Addendum No. 1 to
Master Field Sampling Plan for Chemical Data Gap Investigation
Phase 3 Soil Chemical Sampling at Area IV
Santa Susana Field Laboratory
Ventura County, California

Subarea 5C

Prepared for:

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"I certify that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete."

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Introduction

This document supports implementation of the soil sampling program described in the *Master Field Sampling Plan for Chemical Data Gap Investigation, Phase 3 Soil Chemical Sampling at Area IV, Santa Susana Field Laboratory, Ventura County, California* (Master FSP, CDM Smith 2012a). The Master FSP addresses soil sampling within Subarea 5C of Area IV of the Santa Susana Field Laboratory (SSFL). The Master FSP includes field Standard Operating Procedures (SOPs) describing the details of sampling activities and sample management. For all samples collected at locations within Subarea 5C, the Master FSP and the SOPs dictate the procedures pertaining to:

- Locating and verification of sampling points
- surface soil sampling techniques
- subsurface soil sampling techniques using a direct push technology (DPT) rig and a hand auger and slide hammer for those locations not accessible by the DPT rig
- sampling of trenches and test pits
- sample handling and shipping
- analytical, quality control, and data review
- Instrument calibration and maintenance

The *Administrative Order on Consent [AOC] for Remedial Action* (Docket Number HSA-CO 10/11-037) between DTSC and DOE was signed on December 6, 2010. The AOC is a legally binding order that describes the characterization of Area IV and Northern Buffer Zone soils/sediments and further defines DOE's obligations in relation to radiologic and chemical cleanup of soils within these areas. It stipulated that during Phase 1 of the chemical investigation activities, DOE was to analyze a soil sample for chemical constituents at locations where EPA collected a sample for radiological analysis. Co-located sampling with EPA in Subarea 5C was completed in February 2011.

Phase 3 of the AOC is the data gap investigation, which includes an assessment of data adequacy using the data collected under the Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI) program, the results of co-located soil samples collected during Phase 1 of the AOC, and multiple lines of evidence as described in the *Work Plan for Chemical Data Gap Investigation, Phase 3 Soil Chemical Sampling at Area IV, Santa Susana Field Laboratory, Ventura County, California* (CDM 2010b). The purpose of the data gap investigation is to identify additional soil chemical data needed to support the Soil Remedial Action Implementation Plan for Area IV. This FSP Addendum is based on the results of the data gap investigation.

The Phase 3 sampling within Subarea 5C is governed by the Phase 3 Work Plan and its elements including the Master Field Sampling Plan, Phase 3 Quality Assurance Project Plan (CDM Smith 2012c), Worker Health and Safety Plan (CDM Smith 2012d), and the Phase 3 SOPs (attachments to the Master FSP and QAPP). These documents are incorporated into this FSP Addendum by reference.

Purpose of FSP Addendum

This FSP Addendum addresses Phase 3 sampling in Subarea 5C. The rationale for sample location and chemical analytes is provided in the document *Subarea 5C Data Gap Analysis Technical Memorandum, Santa Susana Field Laboratory Ventura County, California* (MWH 2012[1]) (*Subarea 5C Data Gap TM*). The *Subarea 5C Data Gap TM* is included as an attachment to this FSP Addendum. It illustrates the proposed sample locations and includes a table providing the sampling rationale. Figure 1 of the *Subarea 5C Data Gap TM* provides sample locations in the southern portion Subarea 5C that were identified through the data gap investigation; Figure 2 shows the sample locations in the northern portion of Subarea 5C. Table 1 of the *Subarea 5C Data Gap TM* provides the sampling rationale.

For Subarea 5C, surface, subsurface, and trench/test pit soil samples will be collected. For surface soil samples, only the top 6-inches of soil (surface soil) will be collected. The majority of sample locations will involve collection of subsurface samples. A direct push technology (DPT) rig will be used to sample subsurface soil at all locations except those inaccessible due to terrain constraints. Areas inaccessible to the DPT rig will be sampled using a hand auger and slide hammer as described in the SOPs.

CDM Smith will be responsible for all aspects of the field sampling program under Phase 3 of the AOC. This includes locating in the field the sample locations selected during the data gap investigation and displayed electronically through Geographic Information System (GIS) coordinates. Standard Operating Procedure (SOP) 1 provides the process for verifying that the sample locations identified by GIS review reflect the targeted feature described in Table 1. If necessary the sample location will be adjusted in the field so the targeted feature is sampled. Adjusted and all final sample location coordinates will be provided back to the GIS managers so that the GIS database can be updated.

CDM Smith will be responsible for the physical collection of all samples per the procedures and controls specified in the Master Field Sampling Plan. CDM Smith personnel will be responsible for the sample container preparation, sample handling and documentation, sample shipment, laboratory coordination, chemical analyses of the samples, and chemical data review. Soil samples collected by CDM Smith will be

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[1] MWH Americas prepared this Technical Memorandum under contract with The Boeing Company, which is under direct contract with DOE. Through this contractual relationship and under the regulatory oversight of DTSC, MWH has represented DOE in conducting the Chemical Data Gap Analysis and in the preparation of this Technical Memorandum."

analyzed for chemical analytes identified in Table 1 of the *Subarea 5C Data Gap TM* (MWH 2012). Analytical methods and quality control criteria to be used are stipulated in Table 8-3 (Quality Control Objectives for Analytical Methods) of the Master QAPP (CDM Smith 2012c) and Table 6-1 (Analytical Methods, Containers, Preservatives, and Holding Times) of the Master FSP (CDM Smith 2012a).

Table 1 of the *Subarea 5C Data Gap TM* also identifies proposed target depths for sample collection. Samples will also be collected from depth intervals till refusal that exhibit evidence of staining, odor, debris, or volatile gas instrument readings above background.

Sample Analytes

Table 1 of the *Subarea 5C Data Gap TM* (MWH 2012) provides the chemical analyses (analytes) for each sample proposed for collection under this FSP Addendum and the respective rationale for sample location and chemical analyses. The chemical analyses by location were identified through the data gap investigation process.

Field Locating Soil Samples

CDM Smith will be responsible for locating the precise position of soil samples in the field in accordance with SSFL SOP 1. The locating of the sample locations will also involve clearing the spot for buried utilities, and assessing for protection cultural and biological resources.

Surface Soil Sampling

Surface soil samples will be collected at each location proposed in Table 1. Surface soil samples will be collected in accordance with SSFL SOP 2. A slide hammer with stainless steel sleeve will be used to collect the primary soil sample. Volatile organic compounds and total petroleum hydrocarbon samples will be collected using Encore samplers.

Subsurface Soil Sampling

Subsurface soil samples will be primarily collected through the use of a DPT rig. SSFL SOP 4 describes the DPT sampling procedures. Sampling will be conducted through use of 5-foot long acetate sleeves placed within the DPT sampling tool. All cores will be screened using a PID instrument for volatiles and via a Micro R gamma detection instrument and a dual phosphor alpha/beta detection instrument (SOPs 6 and 7, respectively). Soil samples will be collected at the depths specified in Table 1 of the *Subarea 5C Data Gap TM* (MWH 2012) and/or at locations where instrument readings, soil staining, or evidence of debris is observed.

To determine depth of contamination at locations where prior data indicates contamination at the surface but depth has not been defined, the core will be divided

into one-foot long samples and prepared for shipment to the laboratory. The laboratory will be requested to analyze the shallowest interval first (e.g., 1 to 2 foot interval) and provide results in an expedited turn around. If chemicals are detected above the interim screening levels, the lab will be instructed to analyze the next interval (e.g., 2 to 3 foot interval) and provide results under expedited analytical turn around. This process may be repeated depending on results. To address holding time concerns, the lab may be instructed to extract each interval and hold the extract until the prior interval results are available. Table 1 identifies the locations where the depth analysis process is proposed.

There are proposed sampling locations where the DPT rig will not be able to access. At those locations, subsurface samples will be collected using a hand auger to access the sample depth and a slide hammer sampler with stainless steel sleeve to collect the actual sample. SSFL SOP 3 describes the hand auger sampling procedure.

The logging of all samples, surface and subsurface, will be conducted following SOP 9.

Trenching and Test Pit Sampling

The investigation of Subarea 5C will include the characterization of debris and fill areas through backhoe trenching. Figures 1 and 2 of the *Subarea 5C Data Gap TM* identify the locations of where trenches will be dug. The primary purpose of the trenches will be to visually characterize fill material and to sample subsurface soil within the trench.

Prior to any trenching, geophysical surveys of the trenching locations will be conducted to identify potential buried debris and to assist in targeting trench locations. The geophysical surveys will include ground penetrating radar, electromagnetic surveys, and soil density surveys. The general procedures for the geophysical surveys are described in SSFL SOP 14. Prior to implementing the geophysical surveys, CDM Smith will prepare for DTSC review and approval an Addendum to the Master Field Sampling Plan that describes the objectives and details for all geophysical work. Although the Attachment 1 to the5C Addendum describes the sampling scope and locations of proposed geophysical survey in 5C, actual work on the 5C geophysical survey will not proceed until the geophysical survey addendum is submitted and approved.

Where sampling can be performed safely, soil samples will be collected from the side wall of the trench/pit to 5 feet below ground surface using an impact sampler with extended rod. Soil samples deeper than 5 feet below ground surface (or when samples cannot be collected safely to 5 feet bgs) will be collected directly from the backhoe bucket using the impact sampler. SSFL SOP 5 describes the test pit sampling procedure.

Sampling of Locations with Sustained Instrument

Readings, Odor, or Staining

For any locations where PID instrument readings remain above measured background readings, there is an odor, or the soil appears to be stained with hydrocarbons, samples will be collected at the sample depth interval and analyzed for VOCs, 1,4-dioxane, and TPH-GRO using Encore samplers, in addition to the target analytes specified in Table 1 of the *Subarea 5C Data Gap TM*. Any sustained instrument readings above background (PID, Micro R gamma detection and dual phosphor alpha/beta detection instruments) will be immediately reported to DOE by the CDM Smith Field Team Leader and DOE will contact Boeing with this information in accordance with the Worker Health and Safety Plan requirements. The monitoring instruments will be operated per SSFL SOPs 6 (volatile organics) and 7 (radiation).

Decontamination of Sampling Equipment

Equipment that has the potential for coming in contact with sample material will be decontaminated per SSFL SOP 12. Investigation derived waste will be handle per SSFL SOP 13.

Sample Handling, Recording, and Shipment

SSFL SOPs 10 and 11 describe the sample custody, handling, information recording, preservation, and shipping procedures. Photographic documentation of sampling activities will be performed per SOP 15.

Instrument Calibration and Maintenance

All instruments used to screen samples for volatile organics and radioactivity will be calibrated and maintained per SSFL SOP 16.

Schedule

Soil sampling activities under this FSP Addendum will initiate the week of March 26, 2012 with the locating and staking of proposed sample locations. Soil sampling will not start until early April after DTSC approves the Master WP and this FSP Addendum. Surface soil sampling will start first, followed by shallow soil borings to be drilled by hand auger. Subsurface sampling by DPT rig is expected to start late April 2012. Test pits and trenching will not occur until mid-June after completion of geophysical surveys. A Geophysical Survey Addendum will be provided to DTSC for its review in mid-May. It is anticipated that 40 surface samples, 32 shallow hand auger samples, and 24 DPT boring samples will be collected each week. Each trench/test pit will take one day to dig, observe, sample, and backfill.

References

CDM Smith. 2012a. *Master Field Sampling Plan for Chemical Data Gap Investigation, Phase 3 Soil Chemical Sampling at Area IV, Santa Susana Field Laboratory, Ventura County, California.* April.

CDM Smith. 2012b. *Work Plan for Chemical Data Gap Investigation, Phase 3 Soil Chemical Sampling at Area IV, Santa Susana Field Laboratory, Ventura County, California.* April.

CDM Smith. 2012c. *Quality Assurance Project Plan for Chemical Data Gap Investigation, Phase 3 Soil Chemical Sampling at Area IV, Santa Susana Field Laboratory, Ventura County, California.* April.

CDM Smith. 2012d. *Worker Health and Safety Plan for Chemical Data Gap Investigation, Phase 3 Soil Chemical Sampling at Area IV, Santa Susana Field Laboratory, Ventura County, California.* April.

MWH 2012. *Subarea 5C Phase 3 Data Gap Analysis Technical Memorandum Santa Susana Field Laboratory, Ventura County, California.* April.

Attachment 1

Subarea 5C Phase 3 Data Gap Analysis Technical Memorandum (MWH 2012)

SUBAREA 5C PHASE 3 DATA GAP ANALYSIS
TECHNICAL MEMORANDUM
SANTA SUSANA FIELD LABORATORY
VENTURA COUNTY, CALIFORNIA

Prepared For:

THE UNITED STATES DEPARTMENT OF ENERGY

Prepared By:

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April 2012

"I certify that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete."

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ACCRONYMNS AND ABBREVIATIONS

AOC	Administrative Order of Consent
bgs	below ground surface
DOE	Department of Energy
DQO	Data Quality Objective
DTSC	Department of Toxic Substances Control
EPA	Environmental Protection Agency
GIS	Graphical Information System
HSA	Historical Site Assessment
ISL	Interim Screening Level
MFSP	Master Field Sampling Plan
NBZ	Northern Buffer Zone
SSFL	Santa Susana Field Laboratory
TM	Technical Memorandum
VOC	Volatile Organic Compound

1.0 INTRODUCTION

This technical memorandum (TM) has been prepared to describe the chemical data gap analysis performed by MWH Americas, Inc. (MWH) for the U.S. Department of Energy (DOE) for Subarea 5C within Area IV and the Northern Buffer Zone (NBZ) at the Santa Susana Field Laboratory (SSFL). The chemical data gap analysis was performed in compliance with the Administrative Order on Consent (AOC) for Remedial Action (AOC; Docket No. **HSA-CO 10/11 - 037**), and serves as the basis for the Phase 3 data gap investigation in Subarea 5C being performed by DOE in Area IV and implemented by CDM Smith, a contractor to DOE. This Data Gap TM is included as an appendix to the Master Field Sampling Plan (MFSP) Addendum for Subarea 5C prepared by CDM Smith for review and approval by the California Environmental Protection Agency Department of Toxic Substances Control (DTSC).

The focus of this Data Gap TM is Subarea 5C. Information is provided to describe the overall background and approach for the chemical data gap analysis and investigation, followed by a description of specific application of the data gap analysis approach or unique circumstances within Subarea 5C.

2.0 DATA GAP ANALYSIS PROCESS

The AOC requires a chemical data gap investigation to identify locations within Area IV, the NBZ, or contiguous areas where additional chemical investigation is necessary. Per the AOC (Section 2.5.3.2):

> "In determining the scope, DOE and DTSC shall evaluate the results from the Phase 1 Co-Located sampling effort, the results from the Phase 2 Co-Located sampling effort[1], the results of the U.S. EPA's radiological survey and characterization efforts, the data and information presented in the previous RFI reports and RFI work plans, and any available historical Site data. This scoping effort shall be used to determine the locations at the Site where insufficient chemical data exists and additional chemical investigation is necessary."

This Data Gap TM describes the data evaluation process that has been used to identify chemical data gaps. Data gaps exist where more information is needed for DTSC and DOE to make remedial planning decisions, (i.e., whether soil contamination exists, and if so, to what extent). The data gap analysis approach was developed using the U.S. Environmental Protection Agency's (EPA's) seven-step Data Quality Objective (DQO) process that presents a systematic approach to identify chemical sampling needs, address existing data gaps, and obtain

[1] According to the AOC, the Phase 2 random sampling is to be conducted with EPA. EPA has identified its plans for random sampling within the NBZ. The data gap analysis will use the results from Phase 2 sampling within the NBZ to assess additional sampling for that area.

environmental data and information required for future remedial planning. The Phase 3 chemical data gap investigation DQOs are the framework for the analysis described in this TM and are presented in Section 4.0 of the MFSP (CDM, 2012b).

The Phase 3 data gap analysis described in this TM will be an iterative process. At this time in the data gap analysis process, data are compared with the interim screening levels (ISLs) developed for evaluation of available data (see Master Phase 3 Work Plan Table 2-1, CDM 2012a). The ISLs were developed jointly by DTSC and DOE, and reflect the 2005 background soil concentrations for metals and dioxins, and analytical reporting limits for chemicals not having a background value. In the future, background values will be updated based on the ongoing DTSC soil chemical background study and evaluation of the precision and accuracy requirements for reporting limits. Ultimately, all available previous data, including EPA radionuclide data, will be evaluated based on the final soil cleanup values (Look-up Table values) per the AOC. Therefore, a final data gap analysis will be required incorporating data collected as described in this TM and the Master Phase 3 Work Plan (CDM, 2012a), prior chemical data, and EPA radionuclide results.

The data gap analysis described in this TM was based on available results from EPA's radiological investigation activities (e.g., gamma surveys, geophysical surveys area photograph interpretations), prior RFI results, the Phase 1 co-located sample results, and historical information on activities within Area IV. Since recent radiological data have not been completely published by EPA, this data gap analysis used available EPA summaries of these results for planning purposes.

The data gap analysis identifies where additional information is needed for remedial planning by:

- Comparing existing soil sampling results to ISL criteria to identify additional sample locations needed to define the extent of contamination (based on criteria exceedance) and/or gradients in chemical concentrations away from a potential source;
- Evaluating migration pathways to ensure that samples are collected where contamination may have migrated via natural or anthropogenic processes; and
- Evaluating historical documents and site survey information to identify potential release areas that may not have been adequately characterized.

Each of these evaluation steps are described below.

2.1 COMPARISON OF PREVIOUS SAMPLING DATA TO SCREENING CRITERIA

To determine future chemical sampling needs (to be implemented under the Phase 3 Work Plan and MFSP), validated soil chemistry results are compared with ISL criteria. The ISLs reflect

either existing 2005 soil background concentrations for metals and dioxins[2] or analytical reporting limits for chemicals that do not have 2005 background concentrations. Table 2-1 in the Master Phase 3 Work Plan (CDM, 2012a) lists the ISL values currently being used for the gap analysis.

This data comparison is conducted to answer several questions:

- Are the data adequate to define the extent of soil contamination (i.e., What is the areal extent? How deep does contamination go?)
- Where are additional data needed to address areal and depth extent?
- What types of chemical data are needed at each location?

The soil chemical results within the analytical database are "filterable," meaning each individual soil chemical result can be selectively evaluated or results can be collectively reviewed for each prior sample point. The analytical database incorporates data files for soil chemical data collected under the RFI and co-located sampling programs. A geographic information system (GIS) is used to spatially display the sampling results. To display the data, the sampling results are compared with the ISL values for all chemicals analyzed at each sample location using a computer algorithm. The algorithm calculates the ratio of the soil concentration to the ISL value. The GIS is then used to display the maximum comparison value (i.e., 'ratio') at a sampling location, so that highest result relative to the ISL is displayed. The GIS uses a color-coded system to display the soil concentration relative to the ISL value. For example, soil concentrations that are at or below the ISL value are displayed as a blue symbol. Locations where the soil concentration exceeds the ISL are displayed as yellow, orange, magenta, or red colors, depending on the degree of exceedance of the ISL value. Maps displaying the sampling results as color-coded symbols are included in this Data Gap TM to help display this evaluation step in the context of proposed sampling locations.

The data gap evaluation includes review of sampling results for combined chemicals, individual chemical groups (e.g. VOCs, PAHs, PCBs, etc.), and individual chemicals (e.g. barium, perchlorate). Sampling results in the database are 'filtered' to determine which chemicals are above ISLs, their depth of occurrence, and which chemicals are co-located. This allows for effective evaluation and selection of step-out sample locations and analytical suites for assessing the extent and/or distribution of chemicals that exceed their respective ISLs. In some cases where detected chemical concentrations may only slightly exceed ISL values, Phase 3 step-out sampling is not proposed in this Data Gap TM, but will be subject to an additional data gap review once the final AOC look-up table values are made available. Similarly, sampling to

[2] DTSC is in the process of completing a new soil background study that includes additional chemicals not analyzed in the 2005 study. When the new background values are available they will replace and add to the existing background values and will be used for subsequent data gap analyses.

address elevated reporting limits in historical data is not proposed in all areas in this Data Gap TM. In areas where other data gaps have been identified, sampling for elevated reporting limits is also proposed as needed. In other areas, data gap evaluation for elevated reporting limits in historical data will be addressed after final Lookup Table values are established and in the context of recent sampling results.

The GIS display of the ISL-compared sampling results is used to evaluate potential sampling locations. In areas where detected concentrations exceed ISLs, previous sampling data are evaluated to determine if the lateral or vertical extent of the exceedance is limited by other sampling results below ISLs or other features at the site (e.g., bedrock). If not, then additional sampling is proposed in that area. Conversely, in some areas existing sampling results are adequate to support remedial planning or cleanup decisions. A review of the distribution of results along with other lines of evidence (described below) is used to identify where additional sampling is needed.

Some locations with significant exceedances of ISL values have been identified by DOE and DTSC as soil "clearly contaminated areas." These are areas most likely requiring remediation based on the existing elevated sampling results, and are displayed in GIS and on maps in this TM with pink shading. The data gap analysis for these areas considers whether sufficient information is available to determine the lateral and vertical extent of contamination. In many cases, more data are needed to determine a volume for remedial planning and additional sampling is proposed in these areas.

2.2 EVALUATION OF MIGRATION PATHWAYS

Migration pathways are the means by which chemicals can move in the environment, including surface water transport, downward subsurface soil movement, or air/wind dispersion. Migration pathways are evaluated to answer several questions:

- Where could potentially contaminated soil migrate via surface water flow?
- Where could contaminants migrate in subsurface soils? Could groundwater be affected by the soil contamination?
- Were chemicals potentially released into the air, dispersed by wind and deposited in surrounding areas at concentrations exceeding ISLs?

The topographic and surface water flow data in the GIS is used to identify surface water pathways from potential contamination sources. Prior data for those pathways will be evaluated as to adequacy for addressing contaminant migration. If additional data are needed to define the extent of chemicals moved by surface water, downward migration in the subsurface, or to assess air dispersion, sampling locations are proposed for the migration pathways.

