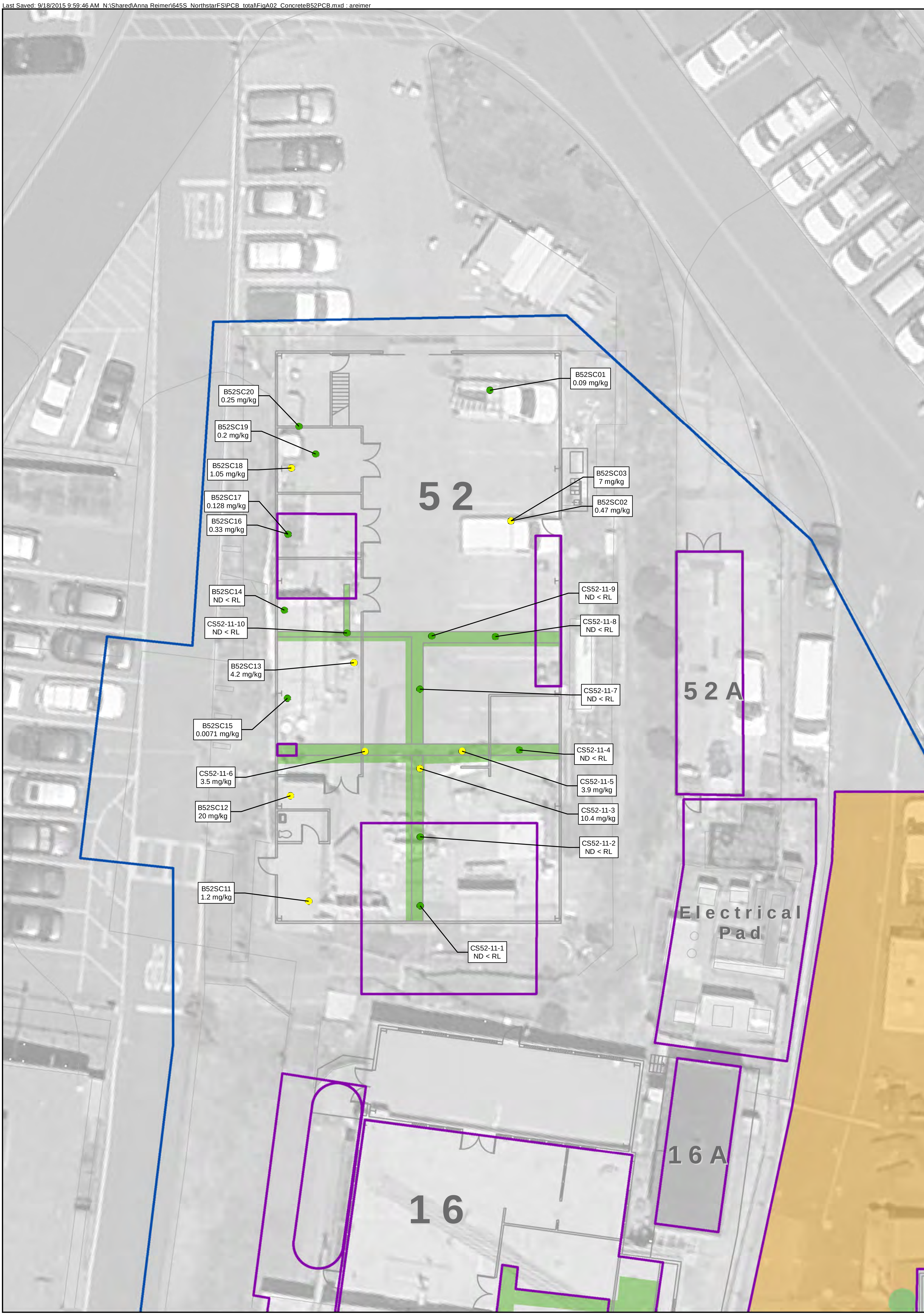

EXPLANATION

- Project Area
- Area of PCB Use
- Pit/Trench/Vault
- Building 5 Radiological Waste Processing Yard

Total PCB Concentration

- 0 - 0.979 mg/kg
- 0.98 - 49.99 mg/kg
- 50 - 499.99 mg/kg
- > 500 mg/kg

N

0 8 16

Scale in Feet

NOTE:
1. "ND < RL" = Non-Detectable, Below Reporting Limit
2. Trenches in Building 52 have been removed and backfilled with concrete.
3. Aerial Imagery © 2014 Pictometry

Figure A-2

Buildings 52. 52A, and the Electrical Pad Total PCB Concentrations in Concrete

Dynamic Management Solutions, LLC
LBNL Old Town

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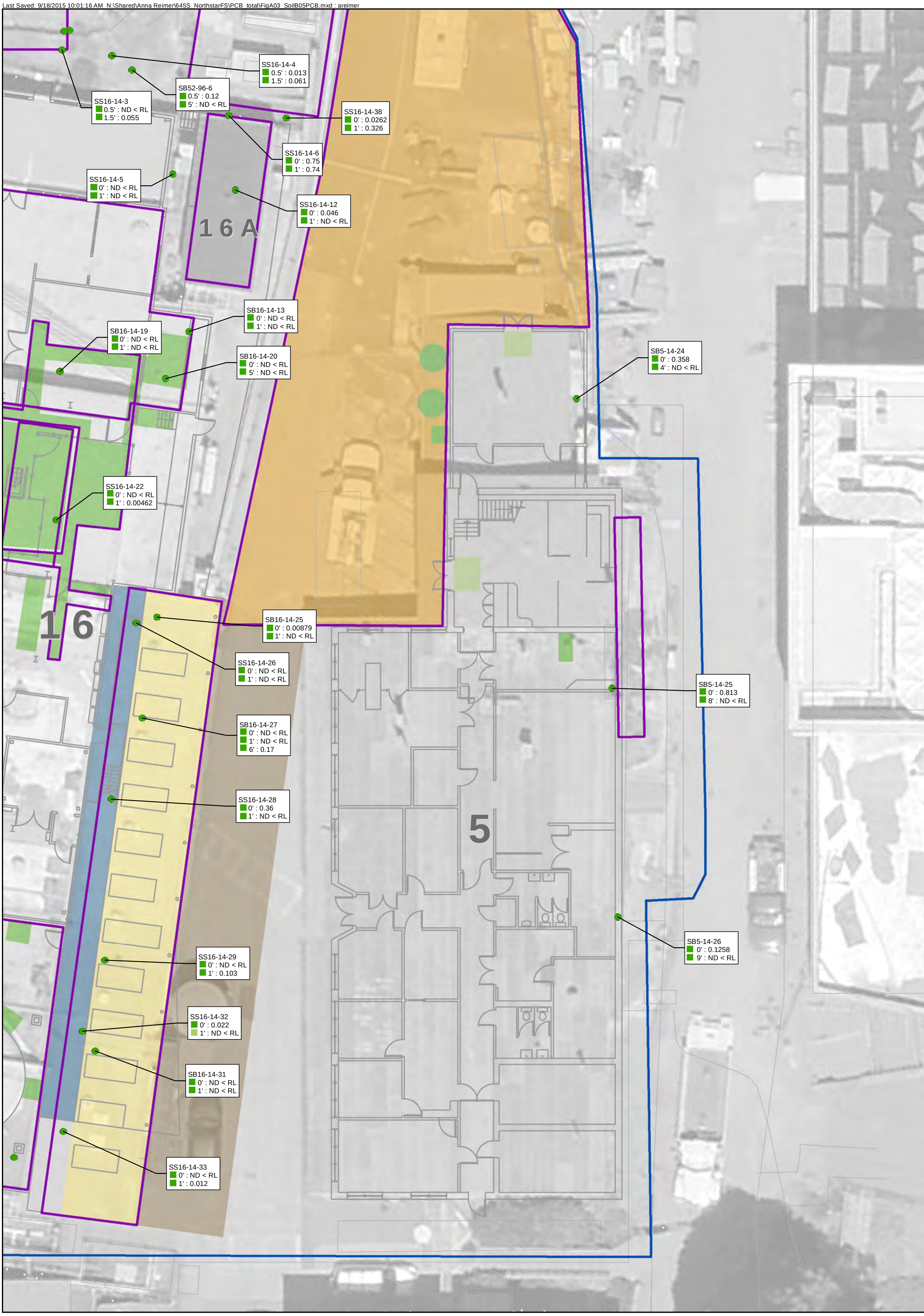

EXPLANATION

- Project Area
- Area of PCB Use
- Dungeon
- Pit/Trench/Vault
- Historical Pit
- Perkins East Sampling
- Building 5 Radiological Waste Processing Yard
- Perkins Pad

Total PCB Concentration

- 0 - 0.979 mg/kg
- 0.98 - 49.99 mg/kg
- 50 - 499.99 mg/kg
- \> 500 mg/kg

NOTE:
1. "ND < RL" = Non-Detectable, Below Reporting Limit
2. Aerial Imagery © 2014 Pictometry

N

0 8 16
Scale in Feet

Figure A-3

Building 5
Total PCB Concentrations in Soil

Dynamic Management Solutions, LLC
LBNL Old Town

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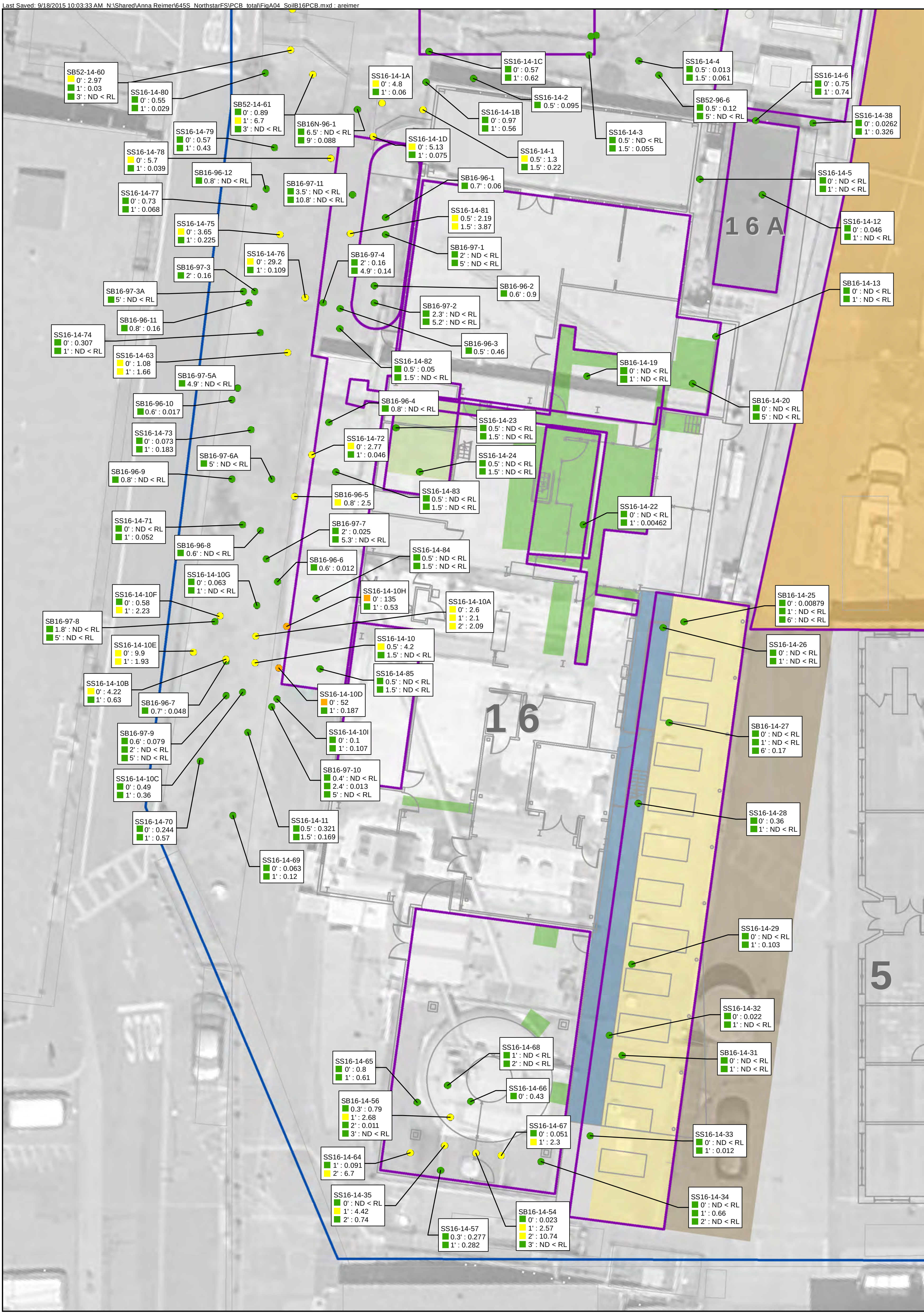

EXPLANATION

- Project Area
- Area of PCB Use
- Dungeon
- Pit/Trench/Vault
- Historical Pit
- Perkins East Sampling
- Building 5 Radiological Waste Processing Yard
- Perkins Pad

Total PCB Concentration

- 0 - 0.979 mg/kg
- 0.98 - 49.99 mg/kg
- 50 - 499.99 mg/kg
- > 500 mg/kg

N

0 8 16
Scale in Feet

NOTE:
1. "ND < RL" = Non-Detectable, Below Reporting Limit
2. Aerial Imagery © 2014 Pictometry

Figure A-4

Buildings 16 and 16A
Total PCB Concentrations in Soil

Dynamic Management Solutions, LLC
LBNL Old Town

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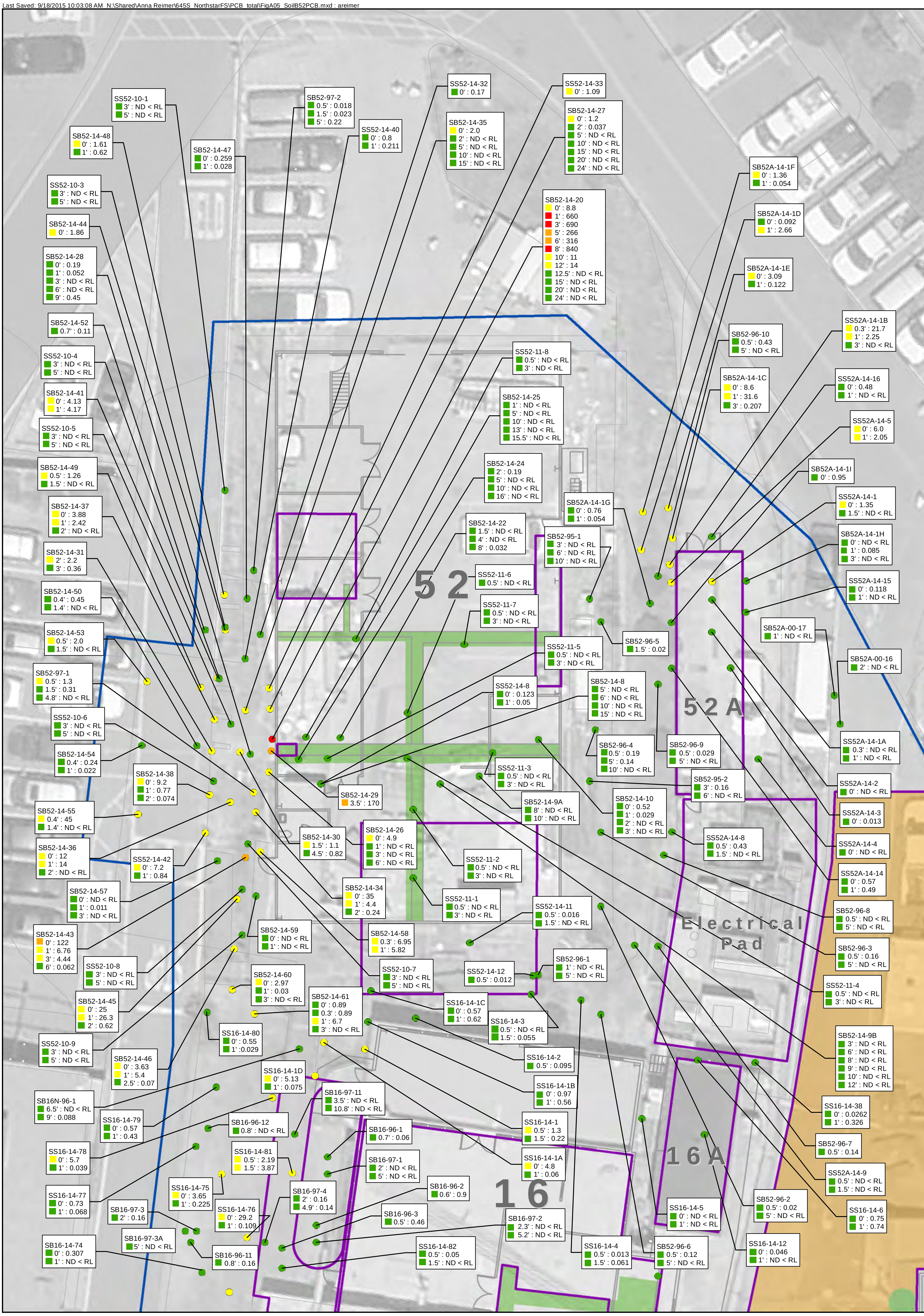

EXPLANATION

- Project Area
- Area of PCB Use
- Pit/Trench/Vault
- Building 5 Radiological Waste Processing Yard

Total PCB Concentration

- 0 - 0.979 mg/kg
- 0.98 - 49.99 mg/kg
- 50 - 499.99 mg/kg
- \> 500 mg/kg

NOTE:
1. "ND < RL" = Non-Detectable, Below Reporting Limit
2. Trenches in Building 52 have been removed and backfilled with concrete.
3. Aerial Imagery © 2014 Pictometry

N

0 8 16

Scale in Feet

Figure A-5

Buildings 52, 52A, and the Electrical Pad Total PCB Concentrations in Soil

Dynamic Management Solutions, LLC
LBNL Old Town

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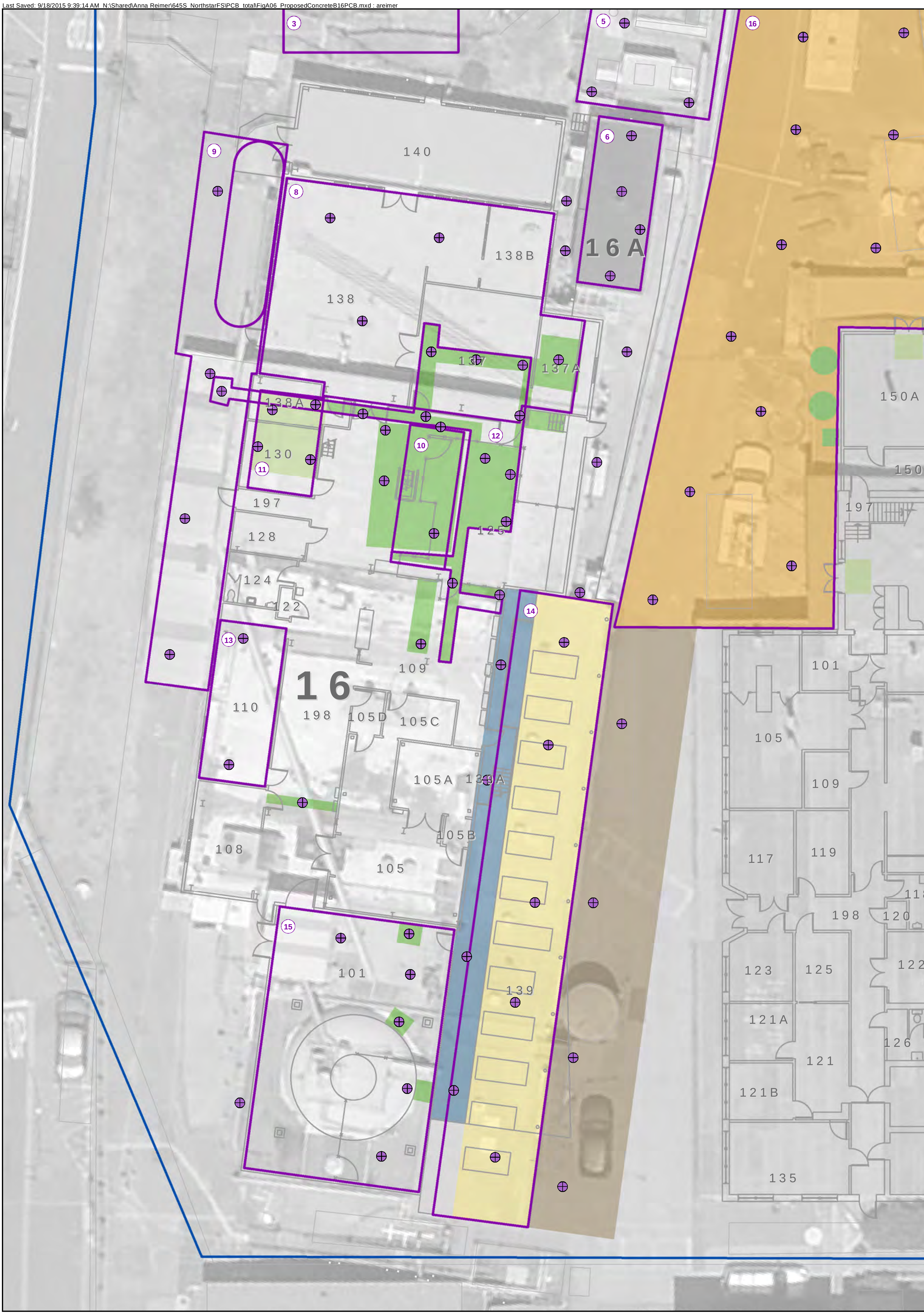


EXPLANATION

- Proposed Concrete Sample Location
- Project Area
- Area of PCB Use with Decision Unit Number
- Dungeon
- Pit/Trench/Vault
- Historical Pit
- Perkins East Sampling
- Building 5 Radiological Waste Processing Yard
- Perkins Pad

NOTE:
1. Aerial Imagery © 2014 Pictometry

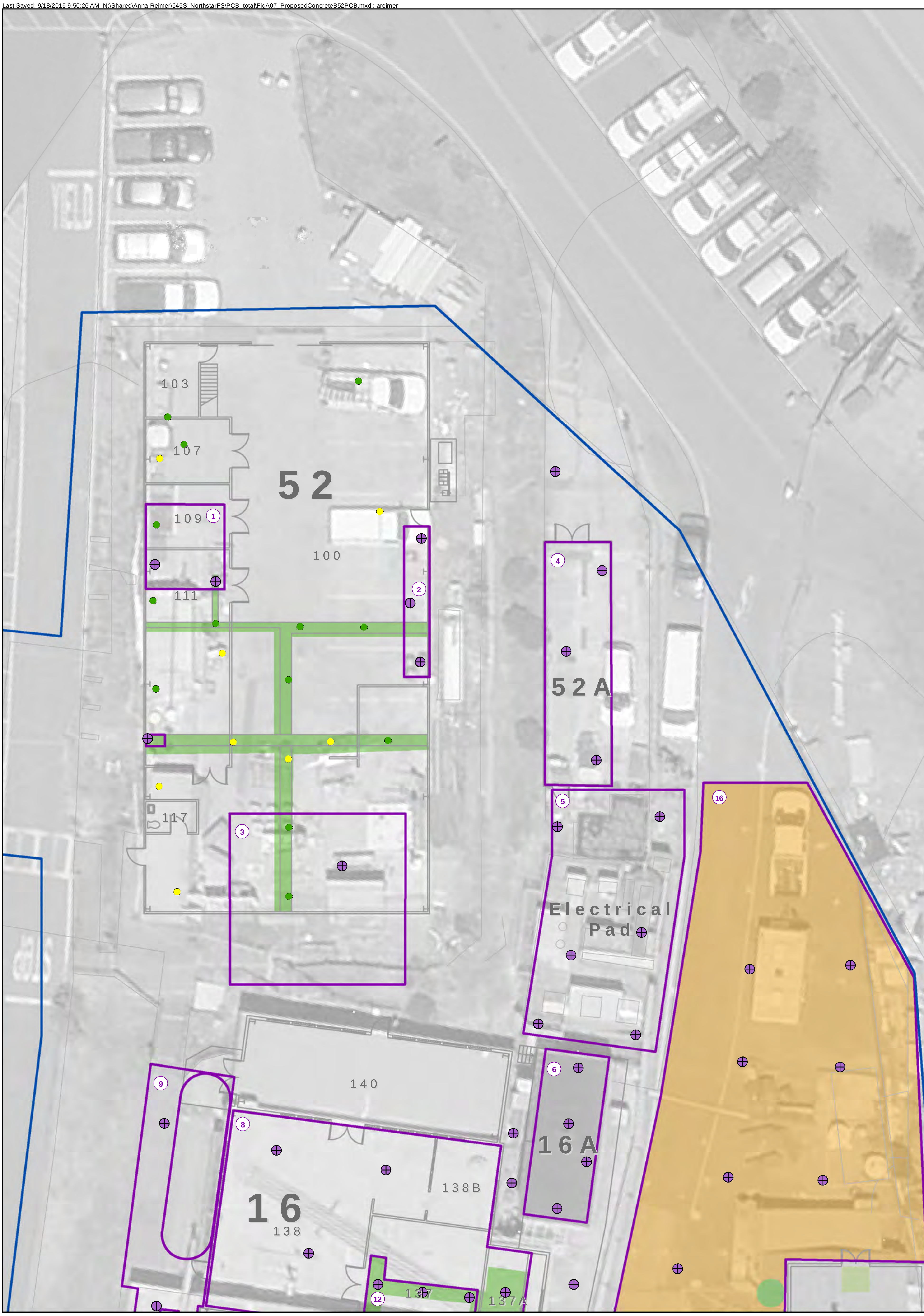
N

0 8 16
Scale in Feet

Figure A-6

Buildings 16 and 16A
Proposed Concrete Sample Locations

Dynamic Management Solutions, LLC
LBNL Old Town



EXPLANATION

- Proposed Concrete Sample Location
- Project Area
- Area of PCB Use with Decision Unit Number
- Pit/Trench/Vault
- Historical Pit
- Building 5 Radiological Waste Processing Yard

Total PCB Concentration

- 0 - 0.979 mg/kg
- 0.98 - 49.99 mg/kg
- 50 - 499.99 mg/kg
- > 500 mg/kg

0 8 16
Scale in Feet

NOTE:
1. Aerial Imagery © 2014 Pictometry

Figure A-7

Buildings 52, 52A, and the Electrical Pad Proposed Concrete Sample Locations

Dynamic Management Solutions, LLC
LBNL Old Town

EXPLANATION

- Proposed Soil Sample Location
- Project Area
- Area of PCB Use
- Dungeon
- Pit/Trench/Vault
- Historical Pit
- Perkins East Sampling Area
- Building 5 Radiological Waste Processing Yard
- Perkins Pad

Total PCB Concentration (within 50 feet of Project Area)

- 0 - 0.979 mg/kg
- 0.98 - 49.99 mg/kg
- 50 - 499.99 mg/kg
- > 500 mg/kg

N

0 8 16

Scale in Feet

NOTE:
1. Aerial Imagery © 2014 Pictometry

Figure A-8

Building 5
Proposed Soil Sample Locations

Dynamic Management Solutions, LLC
LBNL Old Town

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EXPLANATION

- Proposed Soil Sample Location
- Project Area
- Area of PCB Use
- Dungeon
- Pit/Trench/Vault
- Historical Pit
- Perkins East Sampling Area
- Building 5 Radiological Waste Processing Yard
- Perkins Pad

Total PCB Concentration (within 50 feet of Project Area)

- 0 - 0.979 mg/kg
- 0.98 - 49.99 mg/kg
- 50 - 499.99 mg/kg
- > 500 mg/kg

N

0 8 16

Scale in Feet

NOTE:
1. Aerial Imagery © 2014 Pictometry

Figure A-9

Buildings 16 and 16A
Proposed Soil Sample Locations

Dynamic Management Solutions, LLC
LBNL Old Town

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EXPLANATION

Proposed Soil Sample Location
Project Area
Area of PCB Use

Dungeon
Pit/Trench/Vault
Historical Pit
Building 5 Radiological Waste Processing Yard

Total PCB Concentration (within 50 feet of Project Area)

- 0 - 0.979 mg/kg
- 0.98 - 49.99 mg/kg
- 50 - 499.99 mg/kg
- > 500 mg/kg

N

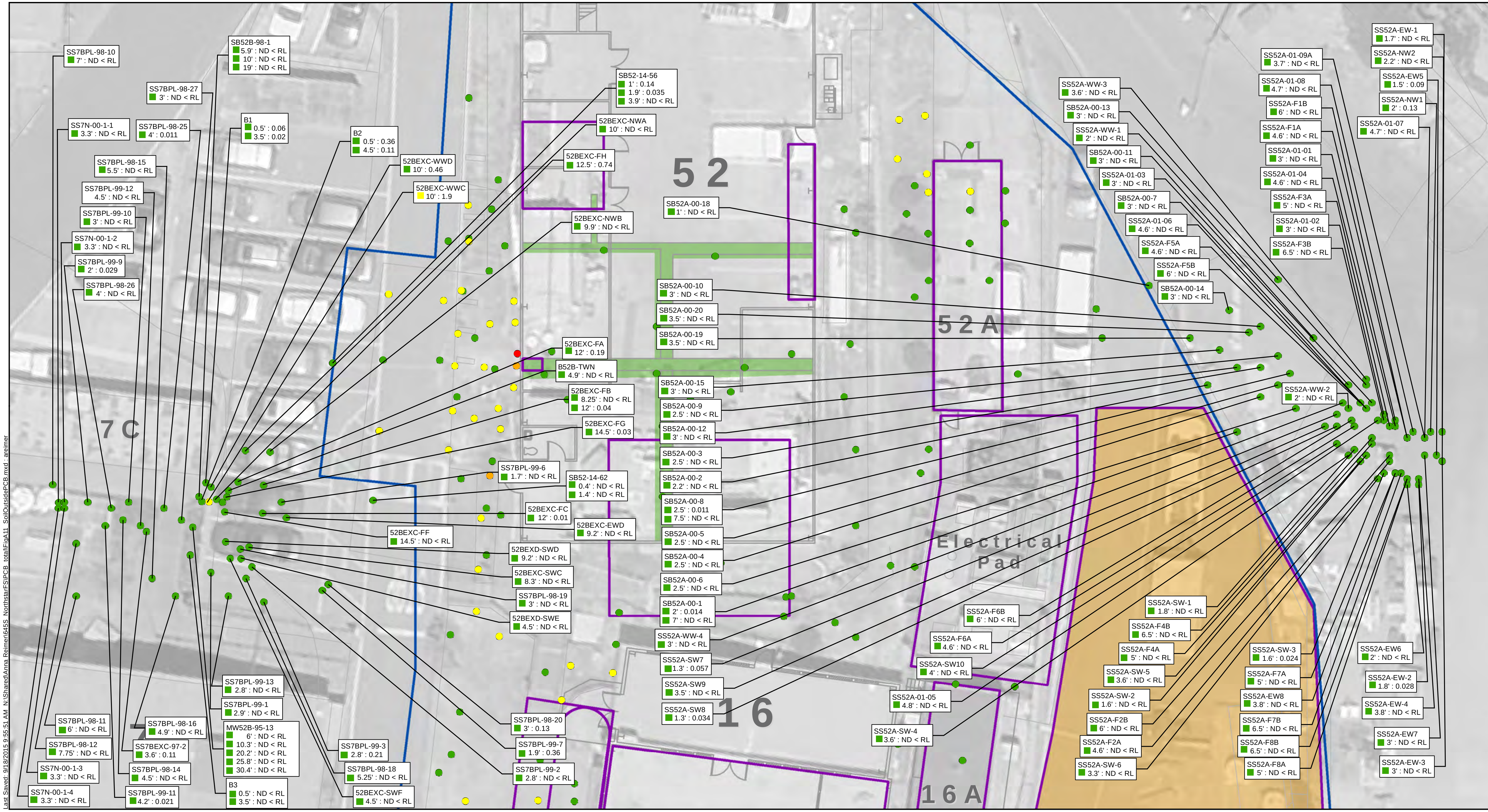
0 8 16
Scale in Feet

NOTE:
1. Trenches in Building 52 have been removed and backfilled with concrete.
2. Aerial Imagery © 2014 Pictometry

