Electronic Transmittal Form for DEEP Remediation, LUST, and PCB Secure File Transfer (SFT)

DEPARTMENT OF ENERGY AND ENVIRONMENTAL PROTECTION
REMEDIATION DIVISION, PCB PROGRAM, AND
LEAKING UNDERGROUND STORAGE TANK COORDINATION PROGRAM
www.ct.gov/deep

This Electronic Transmittal Form must be completed and included as the cover sheet of your electronic document when uploading a document to the Connecticut SFT website. Requirements for Transmittals through the SFT website:

- Documents submitted through the SFT website must include all applicable figures, tables and laboratory data.
- Files must be formatted as PDF/A and use the appropriate naming convention:
  - For Remediation Filings: **REM_REMID #_SiteAddress_Town_DocumentType_DateofDocument**
  - For LUST Filings: **LUST_SiteAddress_Town_AbbreviationForDocumentType_DateofDocument**
  - For PCB Filings: **PCB_SiteAddress_Town_AbbreviationForDocumentType_DateofDocument**

    Example: LUST_1MainStreet_Hartford_ESA_01-01-2001

    Note: For **“**AbbreviationForDocumentType” use appropriate abbreviation at Transmittal of Documents
- If no Rem ID assigned (new filing) or REM ID is unknown leave field blank

Part I: Primary Recipient*: Remediation Program (* required)

For Remediation documents:	For PCB/LUST documents:
Primary Program*: Other Remediation Program	UST Facility ID: (if applicable)
Rem ID*: 447	Spill Case Number: (if known)

Part II: Site Information

Site Name*: Olin - Pine Swamp

Site Address*: 475 Putnam Avenue

City/Town*: Hamden State: CT Zip Code: 06514

Secondary Programs (complete as many as applicable for this document):

Program	Project ID
Program: Select Secondary Program	Project ID:
Program: Select Secondary Program	Project ID:
Program: Select Secondary Program	Project ID:
Program: Select Secondary Program	Project ID:

Provide Project ID for each secondary program if it is known.
Each program has a unique ID (i.e. Rem ID, Spill Case #, UST Facility ID, etc.)

Part III: Document Information (document type required for appropriate program[s] only)

Remediation*: Phase 1 SOW

LUST/PCB*:

Date of Document*: 12/2/2024 Version: Revised

Part IV: Submitter Information

Name*: Jamie Welch

E-mail*: jamie.welch@wsp.com

Name of business this document is being submitted on behalf of and contact person email: *

Olin Corporation, Ebowen@olin.com

Environmental Remediation Group

Olin Corporation
490 Stuart Road NE
Cleveland, TN 37312
EBowen@olin.com

December 2, 2024

Mr. John Duff
Connecticut Department of Energy and Environmental Protection
Remediation Division, Bureau of Water Protection & Land Reuse
79 Elm Street
Hartford, Connecticut 06106-5127

Subject: 2024 Site Investigation Work Plan - REM.ID.447
Pine Swamp Site
475 Putnam Avenue
Hamden, Connecticut

Dear Mr. Duff,

Attached please find the 2024 Site Investigation Work Plan prepared by WSP USA, Inc. on behalf of Olin Corporation (Olin) for the property located at 475 Putnam Avenue, Hamden, Connecticut, REM.ID.447 (the Site). This report details additional investigation activities proposed for the site based on the findings of previous investigation activities and review of historical site data. This Work Plan was originally submitted on October 11, 2024, but at the request of the Connecticut Department of Energy and Environmental Protection (CT DEEP), was revised to include collection of surface water samples from the on-site ponds.

Please contact me at (203) 887-4353 or EBowen@Olin.com if you have questions or would like to discuss the activities proposed in the attached Work Plan.

Sincerely,
Olin Corporation

Elizabeth T. Bowen
Principal, Environmental Remediation

Attachments:
Olin Pine Swamp – 2024 Site Investigation Work Plan, December 2, 2024

CC: Ray Frigon, Mark Lewis, Katherine Nee – CT DEEP
Nelson Walter, Sara Wright, Jamie Welch – WSP

2024 INVESTIGATION WORK PLAN

OLIN PINE SWAMP
HAMDEN, CONNECTICUT
REM.ID.447

OLIN CORPORATION

PROJECT NO: 6107240048
December 2, 2024

WSP USA INC,
TWO MONUMENT SQUARE, SUITE 200
PORTLAND, ME 04101

T: +1 (207) 775-5401
WSP.COM

SIGNATURES

PREPARED BY

Sara Wright
Project Manager

APPROVED[1] BY

Nelson Walter PE, LEP, PMP
Technical Director

[1]Approval of this document is an administrative function indicating readiness for release and does not impart legal liability on to the Approver for any technical content contained herein. Technical accuracy and fit-for-purpose of this content is obtained through the review process. The Approver shall ensure the applicable review process has occurred prior to signing the document.

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

LIST OF ACRONYMS AND ABBREVIATIONS

AOC	Area of Concern
APS	Additional Polluting Substance
COC	contaminant of concern
CSM	conceptual site model
CT DEEP	Connecticut Department of Energy and Environmental Protection
CT RCP	Connecticut Reasonable Confidence Protocol
DPT	Direct Push Technology
EPH	extractable petroleum hydrocarbons
ERT	Environmental Research and Technology
ft	feet
ft bgs	feet below ground surface
HASP	Health and Safety Plan
IWP	Investigation Work Plan
Olin	Olin Corporation
PCBs	polychlorinated biphenyls
PPE	personal protective equipment
PRA	Potential Release Area
RSRs	Remediation Standard Regulations
Site	Olin Pine Swamp property, 475 Putnam Avenue, Hamden, Connecticut
SVOCs	semi-volatile organic compounds
TPH	total petroleum hydrocarbons
VOCs	volatile organic compounds
Winchester	Winchester New Haven Firearms Company
WSP	WSP Environment & Infrastructure Inc.

1 INTRODUCTION

On behalf of Olin Corporation (Olin), WSP Environment & Infrastructure Inc. (WSP) prepared this 2024 Investigation Work Plan (IWP) for the Olin Pine Swamp property located at 475 Putnam Avenue, Hamden, Connecticut, REM.ID.447 ("the Site", see **Figure 1**). This IWP presents proposed supplemental investigation activities in Areas of Concern (AOCs) included in the April 22, 1987, Consent Order between the Connecticut Department of Energy and Environmental Protection (CT DEEP), and Olin. Some investigation activities are also proposed outside the AOCs identified in the 1987 Consent Order in locations identified as potential release areas (PRAs). Proposed Site investigation activities, are detailed in the following sections of the IWP:

- **1.0 - Introduction** – Summary of Site description and regulatory history, background, and physical setting.
- **2.0 - Conceptual Site Models (CSMs)** – Summaries of existing conditions for each AOC, including a description of the distribution of contaminants of concern (COCs) and a preliminary identification of data gaps.
- **3.0 - Investigation Work Plan** – Summary of planned investigation activities for each AOC and select PRAs, and other considerations.

1.1 HISTORIC SITE USE AND REGULATORY FRAMEWORK

Winchester New Haven Firearms Company (Winchester) began operations in New Haven, Connecticut in the 1870s. During the period of 1889 through 1915, Winchester acquired several parcels of land in Hamden, Connecticut to create what is currently referred to as the Pine Swamp Property. The property was formerly used primarily for storage of gunpowder and raw ammunition materials in bunkers. According to historical reports, approximately 30 masonry bunkers existed on-Site; remnants of at least 15 of these former bunkers are visible on current aerial imagery. Gunpowder storage at the Site ended in the late 1960s (Environmental Research and Technology [ERT], 1981).

In addition to gunpowder storage, the Site was used for bulk disposal and burning of waste, including batteries, powders, scrap wood, shotgun shell casings, and plant scrap materials. Burning operations were discontinued in 1966 at the request of the Hamden Department of Health. The bunkers and on-Site buildings were demolished, and some surficial cleanup occurred at the Site in the early 1970s (ERT, 1981). The last reported disposal activity was backfilling of masonry rubble and demolition debris from the bunkers during demolition in 1973.

In January 1986, Olin signed a Consent Order with the Connecticut Department of Environmental Protection (CT DEP, currently CT DEEP) to investigate and remediate the property. Minor revisions to the Consent Order were made in April 1987. A Remedial Investigation Study report for groundwater and soil contamination was completed in 1988 and was certified by Clean Sites, Inc. as required by the Consent Order. In the late 1980s through the 1990s, remedial activities including consolidation of debris and buried waste for removal; excavation of shallow soils in the West Burning Grounds, Incinerator Ash Area, and the Southeast Kettle Area; and soil excavation followed by operation of a soil vapor extraction system in the Anixter Area. Remediation of the Battery Waste Area was delayed due to the lack of an available disposal location for the battery waste materials, and anticipated complexities associated with excavation in areas with shallow groundwater.

In 2021, Olin and CT DEEP re-initiated investigation activities at the Site in accordance with prevailing standards and guidelines. A historical document review, comparison of historical data to current Connecticut Remediation Standard Regulations (RSRs), evaluation of data gaps, identification of areas requiring further investigation, and development of CSMs were completed in 2021 and 2022. The CSMs were used to develop the 2022 Investigation Work Plan (WSP, 2022), which was implemented through 2023. The results of the investigation activities completed in 2023 were reported in the 2023 Site Investigation Report, submitted to the CT DEEP on May 10, 2024 (WSP, 2024).

1.2 CURRENT SITE CONDITIONS

The property lies within Mill River Basin, which has generally flat topography interspersed with topographic depressions of varying magnitude. These depressions are characterized as either glacial landforms, such as kettles, post-glacial drainages that have eroded the flat lying topography, or anthropogenic reworking of native material. The deepest depressions at the Site are glacial kettles which bring topography below the water table to form a series of five ponds, identified as Ponds A through E. The ponds cover approximately 50 acres with water levels at approximately 36 to 37 feet (ft) North American Datum of 1983. Weir dams at the outlets of each pond control water levels and outflow from the ponds. The ponds drain into each other, from south to north, and ultimately discharge to Lake Whitney.

The Mill River is dammed approximately 1 mile to the southeast of the Site at the Goose Dam to form the water supply reservoir, Lake Whitney. A surface water drinking water supply intake is located near the dam. Surface water withdrawn from Lake Whitney is treated at the Whitney Water Treatment Purification Facility and Park and operated by the Regional Water Authority of New Haven.

The on-Site ponds and Mill River downstream of the Site are in the AA surface water quality classification.

The Site's topographic highs vary and are up to an elevation of 70 ft above mean sea level, which is generally consistent with the surrounding topography. Extensive earthworks from the historic use of the Site resulted in cuts into or through these topographic highs. The presence of several of the historic bunkers, berms, and roadways used to traverse the Site are apparent in the topography, as shown in **Figure 2**.

Uplands at the Site are mostly wooded and undeveloped. The remnants of some of the former Site infrastructure, including pavement for access roads, are present but in disrepair. The masonry or earthen walls of some of the bunkers remain on-Site.

1.3 SITE GEOLOGY AND HYDROGEOLOGY

Geology at the Site is mapped as the New Haven Deposits in the 2005 Quaternary Geologic Map of Connecticut and Long Island Sound Basin. This unit is described in the Mill River Valley as ice-marginal fluvial deposits which grades southward to massive delta plains in New Haven, West Haven, and Fair Haven. South of the Site, the deltaic sediments in New Haven overlie more than 200 ft of lake bottom sediment (Stone et al., 2005). At depth, these deposits overlie either a thin layer of glacial till, or directly overlie bedrock, mapped as the New Haven Arkose. The New Haven Arkose is described as a red to brown, medium- to coarse-grained sandstone containing quartz, feldspar, and rock fragments (Rodgers, 1985).

Boring logs from the Site describe native material predominantly as fine to coarse, reddish-brown sand with intermittent rounded trace to minor gravel or intermittent trace to minor silt. Sediment is shown to be stratified with either sharp or gradual transitions between layers differentiated by grain size. A thin layer of dark, organic-rich material is described at the surface near the ponds and in wetlands, typically less than two ft in thickness. In certain borings, fill material is identified by either color, grain size (often finer grained than the native formation), or other indicators such as the presence of masonry. As reported in the 1988 Remedial Investigation, a sand and gravel unit ranges from about 150 ft in thickness at the north end of the Site, to over 220 ft at the southern edge of the Site (Malcolm Pirnie 1988).

Observations detailed in Site boring logs are consistent with the 2005 Quaternary Geologic Map (Stone et al., 2005). Sediments described at the Site are consistent with their location in the gradual transition between the ice-margin fluvial and the massive glacio-deltaic deposits. Deeper borings (up to 160 ft below grade) logs completed in historical investigations do not indicate the presence of glacio-lacustrine deposits described elsewhere in the area.

The Site is situated within a GA classified area by the CT DEEP. Groundwater flow in the shallow overburden is largely controlled by surface water bodies on-Site, where flow is generally towards the nearest surface water body. Surficial topography varies across the Site; however, groundwater elevation does not rise significantly to follow the variation in topography. Depth to water varies from near the ground surface in low lying areas to over 30 ft below grade at higher elevations. The five groundwater-fed ponds on the Site (Ponds A through E), shown on **Figure 2**, are hydrologically connected tributaries of Lake Whitney through a surface water outlet at Pond E located at the north end of the Site (Malcolm Pirnie, 1988). Weir dams maintain water levels in the ponds, which controls the hydraulic gradient in groundwater at the Site. The on-Site ponds are in the AA surface water quality classification.

2 CONCEPTUAL SITE MODELS

CSMs were developed for seven investigation areas identified as AOCs, based on historical reports and the 1987 Consent Order. Potential release mechanisms/exposure pathways, COCs, investigation history, distribution of contaminants, and existing data gaps are summarized in **Table 1 through Table 7**. Historical analytical results for soil and groundwater were used to develop the basis of these CSMs, which informed the scope of the 2023 investigation. The primary objective of the 2023 investigation was to evaluate current Site conditions with modern sampling techniques and analytical methodology, and comparison to the CT DEEP RSRs. This effort provided further development of the CSM for the respective AOCs.

The AOCs referenced in the 1987 Consent Order (CT DEP, 1987) include the following:

- East Burning Grounds
- West Burning Grounds
- Central Disposal Area
- Battery Waste Area
- Anixter Area
- Incinerator Ash Area
- Southeast Kettle Area

The COCs for the 2024 IWP vary by individual AOC and were determined by review of historical reports and evaluation using modern methods and analyses during the 2023 Site Investigation (WSP, 2024). Following the receipt and review of analytical results from the 2023 investigation, a refined list of COCs was developed for each AOC's CSM, and the data gaps section of each CSM was updated.

In addition to the AOCs specified in the 1987 Consent Order, additional PRAs have been identified through review of historic documents, which were identified in the 2023 Site Investigation Report. The extent of several of the PRAs are located within existing AOCs and were evaluated as part of the 2023 investigation.

The following sub-sections provide summaries of the status of the AOCs and PRAs for which Site investigation work is being proposed including details obtained from historical reports and, where applicable, the results of the 2023 investigation.

2.1 EAST BURNING GROUNDS

The East Burning Grounds area contains impacts to shallow soils and groundwater due to buried charcoal, building debris, shotgun shell casings, powder burning, solvent disposal, and battery parts. Contaminants detected in soil at the East Burning Grounds include volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), polychlorinated biphenyls (PCBs), and metals.

The 2023 investigation identified exceedances of CT DEEP RSR criteria for SVOCs, extractable petroleum hydrocarbons (EPH), metals, and PCBs in soils; and exceedances of metals and VOCs in groundwater within the East Burning Grounds (WSP, 2024).

To date, remediation has not been conducted at this AOC. **Table 1** provides the current CSM for this AOC.

2.2 WEST BURNING GROUNDS

The West Burning Grounds area historically contained impacts to shallow soils and groundwater due to buried charcoal, building debris, shotgun shell casings, powder burning, solvent disposal, and battery parts. Two backfilled burning pits within this AOC were previously excavated to address lead and PCB contamination (Malcolm Pirnie, 1991).

The 2023 investigation identified exceedances of CT DEEP RSR criteria for metals in soil and groundwater in the West Burning Grounds (WSP, 2024). **Table 2** provides the current CSM for this AOC.

2.3 CENTRAL DISPOSAL AREA

Limited investigation has been conducted at the Central Disposal Area, which was historically characterized by the presence of demolition debris. Historical investigation included the collection of two soil samples, which contained lead at concentrations above the RSRs. No remediation has been completed in the Central Disposal Area.

The 2023 investigation identified exceedances of CT DEEP RSR criteria for SVOCs, pesticides, PCBs, and metals in soils and exceedances of metals in groundwater in the Central Disposal Area (WSP, 2024). **Table 3** provides the current CSM for this AOC.

2.4 BATTERY WASTE AREA

The Battery Waste Area is located along the center of the Site's southern end. This AOC has historically been reported as an area filled with debris including dry cell battery artifacts. Impacts to soils are reported to extend across approximately one acre, with refuse ranging from two to 12 feet below ground surface (ft bgs), and an estimated volume of about 10,000 cubic yards.

In addition to dry cell battery wastes, the area also contains trap sands from historical ammunition testing and other debris. Many of the historical sample locations in this AOC have elevated concentrations of lead or other metals. Previous remedial activities in the Battery Waste Area were limited to removal of exposed, localized surficial deposits of debris, trash, or bulky waste, and trap sand piles.

The 2023 investigation identified exceedances of CT DEEP RSR criteria for SVOCs/EPH, pesticides, PCBs, and metals in soils; and exceedances of metals in groundwater in the Battery Waste Area (WSP, 2024). **Table 4** provides the current CSM for this AOC.

2.5 ANIXTER AREA

The Anixter Area was reportedly used as a liquid chemical waste disposal area, including chlorinated VOCs. The area where higher concentrations of contaminants are present is in the southern end of the AOC, near the Site boundary. Unlike other AOCs, the Anixter Area contains primarily contaminated native soil, rather than waste fill and debris. There are several historical sample locations with concentrations of VOCs, SVOCs, total petroleum hydrocarbons (TPH), and PCBs above RSRs. Historical samples in this area were not analyzed for metals. Remediation at this AOC included excavation and off-Site disposal of VOC-impacted soil, and operation of a soil vapor extraction system between 1994 and 1998.

The 2023 investigation identified exceedances of CT DEEP RSR criteria for VOCs/volatile petroleum hydrocarbons, SVOCs, EPH, PCBs, and metals in soils; and exceedances of VOCs in groundwater in the Anixter Area (WSP, 2024). **Table 5** provides the current CSM for this AOC.

2.6 INCINERATOR ASH AREA

The Incinerator Ash Area on the eastern side of the Site is an area that contains ash and debris. Impacts to shallow soils exist due to use of incinerator ash, trap sands, concrete pad remnants for testing Ramset® tools and fasteners, reagent bottles, and debris as fill. Historical investigations identified a two-foot-thick layer of waste fill covering approximately 22,500 square feet, with additional visible waste piles and debris. Metals, PCBs, VOCs, SVOCs, and TPH have been detected in this area at concentrations above CT DEEP RSRs. Remediation for this area included consolidation and removal of several trap sand piles with elevated lead concentrations.

The 2023 investigation identified exceedances of CT DEEP RSR criteria for VOCs, SVOCs, EPH, PCBs, and metals in soils; and exceedances of metals in groundwater in the Incinerator Ash Area (WSP, 2024). **Table 6** provides the current CSM for this AOC.

2.7 SOUTHEAST KETTLE AREA

The Southeast Kettle Area is characterized by a large pit or "kettle" formerly used as a waste disposal area. Disposed materials included drums with unknown contents and demolition debris. Previous remedial activities in this area included removal of drums and demolition debris along a steep embankment. Elevated concentrations of VOCs and metals were detected in this area following the debris and drum removal activities.

The 2023 investigation identified exceedances of CT DEEP RSR criteria for SVOCs, EPH, PCBs, and metals in soils; and exceedances of VOCs in groundwater in the Southeast Kettle Area (WSP, 2024). **Table 7** provides the current CSM for this AOC.

2.8 POTENTIAL RELEASE AREAS

As discussed with CT DEEP in a presentation dated December 2022, based on historical literature review, several areas at the Site have been identified as PRAs. Some of these PRAs are collocated within larger AOCs and have therefore been investigated or will be investigated further as part of the investigation activities proposed in this IWP.

The following PRAs and associated potential COCs will be evaluated as detailed in this IWP. The locations of these PRAs are shown in **Figure 2,** summarized in the table below and are further described in **Subsections 2.8.1** through **2.8.5**.

Potential Release Area	Potential Contaminants of Concern
Trap Sand Piles *Location: Between Anixter and Incinerator Ash Areas*	Metals SVOCs
Debris Areas *Location: North of Central Disposal Area and South of East Burning Grounds*	Metals SVOCs ETPH PCBs
Concrete Block Building Foundation *Location: Between Incinerator Ash and Southeast Kettle Areas*	Metals SVOCs ETPH PCBs
Bunkers *Location: North of Battery Waste Area, Center of Site, and Between Incinerator Ash and Southeast Kettle Areas*	Metals Radiological Material Screening
Target Structure Area Location: North of Southeast Kettle Area	Metals

2.8.1 TRAP SAND PILES

Ballistic trap sand along with spent ammunition were identified at several locations in the southeast portion of the property. Trap sands were historically identified visually by a gray-green color and presence of small caliber ammunition. Historic remediation conducted in two phases between 1989 and 1990 included the removal of the trap sands. These efforts included excavation and disposal of 180 cubic yards of waste at seven discrete piles. The objective of the remediation was to excavate to native soil, resulting in residual soil being non-hazardous (with toxicity criteria, <5.0 mg/L lead in leachate).

Some of the former trap sand piles are within the Consent Order AOCs. Trap sand piles located within the Battery Waste and Incinerator Ash AOCs were investigated for metals impacts as part of the 2023 Site investigation (WSP, 2024). Additional trap sand piles were reported outside of these Consent Order AOCs, between the Incinerator Ash and Anixter areas.

2.8.2 DEBRIS AREAS

Building debris consisting of masonry and wood material and miscellaneous debris materials (e.g., assorted metal, bulky waste, demolition debris, and ramset® test pads) are reported in historical reports to be present in six on-Site areas and two off-Site areas, as shown on **Figure 2.** Historic remediation of the debris area in the Southeast Kettle area was part of the 1991 interim remedial efforts and included excavation of 200 cubic yards of debris and removal of 21 drums. No other remediation has been performed on the Debris Areas.

The 2023 investigation included soil borings and evaluation of groundwater quality at the debris areas located within the Southeast Kettle, the Battery Waste, and Central Disposal areas (WSP, 2024). Two on-Site debris areas that were not investigated in 2023 were identified at the south side of the East Burning Ground and to the north of the Central Disposal Area. Two off-Site debris areas were identified to the east of the Incinerator Ash Area and to the northwest of Pond B.

2.8.3 CONCRETE BLOCK BUILDING FOUNDATION

A concrete block building foundation is identified to the west of the Southeast Kettle Area, as shown on **Figure 2**. The use of the former building assumed to be located above the footing is unknown. Other structures on-Site were reportedly used for storage of gunpowder and/or raw materials for manufacturing operations.

No historic or recent sampling has been completed in this area to evaluate potential COCs.

2.8.4 BUNKERS

The existing bunkers were reportedly used for storage of gunpowder and raw materials to produce ammunition. There is one anecdotal report that two of the bunkers were potentially used for short term storage of low-level radiological material. No historical records except for one account regarding the potential storage of radiological materials have been identified. There is no indication of which of the bunkers may have been used for this purpose. The bunkers were demolished in 1973-74, leaving only protection berms. No action to date has been taken to characterize soils within the bunkers.

Topography and Lidar data identify the presence of approximately 30 former bunkers within the Site. These PRAs were not evaluated during the 2023 investigations.

2.8.5 TARGET STRUCTURE AREA

The Target Structure Area was used as a target for testing of ammunition fired from the Shotgun Proofing Area and the Machine Gun–Mount Area. The Target Structure Area includes a large structure located at the northern edge of the Southeast Kettle Area, along with multiple smaller structures and remnants of targets.

No historic or recent soil samples have been collected in the Target Structure Area to characterizes this location.

2.9 OTHER POTENTIAL RELEASE AREAS

The remaining PRAs detailed on **Figure 2** which are not described above include PRAs that are primarily located in the central or northern portions of the Site and off-property. Accessing the PRAs north of the bridge connecting Ponds B and Ponds C will require traversing overgrown access roads and narrow bridges that may not be structural sound. As such, these PRAs will not be investigated during this phase of the project. Access issues will be assessed during mobilization for the investigation work proposed in this IWP to enable design, permitting, and repair of roads and bridges as needed to allow safe access for potential future investigation work.

3 SCOPE OF WORK

To assess existing data gaps within and outside of Consent Order AOCs, additional proposed investigation in this IWP includes surface and subsurface soil sampling, installation and sampling of new and existing monitoring wells, and collection of surface water samples. Additionally, several monitoring wells found to be in damaged condition are proposed for abandonment.

The focus of this investigation is to delineate chemicals that exceeded CT DEEP RSR and Additional Polluting Substance (APS) criteria identified during 2023 Site Investigation in soil and groundwater (WSP, 2024) and to perform additional characterization of Site conditions within the PRAs described in Section 2.8.

Proposed investigation locations for soil are shown on **Figure 3A** through **Figure 8D.** Proposed groundwater sampling locations are shown on **Figure 9**. Monitoring wells proposed for abandonment are shown on **Figures 10A and 10B**. Proposed surface water sample locations are shown on **Figure 11**. Prior to subsurface activities, WSP will mark investigation locations and work with WSP's subcontractor to complete utility clearances including Call before You Dig (CBYD) notification.

3.1 SOIL INVESTIGATION ACTIVITIES

Soil borings will be advanced at locations shown on **Figure 3A** through **Figure 8D**. Proposed boring depths, number of samples, and analytes for the proposed boring locations are included in **Table 8**. The borings will be located with a GPS and marked in the field prior to drilling operations. If a proposed location is deemed inaccessible, an alternative location consistent with the objective of horizontal and vertical delineation of known impacts will be identified. If a boring is relocated, the new location will be located using GPS technology for subsequent data reporting.

Some proposed soil boring locations are within previously delineated wetlands. Prior to investigation activities, Olin and WSP will work with the Hamden Connecticut Inland Wetland Commission to obtain approval for additional work in these wetlands as further discussed in **Section 4.4**.

Borings will be advanced utilizing direct push technology (DPT) or hand tools, including hand augers. The method of subsurface investigation will be determined based on topography and access. DPT will be used to advance drill rods containing dedicated 2-inch diameter by 5-foot acetate liners for sample collection. Soil will be logged by qualified personnel and screened for the presence of VOCs using a photoionization detector. Soil samples will be described using field methods and manual tests procedures to designate a classification under the Unified Soil Classification System and recorded on boring logs. If poor recovery of a direct push sample is obtained, then an offset boring advanced immediately adjacent to the proposed boring may be completed for sampling or soil classification purposes.

Soil samples will be submitted to a Connecticut-certified laboratory for analysis under proper preservation and chain of custody protocols per the Connecticut Reasonable Confidence Protocol (CT RCP). Analytes will include the COCs listed in the soil sample matrix table included as **Table 8**. A portion of soil samples may be held for analysis if vertical and horizontal delineation of the respective COC is obtained by running only a portion of the samples collected in the boring. Proposed sample intervals detailed in **Table 8** are preliminary and may be altered depending on field observations. Preference will be given to sample intervals at borings where indicators of potentially contaminated subsurface material is present based on PID readings, or visual or olfactory observations.

Additionally, screening of accessible former storage bunkers for the potential presence of radiological material will be conducted using a gamma walkover survey. Based on the results of screening, three bunkers will be selected for sampling. At least one bunker will be tested as a background location (results of screening are negative for radiological material) and two with the highest results from screening. Two soil samples from each of the three selected bunkers will be collected and analyzed via gamma spectroscopy.

Following completion of each soil boring, the boring will be backfilled with soil cuttings. If necessary, clean sand will be used to fill to grade. The surface will be restored in-kind with similar materials observed in the surrounding area (generally soil and sand based on the undeveloped nature of the Site, but potentially concrete or cold-patch asphalt).

3.2 GROUNDWATER INVESTIGATION ACTIVITIES

Groundwater sampling will be conducted as detailed in **Table 9** and displayed on **Figure 9**. The monitoring wells and the analyte list for the proposed sampling network was refined following the results of the 2023 investigation (WSP 2024). Modifications to the groundwater sampling program include the addition of three new monitoring wells that will be installed as part of the current IWP and the inclusion of four additional existing monitoring wells.

3.2.1 INSTALLATION OF NEW MONITORING WELLS

Three new monitoring wells will be installed using either a hollow-stem auger or a DPT drill rig as part of investigation activities proposed in this IWP. Monitoring well construction will consist of a 5 to 10 foot (pending depth of well), 2-inch diameter, 0.010-inch slot size, poly vinyl chloride screen with schedule 40 PVC riser with the screened interval placed across the water table. Installation of the well screen and filter pack will be completed with either a prepacked sand filter pack or with an appropriate sand filter pack installed manually in the anulus between the screen and borehole wall. The wells will include a bentonite seal with a locking standpipe or road box as a protective cover. Alternative drilling methodologies or well construction may be used and proposed well locations may be altered if deemed necessary by field personnel based on-Site conditions or accessibility.

The three proposed monitoring wells include one location within each of the following three areas: the Anixter Area (ANX-MW-206), Incinerator Ash Area (IAA-MW-202) and the Central Disposal Area (CDA-MW-212). Existing wells that will be added to the sampling program include one in each of the following AOCs: West Burning Grounds (MP-1S), Anixter Area (MP-9I), East Burning Grounds (MP-3I) and Central Disposal Area (MP-17I). These new and existing wells will supplement the existing monitoring well network and are intended to further evaluate groundwater impacts based on data collected during the 2023 Site investigation activities.

Newly installed monitoring wells and four existing monitoring wells will be developed prior to sampling. For the new wells, development will occur no sooner than 24 hours following the placement of the grout seal. Development of new and existing wells will be completed using a downhole well development pump and include either surging and pumping or over pumping throughout the screened interval. Depth to water, pumping rates, and turbidity measurements will be recorded by qualified field personnel. Groundwater sampling will be collected no sooner than 48 hours following well development.

3.2.2 GROUNDWATER SAMPLING

Groundwater samples will be collected using low flow methods consistent with the *USEPA Region 1 Low-Flow Sampling SOP*, submitted to a Connecticut-certified laboratory for analysis of the relevant COCs listed in **Table 9**. The proposed monitoring network detailing the locations of the new proposed wells and existing wells that will be added to the monitoring network, are detailed in **Figure 9**. Samples collected for metals analysis will be field filtered only if turbidity is greater than 5 Nephelometric Turbidity Units at the time of sampling.