This data gap analysis identifies previous soil sampling locations or features where there may be outstanding groundwater investigation program data needs, and coordinating with the DTSC/DOE groundwater teams to provide them that information. At these features, the data gap analysis is evaluating the adequacy of existing soil sampling results to assess potential migration of contaminants to groundwater, and proposing additional soil sampling to the top of bedrock if gaps are identified.

2.3 HISTORIC AND SITE SURVEY INFORMATION REVIEWS

The data gap analysis also addresses potential sources of contamination not covered by prior sampling events. Historical survey and site operational information for Area IV is represented in GIS and viewed in context of previous sampling results. Historical and site survey information will be used to answer two questions:

- Are there any potential chemical use/release features that have not been sampled?
- If a potential chemical use area has already been sampled (but not for all chemicals potentially used), are additional samples/analyses needed to complete characterization?

A checklist has been developed which is being reviewed along with the chemical data to ensure that features not covered by RFI or Phase 1 co-located sampling are addressed. The checklist includes the results of the historical site assessment (HSA) conducted by Sapere (2005), recent site operational and aerial photography information compiled for the RFI, and the recent HSA completed by EPA (HGL, 2012). The "lines of evidence" reviewed as part of the checklist is provided in the Master Phase 3 Work Plan Table 2-2, and published herein for how that checklist was applied in Subarea 5C.

Site information includes various site features or survey information that is displayed in GIS using a common coordinate system (similar to latitude and longitude). Tanks, buildings, leach fields, geophysical survey results, historical aerial photos, storage areas, debris/disposal areas, identified chemical use areas, and surface water flow paths are examples of site information/features used to identify potential data gaps and proposed sampling locations. Site information is shown as layers in GIS that can be displayed individually or combined with sampling results. The site information features, compiled from historical documents, aerial photo review, and site surveys are evaluated using existing data to assess characterization completeness. If gaps are identified (e.g., a storage area not previously sampled), sampling is proposed with the analytical suites developed based on surrounding site operational uses and existing sample result exceedances.

In addition to site historical use or survey information, soil boring and trench log information is used to inspect for relevant soil conditions (e.g., debris, staining, bedrock depth) since unique soil characteristics may also guide proposed sampling intervals. For example, sampling may be

proposed both within and below stained horizons, or in another case, both within fill materials and below fill materials in native soils. In either of these cases, sampling is needed below a potential contamination zone to identify how far contamination has migrated downward.

Data gaps associated with some historical operational use features are not addressed in this Data Gap TM but will be included in future documents. Historical operational use features not addressed in this plan include the Area IV sewer system, the natural gas pipelines within Area IV, and features within existing Area IV buildings. Data gaps associated with the sewer system and natural gas pipelines are being evaluated for these systems as a whole, and will be addressed in a separate Data Gap TM. Where applicable, sampling is proposed in this TM for where sewer pipelines leave former or existing buildings since these are considered site-specific sampling features. Data gaps associated with existing buildings are being evaluated as part of this process, but sampling requirements within or below existing buildings will be detailed in forthcoming demolition plans since that work will proceed under a different schedule and process.

2.4 DATA GAP ANALYSIS PROCESS SUMMARY

Using the three evaluation components above, a systematic process is being used during data gap analysis to ensure available information from multiple sources is considered during data gap review. Thus, combining data gap recommendations from the three evaluation components (Data Screening Evaluations, Migration Pathway Evaluations, and Historical Document/Site Survey Reviews), sampling is proposed for the evaluated subarea.

The outcome of the data gap analysis process is the identification of soil sampling requirements for Phase 3, including rationale for Phase 3 samples, their locations, depths, and proposed analytical suites. Both soil and soil vapor sampling for chemicals in Phase 3 are proposed in this TM ('soil' sampling is often referred to as 'soil matrix' sampling to distinguish it from soil vapor sampling). Soil matrix and soil vapor media provide different types of chemical data for remedial planning purposes. Soil vapor sampling is preferred to assess the potential release of solvents, which are comprised of volatile organic compounds (VOCs). Since VOCs are highly volatile, they are best evaluated in soil vapor samples, not soil matrix. Therefore, soil vapor sampling is proposed in this TM to evaluate locations where solvents may have been used, stored, or released, or to step-out around previous detections of VOCs above ISLs. Soil vapor sampling is also proposed to provide VOC data over larger areas to evaluate potential solvent release locations when historical operations are uncertain (e.g., large storage areas), or to assess vapor transport from underlying groundwater plume.

The analytical parameters proposed for step-out or step-down sampling locations are based both on what the prior data indicate are chemicals of potential concern for the location, in conjunction with data needs identified based on review of migration pathways and other lines of evidence. Proposed sample spacing is based on the types of operations and releases, the magnitude and

gradients of nearby sampling results, and site conditions (e.g., depth of soil, proximity of bedrock). Generally, samples are located with a 25 to 100 foot spacing laterally, and at 0.5-, 5-, and 10-foot depth intervals vertically. In many cases the deepest samples will be put on 'hold' by the laboratory, and analyzed if elevated results are detected in the shallower samples. In special cases, sampling is proposed at shallower depths (e.g., 2 feet) to assess potentially more limited downward migration of large organic molecules like PCBs, dioxins, or PAHs.

The data gap analysis also identifies additional investigation techniques for some areas to select sampling locations. The additional investigation techniques can include trenching or test pit excavation to observe soil conditions prior to sampling, or conducting geophysical surveying of areas to identify targeted features, such as pipelines, underground storage tanks, or fill areas. In some cases, field reconnaissance or mapping is needed to refine proposed sampling locations, such as along drainages. The sampling rationales included in this Data Gap TM specify these additional investigative techniques where applicable.

The data gap analysis can identify future sampling locations outside of the subarea being evaluated. These future locations are displayed with pink '+' symbols. In some cases, the samples are located outside of Area IV and the NBZ and will require additional surveys and coordination prior to sampling. In other cases, the proposed samples are within another subarea, and will be included in the corresponding Data Gap TM.

The information presented in this Data Gap TM, along with supporting GIS and analytical information, is reviewed with DTSC during the data gap process and with interested stakeholders at the end of the data gap process. Input received from DTSC during review and from the public during meetings is incorporated into the proposed sampling included in this Data Gap TM.

3.0 SUBAREA 5C DATA GAP ANALYSIS

The data gap analysis for Subarea 5C was performed following the process outline above and using the DQOs presented in Section 4 of the MFSP (CDM, 2012b). The proposed sampling for this subarea is presented in Tables 1 (Soil Matrix), 2 (Soil Vapor), and 3 (Future), and Figures 1 (5C South), 2 (5C North), 3 (Soil Vapor), and 4 (Geophysical Survey Areas). Table 4 presents the lines of evidence evaluation summary for this subarea, with checkmarks indicating what information resulted in proposed data gap samples.

As part of the Subarea 5C data gap analysis, some areas were identified where the DQOs were uniquely applied, or where specific sampling approaches have been recommended. These are briefly described below. More detailed, sample-specific rationales for these (and all) areas are provided on Tables 1 through 3.

- Within and east of the Building 4015 Field Clearly Contaminated Area, trenching to observe soil conditions and select sampling locations was proposed since this area was

identified by EPA as a 'fill' area. Sample locations are proposed to be both in the deeper portions of the fill as well as in native soils below the fill to define vertical extent of chemical exceedances. Trenching is also proposed to the east at future locations since fill was identified to extend in this direction. Additionally, there are numerous geophysical anomalies in some portions of the fill within the clearly contaminated area that may require targeted samples in addition to those proposed specifically in this plan. Additional samples will be collected based on field observations during trenching.

- Within the 'SPTF Northeast PCB' and downslope of 'North of B4100' Clearly Contaminated Areas, sampling is proposed at 2 feet below ground surface (bgs) to assess the vertical migration of the PCBs and dioxins since these are large organic molecules that do not readily migrate downwards. Samples at these locations are also proposed to be collected at 3 feet bgs and put on 'hold' by the laboratory. The 3 foot samples will be analyzed if PCBs are detected above ISL values in the 2 foot samples.
- Adjacent to the Drainage East of B4015 Field Clearly Contaminated Area, step-out sampling is proposed to define the extent of the area within drainage overbank deposits. The drainage pathway itself has been identified as a geographical data gap and is recommended for reconnaissance mapping (including collection of additional GPS coordinates) to aid in remedial planning. As part of the mapping, the overbank deposits will be evaluated and the proposed sampling locations shown in Figure 1 may be moved to where the most sedimentation has occurred. If the overbank sediments are extensive, additional sampling should be considered in these locations as well, extending laterally to transect the drainage, or to deeper horizons if present.
- West of Building 4065, a 'loose fill' area was identified in historical records associated with construction of Building 4056 (located to the northeast in Subarea 8). This investigation area has been informally called the 'B4056 Landfill Annex' area for ease of reference. Investigation and sampling proposed in this area is consistent with the investigation performed for the Building 4056 landfill area, including geophysical surveys and test pits to identify the extent of fill and buried debris, and trenching to observe soil conditions, fill, debris, and/or staining. Sampling locations proposed in this TM may be adjusted based on the results of the geophysical surveys or observations made during trenching.
- At the Building 4100 Trench Area, air dispersion of chemicals was considered as a migration pathway since wastes may have been burned within the former pit. Previous and proposed soil sampling density was deemed sufficient to evaluate this pathway except in the northwestern direction. A future sampling location was identified in Subarea 8 to address this data gap, and will be included in that subarea data gap evaluation.

- At the SNAP and B4100 Areas, large area excavations have been previously performed and backfilled with soils. Previous sampling of the backfill soil has been performed by the co-located and RFI programs and deemed adequate for remedial planning or cleanup decision purposes until the Lookup Table values are finalized. More sampling may be required in these areas however once cleanup values are finalized.
- Historical drainages along G and 20th Street are proposed for sampling based on aerial photographic review. These unlined drainage ditches occur along G Street (south of B4100 and SPTF), and along 20th Street (at the eastern boundary of Subarea 5C). Similarly, a smaller unlined drainage ditch was observed in aerial photographs and targeted at B4383; this smaller ditch appeared to have drained from the building to the ditch along G Street.
- Sampling to address potential impacts to groundwater was identified at several locations (listed below and shown on Figure 3). Proposed sampling at these locations included vertical sampling to top of bedrock and soil vapor sampling. In addition, further evaluation by the groundwater team was recommended for soil detections of mobile chemicals, including VOCs, perchlorate, hexavalent chromium, nitrate, and NDMA. Since some of these mobile chemicals are part of DTSC background study, evaluation of these constituents may be completed after background is established. The identified potential groundwater input features/locations identified in Subarea 5C are:
    - B4015 Clearly Contaminated Areas (Field Area and Drainage East of Field)
    - B4383 Leach Field
    - B4100 Trench
    - B4100 Liquid Waste Holdup Tank Vault
    - B4057 Dry Well
    - B4065 Metals Clarifier
    - B4059 SNAP Area

4.0 REFERENCES

CDM Smith (CDM). 2012a. Work Plan for Chemical Data Gap Investigation, Phase 3 Chemical Sampling at Area IV, Santa Susana Field Laboratory, Ventura County, California. April.

CDM. 2012b. Master Field Sampling Plan for Chemical Data Gap Investigation Sampling at Area IV, Santa Susana Field Laboratory, Ventura County, California. April.

Hydrogeologic, Inc. (HGL) 2012. Draft Final Historic Site Assessment Santa Susana Field Laboratory Site Area IV Radiological Study, Ventura County, California.

TABLES

Table 1
Subarea 5C Phase 3 Proposed Soil Sample Locations
(1 of 13)

Location ID[1]	Area	Location Description	Sample Type	Depth (ft bgs)	Analytical Method																			Data Gap Checklist[3]	Rationale / Comments
					PAHs including NDMA (EPA Method 8270C (SIM))	PCBs / PCTs (EPA Method 8082)	Dioxins/Furans (EPA Method 1613)	Metals[2] (EPA Methods 6010B/6010C /6020/6020A/7471A/7471B)	Cr(VI) (EPA Method 7196A)	Silver (EPA Method 6020)	Mercury (EPA Method 7174A)	Biphenyls (EPA Method 8270C)	Terphenyls (EPA Method 8015B)	Glycols (EPA Method 8015B)	Alcohols (EPA Method 8015B)	Perchlorate (EPA Method 314.0/6850/6860)	Energetics (EPA Method 8330A)	TPH (EPA Method 8015B)	Formaldehyde (EPA Method 8315A)	Pesticides (EPA Method 8081)	Herbicides (EPA Method 8151A)	pH (EPA Method 9045C)	Soil Moisture (ASTM D2216/ EPA Method 160.3)		
5C_DG-501	B4015 Field	Fill area east of B4015	Soil Boring	0.5	X	X	X	X								X			H			X	X	√	Complete characterization in southern portion of fill area based on results observed in clearly contaminated portion of fill area. Representative location on hold for formaldehyde (breakdown product of hydrazine) due to low level (less than ISL) concentrations of NDMA - pending offsite (background) NDMA data. **Note: If deeper soils are encountered, additional sampling will be added as needed. Sampling will generally be at 5 foot intervals to bedrock, but will target the top of native soil (beneath fill) and soil just above bedrock. Therefore, sample intervals may be added or adjusted based on field conditions.**
				5	X	X	X	X								X			H			X	X		
				10	X	X	X	X								X			H			X	X		
5C_DG-502	B4015 Field	Fill area east of B4015	Soil Boring	0.5	X	X	X	X								X						X	X	√	Complete characterization in southern portion of fill area based on results observed in clearly contaminated portion of fill area. **Note: If deeper soils are encountered, additional sampling will be added as needed. Sampling will generally be at 5 foot intervals to bedrock, but will target the top of native soil (beneath fill) and soil just above bedrock. Therefore, sample intervals may be added or adjusted based on field conditions.**
				5	X	X	X	X								X						X	X		
				10	X	X	X	X								X						X	X		
5C_DG-507	B4015 Field	Fill area east of B4015	Soil Boring	0.5	X	X	X	X								X						X	X	√	Stepout for dioxins at SL-125 (TEQ = 73.1 ng/kg at 0.5 feet bgs) and to delineate western extent of impacts associated with the fill area to the east. Since impacts observed are surficial, hold deep samples pending surface results and field observations (analyze if fill indicated).
				5	H	H	H	H								H						H	H		
				10	H	H	H	H								H						H	H		
5C_DG-508	B4015 Field	B4015	Soil Boring	0.5	X	X	X	X								X						X	X	√	Stepout from location with elevated dioxins and low level PCBs (SL-125); location is in drainage feature downstream of dark toned material ("probable leakage" noted by EPA) observed at SL-125 location. Hold deep samples pending surface results.
				5	H	H	H	H								H						H	H		
				10	H	H	H	H								H						H	H		
5C_DG-509	B4015 Field	South of B4015	Soil Boring	0.5	X	X	X	X								X						X	X	√	Stepout for dioxins at SL-125 (TEQ = 73.1 ng/kg) and representative sample to characterize potential storage in cleared area around B4015 observed in aerial photographs. Hold deep samples pending surface results.
				5	X	X	H	H								H						H	H		
				10	X	X	H	H								H						H	H		
5C_DG-510	B4015 Field	Drainage south of B4015 Field	Soil Boring	0.5	X	X	X	X								X						X	X	√	Location targets drainage south of B4015 field. Analyze shallow sample since targeting drainage; deep samples on hold pending shallow results.
				5	H	H	H	H								H						H	H		
				10	H	H	H	H								H						H	H		
5C_DG-512	B4015 Field	Slope south of G Street	Soil Boring	0.5	X	X	X	X								X		X				X	X	√	Characterize slope south of G Street since adjacent to road and the site of historical soil disturbance (grading); Facility drawing indicates oiled road. Analyze perchlorate since detected above ISLs in adjacent B4015 field.
				5	X	X	X	X								X		X				X	X		
				10	H	H	H	H								H		H				H	H		
5C_DG-513	B4015 Field	Slope south of G Street	Soil Boring	0.5	X	X	X	X								X		X				X	X	√	Same as 5C-DG-512.
				5	X	X	X	X								X		X				X	X		
				10	H	H	H	H								H		H				H	H		
5C_DG-514	B4015 Field	Slope south of G Street	Soil Boring	0.5	X	X	X	X								X		X				X	X	√	Same as 5C-DG-512.
				5	X	X	X	X								X		X				X	X		
				10	H	H	H	H								H		H				H	H		
5C_DG-515	B4015 Field	Slope south of G Street	Soil Boring	0.5	X	X	X	X								X		X				X	X	√	Same as 5C-DG-512. Location also targets unidentified feature observed in aerial photo.
				5	X	X	X	X								X		X				X	X		
				10	H	H	H	H								H		H				H	H		
5C_DG-516	B4015 Field	Slope south of G Street	Soil Boring	0.5	X	X	X	X										X				X	X	√	Stepout from PAH, PCBs, metals, TPH, and dioxins detections in adjacent samples. Targeted total depth based on previous sample results from nearby location.
				5	X	X	X	X										X				X	X		
5C_DG-517	B4015 Field	Storage yard area south of B4015	Soil Boring	0.5	X	X	X	X								X						X	X	√	Representative sample to characterize potential storage in cleared area around B4015 observed in aerial photographs. Location is also downslope of/adjacent to B4373 leach field to address potential subsurface lateral migration. Analyze formaldehyde to address potential hydrazine use in B4373 area.
				5	X	X	X	X								X			X			X	X		
				10	X	X	X	X								X			X			X	X		
5C_DG-518	B4015 Field	Storage yard area south of B4015	Soil Boring	0.5	X	X	X	X								X						X	X	√	Representative sample to characterize potential storage in cleared area around B4015 observed in aerial photographs. Hold deep samples pending shallow results.
				5	X	X	X	X								X						X	X		
				10	H	H	H	H								H						H	H		
5C_DG-519	B4383 LF Area	Historical drainage feature from B4383 to drainage along road	Trench	0.5	X	X	X	X	X							X						X	X	√	Targets historical drainage feature observed in aerial photo. Analyze hexavalent chromium since detected above ISL in adjacent operational area. Collect/analyze samples at depth due to potential recharge and depth uncertainty associated with feature. Trench to inspect for historical drainage/fill.
				5	X	X	X	X	X							X						X	X		
				10	X	X	X	X	X							X						X	X		
5C_DG-520	B4383 LF Area	Historical drainage south of B4383 operational area	Soil Boring	0.5	X	X	X	X	X							X						X	X	√	Targets historical drainage feature observed in aerial photo. Analyze hexavalent chromium since detected above ISL updrainage. Collect/analyze samples at depth due to potential recharge and depth uncertainty associated with feature.
				5	X	X	X	X	X							X						X	X		
				10	X	X	X	X	X							X						X	X		
5C_DG-521	B4383 LF Area	Historical drainage south of B4383 operational area	Soil Boring	0.5	X	X	X	X	X							X						X	X	√	Targets historical drainage feature observed in aerial photo. Analyze hexavalent chromium since detected above ISL updrainage. Collect/analyze samples at depth due to potential recharge and depth uncertainty associated with feature.
				5	X	X	X	X	X							X						X	X		
				10	X	X	X	X	X							X						X	X		
5C_DG-522	B4383 LF Area	North of B4483	Soil Boring	0.5	X	X	X	X								X						X	X	√	Characterize disturbed areas observed in aerial photos.
				5	X	X	X	X								X						X	X		
				10	X	X	X	X								X						X	X		
5C_DG-523	B4383 LF Area	South of B4483	Soil Boring	0.5	X	X	X	X								X						X	X	√	Characterize disturbed areas observed in aerial photos.
				5	X	X	X	X								X						X	X		
				10	X	X	X	X								X						X	X		
5C_DG-524	B4383 LF Area	B4383 operational area	Soil Boring	0.5	X	X		X										X				X	X		Stepout samples to delineate mercury and PCB detections at B4383 operational/soil disturbance area (Hg up to 0.958 ppm at SL-107). Samples at 0.5 and 5 feet bgs, with 5 foot samples on hold pending surficial resutls; samples not collected at 10 feet based surficial release indicated by previous results (i.e. lack of mercury above background or detected PCBs at depth).
				5	H	H		H										H				H	H		
5C_DG-525	B4383 LF Area	B4383 operational area	Soil Boring	0.5	X	X		X										X				X	X		Stepout samples to delineate mercury and PCB detections at B4383 operational/soil disturbance area (Hg up to 0.958 ppm at SL-107). Sample also targets area north of B4383 where historical aerial photos indicate activity and possible storage.
				5	H	H		H										H				H	H		
				10	H	H		H										H				H	H		
5C_DG-526	B4383 LF Area	B4383 operational area	Soil Boring	0.5	X	X		X										X				X	X		Stepout samples to delineate mercury and PCB detections at B4383 operational/soil disturbance area (Hg up to 0.958 ppm at SL-107). PAHs and TPH included for representative coverage in operational area.
				5	X	X		X										X				X	X		
				10	H	X		X										H				X	X		

Table 1
Subarea 5C Phase 3 Proposed Soil Sample Locations
(2 of 13)

