REMOVAL ASSESSMENT REPORT

Waymire Drum Source Assessment
7702 Maie Avenue
Los Angeles, Los Angeles County, California

Prepared for:

U.S. Environmental Protection Agency

Region 9

EPA Contract Number: 68HE0919D0002
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LIST OF ABBREVIATIONS AND ACRONYMS

%	percent
°C	degrees Celsius
µg/L	micrograms per liter
$\mu g/m^3$	micrograms per meter cubed
µv	microvolt
APN	Assessor's Parcel Number
bgs	below ground surface
CAM-17	California Title 22 Metals
COCs	Contaminants of concern
CPT	cone penetrometer tests
DCA	Dichloroethane
DCE	Dichloroethylene
DPM	Data Management Plan
DPT	direct push technology
DQI	data quality indicator
DQO	data quality objective
DTSC	Department of Toxic Substances Control
DTSC-SL	Department of Toxic Substances Control-Screening Level
DWR	Department of Water Resources, State of California
EC	electrical conductivity
ECD	electron capture detector
EPA	U.S. Environmental Protection Agency
ERT	Environmental Response Team
ESL	Environmental Screening Level
ft^2	square feet
FID	flame ionization detector
GPS	Global Positioning System
HDPE	high density polyethylene
HHMD	Health Hazardous Materials Division
HPT	Hydraulic Profiling Tool
HWSA	Hazardous Waste Storage Area
IDW	investigation-derived waste
K	hydraulic conductivity
LADPW	Los Angeles County Department of Public Works
LACSD	Los Angeles County Sanitation District
LARWCQB	Los Angeles Regional Water Quality Control Board;
LCS	laboratory control sample
MCL	Maximum Contaminant Level
MDL	method detection limit
mg/kg	milligrams per kilogram
MiHPT	Membrane Interface Probe Hydraulic Profiling Tool
MIP	Membrane Interface Probe
mL	milliliter
mL/min	milliliters per minute
mS/m	milli-Siemens per meter

LIST OF ABBREVIATIONS AND ACRONYMS (CONTINUED)

MS/MSD	Matrix Spike/Matrix Spike Duplicate
NPL	National Priorities List
OSC	On-Scene Coordinator
PCE	tetrachloroethene
PID	photoionization detector
PM	Project Manager
POC	point of contact
PPE	personal protective equipment
psi	pounds per square inch
QA	quality assurance
QC	quality control
RA	Removal Assessment
Repo	repossession
RPD	relative percent difference
RSL	Regional Screening Level
RWQCB	Regional Water Quality Control Board
SAP	Sampling and Analysis Plan
SBT	soil behavior type
SOP	Standard Operating Procedure
START	Superfund Technical Assessment and Response Team
SWRCB	California State Water Resources Control Board
TCE	Trichloroethylene
µg/L	micrograms per liter
ug/m3	micrograms per meter cubed
USCS	Unified Soil Classification System
USGS	United States Geological Survey
UST	underground storage tank
VC	vinyl chloride
VISL	vapor intrusion
VOA	volatile organic analysis
VISL	Vapor Intrusion Screening Level
VOC	volatile organic compound
Waymire	Waymire Drum Company
WESTON®	Weston Solutions, Inc.
XSD	halogen-specific detector

EXECUTIVE SUMMARY

The U.S. Environmental Protection Agency (EPA) Region 9 tasked Weston Solutions, Inc. (WESTON) Superfund Technical Assessment and Response Team (START) under Contract Number 68HE0919D0002 and Task Order Number 68HE0919F0134-00 to conduct a Removal Assessment (RA) for the former Waymire Drum Company (Waymire), located at 7702 Maie Avenue, Los Angeles, Los Angeles County, California, herein referred to as the Site (Figure 1). This RA was conducted to assess the extent of contamination for use in developing proposed removal actions of hazardous materials from the Site and to assess the contaminants of concern (COCs), including volatile organic compounds (VOCs), at the Site in order to characterize soils for removal activities.

The Site is in a mixed residential and commercial/industrial neighborhood and consists of [redacted], Paramount Recovery Services (Repo Lot), and Eagle Portables in Los Angeles, Los Angeles County, California (Figure 2). The Site occupies approximately 2.3 acres and is owned by Mr. Rafiel Shahbazian. The Site is zoned for commercial/industrial usage and continued commercial/industrial usage is anticipated for the Site in the future.

From the early 1920s through 1992 the site has been operated as a drum reconditioning, cleaning and recycling facility. The specific industrial wastewater practices utilized during operations are not known; however, historically, caustic stripping solution wastes could drain into the municipal sewer system. By 1977, these wastes were reportedly recycled on-site. The Site is currently a State lead site under the jurisdiction of the Los Angeles Regional Water Quality Control Board (LARWQCB).

WESTON conducted a Preliminary Assessment of the Site in 2017 and a Site Inspection at the Site in 2019, during which high levels of chlorinated hydrocarbons were detected in soil, soil vapor, and groundwater. Soil vapor sampling was conducted in 20 locations throughout the Site and analyzed for VOCs. Trichloroethylene (TCE) was detected above residential and commercial screening levels in all sampling locations (340 to 4,100,000 µg/m3) with the highest concentrations of TCE were detected in the vicinity of the clarifier. Soil samples were collected between 2 feet to 15 feet below ground surface (bgs) at ten soil sampling locations at the Site. TCE was detected at nine of the ten soil sampling locations (1.4 to 170,000 µg/kg). Additionally, one groundwater sample was collected at 100 feet bgs and analyzed for chlorinated hydrocarbons. PCE, TCE, vinyl chloride, and cis-1,2- DCE were detected at concentrations exceeding their respective maximum contaminant levels (MCLs).

Following the findings of the Site Inspection, the U.S. EPA Emergency Response Section conducted a time-critical removal action, installing seven (7) mitigation systems and four (4) sub-slab depressurization systems. Indoor air samples collected [redacted] exceeded the EPA RSL for TCE in ambient air at concentrations (0.5 µg/m3 to 3.2 µg/m3). A total of 16 sub-slab soil vapor samples were collected; from the two enclosed office spaces associated with Eagle Portables in the southern parcel of the Site (i.e., Main Office and South Storage Building) and 14 sampling locations in the active commercial spaces adjacent south of the Site. TCE was detected above the commercial/industrial screening level in every sample (16,020 µg/m3 to 202,000 µg/m3).

The RA included the use of Membrane Interface Probe Hydraulic Profiling Tool (MiHPT) data collection and the collection of correlation subsurface soil samples using direct push technology (DPT). The MiHPT was equipped with seven detectors used to evaluate the soil lithology (electrical conductivity [EC], Hydraulic Profiling Tool [HPT] Pressure and HPT Flow) and the VOCs in soil (electron capture detector [ECD], halogen-specific detector [XSD], photoionization detector [PID] and flame ionization detector [FID]). Soil samples were analyzed for VOCs using EPA Method 8260B. Field data collection activities at the Site were conducted between February 3 through February 26, 2020.

The MiHPT data were used to build a three-dimensional model of the subsurface lithology and qualitative data for COCs, specifically (VOCs. Thirty-three primary MiHPT data points were installed throughout the Site in a grid pattern (Figure 3). Based on the primary MiHPT readings, an additional five step-out MiHPT data points were installed to further delineate qualitative COC readings (Figure 4). The MiHPT data points were installed to a nominal depth of 42 feet bgs or refusal. At select locations, the MiHPTs were extended past 42 feet to refusal to assess deeper soils. Four soil borings were installed adjacent to select MiHPT data points at select depths correlating with MiHPT readings. The results were used to develop a correlation curve to establish MiHPT readings in relation to COC concentrations (specifically TCE).

Based on the MiHPT readings and confirmed with the soil borings the site is underlain by alluvial deposits. The site consists of near surface fill or reworked formation underlain by sands, silty sands, silts and clays.

The XSD readings were used to evaluate the presence and extents of chlorinated compounds at the Site. XSD readings indicated potential chlorinated solvent impacts were observed in three depth intervals, PID and FID data were similar at these depth intervals. These intervals corresponded with three fine soil layers (silts and clays) observed in the lithologic data

- Between 10 and 15 bgs,
- A silt lens observed around 21 feet bgs
- Between 26 to 55 feet bgs

A total of 28 soil samples were collected from the four soil borings installed at the Site. The following VOCs were detected one or more soil samples: 1,1-Dichloroethane, 1,2,3-Trichlorobenzene, 1,2,4-Trichlorobenzene, 1,2,4-Trimethylbenzene, 1,2,4-Trimethylbenzene, 1,2-Dichlorobenzene 1,2-Dichloropropane, 1,3,5-Trimethylbenzene, 1,4-Dichlorobenzene, cis-1,2-Dichloroethene, cis-1,3-Dichloropropene, Naphthalene, PCE, TCE, and Xylenes. 1,2,4-Trichlorobenzene, 1,4-Dichlorobenzene, cis-1,2-Dichloroethene (Table 2).

A correlation curve was developed using EPA's ProUCL software comparing TCE soil sample data and the corresponding MiHPT XSD readings at each sample location and depth. XSD readings were developed correlating to four TCE concentrations:

- TCE at 0.5 mg/kg correlated to XSD readings of 50,000 µV
- TCE at 1.0 mg/kg correlated to XSD readings of 60,000 µV

- TCE at 6.0 mg/kg correlated to XSD readings of 130,000 μV
- TCE at 12.0 mg/kg correlated to XSD readings of 220,000 μV

Using MiHPT data combined with the correlation data from soil samples, START developed iso-concentration contours and three-dimensional shells for each TCE concentration stated above (Figure 4). COCs appear to be sorbed to the fine soils, clays and silts, and not present in the sands. Black staining was also observed only in the silts and clays, but not in the sands. COCs were in general were found at three depths: within the 10-15-foot silt layer (low readings, moderate concentrations), the silt lens at 21 feet (moderate readings, low to high concentrations) and in the interbedded silts and clays from 27 feet to 37 feet bgs (high readings and high concentrations). COCs were not identified in the sands, though vapor phase COCs have been detected in the sand layers during previous investigation. Additionally, due to the sensitivity of the ECD vapor phase COCs were detected some of the sands, but not detected by the other three detectors.

1.0 INTRODUCTION

The U.S. Environmental Protection Agency (EPA) Region 9 tasked the Superfund Technical Assessment Team (START) Weston Solutions, Inc. (WESTON®) START under Contract Number 68HE0919D0002, subtask 68HE0919F0134-00 to conduct a Removal Assessment (RA) at the Waymire Drum Company, located at 7702 Maie Avenue, Los Angeles, Los Angeles County, California, herein referred to as the Site (Figure 1). The Site is made up of commercial/industrial properties comprised of three (3) Los Angeles County Assessor parcels, which are identified by Assessor Parcel Numbers (APNs) 6021-018-031, 6021-018-032 and 6021-018-033 (Figure 2). The RA was conducted to characterize and delineate the presence of contaminants of concern (COCs), including volatile organic compounds (VOCs) in the subsurface soils at the Site. The specific field sampling and chemical analytical methods pertaining to the assessment of the site were in accordance with the Waymire Drum Removal Assessment Sampling and Analysis Plan (SAP) prepared by WESTON in January 2020 (WESTON, 2020).

1.1 OBJECTIVE

The objective of the Removal Assessment is to characterize and delineate the presence of hazardous substances, including volatile organic compounds (VOCs), in the subsurface soils at the Site. Site information was reviewed to determine historical uses and identify hazardous substances that may be present on the Site. Characterization included the nature of soils as well as the concentrations of hazardous substances in the soils using Screening and Definitive methods. Delineation included determination of the lateral and vertical extent of contamination in soil at the Site.

1.2 SCOPE OF WORK

The scope of work for the RA included the following tasks:

- Conduct an underground utility survey for all thirty-five (35) Membrane Interface Probe Hydraulic Profiling Tool (MiHPT) data sampling locations including concrete coring and hand augering to 5 feet below ground surface (bgs).
- Install a minimum of one (1) MiHPT boring within each of the 35 grid-space locations and utilize data to direct the location of correlating direct push technology (DPT) borings and soil sample depths as well as to direct the step-out MiHPT locations.
- Install step-out MiHPT locations to refine the lateral extent of COCs.
- Install soil borings and collect correlation soil samples from continuous core DPT borings. Collect samples to correlate and confirm the VOC, log soil lithology, and collect lithologic MiHPT data.
- Prepare correlation curves and 3-dimensional models to analyze MiHPT results.
- Prepare this RA Report to summarize the findings and identify the potential source area.

1.3 LIMITATIONS AND EXCEPTIONS OF ASSESSMENT

This RA Report contains the results of MiHPT data collection and soil sampling activities at the Site conducted from February 3 through February 27, 2020. Limitations during field activities primary consisted of limited access due to vehicles stored on the Repo Lot. The EPA and START made multiple attempts to negotiate with the business owner, providing a contract to assist with moving vehicles during this sampling event; however, the business owner declined. Any data gaps identified during RA activities are discussed in Section 6.

2.0 SITE DESCRIPTION

The Site is located in a mixed residential and commercial/industrial neighborhood and consists of a [redacted] a Paramount Recovery Services (Repo Lot) (7702 Maie Avenue), and Eagle Portables (7710 Maie Avenue) in Los Angeles, Los Angeles County, California (Figure 1). The Site occupies approximately 2.3 acres (APNs 6021-015-031, 6021-018-032, and 6021-018-033) and is owned by Mr. Rafiel Shahbazian. The Site is zoned for commercial/industrial usage and continued commercial/industrial usage is anticipated for the Site in the future.

The Site is bordered to the north by a single-family residence and a light manufacturing business [redacted]), to the west, across Maie Avenue, by [redacted] single-family residences [redacted] to the south by a multi-business industrial park (7720 Maie Avenue), and to the east, across Metro and freight railroad lines, by a Los Angeles County public park (Franklin D. Roosevelt Park). The Site is entirely fenced and the surface of the industrial portion of the Site ([redacted] is entirely covered in pavement or buildings, although surface soil may be exposed in areas of degraded pavement or in areas where historical structures may have been removed. The current Site layout is presented in Figure 2. A photographic log is included in Appendix A.

Northern Parcel

The northern parcel (Parcel 6021-018-031) is comprised of [redacted] Repo Lot to store repossessed vehicles. A garage of approximately 1,300 square feet in the southwest corner of the parcel (i.e., North Garage) contains a storage area, a carport, and an unoccupied office.

Central Parcel

The central parcel (Parcel 6021-018-032) consists of additional space utilized by the Repo Lot (7702 Maie Avenue) and is comprised of the following features:

- An approximately 4,100-square-foot building at the west-northern portion of the parcel (i.e., Small Shop), immediately south and across a small driveway from the North garage. The building, which includes a shop/staging area, an occupied small office, and has street access, was reportedly constructed in 1948.

- An approximately 8,200-square-foot building at the west-central portion of the parcel (i.e., Large Shop), immediately south and across a small, partially covered breezeway from the Small Shop. The building, which includes a staging area, an unoccupied small office, and a restroom, was reportedly constructed in 1958.

- An approximately 100-square-foot storage and/or restroom building at the central portion of the parcel (i.e., Boiler Building), approximately 75 feet east of the northern portion of the Large Shop. The construction date of the building is not known.
- A three-stage subgrade clarifier is located immediately east of the central portion of the Large Shop.

The remainder of the area is used for storing vehicles and consists mainly of pavement, although surface soil may be exposed in areas of degraded pavement.

Southern Parcel

The southern parcel (6021-018-033) consists of a portable restroom company named Eagle Portables (7710 Maie Avenue) and is comprised of the following features:

- An approximately 750-square-foot occupied office building is located at the southwest corner of the parcel (i.e., Main Office). The construction date of the building is not known.
- An approximately 2,550-square-foot building is located at the south-central portion of the parcel (i.e., South Storage Building). The building, which includes an occupied small office and storage area, was reportedly constructed in 1941.
- An approximately 700-square-foot cellular equipment enclosure (Cell Enclosure) is located at the southeast corner of the Site.

The remainder of the area is used for staging of portable restroom units and equipment. The ground surface in the area is paved.

3.0 SITE HISTORY AND BACKGROUND

From the early 1920s through the early 1940s, the Site was used for unspecified operations associated with steel drums and/or pickling and whiskey barrels. No additional information is known regarding on-site operations or operators during this time period. No documentation was found indicating any operations were conducted on the Site prior to the early 1920s (REI, 1991; DTSC, 2016; RWQCB, 2012).

From at least 1944 through the early 1970s, the Site was occupied by the A. Rooke Cooperage Co. and owned by Ralph Rooke. Operations reportedly included cleaning and recycling 30-gallon and 55-gallon industrial steel drums. As part of these operations, the facility utilized various sumps, traps, and sewer drains. The types of hazardous substances used during these operations are not known. Industrial wastes were generated during on-site activities; however, the specific types of wastes are not known (DTSC, 2016; LADPW, 1950; RWQCB, 2012).

