REMOVAL ACTION WORKPLAN FOR SOIL

Thomas Jefferson High School
1319 East 41st Street
Los Angeles, California

Prepared for

Los Angeles Unified School District

LAUS-17-6714
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Project Site	Thomas Jefferson High School
Property Owner	Los Angeles Unified School District
Chemicals of Concern (COCs)	Lead and Arsenic.
Cleanup Goals	Lead: 80 milligrams per kilogram (mg/kg) Arsenic: 12 mg/kg
Estimated Soil Removal Volume at Completion of RAW Activities	229.04 cubic yards

1. INTRODUCTION

Thomas Jefferson High School (the "Site") is an active high school campus made up of five adjacent parcels (Los Angeles County Tax Assessor Parcel Numbers: 5114-036-900, -901, -902, -903, -904) that total approximately 18.15 acres. The Site is bound by residential homes to the north, Compton Avenue to the east, East 41st Street to the south, and Hooper Avenue to the west.

A Preliminary Environmental Assessment Equivalent (PEA-E) for the Thomas Jefferson High School comprehensive modernization area located on the northern portion of the Site was conducted by Alta Environmental (Alta) on behalf of the Los Angeles Unified School District Office of Environmental Health and Safety (LAUSD-OEHS) (Alta 2017). Soil samples were collected throughout the Site at various depths and analyzed for total petroleum hydrocarbons (TPH), volatile organic compounds (VOCs), polychlorinated biphenyls (PCBs), organochlorine pesticides (OCPs), arsenic, lead, and Title 22 metals. While several analytes were detected at concentrations exceeding laboratory detection limits, only lead and arsenic were detected in soil samples exceeding residential screening levels. Alta recommended that a Removal Action Workplan (RAW) be developed for the Site to address shallow soils impacted with lead and/or arsenic in the areas located throughout the campus.

1.1 Objectives of the RAW

This RAW outlines the proposed action at the Site which will focus on the removal and disposal of the majority of soils impacted with the contaminants of concerns (COCs) identified during PEA-E activities. The COC's identified at this Site are lead and arsenic. Excavation was determined to be the preferred removal action (RA) remedy based on accessibility to the majority of the identified impacted soil.

1.1.1 Removal Action Objectives

Removal Action Objectives (RAOs) have been established; these RAOs are presented below:

- Minimize exposure of humans to the COCs in shallow soil through inhalation, dermal absorption, and ingestion;
- Minimize potential for migration of the COCs from the shallow soil to other media, and;
- Remove the majority of accessible impacted soils that exceed the established Site-specific cleanup goals.

The remedial goals developed and adopted for contaminated media at the Site are responsive to these RAOs.

2. SITE INFORMATION

2.1 Site Location and Description

The subject Site is located at 1319 East 41st Street in the city of Los Angeles, Los Angeles County, California. The Los Angeles River is approximately 1.5 miles east of the Site, the Santa Monica 10 Freeway is approximately 1.0 miles north of the Site, the Long Beach 710 Freeway is located approximately 5.5 miles east of the Site, the Glenn Anderson 105 Freeway is located approximately 6.7 miles south of the Site, and the Harbor 110 Freeway is located approximately 2.7 miles west of the Site. The area surrounding the Site is characterized by a combination of residential, commercial/industrial, public park development areas, and public roads and freeways.

A Site Location Map is presented as Figure 1. Figure 2 (PEA-E Sample Location Map) depicts the soil sampling locations from the PEA-E and identifies the locations where soils are impacted with lead and arsenic above established Site-specific cleanup goals.

2.1.1 Site Name, Address and Size

The Site Name: Thomas Jefferson High School

The Site Address: 1319 East 41st Street, Los Angeles, California 90011

The Site Size: approximately 18.15 acres

2.1.2 Mailing Address and Telephone Number

For the purposes of this RAW, the general contact for information is as follows:

Mr. Patrick Schanen
LOS ANGELES UNIFIED SCHOOL DISTRICT
Office of Environmental Health and Safety
333 S. Beaudry Avenue, 28th Floor
Los Angeles, California 90017

2.1.3 EPA Identification Number

The EPA identification (EPA ID) number for the Site is CAD28409019. This number will be used for the generation, transportation, and off-Site disposal of wastes excavated from the Site, as applicable.

2.1.4 Assessor's Parcel Number(s) and Maps

The APNs for the Site are reportedly 5114-036-900, 5114-036-901, 5114-036-902, 5114-036-903, and 5114-036-904.

2.1.5 Ownership

The Site is owned by the Los Angeles Unified School District (LAUSD).

2.2 Operational History and Status

Based on aerial photographs, Sanborn Fire Insurance Maps, building permits, and agency database review, the property was undeveloped as late as 1850. Between 1880 and 1912, the property was cultivated for agricultural use. By 1915, a stadium had been constructed on the Site. By 1916, portions of the present-day Thomas Jefferson High School had been constructed at the Site. The Site has subsequently continually operated as a High School.

2.3 Topography

The Site is approximately 205 feet above mean sea level (amsl) (Partner, 2016a) in the City of Los Angeles, Los Angeles County, California. The area is characterized by a combination of residential, commercial/industrial, public park development areas, and public roads and freeways. Although the topography of the Site is relatively flat, the Site has a slight topographic gradient to the southwest.

2.4 Geology and Hydrogeology

2.4.1 Site Geology and Soil Types

The subject property is situated within the northern portion of the Downey Plain in the Los Angeles Basin in the Transverse Ranges physiographic province of the State of California. The Downey Plain consists of recent alluvial deposits to the southwest of the Los Angeles River that overlie an older weathered surface. Soils in the Site vicinity are generally described as Quaternary age sediments, primarily younger floodplain and stream deposits of recent alluvium and Pleistocene-age Lakewood Formation. The sediments are generally loose to dense sands, silty sands, and silts with some clayey zones. The uppermost geologic formation underlying the soils at the subject property is the Pleistocene Age Beaumont Formation. The Beaumont Formation comprises the underlying stratigraphy and consists mostly of clay, silt and sand deposited in stream channel, point bar, and fluvial environments. The thickness of the Beaumont Formation is estimated to be over 200 feet. The Beaumont Formation is underlain by the Lissie and Willis Formations, which are estimated to be a total of approximately 300 feet thick.

During the PEA-E investigation, soil-matrix sampling identified the shallow soils at the Site to consist of combinations of silts and sands to the maximum explored depth of 10.5 feet below ground surface (bgs).

2.4.2 Site Hydrogeologic Setting

According to topographic map interpretation presented in the Phase I Environmental Site Assessment (Phase 1 ESA) (Partner, 2016b), the direction of groundwater in the vicinity of the Site is inferred to flow toward the southwest. The nearest surface water in the vicinity of the subject property is the Los Angeles River located approximately 1.5 mile east of the subject property. No settling ponds, lagoons, surface impoundments, wetlands or natural catch basins were observed at the Site during this assessment.

2.5 Surrounding Land Use and Sensitive Ecosystems

The Site is bounded by East 33rd Street, residential development and a truck storage yard Daylight Transport LLC to the north, Hooper Avenue and residential and commercial development to the west, East 41st Street and residential and commercial development to the south, and Compton Avenue and residential and commercial development to the south of the Site. No areas of ecological interest were identified on or near the subject property.

2.6 Previous Site Investigations

2.6.1 Phase I Environmental Site Assessment (ESA) – Partner

Partner Engineering and Science (Partner) completed a Phase I ESA report in May 2016. The assessment identified the following evidence of recognized environmental conditions (RECs) in connection with the Site:

- The subject property operated on-Site industrial arts classrooms including auto engine and auto body repair. The subject property is equipped with two below-grade hydraulic lifts located within the south end of the former industrial arts building and with a spray booth on the north end of the building. The lifts were reported installed during building construction in the 1960s and the spray booth was installed in the 1980s. Soil sampling in the area of the lifts and spray booth was recommended to evaluate the potential for releases of hydraulic oil, paints, or solvents to have impacted soil.

- Three oil/water separators (clarifiers) are located to the north and east of the industrial arts building and are connected to floor drains in the spray booth and in the repair areas. Soil sampling in the area of the clarifiers was recommended to evaluate the potential for releases of oil or other petroleum based substances, and solvents that may have impacted soil.

- Historical shop areas are located in several areas of the school property. A shop area in the industrial arts building was previously used for metal, electrical, wood-working, and printing classrooms. Other historic shop areas were located south of the current industrial arts building and in the original 1916 science and arts buildings. This original 1916 science and arts buildings are currently the Academic Building. Based on the age of the historic shop buildings dating to 1920 or earlier, there is potential for septic tanks, sumps, or clarifiers to remain in these areas.

- Two hazardous materials storage enclosures have the potential to have impacted soils. One hazardous materials storage area containing 55-gallon drums of gasoline and diesel fuel is located to the west of the current arts building. The other storage area which is used to store waste oil, filters, and coolant in 55-gallon drums is located to the east of the industrial arts building. Both of these storage areas date to the 1950s or 1960s and the potential exists for releases from these storage areas to have occurred.

- Two historical paint storage buildings were identified to the north and northwest of the boiler house. Potential exists that releases of paints or solvents in these locations has impacted soil,

- The boiler house building was constructed in 1916 and formerly housed fuel oil boilers and an incinerator. The potential exists that fuel oil ASTs and/or USTs were present beneath or near the building and that spillage or leakage from historical fuel storage has impacted soil.

- The northeastern portion of the subject property is used for a garden and appears to have been since prior to original Site development in 1915/1916. Additionally, the center and the northeastern quarter of the property appear to have been used for agriculture until the 1950s or 1960s. Organochlorine pesticides may have been used historically in these areas.

- Based on experience at other LAUSD school sites of similar age, the potential exists for residual arsenates in soil and under pavement from application of arsenic based herbicides.

- Due to the age of the on-Site structures and historical use of the property for agriculture, it was recommended that soil samples be tested for lead, arsenic, and organochlorine pesticides in accordance with the Department of Toxic Substances Control (DTSC) "Interim Guidance *Evaluation of School Sites with Potential Soil Contamination as a Results of Lead from Lead-Based Paint, Organochlorine Pesticides from Termiticides, and Polychlorinated Biphyenyls from Electrical Transformers"* revised June 9, 2006.

2.6.2 Preliminary Endangerment Assessment-Equivalent (PEA-E) – Alta

The PEA-E sampling and analysis program was conducted between July 2016 through November 2016. The sampling and analysis program consisted of 106 primary borings (SS1 through SS106) to evaluate contaminants of potential concern (COPCs) concentrations in shallow soils throughout the Site (Figure 2). One-hundred-thirty (130) additional step-out borings were required to further assess lead and/or arsenic concentrations in shallow soils (Figures 3 through 8). The lateral and vertical extent of lead and arsenic concentrations exceeding the Department of Toxic Substances (DTSC) screening levels was successfully defined by step-out and step-down soil sampling, and confirmed by fixed laboratory analysis.

Based on the soil matrix sampling conducted during the PEA, the following conclusions were made:

- Soil samples were collected throughout the Site at various depths and analyzed for TPH, VOCs, OCPs, PCBs, arsenic, lead, and Title 22 metals. While several analytes were found at levels in excess of laboratory detection limits, only lead and arsenic were identified in soil samples in excess of residential screening levels.

- Thirty-one areas with shallow soil impacted by lead and/or arsenic in excess of residential screening levels were identified throughout the campus. The shallow step-out soil sampling for lead and arsenic in soil was able to achieve lateral and vertical definition of the areas of impact at the Site. The total estimated amount of impacted soil at the Site is estimated to be approximately 224 cubic yards.

Based on the conclusions of this PEA investigation, Alta recommended that a RAW be prepared to address shallow soils impacted with lead, and/or arsenic in the areas identified throughout the campus.

3. NATURE, SOURCE, AND EXTENT OF ON-SITE CHEMICALS OF CONCERN

3.1 Shallow On-Site Soil

As discussed above, soil samples were collected from various depths across the Site and analyzed for potential COCs. The analysis included TPH, VOCs, PCBs, OCPs, arsenic, lead, and Title 22 metals. While several analytes were found at levels exceeding laboratory detection limits, only lead and arsenic were detected in soil samples exceeding residential screening levels.

3.1.1 COCs in Shallow Soil

Lead-impacted soil appears to be present as a result of historic lead based paint use and/or impacted fill materials. Arsenic impacted soils appear to be present as a suspected result of past use of termiticides throughout the campus.

3.2 Extent and Volume of On-Site Soil Removal

Based on the analytical data collected during the Alta PEA-E, it is estimated that elevated COC concentrations are limited on Site to the areas identified on the attached Figures 3 through 8 and are described in the table below. The estimated volume of impacted soil at the Site above current cleanup goals to be excavated is approximately 224 cubic yards (Table 1).

Site Area Location	Figure Showing Site Area Location	COCs	PEA-E Primary Soil Sample Locations Exceeding Cleanup Goals	Estimated Volume of Impacted Soil (cubic yards)
Southeastern	Figure 3	Arsenic and Lead	SS93, SS95, SS96, SS101, SS102, SS103	64.62

Southwestern (Boy's Gymnasium)	Figure 4	Lead	SS21, SS22	3.04
Southwestern (Power House)	Figure 5	Lead	SS1, SS2, SS32	15.55
Northwestern	Figure 6	Lead	SS73, SS74 SS76	14.81
Northeastern (Homemaking Building)	Figure 7	Arsenic and Lead	SS27, SS38, SS43, SS47, SS92, SS98	52.95
Northeastern (Industrial Arts Building)	Figure 8	Arsenic and Lead	SS53, SS54, SS55, SS68, SS70, SS77, SS79, SS80, SS82, SS87, SS88	73.14

Notes: See Table 1 for step-out sample locations

3.3 Health Effects of Chemicals of Concern

Materials	**Route of Exposure**	**Symptoms**	**Target Organs**
Lead	Inhalation/ingestion/ skin or eye contact	Lassitude, insomnia; facial pallor; anorexia, low weight, malnutrition; constipation, abdominal pain, colic; anemia; gingival lead line; tremors; paralysis in the wrists, ankles; encephalopathy; kidney disease; irritation of the eyes; hypotension	Eyes, GI tract, CNS, kidneys, blood, gingival tissue
Arsenic	Inhalation/absorption/ contact/ ingestion	Ulceration of nasal septum, dermatitis, GI disturbances, respiratory irritation, hyper pigmentation of the skin	Liver, kidneys, skin, lunch, lymphatic system

Notes: GI – gastrointestinal CNS – central nervous system

4. RISK EVALUATION AND ON-SITE SOIL CLEANUP GOALS

This section summarizes results from the human health screening evaluation conducted during the PEA-E and presents the cleanup goals for the identified accessible COCs in soil that can be excavated from the Site.

4.1 Summary of PEA-E Human Health Screening Evaluation

The only target analytes found to exceed applicable screening levels during the PEA-E were lead and arsenic in soil. Therefore, a HHSE was conducted to address the lead and arsenic concentrations in soil only. For the purpose of HHSE, hypothetical adult and child residents were assumed to be exposed to COCs identified in soil by direct dermal contact, incidental ingestion, and inhalation of airborne particulate. The HHSE estimated both carcinogenic and noncarcinogenic risks associated with exposure to hypothetical Site occupants (Alta, 2017).HHSE calculations and analysis are in Appendix A.

4.1.1 HHSE Estimated Carcinogenic Risk

The cumulative carcinogenic risk based on the maximum concentrations of COC's identified at the Site is 1.92E-03. This value exceeds the DTSC's target risk value of 1E-06.

Alta also calculated the cumulative carcinogenic risk using the calculated 95% Upper Confidence Level (UCL) concentration for each COPC. The cumulative carcinogenic risk based on the 95% UCL concentrations of COPC's identified at the Site is 5.96E-04. This value exceeds the DTSC's target risk value of 1E-06.

4.1.2 HHSE Estimated Noncarcinogenic Risk

The cumulative non-carcinogenic risk (Hazard Quotient) based on the maximum concentrations of COPC's identified at the Site is 6.34E+01, which is above the benchmark level for noncancer effects (1.0).

Alta also calculated the cumulative non-carcinogenic risk using the calculated 95% Upper Confidence Level (UCL) concentration for each COPC. The cumulative non-carcinogenic risk based on the 95% UCL concentrations of COPC's identified at the Site is 1.74E+01, which is above the benchmark level for noncancer effects (1.0).

4.2 Recommendation for Further Action

Based on analytical data gathered during the PEA-E and results from the human health screening evaluation, Alta recommends addressing shallow soils impacted with lead and arsenic.

4.3 Soil Excavation Cleanup Goals

The COCs for this Site soils are lead and arsenic. A summary of the COCs, maximum concentration in each area of concern, and cleanup goals are presented on Table 1. The soil cleanup goals are based on residential site screening levels and/or published background concentrations as described below:

- Arsenic: 12 mg/kg based on DTSC's upper bound estimate (95th percentile) for background concentrations in Southern California (DTSC undated).
- Lead: 80 mg/kg based on DTSC-SL for residential land use published in DTSC's HERO Note 3 (DTSC, 2016).

5. REMOVAL ACTIVITIES

5.1 Removal Action Scope

This RAW outlines the remedy for the COCs at the Site, and addresses the accessible metals in soil above cleanup goals that can be practically excavated at the Site. The estimated volume of impacted soil proposed for the RA is approximately 224 cubic yards, based on the analytical data gathered during the PEA-E by Alta (Alta 2017).

5.2 Presumptive Remedy

An immediate soil removal (excavation and off-Site disposal) has generally been accepted as the preferred remedial action for similar site conditions at other similar locations (presumptive remedy). As a presumptive remedy excavation and off-Site disposal has been determined to be the most effective remedy. Therefore, no other alternative removal options will be considered for the accessible COCs in soil that can be practically excavated at this time.

5.3 Description of Selected Removal Action

5.3.1 Soil Excavation

Soil excavation at the Site will remove soil containing the COCs (arsenic and lead) that exceed the cleanup goals listed in Table 1. The excavation will be performed using heavy equipment consisting of, but not limited to, an excavator, backhoe, loader, and dump truck. Ancillary facilities (i.e., wastewater holding tank) will also be used during the removal action. Excavation operations may generate fugitive dust emissions. Suppressant foam, water spray, and other forms of vapor and dust control may be required during excavation, and workers may be required to use personal protective equipment to reduce exposure to the COCs. The depth of excavations may be limited due to physical constraints associated with the Site. Sloping excavation sidewalls and slot-cutting may result in increased volume of soil requiring excavation. Confirmation soil sampling and analysis will be conducted to verify soil impact concentrations at the excavation bottom and sidewalls (see Section 7.8.2).