Location ID[1]	Area	Location Description	Sample Type	Depth (ft bgs)	Analytical Method																			Data Gap Checklist[3]	Rationale / Comments
					PAHs including NDMA (EPA Method 8270C (SIM))	PCBs / PCTs (EPA Method 8082)	Dioxins/Furans (EPA Method 1613)	Metals[2] (EPA Methods 6010B/6010C /6020/6020A/7471A/7471B)	Cr(VI) (EPA Method 7196A)	Silver (EPA Method 6020)	Mercury (EPA Method 7174A)	Biphenyls (EPA Method 8270C)	Terphenyls (EPA Method 8015B)	Glycols (EPA Method 8015B)	Alcohols (EPA Method 8015B)	Perchlorate (EPA Method 314.0/6850/6860)	Energetics (EPA Method 8330A)	TPH (EPA Method 8015B)	Formaldehyde (EPA Method 8315A)	Pesticides (EPA Method 8081)	Herbicides (EPA Method 8151A)	pH (EPA Method 9045C)	Soil Moisture (ASTM D2216/ EPA Method 160.3)		
5C_DG-527	B4383 LF Area	B4383 operational area	Soil Boring	0.5	X	X		X										X				X	X		Stepout samples to delineate mercury and PCB detections at B4383 operational/soil disturbance area (Hg up to 0.958 ppm at SL-107). PAHs and TPH included for representative coverage in operational area. Samples not collected at 10 feet based surficial release indicated by previous results (i.e. lack of mercury above background or detected PCBs at depth).
				5	X	X		X										X				X	X		
5C_DG-528	B4383 LF Area	B4383 operational area	Soil Boring	0.5	X	X		X										X				X	X		Same as 5C_DG-27.
				5	X	X		X										X				X	X		
5C_DG-529	B4383 LF Area	B4383 operational area	Soil Boring	0.5	X	X		X										X				X	X		Same as 5C_DG-27.
				5	X	X		X										X				X	X		
5C_DG-530	B4383 LF Area	East of B4486	Soil Boring	0.5	X	X	X	X								X						X	X	√	Characterize disturbed areas observed in aerial photos and stepout for Hg detect at SL-099. Hold deepest samples pending 0.5 and 5 foot bgs results.
				5	X	X	X	X								X						X	X		
				10	H	H	H	H								H						H	H		
5C_DG-531	B4383 LF Area	B4483	Soil Boring	0.5	X	X	X	X								X						X	X	√	Characterize disturbed areas observed in aerial photos. Hold deepest samples pending 0.5 and 5 foot bgs results.
				5	X	X	X	X								X						X	X		
				10	H	H	H	H								H						H	H		
5C_DG-532	B4383 LF Area	Storm drain southwest of B4383	Soil Boring	0.5	X	X	X	X	X													X	X		Stepout for dioxins, PAHs, PCBs, metals at SL-114 (12.8 ppt). Field verify for precise location based on storm drain sample (may need to move slightly down drainage from storm drain).
5C_DG-533	B4383 LF Area	South of B4483	Soil Boring	0.5	X	X	X	X								X						X	X	√	Characterize disturbed areas observed in aerial photos. Hold deepest samples pending 0.5 and 5 foot bgs results.
				5	X	X	X	X								X						X	X		
				10	H	H	H	H								H						H	H		
5C_DG-534	B4383 LF Area	Historical drainage east of B4383 operational area	Soil Boring	0.5	X	X	X	X								X						X	X	√	Targets historical drainage feature observed in aerial photo. Collect/analyze samples at depth due to potential recharge and depth uncertainty associated with feature.
				5	X	X	X	X								X						X	X		
				10	X	X	X	X								X						X	X		
5C_DG-535	B4383 LF Area	Historical drainage east of B4383 operational area	Soil Boring	0.5	X	X	X	X								X						X	X	√	Targets historical drainage feature observed in aerial photo; located at confluence with historical drainage leading from B4011 operational area observed in 1959/1960 aerial photo. Collect/analyze samples at depth due to potential recharge and depth uncertainty associated with feature.
				5	X	X	X	X								X						X	X		
				10	X	X	X	X								X						X	X		
5C_DG-536	SPTF	Unknown tank south of B4461	Soil Boring	0.5	X	X		X						X	X			X				X	X	√	Unknown tank identified during sitewide aerial photo review; analyze for SPTF suite. PCBs, dioxins added as stepout for detection at SL-096. PAHs added to delineate detections at SL-096 and U5BS1053. Deeper samples on hold pending shallow results since location for potential AST surface release .
				5	H	H		H						H	H			H				H	H		
				10	H	H		H						H	H			H				H	H		
5C_DG-537	SPTF	Unknown tank south of B4461	Soil Boring	0.5	X	X		X						X	X			X				X	X	√	Unknown tank identified during sitewide aerial photo review; analyze for SPTF suite. Deeper samples on hold pending shallow results since location addressing potential surface release related to AST.
				5	H	H		H						H	H			H				H	H		
				10	H	H		H						H	H			H				H	H		
5C_DG-538	B4383 LF Area	Historical drainage east of B4383 operational area	Trench	0.5	X	X	X	X								X				X		X	X	√	Sample near former location L2BS1400 to target historical drainage collection feature observed in aerial photo near road (at apparent culvert). Excavate exploratory trench to inspect soil for fill, sediments, staining, and other indications of historical drainages and/or impacts. Serves to characterize potential runoff from upstream drainages/operational areas and is upstream/upslope of elevated results (e.g., SL-116-SA5C, SL-117-SA5C, SL-179-SA5B). Collect/analyze (no hold) samples at depth due to potential recharge and depth/location uncertainty associated with feature.
				5	X	X	X	X								X				X		X	X		
				10	X	X	X	X								X				X		X	X		
5C_DG-539	SPTF	Storage area north of Alcohol Drainage Pond	Soil Boring	0.5	X	X	X	X						X	X			X				X	X	√	Representative sampling to complete characterization of open storage area.
				5	X	X	X	X						X	X			X				X	X		
				10	H	H	H	H						H	H			H				H	H		
5C_DG-540	B4383 LF Area	Historical drainage east of B4383 operational area	Soil Boring	0.5	X	X	X	X								X						X	X	√	Targets historical drainage feature observed in aerial photo. Collect/analyze samples at depth due to potential recharge and depth uncertainty associated with feature.
				5	X	X	X	X								X						X	X		
				10	X	X	X	X								X						X	X		
5C_DG-542	SPTF	North of B4662 pad	Soil Boring	0.5	X		X	X	X													X	X	√	Stepout to delineate surficial impact of PAHs, lead, hexavalent chromium, and dioxins at B4462 pad. Collect sample at 5 feet or just above bedrock (nearby bedrock at 3 to 4 feet bgs).
				5.0	X		X	X	X													X	X		
5C_DG-543	SPTF	Storage area north of Alcohol Drainage Pond	Soil Boring	0.5	X	X		X						X	X			X				X	X	√	Representative sampling to complete characterization of open storage area; also targets drainage swale north of the pond. Hold deep pending shallow results.
				5	X	X		X						X	X			X				X	X		
				10	H	H		H						H	H			H				H	H		
5C_DG-544	SPTF	Storage area north of Alcohol Drainage Pond	Soil Boring	0.5	X	X		X						X	X			X				X	X	√	Representative sampling to complete characterization of open storage area.
				5	X	X		X						X	X			X				X	X		
				10	H	H		H						H	H			H				H	H		
5C_DG-545	SPTF	Petroleum tank south of B4462	Soil Boring	0.5	X	X		X						X	X			X				X	X	√	Representative sampling to complete characterization of open storage area. Targets petroleum storage tank. PAHs will delineate detects at U5BS1052 (2,080 ppb of B(a)P). Deeper samples on hold pending shallow results since location assesses potential for surface release and delineates surfical impacts.
				5	X	X		X						X	X			X				X	X		
				10	H	H		H						H	H			H				H	H		
5C_DG-546	SPTF	South of B4462	Soil Boring	0.5	X	X		X						X	X			X				X	X	√	Representative sampling to complete characterization of open storage area. PAHs will delineate detects at U5BS1052 (1,000 ppb of B(a)P).
				5	X	X		X						X	X			X				X	X		
				10	H	H		H						H	H			H				H	H		
5C_DG-547	SPTF	Drainage south of Alcohol Drainage Pond	Soil Boring	0.5	X	X		X	X					X	X			X				X	X	√	Location targets drainage swale feature. Hexavalent chromium included to delineate down drainage detection above ISL. Analyze samples at depth to assess vertical migration in a potential recharge feature.
				5	X	X		X	X					X	X			X				X	X		
				10	X	X		X	X					X	X			X				X	X		

Table 1
Subarea 5C Phase 3 Proposed Soil Sample Locations
(3 of 13)

Location ID[1]	Area	Location Description	Sample Type	Depth (ft bgs)	Analytical Method																				Data Gap Checklist[3]	Rationale / Comments
					PAHs including NDMA (EPA Method 8270C (SIM))	PCBs / PCTs (EPA Method 8082)	Dioxins/Furans (EPA Method 1613)	Metals[2] (EPA Methods 6010B/6010C /6020/6020A/7471A/7471B)	Cr(VI) (EPA Method 7196A)	Silver (EPA Method 6020)	Mercury (EPA Method 7174A)	Biphenyls (EPA Method 8270C)	Terphenyls (EPA Method 8015B)	Glycols (EPA Method 8015B)	Alcohols (EPA Method 8015B)	Perchlorate (EPA Method 314.0/6850/6860)	Energetics (EPA Method 8330A)	TPH (EPA Method 8015B)	Formaldehyde (EPA Method 8315A)	Pesticides (EPA Method 8081)	Herbicides (EPA Method 8151A)	pH (EPA Method 9045C)	Soil Moisture (ASTM D2216/ EPA Method 160.3)		
5C_DG-548	SPTF	Drainage south of Alcohol Drainage Pond	Soil Boring	0.5	X	X		X	X					X	X			X				X	X	√	Location targets drainage swale feature. Hexavalent chromium included to delineate down drainage detection above ISL. Analyze samples at depth to assess vertical migration in a potential recharge feature.
				5	X	X		X	X					X	X			X				X	X		
				10	X	X		X	X					X	X			X				X	X		
5C_DG-550	SPTF	Unknown tank west of B4463	Soil Boring	0.5	X	X		X						X	X			X				X	X	√	Sample targeting storage tanks with unknown contents. Hold deep samples pending shallow results since location addresses potential surface release from tank.
				5	X	X		X						X	X			X				X	X		
				10	H	H		H						H	H			H				H	H		
5C_DG-551	SPTF	Alcohol AST south of B4463	Soil Boring	0.5	X	X		X						X	X			X				X	X	√	Sample targeting alcohol storage tank; no previous sample collected. Hold deep samples pending shallow results since location addresses potential surface release from tank.
				5	X	X		X						X	X			X				X	X		
				10	H	H		H						H	H			H				H	H		
5C_DG-552	SPTF	Unknown tank west of B4463	Soil Boring	0.5	X	X		X						X	X			X				X	X	√	Sample targeting storage tank with unknown contents identified during sitewide aerial photo review. Hold deep samples pending shallow results since location addresses potential surface release from tank.
				5	X	X		X						X	X			X				X	X		
				10	H	H		H						H	H			H				H	H		
5C_DG-554	SPTF	Unknown tank west of B4463	Soil Boring	0.5	X	X		X						X	X			X				X	X	√	Sample targeting storage tank with unknown contents identified during sitewide aerial photo review. Hold deep samples pending shallow results since location addresses potential surface release from tank.
				5	X	X		X						X	X			X				X	X		
				10	H	H		H						H	H			H				H	H		
5C_DG-555	SPTF	Unknown tank north of B4463	Soil Boring	0.5	X	X		X						X	X			X				X	X	√	Sample targeting storage tank with unknown contents identified during sitewide aerial photo review. Hold deep samples pending shallow results since location addresses potential surface release from tank.
				5	X	X		X						X	X			X				X	X		
				10	H	H		H						H	H			H				H	H		
5C_DG-556A	B4383 LF Area	Transformer SEof B4487	Soil Boring	0.5		X																	X	√	Previous sample was a composite of four discrete samples with ND result. Transformers in Area IV with previous ND results are being resampled with discrete samples. Recollect samples at four former discrete locations and analyze each sample for PCBs; hold deep samples pending shallow results.
				3		H																	H		
5C_DG-556B	B4383 LF Area	Transformer SEof B4487	Soil Boring	0.5		X																	X		
				3		H																	H		
5C_DG-556C	B4383 LF Area	Transformer SEof B4487	Soil Boring	0.5		X																	X		
				3		H																	H		
5C_DG-556D	B4383 LF Area	Transformer SEof B4487	Soil Boring	0.5		X																	X		
				3		H																	H		
5C_DG-557A	B4383 LF Area	Transformer SWof B4487	Soil Boring	0.5		X																	X	√	Same as 5C_DG-556.
				3		H																	H		
5C_DG-557B	B4383 LF Area	Transformer SWof B4487	Soil Boring	0.5		X																	X		
				3		H																	H		
5C_DG-557C	B4383 LF Area	Transformer SWof B4487	Soil Boring	0.5		X																	X		
				3		H																	H		
5C_DG-557D	B4383 LF Area	Transformer SWof B4487	Soil Boring	0.5		X																	X		
				3		H																	H		
5C_DG-558A	B4383 LF Area	Transformer Sof B4462	Soil Boring	0.5		X																	X	√	Same as 5C_DG-556.
				3		H																	H		
5C_DG-558B	B4383 LF Area	Transformer Sof B4462	Soil Boring	0.5		X																	X		
				3		H																	H		
5C_DG-558C	B4383 LF Area	Transformer Sof B4462	Soil Boring	0.5		X																	X	√	Same as 5C_DG-556.
				3		H																	H		
5C_DG-558D	B4383 LF Area	Transformer Sof B4462	Soil Boring	0.5		X																	X		
				3		H																	H		
5C_DG-559	SPTF	Unknown tanks east of B4462	Soil Boring	0.5	X	X		X						X	X			X				X	X	√	Targets three ASTs with unknown contents. PCBs are targeting discrete location due to detection at composite sample U5BX1014. Collect sample at 3 feet due to PCB re-analysis and collect deeper sample 5 feet below.
				3	H	H		H						H	H			H				H	H		
				8	H	H		H						H	H			H				H	H		
5C_DG-560	SPTF	Drainage swale east of pond	Soil Boring	0.5	X	X		X	X					X	X			X				X	X	√	Targets drainage swale feature. Hexavalent chromium included to delineate detection to the north. Hold deep samples pending shallow results since location targets lined asphalt swale.
				5	H	H		H	H					H	H			H				H	H		
				10	H	H		H	H					H	H			H				H	H		
5C_DG-561	SPTF	Drainage swale west of pond	Soil Boring	0.5	X	X	X	X	X					X	X			X				X	X	√	Targets drainage swale feature and stepout for dioxins to the north. Hold deep samples pending shallow results since location targets lined asphalt swale.
				5	X	X	X	X	X					X	X			X				X	X		
				10	H	H	H	H	H					H	H			H				H	H		
5C_DG-562	SPTF	South of B4462	Soil Boring	0.5	X													X					X		Stepout to delineate PAHs at U5BS1053. Deeper samples on hold pending shallow since no detections above ISLs at depth in adjacent samples.
				5	H													H					H		
				10	H													H					H		
5C_DG-563	SPTF	South of B4462	Soil Boring	0.5	X													X					X		Stepout to delineate PAHs at SL-095 and U5BS1053. Deeper samples on hold pending shallow since no detections above ISLs at depth in adjacent samples.
				5	H													H					H		
				10	H													H					H		
5C_DG-564	SPTF	South of B4462	Soil Boring	0.5	X	X	X																X		PCBs, dioxins to delineate detections at SL-096. PAHs to delineate detections at SL-096 and U5BS1053. Deeper samples on hold pending shallow since no detections above ISLs at depth in adjacent samples.
				5	H	H	H																H		
				10	H	H	H																H		

Table 1
Subarea 5C Phase 3 Proposed Soil Sample Locations
(4 of 13)

Location ID[1]	Area	Location Description	Sample Type	Depth (ft bgs)	Analytical Method																				Data Gap Checklist[3]	Rationale / Comments
					PAHs including NDMA (EPA Method 8270C (SIM))	PCBs / PCTs (EPA Method 8082)	Dioxins/Furans (EPA Method 1613)	Metals[2] (EPA Methods 6010B/6010C /6020/6020A/7471A/7471B)	Cr(VI) (EPA Method 7196A)	Silver (EPA Method 6020)	Mercury (EPA Method 7174A)	Biphenyls (EPA Method 8270C)	Terphenyls (EPA Method 8015B)	Glycols (EPA Method 8015B)	Alcohols (EPA Method 8015B)	Perchlorate (EPA Method 314.0/6850/6860)	Energetics (EPA Method 8330A)	TPH (EPA Method 8015B)	Formaldehyde (EPA Method 8315A)	Pesticides (EPA Method 8081)	Herbicides (EPA Method 8151A)	pH (EPA Method 9045C)	Soil Moisture (ASTM D2216/ EPA Method 160.3)		
5C_DG-565	SPTF	South of B4462	Soil Boring	0.5	X	X	X																	X		Same as 5C_DG-564.
				5	H	H	H																	H		
				10	H	H	H																	H		
5C_DG-566	SPTF	South of B4462	Soil Boring	0.5	X	X	X																	X		Same as 5C_DG-564.
				5	H	H	H																	H		
				10	H	H	H																	H		
5C_DG-567	SPTF	Southeast of B4462	Soil Boring	0.5	X		X																	X		Sample location delineates eastern extent of PAHs - highest value of 2,080 ppb of B(a)P (U5BS1052). Analyze sample at 0.5 feet, hold sample at 5 feet (due to detects near ISL at 5 feet in SL-088) and 10 feet pending shallow results. Analyze dioxins since detections to the south.
				5	X		X																	X		
				10	H		H																	H		
5C_DG-568	SPTF	Southeast of B4462	Soil Boring	0.5	X				X											X				X		Sample location delineates eastern extent of PAHs. Targets north door of B4461 - Cr(VI) and formaldehyde due to evaporative cooler operation in bldg. Analyze samples at 0.5 and 5 feet due to detects at SL-088; sample at 10 feet on hold pending shallow results.
				5	X				X										X					X		
				10	H				H										H					H		
5C_DG-569	SPTF	Southeast of B4462	Soil Boring	0.5			X																	X		Co-locate dioxins with highest B(a)P value (U5BS1052).
				5			X																	X		
5C_DG-570	SPTF	Eastern drainage east of B4015 Field	Soil Boring	0.5	X	X	X	X								X		X	X			X	X		Stepout upstream of SL-145. Full analytical suite to address collection area and to account for possible attenuation in downstream sample.
				5	X	X	X	X								X		X	X			H	H		
5C_DG-571	SPTF	East of B4462	Soil Boring	0.5	X	X		X						X	X			X				X	X	√	Target unknown tank, complete suite for characterization (previously sampled for VOCs and TPH). Analyze sample at 0.5 feet due to potential for surficial release (based on TPH in previous sample); samples at 5 and 10 feet bgs on hold pending shallow results.
				5				H						H	H	H		H				H	H		
				10				H						H	H	H		H				H	H		
5C_DG-572	SPTF	Drainage east of B4462	Soil Boring	0.5	X	X		X						X	X			X				X	X	√	Target drainage east of operational area of B4462; also serves as stepout for PCB detections to the north.
				5	X	X		X						X	X			X				X	X		
				10	X	X		X						X	X			X				X	X		
5C_DG-573	SPTF	Southern door of B4461 pad	Soil Boring	0.5		X			X					X	X				X			X	X		Target southern door; Cr(VI) and formaldehyde due to evaporative cooler in B4461. Complete SPTF analytical suite (PCBs, alcohols, glycols). Deeper results on hold pending shallow results.
				5		X			X					X	X				X			X	X		
				10		H			H					H	H				H			H	H		
5C_DG-574	B4015 Field	North of B4015	Soil Boring	0.5	X	X	X	X								X						X	X	√	Representative sampling in storage area identified during sitewide aerial photo review. Location also targets linear unidentified feature from sitewide aerial photo review (possible pipeline). Sample at 10 feet on hold pending results in 5-foot sample.
				5	X	X	X	X								X						X	X		
				10	H	H	H	H								H						H	H		
5C_DG-575	B4015 Field	Drainage bank north of potential fill area	Soil Boring	0.5	X	X	X	X								X						X	X		Bank sample delineating detections in drainage; include analyses of other chemicals detected in area. Deeper samples on hold pending shallow results.
				5	H	H	H	H								H						H	H		
				10	H	H	H	H								H						H	H		
5C_DG-576	B4015 Field	Potential fill area east of B4015	Trench	0.5	X	X	X	X								X		X	X			X	X	√	Sample characterizes northern extent of potential fill area. Representative location analyzed for formaldehyde (as breakdown product of hydrazine) due to low level (less than ISL) concentrations of NDMA. **See Footnote 1 regarding sampling depths.**
				5	X	X	X	X								X		X	X			X	X		
				10	X	X	X	X								X		X	X			X	X		
5C_DG-577	B4015 Field	Drainage bank north of potential fill area	Soil Boring	0.5	X	X	X	X								X						X	X		Bank sample delineating detections in drainage; include analyses of other chemicals detected in area. Deeper samples on hold pending shallow results.
				5	H	H	H	H								H						H	H		
				10	H	H	H	H								H						H	H		
5C_DG-578	B4015 Field	Central area between drainages east of B4015	Soil Boring	0.5	X	X	X	X								X						X	X	√	Representative sampling targeting disturbed area. Deeper samples on hold pending shallow results.
				5	X	X	X	X								X						X	X		
				10	H	H	H	H								H						H	H		
5C_DG-579	B4015 Field	Area between drainages east of B4015 field.	Soil Boring	0.5	X	X	X	X	X							X		X	X			X	X	√	Delineate PAHs, dioxins, PCBs. Also assesses potential impacts from adjacent reclaimed water sprayfields. Depth is based on refusal at SL-124 and SL-137 (approx 5 ft bgs).
				5	X	X	X	X	X							X		X	X			X	X		
5C_DG-580	B4015 Field	Area between drainages east of B4015 field.	Soil Boring	0.5	X	X	X	X	X							X		X	X			X	X	√	Same as 5C_DG-579.
				5	X	X	X	X	X							X		X	X			X	X		
5C_DG-581	B4015 Field	Area between drainages east of B4015 field.	Soil Boring	0.5	X	X	X	X	X							X		X	X			X	X	√	Same as 5C_DG-579. **Note: Drainage ditch morphology and potential presence of bank deposits will be evaluated in the field and samples proposed as needed to delineate extent of cleanup.**
				5	X	X	X	X	X							X		X	X			X	X		
5C_DG-583	B4100	South of B4100	Soil Boring	0.5	X		X	X														X	X		Stepout from SL-073, SL-074 for dioxins(3.07 ppt), metals, PAHs (chrysene detected at 1.1X ISL; however elevated B(a)P RLs combined with dioxins at > 3X BG indicates potential for PAHs). Hold sample at 5 feet bgs pending shallow results.
				5	H		H	H														H	H		
5C_DG-584	B4100	Field East of B4100	Soil Boring	0.5	X	X		X										X				X	X		Stepout from SL-076 and SL-077 for PAHs. Representative sample in open storage area. Dioxins not selected since not generally detected above background outside the fill area.
				5	X	X		X										X				X	X		
5C_DG-585	B4100	Field East of B4100	Soil Boring	0.5	X	X		X										X				X	X		Same as 5C_DG-584. Location also targets unidentified feature observed in 1967 aerial photograph.
				5	X	X		X										X				X	X		
5C_DG-586	B4100	Drainage northwest of B4100	Soil Boring	0.5	X	X	X	X								X		X				X	X		Sample targets discharge of drainage swale surrounding perimeter of B4100. Stepout for dioxin detections at SL-056 and SL-057 (TEQ = 126.7 ng/kg and 229.3 ng/kg, respectively). Analyze for chemicals detected around building.
				5	X	X	X	X								X		X				X	X		
				10	X	X	X	X								X		X				X	X		
5C_DG-587	B4100	Sanitary sewer line east of B4100	Soil Boring	0.5	X	X	X	X										X				X	X	√	Sample targets sanitary line leaving B4100; general suite. No septic tank or leach field were found during the liquid waste holdup tank removal in 2001 and the sanitary line was observed to terminate at fence line. Sample location targets end of known septic line and also lined drainage surrounding B4100. Sample location will be determined/confirmed during pre-field work utility survey (geophysics). Collect samples at 0.5 and 5 feet bgs and deep sample just above bedrock (10 foot left as placeholder).
				5	X	X	X	X										X				X	X		
				10	X	X	X	X										X				X	X		