From approximately 1975 to 1992, the Site was occupied by the Waymire Drum Company and owned by Edward Waymire. The business operated as a drum reconditioning, cleaning and recycling facility. The facility obtained used drums from various chemical industries, primarily the Bakersfield, California-area petroleum industry. Prior to processing, used drums were typically staged at the northern and eastern portions of the Site. The interiors of the used drums were then cleaned within the tank bottom waste processing area, acid wash station, and/or caustic wash station, which were all located in the southwestern portion of the Site either within, or adjacent south and southeast of, the Large Shop. The exteriors of the used drums were then stripped of paint either with chemical (e.g., solvents, acid stripping, cyanide-based caustic stripping) or mechanical (e.g., sand or pellet blasting) processes. Cleaned drums were then repainted, presumably within the paint booth, and sold to be reused. Drums that were determined to be unsalvageable were sold as scrap metal. It is estimated that the facility reconditioned approximately 1,000 drums per day (DTSC, 2016; Rasmussen, 2011; REI, 1991).

The specific industrial wastewater practices utilized during Waymire Drum Company operations are not known; however, historically, caustic stripping solution wastes were allowed to drain into the municipal sewer system and, by 1977, these wastes were reportedly recycled on-site. In addition, various subgrade sumps, a subgrade 3-stage clarifier, and an aboveground recirculating water tank were used in on-site operations. Reportedly, approximately 8,000 gallons of wastewater per month were pumped from the facility and disposed off-site. With the exception of cyanide, which was generated as a result of drum cleaning activities, additional specific hazardous substances associated with the facility are not known (DTSC, 2016; Waymire, 1977a; Waymire, 1977b; Waymire, 1981; Waymire, 1984).

In 1992, the Waymire Drum Company purchased a property in South Gate, California, that was formerly occupied by the Cooper Drum Company (9316 South Atlantic Avenue) and operated there until 1996, at which time that property was sold to the Consolidated Drum Company. This property was added to the National Priorities List (NPL) as Cooper Drum Co. in 2001 (EPA ID No. CAD055753370) (EPA, 2018).

In approximately 1997, Mr. Waymire formed Mitchell Investors, LLC, and transferred the title of the site property from Waymire Drum Company to Mitchell Investors. At the time, the Site was being used for the storage of empty drums (RWQCB, 2012).

From 2000 to 2005, at least some portion of the Site was occupied by Prestige Imports and/or Prestige Auto Truck Dismantling, an auto parts salvage company. Operations primarily included the sanding and painting of vehicles. Specific hazardous substances used during these operations are not known. In 2003, Rafiel Shahbazian and Abgar Artenyan acquired Mitchell Investors and the site property. By 2008, Mr. Shahbazian had acquired full ownership of both Mitchell investors and the site property (ITC, 2001; LADPW, 2003; LADPW, 2005; LACSD, 2003; RWQCB, 2012).

3.1 SUMMARY OF SITE INSPECTION

WESTON conducted a Preliminary Assessment of the Site in 2017 and a Site Inspection at the Site in 2019, during which high levels of chlorinated hydrocarbons were detected in soil, soil vapor, and groundwater.

Soil vapor sampling was conducted at 20 locations throughout the Site, with one shallow soil vapor sample (6 feet bgs) and one deeper soil vapor sample (15 feet bgs) collected per location and analyzed for VOCs. The residential and commercial screening levels for Trichloroethylene (TCE) are 16 and 100 micrograms per meter cubed ($\mu g/m^3$), respectively. TCE was detected substantially above residential and commercial screening levels in all sampling locations at concentrations ranging between 340 and 4,100,000 $\mu g/m^3$. The highest concentrations of TCE were detected in the vicinity of the clarifier and drum washing area; however, TCE concentrations in the tens of thousands $\mu g/m^3$ were detected throughout the Site. The deeper samples generally contained higher concentrations of TCE.

The residential and commercial screening levels for PCE in soil vapor are 360 and 1,570 $\mu g/m^3$, respectively. PCE was detected at all soil vapor sampling locations at concentrations above residential screening levels, and at all except one soil vapor sampling location at concentrations above commercial screening levels. PCE was detected in soil vapor at concentrations ranging between 430 and 950,000 $\mu g/m^3$.

Soil samples were collected from 2 feet bgs, 5 feet bgs, 10 feet bgs, and 15 feet bgs at ten soil sampling locations at the Site and analyzed for TCE, PCE, and vinyl chloride. TCE was detected at nine of the ten soil sampling locations at concentrations ranging between 1.4 and 170,000 µg/kg. TCE exceeded residential and commercial screening levels in two sampling locations at 10 feet bgs, and in one sampling location at 2 feet bgs. PCE was detected at eight of the ten soil sampling locations at concentrations ranging between 1.7 and 45,000 µg/kg. PCE exceeded residential screening levels in one sampling location at 10 feet bgs. Vinyl chloride was not detected in any soil samples.

The depth to groundwater was found to be 100 feet bgs, one groundwater sample was collected and analyzed for VOCs. PCE, TCE. vinyl chloride and cis-1,2-Dichlorethylene (DCE) were detected at concentrations exceeding their maximum contaminant levels (MCL). Four cone penetrometer tests (CPT) were conducted to approximately 100 feet bgs at the site (Appendix B). The CPT groundwater sample was collected in the southcentral part of the Site, in the Large Shop structure.

An underground storage tank (UST) near the entrance to the Eagle Portables (Figure 2) was encountered during directional boring associated with the installation of utilities for the on-site cell equipment in August 2005. It is not known if the UST is still present at the site; however, during the March 2018 site reconnaissance, a concrete patch was observed in the approximate area of the reported UST location indicating that the tank may have been removed (WESTON®, 2018).

3.2 SUMMARY OF WAYMIRE VAPOR INTRUSION REMOVAL ACTION RESULTS

Following the findings of the Site Inspection, the EPA Emergency Response Section conducted a Time-Critical Removal Action to mitigate the threat of vapor intrusion into the residences and businesses on site and off site. EPA conducted sub-slab soil vapor sampling and ambient indoor air sampling in the on-site structures and in the residences and businesses to the south and west of the Site. Indoor air samples collected from the [redacted] residences [redacted] exceeded the EPA RSL for TCE in ambient air of 0.48 $\mu g/m^3$, with concentrations ranging from 0.5 $\mu g/m^3$ to 3.2 $\mu g/m^3$. Indoor air samples gathered from the commercial spaces directly to the south of the Site exceeded commercial screening levels for TCE in ambient air of 3 $\mu g/m^3$ with results ranging from 4.83 $\mu g/m^3$ to 156 $\mu g/m^3$.

Sub-slab soil vapor samples were collected from the two enclosed office spaces associated with Eagle Portables in the southern parcel of the Site (i.e., Main Office and South Storage Building), as well as from 14 sampling locations in the active commercial spaces directly to the south of the Site. A total of 16 sub-slab soil vapor samples were collected. TCE was detected substantially above the commercial/industrial screening level of 3 $\mu g/m^3$ in every sample, at concentrations ranging from 16,020 $\mu g/m^3$ to 202,000 $\mu g/m^3$. PCE was also detected substantially above the commercial/industrial screening level of 47 $\mu g/m^3$ in every sample, at concentrations ranging from 7,700 $\mu g/m^3$ to 75,900 $\mu g/m^3$. Vinyl chloride was detected above the commercial/industrial screening level of 2.8 $\mu g/m^3$ in four of the 16 sub-slab soil vapor samples, at concentrations ranging from 34 $\mu g/m^3$ to 2,900 $\mu g/m^3$. Vinyl chloride was not detected in the remaining 14 samples; however, the method detection limit was higher than the screening level in 13 of those samples and ranged from 20 $\mu g/m^3$ to 51 $\mu g/m^3$. In samples where the detection limit exceeded the screening level, it is possible that vinyl chloride concentrations exceeded the screening level but not the detection limit. Based on the results of the assessment, seven (7) mitigation systems and four (4) sub-slab depressurization systems were installed.

3.1 PHYSICAL SETTING

Physical characteristics of the Site and surrounding areas, including topography, geology, and hydrology, are discussed below.

3.1.1 Regional Geology

The Site lies within the Central Subbasin in the Coastal Plain of the Los Angeles Groundwater Basin. The Central Subbasin is generally bound to the north by the folded, uplifted and eroded Tertiary basement rocks of the La Brea High surface divide; to the northeast and east by the less permeable Tertiary rocks of the Elysian, Repetto, Merced, and Puente Hills; to the southeast by the Coyote Creek flood control channel (approximate Los Angeles County/Orange County boundary); and to the southwest by the Newport Inglewood Uplift, a regional anticline associated with the Newport Inglewood fault system. Geologic units typically found beneath the subbasin include Holocene-age alluvium, the upper Pleistocene Lakewood Formation, and the lower Pleistocene San Pedro Formation. The Los Angeles and San Gabriel rivers pass across the surface of the subbasin, primarily by way of engineered concrete channels, on their way to the Pacific Ocean. The average net annual precipitation in the subbasin is approximately 12 inches (DWR, 1961; DWR, 2004).

3.2.2 Site Specific Geology

Site specific geology based on the four CPTs soil behavior types (SBT) plots conducted during the SI showed the following generalized lithology in the subsurface.

- Silty sand from the ground surface extending to a depth of 8-10 feet bgs.
- Sandy silt or clay material starting at 8-10 feet bgs and extending to a depth of 13-18 feet bgs.
- Silty sand material starting at 13-18 feet bgs and extending to a depth of 26-27 feet bgs.
- Sandy silt or silty clay starting at 26-27 feet bgs and extending to a depth of 55-58 feet bgs
- Silty sand starting at 55-58 feet bgs and extending to a depth of 62-65 feet bgs
- Sandy silt or silty clay starting at 62-65 feet bgs and extending to a depth of 70-71 feet bgs.
- Sand and silty sand, with gravel layers extending to depth of groundwater at approximately 100 ft.

The logs of the CPTs are included in Appendix B.

The lithological characteristics observed during this RA are similar to the CPT findings and are discussed in detail in Section 5.2.1.

3.2.3 Regional Hydrology

The Central Subbasin has historically been divided into the Los Angeles Forebay at the northwest, the Montebello Forebay at the north, the Whittier Area at the northeast, and the Central Basin Pressure Area at the center and southwest. However, these areal distinctions are appropriate for geographical purposes only and do not accurately represent hydrogeologic conditions within the areas. In actuality, the hydrogeologic forebays, which are generally characterized by unconfined and relatively interconnected aquifer systems, are limited to only small regions within the greater Forebay areas. The Montebello Forebay, as well as the Los Angeles Forebay to a lesser degree, serve as the primary groundwater recharge areas for both shallow and deep aquifers across the entirety of the subbasin. The Central Basin Pressure Area is generally characterized by confined aquifer systems separated by relatively impermeable clay layers, although semipermeable zones within these layers allow aquifers to be interconnected in some areas. These semipermeable zones gradually decrease in frequency and magnitude with increasing distance from the forebays (DWR, 1961; DWR, 2004).

3.2.4 Site Specific Hydrology

The Site is located within the southern portion of the Los Angeles Forebay geographical area; however, underlying hydrogeologic conditions are more accurately represented by those typically identified with the Central Basin Pressure area. Groundwater beneath the Site is approximately 100 feet bgs located in coarse grained sands and gravel sediments consistent with the Gaspur Aquifer (REI , 1991). Deeper aquifers that underlie the Site are the upper Pleistocene Lakewood Formation (Exposition and Gage aquifers), and the lower Pleistocene San Pedro Formation (Hollydale, Lynwood, Silverado, and Sunnyside aquifers). Throughout much of the subbasin, the Jefferson aquifer is described as present between the Hollydale and Lynwood aquifers; however, this aquifer is reportedly absent in the vicinity of the Site. Irregular patches of a perched or semi-perched aquifer are also present within the Holocene alluvium throughout much of the subbasin. Although significant amounts of water can be found within these perched water-bearing zones, they are often discontinuous over relatively short distances and historically have had only minimal economic benefit. Thus, these perched aquifers do not meet the criteria of an "aquifer" for Hazard Ranking System purposes (DWR, 1961; DWR,2004).

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4.0 REMOVAL ASSESSMENT ACTIVITIES

The objective of this RA was to assess the COCs at the Site in order to characterize soils and to identify potential source area(s) for future removal activities. Site information was reviewed to determine historical uses and identify hazardous substances that may be present on the Site. The Site was divided into 35 grid-spaces of 50 feet by 60 feet (Figure 3). The grid-spaces were used to guide assessment activities. The field assessment phase of the project was conducted under the authority of the EPA On-Scene Coordinators (OSC) Ben Castellana and Harry Allen. During the field activities for this project, START followed all pre-determined standard operating procedures (SOPs) for sample collection and documentation, as outlined in the *Waymire Drum Removal Assessment Sampling and Analysis Plan* (SAP) prepared by START in January 2020. The Site reconnaissance was conducted in May 2019. This section provides a summary of specific field procedures used to ensure accurate removal assessment data. The following field activities were conducted from February 3 through February 26, 2020:

- A geophysical survey was performed to identify potential hazards due to underground utilities, as well as any potential environmental contaminant sources, such as sumps, vaults, or underground storage tanks.
- A total of 35 concrete cores were completed for MiHPT drilling activities. Each location was hand augered to 5 feet bgs for additional utility clearance. Soil cuttings were placed back in the borings to stabilize the MiHPT (Figure 3).
- A total of 33 primary soil data borings were advanced utilizing a MiHPT rig. Two primary locations (M-10 and M-15) were not advanced due to access issues and sufficient data collection (Figure 3).
- A total of five step-out soil data borings were advanced utilizing the MiHPT rig, based on the results of the primary MiHPT locations. The step-out locations were in areas where data gaps had been identified and as needed to further define potential source areas (Figure 5).
- A total of 28 discrete correlation subsurface soil samples (including three duplicate samples) were collected from four (4) borings using DPT. Boring locations and sample depths were based on data collected using the MiHPT. Soil samples were collected and analyzed for VOCs by EPA Method 8260B (Figure 3).

The data collected during this RA were used to identify and delineate the source area on the Site, as well as assess the lithology of the subsurface.

4.1 GEOPHYSICAL SURVEY

On February 3, 2020, a geophysical survey was conducted at the Site by Pacific Coast Locators of La Crescenta, California, under subcontract to WESTON®, to locate areas of density and metallic anomalies in the subsurface that could correlate to underground utilities. The survey was conducted using an electromagnetic metal detector, ground induction detector, and ground penetrating radar to identify anomalies. The survey was conducted within each grid-space in a 10-foot by 10-foot area identified for MiHPT data collection.

4.2 DATA COLLECTION AND SAMPLING

MiHPT borings were advanced between February 5 and February 24, 2020 and was conducted by Cascade Drilling of Santa Ana, California, under subcontract to WESTON®. MiHPT data were used to characterize and model the lateral and vertical extent of VOCs and soil lithologies. To confirm the MiHPT data, correlation soil samples were collected from continuous core DPT borings adjacent to four selected MiHPT locations. Soil samples were evaluated for VOCs by Method 8260B. Soil samples were collected on February 24 through 26, 2020. MiHPT and DPT location were recorded using a Global Positioning System (GPS) unit. Figure 3 shows initial MiPHT boring locations and soil sample and step-out MiHPT locations.

4.2.1 MiHPT Data Collection

MiHPT data collection was divided into two phases on Site. Phase I consisted of advancing one MiHPT point within each of the 35 grid-sections. Due to accessibility limitations in two grid sections (10 and 15), a total of 33 MiHPT data points were advanced (M-1 through M-9, M-11 through M-14, and M-16 through M-35). Prior to sampling, each location with an asphalt or concrete surface was cored using a concrete corer followed by hand augering to a depth of 5 feet bgs for utility clearance. The MiHPT probe was then advanced at a rate of approximately 1 foot per minute to a depth of approximately 42 feet bgs or to refusal. Five MiHPT locations were advanced to a depth ranging from 40 feet bgs to 46 feet bgs to collect data at depth. Phase I began February 5 and was completed on February 20, 2020.

Phase II locations were selected based on the results from the Phase I MiHPT readings and in consultation with the OSC. Phase II consisted of advancing five step-out MiHPT locations (M-21-1, M-22-1, M-22-2, M-27-1, and M-32-1) in areas with data gaps and as necessary to further define the source area. The probe was advanced to a depth of 42 to 60.50 feet bgs to further define the vertical extent of contamination. Phase II began on February 19 and was completed on February 24, 2020. All other procedures followed Phase I as discussed above. See Appendix C for MiHPT logs

The following MiHPT detectors were used to assess the lithology of soils:

- Electrical Conductivity (EC) – Measured the electrical conductivity of soils in milli-Siemens per meter (mS/m), higher conductivity generally indicates finer soils such as silts and clays, whereas lower conductivity indicates sands and gravels. The EC dipole is integrated into the membrane interface probe portion of the MiHPT.

- HPT Hydraulic Pressure (HPT Pressure) – Measured the hydraulic pressure of soils in pound-force per square inch (psi), in general, higher pressures indicate finer soils such as silts and clays, and lower pressures indicate sand and gravel.