Figure A-10

Buildings 52, 52A, and the Electrical Pad Proposed Soil Sample Locations

Dynamic Management Solutions, LLC
LBNL Old Town



EXPLANATION

- Project Area
- Area of PCB Use
- Dungeon
- Pit/Trench/Vault
- Historical Pit
- Perkins East Sampling
- Building 5 Radiological Waste Processing Yard
- Perkins Pad

Total PCB Concentration (within 50 feet of Project Area)

- 0 - 0.979 mg/kg
- 0.98 - 49.99 mg/kg
- 50 - 499.99 mg/kg
- > 500 mg/kg

NOTE:
1. "ND < RL" = Non-Detectable, Below Reporting Limit
2. Trenches in Building 52 have been removed and backfilled with concrete.
3. Aerial Imagery © 2014 Pictometry

N

0 8 16
Scale in Feet

Figure A-11

Outside of Phase I Project Boundary Total PCB Concentrations in Soil

Dynamic Management Solutions, LLC
LBNL Old Town

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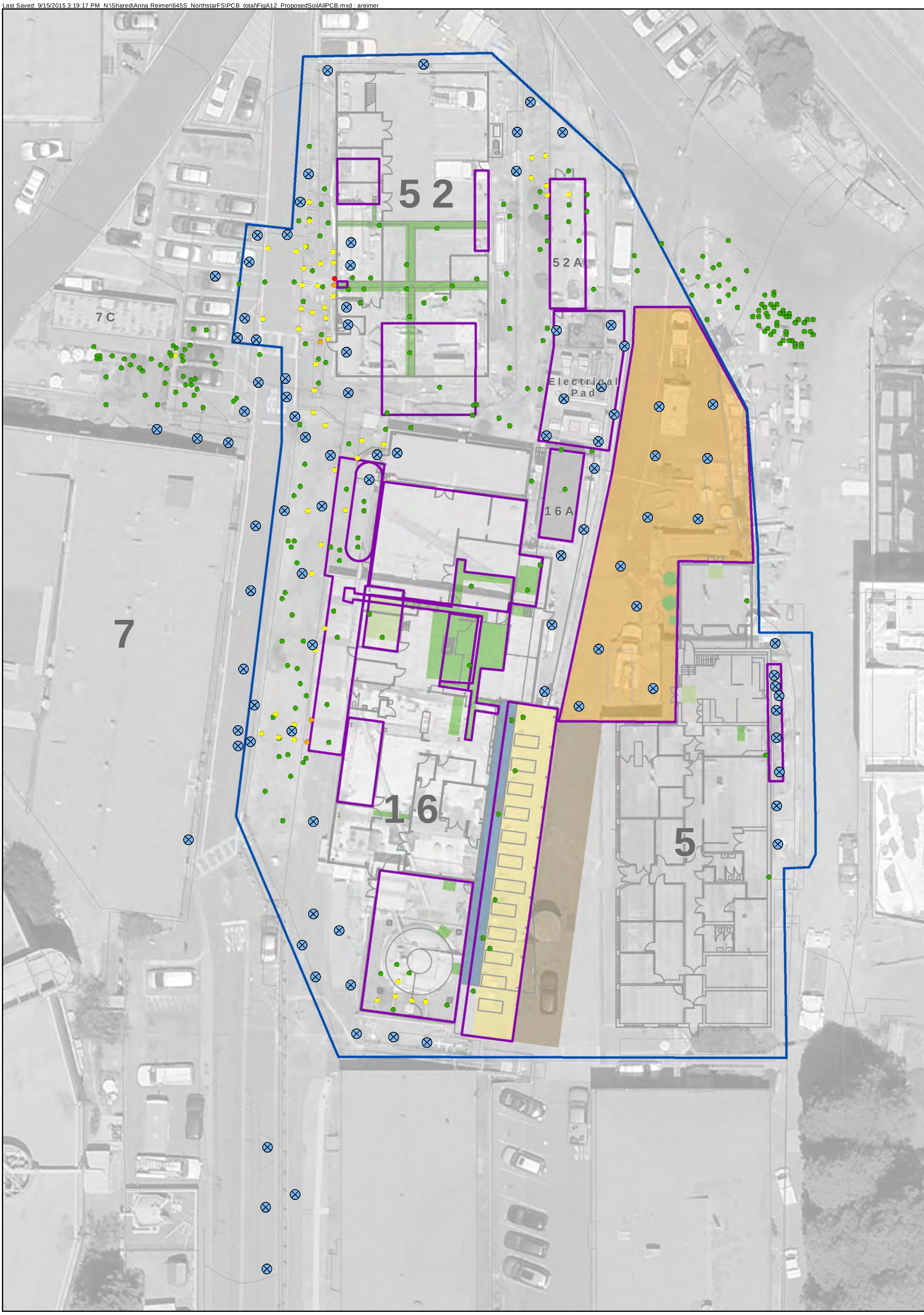


EXPLANATION

Proposed Soil Sample Location
Project Area
Area of PCB Use
Dungeon
Pit/Trench/Vault
Historical Pit
Perkins East Sampling Area
Building 5 Radiological Waste Processing Yard
Perkins Pad

Total PCB Concentration (within 50 feet of Project Area)

0 - 0.979 mg/kg
0.98 - 49.99 mg/kg
50 - 499.99 mg/kg
> 500 mg/kg

N

0 15 30
Scale in Feet

NOTE:
1. Trenches in Building 52 have been removed and backfilled with concrete.
2. Aerial Imagery © 2014 Pictometry

Figure A-12

Proposed Soil Sample Locations Within and Beyond the Phase I Project Boundary

Dynamic Management Solutions, LLC
LBNL Old Town

Appendix B. Summary of PCB Characterization Data

Prior PCB Characterization Data for Building 5

Table 6-7. Analytical Results for PCBs – Building 5

Sample Type	Sample Description	Sample Name	Units	Aroclor 1016	Aroclor 1221	Aroclor 1232	Aroclor 1242	Aroclor 1248	Aroclor 1254	Aroclor 1260
Caulk	Window sill caulking, Room 150 northeast	B5CK01	mg/kg	<0.33	<0.33	<0.33	<0.33	<0.33	0.17 J, T	0.25 J, T
Paint	Wall paint, Room 150 northeast	B5PC01	mg/kg	<0.34	<0.34	<0.34	<0.34	<0.34	4.9	15
Paint	Wall paint, Room 112 east	B5PC02	mg/kg	<3.9	<3.9	<3.9	<3.9	<3.9	3.1 J, T	2.1 J, T
Paint	Wall paint, Room 136 southeast	B5PC03	mg/kg	<0.33	<0.33	<0.33	<0.33	<0.33	1.4	0.94
Concrete	Concrete core, Room 150A southeast	B5SC01	mg/kg	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033
Concrete	Concrete core, Room 150 east	B5SC02	mg/kg	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033
Concrete	Concrete core, Room 150A west	B5SC03	mg/kg	<0.033	<0.033	<0.033	<0.033	<0.033	0.0068 J, T	<0.033
Concrete	Concrete core, Room 150A southwest	B5SC04	mg/kg	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033
Concrete	Concrete core, Room 150	B5SC05	mg/kg	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033
Concrete	Concrete core, Room 100 east	B5SC06	mg/kg	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033
Concrete	Concrete core, Room 100 northwest	B5SC07	mg/kg	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033
Concrete	Concrete core, Room 100 center	B5SC08	mg/kg	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033
Concrete	Concrete core, Room 100 south	B5SC09	mg/kg	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033
Concrete	Concrete wall chips, Room 112 east	B5SC15	mg/kg	<0.033	<0.033	<0.033	<0.033	<0.033	0.071	0.033
Concrete	Concrete wall chips, Room 112 southeast	B5SC16	mg/kg	<0.033	<0.033	<0.033	<0.033	<0.033	0.07	0.032 J, T
Concrete	Concrete, Room 117	B5SC20	mg/kg	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033
Concrete	Concrete core, Room 105 east	B5SC21	mg/kg	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033
Concrete	Concrete core, Room 105 east	B5SC22 DUP	mg/kg	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033
Concrete	Concrete core, Room 105 southeast	B5SC23	mg/kg	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033
Concrete	Concrete core, Room 105	B5SC24	mg/kg	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033
Concrete	Concrete core, Room 105 northeast	B5SC25	mg/kg	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033
Concrete	Concrete core, Room 105 northwest	B5SC26	mg/kg	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033
Sediment	Pit sediment, Room 102 central	B5SE04	mg/kg	<0.33	<0.33	<0.33	<0.33	<0.33	0.33	0.19 J, T

Abbreviations:

DUP = field duplicate
mg/kg = milligrams per kilogram
PCBs = polychlorinated biphenyls
STLC = Soluble Threshold Limit Concentration, Title 22 California Code of Regulations, Section 66261.24
TCLP = Toxicity Characteristic Leaching Procedure, Title 22 California Code of Regulations, Section 66261.24
TTLC = Total Threshold Limit Concentration, Title 22 California Code of Regulations, Section 66261.24

Notes:

<n = analyte not detected above reporting limit of 'n'
J = estimated result
T = trace level compound, poor quantitation
Italics = no published bulk sample concentration (TTLC, STLC, TCLP) at which the constituent is deemed a hazardous waste
red = detected above: 1) the TTLC for solid samples; 2) or the STLC or TCLP for aqueous samples; 3) or the wipe concentration limit
yellow = detected above 10 x STLC or 20 x TCLP concentrations, for solid matrices (does not apply to wipe samples)

Analysis for PCBs by USEPA Method 8082. All samples analyzed by Test America St. Louis, Earth City, Missouri.

The comparison threshold for PCBs of 10 µg/100 cm2 (collected on wipes) applies to non-porous surfaces contaminated with PCBs. Surfaces containing PCB concentrations above this limit are considered to be contaminated (40 CFR 761).

The value used as the threshold for determining if PCBs exceed hazardous waste limits is applicable to the sum of the Aroclor mixtures reported.

Table A-3A
Soil Sampling Results from Old Town Demolition Project-Building 5 Area
Polychlorinated Biphenyls
(concentrations in mg/kg)

					PCBs-8082**				
					Aroclor-1242	Aroclor-1254	Aroclor-1260	Aroclor-1268	Total PCBs
				Screening Level*					1.0
Location	Sample ID	Depth (ft)	Lab	Date					
Soil Samples									
SB5-14-24	SB5-14-24-0'	0.0	GEL	6/13/14	<0.0739	0.219	0.139		0.358
	SB5-14-24-4'	4.0	GEL	6/13/14	<0.00797	<0.00797	<0.00797		ND
SB5-14-25	SB5-14-25-0'	0.0	GEL	5/20/14	<0.0743	0.578	0.235		0.813
	SB5-14-25-8'	8.0	GEL	5/20/14	<0.00408	<0.00408	<0.00408		ND
SB5-14-26	SB5-14-26-0'	0.0	GEL	5/20/14	<0.0195	0.0849[P]	0.0409[P]		0.1258[P]
	SB5-14-26-8.5'	8.5	GEL	5/20/14	<0.00413	<0.00413	<0.00413		ND

* Screening level for total PCBs is the Toxic Substances Control Act (TSCA) self-implementing cleanup level for PCBs in soil in high-occupancy areas.
** Analytes included Aroclors 1016, 1221, 1232, 1242, 1248, 1254, 1260, and 1268 unless otherwise noted.
GEL: Analysis by General Engineering Laboratories LLC
[P] The concentrations between the primary and confirmation columns/detectors is >40% different.

< (shaded)	concentration less than reporting limit (RL)
(blank)	not analyzed

ND: No PCB Aroclors detected

Prior PCB Characterization Data for Buildings 16 and 16A

Table A-3B
Soil Sampling Results from Old Town Demolition Project-Building 16 Area
Polychlorinated Biphenyls
(concentrations in mg/kg)

					PCBs-8082**				
					Aroclor-1242	**Aroclor-1254**	**Aroclor-1260**	**Aroclor-1268**	**Total PCBs**
				Screening Level*					1.0
Location	Sample ID	Depth (ft)	Lab	Date					
Soil Samples									
SS16-14-1	SS16-14-1-0.5'	0.5	CT	5/30/14	<0.034	1.3	<0.034	<0.034	**1.3**
	SS16-14-1-1.5'	1.5	CT	5/30/14	<0.0098	0.22	<0.0098	<0.0098	0.22
SS16-14-1A	SS16-14-1A-3"	0.0	CT	6/25/14	<0.067	3.7	1.1	<0.067	**4.8**
	SS16-14-1A-1'	1.0	CT	6/25/14	<0.0099	0.047	0.113	<0.0099	0.16
SS16-14-1B	SS16-14-1B-3"	0.0	CT	6/25/14	<0.034	0.72	0.25	<0.034	0.97
	SS16-14-1B-1'	1.0	CT	6/25/14	<0.033	0.33	0.23	<0.033	0.56
SS16-14-1C	SS16-14-1C-3"	0.0	CT	6/25/14	<0.034	0.32	0.25	<0.034	0.57
	SS16-14-1C-1'	1.0	CT	6/25/14	<0.034	0.33	0.29	<0.034	0.62
SS16-14-1D	SS16-14-1D-3"	0.0	CT	6/25/14	<0.066	4.4	0.73	<0.066	**5.13**
	SS16-14-1D-1'	1.0	CT	6/25/14	<0.0097	0.058	0.017	<0.0097	0.075
SS16-14-2	SS16-14-2-0.5'	0.5	CT	5/30/14	<0.0096	0.095	<0.0096	<0.0096	0.095
SS16-14-3	SS16-14-3-0.5'	0.5	CT	5/30/14	<0.0099	<0.0099	<0.0099	<0.0099	ND
	SS16-14-3-1.5'	1.5	CT	5/30/14	<0.0099	0.055	<0.0099	<0.0099	0.055
SS16-14-4	SS16-14-4-0.5'	0.5	CT	5/30/14	<0.0097	0.013	<0.0097	<0.0097	0.013
	SS16-14-4-1.5'	1.5	CT	5/30/14	<0.0098	0.061	<0.0098	<0.0098	0.061
SS16-14-5	SS16-14-5-0'	0.0	CT	6/2/14	<0.0097	<0.0097	<0.0097	<0.0097	ND
	SS16-14-5-1'	1.0	CT	6/2/14	<0.0097	<0.0097	<0.0097	<0.0097	ND
SS16-14-6	SS16-14-6-0'	0.0	CT	7/21/14	<0.0099	0.48	0.27	<0.0099	0.75
	SS16-14-6-1'	1.0	CT	7/21/14	<0.0099	0.45	0.29	<0.0099	0.74
SS16-14-10	SS16-14-10-0.5'	0.5	CT	6/2/14	<0.067	4.2	<0.067	<0.067	**4.2**
	SS16-14-10-1.5'	1.5	CT	6/2/14	<0.0095	<0.0095	<0.0095	<0.0095	ND
SS16-14-10A	SS16-14-10A-3"	0.0	CT	6/25/14	<0.034	2.3	0.3	<0.034	**2.6**
	SS16-14-10A-1'	1.0	CT	6/25/14	<0.034	1.8	0.3	<0.034	**2.1**
	SS16-14-10A-2'	2.0	CT	7/21/14	<0.033	1.9	0.19	<0.033	**2.09**
SS16-14-10B	SS16-14-10B-3"	0.0	CT	6/25/14	<0.065	3.4	0.82	<0.065	**4.22**
	SS16-14-10B-1'	1.0	CT	6/25/14	<0.0096	0.46	0.17	<0.0096	0.63
SS16-14-10C	SS16-14-10C-3"	0.0	CT	6/25/14	<0.0098	0.37	0.12	<0.0098	0.49
	SS16-14-10C-1'	1.0	CT	6/25/14	<0.033	0.15	0.21	<0.033	0.36
SS16-14-10D	SS16-14-10D-3"	0.0	CT	6/25/14	<0.68	36	16	<0.68	**52**
	SS16-14-10D-1'	1.0	CT	6/25/14	<0.034	0.15	0.037	<0.034	0.187
SS16-14-10E	SS16-14-10E-0'	0.0	CT	7/18/14	<1.3	9.9	<1.3	<1.3	**9.9**
	SS16-14-10E-1'	1.0	CT	7/18/14	<0.033	1.6	0.33	<0.033	**1.93**
SS16-14-10F	SS16-14-10F-0'	0.0	CT	7/18/14	<0.0098	0.58	<0.0098	<0.0098	0.58
	SS16-14-10F-1'	1.0	CT	7/18/14	<0.034	1.9	0.33	<0.034	**2.23**
SS16-14-10G	SS16-14-10G-0'	0.0	CT	7/18/14	<0.0099	0.063	<0.0099	<0.0099	0.063
	SS16-14-10G-1'	1.0	CT	7/18/14	<0.034	<0.034	<0.034	<0.034	ND
SS16-14-10H	SS16-14-10H-0'	0.0	CT	7/18/14	<1.4	120	15	<1.4	**135**
	SS16-14-10H-1'	1.0	CT	7/18/14	<0.0095	0.53	<0.0095	<0.0095	0.53
SS16-14-10I	SS16-14-10I-0'	0.0	CT	7/18/14	<0.0098	0.06	0.04	<0.0098	0.1
	SS16-14-10I-1'	1.0	CT	7/18/14	<0.0094	0.081	0.026	<0.0094	0.107
SS16-14-11	SS16-14-11-0.5'	0.5	CT	6/2/14	<0.0097	0.24	0.081	<0.0097	0.321
	SS16-14-11-1.5'	1.5	CT	6/2/14	<0.0096	0.11	0.059	<0.0096	0.169
SS16-14-12	SS16-14-12-0'	0.0	CT	6/2/14	<0.0097	0.046	<0.0097	<0.0097	0.046
	SS16-14-12-1'	1.0	CT	6/2/14	<0.0098	<0.0098	<0.0098	<0.0098	ND
SB16-14-13	SS16-14-13-0'	0.0	GEL	6/2/14	<0.00434	<0.00144	<0.00144		ND
	SS16-14-13-1'	1.0	GEL	6/2/14	<0.00414	<0.00414	<0.00414		ND
SB16-14-19	SB16-14-19-0'	0.0	CT	6/2/14	<0.0099	<0.0099	0.0024[J]	<0.0099	0.0024[J]
	SB16-14-19-1'	1.0	CT	6/2/14	<0.0098	<0.0098	0.0024[J]	<0.0098	0.0024[J]

Table A-3B (Cont'd)
Soil Sampling Results from Old Town Demolition Project-Building 16 Area
Polychlorinated Biphenyls
(concentrations in mg/kg)

					PCBs-8082**				
					Aroclor-1242	**Aroclor-1254**	**Aroclor-1260**	**Aroclor-1268**	**Total PCBs**
				Screening Level*					1.0
Location	Sample ID	Depth (ft)	Lab	Date					
Soil Samples									
SB16-14-20	SB16-14-20-0'	0.0	GEL	5/30/14	<0.00415	<0.00415	<0.00415		ND
	SB16-14-20-5'	5.0	GEL	5/30/14	<0.0043	<0.0043	<0.0043		ND
SS16-14-22	SS16-14-22-0'	0.0	GEL	6/2/14	<0.00372	<0.00372	<0.00372		ND
	SS16-14-22-1'	1.0	GEL	6/2/14	<0.00385	0.00462	<0.00385		0.00462
SS16-14-23	SS16-14-23-0.5'	0.5	CT	6/2/14	<0.0096	<0.0096	<0.0096	<0.0096	ND
	SS16-14-23-1.5'	1.5	CT	6/2/14	<0.0098	<0.0098	<0.0098	<0.0098	ND
SS16-14-24	SS16-14-24-0.5'	0.5	CT	6/2/14	<0.0098	<0.0098	<0.0098	<0.0098	ND
	SS16-14-24-1.5'	1.5	CT	6/2/14	<0.0098	<0.0098	<0.0098	<0.0098	ND
SB16-14-25	SB16-14-25-0'	0.0	GEL	5/30/14	<0.00414	0.00439	0.0044		0.00879
	SB16-14-25-1'	1.0	GEL	5/30/14	<0.00414	<0.00414	<0.00414		ND
	SB16-14-25-6'	6.0	GEL	7/3/14	<0.00395	<0.00395	<0.00395		ND
SS16-14-26	SS16-14-26-0'	0.0	CT	5/30/14	<0.0098	<0.0098	<0.0098	<0.0098	ND
	SS16-14-26-1'	1.0	CT	5/30/14	<0.0098	<0.0098	<0.0098	<0.0098	ND
SB16-14-27	SB16-14-27-0'	0.0	CT	5/30/14	<0.0098	<0.0098	<0.0098	<0.0098	ND
	SB16-14-27-1'	1.0	CT	5/30/14	<0.0098	<0.0098	<0.0098	<0.0098	ND
	SB16-14-27-6'	6.0	CT	7/3/14	<0.067	<0.067	0.17	<0.067	0.17
SS16-14-28	SS16-14-28-0'	0.0	CT	5/30/14	<0.0098	0.22	0.14	<0.0098	0.36
	SS16-14-28-1'	1.0	CT	5/30/14	<0.0094	<0.0094	<0.0094	<0.0094	ND
SS16-14-29	SS16-14-29-0'	0.0	CT	5/30/14	<0.0098	<0.0098	<0.0098	<0.0098	ND
	SS16-14-29-1'	1.0	CT	5/30/14	<0.0094	0.085	0.018	<0.0094	0.103
SB16-14-31	SB16-14-31-0'	0.0	CT	6/3/18	<0.0097	<0.0097	<0.0097	<0.0097	ND
	SB16-14-31-1'	1.0	CT	6/3/18	<0.0097	<0.0097	<0.0097	<0.0097	ND
SS16-14-32	SS16-14-32-0'	0.0	CT	5/30/14	<0.0097	<0.0097	0.022	<0.0097	0.022
	SS16-14-32-1'	1.0	CT	5/30/14	<0.0096	<0.0096	0.0042^{J}	<0.0096	0.0042^{J}
SS16-14-33	SS16-14-33-0'	0.0	CT	5/30/14	<0.0093	<0.0093	<0.0093	<0.0093	ND
	SS16-14-33-1'	1.0	CT	5/30/14	<0.0099	<0.0099	0.012	<0.0099	0.012
SS16-14-34	SS16-14-34-0'	0.0	CT	5/30/14	<0.0099	<0.0099	<0.0099	<0.0099	ND
	SS16-14-34-1'	1.0	CT	5/30/14	<0.0098	0.53	0.13	<0.0098	0.66
	SS16-14-34-2'	2.0	CT	6/11/14	<0.012	<0.012	<0.012	<0.012	ND
SS16-14-35	SS16-14-35-0'	0.0	CT	5/30/14	<0.0097	<0.0097	<0.0097	<0.0097	ND
	SS16-14-35-1'	1.0	CT	5/30/14	<0.069	4.2	0.22	<0.069	**4.42**
	SS16-14-35-2'	2.0	CT	6/11/14	<0.012	0.74	<0.012	<0.012	0.74
SS16-14-38	SS16-14-38-0'	0.0	GEL	7/21/14	<0.00369	0.0134	0.0128		0.0262
	SS16-14-38-1'	1.0	GEL	7/21/14	<0.0368	0.185	0.141		0.325
SB16-14-54	SB16-14-54-3"	0.0	CT	6/25/14	<0.0098	<0.0098	0.023	<0.0098	0.023
	SB16-14-54-1'	1.0	CT	6/25/14	<0.033	2.2	0.37	<0.033	**2.57**
	SB16-14-54-2'	2.0	CT	7/21/14	<0.067	10	0.74	<0.067	**10.74**
	SB16-14-54-3'	3.0	CT	7/21/14	<0.0098	<0.0098	<0.0098	<0.0098	ND
SB16-14-56	SB16-14-56-3"	0.0	CT	6/25/14	<0.033	0.59	0.2	<0.033	0.79
	SB16-14-56-1'	1.0	CT	6/25/14	<0.033	2.5	0.18	<0.033	**2.68**
	SB16-14-56-2'	2.0	CT	7/21/14	<0.0099	0.011	<0.0099	<0.0099	0.011
	SB16-14-56-3'	3.0	CT	7/21/14	<0.0096	<0.0096	<0.0096	<0.0096	ND
SS16-14-57	SS16-14-57-3"	0.0	CT	6/25/14	<0.034	0.21	0.067	<0.034	0.277
	SS16-14-57-1'	1.0	CT	6/25/14	<0.033	0.2	0.082	<0.033	0.282
SS16-14-63	SS16-14-63-3"	0.0	CT	7/3/14	<0.066	0.73	0.35	<0.066	**1.08**
	SS16-14-63-1'	1.0	CT	7/3/14	<0.067	1.0	0.66	<0.067	**1.66**
SS16-14-64	SS16-14-64-1'	1.0	CT	7/21/14	<0.0093	0.091	<0.0093	<0.0093	0.091
	SS16-14-64-2'	2.0	CT	7/21/14	<0.34	6.7	<0.34	<0.34	**6.7**

Table A-3B (Cont'd)
Soil Sampling Results from Old Town Demolition Project-Building 16 Area
Polychlorinated Biphenyls
(concentrations in mg/kg)

					PCBs-8082**				
					Aroclor-1242	**Aroclor-1254**	**Aroclor-1260**	**Aroclor-1268**	**Total PCBs**
				Screening Level*					1.0
Location	Sample ID	Depth (ft)	Lab	Date					
Soil Samples									
SS16-14-65	SS16-14-65-0'	0.0	CT	7/21/14	<0.013	0.8	<0.013	<0.013	0.8
	SS16-14-65-1'	1.0	CT	7/21/14	<0.034	0.61	<0.034	<0.034	0.61
SS16-14-66	SS16-14-66-0'	0.0	CT	7/21/14	<0.014	0.43	<0.014	<0.014	0.43
SS16-14-67	SS16-14-67-0'	0.0	CT	7/21/14	<0.0099	0.027	0.024	<0.0099	0.051
	SS16-14-67-1'	1.0	CT	7/21/14	<0.033	2.3	<0.033	<0.033	**2.3**
SS16-14-68	SS16-14-68-1'	1.0	CT	7/21/14	<0.0097	<0.0097	<0.0097	<0.0097	ND
	SS16-14-68-2'	2.0	CT	7/21/14	<0.0095	<0.0095	<0.0095	<0.0095	ND
SS16-14-69	SS16-14-69-0'	0.0	CT	7/25/14	<0.0096	<0.0096	0.063	<0.0096	0.063
	SS16-14-69-1'	1.0	CT	7/25/14	<0.0097	<0.0097	0.086	0.038	0.124
SS16-14-70	SS16-14-70-0'	0.0	CT	7/25/14	<0.0097	0.18	0.064	<0.0097	0.244
	SS16-14-70-1'	1.0	CT	7/25/14	<0.0096	0.39	0.18	<0.0096	0.57
SS16-14-71	SS16-14-71-0'	0.0	CT	7/25/14	<0.0096	<0.0096	<0.0096	<0.0096	ND
	SS16-14-71-1'	1.0	CT	7/25/14	<0.0097	0.024	0.028	<0.0097	0.052
SS16-14-72	SS16-14-72-0'	0.0	CT	7/25/14	<0.033	2.1	0.67	<0.033	**2.77**
	SS16-14-72-1'	1.0	CT	7/25/14	<0.0096	0.046	<0.0096	<0.0096	0.046
SS16-14-73	SS16-14-73-0'	0.0	CT	7/25/14	<0.0096	<0.0096	0.073	<0.0096	0.073
	SS16-14-73-1'	1.0	CT	7/25/14	<0.0097	0.13	0.053	<0.0097	0.183
SS16-14-74	SS16-14-74-0'	0.0	CT	7/25/14	<0.0096	0.22	0.087	<0.0096	0.307
	SS16-14-74-1'	1.0	CT	7/25/14	<0.034	<0.034	<0.034	<0.034	ND
SS16-14-75	SS16-14-75-0'	0.0	CT	7/25/14	<0.068	3.1	0.55	<0.068	**3.65**
	SS16-14-75-1'	1.0	CT	7/25/14	<0.0096	0.19	0.035	<0.0096	0.225
SS16-14-76	SS16-14-76-0'	0.0	CT	7/25/14	<0.33	26	3.2	<0.33	**29.2**
	SS16-14-76-1'	1.0	CT	7/25/14	<0.0095	0.089	0.02	<0.0095	0.109
SS16-14-77	SS16-14-77-0'	0.0	CT	7/25/14	<0.0098	0.51	0.22	<0.0098	0.73
	SS16-14-77-1'	1.0	CT	7/25/14	<0.0099	0.039	0.029	<0.0099	0.068
SS16-14-78	SS16-14-78-0'	0.0	CT	7/25/14	<0.069	4.4	1.3	<0.069	**5.7**
	SS16-14-78-1'	1.0	CT	7/25/14	<0.0098	0.02	0.019	<0.0098	0.039
SS16-14-79	SS16-14-79-0'	0.0	CT	7/25/14	<0.0098	0.42	0.15	<0.0098	0.57
	SS16-14-79-1'	1.0	CT	7/25/14	<0.0096	0.17	0.26	<0.0096	0.43
SS16-14-80	SS16-14-80-0'	0.0	CT	7/25/14	<0.0097	0.4	0.15	<0.0097	0.55
	SS16-14-80-1'	1.0	CT	7/25/14	<0.0094	<0.0094	0.029	<0.0094	0.029
SS16-14-81	SS16-14-81-0.5'	0.5	CT	8/1/14	<0.033	2.0	0.19	<0.033	**2.19**
	SS16-14-81-1.5'	1.5	CT	8/1/14	<0.13	3.6	0.27	<0.13	**3.87**
SS16-14-82	SS16-14-82-0.5'	0.5	CT	8/1/14	<0.0095	0.05	<0.0095	<0.0095	0.05
	SS16-14-82-1.5'	1.5	CT	8/1/14	<0.0094	<0.0094	<0.0094	<0.0094	ND
SS16-14-83	SS16-14-83-0.5'	0.5	CT	8/1/14	<0.0094	<0.0094	<0.0094	<0.0094	ND
	SS16-14-83-1.5'	1.5	CT	8/1/14	<0.0095	<0.0095	<0.0095	<0.0095	ND
SS16-14-84	SS16-14-84-0.5'	0.5	CT	8/1/14	<0.0095	<0.0095	<0.0095	<0.0095	ND
	SS16-14-84-1.5'	1.5	CT	8/1/14	<0.0096	<0.0096	<0.0096	<0.0096	ND
SS16-14-85	SS16-14-85-0.5'	0.5	CT	8/1/14	<0.009	<0.009	<0.009	<0.009	ND
	SS16-14-85-1.5'	1.5	CT	8/1/14	<0.0098	<0.0098	<0.0098	<0.0098	ND

* Screening level for total PCBs is the Toxic Substances Control Act (TSCA) self-implementing cleanup level for PCBs in soil in high-occupancy areas.
** Analytes included Aroclors 1016, 1221, 1232, 1242, 1248, 1254, 1260, and 1268 unless otherwise noted.
Boldface type indicates concentration above screening level
CT: Analysis by Curtis & Tompkins Ltd
GEL: Analysis by General Engineering Laboratories LLC
[J] indicates an estimated value

< (shaded) concentration less than reporting limit (RL)
(blank box) not analyzed
ND: No PCB Aroclors detected

Prior PCB Characterization Data for Buildings 40 and 41

Table 9-6. Analytical Results for PCBs – Building 40

Sample Type	Sample Description	Sample Name	Units	Aroclor 1016	Aroclor 1221	Aroclor 1232	Aroclor 1242	Aroclor 1248	Aroclor 1254	Aroclor 1260	Aroclor 1262	Aroclor 1268
Caulk	Window caulking sample, room 101 south	B40CK01	mg/kg	<0.097	<0.097	<0.097	<0.097	<0.097	0.34	<0.097	---	---
Paint	Wall paint sample, room 101 northeast	B40PC01	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2	2.2	<0.2	---	---
Concrete	Concrete core, room 101 northeast	B40SC01	mg/kg	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033	---	---
Wipe	Floor wipe, room 101 northwest	B40SW05	µg/100 cm²	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0

Abbreviations:

µg/100 cm² = micrograms per 100 square centimeters
mg/kg = milligrams per kilogram
PCBs = polychlorinated biphenyls
STLC = Soluble Threshold Limit Concentration, Title 22 California Code of Regulations, Section 66261.24
TCLP = Toxicity Characteristic Leaching Procedure, Title 22 California Code of Regulations, Section 66261.24
TTLC = Total Threshold Limit Concentration, Title 22 California Code of Regulations, Section 66261.24

Notes:

<n = analyte not detected above reporting limit of 'n'
--- = not analyzed
Italics = no published bulk sample concentration (TTLC, STLC, TCLP) at which the constituent is deemed a hazardous waste
red = detected above: 1) the TTLC for solid samples; 2) or the STLC or TCLP for aqueous samples; 3) or the wipe concentration limit.
yellow = detected above 10 x STLC or 20 x TCLP concentrations, for solid matrices (does not apply to wipe samples)

Analysis for PCBs by USEPA Method 8082. All samples analyzed by Test America St. Louis, Earth City, Missouri.