3.2.3 GROUNDWATER MONITORING WELL ABANDONMENT

An inspection of monitoring wells identified from historic reports was completed in April of 2023 (WSP 2024). The survey identified nine existing monitoring wells that were damaged or destroyed and unsuitable for future groundwater sampling. These wells are proposed to be abandoned by a registered well driller in a manner consistent with the requirements outlined in Section 25-128-57of the Regulations of Connecticut State Agencies. Consistent with these regulations, monitoring wells will be abandoned by either removing the casing or cutting down the well casings to below grade, and filling the void with bentonite, neat cement grout, or bentonite cement grout, then backfilling to grade. The monitoring wells to be abandoned include:

- Battery Waste Area Wells: ERT-14, ERT-15
- Central Disposal Area Well: WP-5
- Anixter Area Wells: MP-9D, Anixter-1D, Anixter-1S
- West Burning Grounds: ERT1 and ERT-1A
- Outside AOCs: MP-21S

Results of the 2023 well inspection efforts, including the locations of wells proposed for abandonment, are shown on **Figures 10A** and **10B** with additional details provided in the 2023 Site Investigation Report (WSP 2024).

3.3 SURFACE WATER INVESTIGATION ACTIVITIES

Surface water sampling at eight locations in the Ponds will be conducted as detailed in **Table 10** and displayed on **Figure 11**. The surface water samples will be collected at locations generally consistent with the past surface water sampling reported in 1988 (Malcolm Pirnie 1988). Locations shown on **Figure 11** are approximate and may be modified based on Site access or field conditions. The intent of the proposed surface water sampling activities is to evaluate current surface water conditions at the inlets and outlets of the pond network with current analytical methods and procedures.

Surface water samples will be collected by submerging the tubing intake of a peristaltic pump at the end of a pole in the desired sample location. Water quality parameters including pH, temperature, dissolved oxygen, specific conductance, and turbidity will be measured and recorded at the sample location. Surface water samples will not be collected within 48 hours after a rain event or if the water appears turbid.

All surface water samples will be analyzed for total metals, VOCs, SVOCs, and ETPH, as detailed in **Table 10**.

3.4 SITE INFRASTRUCTURE EVALUATION

Site reconnaissance completed prior to and during the 2023 investigation indicate that the Site receives stormwater runoff from multiple off-Site sources. An evaluation of publicly available documentation regarding the local storm drain distribution system as well as an inspection of the property for potential off-Site inputs of stormwater will be completed as part of this ongoing investigation.

Site reconnaissance also indicated that access to a portion of the PRAs will require traversing overgrown access roads and narrow bridges that may not be structural sound. The integrity of these bridges to provide safe access for Olin and consultant staff, drill rigs, and other sampling equipment will be evaluated. Access issues will be assessed during investigation activities proposed in this IWP to enable design, permitting, and repair of roads and bridges as needed to allow safe access for potential future investigation work.

3.5 QUALITY ASSURANCE AND QUALITY CONTROL

Soil, groundwater, and surface water samples will be submitted to a Connecticut-certified laboratory under proper preservation and Chain of Custody protocols per the CT RCPs. Soil and groundwater sample results will be compared to the applicable CT DEEP RSRs criteria. Surface water samples will be compared to the applicable Connecticut Water Quality Standards.

Quality Assurance/Quality Control samples will be collected as follows:

- One duplicate sample per every twenty (20) laboratory samples and analysis,

- One Matrix Spike/Matrix Spike Duplicate sample per every twenty (20) samples and analysis.

Laboratory methods for the implementation of this IWP are summarized below.

PARAMETER(S)	METHOD(S)
Total Metals	US EPA Method 6010
VOCs	US EPA Method 8260
SVOCs	US EPA Method 8270
PCBs	US EPA Method 8082
ETPH	Connecticut Extractable Total Petroleum Hydrocarbons Method
Radiological materials	Gamma Spectroscopy Method Ga-01-R

3.6 HEALTH AND SAFETY AND UTILITY CLEARANCE

The Site-specific Health and Safety Plan (HASP) developed for previous Site investigation activities will be updated to reflect the work proposed in this IWP. Field work will be conducted in Level D Modified personal protective equipment (PPE), and workers will have Occupational Safety and Health Administration (OSHA) 40-Hour Hazardous Waste Operations and Emergency Response training, at a minimum. If Site conditions warrant an upgrade from Level D Modified PPE, work will stop, and field conditions will be reevaluated by field staff and communicated to the Project Manager to evaluate appropriate health and safety mitigation measures.

Prior to initiating any subsurface disturbance activities, a Call Before You Dig ticket will be placed at the Site, as required by law. Additionally, the local water and sewer company will be contacted to identify if any known or potential utilities are located within the work area. Geophysical utility locating via ground penetrating radar or electromagnetic detection will be completed prior to ground disturbance activities.

3.7 INVESTIGATION-DERIVED WASTE

Investigation-derived waste (soil and groundwater) generated during this investigation will be containerized and stored on-Site in appropriately labeled 55-gallon Department of Transportation-approved drums. To the extent possible, soil cuttings will be placed back into the borings. Excess drill cuttings will be containerized for waste characterization and off-Site disposal if necessary. Purge water generated during well development and sampling activities will be containerized, characterized, and shipped off-site by a licensed transportation and disposal subcontractor to a permitted disposal facility.

3.8 PERMITTING AND ACCESS

A Wetlands Permit from the Town of Hamden's Inland Wetlands Commission will be required for minor tree and vegetation clearing, advancement of some of the proposed soil borings, installation of monitoring wells, or other disturbance activities located within the wetland areas and within the 200-foot upland review areas. Prior to initiation of ground disturbance or vegetation clearing activities within the wetland or upland review areas, an application will be submitted to the Inland Wetlands Commission.

Access agreements between Olin and owners of abutting properties necessary for sampling activities proposed in this IWP are in place. Notification to property owners will be made prior to use of their properties. Access agreements to evaluate additional off-Site PRAs will be pursued for future investigation activities.

3.9 SCHEDULE

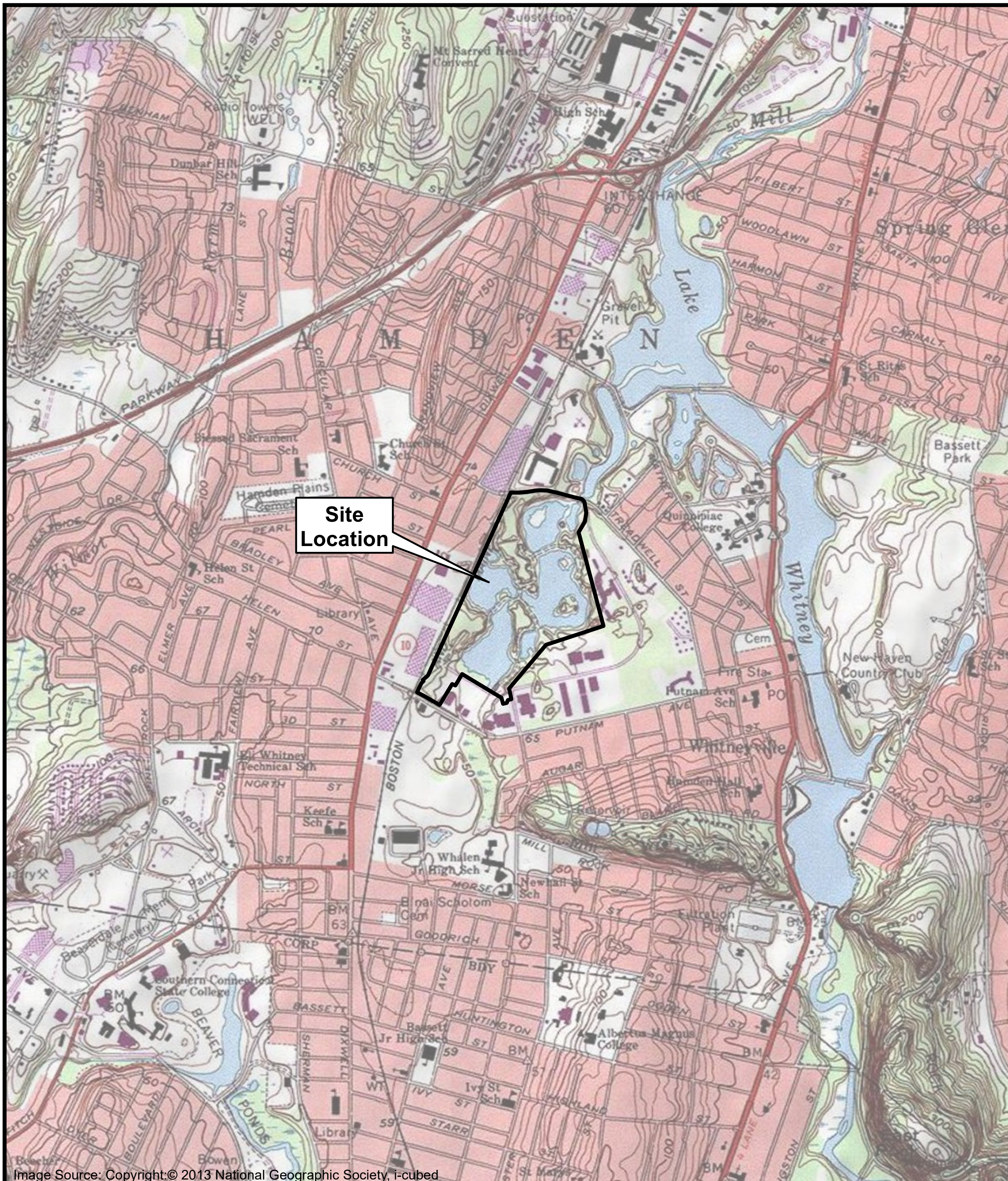
Field activities associated with the work proposed in this IWP will be scheduled upon receipt of CT DEEP approval. The proposed investigation may be completed in multiple mobilizations including soil sampling, monitoring well installation, development of existing and new monitoring wells, groundwater sampling, and surface water sampling.

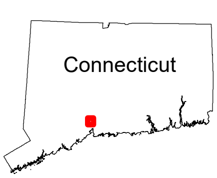
A more detailed schedule of field and reporting activities will be provided to the CT DEEP following approval of this IWP.

4 REFERENCES

- Environmental Research & Technology, 1981. Environmental Investigation of Pine Swamp, Hamden, Ct. January 1981.
- Malcolm Pirnie, 1988. Final Report, Pine Swamp Property Remedial Investigation Study, Hamden, Connecticut. July 1988 (Revised December 1988)
- Malcolm Pirnie, 1991. Olin Pine Swamp Interim Corrective Measures Report. June 1991.Rodgers, John (1985) Connecticut Geological and Natural History Survey, Bedrock Geologic Map of Connecticut
- Stone et al., (2005). USGS, Quaternary Geologic Map of Connecticut and Long Island Sound Basin
- WSP USA, Inc (WSP), 2022. Oline Pine Swamp Investigation Work Plan, 475 Putnam Avenue, Hamden, Connecticut. October 28, 2022
- WSP USA, Inc (WSP), 2024. 2023 Site Investigation Report, 475 Putnam Avenue, Hamden, Connecticut. May 10, 2024

FIGURES





N

0 1,000 2,000 Feet

Prepared/Date: NES 02/19/24 | Checked/Date: RJO 05/03/24

Figure 1
Site Location Map

2024 Investigation Work Plan
Olin Pine Swamp
Hamden, Connecticut

wsp

N
0 150 300 Feet

Legend

Ground Elevation Contour:
- 50 — 10-Foot
- 2-Foot
- Stream
- Shoreline

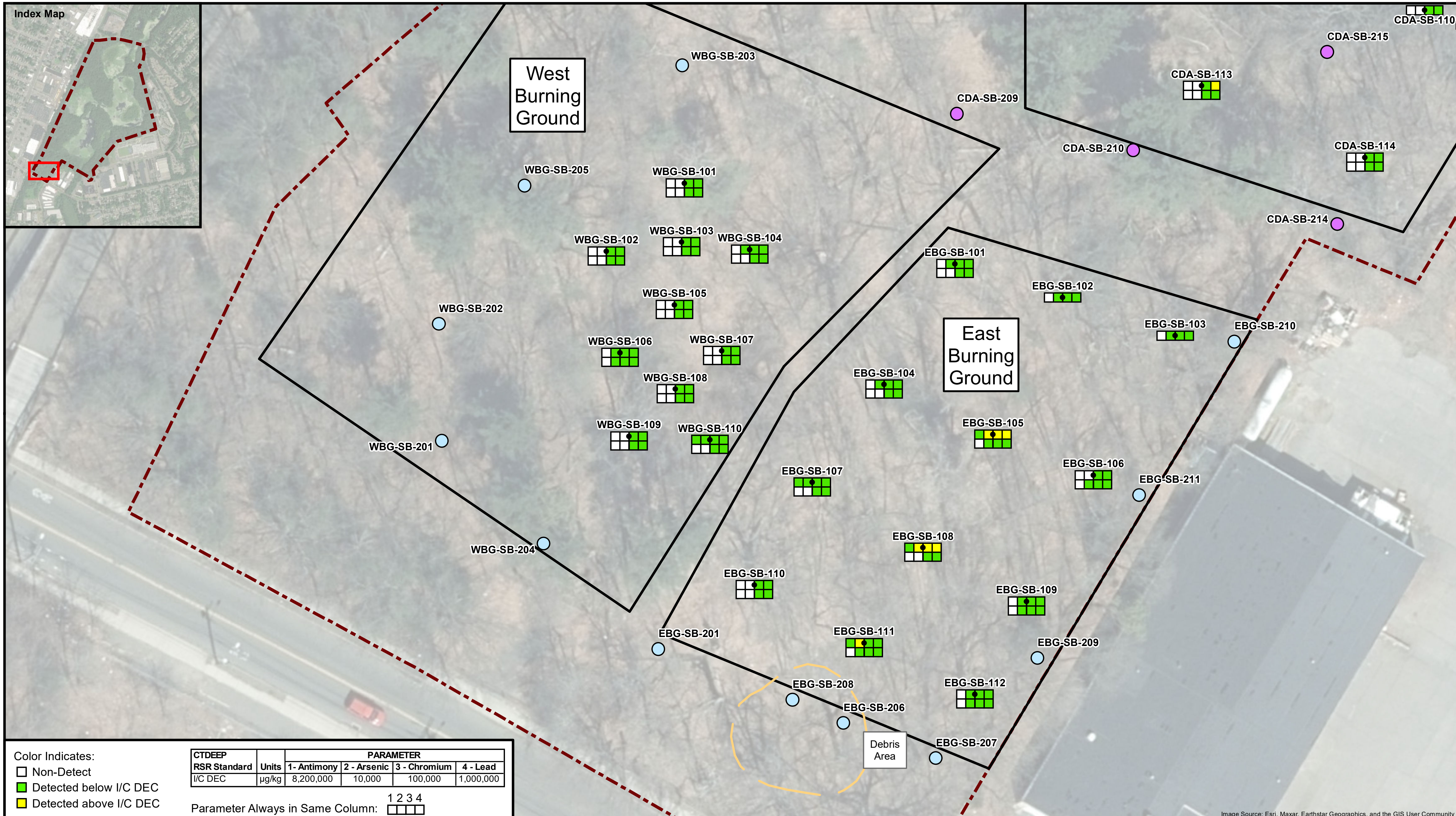
- Reservoir/Lake/Pond
- Areas of Concern
- Approximate Property Boundary
- Potential Release Areas
- Bunker Location
- Trap Sand Piles

Figure 2
Site Map with Consent Order AOCs and Potential Release Areas

2024 Investigation Work Plan
Olin Pine Swamp
Hamden, Connecticut

Prepared/Date: JSW 10/08/24 | Checked/Date: RJO 10/10/24

Document Path: \\corp.pbwan.net\gb-ea\US\USPWM100-PLD2\ProjectProjects\Olin - Pine Swamp\4.0_Deliverables\4.5_Databases\GIS\MapDocuments\IWP2024\Site_Topo_AOC_and_Release_area2024_11x17P.mxd PDF: \\corp.pbwan.net\GLB-EA\US\USPWM100-PLD2\ProjectProjects\Olin - Pine Swamp\4.0_Deliverables\4.2_Work_Plans\2024 Pine Swamp IWP\Figures\Figure 2 - Site Map with AOC and PRA - 2024.pdf 10/8/2024 07:20 PM jennifer.walker



Color Indicates:
- Non-Detect
- Detected below I/C DEC
- Detected above I/C DEC

CTDEEP RSR Standard	Units	PARAMETER 1 - Antimony	2 - Arsenic	3 - Chromium	4 - Lead
I/C DEC	µg/kg	8,200,000	10,000	100,000	1,000,000

Parameter Always in Same Column: 1 2 3 4

wsp

Legend

- 2023 Sample Location
- Approximate Area of Concern
- Approximate Property Boundary
- Potential Release Areas
- Proposed Boring Location for COC Delineation
- Boring Proposed for Vertical Delineation of Fill

N

0 50 100 Feet

Notes:

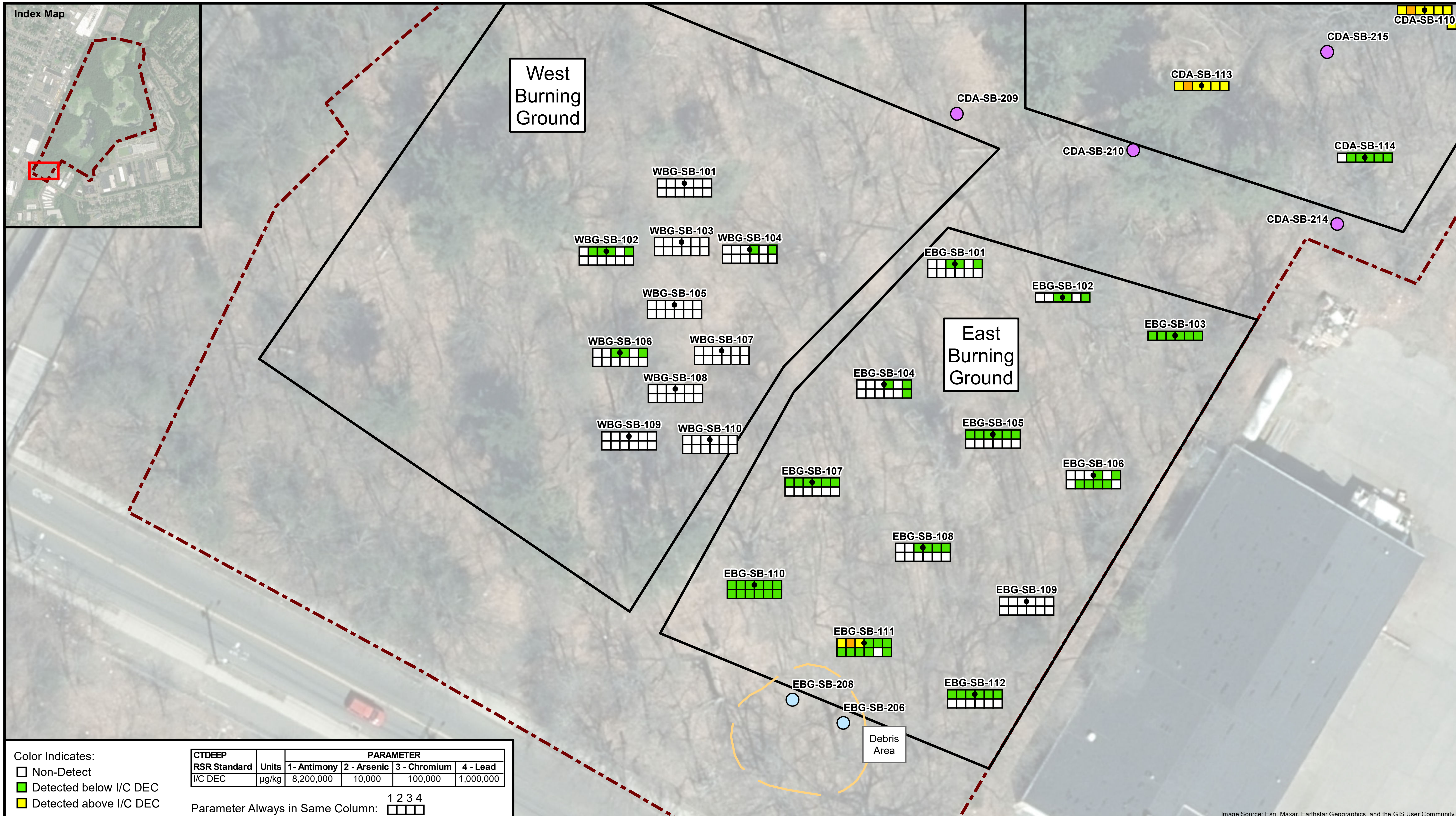
- CTDEEP RSR: I/C DEC 2021
  Direct exposure to soil - Industrial setting
- CT DEEP - Connecticut Department of Energy and Environmental Protection
- RSR - Remediation Standard Regulation
- I/C DEC - Industrial/Commercial Direct Exposure Criteria

- Sample depths reported on analytical tables
- Results for shallowest depth shown on top row, results for deepest depth shown on bottom row
- When duplicate samples were collected, the higher of the two results were compared to the RSR standard(s)
- When soil borings exhibited poor recovery and not enough material was collected for sample submission, preference was given to analyze for total metals

Figure 3A
Proposed Soil Borings
East and West Burning Grounds
Metals

2024 Investigation Work Plan
Olin Pine Swamp
Hamden, Connecticut

Prepared/Date: JSW 10/08/24 | Checked/Date: RJO 10/11/24



Color Indicates:
- Non-Detect
- Detected below I/C DEC
- Detected above I/C DEC

CTDEEP RSR Standard	Units	PARAMETER 1 - Antimony	2 - Arsenic	3 - Chromium	4 - Lead
I/C DEC	µg/kg	8,200,000	10,000	100,000	1,000,000

Parameter Always in Same Column: 1 2 3 4

wsp

Legend

- 2023 Sample Location
- Approximate Area of Concern
- Approximate Property Boundary
- Potential Release Areas
- Proposed Boring Location for COC Delineation
- Boring Proposed for Vertical Delineation of Fill

N

0 50 100 Feet

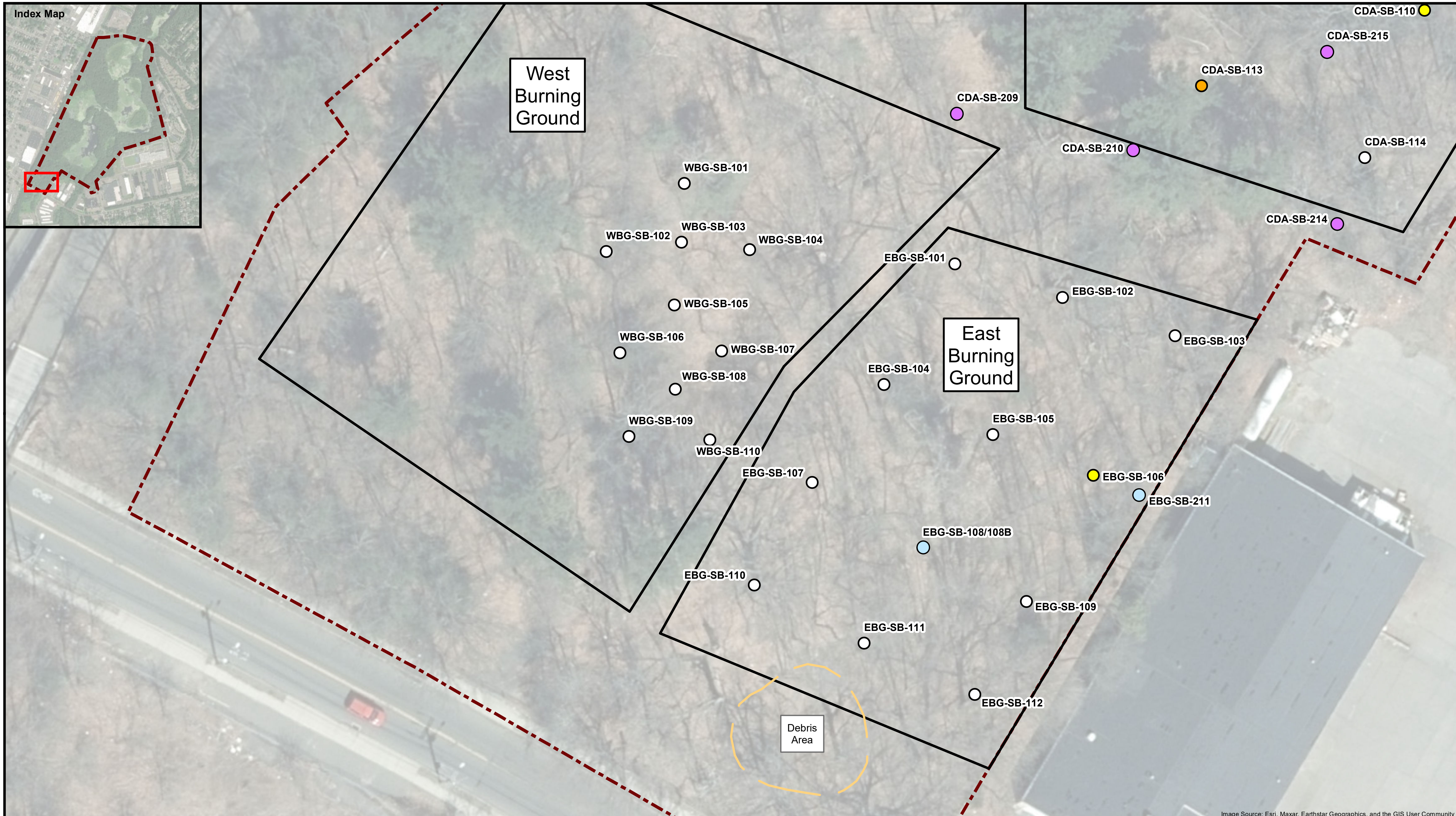
- CT DEEP - Connecticut Department of Energy and Environmental Protection
- RSR - Remediation Standard Regulation
- I/C DEC - Industrial/Commercial Direct Exposure Criteria
- GA PMC - Pollutant Mobility Criteria

- Sample depths reported on analytical tables
- Results for shallowest depth shown on top row, results for deepest depth shown on bottom row
- When duplicate samples were collected, the higher of the two results were compared to the RSR standard(s)
- When soil borings exhibited poor recovery and not enough material was collected for sample submission, preference was given to analyze for total metals

Figure 3B
Proposed Soil Borings
East and West Burning Grounds
SVOC

2024 Investigation Work Plan
Olin Pine Swamp
Hamden, Connecticut

Prepared/Date: JSW 10/11/24 | Checked/Date: RJO 10/11/24



wsp

N

0 50 100 Feet

Prepared/Date: JSW 10/11/24 | Checked/Date: RJO 10/11/24

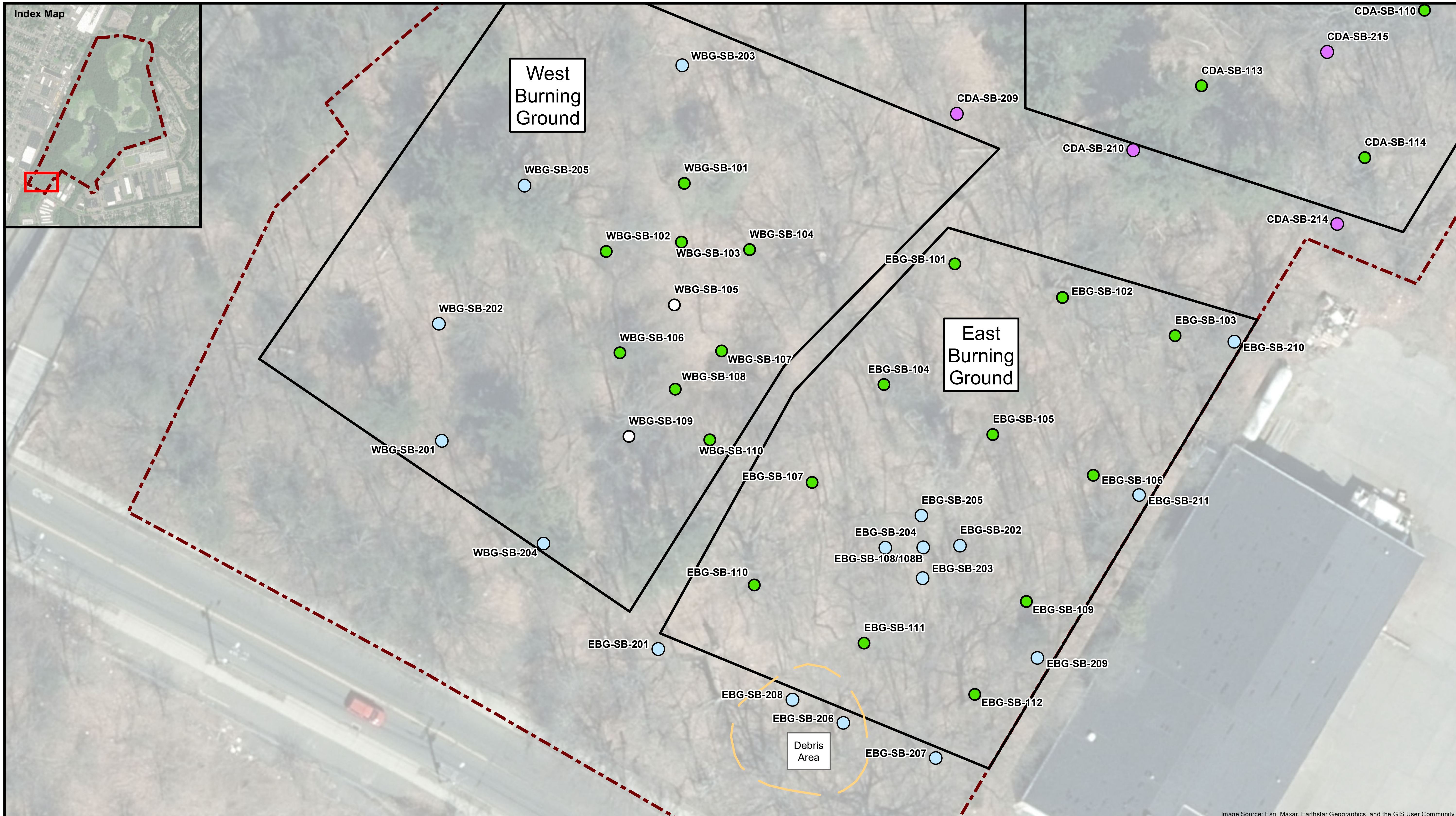
Legend

- Non-Detect
- Exceeds Alternative GA PMC
- Exceeds Alternative I/C DEC
- Approximate Area of Concern
- Approximate Property Boundary
- Potential Release Areas
- Boring Proposed for Vertical Delineation of Fill
- Proposed Boring Location for COC Delineation

Notes:
Reported soil concentrations for existing borings collected during the 2023 soil investigation and compared to CTDEEP RSRs.