- HPT Flow Max (HPT FLOW) – Measured how water flows through a formation in milliliters per minute (mL/min). If the flow max was high indicated porous soils. High flow could indicate sands, gravels and silts, low flows clays and tight silts.

The membrane interface probe of the MiHPT was heated to 120 degrees Celsius (ºC) to vaporize volatile compounds in the soil, the vapors were captured and brought to the surface then analyzed with the following detectors:

- Electron Capture Detector (ECD) – A detector sensitive to chlorine bonds with short detection range. The ECD can pick up vapor phase chlorinated compounds in addition to soil contamination. Readings are measured in microvolts (µV).

- Halogen Specific Detector (XSD) – A detector sensitive to halogenated compounds (such as chlorinated, fluorinated or brominated compounds) in the soil. The higher the response, the higher the concentration of halogenated compounds (i.e., TCE, PCE) in the soil. The detector is less sensitive than the ECD but has a higher detection range. Readings are measured in µV.

- Photoionization Detector (PID) – A general all-around detector that responds to VOCs. Readings are measured in µV.

- Flame Ionization Detector (FID) – A detector that also responds to methane as well as to many of the same compounds as the PID. Readings are measured in µV.

4.2.2 Soil Boring Sampling

Four soil sample borings (S-22, S-22A, S-27, and S-32) were installed approximately 2 feet from corresponding MiHPT data points (M-22-2, M-22-1, M-27-1, and M-31-1 respectively). The borings were installed to collect soil samples and lithology information that could be correlated to the MiHPT data. Sample depths in each boring corresponded to MiHPT readings from adjacent data points.

On February 25, 2020 OSC Allen using the preliminary TCE data collected during the SI calculated the 95% upper control limit (UCL) of 300 to 400 µg/k with EPA's ProUCL software (EPA, 2016). The SI data at this TCE concentration from boring WDC-DP-3 at 10-feet bgs was correlated to the adjacent MiHPT M-23 XSD reading at the 10-foot depth. The correlated XSD reading was estimated to be between 1x105 to 2x105 µV. MiHPT locations and sample depths were selected based on this XSD reading. Per the request of OSC Castellana a minimum of 20 samples across three ranges of the XSD data were to be collected, a minimum of five samples below 1x105 µV, ten samples between 1x105 to 2x105 µV, and five samples above 2x105 µV.

A total of 28 soil samples, plus three duplicate samples, were collected from four DPT soil borings on the Site from February 24 through February 26, 2020. Prior to sampling, each location with an asphalt or concrete surface was cleared using a DPT rig star-bit followed by hand augering to a depth of 5 feet bgs for utility clearance. The borings were further advanced using a DPT rig in accordance with EPA ERT SOP #2050. Soil borings were advanced to a depth of 40 feet bgs, except for S-22A, which was advanced to 45 feet bgs. See Appendix D for Soil Boring logs.

Soil samples were collected at various depths to correlate with a range of readings from the MiHPT XSD data as discussed above. A total of seven samples were collected below 1x105 µV, five above the 2x105 µV, and 16 between 1x105 to 2x105 µV. One duplicate sample was collected from each range. The samples were analyzed using EPA Method 8260B. The soil samples were collected directly from 5-foot DPT acetate liners using EPA Method 5035 kits. The EPA Method 5035 preserved 40 (mL) containers were immediately sealed, labeled, and chilled to 4ºC by placing on ice in an insulated cooler, and hand delivered under chain of-custody control to the Orange Coast Analytical laboratory

4.3 QUALITY CONTROL SAMPLES

Duplicate soil samples were collected for samples S-22-26.5, S-22A-39, and S-32-17. Duplicate soil samples were submitted for the same analyses as each field sample. Duplicate samples for VOC analyses were collected directly from the soil core using a Terracore® type sampling device and were not homogenized. A unique sample number was assigned to each duplicate sample and submitted blind to the laboratory.

Equipment blank samples were also collected during each day of soil sampling (three samples) and once during the MiHPT data collection (one sample). Equipment blanks were collected to ensure the equipment was decontaminated properly and was not cross contaminating the soil or samples during sampling and data collection activities. Distilled water was poured over the decontaminated nose cone of the DPT rig and collected in preserved 40-mL vials for VOC analysis by EPA Method 8260B at the end of each day after soil sampling was completed. Additionally, an equipment blank was collected from the MiHPT probe at the end of one day of data collection after decontaminating the probe.

5.0 REMOVAL ASSESSMENT RESULTS

5.1 GEOPHYSICAL SURVEY RESULTS

The geophysical survey was conducted using an electromagnetic metal detector and ground penetrating radar to identify potential anomalies at proposed drilling locations throughout the Site. Potential utilities were marked with spray paint, and sample locations were adjusted as needed and marked with white spray paint. No geophysical anomalies were identified within the proposed MiHPT locations.

5.2 MIHPT DATA COLLECTION RESULTS

Prior to sampling, each location with an asphalt or concrete surface was cored using a concrete corer followed by hand augering to a depth of 5 feet bgs for utility clearance. During coring activities at approximately 0.5-feet bgs the corer hit metal sheeting in the original location for M-26. The original location for M-26 (approximately 15-feet west of the current location) was located in the suspected footprint of the abandoned UST. None of the other cores encountered subsurface features or utilities.

5.2.1 Lithologic Interpretation of MiHPT Data and Soil Boring Logs

MiPHT and Soil Boring Comparison logs are presented in Appendix E of this report.

When reviewing the MiHPT logs for lithology if the EC readings are high (> 50), the HPT Pressure increases, and the HPT Flow decreases significantly, the soil can be interpreted as a clay. If the EC readings increase, HPT Pressure increases, and the HPT flow stays the same or decreases only slightly, the soils can be interpreted as a silt. Low or moderate EC readings with Low HPT Pressure and high HPT Flow are interpreted as sands.

The following lithological information is based on the EC, HPT Pressure and HPT Flow readings compared to the soil borings. No groundwater was encountered in any of the MiHPT or soil borings:

- Between 0 and 5 feet bgs throughout the site, the soil is made up of fill, which includes silty sands with debris such as metal, wood, brick and glass. The first 5 feet of every location was hand augered; thus, all analysis of these depths is based on visual observation.

- Beneath the fill to approximately 10 feet bgs (plus or minus 1 foot) is formational soils consisting of silty sands to sands with silt medium- to fine-grained coursing downward (from boring observations). In general, EC readings were between 2 to 20 mS/m, and HPT Pressure was 15 to 25 psi, with HPT Flow of 200 to 250 mL/min.

- From approximately 10 to 15 feet (plus or minus 1 foot) bgs is a layer of silt to clayey silt throughout the Site. In the northern portion of the Site, this layer is predominately silt and is finer, more of a clayey silt, in the southern portion of the Site. In general, EC readings were between 60 to 400 mS/m, and HPT Pressure was 15 to 25 psi, with HPT Flow of 150 to 230 mL/min.

- Between approximately 15 feet to 26 feet (plus or minus 1-foot) bgs is a very dense silty sand to sand with silt, fine to medium sands that become more coarse down formation (from boring observations). The bottom of the formation dips to the southeast, around 26 feet in the northwest to 27.5 on the southeast corner. In general, EC readings were between 5 to 30 mS/m, and HPT Pressure was 15 to 40 psi, with HPT Flow of 200 to 275 mL/min.

- A lens of silt approximately 0.5 to 1 foot thick was observed at approximately 21 feet bgs predominately on the west and south side of Site. In general, EC readings were between 50 to 150 mS/m, and HPT Pressure was 40 to 80 psi, with HPT Flow of 150 to 200 mL/min.

- From 26 feet to the bottom of the all the borings (39 feet to 60.50 feet bgs) the soils are interbedded silts and clays. In general, EC readings were between 50 to 500 mS/m, and HPT Pressure was 40 to 80 psi, with HPT Flow of 0 to 200 mL/min.

During data collection, the HPT stopped functioning properly, and five data points (M-23, M-24.M-25, M-16 and M-31) had no HPT data collected. Due to the observed correlation between the EC data and the HPT data, it was deemed sufficient to continue collecting data without the HPT. Access issues and keeping the project moving forward also necessitated this course of action.

5.2.2 Membrane Interface Probe Contaminate Results

The following COC information is based on the data collected using the membrane interface probe portion of the MiHPT. Results are based on the readings from the XSD, ECD, PID and FID.

When reviewing the MiHPT logs both the ECD and XSD will respond when chlorinated compounds are present. If the XSD responds, but the ECD does not, it can be interpreted that non-chlorinated halogenated compounds are present. The FID, PID and XSD readings are used in conjunction to assess whether results indicate the contaminants are mixed compound families or specific families. For example, if the contaminants present are chlorinated compounds, a response will be visible on all four detectors at varying levels, and the XSD, PID and FID wave forms will be similar. If there is a response on all four detectors, but the wave form for the XSD differs from the PID and FID forms, this indicates a mixed plume. If there is a response on only the PID and FID, then halogenated compounds are not present.

The XSD readings were compared to the ECD readings. The elevated XSD data (peaks) corresponded to elevated ECD data, thus XSD spikes were interpreted as chlorinated compounds. Comparing the XSD data to the PID and FID data, in general, all peaks in the XSD readings corresponded to similar waveform peaks in the PID and FID data, indicating that the contamination on-site is predominately chlorinated compounds. From previous investigation results, the primary COCs on-site are chlorinated compounds. The XSD data were used to evaluate the MiHPT data because the data indicate chlorinated compounds.

Elevated XSD readings were observed in three depth intervals; PID and FID data were also elevated in these intervals. These intervals corresponded with the three fine soil layers observed in the lithologic data.

Between 10 and 15 feet bgs, the XSD peak readings ranged from 0.8×10^4 to 22.9×10^4 µV. The highest readings were observed in data points near the clarifier (M-23, M-22-1, M-22-2, M-27-1) and near the Eagle Portables office (M-32 and M-32-1). The lowest readings were observed in the northern and eastern sides of the site.

The XSD readings in the silt lens observed around 21 feet bgs were 0.8×10^4 to 25.3×10^4 µV. The highest reading was measured in M-22-2 just west of the clarifier. Most readings were below 5.0×10^4 throughout the Site.

The XSD readings from 26 to 55 feet bgs ranged from 0.85×10^4 to 42.6×10^4 µV. The highest readings were observed near the clarifier in M-17, M-22-2, M-23, M-27, M-27-1, and M-28. The lowest readings were observed along the northern and eastern portions of the site.

5.3 SOIL SAMPLING RESULTS

The laboratory analytical results for subsurface samples are listed in Table 2. The analytical reports are provided in Appendix F and the data validation reports are provided in Appendix G. Sampling locations are shown on Figure 3.

Soil samples were collected from four borings approximately 12 to 24 inches from a MiHPT data point at depths corresponding to different MiHPT readings. Sample depths were based on the XSD readings in each corresponding MiHPT data point. As discussed in Section 5.2, the MiHPT data indicated chlorinated compounds as the main COCs; thus, the XSD data were used to determine the sample depths. Table 2 also includes the MiHPT locations and XSD readings at each depth. Below is a list of MiHPT locations, corresponding soil boring locations, and the number of samples collected in each soil boring:

- M-32-1 and S-32 (6 samples).
- M-27-1 and S-27 (5 samples).
- M-22-2 and S-22 (8 samples).
- M-22-1 and S-22A (9 samples).

Results from the soil samples were used to build a correlation curve between the corresponding MiHPT readings and the soil results at each sample location and depth. The correlation curve was used to estimate soil concentrations for TCE based on XSD readings. The correlation was used to estimate the vertical and horizontal extents of TCE Appendix H. The correlation curve is discussed in further detail in Section 5.5.

5.3.1 Volatile Organic Compound Results in Soil

A total of 28 discrete soil samples (and three duplicate samples) were collected on the Site and analyzed for VOCs. A total of 28 discrete soil samples (and three duplicate samples) were collected on the Site and analyzed for VOCs. Analytical results for samples collected during the investigation were compared to established screening levels for the protection of future occupants' health based on a commercial/industrial direct soil exposure scenario.

EPA Regional Screening Levels (RSLs) for industrial soil (EPA, 2019a) and

DTSC Screening Levels (DTSC-SLs) for commercial/industrial soil (DTSC, 2019).

The following VOCs were detected at concentrations greater than the respective method detection, but below their respective EPA RSLs and DTSC-SLs in (1) or more soil samples: 1,1-Dichloroethane, 1,2,3-Trichlorobenzene, 1,2,4-Trichlorobenzene, 1,2,4 Trimethylbenzene, 1,2,4-Trimethylbenzene, 1,2-Dichlorobenzene 1,2-Dichloropropane, 1,3,5-Trimethylbenzene, 1,4-Dichlorobenzene, cis-1,2-Dichloroethene, cis-1,3-Dichloropropene, Naphthalene, Tetrachloroethene, Trichloroethene, and Xylenes. The following VOCs were detected at concentrations greater than their respective EPA RSLs and DTSC-SLs:

- 1,2,4-Trichlorobenzene in S-22-21.2 (230,000 µg/kg).
- 1,4-Dichlorobenzene in S-22-21.2 (57,000 µg/kg).
- cis-1,2-Dichloroethene in S-22-21.2 (100,000 µg/kg).
- Naphthalene in S-22-21.2 (55,000 µg/kg).
- □ Trichloroethene results by soil boring location:
- – S-22-13.5 (130,000 µg/kg).
- – S-22-14.5 (6,300 µg/kg).
- – S-22-21.2 (900,000 µg/kg).
- – S-22-26.5 (37,000 µg/kg).
- – S-22-26.5-D (25,000 µg/kg).
- – S-22-32 (6,700 µg/kg).
- – S-27-27.5 (74,000 µg/kg).

- – S-27-34.5 (18,000 µg/kg).

– S-27-36.5 (18,000 µg/kg).Laboratory analytical results for VOCs are presented in Table 2.

5.4 EQUIPMENT BLANK RESULTS

Equipment blank samples were collected from the decontaminated soil sampling cutting shoe used each day that soil sampling was conducted. Three (3) equipment blank samples were analyzed for VOCs. Additionally, one (1) equipment blank was collected during the MiHPT sampling from the probe after decontamination to assess possible cross-contamination. Equipment blank data are presented in Appendix E. Analytes were not detected at concentrations greater than the respective method detection limits in any of the samples, indicating that the decontamination procedures were effective.

5.5 CORRELATION RESULTS

A correlation curve was developed using EPA's ProUCL software (EPA 2016) comparing TCE soil sample data and the corresponding MiHPT XSD readings at each sample location and depth. TCE was chosen because all but one sample contained detectable levels of TCE; thus, the non-detect sample was set equal to the minimum detection limit for that sample (10 µg/kg). Appendix H includes the correlation curve and the data analysis.

Three data points were removed because they were identified as outliers with poor correlations. The correlation curve was developed using the Ordinary Least Squares (OLS) Regression function with 95 percent (%) upper and lower confidence limits, with XSD readings defined as the independent variable and TCE data as the dependent variable. The classical regression trend line (Appendix H) has an R-squared value of 0.7486, the graph also displays the 95% confidence limits. Using this trend line, an estimate was developed for the XSD response (µV) to TCE concentrations milligrams per kilogram (mg/kg). Below is the correlation developed for four TCE concentrations using ProUCL OLS regression.

Correlation of XSD Response to TCE Results Using ProUCL OLS Regression

TCE (mg/kg)	XSD Response (µV)			Notes
	95% Confidence Interval	Least Squares Regression	Rounded	
0.5	14,400-77,800	50,300	50,000	½ of the Residential RSL
1.0	25,500-84,900	57,700	60,000	Residential RSL 0.94 rounded up 1.0
6.0	106,000-158,000	132,000	130,000	Industrial RSL
12.0	191,000-262,000	221,000	220,000	2 x Industrial RSL

Notes:
% = percent
µV = microvolt
mg/kg = milligrams per kilogram
RSL = Regional Screening Level
TCE = Trichloroethylene
XSD = halogen-specific detector

The TCE soil data were also analyzed to obtain a mean estimate that included both left-censored values and extreme high values. Both lognormal distribution statistics and non-parametric estimates were obtained using the R-software packages “NADA” And “EnvStats” (R Core Team 2013). For TCE a Bootstrapped 95% Upper Confidence Limit was recommended at 96,000 µg/Kg using the R-software package “EnvStats” (Helsel, 2012).

Because the data do not meet regression model assumptions, we expect inherent error in the OLS predictions. Due to this nonparametric (Kendall’s Tau) correlation was detected between XSD and TCE data in “NADA” and this suggested lognormal and/or non-parametric regression were most suitable. Ultimately, the non-parametric Akritas-Theil Sen (ATS) regression line equation was selected as a suitable model for the data. Although there is good agreement at the 6 ppm and 12 ppm concentrations, the OLS model over predicted the lower concentrations based on the XSD response.

