



**REMOVAL ACTION WORKPLAN
FOR THE
LODI HIGH SCHOOL - CAMPUS
3 S PACIFIC AVENUE & 31 N PACIFIC AVENUE
LODI, CALIFORNIA
APN: 035-110-12**



PREPARED FOR:
LODI UNIFIED SCHOOL DISTRICT
PROJECT NUMBER: 2022-00008
JULY 15, 2022

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REMOVAL ACTION WORKPLAN

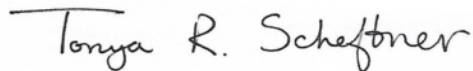
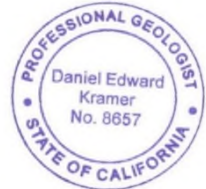
FOR THE LODI HIGH SCHOOL - CAMPUS

3 S PACIFIC AVENUE & 31 N PACIFIC AVENUE
LODI, CALIFORNIA

APN: 035-110-12
(Site Code: 60003172)

The material and data in this report were prepared under the supervision and direction of the undersigned.

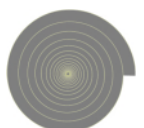
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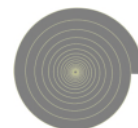
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**REMOVAL ACTION WORKPLAN
LODI HIGH SCHOOL CAMPUS**

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APPENDIX A

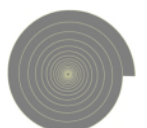
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APPENDIX B

Conceptual Site Model

APPENDIX C

Health and Safety Plan

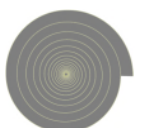


APPENDIX D

Quality Assurance Project Plan

APPENDIX E

Clean Fill Fact Sheet



REMOVAL ACTION WORKPLAN

LODI HIGH SCHOOL
3 S PACIFIC AVENUE & 31 N PACIFIC AVENUE
LODI, CALIFORNIA

PROJECT NO: 2022-00008
(SITE CODE: 60003172)

1.0 INTRODUCTION

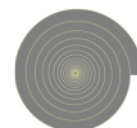
This Removal Action Workplan (RAW) has been prepared by Petralogix Engineering, Inc. (Petralogix) on behalf of the Lodi Unified School District (LUSD) to address the removal of lead contaminated soil characterized as non-RCRA hazardous waste at the Lodi High School, in Lodi, California. A vicinity and site map are included in Appendix A, Plates 1 and 2. The RAW includes a detailed plan for conducting the removal action, a description of on-site contamination, and the goals to be achieved by the removal action, as required by the California Health and Safety Code (H&SC) section 25323.1. The RAW is also consistent with the criteria specified in the H&SC Section 25356.1(h).

The RAW is based on the results of the following:

- Data from sampling events performed by Petralogix Engineering, Inc. compiled in the Preliminary Environmental Assessment – Lodi High School (PEA) dated December 15, 2021, with fieldwork conducted on October 27, 2021 through October 29, 2021 and November 2, 2021 under Department of Toxic Substances Control (DTSC) oversight occurring on October 27, 2021.
- Further data from an additional sampling event by Petralogix on February 9, 2022 was performed to characterize and delineate the horizontal and vertical extent of contamination and is discussed further in below.

The PEA (Petralogix, 2021) identified two locations with reported elevated surface (0.5 feet below ground surface) concentrations of lead above the screening level of 80 mg/kg; discrete soil boring samples B90-0' and B91-0' reported lead at 230 mg/kg and 120 mg/kg, respectively. The surface samples were additionally analyzed for the California hazardous waste Soluble Threshold Limit Concentration (STLC) limit of 5.0 mg/L and Federal RCRA hazardous waste Toxicity Characterization Leaching Procedure (TCLP) threshold of 5.0 mg/L and were not found to exceed these limits. A meeting on behalf of LUSD between DTSC and Petralogix occurred on November 3, 2021 to discuss the lead exceedance; in consultation with DTSC, the District agreed to characterize, remediate, and provide an independent report to DTSC under separate cover.

Data from the subsequent surface sampling event on February 9, 2022, reported additional elevated concentrations of lead above the 80 mg/kg screening level, with two surface samples also reported to exceed the California hazardous waste Soluble Threshold Limit Concentration (STLC) limit of 5.0 mg/L. Reported Toxicity Characterization Leaching Procedure (TCLP) soluble lead concentrations for applicable samples were all non-detect to laboratory limits (<0.10 mg/L), and therefore below the Federal RCRA hazardous waste threshold of 5.0 mg/L. **The lead contaminated**



soil in the area of concern (AOC) is therefore classified as California (non-RCRA) hazardous waste.