Table 1
Subarea 5C Phase 3 Proposed Soil Sample Locations
(5 of 13)

Location ID[1]	Area	Location Description	Sample Type	Depth (ft bgs)	Analytical Method																				Data Gap Checklist[3]	Rationale / Comments
					PAHs including NDMA (EPA Method 8270C (SIM))	PCBs / PCTs (EPA Method 8082)	Dioxins/Furans (EPA Method 1613)	Metals[2] (EPA Methods 6010B/6010C /6020/6020A/7471A/7471B)	Cr(VI) (EPA Method 7196A)	Silver (EPA Method 6020)	Mercury (EPA Method 7174A)	Biphenyls (EPA Method 8270C)	Terphenyls (EPA Method 8015B)	Glycols (EPA Method 8015B)	Alcohols (EPA Method 8015B)	Perchlorate (EPA Method 314.0/6850/6860)	Energetics (EPA Method 8330A)	TPH (EPA Method 8015B)	Formaldehyde (EPA Method 8315A)	Pesticides (EPA Method 8081)	Herbicides (EPA Method 8151A)	pH (EPA Method 9045C)	Soil Moisture (ASTM D2216/ EPA Method 160.3)		
5C_DG-588	B4100	North of B4100	Soil Boring	0.5			X																	X		Stepout location for dioxins (126.7 ppt and 229.3 ppt). Due to surficial nature of previous detections, place samples at 5 and 10 feet bgs on hold pending shallow results.
				5			H																	H		
				10			H																	H		
5C_DG-589	B4100	South of B4100	Soil Boring	0.5	X		X	X															X	X	√	Same as 5C_DG-583. Note: SL-073 is described as a shallow sample (drainage); requires field verification for actual sample location.
				5	H		H	H															H	H		
5C_DG-590A	B4100	South of B4100	Soil Boring	0.5		X																		X		Previous sample was a composite of four discrete samples (ND with elevated RLs). Transformers in Area IV with previous ND results are being resampled with discrete samples. Recollect samples at four former discrete locations and analyze each sample for PCBs; hold deep samples pending shallow results.
				3		H																		H		
5C_DG-590B	B4100	South of B4100	Soil Boring	0.5		X																		X		
				3		H																		H		
5C_DG-590C	B4100	South of B4100	Soil Boring	0.5		X																		X		Previous sample was a composite of four discrete samples (ND with elevated RLs). Transformers in Area IV with previous ND results are being resampled with discrete samples. Recollect samples at four former discrete locations and analyze each sample for PCBs; hold deep samples pending shallow results.
				3		H																		H		
5C_DG-590D	B4100	South of B4100	Soil Boring	0.5		X																		X		
				3		H																		H		
5C_DG-591	B4100	South of B4100	Soil Boring	0.5	X		X	X															X	X	√	Same as 5C_DG-583. Location also targets drainage. Hold sample at 5 feet bgs pending shallow results. Note: SL-073 is described as a shallow sample (drainage); requires field verification for actual sample location.
				5	H		H	H															H	H		
5C_DG-592	B4100	North of B4100	Soil Boring	0.5			X	X															X	X		Stepout location for dioxins (126.7 ppt and 229.3 ppt) and metals at SL-056 and SL-057 (lead and zinc); field verify potential site features (drainage/swale) to place exact sample location. Due to surficial nature of previous detections, place samples at 5 and 10 feet bgs on hold pending shallow results.
				5			H	H															H	H		
				10			H	H															H	H		
5C_DG-594	B4100	North of B4100	Soil Boring	0.5	X	X	X	X								X		X						X		Stepout location for dioxins at SL-056 and SL-057 (126.7 ppt and 229.3 ppt, respectively); also serves to assess the area near a large roll up door. Other analytical suites added to due potential sodium cleaning in area. Hold samples at 5 and 10 feet bgs since location targeting potential surficial release and shallow detections in previous data.
				5																						
				10																						
5C_DG-595	B4100	North of B4100	Soil Boring	2		X	X																	X		Co-locate sample location at SL-056-SA5C. Collect samples at 2 and 3 feet bgs to assess vertical migration of large molecular weight contaminants (PCBs, dioxins). Samples at 3 feet bgs on hold pending shallow results.
				3		H	H																	H		
5C_DG-596	B4100	North of B4100	Soil Boring	2			X																	X		Co-locate sample location at BHBS0007. Collect samples at 2 and 3 feet bgs to assess vertical migration of large molecular weight contaminants (dioxins). Samples at 3 feet bgs on hold pending shallow results.
				3			H																	H		
5C_DG-598	B4100	Field east of B4100	Trench	0.5	X	X	X	X								X		X					X	X	√	Representative sample in debris / fill area. Analytical suites selected since detected in other portions of the fill area. Excavate exploratory trench and collect samples at depth/location based on field observations.
				5	X	X	X	X								X		X					X	X		
				10	X	X	X	X								X		X					X	X		
5C_DG-599	B4100	Field east of B4100	Soil Boring	0.5	X	X	X	X								X		X					X	X	√	Representative sample in storage / debris / fill area. Analytical suites selected based on those detected in other portions of the fill area. Total depth based on previous data.
				5	X	X	X	X								X		X					X	X		
5C_DG-600	B4100	Field east of B4100	Soil Boring	0.5	X	X	X	X								X		X					X	X	√	Representative sample in open storage area. Collect deep sample if soil present (shallow soil observed in previous nearby locations). Hold deep sample pending shallow results since evaluating potential surface relaease.
				5	X	X	X	X								X		X					X	X		
				10	H	H	H	H								H		H					H	H		
5C_DG-601	B4100	Field east of B4100	Trench	0.5	X	X	X									X		X						X	√	Co-located sample to complete the analytical suite at elevated silver detect (5.6 ppm at BHTS18). Representative sample in debris/fill area. Excavate exploratory trench and collect samples at depth/location based on field observations. Actual sample locations will be based on field observation and soil conditions.
				5	X	X	X									X		X						X		
				10	X	X	X									X		X						X		
5C_DG-602	B4100	Field east of B4100	Soil Boring	0.5	X	X	X									X		X						X	√	Co-located sample to complete the suite at elevated mercury detect (0.34 ppm at BHBS1002). Representative sample in debris/fill area. Collect samples at 0.5 and 5 feet bgs since bedrock observed at 5.75 feet.
				5	X	X	X									X		X						X		
5C_DG-603	B4100	Field east of B4100	Soil Boring	0.5	X	X	X	X								X		X					X	X	√	Sample targets drainage in storage / debris / fill area. Stepout for metals detected in adjacent samples. Other analytical suites selected since detected in other portions of the debris/fill area. Sample depths based on bedrock refusal at 5.5 feet bgs in previous nearby sample locations.
				5	X	X	X	X								X		X					X	X		
5C_DG-604	B4100	Field east of B4100	Soil Boring	0.5	X	X		X								X		X					X	X	√	Representative sample in open storage area. Analytical suites selected since detected in other portions of the area. Dioxins not selected since not generally detected outside the fill area. Deep sample at 5 feet on hold pending availability of soil and shallow soil results.
				5	H	H		H								H		H					H	H		
5C_DG-605	B4100	Field east of B4100	Trench	0.5	X	X	X	X								X		X					X	X	√	Representative sample mounded material observed in EPA aerial photo review. Analytical suites selected since detected in other portions of the area. Excavate exploratory trench and collect samples based on field observation. Conditions should be observed in the trench and sample depths should target fill and native soil immediately beneath it.
				5	X	X	X	X								X		X					X	X		
				10	X	X	X	X								X		X					X	X		
5C_DG-606	B4100	Field east of B4100	Soil Boring	0.5	X	X	X	X								X		X					X	X	√	Representative sample of mounded material observed in EPA aerial photo review. Analytical suites selected since detected in other portions of the area. Deep sample on hold since soil is anticipated to be no deeper than 5 feet bgs.
				5	X	X	X	X								X		X					X	X		
				10	H	H	H	H								H		H					H	H		
5C_DG-607	B4100	Field east of B4100	Trench	0.5	X	X	X	X								X		X					X	X	√	Representative sample of mounded material observed in EPA aerial photo review. Analytical suites selected since detected in other portions of the area. Excavate exploratory trench and collect samples based on field observation. Deep sample on hold since soil is anticipated to be no deeper than 5 feet bgs.
				5	X	X	X	X								X		X					X	X		
				10	H	H	H	H								H		H					H	H		
5C_DG-608	B4100	B100 Trench	Soil Boring	0.5		X		X						X	X			X					X	X	√	Targets unknown tank for same analytical suite as unknown tanks at SPTF, adjacent to area. Shallow sample only since bedrock observed at 2 feet bgs at adjacent sample. If additional soil is observed, collect and analyze sample at 5 feet.
5C_DG-609	B4100	B100 Trench	Soil Boring	0.5		X		X						X	X			X					X	X	√	Same as 5C_DG-608.

Table 1
Subarea 5C Phase 3 Proposed Soil Sample Locations
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Location ID[1]	Area	Location Description	Sample Type	Depth (ft bgs)	Analytical Method																				Data Gap Checklist[3]	Rationale / Comments
					PAHs including NDMA (EPA Method 8270C (SIM))	PCBs / PCTs (EPA Method 8082)	Dioxins/Furans (EPA Method 1613)	Metals[2] (EPA Methods 6010B/6010C /6020/6020A/7471A/7471B)	Cr(VI) (EPA Method 7196A)	Silver (EPA Method 6020)	Mercury (EPA Method 7174A)	Biphenyls (EPA Method 8270C)	Terphenyls (EPA Method 8015B)	Glycols (EPA Method 8015B)	Alcohols (EPA Method 8015B)	Perchlorate (EPA Method 314.0/6850/6860)	Energetics (EPA Method 8330A)	TPH (EPA Method 8015B)	Formaldehyde (EPA Method 8315A)	Pesticides (EPA Method 8081)	Herbicides (EPA Method 8151A)	pH (EPA Method 9045C)	Soil Moisture (ASTM D2216/ EPA Method 160.3)		
5C_DG-610	B4100	B100 Trench	Soil Boring	0.5		X		X						X	X			X				X	X	√	Same as 5C_DG-608.
5C_DG-611	B4100	B100 Trench	Soil Boring	0.5	X	X	X	X								X		X				X	X	√	Representative sample of open storage area. Analytical suite selected due to other detections in surrounding areas. Deep sample on hold since soil is anticipated to be no deeper than 5 feet bgs.
				5	X	X	X	X								X		X				X	X		
				10	H	H	H	H								H		H				H	H		
5C_DG-612	B4100	B100 Trench	Soil Boring	0.5	X	X	X	X								X		X				X	X	√	Representative sample of open storage area. Analytical suite selected due to other detections in surrounding areas. Deep sample on hold since soil is anticipated to be no deeper than 5 feet bgs.
				5	X	X	X	X								X		X				X	X		
				10	H	H	H	H								H		H				H	H		
5C_DG-613	B4100	B100 Trench	Soil Boring	0.5	X	X	X																X		Stepout for PAHs and dioxins detected at SL-049; PCBs added due to detection above ISL. Shallow sample only since bedrock observed at 2 feet bgs at adjacent sample. If additional soil is observed, collect sample at 5 feet.
5C_DG-614	B4100	B100 Trench	Soil Boring	0.5	X	X	X																X		Same as 5C_DG-613.
5C_DG-615	B4100	B100 Trench	Soil Boring	0.5	X	X	X	X								X		X		X	X	X	X	√	Targets drainage in southern portion of storage area. Collect deep sample if soil is present; hold since shallow soils observed in previous nearby locations.
				5	X	X	X	X								X		X		X	X	X	X		
				10	H	H	H	H								H		H		H	H	H	H		
5C_DG-618	B4100	B100 Trench	Soil Boring	0.5				X								X						X	X		Stepout location for metals at BHBS1000 and BHBS1405 (Ba up to 980 ppm [7X BG]). Perchlorate added since detected in B100 Trench. Previous samples collected only at 0.5 feet. Analyze sample at 0.5; collect samples 5 feet if soil is present and hold deeper sample pending visual observations during sample collection or results in shallow samples.
				5				H								H						H	H		
5C_DG-619	B4100	B100 Trench	Soil Boring	0.5				X														X	X		Same as 5C_DG-618.
				5				X														X	X		
				10				H														H	H		
5C_DG-620	B4100	B100 Trench	Soil Boring	0.5		X	X	X								X		X				X	X		Bound the eastern margin of the B100 Trench excavation. PCBs analyzed due to limited coverage in eastern trench. Dioxins, metals, perchlorate and TPH analyzed due to detections in trench. Collect samples at 5 and 10 feet if soil is present. Analyze samples at all depths based on potential for subsurface release from B100 Trench.
				5		X	X	X								X		X				X	X		
				10		X	X	X								X		X				X	X		
5C_DG-621	B4100	B100 Trench	Soil Boring	0.5		X	X	X								X		X				X	X		Same as 5C_DG-620.
				5		X	X	X								X		X				X	X		
				10		X	X	X								X		X				X	X		
5C_DG-622	B4015 Field	Fill Area	Trench	approx 10' and 15' (see rationale for further description)	X	X	X	X								X		X	H			X	X	√	Co-locate sample location at SL-130-SA5C. Sampling to (a) verify depth and sample native soil, (b) confirm total depth of impacts below former 10' samples, and (c) assess vertical migration of large molecular weight contaminants (PCBs, dioxins) from overlying fill into native soil. Excavate exploratory trench and collect samples at previous location below 10 ft (targeting top of native soil) to bedrock (actual depths/locations will be determined based on soil conditions observed in trench). Analyze for all chemical groups detected in fill area (PAHs, PCBs, perchlorate, dioxins, metals, NDMA, TPH). Representative location on hold for formaldehyde (breakdown product of hydrazine) due to low level (less than ISL) concentrations of NDMA - pending offsite NDMA data. Note: previous sampling logs do not identify top of native soil; this sampling is intended to target native soil below fill to bedrock.
					X	X	X	X								X		X	H			X	X		
5C_DG-623	B4383 LF Area	B4383 LF Area	Soil Boring	0.5	X	X	X	X								X						X	X	√	Sample characterizes disturbed area observed in aerial photos. Metals analysis delineates Hg detection at SL-124. Hold deepest sample pending 0.5 and 5 foot bgs results.
				5	X	X	X	X								X						X	X		
				10	H	H	H	H								H						H	H		
5C_DG-624	B4015 Field	Fill Area	Trench	approx 10' and 15' (see rationale for further description)	X	X	X	X								X		X	H			X	X	√	Co-locate sample at SL-120-SA5C. Same rationale as 5C_DG-622.
					X	X	X	X								X		X	H			X	X		
5C_DG-625	B4015 Field	Fill Area	Trench	approx 10' and 15' (see rationale for further description)	X	X	X	X								X		X	H			X	X	√	Co-locate sample at SL-129-SA5C. Same rationale as 5C_DG-622.
					X	X	X	X								X		X	H			X	X		
5C_DG-628	B4100	Liquid Waste Hold up Tank Vault	Soil Boring	28	X	X	X	X								X		X				X	X	√	Location targets soil beneath former liquid waste hold up tank vault. Based on demolition/removal photos, the vault excavation bottom is estimated at approx 28 feet bgs. Collect soil from 28 feet to bedrock, sampling from native soil if observed; otherwise collect sample immediately above bedrock. Two samples assumed; sample depths may vary based on field conditions.
				33	X	X	X	X								X		X				X	X		
5C_DG-630	B4100	Liquid Waste Hold up Tank Vault	Soil Boring	28	X	X	X	X								X		X				X	X	√	Location targets former discharge pipe entrance to liquid waste hold up tank vault. Sample depths selected based on hold up tank vault removal to target native soil beneath excavation backfill. Note: All soil immediately adjacent to the inlet (i.e., at inlet depth) was excavated during removal of the hold up tank and backfilled.
				33	X	X	X	X								X		X				X	X		
5C_DG-632	B4015 Field	Transformer N of B4015	Soil Boring	0.5		X																		√	PCBs detected below ISL at previous composite sample U5BX1006. Transformers in Area IV with previous ND results are being resampled with discrete samples. Recollect samples at four former discrete locations and analyze each sample for PCBs; hold deep samples pending shallow results.
				3		X																			
5C_DG-633	B4015 Field	Transformer N of B4015	Soil Boring	0.5		X																			
				3		X																			
5C_DG-634	B4015 Field	Transformer N of B4015	Soil Boring	0.5		X																			
				3		X																			
5C_DG-635	B4015 Field	Transformer N of B4015	Soil Boring	0.5		X																			
				3		X																			

