DRAFT FINAL REMOVAL ACTION WORKPLAN

RESEDA HIGH SCHOOL COMPREHENSIVE MODERNIZATION PROJECT

18230 KITTRIDGE STREET
RESEDA, CALIFORNIA 91335

Prepared for

Los Angeles Unified School District
Office of Environmental Health and Safety
333 South Beaudry Avenue, 21st Floor
Los Angeles, California 90017

March 13, 2019

Prepared by

PARSONS 100 WEST WALNUT STREET • PASADENA • CALIFORNIA 91124

DRAFT FINAL REMOVAL ACTION WORKPLAN
RESEDA HIGH SCHOOL
18230 KITTRIDGE STREET
RESEDA, CALIFORNIA 91335

Prepared for

Los Angeles Unified School District
Office of Environmental Health and Safety
333 South Beaudry Avenue, 21st Floor
Los Angeles, California 90017

March 13, 2019

Prepared by

PARSONS
100 WEST WALNUT STREET • PASADENA • CALIFORNIA 91124

Reviewed by: Jim Goepel
Jim Goepel
Program Manager
Date: 3-13-19

Prepared by: Peter Shair
PROFESSIONAL GEOLOGIST • PETER B. SHAIR • NO. 8362 • Exp. 5/31/20 • STATE OF CALIFORNIA
Peter Shair, P.G.
Project Geologist
Date: 3-13-19

TABLE OF CONTENTS

TABLES

FIGURES

FIGURES CON'T.

APPENDICES

ACRONYMS

AIN	Assessors Identification Number
AOCs	Areas of Concern
ARAR	Applicable or Relevant and Appropriate Requirement
BTEX	Benzene, toluene, ethylbenzene and xylene
bgs	below ground surface
BMPs	Best management practices
Cal-EPA	California Environmental Protection Agency
CCR	California Code of Regulations
CEQA	California Environmental Quality Act
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CMP	Comprehensive Modernization Project
cc/min	cubic centimeters per minute
CoC	Chain of Custody
COC	chemical of concern
DTSC	Department of Toxic Substances Control
EDR	Environmental Data Resources
EE/CA	Engineering Evaluation/Cost Analysis
ELAP	Environmental Laboratory Accreditation Program
EPA	United States Environmental Protection Agency
ESA	Environmental Site Assessment
HASP	Health and Safety Plan
HHSE	human health screening evaluation
HVAC	Heating, ventilation and air conditioning
ft	feet
IDW	investigation-derived waste
LAUSD	Los Angeles Unified School District
LBP	Lead-Based Paint
NAAQS	National Ambient Air Quality Standard
NEPA	National Environmental Policy Act
mg/kg	milligrams per kilogram
mg/L	milligrams per liter
mg/m^3	milligrams per cubic meter
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
ND	Non-detect
OCP	organochlorine pesticides
OEHS	LAUSD Office of Environmental Health and Safety
OEHHA	Office of Environmental Health Hazard Assessment

ACRONYMS Con't.

O&M	operation and maintenance
PCBs	polychlorinated biphenyls
PCE	tetrachloroethene
PEA-E	Preliminary Endangerment Assessment – Equivalent
PID	Photoionization Detector
PPE	personal protective equipment
PSL	Preliminary Screening Level
QA/QC	quality assurance/quality control
RACR	Removal Action Completion Report
RAO	Removal Action Objective
RAW	Removal Action Workplan
RCRA	Resource Conservation and Recovery Act
REC	Recognized Environmental Condition
Report	Preliminary Endangerment Assessment – Equivalent Report
RSL	Risk Based Screening Level
SCAQMD	South Coast Air Quality Management District
Site	Reseda High School
SSCG	Site-specific cleanup goal
STLC	Soluble Threshold Limit Concentration
SVE	soil vapor extraction
TCLP	Toxicity Characteristic Leaching Procedure
TPH	Total Petroleum Hydrocarbons
TSDF	treatment, storage and disposal facilities
USGS	United States Geological Survey
UCL	upper confidence limit
µg/L	micrograms per liter
µg /m^3	micrograms per cubic meter
USA	Underground Service Alert
USGS	United States Geological Survey
VOCs	volatile organic compounds
Work Plan	Preliminary Endangerment Assessment – Equivalent Work Plan

SUMMARY

This Draft Final Removal Action Workplan (RAW) was prepared for the Los Angeles Unified School District's (LAUSD) Comprehensive Modernization Project (CMP) footprint at Reseda High School (Site) located at 18230 Kittridge Street, Reseda, California.

Preliminary Endangerment Assessment – Equivalent (PEA-E) activities were conducted between December 2017 and February 2019 to assess environmental conditions at selected areas within the CMP footprint prior to proposed redevelopment activities. Based on the PEA-E activities, 261 cubic yards of non-hazardous soil and 5 cubic yards of non-RCRA (California) hazardous soil impacted with lead or arsenic above 80 milligrams per kilogram (mg/kg) and 12 mg/kg, respectively, should be excavated and properly disposed of. Relatively low levels of volatile organic compounds (VOCs) were detected in soil vapor in the area around the Industrial Arts buildings.

Four remedial alternatives are evaluated in this RAW. Alternative 3 was selected as the most appropriate, based on the screening criteria reviewed in Section 5 of this RAW. Alternative 3 includes excavation and offsite disposal of lead- and arsenic-impacted soil and future building slab modification. Alternative 3 assumes one or more school buildings would be constructed within the project area footprint containing soil vapor (i.e., PCE) that exceeds screening levels. Alternative 3 would therefore include (in addition to removal of lead- and arsenic-impacted soil in designated areas), in the future building(s) design, the application of a membrane such as Liquid Boot® to new buildings within the VOC-impacted footprint of the project area. A spray-applied Liquid Boot® membrane or similar would seal potential vapor intrusion pathways by preventing soil vapors from penetrating the foundation slab(s), thereby mitigating vapor intrusion into the building(s). Additionally, a sub-slab collection system would be installed under any new buildings constructed within the Industrial Arts building area.

1.0 INTRODUCTION

This document presents a Draft Final Removal Action Workplan (RAW) for the removal of impacted soil located within the Los Angeles Unified School District (LAUSD) Comprehensive Modernization Project (CMP) footprint at Reseda High School (Site) located at 18230 Kittridge Street, Reseda, California (**Figure 1**). **Figure 2** shows the area of the high school subject to the CMP and the building/portable trailers that are planned to be removed.

Initial Preliminary Endangerment Assessment – Equivalent (PEA-E) activities were conducted between December 2017 and May 2018 to assess environmental conditions at selected areas within the CMP footprint prior to LAUSD's proposed demolition, modernization and construction activities. The Site background and environmental setting details are presented in the initial PEA-E Report (Parsons 2018a). The Supplemental PEA-E activities (Parsons, 2019) were conducted between September 2018 and January 2019 to further delineate soil vapor impacts in and around the Industrial Arts Building (**Figure 2**). The PEA-E field program included collecting and analyzing soil samples in areas within the CMP footprint. The CMP footprint includes school buildings, a pad-mounted transformer, an existing (non-operational) incinerator, and an existing (non-operational) clarifier. A human health screening evaluation (HHSE) was also conducted for the Site based on the soil and soil vapor analytical data generated during the PEA-E field activities. The HHSE indicated chemicals are present in soil and soil gas at concentrations that pose a potential health risk to future site receptors. This RAW presents an evaluation of cleanup approaches aimed at mitigating the potential health risks associated with the identified chemicals of concern (COCs) detected in soil and soil gas.

1.1 Removal Action Objective

The PEA-E activities resulted in the determination that soil contains arsenic and/or lead above risk-based screening levels, and soil vapor contains tetrachloroethene (PCE) above risk-based screening levels at specific locations within the proposed CMP area. The following removal action objectives (RAOs) have been established for the Site:

- Minimize human exposures via inhalation, dermal absorption, and ingestion to the COCs in shallow soil;
- Remove the accessible impacted soils that exceed the established Site-specific cleanup goals, and;
- Minimize human exposures via inhalation in indoor air to the COCs in shallow soil vapor.

2.0 SUMMARY OF SITE BACKGROUND

2.1 SITE DESCRIPTION

The Site is located at 18230 Kittridge Street, Reseda, California 91335. The campus is bound to the south by Victory Boulevard and the Los Angeles River, Etiwanda Avenue to the west, Kittridge Street to the north, and Lindley Avenue to the east **(Figure 1)**. The property is identified by the Los Angeles County Assessor's Office with Assessor's Identification Number (AIN) 2124-001-904. The approximate size of the school property is 29.15 acres. The school was established in 1955.

The Site is developed with buildings associated with Reseda High School (**Figure 2**). There are currently sixteen permanent and portable classroom structures, athletic fields, and playground areas. The Site vicinity is primarily occupied by single-family residential structures to the north and east, bound by Reseda Park to the west and the Los Angeles River to the south.

2.2 SITE BACKGROUND

Historical research previously conducted for the Site (Ninyo & Moore, 2017a) indicates the Site consisted of agricultural land with some structures in the northeast corner from the 1920s to 1954/1955, when the Site was first developed with school buildings/improvements (Ninyo & Moore, 2017b). Based on historical aerial photograph evidence, additional structures were added to the Site as follows: 1) structures were added to the southwest portion of the Site between 1995 and 2002; 2) structures were added to the northeast portion of the Site between 2002 and 2005; and 3) structures were added to the southeast portion of the Site between 2005 and 2009. The Site address has been listed as Reseda High School since 1956. Grey Continuation High School is also listed as an occupant at the same address.

2.3 ADJACENT PROPERTY HISTORY

The adjacent properties were agricultural and/or undeveloped land since the 1920s. Reseda Park was established west of the Site in the 1940s. Residential structures first appear near the Site in the 1920s. Large residential communities were built to the north and east of the Site in the 1950s. Heavy residential development to the south of the Site, on the south side of the Los Angeles River, first appear in the 1960s. A summary of the off-site properties/facilities that Ninyo & Moore (2017a) evaluated for potential impact to soil and/or groundwater at the Site can be found in the ESA.

2.4 REGIONAL GEOLOGY AND HYDROGEOLOGY

According to the 2012 United States Geological Survey (USGS) Los Angeles Quadrangle, the center of the school has an approximate latitude (North) of 34.188711 and longitude (West) of -

118.529365. The school elevation is on average approximately 725 feet above mean sea level. The subject school property is essentially flat, with a slight surface gradient toward the east/southeast.

The 1992 Dibblee Geological Foundation Map "DF-36 Geologic Map of the Oat Mountain and Canoga Park (north ½) Quadrangle" shows the school property and surrounding vicinity to be underlain with alluvium (Qa) consisting of alluvial gravel, sand and clay of valley and floodplain areas.

The nearest surface water body to the school is the Reseda Park Lake, located approximately 500 feet west of the western edge of the school property. A concrete-lined portion of the Los Angeles River channel is adjacent to the southern property line of the school. The Los Angeles River flows southeast toward the Pacific Ocean.

According to the State of California Special Studies Zones Canoga Peak Quadrangle Map (Dated February 1, 1998) from the California Department of Conservation, the school property is within a liquification zone. These zones are classified as "areas where historical occurrence of liquefaction, or local geological, geotechnical and groundwater conditions indicate a potential for permanent ground displacements such that mitigation as defined in Public Resources Code Section 2693(c) would be required." The school property does not fall within an identified earthquake-induced landslide zone.

According to the City of Los Angeles Planning Department's ZIMAS interactive mapping tool (http://zimas.lacity.org) accessed on February 22, 2019, the school property is within a potentially liquefiable zone. This is based on soil type and historical depth to groundwater, not site-specific investigation. The school property is not within a potential landslide area per the City of Los Angeles ZIMAS database.

Based on the State of California's Geotracker database (accessed on February 25, 2019), the nearest monitoring wells are associated with a closed environmental case (Leon Automotive Center at 18102 Victory Boulevard, which is several hundred feet south of the school property, across Victory Boulevard to the south) which was granted closure by the Los Angeles Regional Water Quality Control Board in 2016. The groundwater flow direction as determined by others in 2011 during groundwater gauging, was toward the east. Based on the most recent (2011) groundwater gauging data available for the Leon Automotive Center, the depth to water in the four monitoring wells (MW-1 through MW-4) ranged from 30.00 to 31.06 ft below top of well casings. The nearest hydrogeologic data to the school property, provided in the Environmental Data Resources (EDR) GeoCheck Report, is approximately ¾-mile northwest and across the Los Angeles River, and would not be considered representative of hydrogeologic conditions beneath the school property. The hydrogeologic information provided in the EDR GeoCheck report for properties listed in the vicinity (1/2- to 1 mile) of the school property suggests that groundwater flow direction may be southwest or northwest; no gradients are reported. Review of documents on the Geotracker website for nearby sites with groundwater flow direction and gradient information indicates that approximately 600 yards west of the school property, a formerly open leaking UST case "Anchor" at 6616 Reseda Boulevard in Reseda, groundwater was encountered at approximately 30 feet below grade while drilling borings in 1990. A formerly open LUST case (Shell service station) at 6761 Reseda Boulevard, approximately one-half mile northwest of the school property, reported groundwater depths of 23 to 26 feet below grade, during a November 2014 gauging and monitoring event. Groundwater flow at that time was southeast from the Shell service station toward the school property.

2.5 PHASE 1 ESA (2017)

A Phase 1 Environmental Site Assessment (ESA) was performed at the Site by Ninyo & Moore in 2017. Ninyo & Moore identified existing recognized environmental conditions (RECs), historical RECs and controlled RECs associated with the Site. The Phase 1 ESA included a review of the physical setting and background information, a site reconnaissance to visually observe Site conditions, a review of regulatory agency databases (federal, state, tribal and local), an EDR standard environmental database search report, historical research (aerial photographs, topographic maps, Sanborn maps, building department records, etc.), a preliminary vapor encroachment screening to evaluate the potential for vapor encroachment conditions, and an interview with the property owner representative regarding the environmental status of the Site. (Ninyo & Moore, 2017a).

The Phase 1 ESA concluded the following:

- There was former agricultural use of the Site prior until approximately 1955 with some structures formerly located in the northeast portion.
- One existing but inactive clarifier associated with the former automotive shop adjacent to the south of the Industrial Arts building (including a potential vapor encroachment condition).
- The former presence of spray paint booths on-site (including a potential vapor encroachment condition) based on the potential for releases from former leaks.
- Based on the former use of the incinerator to burn solid wastes, the likely presence of burnt material surrounding the incinerator.
- Based on the age of the current Site buildings, persistent termiticides (organochlorine pesticides or OCPs) and lead (from lead-based paint [LBP]) may be present in shallow soil around building foundations.
- Polychlorinated biphenyls (PCB)-containing materials may be present from a pad-mounted transformer installed prior to 1979.
- Arsenic in shallow soil underneath asphalt-concrete (AC) pavement may be present due to the LAUSD's former standard practice of applying herbicides containing this metalloid prior to paving.
- Based on the results of the vapor encroachment screening matrix and information obtained during the Phase I ESA, a vapor encroachment condition could not be ruled out beneath the Site.

Based on the Phase 1 ESA findings, additional environmental assessment was recommended for the Site, including; 1) assess PCBs, OCPs, arsenic, and lead in shallow soil at locations that future construction is planned; and 2) conduct soil and soil vapor investigations near the inactive clarifier, former spray booths, and incinerator if construction or demolition activates are planned in these areas.

2.6 PEA-E (2018)

A PEA-E was conducted to assess environmental conditions at selected areas within the CMP footprint, identified by Ninyo & Moore's Phase 1 ESA (Ninyo & Moore, 2017a), prior to demolition, modernization and construction activities. Ninyo & Moore identified existing RECs, historical RECs and controlled RECs at the Site as described in Section 2.5.

The PEA-E was conducted in accordance with the PEA-E Work Plan (Work Plan) (Ninyo & Moore, 2017b) on behalf of LAUSD, and the *Preliminary Environmental Assessment Guidance Manual* (DTSC, 2015).

The Work Plan identified the following five potential areas of concern (AOCs);

- AOC1 - Lead-based paint, OCPs and PCBs in shallow soil based on the age of the current buildings. Arsenic in shallow soil due to LAUSD's former standard practice of applying herbicides for weed control containing metal prior to paving.
- AOC2 – PCBs in shallow soil near the on-site pad-mounted transformer installed prior to 1979.
- AOC3 - Potential impacts in shallow soil from dioxins and furans near the existing (inactive) incinerator that was previously used to burn solid waste.
- AOC4 – Potential impacts in soil from total petroleum hydrocarbons (TPH), metals, PCBs and volatile organic compounds (VOCs) near the inactive clarifier associated with the former automotive shop adjacent to the Industrial Arts Building. Potential impacts in soil vapor from VOCs near the clarifier.
- AOC5 – Potential impacts in soil vapor from VOCs near the suspected location of historical paint spray booths.

At AOC1, soil from 107 initial boring locations was analyzed for lead and arsenic to a maximum depth of 3.5-feet (ft) below ground surface (bgs). Soil from 10% of the initial soil samples collected at 0.5-ft bgs was analyzed for PCBs. Soil samples from 0.5-ft bgs were composited by the analytical laboratory and analyzed for OCPs. Each sample was a composite of soil from 0.5 ft bgs in four to six adjacent borings or borings surrounding a building. Based on the laboratory analytical results, 92 step-out borings to a maximum depth of 3.5-ft bgs were completed to delineate arsenic exceedances. Four step-out borings to a maximum depth of 2.5-ft bgs were completed to delineate lead exceedances in soil.

At AOC2, surface soil (to 0.5-ft bgs) from two borings was analyzed for PCBs.

At AOC3, surface soil (to 0.5-ft bgs) from one boring was analyzed for dioxins and furans.

At AOC4, soil from two initial boring locations was analyzed for VOCs, TPH, PCBs, and Title 22 Metals to a maximum depth of 5-ft bgs. Soil vapor probes were installed and analyzed for VOCs at 5- and 15-ft bgs at the two initial boring locations. Based on the initial soil vapor analytical results, 11 additional dual-nested (5- and 15-ft bgs) soil vapor probes were installed and sampled at step-out locations to further delineate PCE. Nine sub-slab soil vapor probes were also installed in the floor of the industrial arts building (rooms IA4, IA5A and IA5B) and three sub-slab soil vapor probes were installed in the floor of room IA6 (science room) to evaluate VOCs immediately beneath the foundation slabs.

At AOC5 soil vapor probes were installed at 5- and 15-ft bgs at two boring locations. The soil vapor probes were sampled and analyzed for VOCs.

The results were compared to preliminary screening levels (PSLs), which are risk-based levels developed to be protective of a hypothetical residential receptor. The following conclusions were derived from the PEA-E soil and soil vapor sampling and analyses conducted:

- PCBs were not detected above their respective laboratory reporting limits in any of the soil analyzed. Therefore, PCBs are not considered a Site COC.
- Five OCPs (4,4'-DDD, 4,4'-DDE, 4,4'-DDT, chlordane, and dieldrin) were detected above their respective reporting limits in one or more composite soil samples. OCP concentrations were all below PSLs; therefore, OCPs are not considered Site COCs.
- Dioxins/furans concentrations in the soil samples did not exceed PSLs. Therefore, dioxins and furans are not considered a Site COC.
- TPH-g and TPH-d were not detected above their respective laboratory reporting limits in the soil samples collected at the Site. TPH-o was detected above the laboratory reporting limit in eleven soil samples; the reported concentrations were below the PSL. Therefore, TPHs are not considered Site COCs.
- Title 22 metals were below PSLs, except for arsenic and lead.
- Lead results from soil samples collected in the proposed development areas are below the PSL (80 mg/kg) in 103 of the 107 initial boring locations. The highest concentration of lead which exceeded the lead PSL was 170 mg/kg at location AOC1-B6 at 0.5 ft bgs. Step-down and lateral step-out sampling was conducted until the detected lead concentrations were less than the PSL of 80 mg/kg, a building foundation was reached, access was inadequate to collect a sample, or a subsurface utility was encountered.
- Arsenic results from soil samples collected in the proposed development area are below the arsenic PSL (12 mg/kg) in 95 of the 107 initial boring locations. The highest concentration of arsenic which exceed the PSL at the initial sample locations was 32 mg/kg at AOC1-B10 at 0.5-ft bgs. Step-out and step-down sampling was conducted until the arsenic concentrations detected were below the PSL of 12 mg/kg, a building

foundation was reached, access was inadequate to collect a sample, or a subsurface utility was encountered.

- An estimated 266 cubic yards of soil are impacted by lead and/or arsenic (greater than their respective PSLs) based on the results of the field investigation. Approximately 261 cubic yards can be managed as non-hazardous waste and approximately 5 cubic yards will need to be managed as non-RCRA (California) hazardous waste.
- PCE was detected above the future PSL (15 $\mu g/m^3$) in soil vapor at 5- and 15-ft bgs at locations AOC4-SV1, AOC4-SV3, AOC4-SV4, AOC4-SV8, AOC4-SV10 and AOC4-SV11. PCE was detected above the current PSL in soil vapor at sub-slab locations AOC4-SS1, AOC4-SS2 and AOC4-SS3. The elevated PCE soil-vapor impact has been delineated to the west by AOC4-SV6 and AOC4-SV9; to the east by AOC4-SV5; to the south by AOC4-SV12, and; to the north by AOC4-SV13.
- Benzene in soil vapor was detected above the future PSL (3.2 $\mu g/m^3$) at 15-ft bgs at AOC4-SV12 but was not detected in the 5 ft bgs sample at the same location. This likely indicates that benzene is degrading as it migrates through the soil column and that benzene in soil vapor at AOC4-SV12 does not represent a potential risk. Benzene was detected above the current PSL in soil vapor at sub-slab locations AOC4-SS1, AOC4-SS2 and AOC4-SS3. Overall, benzene in sub-slab soil vapor at the Site does exceed the PSL but likely represents only a slight risk above background exposures from non-Site-related sources.

The following were PEA-E recommendations based on the above conclusions:

- A RAW should be developed for the Site to address shallow soils impacted with lead and/or arsenic above their respective PSLs.
- The RAW should also address PCE and benzene soil vapor above their respective future PSLs.

2.7 SUPPLEMENTAL PEA-E (2019)

Based on the results of the initial PEA-E activities described above, a Supplemental PEA-E (Parsons, 2019) was conducted, by Parsons between September 2018 and January 2019 to further delineate soil vapor impacts in and around the Industrial Arts Building (**Figure 2**). The Supplemental PEA-E was conducted per the Draft Indoor Air Sampling Workplan (Parsons, 2018b) that was verbally approved by LAUSD on October 8, 2018. Various additional sampling activities described in the Supplemental PEA-E Report were requested by LAUSD as the work progressed.

For the supplemental PEA-E activities, soil sampling and soil vapor probe installation was conducted on September 10 and October 6, 2018. Soil vapor sampling was conducted on September 15 and 19 and October 9, 2018, and January 3, 2019. Indoor and outdoor air sampling with concurrent sub-slab soil vapor sampling was conducted on October 5 and 6, 2018, and January 3, 2019.

The supplemental PEA-E field program consisted of soil and soil vapor sampling to further investigate the RECs in and around AOC4, which is the Industrial Arts buildings in the central portion of the school campus. Thirteen soil vapor probes (AOC4-SV1 and AOC4-SV13) were previously installed and sampled during the initial PEA-E field investigation (Parsons, 2018a). Soil vapor probes AOC4-SV14 through AOA4-SV17 were subsequently installed and sampled to further delineate VOCs in soil gas. Twelve sub-slab soil vapor pins were also installed and sampled in the four Industrial Arts building classrooms to evaluate VOCs immediately beneath the foundation slabs. The sample locations, depths, analytical parameters, and sample location rationale were approved by LAUSD. Soil vapor and sub-slab soil vapor locations are shown on **Figures 14.**

Based on the results of the soil vapor and sub-slab soil vapor samples, indoor air samples were collected to determine if there is a complete vapor intrusion pathway and a potential human health risk associated with the Industrial Arts Building in Rooms IA4, IA5A, IA5B, and IA6. Outdoor air samples and sub-slab soil vapor samples (at select locations) were collected concurrently with indoor air samples. Indoor and outdoor air sample locations are shown on **Figure 15**.

The following conclusions were derived from the supplemental investigation conducted at Reseda High School for soil, soil vapor and indoor air. Previous recommendations regarding the presence of lead and arsenic in soil above their respective PSLs were documented in the initial PEA-E Report (Parsons, 2018a).

Soil

- Soil was sampled for PCBs, TPH, and VOCs during the supplemental investigation in AOC4. There were no detections above the PSLs, which is consistent with the original investigation results (Parsons, 2018a). Therefore, PCBs, TPH, and VOCs are not considered COCs in soil.

Soil Vapor

- A total of 41 soil vapor samples, including duplicates, were collected from selected soil vapor probes during the supplemental investigation on September 5 and 19, October 9, 2018 and January 3, 2019 to further characterize soil vapor concentrations in AOC4. Select probes were sampled in multiple events to provide additional data for decision-making purposes. LAUSD Office of Environmental Health and Safety (OEHS) requested that the analytical data be compared against the Department of Toxic Substances

Control's (DTSC's) future PSLs. PCE was detected above the future[1] PSL (15 micrograms per cubic meter [μg/m^3]) at 31 sample (either 5 or 15 ft bgs) locations. In the 41 vapor samples, PCE concentrations ranged from 1.7 μg/m^3 (AOC4-SV17-5) to 1,440 μg/m^3 (AOC4-SV10-5). Naphthalene exceeded the future PSL (2.8 μg/m^3) in five of the 41 samples, ranging from 3.0 μg/m^3 (AOC4-SV16-5) to 774 μg/m^3 (AOC4-SV8-15). 1,2,4-trimethylbenzene exceeded the future PSL concentration (2,100 μg/m^3) in one (AOC4-SV8-15) of the 41 samples, at 2,440 μg/m^3. Benzene exceeded the future PSL concentration (3.2 μg/m^3) in one (AOC4-SV8-15) of the 41 samples, at 7 μg/m^3. Note that for benzene and naphthalene, the non-detect values reported by the laboratory are the method detection limits; some of which exceed the future PSLs. No other VOCs were detected above their respective PSLs.

- Based on the multiple soil vapor sampling events from previously installed and more recently installed soil vapor probes, vapor-phase VOCs are considered laterally delineated but not vertically delineated (**Figure 16 and Figure 17**). VOCs, including PCE (the most prevalent chemical of concern), was detected above the future PSLs in soil vapor at 5- and 15-ft bgs at probe locations in many of the previously installed soil vapor probe locations (AOC4-SV1 through AOC4-SV13) and in the soil vapor probe locations AOC4-SV13 through AOC4-SV15 installed for the supplemental investigation.
- Several soil vapor probes had reported concentrations of naphthalene and 1,2,4-trimethylbenzene above their respective future PSLs. As discussed in Section 3.5 (Parsons 2019), these two compounds have not been observed in any of the other soil vapor probes sampled during multiple events during the initial and supplemental scope of work. Given the sporadic and isolated nature of these detections they are not considered Site COCs.
- On September 15 and 19, 2018, 12 sub-slab vapor pins were sampled for soil vapor. PCE concentrations in the sub-slab vapor pins sampled on September 15 and 19, 2018 ranged from 18 μg/m^3 (AOC4-SS10) to 1,300 μg/m^3 (AOC4-SS-3), compared to the future PSL of 15 μg/m^3. Based on PCE concentrations exceeding the sub-slab PSL, indoor and outdoor air sampling was conducted to further assess vapor intrusion potential to indoor air.
- Benzene was detected at concentrations above the future PSLs at various soil vapor probes and sub-slab probes during the initial investigation (May 2018 sampling event). Subsequent sampling of these and additional probes conducted during the supplemental investigation did not confirm the continued presence of benzene in soil vapor probes and sub-slab probes. Based on the benzene detections during the initial investigation it is considered a Site COC.

[1] Calculated as the risk-based concentration in air divided by the default USEPA (2015) attenuation factor of 0.03. DTSC has not yet officially adopted the USEPA (2015) attenuation factors. Therefore, the term "future" is used here to indicated that the PSL is calculated assuming that DTSC will adopted the USEPA (2015) attenuation factors.

Indoor Air

During the supplemental investigation, three indoor-outdoor air sampling events were conducted using Summa canisters. For each event, three outdoor air samples and four indoor air samples were collected. These samples were collected concurrent with selected sub-slab vapor pins to help interpret the origin of any indoor air VOC detections.

- PCE was not detected above the residential PSL (0.46 $\mu g/m^3$) in any of the 23 indoor, outdoor, or underground utility tunnel air samples collected on any of the three sample dates. Low concentrations of PCE were detected with the heating, ventilation and air conditioning (HVAC) system on and with it off. Thus, even under worst-case conditions (i.e., HVAC off, which reduces the dilution of indoor air with outdoor air), exposures to PCE in indoor air result in a residential risk estimate less than 1×10^{-6} and noncancer hazard quotient less than one, which is acceptable. Although PCE concentrations are below the PSL in indoor air, the sub-slab concentrations are high enough that there is still a potential for concern if the existing building is replaced by a new building.
- Benzene in soil vapor and sub-slab soil vapor at the Site does exceed the future PSL, but the concentrations of benzene in indoor air and outdoor air appear to be relatively similar, indicating that benzene does not represent a potential vapor intrusion issue.

<u>Recommendations</u>

The following were recommendations in the Supplemental PEA-E based on the above conclusions:

- A Removal Action Workplan (RAW) should be developed for the Site to address PCE and benzene soil vapor impacts above the future PSLs, as well as to address previously identified (Parsons, 2018a) shallow soils impacted with lead and/or arsenic above their PSLs.

3.0 NATURE, SOURCE, AND EXTENT OF IMPACTS

Based on the findings of the 2018 PEA-E Report (Parsons, 2018) and 2019 Supplemental PEA-E Report (Parsons, 2019), lead and arsenic were determined to be COCs in soil and PCE and benzene were determined to be COCs in soil vapor within the Project Area. Summaries of the nature, source, and extent of COCs are presented below.

3.1 TYPE, SOURCE, AND LOCATION

3.1.1 LEAD AND ARSENIC IN SOIL

The source of the arsenic and lead concentrations above the PSL in soil may be the historical use of lead arsenate and other arsenic-based herbicides and pesticides. Historically, it was not uncommon to use arsenic as a soil sterilizer. Arsenic (as chromated copper arsenate) was also used as a preservative to make wood resistant to rotting and decay until its used was banned in California in 2005.

Another source of lead concentrations above the PSL in soil may be the historical use of lead-based paint in previously demolished and existing buildings. In response to the potential harmful effects from lead, the U.S. Consumer Product Safety Commission banned the application of paint containing more than 600 mg/kg of lead on residential structures in 1978. Weathering, scraping, chipping, and abrasion can cause lead to be released to, and accumulated in, soil around old structures painted with paint manufactured prior to 1978.

The specific locations of lead- and arsenic-impacted soil were identified and delineated within the proposed CMP footprint and are summarized in the PEA-E Report (Parsons, 2018). All of the lead- and arsenic-impacted soil borings identified and delineated within the proposed CMP footprint were in AOC-1, and are tabulated in **Table 1**, and presented on **Figures 3a - 13a**.

During the initial PEA-E activities, lead results from soil samples collected in the proposed development areas were below the PSL (80 mg/kg) in 103 of the 107 initial boring locations (Parsons, 2018). The highest exceedance of lead was 170 mg/kg at location AOC1-B6 at 0.5 ft bgs. Step-down and lateral step-out sampling was conducted at each lead exceedance location until the detected lead concentrations were less than the PSL of 80 mg/kg, a building foundation was reached, access was limited, or a subsurface utility was encountered.

Arsenic results from soil samples collected in the proposed development area were below the PSL (12 mg/kg) in 95 of the 107 initial boring locations (Parsons, 2018). The highest exceedance of arsenic at the initial sample locations was 32 mg/kg at AOC1-B10 at 0.5-ft bgs. Step-down and lateral step-out sampling was conducted at each arsenic exceedance location until the detected arsenic concentrations were less than the PSL of 12 mg/kg, a building foundation was reached, access was limited, or a subsurface utility was encountered.

3.1.2 VOCs in Soil Vapor

The original source of the benzene- and PCE-impacted soil vapor in the industrial arts buildings has not been identified. The southern Industrial Arts building was formerly used as an auto shop and metal shop; gasoline products and metal cleaning products such as PCE were likely stored, used and possibly disposed of through sinks or drains in the building. The PEA-E data collected to date suggests a release/source of PCE at or near soil vapor sample locations AOC4-SV10 and AOC4-SS3 (**Figure 14).** This area has a sink and floor drain inside the building. The benzene data may indicate a surficial release and given that the full range of benzene, toluene, ethylbenzene and xylene (BTEX) was detected, this appears to be associated with a small gasoline release.

Based on the PEA-E and Supplemental PEA-E activities the VOC-impacts in the Industrial Arts building area have been laterally delineated with respect to the overall soil vapor source. VOCs are considered delineated to the west of the Industrial Arts buildings by the relatively low VOC concentrations in AOC4-SV16 soil vapor, and by the relatively low VOC concentrations in AOC4-SV17 soil vapor to the north. VOC concentrations are delineated by location AOC4-SV5 to the east. Soil vapor is not delineated at location AOC4-SV12 which is south of the Industrial Arts building and north of the underground utility tunnel but is delineated by AOC5-SV1 and AOC5-SV2 (**Figure 14**). Isoconcentrations maps showing PCE in soil vapor are presented on **Figures 15** and **16**. To be conservative, the highest PCE detection was used at each probe location.