Comparison of ProUCL and ATS Prediction Results 95% UCL		
TCE (mg/kg)	XSD Response (µV) ProUCL 95% Confidence Limit	ATS prediction (mg/kg) at the 95% UCL for XSD
0.5	14,400-77,800	2.467
1.0	25,500-84,900	2.804
6.0	106,000-158,000	6.027
12.0	191,000-262,000	11.202

Inherent errors in in the correlation curves and data are present due to multiple reasons including;

- XSD responses represent all chlorinated compounds detected and was compared to only one chlorinated compound sampling result.
- Soil sample data follow a log-normal distribution while the XSD data do not follow a discernable distribution.
- The small lenses of slit (less than 12 inches) may be biased low in the XSD data as the MiHPT probe may not have been directly within the lens when collecting data.

Using a larger dataset and ensuring the XSD reference data selected follows a normal or lognormal distribution may minimize the error in the correlation data.

6.0 EXCEPTIONS, DELETIONS, AND DATA GAPS

The RA was conducted in general conformance with the scope and limitations of the SAP for the Site. Limitations during field activities primarily consisted of limited access due to vehicles being stored on the Repo Lot. The EPA and WESTON made multiple attempts to negotiate with the business owner, providing a contract to assist with moving vehicles during this sampling event; however, the business owner declined. Therefore, two primary locations (M-10 and M-15) were not advanced due to access restrictions. Grid-spaces surrounding location M-10 and M-15 were significantly low and access was not available; therefore, no MiHPT data were collected for locations M-10 and M-15.

Data were not collected to 40 feet bgs at three (3) MiHPT data locations (M-02, M-07, and M-08) due to limitations of the DPT, resulting in refusal. Locations M-22-2, M-27-1, M-32-1, and M-33 were advanced below the depth of 40 feet bgs to explore for additional potential contamination at greater depths. As a result of geologic conditions and the DPT drill rig limitations, the vertical extent of contamination could not be assessed.

Soil samples were not analyzed for California Title-22 (CAM-17) metals, based on the MiHPT data. Metal analysis was to be used for soil disposal profiling. The COCs are located in soils at depths greater than 10 feet bgs and excavation and disposal of soils was not a removal option.

7.0 CONCLUSIONS

The following conclusions are based on the combined findings of the MiHPT readings and correlated TCE soil sample data.

Using MiHPT readings combined with the correlation data from soil samples, iso-concentration contours and three-dimensional shells were developed for each TCE concentration stated in Section 5.5 (Figure 4 and Appendix I) COCs appear to be sorbed to the fine soils, clays and silts, and not present in the sands. Black staining was also observed only in the silts and clays, but not in the sands. COCs were generally found at three depths: within the 10to15-foot silt layer (low readings, moderate concentrations), the silt lens at 21 feet (moderate readings, low to high concentrations) and in the interbedded silts and clays from 27 feet to 37 feet bgs (high readings and high concentrations). COCs were not identified in the sands; although, vapor phase COCs had been detected in the sand layers during a previous investigation. Additionally, because of the sensitivity of the ECD vapor phase COCs were detected in some of the sands, but not identified by the other three detectors. Cross-sections of the lithology and TCE concentrations were developed and are presented on Figure 5 through Figure 10. The cross sections are mapped onto the extent of TCE contamination on Figure 4. Cross-section A to A' starts at the southern edge of the Site and passes through the clarifier as it extends to the northern edge of the Site. B-B' is from west to east in the central portion of the property going through the clairifier. C to C' is in the southern part of the Site extends from the western edge of the Site to the eastern edge of the Site.

7.1 UPPER 10- TO 15-FOOT SILT LAYER

At 50,000 µV (TCE 0.5 mg/kg) there is an approximate 2 to 5-foot-thick impacted area bounded by M-21-1 on the west to M-23 on the east, and M-22 on north to M-32 and M-32-1 to the south.

At 60,000 µV (TCE 1.0 mg/kg) 1 to 5-foot-thick impacted area bounded by M-21-1 on the west to M-23 on the east, and M-22 on north to M-32 and M-32-1 to the south. There is a gap between M-22-2 and M-32 due to XSD readings from M-27 and M-27-1 below the criteria. This gap may be continuous based on the concentration of 3.2 mg/kg of TCE detected in S-27 (S-27-12.5) at 12.5 feet bgs.

No readings exceeded 130,000 µV and the 220,000 µV (TCE 6.0 mg/kg and 12 mg/kg) at this depth interval. A single soil sample had a concentration of 130 mg/kg of TCE collected at 13.5 feet bgs from S-22 (S-22-13.5). Soil samples were collected immediately above and below this sample in the same boring at 12.5-feet (S-22-12.5) and 14.5-feet (S-22-14.5) bgs with TCE concentrations of 3.3 mg/kg and 6.3 mg/kg respectively. These findings could indicate intermittent localized impacts to soils at this depth.

7.2 SILT LENS AT 21 FEET

At 50,000 µV and 60,000 µV (TCE 0.5 mg/kg and 1.0 mg/kg) there is an approximate 1-foot-thick impacted area around M-22-2. The sample collected from S-22 at 21.2 feet bgs (S-22-21.2) had a concentration of 900 mg/kg. Two other samples were collected at this depth, from S-27 (S-27-21.5) at 21.5 feet bgs and from S-32 (S-32-21) at 21 feet bgs TCE was detected at concentrations of 1.4 mg/kg and 0.68 mg/kg respectively. The soil data may indicate that the

TCE impacts at the 0.5 mg/kg may extend south to M-32 and TCE at the1.0 mg/kg concentration may extend south to M-27-1.

Readings from M-22-2 exceeded both 130,000 µV and the 220,000 µV (TCE concentrations of 6.0 mg/kg and 12 mg/kg respectively) at this depth. No other MiHPT readings exceeded these readings in the depth interval. As stated above the TCE concentration at this depth from S-22 (S-22-21.2) was 900 mg/kg.

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7.3 LOWER 26 TO 55 FEET INTERBEDDED SILT AND CLAY LAYER

At 50,000 µV (TCE 0.5 mg/kg) there is an approximately 5 to 25 foot thick impacted area bounded by M-21 on the west to M-28 on the east, and M-17 on north to M-32 and M-33 to the south, the impacted soils may extend to the southwest toward M-31 at the 30-35 foot bgs depth.

At the 60,000-µV (TCE 1.0 mg/kg) level, there is an approximately 5- to 25-foot-thick impacted area bounded by M-21-1 on the west to M-28 on the east, and M-17 on north to M-32 and M-33 to the south.

For both the 50,000 µV and 60,000 µV XSD readings, the impacted soils are not continuous from 26 to 55 feet bgs and there are lenses of unimpacted soils.

At 130,000 µV (TCE 6.0 mg/kg) level there is an approximate 10-foot-thick (27 to 37 feet bgs) impacted area bounded by M-21-1 on the west to M-28 on the east, and M-22 on north to M-27-1 to the south.

At 220,000 µV (TCE 12.0 mg/kg) level there is an approximate 10-foot-thick (27 to 37 feet bgs) impacted area bounded by M-22-2 to the north and west, to M-23 on the east, and M-28 and M-27-1 to the south

8.0 REFERENCES

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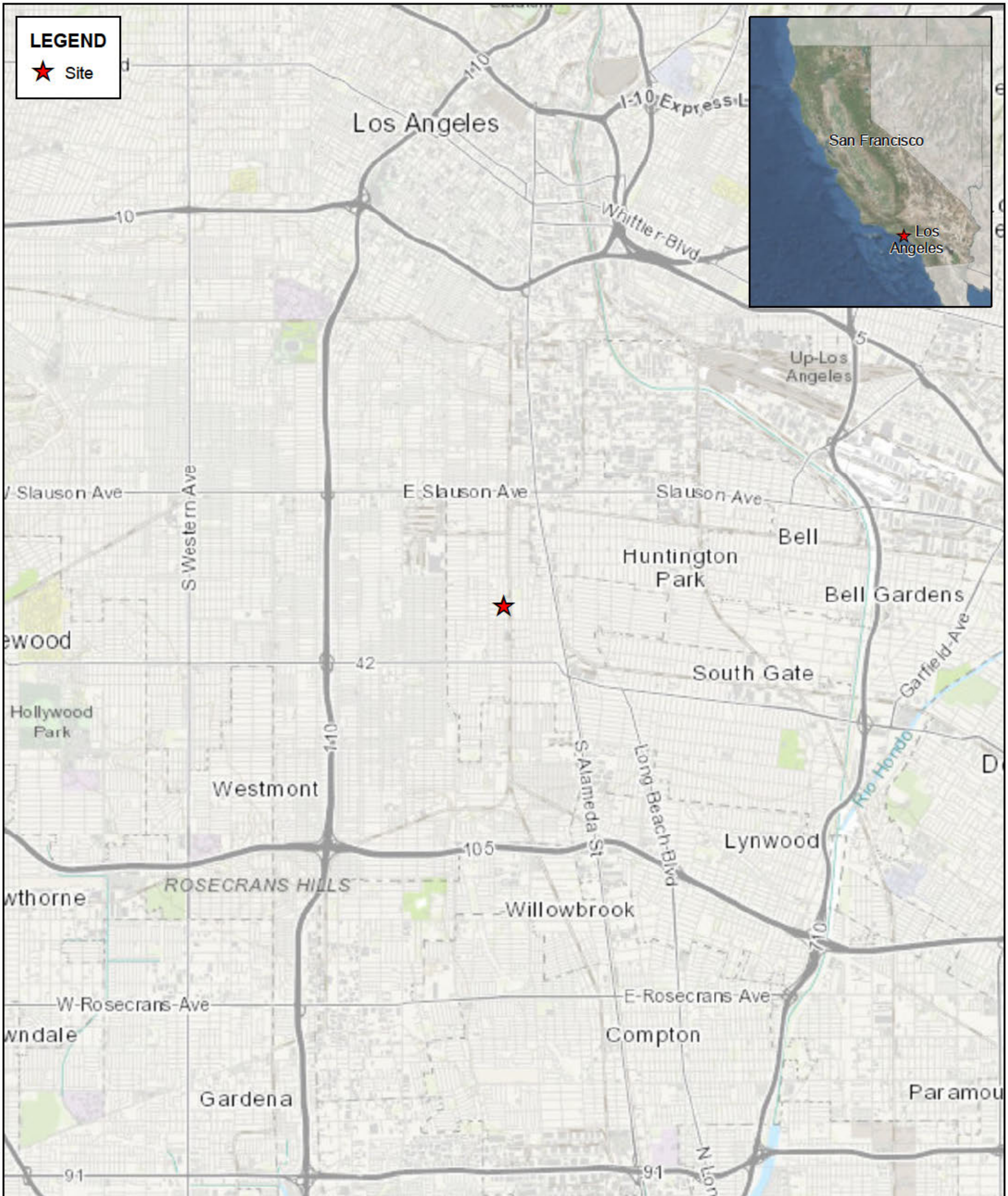
FIGURES



Scale in Miles
0 3
1 inch = 2 miles

Contract: 68HE0919D0002
Task Order: 68HE0919F0134
DCN: 0040-08-AAEL

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Concord, CA 94520
May 2020

FIGURE 1
Site Location
7702 Maie Ave.
Waymire Drum Source
Removal Assessment
Los Angeles, Los Angeles County, CA

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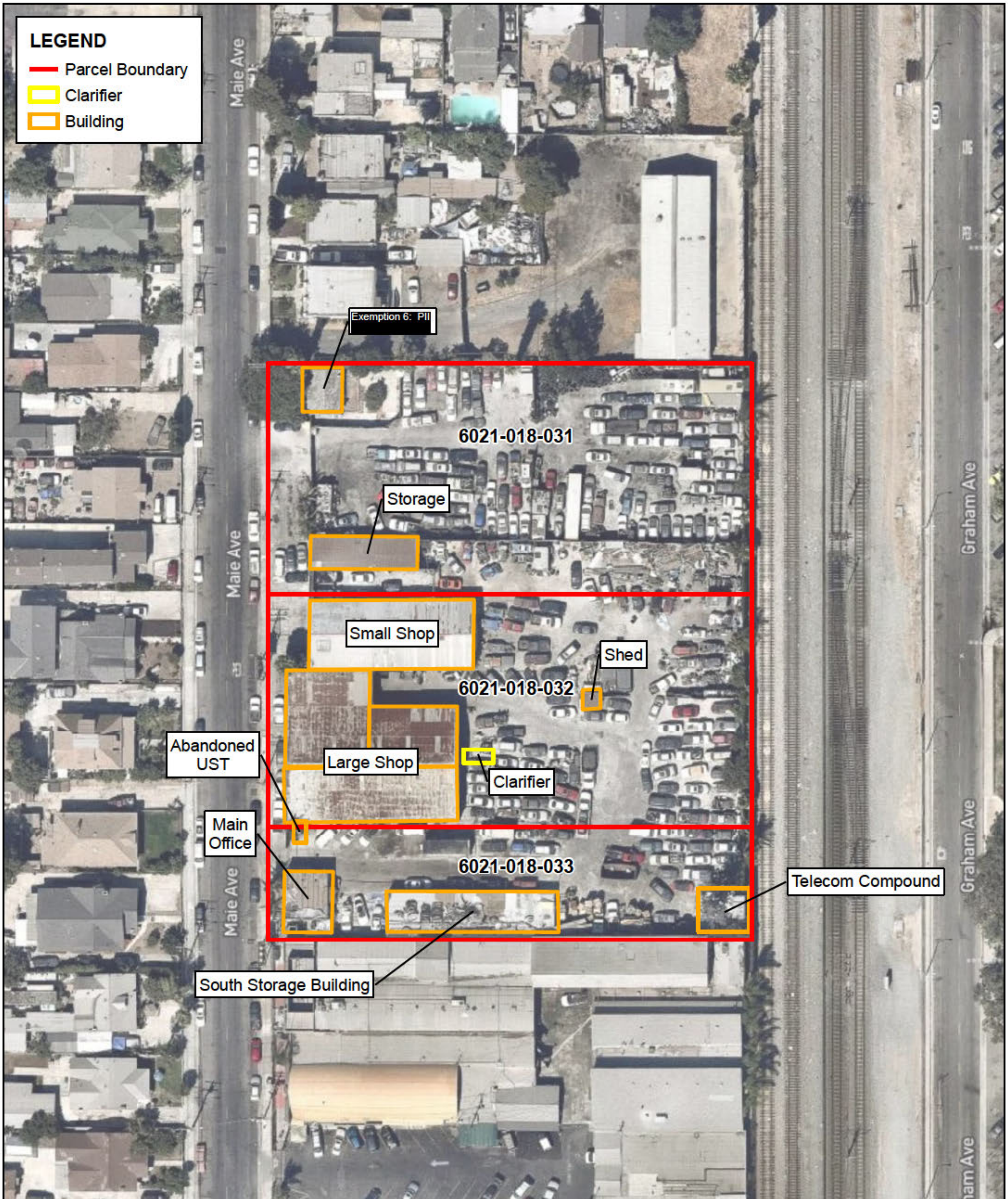

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1 inch = 80 feet

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Task Order: 68HE0919F0134
DCN: 0040-08-AAEL

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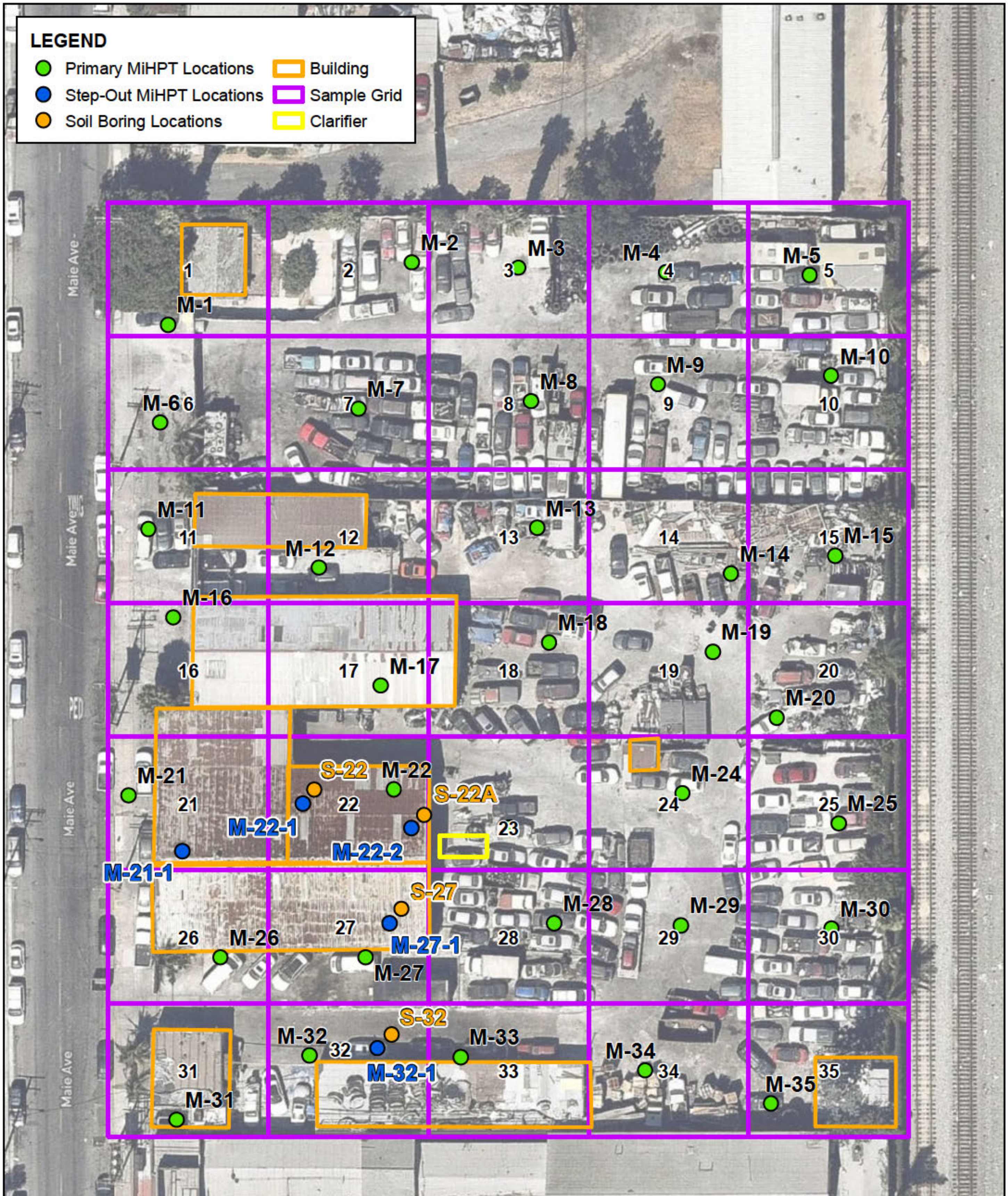
FIGURE 2
Parcel Boundary
7702 Maie Ave.
Waymire Drum Source
Removal Assessment
Los Angeles, Los Angeles County, CA