The Removal Action Workplan has been prepared based on the results of the Final PEA dated December 15, 2021 and the subsequent Lead Characterization sampling event on February 9, 2022. There is sufficient data to support the removal action as proposed in this SRP. Petralogix recommends a removal action be performed to mitigate the identified potential threat to human health and the environment.

1.1 Removal Action Objectives (RAOs)

The proposed action at the Site focuses on the Excavation and Off-site Disposal of soils contaminated with chemicals of concern (COCs), **in particular, lead contaminated soil characterized as California (non-RCRA) hazardous waste.** Petralogix has determined that the proposed action is the preferred removal action remedy in terms of the three technology evaluation criteria: effectiveness, implementability, and cost.

The RAOs include:

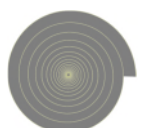
- Minimize exposure of humans to COC in soil through the inhalation, dermal absorption, and ingestion exposure pathways;
- Minimize potential for migration of COC from soil to other media;
- Establish Cleanup Goals (CGs) equivalent to U.S. EPA RSLs or DTSC-modified screening levels; and
- Establish post-RAW site conditions that do not pose a significant risk to human health, safety, or the environment.

2.0 BACKGROUND

Based on historical aerial photographs and topographic maps, the subject property, Lodi High School, was vacant land from at least 1894 and agricultural land from the late 1930s to the late 1950s, until it became a school campus in the late 1950s to present.

In December 2021 a PEA was completed for the Modernization Project Site within the Lodi High School to investigate the potential for organochlorine pesticides (OCPs), lead, and arsenic in soil from historic agricultural pesticide application; the potential of lead in soil from lead-based paint from existing and former building structures, and polychlorinated biphenyl's (PCBs) from the weathering of window caulking. In summary, the results identified elevated concentrations of lead in two samples located in the student agricultural area, however, these were outside the Modernization Project boundaries, therefore LUSD was granted permission to perform further characterization and submit these results to DTSC under a different cover. DTSC issued a No Further Action in response to the PEA on December 15, 2021.

The remediation project Site is set within the Student Agricultural area which is bounded by the existing Lodi High School campus.



2.1 SITE DESCRIPTION

The Site occupies the Student Agricultural area (Plate 2) within the greater footprint of the Lodi High School located at 3 S Pacific Avenue & 31 N Pacific Avenue, Lodi, San Joaquin County, California (APN: 035-110-12). The Site project footprint consists of approximately 620 square feet within the Lodi High School campus along the northern boundary of the Student Agricultural area. The general Student Agricultural area is occupied by a large metal storage container, utility boxes on a concrete slab, a greenhouse, covered animal pens, and miscellaneous storage.

2.1.1 Site Identification

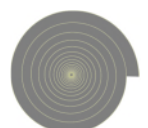
Site Identification Information	
Site Name	Lodi High School
EnviroStore Database Number	60003172
Contact Person	Ms. Vickie Brum, Lodi Unified School District
Site Address	3 S Pacific Avenue & 31 N Pacific Avenue
Mailing Address of Contact Person	880 N Guild Avenue, Lodi, CA 95240
Phone Number of Contact Person	(209) 331-7223
Other Site Names	None
USEPA Identification Number	None
Assessor Parcel Number(s)	035-110-12
Township	3 North
Range	6 East
Land Use	Educational
Zoning	City

2.1.2 Adjacent Properties

The project remediation Area of Concern (AOC) is surrounded by the Lodi High School campus. The Lodi High School campus is bounded to the north by residential properties followed by West Elm Street; to the east by North Pacific Avenue and South Pacific Avenue followed by residential properties and Zion Lutheran Church; to the south by West Lodi Avenue followed residential properties, Emanuel Lutheran Church, and a medical center; and to the west by residential properties followed by Ticknor Court, and South Corinth Avenue.

2.1.3 Planned Development

Lodi Unified School District plans to continue utilizing the Area of Concern (AOC) as the Student Agricultural area, with no immediate or near future plans to develop.



3.0 ENVIRONMENTAL SETTING

The project Site is set within Student Agricultural area bounded by the existing Lodi High School campus.

3.1 PHYSICAL SETTING

3.1.1 Regional Physiographic Conditions

The Site is located within the Great Valley Geomorphic Province of California (Great Valley), a ~100-million-year-old sedimentary basin that formed as a low-lying region between a subducting oceanic plate to the west and the Sierra Nevada mountain range to the east. The province is approximately 450 miles long and 50 miles wide and is comprised of two northwest to southeast-trending sub-basins; the Sacramento Valley to the northwest and the San Joaquin Valley to the southeast. Each of these basins is filled by a thick sequence of Mesozoic to Quaternary sediment, whose terrigenous and subaerial depositional sources have been traced to the Sierra Nevada and Coast Range Geomorphic Provinces.