Naphthalene, ethylbenzene, and 1,2,4-trimethylbenzene were detected in soil vapor samples from probes AOC4-SV8 at 5 and 15 ft bgs during the September 15, 2018 event. Elevated concentrations of these compounds were not detected during the previous sample event (April 21, 2018) at AOC4-SV8 and have not been observed in any of the other soil vapor probes sampled during multiple events during the initial and supplemental soil vapor investigations. These two detections from the September 15, 2018 sample event are considered anomalous. **Table 2** provides the soil vapor probe sampling results and **Table 3** present the sub-slab sample results.

3.2 EXTENT AND VOLUME OF IMPACTS

3.2.1 SOIL

The extent and volume of soil impacted with lead and/or arsenic concentrations above their PSLs was determined by using data from the initial, step-out and step-down sampling locations. Step-out soil sampling was conducted at each initial soil sample locations if a concentration exceeding a PSL was detected. The step-out sampling was conducted to delineate the lateral and vertical extent of soil with concentrations exceeding their PSLs. At the direction of the LAUSD Project Manager, the lateral boundaries of step-out soil borings were determined by establishing a step-out sample location that has sample results below the PSL, or a sample restriction (i.e., building, utility, fence, etc.). The vertical extent of soil PSL exceedances was defined by conducting step-down sampling. The estimated lateral and vertical extent of lead and arsenic in soil exceeding their PSLs are depicted on **Figures 3a - 13a**.

The estimated volumes of soil containing lead and arsenic greater than their PSLs are summarized in **Table 4**. An estimated 266 cubic yards of soil are impacted by lead and/or arsenic based on the results of the PEA-E. Approximately 261 cubic yards should be managed as non-hazardous waste and approximately 5 cubic yards should be managed as non-RCRA (California) hazardous waste.

3.2.2 Soil Vapor

The extent of soil vapor impacted with VOC concentrations above their PSLs was determined by using data from the initial and step-out sampling locations. Step-out soil vapor probe installation and sampling was conducted at each initial soil vapor sample location if a VOC concentration exceeding a PSL was detected. The step-out sampling was conducted to delineate the lateral extent of soil vapor with concentrations exceeding their PSLs. At the direction of the LAUSD Project Manager, the lateral boundaries of step-out borings where soil vapor probes were installed were determined by establishing a step-out vapor sample location with vapor sample results below the PSL. The lateral step-out soil vapor boundaries are shown on **Figures 15 through 16.**

3.3 Health Effects

3.3.1 Health Effects of Soil Impacts

Potential exposures to the COPCs in soil could result from direct contact, i.e., dermal contact with soil, incidental ingestion of the affected soil, as well as the inhalation of airborne dust particulates.

At the concentrations observed in soils at the Site (i.e., up to 37 mg/kg), exposure to arsenic is unlikely to be life threatening from short-term exposures. Rather, longer-term exposures to the relatively low concentrations within the Project Area may result in skin cancer and cancer in the lungs, bladder, liver, kidney, and prostate; inhalation can increase the risk of lung cancer. Other effects that may occur but are less likely from exposures to these lower concentrations include nausea and vomiting, decreased production of red and white blood cells, abnormal heart rhythm, damage to blood vessels, and a sensation of “pins and needles” in hands and feet (ATSDR, 2007a).

Lead is a bio-accumulative substance and a reproductive and developmental toxin. At the concentrations observed in soils at the Site (i.e., up to 110 mg/kg), lead is unlikely to be life threatening from short-term exposures. Rather, longer-term exposures to the relatively low concentrations within the Project Area may result in decreased performance in some tests that measure functions of the nervous system, including intelligence quotient tests. It may also cause weakness in fingers, wrists, or ankles. Lead exposure also causes small increases in blood pressure, particularly in middle-aged and older people and can cause anemia (ATSDR, 2007b).

3.3.2 Health Effects of Soil Vapor Impacts

Exposure for long periods to low levels of PCE may cause changes in mood, memory, attention, reaction time, and vision. Studies in animals exposed to PCE have shown liver and kidney effects, and changes in brain chemistry, but we do not know what these findings mean for humans. Studies in humans suggest that exposure to PCE might lead to a higher risk of getting bladder cancer, multiple myeloma, or non-Hodgkin's lymphoma. In animals, PCE has been shown to cause cancers of the liver, kidney, and blood system (ATSDR, 2014).

Long term exposures to low concentrations of benzene, as have been found at the Site, can cause harmful effects on the bone marrow and can cause a decrease in red blood cells leading to anemia. It can also cause excessive bleeding and can affect the immune system, increasing the chance for infection. The Department of Health and Human Services (DHHS) has determined that benzene is a known carcinogen. Long-term exposure to benzene in the air can cause leukemia, particularly acute myelogenous leukemia (ATSDR, 2007).

3.4 Exposure Pathways at the Site

Exposure to chemicals can occur only if a complete exposure pathway exists by which human receptors may be exposed to chemicals in soil, water, or air. Typically, potential chemical sources, release mechanisms, transport media, routs of environmental transport, exposure media, and potential human receptors are considered.

3.4.1 Soil

For the lead and arsenic in surface or shallow soil, the potentially complete exposure pathways include dermal contact with soils, inhalation of dusts emitted to the atmosphere, and incidental ingestion of soils. For soils that are currently under buildings, sidewalks, or other paved surfaces, the pathway is currently incomplete (i.e., arsenic and lead cannot migrate through cement or asphalt) but future exposures may occur if the overlying structures are removed.

3.4.2 Soil Vapor

For VOCs in shallow soil gas and soil vapor, the potentially complete exposure pathway includes inhalation in both indoor and outdoor air. VOCs in the subsurface can migrate upwards through the soil at be emitted to outdoor air. Where buildings have been built over areas with VOCs in soil gas, those VOCs can migrate through the building’s foundation and accumulate to higher concentrations than in outdoor air.

4.0 CLEANUP GOALS

Risk-based screening levels for soil and soil vapor are being used as the Site-specific cleanup goals (SSCGs) for this project. In accordance with DTSC protocol, the risk-based screening levels developed for a residential exposure scenario are used here to be protective of school receptors.

4.1 SSCGS FOR SOIL

4.1.1 ARSENIC

SSCG: 12 mg/kg

DTSC (Chernoff et al., 2008) has established a regional background concentration for arsenic in Southern California soils for use as a screening tool. The background concentration does not distinguish between residential and commercial/industrial use scenarios. Based on their statistical analysis, attributed to both naturally occurring and anthropogenic sources, the upper bound estimate (95% upper confidence limit on the 99th percentile) for background arsenic concentrations in Southern California is 12 mg/kg.

4.1.2 LEAD

SSCG: 80 mg/kg

The California Environmental Protection Agency (Cal-EPA) Office of Environmental Health Hazard Assessment (OEHHA, 2007) developed a benchmark blood lead concentration of 1 microgram per deciliter (μg/dL) for school children and fetuses. This benchmark estimates the blood lead concentration that would reduce a child's IQ by up to 1 point. Based on this approach, OEHHA established a preliminary remediation goal (action level) of 80 mg/kg for lead in soil (OEHHA, 2009). This standard represents the concentration of lead in soil that will result in a 90th percentile estimate of a 1 μg/dL blood lead concentration in the most sensitive receptor (i.e., a child or fetus). This concentration (80 mg/kg) has been adopted by DTSC as their risk-based screening level (DTSC, 2018).

4.2 SSCGS FOR SOIL VAPOR

4.2.1 PCE

SSCG: New building: 15 $\mu g/m^3$

DTSC (2018) has calculated a risk-based screening level for PCE in air protective of residential exposures of 0.46 $\mu g/m^3$. This screening level is protective of exposures to both indoor and outdoor air. However, there is considerable dilution during migration from soil vapor to indoor air, making this screening-level much lower than necessary. To account for that dilution, United States Environmental Protection Agency (USEPA) (2015) recommends an attenuation factor of

0.03. To be protective of exposures to indoor air, the risk-based screening level is divided by the attenuation factor (i.e., 0.46 µg/m^3/0.03), resulting in a SSCG for soil gas protective of residential inhalation in a new building at the site of 15 µg/m^3.

4.2.2 BENZENE

SSCG: New building: 3.2 µg/m^3

DTSC (2018) has calculated a risk-based screening level for benzene in air protective of residential exposures of 0.097 µg/m^3. This screening level is protective of exposures to both indoor and outdoor air. However, there is considerable dilution during migration from soil vapor to indoor air, making this screening-level much lower than necessary. To account for that dilution, United States Environmental Protection Agency (USEPA) (2015) recommends an attenuation factor of 0.03. To be protective of exposures to indoor air, the risk-based screening level is divided by the attenuation factor (i.e., 0.097 µg/m^3/0.03), resulting in a SSCG for soil gas protective of residential inhalation in a new building at the site of 3.2 µg/m^3.

5.0 ENGINEERING EVALUATION/COST ANALYSIS

An Engineering Evaluation/Cost Analysis (EE/CA) was conducted for the proposed removal action at the Site. It was prepared as part of the RAW to aid in the evaluation of remedial alternatives for the mitigation of soil and soil vapor concentrations above their respective PSLs. The cost for each of the four alternatives discussed in the sections below are tabulated in Appendix A.

The proposed removal action is a non-time-critical removal action. The proposed removal action will be conducted in accordance with protocols of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). Under 40 Code of Federal Regulations (CFR) 300.415, an EE/CA is required to evaluate the implementability, effectiveness, and cost of a non-time-critical removal action. This EE/CA will be used as the basis for the planned non-time-critical removal action.

5.1 REMOVAL ACTION SCOPE

The initial and supplemental PEA-E field program consisted of soil and soil vapor sampling to investigate the RECs at the AOCs identified in Sections 2 through 4 above. The removal action scope would include lead- and arsenic-impacted soil and VOC-impacted soil vapor, in selected areas within the school property.

5.2 EVALUATION OF REMOVAL ACTION ALTERNATIVES

A screening evaluation was conducted to assess remedial technologies and process options for mitigating the impacted soil and soil vapor present at the Site. Based on the RAOs presented in Section 1.2, the following four alternatives were identified and developed for the proposed removal action at the Site.

- **Alternative 1** – No Further Action.
- **Alternative 2** – Soil excavation and off-site disposal of arsenic- and lead-impacted soil along with a land use covenant (LUC) prohibiting new building construction within the soil gas impacted area without prior DTSC review and approval.
- **Alternative 3** – Soil excavation and off-site disposal of arsenic and lead-impacted soil, with a contingent remedy involving the installation of a vapor barrier (Such as Liquid Boot® or Geo-Seal™) and construction of a passive/active sub-slab venting system if a new building is constructed within the footprint of the soil vapor impacts.
- **Alternative 4** – Includes all the elements of Alternative 3 and also includes the installation and operation of an active soil vapor extraction system.

A description and evaluation of each of the four removal action alternatives is discussed in the following sections. The criteria listed below were used during this evaluation process.

Effectiveness:

- Performance and reliability to eliminate or reduce the risk associated with the identified COCs (in terms of toxicity, mobility, or volume)
- Overall protection of public health and the environment (threshold factor)
- Compliance with the Applicable or Relevant and Appropriate Requirements (ARARs) (threshold factors)
- Long- and short-term effectiveness (balancing factor)
- Reduction of toxicity, mobility, or volume through treatment (balancing factor)
- Ability to meet the RAO (threshold factor).

Implementability: a balancing factor

- Capability of the alternative with respect to administrative and technical feasibility to Site conditions; e.g., space limitations, equipment availability, resource availability, utility requirements, monitoring concerns, and operation and maintenance.
- Ability of the alternative to meet applicable federal, state, and local regulations and permitting requirements.
- Ability of the alternative to meet the project schedule and facility operations requirements.

Cost: a balancing factor

- Assess the relative cost of each alternative based on estimated capital cost for construction or initial implementation and ongoing operation and maintenance (O&M) costs.

5.3 DESCRIPTION OF REMOVAL ACTION ALTERNATIVES

This section provides a description of each remedial action alternative selected for evaluation. Rationale for the selection of each alternative for evaluation, and a description of the technology as it applies to the Site is also provided. This section also provides an evaluation of each removal alternative compared to the criteria for feasibility studies defined in 40 Code of Federal Regulations Section 300.430 (e) (9) (iii) of the U.S. EPA National Oil and Hazardous Substances Pollution Contingency Plan. These criteria are identified and described below.

- Short-term effectiveness — This criterion evaluates the effects of the removal alternative during the construction and implementation phase until remedial objectives are met. It accounts for the protection of workers and the community during remedial activities and environmental impacts from implementing the action.

- Long-term effectiveness and permanence — This criterion addresses issues related to the management of residual risk remaining on the Site after a remedial action has been performed and has met its objectives. The primary focus is on the controls that may be required to manage risk posed by treatment residuals and/or untreated wastes.
- Reduction of toxicity, mobility, or volume — This criterion evaluates whether the remedial technology employed results in significant reduction in toxicity, mobility, or volume of the hazardous substance.
- Implementability — This criterion evaluates the administrative and technical feasibility of the alternatives, as well as the availability of the necessary goods and services. This includes the ability to construct and operate an alternative, ability to obtain services and equipment, ability to monitor the performance and effectiveness of technologies, and the ability to obtain necessary approvals from agencies, as necessary.
- Cost — This criterion involves capital and operation and maintenance costs and is based on a variety of factors. The actual costs will depend on true labor and material cost, competitive market conditions, final project scope, and implementation schedule.
- Compliance with applicable or relevant and appropriate requirements (ARARs) - This criterion is intended to evaluate how each alternative complies with ARARs identified for the Site. Evaluation of alternatives by this criterion primarily considers the PSLs that have been developed.
- Overall protection of human health and the environment — This criterion evaluates whether the removal alternative provides adequate protection to human health and the environment.
- State Acceptance - This criterion evaluates the technical and administrative issues and concerns the governing State agency (DTSC) may have regarding each of the alternatives.
- Community Acceptance — This criterion involves consideration of the likelihood of community acceptance or concerns regarding implementation of a particular removal alternative.
- Sustainability - Sustainability tracking has become a critical component of the decision-making process for the implementation of remedial strategies. The tracking of greenhouse gas emissions and local economy boost from the implementation of the remedial action at the Site will allow matrices to be developed and used for comparison on future remediation projects.

During removal of the Industrial Arts buildings and soil beneath the buildings during grading, OEHS should be notified immediately if odors or visual impacts are observed during the demolition work.

The following sections present a description of each alternative and an evaluation of the alternatives with respect to the criteria.

5.3.1 *Alternative 1 – No Further Action*

Consideration of the "No Action" alternative is required by CERCLA and the NCP as a baseline by which all other remedial alternatives can be compared. This alternative involves taking no action toward a remedy, implying no active management or expectation that Site RAOs would be achieved over time. The following presents an evaluation of this alternative with respect to the feasibility criteria:

- Short-Term Effectiveness – Alternative 1 would not result in activities that would disturb the impacted soil or soil vapor, nor would it address any risks posed to persons that may access the Project Area. If the Site was not developed and access were restricted, there would be no short-term risks associated with implementation of this alternative (the area is mostly paved / capped with buildings and pavement but has some unpaved areas). However, under the present use of the Site as a school, there would be potentially significant short-term exposures of onsite workers to residual COCs, particularly those in surface and near-surface soil, during excavation and renovation, repair, or improvement activities. These same activities could also increase the short-term risks to the surrounding community through the potential release of impacted soil to the atmosphere during construction.
- Long-Term Effectiveness – Alternative 1 would not address the impacts due to elevated concentrations of COCs in soil and soil vapor. Consequently, there would be no reduction in the potential health risks and hazards at the Site and the RAO would not be satisfied. Without a reduction in the potential health risks and hazards, the COCs would continue to pose a threat to future occupants of the Site.
- Reduction in Toxicity, Mobility, or Volume – Alternative 1 would not result in a reduction in the toxicity, mobility, or volume of elevated levels of COCs present in soil or soil vapor at the Site and the RAO would not be satisfied.
- Implementability – Alternative 1 is implementable at the Site.
- Cost – Alternative 1 has no associated cost.
- Compliance with ARARs – Alternative 1 fails to meet ARARs, because impacted soil and soil vapor would be left in place that could potentially endanger public health and the environment. Therefore, Alternative 1 would not meet this NCP threshold criterion.
- Overall Protection of Human Health and the Environment – Alternative 1 would not result in any reduction in the potential risk associated with the elevated COCs detected in soil or soil vapor and the RAO would not be met.
- State Acceptance – The Project Area is not currently under State oversight. However, the DTSC would not support this alternative.
- Community Acceptance – Alternative 1 is unlikely to be acceptable to the community because the Site is used as a school. Parents would be reluctant, if not unwilling, to send their children to a school where potential exposures to hazardous substances could occur.
- Sustainability – This Alternative would be the most sustainable of all alternatives as it does not include any form of remediation; therefore, no greenhouse gases would be

generated, and this alternative would eliminate the generation and land application of wastes, among other metrics.

In summary, Alternative 1 (No Action) does not meet RAO or ARARs, nor does it result in a reduction of the toxicity, mobility, or volume of impacted soil and soil vapor present at the Site. Because the impacted soil and soil vapor would remain in place without monitoring, the soil may pose a short-term risk to Site workers and possibly the surrounding community if it were disturbed during school renovation activities. Thereafter, the long-term health risk and hazard would remain a threat to future occupants of the Site. As a result, acceptance by the State and the community for this alternative would not be obtainable.

5.3.2 Alternative 2 – Excavation and Offsite Disposal of Lead- and Arsenic-Impacted Soil

Alternative 2 involves the excavation and offsite disposal of lead- and arsenic-impacted soil (above the lead or arsenic screening levels of 80 mg/kg and 12 mg/kg, respectively) within the proposed Project Area. In addition, a LUC would be implemented ensuring there is no future building construction within the footprint of elevated soil gas around the Industrial Arts building. There are 15 separate impacted areas totaling an estimated 266 cubic yards of lead- and arsenic-impacted soil that will be excavated from within the CMP footprint. The maximum excavation depth is 3.5 ft bgs. The excavation volumes in the 15 proposed excavation areas range from approximately 1.4 to 34 cubic yards (**Table 4**). Note that at the time of this RAW submittal to LAUSD, no buildings are currently planned to be designed or constructed within the proposed excavation footprint in the currently Industrial Arts building area defined in Alternative 2. Assuming no new building is constructed within the CMP footprint, soil excavation of soil vapor-impacted areas would not be necessary to reduce indoor air risk. If construction of school buildings is planned, then soil excavation would occur within the proposed building footprint(s) to the depth designated in this RAW, or the depth of the proposed building footings (whichever is deeper). Excavation and offsite disposal would be an effective means of removing impacted soil and would allow the Site RAO for lead- and arsenic-impacted soil to be met. The 15 excavation locations are illustrated on **Figures 3a - 13a.** The following presents an evaluation of this alternative with respect to the feasibility criteria:

- Short-Term Effectiveness – Potential short-term risks to onsite workers, public health, and the environment could result from dust or particulates that may be generated during soil excavation and handling during the excavation and loading of lead- and arsenic-impacted soil. Some of the lead- and arsenic-impacted soil areas are within the VOC-impacted soil area and there would be an increased short-term risk to workers for inhalation of VOC-impacted soil vapor. These risks could be mitigated using personal protective equipment (PPE) for onsite workers and engineering controls, such as dust suppression, air monitoring for VOCs and particulates, and additional traffic and equipment operating safety procedures, for protection of the surrounding community. The short-term risks are viewed as low.

- Long-Term Effectiveness – Alternative 2 would reduce the concentrations of lead and arsenic COCs in Site soil to levels that no longer present a threat to human health or the environment, thereby eliminating the long-term risk of exposure. Any residual soil gas VOCs would not present a risk as long as no new building is constructed. If a new building is planned for construction in this area in the future, then appropriate review and further remediation as described under Alternatives 3 or 4 would be performed to ensure conditions are protective.
- Reduction in Toxicity, Mobility, or Volume – Although removed from the Site, excavation and offsite land disposal of lead- and arsenic-impacted soil would not result in the reduction of toxicity or volume of the COCs from an offsite perspective, because the COCs are merely moved from one location to another. However, by placing the impacted soil in an engineered landfill suitable for receiving the concentrations of COCs detected, the mobility of the COCs would be reduced. Remaining VOC-impacted soil vapor onsite would likely continue to contain similar toxicity, mobility and volume characteristics.
- Implementability – Alternative 2 is technologically feasible and easily implemented. This alternative relies on proven technology, uses readily available equipment, and requires minimal permitting. Based on the volume of soil that would be removed, the implementation of this alternative would require compliance with the South Coast Air Quality Management District's (SCAQMD) Rule 1466 to minimize off-site fugitive dust emissions from earth-moving activities at sites containing specific toxic air contaminants by establishing dust control measures. Establishing a LUC to ensure that further review and remediation is performed if a new building is constructed is also considered to be readily implementable.
- Cost – Alternative 2 costs are driven primarily by the costs associated with soil excavation, transport, and offsite disposal. These costs depend on the method of excavation, the excavated volume, and the waste classification of the excavated soil, which in turn determines the costs of transportation and disposal. Based on the initial and step-out soil sampling conducted during the PEA-E, approximately 261 cubic yards can be managed as non-hazardous waste and approximately 5 cubic yards can be managed as non-RCRA (California) hazardous waste. The 15 areas designated for lead- and arsenic-impacted soil (**Table 4** and **Figures 3a - 13a)** within the footprint of the proposed CMP area would be excavated and disposed of; the costs associated with this option are considered reasonable.
- Compliance with ARARs – Alternative 2 would comply with all Federal and State ARARs and would not need a waiver under CERCLA, assuming no buildings are constructed within the footprint of the VOC-impacted soil vapor.
- Overall Protection of Human Health and the Environment – Alternative 2 would meet the RAO and is overall protective of human health and the environment, assuming no buildings are constructed within the footprint of the VOC-impacted soil vapor. If new buildings are constructed, then there is a contingency for further remediation.

- State Acceptance – The Project Area is not currently under state oversight. However, Alternative 2 would be viewed favorably by regulatory agencies, because it is protective of human health and the environment. Alternative 2 would not limit future development of the Site or require restriction on land use, assuming no buildings are constructed within the footprint of the VOC-impacted soil vapor.
- Community Acceptance – Alternative 2 is likely to be perceived by the community as acceptable because it would mitigate the identified hazards and risks associated with the lead and arsenic COCs in soil and render the Site safe for renovation and future school use, assuming no buildings are constructed within the footprint of the VOC-impacted soil vapor.
- Sustainability – This alternative would be less sustainable when compared to the previous alternative, because the No Action Alternative is the most sustainable but would not be acceptable for this Site. The excavation and off-site transport and disposal of the impacted materials, and the import of clean fill under this alternative would not be sustainable. However, it could produce a local economy boost if local truckers are used to haul materials and/or a local fill source is identified.

In summary, Alternative 2 (Soil Excavation and Offsite Disposal of lead- and arsenic-impacted soil) is a proven, readily implementable remedial approach commonly used to address shallow soil contamination. The process is straightforward, and the equipment and labor required to implement this alternative are uncomplicated and readily available. Based on the past success related to the excavation and offsite disposal of shallow soil contamination at other LAUSD school sites, it is anticipated that this approach would be acceptable to the community. The costs associated with implementing this alternative are considered reasonable due to the fact that only a fraction of the proposed CMP redevelopment area footprint contains soil with lead or arsenic concentrations exceeding their respective screening levels. A LUC would be established to ensure that further review and remediation is performed if a new building is constructed in the area with elevated soil gas VOCs, which ensures long-term protectiveness.

5.3.3 Alternative 3 – Excavation and Offsite Disposal of Lead- and Arsenic-Impacted Soil and Future Building Slab Modification

Alternative 3 involves the excavation and offsite disposal of lead- and arsenic-impacted soil (above screening levels) within the proposed project area. There are 15 separate impacted areas totaling an estimated 266 cubic yards of lead- and arsenic-impacted soil that will be excavated from within the CMP footprint. The maximum excavation depth is 3.5 ft bgs. The excavation volumes in the 15 proposed excavation areas range from approximately 1.4 to 34 cubic yards (**Table 4**). VOC-impacted soil vapor within the lead- and arsenic-impacted removal areas would thereby be opportunistically be removed. Alternative 3 assumes one or more school buildings would be constructed within the project area footprint containing soil vapor (i.e., PCE and benzene) that exceeds screening levels. Alternative 3 would therefore include (in addition to removal of lead- and arsenic-impacted soil in designated areas), in the future building(s) design, the application of a membrane such as Liquid Boot® to new buildings within the VOC-impacted footprint of the project area. A spray-applied Liquid Boot® membrane or similar would seal potential vapor intrusion pathways by preventing soil vapors from penetrating the foundation slab(s), thereby mitigating vapor intrusion into the building(s). Additionally, a sub-slab collection system would be installed under any new buildings constructed within the Industrial Arts building area, consisting of a series of slotted vent pipes constructed of 4-inch diameter, factory slotted, corrugated HDPE piping, laid out in a minimum 6-inch thick gravel bed. The vapor collection piping would be manifolded and the pipes would initially be capped. This would be constructed as a passive system that could be converted to an active system if monitoring indicates unacceptable concentrations. An operations and maintenance plan would be prepared to define the methodologies and procedures to monitor the effectiveness of the sub-slab mitigation system.

Removing the lead- and arsenic-impacted soil as defined by the exceedance concentrations would be an effective means of removing impacted soil, and along with the additional application of a Liquid Boot® or similar membrane and construction of a passive sub-slab vapor collection system that could be converted to an active system as a contingency, would allow the Site RAO to be met. The following presents an evaluation of this alternative with respect to the feasibility criteria:

- Short-Term Effectiveness – Potential short-term risks to onsite workers, public health, and the environment could result from dust or particulates that may be generated during soil excavation and handling and breathing soil vapor during the excavation and loading of lead- and arsenic-impacted and VOC-impacted soil. These risks could be mitigated using personal PPE for onsite workers and engineering controls, such as dust suppression, air monitoring for VOCs and particulates, and additional traffic and equipment operating safety procedures, for protection of the surrounding community. The short-term risks are viewed as low. The time required to complete Alternative 3 versus Alternative 2 may be slightly longer during the construction phase of the buildings.
- Long-Term Effectiveness – Alternative 3 would reduce the concentrations of lead- and arsenic-impacted COCs in Site soil to levels that no longer present a threat to human health or the environment, thereby eliminating the long-term risk of exposure. Alternative 3 would also eliminate the potential for VOC-impacted soil vapor to migrate into future buildings, thereby eliminating the long-term risk of exposure.
- Reduction in Toxicity, Mobility, or Volume – Although removed from the Site, excavation and offsite land disposal of lead- and arsenic-impacted soil would not result in the reduction of toxicity or volume of the COCs from an offsite perspective, because the COCs are merely moved from one location to another. However, by placing the impacted soil in an engineered landfill suitable for receiving the concentrations of COCs detected, the mobility of the COCs would be reduced. Remaining VOC-impacted soil vapor onsite would likely continue to contain similar toxicity, mobility and volume characteristics; however, the VOC-impacted soil vapor would not have a complete pathway into the buildings due to the implementation.

- Implementability – Alternative 3 is technologically feasible and easily implemented. This alternative relies on proven technology, uses readily available equipment, and requires minimal permitting. Based on the volume of soil that would be removed, the implementation of this alternative would require compliance with the SCAQMD's Rule 1466 to minimize off-site fugitive dust emissions from earth-moving activities at sites containing specific toxic air contaminants by establishing dust control measures. The incorporation of a Liquid Boot® application into building design and construction, and the construction of a passive sub-slab vapor collection system that could be converted to an active system, are not uncommon soil vapor mitigation techniques and are easily implemented by qualified contractors.

- Cost – Alternative 3 costs are driven primarily by soil excavation, transport, and offsite disposal, and the design, Liquid Boot® application, and construction of a sub-slab vapor collection system. The soil excavation, transport, and offsite disposal costs depend on the method of excavation, the excavated volume, and the waste classification of the excavated soil, which in turn determines the costs of transportation and disposal. Based on the initial and step-out soil sampling conducted during the PEA-E, approximately 261 cubic yards can be managed as non-hazardous waste and approximately 5 cubic yards can be managed as non-RCRA hazardous waste. The select soil removal areas defined by soil analytical data (and tabulated in **Table 4**) would be excavated and disposed; these costs are similar to the same scope in Alternative 2. The Alternative 3 costs would be higher than for Alternative 2 because of the Liquid Boot® application, and construction of a sub-slab vapor collection system. This alternative would likely incur costs associated with periodic post-building construction soil vapor monitoring/indoor air monitoring and reporting to confirm potential VOC-impacted soil vapor beneath the new building(s) are not migrating into the buildings.

- Compliance with ARARs – Alternative 3 would comply with all Federal and State ARARs and would not need a waiver under CERCLA.

- Overall Protection of Human Health and the Environment – Alternative 3 would meet the RAO and would be overall protective of human health and the environment.

- State Acceptance – Alternative 3 would be viewed favorably by regulatory agencies, because it is protective of human health and the environment. Alternative 3 would not limit future development of the Site or require restriction on land use.

- Community Acceptance – Alternative 3 would likely to be perceived by the community as acceptable because it would mitigate the identified hazards and risks associated with the COCs in soil and render the Site safe for renovation and future school use.

- Sustainability – This alternative would not be as sustainable when compared to the previous two alternatives for the project. The No Action Alternative is the most sustainable but would not be acceptable for this Site. The excavation and off-site transport and disposal of the metal-impacted materials, and the import of clean fill under this alternative would not be completely sustainable. However, it could produce a local economy boost if local truckers are used to haul materials and/or a local fill source is identified. Implementing Alternative 3 would be sustainable especially considering the increased safety to human health and environment when compared to the sustainability and safety of implementing Alternative 2.

5.3.4 *Alternative 4 – Excavation and Offsite Disposal of Lead- and Arsenic-Impacted Soil, Future Building Slab Modification and Soil Vapor Extraction*

Alternative 4 involves the excavation and offsite disposal of lead- and arsenic-impacted soil (above screening levels) within the proposed project area. There are 15 separate impacted areas totaling an estimated 266 cubic yards of lead- and arsenic-impacted soil that will be excavated from within the CMP footprint. The maximum excavation depth is 3.5 ft bgs. The excavation volumes in the 15 proposed excavation areas range from approximately 1.4 to 34 cubic yards (**Table 4**). VOC-impacted soil vapor within the lead- and arsenic-impacted removal areas would thereby be opportunistically be removed. Alternative 4 assumes one or more school buildings would be constructed within the project area footprint containing soil vapor (i.e., PCE) that exceeds screening levels. Alternative 4 would therefore include (in addition to removal of lead- and arsenic-impacted soil in designated areas), in the future building(s) design, the application of a membrane such as Liquid Boot® to new buildings within the VOC-impacted footprint of the project area. A spray-applied Liquid Boot membrane or similar would seal potential vapor intrusion pathways by preventing soil vapors from penetrating the foundation slab(s), thereby mitigating vapor intrusion into the building(s). Additionally, a sub-slab vapor collection system would be installed under any new buildings constructed within the Industrial Arts building area, consisting of a series of slotted vent pipes constructed of 4-inch diameter, factory slotted, corrugated HDPE piping, laid out in a minimum 6-inch thick gravel bed. The vapor collection piping would be manifolded and the pipes would initially be capped. This would be constructed as a passive system that could be converted to an active system if monitoring indicates unacceptable concentrations. An operations and maintenance plan would be prepared to define the methodologies and procedures to monitor the effectiveness of the sub-slab mitigation system. Removing the lead- and arsenic-impacted soil as defined by the exceedance concentrations would be an effective means of removing impacted soil, and along with the additional incorporation of a sub-slab depressurization system and application of Liquid Boot, would allow the Site RAO to be met. For Alternative 4, mitigating the risks associated with VOC concentrations in soil vapor would require the design, installation and operation of a full-scale soil vapor extraction (SVE) system to actively remove and treat VOC-impacted soil vapor. The SVE system would require an array of SVE wells trenched together in the area impacted by soil vapor and near the future building(s). Installation of an SVE system would require initially installing several SVE wells and conducting an SVE pilot study. Based on the results of the SVE pilot study, a full-scale SVE system could be designed, permitted, installed and operated. The following presents an evaluation of this alternative with respect to the feasibility criteria:

- Short-Term Effectiveness – Potential short-term risks to onsite workers, public health, and the environment could result from dust or particulates that may be generated during soil excavation and handling and breathing soil vapor during the excavation and loading of lead- and arsenic-impacted and VOC-impacted soil. These risks could be mitigated using PPE for onsite workers and engineering controls, such as dust suppression, air monitoring for VOCs and particulates, and additional traffic and equipment operating safety procedures, for protection of the surrounding community. The short-term risks are viewed as low. The time required to complete Alternative 4 versus Alternatives 2 or 3 are longer. The removal of the lead- and arsenic-impacted soil would have the same time requirements as for Alternatives 2 and 3, and the same time requirements as Alternative 3 for the implementation of a sub-slab depressurization system and the application of a membrane such as Liquid Boot® to new buildings within the VOC-impacted footprint of the project area. A significantly longer time period would be required to conduct an SVE pilot study, and then design, permit, install and operate a full-scale SVE system. Additionally, after the SVE system was installed and commenced operation, it would likely require operating for 3 to 5 years to achieve remedial goals, after which time SVE operation could be terminated and the system decommissioned, including abandonment of the SVE wells, trenching and equipment.