C:\Users\sherrili\Documents\Waymire\Maps\Figure 3 - MiHPT and Soil Boring Locations Kazami.mxd 5/14/2020 11:14:16 AM sherrili

0 80
Scale in Feet
1 in = 50 feet

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FIGURE 3
Soil Boring and MiHPT Locations
7702 Maie Ave.
Waymire Drum Source Removal Assessment
Los Angeles, Los Angeles County, CA

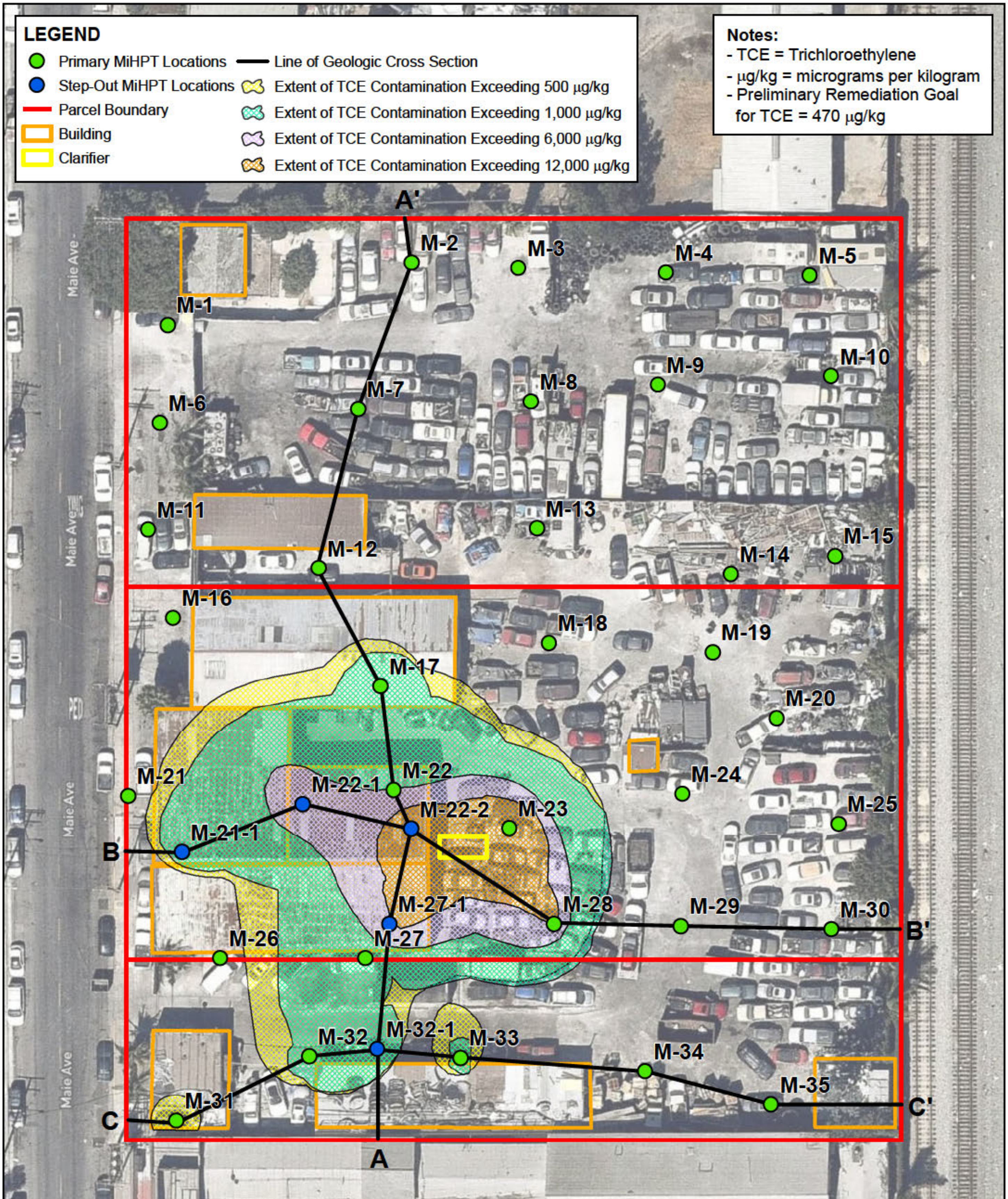

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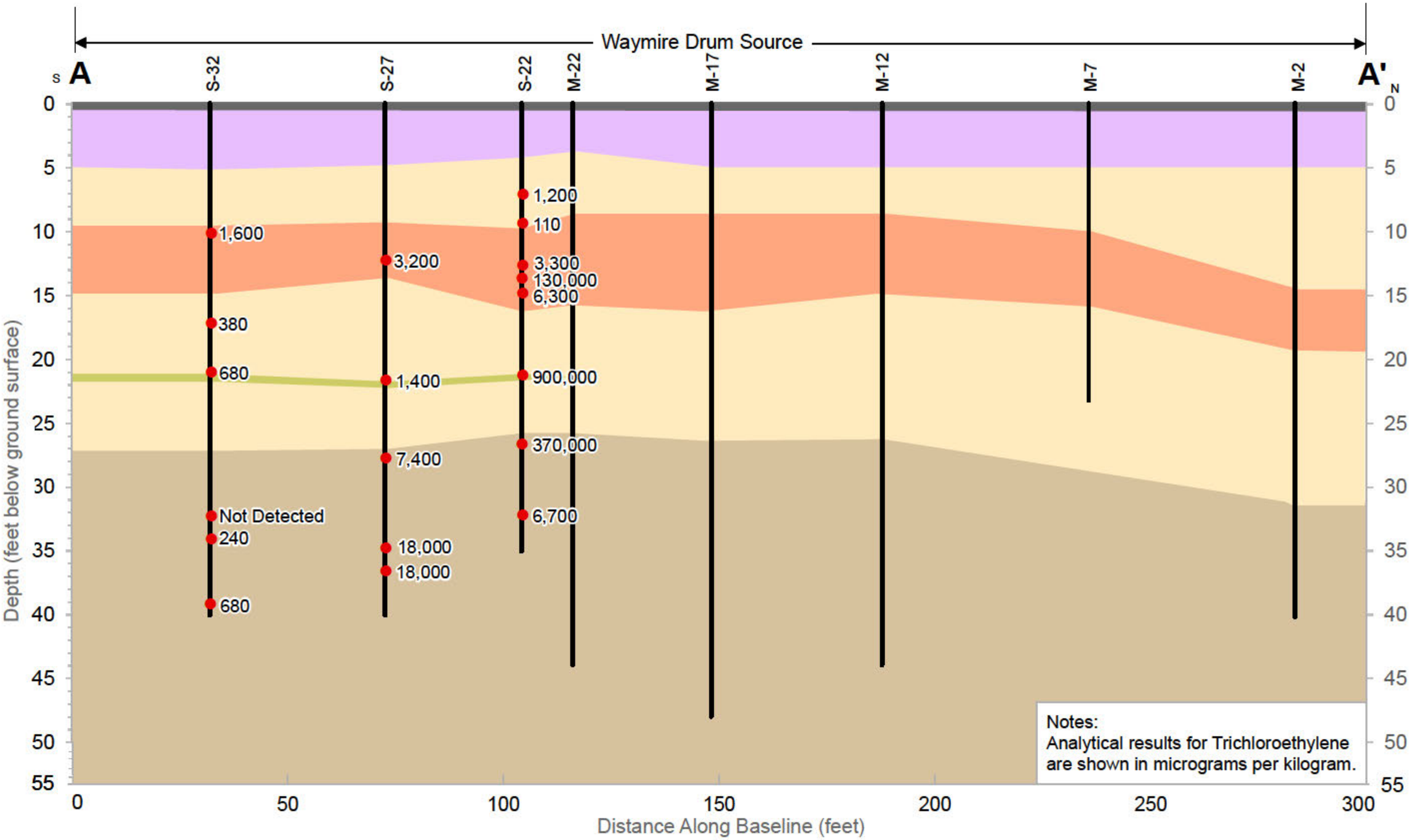
FIGURE 4
Extent of TCE Contamination
7702 Maie Ave.
Waymire Drum Source Removal Assessment
Los Angeles, Los Angeles County, CA



LEGEND

- Sample
- Soil Boring
- Interbedded Silt and Clay
- Silt Lens
- Clayey Silt
- Silty Sand
- Fill
- Asphalt/ Concrete Pavement

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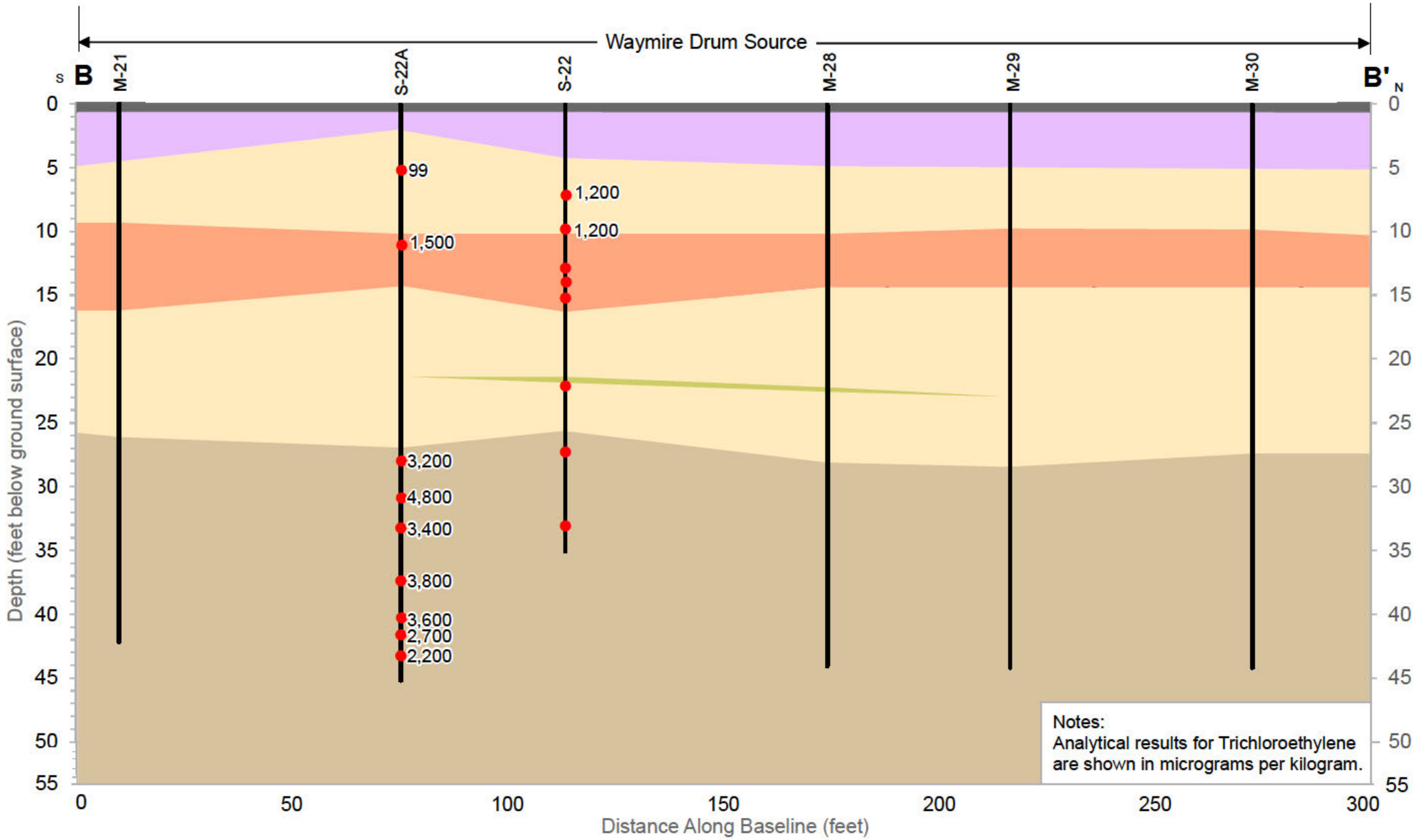
FIGURE 5
Cross Section A - A'
TCE Results in Soil
Waymire Drum Source
Removal Assessment
7702 Maie Ave.
Los Angeles, Los Angeles County, CA



LEGEND

- Sample
- Soil Boring
- Interbedded Silt and Clay
- Silt Lens
- Clayey Silt
- Silty Sand
- Fill
- Asphalt/ Concrete Pavement

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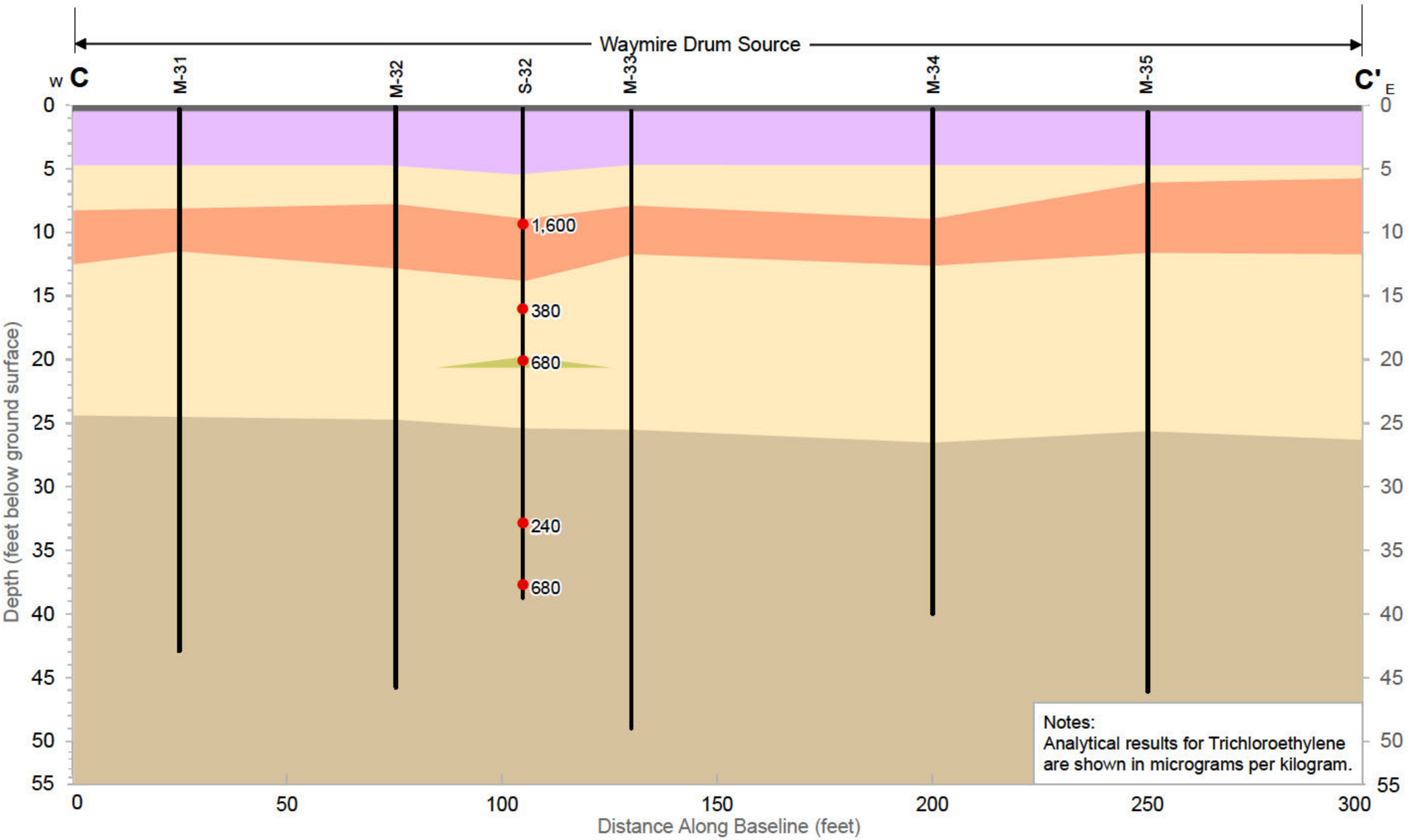
FIGURE 6
Cross Section B - B'
TCE Results in Soil
Waymire Drum Source
Removal Assessment
7702 Maie Ave.
Los Angeles, Los Angeles County, CA