The comparison threshold for PCBs of 10 µg/100 cm2 (collected on wipes) applies to non-porous surfaces contaminated with PCBs. Surfaces containing PCB concentrations above this limit are considered to be contaminated (40 CFR 761).

The value used as the threshold for determining if PCBs exceed hazardous waste limits is applicable to the sum of the Aroclor mixtures reported.

Table 10-6. Analytical Results for PCBs – Building 41

Sample Type	Sample Description	Sample Name	Units	Aroclor 1016	Aroclor 1221	Aroclor 1232	Aroclor 1242	Aroclor 1248	Aroclor 1254	Aroclor 1260
Paint	Wall paint sample, room 103 south	B41PC01	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Concrete	Concrete core, room 104 northeast	B41SC01	mg/kg	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033

Abbreviations:

mg/kg = milligrams per kilogram
PCBs = polychlorinated biphenyls
STLC = Soluble Threshold Limit Concentration, Title 22 California Code of Regulations, Section 66261.24
TCLP = Toxicity Characteristic Leaching Procedure, Title 22 California Code of Regulations, Section 66261.24
TTLC = Total Threshold Limit Concentration, Title 22 California Code of Regulations, Section 66261.24

Notes:

<n = analyte not detected above reporting limit of 'n'
Italics = no published bulk sample concentration (TTLC, STLC, TCLP) at which the constituent is deemed a hazardous waste
red = detected above: 1) the TTLC for solid samples; 2) or the STLC or TCLP for aqueous samples; 3) or the wipe concentration limit.
yellow = detected above 10 x STLC or 20 x TCLP concentrations, for solid matrices (does not apply to wipe samples)

Analysis for PCBs by USEPA Method 8082. All samples analyzed by Test America St. Louis, Earth City, Missouri.

The comparison threshold for PCBs of 10 µg/100 cm2 (collected on wipes) applies to non-porous surfaces contaminated with PCBs. Surfaces containing PCB concentrations above this limit are considered to be contaminated (40 CFR 761).

The value used as the threshold for determining if PCBs exceed hazardous waste limits is applicable to the sum of the Aroclor mixtures reported.

Prior PCB Characterization Data for Building 52 and 52A

Table 13-7. Analytical Results for PCBs – Building 52

Sample Type	Sample Description	Sample Name	Units	Aroclor 1016	Aroclor 1221	Aroclor 1232	Aroclor 1242	Aroclor 1248	Aroclor 1254	Aroclor 1260	Aroclor 1262	Aroclor 1268
Caulk	Window sill caulking, room 100 east	B52CK01	mg/kg	<0.033	<0.033	<0.033	<0.033	<0.033	1.8	<0.033	—	—
Caulk	Window sill caulking, room 100 southeast	B52CK02	mg/kg	<0.033	<0.033	<0.033	<0.033	<0.033	2.1	<0.033	—	—
Caulk	Window sill caulking, room 109 west	B52CK03	mg/kg	<0.033	<0.033	<0.033	<0.033	<0.033	0.87	<0.033	—	—
Exposed Wood	Wood Floor, room 298 north	B52EW01	mg/kg	<0.033	<0.033	<0.033	<0.033	<0.033	0.069	<0.033 UJ, 6L	—	—
Paint	Wall paint, room 100 southwest	B52PC02	mg/kg	<0.099	<0.099	<0.099	<0.099	<0.099	38	<0.099 UJ, 6L	—	—
Paint	Wall paint, room 109	B52PC03	mg/kg	<0.098	<0.098	<0.098	<0.098	<0.098	11	<0.098 UJ, 6L	—	—
Concrete	Concrete core, room 100 northeast	B52SC01	mg/kg	<0.033	<0.033	<0.033	<0.033	<0.033	0.09	<0.033 UJ, 6L	—	—
Concrete	Concrete core, room 100 northeast	B52SC02	mg/kg	<0.033	<0.033	<0.033	<0.033	<0.033	0.47 J, 8	<0.033 UJ, 6L	—	—
Concrete	Concrete core, room 100 northeast	B52SC03 DUP	mg/kg	<0.033	<0.033	<0.033	<0.033	<0.033	7 J, 8	<0.033 UJ, 6L	—	—
Concrete	Concrete core, room 100 southwest	B52SC11	mg/kg	<0.033	<0.033	<0.033	<0.033	<0.033	1.2	<0.033 UJ, 6L	—	—
Concrete	Concrete core, room 100 southwest	B52SC12	mg/kg	<0.033	<0.033	<0.033	<0.033	<0.033	20	<0.033	—	—
Concrete	Concrete core, room 111 east	B52SC13	mg/kg	<0.033	<0.033	<0.033	<0.033	<0.033	4.2	<0.033	—	—
Concrete	Concrete core, room 111 northwest	B52SC14	mg/kg	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033	—	—
Concrete	Concrete core, room 111 west	B52SC15	mg/kg	<0.033	<0.033	<0.033	<0.033	<0.033	0.0071 J, T	<0.033	—	—
Concrete	Concrete core, room 109 west	B52SC16	mg/kg	<0.077	<0.077	<0.077	<0.077	<0.077	0.33 J, 8, I	<0.077	—	—
Concrete	Concrete core, room 109 west	B52SC17 DUP	mg/kg	<0.033	<0.033	<0.033	<0.033	<0.033	0.075 J, 8	0.053	—	—
Concrete	Concrete core, room 107 southwest	B52SC18	mg/kg	<0.033	<0.033	<0.033	<0.033	<0.033	0.61	0.44	—	—
Concrete	Concrete core, room 107 center	B52SC19	mg/kg	<0.033	<0.033	<0.033	<0.033	<0.033	0.2	<0.033	—	—
Concrete	Concrete core, room 103 south	B52SC20	mg/kg	<0.033	<0.033	<0.033	<0.033	<0.033	0.25	<0.033	—	—
Sediment	Trench floor sediment, room 100 east	B52SE04	mg/kg	<0.066	<0.066	<0.066	<0.066	<0.066	[illegible]	<0.066 UJ, 6L	—	—
Sediment	Trench floor sediment at former Bevatron model	B52SE05	mg/kg	<0.033	<0.033	<0.033	<0.033	<0.033	29	<0.033 UJ, 6L	—	—
Sediment	Trench floor sediment, room 100 southeast	B52SE06	mg/kg	<16	<16	<16	<16	<16	[illegible]	<16 UJ, 6L	—	—
Sediment	Trench floor sediment at former Bevatron model	B52SE07	mg/kg	<19	<19	<19	<19	<19	[illegible]	<19 UJ, 6L	—	—
Sediment	Trench floor sediment, room 100 south	B52SE08	mg/kg	<0.097	<0.097	<0.097	<0.097	<0.097	[illegible]	<0.097 UJ, 6L	—	—
Sediment	Trench floor sediment, room 111 northeast	B52SE10	mg/kg	<3.3	<3.3	<3.3	<3.3	<3.3	[illegible]	<3.3 UJ, 6L	—	—
Sediment	Trench floor sediment, room 111 north	B52SE11	mg/kg	<0.033	<0.033	<0.033	<0.033	<0.033	0.078	<0.033	—	—
Sediment	Cryostat pit sediment	B52SE13	mg/kg	<0.033	<0.033	<0.033	<0.033	<0.033	2.4	<0.033 UJ, 6L	—	—
Sludge	Sink trap sludge, room 100 southwest, sink outside bathroom	B52SL01	mg/kg	<0.19	<0.19	<0.19	<0.19	<0.19	37	<0.19	—	—
Sludge	Sink trap sludge, room 117	B52SL02	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	0.00011 J, T	<0.001	—	—
Sludge	Sink trap sludge, room 107 southwest	B52SL04	mg/L	<0.1	<0.1	<0.1	<0.1	<0.1	0.018 J, T	<0.1 UJ, 6L	—	—
Wipe	Floor wipe, room 100 northeast	B52SW04	µg/100 cm²	<1.0	<1.0	<1.0	<1.0	<1.0	1.8	1.2	<1.0	<1.0
Wipe	Floor wipe, room 100 east	B52SW05	µg/100 cm²	<1.0	<1.0	<1.0	<1.0	<1.0	[illegible]	<1.0	<1.0	<1.0
Wipe	Floor wipe, room 100 east	B52SW06	µg/100 cm²	<1.0	<1.0	<1.0	<1.0	<1.0	1.6	1.6	<1.0	<1.0
Wipe	Floor wipe at former Bevatron model	B52SW08	µg/100 cm²	<1.0	<1.0	<1.0	<1.0	<1.0	4.0	3.6	<1.0	<1.0
Wipe	Sewer cleanout wipe, Outside B52, opposite bathroom.	B52SW15	µg/100 cm²	<1.0	<1.0	<1.0	<1.0	<1.0	0.67 J, T	<1.0	<1.0	<1.0
Wipe	Floor wipe, room 111 southwest	B52SW16	µg/100 cm²	<1.0	<1.0	<1.0	<1.0	<1.0	0.98 J, T	1.1	<1.0	<1.0

Table 13-7. Analytical Results for PCBs – Building 52

Sample Type	Sample Description	Sample Name	Units	Aroclor 1016	Aroclor 1221	Aroclor 1232	Aroclor 1242	Aroclor 1248	Aroclor 1254	Aroclor 1260	Aroclor 1262	Aroclor 1268
Wipe	Floor wipe, room 111 southwest	B52SW17 DUP	µg/100 cm²	<1.0	<1.0	<1.0	<1.0	<1.0	0.95 J, T	1.3	<1.0	<1.0
Wipe	Floor wipe, room 111 southeast	B52SW18	µg/100 cm²	<1.0	<1.0	<1.0	<1.0	<1.0	0.95 J, T	1.4	<1.0	<1.0
Wipe	Wall wipe, room 111 southwest	B52SW19	µg/100 cm²	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Wipe	Wall wipe, room 111 southwest	B52SW20	µg/100 cm²	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Wipe	Wall wipe, room 111 west	B52SW21	µg/100 cm²	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Wipe	Wall wipe, room 111 northwest	B52SW22	µg/100 cm²	<1.0	<1.0	<1.0	<1.0	<1.0	0.52	<1.0	<1.0	<1.0
Wipe	Wall wipe, room 111 northeast	B52SW23	µg/100 cm²	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Wipe	Wall wipe, room 111 southeast	B52SW24	µg/100 cm²	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Wipe	Sewer cleanout wipe, room 103 northwest	B52SW27	µg/100 cm²	<1.0	<1.0	<1.0	<1.0	<1.0	2.7	<1.0	<1.0	<1.0
Wipe	Floor wipe, room 219 northeast	B52SW32	µg/100 cm²	<1.0	<1.0	<1.0	<1.0	<1.0	1.6	2.9	<1.0	<1.0
Wipe	Floor wipe, room 211 northeast	B52SW39	µg/100 cm²	<1.0	<1.0	<1.0	<1.0	<1.0	[illegible]	[illegible]	<1.0	<1.0
Wipe	Floor wipe, room 211 northeast	B52SW40 DUP	µg/100 cm²	<1.0	<1.0	<1.0	<1.0	<1.0	[illegible]	[illegible]	<1.0	<1.0
Wipe	Floor wipe, room 100 southwest	B52SW41	µg/100 cm²	<1.0	<1.0	<1.0	<1.0	<1.0	[illegible]	<1.0	<1.0	<1.0
Wastewater	Toilet trap water, room 117	B52WW03	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	0.00021 J, T	<0.001	—	—

Abbreviations:

mg/L = milligrams per liter
µg/100 cm² = micrograms per 100 square centimeters
DUP = field duplicate
mg/kg = milligrams per kilogram
PCBs = polychlorinated biphenyls
STLC = Soluble Threshold Limit Concentration, Title 22 California Code of Regulations, Section 66261.24
TCLP = Toxicity Characteristic Leaching Procedure, Title 22 California Code of Regulations, Section 66261.24
TTLC = Total Threshold Limit Concentration, Title 22 California Code of Regulations, Section 66261.24

Notes:

<n = analyte not detected above reporting limit of 'n'
J = estimated result
T = trace level compound, poor quantitation
UJ = the result is not detected at an estimated detection limit
1 = holding time violation
6L = laboratory control sample recovery below normal limits
8 = field duplicate precision outside limits
— = not analyzed
Italics = no published bulk sample concentration (TTLC, STLC, TCLP) at which the constituent is deemed a hazardous waste
red = detected above: 1) the TTLC for solid samples; 2) or the STLC or TCLP for aqueous samples; 3) or the wipe concentration limit
yellow = detected above 10 x STLC or 20 x TCLP concentrations, for solid matrices (does not apply to wipe samples)

Analysis for PCBs by USEPA Method 8082. All samples analyzed by Test America St. Louis, Earth City, Missouri.

The comparison threshold for PCBs of 10 µg/100 cm2 (collected on wipes) applies to non-porous surfaces contaminated with PCBs. Surfaces containing PCB concentrations above this limit are considered to be contaminated (40 CFR 761).

The value used as the threshold for determining if PCBs exceed hazardous waste limits is applicable to the sum of the Aroclor mixtures reported.

Table A-3C
Soil/Sediment Sampling Results from Old Town Demolition Project-Buildings 52/52A Area
Polychlorinated Biphenyls
(concentrations in mg/kg)

					PCBs-8082**				
					Aroclor-1242	**Aroclor-1254**	**Aroclor-1260**	**Aroclor-1268**	**Total PCBs**
				Screening Level*					1.0
Location	Sample ID	Depth (ft)	Lab	Date					
Soil Samples									
SS52-14-8	SS52-14-8-0'	0.0	CT	3/5/14	<0.012	0.11	0.013		0.123
	SS52-14-8-1'	1.0	CT	3/5/14	<0.0095	0.05	<0.0095		0.05
SB52-14-8	SB52-14-8-5'	5.0	CT	5/21/14	<0.0093	<0.0093	<0.0093	<0.0093	ND
	SB52-14-8-6'	6.0	CT	5/21/14	<0.0098	<0.0098	<0.0098	<0.0098	ND
	SB52-14-8-10'	10	CT	5/21/14	<0.0097	<0.0097	<0.0097	<0.0097	ND
	SB52-14-8-15'	15	CT	5/21/14	<0.0097	<0.0097	<0.0097	<0.0097	ND
SB52-14-9A	SB52-14-9A-8'	8	CT	5/7/14	<0.012	<0.012	<0.012	<0.012	ND
	SB52-14-9A-10'	10	CT	5/7/14	<0.012	<0.012	<0.012	<0.012	ND
SB52-14-9B	SB52-14-9B-3'	3.0	CT	5/21/14	<0.0095	<0.0095	<0.0095	<0.0095	ND
	SB52-14-9B-6'	6.0	CT	5/21/14	<0.0098	<0.0098	<0.0098	<0.0098	ND
	SB52-14-9B-8'	8.0	CT	5/7/14	<0.012	<0.012	<0.012	<0.012	ND
	SB52-14-9B-9'	9.0	CT	5/21/14	<0.0097	<0.0097	<0.0097	<0.0097	ND
	SB52-14-9B-10'	10	CT	5/7/14	<0.012	<0.012	<0.012	<0.012	ND
	SB52-14-9B-12'	12	CT	5/21/14	<0.0098	<0.0098	<0.0098	<0.0098	ND
SB52-14-10	SB52-14-10-2'	0.0	CT	3/5/14	<0.012	<0.012	<0.012		ND
	SB52-14-10-3'	1.0	CT	3/5/14	<0.012	<0.012	<0.012		ND
SS52-14-11	SS52-14-11-0.5	0.5	CT	3/3/14	<0.012	<0.012	0.016		0.016
	SS52-14-11-1.5	1.5	CT	3/3/14	<0.012	<0.012	<0.012		ND
SS52-14-12	SS52-14-12-0.5	0.5	CT	3/3/14	<0.012	<0.012	0.012		0.012
SB52-14-20	SB52-14-20-3"	0.0	CT	5/9/14	<0.17	8.8	<0.17	<0.17	**8.8**
	SB52-14-20-1'	1.0	CT	5/9/14	<17	660	<17	<17	**660**
	SB52-14-20-3'	3.0	CT	5/9/14	<17	690	<17	<17	**690**
	SB52-14-20-5'	5.0	CT	4/7/14	<1.3	250	16		**266**
	SB52-14-20-6'	6.0	CT	4/7/14	<1.3	300	16		**300**
	SB52-14-20-8'	8.0	CT	5/9/14	<17	840	<17	<17	**840**
	SB52-14-20-10'	10	CT	5/9/14	<1.7	11	<1.7	<1.7	**11**
	SB52-14-20-12'	12	CT	5/9/14	<0.84	14	<0.84	<0.84	**14**
	SB52-14-20-12.5'	12.5	CT	5/20/14	<0.0098	<0.0098	<0.0098	<0.0098	ND
	SB52-14-20-15'	15	CT	5/20/14	<0.0097	<0.0097	<0.0097	<0.0097	ND
	SB52-14-20-20'	20	CT	5/20/14	<0.0098	<0.0098	<0.0098	<0.0098	ND
	SB52-14-20-24'	24	CT	5/20/14	<0.0095	<0.0095	<0.0095	<0.0095	ND
SB52-14-22	SB52-14-22-1.5'	1.5	CT	5/21/14	<0.012	<0.012	<0.012	<0.012	ND
	SB52-14-22-4'-8'	4.0	CT	5/21/14	<0.012	<0.012	<0.012	<0.012	ND
	SB52-14-22-8'-12'	8.0	CT	5/21/14	<0.0099	0.032	<0.0099	<0.0099	0.032
SB52-14-24	SB52-14-24-2'	2.0	CT	5/21/14	0.19	<0.012	<0.012	<0.012	0.19
	SB52-14-24-5'	5.0	CT	5/21/14	<0.012	<0.012	<0.012	<0.012	ND
	SB52-14-24-10'	10	CT	5/21/14	<0.012	<0.012	<0.012	<0.012	ND
	SB52-14-24-16'	16	CT	5/21/14	<0.012	<0.012	<0.012	<0.012	ND
SB52-14-25	SB52-14-25-1'	1.0	CT	5/20/14	<0.012	<0.012	<0.012	<0.012	ND
	SB52-14-25-5'	5.0	CT	5/20/14	<0.012	<0.012	<0.012	<0.012	ND
	SB52-14-25-10'	10	CT	5/20/14	<0.012	<0.012	<0.012	<0.012	ND
	SB52-14-25-13'	13	CT	5/20/14	<0.012	<0.012	<0.012	<0.012	ND
	SB52-14-25-15.5'	15.5	CT	5/20/14	<0.012	<0.012	<0.012	<0.012	ND
SB52-14-26	SB52-14-26-3"	0.3	CT	5/9/14	<0.42	4.9	<0.42	<0.42	**4.9**
	SB52-14-26-1'	1.0	CT	5/9/14	<0.012	<0.012	<0.012	<0.012	ND
	SB52-14-26-3'	3.0	CT	5/9/14	<0.012	<0.012	<0.012	<0.012	ND
	SB52-14-26-6'	6.0	CT	5/9/14	<0.012	<0.012	<0.012	<0.012	ND

Table A-3C (Cont'd)
Soil/Sediment Sampling Results from Old Town Demolition Project-Buildings 52/52A Area
Polychlorinated Biphenyls
(concentrations in mg/kg)

					PCBs-8082**				
					Aroclor-1242	**Aroclor-1254**	**Aroclor-1260**	**Aroclor-1268**	**Total PCBs**
				Screening Level*					1.0
Location	Sample ID	Depth (ft)	Lab	Date					
Soil Samples									
SB52-14-27	SB52-14-27-0.25'	0.0	CT	5/21/14	<0.041	1.2	<0.041	<0.041	**1.2**
	SB52-14-27-2'	2.0	CT	5/21/14	<0.012	0.037	<0.012	<0.012	0.037
	SB52-14-27-5'	5.0	CT	5/21/14	<0.012	<0.012	<0.012	<0.012	ND
	SB52-14-27-10'	10	CT	5/21/14	<0.012	<0.012	<0.012	<0.012	ND
	SB52-14-27-15'	15	CT	5/21/14	<0.012	<0.012	<0.012	<0.012	ND
	SB52-14-27-20'	20	CT	5/21/14	<0.012	<0.012	<0.012	<0.012	ND
	SB52-14-27-24'	24	CT	5/21/14	<0.012	<0.012	<0.012	<0.012	ND
SB52-14-28	SB52-14-28-3"	0.0	CT	5/9/14	<0.012	0.19	<0.012	<0.012	0.19
	SB52-14-28-1'	1.0	CT	5/9/14	<0.012	0.052	<0.012	<0.012	0.052
	SB52-14-28-3'	4.0	CT	5/9/14	<0.012	<0.012	<0.012	<0.012	ND
	SB52-14-28-6'	6.0	CT	5/9/14	<0.012	<0.012	<0.012	<0.012	ND
	SB52-14-28-9'	9.0	CT	5/9/14	<0.012	0.45	<0.012	<0.012	0.45
SB52-14-29	SB52-14-29-3.5'	3.5	CT	5/14/14	<83	170	<83	<83	**170**
SB52-14-30	SB52-14-30-1.5'	1.5	CT	5/14/14	<0.041	1.1	<0.041	<0.041	**1.1**
	SB52-14-30-4.5'	4.5	CT	5/14/14	<0.083	0.82	<0.083	<0.083	0.82
SB52-14-31	SB52-14-31-2'	2.0	CT	5/14/14	<0.083	2.2	<0.083	<0.083	**2.2**
	SB52-14-31-3'	3.0	CT	6/13/14	<0.0095	0.36	<0.0095	<0.0095	0.36
SS52-14-32	SS52-14-32-0.25'	0.0	CT	5/16/14	<0.012	0.17	<0.012	<0.012	0.17
SS52-14-33	SS52-14-33-0.25'	0.0	CT	5/16/14	<0.085	0.85	0.24	<0.085	**1.09**
SB52-14-34	SB52-14-34-0.25'	0.0	CT	5/16/14	<0.83	35	<0.83	<0.83	**35**
	SB52-14-34-1'	1.0	CT	6/13/14	<0.066	3.9	0.5	<0.066	**4.4**
	SB52-14-34-2'	2.0	CT	7/21/14	<0.0097	0.24	<0.0097	<0.0097	0.24
SB52-14-35	SB52-14-35-0.25'	0.0	CT	5/21/14	<0.041	2.0	<0.041	<0.041	**2.0**
	SB52-14-35-2'	2.0	CT	5/21/14	<0.0096	<0.0096	0.0091[J]	<0.0096	0.0091[J]
	SB52-14-35-5'	5.0	CT	5/21/14	<0.0098	<0.0098	<0.0098	<0.0098	ND
	SB52-14-35-10'	10	CT	5/21/14	<0.0099	<0.0099	<0.0099	<0.0099	ND
	SB52-14-35-15'	15	CT	5/21/14	<0.0099	<0.0099	<0.0099	<0.0099	ND
SB52-14-36	SB52-14-36-0.25'	0.0	CT	5/21/14	<0.34	12	<0.34	<0.34	**12**
	SB52-14-36-1'	1.0	CT	5/21/14	<0.33	14	<0.33	<0.33	**14**
	SB52-14-36-2'	2.0	CT	6/13/14	<0.0095	<0.0095	<0.0095	<0.0095	ND
SB52-14-37	SB52-14-37-0.25'	0.0	CT	6/16/14	<0.066	3.3	0.58	<0.066	**3.88**
	SB52-14-37-1'	1.0	CT	6/16/14	<0.067	2.0	0.42	<0.067	**2.42**
	SB52-14-37-2'	2.0	CT	6/16/14	<0.0096	<0.0096	<0.0096	<0.0096	ND
SB52-14-38	SB52-14-38-0.25'	0.0	CT	6/16/14	<0.33	9.2	<0.33	<0.33	**9.2**
	SB52-14-38-1'	1.0	CT	6/16/14	<0.033	0.54	0.23	<0.033	0.77
	SB52-14-38-2'	2.0	CT	6/16/14	<0.0096	0.074	<0.0096	<0.0096	0.074
SS52-14-40	SS52-14-40-0.25'	0.0	CT	6/13/14	<0.033	0.63	0.17	<0.033	0.8
	SS52-14-40-1'	1.0	CT	6/13/14	<0.0096	0.2	0.011	<0.0096	0.211
SB52-14-41	SB52-14-41-0.25'	0.0	CT	6/13/14	<0.065	3.6	0.53	<0.065	**4.13**
	SB52-14-41-1'	1.0	CT	6/13/14	<0.065	3.5	0.67	<0.065	**4.17**
SS52-14-42	SS52-14-42-0.25'	0.0	CT	6/13/14	<0.33	6.1	1.1	<0.33	**7.2**
	SS52-14-42-1'	1.0	CT	6/13/14	<0.33	0.69	0.15	<0.33	0.84
SB52-14-43	SB52-14-43-0.25'	0.0	CT	6/13/14	<1.3	110	12	<1.3	**122**
	SB52-14-43-1'	1.0	CT	7/7/14	<0.066	6.1	0.66	<0.066	**6.76**
	SB52-14-43-3'	3.0	CT	7/7/14	<0.066	4.0	0.44	<0.066	**4.44**
	SB52-14-43-6'	6.0	CT	7/7/14	<0.0095	0.062	<0.0095	<0.0095	0.062
SB52-14-44	SB52-14-44-3"	0.0	CT	7/7/14	<0.068	1.5	0.36	<0.068	**1.86**

Table A-3C (Cont'd)
Soil/Sediment Sampling Results from Old Town Demolition Project-Buildings 52/52A Area
Polychlorinated Biphenyls
(concentrations in mg/kg)