- Long-Term Effectiveness – Alternative 4 would reduce the concentrations of all COCs in Site soil and soil vapor to levels that no longer present a threat to human health or the environment, thereby eliminating the long-term risk of exposure. This assumes that groundwater is not a source of impacts to soil vapor and will not re-impact the soil vapor after the SVE system has been shut down and decommissioned.

- Reduction in Toxicity, Mobility, or Volume – Although removed from the Site, soil excavation and offsite land disposal do not result in the reduction of toxicity or volume of the metal COCs from an offsite perspective, because the COCs are merely moved from one location to another. However, by placing the impacted soil in an engineered landfill suitable for receiving the concentrations of COCs detected, the mobility of the COCs will be reduced. VOC-impacted soil vapor would be treated onsite by the SVE system, which could be designed to remove VOCs by using granular activated carbon (GAC), thermal treatment, or other options. SVE would result in the reduction of toxicity, mobility, and volume of VOC-impacted soil vapor.

- Implementability – Alternative 4 is technologically feasible and easily implemented. This alternative relies on proven technology, uses readily available equipment, and requires moderate permitting. Based on the volume of soil that would be removed, the implementation of this alternative would require compliance with the SCAQMD's Rule 1466 to minimize off-site fugitive dust emissions from earth-moving activities at sites containing specific toxic air contaminants by establishing dust control measures. The incorporation of a Liquid Boot® application into building design and construction, and the construction of a passive sub-slab vapor collection system that could be converted to an active system, are not uncommon soil vapor mitigation techniques and are easily implemented by qualified contractors. The installation of an SVE system would require a short-term pilot study to confirm the subsurface conditions are acceptable for SVE. The SVE system would also require permitting with the City of Los Angeles Building and Safety, City of Los Angeles Department of Water and Power, and SCAQMD.

- Cost – Alternative 4 costs are driven by soil excavation, transport, and offsite disposal, the design and construction of the sub-slab depressurization system and Liquid Boot application, and designing, piloting, installing, operating, and eventually removing a full-scale SVE system. The soil excavation, transport, and offsite disposal costs depend on the method of excavation, the excavated volume, and the waste classification of the excavated soil, which in turn determines the costs of transportation and disposal. Based on the initial and step-out soil sampling conducted during the PEA-E, approximately 261 cubic yards can be managed as non-hazardous waste and approximately 5 cubic yards can be managed as non-RCRA hazardous waste. The select soil removal areas defined by soil analytical data (and tabulated in **Table 4**) would be excavated and disposed; these costs are similar to the same scope in Alternatives 2 and 3. The Alternative 4 costs would be similar to Alternative 3 because of the Liquid Boot application and construction of the sub-slab depressurization system. However, the cost for designing, piloting, installing, operating, and eventually removing a full-scale SVE system would be relatively high compared to the methods in Alternatives 2 and 3 to address VOC-impacted soil. There would be up-front costs for design, permitting and installation of the SVE wells, trenching, and remedial compound and equipment. There would be on-going (estimated 3 to 5 years) costs for operations and maintenance of the SVE system, as well as regulatory reporting requirements, and costs associated with SVE well destruction and system decommission after regulatory closure is granted.
- Compliance with ARARs – Alternative 4 could would comply with all Federal and State ARARs and would not need a waiver under CERCLA.
- Overall Protection of Human Health and the Environment – Alternative 4 would meet the RAO and would be overall protective of human health and the environment.
- State Acceptance – Alternative 4 would be viewed favorably by regulatory agencies, because it is protective of human health and the environment. Alternative 4 would not limit future development of the Site or require restriction on land use.
- Community Acceptance – Alternative 4 would likely to be perceived by the community as acceptable because it would mitigate the identified hazards and risks associated with the COCs in soil and render the Site safe for renovation and future school use.
- Sustainability – This alternative would not be one of the most sustainable alternatives when compared to the previous alternatives. The No Action Alternative is the most sustainable but would not be acceptable for this Site. The excavation and off-site transport and disposal of the impacted materials, and the import of clean fill under this alternative would not be completely sustainable. The use of SVE is not particularly sustainable because of resources required to install and removed a full-scale SVE system, and energy requirements to operate the system for 3 to 5 years.

5.4 DESCRIPTION OF SELECTED REMEDY

Alternative 1 (No Action was eliminated from further consideration because it would not meet the RAO. Alternative 2 (Soil excavation and offsite disposal only) was eliminated because the incremental costs exceed the incremental environmental protection, economic efficiency, and ecological necessity benefits. Alternative 4 (Excavation and offsite disposal of lead- and arsenic-impacted soil, future building liquid boot and SVE) was eliminated because the costs and timeframe associated with implementing this option are significantly higher and longer, respectively, than Alternative 3, without providing appreciably greater RAO achievement. Alternative 3 (Excavation and offsite disposal of lead- and arsenic-impacted soil and future building slab modification) is selected as the preferred alternative because it is easily implemented, effective, and provides long-term assurances that future occupants of the Site will not face significant health risks due to elevated levels of COCs in soil. It is the most cost-effective of the active remedial options considered in order to meet the RAOs.

Potential short-term risks during implementation of Alternative 3 include exposure of onsite workers to health and safety hazards during soil excavation activities. These short-term risks can be readily mitigated by the proper use of PPE, adherence to health and safety procedures, and engineering controls (e.g., application of water spray) to suppress fugitive dust and potential VOC emissions during the excavation and handling of impacted soil.

Soil excavation would involve the use of conventional excavation equipment, such as backhoes and loaders to remove the estimated 266 cubic yards of impacted soil from the Project Area. Excavated soil would be directly loaded into staged trucks or bins, or temporarily stockpiled on plastic sheeting next to the excavation areas until it could be loaded out for offsite disposal. Excavation is assumed to be estimated at a maximum of 3.5 feet in depth; therefore, sloping and shoring should not be required.

All of the impacted soils removed from the excavations would be transported offsite to an appropriate, licensed LAUSD-approved facility for disposal. After completion of the soil removal actions at each location, confirmation soil sampling would be conducted along the excavation sidewalls and bottoms to verify that the SSCGs had been met. Following LAUSD requirements, imported backfill soil would be tested and certified, or soil from onsite borrow areas not affected by the COCs, will be used to backfill the excavations in preparation for site construction activities.

Alternative 3 would be selected because LAUSD intends to construct one or more new buildings in the area of the currently existing Industrial Arts buildings that are within the footprint of VOC-impacted soil vapor. Based on the past success related to the excavation and offsite disposal of shallow soil contamination at other LAUSD school sites, it is anticipated that this approach would be acceptable to the community. Costs associated with implementing Alternative 3 ($511,000) are higher than the no-cost alternative and are more than Alternative 2

($186,000), because of the cost associated with the application of a membrane such as Liquid Boot® to new buildings and construction of the sub-slab depressurization system. The costs for implementing Alternative 3 are appreciably less compared to Alternative 4 ($929,000) because full-scale SVE implementation requires a relatively higher cost and significantly longer time to achieve the remedial objectives. The estimated costs and assumptions used to develop the costs are provided in **Appendix A**.

6.0 APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS

The proposed removal action must comply with ARARs. In this section the most relevant ARARs for the proposed removal action are presented.

6.1 PUBLIC PARTICIPATION

Prior to beginning fieldwork for the proposed removal action, the LAUSD will distribute a RAW Work Notice to Reseda High School students and staff and nearby residents and businesses (i.e., within line-of-sight). The notice will also be laminated and posted along the fence line of the project. The notice will be prepared in English and Spanish. It will provide a general description of the fieldwork that will occur, along with the telephone number of the LAUSD OEHS Project Manager for further information.

6.2 CALIFORNIA ENVIRONMENTAL QUALITY ACT (CEQA)

The California Environmental Quality Act (CEQA), modeled after the Federal National Environmental Policy Act (NEPA) of 1969, was enacted in 1970 as a system of checks and balances for land-use development and management decisions in California. It is an administrative procedure to ensure comprehensive environmental review of cumulative impacts prior to project approval. It has no agency enforcement tool but allows challenge in courts.

CEQA applies all discretionary activities proposed to be carried out or approved by California public agencies, unless an exemption applies.

The proposed soil removal project will not have a significant effect on public health or the environment because of the relatively small volume, short project duration, and the controlled manner in which contaminated soils will be excavated, loaded onto trucks, and taken offsite for disposal/treatment. The Site is not on the Hazardous Waste and Substances Sites List or in a sensitive cultural or biological resource area. As a result, the soil removal action is eligible for a Class 30 exemption under CEQA, which is defined under Title 14 of the California Code of Regulations (CCR), Chapter 3, Article 19, Section 15330 to be a minor cleanup action taken to prevent, minimize, stabilize, mitigate, or eliminate the release or threat of release of a hazardous waste or substance.

In compliance with CEQA requirements, LAUSD will prepare a Notice of Exemption (NOE) which will be filed with the Los Angeles County Clerk's office.

6.3 WASTE MANAGEMENT

It is anticipated that five types of wastes could be generated at the Site during implementation of the RAW including the following:

- Recyclable construction debris, including concrete rubble and rock. The recyclable construction debris will be transported to a local recycling facility via dump trucks (end dumps), unless re-use options are available on-site, or there is no local recycling facility available.
- Non-recyclable construction debris including weeds, trash, and discarded personal protective equipment, etc. The non-recyclable construction debris will be transported and disposed at a local landfill via dump trucks.
- All metals-impacted non-RCRA hazardous material would be transported to a permitted and approved facility, such as the Waste Management Kettleman Hills Facility or the Clean Harbors Facility in McKittrick, California. These facilities are permitted Treatment/Storage/Disposal Facilities (TSDF) and are anticipated to be approved by LAUSD for disposal of hazardous material.
- All VOC-impacted non-RCRA hazardous material would be transported to a permitted and approved facility, such as the Waste Management Kettleman Hills Facility or the Clean Harbors Facility in McKittrick, California. These facilities are permitted TSDFs and are anticipated to be approved by LAUSD for disposal of hazardous material.
- Wastewater generated during soil removal activities including but not limited to decontamination liquids will be temporarily placed inside 55-gallon Department of Transportation-approved drums. The drums will be labeled, profiled and transported off-site to an approved treatment or disposal facility.

6.4 HEALTH AND SAFETY PLAN

A site-specific Health and Safety Plan (HASP) will be prepared for the Site by the primary General Contractor selected by LAUSD and will outline current safety standards as defined by the USEPA, the Occupational Safety and Health Administration, and the National Institute of Occupational Safety and Health. Additionally, the HASP will be prepared in accordance with guidelines set forth in Title 8 of CCR Section 5192.

Prior to the commencement of each day's activities, a tailgate health and safety meeting will be held. Everyone working at the Site will be required to sign the site-specific HASP to demonstrate that they are familiar with the HASP and that they participated in, or were briefed on, the daily tailgate meeting. The removal action contractor's Site manager will maintain this signature sheet.

6.5 QUALITY ASSURANCE / QUALITY CONTROL

Quality assurance/quality control measures that will be used during project execution are documented below. Following these procedures will ensure that Site field and analytical data collected meet project Data Quality Objectives and the RAO to support decisions for the redevelopment of the school Property.

6.6 FIELD QC SAMPLES

Field QC samples will be collected and analyzed during project sampling to assess consistency and performance of the sampling program. Field QC samples will include field duplicates, equipment rinsates, trip and temperature blanks. Definitions for field QA/QC samples are presented below.

6.6.1 FIELD DUPLICATES

The purpose of field duplicate samples is to evaluate the precision of the sample collection and analysis process. A field duplicate is defined as two or more samples collected independently at the same sampling location during a single act of sampling. One field duplicate will be collected for every 10 primary project samples that are submitted to the fixed laboratory and will be analyzed for the sample analyses as the primary field sample. If fewer than 10 primary samples are collected, at least one field duplicate shall still be collected and analyzed. Each of the field duplicates will be uniquely identified with a coded identifier, which will be in the same format as other sample identifiers. Field duplicate frequency for on-site VOC analyses will be performed as necessary to provide quality control in support of defensible field and project decisions.

6.6.2 EQUIPMENT RINSATE BLANK

Equipment rinsate blanks (field blanks) are used to measure contamination introduced to a sample set from improperly decontaminated sampling equipment. Equipment rinsate blanks consist of American Society for Testing and Materials (ASTM) Type II water (or equivalent) collected from the final rinse of the decontamination process. The rinsate is transferred to sample bottles appropriate for the analysis and transported to the laboratory. One equipment rinsate sample will be collected per sampling event for each type of sampling equipment used. The equipment rinsate samples are analyzed for the same laboratory parameters as the site samples.

Equipment rinsate blanks for soil sampling equipment will be collected during field activities in the area of the Site anticipated to have the highest contaminant concentrations.

6.6.3 Trip Blanks

The trip blank is used to indicate potential contamination by VOCs during sample collection, shipping, and handling. A trip blank consists of analyte-free laboratory reagent water (ASTM Type II or equivalent) in a 40-milliliter glass vial sealed with a Teflon® septum and preserved with hydrochloric acid. Trip blanks must be free of headspace. The blank accompanies the empty sample bottles to the field and is placed in each cooler returning to the laboratory that contains VOC samples. The trip blank is not opened until analysis with the corresponding Site samples. If no primary samples are submitted for VOC analysis, a trip blank sample is not needed.

6.6.4 Temperature Blanks

One temperature blank will accompany each cooler containing project samples submitted to the subcontract laboratory. Temperature blanks typically consist of deionized water poured into a glass container. Temperature measurements are essential to verify proper sample preservation for all analyses requiring sample preservation by refrigeration (4 ± 2oC). Laboratory personnel will obtain temperature measurements from the temperature blank upon receipt of sample shipment containers, and this measurement will be recorded on the chain-of-custody form.

6.6.5 Laboratory QC Samples and Criteria

Laboratory Quality Control (QC) data are necessary to determine the precision and accuracy of the analyses, confirm matrix interferences, and demonstrate target compound contamination of sample results. QC samples will be analyzed routinely by the analytical laboratory as part of the method QC procedures.

6.7 Stormwater Discharge Management Plan

State Water Resources Control Board Order No. 99-08-DWQ, National Pollutant Discharge Elimination System General Permit No. CAS000002, Waste Discharge Requirements for Discharges of Stormwater Runoff associated with Construction Activity, describes the implementation of a storm water pollution prevention plan for a construction project. This General Permit regulates pollutants in discharges of storm water associated with construction activity (storm water discharges) to surface waters, except from those areas on Tribal Lands; Lake Tahoe Hydrologic Unit; construction projects which disturb less than five acres, unless part of a larger common plan of development or sale; and storm water discharges which are determined ineligible for coverage under this General Permit by the California Regional Water Quality Control Boards. This General Permit does not preempt or supersede the authority of local storm water management agencies to prohibit, restrict, or control storm water discharges to separate storm sewer systems or other watercourses within their jurisdiction, as allowed by State and Federal law. The remediation contractor must follow the general contractor's stormwater pollution prevention plan for the overall redevelopment project and LAUSD's construction Best Management Practices (BMPs).

6.8 South Coast Air Quality Management District (SCAQMD)

The Site is located within the jurisdiction of the South Coast Air Quality Control District. The SCAQMD has two rules that address excavation (Rules 1150 and 1166), and two that address fugitive dust: Rule 403 and Rule 1466. Rule 1466 is designed to minimize the amount of off-site fugitive dust emissions containing toxic air contaminants by reducing particulate emissions in the ambient air as a result of earth-moving activities, including, excavating, grading, handling, treating, stockpiling, transferring, and removing soil that contains applicable toxic air contaminants. Rule 1466 is applicable to a project with earth-moving activities of soil with applicable toxic air contaminants greater than 50 cubic yards. Rule 1150 applies to the excavation of sanitary landfills and does not apply to this project. Rule 1166 is expected to apply to this project because it governs the excavation of soils containing concentrations of VOCs; these were detected during the PEA-E activities.

Several elements of Rule 403, such as protocols for mitigation of potential fugitive dust emissions, have been incorporated into this RAW. Specifically, air monitoring will be conducted during the excavation, loading, and transport of impacted soils, and mitigation measures will be implemented to minimize the generation of fugitive dust. Access to the Site will be controlled and excavation will not be conducted during times of high wind conditions (e.g., wind speed in excess of 15 miles per hour). Notification of the SCAQMD is required for medium or large excavation/grading operations that disturb more than 100 acres or move more than 5,000 or 10,000 cubic yards per day, respectively. This project does not qualify as a medium or large operation; therefore, agency notification or the filing of a Fugitive Dust Emission Control Plan is not required.

6.9 Others

All necessary permits and approvals identified in this RAW will be obtained prior to any removal activities. Removal activities will be performed by a California-certified contractor with oversight from a California Professional Engineer (PE) or Professional Geologist (PG).

7.0 REMOVAL ACTION IMPLEMENTATION

The field procedures and methods that will be used to implement the removal action are described in this section. The construction details of any new future buildings in the soil-vapor impacted area are currently unknown. A detailed design of the Liquid Boot® and sub-slab collection system will be required prior to construction of any new buildings in the soil vapor impacted area.

7.1 SITE PREPARATION AND SECURITY MEASURES

Prior to equipment mobilization for the proposed soil removal action, Site preparation activities may include Site inspections, surveying, marking excavation limits, and improvement of access gates/roads as necessary. It is assumed that the currently existing buildings and pavement overlying or adjacent to the impacted soil areas will be removed prior to excavation work.

7.1.1 DELINEATION OF EXCAVATION AREAS

The lateral and vertical extent of impacted soil was estimated based on the PEA-E sample analytical data (Parsons, 2018 and 2019), which is also summarized on **Table 4**. The estimated limits of impacted soil are shown on **Figures 3a – 13a**. As mentioned above, the estimated volume of soil removed may increase when the excavation work is conducted and will be based on the results of the confirmation soil sampling and analysis that is required to confirm the excavation walls and depths have reached clean (i.e., below screening levels) soil.

7.1.2 UTILITY CLEARANCE

Prior to any subsurface excavation work, a geophysical survey, using a magnetometer and ground penetrating radar, will be conducted in proposed excavation areas to help identify subsurface utilities and features (i.e., underground utility tunnel), and other potential obstructions. Necessary precautions are required to be taken during the excavation activities to ensure that subsurface utility lines and other structures are identified and marked on the ground surface during the geophysical survey, so they are not damaged or impacted.

Prior to commencing with excavation activities, Underground Service Alert (USA) will be contacted more than 72 hours in advance and requested to identify the location of the utilities that enter the Site. The proposed excavation areas will be clearly marked with white paint as required by USA. USA will contact all utility owners of record within the Site vicinity and notify them of the intent to excavate. All utility owners of record will be expected to clearly mark the position of their utilities on the ground surface at they enter the Site, or mark if there is no conflict.

7.1.3 Security Measures

The school is secured by perimeter fencing. In addition, the Project Area will be segregated by temporary fencing with wind screen. Barricades, such as delineators with caution tape, will be placed around the perimeters of the excavation areas at the end of each day to reduce the potential for unauthorized personnel to enter the excavations.

7.1.4 Contaminant Control

Dust suppression will be performed by lightly spraying or misting the work areas with water. Water mist may also be used on soil placed in temporary stockpiles or in the transport trucks. After the soil is loaded into the transport trucks, the soil will be covered to prevent soil from spilling out of the truck during transport to the disposal facility. Additionally, all trucks will be cleaned to remove any soil present on the trucks or their tires.

If precipitation occurs or water seeps into the excavations prior to confirmation soil sampling, water collected in the bottom of the excavation will be pumped from the hole and transferred to an aboveground storage tank or drums and sampled for profiling purposes. Impacted water will be disposed of in accordance with federal, state, and local regulations.

While on the school property, all vehicles will maintain slow speeds (i.e., less than 5 miles per hour) for safety purposes and for dust control measures. Efforts will also be made to minimize the soil drop height from the excavator bucket into the transport trucks.

7.1.5 Permits and Plans

All necessary permits or approvals will be obtained prior to the planned soil removal activities, as well as for the application of a membrane such as Liquid Boot® to new buildings. It is anticipated that a grading permit would be required for the removal of impacted soil prior to the planned construction. Permits required by the SCAQMD will be evaluated and obtained as necessary prior to the removal activities.

7.2 Field Documentation

During the impacted soil excavation activities, a field engineer or geologist under supervision of a California Professional Engineer or Geologist will document field observations. The field notes will contain pertinent observations about excavation dimensions, equipment operation, unusual conditions encountered during excavation, date and time of arrival, general Site conditions, confirmation soil sampling activities, and other field observations relating to the Site. Field documentation will also include photographs and written logs as described below.

7.2.1 Field Logbooks

Logs will be maintained daily and will include:

- Records of all personnel and project-related visitors at the Site
- Work conducted

- Equipment used
- Dust monitor readings from field monitoring
- VOC monitoring
- A record of all formal Site meetings such as health and safety meetings, daily tailgate meetings, and agency meetings
- Description of all photographs taken to document the field conditions and activities

Additionally, the contractor will maintain a detailed log of each truck loaded with soil at the Site, and will include truck identification and driver name, destination, excavated materials and estimated size of load, and a field copy of the shipping manifest.

7.2.2 Chain-of-Custody Records

Detailed chain-of-custody records will be maintained for all confirmation samples.

7.2.3 Photographs

The Site will be documented visually with photographs before, during, and after excavation activities.

7.3 Excavation

To mitigate the impacted soils for the protection of human health, approximately 266 cubic yards of existing soil will be excavated and removed from the Site. The impacted excavated soil will be handled, transported, and disposed of based on the analytical results from the PEA-E sampling activities. Approximately 261 cubic yards can be managed as non-hazardous waste and approximately 5 cubic yards can be managed as non-RCRA (California) hazardous waste. It is possible the soil samples data generated during the completion of the vertical and lateral delineation of the excavation areas will result in a different waste classification of the soil to be disposed of, but based on the existing data to date, a classification change is not anticipated at this time. It is anticipated that additional profiling will be conducted as required by the disposal facility. As discussed previously in Section 7.1.1, the volume of soil required to be excavated based on current screening levels may increase after the currently existing structures and pavement are removed, the impacted soil is excavated, and the confirmation sampling is completed. If regulatory screening levels change between the date of this RAW and the time the removal activities occur, soil excavation and disposal volumes may also be subject to change. The remediation contractor will obtain approval from the disposal facilities prior to the start of excavation activities.

7.3.1 Excavation Procedures

Conventional construction equipment, such as a backhoe or excavator with bladed buckets, will be used to excavate the soil. Dust and vapor suppression procedures are discussed above, and monitoring is discussed below.

For the areas where concrete/asphalt exists above the proposed removal area, the existing concrete/asphalt will be saw-cut and broken out with a pneumatic concrete breaker or equivalent. The concrete/asphalt debris will be segregated and stockpiled nearby for offsite disposal when the remaining concrete is removed during non-remedial school redevelopment activities.

Excavations are not anticipated to be deeper than 3.5 feet bgs; therefore, sloping and shoring should not be required. Once the excavations are completed at each selected location, confirmation soil sampling will be conducted. Excavation will proceed in lateral and vertical directions up to the Project Area boundaries until the SSCGs are demonstrated to have been met, as determined from confirmation soil sampling laboratory data results and LAUSD OEHS direction and approval.

It is anticipated that the impacted excavated soil will be direct loaded into trucks for immediate transport to an appropriate offsite disposal facility, to the extent possible. Temporary stockpiling may be necessary based on truck availability and/or other logistics. If the soil is stockpiled, the stockpiles will be placed on plastic sheeting and covered with plastic sheeting at the end of the day, and the edges of the plastic sheeting will be secured with sandbags or similar. The stockpiles will remain covered until load-out.

7.3.2 WASTE SEGREGATION OPERATIONS

The soil excavated from individual excavations within the proposed excavation footprint areas (as depicted on **Figures 3a – 13a**) areas will be properly managed. Approximately 261 cubic yards can be managed as non-hazardous waste and approximately 5 cubic yards can be managed as non-RCRA hazardous waste. The approach used to characterize most of the soil (proposed for excavation) as non-RCRA hazardous waste is discussed below. The Remediation Contractor and Environmental Consultant will oversee truck loading operations to ensure that a properly completed waste manifest accompanies each truck and that it is directed to the appropriate disposal facility, based on its waste classification.

If impacted soil is temporarily stockpiled onsite, the plastic covering will be marked with large letters, applied with spray paint, to indicate the source of the soil and its waste classification. Labels that indicate the waste generator, waste type, accumulation start date, and contact information will be applied to the outside of any drums or roll-off bins used to temporarily store impacted soil. Strict segregation of soil based on waste type will be maintained to avoid any mixture of non-hazardous soil and adjacent clean soil, and hazardous soil, should it be identified.

During the PEA-E investigation, selected soil samples were analyzed for soluble lead concentrations using the TCLP test to determine if the associated soil would be considered hazardous for waste disposal purposes. Analytical results for the two samples tested are summarized below:

Lead Waste Characterization Data

Sample ID	Total Lead Concentration (mg/kg)	STLC Concentration (mg/L)	TCLP Concentration (mg/L)
AOC1-B34-D0.5	100	6.1	0.15
AOC1-B34-N5-D0.5	120	4.5	NA
AOC1-B100-D0.5	83	1.5	NA
AOC1-B108-D0.5	110	0.19	NA

STLC = Soluble Threshold Limit Concentration
TCLP = Toxicity Characteristic Leaching Procedure
NA = Not analyzed
mg/kg = milligrams per kilogram
mg/L = milligrams per liter

The TCLP concentration for lead that defines a waste as RCRA hazardous is 5 mg/L. The TCLP concentration listed in the above table is less than this level. Additional waste characterization will be necessary for soil disposal prior to excavation and disposal of the impacted soil, based on the age of the soil analytical data.

7.3.3 Decontamination Procedures

In addition to the decontamination procedures outlined in the project HASP, additional protocols may be carried out to prevent soil contamination from the use of construction equipment and implementation of other activities as a part of the removal action. The following decontamination procedures may be used:

- Equipment used for excavation will be dry decontaminated prior to moving to other areas of the Site.
- Prior to exiting the Site, the transport truck drivers will be required to stop and inspect the tires and sides of their trucks for loose soil debris. Extra soil will be removed using a wire brush or broom as deemed appropriate. This cleanup/decontamination area will be setup as close to the loading area as possible to minimize spreading the impacted soil.
- Street sweeping procedures will be implemented as necessary to reduce the potential for fugitive dust and migration of contamination.

7.4 Air and Meteorological Monitoring

Airborne dust monitoring will be conducted using a portable hand-held dust monitor to verify and document dust suppression efforts. Fugitive dust control measures will be implemented at the Site to mitigate offsite dust migration onto neighboring properties through light watering of the active excavation areas throughout the removal action. Air monitoring for dust will be performed during the excavation activities in the worker's breathing zone, in the general work area, and at the perimeters of the excavation areas utilizing an upwind/downwind sampling approach. Dust monitoring will be conducted approximately every 30 minutes using a hand-held dust meter. The National Ambient Air Quality Standard (NAAQS) for dust is 50 micrograms per cubic meter ($\mu g/m^3$), based on dust particles measuring 10 micrometers or less (PM10). The NAAQS dust standard (50 $\mu g/m^3$), steady for 5 minutes, has been selected as the action level for dust monitoring activities at the perimeter of the work area (difference between upwind and downwind readings). The action level for dust for the equipment operators and workers will initially be set at 1 milligram per cubic meter (mg/m^3) steady for 5 minutes. This action level will trigger continuous monitoring and increased dust suppression activities to mitigate dust levels below 1 mg/m^3. If dust levels exceed 2.5 mg/m^3 for greater than 5 minutes, operations will be shut down and additional dust suppression activities will be applied to reduce dust levels below 2.5 mg/m^3.

Monitoring for VOCs will be conducted using a photoionization detector (PID) instrument, such as a Mini-Rae®. The PID will be used to monitor the presence and level of organic vapors in the soil being excavated and in the breathing zone of the workers. The PID will be calibrated daily according to the manufacturer's instruction. These organic vapor readings will be recorded on field logs prepared by the field staff during soil removal activities. If necessary, for field-screening of soil samples for VOCs by headspace screening, approximately 250 milliliters (mL) of soil will be placed into a resealable plastic bag or a glass jar sealed with an aluminum foil septum. After approximately 5 minutes, the concentration in the headspace will be measured by inserting the PID probe inside the plastic bag or aluminum foil. Monitoring of VOCs will also be done in compliance with SCAQMD's 1166 Permit if one is required for this project.

7.5 CONFIRMATION SAMPLING

The confirmation sampling program for the proposed removal action will consist of collecting soil confirmation samples from the bottom and sidewalls of the excavations.

Confirmation sampling will be conducted at an approximate frequency of approximately one sample per 20 linear feet of sidewall and one per 500 square feet of excavation bottom. The sidewall samples will be collected at depths similar to the primary soil samples that were previously collected (i.e., 0.5, 1.5, and 2.5 ft bgs). Confirmation sample locations are depicted on **Figures 3b – 13b.** Duplicate samples will be collected and analyzed at a rate of approximately 10 percent of the primary samples.

The confirmation soil samples will be collected from locations along excavation sidewalls and bottoms by scooping the soil directly into laboratory-supplied, new glass sample jars from either the soil face for shallow excavations or the excavator bucket for deeper excavations; thus, there will be no need for the decontamination of sampling equipment or the collection of equipment blanks. If a hand auger is used for multiple sample locations, then an equipment blank will be collected and analyzed. The soil samples will be labeled with the following information: identification (ID) number, project number, Site name, date and time of collection, requested analysis, and the sampler initials. Chain-of-custody documentation will be maintained for all samples and be delivered with the samples to the laboratory.

Confirmation soil samples collected from the excavations around sample locations AOC1-B6, AOC1-B34, and AOC1-B100 will be analyzed for lead using EPA method 6010B. Confirmation soil samples from the excavations around sample location AOC1-B1, AOC1-B8, AOC1-B10, AOC1-B22, AOC1-B58, AOC1-B64, AOC1-B77, AOC1-B78, AOC1-B81, AOC1-B91, and AOC1-B112 will be analyzed for arsenic using EPA method 6010B. Confirmation soil samples from the excavation around sample location AOC1-B108 will be analyzed for lead and arsenic.

Following confirmation sampling and analysis and evaluation of the concentrations of lead and arsenic of the remaining soil, the quantity of soil removed from the excavations will be reconciled by comparing the volumes excavated to the quantities reported on the waste manifests. The volumes of the excavation areas will be estimated based on the final excavation dimensions. The estimated volumes and reported weights should reconcile to a conversion factor between 1.2 and 1.5 tons per cubic yard. Copies of the waste manifests, showing appropriate signatures from the receiving facility, will be included in the Removal Action Completion Report (RACR).

7.6 IMPORT SOIL SAMPLING

Any soil imported to the Site will be tested and certified in accordance with LAUSD Section 01 4524 specifications – "Environmental Import/Export Materials Testing" (November 2018), which includes provisions for LAUSD-OEHS review and approval prior to soil import.

7.7 TRANSPORTATION PLAN FOR OFFSITE DISPOSAL

It is anticipated that approximately 15 transport truckloads will be needed to haul the impacted soil from the Site, assuming approximately 18 cubic yards per truckload. If additional soil needs to be excavated based on confirmation sampling results, the number of truckloads will increase. The excavated soil will be segregated and managed as explained in Section 5.3. Non-RCRA hazardous soils will be transported to an approved landfill for disposal. Non-RCRA hazardous soils will be transported to a licensed and properly permitted Class 1 disposal facility or an out-of-state facility permitted to accept hazardous waste. If RCRA wastes are encountered, the Class 1 disposal facility that accepts the RCRA hazardous soil may require that the soil be treated prior to disposal pursuant to the land ban restrictions found at Title 40, CCR, Part 376. The final determination as to which facilities are used is subject to approval by the LAUSD-OEHS prior to beginning soil removal activities.

7.8 BACKFILL AND SITE RESTORATION

Backfilling of the excavations will be conducted in approximately 12-inch lifts with compaction (using a sheepsfoot roller, wheel rolling with a rubber-tired loader, or other acceptable compaction method) between each successive lift. In-situ density tests will be conducted as requested by LAUSD's geotechnical engineer to achieve the project standards. Compaction may be coordinated with construction activities to limit doubling efforts.

The excavation areas will be backfilled with clean imported soil tested in accordance with LAUSD's specification for Environmental Import/Export Materials Testing (Section 01 4524).

7.9 VARIANCE

As conditions in the field may vary, it may become necessary to implement minor modifications to soil removal activities as presented in this RAW. Field personnel will notify the OEHS project manager when deviations from this RAW are necessary. Modifications to the RAW will be documented in the field logbook and in the RACR.

8.0 PROJECT SCHEDULE

The following provides an anticipated schedule for RAW approval and implementation. This assumes a start date when the 2019 school year is complete, and implementation of the work would not be delayed due to other project activities, such as existing building demolition.

Task	Calendar Days to Complete	Tentative Start Date
Field Preparation	5	June 2019
Soil Removal and Confirmation Sampling	30	June 2019
Data Compilation and preparation of Draft Removal Action Completion Report (RACR)	45	August 2019
Construction of Sub-Slab Depressurization System and Application of a Membrane Such as Liquid Boot® to New Buildings	TBD *	TBD *

* = Future building construction schedule is unknown at this time and is dependent on the schedule contacted between LAUSD and their new construction contractor.

9.0 REPORT OF COMPLETION

Following completion of the removal action, a RACR will be prepared and submitted to the LAUSD for review and approval. The report will include a summary of the removal action activities, deviations from the RAW (if any), confirmation sampling results, figures showing the excavation limits and sampling locations, appropriate tables, laboratory reports, permits, air monitoring results (as necessary), copies of the waste manifests, and other applicable information and data.