Contract: 68HE0919D0002 ; **Task Order:** 68HE0919F0134

DCN: 0040-08-AAEX



LEGEND

- Sample
- Soil Boring
- Interbedded Silt and Clay
- Silt Lens
- Clayey Silt
- Silty Sand
- Fill
- Asphalt/ Concrete Pavement

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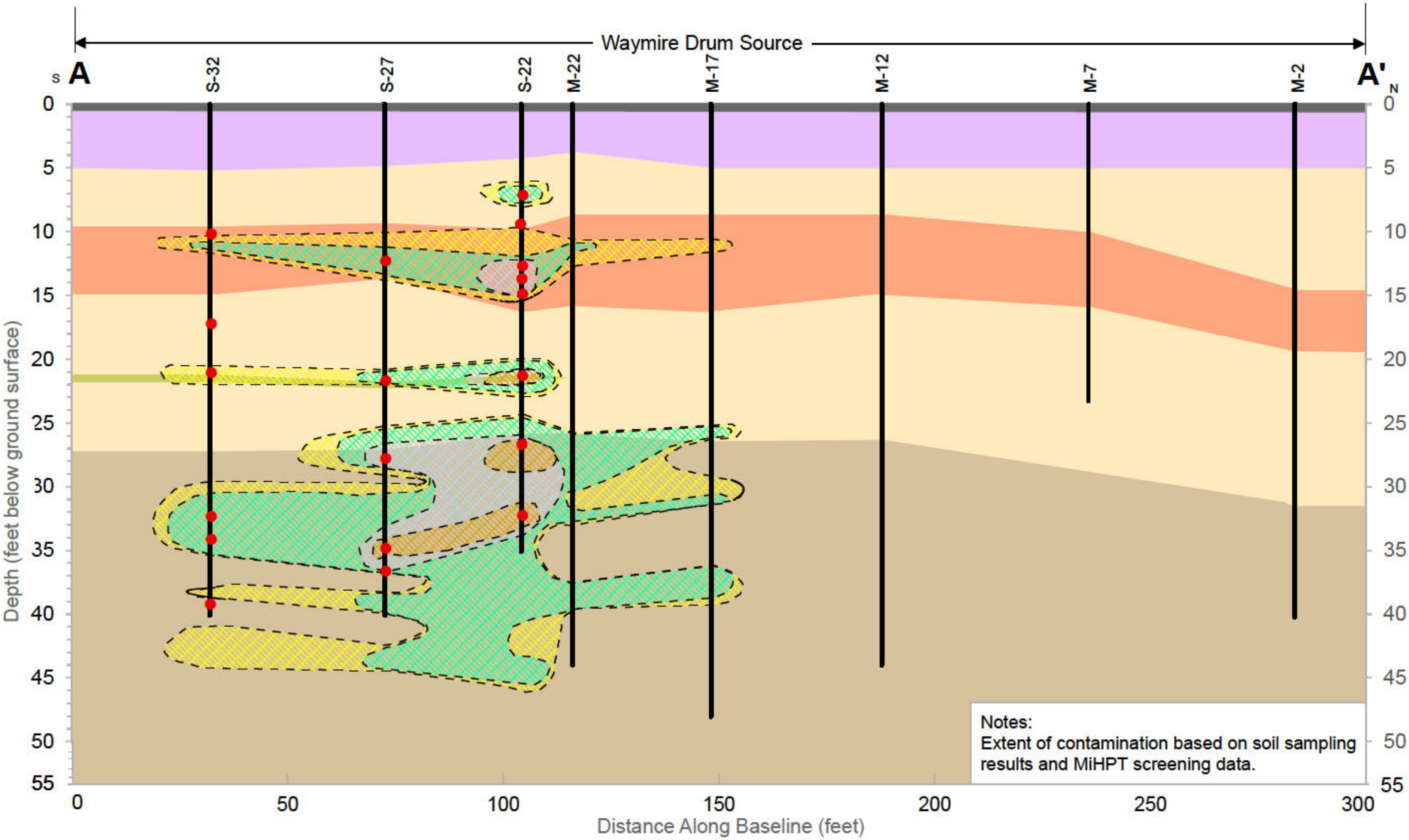
FIGURE 7
Cross Section C - C'
TCE Results in Soil
Waymire Drum Source
Removal Assessment
7702 Maie Ave.
Los Angeles, Los Angeles County, CA

Contract: 68HE0919D0002 ; **Task Order:** 68HE0919F0134

DCN: 0040-08-AAEX



LEGEND

- Sample
- Soil Boring
- Interbedded Silt and Clay
- Silt Lens
- Clayey Silt
- Silty Sand
- Fill
- Asphalt/ Concrete Pavement
- Extent of TCE Contamination Exceeding 500 µg/kg
- Extent of TCE Contamination Exceeding 1,000 µg/kg
- Extent of TCE Contamination Exceeding 6,000 µg/kg
- Extent of TCE Contamination Exceeding 12,000 µg/kg

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FIGURE 8
Cross Section A - A'
Extent of TCE Contamination
Waymire Drum Source
Removal Assessment
7702 Maie Ave.
Los Angeles, Los Angeles County, CA

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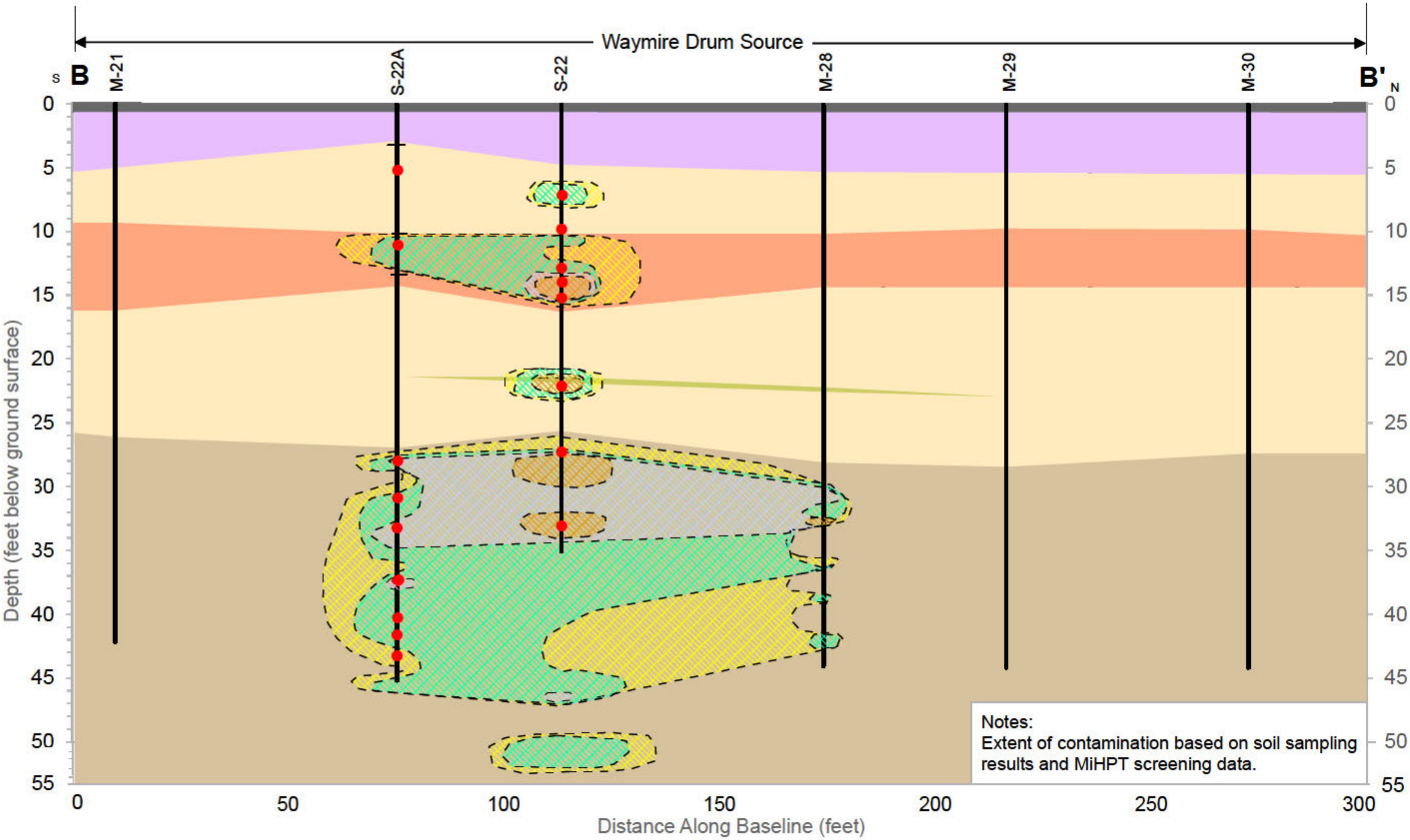
Contract: 68HE0919D0002 ; **Task Order:** 68HE0919F0134

DCN: 0040-08-AAEX



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LEGEND

- Sample
- Soil Boring
- Interbedded Silt and Clay
- Silt Lens
- Clayey Silt
- Silty Sand
- Fill
- Asphalt/ Concrete Pavement
- Extent of TCE Contamination Exceeding 500 µg/kg
- Extent of TCE Contamination Exceeding 1,000 µg/kg
- Extent of TCE Contamination Exceeding 6,000 µg/kg
- Extent of TCE Contamination Exceeding 12,000 µg/kg

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FIGURE 9
Cross Section B - B'
Extent of TCE Contamination
Waymire Drum Source
Removal Assessment
7702 Maie Ave.
Los Angeles, Los Angeles County, CA

Contract: 68HE0919D0002 ; **Task Order:** 68HE0919F0134

DCN: 0040-08-AAEX

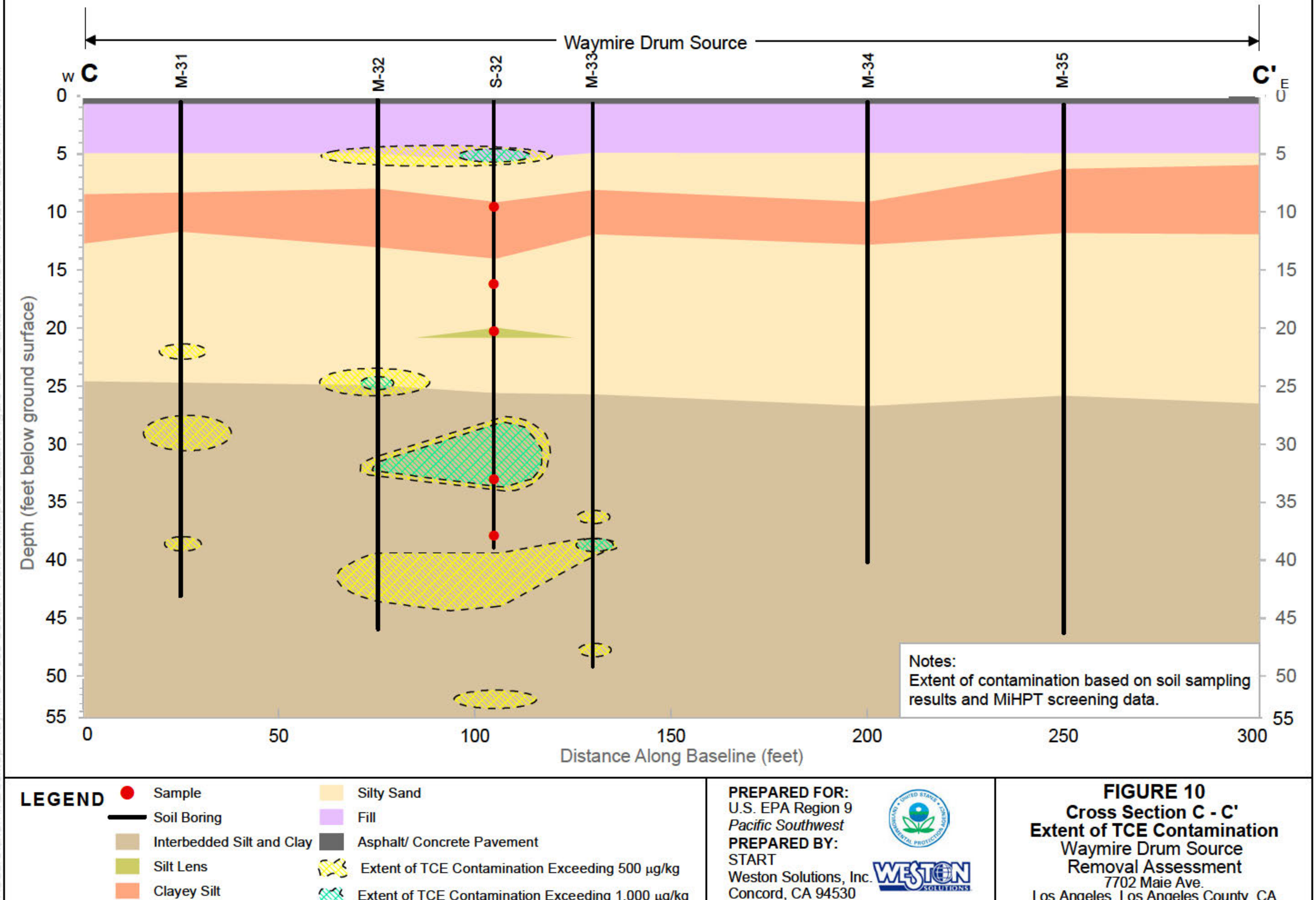

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FIGURE 10
Cross Section C - C'
Extent of TCE Contamination
Waymire Drum Source
Removal Assessment
7702 Maie Ave.
Los Angeles, Los Angeles County, CA

Contract: 68HE0919D0002 ; **Task Order:** 68HE0919F0134
DCN: 0040-08-AAEX

TABLES

Table 1
MiHPT Boring Information

Location	Type	Date	Depth (bgs)
M-01	Primary	2/5/2020	39.40
M-02	Primary	2/20/2020	43.35
M-03	Primary	2/20/2020	43.35
M-04	Primary	2/19/2020	42.55
M-05	Primary	2/19/2020	40.75
M-06	Primary	2/5/2020	42.10
M-07	Primary	2/6/2020	21.85*
M-08	Primary	2/18/2020	42.55
M-09	Primary	2/11/2020	46.20
M-10	Primary	NA	NA
M-11	Primary	2/5/2020	42.00
M-12	Primary	2/11/2020	42.30
M-13	Primary	2/11/2020	42.45
M-14	Primary	2/21/2020	42.35
M-15	Primary	NA	NA
M-16	Primary	2/14/2020	42.95
M-17	Primary	2/20/2020	46.50
M-18	Primary	2/12/2020	42.60
M-19	Primary	2/18/2020	42.40
M-20	Primary	2/21/2020	42.25
M-21	Primary	2/10/2020	43.25
M-22	Primary	2/11/2020	42.70
M-23	Primary	2/13/2020	42.40
M-24	Primary	2/13/2020	42.55
M-25	Primary	2/13/2020	42.80
M-26	Primary	2/10/2020	42.20
M-27	Primary	2/7/2020	46.20
M-28	Primary	2/12/2020	42.50
M-29	Primary	2/18/2020	42.45
M-30	Primary	2/12/2020	42.05
M-31	Primary	2/14/2020	42.30
M-32	Primary	2/10/2020	42.20
M-33	Primary	2/7/2020	52.20
M-34	Primary	2/7/2020	40.20
M-35	Primary	2/7/2020	46.40
M-21-1	Step-out	2/21/2020	42.45
M-22-1	Step-out	2/20/2020	46.55
M-22-2	Step-out	2/24/2020	50.50
M-27-1	Step-out	2/19/2020	60.50
M-32-1	Step-out	2/24/2020	58.00

Notes:

bgs = below ground surface

NA = Not accessable, locations not accessable during sampling.