Figure 3C
Proposed Soil Borings
East and West Burning Grounds
ETPH

2024 Investigation Work Plan
Olin Pine Swamp
Hamden, Connecticut



Legend

- Non-Detect
- Below 1 mg/kg
- Above 10 mg/kg
- Approximate Area of Concern
- Approximate Property Boundary
- Potential Release Areas
- Boring Proposed for Vertical Delineation of Fill
- Proposed Boring Location for COC Delineation

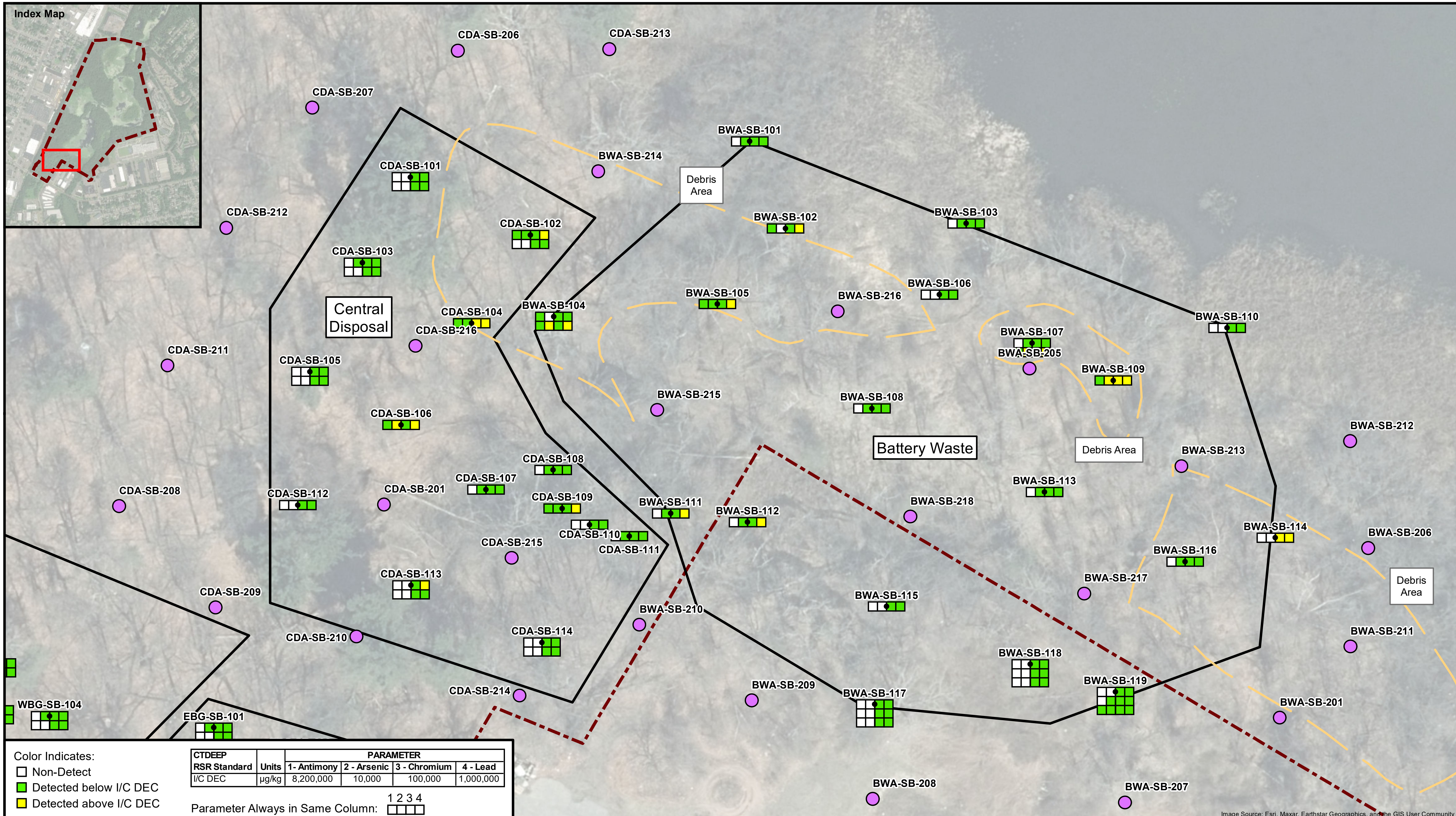
Notes:
Reported soil concentrations for existing borings collected during the 2023 soil investigation and compared to CTDEEP RSRs.

Figure 3D
Proposed Soil Borings
East and West Burning Grounds
PCBs

2024 Investigation Work Plan
Olin Pine Swamp
Hamden, Connecticut

Prepared/Date: JSW 10/08/24	Checked/Date: RJO 10/11/24

Document: \\corp.pbwan.net\glb-e&i\US\USPWM100-PLD2\Project\Projects\Olin - Pine Swamp\4.0_Deliverables\4.5_Databases\GIS\MapDocuments\IWP 2023\PhaseII_ESA\Soil_DotPlots_PCBs_AOCs_11x17LS_Inset_2024_ProposedSB.mxd PDF:\\corp.pbwan.net\GLB-E&I\US\USPWM100-PLD2\Project\Projects\Olin - Pine Swamp\4.0_Deliverables\4.1_Reports\2023 FIR\Figures\2024 Proposed Soil Borings\Figure 3D - PCBs Proposed Soil Borings EBG.pdf 10/8/2024 10:49 PM jennifer.walker



Color Indicates:
- Non-Detect
- Detected below I/C DEC
- Detected above I/C DEC

CTDEEP RSR Standard	Units	PARAMETER 1 - Antimony	2 - Arsenic	3 - Chromium	4 - Lead
I/C DEC	µg/kg	8,200,000	10,000	100,000	1,000,000

Parameter Always in Same Column: 1 2 3 4

Legend

- 2023 Sample Location
- Approximate Area of Concern
- Approximate Property Boundary
- Potential Release Areas
- Proposed Boring Location for COC Delineation
- Boring Proposed for Vertical Delineation of Fill

Notes:

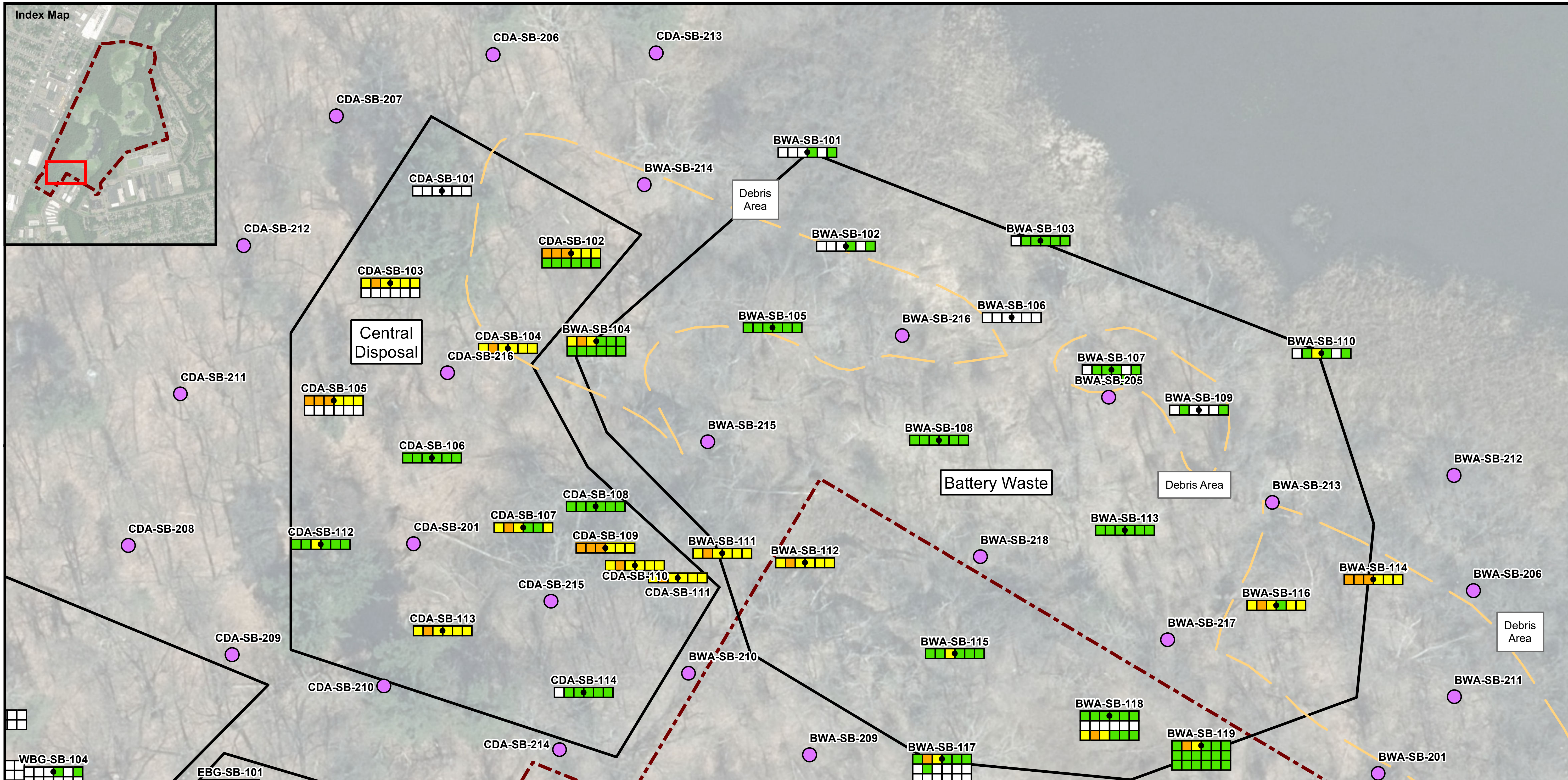
- CTDEEP RSR: I/C DEC 2021 Direct exposure to soil - Industrial setting
- CT DEEP - Connecticut Department of Energy and Environmental Protection
- RSR - Remediation Standard Regulation
- I/C DEC - Industrial/Commercial Direct Exposure Criteria
- Sample depths reported on analytical tables
- Results for shallowest depth shown on top row, results for deepest depth shown on bottom row
- When duplicate samples were collected, the higher of the two results were compared to the RSR standard(s)
- When soil borings exhibited poor recovery and not enough material was collected for sample submission, preference was given to analyze for total metals

Figure 4A
Proposed Borings
Battery Waste and Central Disposal Areas
Metals

2024 Investigation Work Plan
Olin Pine Swamp
Hamden, Connecticut

Prepared/Date: JSW 10/08/24 | Checked/Date:RJO 10/11/24

Document: \\corp.pbwan.net\glb-e&i\US\USPWM100-PLD2\Project\Projects\Olin - Pine Swamp\4.0_Deliverables\4.5_Databases\GIS\MapDocuments\IWP 2023\PhaseII_ESA\Soil_BoxPlots_AOCs_11x17LS_Inset_2024_ProposedSB.mxd PDF: \\corp.pbwan.net\glb-e&i\US\USPWM100-PLD2\Project\Projects\Olin - Pine Swamp\4.0_Deliverables\4.5_Databases\GIS\Figures\SI Report 2023\Figure 4A - Metals Proposed Soil Borings BW-CDA.pdf 10/8/2024 7:48 PM jennifer.walker



Color Indicates:
- Non-Detect
- Detected below GA PMC
- Detected above GA PMC
- Detected above I/C DEC

CTDEEP RSR Standard	Units	1 - Benzo(a)anthracene	2 - Benzo(a)pyrene	3 - Benzo(b)fluoranthene	4 - Fluoranthene	5 - Phenanthrene	6 - Pyrene
GA PMC	µg/kg	1,000	1,000	1,000	5,600	4,000	4,000
I/C DEC	µg/kg	7,800	1,000	7,800	2,500,000	2,500,000	2,500,000

(PARAMETER columns 1–6)

Parameter Always in Same Column: 1 2 3 4 5 6

Legend

- 2023 Sample Location
- Approximate Area of Concern
- Approximate Property Boundary
- Potential Release Areas
- Proposed Boring Location for COC Delineation
- Boring Proposed for Vertical Delineation of Fill

N

0 50 100 Feet

- CT DEEP - Connecticut Department of Energy and Environmental Protection
- RSR - Remediation Standard Regulation
- I/C DEC - Industrial/Commercial Direct Exposure Criteria
- GA PMC - Pollutant Mobility Criteria

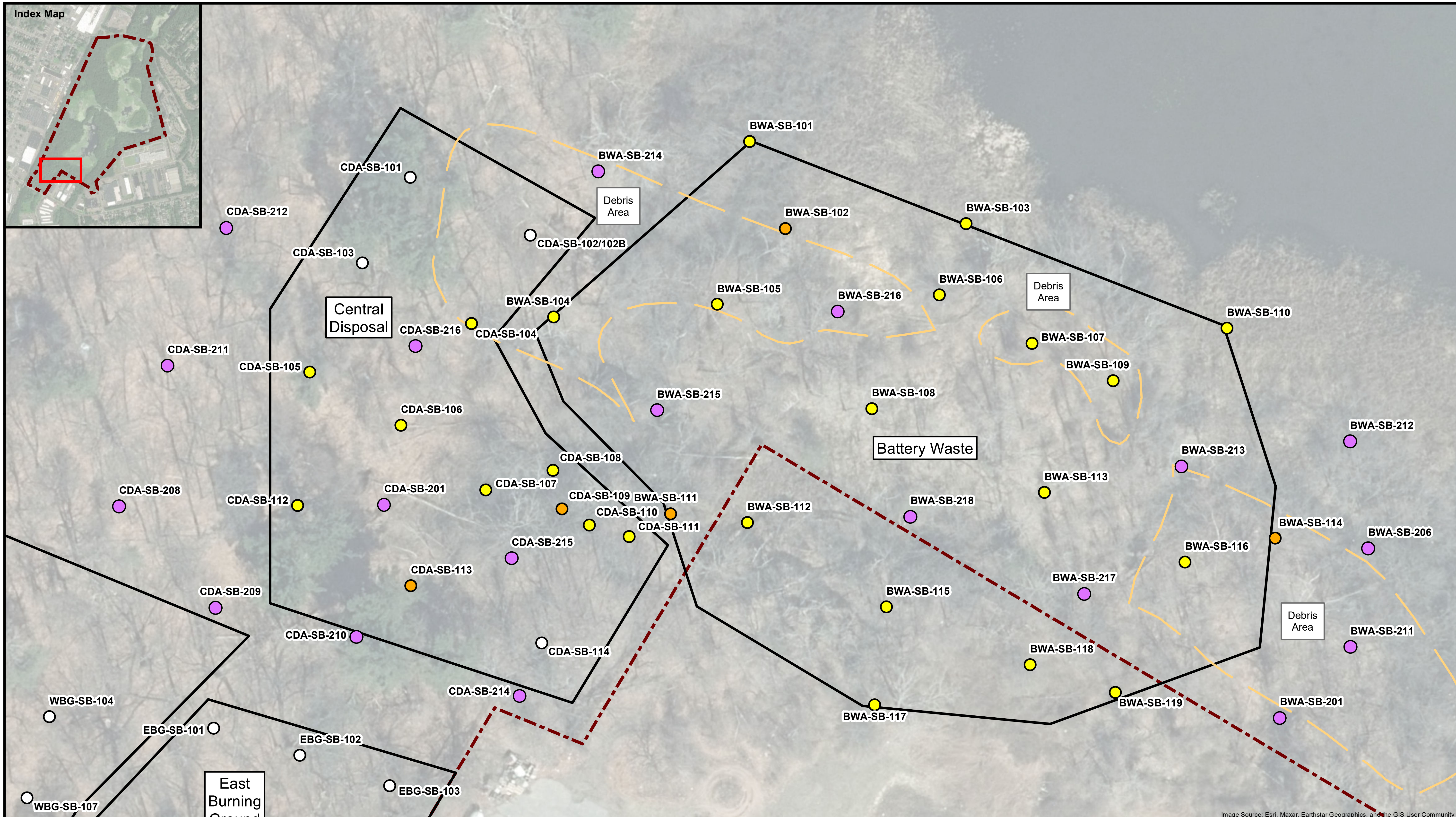
- Sample depths reported on analytical tables
- Results for shallowest depth shown on top row, results for deepest depth shown on bottom row
- When duplicate samples were collected, the higher of the two results were compared to the RSR standard(s)
- When soil borings exhibited poor recovery and not enough material was collected for sample submission, preference was given to analyze for total metals

Figure 4B
Proposed Borings
Battery Waste and Central Disposal Areas
SVOCs

2024 Investigation Work Plan
Olin Pine Swamp
Hamden, Connecticut

Prepared/Date: JSW 10/08/24 | Checked/Date:RJO 10/11/24

Document: \\corp.pbwan.net\glb-e&i\US\USPWM100-PLD2\Project\Projects\Olin - Pine Swamp\4.0_Deliverables\4.5_Databases\GIS\MapDocuments\IWP 2023\PhaseII_ESA\Soil_BoxPlots_AOCs_11x17LS_Inset_2024_ProposedSB.mxd PDF: \\corp.pbwan.net\glb-e&i\US\USPWM100-PLD2\Project\Projects\Olin - Pine Swamp\4.0_Deliverables\4.5_Databases\GIS\Figures\SI Report 2023\Figure 4B - SVOC Proposed Soil Borings BW-CDA.pdf 10/8/2024 7:46 PM jennifer.walker



Legend

- Non-Detect
- Exceeds Alternative GA PMC
- Exceeds Alternative I/C DEC
- Approximate Area of Concern
- Approximate Property Boundary
- Potential Release Areas
- Boring Proposed for Vertical Delineation of Fill
- Proposed Boring Location for COC Delineation

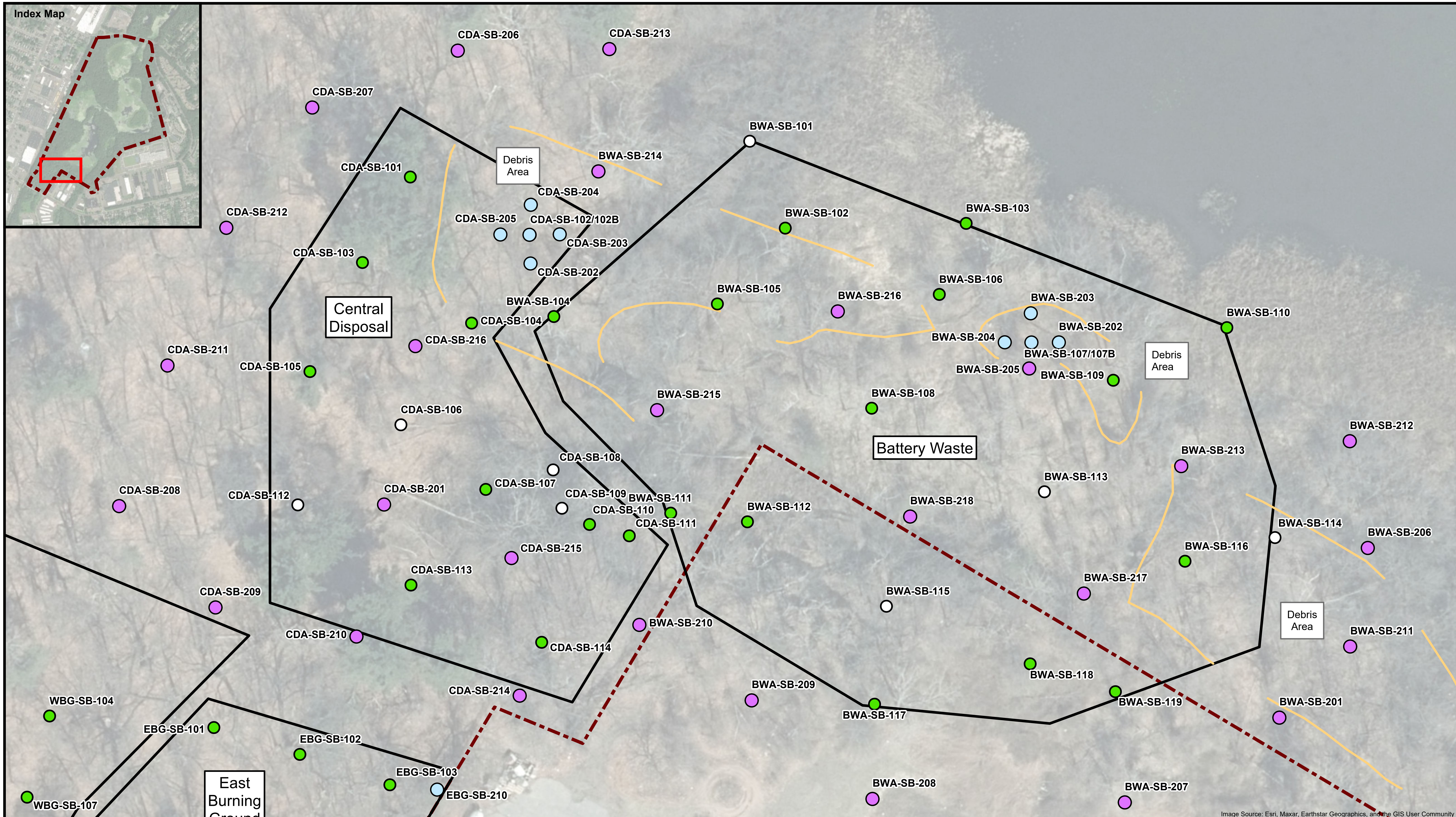
Notes:
Reported soil concentrations for existing borings collected during the 2023 soil investigation and compared to CTDEEP RSRs.

Figure 4C
Proposed Soil Borings
Battery Waste and Central Disposal Areass
ETPH

2024 Investigation Work Plan
Olin Pine Swamp
Hamden, Connecticut

Prepared/Date: JSW 10/11/24	Checked/Date:RJO 10/11/24

Document: \\corp.pbwan.net\glb-e&i\US\USPWM100-PLD2\Project\Projects\Olin - Pine Swamp\4.0_Deliverables\4.5_Databases\GIS\MapDocuments\IWP 2023\PhaseII_ESA\Soil_DotPlots_ETPH_AOCs_11x17LS_Inset_2024_ProposedSB.mxd PDF:\\corp.pbwan.net\GLB-E&I\US\USPWM100-PLD2\Project\Projects\Olin - Pine Swamp\4.0_Deliverables\4.1_Reports\2023 FIR\Figures\2024 Proposed Soil Borings\Figure 4C - ETPH Proposed Soil Borings BW-CDA.pdf 10/11/2024 1:24 PM jennifer.walker



wsp

N

0 50 100 Feet

Prepared/Date: JSW 10/08/24 | Checked/Date:RJO 10/11/24

- Non-Detect
- Below 1 mg/kg
- Between 1 and 10 mg/kg
- Above 10 mg/kg

Legend

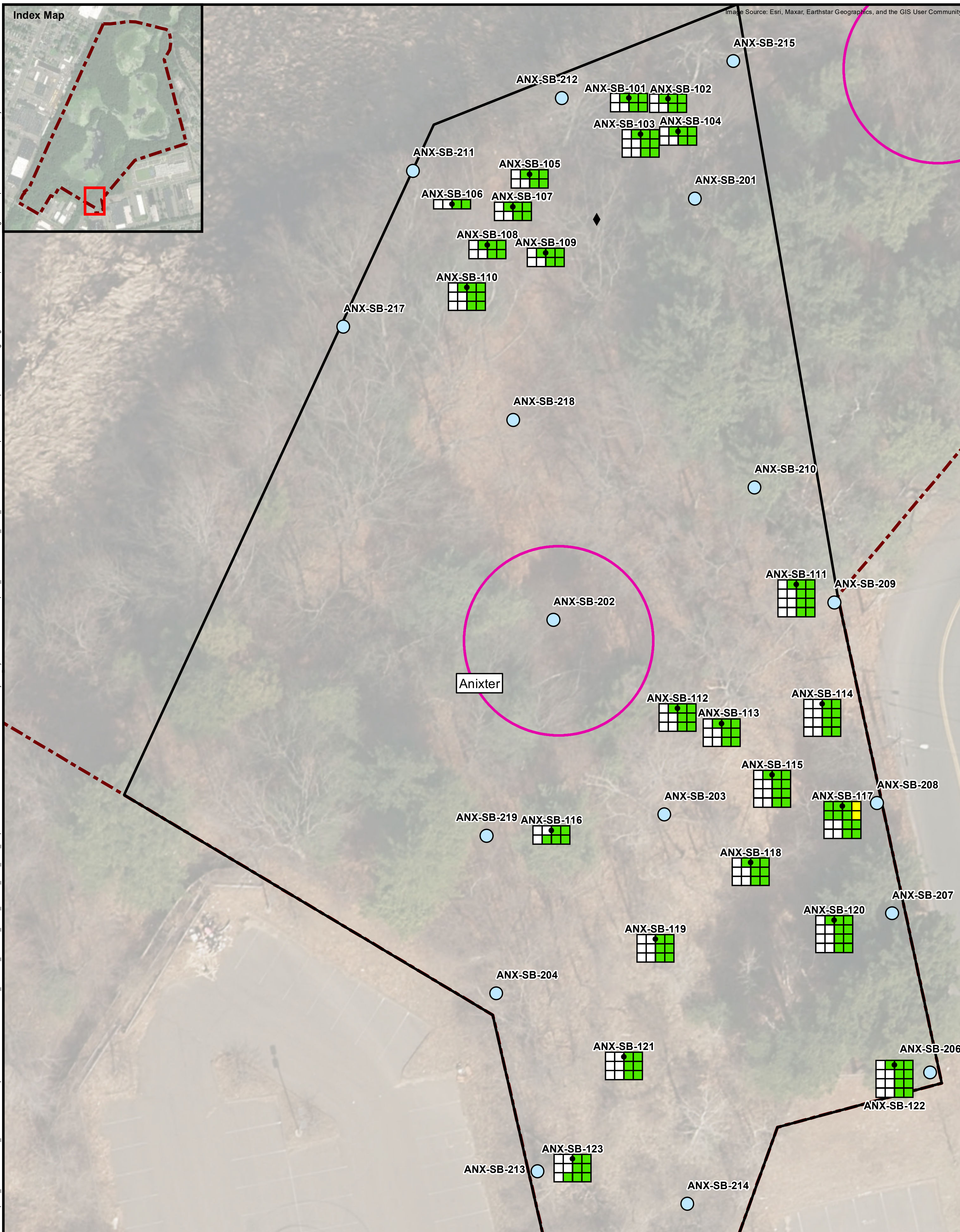
- Approximate Area of Concern
- Approximate Property Boundary
- Potential Release Areas
- Boring Proposed for Vertical Delineation of Fill
- Proposed Boring Location for COC Delineation

Notes:
Reported soil concentrations for existing borings collected during the 2023 soil investigation and compared to CTDEEP RSRs.

Figure 4D
Proposed Soil Borings
Battery Waste and Central Disposal Areas
PCBs

2024 Investigation Work Plan
Olin Pine Swamp
Hamden, Connecticut

Document: X:\US\USPWM100-PLD2\Project\Projects\Olin - Pine Swamp\4.0_Deliverables\4.5_Databases\GIS\MapDocuments\IWP 2023\PhaseII_ESA\Soil_DotPlots_PCBs_AOCs_11x17LS_Inset_2024_ProposedSB.mxd PDF:\\corp.pbwan.net\GLB-E&I\US\USPWM100-PLD2\Project\Projects\Olin - Pine Swamp\4.0_Deliverables\4.1_Reports\2023 FIR\Figures\2024 Proposed Soil Borings\Figure 3D - PCBs Proposed Soil Borings EBG.pdf 10/8/2024 10:49 PM jennifer.walker



Color Indicates:
- Non-Detect
- Detected below GA PMC
- Detected above GA PMC
- Detected above I/C DEC

CTDEEP		PARAMETER					
RSR Standard	Units	1- Benzo(a)anthracene	2 - Benzo(a)pyrene	3 - Benzo(b)fluoranthene	4 - Fluoranthene	5 - Phenanthrene	6 - Pyrene
GA PMC	µg/kg	1,000	1,000	1,000	5,600	4,000	4,000
I/C DEC	µg/kg	7,800	1,000	7,800	2,500,000	2,500,000	2,500,000

Parameter Always in Same Column: 1 2 3 4 5 6

- CT DEEP - Connecticut Department of Energy and Environmental Protection
- RSR - Remediation Standard Regulation
- I/C DEC - Industrial/Commercial Direct Exposure Criteria
- PMC - Pollutant Mobility Criteria

wsp

- Sample depths reported on analytical tables
- Results for shallowest depth shown on top row, results for deepest depth shown on bottom row
- When duplicate samples were collected, the higher of the two results were compared to the RSR standard(s)
- When soil borings exhibited poor recovery and not enough material was collected for sample submission, preference was given to analyze for total metals

N
0 25 Feet

Legend

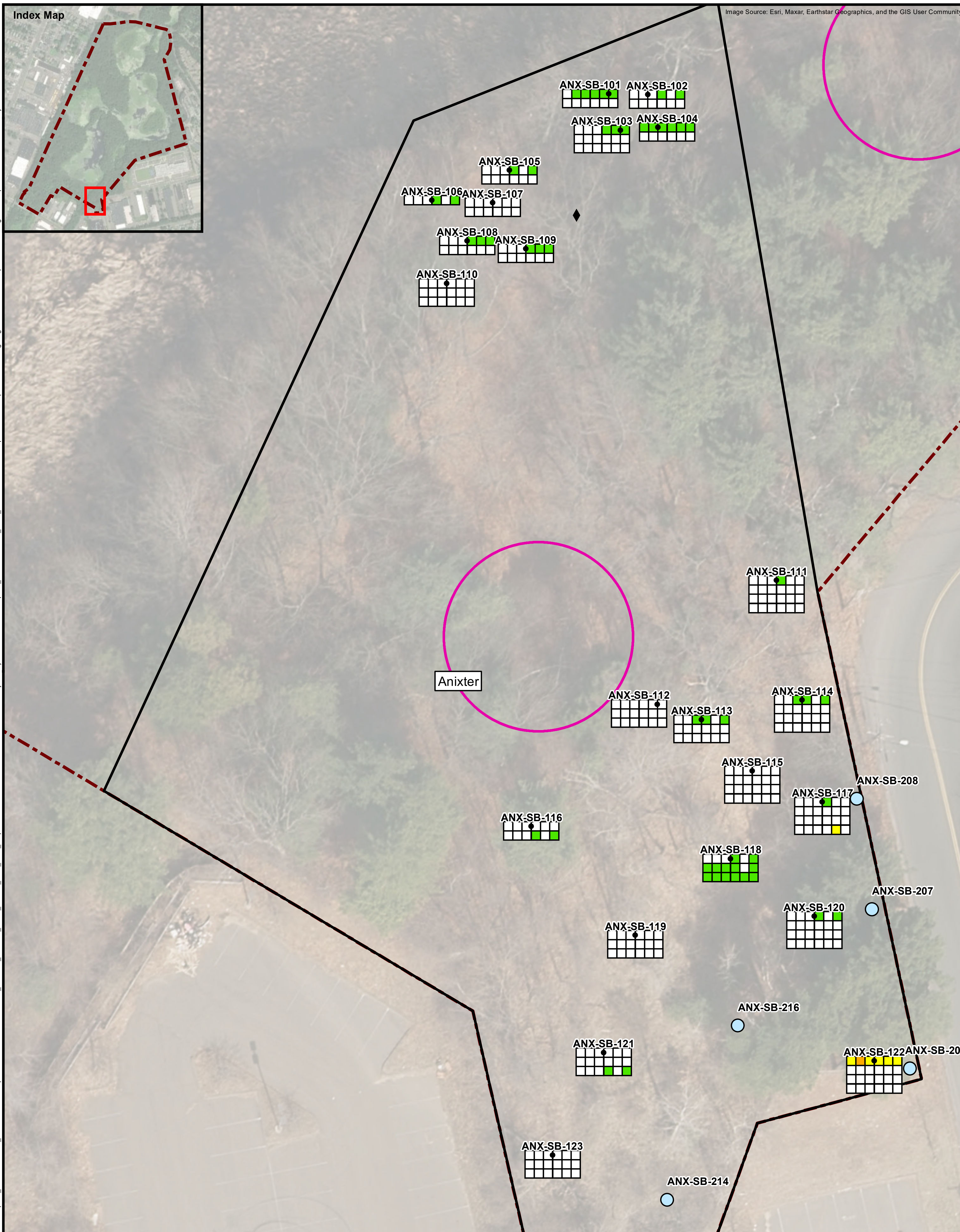
- 2023 Sample Location
- Approximate Area of Concern
- Approximate Property Boundary
- Potential Release Areas
- Proposed Boring Location for COC Delineation
- Bunker Location
- Trap Sand Pile