10.0 REFERENCES

ATSDR (Agency for Toxic Substances and Disease Registry), 2007a. Arsenic - ToxFAQs, CAS # 7439-92-1. August.

ATSDR (Agency for Toxic Substances and Disease Registry), 2007b. Lead - ToxFAQs, CAS # 7440-38-2. August.

ATSDR (Agency for Toxic Substances and Disease Registry), 2007c. Benzene – ToxFAQs, CAS # 71-43-2. August.

ATSDR (Agency for Toxic Substances and Disease Registry), 2014. Tetrachloroethylene – ToxFAQs, CAS # 127-18-4. October.

Chernoff G, Bosan W, Oudiz D. 2008. *Determination of a Southern California regional background arsenic concentration in soil*.

DTSC (Department of Toxic Substances Control), 2011. *Guidance for the evaluation and mitigation of subsurface vapor intrusion to indoor air (vapor intrusion guidance).* Final.

DTSC (Department of Toxic Substances Control), 2015a. *Preliminary Endangerment Assessment Manual. A guidance manual for evaluating hazardous substance release sites*.

DTSC (Department of Toxic Substances Control), 2015b. *Department of Toxic Substances Control (DTSC) 2015 Advisory – Active Soil Gas Investigations.*

DTSC (Department of Toxic Substances Control), 2018. *HERO HHRA Note Number 3, DTSC-Modified Screening Levels (DTSC-SLs).* June.

LAUSD, 2011. Section 01 4524 Environmental Import/Export Materials Testing. November 2018.

Ninyo & Moore, 2017a. *Phase 1 Environmental Assessment* Reseda High School. August 14.

Ninyo & Moore, 2017b. *Preliminary Environmental Assessment Equivalent Workplan Reseda High School.* August 24.

OEHHA (Office of Environmental Health Hazard Assessment), 2007. Development of health criteria for schools site risk assessment pursuant to Health and Safety Code Section 901(g): child-specific benchmark change in blood lead concentration for school site risk assessment.

OEHHA (Office of Environmental Health Hazard Assessment), 2009. *Revised California human health screening levels for lead*.

Parsons, 2018. *Preliminary Endangerment Assessment - Equivalent Report, Reseda High School Comprehensive Modernization Project*, August 7, 2018.

Parsons, 2019. *Supplemental Preliminary Endangerment Assessment - Equivalent Report,* Reseda High School. February 15.

San Francisco Bay Regional Water Quality Control Board, 2019. *Environmental Screening Levels*. January 24.

USEPA, 2015. *OSWER technical guide for assessing and mitigating the vapor intrusion pathway from subsurface vapor sources to indoor air*. OSWER Publication 9200.2-154.

USEPA (US Environmental Protection Agency). 2018. *Regional Screening Levels for Chemical Contaminants at Superfund Sites*. May. Available online at https://www.epa.gov/risk/regional-screening-levels-rsls

TABLES

TABLE 1

LEAD AND ARSENIC IN SOIL ANALYTICAL RESULTS

LAUSD Reseda High School RAW

Sample Location	Sample ID	Sample Date	Sample Depth	Lead	Arsenic	STLC - Lead	TCLP - Lead
Units			ft bgs	mg/kg	mg/kg	mg/L	mg/L
USEPA Test Method			--	6010B	6010B	6010B	6010B
Screening Level			--	80	12	5.0	5.0
AOC1-B1	AOC1-B1-D0.5	12/20/2017	0.5	55	13	NA	NA
	AOC1-B1-D1.5	12/20/2017	1.5	NA	6.5	NA	NA
	AOC1-B1-D2.5	12/20/2017	2.5	NA	7.1	NA	NA
	AOC1-B1-N5-D0.5	2/24/2018	0.5	NA	7.0	NA	NA
	AOC1-B1-N5-D0.5-DUP	2/24/2018	0.5	NA	8.0	NA	NA
	AOC1-B1-N10-D0.5	2/24/2018	0.5	NA	5.7	NA	NA
	AOC1-B1-E5-D0.5	2/24/2018	0.5	NA	15	NA	NA
	AOC1-B1-E5-D1.5	2/24/2018	1.5	NA	5.4	NA	NA
	AOC1-B1-E5-D2.5	2/24/2018	2.5	NA	6.6	NA	NA
	AOC1-B1-E10-D0.5	2/24/2018	0.5	NA	8.8	NA	NA
	AOC1-B1-W5-D0.5	2/24/2018	0.5	NA	6.0	NA	NA
	AOC1-B1-W10-D0.5	2/24/2018	0.5	NA	12	NA	NA
	AOC1-B1-W10-D0.5-DUP	2/24/2018	0.5	NA	11	NA	NA
AOC1-B2	AOC1-B2-D0.5	12/20/2017	0.5	66	10	NA	NA
AOC1-B3	AOC1-B3-D0.5	12/20/2017	0.5	32	7.4	NA	NA
AOC1-B4	AOC1-B4-D0.5	12/20/2017	0.5	14	7.8	NA	NA
AOC1-B5	AOC1-B5-D0.5	12/20/2017	0.5	11	7.9	NA	NA
AOC1-B6	AOC1-B6-D0.5	12/20/2017	0.5	170	11	2.7	NA
	AOC1-B6-D1.5	12/20/2017	1.5	11	NA	NA	NA
	AOC1-B6-D2.5	12/20/2017	2.5	6.2	NA	NA	NA
	AOC1-B6-N5-D0.5	2/19/2018	0.5	16	NA	NA	NA
	AOC1-B6-N10-D0.5	2/19/2018	0.5	8.3	NA	NA	NA
	AOC1-B6-S5-D0.5	2/19/2018	0.5	9.0	NA	NA	NA
	AOC1-B6-S10-D0.5	2/19/2018	0.5	9.6	NA	NA	NA
	AOC1-B6-W5-D0.5	2/19/2018	0.5	7.5	NA	NA	NA
	AOC1-B6-W10-D0.5	2/19/2018	0.5	5.3	NA	NA	NA
AOC1-B8	AOC1-B8-D0.5	12/20/2017	0.5	73	16	NA	NA
	AOC1-B8-D1.5	12/20/2017	1.5	NA	6.7	NA	NA
	AOC1-B8-D2.5	12/20/2017	2.5	NA	5.3	NA	NA
	AOC1-B8-S10-D0.5	2/19/2018	0.5	NA	18	NA	NA
	AOC1-B8-S10-D0.5-DUP	2/19/2018	0.5	NA	17	NA	NA
	AOC1-B8-S10-D1.5	2/19/2018	1.5	NA	12	NA	NA
	AOC1-B8-S10-D2.5	2/19/2018	2.5	NA	7.6	NA	NA
	AOC1-B8-S15-D0.5	3/26/2018	0.5	NA	12	NA	NA
	AOC1-B8-S15-D0.5-DUP	3/26/2018	0.5	NA	13	NA	NA
	AOC1-B8-S15-D1.5	3/26/2018	1.5	NA	7.0	NA	NA
	AOC1-B8-S15-D2.5	3/26/2018	2.5	NA	5.8	NA	NA
	AOC1-B8-S20-D0.5	3/26/2018	0.5	NA	9.0	NA	NA
AOC1-B9	AOC1-B9-D0.5	12/20/2017	0.5	6.9	7.5	NA	NA
AOC1-B10	AOC1-B10-D0.5	12/20/2017	0.5	18	32	NA	NA
	AOC1-B10-D1.5	12/20/2017	1.5	NA	11	NA	NA
	AOC1-B10-D2.5	12/20/2017	2.5	NA	11	NA	NA
	AOC1-B10-N5-D0.5	2/24/2018	0.5	NA	15	NA	NA
	AOC1-B10-N5-D0.5-DUP	2/24/2018	0.5	NA	11	NA	NA
	AOC1-B10-N5-D1.5	2/24/2018	1.5	NA	8.9	NA	NA
	AOC1-B10-N5-D2.5	2/24/2018	2.5	NA	5.8	NA	NA
	AOC1-B10-N10-D0.5	2/24/2018	0.5	NA	4.5	NA	NA
	AOC1-B10-S5-D0.5	2/24/2018	0.5	NA	9.6	NA	NA
	AOC1-B10-S10-D0.5	2/24/2018	0.5	NA	7.9	NA	NA
	AOC1-B10-W5-D0.5	2/24/2018	0.5	NA	16	NA	NA
	AOC1-B10-W5-D1.5	2/24/2018	1.5	NA	6.4	NA	NA
	AOC1-B10-W5-D2.5	2/24/2018	2.5	NA	12	NA	NA
	AOC1-B10-W10-D0.5	2/24/2018	0.5	NA	12	NA	NA
AOC1-B11	AOC1-B11-D0.5	12/20/2017	0.5	11	7.8	NA	NA
AOC1-B12	AOC1-B12-D0.5	12/20/2017	0.5	12	9.7	NA	NA
AOC1-B13	AOC1-B13-D0.5	12/20/2017	0.5	29	10	NA	NA
AOC1-B14	AOC1-B14-D0.5	12/20/2017	0.5	17	9.7	NA	NA
AOC1-B15	AOC1-B15-D0.5	12/20/2017	0.5	42	8.9	NA	NA
AOC1-B16	AOC1-B16-D0.5	12/20/2017	0.5	7.0	5.6	NA	NA
AOC1-B17	AOC1-B17-D0.5	12/20/2017	0.5	9.9	6.8	NA	NA
AOC1-B18	AOC1-B18-D0.5	12/20/2017	0.5	5.0	6.1	NA	NA

TABLE 1
LEAD AND ARSENIC IN SOIL ANALYTICAL RESULTS
LAUSD Reseda High School RAW

Sample Location	Sample ID	Sample Date	Sample Depth	Lead	Arsenic	STLC - Lead	TCLP - Lead
Units			ft bgs	mg/kg	mg/kg	mg/L	mg/L
USEPA Test Method			--	6010B	6010B	6010B	6010B
Screening Level			--	80	12	5.0	5.0
	AOC1-B18-D0.5-DUP	12/20/2017	0.5	5.8	7.0	NA	NA
AOC1-B19	AOC1-B19-D0.5	12/19/2017	0.5	5.6	6.6	NA	NA
AOC1-B20	AOC1-B20-D0.5	12/19/2017	0.5	18	4.8	NA	NA
AOC1-B21	AOC1-B21-D0.5	12/20/2017	0.5	33	5.8	NA	NA
	AOC1-B21-D0.5-DUP	12/20/2017	0.5	41	6.7	NA	NA
AOC1-B22	AOC1-B22-D0.5	12/19/2017	0.5	32	21	NA	NA
	AOC1-B22-D1.5	12/19/2017	1.5	NA	8.7	NA	NA
	AOC1-B22-D2.5	12/19/2017	2.5	NA	11	NA	NA
	AOC1-B22-N5-D0.5	2/19/2018	0.5	NA	16	NA	NA
	AOC1-B22-N5-D1.5	2/19/2018	1.5	NA	11	NA	NA
AOC1-B22 Con't.	AOC1-B22-N5-D2.5	2/19/2018	2.5	NA	7.8	NA	NA
	AOC1-B22-N10-D0.5	2/19/2018	0.5	NA	23	NA	NA
	AOC1-B22-N10-D0.5-DUP	2/19/2018	0.5	NA	6.9	NA	NA
	AOC1-B22-N10-D1.5	2/19/2018	1.5	NA	6.8	NA	NA
	AOC1-B22-N10-D2.5	2/19/2018	2.5	NA	6.1	NA	NA
	AOC1-B22-N15-D0.5	3/26/2018	0.5	NA	26	NA	NA
	AOC1-B22-N15-D1.5	3/26/2018	1.5	NA	13	NA	NA
	AOC1-B22-N15-D2.5	3/26/2018	2.5	NA	6.9	NA	NA
	AOC1-B22-S5-D0.5	2/19/2018	0.5	NA	16	NA	NA
	AOC1-B22-S5-D1.5	2/19/2018	1.5	NA	9.1	NA	NA
	AOC1-B22-S5-D2.5	2/19/2018	2.5	NA	7.5	NA	NA
	AOC1-B22-S10-D0.5	2/19/2018	0.5	NA	18	NA	NA
	AOC1-B22-S10-D1.5	2/19/2018	1.5	NA	9.0	NA	NA
	AOC1-B22-S10-D2.5	2/19/2018	2.5	NA	5.4	NA	NA
	AOC1-B22-S15-D0.5	3/26/2018	0.5	NA	14	NA	NA
	AOC1-B22-S15-D1.5	3/26/2018	1.5	NA	8.9	NA	NA
	AOC1-B22-S15-D2.5	3/26/2018	2.5	NA	7.0	NA	NA
	AOC1-B22-S20-D0.5	3/26/2018	0.5	NA	13	NA	NA
	AOC1-B22-S20-D0.5-DUP	3/26/2018	0.5	NA	20	NA	NA
	AOC1-B22-S20-D1.5	3/26/2018	1.5	NA	7.2	NA	NA
	AOC1-B22-S20-D2.5	3/26/2018	2.5	NA	6.5	NA	NA
	AOC1-B22-E5-D0.5	2/19/2018	0.5	NA	6.1	NA	NA
AOC1-B23	AOC1-B23-D0.5	12/20/2017	0.5	8.6	8.5	NA	NA
AOC1-B24	AOC1-B24-D0.5	12/20/2017	0.5	8.8	9.7	NA	NA
AOC1-B25	AOC1-B25-D0.5	12/20/2017	0.5	6.5	5.9	NA	NA
AOC1-B26	AOC1-B26-D0.5	12/20/2017	0.5	13	9.2	NA	NA
AOC1-B27	AOC1-B27-D0.5	12/20/2017	0.5	8.6	11	NA	NA
AOC1-B28	AOC1-B28-D0.5	12/20/2017	0.5	9.3	8.9	NA	NA
	AOC1-B28-0.5-DUP	12/20/2017	0.5	8.4	8.4	NA	NA
AOC1-B29	AOC1-B29-D0.5	12/20/2017	0.5	7.4	7.6	NA	NA
AOC1-B30	AOC1-B30-D0.5	12/18/2017	0.5	6.6	5.4	NA	NA
AOC1-B31	AOC1-B31-D0.5	12/18/2017	0.5	24	5.6	NA	NA
AOC1-B33	AOC1-B33-D0.5	12/18/2017	0.5	26	9.6	NA	NA
AOC1-B34	AOC1-B34-D0.5	12/18/2017	0.5	100	5.6	6.1	0.15
	AOC1-B34-D1.5	12/18/2017	1.5	21	NA	NA	NA
	AOC1-B34-D2.5	12/18/2017	2.5	29	NA	NA	NA
	AOC1-B34-N5-D0.5	2/24/2018	0.5	120	NA	4.5	NA
	AOC1-B34-N5-D1.5	2/24/2018	1.5	40	NA	NA	NA
	AOC1-B34-N5-D2.5	2/24/2018	2.5	28	NA	NA	NA
	AOC1-B34-N10-D0.5	2/24/2018	0.5	19	NA	NA	NA
	AOC1-B34-S5-D0.5	2/24/2018	0.5	43	NA	NA	NA
	AOC1-B34-S5-D0.5-DUP	2/24/2018	0.5	18	NA	NA	NA
	AOC1-B34-S10-D0.5	2/24/2018	0.5	34	NA	NA	NA
	AOC1-B34-W5-D0.5	2/24/2018	0.5	20	NA	NA	NA
	AOC1-B34-W10-D0.5	2/24/2018	0.5	8.8	NA	NA	NA
AOC1-B36	AOC1-B36-D0.5	12/18/2017	0.5	26	11	NA	NA
AOC1-B37	AOC1-B37-D0.5	12/18/2017	0.5	13	6.6	NA	NA
AOC1-B38	AOC1-B38-D0.5	12/18/2017	0.5	33	9.6	NA	NA
AOC1-B39	AOC1-B39-D0.5	12/18/2017	0.5	19	8.4	NA	NA
AOC1-B40	AOC1-B40-D0.5	12/18/2017	0.5	14	6.7	NA	NA
AOC1-B41	AOC1-B41-D0.5	12/18/2017	0.5	54	8.7	NA	NA

TABLE 1
LEAD AND ARSENIC IN SOIL ANALYTICAL RESULTS
LAUSD Reseda High School RAW

Sample Location	Sample ID	Sample Date	Sample Depth	Lead	Arsenic	STLC - Lead	TCLP - Lead
Units			ft bgs	mg/kg	mg/kg	mg/L	mg/L
USEPA Test Method			--	6010B	6010B	6010B	6010B
Screening Level			--	80	12	5.0	5.0
AOC1-B43	AOC1-B43-D0.5	12/18/2017	0.5	4.0	3.4	NA	NA
AOC1-B44	AOC1-B44-D0.5	12/18/2017	0.5	28	5.8	NA	NA
AOC1-B45	AOC1-B45-D0.5	12/18/2017	0.5	46	8.5	NA	NA
AOC1-B46	AOC1-B46-D0.5	12/18/2017	0.5	19	4.6	NA	NA
AOC1-B47	AOC1-B47-D0.5	12/18/2017	0.5	6.0	4.2	NA	NA
AOC1-B48	AOC1-B48-D0.5	12/19/2017	0.5	5.7	6.0	NA	NA
	AOC1-B48-D0.5-DUP	12/19/2017	0.5	5.7	6.7	NA	NA
AOC1-B51	AOC1-B51-D0.5	12/18/2017	0.5	13	4.6	NA	NA
AOC1-B52	AOC1-B52-D0.5	12/18/2017	0.5	8.6	9.1	NA	NA
AOC1-B54	AOC1-B54-D0.5	12/18/2017	0.5	37	7.3	NA	NA
AOC1-B55	AOC1-B55-D0.5	12/18/2017	0.5	32	7.3	NA	NA
AOC1-B57	AOC1-B57-D0.5	12/19/2017	0.5	9.7	8.0	NA	NA
	AOC1-B57-D0.5-DUP	12/19/2017	0.5	11	8.0	NA	NA
AOC1-B58	AOC1-B58-D0.5	12/18/2017	0.5	27	13	NA	NA
	AOC1-B58-D1.5	12/18/2017	1.5	NA	8.9	NA	NA
	AOC1-B58-D2.5	12/18/2017	2.5	NA	8.0	NA	NA
	AOC1-B58-N5-D0.5	2/24/2018	0.5	NA	8.0	NA	NA
	AOC1-B58-N5-D0.5-DUP	2/24/2018	0.5	NA	5.8	NA	NA
	AOC1-B58-N10-D0.5	2/24/2018	0.5	NA	9.3	NA	NA
	AOC1-B58-S5-D0.5	2/24/2018	0.5	NA	6.3	NA	NA
AOC1-B58 Con't.	AOC1-B58-S10-D0.5	2/24/2018	0.5	NA	5.9	NA	NA
	AOC1-B58-E5-D0.5	2/24/2018	0.5	NA	5.8	NA	NA
	AOC1-B58-E5-D0.5-DUP	2/24/2018	0.5	NA	8.4	NA	NA
AOC1-B58 / AOC1-B64	AOC1-B58/64-9-D0.5	2/24/2018	0.5	NA	7.9	NA	NA
AOC1-B59	AOC1-B59-D0.5	12/18/2017	0.5	23	7.5	NA	NA
	AOC1B59-D0.5-DUP	12/18/2017	0.5	13	7.7	NA	NA
AOC1-B60	AOC1-B60-D0.5	12/18/2017	0.5	4.0	3.6	NA	NA
	AOC1-B60-D0.5-DUP	12/18/2017	0.5	11	6.4	NA	NA
AOC1-B61	AOC1-B61-D0.5	12/18/2017	0.5	18	6.8	NA	NA
	AOC1-B61-D0.5-DUP	12/18/2017	0.5	9.7	5.9	NA	NA
AOC1-B62	AOC1-B62-D0.5	12/18/2017	0.5	15	7.8	NA	NA
AOC1-B63	AOC1-B63-D0.5	12/19/2017	0.5	9.0	7.0	NA	NA
AOC1-B64	AOC1-B64-D0.5	12/18/2017	0.5	35	13	NA	NA
	AOC1-B64-D1.5	12/18/2017	1.5	NA	9.1	NA	NA
	AOC1-B64-D2.5	12/18/2017	2.5	NA	7.6	NA	NA
	AOC1-B64-N5-D0.5	2/24/2018	0.5	NA	12	NA	NA
	AOC1-B64-N10-D0.5	2/24/2018	0.5	NA	7.3	NA	NA
	AOC1-B64-S5-D0.5	2/24/2018	0.5	NA	7.6	NA	NA
	AOC1-B64-S10-D0.5	2/24/2018	0.5	NA	6.0	NA	NA
	AOC1-B64-W5-D0.5	2/24/2018	0.5	NA	7.9	NA	NA
	AOC1-B64-W5-D0.5-DUP	2/24/2018	0.5	NA	12	NA	NA
	AOC1-B64-N5-D0.5-DUP	2/24/2018	0.5	NA	10	NA	NA
AOC1-B65	AOC1-B65-D0.5	12/18/2017	0.5	34	7.9	NA	NA
AOC1-B66	AOC1-B66-D0.5	12/19/2017	0.5	25	8.8	NA	NA
AOC1-B67	AOC1-B67-D0.5	12/18/2017	0.5	29	7.5	NA	NA
AOC1-B68	AOC1-B68-D0.5	12/19/2017	0.5	30	7.1	NA	NA
AOC1-B69	AOC1-B69-D0.5	12/19/2017	0.5	44	9.1	NA	NA
AOC1-B70	AOC1-B70-D0.5	12/18/2017	0.5	30	4.8	NA	NA
	AOC1-B70-D0.5-DUP	12/18/2017	0.5	23	6.9	NA	NA
AOC1-B71	AOC1-B71-D0.5	12/19/2017	0.5	18	6.5	NA	NA
AOC1-B72	AOC1-B72-D0.5	12/19/2017	0.5	38	5.5	NA	NA
AOC1-B73	AOC1-B73-D0.5	12/19/2017	0.5	37	4.3	NA	NA
AOC1-B74	AOC1-B74-D0.5	12/19/2017	0.5	23	5.0	NA	NA
AOC1-B75	AOC1-B75-D0.5	12/19/2017	0.5	6.7	5.0	NA	NA
AOC1-B76	AOC1-B76-D0.5	12/19/2017	0.5	13	7.1	NA	NA
AOC1-B77	AOC1-B77-D0.5	12/19/2017	0.5	19	19	NA	NA
	AOC1-B77-D1.5	12/19/2017	1.5	NA	37	NA	NA
	AOC1-B77-D2.5	12/19/2017	2.5	NA	20	NA	NA
	AOC1-B77-D3.5	3/26/2018	3.5	NA	7.2	NA	NA
	AOC1-B77-NW5-D0.5	2/19/2018	0.5	NA	31	NA	NA
	AOC1-B77-NW5-D1.5	2/19/2018	1.5	NA	20	NA	NA

Sample Location	Sample ID	Sample Date	Sample Depth	Lead	Arsenic	STLC - Lead	TCLP - Lead
Units			ft bgs	mg/kg	mg/kg	mg/L	mg/L
USEPA Test Method			--	6010B	6010B	6010B	6010B
Screening Level			--	80	12	5.0	5.0
	AOC1-B77-NW5-D2.5	2/19/2018	2.5	NA	13	NA	NA
	AOC1-B77-NW5-D2.5-DUP	2/19/2018	2.5	NA	9.4	NA	NA
	AOC1-B77-NW5-D3.5	3/26/2018	3.5	NA	9.4	NA	NA
	AOC1-B77-NW10-D0.5	2/19/2018	0.5	NA	12	NA	NA
	AOC1-B77-NW10-D1.5	2/19/2018	1.5	NA	16	NA	NA
	AOC1-B77-NW10-D2.5	2/19/2018	2.5	NA	13	NA	NA
	AOC1-B77-NW10-D3.5	3/26/2018	3.5	NA	9.9	NA	NA
	AOC1-B77-NW20-D0.5	3/26/2018	0.5	NA	23	NA	NA
	AOC1-B77-NW20-D0.5-DUP	3/26/2018	0.5	NA	11	NA	NA
	AOC1-B77-NW20-D1.5	3/26/2018	1.5	NA	10	NA	NA
	AOC1-B77-NW20-D2.5	3/26/2018	2.5	NA	8.5	NA	NA
	AOC1-B77-NW38-D0.5	3/26/2018	0.5	NA	20	NA	NA
	AOC1-B77-NW38-D0.5-DUP	3/26/2018	0.5	NA	19	NA	NA
	AOC1-B77-NW38-D1.5	3/26/2018	1.5	NA	6.5	NA	NA
	AOC1-B77-NW38-D2.5	3/26/2018	2.5	NA	8.7	NA	NA
	AOC1-B77-SW5-D0.5	2/19/2018	0.5	NA	10	NA	NA
	AOC1-B77-SW5-D1.5	2/19/2018	1.5	NA	31	NA	NA
	AOC1-B77-SW5-D2.5	2/19/2018	2.5	NA	16	NA	NA
	AOC1-B77-SW5-D3.5	5/12/2018	3.5	NA	9.3	NA	NA
	AOC1-B77-SW10-D0.5	2/19/2018	0.5	NA	12	NA	NA
	AOC1-B77-SW10-D1.5	2/19/2018	1.5	NA	7.1	NA	NA
	AOC1-B77-SW10-D2.5	2/19/2018	2.5	NA	5.2	NA	NA
	AOC1-B77-SE5-D0.5	2/19/2018	0.5	NA	26	NA	NA
	AOC1-B77-SE5-D1.5	2/19/2018	1.5	NA	16	NA	NA
	AOC1-B77-SE5-D2.5	2/19/2018	2.5	NA	8.7	NA	NA
	AOC1-B77-SE5-D3.5	3/26/2018	3.5	NA	9.3	NA	NA
	AOC1-B77-SE10-D0.5	2/19/2018	0.5	NA	32	NA	NA
	AOC1-B77-SE10-D1.5	2/19/2018	1.5	NA	13	NA	NA
	AOC1-B77-SE10-D2.5	2/19/2018	2.5	NA	6.7	NA	NA
	AOC1-B77-SE22-D0.5	3/26/2018	0.5	NA	21	NA	NA
AOC1-B77	AOC1-B77-SE22-D1.5	3/26/2018	1.5	NA	15	NA	NA
Con't.	AOC1-B77-SE22-D2.5	3/26/2018	2.5	NA	7.4	NA	NA
AOC1-B78	AOC1-B78-D0.5	12/19/2017	0.5	37	13	NA	NA
	AOC1-B78-D1.5	12/19/2017	1.5	NA	16	NA	NA
	AOC1-B78-D2.5	12/19/2017	2.5	NA	12	NA	NA
	AOC1-B78-NW5-D0.5	2/19/2018	0.5	NA	14	NA	NA
	AOC1-B78-NW5-D1.5	2/19/2018	1.5	NA	8.6	NA	NA
	AOC1-B78-NW10-D0.5	2/19/2018	0.5	NA	19	NA	NA
	AOC1-B78-NW10-D0.5-DUP	2/19/2018	0.5	NA	22	NA	NA
	AOC1-B78-NW10-D1.5	2/19/2018	1.5	NA	7.5	NA	NA
	AOC1-B78-NW22-D0.5	3/26/2018	0.5	NA	11	NA	NA
	AOC1-B78-SE5-D0.5	2/19/2018	0.5	NA	31	NA	NA
	AOC1-B78-SE5-D1.5	2/19/2018	1.5	NA	8.5	NA	NA
	AOC1-B78-SE5-D1.5-DUP	2/19/2018	1.5	NA	8.6	NA	NA
	AOC1-B78-SW5-D0.5	2/19/2018	0.5	NA	7.6	NA	NA
	AOC1-B78-SW5-D1.5	2/19/2018	1.5	NA	8.6	NA	NA
	AOC1-B78-SW10-D0.5	2/19/2018	0.5	NA	8.4	NA	NA
	AOC1-B78-SW10-D0.5-DUP	2/19/2018	0.5	NA	7.3	NA	NA
	AOC1-B78-SW10-D1.5	2/19/2018	1.5	NA	6.8	NA	NA
AOC1-B79	AOC1-B79-D0.5	12/19/2017	0.5	4.9	3.4	NA	NA
AOC1-B80	AOC1-B80-D0.5	12/19/2017	0.5	3.7	2.7J	NA	NA
AOC1-B81	AOC1-B81-D0.5	12/19/2017	0.5	22	16	NA	NA
	AOC1-B81-D1.5	12/19/2017	1.5	NA	11	NA	NA
	AOC1-B81-D2.5	12/19/2017	2.5	NA	14	NA	NA
	AOC1-B81-D3.5	5/12/2018	3.5	NA	8.3	NA	NA
	AOC1-B81-NE5-D0.5	2/19/2018	0.5	NA	15	NA	NA
	AOC1-B81-NE5-D1.5	2/19/2018	1.5	NA	7.1	NA	NA
	AOC1-B81-NE5-D2.5	2/19/2018	2.5	NA	9.4	NA	NA
	AOC1-B81-NE10-D0.5	2/19/2018	0.5	NA	19	NA	NA
	AOC1-B81-NE10-D1.5	2/19/2018	1.5	NA	8.1	NA	NA
	AOC1-B81-NE10-D2.5	2/19/2018	2.5	NA	6.9	NA	NA

TABLE 1
LEAD AND ARSENIC IN SOIL ANALYTICAL RESULTS
LAUSD Reseda High School RAW

Sample Location	Sample ID	Sample Date	Sample Depth	Lead	Arsenic	STLC - Lead	TCLP - Lead
Units			ft bgs	mg/kg	mg/kg	mg/L	mg/L
USEPA Test Method			--	6010B	6010B	6010B	6010B
Screening Level			--	80	12	5.0	5.0
	AOC1-B81-NE15-D0.5	3/26/2018	0.5	NA	23	NA	NA
	AOC1-B81-NE15-D0.DUP	3/26/2018	0.5	NA	26	NA	NA
	AOC1-B81-NE15-D1.5	3/26/2018	1.5	NA	8.6	NA	NA
	AOC1-B81-NE15-D2.5	3/26/2018	2.5	NA	4.8	NA	NA
	AOC1-B81-NE20-D0.5	3/26/2018	0.5	NA	33	NA	NA
	AOC1-B81-NE20-D1.5	3/26/2018	1.5	NA	6.6	NA	NA
	AOC1-B81-NE20-D2.5	3/26/2018	2.5	NA	4.7	NA	NA
	AOC1B81-NE35-D0.5	5/12/2018	0.5	NA	20	NA	NA
	AOC1B81-NE35-D0.5 DUP	5/12/2018	0.5	NA	11	NA	NA
	AOC1B81-NE35-D1.5	5/12/2018	1.5	NA	6.6	NA	NA
	AOC1B81-NE35-D2.5	5/12/2018	2.5	NA	6.7	NA	NA
	AOC1-B81-NW5-D0.5	2/19/2018	0.5	NA	6.5	NA	NA
	AOC1-B81-NW5-D1.5-DUP	2/19/2018	1.5	NA	6.5	NA	NA
	AOC1-B81-NW5-D1.5	2/19/2018	1.5	NA	5.4	NA	NA
	AOC1-B81-NW5-D2.5	2/19/2018	2.5	NA	5.9	NA	NA
	AOC1-B81-SE5-D0.5	2/19/2018	0.5	NA	6.4	NA	NA
	AOC1-B81-SE5-D1.5	2/19/2018	1.5	NA	6.4	NA	NA
	AOC1-B81-SE5-D2.5	2/19/2018	2.5	NA	7.1	NA	NA
	AOC1-B81-SE10-D0.5	2/19/2018	0.5	NA	6.8	NA	NA
	AOC1-B81-SE10-D1.5	2/19/2018	1.5	NA	6.4	NA	NA
	AOC1-B81-SE10-D2.5	2/19/2018	2.5	NA	6.7	NA	NA
	AOC1-B81-SW5-D0.5	2/19/2018	0.5	NA	14	NA	NA
	AOC1-B81-SW5-D1.5	2/19/2018	1.5	NA	6.9	NA	NA
	AOC1-B81-SW5-D1.5-DUP	2/19/2018	1.5	NA	7.3	NA	NA
	AOC1-B81-SW5-D2.5	2/19/2018	2.5	NA	6.8	NA	NA
	AOC1-B81-SW10-D0.5	2/19/2018	0.5	NA	33	NA	NA
	AOC1-B81-SW10-D1.5	2/19/2018	1.5	NA	12	NA	NA
	AOC1-B81-SW10-D2.5	2/19/2018	2.5	NA	12	NA	NA
	AOC1-B81-SW15-D0.5	3/26/2018	0.5	NA	18	NA	NA
	AOC1-B81-SW15-D1.5	3/26/2018	1.5	NA	7.5	NA	NA
	AOC1-B81-SW15-D2.5	3/26/2018	2.5	NA	6.4	NA	NA
	AOC1-B81-SW20-D0.5	3/26/2018	0.5	NA	26	NA	NA
	AOC1-B81-SW20-D0.5-DUP	3/26/2018	0.5	NA	3.7	NA	NA
	AOC1-B81-SW20-D1.5	3/26/2018	1.5	NA	6.3	NA	NA
	AOC1-B81-SW20-D2.5	3/26/2018	2.5	NA	5.5	NA	NA
AOC1-B82	AOC1-B82-D0.5	12/19/2017	0.5	3.8	3.1	NA	NA
AOC1-B83	AOC1-B83-D0.5	12/19/2017	0.5	10	7.0	NA	NA
AOC1-B84	AOC1-B84-D0.5	12/19/2017	0.5	17	9.8	NA	NA
AOC1-B85	AOC1-B85-D0.5	12/19/2017	0.5	6.8	6.1	NA	NA
AOC1-B86	AOC1-B86-D0.5	12/19/2017	0.5	4.8	2.8J	NA	NA
AOC1-B87	AOC1-B87-D0.5	12/19/2017	0.5	7.6	7.0	NA	NA
AOC1-B88	AOC1-B88-D0.5	12/19/2017	0.5	10	8.7	NA	NA
AOC1-B89	AOC1-B89-D0.5	12/19/2017	0.5	8.1	6.4	NA	NA
AOC1-B90	AOC1-B90-D0.5	12/21/2017	0.5	9.1	6.2	NA	NA
AOC1-B91	AOC1-B91-D0.5	12/21/2017	0.5	61	19	NA	NA
	AOC1-B91-D1.5	12/21/2017	1.5	NA	7.3	NA	NA
	AOC1-B91-D2.5	12/21/2017	2.5	NA	6.0	NA	NA
	AOC1-B91-N5-D0.5	2/24/2018	0.5	NA	25	NA	NA
	AOC1-B91-N5-D1.5	2/24/2018	1.5	NA	15	NA	NA
	AOC1-B91-N5-D2.5	2/24/2018	2.5	NA	15	NA	NA
	AOC1-B91-N5-D3.5	5/12/2018	3.5	NA	6.7	NA	NA
	AOC1-B91-N10-D0.5	2/24/2018	0.5	NA	7.2	NA	NA
	AOC1-B91-N10-D0.5-DUP	2/24/2018	0.5	NA	16	NA	NA
	AOC1-B91-N10-D1.5	2/24/2018	1.5	NA	8.6	NA	NA
	AOC1-B91-N10-D2.5	2/24/2018	2.5	NA	4.8	NA	NA
	AOC1-B91-N15-D0.5	3/26/2018	0.5	NA	14	NA	NA
	AOC1-B91-N15-D1.5	3/26/2018	1.5	NA	5.1	NA	NA
	AOC1-B91-N15-D2.5	3/26/2018	2.5	NA	4.2	NA	NA
	AOC1-B91-N20-D0.5	3/26/2018	0.5	NA	16	NA	NA
	AOC1-B91-N20-D1.5	3/26/2018	1.5	NA	6.4	NA	NA
	AOC1-B91-N20-D2.5	3/26/2018	2.5	NA	3.2	NA	NA