					PCBs-8082**				
					Aroclor-1242	**Aroclor-1254**	**Aroclor-1260**	**Aroclor-1268**	**Total PCBs**
				Screening Level*					1.0
Location	Sample ID	Depth (ft)	Lab	Date					
Soil Samples									
SB52-14-45	SB52-14-45-3"	0.0	CT	7/7/14	<0.34	21	4.0	<0.34	**25**
	SB52-14-45-1'	1.0	CT	7/7/14	<1.3	23	3.3	<1.3	**26.3**
	SB52-14-45-2'	2.0	CT	7/21/14	<0.0098	0.62	<0.0098	<0.0098	0.62
SB52-14-46	SB52-14-46-3"	0.0	CT	7/7/14	<0.069	2.9	0.73	<0.069	**3.63**
	SB52-14-46-1'	1.0	CT	7/7/14	<0.067	4.2	1.2	<0.067	**5.4**
	SB52-14-46-2.5'	2.5	CT	7/21/14	<0.0096	0.07	<0.0096	<0.0096	0.07
SB52-14-47	SB52-14-47-0'	0.0	CT	7/18/14	<0.034	0.17	0.089	<0.034	0.259
	SB52-14-47-1'	1.0	CT	7/18/14	<0.0096	0.013	0.015	<0.0096	0.028
SB52-14-48	SB52-14-48-0'	0.0	CT	7/18/14	<0.034	1.3	0.31	<0.034	**1.61**
	SB52-14-48-1'	1.0	CT	7/18/14	<0.033	0.39	0.23	<0.033	0.62
SB52-14-49	SB52-14-49-0.5'	0.5	CT	7/30/14	<0.033	0.26	1.0	<0.033	**1.26**
	SB52-14-49-1.5'	1.5	CT	7/30/14	<0.0096	<0.0096	<0.0096	<0.0096	ND
SB52-14-50	SB52-14-50-0.4'	0.0	CT	7/30/14	<0.0094	<0.0094	0.45	<0.0094	0.45
	SB52-14-50-1.4'	1.4	CT	7/30/14	<0.0095	<0.0095	<0.0095	<0.0095	ND
SB52-14-52	SB52-14-52-0.7'	0.7	CT	7/30/14	<0.0094	<0.0094	0.11	<0.0094	0.11
SB52-14-53	SB52-14-53-0.5'	0.5	CT	7/30/14	<0.033	<0.033	2.0	<0.033	**2.0**
	SB52-14-53-1.5'	1.5	CT	7/30/14	<0.0095	<0.0095	<0.0095	<0.0095	ND
SB52-14-54	SB52-14-54-0.4'	0.0	CT	7/30/14	<0.0095	<0.0095	0.24	<0.0095	0.24
	SB52-14-54-1'	1.0	CT	7/30/14	<0.0093	<0.0093	0.022	<0.0093	0.022
SB52-14-55	SB52-14-55-0.4'	0.4	CT	7/30/14	<1.3	<1.3	45	<1.3	**45**
	SB52-14-55-1.4'	1.4	CT	7/30/14	<0.0094	<0.0094	<0.0094	<0.0094	ND
SB52-14-56	SB52-14-56-1'	1.0	CT	7/30/14	<0.0094	0.066	0.074	<0.0094	0.14
	SB52-14-56-1.9'	1.9	CT	7/30/14	<0.0095	<0.0095	0.035	<0.0095	0.035
	SB52-14-56-3.9'	3.9	CT	7/30/14	<0.0099	<0.0099	<0.0099	<0.0099	ND
SB52-14-57	SB52-14-57-3"	0.0	CT	7/21/14	<0.0095	<0.0095	<0.0095	<0.0095	ND
	SB52-14-57-1'	1.0	CT	7/21/14	<0.0098	<0.0098	0.011	<0.0098	0.011
	SB52-14-57-3'	3.0	CT	7/21/14	<0.0098	<0.0098	<0.0098	<0.0098	ND
SB52-14-58	SB52-14-58-3"	0.0	CT	7/21/14	<0.034	6.6	0.35	<0.034	**6.95**
	SB52-14-58-1'	1.0	CT	7/21/14	<0.066	5.2	0.62	<0.066	**5.82**
SB52-14-59	SB52-14-59-3"	0.0	CT	7/21/14	<0.0097	<0.0097	<0.0097	<0.0097	ND
	SB52-14-59-1'	1.0	CT	7/21/14	<0.0095	<0.0095	<0.0095	<0.0095	ND
SB52-14-60	SB52-14-60-3"	0.0	CT	7/21/14	<0.033	2.4	0.57	<0.033	**2.97**
	SB52-14-60-1'	1.0	CT	7/21/14	<0.0094	0.017	0.013	<0.0094	0.03
	SB52-14-60-3'	3.0	CT	7/21/14	<0.0098	<0.0098	<0.0098	<0.0098	ND
SB52-14-61	SB52-14-61-3"	0.0	CT	7/21/14	<0.0099	0.55	0.34	<0.0099	0.89
	SB52-14-61-1'	1.0	CT	7/21/14	<0.065	5.2	1.5	<0.065	**6.7**
	SB52-14-61-3'	3.0	CT	7/21/14	<0.0093	<0.0093	<0.0093	<0.0093	ND
SB52-14-62	SB52-14-62-0.4'	0.4	CT	7/30/14	<0.013	<0.013	<0.013	<0.013	ND
	SB52-14-62-1.4'	1.4	CT	7/30/14	<0.0095	<0.0095	<0.0095	<0.0095	ND
SS52A-14-1	SS52A-14-1-0	0.0	CT	5/16/14	<0.083	1.2	0.15	<0.083	**1.35**
	SS52A-14-1-1.5	1.5	CT	7/18/14	<0.0095	<0.0095	<0.0095	<0.0095	ND
SS52A-14-1A	SS52A-14-1A-3"	0.0	CT	6/25/14	<0.0097	<0.0097	0.0053[J]	<0.0097	0.0053[J]
	SS52A-14-1A-1'	1.0	CT	6/25/14	<0.034	<0.034	<0.034	<0.034	ND
SS52A-14-1B	SS52A-14-1B-3"	0.0	CT	6/25/14	<0.34	18	3.7	<0.34	**21.7**
	SS52A-14-1B-1'	1.0	CT	6/25/14	<0.032	1.8	0.45	<0.032	**2.25**
	SS52A-14-1B-3'	3.0	CT	7/18/14	<0.0096	<0.0096	<0.0096	<0.0096	ND
SB52A-14-1C	SB52A-14-1C-3"	0.0	CT	6/25/14	<0.13	6.9	1.7	<0.13	**8.6**
	SB52A-14-1C-1'	1.0	CT	6/25/14	<0.33	25	6.6	<0.33	**31.6**
	SB52A-14-1C-3'	3.0	CT	7/18/14	<0.0096	0.17	0.037	<0.0096	0.207

Table A-3C (Cont'd)
Soil/Sediment Sampling Results from Old Town Demolition Project-Buildings 52/52A Area
Polychlorinated Biphenyls
(concentrations in mg/kg)

					PCBs-8082**				
					Aroclor-1242	Aroclor-1254	Aroclor-1260	Aroclor-1268	Total PCBs
				Screening Level*					1.0
Location	Sample ID	Depth (ft)	Lab	Date					
Soil Samples									
SB52A-14-1D	SB52A-14-1D-0'	0.0	CT	7/18/14	<0.0098	0.065	0.027	<0.0098	0.092
	SB52A-14-1D-1'	1.0	CT	7/18/14	<0.034	2.0	0.66	<0.034	**2.66**
SB52A-14-1E	SB52A-14-1E-0'	0.0	CT	7/18/14	<0.069	2.3	0.79	<0.069	**3.09**
	SB52A-14-1E-1'	1.0	CT	7/18/14	<0.0098	0.073	0.049	<0.0098	0.122
SB52A-14-1F	SB52A-14-1F-0'	0.0	CT	7/18/14	<0.034	1.0	0.36	<0.034	**1.36**
	SB52A-14-1F-1'	1.0	CT	7/18/14	<0.0094	0.034	0.02	<0.0094	0.054
SB52A-14-1G	SB52A-14-1G-0'	0.0	CT	7/18/14	<0.0094	0.52	0.24	<0.0094	0.76
	SB52A-14-1G-1'	1.0	CT	7/18/14	<0.0099	<0.0099	0.054	<0.0099	0.054
SB52A-14-1H	SB52A-14-1H-0'	0.0	CT	7/18/14	<0.0095	<0.0095	<0.0095	<0.0095	ND
	SB52A-14-1H-1'	1.0	CT	7/18/14	<0.0099	0.074	0.011	<0.0099	0.085
	SB52A-14-1H-3'	3.0	CT	7/18/14	<0.0094	<0.0094	<0.0094	<0.0094	ND
SB52A-14-1I	SB52A-14-1I-0'	0.0	CT	7/18/14	<0.0098	0.48	0.47	<0.0098	0.95
SS52A-14-2	SS52A-14-2-0	0.0	CT	5/16/14	<0.012	<0.012	0.0068[J]	<0.012	0.0068[J]
SS52A-14-3	SS52A-14-3-0	0.0	CT	5/16/14	<0.012	<0.012	0.013	<0.012	0.013
SS52A-14-4	SS52A-14-4-0	0.0	CT	5/16/14	<0.012	<0.012	<0.012	<0.012	ND
SS52A-14-5	SS52A-14-5-3"	0.0	CT	6/26/14	<0.13	4.0	2.0	<0.13	**6.0**
	SS52A-14-5-1'	1.0	CT	6/26/14	<0.034	1.6	0.45	<0.034	**2.05**
SS52A-14-8	SS52A-14-8-0.5	0.5	CT	2/24/14	<0.2	<0.2	0.43		0.43
	SS52A-14-8-1.5	1.5	CT	2/24/14	<0.2	<0.2	<0.2		ND
SS52A-14-9	SS52A-14-9-0.5	0.5	CT	2/24/14	<0.2	<0.2	<0.2		ND
	SS52A-14-9-1.5	1.5	CT	2/24/14	<0.2	<0.2	<0.2		ND
SS52A-14-10	SS52A-14-10-0'	0.0	CT	6/4/14	<0.0099	0.4	0.12	<0.0099	0.52
	SS52A-14-10-1'	1.0	CT	6/4/14	<0.0095	0.013	0.016	<0.0095	0.029
SS52A-14-12	SS52A-14-12-0'	0.0	CT	6/4/14	<0.0098	0.11	0.13	<0.0098	0.24
	SS52A-14-12-1'	1.0	CT	6/4/14	<0.0099	0.13	0.13	<0.0099	0.26
SS52A-14-13	SS52A-14-13-0'	0.0	CT	6/4/14	<0.0099	0.3	0.37	<0.0099	0.67
	SS52A-14-13-1'	1.0	CT	6/4/14	<0.0099	0.14	0.32	<0.0099	0.46
SS52A-14-14	SS52A-14-14-3"	0.0	CT	6/25/14	<0.034	0.37	0.2	<0.034	0.57
	SS52A-14-14-1'	1.0	CT	6/25/14	<0.034	0.34	0.15	<0.034	0.49
SS52A-14-15	SS52A-14-15-3"	0.0	CT	6/25/14	<0.0094	0.087	0.031	<0.0094	0.118
	SS52A-14-15-1'	1.0	CT	6/25/14	<0.034	<0.034	<0.034	<0.034	ND
SS52A-14-16	SS52A-14-16-3"	0.0	CT	7/7/14	<0.067	0.14	0.34	<0.067	0.48
	SS52A-14-16-1'	1.0	CT	7/7/14	<0.0095	<0.0095	<0.0095	<0.0095	ND
Sediment Sample									
SS52-14-Sump			CT	5/14/14	<83	1,800	<83	<83	1,800

* Screening level for total PCBs is the Toxic Substances Control Act (TSCA) self-implementing cleanup level for PCBs in soil in high-occupancy areas.

** Analytes included Aroclors 1016, 1221, 1232, 1242, 1248, 1254, 1260, and 1268 unless otherwise noted.

CT: Analysis by Curtis & Tompkins Ltd

GEL: Analysis by General Engineering Laboratories LLC

Boldface type indicates concentration above screening level.

J indicates an estimated value

< (shaded)	concentration less than reporting limit (RL)
(blank)	not analyzed

ND: No PCB Aroclors detected

Appendix C. Specifications for Transmitting Analytical and QA/QC Data from a Subcontract Analytical Laboratory to Environment, Health and Safety

Specifications for Transmitting Analytical and QA/QC Data from a Subcontract Analytical Laboratory to Environment, Health and Safety Division, Lawrence Berkeley National Laboratory

April 26, 2012

Direct Questions to:

Robert Fox
Environment, Health and Safety Division, LBNL
or
Steven J. Wyrick
IT Business Systems, LBNL

Contents

1. There are two required files to be transferred for each analytical transmission batch, the sample file and the analysis file. The sample file contains information about the sample taken at the sampling location. The analysis file contains information about the analyses performed on the samples.
2. There are two required files to be transferred for each QA/QC transmission batch, the QA/QC file and the batch number reference file. The first file contains information about the QA/QC samples and their analytes. The second file lists each QC batch number in the first file and each corresponding laboratory log number for all samples supported by that batch.
3. Include only data records in the above four files. Extraneous text or blank lines are erroneously interpreted as values of fields.
4. There is also a fifth text file to be transferred which shall contain additional information relevant to the analyses, that is not included in the above four files. Report case narrative or other qualifying information here. Information that links information in this file to the results to which they apply shall be included. Field Specifications. There are three types of field: character, numeric, and date. The asterisk (*), question mark (?), comma (,), percent sign (%), underscore (_), backslash (\), pound sign (#), single quote ('), double quote ("), and vertical bar (|) may NOT be used in ANY fields. Field contents may be variable length, and shall be less than or equal to the maximum length specified. Leading or trailing spaces should NOT be present (do not fill a field to the maximum length specified).

   Character fields are alphanumeric with restrictions described above. Character data may NOT be within quotes.

   Numeric fields may contain only the digits 0 through 9, "-", ".", or "+", and "e" or "E" when using scientific notation. Specific examples of data that is not acceptable in numeric fields include "NA", "NR", and "Not Reportable", or any use of inequality signs ("<", ">").

   Date fields should be in one of these three formats:
   mm/dd/yyyy (11/15/1988)
   dd-mmm-yyyy (15-nov-1988)
   mm-dd-yyyy (11-15-1988)
5. Field Delimiter. The vertical bar, "|", ASCII decimal code 124, shall be used to separate fields.
6. Record Delimiter. A carriage return with line feed shall separate each record.
7. A field delimiter shall follow every field except for the last field. A field delimiter may NOT follow the last field of a record.
8. If there is no data for a field, nothing should be put in the field; the delimiter indicating the end of the field should immediately follow the delimiter that indicates the end of the previous field. If the last field has no data, do not add a following field delimiter (the delimiter following the previous field becomes the last character of the record). Leave a field blank if the presumed concentration is zero (0), for example the before concentration of a blank spike is presumed zero since it is a known blank. Reporting a zero implies that an analysis was run by the reporting laboratory yielding zero.
9. Character Types. In addition to the restrictions given in #5 above, field contents shall use only characters within the range of ASCII decimal codes 32 through 126.
10. For questions, contact the Data Manager in the specific group with which you are working.

Field	Maximum Length	Description/Domain
log number	12	Analytical lab's unique log number used as the identifier of a sample taken by LBNL When reported: Shall be present and unique within a series approved by LBNL. Format: A unique pair of alpha characters which the lab shall add to the front of the log number will be assigned to the lab by LBNL ensuring that the log number is unique within LBNL's system.
sampling location	30	Unique identifier of a sampling location at LBNL When reported: Shall be present and identical as supplied by LBNL. Format: Any characters excluding asterisk (*), question mark (?), comma (,), percent (%), underscore (_), backslash (\), pound sign (#), single quote ('), double quote ("), and vertical bar (|).
requester	20	LBNL employee requesting the analysis When reported: Shall be present and identical as supplied by LBNL. Format: Any characters excluding asterisk (*), question mark (?), comma (,), percent (%), underscore (_), backslash (\), pound sign (#), single quote ('), double quote ("), and vertical bar (|).
depth of sample	6	Depth (in feet) of the sampling site from the surface When reported: Shall be present if supplied by LBNL Format: Identical as supplied by LBNL; range 0 - 9999.9.
date sampled	11	Date sample was collected from the sampling location When reported: Shall be present and identical as supplied by LBNL. Format: Not case-sensitive and shall be in one of these three formats: mm/dd/yyyy (11/15/1988) dd-mmm-yyyy (15-nov-1988) mm-dd-yyyy (11-15-1988)
note	100	Any notes When reported: Optional. Format: Any characters excluding asterisk (*), question mark (?), comma (,), percent (%), underscore (_), backslash (\), pound sign (#), single quote ('), double quote ("), and vertical bar (|).
lab	10	Identifier of the analytical lab When reported: Shall be present. Format: As assigned to the analytical lab by LBNL
document control number	10	LBNL's control number used to track miscellaneous sampling information When reported: If supplied by LBNL Format: identical as supplied by LBNL.
sample matrix	2	The medium of the sample. When reported: Shall be present Format: identical as supplied by LBNL when supplied or as provided and mutually accepted by the lab and LBNL. See Appendix B for allowable values.

Field	Maximum Length	Description/Domain
log number	12	Analytical lab's unique log number used as the identifier of a sample taken by LBNL When reported: Shall be present. Format: Shall match a log number in the sample file, and shall be unique within a series approved by LBNL. A unique pair of alpha characters which the lab shall add to the front of the log number will be assigned to the lab by LBNL ensuring that the log number is unique within LBNL's system.
parameter code	11	Code (assigned by LBNL) representing the analyte for which the sample is being analyzed When reported: Shall be present as supplied by LBNL. Contact the appropriate Data Manager for a new code if none exists. Format: See Appendix A for a list of acceptable values. No other values are allowed in this field.
reporting limit flag	1	Used to indicate a non-detect or when an analysis result is detected but is less than the contract reporting limit of the analysis When reported: Shall be present if the result is less than the contract reporting limit; otherwise optional if appropriate for the analysis. (See Appendix C – *Reporting convention description* for a more detailed explanation.) Format: "<" if result is less than the contract reporting limit. Empty if the result for the analysis is greater than or equal to the value of the associated contract reporting limit, unless appropriate for the analysis, e.g. ignitability, which can be ">" but not "=".
analysis result	12	Result of the analysis. If the concentration or activity is at or greater than the contract reporting limit (CRL), the concentration or activity should be placed in the result field. If the concentration or activity is less than the CRL, the CRL should be placed in the result field and in this case the reporting limit flag should be set to "<". (See Appendix C – *Reporting convention description* for a more detailed explanation.) If the analyte type is a surrogate, report the percentage of surrogate recovered calculated by the following formula, $\frac{(\text{surrogate concentration})*100}{\text{Spike amount}}$ When reported: Shall be present unless the result is non-numeric. Format: Numeric, in either standard or scientific notation. The number may not contain commas or alpha characters and should only include significant digits with a precision of 12 or fewer digits. If scientific notation is used, it shall be in the format sn.dEsd where each s may be "+", "-", or omitted, n represents a digit, and each d represents one or more digits. The range of n.dEsd is 1.0E-130 to 9.9999E125. If result is not numeric, leave this field blank and report the result in "comments" field as "Non-numeric result is:".

<table>
<tr><td>contract reporting limit (CRL, also CRDL and RL)</td><td>12</td><td>The required contract reporting limit as defined by the Contract Analytical Spreadsheet for the analysis being performed. The value reported in the CRL field must be adjusted to reflect sample dilution if the dilution causes the actual detection limit to exceed the required contract reporting limit. When the measured concentration is less than the contract reporting limit (adjusted for dilution) place the contract reporting limit in the “analysis result” field also, and place a “<” in the “reporting limit flag” field. The analytical method should be able to reliably detect the presence of the analyte in the sample when the analyte is actually present in the sample at a concentration at or above the CRL. When reporting a “contract required detection limit” as defined by the QSAS (page 9) use this field. If the analyte type is a surrogate, then report the surrogate lower control limit in this field.
When reported: Shall be present.
Format: Numeric, in either standard or scientific notation. The number may not contain commas, and only include significant digits with a precision of 12 or fewer digits. If scientific notation is used, it shall be in the format sn.dEsd where each s may be "+", "-", or omitted, n represents a digit, and each d represents one or more digits. The range of n.dEsd is 1.0E-130 to 9.9999E125. Units: as reported in the “units of result” field.</td></tr>
<tr><td>units of result</td><td>10</td><td>The units in which the analysis result is represented
When reported: Shall be present.
Format: Any characters excluding asterisk (*), question mark (?), comma (,), percent (%), underscore (_), vertical bar (|), backslash (\), pound sign (#), single quote (‘), and double quote (“).</td></tr>
<tr><td>requested analysis</td><td>20</td><td>Code representing the analysis requested on the chain of custody (COC).
When reported: Shall be present
Format: Identical as supplied by LBNL. For valid value list see Contract Analytical Spreadsheet.</td></tr>
<tr><td>analysis method</td><td>20</td><td>The EPA method or equivalent details of the method of analysis
When reported: Shall be present
Format: Any characters excluding asterisk (*), question mark (?), comma (,), percent (%), underscore (_), vertical bar (|), backslash (\), pound sign (#), single quote (‘), and double quote (“).</td></tr>
<tr><td>date extracted</td><td>11</td><td>Date analyte was extracted
When reported: Shall be present if applicable
Format: Not case-sensitive and shall be in one of these three formats:
mm/dd/yyyy (11/15/1988)
dd-mmm-yyyy (15-nov-1988)
mm-dd-yyyy (11-15-1988)</td></tr>
<tr><td>date/time analyzed</td><td>19</td><td>Date analysis took place.
When reported: Shall be present.
Format: Is not case-sensitive and the following format is preferred:
mm/dd/yyyy hh24:mi:ss, where
mm = month 01-12
dd = day 1-31
yyyy = year
hh24 = hour specified as 01-24
mi = minutes 01-59
ss = seconds
Report 0s for hours, minutes, seconds if not applicable. Other formats may be acceptable if agreed to by LBNL.</td></tr>
</table>

error in result	10	The error will contain the two sigma total propagated uncertainty associated with the measured value. When reported: Shall be present for radiological data. Present if applicable for other data. Format: Either standard or scientific notation. The number may not contain commas, and only include significant digits with a precision of 12 or fewer digits. If scientific notation is used, it shall be in the format sn.dEsd where each s may be "+", "-", or omitted, n represents a digit, and each d represents one or more digits. The range of n.dEsd is 1.0E-130 to 9.9999E125.
instrument ID	6	Identifying code of the instrument used for analysis When reported: Shall be present. Format: Any characters excluding asterisk (*), question mark (?), comma (,), percent (%), underscore (_), backslash (\\), pound sign (#), single quote (‘), double quote (“), and vertical bar (|).
analyst ID	4	Identifying code of the analyst at the analytical lab When reported: Shall be present. Format: Any characters excluding asterisk (*), question mark (?), comma (,), percent (%), underscore (_), backslash (\\), pound sign (#), single quote (‘), double quote (“), and vertical bar (|).
dilution factor	7	Dilution factor used when performing the analysis. If no dilution is performed, specify a dilution factor equal to 1. When reported: Shall be present. Format: Numeric, in either standard or scientific notation. The number may not contain commas, and only include significant digits with a precision of 2 or fewer digits. If scientific notation is used, it shall be in the format sn.dEsd where each s may be "+", "-", or omitted, n represents a digit, and each d represents one or more digits. The range of n.dEsd is 1.0E-130 to 9.9999E125.
extraction method	20	The identification of the method used to extract the compound for analysis When reported: Shall be present if applicable. Format: Identical as supplied by LBNL, if supplied. Any characters excluding asterisk (*), question mark (?), comma (,), percent (%), underscore (_), backslash (\\), pound sign (#), single quote (‘), double quote (“), and vertical bar (|).
measured concentration or activity	12	The analyzed concentration for chemical analysis or activity for radiological analysis detected and corrected for technical factors, e.g. dilution. Activity shall be reported for radiological analysis. If a measured concentration or activity is below the CRL and reported on hardcopy, it shall be reported in this field. It shall be the same as analysis result when above the CRL. If the analyte type is a surrogate, then report the surrogate upper control limit in this field. (See Appendix C – *Reporting convention description* for a more detailed explanation.) When reported: Shall be present for radiological analyses. Shall be present for chemical analyses if the measured concentration is above the CRL; also shall be present if the measured concentration is between the Critical Level (MDL) and the CRL AND is reported on the hard copy; otherwise blank. Format: Numeric, in either standard or scientific notation. The number may not contain commas, and only include significant digits with a precision of 12 or fewer digits. If scientific notation is used, it shall be in the format sn.dEsd where each s may be "+", "-", or omitted, n represents a digit, and each d represents one or more digits. The range of n.dEsd is 1.0E-130 to 9.9999E125. Units: as reported in the “units of result” field.

critical level (CL, also MDL, L_C)	12	Use this field when reporting a method detection limit (MDL) as defined by the US EPA (40 CFR 136 Appendix B). Leave this field blank when reporting results for radiological analyses, unless reporting for a special project that requires reporting of the radiological decision level concentration (L_C; see the QSAS page 9 and "Additional Reporting Requirements" in the "Analytical Data Deliverables" section of the Statement of Work). The critical level is the lowest measured concentration above which one can confidently assert that the analyte has been detected. It is the lowest measurement that is unlikely to have been obtained from a blank sample. Any measurement above L_C should be considered strong evidence that the analyte is present in the sample. L_C is chosen so that the false detection probability is small. When reported: Shall be present for chemical analyses, blank unless specifically requested for radiological analyses. Format: Numeric, in either standard or scientific notation. The number may not contain commas, and only include significant digits with a precision of 12 or fewer digits. If scientific notation is used, it shall be in the format sn.dEsd where each s may be "+", "-", or omitted, n represents a digit, and each d represents one or more digits. The range of n.dEsd is 1.0E-130 to 9.9999E125.Units: as reported in the "units of result" field.
detectable level (DL, also MDC, L_D)	12	Use this field when reporting a "minimum detectable concentration" as defined by the QSAS pages 14, D-37 through D-41. Use one of formulas on pages D-37 through D-41 of the QSAS, as appropriate, unless prior approval for a project-specific exception has been obtained. Leave this field blank when reporting results for analytical methods that do not have an MDC associated with them. The detectable level is the lowest concentration at or above which an analyte can confidently be detected (i.e., distinguished from zero). That is, when the true concentration is at or above DL, the measured concentration is highly likely to exceed the CL. Failures to detect the analyte should be rare when the true concentration is at or above the DL. When reported: Shall be present for radiological analyses, blank unless specifically requested for chemical analyses. Format: Numeric, in either standard or scientific notation. The number may not contain commas, and only include significant digits with a precision of 12 or fewer digits. If scientific notation is used, it shall be in the format sn.dEsd where each s may be "+", "-", or omitted, n represents a digit, and each d represents one or more digits. The range of n.dEsd is 1.0E-130 to 9.9999E125. Units: as reported in the "units of result" field.
quantitation limit (QL, also PQL, MQL)	12	Use when reporting a "practical quantitation limit" (as defined by the QSAS page 12), or "method quantitation limit" (as defined by SW-846, Method 8000B, sec. 7.4.1.2). The QL should reflect all applicable technical factors affecting its value (for example, dilution). Leave this field blank when reporting results for analytical methods that do not have a QL associated with them. When reported: Shall be present when requested. Format: Numeric, in either standard or scientific notation. The number may not contain commas, and only include significant digits with a precision of 12 or fewer digits. If scientific notation is used, it shall be in the format sn.dEsd where each s may be "+", "-", or omitted, n represents a digit, and each d represents one or more digits. The range of n.dEsd is 1.0E-130 to 9.9999E125. Units: as reported in the "units of result" field.
filtered	1	If the analyte being reported is filtered, place an "L" in this field for lab filtered. If the COC indicates that a sample was field filtered, place an "F" in this field. Otherwise place an "N" for not filtered.

When reported: Shall be present
Format: Shall be one of the following values: L, F, or N.

Specifications for Analysis File(continued)

analyte description	50	Name of the analyte or property being reported. If the analyte description associated with the parameter code is inadequate to fully describe the analyte, e.g., total or filtered metals in water, free-water or organically-bound tritium in vegetation, include that information in the description. When reported: Must be present. Format: Any characters excluding asterisk (*), question mark (?), percent (%), underscore (_), vertical bar (|), backslash (\\), single quote (‘), double quote (“), and pound sign (#). NOTE: Commas are allowed only for chemical names.
comments	100	Any comments including extremely long names for tentatively identified compounds (TICs), retention time for TICs, CAS numbers for TICs, and non-numeric results noted with “Non-numeric result is:”. When reported: Optional. Format: Any characters excluding asterisk (*), question mark (?), percent (%), underscore (_), vertical bar (|), backslash (\\), single quote (‘), double quote (“), and pound sign (#). NOTE: Commas are allowed only for chemical names.
analyte type	3	Must be filled in with either “TRG” for target analytes or “TIC” for tentatively identified compounds or “SUR” for surrogates. When reported: Shall be present. Format: Shall be one of the following values: TRG, TIC, or SUR.