3.1.2 Geologic Conditions

According to the most detailed Geologic Map covering the subject property and vicinity, the majority of the subject property consists of undifferentiated alluvial deposits, mostly arkosic, of the Upper Member of the Modesto Formation (Qm2).¹

Site soil consists of Tokay-Urban land complex (0-2 percent slopes) where the fields are located and Urban land where the structures and parking lots exist. Urban land consists of closely built-up areas where structures cover more than 85 percent of the surface and identification of the soil is not feasible. Tokay-Urban land complex soil consists of approximately 50 percent Tokay fine sandy loam and 35 percent Urban land. The Tokay soil is very deep with low runoff and well drained alluvium derived from granitic rock sources.²

Based on soil boring performed at the Site during the Site investigation, soil at a depth to approximately 5 feet below ground surface, soil was consistent with the soil survey descriptions described above.

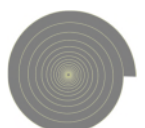
3.1.3 Naturally Occurring Asbestos

According to the USGS Open-File Report 2011-1188, *Reported Historic Asbestos Mines, Historic Asbestos Prospects, and Other Natural Occurrences of Asbestos in California*³, the project Site does not lie within an area mapped as containing Naturally Occurring Asbestos (NOA). Naturally occurring asbestos occurring at the Site is therefore considered unlikely.

¹ US Geological Survey Open File Report 79-933, Atwater, B., Marchand, D., 1979, Preliminary Geologic Map Showing Quaternary Deposits of the Lodi Quadrangle, California. Scale 1:24,000.

² UC Davis California Soil Resource Lab, SoilWeb.

³ Reported historic asbestos mines, historic asbestos prospects, and other natural occurrences of asbestos in California: USGS Open-File Report 2011-1188. Van Gosen, B.S., And Clinkenbeard, J.P., 2011.



3.1.4 Radon

Radon gas emissions from the natural breakdown of elements in soil is a concern in many areas around the country. In particular, Radon gas can buildup in confined spaces such as tunnels and basements. A survey of the subject property was not conducted, but a review based on government data was performed. The area in question is listed on the US EPA Radon Check Map as having 12 local test having been historically performed. Of the twelve tests reported, one test was $>4.0\text{pCi/L}$, indicating low to moderate potential for Radon. The Federal EPA Radon Zone for San Joaquin County is Zone 3, indoor average level $<2\text{ pCi/L}$. Based on this low potential, Radon is a low to moderate concern for the subject property.

3.1.5 Soil Conditions

Site soil consists of Tokay-Urban land complex (0-2 percent slopes) where the Tokay-Urban land complex soil consists of approximately 50 percent Tokay fine sandy loam and 35 percent Urban land. The Tokay soil is very deep with low runoff and well drained alluvium derived from granitic rock sources.⁴

Based on soil boring performed at the Site during the Site investigation, soil at a depth to approximately 5 feet below ground surface, soil was consistent with the soil survey descriptions described above.

3.1.6 Groundwater Conditions

According to the San Joaquin County Spring 2016 and Fall 2016 Groundwater Reports⁵ groundwater elevation contour map, groundwater elevation is approximately -10 feet below mean sea level (msl) during spring and fall. The elevation at the Site is approximately 45 feet msl, therefore depth to groundwater at the subject property is approximately 55 feet below ground surface (bgs). The groundwater flow direction is south-southeast with a gradient of approximately 10 feet per mile.

According to the most recent United States Geological Survey Topographic map covering the subject property and vicinity⁶, the subject property is at an elevation of approximately 45 feet above mean sea level. The Site is relatively flat. The general area slopes shallowly toward the south-southwest.

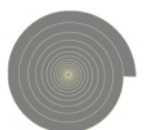
3.1.7 Nearest Surface Water

The Site is approximately 0.75 miles south of Lodi Lake and the Mokelumne River.

⁴ UC Davis California Soil Resource Lab, SoilWeb.

⁵ San Joaquin County Flood Control and Water Conservation District, Spring 2016 and Fall 2016 Flood Control and Water Conservation District Reports.

⁶ US Geological Survey, 2015, 7.5' Topographic Map, California, Lodi North Quadrangle and Lodi South Quadrangle.



3.1.8 Meteorology

According to Western Regional Climate Center data for Lodi, the average maximum temperature in the area is 91.5°F (July), the average minimum temperature is 37.4°F (January), and the average annual precipitation is 13.22 inches.