Excavated soil will be either directly-loaded into waiting dump trucks or temporarily stockpiled within an on-Site "holding area" using a rubber-tire backhoe or similar equipment (such as wheel loader). Any temporary soil stockpiles will be properly secured and protected until ready for loading for off-Site transportation and disposal. Truck loading will take place concurrently with excavation operations, with access of loaders to the stockpile from outside the excavation areas, while excavation operations deposit impacted soil from the excavation areas to the staging areas. Clean, imported soil or other fill material will be brought to the Site to backfill areas where impacted soil was removed. Imported soil and/or other fill material would be accompanied by certificates, analytical data, and/or other supporting documents that indicate the import material is in conformance with cleanup criteria.

5.3.2 Off-Site Disposal

Off-Site disposal involves removing impacted soil from the Site and transporting it to an appropriate off-Site facility for disposal.

The activities that would be conducted to implement this RA are described below.

- Excavate approximately 224 cubic yards of impacted soil from identified locations.
- If necessary, segregate and stockpile impacted soils.
- Conduct confirmation soil sampling using a fixed-base laboratory and compare confirmation data to cleanup goals.
- Load and transport approximately 224 cubic yards of impacted soil to an appropriate disposal facility.
- Grade, backfill, and compact previously excavated areas using clean, imported fill material.

6. APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS

Previous investigations of the Site indicated the presence of the COCs in soil exceeding the established cleanup goals for this Site. The most effective removal action for soil is excavation and off-Site disposal. This section discusses the applicable or relevant and appropriate requirements (ARARs) for the proposed soil excavation and off-Site disposal.

6.1 Waste Management

An EPA ID number (CAD28409019) has been obtained for proper management of waste generated during soil excavation activities. Based on the laboratory analytical results of soil samples summarized in Table 2, a portion of waste has been profiled as a California-hazardous waste. The volume of soil to be excavated is estimated at 224 cubic yards. Excavated impacted soils will be transported to a properly certified landfill.

6.2 Health and Safety Plan

All contractors will be responsible for operating in accordance with the most current requirements of 8 CCR, Section 5192 (8 CCR 5192) and Title 29, Code of Federal Regulations (CFR), Section 1910.120 (29 CFR 1910.120), Standards for Hazardous Waste Operations and Emergency Response (HAZWOPER). On-Site personnel are responsible for operating in accordance with all applicable regulations of the Occupational Safety and Health Administration (OSHA) outlined in 8 CCR, General Industry and Construction Safety Orders, and 29 CFR 1910 and 29 CFR 1926, Construction Industry Standards, as well as other applicable federal, state and local laws and regulations. All personnel will operate in compliance with all California Occupational Safety and Health Administration (Cal-OSHA) requirements.

A Site-specific Health and Safety Plan (HASP) shall be prepared for the RAW by the selected RA contractor (herein referred to as “RA Contractor”) and will be included in Appendix B. The HASP will be prepared in general accordance with current federal and OSHA health and safety standards. The provisions of the HASP are mandatory for all personnel and contractors who are at the Site. All on-Site personnel must read and sign the HASP prior to commencing field activities.

6.3 Quality Assurance Project Plan (QAPP)

Quality assurance/ quality control measures that will be used during project execution are documented in the QAPP included as Appendix C. The QAPP will assure that Site field and analytical data collected meet Data Quality Objectives (DQOs).

6.4 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 supervision from a California-registered professional geologist or professional engineer.

7. REMOVAL ACTION IMPLEMENTATION AND REPORTING

7.1 Public Participation Activities

A public participation process has been developed by LAUSD to ensure that the local community has the opportunity to comment and provide input to the decision process adopted for environmental cleanup of their properties. The LAUSD may prepare a Fact Sheet in English and Spanish (which are languages appropriate to the community) to provide general background information for the Site, including a description of the planned RA, public comment opportunities, and the project schedule. The Fact Sheet will be circulated to residences and businesses immediately adjacent to or within line-of-sight of the Site.

A public notice will be published in local newspapers for general circulation in English and Spanish in order to inform the community of the proposed RA and of the availability of the administrative record for public inspection. Copies of the administrative record (i.e., this RAW, and related determination letters for the Site) will be placed at Information Repositories for access by community members.

If a high level of interest in the Site is expressed by the local community, a public meeting to brief interested parties about the proposed activities may be hosted by the LAUSD. In general, public comment periods are 30-days long. If a public meeting is required, it will be held during the public comment period.

7.1.1 Community Survey

As part of the public participation process, a baseline community survey may be conducted prior to RA implementation. This process would involve mailing of survey forms to all local community members, including businesses owners, residents, and affected parties. Community interviews may also be held with key contacts in the community, as well as elected officials, to solicit community comments concerning the proposed RA.

7.2 Site Preparation and Security Measures

Prior to equipment mobilization for the proposed RA, Site preparation activities will include fieldwork notification, Site inspections, delineation of excavation areas, and utility connections.

7.2.1 Fieldwork notification

Prior to the RA field work activities, a field work notice will be delivered to the businesses and residences within line-of-sight of the Site. Additionally, the field work notices will be delivered to the administrative staff for delivery to the school faculty and staff and enough notices for the administration to hand out to the students. The field work notice will be on blue paper and double-sided, one side in English and one side in Spanish.

7.2.2 Delineation of Excavation Areas

The lateral limits of excavation will extend to the step-out boring location which confirms soil with COC concentrations are less than cleanup goals (Figures 3 through 8). The lateral limits of all excavation areas will be delineated and surveyed by the RA Contractor, in consultation with the client before commencement of removal action activities. The areas to have soil removal will be called the “excavation areas,” and they will be marked (also as the exclusion zones) in the field by the RA Contractor with high-visibility paint. The anticipated excavation boundaries (building walls, utility lines, soil borings with COC concentrations below cleanup goals) along with approximately excavation area dimensions are detailed on Table 1.

7.2.3 Utility Clearance

Clearance of utilities and other hazardous underground obstacles will be conducted prior to initiation of any excavation activities. Such possible obstacles may include water, electrical, gas, oil, communication cable, phone cable, TV cable, and/or sewer lines. At a minimum, the utility clearance will include a 48-hour notification of the local Underground Service Alert (USA) and a Site visit. In addition, a geophysical survey may be conducted as appropriate to clear each excavation area. Underground utilities will be located and the markings inspected to verify they are visible and properly marked. Field crew, equipment operators, and LAUSD-OEHS Site representative will be informed of all these locations during a walk-through prior to initiation of any excavation activities.

Six excavation areas (SS1, SS76C, SS79, SS88, SS95 and SS103) are intersected by subsurface utilities (see Table 1 and Figures 3, 5, 6 and 8). In these areas, the contractor will remain at least two feet away from the mapped location of the utility to avoid damage. Post excavation confirmation sidewall samples will be conducted on both sides of the undisturbed utility, to document the soils that are left in place.

7.2.4 Security Measures

This Site is bounded by a perimeter fence which will increase the likelihood that the work areas are secure and safe. To ensure that trespassers or unauthorized personnel are not allowed near work areas, security measures may include, but are not limited to:

- Posting notices directing visitors to the Site manager.
- Installing barrier fencing around work areas to restrict access to sensitive areas.
- Providing adequate Site security to ensure that unauthorized personnel have no access to work areas and/or contaminated materials.

- Maintaining a safe and secure work area, including areas where equipment is stored or placed, at the close of each workday.
- Persons requesting access to the excavation areas will be required to demonstrate a valid purpose for access and if access to work areas and/or contaminated materials is planned, provide appropriate documentation to demonstrate they have received proper training required by the Site-specific HASP.

7.3 Excavation

All field work will be completed by properly trained and equipped hazardous waste workers. Impacted soil will be removed with earth moving equipment, as necessary, and will involve the use of a backhoe, loader, excavator, and/or shovels. As soil is excavated, it will be loaded directly onto dump trucks to be immediately transported off-Site or temporarily stored in staging areas on Site. If temporarily stockpiled on Site, the soil will be placed and covered with plastic secured with sandbags. In addition, Cal-OSHA Construction Safety Orders (especially 8 CCR 1539 and 1541) will be followed as appropriate.

In the event that one (1) or more confirmation sample concentrations exceed the cleanup goals from an excavation, the excavation will be extended laterally by 5-linear-foot increments where the confirmation sample concentrations exceed the cleanup goal, and additional confirmation samples will be collected and analyzed. If necessary, the process of additional excavation and confirmation sample collection and analysis will be repeated until all confirmation sample concentrations from the completed excavation are less than the cleanup goal or the boundary of the excavation reaches a subsurface utility, a property boundary, or a site/building feature (i.e. building wall, planter wall, fence line, building staircase or ramp).

7.3.1 Contaminant Control

In order to minimize potential exposure of fugitive dust to the adjacent properties, dust monitoring, and if necessary, dust suppression measures will be utilized. Dust suppression measures may consist of spraying water on the excavation area, and other areas susceptible to wind erosion. Care will be taken to avoid excessive water application that could cause a non-storm water runoff event at the Site.

7.3.2 Health and Safety Zones

Health and safety-designated locations such as the Exclusion Zone and Support Zone will be established prior to commencement of field activities. The importance of these zones and their locations will be emphasized with all on-Site workers during daily health and safety tailgate meeting held before RA work activities begin and with each Site visitor or worker as soon as he or she arrives at the Site. The RA Contractor on Site may modify the Site plan during field activities for Site ingress and egress or for health and safety reasons.

7.3.3 Field Documentation

The RA Contractor will be responsible for maintaining field notes during the RA activities. The notes will serve to document observations, personnel on-Site, equipment arrival and departure times, and other vital project information, and will be used in the preparation of the RA Report.

7.3.4 Field Logbooks

Field logbooks will be used to document where, when, how, and from whom any vital project information was obtained. Daily logbook entries will be complete and accurate enough to permit reconstruction of field activities. Logbooks will be bound with consecutively numbered pages. Each page will be dated and the time of entry noted in military time. All entries will be legible, written in indelible ink, and signed by the individual making the entries. If an error is made, corrections will be made by crossing a line through the error and entering the correct information. Corrections will be dated and initialed. No entries will be obliterated or rendered unreadable.

- Entries in the field logbook will include at a minimum the following for each fieldwork date:
- Site name and address
- Recorder's name
- Team members and their responsibilities
- Time of site arrival/entry on Site and time of Site departure
- Other personnel on Site
- A summary of any on-site meetings
- Quantity of impacted soil (in terms of non-RCRA and RCRA hazardous waste) excavated
- Quantity of impacted soil (in terms of non-RCRA and RCRA hazardous waste) temporarily stored on Site (if any)
- Quantity of excavated soil in truckloads (in terms of non-RCRA and RCRA hazardous waste) transported off Site
- Names of waste transporters and proposed disposal facilities
- Copies or numbers of manifests or other shipping documents (such as bill of lading) for waste shipments
- Deviations from this RAW and the HASP
- Changes in personnel and responsibilities as well as reasons for the changes
- Levels of safety protection
- Calibration readings for any equipment used and equipment model and serial number

7.3.5 Chain-of-Custody Records

Chain-of-custody records are used to document sample collection and shipment to the laboratory for analysis. All sample shipments for analyses will be accompanied by a chain-of-custody record. Form(s) will be completed and sent with the samples for each laboratory and each shipment. If multiple coolers are sent to a single laboratory on a single day, chain-of-custody form(s) will be completed and sent with the samples for each cooler. The chain-of-custody record will identify the contents of each shipment and maintain the custodial integrity of the samples. Generally, a sample is considered to be in someone's custody if it is either in someone's physical possession, in someone's view, locked up, or kept in a secured area that is restricted to authorized personnel. Until receipt by the laboratory, the custody of the samples will be the responsibility of the sample collector.

7.3.6 Photographs

Photographs will be taken of the excavation area(s), confirmation sample locations, and other areas of interest on Site to document the RA. They will serve to verify information entered in the field logbook. When a photograph is taken, the following information will be written in the logbook or will be recorded in a separate field photography log:

- Time, date, location, and if appropriate, weather conditions

- Description of the subject photographed
- Name of person taking photographs

7.3.7 Permitting and Notifications

As part of Site work, it will be necessary to obtain the following permits and make the following notifications:

- Underground Service Alert (USA);
- Excavation Permit

Other permits and notifications to complete the work may be required by local, state, or federal agencies. The following subsections describe some of the required permitting activities:

7.3.8 Air Quality Management District (AQMD) Permits

South Coast AQMD has two rules that address soil excavation (Rules 1150 and 1166) and one that addresses fugitive dust (Rule 403). Rule 1150 applies to the excavation of sanitary landfills and does not apply to this project. Rule 1166 applies to the excavation of soils containing VOCs and does not apply to this project.

Several elements of Rule 403, such as protocols for mitigation of potential fugitive dust emissions, have been incorporated into this RAW. Excavation, loading, and transport of impacted soils will be in compliance with Rule 403 prevention, reduction, and mitigation measures for fugitive dust emissions. However, notification of South Coast AQMD is required only for large operations (disturbing more than 100 acres or moving more than 10,000 cubic yards per day). Therefore, no notification or filing of a Fugitive Dust Emission Control Plan is required due to the project size.

7.4 Soil Management

Impacted soils will be stockpiled or direct-loaded onto dump trucks for immediate off-Site disposal. The following sections discuss soil and material segregation, stockpile handling, truck loading, and storm water management.

7.4.1 Soil Staging and Storage Operations

If it is necessary to temporarily store the excavated soil on Site until off-Site transportation and disposal are available, the following may apply:

The staging process will be conducted in a manner to minimize the generation of dust. At the staging areas, excavated soil will be placed on an impermeable barrier base (e.g., concrete floor, plastic sheeting) and covered with tarps or other proper materials (e.g., plastic sheeting) to prevent any run-on and/or dust generation. If significant rainfall is anticipated, the staging areas will be bermed to contain any run-off. When possible, excavated soils may be placed in covered roll-off bins or drums, or may be loaded directly onto transportation trucks.

The temporary on-Site storage of excavated soil wastes will be secured until they are ready for loading. Storage of waste for longer than 90 days after its generation is not anticipated.

Direct loading may take place concurrently with excavation operations, with access of loaders to the stockpile from outside the excavation areas, while excavation operations deposit impacted soil from the excavation areas to the staging areas.

During non-excavation hours, excavated soil stockpiles will be covered with plastic sheeting or other proper materials. Additional field applications may involve installation of a temporary canopy, liner, or other physical barrier that minimizes movement of materials from the Site by wind, water, or any other mechanism.

7.4.2 Waste Segregation Operations

Prior to stockpiling/staging, the excavated soil will be segregated to the extent possible to avoid any mixture of impacted and non-impacted soils. This segregation will minimize the amount of impacted soils generated and their associated disposal cost. The soil segregation will be based on visual observations, generated laboratory data, and the previous site assessment data.

7.5 Decontamination Methods and Procedures

7.5.1 Decontamination Area

Entry to the contaminated areas should be limited to avoid unnecessary exposure and related transfer of contaminants. In unavoidable circumstances, any equipment or truck(s) should be decontaminated in a designated decontamination area before leaving the Site as described below.

7.5.2 Decontamination Procedures

Equipment that comes into direct contact with potentially contaminated soil or water will be decontaminated to assure the quality of samples collected and/or to avoid cross contamination. Disposable equipment intended for one-time use will not be decontaminated but will be packaged for appropriate disposal. Decontamination will occur prior to and after each designated use of a piece of equipment.

Trucks that come into direct contact with potentially contaminated soil or water will be decontaminated before they leave the Site to prevent the off-Site tracking of contaminated soil. Trucks will be visually inspected before leaving the Site, and any dirt adhering to the exterior surfaces will be brushed off and collected on plastic sheeting. The storage bins or beds of the trucks will be inspected to ensure the loads are properly covered and secured. Excavation equipment surfaces will also be brushed off prior to removal from the exclusion zone.

Equipment will be decontaminated in a pre-designated area on pallets or plastic sheeting. Cleaned bulky equipment will be stored on plastic sheeting in uncontaminated areas. Cleaned small equipment will be stored in plastic bags. Materials to be stored more than a few hours will also be covered. Waste material accumulated during decontamination procedures will be collected and properly stored on Site for disposal.

7.6 Air / Meteorological Monitoring and Dust Control

This section details the air and meteorological monitoring strategy and methodologies that will be used during the soil RA. The strategy and methodologies are designed to achieve several goals:

- Identify and measure the air contaminants generated during the soil removal and decontamination activities to assign the appropriate personal protective equipment (PPE) and safety systems specified for those activities.
- Provide feedback to Site operations personnel regarding potential hazards from exposure to hazardous air contaminants generated through Site activities.
- Identify and measure air contaminants at points outside the soil removal and decontamination exclusion zones. Air monitoring will be conducted during work activities to measure potential exposure of sensitive receptors to Site chemical constituents as a result of removal activities.

7.6.1 Air Monitoring

If required, air monitoring will be performed during all Site activities in which contaminated soils are disturbed or handled.

7.6.1.1 Monitoring Dust Levels

The Site air-monitoring professional will have the authority to stop work in the event that on-Site activities generate dust levels which exceed the Site or community action levels (see the following chart). The air-monitoring professional will monitor on-Site meteorological instrumentation and/or coordinate with off-Site meteorological professionals to identify conditions that require cessation of work, e.g., winds in excess of 25 miles per hour (mph). No specific regulatory wind velocity restrictions for soil excavation were found to exist in the subject area. However, a self-imposed action level for work stoppage will be set at a sustained wind velocity of 25 mph.

7.6.1.2 Air Monitoring Strategy and Methodologies

As applicable, the RA Contractor will monitor dust levels in the following general locations:

- Upwind (off-Site property if possible);
- Proximate to the exclusion zone (with the equipment operator);
- Up to three fence line / downwind locations; and
- As deemed necessary to determine employee exposure.

Air monitoring samples will be collected over an eight- to ten-hour period each day that RAW activities are conducted. The air-monitoring professional will check the equipment every 15 minutes during operation.

The RA Contractor will base Site safety procedures, including dust control measures, on the Action Levels specified in the following chart.

EXPOSURE GUIDELINES FOR DUST

Chemical Name	Cal-OSHA PEL [a]	ACGIH TLV [b]	Site Action Levels	Community Action Level (Fence Line) [d, e]
Total dust	10 mg/m^3	10 mg/m^3	1.0 mg/m^3	0.05 mg/m^3
Lead	0.05 mg/m^3	0.05 mg/m^3	0.005 mg/m^3	1.5 $\mu g/m^3$
Arsenic	0.01 mg/m^3	0.01 mg/m^3	0.001 mg/m^3	0.003 $\mu g/m^3$
Chlordane	0.5 mg/m^3	0.5 mg/m^3	0.05 mg/m^3	0.025 $\mu g/m^3$

mg/m^3 = milligrams per cubic meter

ACGIH American Conference of Governmental Industrial Hygienists
ppm parts per million
mg/m^3 milligrams per cubic meter
μg/m3 micrograms per cubic meter
a PELs per Cal/OSHA Article 107, Table AC1.
b TLVs for Chemical Substances and Physical Agents and Biological Exposure Indices (ACGIH,1990-1991).
c Site Action Level is calculated as 10 percent of TLV or PEL (as measured by NIOSH methods), whichever is smaller. If a Site Action Level is equaled or exceeded, then additional dust mitigation measures will be implemented. If the Site air contaminants cannot be controlled reliably within 15 minutes, then all work will cease and a Certified Industrial Hygienist will be consulted. If Site Action Levels are exceeded on the integrated air monitors, then a Certified Industrial Hygienist will be immediately consulted.
d Community action level calculated based on Proposition 65 No Significant Risk Level divided by 20 cubic meters per day (breathing rate) and South Coast Air Quality Management District regulations.
e. The National Ambient Air Quality Standard for lead at 1.5 $\mu g/m^3$ is selected as the fence-line community action level. Community Action Level for total dust/particulate is based on SCAQMD regulations. Site dust levels will be measured using real-time aerosol monitors.