Figure 5A
Proposed Soil Borings
Anixter Area
Total Metals

2024 Investigation Work Plan
Olin Pine Swamp
Hamden, Connecticut

Prepared/Date: JSW 10/11/24 | Checked/Date: RJO 10/11/24

Document: \\corp.pbwan.net\glb-e&i\US\USPWM100-PLD2\Project\Projects\Olin - Pine Swamp\4.0_Deliverables\4.5_Databases\GIS\MapDocuments\IWP 2023\PhaseII_ESA\Soil_BoxPlots_AOCs_11x17P_Inset_2024_ProposedSB.mxd PDF: X:\US\USPWM100-PLD2\Project\Projects\Olin - Pine Swamp\4.0_Deliverables\4.2_Work_Plans\2024 Pine Swamp IWP\2024 Proposed Soil Borings\Figure 5A - Metals Proposed Soil Borings Anixter.pdf 10/11/2024 2:06 PM jennifer.walker



Color Indicates:
- Non-Detect
- Detected below GA PMC
- Detected above GA PMC
- Detected above I/C DEC

CTDEEP		PARAMETER					
RSR Standard	Units	1 - Benzo(a)anthracene	2 - Benzo(a)pyrene	3 - Benzo(b)fluoranthene	4 - Fluoranthene	5 - Phenanthrene	6 - Pyrene
GA PMC	µg/kg	1,000	1,000	1,000	5,600	4,000	4,000
I/C DEC	µg/kg	7,800	1,000	7,800	2,500,000	2,500,000	2,500,000

Parameter Always in Same Column: 1 2 3 4 5 6

- CT DEEP - Connecticut Department of Energy and Environmental Protection
- RSR - Remediation Standard Regulation
- I/C DEC - Industrial/Commercial Direct Exposure Criteria
- PMC - Pollutant Mobility Criteria

wsp

- Sample depths reported on analytical tables
- Results for shallowest depth shown on top row, results for deepest depth shown on bottom row
- When duplicate samples were collected, the higher of the two results were compared to the RSR standard(s)
- When soil borings exhibited poor recovery and not enough material was collected for sample submission, preference was given to analyze for total metals

N 0 25 Feet

Legend

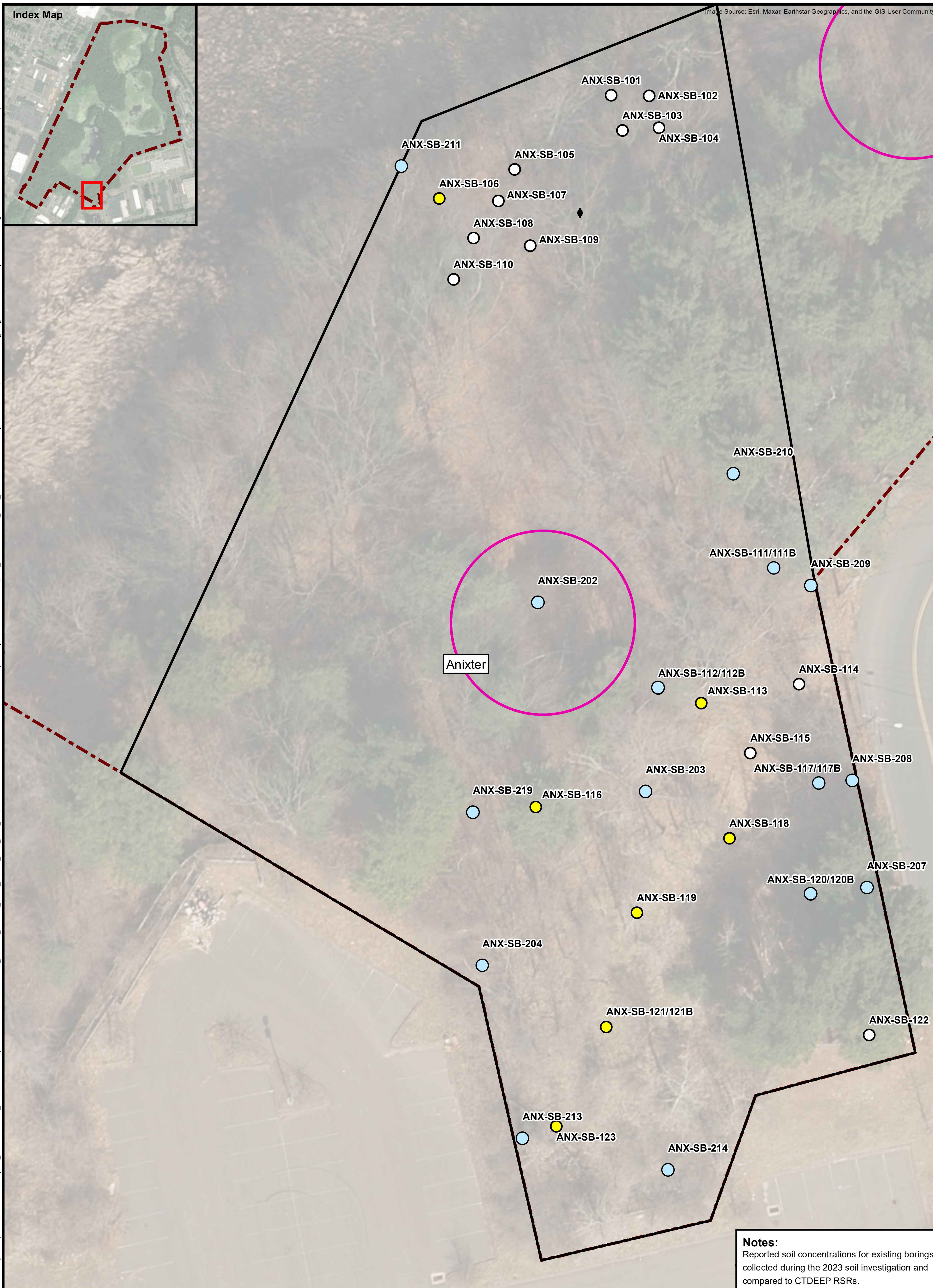
- 2023 Sample Location
- Approximate Area of Concern
- Approximate Property Boundary
- Potential Release Areas
- Proposed Boring Location for COC Delineation
- Bunker Location
- Trap Sand Pile

Figure 5B
Proposed Soil Borings
Anixter Area
SVOCs

2024 Investigation Work Plan
Olin Pine Swamp
Hamden, Connecticut

Prepared/Date: JSW 10/11/24 | Checked/Date: RJO 10/11/24

Document: \\corp.pbwan.net\gb-e&i\US\USPWM100-PLD2\Project\Projects\Olin - Pine Swamp\4.0_Deliverables\4.5_Databases\GIS\MapDocuments\IWP 2023\PhaseII_ESA\Soil_BoxPlots_AOCs_11x17P_Inset_2024_ProposedSB.mxd PDF: X:\US\USPWM100-PLD2\Project\Projects\Olin - Pine Swamp\4.0_Deliverables\4.2_Work_Plans\2024 Pine Swamp IWP\2024 Proposed Soil Borings\Figure 5B - SVOCs Proposed Soil Borings Anixter.pdf 10/1/2024 11:55 AM jennifer.walker



Notes:
Reported soil concentrations for existing borings collected during the 2023 soil investigation and compared to CTDEEP RSRs.

wsp

N
0 25 50 Feet

Legend

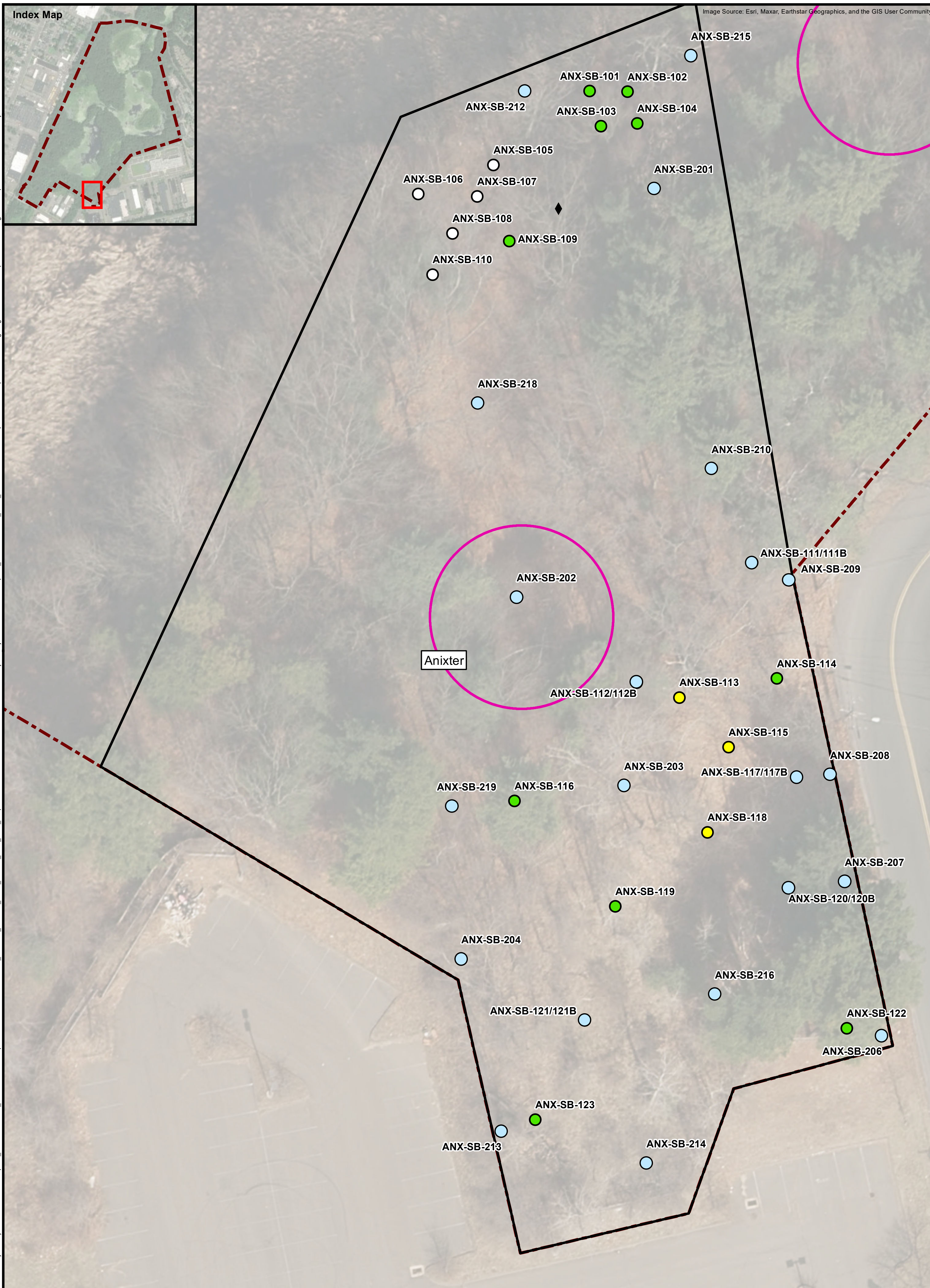
- Approximate Area of Concern
- Approximate Property Boundary
- Potential Release Areas
- Proposed Boring Location for COC Delineation
- Trap Sand Pile
- Non-Detect
- Not Detected Above MA DEP EPH/VPH Criteria
- Exceeds Alternative GA PMC
- Exceeds Alternative I/C DEC
- Bunker Location

Figure 5C
Proposed Soil Borings
Anixter Area
ETPH

2024 Investigation Work Plan
Olin Pine Swamp
Hamden, Connecticut

Prepared/Date: JSW 10/11/24	Checked/Date: RJO 10/11/24

Document: \\corp.pbwan.net\gb-e&i\US\USPWM100-PLD2\Project\Projects\Olin - Pine Swamp\4.0_Deliverables\4.5_Databases\GIS\MapDocuments\IWP 2023\PhaseII_ESA\Soil_DotPlots_ETPH_11x17P_Inset_2024_ProposedSB1.mxd PDF: X:\US\USPWM100-PLD2\Project\Projects\Olin - Pine Swamp\4.0_Deliverables\4.2_Work_Plans\2024 Pine Swamp IWP\2024 Proposed Soil Borings\Figure 5C - ETPH Proposed Soil Borings Anixter.pdf 10/11/2024 1:44 PM jennifer.walker



Legend

- Non-Detect
- Below 1 mg/kg
- Between 1 and 10 mg/kg
- Above 10 mg/kg
- Approximate Area of Concern
- Approximate Property Boundary
- Potential Release Areas
- Bunker Location
- Trap Sand Pile
- Proposed Boring Location for COC Delineation

N

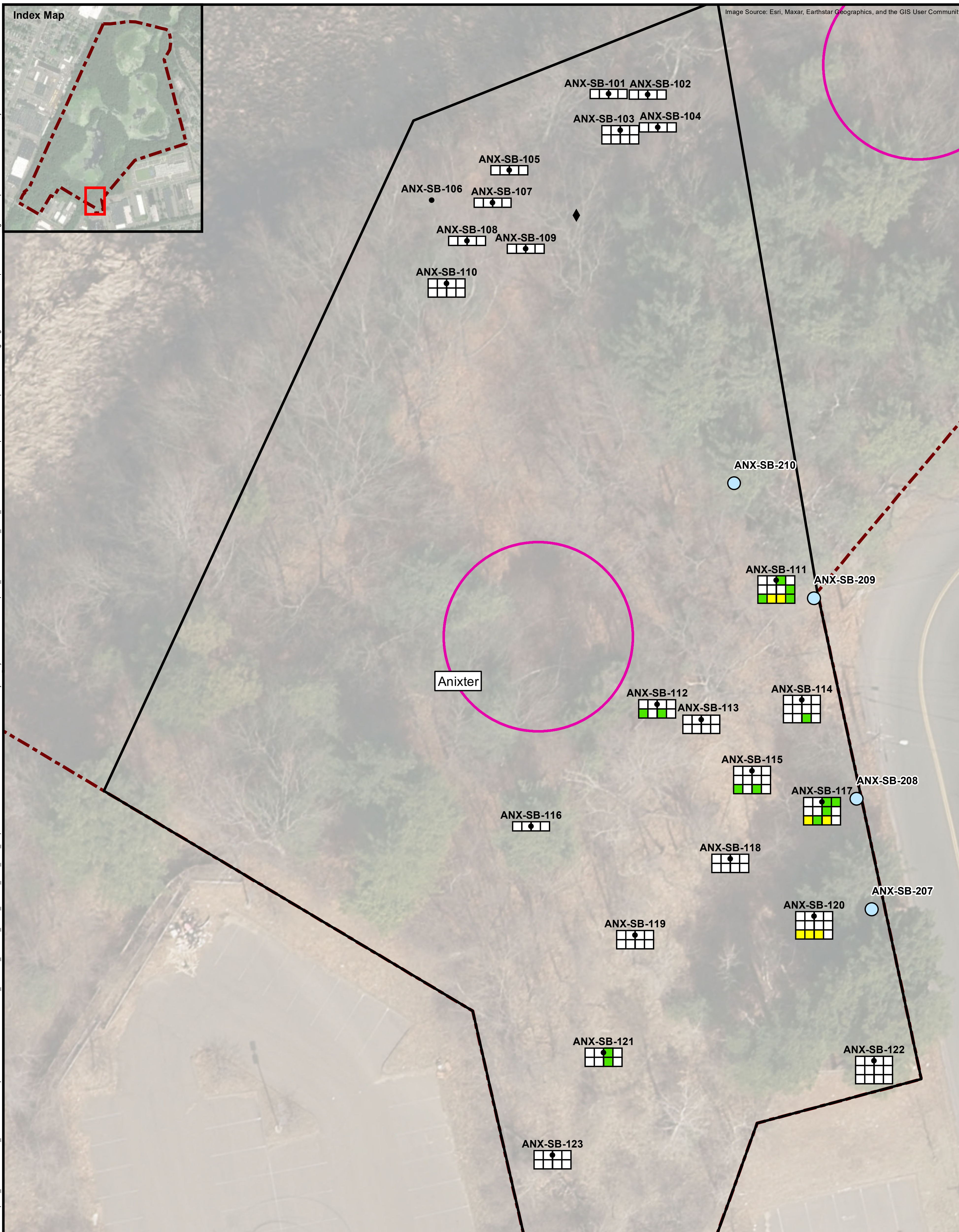
0 25 50 Feet

Notes:
Reported soil concentrations for existing borings collected during the 2023 soil investigation and compared to CTDEEP RSRs.

Prepared/Date: JSW 10/1/2024	Checked/Date: RJO 10/11/24

Figure 5D
Proposed Soil Borings
Anixter
PCBs

2024 Investigation Work Plan
Olin Pine Swamp
Hamden, Connecticut



Color Indicates:
- Non-Detect
- Detected below GA PMC
- Detected above GA PMC
- Detected above I/C DEC

CTDEEP RSR Standard	Units	PARAMETER 1- Chlorobenzene	2 - cis-1,2-Dichloroethene	3 - Tetrachloroethene	4 - Trichloroethene
GA PMC	μg/kg	2,000	1,400	100	100
I/C DEC	μg/kg	1,000,000	1,000,000	110,000	520,000

Parameter Always in Same Column: 1 2 3 4

- CT DEEP - Connecticut Department of Energy and Environmental Protection
- RSR - Remediation Standard Regulation
- I/C DEC - Industrial/Commercial Direct Exposure Criteria
- PMC - Pollutant Mobility Criteria

- Sample depths reported on analytical tables
- Results for shallowest depth shown on top row, results for deepest depth shown on bottom row
- When duplicate samples were collected, the higher of the two results were compared to the RSR standard(s)
- When soil borings exhibited poor recovery and not enough material was collected for sample submission, preference was given to analyze for total metals

N 0 25 Feet

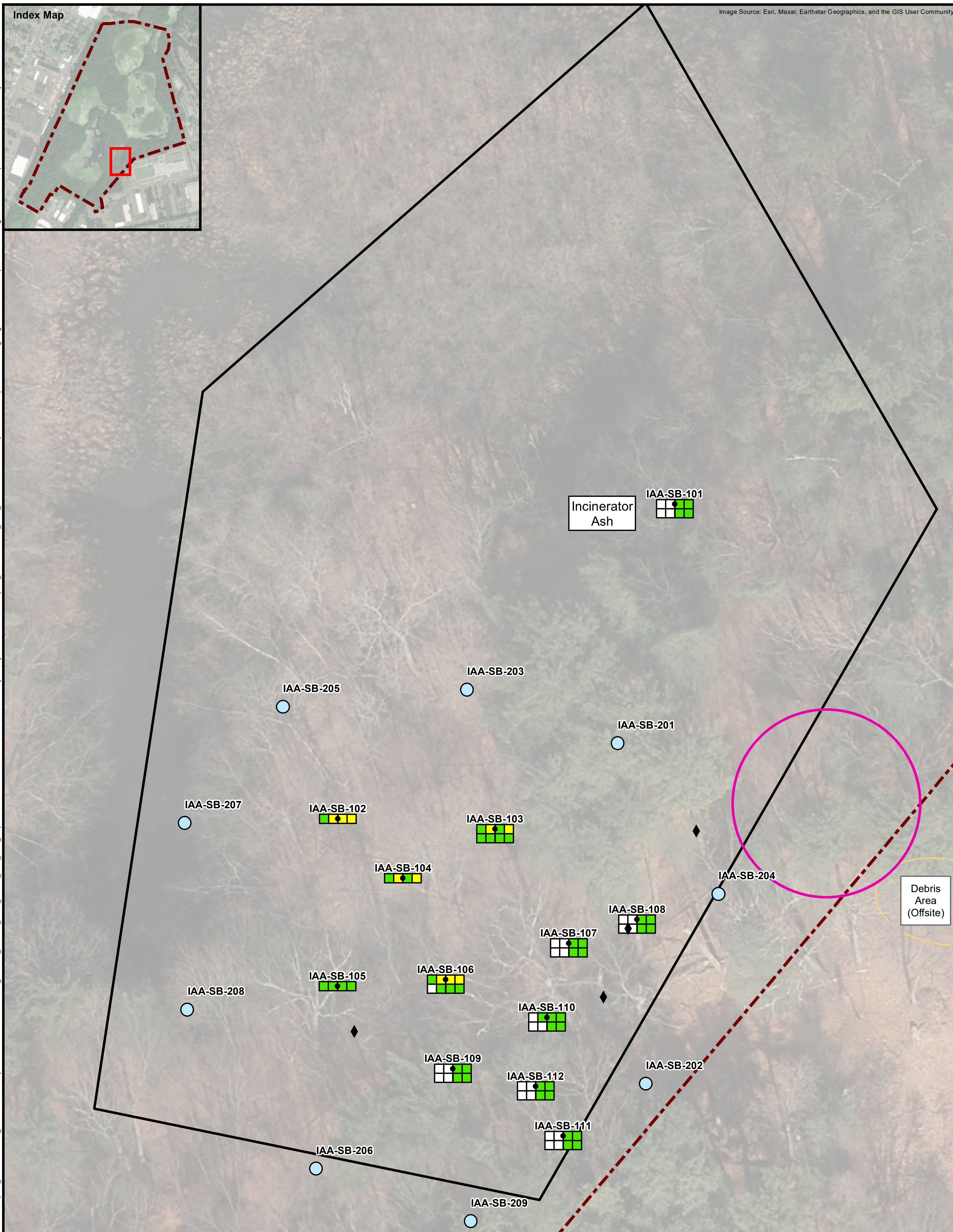
Legend

- 2023 Sample Location
- Approximate Area of Concern
- Approximate Property Boundary
- Potential Release Areas
- Proposed Boring Location for COC Delineation
- Bunker Location
- Trap Sand Pile

Figure 5E
Proposed Soil Borings
Anixter Area
VOCs

2024 Investigation Work Plan
Olin Pine Swamp
Hamden, Connecticut

Prepared/Date: JSW 10/11/24 | Checked/Date: RJO 10/11/24



Color Indicates:
- Non-Detect
- Detected below I/C DEC
- Detected above I/C DEC

CTDEEP RSR Standard	Units	PARAMETER 1- Antimony	2 - Arsenic	3 - Chromium	4 - Lead
I/C DEC	µg/kg	8,200,000	10,000	100,000	1,000,000

Parameter Always in Same Column: 1 2 3 4

- CT DEEP - Connecticut Department of Energy and Environmental Protection
- RSR - Remediation Standard Regulation
- I/C DEC - Industrial/Commercial Direct Exposure Criteria

wsp

- Sample depths reported on analytical tables
- Results for shallowest depth shown on top row, results for deepest depth shown on bottom row
- When duplicate samples were collected, the higher of the two results were compared to the RSR standard(s)
- When soil borings exhibited poor recovery and not enough material was collected for sample submission, preference was given to analyze for total metals

N 0 25 Feet

Legend

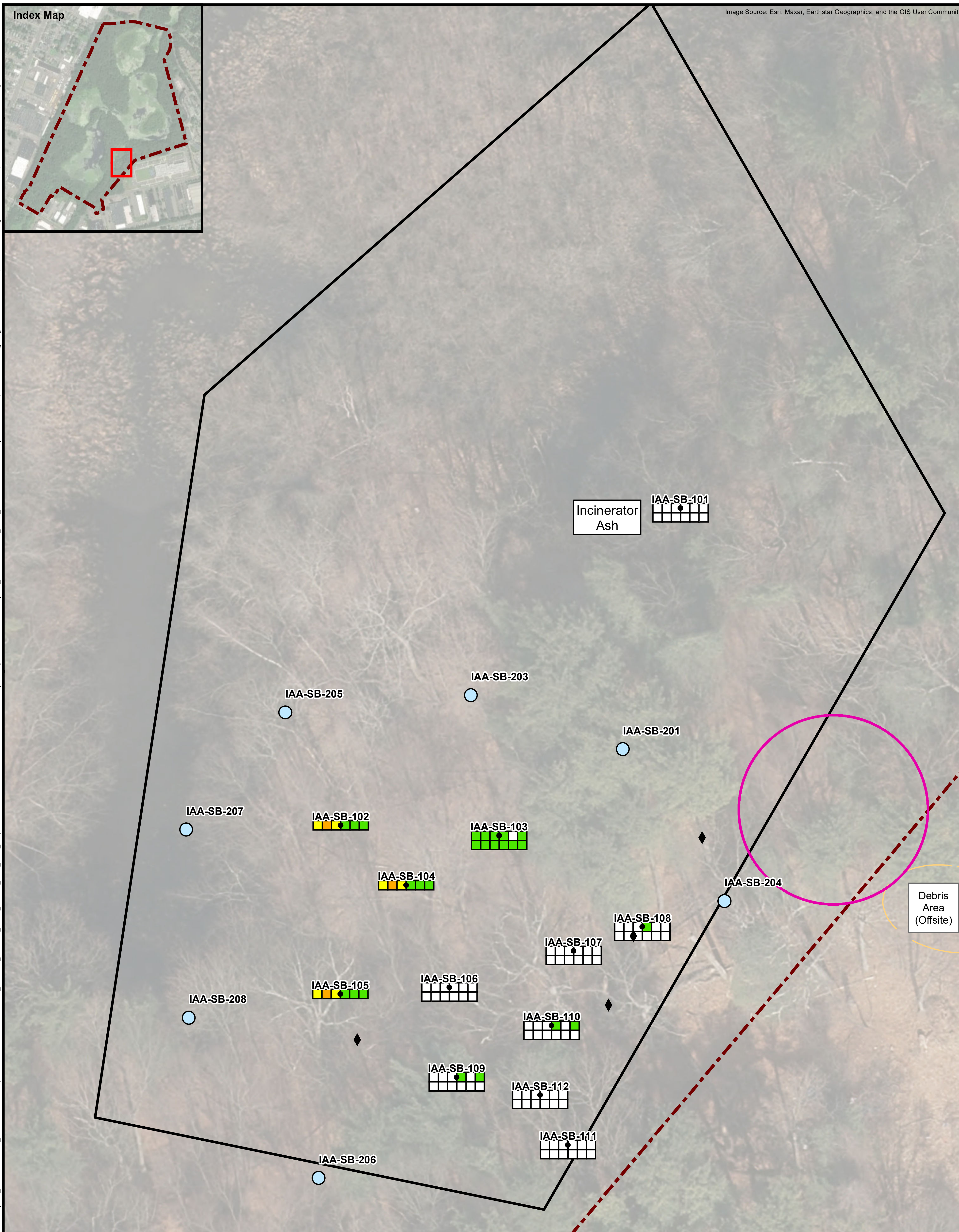
- 2023 Sample Location
- Approximate Area of Concern
- Approximate Property Boundary
- Potential Release Areas
- Proposed Boring Location for COC Delineation
- Bunker Location
- Trap Sand Pile

Figure 6A
Proposed Soil Borings
Incinerator Ash Area
Total Metals

2024 Investigation Work Plan
Olin Pine Swamp
Hamden, Connecticut

Prepared/Date: JSW 10/08/24 | Checked/Date: RJO 10/11/24

Document: \\corp.pbwan.net\glb-e&i\US\USPWM100-PLD2\Project\Projects\Olin - Pine Swamp\4.0_Deliverables\4.5_Databases\GIS\MapDocuments\IWP 2023\PhaseII_ESA\Soil_BoxPlots_AOCs_11x17P_Inset_2024_ProposedSB.mxd PDF: X:\US\USPWM100-PLD2\Project\Projects\Olin - Pine Swamp\4.0_Deliverables\4.2_Work_Plans\2024 Pine Swamp IWP\2024 Proposed Soil Borings\Figure 6A - Metals Proposed Soil Borings Incinerator Ash.pdf 10/8/2024 11:48 PM jennifer.walker



Color Indicates:
- Non-Detect
- Detected below GA PMC
- Detected above GA PMC
- Detected above I/C DEC

CTDEEP RSR Standard	Units	PARAMETER 1- Benzo(a)anthracene	2 - Benzo(a)pyrene	3 - Benzo(b)fluoranthene	4 - Fluoranthene	5 - Phenanthrene	6 - Pyrene
GA PMC	µg/kg	1,000	1,000	1,000	5,600	4,000	4,000
I/C DEC	µg/kg	7,800	1,000	7,800	2,500,000	2,500,000	2,500,000

Parameter Always in Same Column: 1 2 3 4 5 6

- CT DEEP - Connecticut Department of Energy and Environmental Protection
- RSR - Remediation Standard Regulation
- I/C DEC - Industrial/Commercial Direct Exposure Criteria
- PMC - Pollutant Mobility Criteria

- Sample depths reported on analytical tables
- Results for shallowest depth shown on top row, results for deepest depth shown on bottom row
- When duplicate samples were collected, the higher of the two results were compared to the RSR standard(s)
- When soil borings exhibited poor recovery and not enough material was collected for sample submission, preference was given to analyze for total metals