Table 1
Subarea 5C Phase 3 Proposed Soil Sample Locations
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Location ID[1]	Area	Location Description	Sample Type	Depth (ft bgs)	Analytical Method																				Data Gap Checklist[3]	Rationale / Comments
					PAHs including NDMA (EPA Method 8270C (SIM))	PCBs / PCTs (EPA Method 8082)	Dioxins/Furans (EPA Method 1613)	Metals[2] (EPA Methods 6010B/6010C /6020/6020A/7471A/7471B)	Cr(VI) (EPA Method 7196A)	Silver (EPA Method 6020)	Mercury (EPA Method 7174A)	Biphenyls (EPA Method 8270C)	Terphenyls (EPA Method 8015B)	Glycols (EPA Method 8015B)	Alcohols (EPA Method 8015B)	Perchlorate (EPA Method 314.0/6850/6860)	Energetics (EPA Method 8330A)	TPH (EPA Method 8015B)	Formaldehyde (EPA Method 8315A)	Pesticides (EPA Method 8081)	Herbicides (EPA Method 8151A)	pH (EPA Method 9045C)	Soil Moisture (ASTM D2216/ EPA Method 160.3)		
5C_DG-636	SPTF	Transformer E of B4462	Soil Boring	0.5		X																	X	√	Location targets removed transformer east of B4462. Four discrete locations will be collect surrounding transformer. Note: Transformer is being resampled since previous composite sample U5BX1014 had detect <ISL and discrete locations could not be determined accurately.
				3		H																	H		
5C_DG-637	SPTF	Transformer E of B4462	Soil Boring	0.5		X																	X		
				3		H																	H		
5C_DG-638	SPTF	Transformer E of B4462	Soil Boring	0.5		X																	X	√	Location targets removed transformer east of B4462. Four discrete locations will be collect surrounding transformer. Note: Transformer is being resampled since previous composite sample U5BX1014 had detect <ISL and discrete locations could not be determined accurately.
				3		H																	H		
5C_DG-639	SPTF	Transformer E of B4462	Soil Boring	0.5		X																	X		
				3		H																	H		
5C_DG-640	B4383 LF Area	B4383 Leach Field	Soil Boring	6	X	X	X	X	X							X						X	X	√	Location targets former leach field. Samples to be collected just below contact of fill and native (appox 6 feet bgs) to evaluate potential impacts to native soil. Collect samples at 5 foot intervals to bedrock, with deepest sample just above bedrock; analyze all samples.
				11	X	X	X	X	X							X						X	X		
5C_DG-641	B4383 LF Area	B4383 Leach Field	Soil Boring	5	X	X	X	X	X							X						X	X	√	Location targets former leach field. Samples to be collected just below contact of fill and native (appox 5 feet bgs) to evaluate potential impacts to native soil. Collect samples at 5 foot intervals to bedrock, with deepest sample just above bedrock; analyze all samples.
				10	X	X	X	X	X							X						X	X		
5C_DG-642	B4383 LF Area	B4383 Leach Field	Soil Boring	5	X	X	X	X	X							X						X	X	√	Sample at former collocated sample SL-110. Sample targets just below former leach field gravel (previous collocated samples were at 1 foot above and 4 feet below gravels). Collect samples at 5 foot intervals to bedrock, with deepest sample just above bedrock; analyze all samples.
				10	X	X	X	X	X							X						X	X		
5C_DG-643	SPTF	East of B4462	Soil Boring	2		X																	X	√	Co-locate sample location at XFBS16. Collect samples at 2 and 3 feet bgs to assess vertical migration of large molecular weight contaminants (PCBs). Samples at 3 feet bgs on hold pending shallow results.
				3		H																	H		
5C_DG-644	SPTF	East of B4462	Soil Boring	2		X																	X	√	Co-locate sample location at SL-086-SA5C. Collect samples at 2 and 3 feet bgs to assess vertical migration of large molecular weight contaminants (PCBs). Samples at 3 feet bgs on hold pending shallow results.
				3		H																	H		
5C_DG-645	B4015 Field	Fill Area	Trench	approx 10' and 15' (see rationale for further description)	X	X	X	X								X		X	H			X	X	√	Co-locate sample at SL-141-SA5C. Same rationale as 5C_DG-122, however samples will likely be shallower.
					X	X	X	X								X		X	H			X	X		
5C_DG-646	B4065 Metals Clarifier	Southern Screening Area	Trench	0.5	X		X	X														X	X		New potential fill area identified ("Loose Earth Fill") in historical drawing that associated the area with the Building 4056 Landfill. Conduct a geophysical survey and locate trenches and test pits to address any anomalies, and provide coverage over entire area. Excavate 10 exploratory trenches and 13 test pits to characterize the area, with test pits located along outer boundaries to identify extent of fill. Excavate 10 exploratory trenches, to be located based on a geophysical survey and field observations. Collect one sample from each of 10 trenches in new potential fill area. Add samples if targeting specific anomalies observed during trenching, based on PID readings, and/or based on field observations. Analyze all samples for the standard investigation suite (PAHs, PCBs/PCTs, metals, and TPH). Analyze one representative sample for dioxins, Cr(VI), biphenyls, terphenyls, glycols, perchlorate, and energetics due to historical use in Area IV operations to assess potential disposal. Hold all subsequent samples for these analyses pending results of the first sample. (Note: Location 5C_DG-646 selected for representative analysis in the table, but actual representative sample location to be based on field observations). Excavate 13 test pits at regular intervals around the area perimeter to delineate the lateral extent of the potential fill area. Test pit locations may be adjusted based on the geophysical survey results and field observations. One or more test pits may be trenched at historical topographic low points to determine the vertical extent of the potential debris area. Samples will be collected from test pit locations/depths based on field observations and/or PID readings. Collect a minimum of one sample from each test pit (additional samples may be collected if field observations warrant). For this FSP Addendum, assume 7 samples (approx. half of test pits) will be analyzed for the standard investigation suite (PAHs, PCBs/PCTs, metals, and TPH) and the remaining samples placed on hold pending field observations. Analyze one representative sample collected from test pit locations for dioxins, Cr(VI), biphenyls, terphenyls, glycols, perchlorate, and energetics due to historical use in Area IV operations to assess potential disposal; these analyses on hold in all subsequent samples pending results in representative sample. (Note: Location 5C_DG-656 selected for representative analysis in the table, but actual representative sample location to be based on field observations). Collect surface samples at ten locations (5C_DG-646, -648, -649, -652, -654, -655, -659, -663, -666, -668) to characterize area for potential aerial deposition from burning activities at the B100 Trench; analyze for PAHs, metals, and dioxins. NOTE: Overall sampling will be located to be representative of the fill area both laterally and with depth, as well as targeted locations depending on field observations.
				(see rationale)	X	X	X	X	X			X	X	X		X	X	X				X	X		
5C_DG-647	B4065 Metals Clarifier	Southern Screening Area	Trench	(see rationale)	X	X	H	X	H			H	H	H		H	H	X				X	X		
5C_DG-648	B4065 Metals Clarifier	Southern Screening Area	Trench	0.5	X		X	X														X	X		
				(see rationale)	X	X	H	X	H			H	H	H		H	H	X				X	X		
5C_DG-649	B4065 Metals Clarifier	Southern Screening Area	Trench	0.5	X		X	X														X	X		
				(see rationale)	X	X	H	X	H			H	H	H		H	H	X				X	X		
5C_DG-650	B4065 Metals Clarifier	Southern Screening Area	Trench	(see rationale)	X	X	H	X	H			H	H	H		H	H	X				X	X		
5C_DG-651	B4065 Metals Clarifier	Southern Screening Area	Trench	(see rationale)	X	X	H	X	H			H	H	H		H	H	X				X	X		
5C_DG-652	B4065 Metals Clarifier	Southern Screening Area	Trench	0.5	X		X	X														X	X		
				(see rationale)	X	X	H	X	H			H	H	H		H	H	X				X	X		
5C_DG-653	B4065 Metals Clarifier	Southern Screening Area	Trench	(see rationale)	X	X	H	X	H			H	H	H		H	H	X				X	X		
5C_DG-654	B4065 Metals Clarifier	Southern Screening Area	Trench	0.5	X		X	X														X	X		
				(see rationale)	X	X	H	X	H			H	H	H		H	H	X				X	X		
5C_DG-655	B4065 Metals Clarifier	Southern Screening Area	Trench	0.5	X		X	X														X	X		
				(see rationale)	X	X	H	X	H			H	H	H		H	H	X				X	X		
5C_DG-656	B4065 Metals Clarifier	Southern Screening Area	Test Pit	(see rationale)	X	X	X	X	X			X	X	X		X	X	X				X	X		
5C_DG-657	B4065 Metals Clarifier	Southern Screening Area	Test Pit	(see rationale)	H	H	H	H	H			H	H	H		H	H	H				H	H		

Table 1
Subarea 5C Phase 3 Proposed Soil Sample Locations
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Location ID[1]	Area	Location Description	Sample Type	Depth (ft bgs)	Analytical Method																				Data Gap Checklist[3]	Rationale / Comments
					PAHs including NDMA (EPA Method 8270C (SIM))	PCBs / PCTs (EPA Method 8082)	Dioxins/Furans (EPA Method 1613)	Metals[2] (EPA Methods 6010B/6010C /6020/6020A/7471A/7471B)	Cr(VI) (EPA Method 7196A)	Silver (EPA Method 6020)	Mercury (EPA Method 7174A)	Biphenyls (EPA Method 8270C)	Terphenyls (EPA Method 8015B)	Glycols (EPA Method 8015B)	Alcohols (EPA Method 8015B)	Perchlorate (EPA Method 314.0/6850/6860)	Energetics (EPA Method 8330A)	TPH (EPA Method 8015B)	Formaldehyde (EPA Method 8315A)	Pesticides (EPA Method 8081)	Herbicides (EPA Method 8151A)	pH (EPA Method 9045C)	Soil Moisture (ASTM D2216/ EPA Method 160.3)		
5C_DG-658	B4065 Metals Clarifier	Southern Screening Area	Test Pit	(see rationale)	X	X	H	X	H			H	H	H		H	H	X				X	X		Same as 5C_DG-646 thru 5C_DG-661.
5C_DG-659	B4065 Metals Clarifier	Southern Screening Area	Test Pit	0.5	X		X	X														X	X		
				(see rationale)	H	H	H	H	H			H	H	H		H	H	H				H	H		
5C_DG-660	B4065 Metals Clarifier	Southern Screening Area	Test Pit	(see rationale)	X	X	H	X	H			H	H	H		H	H	X				X	X		
5C_DG-661	B4065 Metals Clarifier	Southern Screening Area	Test Pit	(see rationale)	H	H	H	H	H			H	H	H		H	H	H				H	H		
5C_DG-662	B4065 Metals Clarifier	Southern Screening Area	Test Pit	(see rationale)	X	X	H	X	H			H	H	H		H	H	X				X	X		
5C_DG-663	B4065 Metals Clarifier	Southern Screening Area	Test Pit	0.5	X		X	X														X	X		
				(see rationale)	H	H	H	H	H			H	H	H		H	H	H				H	H		
5C_DG-664	B4065 Metals Clarifier	Southern Screening Area	Test Pit	(see rationale)	X	X	H	X	H			H	H	H		H	H	X				X	X		
5C_DG-665	B4065 Metals Clarifier	Southern Screening Area	Test Pit	(see rationale)	H	H	H	H	H			H	H	H		H	H	H				H	H		
5C_DG-666	B4065 Metals Clarifier	Southern Screening Area	Test Pit	0.5	X		X	X														X	X		
				(see rationale)	H	H	H	H	H			H	H	H		H	H	H				H	H		
5C_DG-667	B4065 Metals Clarifier	Southern Screening Area	Test Pit	(see rationale)	H	H	H	H	H			H	H	H		H	H	H				H	H		
5C_DG-668	B4065 Metals Clarifier	Southern Screening Area	Test Pit	0.5	X		X	X														X	X		
				(see rationale)	H	H	H	H	H			H	H	H		H	H	H				H	H		
5C_DG-669A	B4065 Metals Clarifier	Former Transformer West of B4065	Soil Boring	0.5		X																	X	√	PCB results ND with elevated RLs in previous samples (XFBS03 and XFBS04). Transformers in Area IV with previous ND results are being resampled with discrete samples. Recollect samples at four former discrete locations and analyze each sample for PCBs; hold deep samples pending shallow results.
				3		H																	H		
5C_DG-669B	B4065 Metals Clarifier	Former Transformer West of B4065	Soil Boring	0.5		X																	X		
				3		H																	H		
5C_DG-669C	B4065 Metals Clarifier	Former Transformer West of B4065	Soil Boring	0.5		X																	X		
				3		H																	H		
5C_DG-669D	B4065 Metals Clarifier	Former Transformer West of B4065	Soil Boring	0.5		X																	X		
				3		H																	H		
5C_DG-670	B4065 Metals Clarifier	Storage Area West of B4065	Soil Boring	0.5	X	X	X	X										X				X	X	√	Stepout sample to delineate dioxins and metals at SL-043. TPH added since detected in storage area. Refusal observed at approx. 3 feet in area; collect deeper sample just above bedrock and analyze since detections at SL-039 and SL-043 at depth.
				5	X	X	X	X										X				X	X		
5C_DG-671	B4065 Metals Clarifier	Storage Area West of B4065	Soil Boring	0.5	X	X	X	X										X				X	X	√	Stepout sample to delineate dioxins and metals at SL-043. TPH added since detected in storage area. Refusal observed at approx. 3 feet in area; collect deeper sample just above bedrock and analyze since detections at SL-039 and SL-043 at depth.
				5	X	X	X	X										X				X	X		
5C_DG-672	B4065 Metals Clarifier	Storage Area West of B4065	Soil Boring	0.5	X	X	X	X										X				X	X	√	Stepout sample to delineate dioxins and metals at SL-043. TPH added since detected in storage area. Refusal observed at approx. 3 feet in area; collect deeper sample just above bedrock and analyze since detections at SL-039 and SL0-43 at depth.
				5	X	X	X	X										X				X	X		
5C_DG-673	B4065 Metals Clarifier	Storage Area West of B4065	Soil Boring	0.5	X	X	X	X										X				X	X	√	Stepout sample to delineate dioxins and metals at SL-043. TPH added since detected in storage area. Refusal observed at approx. 3 feet in area; collect deeper sample just above bedrock and analyze since detections at SL-039 and SL-043 at depth.
				5	X	X	X	X										X				X	X		
5C_DG-674	B4065 Metals Clarifier	Storage Area West of B4065	Soil Boring	0.5	X	X	X	X						X	X	X		X				X	X	√	Location targets undefined feature/structure (1980 aerial) in open storage area. Also serves as stepout sample to delineate dioxins and metals at SL-043 and TPH and pesticides at SL-039. Refusal observed at 3 feet approx. 30 feet south; collect deeper sample just above bedrock and analyze since detections at SL-039 and SL-043 at depth.
				5	H	X	X	H						H	H	H		X				H	H		
5C_DG-675	B4065 Metals Clarifier	Open storage area West of B4065	Soil Boring	0.5	X	X	X	X										X		X		X	X	√	Stepout to delineate TPH and pesticides. Dioxins and metals analyzed since detected in storage area. Refusal observed at 5 feet in area; collect deeper sample just above bedrock and analyze since detections at SL-039 and SL-043 at depth.
				5	X	X	X	X										X		X		X	X		
5C_DG-676	B4065 Metals Clarifier	Storage Area Northwest of B4065	Soil Boring	0.5	X	X	X	X										X		X		X	X	√	Stepout sample to delineate dioxins and metals at SL-043. TPH added since detected in storage area. Refusal observed at approx. 3 feet in area; collect deeper sample just above bedrock and analyze since detections at SL-039 and SL-043 at depth.
				5	X	X	X	X										X		X		X	X		
5C_DG-677	B4065 Metals Clarifier	Open storage area West of B4065	Soil Boring	0.5	X	X	X	X										X				X	X	√	Sample assesses storage area (observed in 1978, 1980 aerial photos) based on previous detections (dioxins, metals, TPH). Refusal observed at approx.5 feet in area; collect deeper sample just above bedrock and analyze since detections at SL-039 and SL-043 at depth.
				5	X	X	X	X										X				X	X		

Table 1
Subarea 5C Phase 3 Proposed Soil Sample Locations
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Location ID[1]	Area	Location Description	Sample Type	Depth (ft bgs)	Analytical Method																			Data Gap Checklist[3]	Rationale / Comments
					PAHs including NDMA (EPA Method 8270C (SIM))	PCBs / PCTs (EPA Method 8082)	Dioxins/Furans (EPA Method 1613)	Metals[2] (EPA Methods 6010B/6010C /6020/6020A/7471A/7471B)	Cr(VI) (EPA Method 7196A)	Silver (EPA Method 6020)	Mercury (EPA Method 7174A)	Biphenyls (EPA Method 8270C)	Terphenyls (EPA Method 8015B)	Glycols (EPA Method 8015B)	Alcohols (EPA Method 8015B)	Perchlorate (EPA Method 314.0/6850/6860)	Energetics (EPA Method 8330A)	TPH (EPA Method 8015B)	Formaldehyde (EPA Method 8315A)	Pesticides (EPA Method 8081)	Herbicides (EPA Method 8151A)	pH (EPA Method 9045C)	Soil Moisture (ASTM D2216/ EPA Method 160.3)		
5C_DG-678	B4065 Metals Clarifier	Storage Area Northwest of B4065	Soil Boring	0.5	X	X	X	X										X		X		X	X	√	Stepout to delineate TPH and pesticides SL-039 and assess storage area. Dioxins and metals analyzed since detected in storage area. Refusal observed at approx. 5 to 6 feet in area; collect deeper sample just above bedrock and analyze since detections at SL-039 and SL-043 at depth.
				5	X	X	X	X										X		X		X	X		
5C_DG-679	B4065 Metals Clarifier	Open storage area Northwest of B4065	Soil Boring	0.5	X	X	X	X										X				X	X	√	Sample assesses storage area based on previous detections (dioxins, metals, TPH). Refusal observed at approx. 6 feet in area; collect deeper sample just above bedrock and analyze since detections at SL-043 at depth.
				5	X	X	X	X										X				X	X		
5C_DG-680	B4059 SNAP	Southwest of B4626	Soil Boring	0.5	X	X	X	X										X				X	X	√	Representative location to characterize open storage. Refusal observed between 5 and 10 feet in area; collect deeper sample just above bedrock and analyze since detections at SL-039 and SL-043 at depth.
				5	X	X	X	X										X				X	X		
				10	X	X	X	X										X				X	X		
5C_DG-681	B4059 SNAP	South of B4626	Soil Boring	0.5	X	X	X	X										X				X	X	√	Same as 5C_DG-680.
				5	X	X	X	X										X				X	X		
				10	X	X	X	X										X				X	X		
5C_DG-682	B4059 SNAP	South of B4626	Soil Boring	0.5	X	X	X	X										X				X	X	√	Same as 5C_DG-680.
				5	X	X	X	X										X				X	X		
				10	X	X	X	X										X				X	X		
5C_DG-683	B4059 SNAP	West of B4626	Soil Boring	0.5	X	X	X	X										X				X	X	√	Representative location to characterize open storage and stepout to delineate dioxins at SL-032. Refusal observed between 5 and 7 feet in area; collect deeper sample just above bedrock and analyze since detections at SL-039 and SL-043 at depth.
				5	X	X	X	X										X				X	X		
				10	X	X	X	X										X				X	X		
5C_DG-684	B4059 SNAP	West of B4626	Soil Boring	0.5	X	X	X	X										X				X	X	√	Same as 5C_DG-683.
				5	X	X	X	X										X				X	X		
				10	X	X	X	X										X				X	X		
5C_DG-685	B4059 SNAP	Building 4626	Soil Boring	0.5	X	X	X	X										X				X	X	√	Representative location to characterize open storage and stepout to delineate dioxins at SL-032. Refusal observed between 5 and 7 feet in area; collect deeper sample just above bedrock and analyze since detections at SL-039 and SL-043 at depth.
				5	X	X	X	X										X				X	X		
				10	X	X	X	X										X				X	X		
5C_DG-686	B4059 SNAP	Building 4626	Soil Boring	0.5	X	X	X	X										X				X	X		Representative location to characterize footprint of former Building 4626 (equipment storage). Hold deeper samples pending shallow results.
				5	X	X	X	X										X				X	X		
				10	H	H	H	H										H				H	H		
5C_DG-687	B4059 SNAP	Open Storage West of B4059	Soil Boring	0.5	X	X	X	X										X				X	X	√	Representative location in open storage area identified in EPA HSA (open storage observed in several aerial photographs: 1978, 1988, 1990). 5C_DG-192 targets dense storage area. Hold deep samples pending shallow results to evaluate potential surficial releases.
				5	H	X	X	X										X				X	X		
				10	H	H	H	H										H				H	H		
5C_DG-688	B4059 SNAP	Open Storage West of B4059	Soil Boring	0.5	X	X	X	X										X				X	X	√	Same as 5C_DG-687.
				5	H	X	X	X										X				X	X		
				10	H	H	H	H										H				H	H		
5C_DG-689	B4059 SNAP	Open Storage West of B4059	Soil Boring	0.5	X	X	X	X										X				X	X	√	Same as 5C_DG-687.
				5	X	X	X	X										X				X	X		
				10	H	H	H	H										H				H	H		
5C_DG-690	B4059 SNAP	Open Storage West of B4059	Soil Boring	0.5	X	X	X	X										X				X	X	√	Same as 5C_DG-687.
				5	H	X	X	X										X				X	X		
				10	H	H	H	H										H				H	H		
5C_DG-691	B4059 SNAP	Open Storage West of B4059	Soil Boring	0.5	X	X	X	X										X				X	X	√	Same as 5C_DG-687.
				5	H	X	X	X										X				X	X		
				10	H	H	H	H										H				H	H		
5C_DG-692	B4059 SNAP	Open Storage West of B4059	Soil Boring	0.5	X	X	X	X										X				X	X	√	Same as 5C_DG-687.
				5	H	X	X	X										X				X	X		
				10	H	H	H	H										H				H	H		
5C_DG-693	B4059 SNAP	Open Storage West of B4059	Soil Boring	0.5	X	X	X	X										X				X	X	√	Same as 5C_DG-687.
				5	H	X	X	X										X				X	X		
				10	H	H	H	H										H				H	H		
5C_DG-694	B4065 Metals Clarifier	Storage Yard West of B4065	Soil Boring	0.5	X	X	X	X										X				X	X	√	Representative sampling addresses storage area west of B4065 observed in aerial photographs (1980, 1983).
				5	X	X	X	X										X				X	X		
				10	H	H	H	H										H				H	H		
5C_DG-695	B4065 Metals Clarifier	Sewer Line Exiting B4065	Soil Boring	0.5	X	X		X	X									X	X					√	Sample targets location where sanitary sewer line exited former building (Note: proposed location selected to address uncertainty between conflicting documented sewer line locations; actual location will be based on sewer manhole inspection for line and/or geophysical survey performed prior to sampling). Location also addresses potential cooling tower (historical documentation indicated presence of a cooling tower at B4065 and aerial photographs show potential pipe/vent that may have been related to cooling tower). Hold 10 foot sample pending shallow results.
				5	X	X		X	X									X	X						
				10	H	H		H	H									H	H						
5C_DG-696	B4065 Metals Clarifier	B4065 Metals Clarifier Outlet	Soil Boring	2								X											X		Samples target clarifier outlet on west side (line to sewer). Shallow sample depth of 2 feet based on inlet depth shown on trench log (outlet not shown). Refusal (bedrock) anticipated at less than 10 feet bgs; collect deepest sample just above bedrock.
				5								X											H		
				10								X											H		
5C_DG-697	B4065 Metals Clarifier	B4065 Metals Clarifier/UT-76	Soil Boring	0.5														X					X		Stepout location to define extent of subsurface TPH impacts observed at SL-046 originating from UT-76. Analyze both subsurface depths due to potential migration of TPH from UT-76 along bedrock.
				5														X					X		
				10														X					X		
5C_DG-698	B4065 Metals Clarifier	B4065 Metals Clarifier/UT-76	Soil Boring	0.5	X													X					X		Stepout location to define extent of subsurface TPH impacts observed at MCTS01S02 originating from UT-76. Analyze both subsurface depths due to potential migration of TPH from UT-76 along bedrock. PAHs analzed to assess TPH constituents.
				5	X													X					X		
				10	X													X					X		