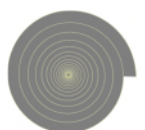
4.0 NATURE, SOURCE, AND EXTENT OF CONTAMINANTS

4.1 NATURE AND SOURCE OF CONTAMINANTS

The results of the PEA and subsequent delineation identified and confirmed the presence of lead contaminated soil within the Student Agricultural area. The chemical of concern (COC) for this Site is lead. Metallic lead is resistant to corrosion; when exposed to air or water, thin films of lead compounds are formed that protect the metal from further attack. Lead is combined with other metals to form alloys and are commonly found (but not limited to) in pipes, storage batteries, weights, and cables. Lead compounds are used as a pigment in paints, dyes, and ceramic glazes and in caulk.

Concentrations of lead have been detected at levels above the screening level (SL) of 80 mg/kg as determined by Department of Toxic Substances Control (DTSC) Human Health Risk Assessment Note Number 3 (2020) for unrestricted land use. surface samples also reported to exceed the California hazardous waste Soluble Threshold Limit Concentration (STLC) limit of 5.0 mg/L. Reported Toxicity Characterization Leaching Procedure (TCLP) soluble lead concentrations for applicable samples were all non-detect to laboratory limits (<0.10 mg/L), and therefore below the Federal RCRA hazardous waste threshold of 5.0 mg/L. **The lead contaminated soil in the area of concern (AOC) is therefore classified as California (non-RCRA) hazardous waste.**

As discussed in Section 5.0, the Site cleanup goals (CG) for removal of soil are <80 mg/kg.



4.2 EXTENT AND VOLUME OF CONTAMINATION

Confirmed Contamination Area (North of Storage Container):

The extent and volume of soil known to be impacted by COCs at concentrations exceeding their respective risk screening levels of greater than 80 mg/kg has been calculated to be approximately 360 cubic feet or 13 cubic yards, detected in the narrow area north of the metal storage container and student parking lot (**Plate 3**). The known contamination is approximately 0.5 feet below ground surface (bgs); conservative excavation depth for remediation is assumed down to 1.5 bgs. The volume is an estimate which is based on limited sampling. Additional volume may need to be removed and off-hauled pending post-excavation confirmation sampling results.

Potential Contamination Area (Soil Beneath Storage Container):

The soil beneath the metal storage container (Plate 4) is potentially contaminated with elevated concentrations of lead. Soil samples adjacent north of the storage container is confirmed to have elevated non-RCRA hazardous waste levels of lead; the soil adjacent south of the storage container did not have elevated soil reported during lead characterization sampling dated February 9, 2022. The storage container area is approximately 40 feet long by 9 feet wide, or 360 cubic feet. A conservative excavation depth for remediation is assumed down to 1.5 feet bgs; this conservative estimate, assuming the soil is reported as contaminated, is 540 cubic feet or 20 cubic yards. The volume is an estimate which is based on limited sampling. Additional volume may need to be removed and off-hauled pending post-excavation confirmation sampling results.

The AOC has been designated into two sub-areas, as discussed above and summarized below:

- AOC 1 - Confirmed Contamination Area – (13 cubic yards)
- AOC 2 – Potential Contamination Area (Beneath Storage Container) – (20 cubic yards)

When compacted soil is excavated and stockpiled, the compacted soil is loosened, and depending on the soil types the volume of stockpiled soil may increase (expansion factor). Additionally, excavated soil is transported and disposed of by weight (i.e., tonnage). The conversion factor from soil in cubic yards to soil in tonnage is calculated as follows:

- Soil volume (cubic yards) x conversion factor = Total tons

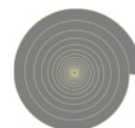
Whereas,

- AOC 1 – 13 cubic yards x 1.2 tons per cubic yard = 15.6 tons
- AOC 2 – 20 cubic yards x 1.2 tons per cubic yard = 24 tons

The estimated total weight of soil to be transported and disposed of at the appropriate landfill facility is calculated to range between approximately 15.6 to 39.6 tons.

Transporting soil using a truck and trailer combination would allow for approximately 20 tons per load, therefore, the calculated quantity of truck and trailer loads is calculated as follows:

- 39.6 tons divided by 20 tons per load = approximately 2 truck and trailer loads.



The locations of the removal action areas at the Project Site are presented in Plates 2 through 4. Additional excavation at the location of the removal action area may be necessary based on the results of confirmation soil sampling as discussed in Section 8.3.5.