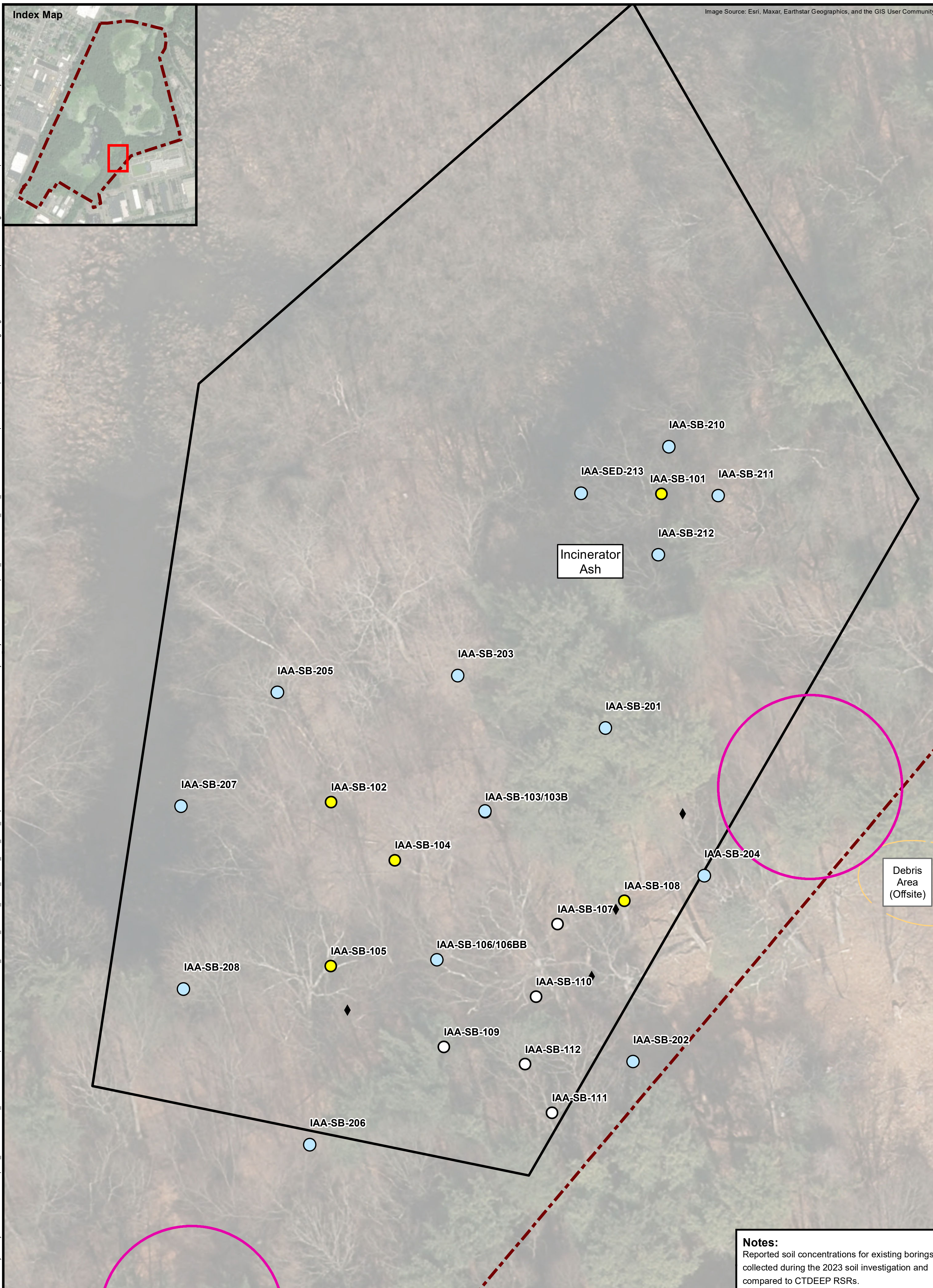
N
0 25 Feet

Legend
- 2023 Sample Location
- Approximate Area of Concern
- Approximate Property Boundary
- Potential Release Areas
- Proposed Boring Location for COC Delineation
- Bunker Location
- Trap Sand Pile

Figure 6B
Proposed Soil Borings
Incinerator Ash Area
SVOCs

2024 Investigation Work Plan
Olin Pine Swamp
Hamden, Connecticut

Prepared/Date: JSW 10/08/24 | Checked/Date: RJO 10/11/24



Legend

- Approximate Area of Concern
- Approximate Property Boundary
- Potential Release Areas
- Proposed Boring Location for COC Delineation
- Trap Sand Pile
- Non-Detect
- Not Detected Above MA DEP EPH/VPH Criteria
- Exceeds Alternative GA PMC
- Exceeds Alternative I/C DEC
- Bunker Location

N

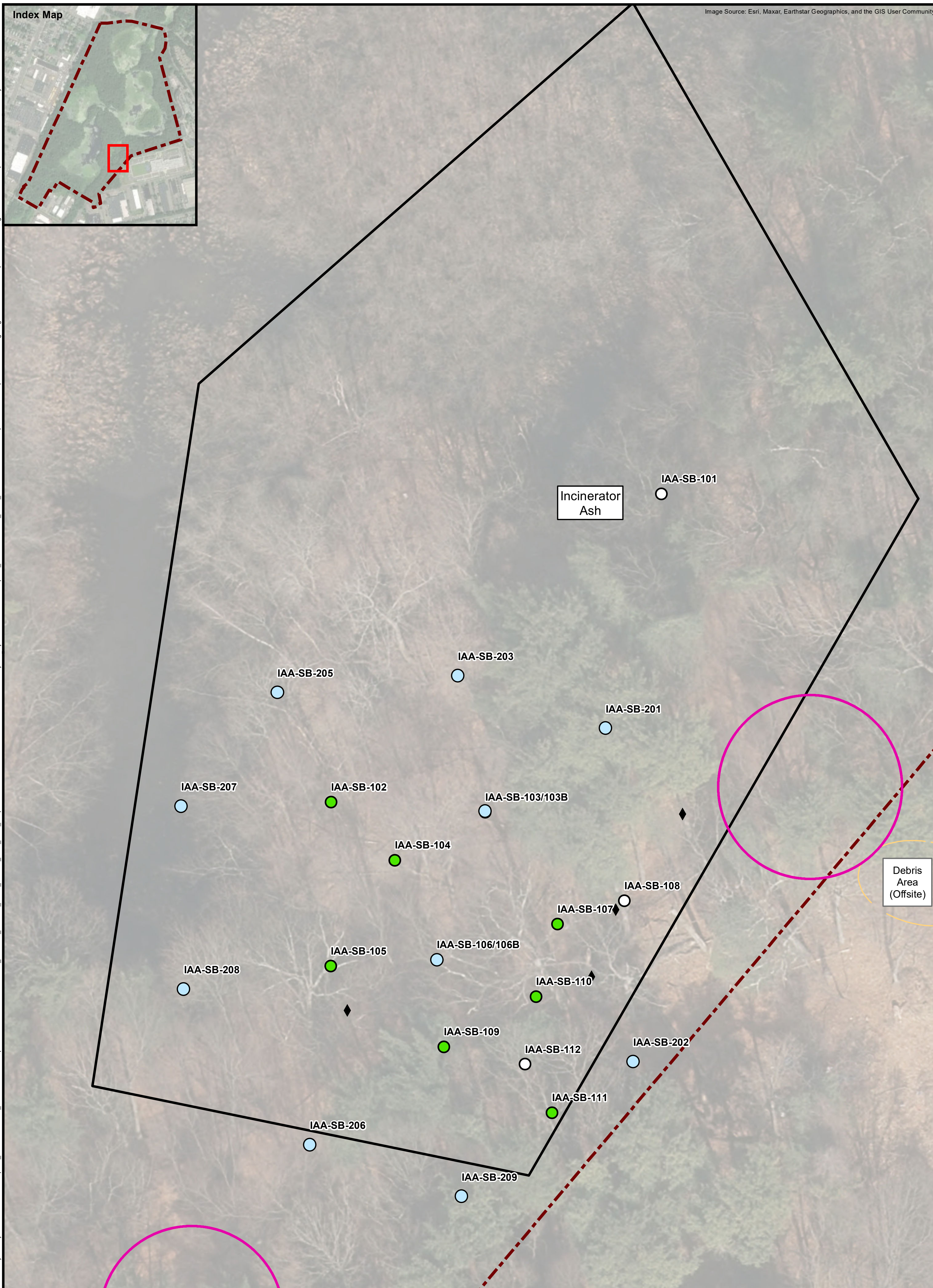
0 25 50 Feet

Figure 6C
Proposed Soil Borings
Incinerator Ash Area
ETPH

2024 Investigation Work Plan
Olin Pine Swamp
Hamden, Connecticut

Prepared/Date: JSW 10/11/24 | Checked/Date: RJO 10/11/24

Document: \\corp.pbwan.net\gb-e&i\US\USPWM100-PLD2\Project\Projects\Olin - Pine Swamp\4.0_Deliverables\4.5_Databases\GIS\MapDocuments\IWP 2023\PhaseII_ESA\Soil_DotPlots_ETPH_11x17P_Inset_2024_ProposedSB1.mxd PDF: X:\US\USPWM100-PLD2\Project\Projects\Olin - Pine Swamp\4.0_Deliverables\4.2_Work_Plans\2024 Pine Swamp IWP\2024 Proposed Soil Borings\Figure 6C - ETPH Proposed Soil Borings Incinerator Ash.pdf 10/11/2024 1:40 PM jennifer.walker



wsp

Legend

- Non-Detect
- Below 1 mg/kg
- Between 1 and 10 mg/kg
- Above 10 mg/kg
- Approximate Area of Concern
- Approximate Property Boundary
- Potential Release Areas
- Bunker Location
- Trap Sand Pile
- Proposed Boring Location for COC Delineation

N

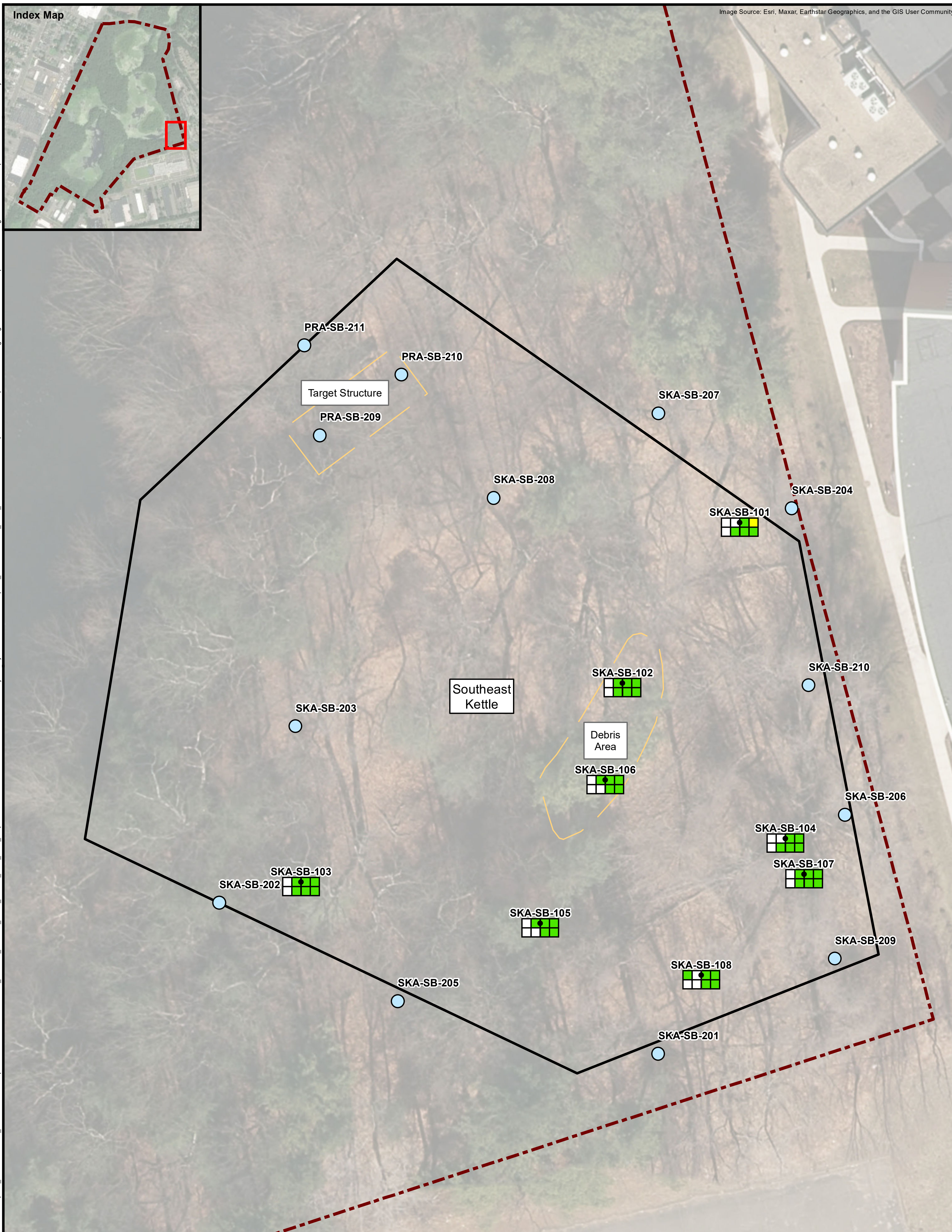
0 25 50 Feet

Notes:
Reported soil concentrations for existing borings collected during the 2023 soil investigation and compared to CTDEEP RSRs.

Prepared/Date: JSW 10/11/24	Checked/Date: RJO 10/11/24

Figure 6D
Proposed Soil Borings
Incinerator Ash Area
PCBs

2024 Investigation Work Plan
Olin Pine Swamp
Hamden, Connecticut



Color Indicates:
- Non-Detect
- Detected below I/C DEC
- Detected above I/C DEC

CTDEEP		PARAMETER			
RSR Standard	Units	1- Antimony	2 - Arsenic	3 - Chromium	4 - Lead
I/C DEC	µg/kg	8,200,000	10,000	100,000	1,000,000

Parameter Always in Same Column: 1 2 3 4

- CT DEEP - Connecticut Department of Energy and Environmental Protection
- RSR - Remediation Standard Regulation
- I/C DEC - Industrial/Commercial Direct Exposure Criteria

wsp

- Sample depths reported on analytical tables
- Results for shallowest depth shown on top row, results for deepest depth shown on bottom row
- When duplicate samples were collected, the higher of the two results were compared to the RSR standard(s)
- When soil borings exhibited poor recovery and not enough material was collected for sample submission, preference was given to analyze for total metals

N

0 25 Feet

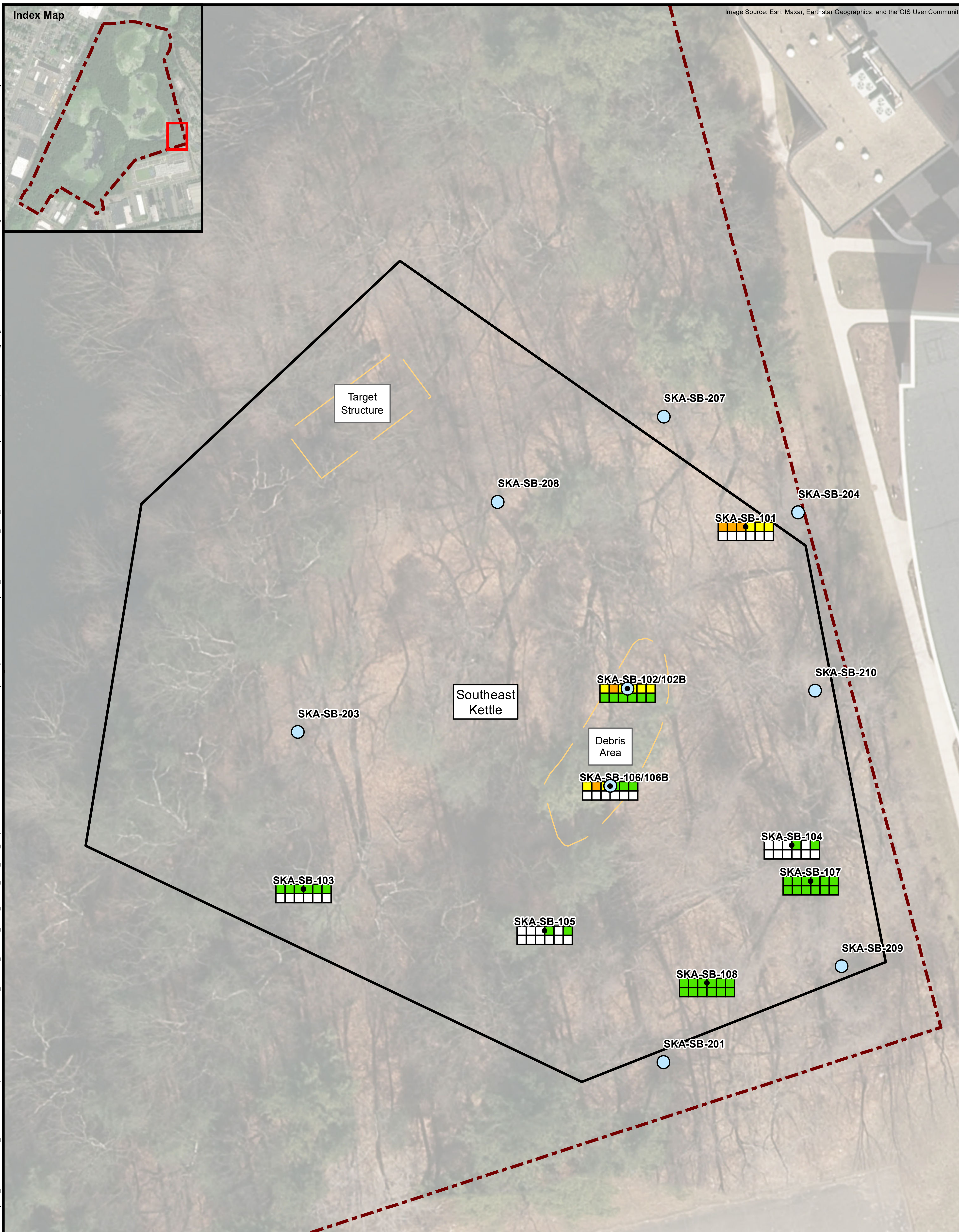
Legend

- 2023 Sample Location
- Approximate Area of Concern
- Approximate Property Boundary
- Potential Release Areas
- Proposed Boring Location for COC Delineation

Figure 7A
Proposed Soil Borings
Southeast Kettle Area
Total Metals

2024 Investigation Work Plan
Olin Pine Swamp
Hamden, Connecticut

Prepared/Date: JSW 10/09/24	Checked/Date: RJO 10/11/24



Color Indicates:
- Non-Detect
- Detected below GA PMC
- Detected above GA PMC
- Detected above I/C DEC

CTDEEP		PARAMETER					
RSR Standard	Units	1- Benzo(a)anthracene	2 - Benzo(a)pyrene	3 - Benzo(b)fluoranthene	4 - Fluoranthene	5 - Phenanthrene	6 - Pyrene
GA PMC	µg/kg	1,000	1,000	1,000	5,600	4,000	4,000
I/C DEC	µg/kg	7,800	1,000	7,800	2,500,000	2,500,000	2,500,000

Parameter Always in Same Column: 1 2 3 4 5 6

- CT DEEP - Connecticut Department of Energy and Environmental Protection
- RSR - Remediation Standard Regulation
- I/C DEC - Industrial/Commercial Direct Exposure Criteria
- PMC - Pollutant Mobility Criteria

wsp

- Sample depths reported on analytical tables
- Results for shallowest depth shown on top row, results for deepest depth shown on bottom row
- When duplicate samples were collected, the higher of the two results were compared to the RSR standard(s)
- When soil borings exhibited poor recovery and not enough material was collected for sample submission, preference was given to analyze for total metals

N
0 25 Feet

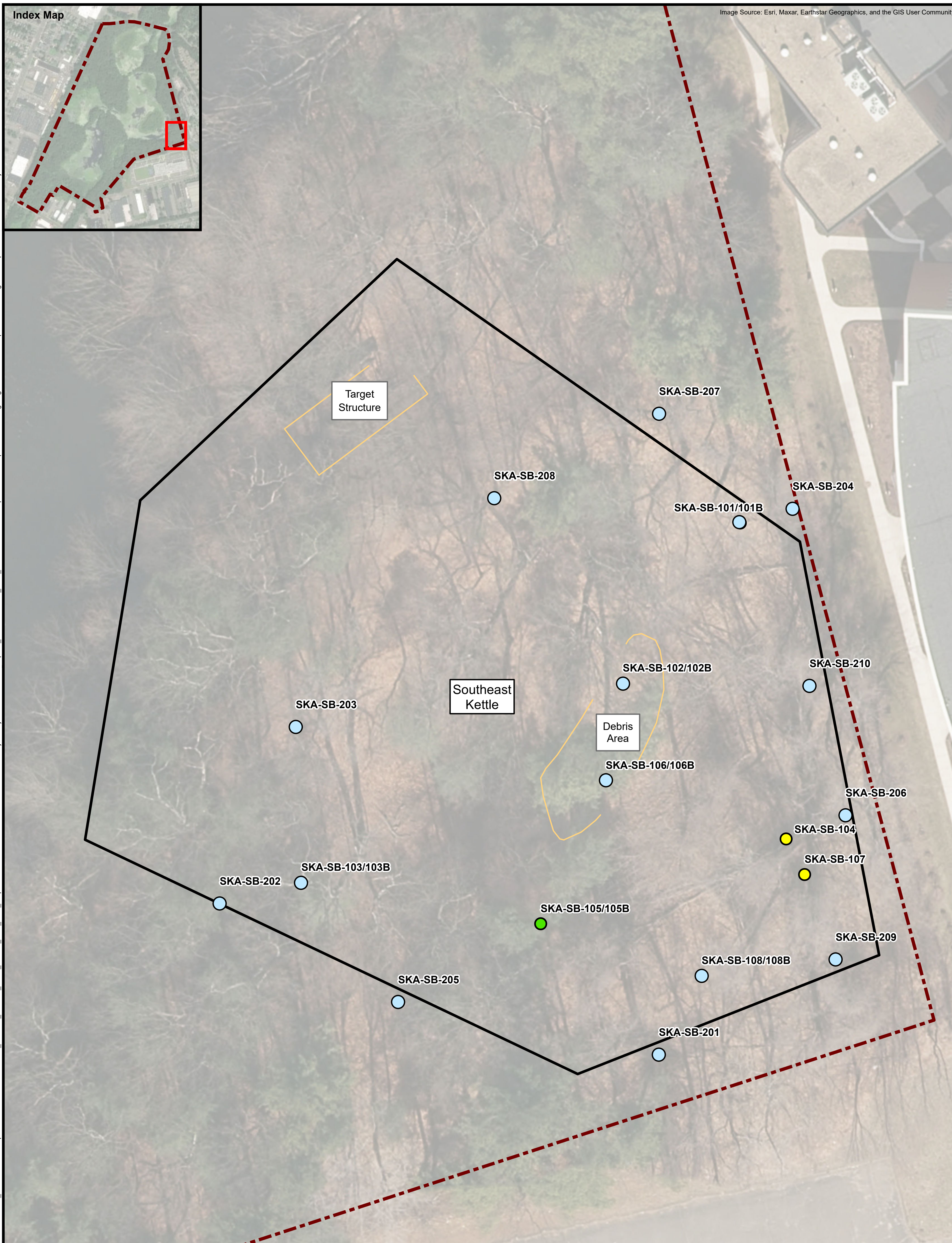
Legend

- 2023 Sample Location
- Approximate Area of Concern
- Approximate Property Boundary
- Potential Release Areas
- Proposed Boring Location for COC Delineation
- Bunker Location
- Trap Sand Pile

Figure 7B
Proposed Soil Borings
Southeast Kettle Area
SVOCs

2024 Investigation Work Plan
Olin Pine Swamp
Hamden, Connecticut

Prepared/Date: JSW 10/09/24 | Checked/Date: RJO 10/11/24



Notes:
Reported soil concentrations for existing borings collected during the 2023 soil investigation and compared to CTDEEP RSRs.

wsp

Legend

- Approximate Area of Concern
- Approximate Property Boundary
- Potential Release Areas
- Proposed Boring Location for COC Delineation
- Trap Sand Pile
- Non-Detect
- Not Detected Above MA DEP EPH/VPH Criteria
- Exceeds Alternative GA PMC
- Exceeds Alternative I/C DEC
- Bunker Location

N

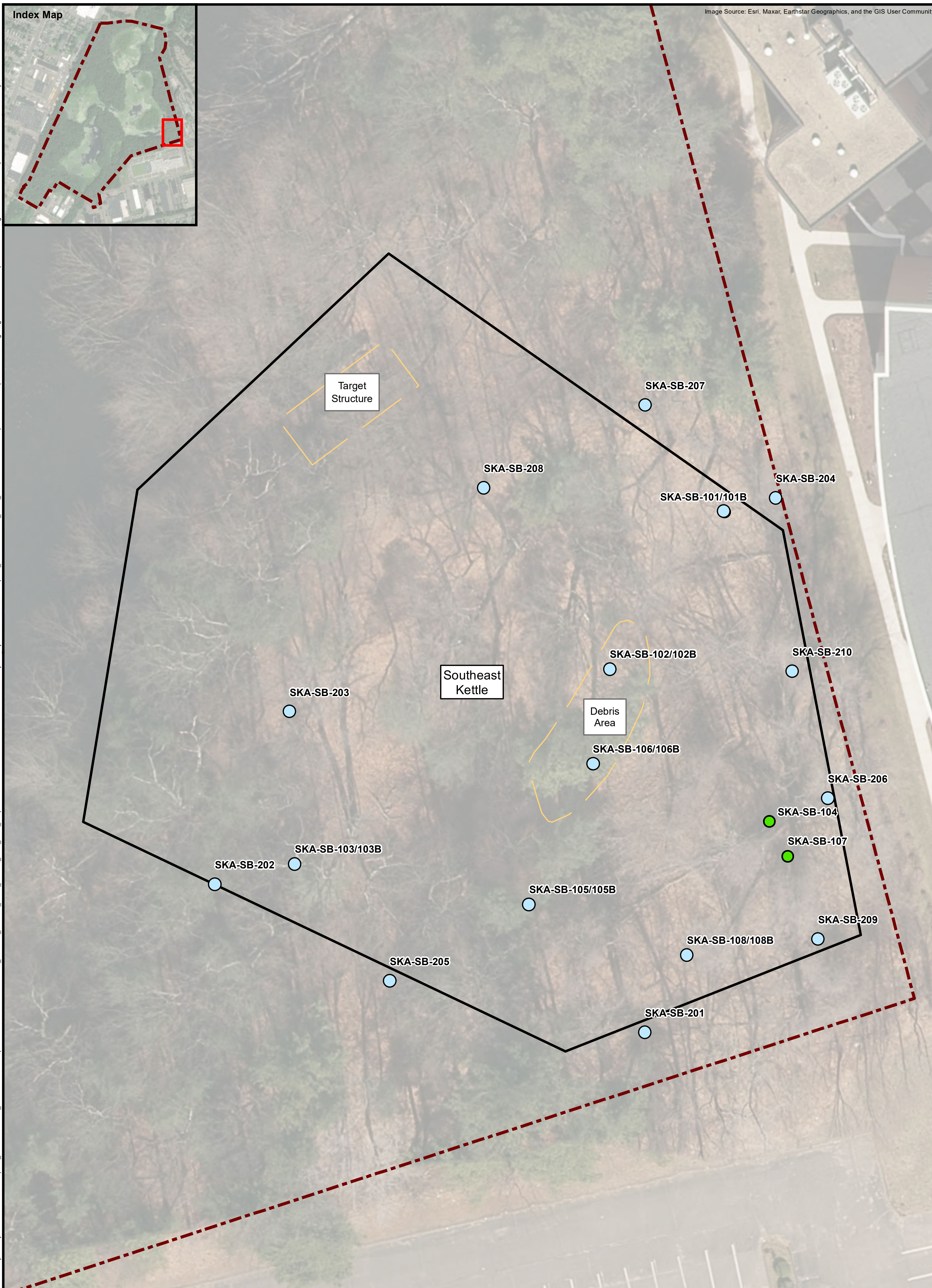
0 25 50 Feet

Prepared/Date: JSW 10/11/24 | Checked/Date: RJO 10/11/24

Figure 7C
Proposed Soil Borings
Southeast Kettle Area
ETPH

2024 Investigation Work Plan
Olin Pine Swamp
Hamden, Connecticut

Document: X:\US\USPWM100-PLD2\Project\Projects\Olin - Pine Swamp\4.0_Deliverables\4.5_Databases\GIS\MapDocuments\WP 2023\PhaseII_ESA\Soil_DotPlots_ETPH_11x17P_Inset_2024_ProposedSB1.mxd PDF: X:\US\USPWM100-PLD2\Project\Projects\Olin - Pine Swamp\4.0_Deliverables\4.2_Work_Plans\2024 Pine Swamp IWP\2024 Proposed Soil Borings\Figure 5C - ETPH Proposed Soil Borings Anixter.pdf 10/11/2024 3:02 PM jennifer.walker



wsp

Legend

- Non-Detect
- Below 1 mg/kg
- Between 1 and 10 mg/kg
- Above 10 mg/kg
- Approximate Area of Concern
- Approximate Property Boundary
- Potential Release Areas
- Proposed Boring Location for COC Delineation

N

0 25 50 Feet

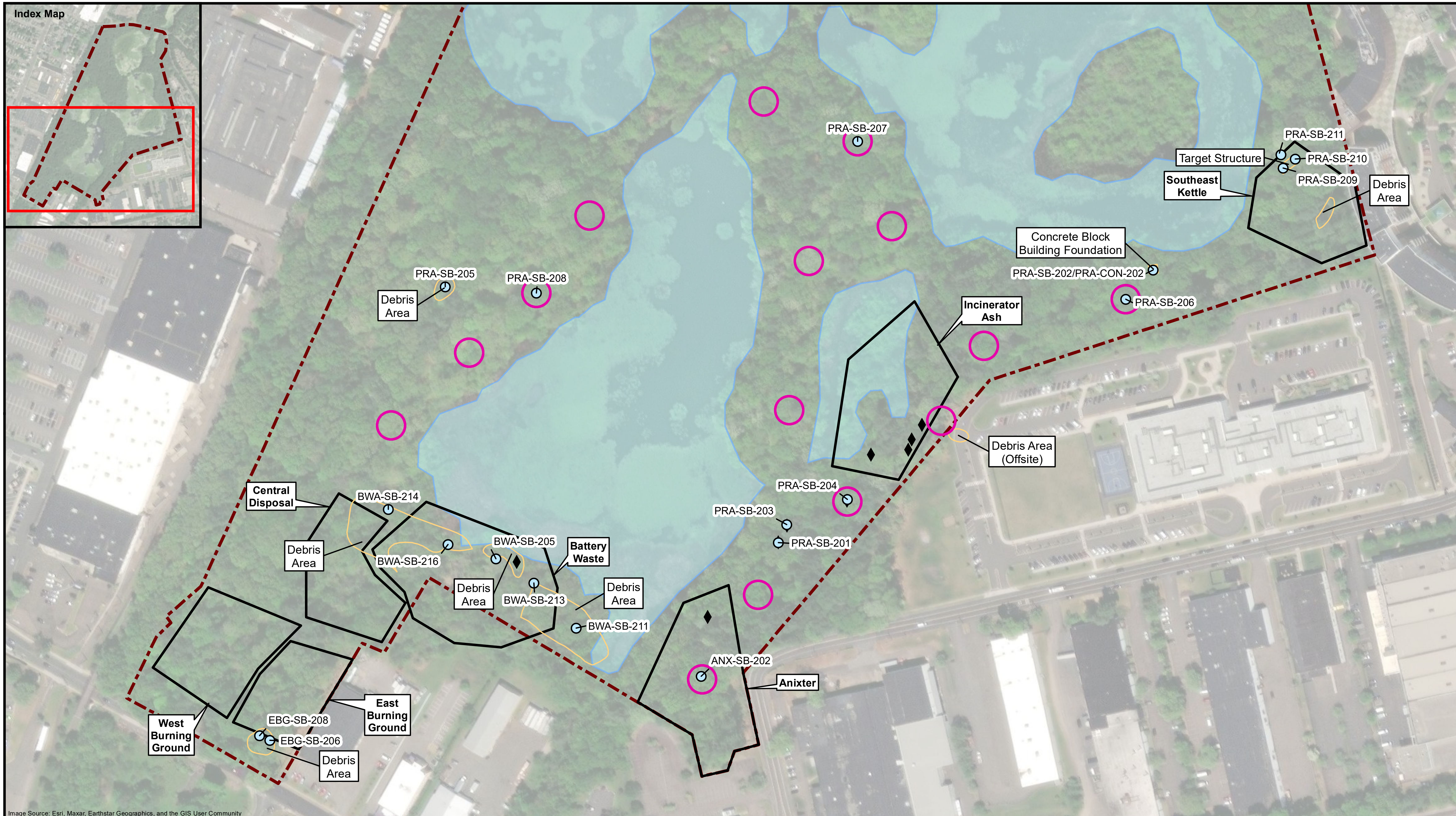
Notes:
Reported soil concentrations for existing borings collected during the 2023 soil investigation and compared to CTDEEP RSRs.