7.6.2 Meteorological Monitoring

If required, Site ambient weather conditions (wind speed and direction, and relative humidity) will be monitored by the following methods: an off-Site meteorology station, real-time Internet weather locations, and the National Weather Service (if a local station can provide data relevant to the Site). If off-Site meteorological stations cannot provide data relevant to the Site, an on-Site meteorological station will be set up and monitored during excavation activities.

On-Site meteorological monitoring will be performed simultaneously with the excavation activities to ensure all necessary precautions have been taken.

7.6.3 Dust Monitoring

If required, the RA Contractor will implement appropriate procedures to control the generation of airborne dust by soil removal activities. Such procedures will include but will not be limited to the following:

Generation of dust during the removal operations will be minimized as necessary with the use of water as a dust suppressant. The water will be available via service from the adjacent property, a water truck or a metered discharge from a fire hydrant located proximate to the Site. The RA Contractor will control dust generation by directing the contractor to spray water prior to daily work activities, during excavation/loading activities (as necessary), and at truck staging locations. Watering equipment will be continuously available to provide proper dust control.

If required, the air-monitoring professional will monitor on-Site meteorological instrumentation and/or coordinate with off-Site meteorological professionals to identify conditions that require cessation of work.

7.7 Sampling and Analysis Plan

7.7.1 Waste Profile Sampling

Soil having toxicity characteristic leaching potential (TCLP) metal concentrations greater than corresponding TCLP are classified as RCRA hazardous waste. Soil having total threshold limit concentration (TTLC) or soluble threshold limit concentration (STLC) greater than corresponding TTLCs or STLCs, respectively are classified as non-RCRA (California-listed) hazardous waste.

Limited soluble analysis was conducted during the PEA-E (Alta 2017) on selected samples from 27 areas of concern (Table 2). Fifteen of 27 samples were found to contain total or soluble concentrations of a respective COC that would characterize the impacted soil as a California-listed hazardous waste. None were found to be above federal RCRA hazardous waste limits. It is recommended that the actual determination of waste classification be based on profile samples collected from the soils to be disposed of prior to, or during the implementation of the RA. Copies of the laboratory results are included in the PEA-E (Alta 2017) and will be provided to the RA Contractor for profiling prior to excavation. Should the disposal facility require additional profile data, the RA Contractor will collect and submit additional soil data for analysis and provide it to the disposal facility for proper characterization of the excavated soil.

7.7.2 Confirmation Sampling

Once complete, each excavation area will be sampled at the bottom and sidewalls to verify remaining contaminant concentrations, if any. Confirmation soil sample locations will be determined in the field, as the excavation progresses.

Sidewall samples will be collected at approximately one (1) sample for each 20 linear feet of sidewall, with a minimum of one (1) sidewall sample collected from each excavation sidewall, which is less than 20 linear feet wide. Each sidewall location will consist of one sample collected at the midpoint in depth (approximately halfway between the excavation floor and the ground surface surrounding the excavation perimeter). Bottom samples will be collected at the rate of one sample for each 400 square feet of excavation area at the midpoint of each interval. Additional confirmation sampling will be implemented if any field-evident soil is encountered, based on visual/olfactory field observations.

Arsenic and lead (as applicable) will be analyzed in the field using an X-ray fluorescence (XRF) unit to determine if arsenic or lead detections meet the proposed cleanup goal. A detection will be confirmed with laboratory analysis of the same confirmation sample at the corresponding location.

Confirmation samples for COCs will be collected using a clean trowel or plastic disposable trowels and transferred directly into sampling jars or tubes. The final confirmation samples will be properly covered, labeled and stored on Site in a cooled chest prior to delivery to a California laboratory certified by the Environmental Laboratory Accreditation Program.

Confirmation soil samples will be delivered to the laboratory on the same day collected, if time permits, and no later than the day following collection. The samples will be secured under proper chain-of-custody documentation until delivery.

Confirmation samples will be analyzed as follows.

- Arsenic - U.S. EPA Method 6020
- Lead – U.S. EPA Method 6010

If confirmation sampling results indicate the target cleanup goals have not been attained, further soil sampling and/or soil excavation will be conducted as described in Section 7.3. The excavation will terminate when the cleanup goals are met or it becomes impractical to continue excavating, such as the excavation boundary reaching a subsurface utility, a property boundary, or a site/building feature (i.e. building wall, planter wall, fence line, building staircase or ramp). In this case, the excavated areas will be backfilled in accordance with procedures outlined in Section 7.9.

7.8 Transportation Plan for Off-Site Disposal

As soil is excavated, it will be direct-loaded for transportation off-Site or temporarily stockpiled on Site until off-Site transportation and disposal can be arranged. Off-Site transportation and disposal will typically be conducted during weekdays between 7AM and 5PM. Detailed information on waste transportation and disposal are described in the Transportation Plan (Appendix D).

The RA Contractor will coordinate transportation and off-Site disposal of all wastes generated during RA field activities according to local, California, and Federal laws and regulations. Approval of the waste material will be received from the disposal facility before soil is transported off-Site for lawful disposition. Once the disposal facility is confirmed, the soil will be transported for disposal. The haul trucks may be loaded only to the maximum tonnage as authorized by the US Department of Transportation (US DOT) to prevent overloading and avoid weight issues.

7.9 Backfill and Site Restoration

An off-Site certified source of clean backfill material will be identified prior to the RA. Imported soils will be appropriately tested or documented before backfilling activities commence to verify both environmental and geotechnical suitability. All imported backfill material will be obtained from a certified source or verified by analysis (LAUSD’s Specification for Environmental Import/Export Materials Testing Section 01 5424) as clean material. Backfill material will also be tested and verified by analysis for geotechnical suitability by methods and parameters for import acceptance approved by LAUSD’s Geotechnical Engineer and documented on the approved project grading plans.

7.9.1 Load Checking

As applicable, all loads of imported fill entering the Site will be checked by an organic vapor analyzer (OVA) or equivalent and by visual screening for potential contamination.

7.9.2 Diversion of Unacceptable Fill Materials

Imported fill soils material will be visually checked for unacceptable materials. If loads containing unacceptable materials (exhibit staining, odors, or detectable VOCs) are dumped, transporters of the unacceptable loads will be stopped before leaving the Site.

Equipment operators will watch for evidence of contaminated imported fill in loads being dumped at the working face. If contaminated soils are found or suspected, the imported fill soils are to be isolated. The hauler of the prohibited materials will be identified, and the Site Manager will be contacted to determine what appropriate actions will be taken.

Segregated improper materials will be removed from the working face immediately. These materials will be reloaded to the transporter’s vehicle when possible, or stockpiled in an appropriate area for later removal by a properly-licensed waste hauler.

7.9.3 Documentation of Rejected Loads

All loads that enter the Site that are subsequently rejected will be recorded. Data compiled will include when the incident occurred, who the hauler was, why the load was rejected, whether the load was dumped prior to rejection, and what steps were taken to remove the rejected material. Additional data may be recorded as deemed necessary for the particular situation.

A separate area will always be maintained for the storage of unacceptable materials, pending removal by the original transporter or a properly licensed waste hauler.

7.9.4 Site Restoration

The objective of site restoration is to leave the Site essentially as it was prior to the soil RA. Following completion of RA field activities, all drums, bins, trash, and other waste will be removed. Decontamination water and contaminated soil will be transported to an appropriate disposal facility.

Backfill activities will not begin until confirmation sample results have been evaluated and approval to backfill has been obtained from LAUSD-OEHS. Site restoration will include backfilling the excavation areas with clean soil (from an off-Site source) in accordance with Site construction/grading plans approved for the Site. Backfilling will proceed in approximately 1-foot lifts with compaction (by tracking with a dozer or other equipment) between each successive lift to the preexisting grade or level specified in the grading plans. Compaction testing and certification of backfill by a Geotechnical Engineer will be necessary. All backfill soil will be compacted to 95% compaction (or as designated by approved grading plan) and will be certified and documented by a Geotechnical Engineer per City of Los Angeles and California Division of State Architect (DSA) requirements. Compaction will be certified, and a compaction report provided in the final report for this Site work. If weather conditions prevent immediate restoration of the excavation areas, erosion controls will be established as necessary.

After backfill, compaction, and waste disposal are completed and the Site has been returned to near its original condition, all construction equipment and materials will be removed from the Site. A field survey should be completed to document the final boundaries and location of excavation and backfill activities at the Site.

7.10 Reporting

A report detailing the removal action will be prepared for submittal to LAUSD. The report will document the field activities, including areas of excavation, final disposition of the soil and transport and disposal documentation, results of confirmation soil sampling, dust monitoring and dust suppression activities, , and compaction reporting.

As conditions in the field can vary, it may become necessary to implement modifications to soil removal activities as presented in this RAW. These variations will be documented in the final report.

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3. Department of Toxic Substances Control (DTSC), 2006, *Interim Guidance Evaluation of School Sites with Potential Soil Contamination as a Result of Lead from Lead-Based Paint, Organochlorine Pesticides from Termiticides, and Polychlorinated Biphenyls from Electrical Transformers;* June 9, 2006.

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7. DTSC, Undated (accessed September 20, 2016). Determination of a Southern California Regional Background Arsenic Concentration in Soil, http://www.dtsc.ca.gov/upload/Background-Arsenic.pdf.

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10. Partner, 2016b, Preliminary Endangerment Assessment (PEA*) Equivalent Work Plan, Thomas Jefferson High School, 1319 E. 41st Street, Los Angeles, California 90011*, Partner Project No. 16-158197.2; May 27, 2016.

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TABLES

TABLE 1
Summary of Excavation Area Details
Thomas Jefferson High School
1319 E. 41st Street, Los Angeles, CA

Area of Concern	Figure #	Contaminant(s) of Concern	Maximum Concentration (mg/kg)	Cleanup Goal Concentration (mg/kg)	Approximate Dimensions of Excavation (LxW) (ft)	Depth of Excavation (ft. bgs)	Volume of Excavation (cubic yards)	Northern Boundary	Eastern Boundary	Southern Boundary	Western Boundary	Surface Material	Notes
SS1	Figure 5	Lead	169	80[1]	10 x 10	1	3.70	SS1C	Communications Utility Line	SS1D	2 Story Power House Building	Concrete	Electrical line runs through excavation
SS2	Figure 5	Lead	194	80[1]	2 x 5 , 10 x 5	1	2.22	Two-Story Power House Building	SS2C	Communications Utility Line	Steam Tunnel	Concrete	None
SS2A	Figure 5	Lead	174	80[1]	10 x 5	2	3.70	Two-Story Power House Building	SS2	Communications Utility Line	SS2D	Concrete	None
SS21	Figure 4	Lead	146	80[1]	10 x 5	1	1.85	Boy's Gymnasium Building	Boy's Gymnasium Building	SS21A	SS21B	Dirt (Planter)	None
SS22	Figure 4	Lead	160	80[1]	4 x 8	1	1.19	Boy's Gymnasium Building	SS22A	SS22B	SS22C	Dirt (Planter)	None
SS27	Figure 7	Lead Arsenic	268 17.1	80[1] 12[2]	20 x 20	2	29.63	Single-Story Homemaking Building	SS27F	Electrical Utility Line	Electrical Utility Line	Dirt	None
SS27A	Figure 7	Lead	87.5	80[1]	15 x 20	1	11.11	Single-Story Homemaking Building	Gas or Oil Utility Line	SS27I	SS27D and SS27L	Dirt	None
SS32	Figure 5	Lead	201	80[1]	20 x 8	1	5.93	SS32C	Classroom Building	SS32D	Electrical Utility Line	Dirt (Planter)	None
SS38	Figure 7	Lead	107	80[1]	10 x 8	1	2.96	1 Story Building	SS38C	SS38B	SS38A	Asphalt	None
SS43	Figure 7	Lead	85.3	80[1]	10 x 8	1	2.00	SS43A	SS43B	SS43C	1 Story Building	Asphalt	None
SS47	Figure 7	Lead	310	80[1]	10 x 8	1	2.07	SS47A	SS47B	SS47C	1 Story Building	Asphalt	None
SS53	Figure 8	Lead	109	80[1]	10 x 5	1	2.22	SS53B	SS53C	1 Story Industrial Arts Building	SS53A	Concrete	None
SS54	Figure 8	Lead	84.7	80[1]	10 x 10	1	2.96	SS54B	SS54C	1 Story Industrial Arts Building	SS54A	Concrete	None
SS55	Figure 8	Arsenic	20.5	12[2]	15 x 5	1	2.78	1 Story Industrial Arts Building	SS55D	SS55B	SS55A	Asphalt	None
SS68	Figure 8	Lead	241	80[1]	25 x 10	1	9.26	SS68A	Flammable Storage Building	SS68B	SS68E	Asphalt	None
SS70	Figure 8	Lead	134	80[1]	24 x 15	1	13.33	Electrical Utility	SS70C	1 Story Building	SS70A	Asphalt	None
SS73	Figure 6	Lead	121	80[1]	20 x 10	1	7.41	SS74D	SS73B	SS73A	1 Story Building	Dirt (Planter)	None
SS74	Figure 6	Lead	247	80[1]	20 x 5	1	3.70	SS74B	SS74D	1 Story Building	SS74C	Asphalt	None
SS76	Figure 6	Lead	106	80[1]	10 x 5	1	1.85	Classroom Building	SS76C	SS76B	SS76D	Asphalt	None
SS76C	Figure 6	Lead	570	80[1]	5 x 5	2	1.85	Classroom Building	Unknown Utility Line	SS76B	SS76	Asphalt	Unknown Utility line runs close to the east side of SS76C

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Thomas Jefferson High School
1319 E. 41st Street, Los Angeles, CA

Area of Concern	Figure #	Contaminant(s) of Concern	Maximum Concentration (mg/kg)	Cleanup Goal Concentration (mg/kg)	Approximate Dimensions of Excavation (LxW) (ft)	Depth of Excavation (ft. bgs)	Volume of Excavation (cubic yards)	Northern Boundary	Eastern Boundary	Southern Boundary	Western Boundary	Surface Material	Notes
SS77	Figure 8	Lead	848	80[1]	10 x 10	1	3.70	SS77C	Electrical and Gas/Oil Utility Line	SS77A	1 Story Building	Asphalt	None
SS77A	Figure 8	Lead	468	80[1]	5 x 5	2	1.85	SS77	Electrical and Gas/Oil Utility Line	Electrical Utility	1 Story Building	Asphalt	None
SS79	Figure 8	Lead	192	80[1]	20 x 20	1	14.81	Unknown Utility Line	1 Story Building	SS79C	Electrical Utility Line	Asphalt	Communications and Electricsl Utility lines run through excavation
SS80	Figure 8	Lead	146	80[1]	15 x 10	1	5.56	Classroom Building	SS80C	SS80B	SS80A	Asphalt	None
SS82	Figure 8	Lead	88.7	80[1]	10 x 5	1	1.85	SS82C	SS82B	SS82A	1 Story Building	Asphalt	None
SS87	Figure 8	Lead	131	80[1]	10 x 10, 15 x 15	1	12.04	SS87F	1 Story Building	SS87E	SS87B and SS87H	Asphalt	None
SS88	Figure 8	Lead Arsenic	154 14.4	80[1] 12[2]	15 x 5	1	2.78	Classroom Building	SS88C	SS88B	SS88A	Asphalt	Uknown utility line runs through excavation
SS92	Figure 7	Lead	80.9	80[1]	10 x 10	1	3.70	SS92A	Rainwater Storage Building	SS92C	SS92B	Asphalt	None
SS93	Figure 3	Lead	204	80[1]	25 x 5	1	4.63	SS93E	SS93G	1 Story Building	SS93F	Dirt	None
SS95	Figure 3	Lead	132	80[1]	15 x 7	1	4.44	Classroom Building	SS95C	Electrical Utility Line and SS101B	Staircase for 1 Story Building	Concrete	Electrical line runs through excavation
SS96	Figure 3	Lead	602	80[1]	17 x 9, 5 x 4	1	6.30	Unknown Utility Line	Sidewalk and SS96B	SS96A	1 Story Building	Dirt	None
SS98	Figure 7	Lead	108	80[1]	8 x 5	1	1.48	Electrical Utility Line and Building	Flammable Storage Building	SS98C	SS98B	Asphalt	None
SS101	Figure 3	Lead Arsenic	104 21.1	80[1] 12[2]	7 x 7	2	3.62	SS95B	SS101A	Music Building	SS101C	Concrete	None
SS102	Figure 3	Lead	92.3	80[1]	8 x 4	1	1.19	SS102C	Music Building	SS102A	SS102B	Concrete	None
SS103	Figure 3	Lead	150	80[1]	40 x 30	1	44.44	Music Building	Sidewalk	Unknown Utility Line	SS103A and SS103F	Grass	Gas or Oil Utility Line running through excavation

Notes:
ft. bgs. = feet below ground surface
mg/kg = milligrams per kilogram
L x W = Length x Width
[1] Department of Toxic Substances Control (DTSC) Modified Screening Level (DTSC-SL)
for residential land use published in DTSC's Human and Ecological Risk Office (HERO) Note 3 (DTSC 2016)
[2] DTSC upper bound estimate (95th percentile) for background concentrations in Southern California (DTSC undated)

TABLE 2
Summary of Shallow Soil Matrix STLC and TCLP Results
Thomas Jefferson High School RAW
1319 E. 41st Street, Los Angeles, CA