* = Refusal encountered, deeper data was not required

Table 2
Soil Samples Results
Waymire Drum Source Assessment

Analyte	U.S EPA RSLs (ug/kg)	DTSC-SL (ug/kg)	Sample ID	S-22-7.0	S-22-9.5	S-22-12.5	S-22-13.5	S-22-14.5	S-22-21.2	S-22-26.5	S-22-26.5-D	S-22-32	S-22A-5	S-22A-10.5	S-22A-27	S-22A-30	S-22A-32	S-22A-36	S-22A-39	S-22A-39-D	S-22A-40	S-22A-42
			Sample Date	2/25/2020 14:37	2/25/2020 14:35	2/25/2020 14:47	2/25/2020 14:49	2/25/2020 14:50	2/25/2020 15:02	2/25/2020 15:16	2/25/2020 15:18	2/25/2020 15:30	2/26/2020 8:40	2/26/2020 8:44	2/26/2020 9:22	2/26/2020 9:33	2/26/2020 9:35	2/26/2020 9:57	2/26/2020 9:59	2/26/2020 10:01	2/26/2020 10:03	2/26/2020 10:14
			MiHPT Location	M-22-2	M-22-2	M-22-2	M-22-2	M-22-2	M-22-2	M-22-2	Duplicate	M-22-2	M-22-1	M-22-1	M-22-1	M-22-1	M-22-1	M-22-1	M-22-1	M-22-1	M-22-1	M-22-1
			MiHPT Depth (feet bgs)	7	9.5	12.5	13.5	14.5	21.2	26.5		32	5	10.345	27.05	30.05	32	36	39	Duplicate	40	42
			XSD (µV)	14000	34000	100000	88000	105000	250000	376000		240000	8400	99800	144000	127000	178000	146000	94000		97000	97000
			Unit / Sample Type	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
1,1,1,2-Tetrachloroethane	8800	2700000	Grab	<17	<4.2	<8.4	<210	<17	<1700	<84	<42	<17	<4.2	<17	<17	<17	<17	<17	<17	<8.4	<8.4	<8.4
1,1,1-Trichloroethane	36000000	7200000	Grab	<14	<3.4	<6.8	<170	<14	<1400	<68	<34	<14	<3.4	<14	<14	<14	<14	<14	<14	<6.8	<6.8	<6.8
1,1,2,2-Tetrachloroethane	2700	4300000	Grab	<18	<4.4	<8.8	<220	<18	<1800	<88	<44	<18	<4.4	<18	<18	<18	<18	<18	<18	<8.8	<8.8	<8.8
1,1,2-Trichloroethane	5000	NA	Grab	<18	<4.4	<8.8	<220	<18	<1800	<88	<44	<18	<4.4	<18	<18	<18	<18	<18	<18	<8.8	<8.8	<8.8
1,1-Dichloroethane	16000	7100000	Grab	<19	<4.8	<9.6	<240	250	<1900	<96	<48	<19	<4.8	<19	<19	210	<19	230	210	160	170	140
1,1-Dichloroethene	1000000	350000	Grab	<23	<5.8	<12	<290	<23	<2300	<120	<58	<23	<5.8	<23	<23	<23	<23	<23	<23	<12	<12	<12
1,1-Dichloropropene	NA	NA	Grab	<19	<4.8	<9.6	<240	<19	<1900	<96	<48	<19	<4.8	<19	<19	<19	<19	<19	<19	<9.6	<9.6	<9.6
1,2,3-Trichlorobenzene	930000	300000	Grab	<16	<4.0	<8.0	<200	<16	66000	1400	840	<16	<4.0	<16	<16	<16	<16	<16	<16	<8.0	<8.0	<8.0
1,2,3-Trichloropropane	250000	21000	Grab	<34	<8.6	<17	<430	<34	<3400	<170	<86	<34	<8.6	<34	<34	<34	<34	<34	<34	<17	<17	<17
1,2,4-Trichlorobenzene	110000	260000	Grab	<21	<5.2	<10	<260	<21	**230000**	5700	3900	240	<5.2	21	330	270	<21	<21	<21	<10	<10	<10
1,2,4-Trimethylbenzene	1800000	NA	Grab	<30	<7.4	<15	<370	<30	22000	1000	770	<30	<7.4	<30	<30	<30	<30	<30	<30	<15	150	<15
1,2-Dibromo-3-chloropropane	64	25000	Grab	<18	<4.6	<9.2	<230	<18	<1800	<92	<46	<18	<4.6	<18	<18	<18	<18	<18	<18	<9.2	<9.2	<9.2
1,2-Dibromoethane	160	30000	Grab	<13	<3.2	<6.4	<160	<13	<1300	<64	<32	<13	<3.2	<13	<13	<13	<13	<13	<13	<6.4	<6.4	<6.4
1,2-Dichlorobenzene	9300000	NA	Grab	<18	<4.6	<9.2	<230	<18	140000	2100	2000	<18	<4.6	<18	<18	<18	<18	<18	<18	<9.2	<9.2	<9.2
1,2-Dichloroethane	2000	NA	Grab	<17	<4.2	<8.4	<210	<17	<1700	<84	<42	<17	<4.2	<17	<17	<17	<17	<17	<17	<8.4	<8.4	<8.4
1,2-Dichloropropane	11000	NA	Grab	<13	<3.2	<6.4	<160	<13	<1300	1200	<32	<13	<3.2	<13	<13	<13	<13	<13	<13	<6.4	<6.4	<6.4
1,3,5-Trimethylbenzene	1500000	NA	Grab	<31	<7.8	<16	<390	<31	<3100	<160	<78	<31	<7.8	<31	<31	<31	<31	<31	<31	<16	120	<16
1,3-Dichlorobenzene	NA	NA	Grab	<17	<4.2	<8.4	<210	<17	<1700	<84	<42	<17	<4.2	<17	<17	<17	<17	<17	<17	<8.4	<8.4	<8.4
1,3-Dichloropropane	23000000	2200000	Grab	<15	<3.8	<7.6	<190	<15	<1500	<76	<38	<15	<3.8	<15	<15	<15	<15	<15	<15	<7.6	<7.6	<7.6
1,4-Dichlorobenzene	11000	NA	Grab	<23	<5.8	<12	<290	<23	**57000**	<120	780	<23	<5.8	<23	<23	<23	<23	<23	<23	<12	<12	<12
2,2-Dichloropropane	NA	NA	Grab	<11	<2.8	<5.6	<140	<11	<1100	<56	<28	<11	<2.8	<11	<11	<11	<11	<11	<11	<5.6	<5.6	<5.6
2-Chlorotoluene	23000000	2500000	Grab	<31	<7.8	<16	<390	<31	<3100	<160	<78	<31	<7.8	<31	<31	<31	<31	<31	<31	<16	<16	<16
4-Chlorotoluene	350000	2300000	Grab	<13	<3.2	<6.4	<160	<13	<1300	<64	<32	<13	<3.2	<13	<13	<13	<13	<13	<13	<6.4	<6.4	<6.4
4-Isopropyltoluene	23000000	NA	Grab	<11	<2.8	<5.6	<140	<11	<1100	<56	<28	<11	<2.8	<11	<11	<11	<11	<11	<11	<5.6	<5.6	<5.6
Benzene	5100	46000	Grab	<18	<4.6	<9.2	<230	<18	<1800	<92	<46	<18	<4.6	<18	<18	<18	<18	<18	<18	<9.2	<9.2	<9.2
Bromobenzene	1800000	NA	Grab	<20	<5.0	<10	<250	<20	<2000	<100	<50	<20	<5.0	<20	<20	<20	<20	<20	<20	<10	<10	<10
Bromochloromethane	630000	NA	Grab	<23	<5.8	<12	<290	<23	<2300	<120	<58	<23	<5.8	<23	<23	<23	<23	<23	<23	<12	<12	<12
Bromodichloromethane	1300	NA	Grab	<22	<5.4	<11	<270	<22	<2200	<110	<54	<22	<5.4	<22	<22	<22	<22	<22	<22	<11	<11	<11
Bromoform	86000	3000000	Grab	<32	<8.0	<16	<400	<32	<3200	<160	<80	<32	<8.0	<32	<32	<32	<32	<32	<32	<16	<16	<16
Bromomethane	30000	NA	Grab	<18	<4.4	<8.8	<220	<18	<1800	<88	<44	<18	<4.4	<18	<18	<18	<18	<18	<18	<8.8	<8.8	<8.8
Carbon tetrachloride	2900	250000	Grab	<19	<4.8	<9.6	<240	<19	<1900	<96	<48	<19	<4.8	<19	<19	<19	<19	<19	<19	<9.6	<9.6	<9.6
Chlorobenzene	1300000	NA	Grab	<18	<4.4	<8.8	<220	<18	<1800	<88	<44	<18	<4.4	<18	<18	<18	<18	<18	<18	<8.8	<8.8	<8.8
Chloroethane	57000000	NA	Grab	<28	<7.0	<14	<350	<28	<2800	<140	<70	<28	<7.0	<28	<28	<28	<28	<28	<28	<14	<14	<14
Chloroform	1400	NA	Grab	<18	<4.6	<9.2	<230	<18	<1800	<92	<46	<18	<4.6	<18	<18	<18	<18	<18	<18	<9.2	<9.2	<9.2
Chloromethane	460000	NA	Grab	<96	<24	<48	<1200	<96	<9600	<480	<240	<96	<24	<96	<96	<96	<96	<96	<96	<48	<48	<48
cis-1,2-Dichloroethene	2300000	84000	Grab	470	110	860	31000	4700	***100000***	25000	19000	9500	70	1300	2300	3300	2700	3200	<17	3000	3200	2800
cis-1,3-Dichloropropene	NA	NA	Grab	<19	<4.8	<9.6	<240	<19	<1900	<96	<48	<19	<4.8	<19	<19	<19	<19	<19	3400	<9.6	<9.6	<9.6
Dibromochloromethane	39000	2500000	Grab	<24	<6.0	<12	<300	<24	<2400	<120	<60	<24	<6.0	<24	<24	<24	<24	<24	<24	<12	<12	<12
Dibromomethane	99000	NA	Grab	<18	<4.6	<9.2	<230	<18	<1800	<92	<46	<18	<4.6	<18	<18	<18	<18	<18	<18	<9.2	<9.2	<9.2
Dichlorodifluoromethane	370000	NA	Grab	<130	<32	<64	<1600	<130	<13000	<640	<320	<130	<32	<130	<130	<130	<130	<130	<130	<64	<64	<64
Diisopropyl ether (DIPE)	9400000	NA	Grab	<26	<6.6	<13	<330	<26	<2600	<130	<66	<26	<6.6	<26	<26	<26	<26	<26	<26	<13	<13	<13
Ethyl t-butyl ether (ETBE)	NA	NA	Grab	<15	<3.8	<7.6	<190	<15	<1500	<76	<38	<15	<3.8	<15	<15	<15	<15	<15	<15	<7.6	<7.6	<7.6
Ethylbenzene	25000	NA	Grab	<22	<5.6	<11	<280	<22	<2200	<110	<56	<22	<5.6	<22	<22	<22	<22	<22	<22	<11	<11	<11
Hexachlorobutadiene	5300	160000	Grab	<19	<4.8	<9.6	<240	<19	<1900	<96	<48	<19	<4.8	<19	<19	<19	<19	<19	<19	<9.6	<9.6	<9.6
Isopropylbenzene	9900000	NA	Grab	<23	<5.8	<12	<290	<23	<2300	<120	<58	<23	<5.8	<23	<23	<23	<23	<23	<23	<12	<12	<12
Methyl t-butyl ether (MTBE)	210000	NA	Grab	<38	<9.6	<19	<480	<38	<3800	<190	<96	<38	<9.6	<38	<38	<38	<38	<38	<38	<19	<19	<19
n-Butylbenzene	58000000	18000000	Grab	<24	<6.0	<12	<300	<24	<2400	<120	<60	<24	<6.0	<24	<24	<24	<24	<24	<24	<12	<12	<12
n-Propylbenzene	24000000	NA	Grab	<25	<6.2	<12	<310	<25	<2500	<120	<62	<25	<6.2	<25	<25	<25	<25	<25	<25	<12	<12	<12
Naphthalene	17000	570000	Grab	<23	<5.8	<12	8500	<23	**55000**	2800	2900	840	<5.8	<23	<23	<23	<23	<23	<23	<12	180	<12
sec-Butylbenzene	120000000	12000000	Grab	<28	<7.0	<14	<350	<28	<2800	<140	<70	<28	<7.0	<28	<28	<28	<28	<28	<28	<14	<14	<14
Styrene	35000000	32000000	Grab	<13	<3.2	<6.4	<160	<13	<1300	<64	<32	<13	<3.2	<13	<13	<13	<13	<13	<13	<6.4	<6.4	<6.4
t-Amyl methyl ether (TAME)	NA	NA	Grab	<14	<3.4	<6.8	<170	<14	<1400	<68	<34	<14	<3.4	<14	<14	<14	<14	<14	<14	<6.8	<6.8	<6.8
tert-Butyl alcohol (TBA)	NA	NA	Grab	<340	86	170	<4300	<340	<34000	<1700	<860	<340	<86	<340	<340	<340	<340	<340	<340	<170	<170	<170
tert-Butylbenzene	120000000	12000000	Grab	<20	<5.0	<10	<250	<20	<2000	<100	<50	<20	<5.0	<20	<20	<20	<20	<20	<20	<10	<10	<10
Tetrachloroethene	100000	390000	Grab	1400	63	180	3800	590	370000	12000	10000	830	<3.4	290	630	690	380	370	270	190	110	100
Toluene	47000000	5300000	Grab	<29	<7.2	<14	<360	<29	<2900	1300	980	230	<7.2	<29	<29	<29	<29	<29	<29	<14	<14	<14
trans-1,2-Dichloroethene	23000000	600000	Grab	<16	<4.0	<8.0	<200	<16	<1600	<80	<40	<16	<4.0	<16	<16	<16	<16	<16	<16	<8.0	<8.0	<8.0
trans-1,3-Dichloropropene	NA	NA	Grab	<22	<5.4	<11	<270	<22	<2200	<110	<54	<22	<5.4	<22	<22	<22	<22	<22	<22	<11	<11	<11
Trichloroethene	6000	NA	Grab	1200	110	3300	**130000**	**6300**	**900000**	**37000**	**25000**	**6700**	99	1500	3200	4800	3400	3800	3600	3000	2700	2200
Trichlorofluoromethane	350000000	5400000	Grab	<20	<5.0	<10	<250	<20	<2000	<100	<50	<20	<5.0	<20	<20	<20	<20	<20	<20	<10	<10	<10
Vinyl Chloride	1700	370000	Grab	<77	<19	<38	<960	<77	<7700	<380	<190	<77	<19	<77	<77	<77	<77	<77	<77	<38	<38	<38
Xylenes, Total	2500000	NA	Grab	<72	<18	<36	2300	<72	32000	2700	2000	370	<18	<72	<72	<72	<72	<72	<72	<36	180	<36

Notes
Bold and Highlighted = Analytical result exceed U.S. EPA RSL screening levels
Bold, Italic, and Highlighted = Analytical result exceed DTSC screening levels
bgs = Below ground surface
DTSC SL = Department of Toxic Substances Control - Screening Levels (California DTSC 2019)
EPA RSL = Environmental Protection Agency Regional Screening Levels (EPA 2019)
NA = Not Applicable
<#.# = Analyte not detected above minimum detection limit
ug/kg = micrograms per kilogram
VOCs by EPA Method 8260