TABLE 1
LEAD AND ARSENIC IN SOIL ANALYTICAL RESULTS
LAUSD Reseda High School RAW

Sample Location	Sample ID	Sample Date	Sample Depth	Lead	Arsenic	STLC - Lead	TCLP - Lead
Units			ft bgs	mg/kg	mg/kg	mg/L	mg/L
USEPA Test Method			--	6010B	6010B	6010B	6010B
Screening Level			--	80	12	5.0	5.0
	AOC1-B91-N30-D0.5	5/12/2018	0.5	NA	7.3	NA	NA
	AOC1-B91-S5-D0.5	2/24/2018	0.5	NA	21	NA	NA
	AOC1-B91-S5-D1.5	2/24/2018	1.5	NA	7.5	NA	NA
	AOC1-B91-S5-D2.5	2/24/2018	2.5	NA	4.5	NA	NA
	AOC1-B91-S10-D0.5	2/24/2018	0.5	NA	5.8	NA	NA
	AOC1-B91-S10-D0.5-DUP	2/24/2018	0.5	NA	7.3	NA	NA
	AOC1-B91-E5-D0.5	3/26/2018	0.5	NA	6.0	NA	NA
	AOC1-B91-E10-D0.5	3/26/2018	0.5	NA	4.3	NA	NA
	AOC1-B91-E10-D0.5-DUP	3/26/2018	0.5	NA	1.9 J	NA	NA
AOC1-B92	AOC1-B92-D0.5	12/21/2017	0.5	58	9.0	NA	NA
AOC1-B93	AOC1-B93-D0.5	12/20/2017	0.5	9.0	6.0	NA	NA
AOC1-B94	AOC1-B94-D0.5	12/20/2017	0.5	6.4	7.9	NA	NA
AOC1-B95	AOC1-B95-D0.5	12/20/2017	0.5	7.0	7.5	NA	NA
AOC1-B96	AOC1-B96-D0.5	12/20/2017	0.5	12	8.1	NA	NA
AOC1-B97	AOC1-B97-D0.5	12/20/2017	0.5	19	8.5	NA	NA
AOC1-B98	AOC1-B98-D0.5	12/21/2017	0.5	7.6	6.8	NA	NA
AOC1-B99	AOC1-B99-D0.5	12/21/2017	0.5	47	9.1	NA	NA
AOC1-B100	AOC1-B100-D0.5	12/21/2017	0.5	83	11	1.5	NA
	AOC1-B100-D1.5	12/21/2017	1.5	7.0	NA	NA	NA
	AOC1-B100-D2.5	12/21/2017	2.5	8.4	NA	NA	NA
	AOC1-B100-N5-D0.5	2/19/2018	0.5	9.8	NA	NA	NA
	AOC1-B100-S5-D0.5	2/19/2018	0.5	11	NA	NA	NA
	AOC1-B100-S10-D0.5	2/19/2018	0.5	26	NA	NA	NA
	AOC1-B100-E5-D0.5	2/19/2018	0.5	21	NA	NA	NA
	AOC1-B100-E5-D0.5-DUP	2/19/2018	0.5	13	NA	NA	NA
	AOC1-B100-E10-D0.5	2/19/2018	0.5	29	NA	NA	NA
	AOC1-B100-W5-D0.5	2/19/2018	0.5	36	NA	NA	NA
	AOC1-B100-W10-D0.5	2/19/2018	0.5	17	NA	NA	NA
AOC1-B101	AOC1-B101-D0.5	12/21/2017	0.5	6.0	7.0	NA	NA
	AOC1-B101-D0.5 DUP	12/21/2017	0.5	6.0	5.7	NA	NA
AOC1-B102	AOC1-B102-D0.5	12/21/2017	0.5	8.2	5.1	NA	NA
AOC1-B103	AOC1-B103-D0.5	12/21/2017	0.5	4.6	3.8	NA	NA
AOC1-B104	AOC1-B104-D0.5	12/21/2017	0.5	7.1	5.0	NA	NA
AOC1-B105	AOC1-B105-D0.5	12/21/2017	0.5	7.0	5.7	NA	NA
AOC1-B106	AOC1-B106-D0.5	12/21/2017	0.5	6.2	6.0	NA	NA
AOC1-B107	AOC1-B107-D0.5	12/21/2017	0.5	6.5	6.1	NA	NA
AOC1-B108	AOC1-B108-D0.5	12/21/2017	0.5	110	17	0.19	NA
	AOC1-B108-D1.5	12/21/2017	1.5	6.3	9.6	NA	NA
	AOC1-B108-D2.5	12/21/2017	2.5	8.3	7.1	NA	NA
	AOC1-B108-S5-D0.5	2/19/2018	0.5	6.0	6.0	NA	NA
	AOC1-B108-S10-D0.5	2/19/2018	0.5	7.4	5.6	NA	NA
	AOC1-B108-S10-D0.5-DUP	2/20/2018	1.5	5.3	5.8	NA	NA
	AOC1-B108-E5-D0.5	2/19/2018	0.5	6.6	8.1	NA	NA
AOC1-B109	AOC1-B109-D0.5	12/21/2017	0.5	5.9	5.7	NA	NA
AOC1-B110	AOC1-B110-D0.5	12/21/2017	0.5	6.9	6.4	NA	NA
AOC1-B111	AOC1-B111-D0.5	12/21/2017	0.5	8.6	4.2	NA	NA
AOC1-B112	AOC1-B112-D0.5	12/21/2017	0.5	9.3	13	NA	NA
	AOC1-B112-D1.5	12/21/2017	1.5	NA	8.4	NA	NA
	AOC1-B112-D2.5	12/21/2017	2.5	NA	6.2	NA	NA
	AOC1-B112-N5-D0.5	2/19/2018	0.5	NA	13	NA	NA
	AOC1-B112-N5-D1.5	2/19/2018	1.5	NA	7.1	NA	NA
	AOC1-B112-N5-D2.5	2/19/2018	2.5	NA	8.7	NA	NA
	AOC1-B112-N10-D0.5	2/19/2018	0.5	NA	13	NA	NA
	AOC1-B112-N10-D1.5	2/19/2018	1.5	NA	7.8	NA	NA
AOC1-B112 Con't.	AOC1-B112-N10-D2.5	2/19/2018	2.5	NA	8.2	NA	NA
	AOC1-B112-N15-D0.5	3/26/2018	0.5	NA	15	NA	NA
	AOC1-B112-N15-D0.5-DUP	3/26/2018	0.5	NA	11	NA	NA
	AOC1-B112-N15-D1.5	3/26/2018	1.5	NA	5.4	NA	NA
	AOC1-B112-N15-D2.5	3/26/2018	2.5	NA	9.2	NA	NA
	AOC1-B112-N20-D0.5	3/26/2018	0.5	NA	7.5	NA	NA
	AOC1-B112-W5-D0.5	2/19/2018	0.5	NA	8.2	NA	NA

TABLE 1
LEAD AND ARSENIC IN SOIL ANALYTICAL RESULTS
LAUSD Reseda High School RAW

Sample Location	Sample ID	Sample Date	Sample Depth	Lead	Arsenic	STLC - Lead	TCLP - Lead
Units			ft bgs	mg/kg	mg/kg	mg/L	mg/L
USEPA Test Method			--	6010B	6010B	6010B	6010B
Screening Level			--	80	12	5.0	5.0
	AOC1-B112-W5-D0.5-DUP	2/19/2018	0.5	NA	8.4	NA	NA
	AOC1-B112-W10-D0.5	2/19/2018	0.5	NA	7.8	NA	NA
AOC1-B113	AOC1-B113-D0.5	12/21/2017	0.5	21	12	NA	NA
AOC1-B114	AOC1-B114-D0.5	12/21/2017	0.5	12	6.9	NA	NA
	AOC1-B114-D0.5 DUP	12/21/2017	0.5	13	6.4	NA	NA
AOC1-B115	AOC1-B115-D0.5	12/21/2017	0.5	45	9.6	NA	NA

NOTES:
mg/kg = millgrams per kilogram
mg/L = milligrams per Liter
Arsenic and lead analyzed by EPA Method 6010B
Derivation of the screening level is explained in text
Yellow highlighted cell = lead value >80 mg/kg or arsenic value >12 mg/kg
Grey hightlighted cell indicates step-out sample
NA = not analyzed
ft bgs = feet below ground surface
STLC = Soluble Threshold Limit Concentration
TCLP = Toxicity Characteristic Leaching Procedure

Table 2

Soil Vapor Probe Sampling Analytical Results

LAUSD Reseda High School RAW

Sample Location	Sample ID	Depth	Sample Date	Benzene	1,2,4-Trimethylbenzene	Napthalene	Tetrachloroethene (PCE)	Other VOCs
Units		ft	--	ug/m3	ug/m3	ug/m3	ug/m3	--
Current Preliminary Screening Level				97	63,000	83	460	--
Future Preliminary Screening Level				3.2	2,100	2.8	15	--
AOC4-SV1	AOC4-SV1-5	5	1/3/2018	ND<8.0	ND<8.0	ND<40	259	See Lab Report
	AOC4-SV1-15	15	1/3/2018	ND<8.0	ND<8.0	ND<40	322	See Lab Report
	AOC4-SV1-5	5	2/27/2018	ND<8.0	ND<8.0	ND<40	226	See Lab Report
	AOC4-SV1-5 REP	5	2/27/2018	ND<8.0	ND<8.0	ND<40	195	See Lab Report
	AOC4-SV1-15	15	2/27/2018	ND<8.0	ND<8.0	ND<40	257	See Lab Report
	AOC4-SV1-5	5	4/21/2018	ND<8.0	ND<8.0	ND<40	252	See Lab Report
	AOC4-SV1-15	15	4/21/2018	ND<8.0	10	ND<40	294	See Lab Report
	AOC4-SV1-5	5	9/15/2018	ND<2	ND<7	ND<8	289	See Lab Report
	AOC4-SV1-15	15	9/15/2018	ND<2	ND<7	ND<8	292	See Lab Report
	AOC4-SV1-15REP	15	9/15/2018	ND<2	ND<7	ND<8	302	See Lab Report
AOC4-SV2	AOC4-SV2-5	5	1/3/2018	ND<8.0	ND<8.0	ND<40	186	See Lab Report
	AOC4-SV2-5 REP	5	1/3/2018	ND<8.0	ND<8.0	ND<40	197	See Lab Report
	AOC4-SV2-15	15	1/3/2018	ND<8.0	ND<8.0	ND<40	173	See Lab Report
	AOC4-SV2-5	5	2/27/2018	ND<8.0	ND<8.0	ND<40	149	See Lab Report
	AOC4-SV2-15	15	2/27/2018	ND<8.0	ND<8.0	ND<40	125	See Lab Report
	AOC4-SV2-5	5	9/15/2018	ND<2	ND<7	ND<8	311	See Lab Report
	AOC4-SV2-15	15	9/15/2018	ND<2	ND<7	ND<8	151	See Lab Report
AOC4-SV3	AOC4-SV3-5	5	2/27/2018	ND<8.0	ND<8.0	ND<40	322	See Lab Report
	AOC4-SV3-15	15	2/27/2018	ND<8.0	ND<8.0	ND<40	448	See Lab Report
	AOC4-SV3-5	5	4/21/2018	ND<8.0	ND<8.0	ND<40	416	See Lab Report
	AOC4-SV3-5 REP	5	4/21/2018	ND<8.0	ND<8.0	ND<40	455	See Lab Report
	AOC4-SV3-15	15	4/21/2018	ND<8.0	ND<8.0	ND<40	489	See Lab Report
	AOC4-SV3-5	5	9/15/2018	ND<2	ND<7	ND<8	728	See Lab Report
	AOC4-SV3-15	15	9/15/2018	ND<2	ND<7	ND<8	491	See Lab Report
AOC4-SV4	AOC4-SV4-5	5	2/27/2018	ND<8.0	ND<8.0	ND<40	118	See Lab Report
	AOC4-SV4-15	15	2/27/2018	ND<8.0	ND<8.0	ND<40	179	See Lab Report
AOC4-SV5	AOC4-SV5-5	5	2/27/2018	ND<8.0	ND<8.0	ND<40	ND<8.0	See Lab Report
	AOC4-SV5-15	15	2/27/2018	ND<8.0	ND<8.0	ND<40	11	See Lab Report
	AOC4-SV5-5	5	1/3/2019	ND<8.0	ND<8.0	ND<40	15	See Lab Report
	AOC4-SV5-15	15	1/3/2019	ND<8.0	ND<8.0	ND<40	11	See Lab Report
AOC4-SV6	AOC4-SV6-5	5	4/21/2018	ND<8.0	ND<8.0	ND<40	93	See Lab Report
	AOC4-SV6-15	15	4/21/2018	ND<8.0	ND<8.0	ND<40	147	See Lab Report
	AOC4-SV6-5	5	9/15/2018	ND<2	8 J	ND<8	196	See Lab Report
	AOC4-SV6-15	15	9/15/2018	ND<2	ND<7	15 J	174	See Lab Report
AOC4-SV8	AOC4-SV8-5	5	4/21/2018	ND<8.0	ND<8.0	ND<40	265	See Lab Report
	AOC4-SV8-15	15	4/21/2018	ND<8.0	ND<8.0	ND<40	387	See Lab Report
	AOC4-SV8-5	5	9/15/2018	ND<2.0	378	199	494	See Lab Report
	AOC4-SV8-15	15	9/15/2018	7 J	2440	774	458	See Lab Report
AOC4-SV9	AOC4-SV9-5	5	4/21/2018	ND<8.0	ND<8.0	ND<40	144	See Lab Report
	AOC4-SV9-15	15	4/21/2018	ND<8.0	ND<8.0	ND<40	146	See Lab Report
	AOC4-SV9-15 REP	15	4/21/2018	ND<8.0	ND<8.0	ND<40	150	See Lab Report
	AOC4-SV9-5	5	9/19/2018	ND<8.0	ND<8.0	ND<40	844	See Lab Report
	AOC4-SV9-15	15	9/19/2018	ND<8.0	ND<8.0	ND<40	680	See Lab Report
AOC4-SV10	AOC4-SV10-5	5	4/21/2018	ND<8.0	ND<8.0	ND<40	473	See Lab Report
	AOC4-SV10-15	15	4/21/2018	ND<8.0	ND<8.0	ND<40	465	See Lab Report
	AOC4-SV10-5	5	9/19/2018	ND<8.0	ND<8.0	ND<40	1440	See Lab Report
	AOC4-SV10-15	15	9/19/2018	ND<8.0	ND<8.0	ND<40	1110	See Lab Report
	AOC4-SV10-15REP	15	9/19/2018	ND<8.0	ND<8.0	ND<40	1070	See Lab Report
	AOC4-SV10-5	5	1/3/2019	ND<8.0	ND<8.0	ND<40	481	See Lab Report
	AOC4-SV10-15	15	1/3/2019	ND<8.0	ND<8.0	ND<40	414	See Lab Report
AOC4-SV11	AOC4-SV11-5	5	5/22/2018	28	ND<8.0	ND<40	296	See Lab Report
	AOC4-SV11-15	15	5/22/2018	ND<8.0	ND<8.0	ND<40	292	See Lab Report
	AOC4-SV11-5	5	9/19/2018	ND<8.0	ND<8.0	ND<40	1080	See Lab Report
	AOC4-SV11-15	15	9/19/2018	ND<8.0	ND<8.0	ND<40	911	See Lab Report
AOC4-SV12	AOC4-SV12-5	5	5/22/2018	ND<8.0	ND<8.0	ND<40	105	See Lab Report

Table 2
Soil Vapor Probe Sampling Analytical Results
LAUSD Reseda High School RAW

Sample Location	Sample ID	Depth	Sample Date	Benzene	1,2,4-Trimethylbenzene	Napthalene	Tetrachloroethene (PCE)	Other VOCs
Units		**ft**	**--**	**ug/m3**	**ug/m3**	**ug/m3**	**ug/m3**	**--**
Current Preliminary Screening Level				**97**	**63,000**	**83**	**460**	**--**
Future Preliminary Screening Level				**3.2**	**2,100**	**2.8**	**15**	**--**
	AOC4-SV12-15	15	5/22/2018	98	ND<8.0	ND<40	183	See Lab Report
	AOC4-SV12-5	5	1/3/2019	ND<8.0	ND<8.0	ND<40	36	See Lab Report
	AOC4-SV12-15	15	1/3/2019	ND<8.0	ND<8.0	ND<40	167	See Lab Report
AOC4-SV13	AOC4-SV13-5	5	5/22/2018	16	ND<8.0	ND<40	17	See Lab Report
	AOC4-SV13-5REP	5	5/22/2018	12	ND<8.0	ND<40	18	See Lab Report
	AOC4-SV13-15	15	5/22/2018	ND<8.0	ND<8.0	ND<40	35	See Lab Report
	AOC4-SV13-5	5	9/19/2018	ND<8.0	ND<8.0	ND<40	551	See Lab Report
	AOC4-SV13-15	15	9/19/2018	ND<8.0	ND<8.0	ND<40	722	See Lab Report
AOC4-SV14	AOC4-SV14-5	5	9/19/2018	ND<8.0	ND<8.0	ND<40	947	See Lab Report
	AOC4-SV14-15	15	9/19/2018	ND<8.0	9.0	ND<40	984	See Lab Report
AOC4-SV15	AOC4-SV15-5	5	9/15/2018	ND<2	ND<7	ND<8	683	See Lab Report
	AOC4-SV15-5REP	5	9/15/2018	ND<2	ND<7	ND<8	676	See Lab Report
	AOC4-SV15-15	15	9/15/2018	ND<2	ND<7	ND<8	463	See Lab Report
AOC4-SV16	AOC4-SV16-5	5	10/9/2018	0.4 J	1.8	3.0	2.8	See Lab Report
	AOC4-SV16-15	15	10/9/2018	0.4 J	ND<0.2	3.8	9.7	See Lab Report
	AOC4-SV16-15DUP	15	10/9/2018	0.5 J	3.0	3.7	8.7	See Lab Report
	AOC4-SV16-5	5	1/3/2019	ND<4	ND<3	ND<2	9	See Lab Report
	AOC4-SV16-15	15	1/3/2019	ND<4	ND<3	ND<2	15	See Lab Report
	AOC4-SV16-15DUP	15	1/3/2019	ND<4	ND<3	ND<2	13	See Lab Report
AOC4-SV17	AOC4-SV17-5	5	10/9/2018	0.4 J	1.9	3.4	1.7	See Lab Report
	AOC4-SV17-15	15	10/9/2018	0.4 J	1.9	4.0	3.1	See Lab Report
	AOC4-SV17-5	5	1/3/2019	ND<4	ND<3	ND<2	5 J	See Lab Report
	AOC4-SV17-15	15	1/3/2019	ND<4	ND<3	ND<2	ND<4	See Lab Report
AOC5-SV1	AOC5-SV1-5	5	1/3/2018	ND<8.0	ND<8.0	ND<40	ND<8.0	See Lab Report
	AOC5-SV1-15	15	1/3/2018	ND<8.0	ND<8.0	ND<40	ND<8.0	See Lab Report
AOC5-SV2	AOC5-SV2-5	5	1/3/2018	ND<8.0	ND<8.0	ND<40	ND<8.0	See Lab Report
	AOC5-SV2-15	15	1/3/2018	ND<8.0	ND<8.0	ND<40	ND<8.0	See Lab Report

Value Exceeds Future Screening Level
PSL = Preliminary Screening Level; i.e., DTSC (2018) residential SLs, as supplemented by USEPA (2018) residential RSLs
Current PSL is residential air PSL divided by DTSC (2011) default attenuation factor of 0.001 for a future residential building
Future PSL is residential air PSL divided by USEPA (2015) default attenuation factor of 0.03
ug/m3 = micrograms per cubic meter
ft = feet
ND = not detected above value indicated

Table 3

Sub-Slab Sampling Analytical Results

LAUSD Reseda High School RAW

Sample Location	Sample ID	Depth	Sample Date	Benzene	m,p-Xylene	o-Xylene	Tetrachloroethene (PCE)	Toluene
Units		ft	--	ug/m3	ug/m3	ug/m3	ug/m3	ug/m3
Current Preliminary Screening Level				1.9	2,000	2,000	9.2	6,200
Future Preliminary Screening Level				3.2	3,333	3,333	15	10,333
AOC4-SS1	AOC4-SS1	SS	5/22/2018	209	74	22	144	198
	AOC4-SS1	SS	9/19/2018	ND<8.0	ND<8.0	ND<8.0	845	ND<8.0
AOC4-SS2	AOC4-SS2	SS	5/22/2018	38	ND<8.0	ND<8.0	446	45
	AOC4-SS2	SS	9/19/2018	ND<8.0	ND<8.0	ND<8.0	1050	ND<8.0
AOC4-SS3	AOC4-SS3	SS	5/22/2018	80	ND<8.0	ND<8.0	523	62
	AOC4-SS3	SS	9/19/2018	ND<8.0	ND<8.0	ND<8.0	1300	ND
	AOC4-SS3	SS	10/5/2018	ND<3.0	NR	NR	323	NR
	AO4-SS3 REP	SS	10/5/2018	ND<3.0	NR	NR	373	NR
	AOC4-SS3	SS	10/6/2018	ND<3.0	NR	NR	374	NR
	AOC4-SS3	SS	1/3/2019	ND<1.0	NR	NR	245	NR
AOC4-SS4	AOC4-SS4	SS	9/19/2018	ND<8.0	ND<8.0	ND<8.0	757	ND<8.0
AOC4-SS5	AOC4-SS5	SS	9/19/2018	ND<8.0	ND<8.0	ND<8.0	866	ND<8.0
	AOC4-SS5	SS	10/5/2018	ND<3.0	NR	NR	4.0	NR
	AOC4-SS5	SS	10/6/2018	ND<3.0	NR	NR	19	NR
	AOC4-SS5	SS	1/3/2019	ND<1.0	NR	NR	42.6	NR
AOC4-SS6	AOC4-SS6	SS	9/19/2018	NS	NS	NS	NS	NS
AOC4-SS7	AOC4-SS7	SS	9/19/2018	ND<8.0	ND<8.0	ND<8.0	1040	ND<8.0
	AOC4-SS7	SS	10/5/2018	ND<3.0	NR	NR	234	NR
	AOC4-SS7	SS	10/6/2018	ND<3.0	NR	NR	9.0*	NR
	AOC4-SS7	SS	1/3/2019	ND<1.0	NR	NR	122	NR
AOC4-SS8	AOC4-SS8	SS	9/15/2018	ND<2	ND<13	ND<8	566	ND<4
AOC4-SS9	AOC4-SS9	SS	9/15/2018	ND<2	ND<13	ND<8	438	ND<4
AOC4-SS10	AOC4-SS10	SS	9/15/2018	ND<2	ND<13	ND<8	18	ND<4
AOC4-SS11	AOC4-SS11	SS	9/15/2018	ND<2	ND<13	ND<8	73	ND<4
AOC4-SS12	AOC4-SS12	SS	9/15/2018	ND<8.0	ND	ND	109	ND<8.0
	AOC4-SS12	SS	10/5/2018	ND<3.0	NR	NR	89	NR
	AOC4-SS12	SS	10/6/2018	ND<3.0	NR	NR	127	NR
	AOC4-SS12	SS	1/3/2019	ND<1.0	NR	NR	79.6	NR
	AOC4-SS12 DUP	SS	1/3/2019	ND<1.0	NR	NR	85.2	NR

NOTES:

Value Exceeds Screening Level

Derivation of the screening levels is explained in text

NS = unable to obtain sample due to no flow in probe

NR = analyte not reported.

ND = not detected above value indicated

ug/m3 = micrograms per cubic meter

ft = feet

* - tracer gas detected in sample

PSL = Preliminary Screening Level; i.e., DTSC (2018) residential SLs, as supplemented by USEPA (2018) residential RSLs

Current PSL is residential air PSL divided by DTSC (2011) default attenuation factor of 0.05 residential sub-slab samples

Future PSL is residential air PSL divided by USEPA (2015) default attenuation factor of 0.03

Table 4

ESTIMATED VOLUMES OF IMPACTED SOIL

LAUSD Reseda High School PEA Equivalent

Soil Impact Area	COC	Dimensions (Linear Ft)	Area (Sq. ft)	Total Depth (Ft)	Impacted Soil Volume (CY)	Waste Type
AOC1-B1	Arsenic	15 x 9	135	1.5	7.5	Non-hazardous
AOC1-B6	Lead	10 x 9	90	1.5	5	Non-RCRA hazardous
AOC1-B8	Arsenic	23 x 10	230	1.5	13	Non-hazardous
AOC1-B10	Arsenic	14 x 15	210	1.5	12	Non-hazardous
AOC1-B22	Arsenic	10 x 32	320	1.5	18	Non-hazardous
		10 x 6	60	2.5	6	Non-hazardous
AOC1-B34	Lead	15 x 8	120	1.5	7	Non-hazardous
AOC1-B58	Arsenic	5 x 10	50	1.5	2.8	Non-hazardous
AOC1-B64	Arsenic	5 x 10	50	1.5	2.8	Non-hazardous
AOC1-B77	Arsenic	23 x 12.5	288	1.5	16	Non-hazardous
		29 x 12.5	363	2.5	34	Non-hazardous
		25 x 12.5	312.5	3.5	41	Non-hazardous
AOC1-B78	Arsenic	19.5 x 7.5	146.25	1.5	8.1	Non-hazardous
		10 x 7.5	75	2.5	6.9	Non-hazardous
AOC1-B81	Arsenic	50x10	500	1.5	28	Non-hazardous
		10x10	100	3.5	13	Non-hazardous
AOC1-B91	Arsenic	30 x 8	240	1.5	13	Non-hazardous
		10 x 8	80	3.5	10	Non-hazardous
AOC1-B100	Lead	5 x 5	25	1.5	1.4	Non-hazardous
AOC1-B108	Lead/Arsenic	8 x 8	64	1.5	3.6	Non-hazardous
AOC1-B112	Arsenic	14 x 24	336	1.5	19	Non-hazardous
Non-hazardous Impacted Soil Volume					261	
Non-RCRA Hazardous Impacted Soil Volume					5.0	
Total Impacted Soil Volume					266	

NOTES:

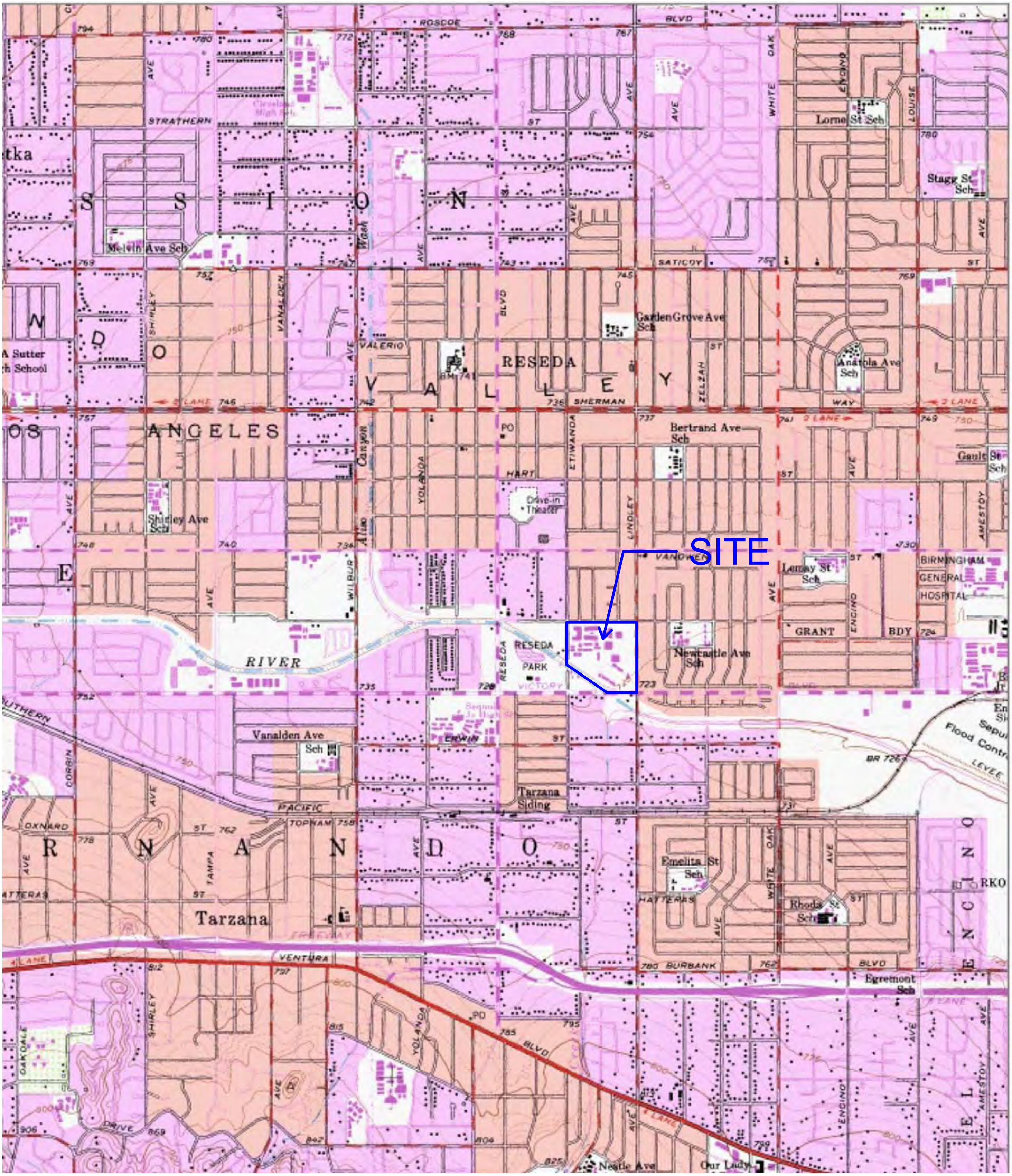
COC = chemical of concern

RCRA = Resource Conservation and Recovery Act

Sq. ft = square feet

CY = cubic yards

FIGURES



Site

N

0 1,250 2,500
Scale In Feet

Figure 1

SITE LOCATION MAP

Reseda High School
18230 Kittridge Street
Reseda, California

PARSONS

Pasadena, CA

K:\Depts\Dept48\LAUSD\MSA WORK\Reseda HS\PEA\Report\Supplemental Report\Figures\Figure 1 - Site Location Map.dwg