Sample ID	Total and Soluble Waste Threshold Concentrations						Waste Characterization
	Lead - TTLC (mg/kg)	Lead - STLC (mg/L)	Lead - TCLP (mg/L)	Arsenic - TTLC (mg/kg)	Arsenic - STLC (mg/L)	Lead - TCLP (mg/L)	
Hazardous Waste Limits	1,000	5	5	500	5	5	
SS1A-0.5	169	15.4	0.203	▪	▪	▪	California Hazardous
SS2A-0.5	174	15.1	0.302	▪	▪	▪	California Hazardous
SS22A-0.5	68.8	3.26	0.022 J	▪	▪	▪	Non-Hazardous
SS22C-0.5	59.7	2.16	0.008 J	▪	▪	▪	Non-Hazardous
SS27C-1.5	▪	▪	▪	17.1	1.08	0.01	Non-Hazardous
SS32A-0.5	201	83.7	0.020 J	▪	▪	▪	California Hazardous
SS38C-0.5	71.7	3.1	0.011J	▪	▪	▪	Non-Hazardous
SS47C-0.5	62.7	3.32	0.017 J	▪	▪	▪	Non-Hazardous
SS54C-0.5	63.6	4.47	0.036 J	▪	▪	▪	Non-Hazardous
SS55C-0.5	▪	▪	▪	12.8	0.16	0.029 J	Non-Hazardous
SS70B-0.5	134	11.5	0.16	▪	▪	▪	California Hazardous
SS73C-0.5	121	6.51	< 0.004	▪	▪	▪	California Hazardous
SS74A-0.5	247	17.6	0.107	▪	▪	▪	California Hazardous
SS76C-1.5	570	9.14	0.147	▪	▪	▪	California Hazardous
SS77A-0.5	468	36.2	0.302	▪	▪	▪	California Hazardous
SS79D-0.5DUP	121	8.68	0.16	▪	▪	▪	California Hazardous
SS80C-0.5	131	9.88	0.089	▪	▪	▪	California Hazardous
SS82C-0.5	55	3.53	0.06	▪	▪	▪	Non-Hazardous
SS87C-0.5	131	10.8	0.07	▪	▪	▪	California Hazardous
SS88C-0.5	▪	▪	▪	14.4	1.353	0.056	Non-Hazardous
SS92C-0.5	55.7	2.32	0.006 J	▪	▪	▪	Non-Hazardous
SS93A-0.5	204	4.15	0.024 J	▪	▪	▪	Non-Hazardous
SS95A-0.5	132	14.1	0.056	▪	▪	▪	California Hazardous
SS96C-0.5	602	15.8	0.182	▪	▪	▪	California Hazardous
SS98B-0.5	27.8	0.636	<0.004	▪	▪	▪	Non-Hazardous
SS101B-1.5	▪	▪	▪	19.4	1.55	0.201	Non-Hazardous
SS102A-0.5	74.8	7.34	0.067	▪	▪	▪	California Hazardous

NOTES:

▪ = Not analyzed

STLC = Soluble Threshold Limit Concentration

TTLC = Total Treshold Limit Concentration

TCLP = Toxicity Characteristic Leaching Procedure

J=concentration is between method detection limit and laboratory reporting limit.

mg/L = milligrams per liter

mg/kg = milligrams per kilogram

[yellow highlight] = Concentration exceeds the value of the Hazardous Waste Limit

ALTA ENVIRONMENTAL

FIGURES

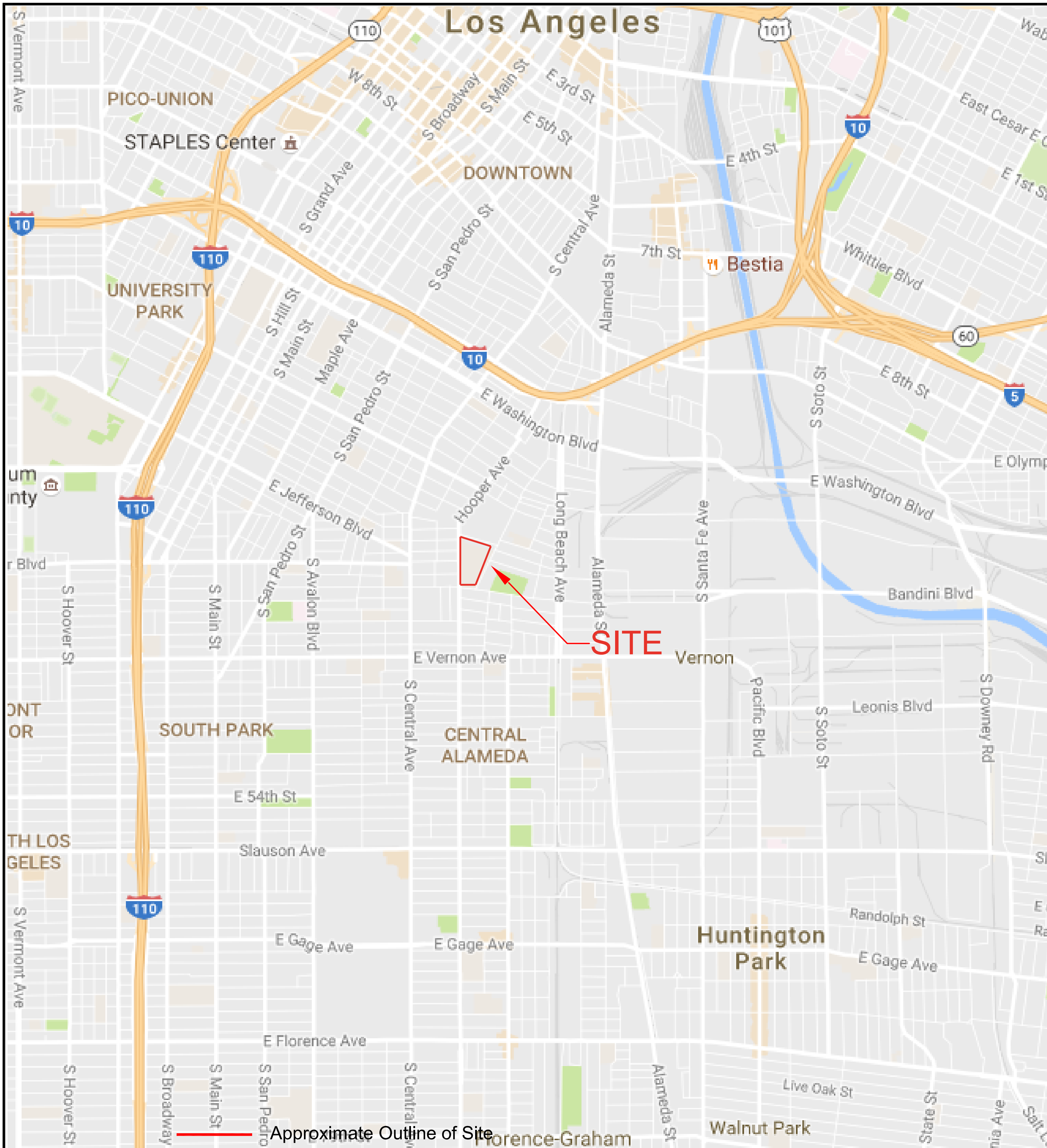


FIGURE 1: SITE LOCATION MAP

CLIENT:
Los Angeles Unified School District

PROJECT #: LAUS-16-6714

SITE LOCATION: Thomas Jefferson High School
1319 East 41st Street,
Los Angeles, California

ALTA ENVIRONMENTAL
3777 Long Beach Blvd., Annex Bldg.
Long Beach, CA 90807
(562) 495-5777 www.altaenviron.com

DRAWN: BP

APPROVED: EF

SCALE: None

DATE: 8/17/2016

NORTH

LEGEND:

- Approximate Sample Location
- Approximate Sample Locations with lead and arsenic concentrations in exceedance of acceptable screening levels

NOTE:
All location are approximate.

Figure created in color. Significant information may be lost if copied in black and white.

FIGURE 2: PEA-E Sample Location Map		
CLIENT. LOS ANGELES UNIFIED SCHOOL DISTRICT	DRAWN: BP SCALE: No scale	APPROVED: EF DATE: July 2016
SITE: Thomas Jefferson High School 1319 East 41st Street Los Angeles, California	ALTA ENVIRONMENTAL 3777 Long Beach Blvd. Annex Bldg. Long Beach CA 90807 P: (562) 495-5777 ♦ F: (562) 495-5877 ♦ altaenviron.com	
PROJ. NO.: LAUS-17-6714		

SOURCE : GROUND TOPOGRAPHIC AND SUBSTRUCTURE UTILITY SURVEY BY SURVEYING & DRAFTING SERVICES, INC. (2016)

LEGEND:

- Approximate Sample Location
- Approximate Step-out Sample Location
- Approximate Area of Impacted Soil (1 ft)
- Approximate Area of Impacted Soil (2 ft)

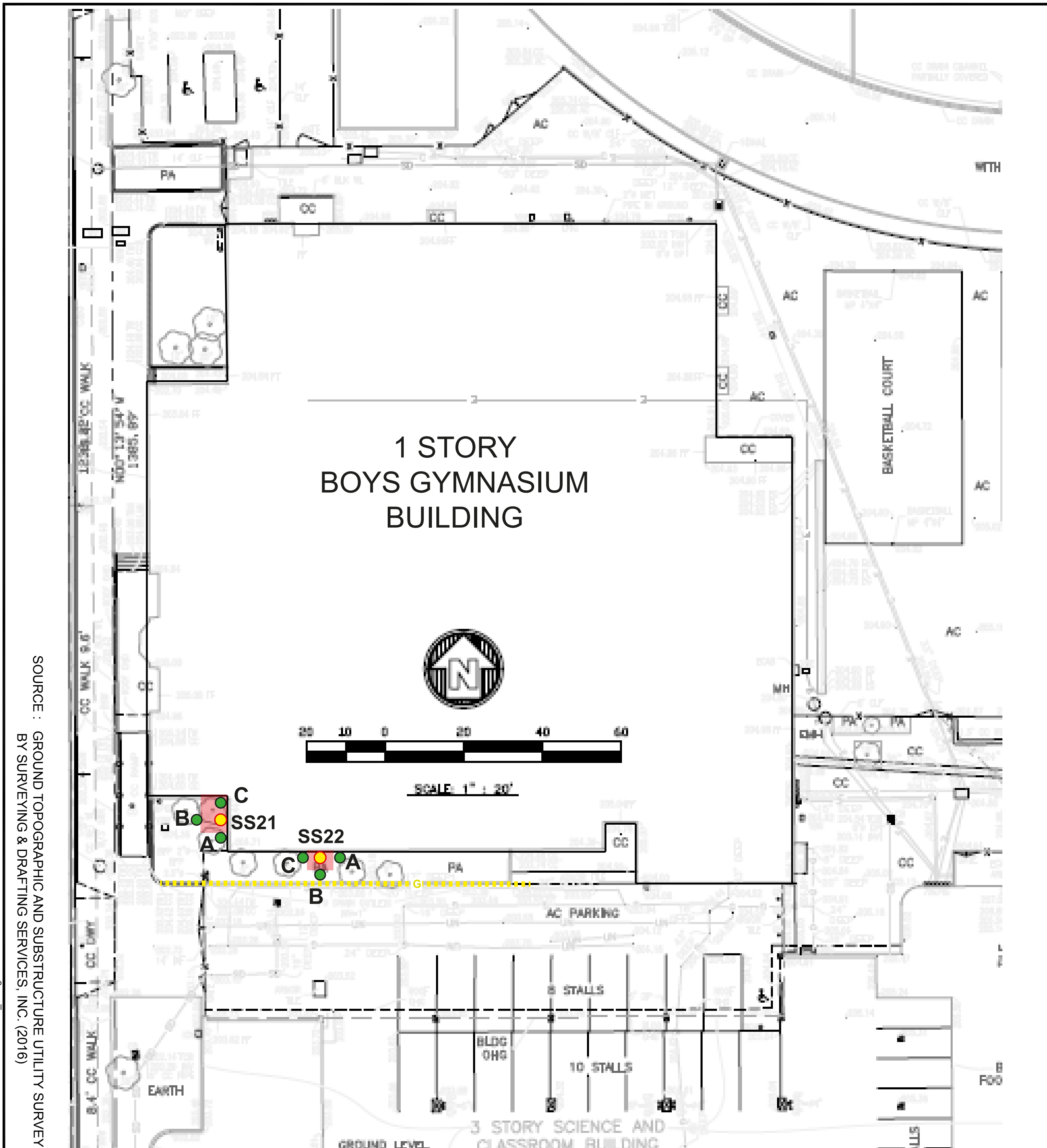
Note: All Locations are Approximate

- E — Electrical Power Line
- W — Potable Water
- C — Communication/Cable Line
- G — Gas or Oil Line
- S — Sewer or Drain Line
- X — Unknown Utility Line
- Fire Suppression Line

Figure created in color. Significant information may be lost if copied in black and white.

Figure 3: PEA-E Southeastern Step-out Sample Locations and Area of Impacted Soil

CLIENT. LOS ANGELES UNIFIED SCHOOL DISTRICT	DRAWN: BP	APPROVED: EF
	SCALE: No scale	DATE: March 2017
SITE: Thomas Jefferson High School 1319 East 41st Street Los Angeles, California	ALTA ENVIRONMENTAL	
PROJ. NO.: LAUS-17-6714	3777 Long Beach Blvd. Annex Bldg. Long Beach CA 90807 P: (562) 495-5777 ♦ F: (562) 495-5877 ♦ altaenviron.com	



LEGEND:

- Approximate Sample Location
- Approximate Step-out Sample Location
- Approximate Area of Impacted Soil (1 ft)
- Approximate Area of Impacted Soil (2 ft)

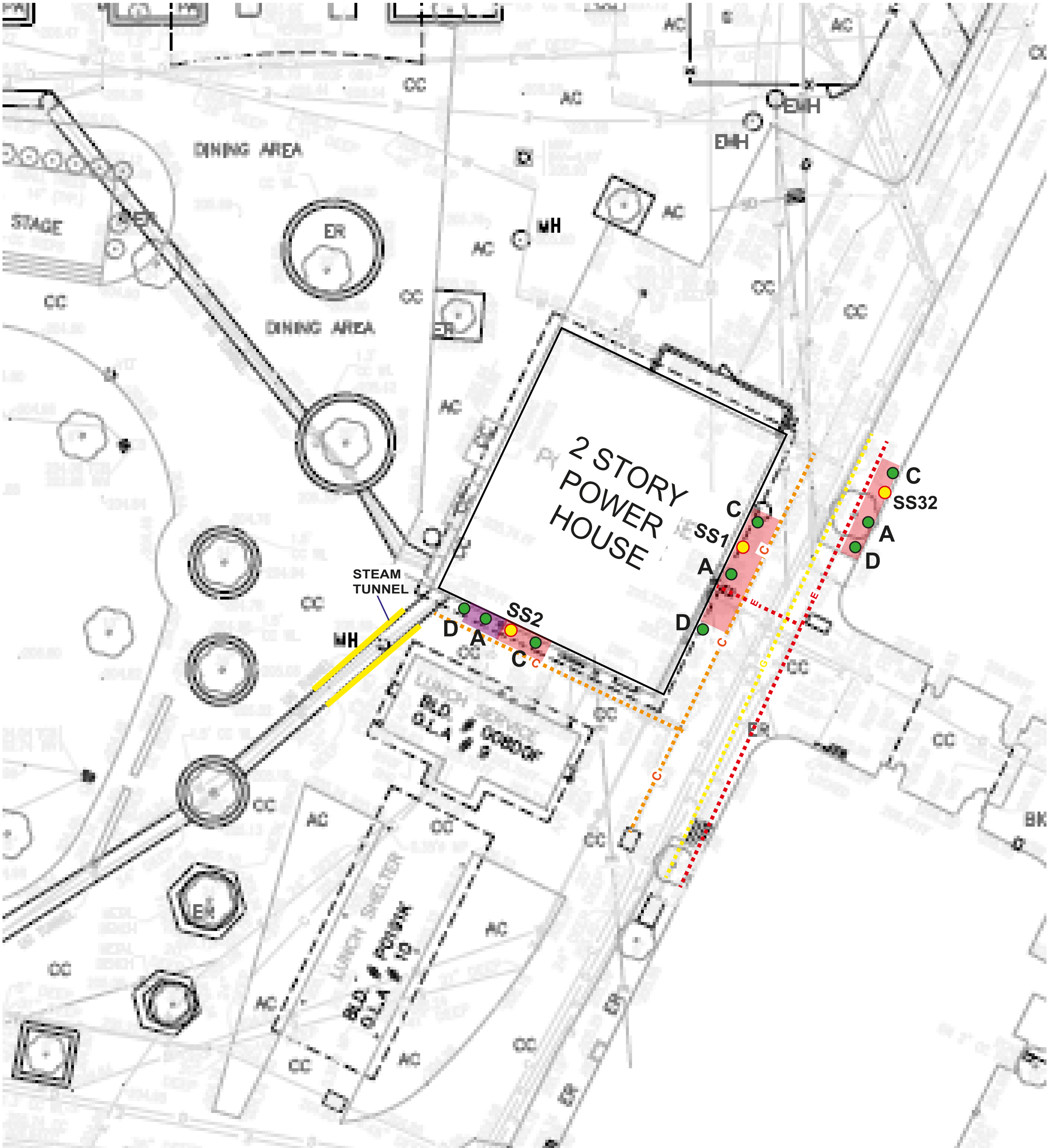
- E — Electrical Power Line
- W — Potable Water
- C — Communication/Cable Line
- G — Gas or Oil Line
- S — Sewer or Drain Line
- X — Unknown Utility Line

Note: Alll Locations are Approximate

Figure created in color. Significant information may be lost if copied in black and white.

Figure 4: PEA-E Southwestern Step-Out Sample Locations and Areas of Impacted Soil (Boy's Gymnasium)

CLIENT. LOS ANGELES UNIFIED SCHOOL DISTRICT	DRAWN: BP SCALE: No scale	APPROVED: EF DATE: March 2017
SITE: Thomas Jefferson High School, 1319 East 41st Street, Los Angeles, California	ALTA ENVIRONMENTAL	
PROJ. NO.: LAUS-17-6714	3777 Long Beach Blvd. Annex Bldg. Long Beach CA 90807 P: (562) 495-5777 ♦ F: (562) 495-5877 ♦ altaenviron.con	



SOURCE : GROUND TOPOGRAPHIC AND SUBSTRUCTURE UTILITY SURVEY BY SURVEYING & DRAFTING SERVICES, INC. (2016)

LEGEND:

- Approximate Sample Location
- Approximate Step-out Sample Location
- Approximate Area of Impacted Soil (1 ft)
- Approximate Area of Impacted Soil (2 ft)

E	Electrical Power Line
W	Potable Water
C	Communication/Cable Line
G	Gas or Oil Line
S	Sewer or Drain Line
X	Unknown Utility Line

Note: Alll Locations are Approximate

Figure created in color. Significant information may be lost if copied in black and white.