Table 1
Subarea 5C Phase 3 Proposed Soil Sample Locations
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Location ID[1]	Area	Location Description	Sample Type	Depth (ft bgs)	Analytical Method																				Data Gap Checklist[3]	Rationale / Comments
					PAHs including NDMA (EPA Method 8270C (SIM))	PCBs / PCTs (EPA Method 8082)	Dioxins/Furans (EPA Method 1613)	Metals[2] (EPA Methods 6010B/6010C /6020/6020A/7471A/7471B)	Cr(VI) (EPA Method 7196A)	Silver (EPA Method 6020)	Mercury (EPA Method 7174A)	Biphenyls (EPA Method 8270C)	Terphenyls (EPA Method 8015B)	Glycols (EPA Method 8015B)	Alcohols (EPA Method 8015B)	Perchlorate (EPA Method 314.0/6850/6860)	Energetics (EPA Method 8330A)	TPH (EPA Method 8015B)	Formaldehyde (EPA Method 8315A)	Pesticides (EPA Method 8081)	Herbicides (EPA Method 8151A)	pH (EPA Method 9045C)	Soil Moisture (ASTM D2216/ EPA Method 160.3)		
5C_DG-699	B4065 Metals Clarifier	B4065 Metals Clarifier/UT-76	Soil Boring	0.5	X													X					X		Stepout location to define extent of subsurface TPH impacts observed at MCTS01S02 originating from UT-76. Analyze both subsurface depths due to potential migration of TPH from UT-76 along bedrock. PAHs analzed to assess TPH constituents.
				5	X													X					X		
				10	X													X					X		
5C_DG-700	B4065 Metals Clarifier	B4065 Metals Clarifier/UT-76	Soil Boring	0.5														X					X		Stepout location to define extent of subsurface TPH impacts observed at MCTS01S02 originating from UT-76. Analyze both subsurface depths due to potential migration of TPH from UT-76 along bedrock.
				5														X					X		
				10														X					X		
5C_DG-701	B4065 Metals Clarifier	B4065 Metals Clarifier/UT-76	Soil Boring	0.5	X													X					X		Stepout location to define extent of subsurface TPH impacts observed at MCTS01S02 originating from UT-76. Analyze both subsurface depths due to potential migration of TPH from UT-76 along bedrock. PAHs analzed to assess TPH constituents.
				5	X													X					X		
				10	X													X					X		
5C_DG-702	B4065 Metals Clarifier	East of B4065	Soil Boring	0.5			X	X															X	X	√	Stepout to delineate dioxins at SL-045. Also serves as stepout for sample MCBS1000 with zinc at 2.6x ISL. Zinc and dioxins < ISL at depth; therefore surface sampling only.
				5			X	X															X	X		
				10			X	X															X	X		
5C_DG-703	B4065 Metals Clarifier	Building 4065	Soil Boring	0.5	X	X		X	X					X	X			X					X	X	√	Sample targets B4065 footprint. Analytical suites selected to address historical operations in B4065. Analyze all depths due to potential for soil disturbance during building demolition.
				5	X	X		X	X					X	X			X					X	X		
				10	H	H		X	X					X	X			X					X	X		
5C_DG-704	B4065 Metals Clarifier	Storage Yard West of B4065	Soil Boring	0.5	X	X	X	X										X					X	X	√	Representative sampling addresses storage area west of B4065 observed in aerial photographs (1980, 1983).
				5	X	X	X	X										X					X	X		
				10	H	H	H	H										H					H	H		
5C_DG-705	B4065 Metals Clarifier	Storage Yard West of B4065	Soil Boring	0.5	X	X	X	X										X					X	X	√	Representative sampling addresses storage area west of B4065 observed in aerial photographs (1980, 1983).
				5	X	X	X	X										X					X	X		
				10	H	H	H	H										H					H	H		
5C_DG-706	B4065 Metals Clarifier	Building 4065	Soil Boring	0.5	X	X		X										X					X	X	√	Sample targets B4065 footprint. Analytical suites selected to address historical operations in B4065. Hold 10' sample pending shallower results.
				5	X	X		X										X					X	X		
				10	H	H		H										H					H	H		
5C_DG-707	B4065 Metals Clarifier	East of B4065	Soil Boring	0.5																					√	Stepdown from Sample SL-044 for deeper sample. SL-044 was collected to assess unidentified tank. Based on nearby borings, bedrock is anticipated just over 10 feet bgs; collect sample just above bedrock to assess boron, NDMA, and TPH detected in SL-044 at depth.
				5																						
				10+	X			X										X					X	X		
5C_DG-708	B4065 Metals Clarifier	East of B4065	Soil Boring	0.5			X																		√	Stepout to delineate dioxins at SL-045. Dioxins < ISL at depth; therefore surface sample only.
5C_DG-709	B4065 Metals Clarifier	Northeast of B4065 Metals Clarifier Area	Soil Boring	0.5							X													X		Stepout for surficial Hg detections at MCBS1005. Hold deeper samples pending shallow results.
				5							H													H		
				10							H													H		
5C_DG-710A	B4065 Metals Clarifier	Transformer 4762 East of B4065	Soil Boring	0.5			X																	X	√	PCB results ND with elevated RLs in previous samples XFBS24, XFBS25. Transformers in Area IV with previous ND results are being resampled with discrete samples. Recollect samples at four former discrete locations and analyze each sample for PCBs; hold deep samples pending shallow results.
				3			H																	H		
5C_DG-710B	B4065 Metals Clarifier	Transformer 4762 East of B4065	Soil Boring	0.5			X																	X		
				3			H																	H		
5C_DG-710C	B4065 Metals Clarifier	Transformer 4762 East of B4065	Soil Boring	0.5			X																	X		
				3			H																	H		
5C_DG-710D	B4065 Metals Clarifier	Transformer 4762 East of B4065	Soil Boring	0.5			X																	X		
				3			H																	H		
5C_DG-711	B4065 Metals Clarifier	East of B4065	Soil Boring	0.5	X	X	X	X										X					X	X		One of three representative samples (5C_ DG-711, 5C_DG-724, 5CN_ DG-723) to assess operational area east of B4065 and west of B4062/B4066. Hold deeper samples pending shallow results.
				5	X	X	X	X										X					X	X		
				10	H	H	H	H										H					H	H		
5C_DG-712	B4065 Metals Clarifier	North side of B4066	Soil Boring	0.5	X	X	X	X										X					X	X		Sample located on north side of B4066 to address potential storage observed in aerial photos. Hold 10 foot samples pending shallower results.
				5	X	X	X	X										X					X	X		
				10	H	H	H	H										H					H	H		
5C_DG-713	B4065 Metals Clarifier	B4066	Soil Boring	0.5	X	X	X	X										X					X	X		Representative sample located in former B4066 footprint to address historical operations. Hold 10 foot samples pending shallow results.
				5	X	X	X	X										X					X	X		
				10	H	H	H	H										H					H	H		
5C_DG-714	B4065 Metals Clarifier	Drainage Southeast of B4066	Soil Boring	0.5	X	X	X	X										X					X	X		Targets historical drainage feature observed in aerial photo. Collect/analyze samples at depth due to potential recharge and depth uncertainty associated with feature (collect last sample just above bedrock).
				5	X	X	X	X										X					X	X		
				10	X	X	X	X										X					X	X		
5C_DG-715	B4065 Metals Clarifier	North side of B4066	Soil Boring	0.5	X	X	X	X	X									X	X				X	X		Sample targets building operations on north side of B4066. Formaldehyde, hexavalent chromium, NDMA added due to potential cooling system operation. Hold 10 foot samples pending shallow results.
				5	X	X	X	X	X									X	X				X	X		
				10	H	H	H	H	H									H	H				H	H		
5C_DG-716	B4065 Metals Clarifier	South of B4062	Soil Boring	0.5		X	X	X															X	X		Stepout for dioxins, PCBs, and metals at SL-041. Refusal at 5 feet at SL-041. Collect sample at 10 feet if soil present; otherwise collect deep sample just above bedrock since detections > ISL at 5 ft in SL-041.
				5		X	X	X															X	X		
				10		X	X	X															X	X		
5C_DG-717	B4065 Metals Clarifier	B4062	Soil Boring	0.5		X	X	X															X	X		Stepout for dioxins, PCBs, and metals at SL-041. Refusal at 5 feet at SL-041. Collect sample at 10 feet if soil present; otherwise collect deep sample just above bedrock since detections > ISL at 5 ft in SL-041.
				5		X	X	X															X	X		
				10		X	X	X															X	X		
5C_DG-718	B4065 Metals Clarifier	B4062	Soil Boring	0.5		X	X	X															X	X		Stepout for dioxins, PCBs, and metals at SL-041. Refusal at 5 feet at SL-041. Collect sample at 10 feet if soil present; otherwise collect deep sample just above bedrock since detections > ISL at 5 ft in SL-041. Also stepout for selenium U5BS1201.
				5		X	X	X															X	X		
				10		X	X	X															X	X		

Table 1
Subarea 5C Phase 3 Proposed Soil Sample Locations
(11 of 13)

Location ID[1]	Area	Location Description	Sample Type	Depth (ft bgs)	Analytical Method																			Data Gap Checklist[3]	Rationale / Comments
					PAHs including NDMA (EPA Method 8270C (SIM))	PCBs / PCTs (EPA Method 8082)	Dioxins/Furans (EPA Method 1613)	Metals[2] (EPA Methods 6010B/6010C /6020/6020A/7471A/7471B)	Cr(VI) (EPA Method 7196A)	Silver (EPA Method 6020)	Mercury (EPA Method 7174A)	Biphenyls (EPA Method 8270C)	Terphenyls (EPA Method 8015B)	Glycols (EPA Method 8015B)	Alcohols (EPA Method 8015B)	Perchlorate (EPA Method 314.0/6850/6860)	Energetics (EPA Method 8330A)	TPH (EPA Method 8015B)	Formaldehyde (EPA Method 8315A)	Pesticides (EPA Method 8081)	Herbicides (EPA Method 8151A)	pH (EPA Method 9045C)	Soil Moisture (ASTM D2216/ EPA Method 160.3)		
5C_DG-719	B4065 Metals Clarifier	South of B4062	Soil Boring	0.5		X	X	X														X	X		Stepout for dioxins, PCBs, and metals at SL-041. Refusal at 5 feet at SL-041. Collect sample at 10 feet if soil present; otherwise collect deep sample just above bedrock since detections > ISL at 5 ft in SL-041.
				5		X	X	X														X	X		
				10		X	X	X														X	X		
5C_DG-720	B4065 Metals Clarifier	South side of B4062	Soil Boring	0.5	X	X	X	X										X				X	X		Targets potential storage along southern wall of B4062 in consideration of nearby results. Hold deep samples pending shallow results.
				5	X	X	X	X										X				X	X		
				10	H	H	H	H										H				H	H		
5C_DG-721	B4065 Metals Clarifier	Drainage Southeast of B4062	Soil Boring	0.5	X	X	X	X										X				X	X		Targets historical drainage feature observed in aerial photo. Collect/analyze samples at depth due to potential recharge and depth uncertainty associated with feature (collect last sample just above bedrock).
				5	X	X	X	X										X				X	X		
				10	X	X	X	X										X				X	X		
5C_DG-722	B4065 Metals Clarifier	B4062	Soil Boring	0.5	X	X	X	X										X				X	X		Stepout for selenium at U5BS1201. Analyze general suite (PAHs, PCBs, dioxins, metals, TPH) due to testing activities at B4062. Hold the 10 foot sample pending shallower results.
				5	X	X	X	X										X				X	X		
				10	H	H	H	H										H				H	H		
5C_DG-723	B4065 Metals Clarifier	East of B4065	Soil Boring	0.5	X	X	X	X										X				X	X		One of three representative samples (5C_ DG-711 ,5C_DG-724, 5CN_ DG-723) to assess operational area east of B4065 and west of B4062/B4066. Hold deeper samples pending shallow results.
				5	X	X	X	X										X				X	X		
				10	H	H	H	H										H				H	H		
5C_DG-724	B4065 Metals Clarifier	Northeast of B4065	Soil Boring	0.5	X	X	X	X										X				X	X		One of three representative samples (5C_ DG-711 ,5C_DG-724, 5CN_ DG-723) to assess operational area east of B4065 and west of B4062/B4066. Hold deeper samples pending shallow results.
				5	X	X	X	X										X				X	X		
				10	H	H	H	H										H				H	H		
5C_DG-725	B4065 Metals Clarifier	North side of B4062	Soil Boring	0.5	X	X	X	X										X				X	X		Sample targets unidentified feature observed in 1980 aerial photograph. Hold deeper samples pending shallow results. Conduct geophysical survey along north side of building to assess potential pipeline from UST to building.
				5	H	H	H	H										H				H	H	√	
				10	H	H	H	H										H				H	H		
5C_DG-726	B4065 Metals Clarifier	B4062	Soil Boring	0.5	X	X	X	X										X				X	X		Sample targets the sanitary sewer exit from building. Analyze general suite (PAHs, PCBs, dioxins, metals, TPH) due to testing activities in the building. Hold deep sample pending shallow results. Conduct geophysical survey to assess actual location of sanitary sewer line.
				5	X	X	X	X										X				X	X		
				10	H	H	H	H										H				H	H		
5C_DG-727	B4059 SNAP	Southwest of B4057	Soil Boring	0.5	X	X	X	X										X				X	X		Representative sample in operational area west of B4057; may serve as stepout for TPH impacts south of B4057 and/or stepout for deep impacts if observed at dry well to east. Hold deeper samples pending shallow results at 5C_ DG-728 or deep results to east along bedrock.
				5	H	X	X	X										X				X	X		
				10	H	H	H	H										H				H	H		
5C_DG-728	B4059 SNAP	South of B4057	Soil Boring	0.5														X							Stepout for TPH detections at SABS1005. Deepest sample will target just above bedrock; analyze larger chemical suite depending on 5C_DG-730 and/or 5C_DG-731 results near bedock to assess migration along bedrock from drywell.
				5														X							
				10														X							
5C_DG-729	B4059 SNAP	South of B4057	Soil Boring	0.5														X							Same as 5C_DG-728.
				5														X							
				10														X							
5C_DG-730	B4059 SNAP	Dry Well South of B4057	Soil Boring	0.5	X			X	X									X	X			X	X		Stepout / stepdown for TPH and metals in samples targeting dry well (SL-030, SL-031); includes NDMA, Cr(VI), and formaldehyde to address operations involving cooling water use. Dry well feature has total depth of 6 feet bgs. Collect samples at 6 and 11 feet, with the deepest sample just above bedrock since detections in previous sampling at depth and to assess migration along bedrock from dry well.
				5	X			X	X									X	X			X	X	√	
				10	X			X	X									X	X			X	X		
5C_DG-731	B4059 SNAP	Dry Well South of B4057	Soil Boring	0.5	X			X	X									X	X			X	X		Same as 5C_DG-730.
				5	X			X	X									X	X			X	X	√	
				10	X			X	X									X	X			X	X		
5C_DG-732	B4059 SNAP	Dry Well South of B4057	Soil Boring	6	X			X	X									X	X			X	X		Same as 5C_DG-730.
				11	X			X	X									X	X			X	X	√	
				15	X			X	X									X	X			X	X		
5C_DG-733	S of B4057	Sewer discharge from B4057	Soil Boring	0.5	X	X	X	X	X									X	X			X	X		Targets sewer discharge from B4057; includes Cr(VI) and formaldehyde to address operations involving cooling water use. Collect deep sample just above bedrock and hold pending shallow results. Analyze larger chemical suite in deep sample depending on 5C_DG-732 results near bedock to assess migration along bedrock from drywell.
				5	X	X	X	X	X									X	X			X	X	√	
				10	H	H	H	H	H									H	H			H	H		
5C_DG-734	B4059 SNAP	West Side of B4057	Soil Boring	0.5	X	X	X	X										X				X	X		Sample location targets accessway west of B4057 observed in aerial photographs and serves as stepout for TPH at SABS1004 near utility trench. Maximum TPH at 6 feet bgs in SABS1004; hold 10 foot sample pending shallower results.
				5	X	X	X	X										X				X	X		
				10	H	H	H	H										H				H	H		
5C_DG-735	B4059 SNAP	West of B4057	Soil Boring	0.5		X	X	X										X				X	X		Representative location (at surface) in operations area and stepout for TPH at NSTS02S01 and silver (confirmation) at NSTSS02/S03 in utility trench. Hold 10 foot samples pending shallow results. If surface sample detects > ISL, analyze for broad suite; or if 5C_DG-737 or -739 detects > ISLs, analyze for respective chemicals.
				5		X	X	X										X				X	X		
				10		H	H	H										H				H	H		
5C_DG-736	B4059 SNAP	West of B4057	Soil Boring	3						X															Recollect silver at previous elevated detections (NSTS02S02/NSTS02S03 at 3 to 5 feet bgs) to assess potential laboratory bias. Stepdown sample at 10 feet on hold pending shallow results. Location also serves as stepout for TPH detection to the west.
				5				X		X								X				X	X		
				10				H		H								H				H	H		
5C_DG-737	B4059 SNAP	West of B4057	Soil Boring	0.5		X	X	X										X				X	X		Stepdown below utility trench for TPH at 3.5 feet at NSTS02S01; also serves as stepout for silver (confirmation; hold pending results at data gap location to the east) detected in NSTS02S02/NSTS02S03 at 3 to 5 feet bgs. Surface sample provides representative sample for potential surficial release in operational area adjacent to equipment storage (B4626). Analytical supplements previous sampling suite (metals, TPH, and PAHs only in previous sample); see also 5C_DG-739. Hold 10 foot sample pending shallow results.
				3.5						X															
				5		X	X	X										X				X	X		
				10		H	H	H										H				H	H		
5C_DG-738	B4059 SNAP	West of B4057	Soil Boring	0.5		X	X	X										X				X	X		Same as 5C_DG-735.
				5		X	X	X										X				X	X		
				10		H	H	H										H				H	H		

Table 1
Subarea 5C Phase 3 Proposed Soil Sample Locations
(12 of 13)

Location ID[1]	Area	Location Description	Sample Type	Depth (ft bgs)	Analytical Method																			Data Gap Checklist[3]	Rationale / Comments
					PAHs including NDMA (EPA Method 8270C (SIM))	PCBs / PCTs (EPA Method 8082)	Dioxins/Furans (EPA Method 1613)	Metals[2] (EPA Methods 6010B/6010C /6020/6020A/7471A/7471B)	Cr(VI) (EPA Method 7196A)	Silver (EPA Method 6020)	Mercury (EPA Method 7174A)	Biphenyls (EPA Method 8270C)	Terphenyls (EPA Method 8015B)	Glycols (EPA Method 8015B)	Alcohols (EPA Method 8015B)	Perchlorate (EPA Method 314.0/6850/6860)	Energetics (EPA Method 8330A)	TPH (EPA Method 8015B)	Formaldehyde (EPA Method 8315A)	Pesticides (EPA Method 8081)	Herbicides (EPA Method 8151A)	pH (EPA Method 9045C)	Soil Moisture (ASTM D2216/ EPA Method 160.3)		
5C_DG-739	B4059 SNAP	West Side of B4057	Soil Boring	0.5	X	X	X	X										X				X	X		Stepout for TPH at SABS1004 and silver (confirmation for previous, biased high silver) at NSTSS02/S03; serves to characterize utility trench and provides representative sample in operational area/accessway between B4057 and B4626. Full analytical suite (also see 5C_DG-737). Hold 10 foot sample pending shallow results.
				5	X	X	X	X										X				X	X		
				10	H	H	H	H										H				H	H		
5C_DG-740	B4059 SNAP	West Side of B4057	Soil Boring	10														X					X		Stepdown for TPH at 6 feet at SABS1004, near utility trench (previous 10 foot sample not analyzed for TPH). Refusal was encountered at 10 feet; collect at 10 feet if soil is present or just above bedrock.
5C_DG-741	B4059 SNAP	North Side of B4057	Soil Boring	0.5	X	X	X	X	X									X	X			X	X		Sample location targets storage along north side of B4057 observed in aerial photographs and serves as stepout for TPH at SABS1004 near utility trench. Maximum TPH at 6 feet bgs in SABS1004; hold 10 foot sample pending shallower results. Includes Cr(VI) and formaldehyde to address operations involving cooling water use.
				5	X	X	X	X	X									X	X			X	X		
				10	H	H	H	H	H									H	H			H	H		
5C_DG-742	B4059 SNAP	North of B4057	Soil Boring	0.5	X	X	X	X	X									X	X			X	X		Representative sample in area between B4057 and B4039 to characterize for potential storage/operations associated with buildings. Includes Cr(VI) and formaldehyde to address operations involving cooling water use. Historical documentation indicates storage cabinet with chemicals was located on north wall of B4057 (SNAP RFI Report, 2008).
				5	H	X	X	X	X									X	X			X	X		
				10	H	H	H	H	H									H	H			H	H		
5C_DG-743	NW of B4059	Former Diesel Tank	Soil Boring	2	X													X					X	√	Sample location is stepout for TPH at depth at SL-005-SA5C and targets location of former AST AT-SA-16 just outside of SNAP excavation. Collect/analyze sample at 2 feet since surface soil beneath for AST likely disturbed. **Note: Drill boring to bedrock and collect/analyze samples if staining is observed.**
				5	X													X					X		
				10	X													X					X		
				15	X													X					X		
5C_DG-744A	B4059 SNAP	B4759 Transformer	Soil Boring	0.5		X																	X	√	PCB results ND with elevated RLs in previous samples (SABS01, SABS02). Transformers in Area IV with previous ND results are being resampled with discrete samples. Recollect samples at four former discrete locations and analyze each sample for PCBs; hold deep samples pending shallow results.
				3		H																	H		
5C_DG-744B	B4059 SNAP	B4759 Transformer	Soil Boring	0.5		X																	X		
				3		H																	H		
5C_DG-744C	B4059 SNAP	B4759 Transformer	Soil Boring	0.5		X																	X		
				3		H																	H		
5C_DG-745	B4065 Metals Clarifier	Drainage east of B4038	Soil Boring	0.5	X	X	X	X										X				X	X		Targets historical drainage feature observed in aerial photo (note EPA drainage sediment samples not collected due to lack of sediment in lined drainage). Collect/analyze (no hold) samples at depth due to potential recharge and depth uncertainty associated with feature (collect last sample just above bedrock).
				5	X	X	X	X										X				X	X		
				10	X	X	X	X										X				X	X		
5C_DG-746A	B4059 SNAP	Former Transformer North of B4057	Soil Boring	0.5		X																	X	√	PCB results ND with elevated RLs in previous samples (SABS01, SABS02). Transformers in Area IV with previous ND results are being resampled with discrete samples. Recollect samples at four former discrete locations and analyze each sample for PCBs; hold deep samples pending shallow results.
				3		H																	H		
5C_DG-746B	B4059 SNAP	Former Transformer North of B4057	Soil Boring	0.5		X																	X		
				3		H																	H		
5C_DG-746C	B4059 SNAP	Former Transformer North of B4057	Soil Boring	0.5		X																	X		
				3		H																	H		
5C_DG-746D	B4059 SNAP	Former Transformer North of B4057	Soil Boring	0.5		X																	X		
				3		H																	H		
5C_DG-747	B4015 Field	West Bank of Drainage	Soil Boring	0.5	X	X	X	X										X				X	X		Stepout for PAHs and dioxins detected at SL-136-SA5C and SL-144-SA5C; sample location targets western bank of drainage (verify exact location in the field). **Note: Drainage ditch morphology and potential presence of bank deposits will be evaluated in the field and samples proposed as needed to delineate extent of cleanup.**
				5	X	X	X	X										X				X	X		
				10	X	X	X	X										X				X	X		
5C_DG-750	B4065 Metals Clarifier	B4062	Soil Boring	0.5	X	X	X	X										X				X	X	√	Sample characterizes area for potential fuel line leading from UST to B4062. Analyze general suite (PAHs, PCBs, dioxins, metals, TPH) due to testing activities in the building. Conduct geophysical survey to assess actual location of fuel conveyance line. Hold 10 foot sample pending results in 0.5 and 5 foot samples.
				5	X	X	X	X										X				X	X		
				10	H	H	H	H										H				H	H		

Table 1
Subarea 5C Phase 3 Proposed Soil Sample Locations
(13 of 13)

Location ID[1]	Area	Location Description	Sample Type	Depth (ft bgs)	Analytical Method																			Data Gap Checklist[3]	Rationale / Comments
					PAHs including NDMA (EPA Method 8270C (SIM))	PCBs / PCTs (EPA Method 8082)	Dioxins/Furans (EPA Method 1613)	Metals[2] (EPA Methods 6010B/6010C /6020/6020A/7471A/7471B)	Cr(VI) (EPA Method 7196A)	Silver (EPA Method 6020)	Mercury (EPA Method 7174A)	Biphenyls (EPA Method 8270C)	Terphenyls (EPA Method 8015B)	Glycols (EPA Method 8015B)	Alcohols (EPA Method 8015B)	Perchlorate (EPA Method 314.0/6850/6860)	Energetics (EPA Method 8330A)	TPH (EPA Method 8015B)	Formaldehyde (EPA Method 8315A)	Pesticides (EPA Method 8081)	Herbicides (EPA Method 8151A)	pH (EPA Method 9045C)	Soil Moisture (ASTM D2216/ EPA Method 160.3)		
5C_DG-751	B4065 Metals Clarifier	B4062	Soil Boring	0.5	X	X	X	X										X				X	X	√	Sample characterizes area for potential fuel line leading from UST to B4062. Analyze general suite (PAHs, PCBs, dioxins, metals, TPH) due to testing activities in the building. Conduct geophysical survey to assess actual location of fuel conveyance line. Hold 10 foot sample pending results in 0.5 and 5 foot samples.
				5	X	X	X	X										X				X	X		
				10	H	H	H	H										H				H	H		
5C_DG-752	SPTF	North Edge of Alcohol Drainage Pond	Soil Boring	0.5	X	X	X	X	X					X	X			X				X	X	√	Location targets north edge of Alcohol Drainage Pond. Analyze hexavalent chromium to delineate detection to the west.
				5	X	X	X	X	X					X	X			X				X	X		
				10	H	H	H	H	H					H	H			H				H	H		

Footnotes
1. The following Location IDs were omitted or deleted during the data gap analysis process and are not included in this table: 5C_DG-503, -504, -505, -506, -511, -541, -549, -553, -582, -593, -597, -617, -626, -627, -629, -631, -748, -749.
2. Standard metals analysis includes silver and mercury, but does not include hexavalent chromium. Individual analyses for silver and mercury included for select locations.
3. Checkmark in column indicates sample was proposed based on review of information source indicated in Table 4 for the area listed in "Location Description" (GIS or aerial photo review layers).