Prepared/Date: JSW 10/11/24 | Checked/Date: RJO 10/11/24

Figure 7D
Proposed Soil Borings
Southeast Kettle Area
PCBs

2024 Investigation Work Plan
Olin Pine Swamp
Hamden, Connecticut

Document: \\corp.pbwan.net\gb-e&i\US\USPWM100-PLD2\Project\Projects\Olin - Pine Swamp\4.0_Deliverables\4.5_Database\GIS\MapDocuments\IWP 2023\PhaseII_ESA\Soil_DotPlots_PCBs_11x17P_Inset_2024_ProposedSB.mxd PDF: X:\US\USPWM100-PLD2\Project\Projects\Olin - Pine Swamp\4.0_Deliverables\4.2_Work_Plans\2024 Pine Swamp IWP\2024 Proposed Soil Borings\Figure 7D - PCBs Proposed Soil Borings Southeast Kettle.pdf 10/11/2024 01:56 PM jennifer.walker



wsp

N
0 100 200 400 Feet

Legend

- Proposed Boring Locations
- Trap Sand Pile
- Approximate Area of Concern
- Approximate Property Boundary
- Bunker Location
- Potential Release Areas

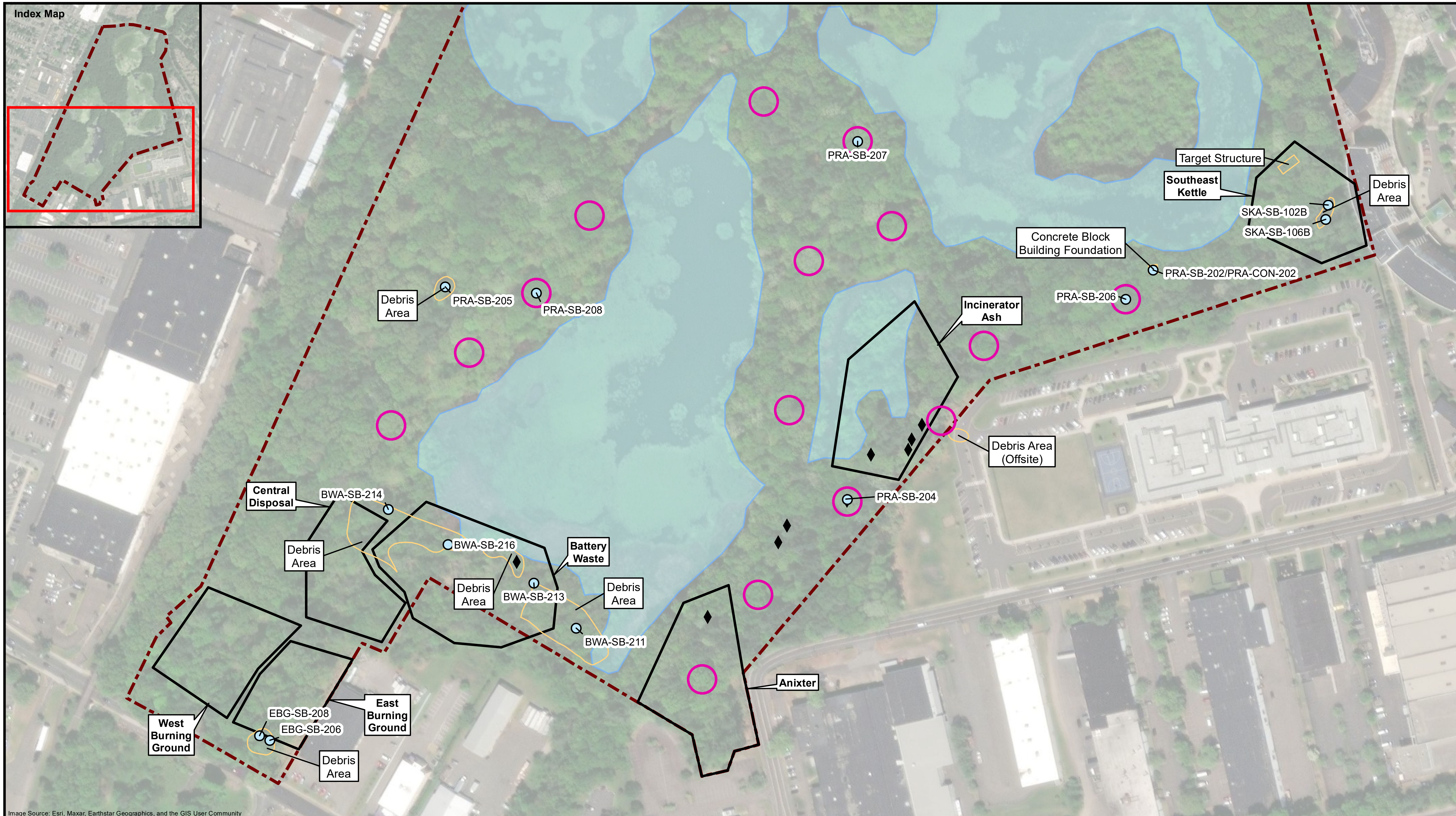
Notes:
Potential release areas mapped using review of historic documentation, locations and extents are approximate.

Figure 8A
Proposed Soil Borings
Potential Release Area
Total Metals

2024 Investigation Work Plan
Olin Pine Swamp
Hamden, Connecticut

Prepared/Date: JSW 10/11/24	Checked/Date: RJO 10/11/24

Document: \\corp.pbwan.net\glb-e&i\US\USPWM100-PLD2\Project\Projects\Olin - Pine Swamp\4.0_Deliverables\4.5_Databases\GIS\MapDocuments\IWP2024\Proposed_PRABorings_2024_11x17LS_Inset.mxd PDF: X:\US\USPWM100-PLD2\Project\Projects\Olin - Pine Swamp\4.0_Deliverables\4.5_Databases\GIS\Figures\Figure 8A - Metals Proposed Soil Borings PRA.pdf 10/11/2024 3:14 PM jennifer.walker



wsp

Legend

- Proposed Boring Locations
- Trap Sand Pile
- Approximate Area of Concern
- Approximate Property Boundary
- Bunker Location
- Potential Release Areas

N

0 100 200 400 Feet

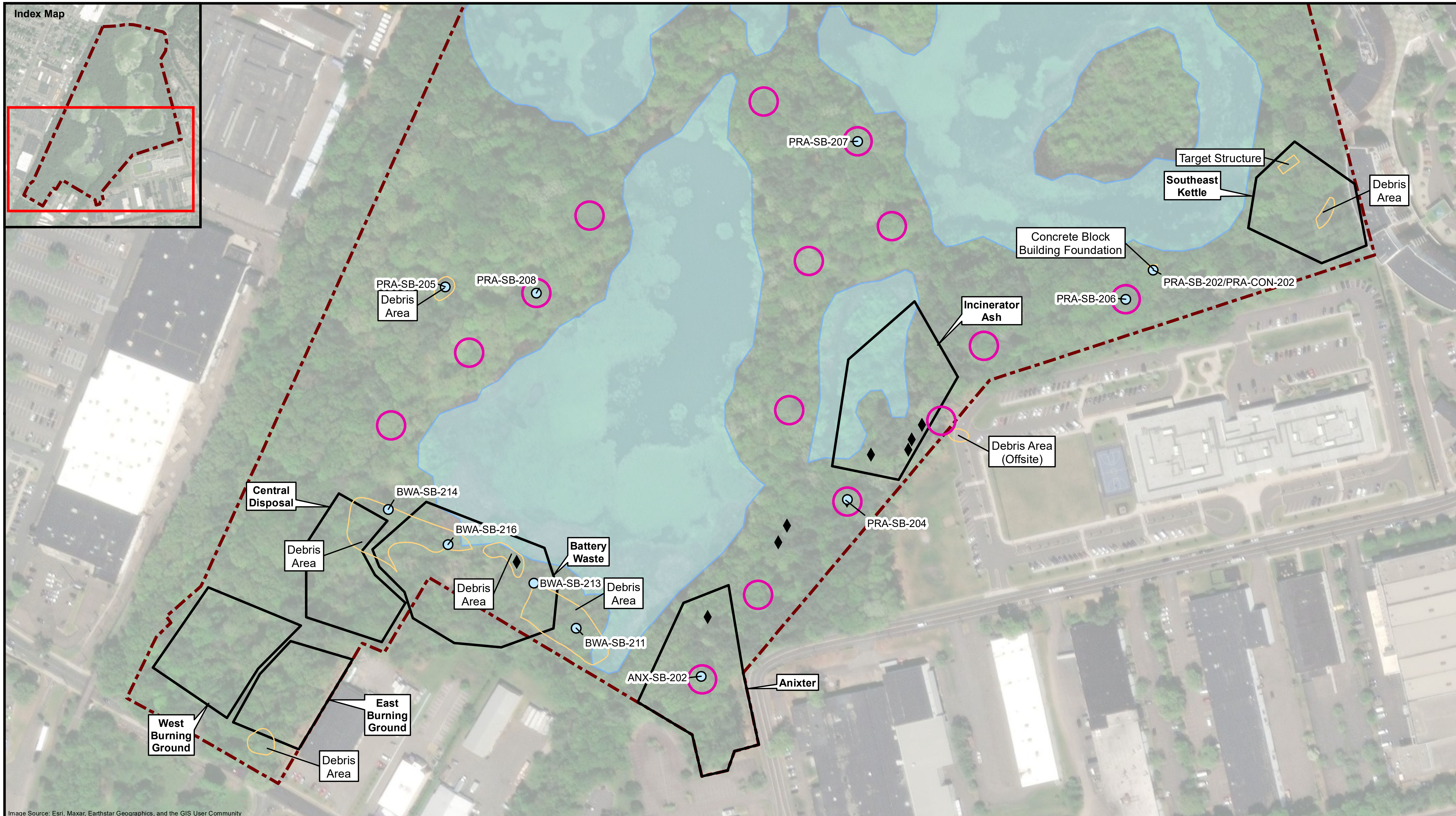
Notes:
Potential release areas mapped using review of historic documentation, locations and extents are approximate.

Figure 8B
Proposed Soil Borings
Potential Release Area
SVOCs

2024 Investigation Work Plan
Olin Pine Swamp
Hamden, Connecticut

Prepared/Date: JSW 10/11/24	Checked/Date: RJO 10/11/24

Document: \\corp.pbwan.net\glb-e&i\US\USPWM100-PLD2\Project\Projects\Olin - Pine Swamp\4.0_Deliverables\4.5_Databases\GIS\MapDocuments\IWP2024\Proposed_PRABorings_2024_11x17LS_Inset.mxd PDF: X:\US\USPWM100-PLD2\Project\Projects\Olin - Pine Swamp\4.0_Deliverables\4.5_Databases\GIS\Figures\Figure 8B - SVOCs Proposed Soil Borings PRA.pdf 10/11/2024 3:26 PM jennifer.walker



Legend

- Proposed Boring Locations
- Trap Sand Pile
- Approximate Area of Concern
- Approximate Property Boundary
- Bunker Location
- Potential Release Areas

N

0 100 200 400 Feet

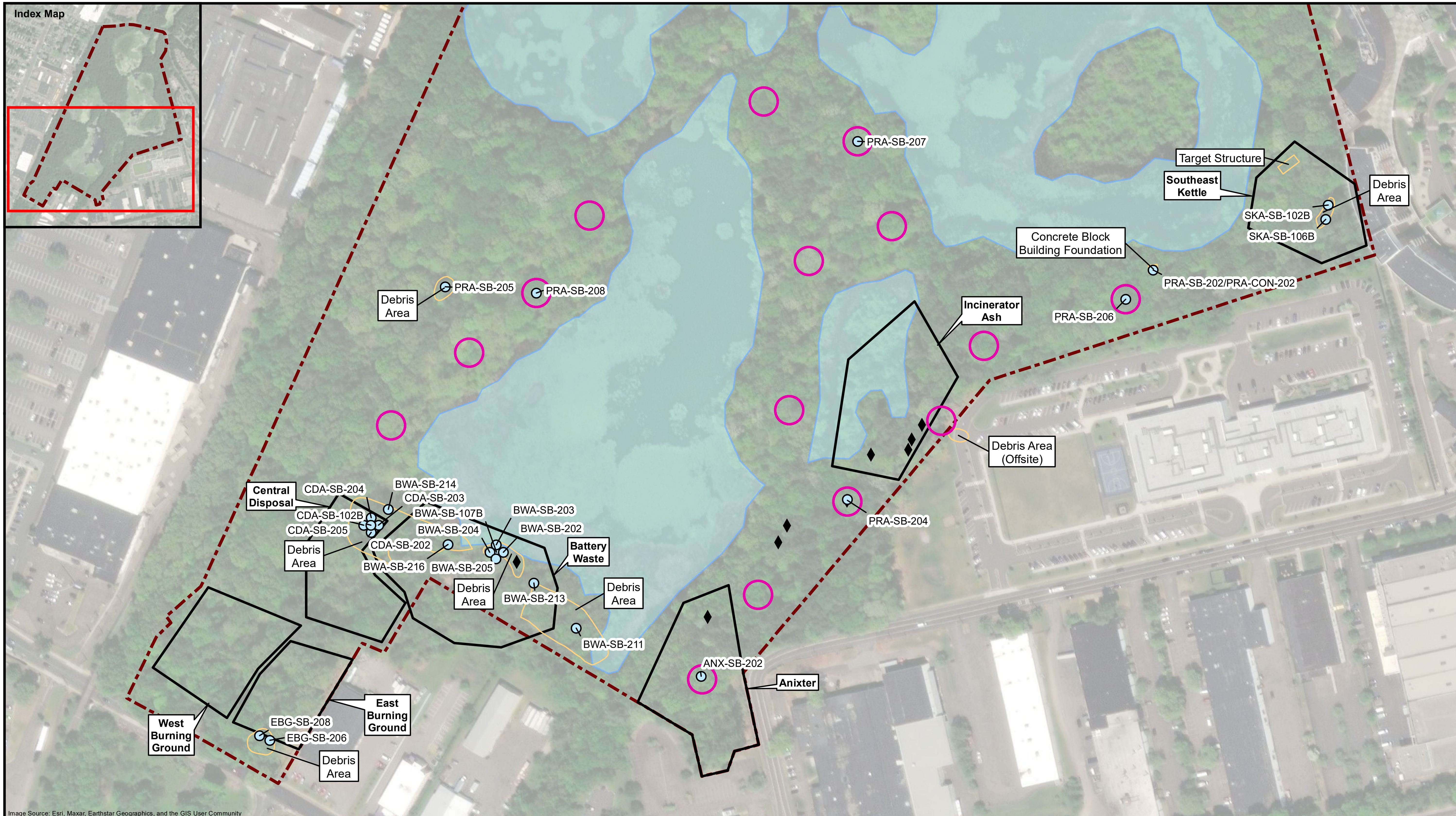
Notes:
Potential release areas mapped using review of historic documentation, locations and extents are approximate.

Figure 8C
Proposed Soil Borings
Potential Release Area
ETPH

2024 Investigation Work Plan
Olin Pine Swamp
Hamden, Connecticut

Prepared/Date: JSW 10/11/24	Checked/Date: RJO 10/11/24

Document: \\corp.pbwan.net\glb-e&i\US\USPWM100-PLD2\Project\Projects\Olin - Pine Swamp\4.0_Deliverables\4.5_Databases\GIS\MapDocuments\IWP2024\Proposed_PRABorings_2024_11x17LS_Inset.mxd PDF: X:\US\USPWM100-PLD2\Project\Projects\Olin - Pine Swamp\4.0_Deliverables\4.5_Databases\GIS\Figures\Figure 8C - ETPH Proposed Soil Borings PRA.pdf 10/11/2024 3:23 PM jennifer.walker



wsp

N
0 100 200 400 Feet

Legend

- Proposed Boring Locations
- Trap Sand Pile
- Approximate Area of Concern
- Approximate Property Boundary
- Bunker Location
- Potential Release Areas

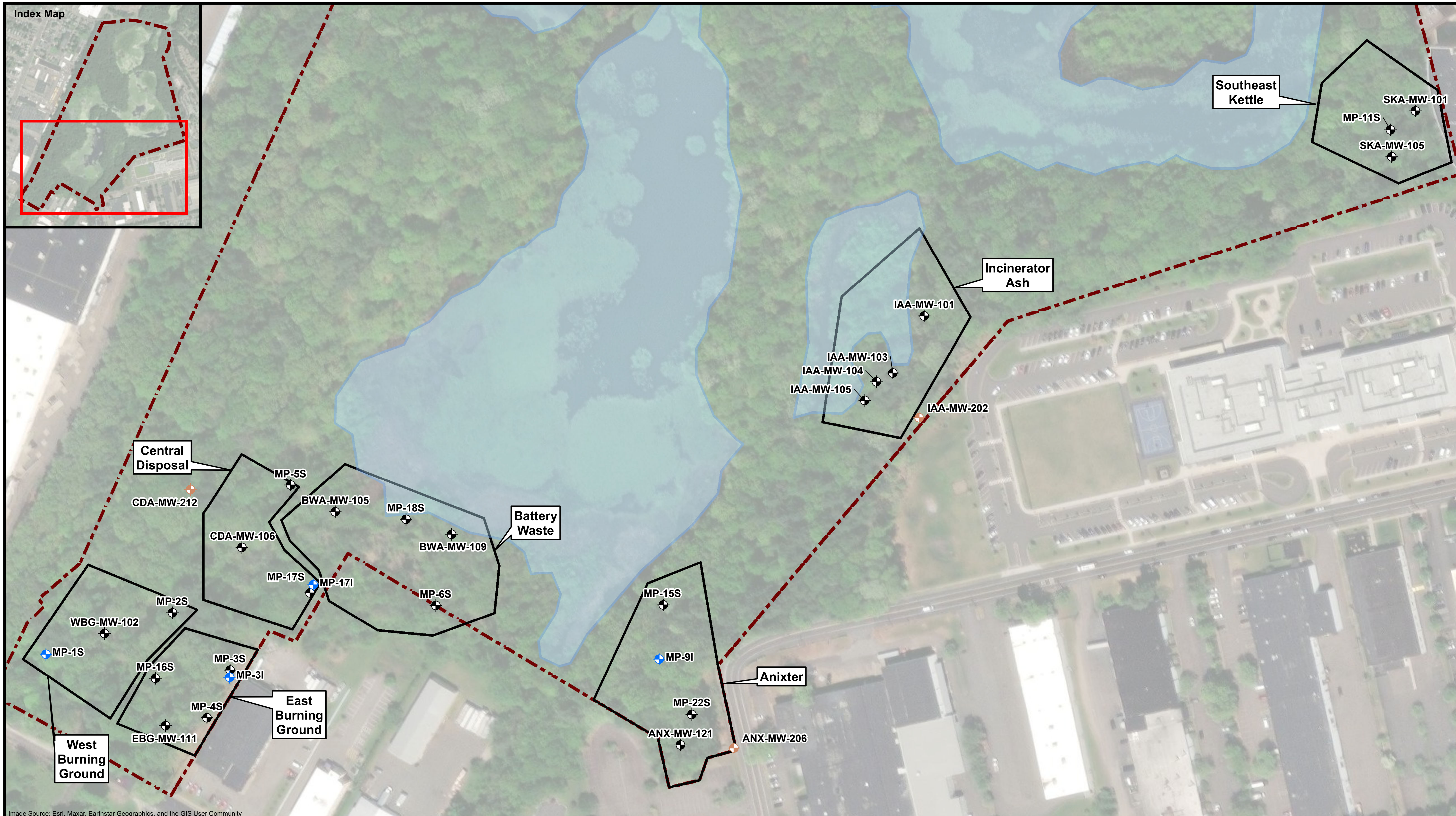
Notes:
Potential release areas mapped using review of historic documentation, locations and extents are approximate.

Figure 8D
Proposed Soil Borings
Potential Release Area
PCBs

2024 Investigation Work Plan
Olin Pine Swamp
Hamden, Connecticut

Prepared/Date: JSW 10/11/24	Checked/Date: RJO 10/11/24

Document: \\corp.pbwan.net\glb-e&i\US\USPWM100-PLD2\Project\Projects\Olin - Pine Swamp\4.0_Deliverables\4.5_Databases\GIS\MapDocuments\IWP2024\Proposed_PRABorings_2024_11x17LS_Inset.mxd PDF: X:\US\USPWM100-PLD2\Project\Projects\Olin - Pine Swamp\4.0_Deliverables\4.5_Databases\GIS\Figures\Figure 8D - PCBs Proposed Soil Borings PRA.pdf 10/11/2024 3:22 PM jennifer.walker



wsp

Legend

- Monitoring Well Sampled in 2023 Investigation
- Proposed New Groundwater Monitoring Well Location
- Existing Monitoring Well Proposed for Inclusion in Monitoring Network
- Approximate Area of Concern
- Approximate Property Boundary
- Reservoir/Lake/Pond

N

0 85 170 Feet

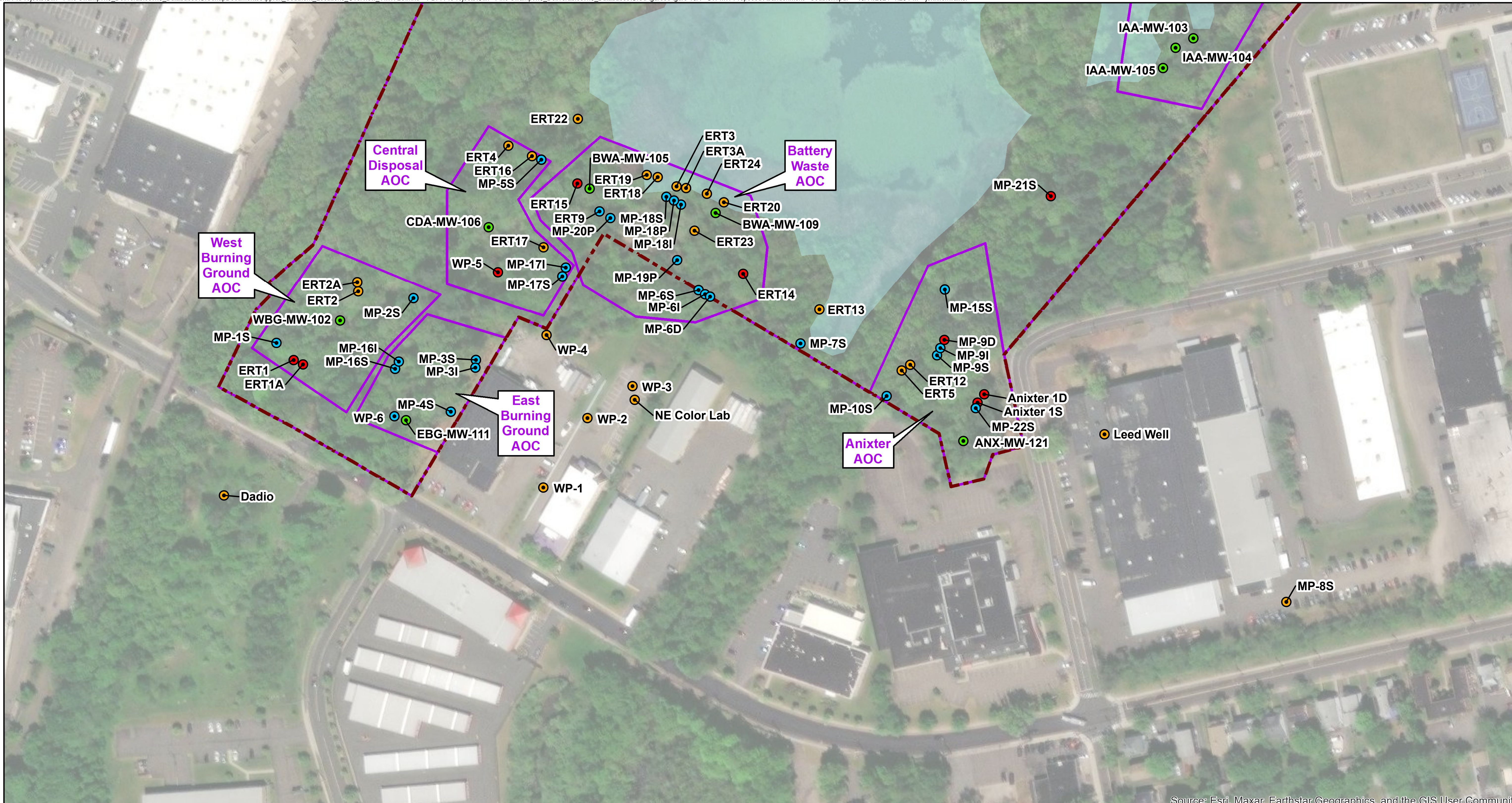
Notes:
- Monitoring Wells Surveyed April 2024
- Refer to Table 9 of 2024 IWP for sample marix for corresponding monitoring wells

Figure 9
Proposed Monitoring Well Network

2024 Investigation Work Plan
Olin Pine Swamp
Hamden, Connecticut

Prepared/Date: RJO 9-30-24	Checked/Date: HM 10/11/24

Document: X:\US\USPWM100-PLD2\Project\Projects\Olin - Pine Swamp\4.0_Deliverables\4.5_Databases\GIS\MapDocuments\IWP2024\Proposed_MW_Network_2024_11x17LS_Inset.mxd PDF: X:\US\USPWM100-PLD2\Project\Projects\Olin - Pine Swamp\4.0_Deliverables\4.5_Databases\GIS\Figures\Proposed IWP 2024 Monitoring Well Network 07/10/2024 benjamin.paulus



Legend

Well Condition

- Unknown Condition
- Damaged
- Fair - Good
- New

- Approximate Property Boundary
- AOCs
- Reservoir/Lake/Pond

Note:
Well condition determined during well survey reported in 2023 Site Investigation Report. All monitoring wells identified as being damaged are recommended for abandonment.

Figure 10A
Proposed Monitoring Wells For Abandonment - Southern

2024 Investigation Work Plan
Olin Pine Swamp
Hamden, Connecticut

Prepared/Date: JSW 10/01/2024 | Checked/Date: RJO 10/11/24

Note:
Well condition determined during well survey reported in 2023 Site Investigation Report.
All monitoring wells identified as being damaged are recommended for abandonment.

Legend

Well Condition
- Unknown Condition
- Damaged
- Fair - Good
- New

- Approximate Property Boundary
- AOCs
- Reservoir/Lake/Pond

0 45 90 180 270 360 Feet

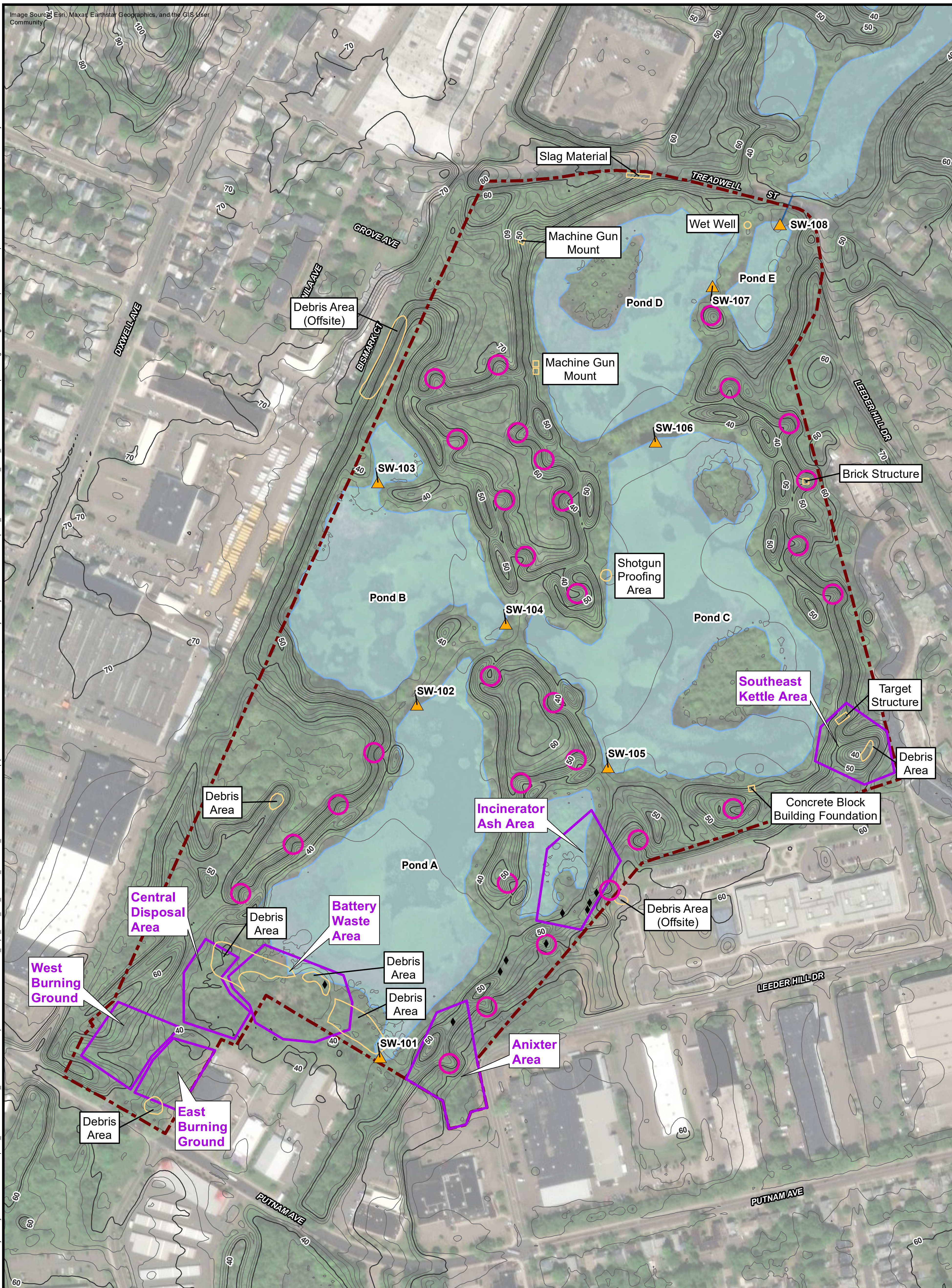
N

Prepared/Date: JSW 10/01/24 | Checked/Date: RJO 10/11/24

Figure 10B
Proposed Monitoring Wells
For Abandonment - Northern

2024 Investigation Work Plan
Olin Pine Swamp
Hamden, Connecticut

Document: P:\Projects\Olin - Pine Swamp\4.0 Deliverables\4.5 Databases\GIS\MapDocuments\Approx Northern Locations Overview 11x17P.mxd PDF: P:\Projects\Olin - Pine Swamp\4.0 Deliverables\4.5 Databases\GIS\Figures\Figure 10B - GW MW Proposed Abandonment - Northern.pdf 10/11/2024 1:33 PM jennifer.walker



Legend

wsp

Ground Elevation Contour:
- 50 10-Foot
- 2-Foot
- Stream
- Shoreline

- Reservoir/Lake/Pond
- Areas of Concern
- Approximate Property Boundary
- Potential Release Areas
- Bunker Location
- Trap Sand Piles
- Proposed Surface Water Sample

N
0 150 300 Feet

Note:
Proposed surface water sample locations are approximate, final locations will be determined based on field reconnaissance.