Figure 5: PEA-E Southwestern Step-Out Sample Locations and Areas of Impacted Soil (Power House)

CLIENT.
LOS ANGELES UNIFIED SCHOOL DISTRICT

DRAWN: BP
APPROVED: EF
SCALE: No scale
DATE: March 2017

SITE:
Thomas Jefferson High School
1319 East 41st Street
Los Angeles, California

PROJ. NO.: LAUS-16-6714

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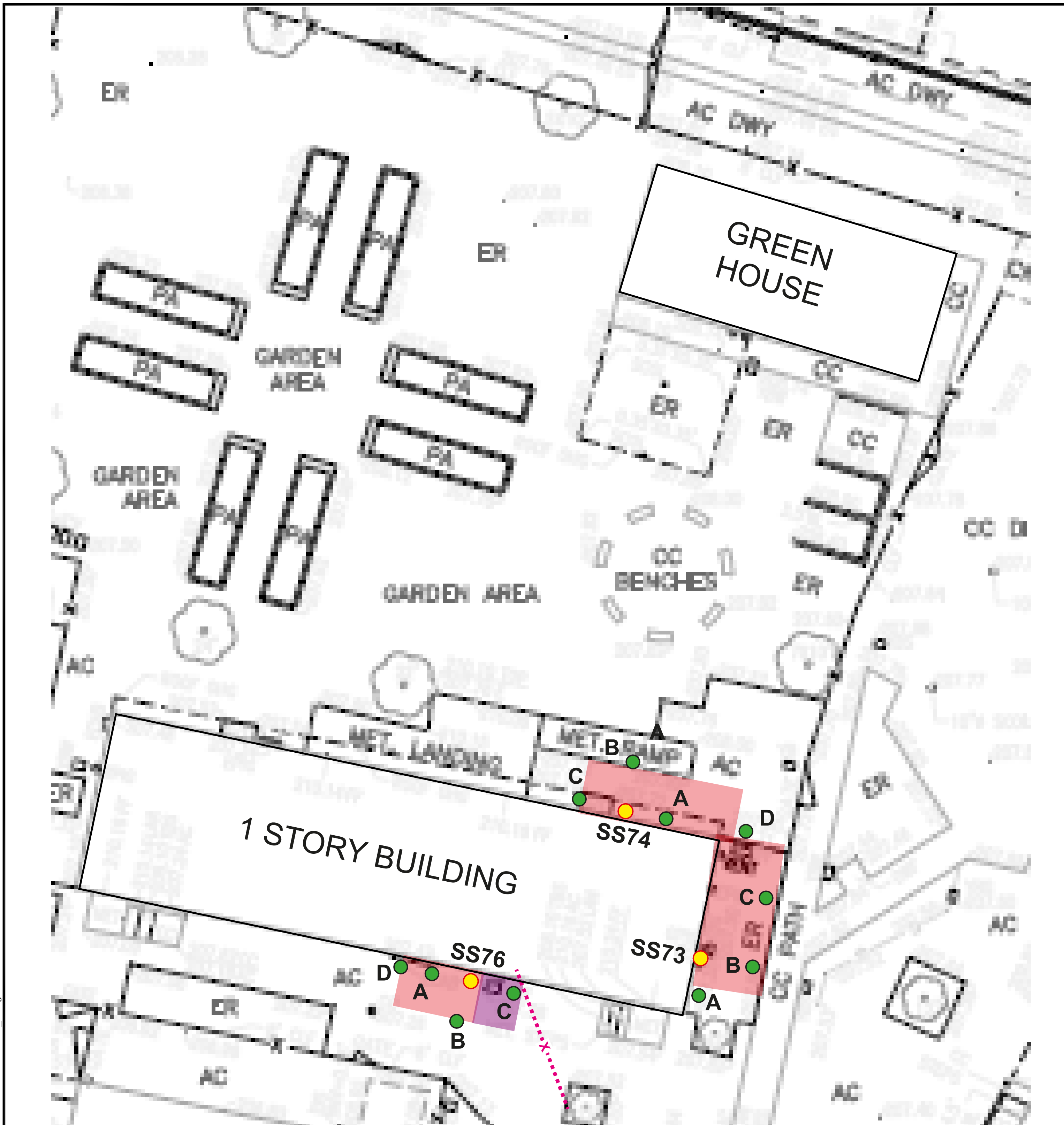

SOURCE : GROUND TOPOGRAPHIC AND SUBSTRUCTURE UTILITY SURVEY BY SURVEYING & DRAFTING SERVICES, INC. (2016)

LEGEND:

- Approximate Sample Location
- Approximate Step-out Sample Location
- Approximate Area of Impacted Soil (1 ft)
- Approximate Area of Impacted Soil (2 ft)
- E — Electrical Power Line
- W — Potable Water
- C — Communication/Cable Line
- G — Gas or Oil Line
- S — Sewer or Drain Line
- X — Unknown Utility Line

Note: Alll Locations are Approximate

Figure created in color. Significant information may be lost if copied in black and white.

Figure 6: PEA-E Northwestern Step-Out Sample Locations and Area of Impacted Soil

CLIENT. LOS ANGELES UNIFIED SCHOOL DISTRICT	DRAWN: BP	APPROVED: EF
	SCALE: No scale	DATE: March 2017

SITE:
Thomas Jefferson High School
1319 East 41st Street
Los Angeles, California

PROJ. NO.: LAUS-16-6714

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3777 Long Beach Blvd. Annex Bldg. Long Beach CA 90807
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SOURCE : GROUND TOPOGRAPHIC AND SUBSTRUCTURE UTILITY SURVEY
BY SURVEYING & DRAFTING SERVICES, INC. (2016)

LEGEND:

- Approximate Sample Location
- Approximate Step-out Sample Location
- Approximate Area of Impacted Soil (1 ft)
- Approximate Area of Impacted Soil (2 ft)

- E — Electrical Power Line
- W — Potable Water
- C — Communication/Cable Line
- G — Gas or Oil Line
- S — Sewer or Drain Line
- X — Unknown Utility Line

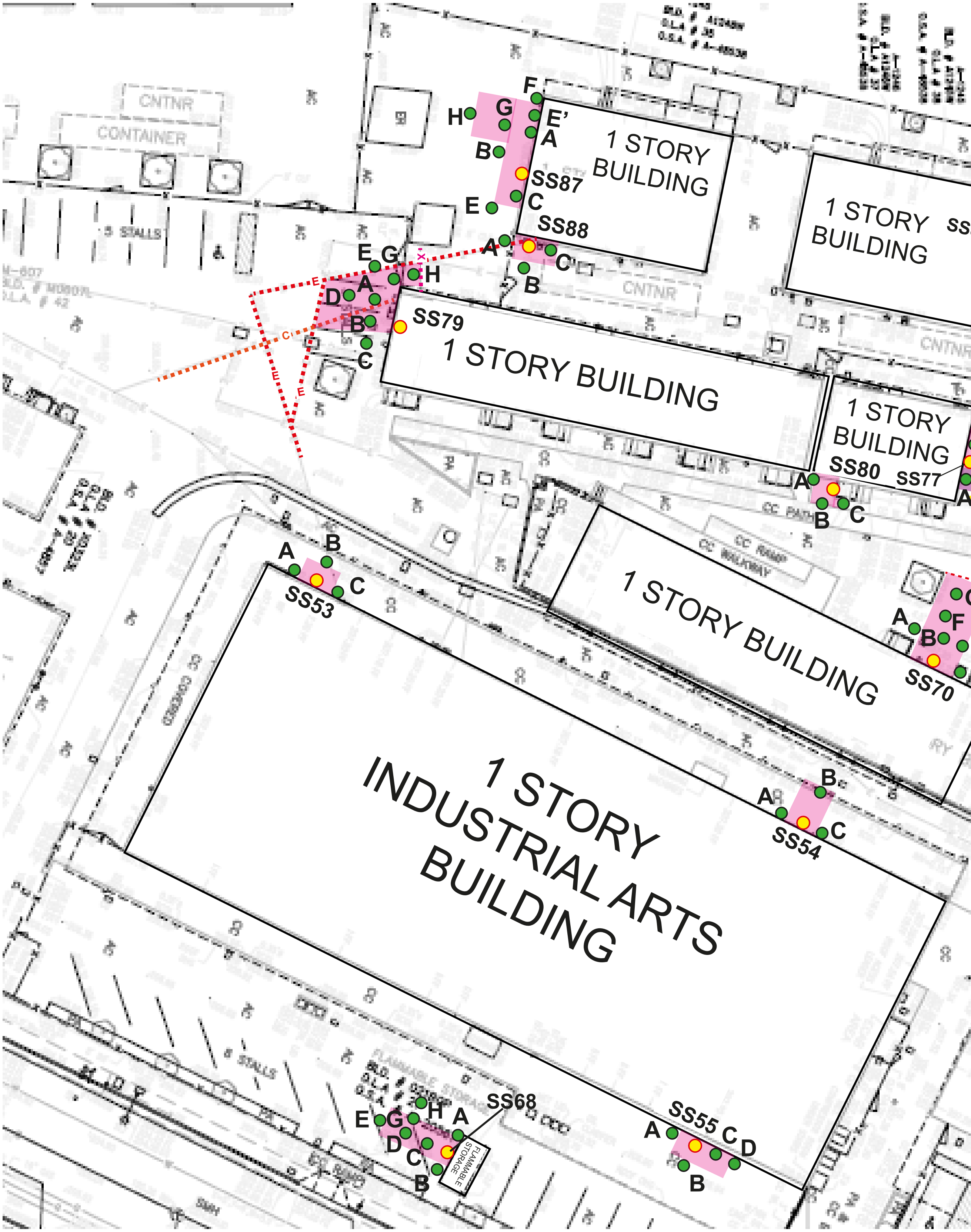
N

Note: Alll Locations are Approximate

Figure created in color. Significant information may be lost if copied in black and white.

Figure 7: PEA-E Northeastern Step-Out Sample Locations and Areas of Impacted Soil (Homemaking Building)

CLIENT. LOS ANGELES UNIFIED SCHOOL DISTRICT	DRAWN: BP APPROVED: EF SCALE: No scale DATE: March 2017
SITE: Thomas Jefferson High School, 1319 East 41st Street, Los Angeles, California	ALTA ENVIRONMENTAL
PROJ. NO.: LAUS-17-6714	3777 Long Beach Blvd. Annex Bldg. Long Beach CA 90807 P: (562) 495-5777 ♦ F: (562) 495-5877 ♦ altaenviron.com



LEGEND:

Approximate Sample Location
Approximate Step-out Sample Location
Approximate Area of Impacted Soil (1 ft)
Approximate Area of Impacted Soil (2 ft)

E — Electrical Power Line
W — Potable Water
C — Communication/Cable Line
G — Gas or Oil Line
S — Sewer or Drain Line
X — Unknown Utility Line

N

Note: Alll Locations are Approximate

Figure created in color. Significant information may be lost if copied in black and white.

Figure 8: PEA-E Northeastern Step-Out Sample Locations and Areas of Impacted Soil (Industrial Arts Building)

CLIENT. LOS ANGELES UNIFIED SCHOOL DISTRICT	DRAWN: BP	APPROVED: EF
	SCALE: No scale	DATE: March 2017

SITE:
Thomas Jefferson High School
1319 East 41st Street
Los Angeles, California

PROJ. NO.: LAUS-16-6714

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3777 Long Beach Blvd. Annex Bldg. Long Beach CA 90807
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APPENDIX A

Human Health Screening Evaluation

Human Health Screening Evaluation - Soil
Thomas Jefferson High School PEA-Equivalent
1319 E. 41st Street, Los Angeles, CA

Maxium Detected Concentrations

Constituent of Concern	Maximum Detected Concentration mg/kg	Sample Location	Sample Depth Feet BGS	Cancer Screening Level (mg/kg)	Source	Non-Cancer Screening Level (mg/kg)	Source	Calculated Cancer Risk	Calculated Hazard Index
Arsenic	21.1	SS101	0-0.5	0.11	Note 3	0.40	Note 3	1.92E-03	5.28E+01
Lead	848	SS77D	0-0.5	▪	Note 3	80	Note 3	▪	1.06E+01
Cumulative Risk								**1.92E-03**	**6.34E+01**

95% UCL Concentrations

Constituent of Concern	95% UCL Concentration mg/kg	Cancer Screening Level (mg/kg)	Source	Non-Cancer Screening Level (mg/kg)	Source	Calculated Cancer Risk	Calculated Hazard Index
Arsenic	6.55	0.11	Note 3	0.40	Note 3	5.96E-04	1.64E+01
Lead	81.4	▪	Note 3	80	Note 3	▪	1.02E+00
Cumulative Risk						**5.96E-04**	**1.74E+01**

NOTES:

▪ = Not Appicable

mg/kg = milligrams per kilogram

Feet BGS = feet below ground surface

UCL = Upper Confidence Limit

APPENDIX B

Health and Safety Plan (HASP)

DOCUMENT PLACEHOLDER

HASP TO BE PREPARED BY RA CONTRACTOR AND INCLUDED IN RAW

APPENDIX C

Quality Assurance Project Plan (QAPP)

Thomas Jefferson High School Comprehensive Modernization
1319 East 41st Street
Los Angeles, California 90011

QUALITY ASSURANCE PROJECT PLAN

Prepared for

Los Angeles Unified School District
Office of Environmental Health and Safety
333 South Beaudry Avenue, 28th Floor
Los Angeles, California 90012

LAUS-17-6714
May 10, 2017

Alta Environmental
3777 Long Beach Boulevard, Annex Building
Long Beach, CA 90807 www.altaenviron.com

QUALITY ASSURANCE PROJECT PLAN

Los Angeles Unified School District
Thomas Jefferson High School Comprehensive Modernization
1319 E. 41st Street
Los Angeles, California

This Quality Assurance Project Plan (QAPP) for the Thomas Jefferson High School Removal Action Workplan (RAW) Implementation, located in the City of Los Angeles, California, was prepared by Alta Environmental on behalf of the Los Angeles Unified School District in a manner consistent with the level of care and skill ordinarily exercised by professional engineers, geologists, and environmental scientists. This report was prepared under the technical direction of the undersigned.

Eric Fraske, P.E.
Senior Project Manager/Engineer III

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1. INTRODUCTION/BACKGROUND

This *Quality Assurance Project Plan* (QAPP) has been prepared by Alta Environmental (Alta) on behalf of the Los Angeles Unified School District (LAUSD) to address quality assurance (QA) and quality control (QC) policies associated with the collection of environmental data at Thomas Jefferson High School Comprehensive Modernization Project Site (the "Site") located in Los Angeles, California (Figure 1). Together with the confirmation sampling plan provided in the *Removal Action Workplan* (RAW) (Alta, 2017), this QAPP presents the plan for sampling and analysis as part of the Remedial Action (RA) field activities for the Site. The purpose of this QAPP is to identify the methods to be employed to establish technical accuracy, precision, and validity of data that are generated during the RA for the Site.

The sampling program is formally described in the *Sampling and Analysis Plan* section of the RAW (Alta, 2017). This QAPP contains general and specific details regarding field sampling, laboratory and analytical procedures that apply to activities described in the sampling and analysis plan. This document provides field and laboratory personnel with instructions regarding activities to be performed before, during, and after field investigations. These instructions will ensure data collected for use in the project decisions will be of the type and quality needed and expected for their intended purpose.

Guidelines followed in preparation of this QAPP are described in the USEPA's *Requirements for Quality Assurance Project Plans,* EPA QA/R-5 (USEPA, 2001) and *Guidance for Quality Assurance Project Plans,* EPA QA/G-5 (USEPA, 2002). Other documents referenced in this plan include *Guidance for the Data Quality Objectives Process,* EPA QA/G-4 (USEPA, 1994) and *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods* (USEPA, SW-846, Third Edition, 1996).

1.1 Project History and Objectives

Project Site	Thomas Jefferson High School
Project Proponent	Los Angeles Unified School District
Property Owner	Los Angeles Unified School District
Chemicals of Concern (COCs)	Arsenic and Lead
Clean Up Goals	Arsenic: 12 milligrams per kilogram (mg/kg) Lead: 80 mg/kg
Estimated Volume of Soil Removal	224 cubic yards

The LAUSD is planning a redevelopment project at the existing Thomas Jefferson High School located at 1319 E. 41st Street in Los Angeles, California. PEA-E activities (Alta, 2016) identified several isolated areas throughout the campus with shallow soils that are impacted with lead, arsenic, or combination thereof. This QAPP concerns the remedial activities at the Site.

2. PROJECT DESCRIPTION

This section presents information concerning the proposed sampling activities, selected analytical parameters, data objectives, and the resulting project decisions.

2.1 Analytical Scope

Following soil excavations, confirmation soil samples will be collected from the locations specified in the *Confirmation Sampling* section of the RAW (Alta, 2017). The soil matrix confirmation samples will be analyzed for the specific COCs associated with the impacted areas, which is defined in the *Nature,* *Source, and Extent of On-Site Chemicals of Concern* section of the RAW (Alta, 2017). The COCs associated with the impacted areas are arsenic and lead in soil.

The confirmation soil samples collected for analysis of arsenic and lead impacted soils shall be initially screened in the field utilizing a portable X-ray fluorescence (XRF) unit. Offsite laboratory analysis shall be performed on all aliquot arsenic and lead samples collected from the excavation sidewalls and bottoms, below the cleanup goals as reported by XRF. Samples designated for offsite laboratory analysis shall remain in the sample container utilized for XRF screening. All confirmation samples collected for arsenic analysis will be analyzed by EPA Method 6020 and all confirmation samples collected for lead will be analyzed by EPA Method 6010.

All sample containers will be capped, sealed, labeled, and stored in a cool ice chest prior to sending to the offsite laboratory for analysis. All confirmation samples for analysis of COCs will be collected into containers as described in Table 1 and preserved at less than 6°C. The soil samples will be delivered to a California-certified laboratory for analysis by standard USEPA Methods. The sampling program will be in accordance with the details provided in the QAPP. The appropriate analyses selected for this field program, and the rationale for selection of these parameters, are further provided in the RAW (Alta, 2017).

2.2 Data Use

Decisions to be made based on the planned sampling and analysis effort will be determined by the data compiled from the sampling and analysis program. It is intended that data collected through implementation of this QAPP will satisfy federal, state, and local data quality requirements. The data may be used to characterize the nature and extent of any residual contamination, support the completeness of the remedial action, or assist in determination of additional actions.

The presence of environmental contaminants will be determined by the extent of valid detectable concentrations of the constituents discussed above. If the data associated with any COCs are confirmed, the data will be compared to the cleanup goals on a wet-weight basis. If results are below the proposed cleanup levels, then the LAUSD will use the data to support a “no further action” determination. If the evaluation indicates unacceptable risks of exposure, then the data can be used by the LAUSD for further consideration of action.

3. PROJECT ORGANIZATION

This section provides a description of the organizational structure and responsibilities of the individual positions for this project. This description defines the lines of communication and identifies key personnel assigned to various activities for the project.

3.1 Los Angeles Unified School District

LAUSD‘s Project Manager will be responsible for the directional decisions, as well as budget control, for work conducted at the Site. LAUSD will perform document review of related work plans, reports, and drawings for activities associated with this project.

3.2 RAW Implementation Contractor

The LAUSD investigation contractor has responsibility for assigned phases of investigation and reporting. Together, the management team (Project Manager [PM], Field Team Leader and the Health and Safety Coordinator) will be responsible for the technical planning and implementation of the work prescribed in the RAW (Alta, 2017). The QA staff has the responsibility for effective planning, verification and management of QA activities associated with the assigned project.