Acronyms
AST = above-ground storage tank
B(a)P = benzo(a)pyrene
bgs = below ground surface
Cr(VI) = hexavalent chromium
EPA = Environmental Protection Agency
ft = foot/feet
H = sample on hold
Hg = mercury
ISL = interim screening level
kg = kilogram
LF = leach field
ng = nanogram
NDMA = n-nitrosodimethylamine
PAH = polyaromatic hydrocarbons
PCB = polychlorinated biphenyls
ppm = parts per million
ppt = parts per trillion
SPTF = Sodium Pump Test Facility
SM = soil matrix
SV = soil vapor
TEQ = toxicity eqivalent quotient
TPH = total petroleum hydrocarbons
VOC = volatile organice compound
X = sample to be analyzed by corresponding analytical method

Table 2
Subarea 5C Phase 3 Proposed Soil Vapor Sample Locations
(1 of 3)

Location ID	North / South	Area	Location Description	Depth (ft bgs)[1]	Data Gap Checklist[2]	Rationale / Comments
5CSV_DG-503	South	B4015 Field	Fill area in B4015 Field	5 10	√	Representative sample location for B4015 field fill area.
5CSV_DG-504	South	B4015 Field	Fill area in B4015 Field	5 10	√	Same as 5CSV_DG-503.
5CSV_DG-505	South	B4015 Field	Fill area in B4015 Field	5 10	√	Representative sample location to characterize potential storage in cleared area around B4015 observed in aerial photographs.
5CSV_DG-506	South	B4015 Field	Fill area in B4015 Field	5 10	√	Same as 5CSV_DG-503.
5CSV_DG-507	South	B4015 Field	Fill area in B4015 Field	5 10	√	Same as 5CSV_DG-503; also targets debris area.
5CSV_DG-508	South	B4015 Field	Fill area in B4015 Field	5 10	√	Same as 5CSV_DG-503.
5CSV_DG-509	South	B4015 Field	Fill area in B4015 Field	5 10	√	Same as 5CSV_DG-503.
5CSV_DG-510	South	B4015 Field	Slope south of G Street	5 10		Characterize slope south of G Street since adjacent to road and the site of historical soil disturbance (grading).
5CSV_DG-511	South	B4015 Field	Area between drainages east of B4015 field	5	√	Representative sample location in area between drainages where PAH/metals impacts observed. Sample depth based on refusal at nearby samples SL-124 and SL-137 (approx 5 ft bgs).
5CSV_DG-512	South	B4015 Field	Slope south of G Street	5 10		Characterize slope south of G Street since adjacent to road and the site of historical soil disturbance (grading).
5CSV_DG-513	South	B4015 Field	Area between drainages east of B4015 field	5	√	Same as 5CSV_DG-511.
5CSV_DG-514	South	B4383 LF Area	Drainage south of B4383 LF Area	5 10	√	Location targets historical drainage observed in aerial photos.
5CSV_DG-515	South	B4383 LF Area	North Building 4483	5 10	√	Location characterizes disturbed area observed in aerial photos.
5CSV_DG-516	South	B4383 LF Area	B4383 Leach Field	5 10	√	Targets former leach field and B4383 operational area. Collect samples at 5 foot intervals to bedrock, with deepest sample just above bedrock.
5CSV_DG-517	South	B4383 LF Area	Building 4487	5 10		Representative sample in B4383 operational area.
5CSV_DG-518	South	B4015 Field	South of SPTF	5 10	√	Location targets drainage observed in historical aerial photos along G Street to the south of SPTF.
5CSV_DG-519	South	SPTF	South of SPTF	5 10	√	Location targets drainage observed in historical aerial photos along G Street to the south of SPTF.
5CSV_DG-520	South	B100 Trench	South of B100 Trench	5	√	Location targets B100 Trench excavation/backfill and addresses elevated RLs in previous sampling (BHSV04). Sample depth based on refusal observed at nearby locations; collect deeper samples if soil is presesnt.
5CSV_DG-521	South	B4100	Field East of B4100	5 10		Location targets drainage feature in field east of B4100.
5CSV_DG-522	South	B4100	Field East of B4100	5 10	√	Representative sample in open storage area.
5CSV_DG-523	South	B4100	East Side of B4100	5 10		One of four samples representing area around B4100; addresses elevated RLs in previous sampling (BHSV0007). Previous sample encountered refusal at 8.5 feet bgs; Sampling will be conducted to the northwest of previous location in deeper soil.
5CSV_DG-524	South	B4100	East Side of B4100	5 10		One of four samples representing area around B4100; addresses elevated RLs in previous sampling (BHSV0008).
5CSV_DG-525	South	B4100	East Side of B4100	5 10 15 20		One of four samples representing area around B4100; addresses data gap at depth (previous sample from 5 feet bgs only) and elevated RLs in previous sampling (BHSV0009). Proposed depths based on refusal at 19.5 feet bgs in previous soil vapor boring.
5CSV_DG-526	South	B4100	East Side of B4100	5 10		One of four samples representing area around B4100; addresses elevated RLs in previous sampling (BHSV0006). Previous sample encountered refusal at 3 feet bgs; Sampling will be conducted southeast of previous location in deeper soil.
5CSV_DG-527	South	B4100	Field East of B4100	5 10		Representative sample in debris / fill area. Also addresses elevated RLs in previous sample BHSV03.
5CSV_DG-528	South	SPTF	South of B4462	5	√	Location targets storage area, drainage swale to south, and nearby pipeline to catchment basin. Sample depth based on refusal observed at nearby locations; collect deeper samples if soil is present.
5CSV_DG-529	South	B4100	Field East of B4100	5 10		Representative sample in debris / fill area.
5CSV_DG-530	South	B4100	Field East of B4100	5 10		Representative sample in debris / fill area.
5CSV_DG-531	South	B100 Trench	B100 Trench	5		Location targets B100 Trench excavation/backfill and addresses elevated RLs in previous sampling (BHSV02, BHSV1000). Sample depth based on refusal observed at nearby locations; collect deeper samples if soil is presesnt.
5CSV_DG-532	South	SPTF	Tanks West of B4462	5	√	Location targets above-ground storage tanks with unknown contents observed in aerial photos. Sample depth based on refusal observed at nearby locations; collect deeper samples if soil is presesnt.

Table 2
Subarea 5C Phase 3 Proposed Soil Vapor Sample Locations
(2 of 3)

Location ID	North / South	Area	Location Description	Depth (ft bgs)[1]	Data Gap Checklist[2]	Rationale / Comments
5CSV_DG-533	South	SPTF	Tanks Northwest of B4462	5	√	Location targets above-ground storage tanks with unknown contents observed in aerial photos. Sample depth based on refusal observed at nearby locations; collect deeper samples if soil is presesnt.
5CSV_DG-534	South	B100 Trench	Tanks North of B100 Trench	5	√	Location targets above-ground storage tanks with unknown contents observed in aerial photographs. Sample depth based on refusal observed at nearby locations; collect deeper samples if soil is presesnt.
5CSV_DG-535	South	B4383 LF Area	Building 4487	5 10		Representative sample in B4383 operational area.
5CSV_DG-536	South	B4383 LF Area	Drainage east of B4383 LF Area	5 10	√	Location targets historical drainage observed in aerial photos.
5CSV_DG-537	South	B4383 LF Area	North Building 4483	5 10	√	Representative sample in area of open storage.
5CSV_DG-538	North	B4065 Metals Clarifier	Drainage East of B4065	5 10	√	Targets historical drainage located downstream of metals clarifier.
5CSV_DG-539	North	B4065 Metals Clarifier	Drainage Southwest of B4066	5 10	√	Targets historical drainage feature observed in aerial photo.
5CSV_DG-540	North	B4065 Metals Clarifier	Drainage Southwest of B4062	5 10	√	Targets historical drainage feature observed in aerial photo.
5CSV_DG-541	North	B4065 Metals Clarifier	North of B4066	5 10	√	Sample location targets storage observed in aerial photos on north side of B4066; also serves as a stepout for U5SV1201.
5CSV_DG-542	North	B4065 Metals Clarifier	East of B4065	5 10		Representative location in operational area; also serves as stepout for detects at MCSV01.
5CSV_DG-543	North	B4065 Metals Clarifier	South of Metals Clarifier	5 10		Location targets vicinity of metals clarifier and historical drainage; also serves as stepout for detects at MCSV01.
5CSV_DG-544	North	B4065 Metals Clarifier	West of B4065	5 10	√	Location targets storage observed in aerial photographs; also serves as stepout for detects at MCSV01.
5CSV_DG-545	North	B4065 Metals Clarifier	West of B4065	5	√	Location targets open storage area identified during EPA aerial photo review. Refusal observed at approx. 3 feet in area; collect sample at 5 feet or just above bedrock.
5CSV_DG-546	North	B4065 Metals Clarifier	West of B4065	5 10	√	Location targets storage observed in aerial photographs.
5CSV_DG-547	North	B4065 Metals Clarifier	North of B4065	5	√	Same as 5CSV_DG-545. Refusal observed at approx. 5 feet in area; collect sample at 5 feet or just above bedrock.
5CSV_DG-548	North	B4065 Metals Clarifier	Northweast of B4065	5 10		Representative location in operational area; also serves as a stepout for detects at U5SV1201.
5CSV_DG-549	North	B4065 Metals Clarifier	Northwest of B4062	5 10		Representative location in operational area.
5CSV_DG-550	North	B4065 Metals Clarifier	North of B4062	5 10		Representative location in operational area; also serves as a stepout for detects at U5SV1201.
5CSV_DG-551	North	B4065 Metals Clarifier	Southern Screening Area	5 10		Representative location to characterize fill area southeast of the Building 56 Landfill.
5CSV_DG-552	North	B4065 Metals Clarifier	Southern Screening Area	5 10		Same as 5CSV_DG-551.
5CSV_DG-553	North	B4065 Metals Clarifier	Southern Screening Area	5 10		Same as 5CSV_DG-551.
5CSV_DG-554	North	B4065 Metals Clarifier	Southern Screening Area	5 10		Same as 5CSV_DG-551.
5CSV_DG-555	North	B4065 Metals Clarifier	Southern Screening Area	5 10		Same as 5CSV_DG-551.
5CSV_DG-556	North	B4065 Metals Clarifier	Southern Screening Area	5 10		Same as 5CSV_DG-551.
5CSV_DG-557	North	B4065 Metals Clarifier	Southern Screening Area	5 10		Same as 5CSV_DG-551.
5CSV_DG-558	North	B4059 SNAP	West of B4626	5 10	√	Location targets open storage area identified during EPA aerial photo review.
5CSV_DG-559	North	B4059 SNAP	Northwest of B4038	5 10	√	Same as 5CSV_DG-558.
5CSV_DG-560	North	B4059 SNAP	Southwest of B4057	5 10		Sample located in operational area southwest of B4057; also a stepout for U5SV1205/SASV1005, and potentially helps define chemical gradients in the vicinity of the dry well.
5CSV_DG-561	North	B4059 SNAP	South of B4057	5 10		Stepout for detects at locations near the dry well (SASV1005, SASV1006, SASV1007).
5CSV_DG-562	North	B4059 SNAP	South of B4057	5 10		Stepout for detects at locations near the dry well (SASV1005, SASV1006, SASV1007).
5CSV_DG-563	North	B4059 SNAP	North side of B4057	5 10		Location addresses potential storage on north wall of B4057 indicated by historical documentation (SNAP RFI Report, 2008).
5CSV_DG-564	North	B4059 SNAP	West of B4057	5 10		Sample location in operational area west of B4057 and targets the former utility trench.
5CSV_DG-565	North	B4059 SNAP	West of B4059	5 10	√	Same as 5CSV_DG-558. Also a stepout for detects at SASV1002.

Table 2
Subarea 5C Phase 3 Proposed Soil Vapor Sample Locations
(3 of 3)

Location ID	North / South	Area	Location Description	Depth (ft bgs)[1]	Data Gap Checklist[2]	Rationale / Comments
5CSV_DG-566	North	B4059 SNAP	West of B4059	5 10	√	Same as 5CSV_DG-558. Also a stepout for detects at SASV1002.
5CSV_DG-567	North	B4059 SNAP	West of B4059	5 10	√	Same as 5CSV_DG-558. Also a stepout for detects at SASV1002.
5CSV_DG-568	North	B4059 SNAP	South of B4059	5 10		Representative location in B4059 operational area, along south wall of excavation. Also a stepout for detects at SASV1002.
5CSV_DG-569	North	B4059 SNAP	South of B4059	5 10		Representative location in B4059 operational area, along south wall of excavation.
5CSV_DG-570	North	B4059 SNAP	B4059 SNAP Excavation	5 10		Targets backfill since demolition logs and site personnel indicate soil excavated during demolition of B4059 was stockpiled and then used to backfill the excavation (Note: the top four feet of the excavation was backfilled with soil imported from the Area IV Borrow Pit). Also assesses potential soil vapor impacts from bedrock and groundwater.
5CSV_DG-571	North	B4059 SNAP	North B4059 SNAP Excavation	5 10		Sample addresses elevated RLs in previous sample (SASV1000).
5CSV_DG-572	South	B4100	Liquid Waste Holdup Vault West of B4100	5 10	√	Targets former liquid waste hold up vault.
5CSV_DG-573	North	B4065 Metals Clarifier	North of B4062	5 10	√	Targets potential fuel pipeline leading from UST to B4062.
5CSV_DG-574	South	B4015 Field	Southwest of B4015	5 10		Characterizes area west of B4373 leach field.

Footnotes

1. Soil vapor sampling field protocols still being defined; proposed sampling included in table to be implemented after DTSC approval of Soil Vapor SOP. It is anticipated that soil vapor samples will be collected at 5-foot intervals to a depth of 20 feet bgs, and at 10-foot intervals thereafter to bedrock. All soil vapor samples will be collected and analyzed in accordance with approved procedures in a Soil Vapor SOP. In areas where soils are not deep enough for soil vapor analysis, soil matrix samples will be collected for VOC analysis using EPA Method 8260B is soils are more than 2 feet thick.

2. Checkmark in column indicates sample was proposed based on review of information source indicated in Table 4 for the area listed in "Location Description" (GIS or aerial photo review layers).

Acronyms
bgs = below ground surface
DTSC = California Department of Toxic Substances Control
EPA = Environmental Protection Agency
ft = foot/feet
GIS = geographic information system
ISL = interim screening level
LF = leach field
SNAP = Systems for Nuclear Auxillary Power
SPTF = Sodium Pump Test Facility
VOC = volatile organic compound

Table 3
Subarea 5C Phase 3 Proposed Sample Locations for Future Collection
(1 of 1)

Location ID	Area	Location Description	Sample Type	Depth (ft bgs)	Analytical Method																				Data Gap Checklist[3]	Rationale / Comments
					PAHs including NDMA (EPA Method 8270C (SIM))	PCBs / PCTs (EPA Method 8082/1668)	Dioxins/Furans (EPA Method 8290 1613)	Metals (EPA Method 6010B/6010C /6020/6020A/7471A/7471B)	Cr(VI) (EPA Method 7196A)	Silver (EPA Method 6020)	Mercury (EPA Method 7174A)	Biphenyls (EPA Method 8270C)	Terphenyls (EPA Method 8015B)	Glycols (EPA Method 8015B)	Alcohols (EPA Method 8015B)	Perchlorate (EPA Method 8321/331.0/6850/6860)	Energetics EPA Method 8330A)	TPH (EPA Method 8015B)	Formaldehyde (EPA Method 8315A)	Pesticides (EPA Method 8081)	Herbicides (EPA Method 8151A)	VOCs (SV)[2] (EPA Method 8260B)	pH (EPA Method 9045C)	Soil Moisture		
5C_DG-503	B4015 Field (Area III)	Fill area east of B4015	Trench	0.5	X	X	X	X								X							X	X	√	Future Location. Complete characterization in downslope, eastern portion of fill area based on results observed in clearly contaminated fill area to the west. **See Footnote 1 regarding sample depths.**
				5	X	X	X	X								X							X	X		
				10	X	X	X	X								X							X	X		
5C_DG-504	B4015 Field (Area III)	Fill area east of B4015	Trench	0.5	X	X	X	X								X							X	X	√	Future Location. Complete characterization in downslope, eastern portion of fill area based on results observed in clearly contaminated fill area to the west. **See Footnote 1 regarding sample depths.**
				5	X	X	X	X								X							X	X		
				10	X	X	X	X								X							X	X		
5C_DG-505	B4015 Field (Area III)	Fill area east of B4015	Trench	0.5	X	X	X	X								X							X	X	√	Future Location. Complete characterization in downslope, eastern portion of fill area based on results observed in clearly contaminated fill area to the west. **See Footnote 1 regarding sample depths.**
				5	X	X	X	X								X							X	X		
				10	X	X	X	X								X							X	X		
5C_DG-506	B4015 Field (Area III)	Fill area east of B4015	Trench	0.5	X	X	X	X								X							X	X	√	Future Location. Complete characterization in downslope, eastern portion of fill area based on results observed in clearly contaminated fill area to the west. **See Footnote 1 regarding sample depths.**
				5	X	X	X	X								X							X	X		
				10	X	X	X	X								X							X	X		
5C_DG-511	B4015 Field (Area III)	Drainage southeast of potential fill area east of B4015	Soil Boring	0.5	X	X	X	X								X							X	X	√	Future Location. Location targets drainage southeast of B4015 field in Area III just before confluence with STL-IV drainage. Additional samples may be proposed in drainage.
				5	H	H	H	H								H							H	H		
				10	H	H	H	H								H							H	H		
5C_DG-582	B4015 Field	Area III Southeast of B4015 field.	Soil Boring	0.5	X	X	X	X	X							X		X	X				X	X	√	Future Location. Stepout in Area III from PAH, PCBs, metals, TPH, and dioxins detections in adjacent samples to the northwest. Also assesses potential impacts from adjacent reclaimed water sprayfields.
				5	X	X	X	X	X							X		X	X				X	X		
5C_DG-593	B4100	North of B4100	Soil Boring	0.5		X	X	X								X		X					X	X	√	Future Location. Evaluate area northwest (prevalent wind direction) of B4100 and propose samples during HSA 8 North data gap evaluation to address potential aerial deposition due to burning activities at B100 Trench.
				5		H	H	H								H		H					H	H		
				10		H	H	H								H		H					H	H		
5C_DG-748	B4015 Field	Drainage Southeast of B4015 Field	Soil Boring	0.5	X	X	X	X								X							X	X	√	Future Location. Location targets southeast portion of the drainage that runs through the B4015 field; specifically characterizes area down drainage from detects and prior to confluence with the drainage east of B4015 field. Hold deep samples pending shallow results.
				5	H	H	H	H								H							H	H		
				10	H	H	H	H								H							H	H		
5C_DG-749	B4015 Field	Drainage Southeast of B4015 Field	Soil Boring	0.5	X	X	X	X								X							X	X	√	Future Location. Location targets southern portion of the drainage east of B4015 field; specifically characterizes area down drainage from detects and prior to confluence with the drainage that runs through B4015 field. Hold deep samples pending shallow results.
				5	H	H	H	H								H							H	H		
				10	H	H	H	H								H							H	H		
5CSV_DG-501	B4015 Field	Fill area in B4015 Field	Soil Vapor	5																		X			√	Future Location. Representative sample location for B4015 field fill area. **See Footnote 2.**
				10																		X				
5CSV_DG-502	B4015 Field	Fill area in B4015 Field	Soil Vapor	5																		X			√	Future Location. Representative sample location for B4015 field fill area. **See Footnote 2.**
				10																		X				
5C_DG-753	B4015 Field (Area III)	Drainage south of B4015 Field	Soil Boring	0.5	X	X	X	X								X							X	X	√	Future Location. Location targets drainage southeast of B4015 field in Area III; deeper samples on hold pending shallow results.
				5	H	H	H	H								H							H	H		
				10	H	H	H	H								H							H	H		

Footnotes

1. If deeper soils are encountered, additional sampling will be added as needed. Sampling will generally be at 5 foot intervals to bedrock, but will target the top of native soil (beneath fill) and soil just above bedrock. Therefore, sample intervals may be added or adjusted based on field conditions.