Specifications for the QA/QC File

Field	Maximum Length	Description/Domain
QC batch number	20	Laboratory number assigned by the laboratory to each batch of samples analyzed for quality control tracking purposes including laboratory internally generated QC samples When reported: Shall be present and unique within a series approved by LBNL. Format: Two unique alpha characters that the lab shall add to the front of the log number will be assigned to the lab by LBNL. This 2-letter lab code will ensure that the batch number is unique within LBNL's system. All QC batch numbers that appear in this file shall also be present in the Batch Number Reference file.
QC sample type	4	The following QC sample types are specified: BLM Method blank BS/BSD Blank spike or blank spike duplicate, prepared by non-LBNL personnel using deionized water (replaces matrix spike if not enough sample is available) LBLM Leachate method blank LCS/LCSD Lab control sample or standard, or lab control sample duplicate MS/MSD Matrix spike or matrix spike duplicate, prepared by non-LBNL personnel from a LBNL sample PDS Post-Digestion Spike REP Replicate/duplicate or split prepared by non-LBNL personnel SBLM Surrogate for the method blank SBS/SBSD Surrogate blank spike or surrogate blank spike duplicate SLCS/SLC1 Surrogate for the LCS or surrogate for the LCS duplicate SMS/SMSD Surrogate for the matrix spike or surrogate for the matrix spike duplicate SREP Surrogate for the sample replicate/duplicate Note that the results for the BS/BSD, LCS/LSCD, MS/MSD, SBS/SBSD, SLCS/SLC1 and SMS/SMSD QC sample types are reported as one row of data, not two rows. When reported: Shall be present. Format: Shall be one of the following values: BLM, BS, BSD, LCS, LCSD, LBLM, MS, MSD, PDS, REP, SBLM, SBS, SBSD, SLCS, SLC1, SMS, SMSD, SREP.
lab	10	Identifier of the analytical laboratory. When reported: Shall be present. Format: As assigned to the analytical lab by LBNL.

date sampled	11	Date sample was collected from the sampling location or date prepared for QA purposes; for example, date spike was created. For some samples this date will be the same as the analyzed date. There can be only one prepared date per QC batch number. For silica gel, use the date bubbled through the gel. When reported: Shall be present. Format: Is not case-sensitive and shall be in one of these three formats: mm/dd/yyyy (11/15/1988) dd-mmm-yyyy (15-nov-1988) mm-dd-yyyy (11-15-1988)
lower control limit	12	The value below which the data is qualified. This value is one of the laboratory's internal control limits. When reported: Shall be present for BS, BSD, LCS, LCSD, MS, MSD, PDS, SBS, SBSD, SBLM, SLCS, SLC1,SMS, SMSD and SREP sample types. Shall be blank for REP and BLM QC sample types. Format: Numeric, in either standard or scientific notation. The number may not contain commas, and only include significant digits with a precision of 12 or fewer digits. If scientific notation is used, it shall be in the format sn.dEsd where each s may be "+", "-", or omitted, n represents a digit, and each d represents one or more digits. The range of n.dEsd is 1.0E-130 to 9.9999E125. Units: as reported in the "units of result" field.
upper control limit	12	The value above which the data is qualified. This value is one of the laboratory's internal control limits. When reported: Shall be present for BS, BSD, LCS, LCSD, MS, MSD, PDS, SBS, SBSD, SBLM, SLCS, SLC1,SMS, SMSD and SREP sample types. Shall be blank for REP and BLM QC sample types. Format: Numeric, in either standard or scientific notation. The number may not contain commas, and only include significant digits with a precision of 12 or fewer digits. If scientific notation is used, it shall be in the format sn.dEsd where each s may be "+", "-", or omitted, n represents a digit, and each d represents one or more digits. The range of n.dEsd is 1.0E-130 to 9.9999E125. Units: as reported in the "units of result" field.
before concentration	12	Measured value of sample before a spike as used to calculate recovery. If no such value is used, nothing should be reported in this field. When reported: Shall be present for all non-surrogate spikes (QC sample types BS, BSD, MS, MSD, PDS). Shall be blank for all other QC sample types. For radiological analytes report the value reported in the measured concentration or activity field for the corresponding sample in the Analysis File. For chemical analytes, if detected report the value reported in the analysis result field for the corresponding sample; if non-detect, if between the Critical Level (MDL) and the CRL AND reported in the results file, report the value reported in the measured concentration or activity field; if that value is not reported, report a zero (0) in the field. Do not leave blank unless no measurement was done. Format: Numeric, in either standard or scientific notation. The number may not contain commas, and only include significant digits with a precision of 12 or fewer digits. If scientific notation is used, it shall be in the format sn.dEsd where each s may be "+", "-", or omitted, n represents a digit, and each d represents one or more digits. The range of n.dEsd is 1.0E-130 to 9.9999E125. Units: as reported in the "units of result" field.

before concentration error	12	The error will contain the two sigma total propagated uncertainty associated with the measured value for the concentration before a spike. When reported: Shall be present whenever before concentration is present and analyte is a radionuclide. Shall be blank for all other QC sample types. Format: Numeric, in either standard or scientific notation. The number may not contain commas, and only include significant digits with a precision of 12 or fewer digits If scientific notation is used, it shall be in the format sn.dEsd where each s may be "+", "-", or omitted, n represents a digit, and each d represents one or more digits. The range of n.dEsd is 1.0E-130 to 9.9999E125. Units: as reported in the “units of result” field.
contract reporting limit (CRL, also CRDL and RL) for before concentration	12	The required contract reporting limit as defined by the Contract Analytical Spreadsheet for the analysis being performed. The analytical method should be able to reliably detect the presence of the analyte in the sample when the analyte is actually present in the sample at a concentration above the CRL. When reporting a “contract required detection limit” as defined by the QSAS (page 18) use this field. When reported: Shall be present whenever before concentration is present. Format: Numeric, in either standard or scientific notation. The number may not contain commas, and only include significant digits with a precision of 12 or fewer digits. If scientific notation is used, it shall be in the format sn.dEsd where each s may be "+", "-", or omitted, n represents a digit, and each d represents one or more digits. The range of n.dEsd is 1.0E-130 to 9.9999E125. Units: as reported in the “units of result” field
spike amount	12	Concentration appropriate for compound added to create a spike, or known certified concentration for laboratory control samples. When reported: Shall be present for all spikes (QC sample types BS, BSD, MS, MSD, PDS, SBLM, SBS, SBSD, ~~SLCS,~~ SMS, SMSD, SREP), and lab control samples (QC sample types LCS, LCSD, SLCS, SLC1). Shall be blank for all other QC sample types. Format: Numeric, in either standard or scientific notation. The number may not contain commas, and only include significant digits with a precision of 12 or fewer digits. If scientific notation is used, it shall be in the format sn.dEsd where each s may be "+", "-", or omitted, n represents a digit, and each d represents one or more digits. The range of n.dEsd is 1.0E-130 to 9.9999E125. Units: as reported in the “units of result” field.
reporting limit flag associated with result1	1	Used to indicate a non-detect or when an analysis result is detected but is less than the contract reporting limit of the analysis When reported: shall be present if result1 is less than the contract limit; otherwise optional if appropriate for the analysis. Format: “<“ if result1 is less than the contract reporting limit. Empty if the result for the analysis is equal to or greater than the value of the associated contract reporting limit, unless appropriate for the analysis, e.g. ignitability, which can be “>” but not “=”.

result1	12	Measured concentration or activity when a single value is appropriate, or the first analysis of replicate aliquots of a sample used to determine precision. For replicate/duplicate or split samples (REP), place the original sample measured concentration or activity, as reported in the measured concentration or activity field of the analysis file, in this field and the replicate result in result2. For chemical analytes, when the result is non-detect and measured concentration is not reported, place the contract reporting limit in this field. For surrogates (QC sample types SBLM, SBS, SBSD, SLCS, SLC1, SMS, SMSD, SREP) report percent recovery for the surrogate in this field (as well as in the percent of recovery1 field). When reported: Shall be present and shall be present if result2 is reported. Format: Numeric, in either standard or scientific notation. The number may not contain commas or alpha characters, and should only include significant digits with a precision of 12 or fewer digits. If scientific notation is used, it shall be in the format sn.dEsd where each s may be "+", "-", or omitted, n represents a digit, and each d represents one or more digits. The range of n.dEsd is 1.0E-130 to 9.9999E125. Units: as reported in the “units of result” field
error1	12	The error will contain the two sigma total propagated uncertainty associated with the measured value for result1. When reported: Shall be present if result1 is reported and data is radiological. Present if applicable for other data. Format: Numeric, in either standard or scientific notation. The number may not contain commas, and only include significant digits with a precision of 12 or fewer digits. If scientific notation is used, it shall be in the format sn.dEsd where each s may be "+", "-", or omitted, n represents a digit, and each d represents one or more digits. The range of n.dEsd is 1.0E-130 to 9.9999E125. Units: as reported in the “units of result” field
contract reporting limit (CRL, also CRDL and RL) for Result1	12	The required contract reporting limit as defined by the Contract Analytical Spreadsheet for the analysis being performed to obtain Result1. When the measured concentration is less than the contract reporting limit, place a “<” in the “reporting limit flag associated with result1” field. For chemical analytes, when the measured concentration is less than the contract reporting limit, also place the contract reporting limit in the result1 field. The analytical method should be able to reliably detect the presence of the analyte in the sample when the analyte is actually present in the sample at a concentration above the CRL. When reporting a “contract required detection limit” as defined by the QSAS (page 18) use this field. When reported: Shall be present if result1 is reported for a target analyte; leave blank for surrogates. Format: Numeric, in either standard or scientific notation. The number may not contain commas, and only include significant digits with a precision of 12 or fewer digits. If scientific notation is used, it shall be in the format sn.dEsd where each s may be "+", "-", or omitted, n represents a digit, and each d represents one or more digits. The range of n.dEsd is 1.0E-130 to 9.9999E125. Units: as reported in the “units of result” field

Percent of recovery1	10	The percentage of analyte recovered associated with Result1 calculated by the following formulas. For Lab Control Sample or Standard (LCS), the percent recovery calculation is: $$\frac{(\text{LCS concentration}) * 100}{\text{Spike amount}}$$ For spike recoveries, the percent recovery calculation is: $$\frac{(\text{Sample conc. with spike} - \text{Sample Conc.}) * 100}{\text{Spike concentration}}$$ or: $$\frac{(\text{result1} - \text{before concentration}) * 100}{\text{spike amount}}$$ (report the calculated value, whether positive or negative) When reported: Shall be present for QC sample types BS, BSD, LCS, LCSD, MS, MSD, PDS, SBLM, SBS, SBSD, SLCS, SLC1, SMS, SMSD and SREP QC sample types. Shall be blank for all other QC sample types. Format: Numeric, in standard notation.
result2	12	Measured concentration or activity of the second analysis of replicate aliquots used to determine precision. For chemical analytes, when the result is non-detect and measured concentration is not reported, place the contract reporting limit in this field. When reported: Shall be present for QC sample types BSD, MSD, LCSD, SBSD and SMSD, replicate/duplicate or split (REP), SLC1, and SREP and only if result1 is also reported. For surrogates (SBSD, SLC1, SMSD, SREP) report the percent recovery associated with result2 in this field. Format: Numeric, in either standard or scientific notation. The number may not contain commas, and only include significant digits with a precision of 12 or fewer digits. If scientific notation is used, it shall be in the format sn.dEsd where each s may be "+", "-", or omitted, n represents a digit, and each d represents one or more digits. The range of n.dEsd is 1.0E-130 to 9.9999E125. Units: as reported in the “units of result” field.
error2	12	The error will contain the two sigma total propagated uncertainty associated with the measured value for result2. When reported: Shall be present if result2 is reported and data is radiological. Present if applicable for other data. Format: Numeric, in either standard or scientific notation. The number may not contain commas, and only include significant digits with a precision of 12 or fewer digits. If scientific notation is used, it shall be in the format sn.dEsd where each s may be "+", "-", or omitted, n represents a digit, and each d represents one or more digits. The range of n.dEsd is 1.0E-130 to 9.9999E125. Units: as reported in the “units of result” field

contract reporting limit (CRL, also CRDL and RL) for Result2	12	The required contract reporting limit as defined by the Contract Analytical Spreadsheet for the analysis being performed to obtain Result2. When the measured concentration is less than the contract reporting limit, place the contract reporting limit in the “analysis result” field also, and place a “<” in the “reporting limit flag” field. The analytical method should be able to reliably detect the presence of the analyte in the sample when the analyte is actually present in the sample at a concentration above the CRL. When reporting a “contract required detection limit” as defined by the QSAS (page 18) use this field. <u>When reported:</u> Shall be present if result2 is reported for a target analyte; leave blank for surrogates. <u>Format:</u> Numeric, in either standard or scientific notation. The number may not contain commas, and only include significant digits with a precision of 12 or fewer digits. If scientific notation is used, it shall be in the format sn.dEsd where each s may be "+", "-", or omitted, n represents a digit, and each d represents one or more digits. The range of n.dEsd is 1.0E-130 to 9.9999E125. Units: as reported in the “units of result” field
Percent recovery2	10	The percentage of analyte recovered associated with Result2 calculated by the following formulas. For Lab Control Sample or Standard (LCS), the percent recovery calculation is: $\frac{\text{(LCS concentration)* 100}}{\text{Spike amount}}$ For spike recoveries, the percent recovery calculation is: $\frac{\text{(Sample conc. with spike – Sample Conc.) * 100}}{\text{Spike concentration}}$ or: $\frac{\text{(result2 – before concentration) * 100}}{\text{spike amount}}$ (report the calculated value, whether positive or negative). <u>When reported:</u> Shall be present for QC sample types BSD, MSD, LCSD, SBSD, SLC1, SMSD and SREP. Blank for all other QC sample types. <u>Format:</u> Numeric, in standard notation.
error type	1	Type of error reported (numeric or percentage) <u>When reported:</u> Shall be present as “P” if error reported is a percentage of the result. Blank if error is numeric.
parameter code	11	Code (assigned by LBNL) representing the analyte for which the sample is being analyzed <u>When reported:</u> Shall be present as supplied by LBNL. Contact the appropriate Data Manager for a new code, if none exists. <u>Format:</u> See Appendix A for a list of acceptable values. No other values are allowed in this field.
requested analysis	20	Code representing the analysis requested on the chain of custody (COC) for which the QA/QC sample is being run <u>When reported:</u> Shall be present. <u>Format:</u> Identical as supplied by LBNL For valid value list see Contract Analytical Spreadsheet.
sample matrix	2	The medium of the sample or BW for method blank or laboratory control sample if it is aqueous or SO for method blank or laboratory control sample if it is soil <u>When reported:</u> Shall be present <u>Format:</u> Identical as supplied by LBNL when supplied or as provided and mutually accepted by the lab and LBNL. See Appendix B for allowable values.

percent relative difference	10	Calculated using the following: $\frac{\|R1-R2\| * 100}{(R1+R2) / 2}$ where R1 is the result1 and R2 is the result2. Report only when R1 and R2 are positive (for chemical analytes, report only when result1 and result 2 are both detect) <u>When reported:</u> Radiological analytes: shall be present for QA sample types BSD, MSD, and REP. Shall be present for LCSD samples if Result2 was reported. May be reported but not required for surrogates (SBSD, SLC1, SMSD, SREP). Blank for all other QA sample types. Chemical analytes: as above, when both results are detect. Blank otherwise. <u>Format:</u> Numeric, in standard notation only.
units of result	10	The units in which the analysis spike amount, result1, result2, error1, error2 and all detection limits are represented <u>When reported:</u> Shall be present and the same for all concentrations or activities reported. <u>Format:</u> Can include any characters excluding asterisk (*), question mark (?), comma (,), percent (%), underscore (_), backslash (\\), pound sign (#), single quote (‘), double quote (“), and vertical bar (|).
analysis method	20	The EPA method or equivalent details of the method of analysis <u>When reported</u>: Shall be present. <u>Format:</u> Can include any characters excluding asterisk (*), question mark (?), comma (,), percent (%), underscore (_), vertical bar (|), backslash (\\), pound sign (#), single quote (‘), and double quote (“).
date/time analyzed	19	Date analysis took place. <u>When reported:</u> Shall be present. <u>Format:</u> Is not case-sensitive and the following format is preferred: mm/dd/yyyy hh24:mi:ss, where mm = month 01-12 dd = day 1-31 yyyy = year hh24 = hour specified as 01-24 mi = minutes 01-59 ss = seconds Report 0s for hours, minutes, seconds if not applicable. Other formats may be acceptable if agreed to by LBNL.
extraction method	20	The identification of the method used to extract the compound for analysis <u>When reported:</u> Shall be present if applicable. <u>Format:</u> Identical as supplied by LBNL if supplied. Any characters excluding asterisk(*), question mark(?), comma(,), percent(%), underscore(_), backslash (\\), pound sign (#), single quote (‘), double quote(“), and vertical bar(|).
extraction date	11	Date extraction took place, if appropriate <u>When reported:</u> Shall be present if appropriate. <u>Format:</u> Is not case-sensitive and shall be in one of these three formats: mm/dd/yyyy (11/15/1988) dd-mmm-yyyy (15-nov-1988) mm-dd-yyyy (11-15-1988)

instrument ID	6	Identifying code of the instrument used for analysis When reported: Shall be present. Format: Can include any characters excluding asterisk (*), question mark (?), comma (,), percent (%), underscore (_), backslash (\), pound sign (#), single quote (‘), double quote (“), and vertical bar (|).
analyst ID	6	Identifying code of the analyst at the analytical lab When reported: Shall be present Format: Can include any characters excluding asterisk (*), question mark (?), comma (,), percent (%), underscore (_), backslash (\), pound sign (#), single quote (‘), double quote (“), and vertical bar (|).
comments	100	Any comments When reported: Shall be present when applicable Format: Can include any characters excluding asterisk (*), question mark (?), comma (,), percent (%), underscore (_), backslash (\), pound sign (#), single quote (‘), double quote (“), and vertical bar (|).
relative difference control limit	10	If the relative difference is above this value, the data should be qualified. This value is one of the laboratory’s internal control limits. When reported: Shall be present whenever “percent relative difference” field is not blank (required for BSD, MSD and REP QC sample types, required for LCSD~~/SLCS~~ QC sample type if result2 is reported). Format: Numeric, in standard notation only. Must be positive.
relative error ratio (RER)	12	Calculated using the following: $RER = \|R1-R2\|/(S1+S2)$ where R1 is the result1, R2 is the result2, S1 and S2 are the same values as reported in the error1 and error2 fields. The uncertainties used to calculate S1 and S2 shall be in the same units of measurement as R1 and R2 (not percent uncertainty). Pairs of results having a RER greater than 1 should be investigated and explained in the case narrative. When reported: Shall be present when the analyte is radiological and result1, result2, error1 and error2 are reported. Format: Numeric, in either standard or scientific notation. The number may not contain commas, and only include significant digits with a precision of 12 or fewer digits. If scientific notation is used, it shall be in the format sn.dEsd where each s may be "+", "-", or omitted, n represents a digit, and each d represents one or more digits. The range of n.dEsd is 1.0E-130 to 9.9999E125.
detectable level (DL, also MDC, LD) associated with Result1	12	Use this field when reporting a “minimum detectable concentration” as defined by the QSAS pages 14, D-37 through D-41. Use one of formulas on pages D-37 through D-41 of the QSAS, as appropriate, unless prior approval for a project-specific exception has been obtained. Leave this field blank when reporting results for analytical methods that do not have an MDC associated with them. The detectable level is the lowest concentration at or above which an analyte can confidently be detected (i.e., distinguished from zero). That is, when the true concentration is at or above DL, the measured concentration is highly likely to exceed the CL. Failures to detect the analyte should be rare when the true concentration is at or above the DL. When reported: Shall be present for radiological analyses, blank unless specifically requested for chemical analyses. Format: Numeric, in either standard or scientific notation. The number may not contain commas, and only include significant digits with a precision of 12 or fewer digits. If scientific notation is used, it shall be in the format sn.dEsd where each s may be "+", "-", or omitted, n represents a digit, and each d represents one or more digits. The range of n.dEsd is 1.0E-130 to 9.9999E125. Units: as reported in the “units of result” field.

detectable level (DL, also MDC, LD) associated with result2	12	Use this field when reporting a “minimum detectable concentration” as defined by the pages 14, D-37 through D-41. Use one of formulas on pages D-37 through D-41 of the QSAS, as appropriate, unless prior approval for a project-specific exception has been obtained. Leave this field blank when reporting results for analytical methods that do not have an MDC associated with them. The detectable level is the lowest concentration at or above which an analyte can confidently be detected (i.e., distinguished from zero). That is, when the true concentration is at or above DL, the measured concentration is highly likely to exceed the CL. Failures to detect the analyte should be rare when the true concentration is at or above the DL. When reported: Shall be present for radiological analyses when result2 is reported, blank unless specifically requested for chemical analyses. Format: Numeric, in either standard or scientific notation. The number may not contain commas, and only include significant digits with a precision of 12 or fewer digits. If scientific notation is used, it shall be in the format sn.dEsd where each s may be "+", "-", or omitted, n represents a digit, and each d represents one or more digits. The range of n.dEsd is 1.0E-130 to 9.9999E125. Units: as reported in the “units of result” field.
reporting limit flag associated with result2	1	Used to indicate a non-detect or when an analysis result is detected but is less than the contract reporting limit of the analysis When reported: shall be present if result2 is less than the contract limit; otherwise optional if appropriate for the analysis. Format: “<“ if result1 is less than the contract reporting limit. Empty if the result for the analysis is equal to or greater than the value of the associated contract reporting limit, unless appropriate for the analysis, e.g. ignitability, which can be “>” but not “=”.

Specifications for Batch Number Reference File

Field	Maximum Length	Description/Domain
QC batch number	20	Laboratory number assigned by the laboratory to each batch of samples analyzed for quality control tracking purposes including laboratory internally generated QC samples. For every log number in the sample file, there shall be a row in this file if there is QA/QC data associated with it. When reported: Shall be present and unique within a series approved by LBNL. Format: Two unique alpha characters that the lab shall add to the front of the log number will be assigned to the lab by LBNL. This 2-letter lab code will ensure that the batch number is unique within LBNL's system. All QC batch numbers that appear in this file shall also be present in the QA/QC file.
log number	12	Analytical lab's unique log number used as the identifier of a sample taken by LBNL When reported: Shall be present. Format: Shall be identical to log number sent with analytical results via regular electronic data transmittal. A unique pair of alpha characters that the lab shall add to the front of the log number will be assigned to the lab by LBNL ensuring that the log number is unique within LBNL's system.

Specifications for Text File

Text file. This file shall contain information relevant to the analysis, which is not included in the other EDD files. Report case narrative or other qualifying information here. Information that links data in this file to the results to which they apply shall be included. Format: plain text only; special formatting (underlining, etc.) or special characters (i.e. asterisk (*), question mark (?), percent (%), underscore (_), vertical bar (|), backslash (\), single quote ('), double quote ("), and pound sign (#)) are not allowed. No maximum length. Other file formats (e.g., doc, rtf, pdf, etc.) may be uploaded only with prior permission from the LBNL group requesting the work, and if the file format is anything other than plain-text, this must be noted in the "Optional Comments" field on the final screen of the data upload website during upload.

Checks to be Performed on Analytical Data Before Transfer to LBNL

ALL ELECTRONIC DATA MUST MATCH DATA REPORTED ON HARDCOPY.

These checks for erroneous conditions will be programmatically performed on data received at LBNL from outside laboratories. At minimum, these same checks are to be performed via program code at the outside laboratory to insure that none of the conditions exist just before the data is sent to LBNL.

The following checks shall be performed on the sample file:

- null or blank log number
- two or more records for same log number
- no analysis data for a log number
- null or blank date sampled
- null or blank requester name
- null or blank lab name
- null or blank sampling location

The following checks shall be performed on the analysis file:

- null or blank log number
- no sample file record matching this log number
- invalid or null parameter code
- two or more records with same log number, parameter code, and requested analysis
- Reporting limit flag indicator shall be equal to “<”, “>”, or be empty
- null or blank units
- null or blank date analyzed
- null or blank requested analysis
- contract reporting limit (CRL) less than or equal to zero
- error less than zero
- reporting limit flag not equal to “<” when measured concentration or activity is less than or equal to the contract reporting limit (CRL)
- result not equal to contract reporting limit (CRL) when measured concentration or activity is less than or equal to contract reporting limit (CRL)
- result not equal to measured concentration or activity when measured concentration or activity is greater than contract reporting limit (CRL)

The following checks shall be performed on the QA/QC file:

- null or blank batch number
- two or more record with same QC batch number and QC sample type
- null or blank date sampled
- null or blank requested analysis
- null or blank lab name
- invalid or null parameter code
- two or more records with same QC batch number, sample type, analyte, and requested analysis
- reporting limit flag shall be equal to “<”, “>”, or be empty
- null or blank units
- null or blank date analyzed
- contract reporting limit (CRL) value less than or equal to zero
- reporting limit flag not equal to “<” when measured concentration or activity is less than the contract reporting limit
- null or non-zero relative difference control limit when RPD is reported

The following checks shall be performed on the batch number reference file:

- null or blank batch number
- null or blank log number
- two or more records with same QC batch number and log number

Appendix A - Codes of Parameters

List of Parameter Codes
See AppendixA.xls

Appendix B - Matrix Codes

Analysis	Analyte	Parameter Code
PCB:Congeners	13C-labeled PCB-1	12001
PCB:Congeners	13C-labeled PCB-101	12101
PCB:Congeners	13C-labeled PCB-104	12104
PCB:Congeners	13C-labeled PCB-105	12105
PCB:Congeners	13C-labeled PCB-11	12011
PCB:Congeners	13C-labeled PCB-114	12114
PCB:Congeners	13C-labeled PCB-118	12118
PCB:Congeners	13C-labeled PCB-123	12123
PCB:Congeners	13C-labeled PCB-126	12126
PCB:Congeners	13C-labeled PCB-127	12127
PCB:Congeners	13C-labeled PCB-138	12138
PCB:Congeners	13C-labeled PCB-141	12141
PCB:Congeners	13C-labeled PCB-153	12153
PCB:Congeners	13C-labeled PCB-155	12155
PCB:Congeners	13C-labeled PCB-156	12156
PCB:Congeners	13C-labeled PCB-157	12157
PCB:Congeners	13C-labeled PCB-159	12159
PCB:Congeners	13C-labeled PCB-167	12167
PCB:Congeners	13C-labeled PCB-169	12169
PCB:Congeners	13C-labeled PCB-170	12170
PCB:Congeners	13C-labeled PCB-178	12178
PCB:Congeners	13C-labeled PCB-180	12180
PCB:Congeners	13C-labeled PCB-188	12188
PCB:Congeners	13C-labeled PCB-189	12189
PCB:Congeners	13C-labeled PCB-19	12019
PCB:Congeners	13C-labeled PCB-194	12194
PCB:Congeners	13C-labeled PCB-202	12202
PCB:Congeners	13C-labeled PCB-206	12206
PCB:Congeners	13C-labeled PCB-208	12208
PCB:Congeners	13C-labeled PCB-209	12209
PCB:Congeners	13C-labeled PCB-28	12028
PCB:Congeners	13C-labeled PCB-3	12003
PCB:Congeners	13C-labeled PCB-32	12032
PCB:Congeners	13C-labeled PCB-37	12037
PCB:Congeners	13C-labeled PCB-4	12004
PCB:Congeners	13C-labeled PCB-47	12047
PCB:Congeners	13C-labeled PCB-52	12052
PCB:Congeners	13C-labeled PCB-54	12054
PCB:Congeners	13C-labeled PCB-70	12070
PCB:Congeners	13C-labeled PCB-77	12077
PCB:Congeners	13C-labeled PCB-79	12079
PCB:Congeners	13C-labeled PCB-80	12080
PCB:Congeners	13C-labeled PCB-81	12081
PCB:Congeners	13C-labeled PCB-9	12009
PCB:Congeners	13C-labeled PCB-95	12095
PCB:Congeners	13C-labeled PCB-97	12097

Analysis	Analyte	Parameter Code
PCB:Congeners	59 PCB Congener Summation	12210
PCB:Congeners	PCB 001	10001
PCB:Congeners	PCB 002	10002
PCB:Congeners	PCB 003	10003
PCB:Congeners	PCB 006	10006
PCB:Congeners	PCB 011	10011
PCB:Congeners	PCB 014	10014
PCB:Congeners	PCB 015	10015
PCB:Congeners	PCB 017	10017
PCB:Congeners	PCB 018	10018
PCB:Congeners	PCB 019	10019
PCB:Congeners	PCB 022	10022
PCB:Congeners	PCB 023	10023
PCB:Congeners	PCB 025	10025
PCB:Congeners	PCB 026	10026
PCB:Congeners	PCB 028	10028
PCB:Congeners	PCB 029	10029
PCB:Congeners	PCB 030	10030
PCB:Congeners	PCB 031	10031
PCB:Congeners	PCB 034	10034
PCB:Congeners	PCB 035	10035
PCB:Congeners	PCB 036	10036
PCB:Congeners	PCB 037	10037
PCB:Congeners	PCB 038	10038
PCB:Congeners	PCB 039	10039
PCB:Congeners	PCB 040	10040
PCB:Congeners	PCB 044	10044
PCB:Congeners	PCB 045	10045
PCB:Congeners	PCB 046	10046
PCB:Congeners	PCB 047	10047
PCB:Congeners	PCB 050	10050
PCB:Congeners	PCB 051	10051
PCB:Congeners	PCB 053	10053
PCB:Congeners	PCB 054	10054
PCB:Congeners	PCB 055	10055
PCB:Congeners	PCB 057	10057
PCB:Congeners	PCB 058	10058
PCB:Congeners	PCB 062	10062
PCB:Congeners	PCB 063	10063
PCB:Congeners	PCB 065	10065
PCB:Congeners	PCB 067	10067
PCB:Congeners	PCB 068	10068
PCB:Congeners	PCB 073	10073
PCB:Congeners	PCB 074	10074
PCB:Congeners	PCB 077	10077

Analysis	Analyte	Parameter Code
PCB:Congeners	PCB 078	10078
PCB:Congeners	PCB 079	10079
PCB:Congeners	PCB 080	10080
PCB:Congeners	PCB 081	10081
PCB:Congeners	PCB 082	10082
PCB:Congeners	PCB 083	10083
PCB:Congeners	PCB 086	10086
PCB:Congeners	PCB 089	10089
PCB:Congeners	PCB 093	10093
PCB:Congeners	PCB 094	10094
PCB:Congeners	PCB 096	10096
PCB:Congeners	PCB 097	10097
PCB:Congeners	PCB 099	10099
PCB:Congeners	PCB 100	10100
PCB:Congeners	PCB 103	10103
PCB:Congeners	PCB 104	10104
PCB:Congeners	PCB 105	10105
PCB:Congeners	PCB 110	10110
PCB:Congeners	PCB 113	10113
PCB:Congeners	PCB 114	10114
PCB:Congeners	PCB 119	10119
PCB:Congeners	PCB 120	10120
PCB:Congeners	PCB 121	10121
PCB:Congeners	PCB 122	10122
PCB:Congeners	PCB 123	10123
PCB:Congeners	PCB 124	10124
PCB:Congeners	PCB 126	10126
PCB:Congeners	PCB 127	10127
PCB:Congeners	PCB 129	10129
PCB:Congeners	PCB 130	10130
PCB:Congeners	PCB 131	10131
PCB:Congeners	PCB 135	10135
PCB:Congeners	PCB 136	10136
PCB:Congeners	PCB 137	10137
PCB:Congeners	PCB 140	10140
PCB:Congeners	PCB 141	10141
PCB:Congeners	PCB 144	10144
PCB:Congeners	PCB 145	10145
PCB:Congeners	PCB 147	10147
PCB:Congeners	PCB 148	10148
PCB:Congeners	PCB 150	10150
PCB:Congeners	PCB 151	10151
PCB:Congeners	PCB 152	10152
PCB:Congeners	PCB 153	10153
PCB:Congeners	PCB 154	10154
PCB:Congeners	PCB 155	10155

Analysis	Analyte	Parameter Code
PCB:Congeners	PCB 156	10156
PCB:Congeners	PCB 157	10157
PCB:Congeners	PCB 159	10159
PCB:Congeners	PCB 166	10166
PCB:Congeners	PCB 167	10167
PCB:Congeners	PCB 168	10168
PCB:Congeners	PCB 169	10169
PCB:Congeners	PCB 170	10170
PCB:Congeners	PCB 171	10171
PCB:Congeners	PCB 172	10172
PCB:Congeners	PCB 173	10173
PCB:Congeners	PCB 174	10174
PCB:Congeners	PCB 175	10175
PCB:Congeners	PCB 176	10176
PCB:Congeners	PCB 177	10177
PCB:Congeners	PCB 178	10178
PCB:Congeners	PCB 179	10179
PCB:Congeners	PCB 180	10180
PCB:Congeners	PCB 181	10181
PCB:Congeners	PCB 183	10183
PCB:Congeners	PCB 184	10184
PCB:Congeners	PCB 185	10185
PCB:Congeners	PCB 186	10186
PCB:Congeners	PCB 188	10188
PCB:Congeners	PCB 189	10189
PCB:Congeners	PCB 190	10190
PCB:Congeners	PCB 191	10191
PCB:Congeners	PCB 192	10192
PCB:Congeners	PCB 193	10193
PCB:Congeners	PCB 194	10194
PCB:Congeners	PCB 195	10195
PCB:Congeners	PCB 197	10197
PCB:Congeners	PCB 198	10198
PCB:Congeners	PCB 199	10199
PCB:Congeners	PCB 200	10200
PCB:Congeners	PCB 201	10201
PCB:Congeners	PCB 202	10202
PCB:Congeners	PCB 204	10204
PCB:Congeners	PCB 205	10205
PCB:Congeners	PCB 206	10206
PCB:Congeners	PCB 207	10207
PCB:Congeners	PCB 208	10208
PCB:Congeners	PCB 209	10209
PCB:Congeners	PCB-106/118 co-eluter	11106
PCB:Congeners	PCB-107/109 co-eluter	11107
PCB:Congeners	PCB-108/112 co-eluter	11108

Analysis	Analyte	Parameter Code
PCB:Congeners	PCB-111/115 co-eluter	11111
PCB:Congeners	PCB-12/13 co-eluter	11012
PCB:Congeners	PCB-128/162 co-eluter	11128
PCB:Congeners	PCB-132/161 co-eluter	11132
PCB:Congeners	PCB-133/142 co-eluter	11133
PCB:Congeners	PCB-134/143 co-eluter	11134
PCB:Congeners	PCB-138/163/164 co-eluter	11138
PCB:Congeners	PCB-139/149 co-eluter	11139
PCB:Congeners	PCB-146/165 co-eluter	11146
PCB:Congeners	PCB-158/160 co-eluter	11158
PCB:Congeners	PCB-16/32 co-eluter	11016
PCB:Congeners	PCB-182/187 co-eluter	11182
PCB:Congeners	PCB-196/203 co-eluter	11196
PCB:Congeners	PCB-20/21/33 co-eluter	11020
PCB:Congeners	PCB-24/27 co-eluter	11024
PCB:Congeners	PCB-4/10 co-eluter	11004
PCB:Congeners	PCB-41/64/71/72 co-eluter	11041
PCB:Congeners	PCB-42/59 co-eluter	11042
PCB:Congeners	PCB-43/49 co-eluter	11043
PCB:Congeners	PCB-48/75 co-eluter	11048
PCB:Congeners	PCB-5/8 co-eluter	11005
PCB:Congeners	PCB-52/69 co-eluter	11052
PCB:Congeners	PCB-56/60 co-eluter	11056
PCB:Congeners	PCB-61/70 co-eluter	11061
PCB:Congeners	PCB-7/9 co-eluter	11007
PCB:Congeners	PCB-76/66 co-eluter	11076
PCB:Congeners	PCB-84/92 co-eluter	11084
PCB:Congeners	PCB-85/116 co-eluter	11085
PCB:Congeners	PCB-87/117/125 co-eluter	11087
PCB:Congeners	PCB-88/91 co-eluter	11088
PCB:Congeners	PCB-90/101 co-eluter	11090
PCB:Congeners	PCB-95/98/102 co-eluter	11095

List of Matrix Codes
See AppendixB.xls

MATRIX	DESCRIPTION
AB	Alpha Beta Background Low Vol Air Particulate
AF	air filter
AQ	aqueous: water modified in any manner from ground water, including treatment, passing through a pipe, or a borehole sampled with a bailer. All treatment facility sample ports are aqueous.
AS	asphalt
AT	air tritium
BF	backfill
BW	blank water
CH	charcoal
CO	concrete
CV	condensed vapor sample
DF	drilling fluid
DS	dosimeter
DW	drinking water
GR	gravel
GW	ground water: water from a single developed well, unaltered by sampling method or treatment. Spring samples are also ground water.
HY	honey
LI	liquid, nonaqueous
ML	milk
OL	oil
OR	organics
OS	solvents/oils
OT	other
PD	pad from Seamist soil vapor monitoring
PS	solvents/paints
PW	processed waste water
RA	rain
RM	roof material
RO	storm water runoff
RT	retention tank liquid
SL	sludge, liquid
SO	soil or sediment
SS	sludge, solid
SW	sewer effluent
TW	cooling tower water
VA	vapor or air
VB	vapor blank
VG	vegetation
WA	waste, solid
WI	wine
WP	sampling wipe
WW	wastewater
BR	brick

The following language is a clarification of how the “analysis result” field should be filled in the EDD. These are *not new*; but just a re-wording of existing definitions, in the hopes that it will be clearer.