The contractor's Project Manager (PM) will serve as the primary contact for the LAUSD. The PM will have the authority to commit the necessary resources to ensure timely completion of the project tasks. Responsibilities include strategy development, schedule creation, budget control and document review. The PM will also be responsible for the day-to-day coordination, along with the subcontractors and field crews, to ensure field activities conform to the specifications presented in the RAW (Alta, 2017) and health and safety plan.

The contractor's Health and Safety Coordinator will be responsible for ensuring that the health and safety plan is properly implemented during fieldwork.

The contractor's QA Manager will be responsible for the QA and QC aspects of the project. It is the responsibility of the QA Manager to ensure that all required QA/QC protocols are met in the field and laboratory and to provide oversight of related data validation activities.

3.3 Laboratory

The offsite laboratory employed for this project will hold current testing laboratory certification by the State of California in each analysis required for the proper execution and completion of the project. A certified laboratory will perform analytical testing for soil samples collected for this investigation. The laboratory's project manager will report to the LAUSD contractor's PM on all aspects of the sample analysis. In addition, the contractor's QA Manager shall be advised of any matters related to data quality during the course of the investigation. The laboratory will conform to the QA and QC procedures outlined in their laboratory QA/QC plan.

4. DATA QUALITY OBJECTIVES

Data quality objectives (DQOs) have been specified for each data collection activity, and the work will be conducted and documented so that the data collected are of sufficient quality for their intended use (USEPA, 1998). DQOs specify the data type, quality, quantity, and uses needed to make decisions and are the basis for designing data collection activities. The DQOs were used to design the data collection activities presented in the *Sampling and Analysis Plan* section of the RAW (Alta, 2017). The DQOs for the project are discussed in the following sections.

4.1 Data Quality Objective Process

The project DQOs developed specifically for the planned sampling and analysis program have been determined based on the USEPA's seven-step DQO process (USEPA, 1994). The PM will evaluate the project DQOs to determine whether the quantitative and qualitative needs of the sampling and analysis program have been met. The project definition associated with each step of the DQO process is summarized as follows:

- **State the Problem:** The purpose of the sampling program is to confirm that the RA is complete.
- **Identify the Decision:** The data obtained from the sampling and testing activities will be used to evaluate whether COCs remain in soil at concentrations above the preliminary cleanup goals. Based on a review of the data, the need for additional sampling will be determined.
- **Identify Inputs to the Decision:** Inputs to the decision will include results of analytical testing soil samples. The samples will be tested for the specified analytes discussed in Section 2.
- **Define the Study Boundaries:** The boundaries of the field sampling and analysis program were defined in the RAW (Alta, 2017).
- **Develop a Decision Rule:** Decisions will be based on laboratory results for the target constituents presented in Table 1 for each respective matrix tested. If the concentrations of target compounds are

below the preliminary cleanup goals, then a decision will be made that no further action is required. If target constituents are detected in the samples tested, then the data will be compiled for use in determining the need for further step-out and step-down sampling.

- **Specify Limits on Decision Error:** The results of all analytical testing will be subjected to data validation as specified in Section 8.5 of this plan. Data are determined to be valid if the specified limits on precision, accuracy, representativeness, comparability and completeness are achieved. The results of any detected target constituents will be considered in evaluating the need for additional sampling of the Site and assessing the necessity of reducing any risks posed by the potential contamination.
- **Optimize the Design:** The sampling and analysis plan has been designed to provide the type and quantity of data needed to satisfy each of the aforementioned objectives. The quality of the data will be assessed through the procedures further described in this QAPP.

4.2 Precision, Accuracy, Representativeness, Comparability and Completeness

The basis for assessing the elements of data quality is discussed in the following subsections. In the absence of laboratory-specific precision and accuracy limits, the QC limits listed in this section must be met.

4.2.1 Precision

Precision measures the reproducibility of repetitive measurements. It is strictly defined as the degree of mutual agreement among independent measurements as the result of repeated application of the sample process under similar conditions.

Analytical precision is a measurement of the variability associated with duplicate or replicate analyses of the same sample in the laboratory, and is determined by analysis of laboratory QC samples, such as laboratory control sample duplicates (LCSD), matrix spike duplicates (MSD), or sample duplicates. If the recoveries of analytes in the specified control samples are comparable within established control limits, then precision is within limits.

Total precision is a measurement of the variability associated with the entire sampling and analytical process. It is determined by analysis of duplicate or replicate field samples, and measures variability introduced by both the laboratory and field operations. Field duplicate samples are analyzed to assess field and analytical precision.

Duplicate results are assessed using the relative percent difference (RPD) between duplicate measurements. If the RPD for laboratory QC samples exceeds the laboratory’s statistically determined acceptance ranges, data will be qualified as described in the application validation procedure. If the RPD between primary and duplicate field samples exceeds 100 percent for soil, data will be qualified as described in the applicable validation procedure. The RPD will be calculated as follows:

$$\%RPD = 200 \times \frac{X_2 - X_1}{X_2 + X_1}$$

(Where X_1 is the smaller of the two observed values)

4.2.2 Accuracy

Accuracy is a statistical measurement of correctness and includes components of random error (variability due to imprecision) and systematic error. It reflects the total error associated with a measurement. A measurement is accurate when the value reported does not differ from the true value or known concentration of the spike or standard.

Accuracy of laboratory analyses will be assessed by laboratory control samples, surrogate standards, matrix spikes and initial and continuing calibrations of instruments. Laboratory accuracy is expressed as the percent recovery (%R). . If the %R is determined to be outside acceptance criteria, data will be qualified as described in the applicable validation procedure. The calculation of percent recovery is provided below:

$$\%R = 100\% \times \frac{X_s - X}{T}$$

(Where X_s is the measured value of the spiked sample, X is the measured value of the non-spiked sample, and T is the true value of the spike solution added)

Field accuracy will be assessed through the analysis of field equipment blanks. Analysis of blanks will monitor errors associated with the sampling process and field contamination. The DQO for field equipment and trip blanks is that all values are less than the reporting limit for each target constituent. If contamination is reported in the field equipment blanks, data will be qualified as described in the applicable validation procedure.

4.2.3 Representativeness

Representativeness is the degree to which data accurately and precisely present selected characteristics of the media sampled. Representativeness of data collection is addressed by careful preparation of sampling and analysis programs. This QAPP, together with the RAW, addresses representativeness by specifying sufficient and proper numbers and locations of samples, incorporating appropriate sampling methodologies, specifying proper sample collection techniques and decontamination procedures, selecting appropriate laboratory methods to prepare and analyze samples, and establishing proper field and laboratory QA/QC procedures.

4.2.4 Completeness

Completeness is the amount of valid data obtained compared to the amount that was expected under ideal conditions. The number of valid results divided by the number of possible results expressed as a percentage defines the completeness of the data set. The objective for completeness is to recover at least 90 percent of the planned data to support field efforts. The formula for calculation of completeness is presented as follows:

$$\%\text{Completeness} = 100\% \times \frac{\text{number of valid results}}{\text{number of expected results}}$$

4.2.5 Comparability

Comparability is an expression of confidence with which one data set can be compared to another. The objective of comparability is to ensure that data developed during the investigation are comparable to Site knowledge and adequately address applicable criteria or standards established by the USEPA and the California Department of Health Services (CDHS). This QAPP addresses comparability by specifying laboratory methods that are consistent with the current standards of practice as approved by the USEPA and the CDHS. Field methods are discussed in the sampling and analysis plan.

5. QUALITY CONTROL ELEMENTS

This section presents QC requirements relevant to analysis of environmental samples that will be followed during all project analytical activities. The purpose of the QC program is to produce data of known quality that satisfy the project objectives and meet or exceed the requirements of the standard methods of analysis. This program provides a mechanism for ongoing control and evaluation of data quality measurements through the use of the QC procedures, materials, and samples.

5.1 Quality Control Procedures

The chemical data to be collected for this effort will be used to determine that the extent of contamination is properly evaluated. As such, it is critical that the chemical data be of the highest confidence and quality. Consequently, strict QA/QC procedures will be adhered to. These procedures include:

- Adherence to strict protocols for field sampling and decontamination procedures;
- Collection and laboratory analysis of appropriate field equipment and trip blanks to monitor for contamination of samples in the field or the laboratory;
- Collection and laboratory analysis of matrix spike, MSD, and field duplicate samples to evaluate precision and accuracy; and
- Attainment of completeness of goals.

5.1.1 Equipment Decontamination

Non-dedicated equipment must be decontaminated before and after each sample is collected. The equipment is to be washed in a non-phosphate detergent solution, rinsed in tap water, and rinsed in distilled water.

5.1.2 Standards

Standards used for calibration or to prepare samples are to be certified by the National Institute of Standards and Technology, the USEPA, or other equivalent source. The standards will be current. The expiration date will be established by the manufacturer, or based on chemical stability, the possibility of contamination, and environmental and storage conditions. Standards must be labeled with expiration dates, and will reference primary standard sources if applicable. Expired standards must be discarded.

5.1.3 Supplies

All supplies must be inspected prior to their use in the field or laboratory. The descriptions for sample collection and analysis contained in the methods will be used as a guideline for establishing the acceptance criteria for supplies. A current inventory and appropriate storage system for these materials will ensure their integrity prior to use. Efficiency and purity of supplies will be monitored through the use of standards and blank samples.

5.1.4 Holding Time Compliance

Sample preparation and analysis must be completed within the required method holding times (Table 1). Holding time begins at the time of sample collection. If holding times are exceeded, and the analyses are performed, the associated results will be qualified as described in the applicable validation procedure. The following definitions of extraction and analysis compliance are to be used to assess holding times:

- Preparation or extraction completion – completion of the sample preparation process as described in the applicable method, prior to any necessary extract cleanup
- Analysis completion – completion of all analytical runs, including dilutions, second-column confirmations, and any required re-analysis

5.1.5 Preventive Maintenance

The LAUSD contractor Field Manager is responsible for documenting the maintenance of all field equipment prescribed in the manufacturer’s specifications. Scheduled maintenance is to be performed by trained personnel only. The analytical laboratory is responsible for all analytical equipment calibration and maintenance as described in their laboratory QA/QC plan. Subcontractors are responsible for maintenance of all equipment needed to carry out subcontracted duties. Backup instrumentation and equipment will be available locally and shipped to the Site as needed.

5.2 Field QC Samples

The types of field QC samples that will be collected during confirmation sampling for the remedial action and their purpose in relation to the DQOs are discussed in the following sections.

5.2.1 Field Duplicate Samples

Field duplicate samples will be collected and analyzed to evaluate sampling and analytical precision. Field duplicates are collected and analyzed in the same manner as the primary samples. Agreement between duplicate sample results will indicate good sampling and analytical precision. Field duplicates will be collected at a frequency of 10 percent of the primary soil samples collected. The duplicate sample will be subject to the same laboratory analyses performed on the associated primary sample.

5.2.2 Field Equipment Blanks

A field equipment blank is a sample that is prepared in the field by pouring de-ionized water into cleaned sampling equipment. The water is then collected and analyzed as a sample. The field equipment blanks give an indication of contamination from field procedures (e.g., improperly cleaned sampling equipment, cross-contamination). Field equipment blanks will be collected at a frequency of one per day. The field equipment blanks will be subject to the same analyses requested for the associated primary samples collected.

5.3 Laboratory QC Samples

Laboratory QC samples are used to ensure that conducted analyses are within QC limits and document the quality of analytical results. The types of QC samples the laboratory will employ depend on the particular analytical methodology used to analyze the samples. Each analytical method has a required QC procedure that must meet laboratory-developed acceptance limits in order for the data to be considered valid. In addition, as part of the laboratory’s accreditation program, performance evaluation samples and method detection limit studies are conducted to evaluate the laboratory’s capability of performing the method accurately and precisely. The primary types of laboratory QC samples are discussed in the following sections.

5.3.1 Laboratory Method Blanks

A laboratory method blank is prepared and analyzed by the laboratory in exactly the same manner as project samples in the analytical batch. Analysis of the method blank indicates potential sources of contamination from laboratory procedures (e.g., contaminated reagents, improperly cleaned laboratory equipment, or persistent contamination due to presence of certain compounds in the ambient laboratory air). A method blank is included with the analysis of every analytical batch or as stated in the method, whichever is more frequent.

5.3.2 Laboratory Control Samples

Laboratory control samples are analyzed by the analytical laboratory to evaluate the efficiency of the extraction and analysis procedures, and are necessary to verify the accuracy and precision of the extraction and analysis. The laboratory control sample is prepared by the addition of known quantities of target compounds to a blank matrix. The laboratory control sample is extracted and analyzed in the same manner as project samples in the analytical batch. The results of the analysis are compared with the known additions, and a laboratory control samples recovery is calculated to provide an evaluation of the accuracy of the extraction and analysis procedures. Laboratory control sample recoveries are required to check that they are within laboratory's determined acceptance ranges. The acceptable ranges vary with both sample matrix and analytical method. Laboratory control sample and laboratory control sample duplicates will be analyzed by the laboratory with each sample batch at a frequency of at least one per batch of 20 samples. Analysis of laboratory control samples may be performed in duplicate in order to evaluate the precision of the procedures as well as the accuracy. Precision objectives (represented by agreement between laboratory control sample and laboratory control sample duplicate recoveries) and accuracy objectives (represented by laboratory control sample recovery results) are based on statistically generated limits established annually by the analytical laboratory. If a bias is determined, the associated data will be qualified and the direction of the bias indicated in the data validation report.

5.3.3 Matrix Spike Samples

Matrix spike analyses are performed by the analytical laboratory to evaluate the efficiency of the sample extraction and analysis procedures, and are necessary because matrix interference (that is, interference from the sample matrix, water or soil) may have a widely varying impact on the accuracy and precision of the extraction analysis. The matrix spike is prepared by the addition of known quantities of target compounds to a project-specific sample. The matrix spike sample is extracted and analyzed in the same manner as project samples in the analytical batch. The results of the analysis are compared with the known additions and a matrix spike recovery is calculated to provide an evaluation of accuracy of the extraction and analysis procedures. Matrix spike recoveries are reviewed to check that they are within the laboratory's statistically determined acceptance ranges. However, the acceptance ranges vary widely with both sample matrix and analytical method. Matrix spikes and matrix spike duplicates will be analyzed by the laboratory at a frequency of at least one per batch of 20 samples or less. Typically, matrix spike analyses are performed in duplicate in order to evaluate the precision of the procedures as well as the accuracy. Precision objectives (represented by agreement between matrix spike and matrix spike duplicate recoveries) and accuracy objectives (represented by matrix spike recovery results) are based on statistically generated limits established annually by the analytical laboratory. It is important to note that these objectives are to be viewed as goals, not as criteria. If matrix bias is suspected, the associated data will be qualified and the direction of the bias indicated in the data validation report.

6. SAMPLING PROCEDURES

The defensibility of data depends on the use of well defined, accepted sampling procedures. This section describes the sampling and handling procedures that will be followed for each sampling event.

6.1 Field Procedures

Collection of environmental samples of high integrity is important to the quality of chemical data to be generated. To this end, strict field procedures have been developed as general descriptions of field methods that will be employed at various locations during phases of the field investigation. These procedures are contained in the sampling and analysis plan.

6.2 Sample Containers, Preservation and Holding Times

Table 1 lists the required sample containers, preservatives and recommended maximum holding times for samples. Sample containers will be provided by the laboratory.

6.3 Sample Handling and Storage

In the field, each sampler container will be marked with the sampling location number, date and time of sample collection. All sample containers will be wiped with clean paper towels, securely packed in zipper-sealed plastic bags, and placed into coolers that are properly chilled at less than 6°C.

Upon receipt of the samples, the laboratory will immediately notify the Field Manager if conditions or problems are identified that require immediate resolution. Such conditions include container breakage, missing or improper chain-of-custody forms, exceeded holding times, missing or illegible sample labeling, or temperature excursions.

6.4 Sample Custody

For each sample that is submitted to the laboratory for analysis, an entry will be made on a chain-of-custody form supplied by the laboratory. The information to be recorded includes the sampling date and time, sample identification number, matrix type, requested analyses and methods, preservatives and the sampler's name. The chain-of-custody form will also specify the laboratory turnaround time that will be appropriate to meet the USEPA holding times for the requested methods.

Sampling team members will maintain custody of the samples until they are relinquished to laboratory personnel or a professional courier service. The chain-of-custody form will accompany the samples from the time of collection until received by the laboratory. Each party in possession of the samples (except the professional courier service) will sign the chain-of-custody form signifying receipt. The chain-of-custody form will be placed in a plastic bag and shipped with samples inside the cooler. After the samples, ice and chain-of-custody forms are packed in the cooler, it will be appropriately sealed before being relinquished to the courier. A copy of the original completed form will be provided by the laboratory along with the report of results. Upon receipt, the laboratory will inspect the condition of the sample containers and report the information on the chain-of-custody or similar form.

7. ANALYTICAL PROCEDURES

The analytical methods used for this project are primarily USEPA-approved methods and are listed in Table 1. Specific analytical method procedures are detailed in the laboratory QA/QC Plan of the selected laboratory, which may be reviewed by QA staff during laboratory audits to ensure that project specifications are met. Laboratory audits are discussed in Section 9.2.

7.1 Internal Standards

Internal standards are measured amounts of method-specified compounds added after preparation, or extraction, of a sample. Internal standards are added to samples, controls, and blanks in accordance with method requirements to identify column injection losses, purging losses, or viscosity effects.

Acceptance limits for internal standard recoveries are set forth in the applicable method. If the internal standard recovery falls outside acceptance criteria, the instrument will be checked for malfunction, and re-analysis of the sample will be performed after any problems are resolved.

7.2 Retention Time Windows

Retention time windows will be established as described in SW-846 Method 8000A for applicable analyses of organic compounds if necessary. Retention time windows are used for qualitative identification of analytes and are calculated based on multiple, replicated analyses of respective standards.

Retention times will be checked daily. Acceptance criteria for retention time windows are established in the referenced method. If the retention time falls outside the respective window, action will be taken to correct the problem. The instrument must be re-calibrated after any retention time window failure, and the affected samples must be re-analyzed.

7.3 Method Detection Limits

The method detection limit (MDL) is the minimum concentration of an analyte, or compound, that can be measured and reported with 99 percent confidence that the concentration is greater than zero. MDLs are established for each method, matrix and analyte, and for each instrument used to analyze project samples. MDLs are derived using the procedures described in 40 CFR §136, Appendix B (USEPA, 1990a). The USEPA requires that MDLs be established annually. MDLs must be below applicable reporting limits for each target analyte.

7.4 Instrument Calibration

Analytical instruments will be calibrated in accordance with the procedures specified in the applicable methods. All analytes that are reported must be present in the initial and continuing calibrations, and these calibrations must meet the acceptance criteria specified in the reference method. Records of standard preparation and instrument calibration will be maintained. Records must unambiguously trace the preparation of standards and their use in calibration and quantification of sample results. Calibration records will be traceable to standards materials as described in Section 5.1.2.