Figure 2

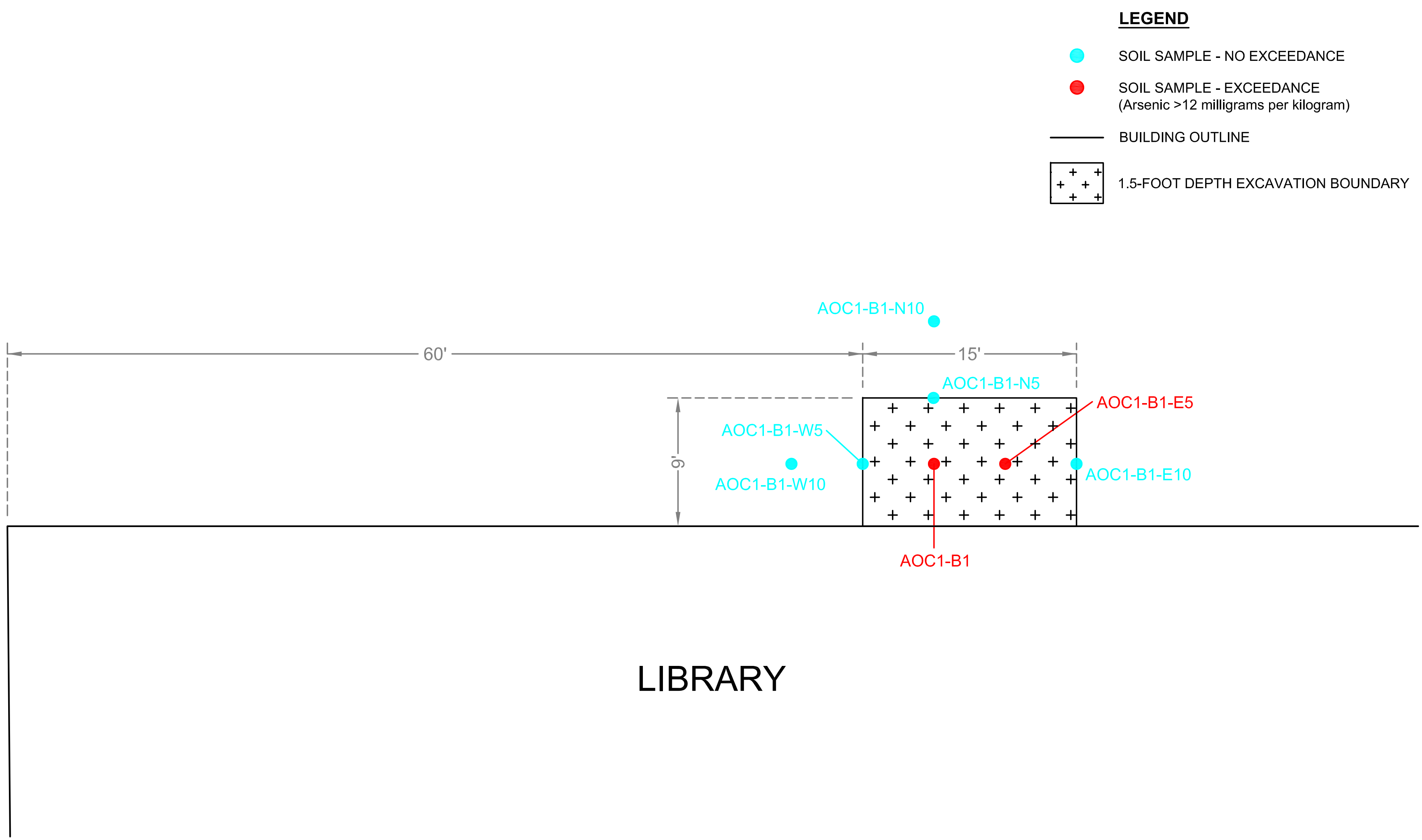
BUILDING LOCATIONS

Reseda High School
18230 Kittridge Street
Reseda, California

PARSONS

Pasadena, CA

U:\Depts\Dept48\LAUSD\MSA WORK\Reseda HS\RAW\RAW document\Figures\Figure 2 – Building Locations.dwg



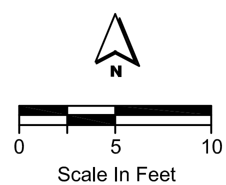


Figure 3a

SAMPLE LOCATIONS AND IMPACTED AREA BOUNDARY - AOC1-B1

Reseda High School
18230 Kittridge Street
Reseda, California

PARSONS

Pasadena, CA

K:\Depts\Dept48\LAUSD\MSA WORK\Reseda HS\PEA\Report\Figures\Step-outs\Figure 3a - Sample Locations and Impacted Area Boundary.dwg

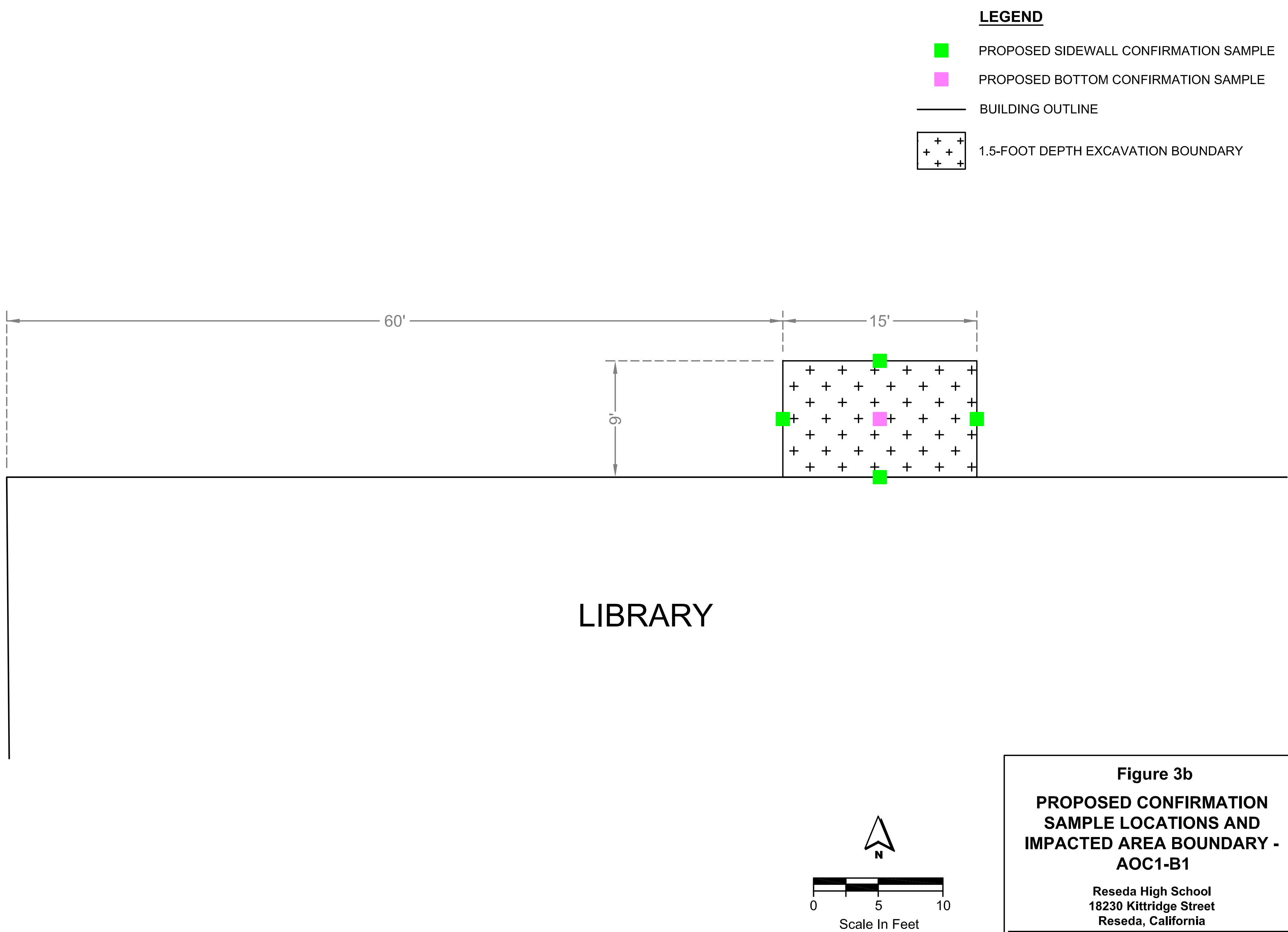


Figure 3b

PROPOSED CONFIRMATION SAMPLE LOCATIONS AND IMPACTED AREA BOUNDARY - AOC1-B1

Reseda High School
18230 Kittridge Street
Reseda, California

PARSONS

Pasadena, CA

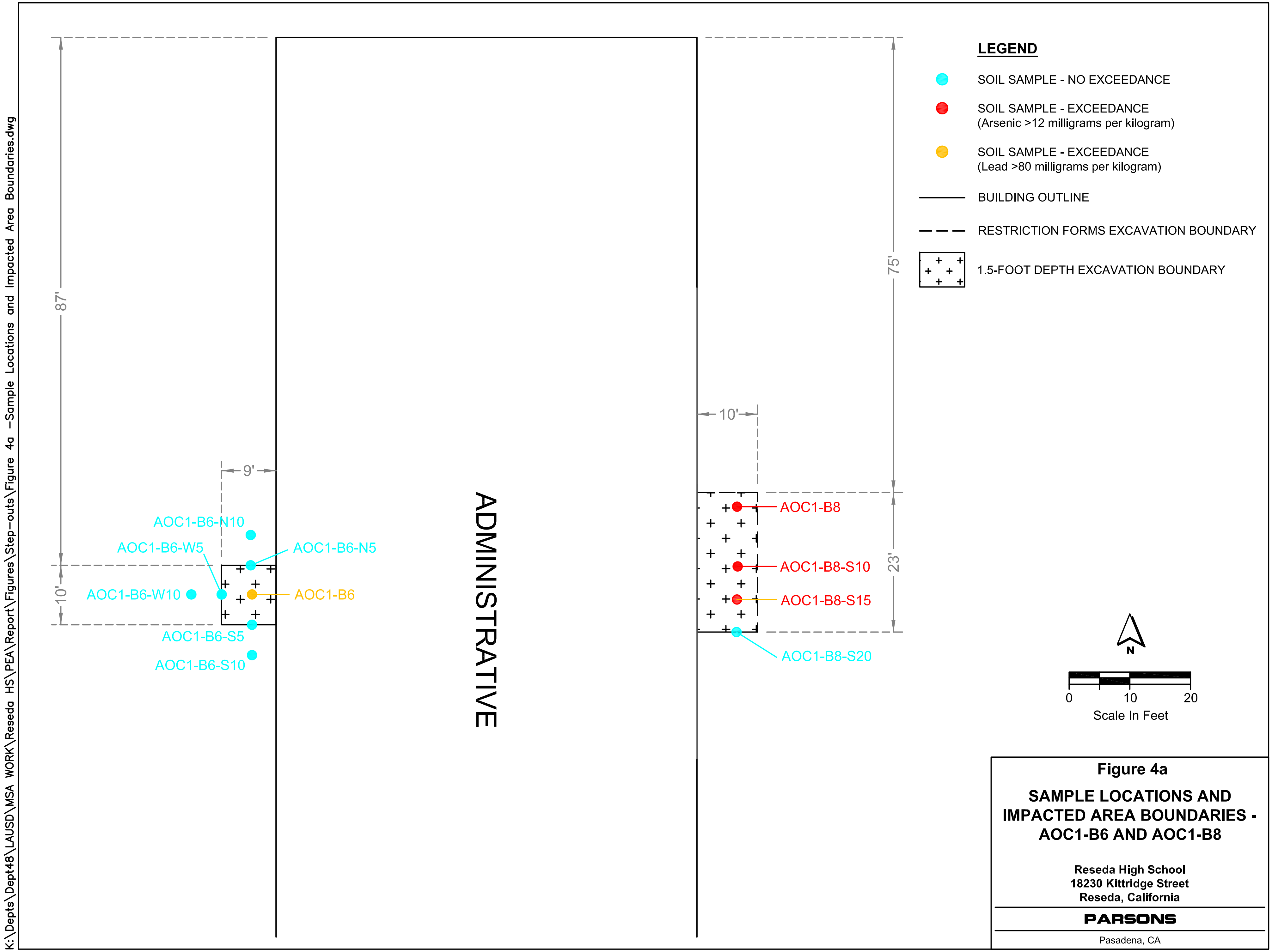


Figure 4a

SAMPLE LOCATIONS AND IMPACTED AREA BOUNDARIES - AOC1-B6 AND AOC1-B8

Reseda High School
18230 Kittridge Street
Reseda, California

PARSONS

Pasadena, CA

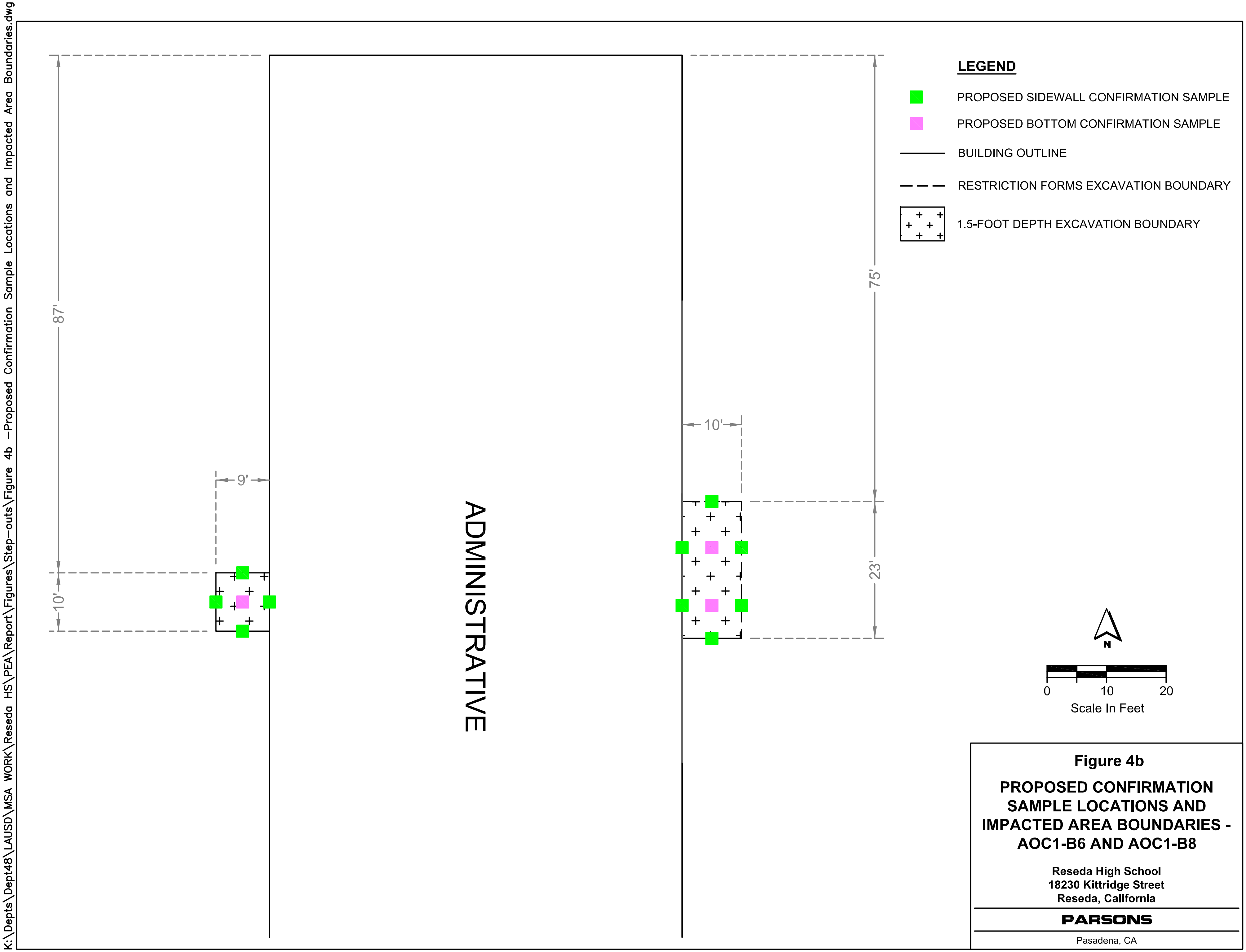


Figure 4b

PROPOSED CONFIRMATION SAMPLE LOCATIONS AND IMPACTED AREA BOUNDARIES - AOC1-B6 AND AOC1-B8

Reseda High School
18230 Kittridge Street
Reseda, California

PARSONS

Pasadena, CA

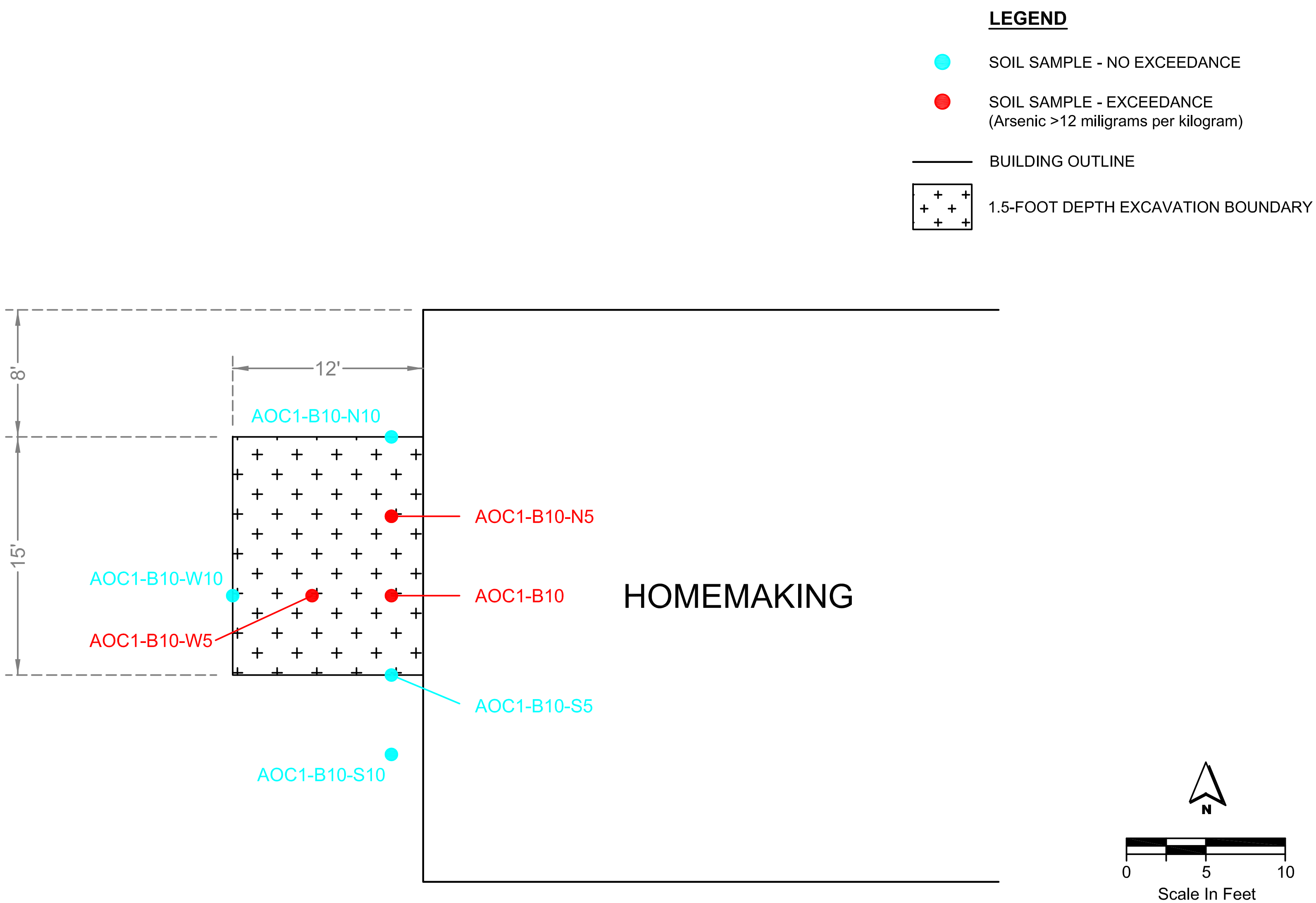


Figure 5a

SAMPLE LOCATIONS AND IMPACTED AREA BOUNDARY- AOC1-B10

Reseda High School
18230 Kittridge Street
Reseda, California

PARSONS

Pasadena, CA

K:\Depts\Dept48\LAUSD\MSA WORK\Reseda HS\PEA\Report\Figures\Step-outs\Figure 5a - Sample Locations and Impacted Area Boundary.dwg

K:\Depts\Dept48\LAUSD\MSA WORK\Reseda HS\PEA\Report\Figures\Step-outs\Figure 5b – Proposed Confirmation Sample Locations and Impacted Area Boundary.dwg

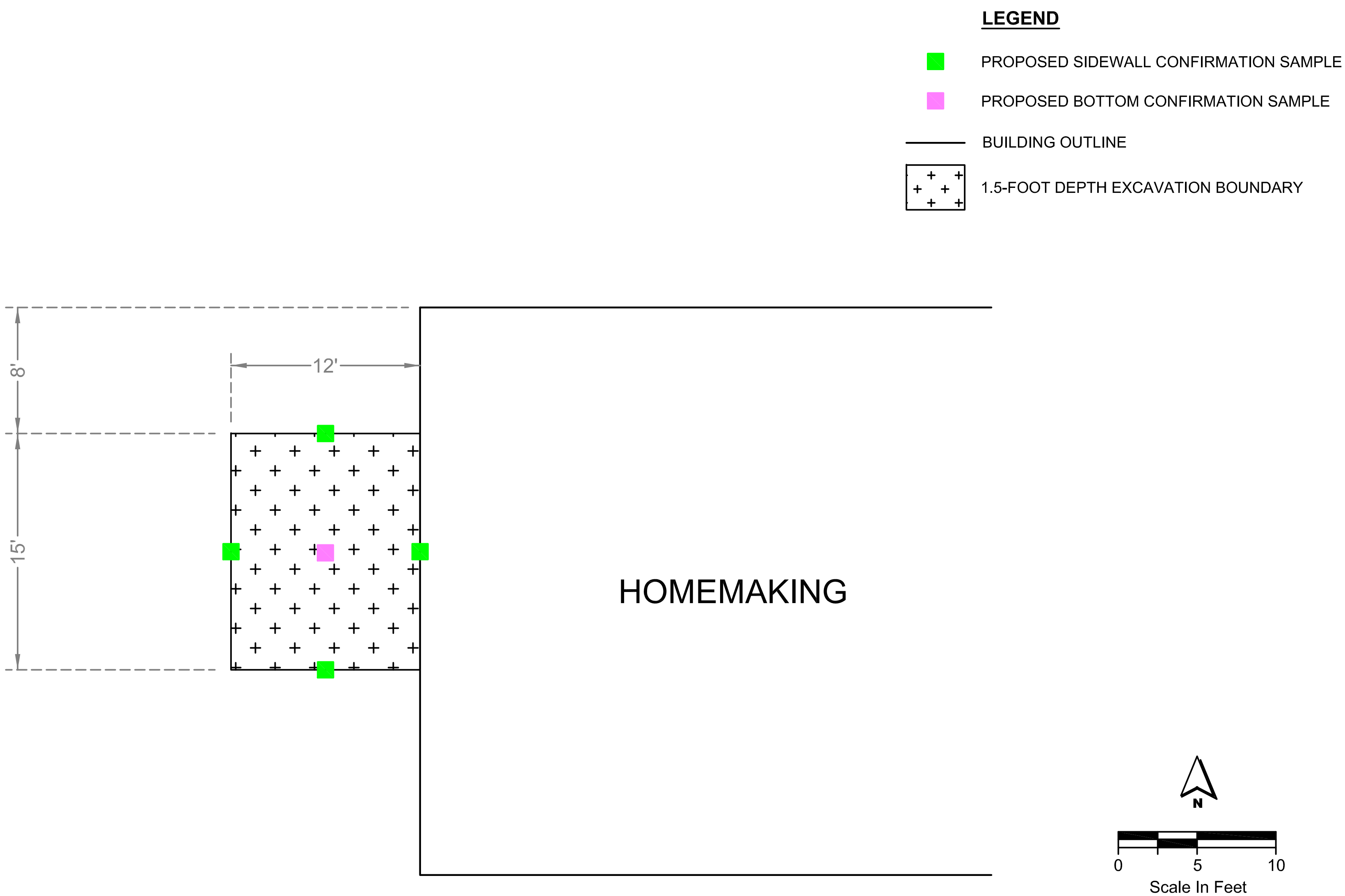


Figure 5b

PROPOSED CONFIRMATION SAMPLE LOCATIONS AND IMPACTED AREA BOUNDARY-AOC1-B10

Reseda High School
18230 Kittridge Street
Reseda, California

PARSONS

Pasadena, CA

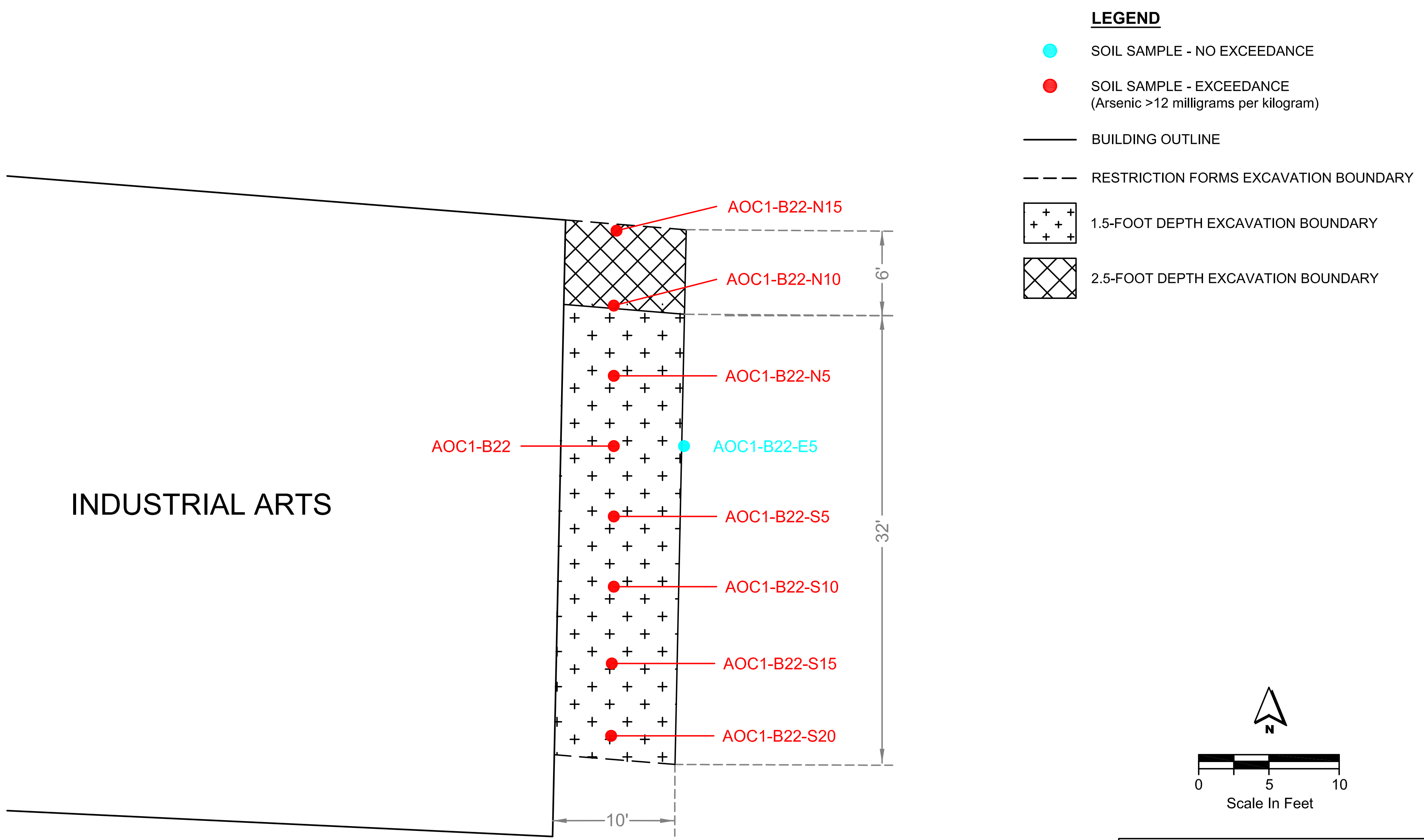


Figure 6a

SAMPLE LOCATIONS AND IMPACTED AREA BOUNDARY - AOC1-B22

Reseda High School
18230 Kittridge Street
Reseda, California

PARSONS

Pasadena, CA

K:\Depts\Dept48\LAUSD\MSA WORK\Reseda HS\PEA\Report\Figures\Step-outs\Figure 6a - Sample Locations and Impacted Area Boundary.dwg

U:\Depts\Dept48\LAUSD\MSA WORK\Reseda HS\RAW\RAW document\Figures\Figure 6b - Proposed Confirmation Sample Locations and Impacted Area Boundary.dwg

Figure 6b

PROPOSED CONFIRMATION SAMPLE LOCATIONS AND IMPACTED AREA BOUNDARY - AOC1-B22

Reseda High School
18230 Kittridge Street
Reseda, California

PARSONS

Pasadena, CA

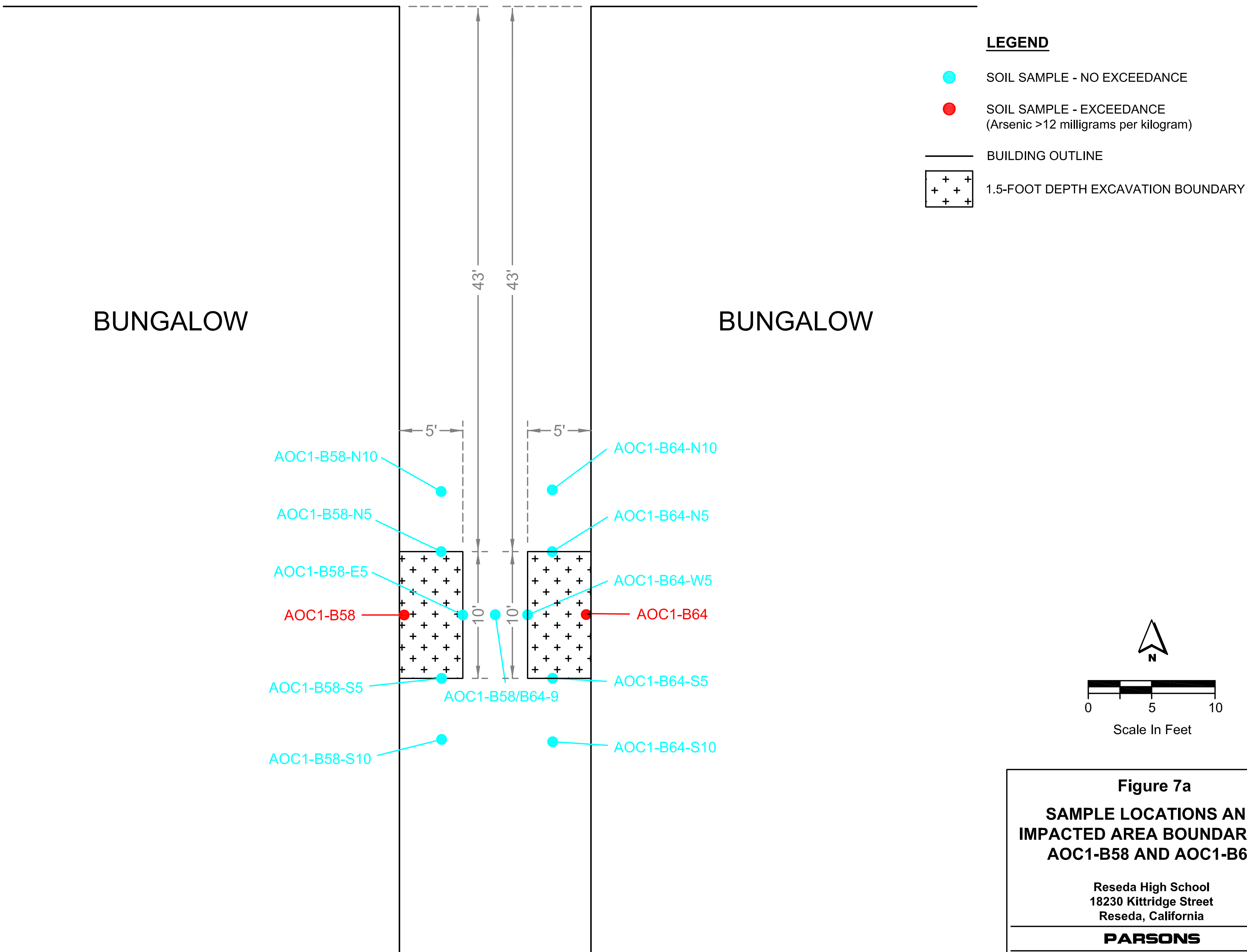


Figure 7a

SAMPLE LOCATIONS AND IMPACTED AREA BOUNDARIES - AOC1-B58 AND AOC1-B64

Reseda High School
18230 Kittridge Street
Reseda, California

PARSONS

Pasadena, CA

K:\Depts\Dept48\LAUSD\MSA WORK\Reseda HS\PEA\Report\Figures\Step-outs\Figure 7a -Sample Locations and Impacted Area Boundaries.dwg