The fields involved are the “analysis result”, “measured concentration or activity”, “contract reporting limit” and “reporting limit flag” fields.

The term “measured concentration or activity” refers to a number representing the actual measured concentration or activity, regardless of whether it is less than or greater than any of the various kinds of detection limits, regardless of whether it is positive or negative, and regardless of whether the measurement uncertainty is large or small. Although non-radiological methods do no normally *report* any such number, these rules are written as if such a number is available to the lab, even if not reported (i.e., the measurement process produces a number, even if the number is so close to zero as to be considered most likely a result of instrumental noise). Radiological results are reported as activity *per unit mass or volume*, so the term “concentration” is appropriate for both radiological and non-radiological analyses.

Reporting rules:

- In all cases, place the contract reporting limit in the “contract reporting limit” field.

Rules for the “measured concentration or activity” field

- For all analyses of radionuclides, always place the measured activity in the “measured concentration or activity” field.
- For certain projects with special reporting requirements for non-radiological analyses, if the measured concentration is between the method detection limit (MDL) and the contract reporting limit, place the measured concentration in the “measured concentration or activity” field.
- For non-radiological analyses, when the measured concentration is greater than or equal to the contract reporting limit, place the measured concentration in the “measured concentration or activity” field.
- Otherwise leave the “measured concentration or activity” field empty.

Rules for the “analysis result” and “reporting limit flag” fields

- When the measured concentration or activity is greater than or equal to the contract reporting limit, place the measured concentration or activity in the “analysis result” field. Leave the “reporting limit flag” field empty (exception: if appropriate place a “>” sign in the “reporting limit flag” field for certain analytical methods, e.g., ignitability).
- When the measured concentration or activity is less than the contract reporting limit, place the contract reporting limit in the “analysis result” field and place a “<” in the “reporting limit flag” field.

Rule when numerical value not available

- When an analytical method does not provide a numerical value (i.e., for extremely low levels or non-detections), leave the “measured concentration or activity” field empty. Place the contract reporting limit in the “analytical result” field and a “<” sign in the “reporting limit flag” field.

Transfer Instructions to LBNL

Uploading Electronic Data Deliverables (EDDs) to Lawrence Berkeley National Laboratory (LBNL) users

LBNL maintains a secure website for analytical laboratories to upload EDDs. Prior to first use, laboratory representatives must contact Steve Wyrick, LBNL Environment, Health & Safety Division, at 510-486-6903 or sjwyrick@lbl.gov to obtain a laboratory user account and passwords. One account is assigned per analytical laboratory; individual users are not assigned separate accounts. Each user account has multiple passwords which correspond to the individual LBNL user groups.

The LBNL Data Upload website is located at http://ehswprod.lbl.gov/DataUpload/; it is compatible with Mozilla, Netscape and Internet Explorer. Users log in with their laboratory's user name, the password corresponding to the LBNL user group to which the EDD is being uploaded, and the LBNL chain-of-custody number. If the EDD represents a reanalysis, enter the letter corresponding to the number of the reanalysis ('a' for the 1st reanalysis, 'b' for the 2nd, etc.); leave this field blank for the initial data set (Figures 1 and 2).

Figure 1.

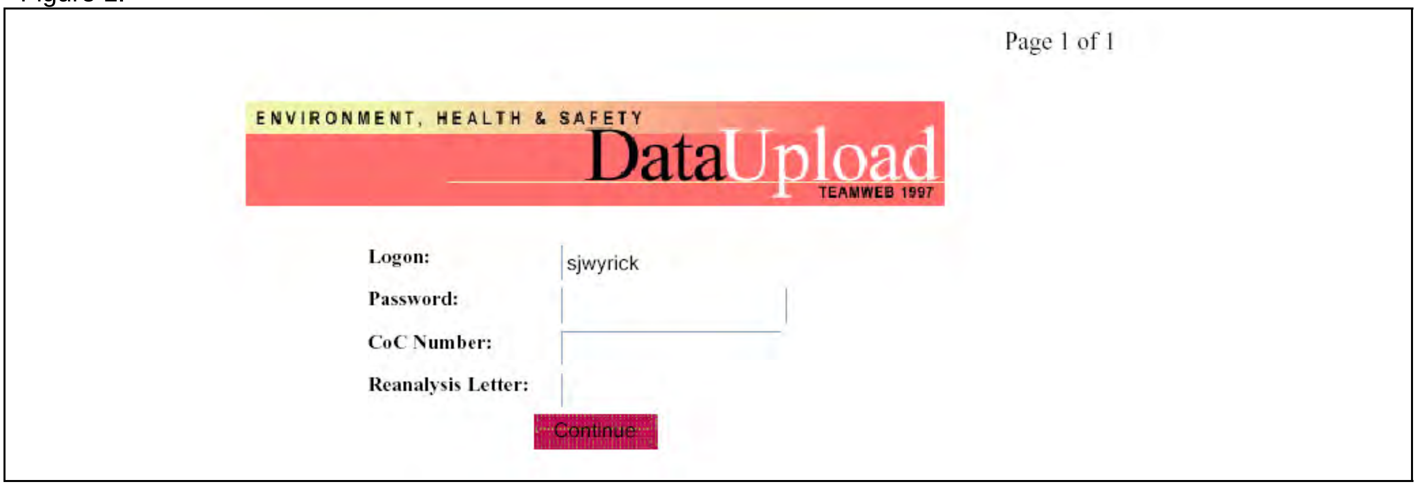
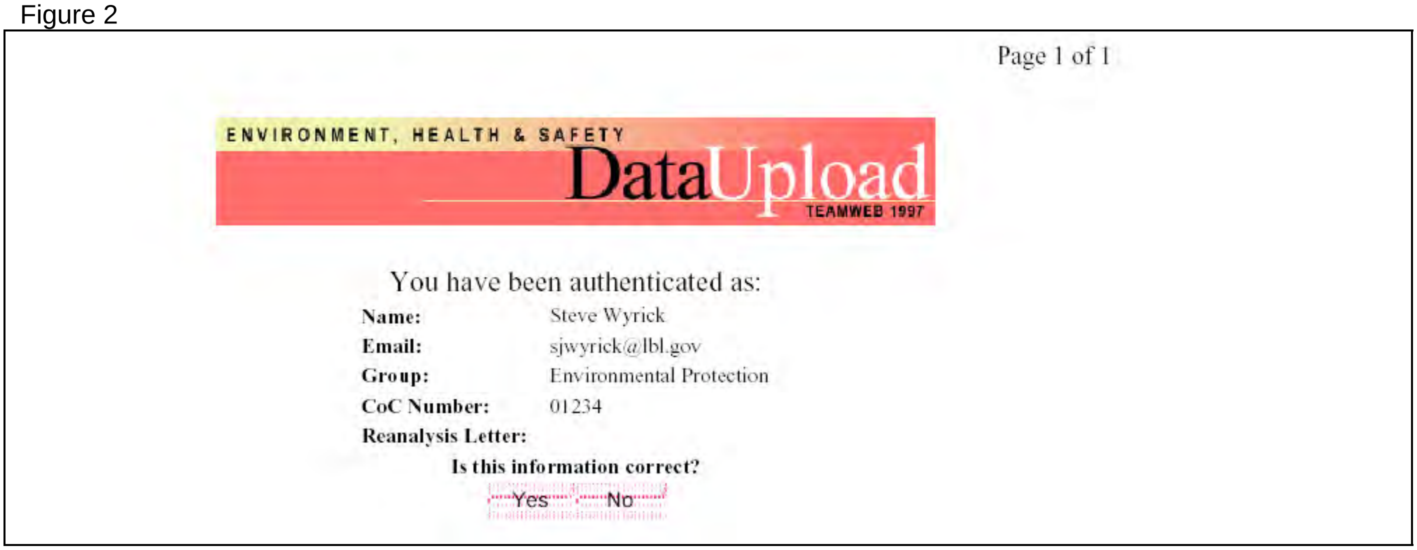
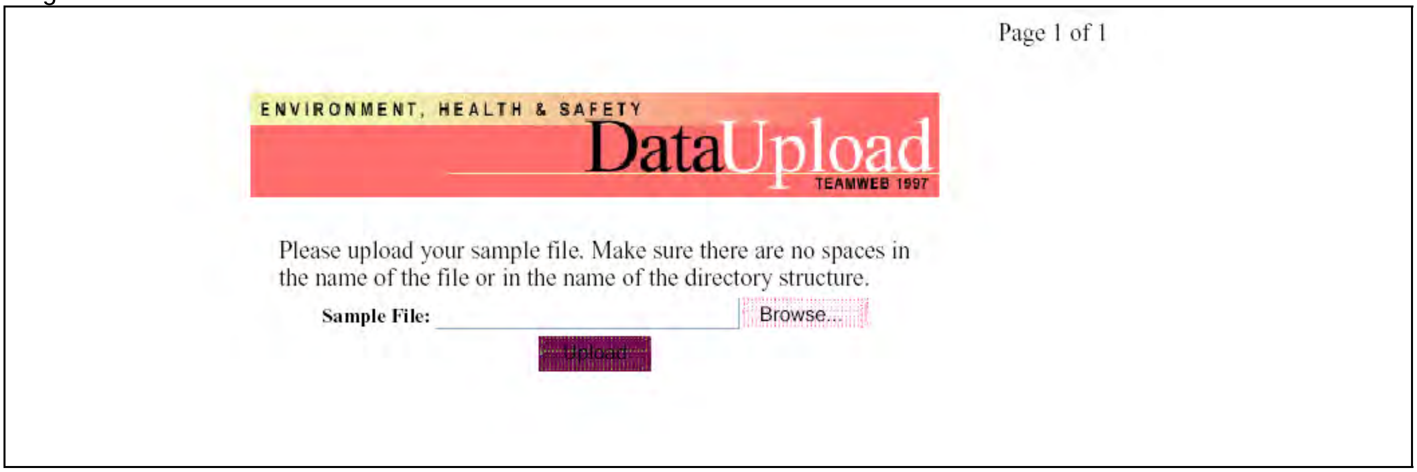


Figure 2



The website then prompts the user to browse their computer or network to locate and upload the analysis results file (.ana), quality control results file (.qac), mapping file (.ref), sample file (.sam), and optional text (.txt) file (Figure 3). Files are not required to have these extensions initially; the correct file names and extensions are appended when the files are uploaded to the website.

Figure 3.



Finally the website provides an area to enter comments about the batch that will appear on an e-mail message sent to the LBNL user group's data manager (Figure 4).

Figure 4

Clicking on the ‘finish’ button completes the uploading process by sending an e-mail to the LBNL data manager to alert her/him that the files have been uploaded and are available for download from the website. Once the final screen appears signaling that files have been uploaded successfully (Figure 5) the upload process is complete.

Figure 5

Please address all questions and problems regarding the website or the data upload process to Steve Wyrick (see contact information at the beginning of this section).

Appendix D. Curtis & Tompkins Laboratory Certifications

CALIFORNIA STATE
ENVIRONMENTAL LABORATORY ACCREDITATION PROGRAM
Accredited Fields of Testing

Curtis & Tompkins, Ltd.

2323 Fifth Street
Berkeley, CA 94710
Phone: (510) 486-0900

Certificate No.: 2896
Renew Date: 1/31/2017

Field of Testing: 102 - Inorganic Chemistry of Drinking Water

102.022	001	Turbidity	SM2130B
102.030	001	Bromide	EPA 300.0
102.030	003	Chloride	EPA 300.0
102.030	005	Fluoride	EPA 300.0
102.030	006	Nitrate	EPA 300.0
102.030	007	Nitrite	EPA 300.0
102.030	010	Sulfate	EPA 300.0
102.045	001	Perchlorate	EPA 314.0
102.100	001	Alkalinity	SM2320B
102.120	001	Hardness	SM2340B
102.130	001	Conductivity	SM2510B
102.140	001	Total Dissolved Solids	SM2540C
102.190	001	Cyanide, Total	SM4500-CN E
102.240	001	Phosphate, Ortho	SM4500-P E
102.270	001	Surfactants	SM5540C
102.520	001	Calcium	EPA 200.7
102.520	002	Magnesium	EPA 200.7
102.520	003	Potassium	EPA 200.7
102.520	005	Sodium	EPA 200.7
102.520	006	Hardness (calculation)	EPA 200.7
102.551	002	Chlorine, Free, Combined, Total	SM4500-Cl G

Field of Testing: 103 - Toxic Chemical Elements of Drinking Water

103.130	001	Aluminum	EPA 200.7
103.130	003	Barium	EPA 200.7
103.130	004	Beryllium	EPA 200.7
103.130	005	Cadmium	EPA 200.7
103.130	007	Chromium	EPA 200.7
103.130	008	Copper	EPA 200.7
103.130	009	Iron	EPA 200.7
103.130	011	Manganese	EPA 200.7
103.130	012	Nickel	EPA 200.7
103.130	015	Silver	EPA 200.7
103.130	017	Zinc	EPA 200.7
103.140	001	Aluminum	EPA 200.8
103.140	002	Antimony	EPA 200.8
103.140	003	Arsenic	EPA 200.8
103.140	004	Barium	EPA 200.8
103.140	005	Beryllium	EPA 200.8

103.140	006	Cadmium	EPA 200.8
103.140	007	Chromium	EPA 200.8
103.140	008	Copper	EPA 200.8
103.140	009	Lead	EPA 200.8
103.140	010	Manganese	EPA 200.8
103.140	012	Nickel	EPA 200.8
103.140	013	Selenium	EPA 200.8
103.140	014	Silver	EPA 200.8
103.140	015	Thallium	EPA 200.8
103.140	016	Zinc	EPA 200.8
103.160	001	Mercury	EPA 245.1

Field of Testing: 108 - Inorganic Chemistry of Wastewater

108.112	001	Boron	EPA 200.7
108.112	002	Calcium	EPA 200.7
108.112	003	Hardness (calculation)	EPA 200.7
108.112	004	Magnesium	EPA 200.7
108.112	005	Potassium	EPA 200.7
108.112	007	Sodium	EPA 200.7
108.113	002	Calcium	EPA 200.8
108.113	003	Magnesium	EPA 200.8
108.113	004	Potassium	EPA 200.8
108.113	006	Sodium	EPA 200.8
108.120	001	Bromide	EPA 300.0
108.120	002	Chloride	EPA 300.0
108.120	003	Fluoride	EPA 300.0
108.120	004	Nitrate	EPA 300.0
108.120	005	Nitrite	EPA 300.0
108.120	008	Sulfate	EPA 300.0
108.360	001	Phenols, Total	EPA 420.1
108.381	001	Oil and Grease	EPA 1664A
108.390	001	Turbidity	SM2130B
108.410	001	Alkalinity	SM2320B
108.420	001	Hardness (calculation)	SM2340B
108.430	001	Conductivity	SM2510B
108.440	001	Residue, Total	SM2540B
108.441	001	Residue, Filterable TDS	SM2540C
108.442	001	Residue, Non-filterable TSS	SM2540D
108.443	001	Residue, Settleable	SM2540F
108.465	001	Chlorine, Total	SM4500-Cl G
108.472	001	Cyanide, Total	SM4500-CN E
108.490	001	Hydrogen Ion (pH)	SM4500-H+ B
108.491	002	Kjeldahl Nitrogen	SM4500-NH3 C (18th)
108.493	001	Ammonia	SM4500-NH3 D or E (19th/20th)
108.540	001	Phosphate, Ortho	SM4500-P E
108.541	001	Phosphorus, Total	SM4500-P E
108.551	001	Silica	SM4500-SiO2 C (20th)
108.580	001	Sulfide	SM4500-S= D

108.590	001	Biochemical Oxygen Demand	SM5210B
108.602	001	Chemical Oxygen Demand	SM5220D
108.611	001	Total Organic Carbon	SM5310C
108.640	001	Surfactants	SM5540C

Field of Testing: 109 - Toxic Chemical Elements of Wastewater

109.010	001	Aluminum	EPA 200.7
109.010	002	Antimony	EPA 200.7
109.010	003	Arsenic	EPA 200.7
109.010	004	Barium	EPA 200.7
109.010	005	Beryllium	EPA 200.7
109.010	007	Cadmium	EPA 200.7
109.010	009	Chromium	EPA 200.7
109.010	010	Cobalt	EPA 200.7
109.010	011	Copper	EPA 200.7
109.010	012	Iron	EPA 200.7
109.010	013	Lead	EPA 200.7
109.010	015	Manganese	EPA 200.7
109.010	016	Molybdenum	EPA 200.7
109.010	017	Nickel	EPA 200.7
109.010	019	Selenium	EPA 200.7
109.010	021	Silver	EPA 200.7
109.010	023	Thallium	EPA 200.7
109.010	024	Tin	EPA 200.7
109.010	026	Vanadium	EPA 200.7
109.010	027	Zinc	EPA 200.7
109.020	001	Aluminum	EPA 200.8
109.020	002	Antimony	EPA 200.8
109.020	003	Arsenic	EPA 200.8
109.020	004	Barium	EPA 200.8
109.020	005	Beryllium	EPA 200.8
109.020	006	Cadmium	EPA 200.8
109.020	007	Chromium	EPA 200.8
109.020	008	Cobalt	EPA 200.8
109.020	009	Copper	EPA 200.8
109.020	010	Lead	EPA 200.8
109.020	011	Manganese	EPA 200.8
109.020	012	Molybdenum	EPA 200.8
109.020	013	Nickel	EPA 200.8
109.020	014	Selenium	EPA 200.8
109.020	015	Silver	EPA 200.8
109.020	016	Thallium	EPA 200.8
109.020	017	Vanadium	EPA 200.8
109.020	018	Zinc	EPA 200.8
109.020	021	Iron	EPA 200.8
109.190	001	Mercury	EPA 245.1

Field of Testing: 110 - Volatile Organic Chemistry of Wastewater

110.040	040	Halogenated Hydrocarbons	EPA 624
110.040	041	Aromatic Compounds	EPA 624
110.040	042	Oxygenates	EPA 624
110.040	043	Other Volatile Organics	EPA 624

Field of Testing: 111 - Semi-volatile Organic Chemistry of Wastewater

111.100	000	Base/Neutral & Acid Organics	EPA 625
111.170	030	Pesticides & PCBs	EPA 608
111.170	031	PCBs	EPA 608

Field of Testing: 114 - Inorganic Chemistry of Hazardous Waste

114.010	001	Antimony	EPA 6010B
114.010	002	Arsenic	EPA 6010B
114.010	003	Barium	EPA 6010B
114.010	004	Beryllium	EPA 6010B
114.010	005	Cadmium	EPA 6010B
114.010	006	Chromium	EPA 6010B
114.010	007	Cobalt	EPA 6010B
114.010	008	Copper	EPA 6010B
114.010	009	Lead	EPA 6010B
114.010	010	Molybdenum	EPA 6010B
114.010	011	Nickel	EPA 6010B
114.010	012	Selenium	EPA 6010B
114.010	013	Silver	EPA 6010B
114.010	014	Thallium	EPA 6010B
114.010	015	Vanadium	EPA 6010B
114.010	016	Zinc	EPA 6010B
114.020	001	Antimony	EPA 6020
114.020	002	Arsenic	EPA 6020
114.020	003	Barium	EPA 6020
114.020	004	Beryllium	EPA 6020
114.020	005	Cadmium	EPA 6020
114.020	006	Chromium	EPA 6020
114.020	007	Cobalt	EPA 6020
114.020	008	Copper	EPA 6020
114.020	009	Lead	EPA 6020
114.020	010	Molybdenum	EPA 6020
114.020	011	Nickel	EPA 6020
114.020	012	Selenium	EPA 6020
114.020	013	Silver	EPA 6020
114.020	014	Thallium	EPA 6020
114.020	015	Vanadium	EPA 6020
114.020	016	Zinc	EPA 6020
114.103	001	Chromium (VI)	EPA 7196A
114.106	001	Chromium (VI)	EPA 7199
114.140	001	Mercury	EPA 7470A
114.141	001	Mercury	EPA 7471A
114.222	001	Cyanide	EPA 9014

114.230	001	Sulfides, Total	EPA 9034
114.240	001	Corrosivity - pH Determination	EPA 9040B
114.241	001	Corrosivity - pH Determination	EPA 9045C

Field of Testing: 115 - Extraction Test of Hazardous Waste

115.020	001	Toxicity Characteristic Leaching Procedure (TCLP)	EPA 1311
115.030	001	Waste Extraction Test (WET)	CCR Chapter11, Article 5, Appendix II
115.040	001	Synthetic Precipitation Leaching Procedure (SPLP)	EPA 1312

Field of Testing: 116 - Volatile Organic Chemistry of Hazardous Waste

116.020	031	Ethanol and Methanol	EPA 8015B
116.030	001	Gasoline-range Organics	EPA 8015B
116.040	041	Methyl tert-butyl Ether (MTBE)	EPA 8021B
116.040	062	BTEX	EPA 8021B
116.080	000	Volatile Organic Compounds	EPA 8260B
116.080	120	Oxygenates	EPA 8260B

Field of Testing: 117 - Semi-volatile Organic Chemistry of Hazardous Waste

117.010	001	Diesel-range Total Petroleum Hydrocarbons	EPA 8015B
117.110	000	Extractable Organics	EPA 8270C
117.140	000	Polynuclear Aromatic Hydrocarbons	EPA 8310
117.170	000	Nitroaromatics and Nitramines	EPA 8330
117.210	000	Pesticides & PCBs	EPA 8081A
117.220	000	PCBs	EPA 8082

Field of Testing: 118 - Radiochemistry of Hazardous Waste

118.200	001	Gamma Emitters	DOE 4.5.2.3

Field of Testing: 120 - Physical Properties of Hazardous Waste

120.010	001	Ignitability	EPA 1010
120.030	001	Corrosivity	EPA 1110
120.040	001	Reactive Cyanide	Section 7.3 SW-846
120.050	001	Reactive Sulfide	Section 7.3 SW-846
120.070	001	Corrosivity - pH Determination	EPA 9040B
120.080	001	Corrosivity - pH Determination	EPA 9045C

SCOPE OF ACCREDITATION TO ISO/IEC 17025:2005

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ENVIRONMENTAL

Valid To: February 29, 2016 Certificate Number: 2943.01

In recognition of the successful completion of the A2LA evaluation process, (including an assessment of the laboratory's compliance with ISO IEC 17025:2005, the 2003 NELAC Chapter 5 Standard, and the requirements of the DoD Environmental Laboratory Accreditation Program (DoD ELAP) as detailed in version 4.2 of the DoD Quality Systems Manual for Environmental Laboratories) accreditation is granted to this laboratory to perform recognized EPA methods using the following testing technologies and in the analyte categories identified below:

Testing Technologies

Atomic Absorption/ICP-AES Spectrometry, ICP/MS, Gas Chromatography, Gas Chromatography/Mass Spectrometry, Gravimetry, High Performance Liquid Chromatography, Ion Chromatography, Misc.- Electronic Probes (pH, O_2), Oxygen Demand, Hazardous Waste Characteristics Tests, Spectrophotometry (Visible), Spectrophotometry (Automated), IR Spectrometry, Titrimetry, Total Organic Carbon

Parameter/Analyte	Potable Water	Potable Water Prep Methods	Nonpotable Water	Nonpotable Water Prep Methods	Solid Hazardous Waste	Solid Hazardous Waste Prep Methods
Metals						
Aluminum	-----	-----	EPA 6010B / 6010C / 6020 / 6020A	EPA 200.8 / 3010A	EPA 6010B / 6010C / 6020 / 6020A	EPA 3050B
Antimony	-----	-----	EPA 6010B / 6010C / 6020 / 6020A	EPA 200.8 / 3010A	EPA 6010B / 6010C / 6020 / 6020A	EPA 3050B
Arsenic	-----	-----	EPA 6010B / 6010C / 6020 / 6020A	EPA 200.8 / 3010A	EPA 6010B / 6010C / 6020 / 6020A	EPA 3050B
Barium	-----	-----	EPA 6010B / 6010C / 6020 / 6020A	EPA 200.8 / 3010A	EPA 6010B / 6010C / 6020/ 6020A	EPA 3050B
Beryllium	-----	-----	EPA 6010B / 6010C / 6020 / 6020A	EPA 200.8 / 3010A	EPA 6010B / 6010C / 6020 / 6020A	EPA 3050B

Parameter/Analyte	Potable Water	Potable Water Prep Methods	Nonpotable Water	Nonpotable Water Prep Methods	Solid Hazardous Waste	Solid Hazardous Waste Prep Methods
Cadmium	- - - - -	- - - - -	EPA 6010B / 6010C / 6020 / 6020A	EPA 200.8 / 3010A	EPA 6010B / 6010C / 6020 / 6020A	EPA 3050B
Calcium	- - - - -	- - - - -	EPA 6010B / 6010C / 6020 / 6020A	EPA 200.8 / 3010A	EPA 6010B / 6010C / 6020 / 6020A	EPA 3050B
Chromium	- - - - -	- - - - -	EPA 6010B / 6010C / 6020 / 6020A	EPA 200.8 / 3010A	EPA 6010B / 6010C / 6020 / 6020A	EPA 3050B
Cobalt	- - - - -	- - - - -	EPA 6010B / 6010C / 6020 / 6020A	EPA 200.8 / 3010A	EPA 6010B / 6010C / 6020 / 6020A	EPA 3050B
Copper	- - - - -	- - - - -	EPA 6010B / 6010C / 6020 / 6020A	EPA 200.8 / 3010A	EPA 6010B / 6010C / 6020 / 6020A	EPA 3050B
Iron	- - - - -	- - - - -	EPA 6010B / 6010C / 6020 / 6020A	EPA 200.8 / 3010A	EPA 6010B / 6010C / 6020 / 6020A	EPA 3050B
Lead	- - - - -	- - - - -	EPA 6010B / 6010C / 6020 / 6020A	EPA 200.8 / 3010A	EPA 6010B / 6010C / 6020 / 6020A	EPA 3050B
Magnesium	- - - - -	- - - - -	EPA 6010B / 6010C / 6020 / 6020A	EPA 200.8 / 3010A	EPA 6010B / 6010C / 6020 / 6020A	EPA 3050B
Manganese	- - - - -	- - - - -	EPA 6010B / 6010C / 6020 / 6020A	EPA 200.8 / 3010A	EPA 6010B / 6010C / 6020 / 6020A	EPA 3050B
Mercury	- - - - -	- - - - -	EPA 7470A	EPA 7470A	EPA 7471A / 7471B	EPA 7471A / 7471B
Molybdenum	- - - - -	- - - - -	EPA 6010B / 6010C / 6020 / 6020A	EPA 200.8 / 3010A	EPA 6010B / 6010C / 6020 6020A	EPA 3050B
Nickel	- - - - -	- - - - -	EPA 6010B / 6010C / 6020 / 6020A	EPA 200.8 / 3010A	EPA 6010B / 6010C / 6020 / 6020A	EPA 3050B
Potassium	- - - - -	- - - - -	EPA 6010B / 6010C / 6020 / 6020A	EPA 200.8 / 3010A	EPA 6010B / 6010C / 6020 / 6020A	EPA 3050B
Selenium	- - - - -	- - - - -	EPA 6010B / 6010C / 6020 / 6020A	EPA 200.8 / 3010A	EPA 6010B / 6010C / 6020 / 6020A	EPA 3050B
Silver	- - - - -	- - - - -	EPA 6010B / 6010C / 6020 / 6020A	EPA 200.8 / 3010A	EPA 6010B / 6010C / 6020 / 6020A	EPA 3050B
Sodium	- - - - -	- - - - -	EPA 6010B / 6010C / 6020 / 6020A	EPA 200.8 / 3010A	EPA 6010B / 6010C / 6020 / 6020A	EPA 3050B