At the onset of analysis, instrument calibrations will be checked using all of the analytes of interest. At a minimum, calibration criteria will satisfy method requirements. Analyte concentrations can be determined with either calibration curves or response factors, as defined in the method. Guidance provided in SW-846 should be considered to determine appropriate evaluation procedures.

8. DATA REPORTING

This section presents reporting requirements relevant to the data produced during all project analytical activities.

8.1 Field Data

Data measured by field instruments will be recorded in field logbooks, and/or on required field forms. Units of measure for field analyses are identified on the field forms. The field data will be reviewed by the PM or Field Manager to evaluate completeness of the field records and appropriateness of the field methods employed. All field records will be retained in the project files.

8.2 Laboratory Data

Analytical data will contain the necessary sample results and quality control data to evaluate the DQOs defined for the project. At a minimum the laboratory reports will include the following data and summary forms:

- Narrative, cross-reference, chain-of-custody and method references;
- Analytical results;
- Calibration summary upon request;
- Blank results;
- Laboratory control sample recoveries;
- Duplicate sample results or duplicate spike recoveries;
- Sample spike recoveries;
- Instrument tuning summary upon request;
- Associated raw data upon request; and

- Magnetic tape or equivalent upon request.

Data validation will be performed on all laboratory data in accordance with the guidance, *Data Validation Memorandum, Summary of Level II Data Validation* (DTSC, May 2006), as published on the DTSC website, <http://www.dtsc.ca.gov/Schools/upload/Data_Validation.pdf>.

The laboratory data will be reviewed for compliance with the applicable method and the quality of the data reported. The areas of data validation are summarized as follows.

- Data completeness
- Holding times
- Blanks
- Laboratory control samples
- Matrix spike/matrix spike duplicates
- Field quality control samples

The application of data validation criteria is a function of project-specific DQOs. The QA Manager will determine whether the data quality objectives for the analytical data have been met. Results of the data validation review will be documented and summarized in a data validation memorandum, which will be included as an appendix to the remedial action completion report.

8.3 Project Data Management

Data management is the process of organizing, maintaining and applying a variety of data to provide a useful and coherent view of the Site conditions. Data collected for the project implementation include sample collection data, field measurement data, onsite laboratory analytical data and offsite laboratory analytical data. The database used for the confirmation sampling and analytical results is Microsoft Excel.

8.4 Project Data Flow

Data received by the Data Manager from the contracted laboratory are either hard copy or electronic format. Analytical results received in hardcopy form are manually entered into a “temporary file” utilizing a proprietary data program. Analytical results received from the laboratory as an electronic file are converted to the project’s standard database structure. Printouts are created from all sources of analytical data and verified for accuracy using the hard copy report. Any errors noted by the reviewer and communicated to the Data Manager for correction. Upon completion of the data verification and data validation processes, the analytical data are appended to the main, composite database for storage and eventual reporting. Data qualifiers assigned to particular analytical results upon completion of the data validation are appended to the results in the database utilizing a proprietary validation program. Proprietary custom report programs are used to generate tabular data presentations and statistical reports. Prior to distribution to project personnel, these database outputs are re-verified for accuracy and consistency against the original data. Upon final approval, the final analytical tables and statistical reports are distributed to project personnel for data evaluation and project decisions.

Project reports will be permanently retained by the LAUSD Project Manager.

8.5 Procedures for Data Validation

Guidance for performing data validation for the types of analyses to be utilized for this investigation is provided in the *Contract Laboratory Program National Functional Guidelines for Organic Data Review* (USEPA, 1996b) and *Contract Laboratory Program National Functional Guidelines for Inorganic Data Review* (USEPA, 2002). Data validation will be documented in a manner consistent with these functional guidelines. The results of the data validation will be included in the data validation memorandum, which will be maintained in the project files.

8.6 Data Qualifiers

The data validation procedures were designed to review each data set and identify biases inherent to the data and determine its usefulness. Data validation flags are applied to those sample results that fall outside of specified tolerance limits and therefore did not meet the program's QA objectives as described in Section 4.2. Data validation flags to be used for this project are defined in the *Contract Laboratory Program National Functional Guidelines for Organic Data Review* (USEPA, 1996b) and *Contract Laboratory Program National Functional Guidelines for Inorganic Data Review* (USEPA, 2002). Data validation flags will indicate if results are considered anomalous, estimated or rejected. Only rejected data are considered unusable for decision-making purposes; however, other qualified data may require further verification.

9. PERFORMANCE AND SYSTEM AUDITS

Audit programs are established and directed by the LAUSD contractor to ensure that field and laboratory activities are performed in compliance with project controlling documents. This section describes responsibilities, requirements and methods for scheduling, conducting and documenting audits of field and laboratory activities.

9.1 Field Audits

Field audits focus on appropriateness of personnel assignments and expertise, availability of field equipment, adherence to project controlling documents for sample collection and identification, sample handling and transport, use of QA samples, chain-of-custody procedures, equipment decontamination and documentation. Field audits are not required but may be performed in the event significant discrepancies are identified that warrant evaluation of field practices.

9.2 Laboratory Audits

Laboratory audits include reviews of sample handling procedures, internal sample tracking, standard operating procedures, analytical data documentation, QA/QC protocols, and data reporting. Any selected laboratory will be licensed by the State of California as a certified testing laboratory and will participate in a state-approved Performance Evaluation Program, as appropriate, for hazardous waste, wastewater and drinking water analyses. If no previous audit has been conducted, a scheduled audit will be conducted by the QA staff during the course of this project to ensure the integrity of sample handling and processing by the laboratory.

9.3 Data Audits

Data audits will be performed on analytical results received from the laboratories if issues arise that question the data. These audits will be accomplished through the process of data validation as described in Section 8.5, and involve a more detailed review of laboratory analytical records. Data audits require the laboratory to submit complete raw data files to the LAUSD contractor for validation and verification. DPW contractor chemists will perform a review of the data consistent with the level of effort described in the *Contract Laboratory Program National Functional Guidelines for Organic Data Review* (USEPA, 1996b) and *Contract Laboratory Program National Functional Guidelines for Inorganic Data Review* (USEPA, 2002). This level of validation consists of a detailed review of sample data, including verification of data calculations for calibration and QC samples to assess whether the data are consistent with method requirements. Upon request, the laboratory will make available all supporting documentation in a timely fashion.

9.4 Scheduling

Audits will be scheduled such that field and laboratory activities are adequately monitored, or in the event discrepancies are identified. The overall frequency of audits conducted for these activities will be based on the importance and duration of work, as well as significant changes in project scope or personnel.

9.5 Reports to Management and Responsibilities

Upon completion of any audit, the auditor will submit to the PM and the Field Manager a report or memorandum describing any problems or deficiencies identified during the audit. It is the responsibility of the PM to determine whether the deviations will result in any adverse effect on the project conclusions. If it is determined that corrective action is necessary, procedures outlined in Section 9.6 will be followed.

9.6 Corrective Action

Corrective actions will be initiated whenever data quality indicators suggest that DQOs have not been met. Corrective actions will begin with identifying the source of the problem. Potential problem sources include failure to adhere to method procedures, improper data reduction, equipment malfunctions or systemic contamination. The first level of responsibility for identifying the problems and initiating corrective action lies with the analyst/field personnel. The second level of responsibility lies with any person reviewing the data. Corrective actions may include more intensive staff training, equipment repair followed by a more intensive preventive maintenance program, or removal of the source of systemic contamination. Once resolved, the corrective action procedure will be fully documented, and if DQOs were not met, the samples in question must be re-collected and/or re-analyzed utilizing a properly functioning system.

10. REFERENCES

1. Alta Environmental, 2017, *Preliminary Environmental Assessment-Equivalent Report*– Thomas Jefferson High School, February 13, 2017.
2. Alta Environmental, 2017, *Removal Action Workplan for Soil*– Thomas Jefferson High School, May 10, 2017.
3. Department of Toxic Substances Control (DTSC), *Data Validation Memorandum, Summary of Level II Data Validation,* <http://www.dtsc.ca.gov/Schools/upload/Data_Validation.pdf>, May 2006.
4. DTSC, *Interim Guidance Evaluation of School Sites with Potential Soil Contamination as a Result of Lead from Lead-based Paint, Organochlorine Pesticides from Termiticides, and Polychlorinated Biphenyls from Electrical Transformers* revised June 9, 2006.
5. Office of Environmental Health Hazard Assessment (OEHHA), *Human-Exposure-Based Screening Numbers Developed to Aid Estimation of Cleanup Costs for Contaminated Soil,* Revision January, 2005.
6. USEPA, *Code of Federal Regulations, Title 40 – Protection of Environment,* Office of Research and Development, U.S. Environmental Protection Agency, Washington, DC, 1990.
7. USEPA, *Contract Laboratory Program National Functional Guidelines for Inorganic Data Review,* EPA540/R-01/008, Office of Emergency and Remedial Response, Washington, DC, 2002.
8. USEPA, 1996b, *Contract Laboratory Program National Functional Guidelines for Organic Data Review,* EPA540/R-99/008, Office of Emergency and Remedial Response, Washington, DC.
9. USEPA, *Draft Region 9 Laboratory Documentation Requirements for Data Validation Document Control,* No. 9QA-07-97, U.S. Environmental Protection Agency, Region 9, San Francisco, CA, 1997.

10. USEPA, *EPA Guidance for Quality Assurance Project Plans,* EPA/240/B-1/003 (EPA QA/R-5), Washington, DC, 2002.

11. USEPA, *Guidance for the Data Quality Objectives Process, EPA QA/G-4*, Office of Research and Development, U.S. Environmental Protection Agency. Washington, DC, 1994.

12. USEPA, *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods*, SW-846, Third Edition, Office of Solid Waste and Emergency Response, U.S. Environmental Protection Agency, Washington, DC, 1996.

Tables

Table 1 – Sample Containers, Preservatives and Holding Times, Laboratory Reporting Limits

Soil Analyses					
Analyte	**Method**	**Container**	**Preservative**	**Holding Time**	**Reporting Limits**
Arsenic	EPA 6020	glass jar or acetate/brass/ stainless steel sleeve	4ºC +/- 2ºC, ice	180 days	0.3 mg/kg
Lead	EPA 6010B	glass jar or acetate/brass/ stainless steel sleeve	4ºC +/- 2ºC, ice	180 days	0.5 mg/kg

Notes: mg/kg = milligrams per kilogram

µg/kg = micrograms per kilogram

Figures

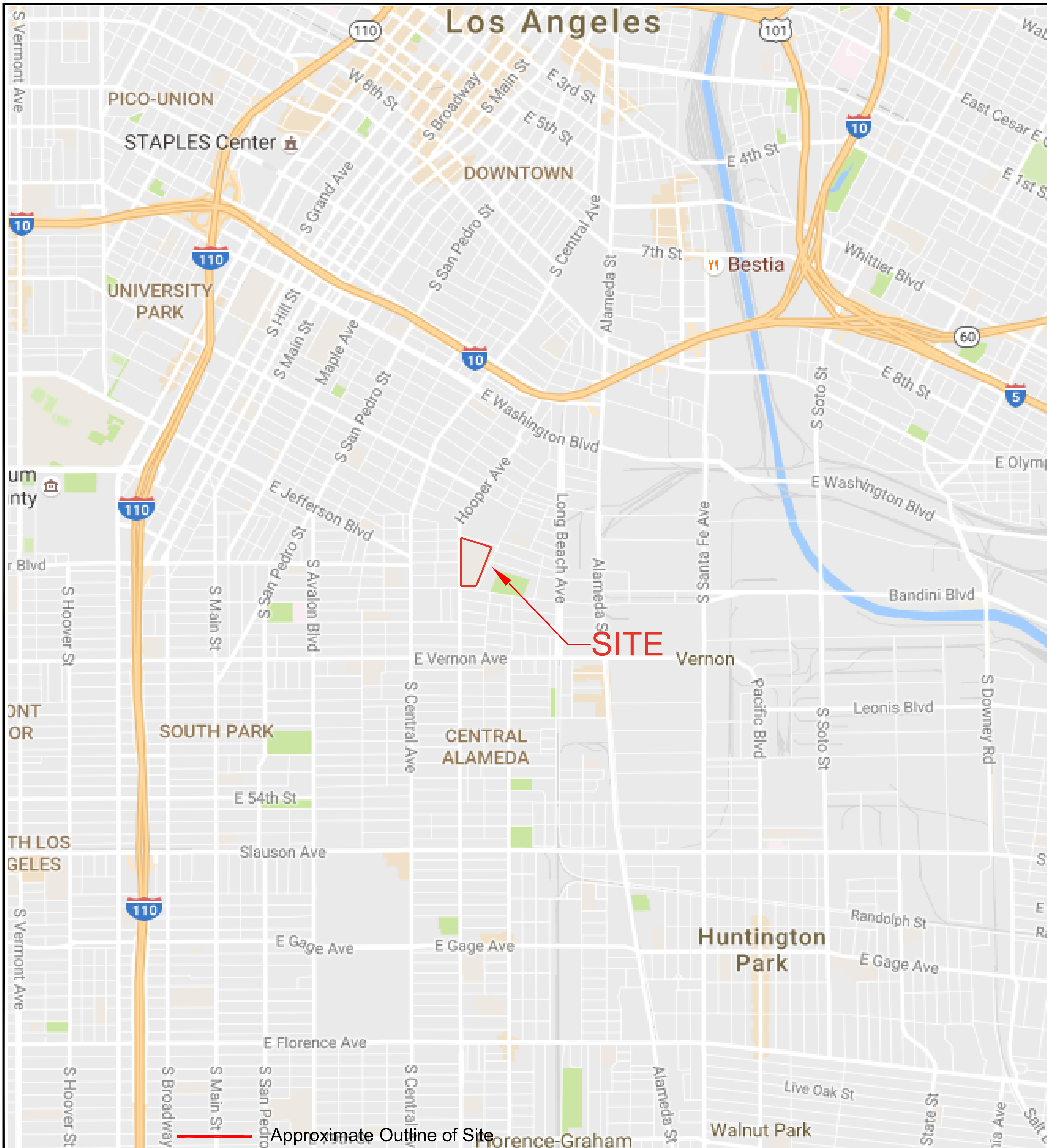

FIGURE 1: SITE LOCATION MAP

CLIENT:
Los Angeles Unified School District

PROJECT #: LAUS-16-6714

SITE LOCATION: Thomas Jefferson High School
1319 East 41st Street,
Los Angeles, California

ALTA ENVIRONMENTAL

3777 Long Beach Blvd., Annex Bldg.
Long Beach, CA 90807
(562) 495-5777 www.altaenviron.com

DRAWN: BP	APPROVED: EF
SCALE: None	DATE: 8/17/2016

NORTH

LEGEND:

Approximate Sample Location

Approximate Sample Locations with lead and arsenic concentrations in exceedance of acceptable screening levels

NOTE:
All location are approximate.

Figure created in color. Significant information may be lost if copied in black and white.

FIGURE 2: Sample Location Map

CLIENT: LOS ANGELES UNIFIED SCHOOL DISTRICT	DRAWN: BP	APPROVED: EF
	SCALE: No scale	DATE: July 2016

SITE:
Thomas Jefferson High School
1319 East 41st Street
Los Angeles, California

PROJ. NO.: LAUS-17-6714

ALTA ENVIRONMENTAL

3777 Long Beach Blvd. Annex Bldg. Long Beach CA 90807
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APPENDIX D

Transportation Plan

TRANSPORTATION PLAN
For Off-Site Disposal of Soils

Thomas Jefferson High School
1319 East 41st Street
Los Angeles, California 90011

Prepared for

Los Angeles Unified School District

LAUS-17-6714
May 10, 2017

Alta Environmental
3777 Long Beach Boulevard, Annex Building
Long Beach, CA 90807   www.altaenviron.com

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Figures

PROJECT SUMMARY

Project Site (Site):	Thomas Jefferson High School
Site Address:	1319 E. 41st Street
Project Proponent (PP):	Los Angeles Unified School District (LAUSD)
Removal Action (RA) Contractor:	TBD (to be determined).
Chemicals of Concerns (COCs):	Lead and Arsenic
Site-Specific Cleanup Goals (CGs):	Lead: 80 milligrams per kilogram (mg/kg)
	Arsenic: 12 mg/kg
Estimated Volume of Soil Removal:	224 cubic yards
Distance to a Sensitive Environment:	No sensitive environments are located within the vicinity of the Site.

1 INTRODUCTION

Thomas Jefferson High School (the “Site”) is an active high school campus made up of five adjacent parcels (Los Angeles County Tax Assessor Parcel Numbers: 5114-036-900, -901, -902, -903, -904) that total approximately 18.5 acres. The Site is bound by residential homes to the north, Compton Avenue to the east, East 41st Street to the south, and Hooper Avenue to the west (see Figure 1).

The Site is currently occupied by a single campus used by three schools: Thomas Jefferson High School, which has occupied the site since 1915/1916; and Student Empowerment Academy Charter and Nava College and Preparatory Academy, which have occupied the property since 2006 and 2014, respectively. The on-site buildings include a main academic and office building, auditorium, science building, cafeteria, two gymnasiums, a boiler house, arts and shops buildings, and former industrial arts buildings, as well as modular classroom buildings, storage sheds, greenhouse, covered structures, and ancillary structures (athletic, ROTC, parent’s center, etc.). The northwest quarter of the subject property is developed with athletic tracks and fields and associated structures, tennis courts, and a garden area. The remainder of the property is developed with lawns and paved courtyards, assembly areas, and walkways with associated landscaping

A Preliminary Environmental Assessment Equivalent (PEA-E) for the Thomas Jefferson High School comprehensive modernization area in the northern portion of the Site was conducted by Alta Environmental (Alta) on behalf of the Los Angeles Unified School District Office of Environmental Health and Safety (LAUSD-OEHS). Soil samples were collected throughout the Site at various depths and analyzed for total petroleum hydrocarbons (TPH), volatile organic compounds (VOCs), polychlorinated byphenols (PCBs), organochlorine pesticides (OCPs), arsenic, lead, and Title 22 metals. While several analytes were found at levels in excess of laboratory detection limits, only lead and arsenic were identified in soil samples in excess of residential screening levels. Alta recommended that a Removal Action Workplan (RAW) be developed for the site to address shallow soils impacted with lead, and/or arsenic in the areas identified (see Figure 2).

This document outlines the plan for transporting excavated soil to an offsite disposal facility. The purpose of this Transportation Plan is to ensure that soils excavated from the site are properly disposed of at an off-site disposal facility, and to minimize the risks associated with impacted soils. Approximately 25-50 trucks per day would be required for soil hauling. Additional vehicle trips may be generated by project vendors and worker commute.