Figure 11
Proposed Surface Water Sample Locations

2024 Investigation Work Plan
Olin Pine Swamp
Hamden, Connecticut

Prepared/Date: JSW 12/02/24 | Checked/Date:

Document Path: \\corp.pbwan.net\glb-e&i\US\USPWM100-PLD2\Project\Projects\Olin - Pine Swamp\4.0_Deliverables\4.5_Databases\GIS\MapDocuments\IWP2024\Site_Topo_AOC_and_Release_area2024_11x17P.mxd PDF: \\corp.pbwan.net\GLB-E&I\US\USPWM100-PLD2\Project\Projects\Olin - Pine Swamp\4.0_Deliverables\4.2_Work_Plans\2024 Pine Swamp IWP\Figures\Figure 11 - Proposed SW Sample Locations.pdf 12/2/2024 10:46 AM jennifer.walker

TABLES

Table 1
Conceptual Site Model, East Burning Grounds

Categories	Site Investigation Phase				
	Potential Release Mechanism(s)	**Contaminants of Concern (COCs)**		**Potential Exposure Pathways**	**COCs Exceeding RSRs Criteria**
Conceptual Site Model Components	Surface exposure of waste of building debris, shotgun shell casings, powder burning, solvent disposal, and battery parts, and/or leaching of contaminants into groundwater.	Evaluated in Soil: Metals, SVOCs/EPH, PCBs, pesticides, herbicides, and VOCs/VPH 2023 Exceedance in soils: metals, SVOCs/EPH, PCBs	Evaluated in Groundwater: Metals, SVOCs, VOCs, Nitrate 2023 Exceedance in Groundwater: Metals, VOCs	Soil/Waste/Ash: Direct contact or ingestion. Groundwater: Exposure if Site waste/soil is excavated (ingestion unlikely due to the lack of development and availability of public water). Vapor: Exposure pathway not complete due to lack of structures.	Historic investigations: Metals, PCBs, SVOCs, and VOCs 2023 Investigation: SVOCs/EPH, PCBs, VOCs, and metals
Investigation History	•Phase I/II investigation completed by ERT in January 1981 •Phase II investigation completed in June 1982 by ERT •Final Remedial Investigation Study Report completed July 1988 by Malcolm Pirnie •Supplemental East Burning Grounds Site Characterization completed June 1991 by Malcolm Pirnie •Site Investigation completed August 2023 through October 2023 by WSP Historical investigations included soil borings, groundwater monitoring (5 shallow, 4 intermediate, 6 well points), surface soil gas survey, and electromagnetic geophysical investigations. The geophysical investigation identified highest conductivity readings coincident with a slight topographic depression at the location of historical disposal pit and burning cage. Elevated soil gas readings were generally coincident with the same location. Investigations evaluated three source areas: 1. 740 CY of misc. bulky waste and debris backfill, soil, glass, charred material, dry cell batteries, metal, covered by graded fill veneer up to 2 feet thick. 2. 335 CY of backfill in a pit impacted with halogenated and aromatic compounds, from up to 6 feet deep to groundwater table. 3. 135 CY of native soil with visible sheen, halogenated volatile organics, possible spill site. The 2023 Site Investigation completed by WSP included 12 direct push soil borings, completed in a grid pattern with approximately 50 ft spacings across the entire AOC. Borings were advanced to the water table, with samples being collected and analyzed for VOCs, SVOCs, total and SPLP metals, pesticides, PCBS, VPH, and EPH. One new shallow groundwater monitoring well was installed while three existing shallow groundwater monitoring wells were inspected and redeveloped to allow for sampling. Four shallow monitoring wells in this AOC were sampled and analyzed for VOCs, SVOCs, total metals, VPH, EPH, and nitrate. Soil vapor samplers were installed across the AOC, all were recovered and analyzed for VOCs.				
Remedial History	No remediation in this area has occurred. Basic remedial alternatives were compared by Malcom Pirnie in 1991, but no action was taken.				
Existing COC Distribution in Soil	From historic investigations, three sample locations exist for lead, other metals, pesticides, PCBs, and SVOCs. Six sample locations exist for VOCs. Generally, contaminant concentration in this area has been lower than other AOCs for all analytes, with several compliant samples, no exceedances of I/C DEC criteria, and no pesticide detections. Visual and olfactory observations of "oily" and "stained" soil with strong odors were recorded coincident with the water table, extending from the pit area. PID readings were generally highest from 6-10 feet below grade, with the highest recorded readings from 8-10 feet below grade at BG-13. Borings were not advanced beyond 10 feet below grade. As part of the 2023 investigation, twelve direct push soil borings were completed in a grid pattern across the AOC, from ground surface to the water table, between four to thirteen feet below grade. Soil samples were collected and exceedances of the CTDEEP Industrial/commercial direct exposure and GA potential mobility criteria were identified for a subset of SVOCs and metals. PCBs were detected above the RES DEC in one shallow soil sample. VOCs were detected below regulatory standards in a portion of these samples.				
Existing COC Distribution in Groundwater	Groundwater has been found from 3 to 10 feet below ground surface during recent and historical investigations, with a slight hydraulic gradient towards the north. Recent sampling of existing monitoring wells and a newly installed shallow monitoring well indicate detections of VOCs, including CVOCs and benzene above groundwater protection criteria and arsenic above surface water protection criteria. Wells screened at 50 to 60 ft below water table have historically exhibited low levels of indicator constituents.				
Data Gaps - Soil	Additional horizontal delineation required for PCBs, Metals, SVOCs and ETPH exceedences.				
Data Gaps - Groundwater	Additional sampling of monitoring wells to evaluate distribution of chemical concentrations in groundwater.				
Data Quality Comments	To resolve previously identified data quality issues including the approximation of sample locations from hand drawn historical figures, high detection limits exceeding RSR criteria for pesticides, and use of EP tox leachability methodology rather than modern accepted TCLP/SPLP methods, soil borings were advanced in a grid pattern across the entire AOC and analyzed all potential COCs with current analytical methods.				

Prepared by/Date: RJO 7/11/24
Reviewd by/Date: JDW 7/18/24

Table 2
Conceptual Site Model, West Burning Grounds

Categories	Site Investigation Phase				
	Potential Release Mechanism(s)	**Contaminants of Concern (COCs)**		**Potential Exposure Pathways**	**COCs Exceeding RSRs Criteria**
Conceptual Site Model Components	Impacts to shallow soils and groundwater due to accumulations of charcoal and buried debris in two backfilled burning pits.	Evaluated in Soil: Metals, SVOCs/EPH, PCBs, pesticides, herbicides, and VOCs/VPH 2023 Exceedance in soils: Metals	Evaluated in groundwater: Metals, SVOCs, VOCs, Nitrate 2023 Exceedance in groundwater: Metals	Soil/Waste/Ash: Direct contact or ingestion. Groundwater: Exposure if Site waste/soil is excavated (ingestion unlikely due to the lack of development and public water). Vapor: Exposure pathway not complete due to lack of structures.	Historic investigations: Metals, PCBs, SVOCs, VOCs 2023 Investigation: Metals
Investigation History	•Phase I/II investigation completed January 1981 by ERT •Phase II investigation completed June 1982 by ERT •Final Remedial Investigation Study Report completed July 1988 by Malcolm Pirnie •Interim Corrective Measures Report completed June 1991 by Malcolm Pirnie Investigations included test pitting, groundwater monitoring (3 shallow, one intermediate well), surface soil gas survey, and electromagnetic geophysical investigations. The geophysical investigation identified two areas of high conductivity readings and magnetic anomalies. Ten test pits were excavated, which found metallic objects such as gun powder transport cylinders and other metallic debris. Charred material was consistently found under metallic fill to depths of up to 5.5 feet below grade. Additional sampling was conducted during remedial excavation to delineate PCBs encountered during confirmation sampling. Investigations evaluated two potential backfilled burning pits with significant scrap metals, debris, and charred material. Samples were collected for VOCs, SVOCs, lead, pesticides, and PCBs from the charred waste horizon. No samples were collected from the heterogenous, bulky, metallic debris fill horizon. The 2023 Site Investigation completed by WSP included 10 direct push soil borings, completed in targeted areas in the middle of and surrounding the previously identified and remediated source area. Borings were advanced to the water table, with samples being collected and analyzed for VOCs, SVOCs, total and SPLP metals, pesticides, PCBS, VPH, and EPH. One new shallow groundwater monitoring well was installed while one existing shallow groundwater monitoring well was inspected and redeveloped to allow for sampling. Two shallow monitoring wells in this AOC were sampled and analyzed for VOCs, SVOCs, total metals, VPH, EPH, and nitrate. Soil vapor samplers were installed across the AOC, all were recovered and analyzed for VOCs.				
Remedial History	The two backfilled burning pits identified during investigations were excavated during two phases in 1990 and documented in the 1991 Interim Corrective Measures Report. Each pit was excavated to native soil and sampled for lead and PCBs to an average depth of about three feet, with combined dimensions of approximately 32 by 34 feet, and 210 CY of waste fill and soil removed from the site. Ten composite post excavation soil samples were collected from the perimeter and bottom of both pits, some of which had significant PCB concentrations, prompting additional excavation and PCB sampling. Excavation of 382 CY of PCB impacted soil continued to the seasonal low water table in June 1990. All excavations were backfilled, loamed, and seeded. Final clean-up criteria for the West Burning Grounds included: •Removal of all physically identifiable waste fill to native soil limit •Residual soil at limit of excavation to be non-hazardous by EP Toxicity criteria for lead (<5.0 mg/l lead in leachate) •Exposed soils greater than 500 mg/kg total lead to be covered with 2 feet of clean fill •Residual criteria of <2 mg/kg PCBs				
Existing COC Distribution in Soil	Borings completed through and in a perimeter around the previously identified source areas, where site contaminants have been remediated through soil excavation and replacement with clean backfill, did not detect historically identified site COCs above regulatory standards, with the exception of metals above the GA PMC standards.				
Existing COC Distribution in Groundwater	Historically identified contaminant concentrations (up to 2,227 µg/L TVOC) in shallow groundwater wells appears to have been resolved through remedial efforts. Remaining COCs in groundwater include total metals.				
Data Gaps - Soil	Additional horizontal delineation required for the presence of PCBs and Metals.				
Data Gaps - Groundwater	Additional sampling of monitoring wells to evaluate distribution of chemical concentrations in groundwater.				
Data Quality Comments	Soil borings have been completed to confirm the previously reported remedial activities meet current regulatory standards, with samples being analyzed utilizing modern analytical methods.				

Prepared by/Date: RJO 7/11/24
Reviewd by/Date: JDW 7/18/24

Table 3
Conceptual Site Model, Central Disposal Area

Categories	Site Investigation Phase				
	Potential Release Mechanism(s)	**Contaminants of Concern (COCs)**		**Potential Exposure Pathways**	**COCs Exceeding RSRs Criteria**
Conceptual Site Model Components	Potentially contaminated demolition debris could be exposed at the surface and/or leach contaminants into groundwater.	Evaluated in Soil: Metals, SVOCs/EPH, PCBs, pesticides, herbicides, and VOCs/VPH 2023 Exceedance in soils: SVOCs, pesticides, PCBs, SPLP and total metals	Evaluated in Groundwater: Metals, SVOCs, VOCs, EPH, VPH, NO_3 2023 Exceedance in groundwater: total metals	Soil/Waste/Ash: Direct contact or ingestion. Groundwater: Exposure if Site waste/soil is excavated (ingestion unlikely due to the lack of development and public water). Vapor: Exposure pathway not complete due to lack of structures.	Historic investigations: Lead 2023 Investigation: SVOCs, pesticides, and metals
Investigation History	•Phase I/II investigation completed January 1981 by ERT Investigations included three test pits at the site. "In general, this area appears to have been used primarily for the disposal of building demolition rubble and wood. Little or no evidence of extensive burning was encountered; this suggests that bulk dumping was more common here than in the west burning area. The maximum fill thickness was 3 feet." "No objectionable or chemical odors were encountered at any of the trench locations. Paper, plastic, and metal debris from a minor amount of domestic refuse disposal postdated the fill described above. A single container, still wet with an oil stain, which had probably been used for automotive oil changes, was found in this area. No other evidence of automotive oil was encountered." Two borings were advanced by ERT that are located within the current boundaries of this AOC. Both exhibited elevated lead. The 2023 Site Investigation completed by WSP included 14 direct push soil borings, the majority of which were advanced in a grid pattern across the AOC, with a higher density of borings completed in the interpreted source area, adjacent to the battery waste area. Borings were advanced to the water table, with samples being collected and analyzed for VOCs, SVOCs, total and SPLP metals, VPH, EPH, pesticides, and PCBs. One new shallow groundwater monitoring well was installed while two existing shallow groundwater monitoring wells were inspected and redeveloped to allow for sampling. Three shallow monitoring wells in this AOC were sampled and analyzed for VOCs, SVOCs, total metals, VPH, EPH, and nitrate. Passive soil vapor samplers were installed across the AOC however only two of the passive soil vapor sampler could be analyzed for VOCs due to the surface seal being compromised by animal activity.				
Remedial History	No remediation in this area has occurred.				
Existing COC Distribution in Soil	Impacts from SVOCs, total and SPLP metals have been identified				
Existing COC Distribution in Groundwater	Groundwater in all three monitoring wells exhibited concentrations of total metals above the CTDEEP surface water protection criteria in 2023.				
Data Gaps - Soil	Additional horizontal delineation required for PCBs, Metals, SVOCs and ETPH exceedences.				
Data Gaps - Groundwater	Additional sampling of monitoring wells to evaluate distribution of chemical concentrations in groundwater.				
Data Quality Comments	To resolve previously identified data quality issues including the approximation of sample locations from hand drawn historical figures, soil borings were advanced in a grid pattern across the entire AOC and analyzed all potential COCs with current analytical methods.				

Prepared by/Date: RJO 7/11/24
Reviewd by/Date: JDW 7/18/24

Table 4
Conceptual Site Model, Battery Waste Area

<table>
<tr><th rowspan="2">Category</th><th colspan="5">Site Investigation Phase</th></tr>
<tr><th>Potential Release Mechanism(s)</th><th colspan="2">Contaminants of Concern (COCs)</th><th>Potential Exposure Pathways</th><th>COCs Exceeding RSRs Criteria</th></tr>
<tr><td>Conceptual Site Model Components</td><td>Potential surface exposure of batteries, trap sands, and debris, and/or leaching of contaminants into groundwater.</td><td>Evaluated in Soil:
Metals, SVOCs/EPH, PCBs, pesticides, herbicides, and VOCs/VPH

2023 Exceedances in soils: SVOCs/EPH, PCBs, pesticides, metals</td><td>Evaluated in Groundwater:
Metals, SVOCs, Pest/Herb, VOCs, NO_3

2023 Exceedances in Groundwater: metals</td><td>Soil/Waste: Direct contact or ingestion.

Groundwater/Surface Water: If contaminated, contact with Pond A water where waste is present and where groundwater likely discharges (ingestion unlikely due to lack of development and public water supply).

Vapor: Exposure pathway not complete due to lack of volatile COCs and structures.</td><td>Historic investigations: Metals, PCBs, Pest/Herb, SVOCs.

2023 Investigation: SVOCs/EPH, pesticides, and metals</td></tr>
<tr><td>Investigation History</td><td colspan="5">The quantity or exact locations of batteries buried in this area is unclear due to a lack of record keeping. Several environmental investigations took place in this area, considered the largest and most significant AOC at Pine Swamp.

•Phase I and Phase II investigation in the Battery Waste Area completed in 1981 by Environmental Research & Technology Inc.
•Phase II Investigation was conducted January 1986 by ERT
•Battery Waste Area Supplemental Study completed in 1986 by Malcolm Pirnie
•Remedial Investigation Study was completed by Malcom Pirnie in 1988, including soil borings, test pits, and groundwater sampling. These investigations found approximately one acre (10,000 CY) of “battery waste” including scrap wood, metal, demolition debris, trap sands, and batteries at depths of 2-12 ft bgs. Groundwater exists at 2-3 ft bgs, with waste material extending into the bank of Pond A.

The 2023 Site Investigation completed by WSP included 19 direct push soil borings, the majority of which were advanced in a grid pattern across the AOC. Borings were advanced to the water table, with samples being collected and analyzed for VOCs, SVOCs, total and SPLP metals, VPH, EPH, pesticides, and PCBs. Two new shallow groundwater monitoring well were installed while two existing shallow groundwater monitoring wells were inspected and redeveloped to allow for sampling. Four shallow monitoring wells in this AOC were sampled and analyzed for VOCs, SVOCs, total metals, VPH, EPH, and nitrate. Passive soil vapor samplers were installed across the AOC however none of the passive soil vapor sampler could be analyzed for VOCs due to the surface seal being compromised by animal activity.</td></tr>
<tr><td>Remedial History</td><td colspan="5">Substantial impacts in this area remain in place. Excavated material limited to “elements best described as good housekeeping… exposed, localized, surficial deposits of debris, trash, or bulky waste which presented a safety or aesthetic concern”. Trap sand piles were visually identified for removal by “unique physical characteristics; they were devoid of vegetation, coarse textured, gray, and contained spent bullets within the sand matrix.” Two trap sand piles were removed from the battery waste area to depths of up to 3-4 feet, with confirmation samples taken to confirm acceptance of historic 0.05 mg/l EP toxic lead criteria. Excavated areas were backfilled, graded, and reseeded.

Remediation of this area was not completed in part due to anticipated complexity. Malcom Pirnie estimated simple excavation and offsite disposal to be challenging due to necessity of dewatering (5+ feet of drawdown) for a substantial period, potentially allowing for contaminant migration and significant disturbance of Pond A and sitewide groundwater monitoring.</td></tr>
<tr><td>Existing COC Distribution in Soil</td><td colspan="5">Historic sample data exists for 35 approximated locations based on historical reporting. COCs in this area were identified to be present in shallow soil at depths between 0-10.5 feet below ground surface (bgs). Concentrations generally reduced with sample depth to a maximum sample depth of 10.5 feet, however only 11 total samples were collected at a depth of 8.5 feet or below. RSR exceedances were only registered at one location as deep as 10.5 feet, at ERT23 for chromium, lead, and zinc. Commingled trap sands exist with underlying battery waste in areas of trap sand removal, understood to be primary source of lead contamination. Other metals, especially zinc and manganese are attributed to battery disposal. Waste and distribution of metals contamination determined to be heterogeneous throughout the dumping area.

The 2023 investigation identified shallow soil impacts with exceedances of applicable regulatory criteria for SVOCs, PCBs, and or metals. Impacts are shown to be primarily in shallow soils.</td></tr>
<tr><td>Existing COC Distribution in Groundwater</td><td colspan="5">Sample data exists for 18 approximated locations based on historical reporting. Of three samples collected in battery waste area in 2014, one well (MP-18P) exceeded GA PMC for one analyte, TPH. Historical sample data from the 1980s and 1990s was generally only collected for metals and VOCs.

In 2023 exceedances of RSR criteria were identified in one monitoring well.</td></tr>
<tr><td>Data Gaps - Soil</td><td colspan="5">Additional horizontal delineation required for PCBs, Metals, SVOCs and ETPH exceedences.</td></tr>
<tr><td>Data Gaps - Groundwater</td><td colspan="5">Additional sampling of monitoring wells to evaluate distribution of chemical concentrations in groundwater.</td></tr>
<tr><td>Data Quality Comments</td><td colspan="5">To resolve previously identified data quality issues including the approximation of sample locations from hand drawn historical figures, soil borings were advanced in a grid pattern across the entire AOC and analyzed all potential COCs with current analytical methods.</td></tr>
</table>

Prepared by/Date: RJO 7/11/24
Reviewd by/Date: JDW 7/18/24

Table 5
Conceptual Site Model, Anixter Area

<table>
<tr><th rowspan="2">Categories</th><th colspan="5">Site Investigation Phase</th></tr>
<tr><th>Potential Release Mechanism(s)</th><th colspan="2">Contaminants of Concern (COCs)</th><th>Potential Exposure Pathways</th><th>COCs Exceeding RSRs</th></tr>
<tr><td>Conceptual Site Model Components</td><td>Impacts to shallow soils and shallow to deep groundwater likely due to chlorinated organic solvent disposal. No waste material has been detected.</td><td>Evaluated in Soil:
Metals, SVOCs/EPH, PCBs, pesticides, herbicides, and VOCs/VPH

2023 Exceedances in soils: VOCs/VPH, SVOCs/EPH, metals, PCBs</td><td>Evaluated in Groundwater: Metals, SVOCs, VOCs, NO_3

2023 Exceedances in Groundwater: VOCs</td><td>Soil/Waste/Ash: Direct contact or ingestion.

Groundwater: Exposure if Site waste/soil is excavated, ingestion unlikely due to lack of development and public water supply availability.

Vapor: Exposure pathway not complete due to lack of structures. See description of soil vapor extraction system below.</td><td>Historic investigations: VOCs, SVOCs, Lead, PCBs

2023 Investigation: VOCs/VPH, SVOCs/EPH, metals, PCBs</td></tr>
<tr><td>Investigation History</td><td colspan="5">The Anixter AOC comprises a former chemical waste disposal area.

•Hydrogeologic Study, Anixter Communications completed in 1984 by Fuss & O'Neill
•Soil Excavation at Anixter completed in 1984 by Fuss & O'Neill
•Final Remedial Investigation Study Report completed July 1988 by Malcolm Pirnie
•Interim Corrective Measures Report completed June 1991 by Malcolm Pirnie
•The Site Investigation and Exposure Assessment for PCBs at Anixter completed September 1991 by ABB

Historic investigations included groundwater monitoring (6 shallow, 4 intermediate, and 1 deep well), soil borings with PID screening and analytical sampling for VOCs, SVOCs, and PCBs. The majority of VOCs were in the unsaturated zone between 15 to 30 feet bgs, which was the target area for later soil vapor extraction. Groundwater ranges from approximately 19 to 30 feet bgs where the terrain slopes towards the ponds.

The 2023 Site Investigation completed by WSP included 23 direct push soil borings, the majority of which were advanced across the AOC. Borings were advanced to the water table, with samples being collected and analyzed for VOCs, SVOCs, total and SPLP metals, VPH, EPH, pesticides, and PCBs. One new shallow groundwater monitoring was installed while two existing shallow groundwater monitoring wells were inspected and redeveloped to allow for sampling. Three shallow monitoring wells in this AOC were sampled and analyzed for VOCs, SVOCs, total metals, VPH, EPH, and nitrate. Passive soil vapor samplers were collected, targeted on a slope between a cluster of borings completed on the south side of the AOC and the north side of the AOC, which was too steep to allow for a drill rig to access and advance deeper borings. One passive soil vapor sampler could not be analyzed for VOCs due to the surface seal being compromised by animal activity.</td></tr>
<tr><td>Remedial History</td><td colspan="5">In 1984, the Anixter AED company excavated 1,608 CY of VOC contaminated soil to depths of up to 25 feet. Residual contaminants were reported to remain onsite due to physical constraints on the limit of excavation.

A four well soil vapor extraction system operated from March 3, 1994, to December 21, 1998, with a fifth well added in June 1996, logging 716 operational days and 2,655 lbs of VOC removal before reaching asymptotic recovery rates. The area of SVE influence was an expansion of the area of VOC contaminated soil removal on the eastern border of the Site. See Final Report on SVE System at Anixter Site completed by Envirogen in May 1999. An air sparging pilot test was conducted to determine the feasibility of increased VOC extraction from groundwater and saturated soils, but the potential removal was determined to be inconsequential in 1998, operating at only 1% efficiency due to cosolvency of VOCs and TPH.</td></tr>
<tr><td>Existing COC Distribution in Soil</td><td colspan="5">"PCBs in subsurface soil are associated with an oily material which is largely confined to a soil horizon immediately above the groundwater table, at a depth of 28-30 feet bgs. PCBs in soil closer to the surface [are] only in a small portion of the western part of the site, which is interpreted to represent a relic of the former disposal area not excavated in 1984." No PCB contamination occurs in surficial soils.

"Based on vapor probe and wellhead VOC and vacuum readings, the soil vapor extraction system was limited by the rate of volatilization of VOCs from the groundwater to the vadose zone soil gas." No soil samples were collected after SVE implementation, and soil vapor concentrations may have rebounded since SVE demobilization. Significant SVOC concentrations exceeding RSRs remain south and west of the SVE area, but known VOC exceedances are lower in concentration and extent.

Concentrations of total lead exceeding direct/indirect exposure criteria were identified in soil boring ANX-SB-117 but were not identified in the northern end of the AOC where trap sands had historically been identified. Exceedances of SPLP metals were identified in exceedance of the GA PMC criteria in the majority of samples.</td></tr>
<tr><td>Existing COC Distribution in Groundwater</td><td colspan="5">Groundwater is generally 30 feet below ground surface on the south end of the AOC but topography decreases to the north, where groundwater approaches 19 feet bgs. Prior to remediation, significant contaminant concentrations (historically up to 15,100 ug/L TVOC) were observed downgradient throughout the groundwater column to depths of 60 feet, extending across over 200 feet in a broad plume in the vicinity of Pond A. Other COCs have been observed in the Anixter area groundwater at smaller concentrations and extent.

2023 sampling of existing and new groundwater wells has illustrated significantly reduced CVOC impacts to groundwater, orders of magnitude lower than historically reported values.</td></tr>
<tr><td>Data Gaps - Soil</td><td colspan="5">Additional horizontal delineation required for PCBs, Metals, SVOCs and ETPH exceedences.</td></tr>
<tr><td>Data Gaps - Groundwater</td><td colspan="5">Additional sampling of monitoring wells to evaluate distribution of chemical concentrations in groundwater.</td></tr>
<tr><td>Data Quality Comments</td><td colspan="5">To resolve previously identified data quality issues including the approximation of sample locations from hand drawn historical figures, soil borings were advanced across the AOC where accessible and analyzed all potential COCs with current analytical methods. Soil vapor samplers were installed on a hillside between a northern and southern investigation area where advancing soil borings was not feasible due to topographic relief.</td></tr>
</table>

Prepared by/Date: RJO 7/11/24
Reviewd by/Date: JDW 7/18/24

Table 6
Conceptual Site Model, Incinerator Ash Area

Categories	Site Investigation Phase				
	Potential Release Mechanism(s)	**Contaminants of Concern (COCs)**		**Potential Exposure Pathways**	**COCs Exceeding RSRs Criteria**
Conceptual Site Model Components	Impacts to shallow soils and groundwater due to waste piles including incinerator ash, historic trap sands, and miscellaneous debris	Evaluated in soil: Metals, VOCs/VPH, SVOCs/EPH, metals, pesticides, herbicides, and PCBs 2023 Exceedances in soils: VOCs, SVOCs/EPH, metals, and PCBs	Evaluated in Groundwater: Metals, VOCs, SVOCs, NO_3 2023 Exceedances in Groundwater: Metals	Soil/Waste/Ash: Direct contact or ingestion. Groundwater: Exposure if Site waste/soil is excavated, especially since the water table is very shallow (ingestion unlikely due to the lack of development and public water). Vapor: Exposure pathway not complete due to lack of structures.	Historic investigations: Metals, PCBs, SVOCs, VOCs 2023 Investigation: VOCs, SVOCs/EPH, metals, and PCBs
Investigation History	•Final Remedial Investigation Study Report completed July 1988 by Malcolm Pirnie •Interim Corrective Measures Report completed June 1991 by Malcolm Pirnie Investigations included visual reconnaissance and hand cores, and eight soil core analytical samples coincident with observed waste piles in the southerly end of the fill area. Investigations generally determined there is a 22,500 square foot contaminated soil "blanket" of waste fill about two feet thick totaling 2140 CY of material, plus at least three distinct waste piles. This area is bordered by wetland area, with a relief above the wetland of approximately one foot. Groundwater has not been sampled in this area, but is understood to be very shallow based on local wetland. Many other "less conspicuous piles" exist throughout the southern portion of the area. Some of these piles identified as trap sand piles were removed during interim corrective measures. Majority of samples were collected from apparent overlying waste material. One sample collected from apparent native soil (IA8) had a lead concentration of 11,900 mg/kg but little VOC contamination. The 2023 Site Investigation completed by WSP included 12 direct push soil borings across the AOC. Borings were advanced to the water table, with samples being collected and analyzed for VOCs, SVOCs, total and SPLP metals, VPH, EPH, pesticides, and PCBs. Four new shallow groundwater monitoring wells were installed to allow for sampling of groundwater. The four shallow monitoring wells in this AOC were sampled and analyzed for VOCs, SVOCs, total metals, VPH, EPH, and nitrate. Passive soil vapor samplers were installed across the AOC however only one passive soil vapor sampler could be analyzed for VOCs due to the surface seal being compromised by animal activity.				
Remedial History	Trap sand removal in the incinerator ash area took place between October 1989 and April 1990. Volume of material removed from this area is unknown. A total of 180 CY was removed across six other areas, three of which were included in the incinerator ash area. Trap sand piles were visually identified for removal by "unique physical characteristics; they were devoid of vegetation, coarse textured, gray, and contained spent bullets within the sand matrix." Three trap sand pile areas were removed from the incinerator ash area to depths of up to 3-4 feet, with confirmation samples (discrete and/or composite) taken to confirm acceptance of historic 0.05 mg/l EP toxic lead criteria. Excavated areas were backfilled, graded, and reseeded.				
Existing COC Distribution in Soil	Historic estimates of contamination cover an area of 22,500 square feet with a thickness of two feet. Most samples collected from surface waste fill, piles, or apparent native fill exceed RSRs for most COC classes, potential for contamination of surrounding native soils below or adjacent to visually identifiable waste fill "blanket" is unknown. Some confirmation samples in areas of trap sand excavations near the waste fill "blanket" exceed current RSRs for lead. The 2023 investigation identified shallow soil impacts with exceedances of applicable regulatory criteria for SVOCs, PCBs, and or metals in the southwestern quadrant of the AOC, including borings IAA-SB-102, 103, 104, 105, and 106. The extent of impacts are delineated to the east however the extent of impacts have not been confirmed to the north, south, or west.				
Existing COC Distribution in Groundwater	Four shallow groundwater monitoring wells were installed as part of the 2023 investigation. Lead impacts above the surface water protection criteria were identified in two of those wells. No other impacts above regulatory standards were identified.				
Data Gaps - Soil	Additional horizontal delineation required for PCBs, Metals, SVOCs and ETPH exceedences.				
Data Gaps - Groundwater	Additional sampling of monitoring wells to evaluate distribution of chemical concentrations in groundwater.				
Data Quality Comments	To resolve previously identified data quality issues including the approximation of sample locations from hand drawn historical figures, soil borings were advanced across the entire AOC and analyzed all potential COCs with current analytical methods.				