Parameter/Analyte	Potable Water	Potable Water Prep Methods	Nonpotable Water	Nonpotable Water Prep Methods	Solid Hazardous Waste	Solid Hazardous Waste Prep Methods
Thallium	- - - - -	- - - - -	EPA 6010B / 6010C / 6020 / 6020A	EPA 200.8 / 3010A	EPA 6010B / 6010C / 6020 / 6020A	EPA 3050B
Vanadium	- - - - -	- - - - -	EPA 6010B / 6010C / 6020 / 6020A	EPA 200.8 / 3010A	EPA 6010B / 6010C / 6020 / 6020A	EPA 3050B
Zinc	- - - - -	- - - - -	EPA 6010B / 6010C / 6020 / 6020A	EPA 200.8 / 3010A	EPA 6010B / 6010C / 6020 / 6020A	EPA 3050B
Nutrients						
Ammonia (as N)	- - - - -	- - - - -	SM 4500NH3-D	SM 4500NH3-D	SM 4500NH3-D	SM 4500NH3-D
Kjeldahl Nitrogen	- - - - -	- - - - -	SM 4500NH3-C	SM 4500NH3-C	SM 4500NH3-C	SM 4500NH3-C
Nitrate (as N)	- - - - -	- - - - -	EPA 300.0 / 9056	EPA 300.0 / 9056	EPA 300.0 / 9056	EPA 300.0 / 9056
Nitrite (as N)	- - - - -	- - - - -	EPA 300.0 / 9056	EPA 300.0 / 9056	EPA 300.0 / 9056	EPA 300.0 / 9056
Perchlorate	- - - - -	- - - - -	EPA 314.0	EPA 314.0	- - - - -	- - - - -
Total Phosphorus	- - - - -	- - - - -	SM 4500P-E	SM 4500P-E	- - - - -	- - - - -
Demands						
Biochemical Oxygen Demand	- - - - -	- - - - -	SM 5210B	SM 5210B	- - - - -	- - - - -
Chemical Oxygen Demand	- - - - -	- - - - -	SM 5220D	SM 5220D	- - - - -	- - - - -
Total Organic Carbon	- - - - -	- - - - -	SM 5310C	SM 5310C	- - - - -	- - - - -
Wet Chemistry						
Alkalinity	- - - - -	- - - - -	SM 2320B	SM 2320B	- - - - -	- - - - -
Bromide	- - - - -	- - - - -	EPA 300.0 / 9056	EPA 300.0 / 9056	EPA 300.0 / 9056	EPA 300.0 / 9056
Chloride	- - - - -	- - - - -	EPA 300.0 / 9056	EPA 300.0 / 9056	EPA 300.0 / 9056	EPA 300.0 / 9056
Cyanide	- - - - -	- - - - -	SM 4500 CN-E / EPA 9010B / 9014	SM 4500 CN-E / EPA 9010B / 9014	SM 4500 CN-E EPA 9010B / 9014	SM 4500CN-E EPA 9010B / 9014
Amenable Cyanide	- - - - -	- - - - -	SM 4500 CN-E / EPA 9010B / 9014	SM 4500 CN-E / EPA 9010B / 9014	EPA 9010B / 9014	EPA 9010B / 9014
Ferrous Iron	- - - - -	- - - - -	SM 3500Fe-B	SM 3500Fe-B	- - - - -	- - - - -
Flash Point	- - - - -	- - - - -	EPA 1010 / ASTM D93	EPA 1010 / ASTM D93	- - - - -	- - - - -
Fluoride	- - - - -	- - - - -	EPA 300.0 / 9056	EPA 300.0 / 9056	EPA 300.0 / 9056	EPA 300.0 / 9056

Parameter/Analyte	Potable Water	Potable Water Prep Methods	Nonpotable Water	Nonpotable Water Prep Methods	Solid Hazardous Waste	Solid Hazardous Waste Prep Methods
Hexavalent Chromium	- - - - -	- - - - -	EPA 7196A / 7199	EPA 7196A / 7199 /	EPA 3060 / 7196A	EPA 3060 / 7196A
pH	- - - - -	- - - - -	EPA 9040B / SM 4500-H^+ B	EPA 9040B / SM 4500-H^+ B	EPA 9045C	EPA 9045C
Specific Conductance	- - - - -	- - - - -	SM 2510 B	SM 2510 B	- - - - -	- - - - -
Sulfate	- - - - -	- - - - -	EPA 300.0 / 9056	EPA 300.0 / 9056	EPA 300.0 / 9056	EPA 300.0 / 9056
Sulfide	- - - - -	- - - - -	SM 4500S2-D	SM 4500S2-D	SM 9034	SM 9030B
Total Dissolved Solids (TSS)	- - - - -	- - - - -	SM 2540C	SM 2540C	- - - - -	- - - - -
Total Suspended Solids (TSD)	- - - - -	- - - - -	SM 2540D	SM 2540D	- - - - -	- - - - -
Purgeable Organics (volatiles)						
Gas Range Organics (GRO)	- - - - -	- - - - -	EPA 8015B / 8015D	EPA 5030B / 5030C	EPA 8015B / 8015D	EPA 5030B / 5030C / 5035 / 5035A
Acetone	- - - - -	- - - - -	EPA 8260B / 8260C	EPA 5030B / 5030C	EPA 8260B / 8260C	EPA 5030B / 5030C / 5035 / 5035A
Benzene	- - - - -	- - - - -	EPA 8260B / 8260C / 8021B	EPA 5030B / 5030C	EPA 8260B / 8260C / 8021B	EPA 5030B / 5030C / 5035 / 5035A
Bromobenzene	- - - - -	- - - - -	EPA 8260B / 8260C	EPA 5030B / 5030C	EPA 8260B / 8260C	EPA 5030B / 5030C / 5035 / 5035A
Bromochloromethane	- - - - -	- - - - -	EPA 8260B / 8260C	EPA 5030B / 5030C	EPA 8260B / 8260C	EPA 5030B / 5030C / 5035 / 5035A
Bromodichloromethane	- - - - -	- - - - -	EPA 8260B / 8260C	EPA 5030B / 5030C	EPA 8260B / 8260C	EPA 5030B / 5030C / 5035 / 5035A
Bromoform	- - - - -	- - - - -	EPA 8260B / 8260C	EPA 5030B / 5030C	EPA 8260B / 8260C	EPA 5030B / 5030C / 5035 / 5035A
Bromomethane	- - - - -	- - - - -	EPA 8260B / 8260C	EPA 5030B / 5030C	EPA 8260B / 8260C	EPA 5030B / 5030C / 5035 / 5035A
2-Butanone	- - - - -	- - - - -	EPA 8260B / 8260C	EPA 5030B / 5030C	EPA 8260B / 8260C	EPA 5030B / 5030C / 5035 / 5035A
Tert-Butyl Alcohol (TBA)	- - - - -	- - - - -	EPA 8260B / 8260C	EPA 5030B / 5030C	EPA 8260B / 8260C	EPA 5030B / 5030C / 5035 / 5035A
n-Butylbenzene	- - - - -	- - - - -	EPA 8260B / 8260C	EPA 5030B / 5030C	EPA 8260B / 8260C	EPA 5030B / 5030C / 5035 / 5035A

Parameter/Analyte	Potable Water	Potable Water Prep Methods	Nonpotable Water	Nonpotable Water Prep Methods	Solid Hazardous Waste	Solid Hazardous Waste Prep Methods
sec-Butylbenzene	-----	-----	EPA 8260B / 8260C	EPA 5030B / 5030C	EPA 8260B / 8260C	EPA 5030B / 5030C / 5035 / 5035A
tert-Butylbenzene	-----	-----	EPA 8260B / 8260C	EPA 5030B / 5030C	EPA 8260B / 8260C	EPA 5030B / 5030C / 5035 / 5035A
Carbon Disulfide	-----	-----	EPA 8260B / 8260C	EPA 5030B / 5030C	EPA 8260B / 8260C	EPA 5030B / 5030C / 5035 / 5035A
Carbon Tetrachloride	-----	-----	EPA 8260B / 8260C	EPA 5030B / 5030C	EPA 8260B / 8260C	EPA 5030B / 5030C / 5035 / 5035A
Chlorobenzene	-----	-----	EPA 8260B / 8260C	EPA 5030B / 5030C	EPA 8260B / 8260C	EPA 5030B / 5030C / 5035 / 5035A
Chloroethane	-----	-----	EPA 8260B / 8260C	EPA 5030B / 5030C	EPA 8260B / 8260C	EPA 5030B / 5030C / 5035 / 5035A
Chloroform	-----	-----	EPA 8260B / 8260C	EPA 5030B / 5030C	EPA 8260B / 8260C	EPA 5030B / 5030C / 5035 / 5035A
Chloromethane	-----	-----	EPA 8260B / 8260C	EPA 5030B / 5030C	EPA 8260B / 8260C	EPA 5030B / 5030C / 5035 / 5035A
2-Chlorotoluene	-----	-----	EPA 8260B / 8260C	EPA 5030B / 5030C	EPA 8260B / 8260C	EPA 5030B / 5030C / 5035 / 5035A
4-Chlorotoluene	-----	-----	EPA 8260B / 8260C	EPA 5030B / 5030C	EPA 8260B / 8260C	EPA 5030B / 5030C / 5035 / 5035A
Dibromochloromethane	-----	-----	EPA 8260B / 8260C	EPA 5030B / 5030C	EPA 8260B / 8260C	EPA 5030B / 5030C / 5035 / 5035A
1,2-Dibromo-3-chloropropane (DBCP)	-----	-----	EPA 8260B / 8260C	EPA 5030B / 5030C	EPA 8260B / 8260C	EPA 5030B / 5030C / 5035 / 5035A
Dibromomethane	-----	-----	EPA 8260B / 8260C	EPA 5030B / 5030C	EPA 8260B / 8260C	EPA 5030B / 5030C / 5035 / 5035A
1,2 Dibromomethane (EDB)	-----	-----	EPA 8260B / 8260C	EPA 5030B / 5030C	EPA 8260B / 8260C	EPA 5030B / 5030C / 5035 / 5035A
1,2-Dichlorobenzene	-----	-----	EPA 8260B / 8260C	EPA 5030B / 5030C	EPA 8260B / 8260C	EPA 5030B / 5030C / 5035 / 5035A
1,3-Dichlorobenzene	-----	-----	EPA 8260B / 8260C	EPA 5030B / 5030C	EPA 8260B / 8260C	EPA 5030B / 5030C / 5035 / 5035A

Peter Mhyer

Parameter/Analyte	Potable Water	Potable Water Prep Methods	Nonpotable Water	Nonpotable Water Prep Methods	Solid Hazardous Waste	Solid Hazardous Waste Prep Methods
1,4-Dichlorobenzene	- - - - -	- - - - -	EPA 8260B / 8260C	EPA 5030B / 5030C	EPA 8260B / 8260C	EPA 5030B / 5030C / 5035 / 5035A
Dichlorodifluoro-methane	- - - - -	- - - - -	EPA 8260B / 8260C	EPA 5030B / 5030C	EPA 8260B / 8260C	EPA 5030B / 5030C / 5035 / 5035A
1,1-Dichloroethane	- - - - -	- - - - -	EPA 8260B / 8260C	EPA 5030B / 5030C	EPA 8260B / 8260C	EPA 5030B / 5030C / 5035 / 5035A
1,2-Dichloroethane	- - - - -	- - - - -	EPA 8260B / 8260C	EPA 5030B / 5030C	EPA 8260B / 8260C	EPA 5030B / 5030C / 5035 / 5035A
1,1-Dichloroethene	- - - - -	- - - - -	EPA 8260B / 8260C	EPA 5030B / 5030C	EPA 8260B / 8260C	EPA 5030B / 5030C / 5035 / 5035A
cis-1,2-Dichloroethene	- - - - -	- - - - -	EPA 8260B / 8260C	EPA 5030B / 5030C	EPA 8260B / 8260C	EPA 5030B / 5030C / 5035 / 5035A
trans-1,2-Dichloroethene	- - - - -	- - - - -	EPA 8260B / 8260C	EPA 5030B / 5030C	EPA 8260B / 8260C	EPA 5030B / 5030C / 5035 / 5035A
1,2-Dichloropropane	- - - - -	- - - - -	EPA 8260B / 8260C	EPA 5030B / 5030C	EPA 8260B / 8260C	EPA 5030B / 5030C / 5035 / 5035A
1,3-Dichloropropane	- - - - -	- - - - -	EPA 8260B / 8260C	EPA 5030B / 5030C	EPA 8260B / 8260C	EPA 5030B / 5030C / 5035 / 5035A
2,2-Dichloropropane	- - - - -	- - - - -	EPA 8260B / 8260C	EPA 5030B / 5030C	EPA 8260B / 8260C	EPA 5030B / 5030C / 5035 / 5035A
1,1-Dichloropropene	- - - - -	- - - - -	EPA 8260B / 8260C	EPA 5030B / 5030C	EPA 8260B / 8260C	EPA 5030B / 5030C / 5035 / 5035A
cis-1,3-Dichloropropene	- - - - -	- - - - -	EPA 8260B / 8260C	EPA 5030B / 5030C	EPA 8260B / 8260C	EPA 5030B / 5030C / 5035 / 5035A
trans-1,3-Dichloropropene	- - - - -	- - - - -	EPA 8260B / 8260C	EPA 5030B / 5030C	EPA 8260B / 8260C	EPA 5030B / 5030C / 5035 / 5035A
Ethyl Benzene	- - - - -	- - - - -	EPA 8260B / 8260C / 8021B	EPA 5030B / 5030C	EPA 8260B / 8260C / 8021B	EPA 5030B / 5030C / 5035 / 5035A
Ethyl tert-Butyl Ether (ETBE)	- - - - -	- - - - -	EPA 8260B / 8260C	EPA 5030B / 5030C	EPA 8260B / 8260C	EPA 5030B / 5030C / 5035 / 5035A
1,1,2-Trichloro-1,2,2-Trifluoroethane (Freon 113)	- - - - -	- - - - -	EPA 8260B / 8260C	EPA 5030B / 5030C	EPA 8260B / 8260C	EPA 5030B / 5030C / 5035 / 5035A

Parameter/Analyte	Potable Water	Potable Water Prep Methods	Nonpotable Water	Nonpotable Water Prep Methods	Solid Hazardous Waste	Solid Hazardous Waste Prep Methods
2-Hexanone	- - - - -	- - - - -	EPA 8260B / 8260C	EPA 5030B / 5030C	EPA 8260B / 8260C	EPA 5030B / 5030C / 5035 / 5035A
Hexachlorobutadiene	- - - - -	- - - - -	EPA 8260B / 8260C	EPA 5030B / 5030C	EPA 8260B / 8260C	EPA 5030B / 5030C / 5035 / 5035A
Isopropylbenzene	- - - - -	- - - - -	EPA 8260B / 8260C	EPA 5030B / 5030C	EPA 8260B / 8260C	EPA 5030B / 5030C / 5035 / 5035A
Isopropyl Ether (DIPE)	- - - - -	- - - - -	EPA 8260B / 8260C	EPA 5030B / 5030C	EPA 8260B / 8260C	EPA 5030B / 5030C / 5035 / 5035A
Para-Isopropyltoluene	- - - - -	- - - - -	EPA 8260B / 8260C	EPA 5030B / 5030C	EPA 8260B / 8260C	EPA 5030B / 5030C / 5035 / 5035A
Methylene Chloride	- - - - -	- - - - -	EPA 8260B / 8260C	EPA 5030B / 5030C	EPA 8260B / 8260C	EPA 5030B / 5030C / 5035 / 5035A
4-Methyl-2-pentanone	- - - - -	- - - - -	EPA 8260B / 8260C	EPA 5030B / 5030C	EPA 8260B / 8260C	EPA 5030B / 5030C / 5035 / 5035A
Methyl tert-amyl Ether (TAME)	- - - - -	- - - - -	EPA 8260B / 8260C	EPA 5030B / 5030C	EPA 8260B / 8260C	EPA 5030B / 5030C / 5035 / 5035A
Methyl tert-butyl ether (MTBE)	- - - - -	- - - - -	EPA 8260B / 8260C / 8021B	EPA 5030B / 5030C	EPA 8260B / 8260C / 8021B	EPA 5030B / 5030C / 5035 / 5035A
Naphthalene	- - - - -	- - - - -	EPA 8260B / 8260C	EPA 5030B / 5030C	EPA 8260B / 8260C	EPA 5030B / 5030C / 5035 / 5035A
n-Propylbenzene	- - - - -	- - - - -	EPA 8260B / 8260C	EPA 5030B / 5030C	EPA 8260B / 8260C	EPA 5030B / 5030C / 5035 / 5035A
Styrene	- - - - -	- - - - -	EPA 8260B / 8260C	EPA 5030B / 5030C	EPA 8260B / 8260C	EPA 5030B / 5030C / 5035 / 5035A
1,1,1,2-Tetrachloroethane	- - - - -	- - - - -	EPA 8260B / 8260C	EPA 5030B / 5030C	EPA 8260B / 8260C	EPA 5030B / 5030C / 5035 / 5035A
1,1,2,2-Tetrachloroethane	- - - - -	- - - - -	EPA 8260B / 8260C	EPA 5030B / 5030C	EPA 8260B / 8260C	EPA 5030B / 5030C / 5035 / 5035A
Tetrachloroethene	- - - - -	- - - - -	EPA 8260B / 8260C	EPA 5030B / 5030C	EPA 8260B / 8260C	EPA 5030B / 5030C / 5035 / 5035A
Toluene	- - - - -	- - - - -	EPA 8260B / 8260C / 8021B	EPA 5030B / 5030C	EPA 8260B / 8260C / 8021B	EPA 5030B / 5030C / 5035 / 5035A

Parameter/Analyte	Potable Water	Potable Water Prep Methods	Nonpotable Water	Nonpotable Water Prep Methods	Solid Hazardous Waste	Solid Hazardous Waste Prep Methods
1,2,3-Trichlorobenzene	- - - - -	- - - - -	EPA 8260B / 8260C	EPA 5030B / 5030C	EPA 8260B / 8260C	EPA 5030B / 5030C / 5035 / 5035A
1,2,4-Trichlorobenzene	- - - - -	- - - - -	EPA 8260B / 8260C	EPA 5030B / 5030C	EPA 8260B / 8260C	EPA 5030B / 5030C / 5035 / 5035A
1,1,1-Trichloroethane	- - - - -	- - - - -	EPA 8260B / 8260C	EPA 5030B / 5030C	EPA 8260B / 8260C	EPA 5030B / 5030C / 5035 / 5035A
1,1,2-Trichloroethane	- - - - -	- - - - -	EPA 8260B / 8260C	EPA 5030B / 5030C	EPA 8260B / 8260C	EPA 5030B / 5030C / 5035 / 5035A
Trichloroethene	- - - - -	- - - - -	EPA 8260B / 8260C	EPA 5030B / 5030C	EPA 8260B / 8260C	EPA 5030B / 5030C / 5035 / 5035A
Trichlorofluoromethane	- - - - -	- - - - -	EPA 8260B / 8260C	EPA 5030B / 5030C	EPA 8260B / 8260C	EPA 5030B / 5030C / 5035 / 5035A
1,2,3-Trichloropropane	- - - - -	- - - - -	EPA 8260B / 8260C	EPA 5030B / 5030C	EPA 8260B / 8260C	EPA 5030B / 5030C / 5035 / 5035A
1,2,4-Trimethylbenzene	- - - - -	- - - - -	EPA 8260B / 8260C	EPA 5030B / 5030C	EPA 8260B / 8260C	EPA 5030B / 5030C / 5035 / 5035A
1,3,5-Trimethylbenzene	- - - - -	- - - - -	EPA 8260B / 8260C	EPA 5030B / 5030C	EPA 8260B / 8260C	EPA 5030B / 5030C / 5035 / 5035A
Vinyl Acetate	- - - - -	- - - - -	EPA 8260B / 8260C	EPA 5030B / 5030C	EPA 8260B / 8260C	EPA 5030B / 5030C / 5035 / 5035A
Vinyl Chloride	- - - - -	- - - - -	EPA 8260B / 8260C	EPA 5030B / 5030C	EPA 8260B / 8260C	EPA 5030B / 5030C / 5035 / 5035A
m,p-Xylene	- - - - -	- - - - -	EPA 8260B / 8260C / 8021B	EPA 5030B / 5030C	EPA 8260B / 8260C / 8021B	EPA 5030B / 5030C / 5035 / 5035A
o-Xylene	- - - - -	- - - - -	EPA 8260B / 8260C / 8021B	EPA 5030B / 5030C	EPA 8260B / 8260C / 8021B	EPA 5030B / 5030C / 5035 / 5035A
Extractable Organics (semivolatiles)						
DRO	- - - - -	- - - - -	EPA 8015B / 8015D	EPA 3520C	EPA 8015B / 8015D/	EPA 3550B / 3550C
Acenaphthene	- - - - -	- - - - -	EPA 8270C / 8270D / 8270C-SIM / 8270D-SIM	EPA 3520C	EPA 8270 C / 8270D / 8270C-SIM / 8270D-SIM	EPA 3550B / 3550C

Parameter/Analyte	Potable Water	Potable Water Prep Methods	Nonpotable Water	Nonpotable Water Prep Methods	Solid Hazardous Waste	Solid Hazardous Waste Prep Methods
Acenaphthylene	- - - - -	- - - - -	EPA 8270C / 8270D / 8270C-SIM / 8270D-SIM	EPA 3520C	EPA 8270 C / 8270D / 8270C-SIM / 8270D-SIM	EPA 3550B / 3550C
Anthracene	- - - - -	- - - - -	EPA 8270C / 8270D / 8270C-SIM / 8270D-SIM	EPA 3520C	EPA 8270 C / 8270D / 8270C-SIM / 8270D-SIM	EPA 3550B / 3550C
Benzoic Acid	- - - - -	- - - - -	EPA 8270C / 8270D	EPA 3520C	EPA 8270 C 8270D	EPA 3550B / 3550C
Benzo (a) Anthracene	- - - - -	- - - - -	EPA 8270C / 8270D / 8270C-SIM / 8270D-SIM	EPA 3520C	EPA 8270 C / 8270D / 8270C-SIM / 8270D-SIM	EPA 3550B / 3550C
Benzo (b) Fluoranthene	- - - - -	- - - - -	EPA 8270C / 8270D / 8270C-SIM / 8270D-SIM	EPA 3520C	EPA 8270 C / 8270D / 8270C-SIM / 8270D-SIM	EPA 3550B / 3550C
Benzo (k) Fluoranthene	- - - - -	- - - - -	EPA 8270C / 8270D / 8270C-SIM / 8270D-SIM	EPA 3520C	EPA 8270 C / 8270D / 8270C-SIM / 8270D-SIM	EPA 3550B / 3550C
Benzo (ghi) Fluoranthene	- - - - -	- - - - -	EPA 8270C / 8270D / 8270C-SIM / 8270D-SIM	EPA 3520C	EPA 8270 C / 8270D / 8270C-SIM / 8270D-SIM	EPA 3550B / 3550C
Benzo (a) Pyrene	- - - - -	- - - - -	EPA 8270C / 8270D / 8270C-SIM / 8270D-SIM	EPA 3520C	EPA 8270 C / 8270D / 8270C-SIM / 8270D-SIM	EPA 3550B / 3550C
Benzyl Alcohol	- - - - -	- - - - -	EPA 8270C / 8270D	EPA 3520C	EPA 8270C / 8270D	EPA 3550B / 3550C
Bis (2-chloroethoxy) Methane	- - - - -	- - - - -	EPA 8270C / 8270D	EPA 3520C	EPA 8270C / 8270D	EPA 3550B / 3550C
Bis (2-chloroethyl) Ether	- - - - -	- - - - -	EPA 8270C / 8270D	EPA 3520C	EPA 8270C / 8270D	EPA 3550B / 3550C
Bis (2-chloroisopropyl) Ether	- - - - -	- - - - -	EPA 8270C / 8270D	EPA 3520C	EPA 8270C / 8270D	EPA 3550B / 3550C
Bis (2-ethylhexyl) Phthalate	- - - - -	- - - - -	EPA 8270C / 8270D	EPA 3520C	EPA 8270C / 8270D	EPA 3550B / 3550C
4-Bromophenyl-Phenylether	- - - - -	- - - - -	EPA 8270C / 8270D	EPA 3520C	EPA 8270C / 8270D	EPA 3550B / 3550C
Butyl Benzyl Phthalate	- - - - -	- - - - -	EPA 8270C / 8270D	EPA 3520C	EPA 8270C / 8270D	EPA 3550B / 3550C
4-Chloroaniline	- - - - -	- - - - -	EPA 8270C / 8270D	EPA 3520C	EPA 8270C / 8270D	EPA 3550B / 3550C
4-Chloro-3-methylphenol	- - - - -	- - - - -	EPA 8270C / 8270D	EPA 3520C	EPA 8270C / 8270D	EPA 3550B / 3550C

Parameter/Analyte	Potable Water	Potable Water Prep Methods	Nonpotable Water	Nonpotable Water Prep Methods	Solid Hazardous Waste	Solid Hazardous Waste Prep Methods
2-Chloronaphthalene	- - - - -	- - - - -	EPA 8270C / 8270D	EPA 3520C	EPA 8270C / 8270D	EPA 3550B / 3550C
2-Chlorophenol	- - - - -	- - - - -	EPA 8270C / 8270D	EPA 3520C	EPA 8270C / 8270D	EPA 3550B / 3550C
4-Chlorophenyl Phenyl Ether	- - - - -	- - - - -	EPA 8270C / 8270D	EPA 3520C	EPA 8270C / 8270D	EPA 3550B / 3550C
Chrysene	- - - - -	- - - - -	EPA 8270C / 8270D / 8270C-SIM / 8270D-SIM	EPA 3520C	EPA 8270C / 8270D / 8270C-SIM / 8270D-SIM	EPA 3550B / 3550C
Dibenzo (a,h) Anthracene	- - - - -	- - - - -	EPA 8270C / 8270D / 8270C-SIM / 8270D-SIM	EPA 3520C	EPA 8270C / 8270D / 8270C-SIM / 8270D-SIM	EPA 3550B / 3550C
Dibenzofuran	- - - - -	- - - - -	EPA 8270C / 8270D	EPA 3520C	EPA 8270C / 8270D	EPA 3550B / 3550C
1,2-Dichlorobenzene	- - - - -	- - - - -	EPA 8270C / 8270D	EPA 3520C	EPA 8270C / 8270D	EPA 3550B / 3550C
1,3-Dichlorobenzene	- - - - -	- - - - -	EPA 8270C / 8270D	EPA 3520C	EPA 8270C / 8270D	EPA 3550B / 3550C
1,4-Dichlorobenzene	- - - - -	- - - - -	EPA 8270C / 8270D	EPA 3520C	EPA 8270C / 8270D	EPA 3550B / 3550C
3,3’-Dichlorobenzidine	- - - - -	- - - - -	EPA 8270C / 8270D	EPA 3520C	EPA 8270C / 8270D	EPA 3550B / 3550C
2,4-Dichlorophenol	- - - - -	- - - - -	EPA 8270C / 8270D	EPA 3520C	EPA 8270C / 8270D	EPA 3550B / 3550C
Diethyl Phthalate	- - - - -	- - - - -	EPA 8270C / 8270D	EPA 3520C	EPA 8270C / 8270D	EPA 3550B / 3550C
2,4-Dimethylphenol	- - - - -	- - - - -	EPA 8270C / 8270D	EPA 3520C	EPA 8270C / 8270D	EPA 3550B / 3550C
Dimethyl Phthalate	- - - - -	- - - - -	EPA 8270C / 8270D	EPA 3520C	EPA 8270C / 8270D	EPA 3550B / 3550C
Di-n-butyl Phthalate	- - - - -	- - - - -	EPA 8270C / 8270D	EPA 3520C	EPA 8270C / 8270D	EPA 3550B / 3550C
Di-n-octyl Phthalate	- - - - -	- - - - -	EPA 8270C / 8270D	EPA 3520C	EPA 8270C / 8270D	EPA 3550B / 3550C
4,6-Dinitro-2-methylphenol	- - - - -	- - - - -	EPA 8270C / 8270D	EPA 3520C	EPA 8270C / 8270D	EPA 3550B / 3550C
2,4-Dinitrophenol	- - - - -	- - - - -	EPA 8270C / 8270D	EPA 3520C	EPA 8270C / 8270D	EPA 3550B / 3550C
2,4-Dinitrotoluene	- - - - -	- - - - -	EPA 8270C / 8270D	EPA 3520C	EPA 8270C / 8270D	EPA 3550B / 3550C
2,6-Dinitrotoluene	- - - - -	- - - - -	EPA 8270C / 8270D	EPA 3520C	EPA 8270C / 8270D	EPA 3550B / 3550C
1,4 - Dioxane			EPA 8270C-SIM / 8270D-SIM	EPA 3520C	EPA 8270C-SIM / 8270D-SIM	EPA 3550B / 3550C

Parameter/Analyte	Potable Water	Potable Water Prep Methods	Nonpotable Water	Nonpotable Water Prep Methods	Solid Hazardous Waste	Solid Hazardous Waste Prep Methods
1,2-Diphenylhydrazine reported as Azobenzene due to breakdown	- - - - -	- - - - -	EPA 8270C / 8270D	EPA 3520C	EPA8270C / 8270D	EPA 3550B / 3550C
Fluoroanthene	- - - - -	- - - - -	EPA 8270C / 8270D / 8270C-SIM / 8270D-SIM	EPA 3520C	EPA 8270C / 8270D / 8270C-SIM / 8270D-SIM	EPA 3550B / 3550C
Fluorene	- - - - -	- - - - -	EPA 8270C / 8270D / 8270C-SIM / 8270D-SIM	EPA 3520C	EPA 8270C / 8270D / 8270C-SIM / 8270D-SIM	EPA 3550B / 3550C
Hexachlorobenzene	- - - - -	- - - - -	EPA 8270C / 8270D	EPA 3520C	EPA 8270C / 8270D	EPA 3550B / 3550C
Hexachlorobutadiene	- - - - -	- - - - -	EPA 8270C / 8270D	EPA 3520C	EPA 8270C / 8270D	EPA 3550B / 3550C
Hexachloro-cyclopentadiene	- - - - -	- - - - -	EPA 8270C / 8270D	EPA 3520C	EPA 8270C / 8270D	EPA 3550B / 3550C
Hexachloroethane	- - - - -	- - - - -	EPA 8270C / 8270D	EPA 3520C	EPA 8270C / 8270D	EPA 3550B / 3550C
Indeno (1,2,3-cd) pyrene	- - - - -	- - - - -	EPA 8270C / 8270D / 8270C-SIM / 8270D-SIM	EPA 3520C	EPA 8270C / 8270D / 8270C-SIM / 8270D-SIM	EPA 3550B / 3550C
Isophorone	- - - - -	- - - - -	EPA 8270C / 8270D	EPA 3520C	EPA 8270C / 8270D	EPA 3550B / 3550C
1-Methylnaphthalene	- - - - -	- - - - -	EPA 8270C-SIM / 8270D-DIM	EPA 3520C	EPA 8270C-SIM / 8270D-SIM	EPA 3550B / 3550C
2-Methylnaphthalene	- - - - -	- - - - -	EPA 8270C / 8270D / 8270C-SIM / 8270D-SIM	EPA 3520C	EPA 8270C / 8270D / 8270C-SIM / 8270D-SIM	EPA 3550B / 3550C
2-Methylphenol	- - - - -	- - - - -	EPA 8270C / 8270D	EPA 3520C	EPA 8270C / 8270D	EPA 3550B / 3550C
4-Methylphenol	- - - - -	- - - - -	EPA 8270C / 8270D	EPA 3520C	EPA 8270C / 8270D	EPA 3550B / 3550C
Naphthalene	- - - - -	- - - - -	EPA 8270C / 8270D / 8270C-SIM / 8270D-SIM	EPA 3520C	EPA 8270C / 8270D / 8270C-SIM / 8270D-SIM	EPA 3550B / 3550C
2-Nitroaniline	- - - - -	- - - - -	EPA 8270C / 8270D	EPA 3520C	EPA 8270C / 8270D	EPA 3550B / 3550C
3-Nitroaniline	- - - - -	- - - - -	EPA 8270C / 8270D	EPA 3520C	EPA 8270C / 8270D	EPA 3550B / 3550C
4-Nitroaniline	- - - - -	- - - - -	EPA 8270C / 8270D	EPA 3520C	EPA 8270C / 8270D	EPA 3550B / 3550C
Nitrobenzene	- - - - -	- - - - -	EPA 8270C / 8270D	EPA 3520C	EPA 8270C / 8270D	EPA 3550B / 3550C