2 WASTE CHARACTERIZATION AND QUANTITY

2.1 Waste Profile

Excavated soils will be profiled for acceptance by the selected disposal facility. Approval from the disposal facility will be obtained before any excavation activities commence. Additional documentation will be provided to LAUSD pertaining to waste disposal profiles and waste disposal acceptance prior to any off-site shipments of waste.

2.2 Hazardous Waste Management

Resource Conservation and Recovery Act (RCRA) hazardous waste is regulated under both RCRA and the California Health and Safety Code (H&SC). RCRA regulatory levels for D-listed wastes, using the Toxicity Characteristic Leaching Procedure (TCLP), are listed under Title 22 of the *California Code of Regulations*, Section 66261.24(a)(1) (22 CCR 66261.24(a)(1)). Non-RCRA hazardous waste is regulated only under H&SC and 22 CCR. The Total Threshold Limit Concentration and Soluble Threshold Limit Concentration (STLC) values for certain chemicals are listed under 22 CCR 66261.24(a)(2).

Since some soil to be excavated as part of this RAW is classified as a hazardous waste, LAUSD has secured a U.S. Environmental Protection Agency (EPA) identification number for the Site (CAD28409019) from the California Department of Toxic Substances Control (DTSC) for proper hazardous waste management. Compliance with DTSC requirements of hazardous waste generation, temporary on-site storage, transportation, and disposal is required.

Limited soluble analysis was conducted during the PEA-E (Alta 2017) on selected samples from twenty-seven areas of concern. Fifteen of the twenty-seven samples were found to contain soluble concentrations of lead that would characterize the impacted soil as a California listed hazardous waste. None were found to be above federal RCRA hazardous waste limits.

2.3 Contaminated Soil Control

After the delineated areas of impacted soil have been excavated to the appropriate depths, confirmation soil samples will be collected from the bottom and sidewalls of the excavations. Confirmation sampling frequency and clean-up goals are discussed in the RAW.

2.3 Waste Quantity

- Estimated quantity of Non-hazardous waste: 224 cubic yards
- Estimated Number of Truckloads per Day: 25-50

3 SOIL LOADING OPERATIONS

Soil will be removed with excavators or other types of earth moving equipment, as necessary. As the COC-impacted soil is excavated from the Site, it may be temporarily stockpiled and stored onsite. The contractor will transport the COC-impacted soil when offsite transportation and disposal are available. The trucks awaiting loading will be staged within the boundaries of the site.

Shallow excavation in the COC-impacted areas will be backfilled. Soil management is discussed in Section 7.5 of the RAW.

3.1 Soil Segregation Operations

Excavated soils are classified as non-hazardous waste with a portion classified as California-hazardous waste. Segregation operations may be necessary to segregate clean from impacted soils.

The soil segregation will be based laboratory data collected in the field, visual, olfactory, PID or equivalent readings; and previous soil sampling data.

3.2 Truck Loading Operations

Haul vehicles shall only be loaded in designated areas. Haul trucks may be loaded utilizing a front-end loader, or similar contractor approved equipment, from temporary stockpiles. Whenever possible, haul vehicles shall be loaded in staging areas. Water spray or mist, as appropriate, will be applied during soil loading operations.

All vehicles will be decontaminated prior to leaving the work area. For track-out prevention and control, all trucks will be broom cleaned after loading. The dump truck or roll-off bin portion of the truck will then be covered with a tarp to prevent soil and/or dust from spilling out of the truck during transport to the disposal facility. Any waste accumulated during decontamination procedures will be containerized for appropriate disposal.

Prior to leaving the load area, each haul vehicle will be inspected to ensure that the payloads are adequately covered, the vehicles are cleaned of spilled soil, and the shipment is properly manifested.

3.3 Working Hours and Duration

In most cases, excavation, truck loading and unloading will be conducted between 7 AM to 5 PM daily for as many days necessary.

4 TRANSPORTATION CONTROL

4.1 Dust Control

Soil for offsite disposal will be transported in tarped end-dump trailers/trucks, drums, or roll-off bins to an approved land disposal facility. All waste hauler vehicles will be decontaminated prior to leaving the work area. Clean fill materials will be transported in tarped trailers/trucks to the Site.

4.2 Traffic Control

Prior to loading or unloading at the Site, all trucks will be staged on Site as much as possible to avoid impacts on the local streets. Careful coordination of trucks will be exercised to help avoid staging offsite and long wait times for trucks.

4.3 Site Access Control

Trucks to be loaded or unloaded at the Site will only access the Site through designated entry/access points. Waste hauling vehicles will not be allowed to cross soil removal or staging areas. If necessary, a flag person will be located at the entry way to assist the truck drivers to safely enter and depart the Site.

4.4 Onsite Traffic Flow

Traffic will be coordinated in such a manner that, at any given time, no more than ten (10) transportation trucks will be onsite to reduce truck traffic on surrounding surface streets and reduce dust generation during onsite transportation.

4.5 Speed Limit

While on the Site, all vehicles are required to maintain slow speeds, e.g., less than five miles per hour (5 mph), for safety purposes and for dust control measures. While on streets or freeways, all transporters will be directed to follow the speed limit requirements and use defensive driving techniques for traffic safety.

4.6 Transportation Routes

A proposed transportation route and alternate route for offsite shipment of impacted soil are included as Figure 3 of this Transportation Plan and will be updated as necessary.

4.7 Consultation with Local Transportation Department

A "haul route permit" may be required and obtained from the Los Angeles County Department of Public Works (LADPW) with a copy of the transportation route map at least 3 days prior to commencement of the proposed RA. The haul route permit is sufficient for the trucks hauling soils because the loaded weight will be less than 40 tons. Mobilization and demobilization of large earthmoving equipment may exceed this weight and would require additional permits (green and/or purple) from the state (and local transportation agencies). Heavier loads have higher permit fees and restrictions on time of travel.

4.8 Local Traffic Control

Transportation of impacted soils will be on arterial streets and/or freeways, approved for truck traffic, to minimize any potential impact on the local neighborhood. Moving along the proposed transportation route, all street intersections (except those marked on the transportation route map) are controlled by traffic lights or stop signs. For entry and exit from the school parking lot, a flag person of the RA contractor may be located to assist or direct traffic flow during heavy traffic hours. Therefore, the number of daily truckloads during implementation of the RAW is not expected to cause a disruption in local traffic.

4.9 Street Maintenance

If required, a "work notice" may be given to the street maintenance authority with a copy of the transportation route map at least three (3) days prior to initiation of the proposed RA. If necessary, streets will be cleaned of spilled soils and the final cleanup after completion of field activities, such as washing paved areas, will be conducted. The number of daily truckloads during implementation of the RAW is not expected to cause damage to surface streets.

5 OFFSITE LAND DISPOSAL FACILITIES

A non-RCRA hazardous waste is a California-only hazardous waste. Non-RCRA and RCRA hazardous wastes will be disposed of at a California Class 1 land disposal facility or an out of state landfill permitted to accept such wastes. The following waste management facilities have been selected for this project:

Clean Harbors Buttonwillow

2500 West Lokern Road
Buttonwillow, CA 93206
Phone: (661) 762-6200 or (310) 835-9998
Fax: (661) 761-7681

Alternatives:

U.S. Ecology Nevada, Inc.
Highway 95 – 12 miles South of Beatty, Nevada

Phone: 1 (800) 239-3943 or (775) 553-2203
Fax: (775) 553-2742

South Yuma County Landfill
19536 S. Ave #1E
Yuma, Arizona 85365
Phone: (928) 750-2003

Waste Management Northwest Regional Landfill
19401 W. Deer Valley Road
Surprise, Arizona 85387
Phone: (602) 437-3165

5.1 SHIPING DOCUMENTATION

Manifests, bill of lading and/or invoice from the selected hauler will be used to document and accompany each truck shipment. At a minimum, the shipping document will include the following information:

- Name and Address of Waste Generator
- Name and Address of Waste Transporter
- Name and Address of Disposal Facility
- Description of the Waste
- Quantity of Waste Shipped

Copies will be maintained of the shipping document for each truckload of excavated soils or fill materials and these documents will be submitted to the LAUSD in the final RA report.

6 RECORDKEEPING

Notes will be maintained during the removal activities. The notes will serve to document observations, personnel onsite, truck arrival and departure times, and other vital project information.

7 HEALTH AND SAFETY

A site-specific health and safety plan (HASP) will be prepared by the awarded RA contractor and included in the RAW. Everyone working at the Site will be required to be familiar with the HASP.

8 IMPORT FILL MATERIAL

_____ No fill materials are required at the Site during the implementation of the RAW.

__x__ Fill materials will be secured

9 TRANSPORTER REQUIREMENTS

Qualified transporters will be hired for hauling the excavated soil away or hauling fill materials to the Site.

9.1 License and Insurance

The selected haulers will be fully licensed and insured to transport the excavated soils or fill materials. If any are encountered, hazardous wastes must be shipped by a registered hazardous waste hauler.

FIGURES

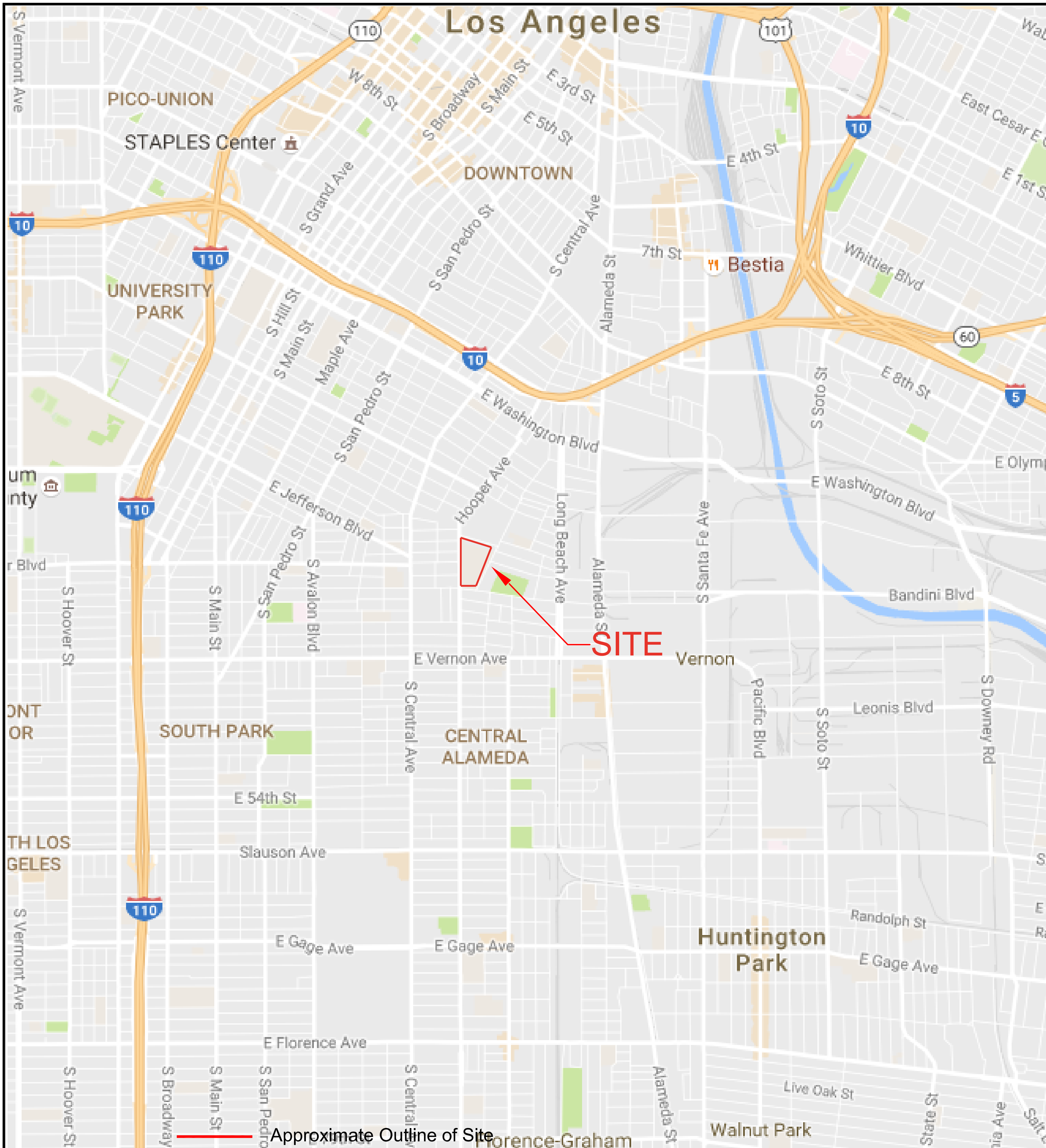


FIGURE 1: SITE LOCATION MAP

CLIENT: Los Angeles Unified School District	SITE LOCATION: Thomas Jefferson High School 1319 East 41st Street, Los Angeles, California
PROJECT #: LAUS-16-6714	

ALTA ENVIRONMENTAL
3777 Long Beach Blvd., Annex Bldg.
Long Beach, CA 90807
(562) 495-5777 www.altaenviron.com

DRAWN: BP	APPROVED: EF	NORTH
SCALE: None	DATE: 8/17/2016	

LEGEND:

- Approximate Sample Location
- Approximate Sample Locations with lead and arsenic concentrations in exceedance of acceptable screening levels

NOTE:
All location are approximate.

Figure created in color. Significant information may be lost if copied in black and white.

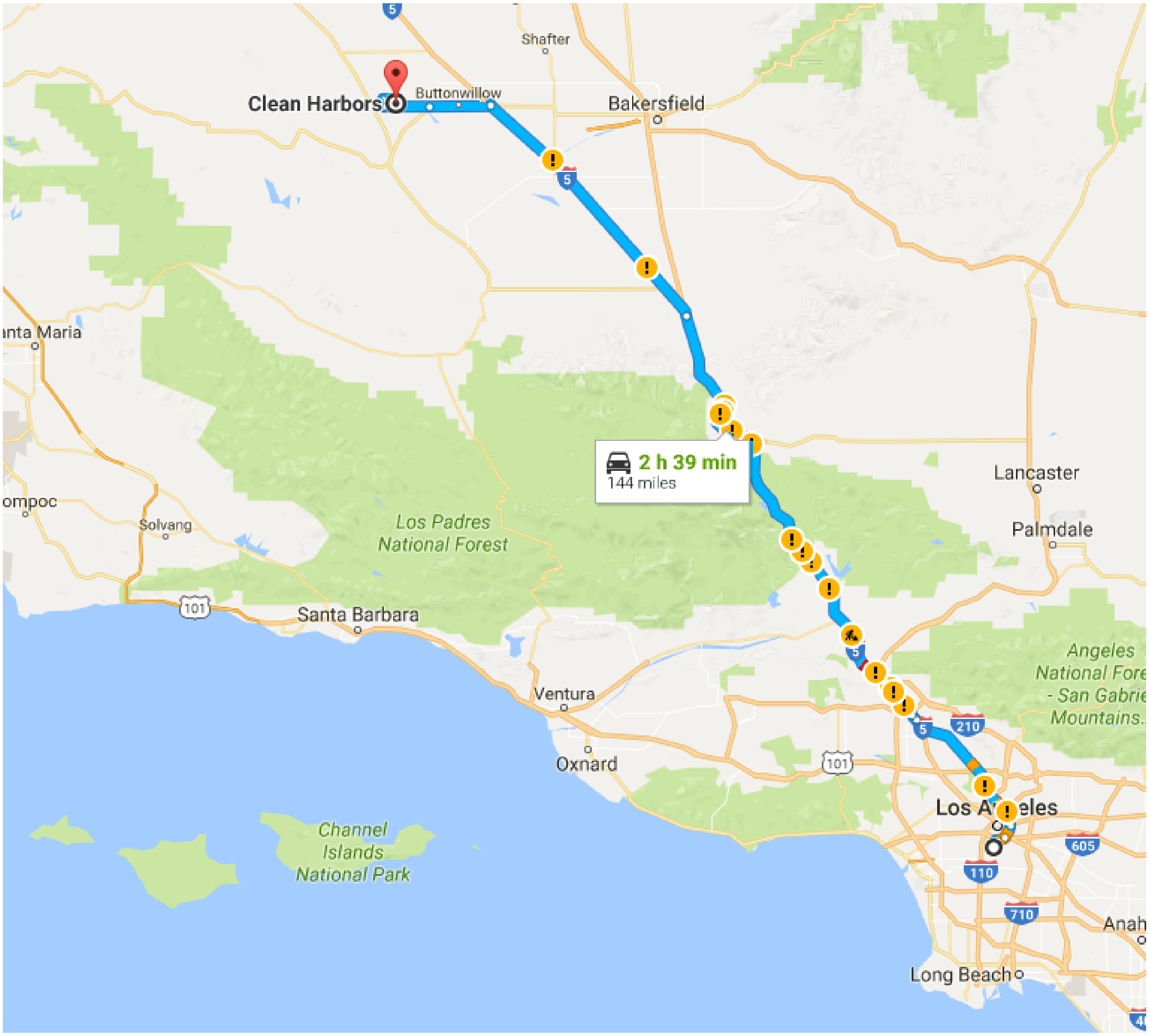
FIGURE 2: Sample Location Map

CLIENT: LOS ANGELES UNIFIED SCHOOL DISTRICT	DRAWN: BP	APPROVED: EF
	SCALE: No scale	DATE: July 2016

SITE:
Thomas Jefferson High School
1319 East 41st Street
Los Angeles, California

PROJ. NO.: LAUS-17-6714

ALTA ENVIRONMENTAL
3777 Long Beach Blvd. Annex Bldg. Long Beach CA 90807
P: (562) 495-5777 ♦ F: (562) 495-5877 ♦ altaenviron.com



1. Head west on E. 41st St. toward S. Hooper Ave	243 ft
2. Turn right onto S. Hooper Ave	0.5 mi
3. Turn left onto E. 21st St	0.5 mi
4. Turn right onto E. 17th St	0.3 mi
5. Take the ramp on the left onto I-10 E	0.2 mi
6. Merge onto I-5 North	3 mi
7. Continue on I-5 North	122.6 mi
8. Take exit 257 toward CA-58/Buttonwillow/McKitrick	0.2 mi
9. Take CA-58 W and Lorken Rd. to Delfern Rd.	17.0 mi
Arrive at Clean Harbors Buttonwillow, 2500 West Lorken Road, Buttonwillow, CA 93206	

FIGURE 3 : TRANSPORTATION ROUTE

CLIENT:
Los Angeles Unified School District

PROJECT #: LAUS-17-6714

SITE LOCATION: Thomas Jefferson High School
1319 E. 41st Street
Los Angeles, California

ALTA ENVIRONMENTAL
3777 Long Beach Blvd., Annex Bldg.
Long Beach, CA 90807
(562) 495-5777 www.altaenviron.com

DRAWN: BP

APPROVED: EF

SCALE: None

DATE: 4/24/17

NORTH