Table 2
Soil Samples Results
Waymire Drum Source Assessment

Analyte	U.S EPA RSLs (ug/kg)	DTSC-SL (ug/kg)	S-27-12.5	S-27-21.5	S-27-27.5	S-27-34.5	S-27-36.5	S-32-10	S-32-17	S-32-17-D	S-32-21	S-32-32	S-32-34	S-32-39
			2/25/2020 10:07	2/25/2020 10:27	2/25/2020 11:00	2/25/2020 11:55	2/25/2020 12:46	2/24/2020 12:25	2/24/2020 12:35	2/24/2020 12:36	2/24/2020 12:45	2/24/2020 13:15	2/24/2020 13:20	2/24/2020 13:40
			M-27-1	M-27-1	M-27-1	M-27-1	M-27-1	M-32-1	M-32-1	M-32-1	M-32-1	M-32-1	M-32-1	M-32-1
			12.5	21.5	27.5	34.5	36.5	10	17	Duplicate	21	32	34	39
			20000	20000	150000	410000	230000	107000	10000		30000	97000	97000	97000
			ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
1,1,1,2-Tetrachloroethane	8800	2700000	<42	8.4	<170	<84	<42	<8.4	<4.2	<4.2	<42	<8.4	<8.4	<42
1,1,1-Trichloroethane	36000000	7200000	<34	6.8	<140	<68	<34	<6.8	<3.4	<3.4	<34	<6.8	<6.8	<34
1,1,2,2-Tetrachloroethane	2700	4300000	<44	8.8	<180	<88	<44	<8.8	<4.4	<4.4	<44	<8.8	<8.8	<44
1,1,2-Trichloroethane	5000	NA	<44	8.8	<180	<88	<44	<8.8	<4.4	<4.4	<44	<8.8	<8.8	<44
1,1-Dichloroethane	16000	7100000	<48	9.6	<190	<96	510	160	<4.8	<4.8	<48	180	<9.6	<48
1,1-Dichloroethene	1000000	350000	<58	12	<230	<120	<58	<12	<5.8	<5.8	<58	<12	<12	<58
1,1-Dichloropropene	NA	NA	<48	9.6	<190	<96	<48	<9.6	<4.8	<4.8	<48	<9.6	<9.6	<48
1,2,3-Trichlorobenzene	930000	300000	<40	8	<160	<80	<40	<8.0	<4.0	<4.0	<40	<8.0	<8.0	<40
1,2,3-Trichloropropane	250000	21000	<86	17	<340	<170	<86	<17	<8.6	<8.6	<86	<17	<17	<86
1,2,4-Trichlorobenzene	110000	260000	<52	10	44000	1400	2600	<10	<5.2	<5.2	<52	<10	<10	<52
1,2,4-Trimethylbenzene	1800000	NA	<74	15	3100	<150	<74	<15	<7.4	<7.4	<74	<15	120	<74
1,2-Dibromo-3-chloropropane	64	25000	<46	9.2	<180	<92	<46	<9.2	<4.6	<4.6	<46	<9.2	<9.2	<46
1,2-Dibromoethane	160	30000	<32	6.4	<130	<64	<32	<6.4	<3.2	<3.2	<32	<6.4	<6.4	<32
1,2-Dichlorobenzene	9300000	NA	<46	9.2	7900	<92	<46	<9.2	<4.6	<4.6	<46	<9.2	<9.2	<46
1,2-Dichloroethane	2000	NA	<42	8.4	<170	<84	<42	<8.4	<4.2	<4.2	<42	<8.4	<8.4	<42
1,2-Dichloropropane	11000	NA	<32	6.4	<130	<64	<32	120	<3.2	<3.2	<32	<6.4	<6.4	<32
1,3,5-Trimethylbenzene	1500000	NA	<78	16	<310	<160	<78	<16	<7.8	<7.8	<78	<16	<16	<78
1,3-Dichlorobenzene	NA	NA	<42	8.4	<170	<84	<42	<8.4	<4.2	<4.2	<42	<8.4	<8.4	<42
1,3-Dichloropropane	23000000	2200000	<38	7.6	<150	<76	<38	<7.6	<3.8	<3.8	<38	<7.6	<7.6	<38
1,4-Dichlorobenzene	11000	NA	<58	12	3600	<120	<58	<12	<5.8	<5.8	<58	<12	<12	<58
2,2-Dichloropropane	NA	NA	<28	5.6	<110	<56	<28	<5.6	<2.8	<2.8	<28	<5.6	<5.6	<28
2-Chlorotoluene	23000000	2500000	<78	16	<310	<160	<78	<16	<7.8	<7.8	<78	<16	<16	<78
4-Chlorotoluene	350000	2300000	<32	6.4	<130	<64	<32	<6.4	<3.2	<3.2	<32	<6.4	<6.4	<32
4-Isopropyltoluene	23000000	NA	<28	5.6	<110	<56	<28	<5.6	<2.8	<2.8	<28	<5.6	<5.6	<28
Benzene	5100	46000	<46	9.2	<180	<92	<46	<9.2	<4.6	<4.6	<46	<9.2	<9.2	<46
Bromobenzene	1800000	NA	<50	10	<200	<100	<50	<10	<5.0	<5.0	<50	<10	<10	<50
Bromochloromethane	630000	NA	<58	12	<230	<120	<58	<12	<5.8	<5.8	<58	<12	<12	<58
Bromodichloromethane	1300	NA	<54	11	<220	<110	<54	<11	<5.4	<5.4	<54	<11	<11	<54
Bromoform	86000	3000000	<80	16	<320	<160	<80	<16	<8.0	<8.0	<80	<16	<16	<80
Bromomethane	30000	NA	<44	8.8	<180	<88	<44	<8.8	<4.4	<4.4	<44	<8.8	<8.8	<44
Carbon tetrachloride	2900	250000	<48	9.6	<190	<96	<48	<9.6	<4.8	<4.8	<48	<9.6	<9.6	<48
Chlorobenzene	1300000	NA	<44	8.8	<180	<88	<44	<8.8	<4.4	<4.4	<44	<8.8	<8.8	<44
Chloroethane	57000000	NA	<70	14	<280	<140	<70	<14	<7.0	<7.0	<70	<14	<14	<70
Chloroform	1400	NA	<46	9.2	<180	<92	<46	<9.2	<4.6	<4.6	<46	<9.2	<9.2	<46
Chloromethane	460000	NA	<240	48	<960	<480	<240	<48	<24	<24	<240	<48	<48	<240
cis-1,2-Dichloroethene	2300000	84000	3300	1500	12000	10000	13000	2500	640	160	1700	2700	1600	4500
cis-1,3-Dichloropropene	NA	NA	<48	9.6	<190	<96	<48	<9.6	<4.8	<4.8	<48	<9.6	<9.6	<48
Dibromochloromethane	39000	2500000	<60	12	<240	<120	<60	<12	<6.0	<6.0	<60	<12	<12	<60
Dibromomethane	99000	NA	<46	9.2	<180	<92	<46	<9.2	<4.6	<4.6	<46	<9.2	<9.2	<46
Dichlorodifluoromethane	370000	NA	<320	64	<1300	<640	<320	<64	<32	<32	<320	<64	<64	<320
Diisopropyl ether (DIPE)	9400000	NA	<66	13	<260	<130	<66	<13	<6.6	<6.6	<66	<13	<13	<66
Ethyl t-butyl ether (ETBE)	NA	NA	<38	7.6	<150	<76	<38	<7.6	<3.8	<3.8	<38	<7.6	<7.6	<38
Ethylbenzene	25000	NA	<56	11	<220	<110	<56	<11	<5.6	<5.6	<56	<11	<11	<56
Hexachlorobutadiene	5300	160000	<48	9.6	<190	<96	<48	<9.6	<4.8	<4.8	<48	<9.6	<9.6	<48
Isopropylbenzene	9900000	NA	<58	12	<230	<120	<58	<12	<5.8	<5.8	<58	<12	<12	<58
Methyl t-butyl ether (MTBE)	210000	NA	<96	19	<380	<190	<96	<19	<9.6	<9.6	<96	<19	<19	<96
n-Butylbenzene	58000000	18000000	<60	12	<240	<120	<60	<12	<6.0	<6.0	<60	<12	<12	<60
n-Propylbenzene	24000000	NA	<62	12	<250	<120	<62	<12	<6.2	<6.2	<62	<12	<12	<62
Naphthalene	17000	570000	<58	12	5200	<120	<58	210	<5.8	<5.8	<58	190	390	<58
sec-Butylbenzene	120000000	12000000	<70	14	<280	<140	<70	<14	<7.0	<7.0	<70	<14	100	<70
Styrene	35000000	32000000	<32	6.4	<130	<64	<32	<6.4	<3.2	<3.2	<32	<6.4	<6.4	<32
t-Amyl methyl ether (TAME)	NA	NA	<34	6.8	<140	<68	<34	<6.8	<3.4	<3.4	<34	<6.8	<6.8	<34
tert-Butyl alcohol (TBA)	NA	NA	<860	170	<3400	<1700	<860	<170	<86	<86	<860	<170	<170	<860
tert-Butylbenzene	120000000	12000000	<50	10	<200	<100	<50	<10	<5.0	<5.0	<50	<10	<10	<50
Tetrachloroethene	100000	390000	970	360	50000	2900	3700	610	150	<3.4	<34	<6.8	<6.8	<34
Toluene	47000000	5300000	<72	14	<290	<140	<72	<14	<7.2	<7.2	<72	110	140	<72
trans-1,2-Dichloroethene	23000000	600000	<40	8	<160	<80	<40	<8.0	<4.0	<4.0	<40	<8.0	<8.0	<40
trans-1,3-Dichloropropene	NA	NA	<54	11	<220	<110	<54	<11	<5.4	<5.4	<54	<11	<11	<54
Trichloroethene	6000	NA	3200	1400	**74000**	**18000**	**18000**	1600	380	78	680	<10	240	680
Trichlorofluoromethane	350000000	5400000	<50	10	<200	<100	<50	<10	<5.0	<5.0	<50	<10	<10	<50
Vinyl Chloride	1700	370000	<190	38	<770	<380	<190	<38	<19	<19	<190	<38	<38	<190
Xylenes, Total	2500000	NA	<180	36	6800	1600	870	160	<18	<18	<180	200	270	700

Notes
Bold and Highlighted = Analytical result exceed U.S. EPA RSL screening levels
Bold, Italic, and Highlighted = Analytical result exceed DTSC screening levels
bgs = Below ground surface
DTSC SL = Department of Toxic Substances Control - Screening Levels (California DTSC 2019)
EPA RSL = Environmental Protection Agency Regional Screening Levels (EPA 2019)
NA = Not Applicable
<#.# = Analyte not detected above minimum detection limit
ug/kg = micrograms per kilogram
VOCs by EPA Method 8260

APPENDIX A
PHOTOGRAPHIC LOG

PHOTOGRAPH LOG

Project Name: Waymire Drum Source Assessment	Site Location: Los Angeles, California	Subtask No.: 68HE0919F0134-00

Photo No. 1	**Date:** 02/05/2020
Direction Photo Taken: Southeast	
Description: Southeast overview of MiHPT activities at location M-6	

Photo No. 2	**Date:** 02/05/2020
Direction Photo Taken: East	
Description: Interior overview of MiHPT equipment	

Photo No. 3	Date: 02/06/2020
Direction Photo Taken: West	
Description: West overview of MiHPT activities at location M-7	

Photo No. 4	Date: 12/10/2019
Direction Photo Taken: West	
Description: West overview of MiHPT activities at location M-30	

Photo No. 5	Date: 02/19/2020
Direction Photo Taken: Southeast	
Description: Southeast overview of clarifier within grid location 23	

[redacted]

Photo No. 6	Date: 02/20/2020
Direction Photo Taken: South	
Description: Overview photo MiHPT activities at location M-17	

[redacted]

Photo No. 7	Date: 02/21/2020
Direction Photo Taken: Southwest	
Description: Southwest overview of MiHPT activities at location M-21-1	

Photo No. 8	Date: 02/24/2020
Direction Photo Taken: West	
Description: West overview of soil sampling activities at location S-32	

Photo No. 9	Date: 02/25/2020
Direction Photo Taken: Northwest	
Description: START collecting soil samples from location S-32	

Photo No. 10	Date: 02/25/2020
Direction Photo Taken: South	
Description: South at soil sampling activities at location S-27	

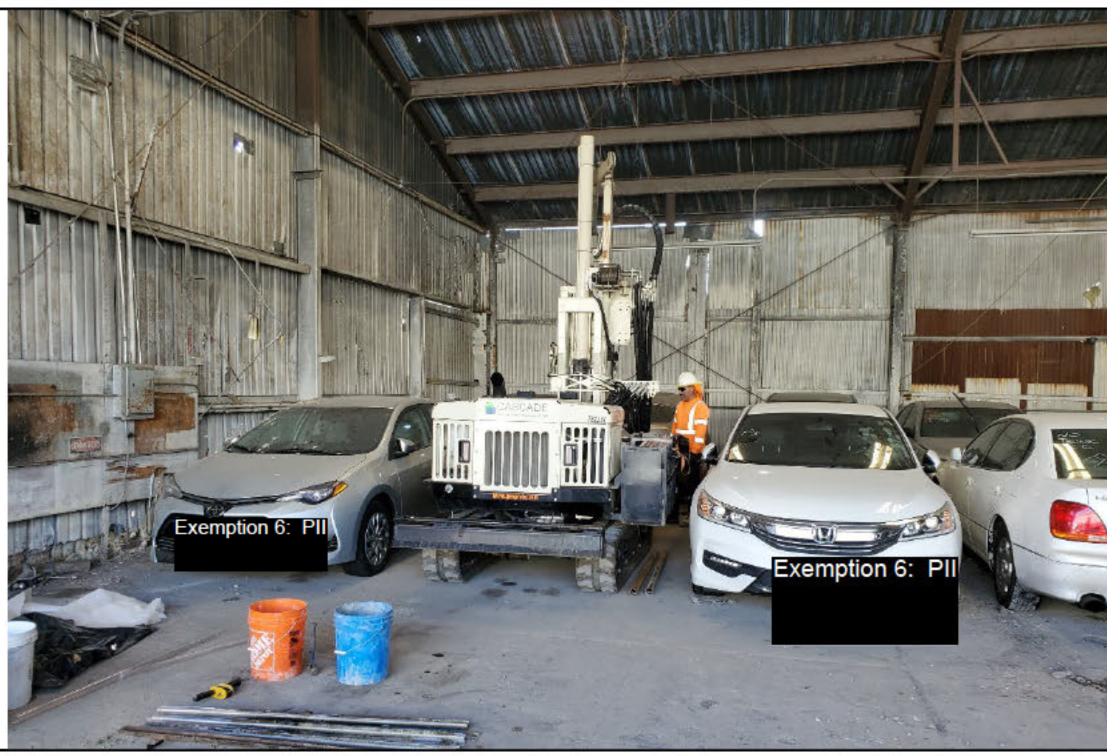


Photo No. 11 | **Date:** 02/26/2020

Direction Photo Taken: Southwest

Description:

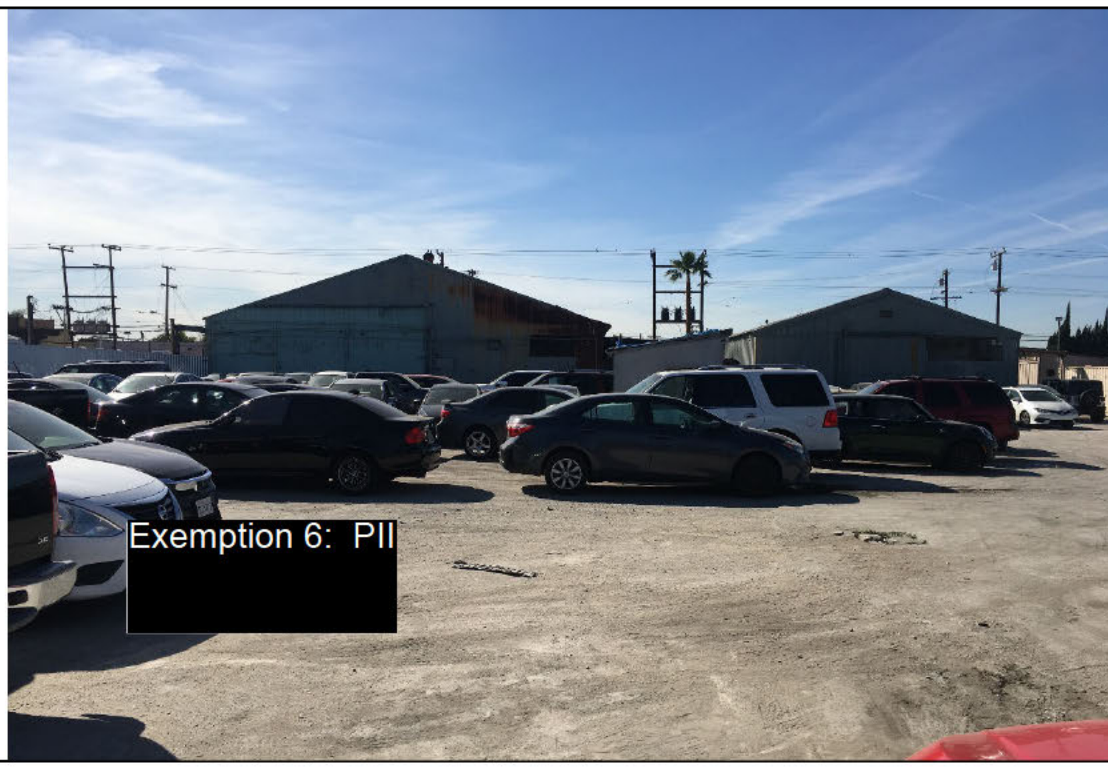
Southwest overview of sample grid location 22

Photo No. 12 | **Date:** 12/10/2019

Direction Photo Taken: West

Description:

Overview of southern Repo Lot



APPENDIX B
CPT DATA LOGS

APPENDIX C
MIHPT DATA LOGS

APPENDIX D
SOIL BORING LOGS

APPENDIX E
MIHPT AND SOIL BORING COMPARISON LOGS

APPENDIX F
LABORATORY REPORTS

APPENDIX G
DATA VALIDATION

APPENDIX H
CORRELATION DATA AND CURVE

APPENDIX I
3-D MODEL OF MIHPT DATA