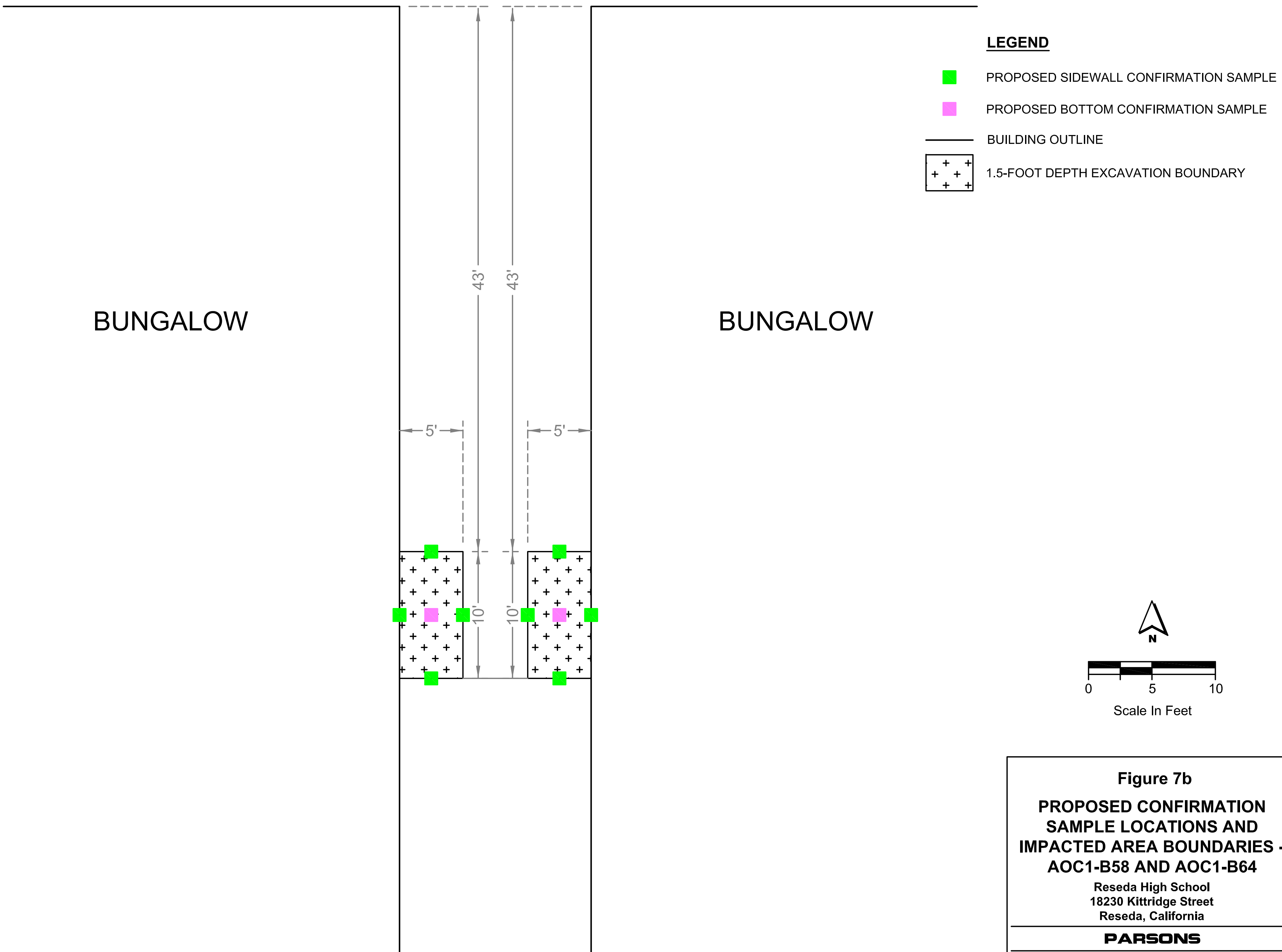


Figure 7b

PROPOSED CONFIRMATION SAMPLE LOCATIONS AND IMPACTED AREA BOUNDARIES - AOC1-B58 AND AOC1-B64

Reseda High School
18230 Kittridge Street
Reseda, California

PARSONS

Pasadena, CA

K:\Depts\Dept48\LAUSD\MSA WORK\Reseda HS\PEA\Report\Figures\Step-outs\Figure 7b -Proposed Confirmation Sample Locations and Impacted Area Boundaries.dwg

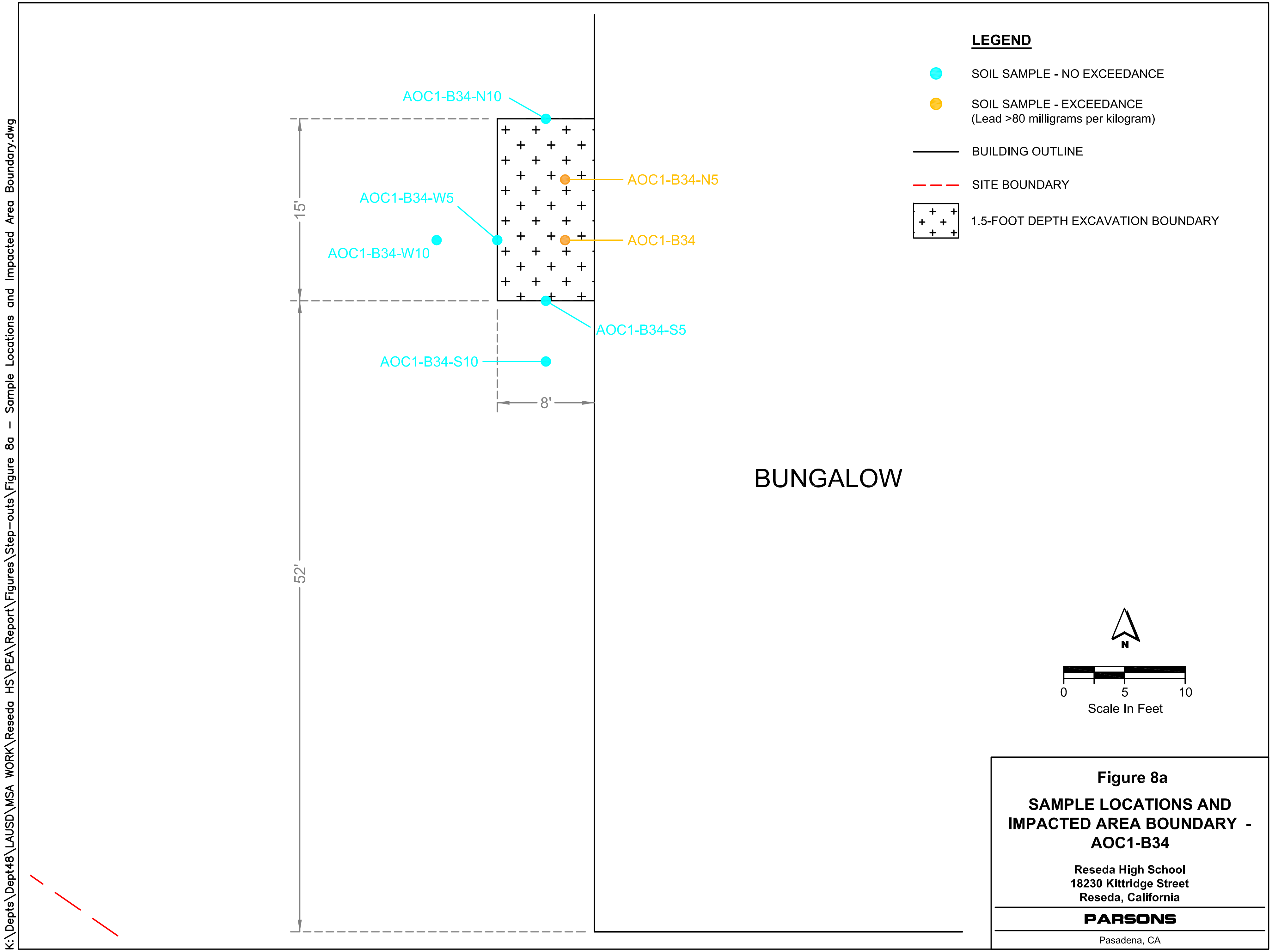


Figure 8a

SAMPLE LOCATIONS AND IMPACTED AREA BOUNDARY - AOC1-B34

Reseda High School
18230 Kittridge Street
Reseda, California

PARSONS

Pasadena, CA

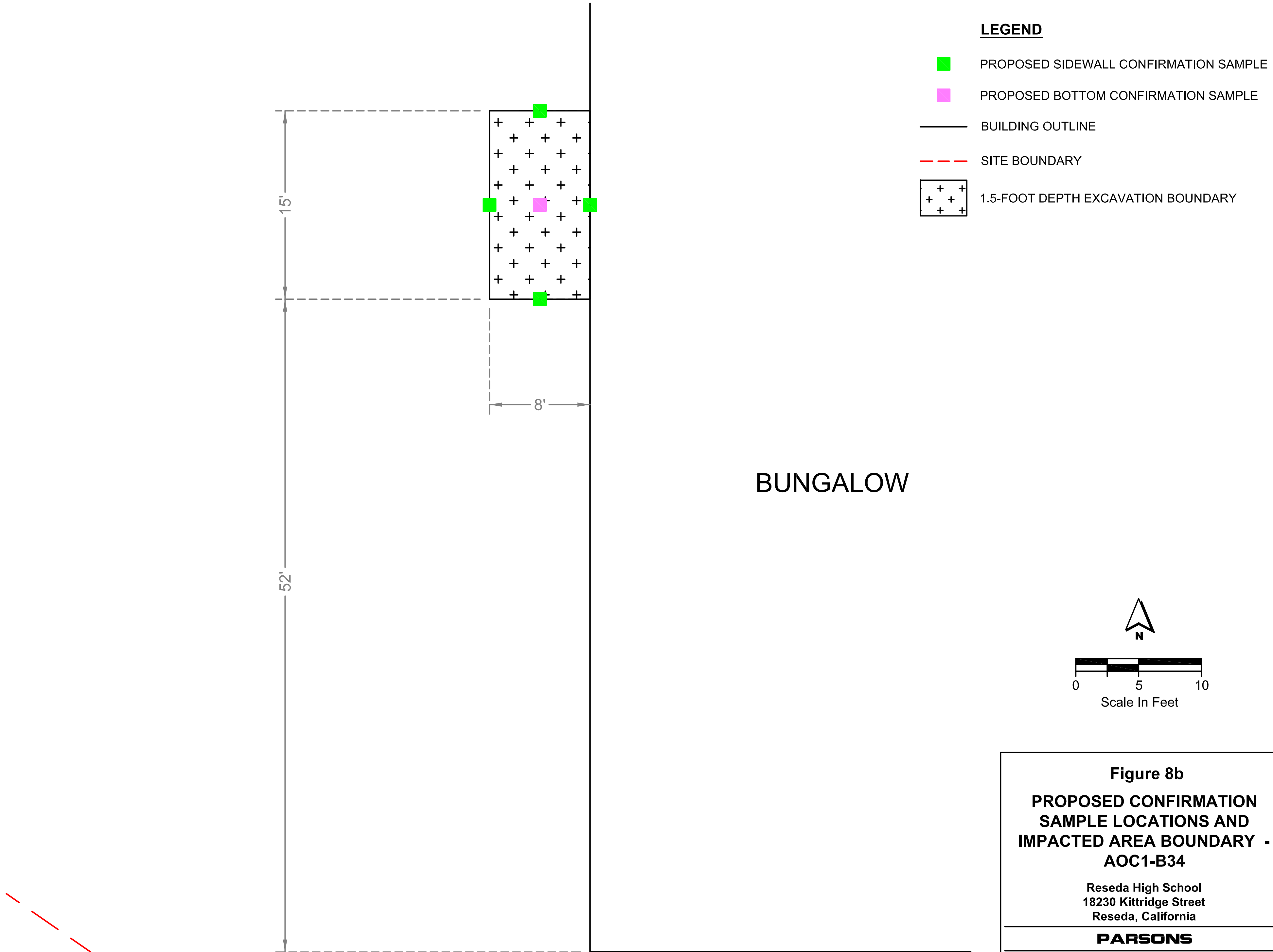


Figure 8b

PROPOSED CONFIRMATION SAMPLE LOCATIONS AND IMPACTED AREA BOUNDARY - AOC1-B34

Reseda High School
18230 Kittridge Street
Reseda, California

PARSONS

Pasadena, CA

K:\Depts\Dept48\LAUSD\MSA WORK\Reseda HS\PEA\Report\Figures\Step-outs\Figure 8b - Proposed Confirmation Sample Locations and Impacted Area Boundary.dwg

LEGEND

- SOIL SAMPLE - NO EXCEEDANCE
- SOIL SAMPLE - EXCEEDANCE (Arsenic >12 milligrams per kilogram)
- BUILDING OUTLINE
- RESTRICTION FORMS EXCAVATION BOUNDARY
- SITE BOUNDARY
- 1.5-FOOT EXCAVATION DEPTH
- 2.5-FOOT EXCAVATION DEPTH
- 3.5-FOOT EXCAVATION DEPTH

N

0 12.5 25
Scale In Feet

Figure 9a

SAMPLE LOCATIONS AND IMPACTED AREA BOUNDARIES - AOC1-B77, AOC1-B78 AND AOC1-B81

Reseda High School
18230 Kittridge Street
Reseda, California

PARSONS

Pasadena, CA

K:\Depts\Dept48\LAUSD\MSA WORK\Reseda HS\PEA\Report\Figures\Step-outs\Figure 9a – Sample Locations and Impacted Area Boundaries.dwg

LEGEND

PROPOSED SIDEWALL CONFIRMATION SAMPLE

PROPOSED BOTTOM CONFIRMATION SAMPLE

BUILDING OUTLINE

RESTRICTION FORMS EXCAVATION BOUNDARY

SITE BOUNDARY

1.5-FOOT EXCAVATION DEPTH

2.5-FOOT EXCAVATION DEPTH

3.5-FOOT EXCAVATION DEPTH

0 12.5 25

Scale In Feet

Figure 9b

PROPOSED CONFIRMATION SAMPLE LOCATIONS AND IMPACTED AREA BOUNDARIES - AOC1-B77, AOC1-B78 AND AOC1-B81

Reseda High School
18230 Kittridge Street
Reseda, California

PARSONS

Pasadena, CA

U:\Depts\Dept48\LAUSD\MSA WORK\Reseda HS\RAW\RAW document\Figures\Figure 9b – Proposed Confirmation Sample Locations and Impacted Area Boundaries.dwg

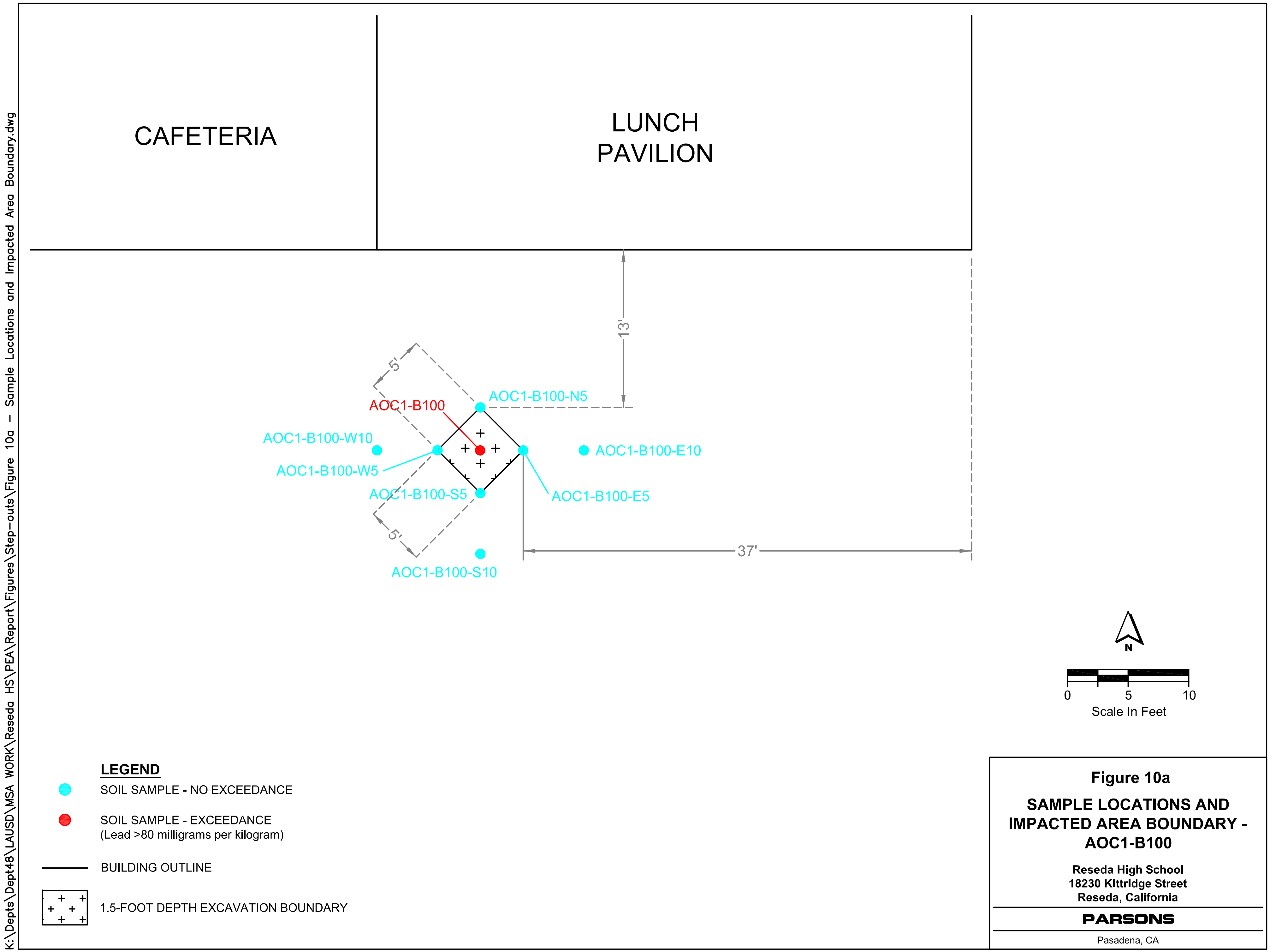


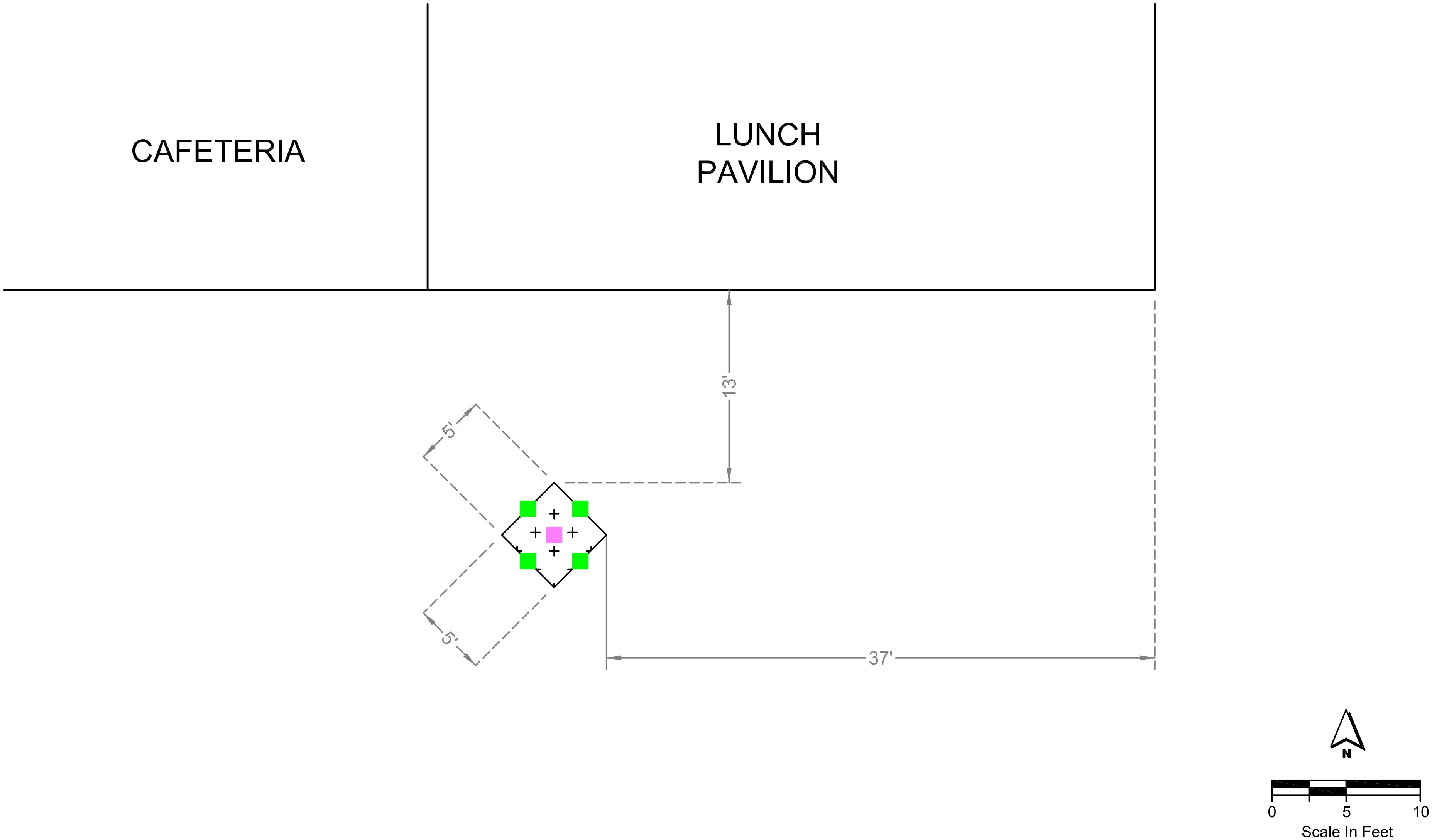
Figure 10a

SAMPLE LOCATIONS AND IMPACTED AREA BOUNDARY - AOC1-B100

Reseda High School
18230 Kittridge Street
Reseda, California

PARSONS

Pasadena, CA



LEGEND

PROPOSED SIDEWALL CONFIRMATION SAMPLE

PROPOSED BOTTOM CONFIRMATION SAMPLE

BUILDING OUTLINE

1.5-FOOT DEPTH EXCAVATION BOUNDARY

Figure 10b

PROPOSED CONFIRMATION SAMPLE LOCATIONS AND IMPACTED AREA BOUNDARY - AOC1-B100

Reseda High School
18230 Kittridge Street
Reseda, California

PARSONS

Pasadena, CA

K:\Depts\Dept48\LAUSD\MSA WORK\Reseda HS\PEA\Report\Figures\Step-outs\Figure 10b – Proposed Confirmation Sample Locations and Impacted Area Boundary.dwg

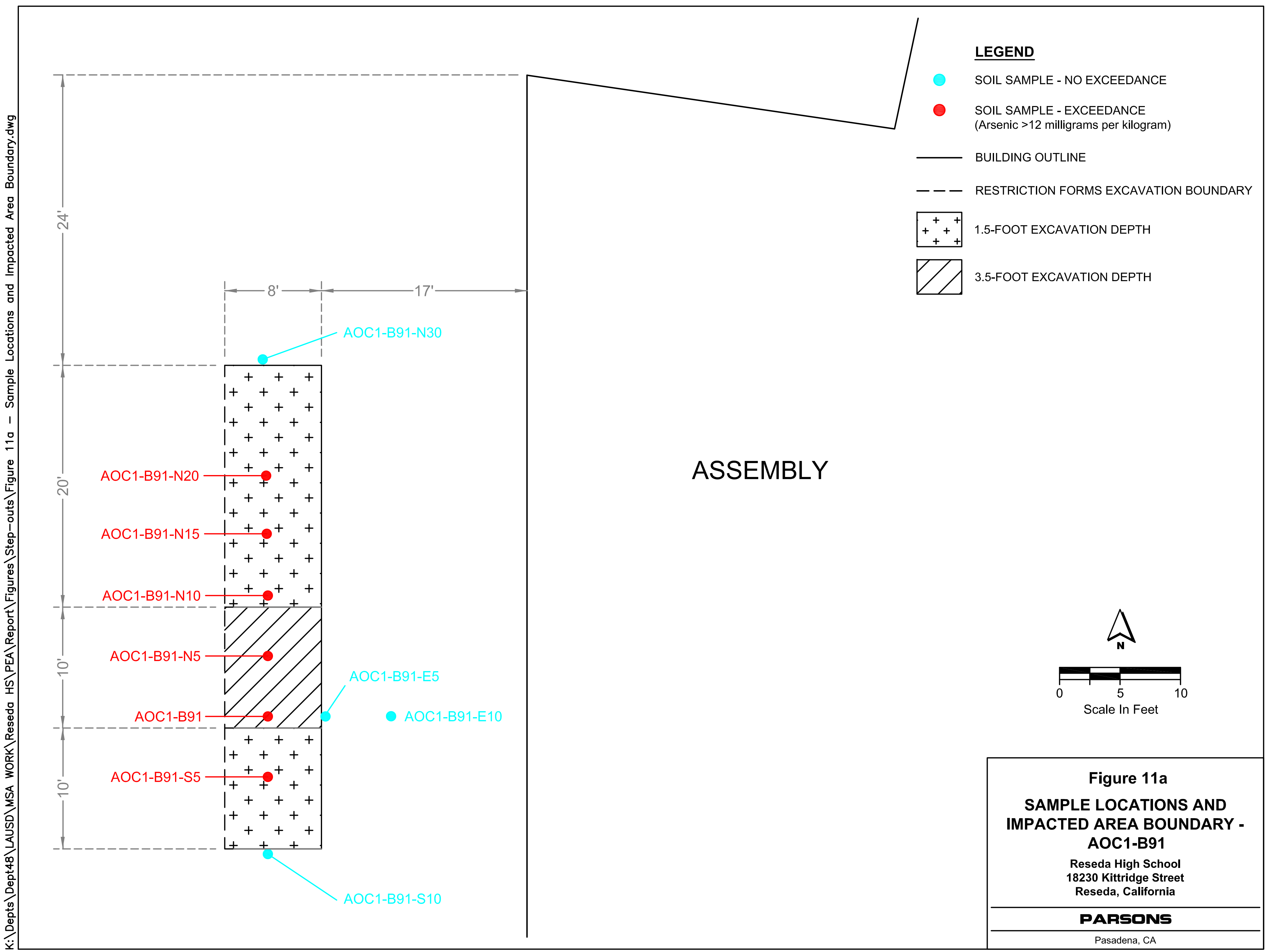


Figure 11a

SAMPLE LOCATIONS AND IMPACTED AREA BOUNDARY - AOC1-B91

Reseda High School
18230 Kittridge Street
Reseda, California

PARSONS

Pasadena, CA

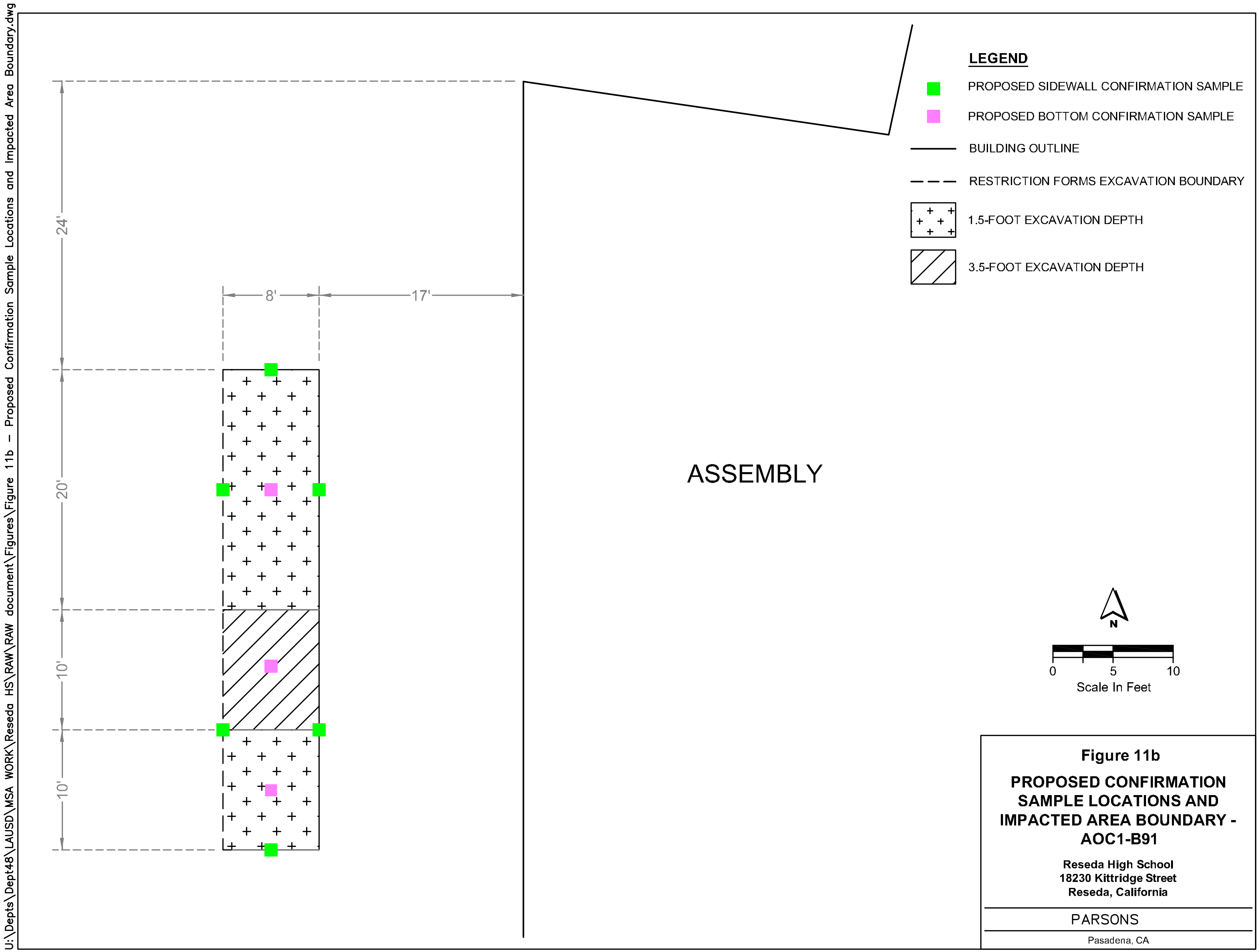


Figure 11b

PROPOSED CONFIRMATION SAMPLE LOCATIONS AND IMPACTED AREA BOUNDARY - AOC1-B91

Reseda High School
18230 Kittridge Street
Reseda, California

PARSONS

Pasadena, CA

Figure 12a

SAMPLE LOCATIONS AND IMPACTED AREA BOUNDARY - AOC1-B108

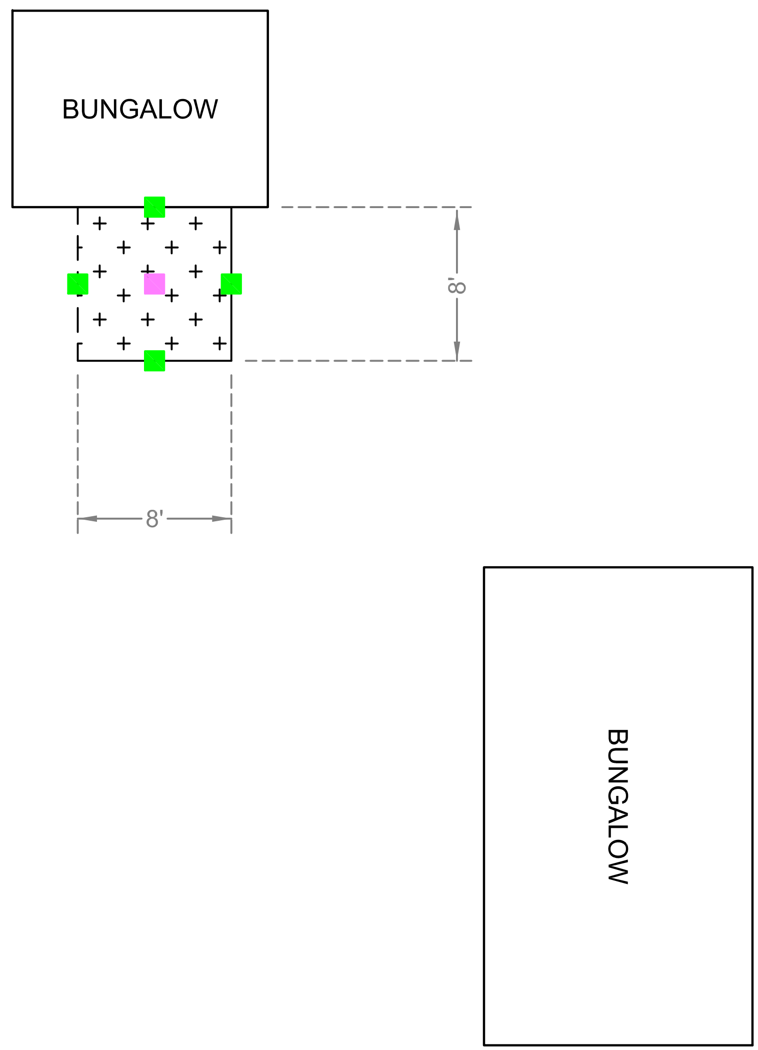
Reseda High School
18230 Kittridge Street
Reseda, California

PARSONS

Pasadena, CA

K:\Depts\Dept48\LAUSD\MSA WORK\Reseda HS\PEA\Report\Figures\Step-outs\Figure 12a – Sample Locations and Impacted Area Boundary.dwg