Parameter/Analyte	Potable Water	Potable Water Prep Methods	Nonpotable Water	Nonpotable Water Prep Methods	Solid Hazardous Waste	Solid Hazardous Waste Prep Methods
2-Nitrophenol	- - - - -	- - - - -	EPA 8270C / 8270D	EPA 3520C	EPA 8270C / 8270D	EPA 3550B / 3550C
4-Nitrophenol	- - - - -	- - - - -	EPA 8270C / 8270D	EPA 3520C	EPA 8270C / 8270D	EPA 3550B / 3550C
N-Nitrosodi-n-propylamine	- - - - -	- - - - -	EPA 8270C / 8270D	EPA 3520C	EPA 8270C / 8270D	EPA 3550B / 3550C
N-Nitrosodimethylamine	- - - - -	- - - - -	EPA 8270C / 8270D	EPA 3520C	EPA 8270C / 8270D	EPA 3550B / 3550C
N-Nitrosodiphenylamine	- - - - -	- - - - -	EPA 8270C / 8270D	EPA 3520C	EPA 8270C / 8270D	EPA 3550B / 3550C
Pentachlorophenol	- - - - -	- - - - -	EPA 8270C / 8270D	EPA 3520C	EPA 8270C / 8270D	EPA 3550B / 3550C
Phenanthrene	- - - - -	- - - - -	EPA 8270C / 8270D / 8270C-SIM / 8270D-SIM	EPA 3520C	EPA 8270C / 8270D / 8270C-SIM / 8270D-SIM	EPA 3550B / 3550C
Phenol	- - - - -	- - - - -	EPA 8270C / 8270D	EPA 3520C	EPA 8270C / 8270D	EPA 3550B / 3550C
Pyrene	- - - - -	- - - - -	EPA 8270C / 8270D / 8270C-SIM / 8270D-SIM	EPA 3520C	EPA 8270C / 8270D / 8270C-SIM / 8270D-SIM	EPA 3550B / 3550C
1,2,4-Trichlorobenzene	- - - - -	- - - - -	EPA 8270C / 8270D	EPA 3520C	EPA 8270C / 8270D	EPA 3550B / 3550C
2,4,5-Trichlorophenol	- - - - -	- - - - -	EPA 8270C / 8270D	EPA 3520C	EPA 8270C / 8270D	EPA 3550B / 3550C
2,4,6-Trichlorophenol	- - - - -	- - - - -	EPA 8270C / 8270D	EPA 3520C	EPA 8270C / 8270D	EPA 3550B / 3550C
Pesticides/PCBs						
Aldrin	- - - - -	- - - - -	EPA 8081A / 8081B	EPA 3520C	EPA 8081A / 8081B	EPA 3550B / 3550C
alpha-BHC	- - - - -	- - - - -	EPA 8081A / 8081B	EPA 3520C	EPA 8081A / 8081B	EPA 3550B / 3550C
beta-BHC	- - - - -	- - - - -	EPA 8081A / 8081B	EPA 3520C	EPA 8081A / 8081B	EPA 3550B / 3550C
delta-BHC	- - - - -	- - - - -	EPA 8081A / 8081B	EPA 3520C	EPA 8081A / 8081B	EPA 3550B / 3550C
gamma-BHC	- - - - -	- - - - -	EPA 8081A / 8081B	EPA 3520C	EPA 8081A / 8081B	EPA 3550B / 3550C
Chlordane (technical)	- - - - -	- - - - -	EPA 8081A / 8081B	EPA 3520C	EPA 8081A / 8081B	EPA 3550B / 3550C
alpha-Chlordane	- - - - -	- - - - -	EPA 8081A / 8081B	EPA 3520C	EPA 8081A / 8081B	EPA 3550B / 3550C
gamma-Chlordane	- - - - -	- - - - -	EPA 8081A / 8081B	EPA 3520C	EPA 8081A / 8081B	EPA 3550B / 3550C
4,4'-DDD	- - - - -	- - - - -	EPA 8081A / 8081B	EPA 3520C	EPA 8081A / 8081B	EPA 3550B / 3550C

Parameter/Analyte	Potable Water	Potable Water Prep Methods	Nonpotable Water	Nonpotable Water Prep Methods	Solid Hazardous Waste	Solid Hazardous Waste Prep Methods
4,4'-DDE	- - - - -	- - - - -	EPA 8081A / 8081B	EPA 3520C	EPA 8081A / 8081B	EPA 3550B / 3550C
4,4',-DDT	- - - - -	- - - - -	EPA 8081A / 8081B	EPA 3520C	EPA 8081A / 8081B	EPA 3550B / 3550C
Dieldrin	- - - - -	- - - - -	EPA 8081A / 8081B	EPA 3520C	EPA 8081A / 8081B	EPA 3550B / 3550C
Endosulfan I	- - - - -	- - - - -	EPA 8081A / 8081B	EPA 3520C	EPA 8081A / 8081B	EPA 3550B / 3550C
Endosulfan II	- - - - -	- - - - -	EPA 8081A / 8081B	EPA 3520C	EPA 8081A / 8081B	EPA 3550B / 3550C
Endosulfan Sulfate	- - - - -	- - - - -	EPA 8081A / 8081B	EPA 3520C	EPA 8081A / 8081B	EPA 3550B / 3550C
Endrin	- - - - -	- - - - -	EPA 8081A / 8081B	EPA 3520C	EPA 8081A / 8081B	EPA 3550B / 3550C
Endrin Aldehyde	- - - - -	- - - - -	EPA 8081A / 8081B	EPA 3520C	EPA 8081A / 8081B	EPA 3550B / 3550C
Endrin Ketone	- - - - -	- - - - -	EPA 8081A / 8081B	EPA 3520C	EPA 8081A / 8081B	EPA 3550B / 3550C
Heptachlor	- - - - -	- - - - -	EPA 8081A / 8081B	EPA 3520C	EPA 8081A / 8081B	EPA 3550B / 3550C
Heptachlor Epoxide	- - - - -	- - - - -	EPA 8081A / 8081B	EPA 3520C	EPA 8081A / 8081B	EPA 3550B / 3550C
Methoxychlor	- - - - -	- - - - -	EPA 8081A / 8081B	EPA 3520C	EPA 8081A / 8081B	EPA 3550B / 3550C
PCB-1016 (Arochlor)	- - - - -	- - - - -	EPA 8082 / 8082A	EPA 3520C	EPA 8082 / 8082A	EPA 3550B / 3550C
PCB-1221	- - - - -	- - - - -	EPA 8082 / 8082A	EPA 3520C	EPA 8082 / 8082A	EPA 3550B / 3550C
PCB-1232	- - - - -	- - - - -	EPA 8082 / 8082A	EPA 3520C	EPA 8082 / 8082A	EPA 3550B / 3550C
PCB-1242	- - - - -	- - - - -	EPA 8082 / 8082A	EPA 3520C	EPA 8082 / 8082A	EPA 3550B / 3550C
PCB-1248	- - - - -	- - - - -	EPA 8082 / 8082A	EPA 3520C	EPA 8082 / 8082A	EPA 3550B / 3550C
PCB-1254	- - - - -	- - - - -	EPA 8082 / 8082A	EPA 3520C	EPA 8082 / 8082A	EPA 3550B / 3550C
PCB-1260	- - - - -	- - - - -	EPA 8082 / 8082A	EPA 3520C	EPA 8082 / 8082A	EPA 3550B / 3550C
Toxaphene	- - - - -	- - - - -	EPA 8081A / 8081B	EPA 3520C	EPA 8081A / 8081B	EPA 3550B / 3550C
Nitroaromatics & Nitramines						
2-Amino-4,6-dinitrotoluene	- - - - -	- - - - -	EPA 8330 / 8330A	EPA 3535	EPA 8330 / 8330A / 8330A Modified / 8330B Modified	EPA 8330 / 8330A

Parameter/Analyte	Potable Water	Potable Water Prep Methods	Nonpotable Water	Nonpotable Water Prep Methods	Solid Hazardous Waste	Solid Hazardous Waste Prep Methods
4-Amino-2,6-dinitrotoluene	- - - - -	- - - - -	EPA 8330 / 8330A	EPA 3535	EPA 8330 / 8330A / 8330A Modified / 8330B Modified	EPA 8330 / 8330A
3,5-Dinitroaniline	- - - - -	- - - - -	- - - - - - - - - - - -	- - - - - - - - - - - -	EPA 8330 / 8330A / 8330A Modified / 8330B Modified	EPA 8330 / 8330A
1,3-Dinitrotoluene	- - - - -	- - - - -	EPA 8330 / 8330A	EPA 3535	EPA 8330 / 8330A / 8330A Modified / 8330B Modified	EPA 8330 / 8330A
2,4-Dinitrotoluene	- - - - -	- - - - -	EPA 8330 / 8330A	EPA 3535	EPA 8330 / 8330A / 8330A Modified / 8330B Modified	EPA 8330 / 8330A
2,6-Dinitrotoluene	- - - - -	- - - - -	EPA 8330 / 8330A	EPA 3535	EPA 8330 / 8330A / 8330A Modified / 8330B Modified	EPA 8330 / 8330A
HMX	- - - - -	- - - - -	EPA 8330 / 8330A	EPA 3535	EPA 8330 / 8330A / 8330A Modified / 8330B Modified	EPA 8330 / 8330A
Nitroglycerine	- - - - -	- - - - -	- - - - - - - - - - - -	- - - - - - - - - - - -	EPA 8330 / 8330A / 8330A Modified / 8330B Modified	EPA 8330 / 8330A
Nitrobenzene	- - - - -	- - - - -	EPA 8330 / 8330A	EPA 3535	EPA 8330 / 8330A / 8330A Modified / 8330B Modified	EPA 8330 / 8330A
2-Nitrotoluene	- - - - -	- - - - -	EPA 8330 / 8330A	EPA 3535	EPA 8330 / 8330A / 8330A Modified / 8330B Modified	EPA 8330 / 8330A
3-Nitrotoluene	- - - - -	- - - - -	EPA 8330 / 8330A	EPA 3535	EPA 8330 / 8330A / 8330A Modified / 8330B Modified	EPA 8330 / 8330A
4-Nitrotoluene	- - - - -	- - - - -	EPA 8330 / 8330A	EPA 3535	EPA 8330 / 8330A / 8330A Modified / 8330B Modified	EPA 8330 / 8330A
Pentaerythritol (PETN)	- - - - -	- - - - -	- - - - - - - - - - - -	- - - - - - - - - - - -	EPA 8330 / 8330A / 8330A Modified / 8330B Modified	EPA 8330 / 8330A

Parameter/Analyte	Potable Water	Potable Water Prep Methods	Nonpotable Water	Nonpotable Water Prep Methods	Solid Hazardous Waste	Solid Hazardous Waste Prep Methods
RDX	- - - - -	- - - - -	EPA 8330 / 8330A	EPA 3535	EPA 8330 / 8330A / 8330A Modified / 8330B Modified	EPA 8330 / 8330A
Tetryl	- - - - -	- - - - -	EPA 8330 / 8330A	EPA 3535	EPA 8330 / 8330A / 8330A Modified / 8330B Modified	EPA 8330 / 8330A
1,3,5-Trinitrobenzene	- - - - -	- - - - -	EPA 8330 / 8330A	EPA 3535	EPA 8330 / 8330A / 8330A Modified / 8330B Modified	EPA 8330 / 8330A
2,4,6-Trinitrotoluene	- - - - -	- - - - -	EPA 8330 / 8330A	EPA 3535	EPA 8330 / 8330A / 8330A Modified / 8330B Modified	EPA 8330 / 8330A
Hazardous Waste Characteristics						
Synthetic Precipitation Leaching Procedure (SPLP)	- - - - -	- - - - -	- - - - -	- - - - -	EPA 1312	EPA1312
Toxicity Characteristic Leaching Procedure (TCLP)	- - - - -	- - - - -	- - - - -	- - - - -	EPA 1311	EPA 1311
Air						
Ethane	- - - - -	- - - - -	RSK-175	RSK-175	- - - - -	- - - - -
Ethene	- - - - -	- - - - -	RSK-175	RSK-175	- - - - -	- - - - -
Methane	- - - - -	- - - - -	RSK-175	RSK-175	- - - - -	- - - - -
Acetylene	- - - - -	- - - - -	RSK-175	RSK-175	- - - - -	- - - - -

Parameter/Analyte	Air Analysis
1,1,1-Trichloroethane	TO-15
1,1,2,2-Tetrachloroethane	TO-15
1,1,2-Trichloroethane	TO-15
1,1-Dichloroethane	TO-15
1,1-Dichloroethene	TO-15
1,2,4-Trichlorobenzene	TO-15
1,2,4-Trimethylbenzene	TO-15
1,2-Dibromoethane	TO-15
1,2-Dichlorobenzene	TO-15
1,2-Dichloroethane	TO-15
1,2-Dichloropropane	TO-15
1,3,5-Trimethylbenzene	TO-15
1,3-Butadiene	TO-15

Parameter/Analyte	Air Analysis
1,3-Dichlorobenzene	TO-15
1,4-Dichlorobenzene	TO-15
2-Butanone	TO-15
2-Hexanone	TO-15
4-Ethyltoluene	TO-15
4-Methyl-2-pentanone	TO-15
Acetone	TO-15
Acrolein	TO-15
Benzene	TO-15
Benzyl chloride	TO-15
Bromodichloromethane	TO-15
Bromoform	TO-15
Bromomethane	TO-15
Carbon Disulfide	TO-15
Carbon Tetrachloride	TO-15
Chlorobenzene	TO-15
Chloroethane	TO-15
Chloroform	TO-15
Chloromethane	TO-15
Cyclohexane	TO-15
Dibromochloromethane	TO-15
Ethyl Acetate	TO-15
Ethylbenzene	TO-15
Freon 113	TO-15
Freon 114	TO-15
Freon 12	TO-15
Hexachlorobutadiene	TO-15
MTBE	TO-15
Methylene Chloride	TO-15
Napthalene	TO-15
Propylene	TO-15
Styrene	TO-15
Tetrachloroethene	TO-15
Tetrahydrofuran	TO-15
Toluene	TO-15
Trichloroethene	TO-15
Trichlorofluoromethane	TO-15
Vinyl Acetate	TO-15
Vinyl Chloride	TO-15
cis-1,2-dichloroethene	TO-15
cis-1,3-dichloropropene	TO-15
m,p-Xylenes	TO-15
n-Heptane	TO-15
n-Hexane	TO-15
o-Xylene	TO-15
trans-1,2-dichloroethene	TO-15
trans-1,3-dichloropropene	TO-15

Parameter/Analyte	Air Analysis
Carbon Dioxide	ASTM D1946
Carbon Monoxide	ASTM D1946
Helium	ASTM D1946
Hydrogen	ASTM D1946
Methane	ASTM D1946
Nitrogen	ASTM D1946
Oxygen	ASTM D1946

Parameter/Analyte	
Gamma Spectroscopy	Solid Hazardous Waste
Actinium – 228	Modified EPAMethod 901.1 / DoE HASL 300 Ga-01
Americium – 241	Modified EPAMethod 901.1 / DoE HASL 300 Ga-01
Bismuth – 212	Modified EPAMethod 901.1 / DoE HASL 300 Ga-01
Bismuth – 214	Modified EPAMethod 901.1 / DoE HASL 300 Ga-01
Cesium – 137	Modified EPAMethod 901.1 / DoE HASL 300 Ga-01
Cobalt – 60	Modified EPAMethod 901.1 / DoE HASL 300 Ga-01
Europium – 152	Modified EPAMethod 901.1 / DoE HASL 300 Ga-01
Europium – 154	Modified EPAMethod 901.1 / DoE HASL 300 Ga-01
Lead – 210	Modified EPAMethod 901.1 / DoE HASL 300 Ga-01
Lead – 212	Modified EPAMethod 901.1 / DoE HASL 300 Ga-01
Lead – 214	Modified EPAMethod 901.1 / DoE HASL 300 Ga-01
Protactinium – 234M	Modified EPAMethod 901.1 / DoE HASL 300 Ga-01
Radium – 226	Modified EPAMethod 901.1 / DoE HASL 300 Ga-01
Thallium - 208	Modified EPAMethod 901.1 / DoE HASL 300 Ga-01
Thorium – 232	Modified EPAMethod 901.1 / DoE HASL 300 Ga-01
Uranium - 235	Modified EPAMethod 901.1 / DoE HASL 300 Ga-01

1. **This accreditation covers testing performed at the main laboratory listed above and the following satellite laboratory listed below for the following tests:**

201A & 201B Fischer Ave
Hunters Point Naval Ship Yard
San Francisco, CA 94124

Parameter/Analyte	
Gamma Spectroscopy	Solid/Wipe Analysis
Actinium – 228	Modified EPAMethod 901.1 / DoE HASL 300 Ga-01
Americium – 241	Modified EPAMethod 901.1 / DoE HASL 300 Ga-01
Bismuth – 212	Modified EPAMethod 901.1 / DoE HASL 300 Ga-01
Bismuth – 214	Modified EPAMethod 901.1 / DoE HASL 300 Ga-01
Cesium – 137	Modified EPAMethod 901.1 / DoE HASL 300 Ga-01
Cobalt – 60	Modified EPAMethod 901.1 / DoE HASL 300 Ga-01
Europium – 152	Modified EPAMethod 901.1 / DoE HASL 300 Ga-01
Europium – 154	Modified EPAMethod 901.1 / DoE HASL 300 Ga-01
Lead – 210	Modified EPAMethod 901.1 / DoE HASL 300 Ga-01
Lead – 212	Modified EPAMethod 901.1 / DoE HASL 300 Ga-01

Parameter/Analyte	
Gamma Spectroscopy	Solid/Wipe Analysis
Lead – 214	Modified EPAMethod 901.1 / DoE HASL 300 Ga-01
Potassium – 40	Modified EPAMethod 901.1 / DoE HASL 300 Ga-01
Protactinium – 234M	Modified EPAMethod 901.1 / DoE HASL 300 Ga-01
Radium – 226	Modified EPAMethod 901.1 / DoE HASL 300 Ga-01
Thallium - 208	Modified EPAMethod 901.1 / DoE HASL 300 Ga-01
Thorium – 232	Modified EPAMethod 901.1 / DoE HASL 300 Ga-01
Thorium – 234	Modified EPAMethod 901.1 / DoE HASL 300 Ga-01
Uranium - 235	Modified EPAMethod 901.1 / DoE HASL 300 Ga-01
Gross Alpha Beta Spectroscopy Gas Proportional Counter	
Alpha & Beta Radiation	Modified EPA Method 9310

Peter Abraham

American Association for Laboratory Accreditation

Accredited DoD ELAP Laboratory

A2LA has accredited

CURTIS & TOMPKINS, LLC

Berkeley, CA

for technical competence in the field of

Environmental Testing

In recognition of the successful completion of the A2LA evaluation process that includes an assessment of the laboratory's compliance with ISO/IEC 17025:2005, the 2003 NELAC Chapter 5 Standard, and the requirements of the Department of Defense Environmental Laboratory Accreditation Program (DoD ELAP) as detailed in version 4.2 of the DoD Quality System Manual for Environmental Laboratories (QSM); accreditation is granted to this laboratory to perform recognized EPA methods as defined on the associated A2LA Environmental Scope of Accreditation. This accreditation demonstrates technical competence for this defined scope and the operation of a laboratory quality management system (refer to joint ISO-ILAC-IAF Communiqué dated 8 January 2009).

Presented this 5th day of March 2014.

President & CEO
For the Accreditation Council
Certificate Number 2943.01
Valid to February 29, 2016

For the tests to which this accreditation applies, please refer to the laboratory's Environmental Scope of Accreditation.

Appendix E. RP-006 Sample Collection Procedure, Old Town Demolition, Revision 0, April 2015

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DMS-7209030-RIP-45

RP-006 Sample Collection Procedure, Old Town Phase 1 Demolition

Rev. 0

April 2015

Rev.	Reason for Revision	Originator	Date	Reviewer	Date

RP-006 Sample Collection Procedure
Rev. 0, April 2015

Prepared by:	[signature]	4-11-15
	Dennis Brown, CHP, RSO Radiation Protection Lead	
Reviewed by:	[signature]	4-11-15
	Scott LaBuy, Director of Planning	
Approved by:	[signature]	4-11-15
	Jeffry Parkin, Project Manager	

Table of Contents

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Acronyms and Abbreviations

COC	Chain of Custody
DMS	Dynamic Management Solutions, LLC
LLW	Low-Level Waste
PM	Project Manager
RCT	Radiation Control Technician
RPL	Radiation Protection Lead
RWA	Radiological Work Authorization

1 INTRODUCTION

The purpose of this procedure is to provide guidance for the collection of samples at the Old Town Phase 1 Demolition project.

2 SCOPE OF WORK

The scope of this procedure is any solid or liquid volumetric media sample, filters, and removable activity wipes that are collected for the purpose of on-site or off-site analysis. This includes, but is not limited to:

- Soils (up to 500 g) (follow any applicable sample plan)
- Liquids (up to 500 ml) (follow any applicable sample plan)
- Paint chips (up to 50 g) (follow any applicable sample plan)
- Concrete chips (up to 500 g) (follow any applicable sample plan)
- Metals (up to 500 g) (follow any applicable sample plan)
- Swipes or smears (wipes do not vary in size, shape, or nominally, mass; the surface area sampled can vary and is controlled by the person taking the sample, typically a dry wipe on a dry surface with moderate pressure over one of the following two surface areas (1) 100 cm^2 wipe area for ordinary wipes, (2) 300 cm^2 for large area wipes) (follow any applicable sample plan)
- Filter media—follow any applicable sample plan

3 DEFINITIONS

Chain of Custody Form: A chain-of-custody (COC) form is a document of accountability to ensure that the sample which is taken or collected, is the same sample which is analyzed or tested; and to ensure that the sample is not altered, changed, substituted, or tampered with between the field collection and submission to the lab for testing. The COC ensures the physical security of samples and it references an identification of each sample taken, their location, analysis, preservative and project specific information to include the individuals responsible for their custody and transfer of custody. The COC begins with the taking of a sample and remains intact through the analysis and final holding or disposal.

Off-site Laboratory: A laboratory under contract or sub-contract for the purpose of radiological sample analysis and subsequent data reporting.

4 RESPONSIBILITIES

4.1 Project Manager

The Project Manager (PM) maintains responsibility for overall compliance with the procedure. The PM shall ensure that the capability of project radiation protection services is sufficient to meet the requirements of the procedure, as well as federal and state regulations.

4.2 Radiation Protection Lead

The Radiation Protection Lead (RPL) is responsible for technical oversight, administration, and implementation of this procedure, including oversight of Radiological Control Technician (RCT) activities described in this procedure.

4.3 Site Superintendent

The Site Superintendent is responsible for the supervision of radiation workers for the implementation of this procedure.

4.4 Radiological Control Technician (RCT)

An RCT is responsible for the implementation of this procedure at the direction of the RPL or designee.

4.5 Waste Coordinator

The waste coordinator has responsibility for assuring that waste samples are collected consistent with disposal facility waste acceptance criteria sampling guidelines and will work with the RPL in sampling packages including sample packages to meet all applicable 49 CFR 173-175 DOT shipping requirements.

5 PROCEDURE

5.1 Prerequisites

1. Ensure that all sample areas are accessible and unobstructed. Make arrangements for the movement or staging of equipment or materials, as necessary.
2. Ensure that all personnel involved in sampling under this procedure receive applicable training. The RPL or designee will be responsible to provide the necessary training to personnel.
3. Ensure that access control is followed when performing surveys, as applicable.
4. Ensure that a Radiological Work Authorization (RWA) is available when entering RWA required areas, as applicable.
5. Ensure that the reference coordinate grid system has been established for the area to be sampled, if required.

5.2 General Sampling Instructions

The sampling instructions listed below shall be followed for all sample collection activities described in this procedure, if applicable. Additional instructions may be provided by the project RPL or designee.

1. Assemble the necessary equipment to obtain samples. Refer to **Table 1** for a listing of typical equipment that may be needed to support sampling.

Table 1. Typical Sample Equipment

Plastic Bags	Disposable Plastic/Rubber Gloves	Chain of Custody Forms	Rinse Water
Sample Containers	Duct Tape	Field Use Logbook	Scrub Brush and Bucket
Knife or Suitable Cutting Implements	Plastic Sheeting	Pens, Pencils, and Indelible Markers	Non-phosphate Containing Detergent
Trowel	Trash Containers/Bags	Labels, Tags, and Tamper Resistant Seals	Paper Towels

2. Locate the sampling point using the guidance provided by the survey plan, sampling plan, RPL or designee.

3. Loosen the media at the selected sampling site using an appropriate tool or device.

4. Collect the appropriate amount of media using the guidance provided by the final status survey plan, sampling and analysis plan, or specified scope in accordance with a work package, RWA, RPL's or designee's direction.

5. Place the sampled media into a clean sample container.

6. Wipe the outside of the sample container clean, if necessary.

7. Seal the sample container to prevent inadvertent sample loss.

8. Obtain a valid Sample Serial number(s) from the Sample Log Book (Appendix A) and complete all required information in the Sample Log book. Sample prefixes include:

   - SC Concrete sample
   - SW Dry Swipe
   - HT Tritium swipe
   - SN Floor Tile/Mastic sample
   - CN Ceramic tile
   - SE Sediment/sludge sample
   - ME Metal
   - DW Drywall
   - WO Wood
   - RF Roofing/shingle/paper
   - ST Stone/roofing stone
   - DT Soil/similar debris
   - BK Brick
   - LH Liquid sample
   - PC Paint sample
   - CK Caulk sample
   - AW Asbestos Wall Sample
   - AC Asbestos Ceiling Sample
   - AR Asbestos Roofing Sample
   - AT Asbestos TSI Sample
   - AM Asbestos Miscellaneous
   - OT Other/Miscellaneous

9. All sample containers shall be labeled with an indelible marker or tag with the following information:

   a. Sample Serial Number

   b. Location where the sample was taken (use reference coordinate grid system, landmarks, survey unit identification number, etc.)

   c. Date and time sample was obtained

   d. Sampler's initials

10. Prior to collecting further samples, decontaminate the collection tools or devices as necessary using clean rinse water and agitating with a clean scrub brush. Non-phosphate containing detergent may be used as necessary. The scrub brush may be disposed of as low-level radioactive waste (LLW) or mixed waste as appropriate. Any water used in this process will be held for sampling, evaporated, and the container disposed of as LLW or mixed waste, as appropriate. Nominal amounts of liquid residue may be absorbed into a solid matrix for disposal as LLW or mixed waste, as appropriate.

11. Upon completion of the sampling event, return all samples to the storage area in preparation for shipment to the designated on-site (if applicable for sample counting, such as wipes for gross alpha, gross beta) or off-site laboratory for required analyses.

6 DOCUMENTATION

6.1 Chain of Custody Preparation

A Chain of Custody (COC) Form is required for samples collected for off-site analysis. The following fields are to be completed by the sample collector:

1. **Site Contact –** This is the person that collected the sample and completed the COC

2. **Date –** This is the COC inception date. This is not necessarily the same date as the sample event, additional samples may be collected and entered on the form at a later date.

3. **COC Number –** Obtain a COC number from the COC Number Log (Appendix C) and complete all required information.

4. **Page number(s) –** Enter the page number and the total pages in the requested form fields

5. **Sample Identification –** The Sample Serial numbers (from the Sample Serial Number Log) included in the sample event.

6. **Sample Date –** The date of sample collection.

7. **Sample Time –** The time of sample collection.

8. **Sample Type –** Enter either “Grab” or “Composite” as applicable.

9. **Matrix –** Enter either “Solid” or “Liquid” as applicable.

10. **Number of Containers –** Enter the number of containers comprising the individual sample. Generally, this will be “1.”

11. **Preservation –** Enter the preservation method used, if any. Generally, this will be “N.”

6.2 Chain of Custody Completion

Deliver the prepared COC to the RPL or designee for completion of the remaining fields. Once these fields have been completed, package the sample(s) for shipment at the direction of the RPL, sign the “Relinquished by” field, and fill in “Company” and “Date/Time.” Enter the transporter name (e.g., FedEx, UPS, DHL, etc.) in the “Received by,” along with the date and time of packaging and ship the container to the selected off-site laboratory.

Appendix A. Sample Serial Number Log

Sample Serial Number Log **Page_____of_____**

Prefix (See note 1)	Sample ID (See note 2)	Date	Technician(s) Initials	Location / Comments

Note 1: Valid prefixes are “SS” for ALL solids (soil, concrete, paint, chips, etc.) and “LS” for ALL liquids (water)

Note 2: Sample IDs shall be numbered sequentially starting with 0001 and shall not be repeated.

Appendix B. Chain of Custody Form

Laboratory Contact		Project Manager:	Site Contact:	Date:	COC No:
Name:		Tel/Fax:	Lab Contact:	Carrier:	Page of
Address:		**Analysis Turnaround Time**			Job No.
		☐ Other (Specify) ________ days			
	Text	☐ 30 Days			
Phone:		☐ 21 Days			SDG No.
FAX:		☐ 14 Days			
Project:		☐ 7 Days			
P O #:					

Sample Identification	Sample Date	Sample Time	Sample Type	Matrix	# of Cont.	Filtered Sample	AlphaSpec (Uranium)	TCLP Metals	PCB															Preservation	Sample Specific Notes:

Preservation Used: 1 = Ice, 2= HCl, 3= H_2SO_4, 4=HNO_3, 5=NaOH, 6= Other __________, N =None

Possible Hazard Identification	***Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)***
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown	☐ Return to Client ☐ Disposal by Lab ☐ Archive for Months / Weeks / Days (circle one)

Special Instructions/QC Requirements & Comments:

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:

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Appendix C. COC Number Log

COC Number Log **Page_____of_____**

COC Number (See Note 1)	**Date**	**Technician(s) Initials**	**Location / Comments**
COC-			
COC-			
COC-			
COC-			
COC-			
COC-			
COC-			
COC-			
COC-			
COC-			
COC-			
COC-			
COC-			
COC-			
COC-			

Note 1: All COC numbers are to begin with “COC-” and progress sequentially from 0001