Prepared by/Date: RJO 7/11/24
Reviewd by/Date: JDW 7/18/24

Table 7
Conceptual Site Model, Southeast Kettle Area

Categories	Site Investigation Phase				
	Potential Release Mechanism(s)	**Constituents of Concern (COCs)**		**Potential Exposure Pathways**	**COCs Exceeding RSRs Criteria**
Conceptual Site Model Components	Impacts to shallow soils and groundwater due to solid waste disposal	Evaluated in Soil: SVOCs/EPH, Metals, SVOCs/EPH, PCBs, pesticides, herbicides, and VOCs/VPH 2023 Exceedances in soils: SVOCs/EPH, metals, PCBs	Evaluated in Groundwater: Metals, SVOCs, VOCs, NO_3 2023 Exceedances in Groundwater: VOCs	Soil/Waste/Ash: Direct contact or ingestion. Groundwater: Exposure if Site waste/soil is excavated, especially since the water table is very shallow (ingestion unlikely due to the lack of development and public water). Vapor: Exposure pathway not complete due to lack of structures.	Historic investigations: VOCs, Lead 2023 Investigation: VOCs, SVOCs/EPH, metals, PCBs
Investigation History	This area is located in the southeastern corner of the Site, away from most other AOCs. This area was characterized by a large pit "kettle", historical disposal of drums with unknown contents (possibly empty), and accumulated demolition debris, forming a steep face with voids, protruding timbers, metal, rubble, and trash. •Phase I/II investigation completed January 1981 by ERT •A Phase II investigation completed June 1982 by ERT •A Final Remedial Investigation Study Report completed July 1988 by Malcolm Pirnie •Interim Corrective Measures Report completed June 1991by Malcolm Pirnie Investigations included soil borings with PID screenings and analytical sampling for VOCs, and groundwater monitoring (5 shallow, 1 intermediate well). Investigations resulted in an estimated extent of contaminated soil (primarily TCE, PCE) of approximately 525 square feet, 100 CY, with an additional unquantified amount of demolition debris based on field screening and laboratory analysis of five borings. Following completion of interim corrective measures, due to the discovery of drums, three post excavation samples were collected from bottom of the "kettle" and analyzed for volatiles and EP toxic metals. Total halogenated organics ranged from 103 to 341 µg/kg. Total aromatic volatiles ranged from 63 to 139 µg/kg of mostly BTEX compounds. Elevated concentrations of lead exceeding current RSRs were detected, but samples for other metals and SVOCs were non-detect or meet current criteria. The 2023 Phase II ESA completed by WSP included 8 direct push soil borings across the AOC. Borings were advanced to the water table, with samples being collected and analyzed for VOCs, SVOCs, total and SPLP metals, VPH, EPH, pesticides, herbicides, and PCBs. Two new shallow groundwater monitoring wells were installed while one existing shallow groundwater monitoring well was inspected and redeveloped to allow for sampling. The three shallow monitoring wells in this AOC were sampled and analyzed for VOCs, SVOCs, total metals, VPH, EPH, and nitrate. Passive soil vapor samplers were installed across the AOC, one passive soil vapor sampler could not be analyzed for VOCs due to the surface seal being compromised by animal activity.				
Remedial History	Demolition debris and drum removal was included as an Interim Corrective Measure due to the safety hazard associated with potential unauthorized entry near the unstable near vertical debris face. Approximately 200 CY of debris, timbers, structural metal, and rubble was removed from the site in July 1990 to establish a stable side slope. Note this material did not necessarily include the contaminated soil area identified during investigations and was not intended to fully remediate this area. At the limits of excavation, miscellaneous debris was observed comingled with soil, and the extent of any remaining waste fill left in place was not determined. The disturbed area was graded to uniform slope, covered with earth, seeded, and stabilized. Twenty-one drums were overpacked and removed during debris removal and disposed of separately.				
Existing COC Distribution in Soil	Historic records indicate total volatile organics in soil samples collected from borings in the kettle pit in 1988 were highest at the 4 to 6 feet bgs interval along the top of the water table in the location of empty drum disposal. Three samples collected from 1 to 2 feet bgs in the area excavated in 1990 exceeded VOC RSRs criteria, and 2 of 3 samples exceeded lead RSRs criteria. Estimated 100 CY of contaminated soil remains in kettle pit area, potential volume of impacted surrounding native soil unknown. The 2023 investigation identified shallow soil impacts with exceedances of applicable regulatory criteria for SVOCs, PCBs, and or metals in borings SKA-SB-101, 102, 106, and 108. Impacts are shown to be primarily in shallow soils.				
Existing COC Distribution in Groundwater	Two shallow groundwater monitoring wells were installed as part of the 2023 investigation to supplement an existing shallow groundwater monitoring well. VOC impacts above the groundwater protection criteria were identified for tetrachloroethene and benzene at orders of magnitudes lower than historically reported concentrations.				
Data Gaps - Soil	Additional horizontal delineation required for PCBs, Metals, SVOCs and ETPH exceedences.				
Data Gaps - Groundwater	Additional sampling of monitoring wells to evaluate distribution of chemical concentrations in groundwater.				
Data Quality Comments	To resolve previously identified data quality issues including the approximation of sample locations from hand drawn historical figures, soil borings were advanced across the entire AOC and analyzed all potential COCs with current analytical methods.				

Prepared by/Date: RJO 7/11/24
Reviewd by/Date: JDW 7/18/24

Table 8
Proposed Soil Investigation Sample Matrix

Areas of Investigation	Location Rationale	Proposed Depth of Boring (ft BGS)	Total Metals (6010)	SVOCs (8270)	ETPH (Connecticut ETPH Method)	PCBs (8082)	VOCs (8260)	Radiological	Maximum Number of Samples	Proposed Sample Intervals (ft bgs)[1,2]
West Burning Ground (WBG)									**15**	
WBG-SB-201	Delineate PCB and SPLP metal detections	5	x			x			3	0-0.5, 2-2.5, 4-4.5
WBG-SB-202	Delineate PCB and SPLP metal detections	5	x			x			3	0-0.5, 2-2.5, 4-4.5
WBG-SB-203	Delineate PCB and SPLP metal detections	5	x			x			3	0-0.5, 2-2.5, 4-4.5
WBG-SB-204	Delineate PCB and SPLP metal detections	5	x			x			3	0-0.5, 2-2.5, 4-4.5
WBG-SB-205	Delineate PCB and SPLP metal detections	5	x			x			3	0-0.5, 2-2.5, 4-4.5
East Burning Ground (EBG)									**36**	
EBG-SB-201	Horizontal and vertical delineation of COC detections	5	x			x			3	0-0.5, 2-2.5, 4-4.5
EBG-SB-108B	Delineate Depth of PCB exceedance and evaluate ETPH	5			x	x			3	0-0.5, 2-2.5, 4-4.5
EBG-SB-202	Delineate PCB exceedance	5				x			3	0-0.5, 2-2.5, 4-4.5
EBG-SB-203	Delineate PCB exceedance	5				x			3	0-0.5, 2-2.5, 4-4.5
EBG-SB-204	Delineate PCB exceedance	5				x			3	0-0.5, 2-2.5, 4-4.5
EBG-SB-205	Delineate PCB exceedance	5				x			3	0-0.5, 2-2.5, 4-4.5
EBG-SB-206	Horizontal and vertical delineation of COC detections and evaluation of fill in Debris Area PRA	10	x	x		x			3	0-0.5, 2-2.5, 0.5 ft below fill/debris
EBG-SB-207	Horizontal and vertical delineation of COC detections	5	x			x			3	0-0.5, 2-2.5, 4-4.5
EBG-SB-208	Horizontal and vertical delineation of COC detections and evaluation of fill in Debris Area PRA	10	x	x		x			3	0-0.5, 2-2.5, 0.5 ft below fill/debris
EBG-SB-209	Horizontal and vertical delineation of COC detections	5	x			x			3	0-0.5, 2-2.5, 4-4.5
EBG-SB-210	Horizontal and vertical delineation of COC detections	5	x			x			3	0-0.5, 2-2.5, 4-4.5
EBG-SB-211	Horizontal and vertical delineation of COC detections	5	x		x	x			3	0-0.5, 2-2.5, 4-4.5
Central Disposal (CD)									**45**	
CDA-SB-201	Delineate vertical extent of fill	15	x	x	x	x			1	0.5 ft below fill
CDA-SB-102B	Delineate Depth of PCB exceedance and evaluate fill in Debris Area PRA	5				x			3	0-0.5, 2-2.5, 4-4.5
CDA-SB-202	Delineate PCB exceedance and evaluate Debris Area PRA	5				x			3	0-0.5, 2-2.5, 4-4.5
CDA-SB-203	Delineate PCB exceedance and evaluate Debris Area PRA	5				x			3	0-0.5, 2-2.5, 4-4.5
CDA-SB-204	Delineate PCB exceedance and evaluate Debris Area PRA	5				x			3	0-0.5, 2-2.5, 4-4.5
CDA-SB-205	Delineate PCB exceedance and evaluate Debris Area PRA	5				x			3	0-0.5, 2-2.5, 4-4.5
CDA-SB-206	Horizontal and vertical delineation of COC detections and vertical extent of fill	10	x			x			3	0-0.5, 4-4.5, 0.5 ft below fill
CDA-SB-207	Horizontal and vertical delineation of COC detections and vertical extent of fill	10	x			x			3	0-0.5, 4-4.5, 0.5 ft below fill
CDA-SB-208	Horizontal and vertical delineation of COC detections and vertical extent of fill	10	x	x	x	x			3	0-0.5, 4-4.5, 0.5 ft below fill
CDA-SB-209	Horizontal and vertical delineation of COC detections and vertical extent of fill	10	x	x	x	x			3	0-0.5, 4-4.5, 0.5 ft below fill
CDA-SB-210	Horizontal and vertical delineation of COC detections and vertical extent of fill	10	x	x	x	x			3	0-0.5, 4-4.5, 0.5 ft below fill
CDA-SB-211	Horizontal and vertical delineation of COC detections and vertical extent of fill	10	x	x	x	x			3	0-0.5, 4-4.5, 0.5 ft below fill
CDA-SB-212	Horizontal and vertical delineation of COC detections and vertical extent of fill	10	x	x	x	x			3	0-0.5, 4-4.5, 0.5 ft below fill
CDA-SB-213	Horizontal and vertical delineation of COC detections and vertical extent of fill	10	x	x		x			3	0-0.5, 4-4.5, 0.5 ft below fill
CDA-SB-214	Horizontal and vertical delineation of COC detections and vertical extent of fill	10	x	x	x	x			3	0-0.5, 4-4.5, 0.5 ft below fill
CDA-SB-215	Delineate vertical extent of fill	15	x	x	x	x			1	0.5 ft below fill
CDA-SB-216	Delineate vertical extent of fill	15	x	x	x	x			1	0.5 ft below fill
Battery Waste (BW)									**46**	
BWA-SB-201	Horizontal and vertical delineation of COC detections and vertical extent of fill	10	x	x	x	x			3	
BWA-SB-107B	Delineate PCB exceedance and evaluate Debris Area PRA	5				x			3	0-0.5, 2-2.5, 4-4.5
BWA-SB-202	Delineate PCB exceedance and evaluate Debris Area PRA	5				x			3	0-0.5, 2-2.5, 4-4.5
BWA-SB-203	Delineate PCB exceedance and evaluate Debris Area PRA	5				x			3	0-0.5, 2-2.5, 4-4.5
BWA-SB-204	Delineate PCB exceedance and evaluate Debris Area PRA	5				x			3	0-0.5, 2-2.5, 4-4.5
BWA-SB-205	Horizontal and vertical delineation of COC detections and evaluate fill in Debris Area PRA	15	x			x			4	0-0.5, 2-2.5, 4-4.5, 0.5 ft below fill

Prepared by: RJO 7-11-24
Checked by: JDW 7-19-24
Updated: RJO 9-26-24
Checked By: HM 10-10-24
Updated: RJO 10-11-24

Table 8
Proposed Soil Investigation Sample Matrix

Areas of Investigation	Location Rationale	Proposed Depth of Boring (ft BGS)	Total Metals (6010)	SVOCs (8270)	ETPH (Connecticut ETPH Method)	PCBs (8082)	VOCs (8260)	Radiological	Maximum Number of Samples	Proposed Sample Intervals (ft bgs)[1,2]
BWA-SB-206	Horizontal and vertical delineation of COC detections and vertical extent of fill	10	x	x	x	x			3	0-0.5, 4-4.5, 0.5 ft below fill
BWA-SB-207	Horizontal and vertical delineation of COC detections and vertical extent of fill	10	x	x		x			3	0-0.5, 4-4.5, 0.5 ft below fill
BWA-SB-208	Horizontal and vertical delineation of COC detections and vertical extent of fill	10	x	x		x			3	0-0.5, 4-4.5, 0.5 ft below fill
BWA-SB-209	Horizontal and vertical delineation of COC detections and vertical extent of fill	10	x	x		x			3	0-0.5, 4-4.5, 0.5 ft below fill
BWA-SB-210	Horizontal and vertical delineation of COC detections and vertical extent of fill	10	x	x		x			3	0-0.5, 4-4.5, 0.5 ft below fill
BWA-SB-211	Horizontal and vertical delineation of COC detections and evaluate fill in Debris Area PRA	10	x	x	x	x			3	0-0.5, 4-4.5, 0.5 ft below fill
BWA-SB-212	Horizontal and vertical delineation of COC detections and vertical extent of fill	10	x	x	x	x			3	0-0.5, 4-4.5, 0.5 ft below fill
BWA-SB-213	Delineate vertical extent of fill and evaluate fill in Debris Area PRA	15	x	x	x	x			1	0.5 ft below fill
BWA-SB-214	Delineate vertical extent of fill and evaluate fill in Debris Area PRA	15	x	x	x	x			1	0.5 ft below fill
BWA-SB-215	Delineate vertical extent of fill	15	x	x	x	x			1	0.5 ft below fill
BWA-SB-216	Delineate vertical extent of fill and evaluate fill in Debris Area PRA	15	x	x	x	x			1	0.5 ft below fill
BWA-SB-217	Delineate vertical extent of fill	15	x	x	x	x			1	0.5 ft below fill
BWA-SB-218	Delineate vertical extent of fill	15	x	x	x	x			1	0.5 ft below fill
Anixter (AX)									**79**	
ANX-SB-201	Horizontal and vertical delineation of COC detections	5	x			x			3	0-0.5, 2-2.5, 4-4.5
ANX-SB-202	Horizontal and vertical delineation of COC detections and evaluate Bunker	5	x		x	x			3	0-0.5, 2-2.5, 4-4.5
ANX-SB-203	Horizontal and vertical delineation of COC detections	30	x		x	x			4	0-0.5, 2-2.5, 4-4.6, 0.5 ft above water table
ANX-SB-204	Horizontal and vertical delineation of COC detections	30	x		x	x			4	0-0.5, 2-2.5, 4-4.6, 0.5 ft above water table
ANX-SB-206	Horizontal and vertical delineation of COC detections	30	x	x		x			4	0-0.5, 2-2.5, 4-4.6, 0.5 ft above water table
ANX-SB-207	Horizontal and vertical delineation of COC detections	30	x	x	x	x	x		4	0-0.5, 2-2.5, 4-4.6, 0.5 ft above water table
ANX-SB-208	Horizontal and vertical delineation of COC detections	30	x	x	x	x	x		4	0-0.5, 2-2.5, 4-4.6, 0.5 ft above water table
ANX-SB-209	Horizontal and vertical delineation of COC detections	30	x		x	x	x		4	0-0.5, 2-2.5, 4-4.6, 0.5 ft above water table
ANX-SB-210	Horizontal and vertical delineation of COC detections	30	x		x	x	x		4	0-0.5, 2-2.5, 4-4.6, 0.5 ft above water table
ANX-SB-211	Horizontal and vertical delineation of COC detections	5	x		x				3	0-0.5, 2-2.5, 4-4.5
ANX-SB-212	Horizontal and vertical delineation of COC detections	5	x			x			3	0-0.5, 2-2.5, 4-4.5
ANX-SB-213	Horizontal and vertical delineation of COC detections	30	x		x	x			4	0-0.5, 2-2.5, 4-4.6, 0.5 ft above water table
ANX-SB-214	Horizontal and vertical delineation of COC detections	30	x		x	x			4	0-0.5, 2-2.5, 4-4.6, 0.5 ft above water table
ANX-SB-215	Horizontal and vertical delineation of COC detections	5	x			x			3	0-0.5, 2-2.5, 4-4.5
ANX-SB-216	Horizontal and vertical delineation of COC detections	5		x		x			3	0-0.5, 2-2.5, 4-4.5
ANX-SB-217	Horizontal and vertical delineation of COC detections	5	x						3	0-0.5, 2-2.5, 4-4.5
ANX-SB-218	Horizontal and vertical delineation of COC detections	5	x			x			3	0-0.5, 2-2.5, 4-4.5
ANX-SB-219	Horizontal and vertical delineation of COC detections	30	x		x	x				0-0.5, 2-2.5, 4-4.6, 0.5 ft above water table
ANX-SB-111B	Horizontal and vertical delineation of COC detections	30			x	x			4	0-0.5, 2-2.5, 4-4.6, 0.5 ft above water table
ANX-SB-112B	Horizontal and vertical delineation of COC detections	30			x	x			4	0-0.5, 2-2.5, 4-4.6, 0.5 ft above water table
ANX-SB-120B	Horizontal and vertical delineation of COC detections	30			x	x			4	0-0.5, 2-2.5, 4-4.6, 0.5 ft above water table
ANX-SB-117B	Horizontal and vertical delineation of COC detections	30			x	x			4	0-0.5, 2-2.5, 4-4.6, 0.5 ft above water table
ANX-SB-121B	Horizontal and vertical delineation of COC detections	5				x			3	0-0.5, 2-2.5, 4-4.5
Incinerator Ash (IA)									**41**	
IAA-SB-201	Horizontal and vertical delineation of COC detections	5	x	x	x	x			3	0-0.5, 2-2.5, 4-4.5
IAA-SB-202	Horizontal and vertical delineation of COC detections	5	x		x	x			3	0-0.5, 2-2.5, 4-4.5
IAA-SB-203	Horizontal and vertical delineation of COC detections	5	x	x	x	x			3	0-0.5, 2-2.5, 4-4.5
IAA-SB-204	Horizontal and vertical delineation of COC detections	5	x	x	x				3	0-0.5, 2-2.5, 4-4.5
IAA-SB-205	Horizontal and vertical delineation of COC detections	5	x	x	x	x			3	0-0.5, 2-2.5, 4-4.5
IAA-SB-206	Horizontal and vertical delineation of COC detections	5	x	x	x	x			3	0-0.5, 2-2.5, 4-4.5
IAA-SB-207	Horizontal and vertical delineation of COC detections	5	x	x	x	x			3	0-0.5, 2-2.5, 4-4.5
IAA-SB-208	Horizontal and vertical delineation of COC detections	5	x	x	x	x			3	0-0.5, 2-2.5, 4-4.5
IAA-SB-209	Horizontal and vertical delineation of COC detections	5	x			x			3	0-0.5, 2-2.5, 4-4.5
IAA-SB-106B	Horizontal and vertical delineation of COC detections	5			x	x			3	0-0.5, 2-2.5, 4-4.5

Prepared by: RJO 7-11-24
Checked by: JDW 7-19-24
Updated: RJO 9-26-24
Checked By: HM 10-10-24
Updated: RJO 10-11-24

Table 8
Proposed Soil Investigation Sample Matrix

Areas of Investigation	Location Rationale	Proposed Depth of Boring (ft BGS)	Total Metals (6010)	SVOCs (8270)	ETPH (Connecticut ETPH Method)	PCBs (8082)	VOCs (8260)	Radiological	Maximum Number of Samples	Proposed Sample Intervals (ft bgs)[1,2]
IAA-SB-103B	Horizontal and vertical delineation of COC detections	5			x	x			3	0-0.5, 2-2.5, 4-4.5
IAA-SB-210	Horizontal and vertical delineation of COC detections	5			x				2	0-0.5, 2-2.5, 4-4.5
IAA-SB-211	Horizontal and vertical delineation of COC detections	5			x				2	0-0.5, 2-2.5, 4-4.5
IAA-SB-212	Horizontal and vertical delineation of COC detections	5			x				2	0-0.5, 2-2.5, 4-4.5
IAA-SB-213	Horizontal and vertical delineation of COC detections	5			x				2	0-0.5, 2-2.5, 4-4.5
Southeast Kettle									**45**	
SKA-SB-101B	Delineate PCB exceedance	5			x	x			3	0-0.5, 2-2.5, 4-4.5
SKA-SB-102B	Horizontal and vertical delineation of PCB and SVOC detections and evaluate Debris Area PRA	5		x	x	x			3	0-0.5, 2-2.5, 4-4.5
SKA-SB-103B	Horizontal and vertical delineation of COC detections	5			x	x			3	0-0.5, 2-2.5, 4-4.5
SKA-SB-105B	Delineate PCB exceedance	5				x			3	0-0.5, 2-2.5, 4-4.5
SKA-SB-106B	Horizontal and vertical delineation of PCB and SVOC detections and evaluate Debris Area PRA	5		x	x	x			3	0-0.5, 2-2.5, 4-4.5
SKA-SB-108B	Delineate PCB exceedance	5			x	x			3	0-0.5, 2-2.5, 4-4.5
SKA-SB-201	Horizontal and vertical delineation of COC detections	5	x	x	x	x			3	0-0.5, 2-2.5, 4-4.5
SKA-SB-202	Horizontal and vertical delineation of COC detections	5	x		x	x			3	0-0.5, 2-2.5, 4-4.5
SKA-SB-203	Horizontal and vertical delineation of COC detections	5	x	x	x	x			3	0-0.5, 2-2.5, 4-4.5
SKA-SB-204	Horizontal and vertical delineation of COC detections	5	x	x	x	x			3	0-0.5, 2-2.5, 4-4.5
SKA-SB-205	Horizontal and vertical delineation of COC detections	5	x		x	x			3	0-0.5, 2-2.5, 4-4.5
SKA-SB-206	Horizontal and vertical delineation of COC detections	5	x		x	x			3	0-0.5, 2-2.5, 4-4.5
SKA-SB-207	Horizontal and vertical delineation of COC detections	5	x	x	x	x			3	0-0.5, 2-2.5, 4-4.5
SKA-SB-208	Horizontal and vertical delineation of COC detections	5	x	x	x	x			3	0-0.5, 2-2.5, 4-4.5
SKA-SB-209	Horizontal and vertical delineation of COC detections	5	x	x	x	x			3	0-0.5, 2-2.5, 4-4.5
SKA-SB-210	Horizontal and vertical delineation of COC detections	5	x	x	x	x			3	0-0.5, 2-2.5, 4-4.5
Potential Release Areas[3]									**17**	
PRA-SB-201	Evaluate former Trap Sand Piles	1	x						1	0-0.5
PRA-SB-202	Evalute Concrete Block Footing	1	x	x	x	x			1	0-0.5
PRA-CON-202	Evalute Concrete Block Footing	NA	x	x	x	x			1	Concrete Chips from block footing
PRA-SB-203	Evaluate former Trap Sand Piles	1	x						1	0-0.5
PRA-SB-204	Evaluate former Trap Sand Piles and collocated bunker	1	x	x	x	x	x		1	0-0.5
PRA-SB-205	Investigate Debris Area	5	x	x	x	x	x		3	0-0.5, 2-2.5, 4-4.5
PRA-SB-206	Investigate Bunker - location subject to change based on field evaluation	1	x	x	x	x	x	x	2	0-0.5
PRA-SB-207	Investigate Bunker - location subject to change based on field evaluation	1	x	x	x	x	x	x	2	0-0.5
PRA-SB-208	Investigate Bunker - location subject to change based on field evaluation	1	x	x	x	x	x	x	2	0-0.5
PRA-SB-209	Investigate Target Structure	1	x						1	0-0.5
PRA-SB-210	Investigate Target Structure	1	x						1	0-0.5
PRA-SB-211	Investigate Target Structure	1	x						1	0-0.5

Notes:
1. Proposed sample intervals are preliminary and may be altered depending on field observations, there will be a preference to sample intervals where indicators of contaminated subsurface material is present
2. A portion of soil samples may be held for analysis if vertical and horizontal delineation of the respective COC is obtained.
3. Several potential release areas have or will be investigated as part previous investigations within AOCs.
4. ***Bold and italicized*** borings are intended for delineation of AOCs and are collocated with identified potential release areas that are near or within the AOC.

Prepared by: RJO 7-11-24
Checked by: JDW 7-19-24
Updated: RJO 9-26-24
Checked By: HM 10-10-24
Updated: RJO 10-11-24

Table 9
Proposed Monitoring Well Network and Sample Matrix

Area of Investigation	WELL ID	Installation Date	Measuring Point Elevation (ft ngvd)	Top of Screen Intercal (ft bgs)	Bottom of Screen Interval (ft bgs)	Well/Riser Diameter (inches)	Well Condition	Sampling Matrix				
								PCBs (method 8082)	Total Metals (method 6010)	VOCs (method 8260)	SVOCs (method 8270)	ETPH
Included in 2023 Investigation												
Anixter	ANX-MW-121	9/1/2023	68.29	26.5	36.5	2	New	x	x	x	x	x
Anixter	MP-15S	9/22/1986	44.76	5	15	4	Fair	x	x	x	x	x
Anixter	MP-22S	5/1/1991	66.32	27	37	2	Fair	x	x	x	x	x
Battery Waste Area	BWA-MW-105	10/11/2023	39.57	2.5	12.5	2	Good		x	x	x	x
Battery Waste Area	BWA-MW-109	10/10/2023	40.42	2.5	12.5	2	Good		x	x	x	x
Battery Waste Area	MP-18S	7/31/1987	41.03	10	20	2	Fair		x	x	x	x
Battery Waste Area	MP-6S	9/24/1986	40.44	12	22	4	Fair		x	x	x	x
Central Disposal Area	CDA-MW-106	10/9/2023	42.18	0.5	10.5	2	New		x	x	x	x
Central Disposal Area	MP-17S	7/31/1987	40.66	10	20	2	Fair		x	x	x	x
Central Disposal Area	MP-5S	9/23/1986	39.82	9.5	19.5	2	Fair		x	x	x	x
East Burning Grounds	EBG-MW-111	8/24/2023	44.52	2.5	12.5	2	New		x	x	x	x
East Burning Grounds	MP-16S	10/16/1986	45.26	13.5	23.5	4	Fair		x	x	x	x
East Burning Grounds	MP-3S	10/20/1986	43.67	3.7	13.7	4	Fair		x	x	x	x
East Burning Grounds	MP-4S	10/16/1986	47.21	15.5	25.5	4	Fair		x	x	x	x
Incinerator Ash	IAA-MW-101	8/28/2023	44.91	5.5	15.5	2	New		x	x	x	x
Incinerator Ash	IAA-MW-103	10/10/2023	40.43	0.5	10.5	2	New		x	x	x	x
Incinerator Ash	IAA-MW-104	10/10/2023	40.43	0.5	10.5	2	New		x	x	x	x
Incinerator Ash	IAA-MW-105	10/10/2023	40.32	2.6	12.6	2	New		x	x	x	x
Southeast Kettle Area	MP-11S	9/12/1986	42.67	9	19	2	Fair		x	x	x	x
Southeast Kettle Area	SKA-MW-101	9/6/2023	47.83	6.5	16.5	2	New		x	x	x	x
Southeast Kettle Area	SKA-MW-105	9/5/2023	54.54	14.5	24.5	2	New		x	x	x	x
West Burning Grounds	MP-2S	10/21/1986	43.82	13	23	4	Fair		x	x	x	x
West Burning Grounds	WBG-MW-102	8/22/2023	55.05	14.50	24.50	2.00	New		x	x	x	x

Prepared By: RJO 7-11-24
Checked by: JDW 7-19-24

Table 9
Proposed Monitoring Well Network and Sample Matrix

Area of Investigation	WELL ID	Installation Date	Measuring Point Elevation (ft ngvd)	Top of Screen Intercal (ft bgs)	Bottom of Screen Interval (ft bgs)	Well/Riser Diameter (inches)	Well Condition	Sampling Matrix				
								PCBs (method 8082)	Total Metals (method 6010)	VOCs (method 8260)	SVOCs (method 8270)	ETPH
Additional Existing Wells to be Sampled in 2024												
West Burning Grounds	MP-1S	9/25/1986	52.32	5	15	4	Fair		x			
Anixter	MP-9I	9/22/1986	45.61	50	60	4	Fair	x	x	x	x	x
East Burning Grounds	MP-3I	10/22/1986	43.98	50	60	4	Fair		x	x		
Central Disposal Area	MP-17I	8/3/1987	41.08	50	60	2	Fair		x	x		
Proposed New Wells												
Anixter	ANX-MW-206	Proposed	TBD	At Water Table	5-10 feet below water table	2	Proposed	x	x	x	x	x
Incinerator Ash	IAA-MW-202	Proposed	TBD	At Water Table	5-10 feet below water table	2	Proposed		x	x	x	x
Central Disposal Area	CDA-MW-212	Proposed	TBD	At Water Table	5-10 feet below water table	2	Proposed		x	x	x	x

Notes:
SVOCs = semi-volatile organic compounds
VOCs = volatile organic compounds
ETPH = extractable total petroleum hydrocarbons
PCBs = polychlorinated biphenyls
TBD = to be determined
Well construction details and results of inspection of monitoring wells reported in 2023 Investigation report (WSP 2024)
Wells included in sampling list proposed to be sampled semi-annually during investigation activities

Prepared By: RJO 7-11-24
Checked by: JDW 7-19-24

Table 10
Proposed Surface Water Sample Matrix

Surface Water Body	Rationale	Sample ID	Sampling Matrix			
			Total Metals (method 6010)	VOCs (method 8260)	SVOCs (method 8270)	ETPH
Pond A	Evaluate water quality at inlet of Pond A	SW-101	x	x	x	x
Pond A	Evaluate water quality at outlet of Pond A	SW-102	x	x	x	x
Pond B	Evaluate water quality at inlet to Pond B fed by stormwater discharge	SW-103	x	x	x	x
Pond B	Evaluate water quality at outlet of Pond B	SW-104	x	x	x	x
Pond C	Evaluate water quality at inlet of Pond C	SW-105	x	x	x	x
Pond C	Evaluate water quality at outlet of Pond C	SW-106	x	x	x	x
Pond D	Evaluate water quality at outlet of Pond D	SW-107	x	x	x	x
Pond E	Evaluate water quality at outlet of Pond E	SW-108	x	x	x	x

Prepared By: RJO 11/18/24
Checked by: JDW 11/27/24