K:\Depts\Dept48\LAUSD\MSA WORK\Reseda HS\PEA\Report\Figures\Step-outs\Figure 12b – Proposed Confirmation Sample Locations and Impacted Area Boundary.dwg



LEGEND

- PROPOSED SIDEWALL CONFIRMATION SAMPLE
- PROPOSED BOTTOM CONFIRMATION SAMPLE
- BUILDING OUTLINE
- RESTRICTION FORMS EXCAVATION BOUNDARY
- 1.5-DEPTH FOOT EXCAVATION BOUNDARY

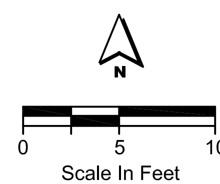


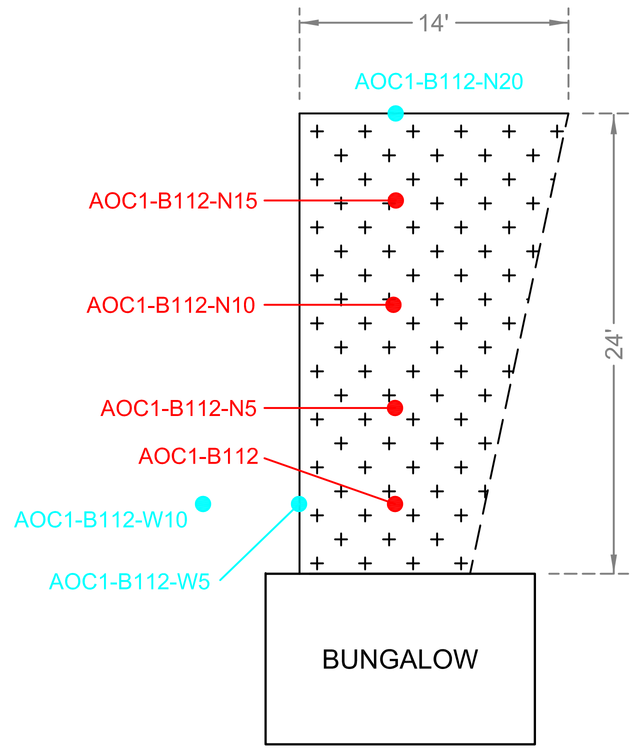
Figure 12b

PROPOSED CONFIRMATION SAMPLE LOCATIONS AND IMPACTED AREA BOUNDARY - AOC1-B108

Reseda High School
18230 Kittridge Street
Reseda, California

PARSONS

Pasadena, CA



LEGEND

- SOIL SAMPLE - NO EXCEEDANCE
- SOIL SAMPLE - EXCEEDANCE (Arsenic >12 milligrams per kilogram)
- BUILDING OUTLINE
- RESTRICTION FORMS EXCAVATION BOUNDARY
- 1.5-FOOT EXCAVATION DEPTH

N

0 5 10
Scale In Feet

Figure 13a

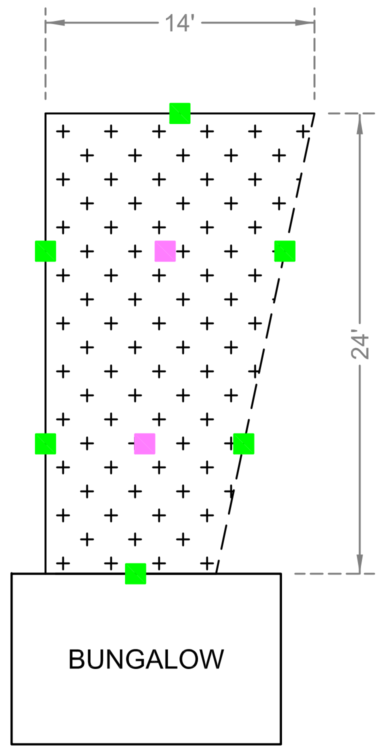
SAMPLE LOCATIONS AND IMPACTED AREA BOUNDARY - AOC1-B112

Reseda High School
18230 Kittridge Street
Reseda, California

PARSONS

Pasadena, CA

K:\Depts\Dept48\LAUSD\MSA WORK\Reseda HS\PEA\Report\Figures\Step-outs\Figure 13b - Proposed Confirmation Sample Locations and Impacted Area Boundary.dwg



LEGEND

PROPOSED SIDEWALL CONFIRMATION SAMPLE

PROPOSED BOTTOM CONFIRMATION SAMPLE

BUILDING OUTLINE

RESTRICTION FORMS EXCAVATION BOUNDARY

1.5-FOOT EXCAVATION DEPTH

N

0 5 10

Scale In Feet

Figure 13b

PROPOSED CONFIRMATION SAMPLE LOCATIONS AND IMPACTED AREA BOUNDARY - AOC1-B112

Reseda High School
18230 Kittridge Street
Reseda, California

PARSONS

Pasadena, CA

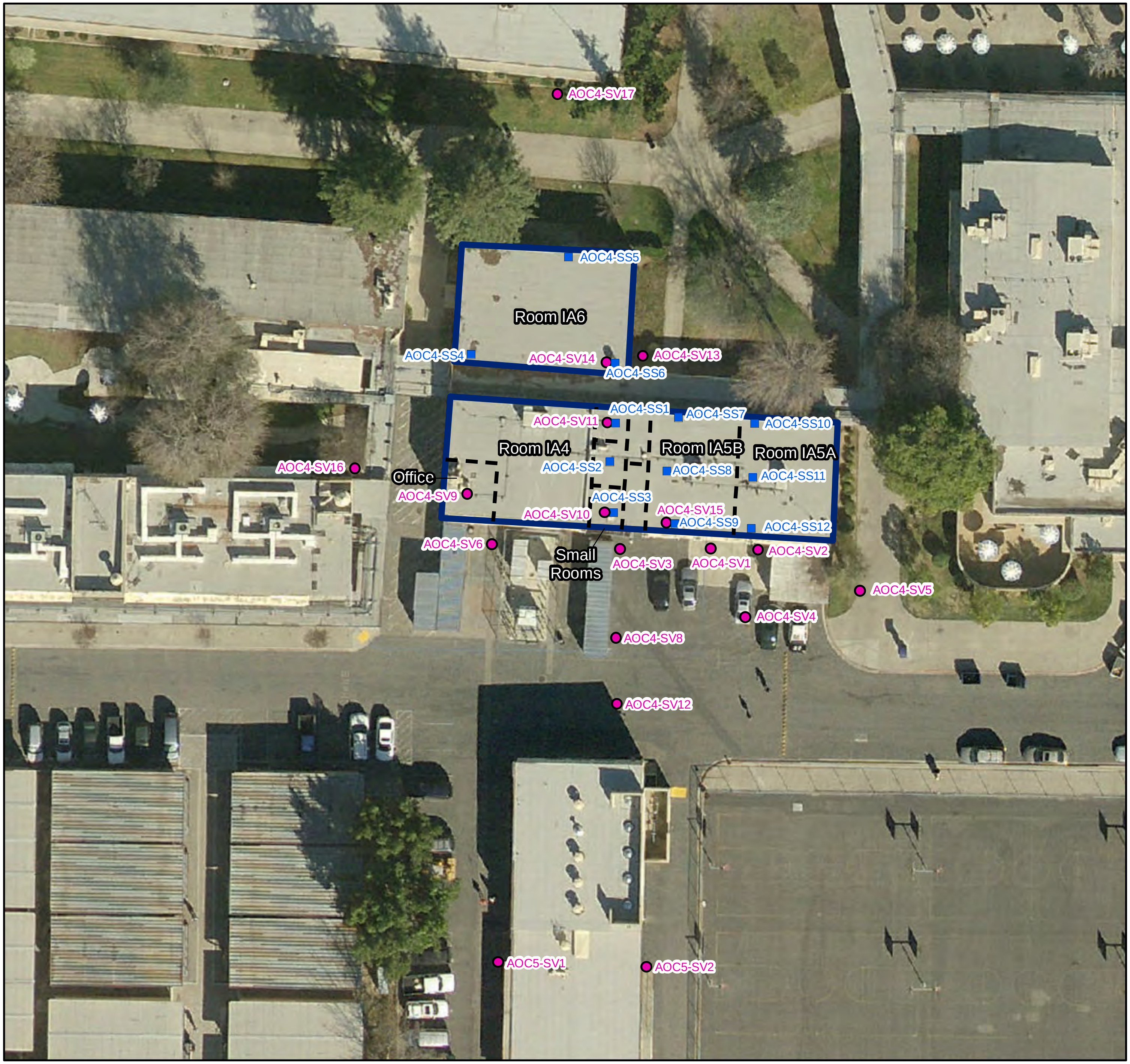


Figure 14
SOIL VAPOR and SUB-SLAB SAMPLING LOCATIONS

Reseda High School
18230 Kittridge Street
Reseda, California

LEGEND

- Sub-Slab Soil Vapor Sample Location
- Soil Vapor Sample Location
- Interior Wall
- Building Outline

PARSONS

Coordinate System:
WGS 1984 UTM Zone 11N

Feet
25 0 25 50

N

PATH: F:\GISCADD\projects\LAUSD_Reseda\Mapfiles\RemAction_Workplan\2_SV_SSS_Locs.mxd Date: 3/4/2019

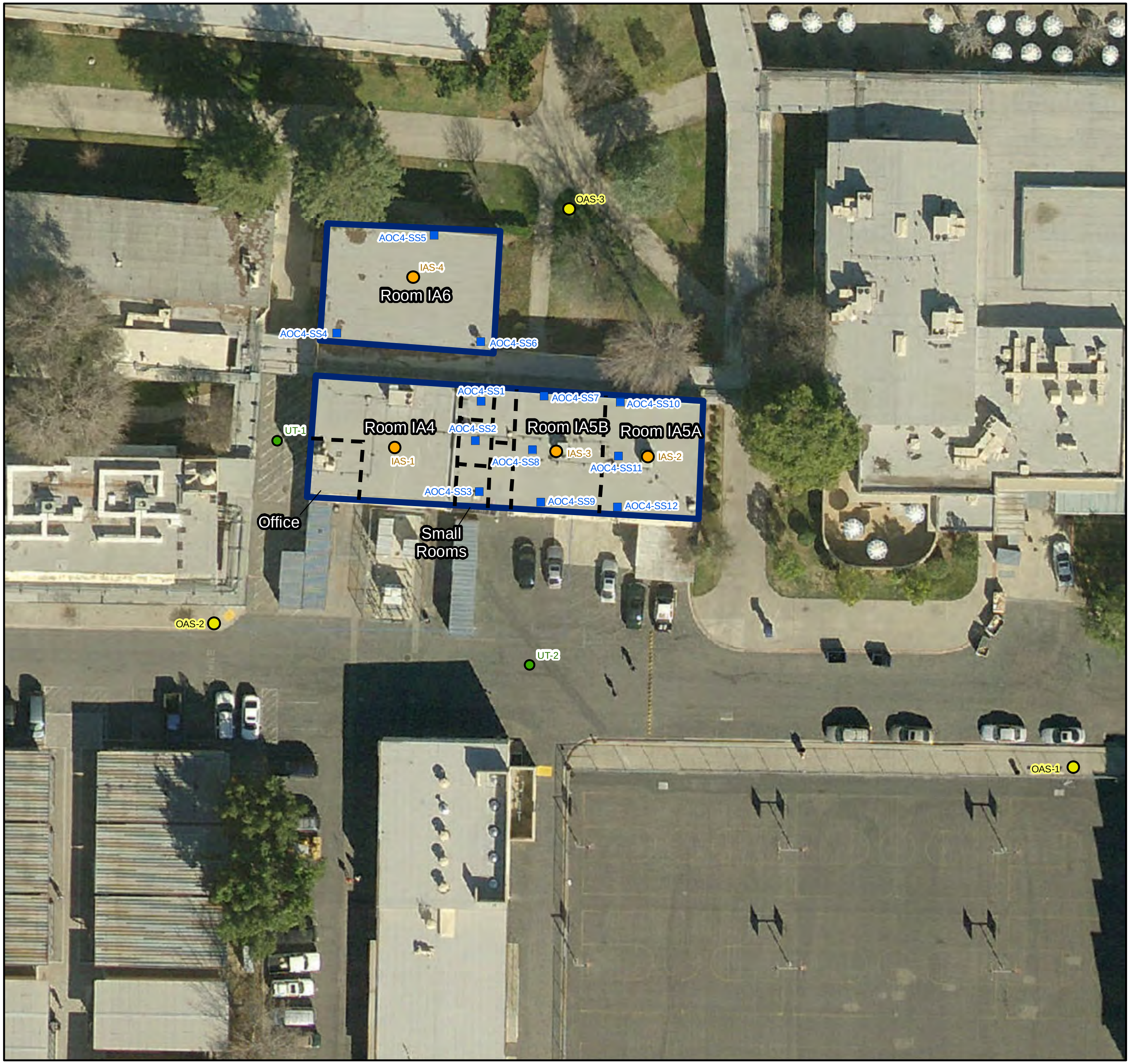


Figure 15
INDOOR/OUTDOOR AIR and SUB-SLAB SAMPLING LOCATIONS

Reseda High School
18230 Kittridge Street
Reseda, California

LEGEND

- Sub-Slab Soil Vapor Sample Location
- Indoor Air Sampling Location
- Outdoor (Ambient) Air Sampling Location
- Underground Service Tunnel Air Sample Location
- Interior Wall
- Building Outline

PARSONS

Coordinate System:
WGS 1984 UTM Zone 11N

25 0 25 50 Feet

N

PATH: F:\GISCADD\projects\LAUSD_Reseda\Mapfiles\RemAction_Workplan\indoorair_subslab.mxd Date: 3/4/2019

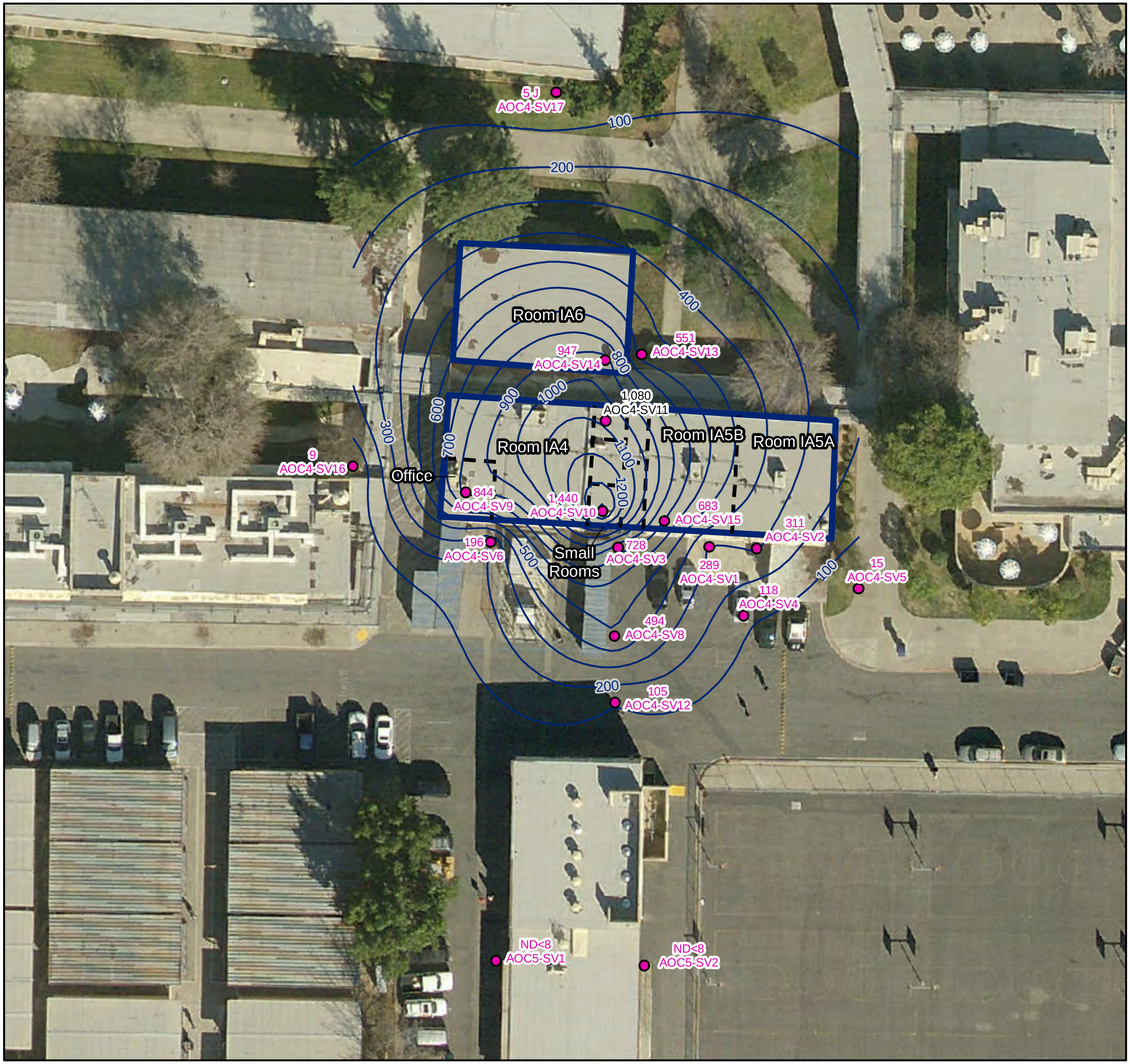


Figure 16
TETRACHLOROETHENE IN SOIL VAPOR AT 5 FT BGS (January, 2019)

Reseda High School
18230 Kittridge Street
Reseda, California

LEGEND

- Soil Vapor Sample Location
- PCE Contour (100 ug/m^3 contour interval)
- Interior Wall
- Building Outline

NOTES:
NS = Not Sampled.
ND = Non-detect at the indicated reporting limit.
FT BGS = Feet Below Ground Surface
J = Estimated value
PCE units = ug/m^3
PCE Screening Levels (ug/m^3):

	Unrestricted/Residential	Industrial
Current	230	2,000
Future	15	67

The results for the following samples are from the indicated dates:

Sample Location	Sample Date
AOC4-SV1	9/15/2018
AOC4-SV2	9/15/2018
AOC4-SV3	9/15/2018
AOC4-SV4	2/27/2018
AOC4-SV5	1/3/2019
AOC4-SV6	9/15/2018
AOC4-SV8	9/15/2018
AOC4-SV9	9/19/2018
AOC4-SV10	9/19/2018
AOC4-SV11	9/19/2018
AOC4-SV12	5/22/2018
AOC4-SV13	9/19/2018
AOC4-SV14	9/19/2018
AOC4-SV15	9/19/2018
AOC4-SV16	1/3/2019
AOC4-SV17	1/3/2019
AOC5-SV1	1/3/2018
AOC5-SV2	1/3/2018

PARSONS

Coordinate System:
WGS 1984 UTM Zone 11N

Feet
20 0 20 40

N

PATH: F:\GISCADD\projects\LAUSD_Reseda\Mapfiles\RemAction_Workplan\2_PCE_5ft_jan2019.mxd Date: 3/4/2019

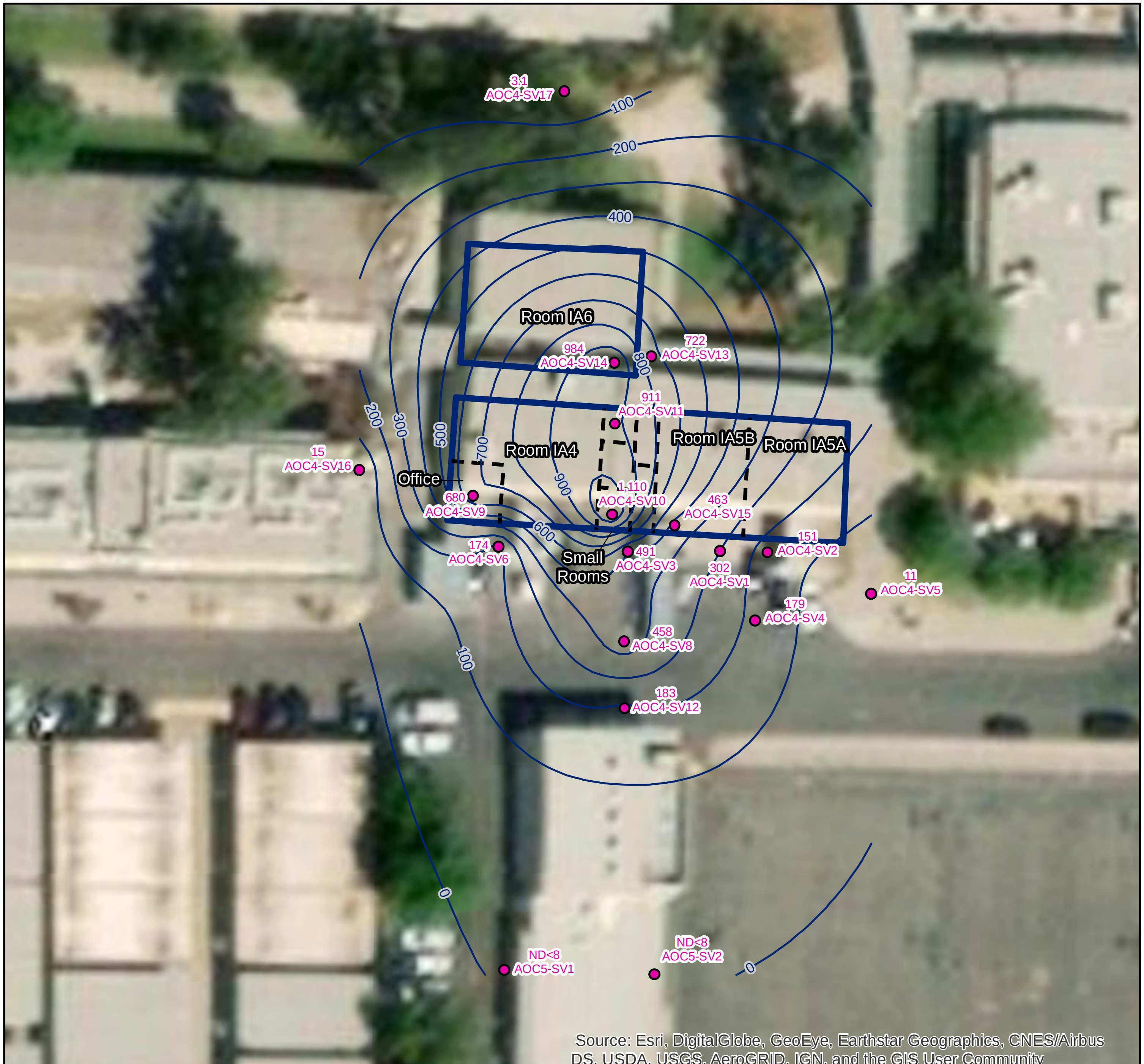


Figure 17
TETRACHLOROETHENE IN SOIL VAPOR AT 15 FT BGS (January, 2019)

Reseda High School
18230 Kittridge Street
Reseda, California

LEGEND

- Soil Vapor Sample Location
- PCE Contour (100 ug/m³ contour interval)
- Interior Wall
- Building Outline

NOTES:
NS = Not Sampled.
ND = Non-detect at the indicated reporting limit.
FT BGS = Feet Below Ground Surface
PCE units = ug/m^3
PCE Screening Levels (ug/m^3):

	Unrestricted/Residential	Industrial
Current	230	2,000
Future	15	67

The results for the following samples are from the indicated dates:

Sample Location	Sample Date
AOC4-SV1	9/15/2018
AOC4-SV2	9/15/2018
AOC4-SV3	9/15/2018
AOC4-SV4	2/27/2018
AOC4-SV5	2/27/2018
AOC4-SV6	9/15/2018
AOC4-SV8	9/15/2018
AOC4-SV9	9/19/2018
AOC4-SV10	9/19/2018
AOC4-SV11	9/19/2018
AOC4-SV12	5/22/2018
AOC4-SV13	9/19/2018
AOC4-SV14	9/19/2018
AOC4-SV15	9/19/2018
AOC4-SV16	1/3/2019
AOC4-SV17	10/9/2018
AOC5-SV1	1/3/2018
AOC5-SV2	1/3/2018

PARSONS

Coordinate System:
WGS 1984 UTM Zone 11N

Feet
25 0 25 50

N

PATH: F:\GISCADD\projects\LAUSD_Reseda\Mapfiles\RemAction_Workplan\2_PCE_15ft_jan2019.mxd Date: 3/4/2019

APPENDIX A

(Alternatives 1 – 4 ROM Cost Estimates)

COST SUMMARY SHEET FOR ALTERNATIVES 1 - 4
LAUSD RESEDA HIGH SCHOOL
Reseda RAW

Alternative	No Further Action (Cost)	Excavation of Arsenic and Lead Impacted Soil (Cost)[1]	Sub-Slab Vapor Collection and Barrier (Cost)[2]	Soil Vapor Extraction (Cost)[3]	TOTAL COST ($)
Alternative 1	$0	--	--	--	$0
Alternative 2	--	$186,125	--	--	$186,125
Alternative 3	--	$186,125	$324,796	--	$510,921
Alternative 4	--	$186,125	$324,796	$417,752	$928,673

[1] Costs excavation, transportation and disposal of 266 cubic yards of lead and arsenic impacted soil. Backfill, compaction and restoration included.
[2] Costs include design and installation of liquid boot and sub-slab collection system. 3 years of quarterly operation, maintenance and monitoring (OM&M)
[3] Costs include design and installation of Soil Vapor Extraction System. 1 year of OM&M

LAUSD Reseda High School RAW
Soil Excavation ROM (For Alt. 2)

Basis

266	cy soil for excavation
5	cy soil is CA hazardous, the rest is non-haz
5	ft soil for excavation
1	wk for soil excavation, transportation, and disposal
1	wk for backfill, compaction, and restoration

		Unit Cost	Quantity	unit	Subtotal
Project Plans and Design					
Work Plan	$	100	100	hr	$10,000
Site survey	$	2,000	1	day	$2,000
Bid Support including bid prep, meeting, and subcontractor selection	$	100	50	hr	$5,000
Permitting	$	5,000	1	EA	$5,000
Soil Excavation, transportation, and disposal					
Mob	$	4,000	1	EA	$4,000
Health and Safety	$	2,500	1	EA	$2,500
Dust control	$	200	5	day	$1,000
Erosion control	$	10	100	snd bag	$1,000
Concrete/asphalt removal	$	50	53.2	ton	$2,660
Excavation of impacted soil	$	15	399	ton	$5,985
Waste characterization	$	500	2	EA	$1,000
Transportation and disposal- Cal haz	$	100	7.5	ton	$750
Transportation and disposal- Non haz	$	60	391.5	ton	$23,490
Confirmation survey	$	2,000	1	day	$2,000
Subcontractor labor	$	3,000	5	day	$15,000
Oversight labor	$	2,000	5	day	$10,000
ODCs	$	300	5	day	$1,500
Backfill. Compaction, and Restoration					
Confirmation sampling	$	20	100	samples	$2,000
Import soil	$	20	399	ton	$7,980
Backfill and compaction	$	15	399	ton	$5,985
Regrade site	$	5	160	sy	$800
Subcontractor labor	$	2,000	5	day	$10,000
Oversight labor	$	1,000	5	day	$5,000
ODCs	$	300	5	day	$1,500
Demob	$	2,000	1	EA	$2,000
Reporting					
Completion Report	$	100	150	hr	$15,000
Project Management					$14,325
Contingency (This is calculated NOT including PM cost)					$28,650
TOTAL					**$186,125**

Assumptions:

SWPPP is not required
PM cost will be 10% of Project cost
Contingency will be 20% of project cost excluding PM cost
No DTSC regulatory oversight

LAUSD Reseda High School RAW
Sub-Slab Vapor Collection and Barrier ROM (for Alt. 3)

Basis

8000 SF for the footprint of the Bldgs
Stack 10 ft exceeding the building roof
2 wk for the system installation and testing
3 yr quarterly operation, monitoring and maintenance

	Unit Cost		Quantity	unit	Subtotal
Design , Workplan, and Bid Support					
Design including drawings and spec.	$	100	50	hr	$5,000
Work Plan including installation and OM&M	$	100	50	hr	$5,000
Bid Support including bid prep, meeting, and subcontractor selection	$	100	25	hr	$2,500
Sub-slab Collection System and Barrier Installation					
Mob/demob	$	2,000	1	EA	$2,000
Health and Safety	$	1,500	1	EA	$1,500
Subcontractor installation cost	$	2,000	10	day	$20,000
6-in Gravel	$	35	148	cy	$5,185
Piping (4" Sch 40 PVC) including connector, fitting, probe, support, etc.	$	12	200	ft	$2,400
Blower including gauges, sensors, etc.	$	20,000	1	EA	$20,000
2-in sand	$	28	49	cy	$1,358
60 mil HDPE or equivalent (Liquid Boot)	$	5	8000	sf	$40,000
Oversight Labor	$	1,250	10	day	$12,500
Oversight ODC and materials	$	300	10	day	$3,000
Quarterly Operation, Maintenance, and Monitoring					
O&M check and sampling cost	$	4,000	3	Yr	$12,000
Laboratory analyses cost for 3 soil vapor samples quarterly	$	1,800	3	Yr	$5,400
Field instrument rental	$	800	3	Yr	$2,400
Field supplies and consumable	$	1,200	3	Yr	$3,600
Reporting					
Installation Completion Report including as-built drawings	$	100	100	hr	$10,000
Quarterly O&M Report	$	32,000	3	Yr	$96,000
Project Management					$24,984
Contingency (This is calculated NOT including PM cost)					$49,969
TOTAL					**$324,796**

Assumptions:

Bldg. has existing power suited for the blower
Air permit is not required
Soil vapor treatment is not required
PM cost will be 10% of Project cost
Contingency will be 20% of project cost excluding PM cost
No DTSC regulatory oversight

LAUSD Reseda High School RAW
Soil Vapor Extraction ROM (for Alt. 4)

Estimated SVE Flow Rate

Area[1] (sf)	ROI[2] (ft)	SVE wells	Well screen interval[3] (ft)	Porosity[4] (%)	Pore volume (cf)	No. of pore volume per day	Required flow rate (cfm)
5,000	15	8	15	10%	8,482	4	24
Total							24

Note:

(1) Assume treatment zone area is PCE contour of 1,000 ug/m3 in September 2018

(2) Assume ROI is 15 ft

(3) Assume SVE well screen 5-20 ft bgs

(4) Assume porosity 10%.

(5) Assume SVE Blower vacuum pressure is 12 in-Hg

SVE Blower Spec.

Flow Rate	100	scfm
Vac. Pressure	12	in-Hg

Soil Vapor Extraction ROM (for Alt. 4)

Assumptions

4 Soil vapor probes (20 ft deep)
12 Drilling boreholes
8 SVE wells (20 ft deep)
1 years of OM&M

Installation/Permitting/Disposal Cost for SVE Wells and probes		Unit Cost	Quantity	Unit	
Driller cost for installing SVE well	$	4,000	8	well	$32,000
Driller cost for installing SVE probe	$	3,000	4	probe	$12,000
Well Permit Cost	$	564	12	borehole	$6,768
Geophysical survey	$	3,000	1	day	$3,000
IDW analyses and disposal	$	4,000	1	ea	$4,000
Well survey	$	3,000	1	ea	$3,000
Drilling Oversight Labor (2 people)	$	2,160	8	day	$17,280
ODCs	$	300	8	day	$2,400
Pre-field	$	7,000	1	ea	$7,000
SVE Unit Purchase/Implementation/Startup Cost					
Air Permit	$	5,000	1	ea	$5,000
SVE (100 cfm, 12 in-Hg) and GAC (2 x 1,000lb)	$	60,000	1	ea	$60,000
Aboveground piping for connection of SVE wells to SVE unit	$	10	500	feet	$5,000
Install Electric Panel to accommodate SVE unit	$	20,000	1	ea	$20,000
Sub Startup Labor (2 person: 5 days startup)	$	2,000	5	day	$10,000
Labor - oversight (one person, 10 days)	$	1,200	10	day	$12,000
Startup Labor (1 person: 5 days startup)	$	840	5	day	$4,200
ODCs	$	300	15	day	$4,500
OM&M cost					
SVE unit O&M and monitoring (including carbon change)	$	20,000	1	year	$20,000
Labor - weekly for first 3 months, then monthly	$	840	22	day	$18,480
ODCs	$	300	22	day	$6,600
Laboratory analyses cost	$	21,120	1	LS	$21,120
Reporting/Regulatory Correspondence					
Reports (Design/Installtion, Completion)	$	20,000	2	ea	$40,000
Regulatory Correspondence	$	7,000	1	ea	$7,000
Project Management (10%)					$32,135
Contingency (20% NOT including PM cost)					$64,270
TOTAL					**$417,752**

Analyses cost (Baseline + weekly first 3 months + monthly thereafter)

Analyses cost for

4 Soil vapor probes +Influent & Effluent

Soil Vapor	**Unit Cost**	**Quantity**	**Unit**	Total
TO-15	$150	132	sample	$19,800
Tedlar bag	$10	132	sample	$1,320
TOTAL cost + baseline (1)				**$21,120**

Assumptions:

ROI is 15 feet for SVE wells
SVE wells will be measured with PID/FID, but not sampled, during OM&M
GAC change is based on quarterly change of one 1,000-lb vessel carbon
Electricity cost is not included
PM cost will be 10% of Project cost
Contingency will be 20% of Project cost excluding PM cost
No DTSC regulatory oversight