2. Soil vapor sampling field protocols still being defined; proposed sampling included in table to be implemented after DTSC approval of Soil Vapor SOP. It is anticipated that soil vapor samples will be collected at 5-foot intervals to a depth of 20 feet bgs, and at 10-foot intervals thereafter to bedrock. All soil vapor samples will be collected and analyzed in accordance with approved procedures in a Soil Vapor SOP. In areas where soils are not deep enough for soil vapor analysis, soil matrix samples will be collected for VOC analysis using EPA Method 8270 is soils are more than 2 feet thick.

3. Checkmark in column indicates sample was proposed based on review of information source indicated in Table 4 for the area listed in "Location Description" (GIS or aerial photo review layers).

Acronyms

AST = above-ground storage tank
B(a)P = benzo(a)pyrene
bgs = below ground surface
Cr(VI) = hexavalent chromium
EPA = Environmental Protection Agency
ft = foot/feet
H = sample on hold for specified analyses
Hg = mercury
ISL = interim screening level
kg = kilogram
LF = leach field
ng = nanogram
NDMA = n-nitrosodimethylamine
PAH = polyaromatic hydrocarbons
PCB = polychlorinated biphenyls
ppm = parts per million
ppt = parts per trillion
SPTF = Sodium Pump Test Facility
SM = soil matrix
SV = soil vapor
TEQ = toxicity eqivalent quotient
TPH = total petroleum hydrocarbons
VOC = volatile organice compound
X = sample to be analyzed by corresponding analytical method

Table 4
Subarea 5C Data Gap Checklist
(Page 1 of 1)

INFORMATION SOURCE	5C Data Gap Evaluation Areas [1]					
	B4015 Field Area	B4383 Area	SPTF Area	B4100 Area	B4065 Metals Clarifier Area	B4059 SNAP Area
GIS Base Map Layers						
Tanks (and Sitewide Tank Inventory Table)	√	√	√	√	√	√
Transformers	√	√	√	√	√	√
Structures	√	√	√	√	√	√
Sumps	√	√	√	√	√	√
Vaults	√	√	√	√	√	√
Pipes	√	√	√	√	√	√
Undefined features	√	√	√	√	√	√
Chemical Use Areas (RFI)	√	√	√	√	√	√
Streams/ditches	√	√	√	√	√	√
Leachfields	√	√	√	√	√	√
Storage Yard Areas	√	√	√	√	√	√
Roads	√	√	√	√	√	√
Soil Disturbance (Veg clearance, excavation, grading, etc)	√	√	√	√	√	√
Migration Pathways						
Surface Water	√	√	√	√	√	√
Aerial Dispersion [2]	√	√	√	√	√	√
Subsurface Soil	√	√	√	√	√	√
Site-wide Infrastructure						
IWW - spray fields	√	√	√	√	√	√
Natural Gas Pipelines (site-wide approach also in progress)	√	√	√	√	√	√
Sewer (site-wide approach also in progress)	√	√	√	√	√	√
Aerial Photo Review						
Historical aerial photographs from 17 years (1953 - 2005)	√	√	√	√	√	√
EPA Layers						
Gamma Scan	√	√	√	√	√	√
Potential Gamma Anomalies (PGRAY)	√	√	√	√	√	√
Tank Points	√	√	√	√	√	√
HSA Line Layer (HSA linear features)	√	√	√	√	√	√
HSA Photo Layer (HSA aerial photo review features)	√	√	√	√	√	√
Historical Use Data (chem use, storage, leach fields, releases, interviews, etc.)	√	√	√	√	√	√
Area IV Conduit (pipelines)	√	√	√	√	√	√
Geophysical Survey (EM, GPR, TC)	√	√	√	√	√	√
Other [3]						
Existing Building Feature Documentation - process info reviewed	√	--	√	√	√	√
Historical Facility Diagrams - deep feature info reviewed	√	√	√	√	√	√
Groundwater Impacts / Potential Inputs to Groundwater Evaluated [4]	√	√	√	√	√	√
Site-wide Tank Inventory Table for unlocated tanks (viewed with Tanks Base Map layer)	√	√	√	√	√	√
EPA Area IV radiological sampling results [5]	√	√	√	√	√	√
Uncollected EPA Phase 1 sample locations [6]	√	√	√	√	√	√

√	Feature reviewed during data gaps evaluation
√	Indicates sampling proposed based on reviewed feature
--	No buildings present for inspection

Notes

1. Data gap evaluations were performed over smaller footprints within each subarea. For Subarea 5C: the B4383 area includes the buildings west of SPTF to the subarea boundary; B4100 area includes the B4100, the B4100 Trench, and the fill materials east of the building; B4065 Metals Clarifier area includes B4065, B4066, B4062, B4038 and areas surrounding the buildings, and the potential landfill area to the west; and B4059 SNAP area includes B4059, B4057, B4626, and areas surrounding the buildings.

2. Evaluation of air dispersion migration pathways was performed using existing sampling results, or proposing additional sampling as warranted along predominant wind directions (NW-SE), and/or in adjacent drainages. For Subarea 5C, one air dispersion source was evaluated where open burning may have occurred (B4100 Trench). Additional future sampling is recommended in Subarea 8 North to assess this pathway, but existing data along with newly proposed Phase 3 data near B4100 Trench and the B4056 fill area (west of Metals Clarifier) is considered sufficient to assess potential contamination within Subarea 5C from this pathway.

3. Other notes and resources used in the data gap process included data dotmaps, a co-located sampling boring log summary table (including analytical and sample depth info), boring and trench logs from the RFI, EPA boring logs from co-located sampling, filterable dataset, the EPA HSA document, and previous RFI SAPs (e.g Group 8 for B4056 drainage north of B4100). Previous RFI Group reports were used as a reference on an as-needed basis in evaluation of selected features (e.g. building use descriptions).

4. Feature/area identified that may warrant further consideration of groundwater input sources and threat to groundwater sampling requirements by DTSC and SSFL groundwater teams. Identification based on type of feature (typically, a liquid waste disposal or storage feature), and soil detections of mobile chemicals (e.g., VOCs, NDMA, perchlorate, 1,4-dioxane), and/or multiple chemical detections signficantly above ISLs.

5. EPA radiological sampling results summaries included as part of chemical data gap evaluation process; validated data from EPA will be reviewed when available. For Subarea 5C, no chemical data gaps indicated based only on radiological sampling results although chemical sampling proposed at 2 areas with radiological trigger level exceedances (B4015 Field and B4100 Areas).

6. Proposed Phase 1 sampling locations where no radiological sample was collected by EPA (due to refusal, safety concerns, etc.) were evaluated to determine if a chemical data gap still existed, with additional sampling proposed in Phase 3 if a gap was identified.

FIGURES

Drainage courses are approximate based on topography, sample locations and aerial photograph review. Actual locations will be refined based on field reconnaissance during sampling.

HSA 8 North

HSA 5C North

HSA 5C South

HSA 5B

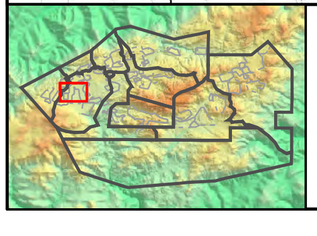
HSA 5D North

RD-16 RD-07 RD-91

4038 4062 4065 4066 4657 4806 4008 4639 4011 4172 4171 4612 4611 4486 4485 4484 4483 4487 4482 4393 4383 4100 4463 4462 4461 4662 4628 4343B 4155 4055 4020 4468 4374 4848 4373 4707 4015 4343A

5C_DG-593 5C_DG-588 5C_DG-596 5C_DG-586 5C_DG-592 5C_DG-595 5C_DG-628 5C_DG-599 5C_DG-630 5C_DG-594 5C_DG-587 5C_DG-598 5C_DG-606 5C_DG-607 5C_DG-601 5C_DG-611 5C_DG-605 5C_DG-608 5C_DG-609 5C_DG-613 5C_DG-614 5C_DG-610 5C_DG-600 5C_DG-602 5C_DG-603 5C_DG-612 5C_DG-585 5C_DG-604 5C_DG-584 5C_DG-591 5C_DG-589 5C_DG-583 5C_DG-590A 5C_DG-590D 5C_DG-590C 5C_DG-590B 5C_DG-615 5C_DG-561 5C_DG-752 5C_DG-547 5C_DG-555 5C_DG-620 5C_DG-554 5C_DG-621 5C_DG-552 5C_DG-550 5C_DG-551 5C_DG-619 5C_DG-618 5C_DG-543 5C_DG-542 5C_DG-539 5C_DG-544 5C_DG-545 5C_DG-546 5C_DG-558A 5C_DG-560 5C_DG-537 5C_DG-558D 5C_DG-548 5C_DG-558C 5C_DG-558B 5C_DG-643 5C_DG-644 5C_DG-637 5C_DG-638 5C_DG-568 5C_DG-567 5C_DG-569 5C_DG-571 5C_DG-572 5C_DG-639 5C_DG-636 5C_DG-559 5C_DG-536 5C_DG-573 5C_DG-564 5C_DG-562 5C_DG-565 5C_DG-566 5C_DG-563 5C_DG-529 5C_DG-528 5C_DG-522 5C_DG-530 5C_DG-534 5C_DG-623 5C_DG-531 5C_DG-527 5C_DG-540 5C_DG-523 5C_DG-524 5C_DG-526 5C_DG-640 5C_DG-641 5C_DG-557A 5C_DG-557B 5C_DG-642 5C_DG-557D 5C_DG-525 5C_DG-556A 5C_DG-556B 5C_DG-556C 5C_DG-556D 5C_DG-557C 5C_DG-532 5C_DG-519 5C_DG-533 5C_DG-535 5C_DG-538 5C_DG-521 5C_DG-520 5C_DG-513 5C_DG-514 5C_DG-516 5C_DG-512 5C_DG-575 5C_DG-515 5C_DG-579 5C_DG-580 5C_DG-581 5C_DG-570 5C_DG-577 5C_DG-578 5C_DG-747 5C_DG-582 5C_DG-749 5C_DG-748 5C_DG-505 5C_DG-503 5C_DG-504 5C_DG-506 5C_DG-753 5C_DG-511 5C_DG-632 5C_DG-633 5C_DG-635 5C_DG-574 5C_DG-634 5C_DG-624 5C_DG-576 5C_DG-622 5C_DG-508 5C_DG-507 5C_DG-625 5C_DG-645 5C_DG-509 5C_DG-518 5C_DG-501 5C_DG-502 5C_DG-517 5C_DG-510

Please Note: The original version of this figure includes colorized features and shading. A black and white copy of the figure should not be used because it may not accurately represent the information presented.



Base Map Legend

- Administrative Area Boundary
- Area IV HSA Subarea
- Identified Contamination Areas
- Existing Building or Structure
- Removed Building or Structure
- Ponds
- Excavated Area
- Backfilled Excavation Area
- Pipe
- Leach Field
- Drainage
- Concrete Lined Drainage
- Surface Water Divide
- Rock Outcrop
- Dirt Road
- A/C Paving
- Elevation Contour

Groundwater Wells

- Near Surface
- Chatsworth

Trenches

- Previous
- Proposed

For the "Combined Analyte" Data Summary, ratios of dioxin TEQ (2,3,7,8-TCDD TEQ), perchlorate, energetics, herbicides, pesticides, metals, NDMA, PAHs, and PCB/PCT results to respective DOE Interim Screening Levels (ISLs) were calculated. The maximum ratio was used to color code symbols at each location as shown in the legend. For locations where at least one chemical was detected, the maximum detected concentration/ISL ratio was used; otherwise the maximum RL/ISL ratio was used and the location was symbolized as ND. Locations for which detected concentrations or RLs are below both the ISL and LDC are shown as green. The chemicals included in the "combined analyte" comparison were selected to provide a single, integrated representation of primary, commonly detected chemicals for trend evaluation. Dioxin congeners, VOCs, TPH, glycols/alcohols, and formaldehyde are not included in the "combined analyte" comparison.

Proposed Area IV Data Gap Locations

- Future Sample Location
- Add to Analytical Suite at Sample Location
- Re-analysis Sample Location (RLs)
- Other Targeted Sample Location
- Tank Sample location
- Stepout/Stepdown Sample location
- Post Demolition Sampling Area

Combined Detect / LDC

- <1x LDC

Combined ND / LDC

- < 1x LDC

Combined Detect / ISL

- < 1x ISL
- 1x to 2x ISL
- 2x to 10x ISL
- 10x to 100x ISL
- > 100x ISL

Combined ND / ISL

- < 1x ISL
- 1x ISL to 2x ISL
- 2x ISL to 10x ISL
- 10x ISL to 19x ISL

LDC = Lower Display Criteria
ISL = Interim Screening Level

Subarea 5C South
Phase 3 Proposed Soil Matrix Sampling Locations

SANTA SUSANA FIELD LABORATORY

Path: T:\projects\rock3\HSA\Working\HSA5CS_Summary.mxd

Date: 5/2/2012

1 inch = 80 feet

0 80 160 Feet

FIGURE 1

Drainage courses are approximate based on topography, sample locations and aerial photograph review. Actual locations will be refined based on field reconnaissance during sampling.

BZ-NW

HSA 7

HSA 8 North

HSA 5C North

HSA 5C South

HSA 5B

Please Note: The original version of this figure includes colorized features and shading. A black and white copy of the figure should not be used because it may not accurately represent the information presented.

Base Map Legend

- Administrative Area Boundary
- Area IV HSA Subarea
- Identified Contamination Areas
- Existing Building or Structure
- Removed Building or Structure
- Ponds
- Excavated Area
- Backfilled Excavation Area
- Pipe
- Leach Field
- Drainage
- Concrete Lined Drainage
- Surface Water Divide
- Rock Outcrop
- Dirt Road
- A/C Paving
- Elevation Contour

Groundwater Wells

- Near Surface
- Chatsworth

Trenches

- Previous
- Proposed

For the "Combined Analyte" Data Summary, ratios of dioxin TEQ (2,3,7,8-TCDD TEQ), perchlorate, energetics, herbicides, pesticides, metals, NDMA, PAHs, and PCB/PCT results to respective DOE Interim Screening Levels (ISLs) were calculated. The maximum ratio was used to color code symbols at each location as shown in the legend. For locations where at least one chemical was detected, the maximum detected concentration/ISL ratio was used; otherwise the maximum RL/ISL ratio was used and the location was symbolized as ND. Locations for which detected concentrations or RLs are below both the ISL and LDC are shown as green. The chemicals included in the "combined analyte" comparison were selected to provide a single, integrated representation of primary, commonly detected chemicals for trend evaluation. Dioxin congeners, VOCs, TPH, glycols/alcohols, and formaldehyde are not included in the "combined analyte" comparison.

Proposed Area IV Data Gap Locations

- Future Sample Location
- Add to Analytical Suite at Sample Location
- Re-analysis Sample Location (RLs)
- Other Targeted Sample Location
- Tank Sample location
- Stepout/Stepdown Sample location
- Test Pit Lcoation
- Post Demolition Sampling Area

Combined Detect / LDC

- <1x LDC

Combined ND / LDC

- Combined ND / LDC

Combined Detect / ISL

- < 1x ISL
- 1x to 2x ISL
- 2x to 10x ISL
- 10x to 100x ISL
- > 100x ISL

Combined ND / ISL

- < 1x ISL
- 1x ISL to 2x ISL
- 2x ISL to 10x ISL
- 10x ISL to 19x ISL

LDC = Lower Display Criteria
ISL = Interim Screening Level

Subarea 5C North
Phase 3 Proposed Soil Matrix Sampling Locations

SANTA SUSANA FIELD LABORATORY

Path: T:\projects\rock3\HSA\Working\HSA5CN_Summary.mxd

Date: 5/2/2012

1 inch = 80 feet

0 80 160 Feet

FIGURE 2

Drainage courses are approximate based on topography, sample locations and aerial photograph review. Actual locations will be refined based on field reconnaissance during sampling.

BZ-NW

HSA 7

HSA 8 North

HSA 5C North

HSA 5C South

HSA 5B

HSA 5D North

B4059
SNAP Area

B4057
Dry Well

B4100
Trench

B4100 Liquid Waste
Holdup Tank Vault

B4065
Metals Clarifier

B4383
Leach Field

B4015 Field
Identified Contamination Area

Drainage Identified
Contamination Area

5CSV_DG-571
5CSV_DG-570
5CSV_DG-569
5CSV_DG-567
5CSV_DG-568
5CSV_DG-563
5CSV_DG-565
5CSV_DG-562
5CSV_DG-564
5CSV_DG-566
5CSV_DG-561
5CSV_DG-558
5CSV_DG-560
5CSV_DG-557
5CSV_DG-550
5CSV_DG-559
5CSV_DG-549
5CSV_DG-556
5CSV_DG-574
5CSV_DG-555
5CSV_DG-547
5CSV_DG-540
5CSV_DG-553
5CSV_DG-548
5CSV_DG-552
5CSV_DG-541
5CSV_DG-554
5CSV_DG-544
5CSV_DG-539
5CSV_DG-546
5CSV_DG-542
5CSV_DG-545
5CSV_DG-551
5CSV_DG-538
5CSV_DG-543
5CSV_DG-530
5CSV_DG-534
5CSV_DG-533
5CSV_DG-537
5CSV_DG-529
5CSV_DG-536
5CSV_DG-531
5CSV_DG-532
5CSV_DG-535
5CSV_DG-525
5CSV_DG-572
5CSV_DG-526
5CSV_DG-527
5CSV_DG-528
5CSV_DG-516
5CSV_DG-514
5CSV_DG-524
5CSV_DG-522
5CSV_DG-518
5CSV_DG-515
5CSV_DG-517
5CSV_DG-523
5CSV_DG-521
5CSV_DG-520
5CSV_DG-519
5CSV_DG-512
5CSV_DG-513
5CSV_DG-510
5CSV_DG-511
5CSV_DG-507
5CSV_DG-506
5CSV_DG-508
5CSV_DG-509
5CSV_DG-505
5CSV_DG-504
5CSV_DG-503
5CSV_DG-501
5CSV_DG-502
5CSV_DG-573

Please Note: The original version of this figure includes colorized features and shading. A black and white copy of the figure should not be used because it may not accurately represent the information presented.

Base Map Legend

- Administrative Area Boundary
- Area IV HSA Subarea
- Identified Contamination Areas
- Existing Building or Structure
- Removed Building or Structure
- Ponds
- Excavated Area
- Backfilled Excavation Area
- Pipe
- Leach Field
- Drainage
- Concrete Lined Drainage
- Surface Water Divide
- Rock Outcrop
- Dirt Road
- A/C Paving
- Elevation Contour

Groundwater Wells

- Near Surface
- Chatsworth

Trenches

- Previous
- Proposed

Proposed Area IV Data Gap Locations

- Future Sample Location
- Proposed Soil Vapor Sampling Location
- Post Demolition Sampling Area
- Area / Feature Identified as Potential Input Location to Groundwater Contamination

Subarea 5C
Phase 3 Proposed Soil Vapor Sampling Locations

SANTA SUSANA FIELD LABORATORY

Path: T:\projects\rock3\HSA\Working\HSA5C_SV_Proposed.mxd

Date: 5/2/2012

1 inch = 110 feet

0 110 220 Feet

FIGURE 3

Conduct geophysical survey of B4056 Landfill Annex to field locate exploratory test pits and trenches that will be used to delineate and characterize potential fill area.

1 inch = 50 feet

Conduct geophysical survey north of Building 4062 to assess potential location of fuel lines that connected a former fuel UST to equipment within the building.

1 inch = 25 feet

Conduct geophysical survey along southern wall of Building 4065 to confirm location of former sanitary sewer line connection to the building.

1 inch = 25 feet

Conduct geophysical survey to locate sanitary sewer line exiting west side of Building 4100, and confirm the sewer line terminates at the lined drainage as indicated in facility records.

1 inch = 25 feet

HSA 7

HSA 5B

HSA 5C

HSA 5D

RD-96

RD-91

PZ-102

PZ-098

Drainage courses are approximate based on topography, sample locations and aerial photograph review. Actual locations will be refined based on field reconnaissance during sampling.

Please Note: The original version of this figure includes colorized features and shading. A black and white copy of the figure should not be used because it may not accurately represent the information presented.

Base Map Legend

- Administrative Area Boundary
- Area IV HSA Subarea
- Identified Contamination Areas
- Existing Building or Structure
- Removed Building or Structure
- Ponds
- Excavated Area
- Backfilled Excavation Area
- Pipe
- Leach Field
- Drainage
- Concrete Lined Drainage
- Rock Outcrop
- Dirt Road
- A/C Paving
- Elevation Contour

Groundwater Wells

- Near Surface
- Chatsworth

Trenches

- Previous
- Proposed

Test Pit Location

Figure Legend

- Sanitary Sewer Line
- Proposed Geophysical Survey Area

Tank Legend

- Alcohol
- Chemicals
- Coal
- DI Water
- Drinking Water
- Flourine
- GHE
- Helium
- Hydrazine
- Morpholine
- Natural Gas
- Nitrogen
- Other
- Petroleum Fuel/Oil Tank
- R/A Water
- Septic
- Sodium
- Solvent
- TCE
- Unknown
- Water

Subarea 5C
Proposed Locations of Geophysical Surveys

SANTA SUSANA FIELD LABORATORY

Path: T:\projects\rock3\HSA\Working\HSA5C_Geophysical.mxd

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1 inch = 110 feet

0 110 220 Feet

FIGURE 4