4.3 HEALTH EFFECTS OF CONTAMINATION

Lead may enter the body through mouth, throat, or digestive tract. Lead serves no useful purpose in the human body, and the presence in the body can lead to toxic effects, regardless of age, gender, or exposure pathway (ATSDR 2005). The main target for lead toxicity is the nervous system in both adults and children. Long-term exposure of adults to lead in the workplace has resulted in decreased performance in nervous system functions. At elevated levels, lead can damage the brain and kidneys in adults or children and can lead to death. At lower exposure levels, lead can affect a child's mental and physical growth. There is no conclusive proof that lead causes cancer (is carcinogenic) in humans, however, the United States Environmental Protection Agency (EPA) has determined that lead is a probable human carcinogen.

4.4 TARGETS POTENTIALLY AFFECTED BY THE SIGHT

A conceptual site model has been developed that identifies the receptors that may be exposed to COC at the Project Site. The conceptual site model identifies the potential exposure pathways (i.e., ingestion, inhalation, and dermal contact of contaminated soils) for the contaminated media at the project site. The conceptual site model developed during the PEA is presented in Appendix B.

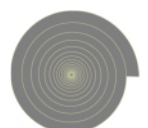
5.0 RISK EVALUATION AND PRELIMINARY CLEANUP GOALS

This section presents detailed information regarding preliminary cleanup goals (CGs) for the identified lead contamination at the Site. The CG was developed based on the DTSC-SL HHRA Note 3 for unrestricted use.

5.1 RISK EVALUATION

DTSC recommends comparing Site specific analytical soil sampling results with the Department of Toxic Substances Control (DTSC) modified Screening Levels (DTSC-SLs) presented in DTSC's Office of Human and Ecological Risk (HERO) guidance document Human Health Risk Assessment (HHRA) Note 3 (HERO, June 2020). The DTSC-modified screening levels (DTSC-SLs) were used to conduct a screening-level risk assessment using the residential land-use scenario. The highest lead concentration was evaluated using DTSC's lead risk assessment spreadsheet model (DTSC LeadSpread Version 8).

Lead concentrations ranged from 3.6 to 250 mg/kg in soil samples collected at the Site. A risk assessment was performed using the DTSC lead risk assessment spreadsheet model (DTSC LeadSpread Version 8). Based on the LeadSpread output using the highest concentration (250 mg/kg), exposure at the Site could result in a 90th percentile blood lead concentration. The purpose of a PEA-based screening evaluation is to provide risk managers with a general overview of the Site conditions and potential risks to human health and the environment. Based on the LeadSpread



using the highest concentration (250 mg/kg), exposure lead concentrations detected at the Site could result in a 90th percentile blood lead concentration of 6.5 micrograms per deciliter (µg/dl) in children which exceeds the Office of Environmental Health Hazard Assessment (OEHHA) blood toxicity level of 1 µg/dl.

Table 1. Comparison to Screening Levels

Contaminant of Concern	Highest Site Concentration (mg/kg)	Screening Level (mg/kg)
Lead	250	80 ^(a)

Notes:

mg/kg = milligrams per kilogram

^(a)DTSC-SL

5.1.1 Environmental Screening Risk Evaluation

A detailed ecological screening was not performed as part of the PEA. There are no potential threats to the environment for wind and surface water runoff to cause the migration of contaminated soils from the Site to environmentally sensitive areas.

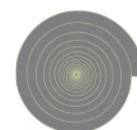
5.2 CLEANUP GOALS

As discussed in **Section 1.1** the identified COC in soil at the Site consist of lead. Soil samples collected on-site exhibited levels of lead up to 250 mg/kg. The cleanup goals (CGs) for the Site are based off of Department of Toxic Substances Control Screening Levels (DTSC-SLs), which is 80 mg/kg for lead. The DTSC-SL threshold is conservative and responsive to the protection of human health and the environment.

The cleanup goal will be achieved when the analytical results from confirmation soil samples are collected from the excavation area floor and sidewalls indicate that any residual concentrations of lead in the soil are below the respective cleanup goal of 80 mg/kg.

6.0 REMOVAL ACTION

The proposed removal action at the Site will occur inside six month of planning period. An Engineering Evaluation/Cost Analysis (EE/CA) is therefore not required under 40 CFR 300.415 of the National Contingency Plan (NCP). However, the implementability and effectiveness of the removal action are discussed in the following sections to aid in the evaluation of remediation for the mitigation of contaminated soils at the Site. The proposed removal action will be conducted in accordance with protocols of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). Petralogix will be assisting the District in all oversight and confirmation sampling associated with this RA.



6.1 REMEDIAL ACTION SCOPE

Petralogix will be assisting the District in all oversight and confirmation sampling associated with this RA. This removal action workplan covers all detections of lead above the CGs at the Site as described in the Lead Characterization Report (LCR) (Petralogix, 2022) and in Section 1.1. due to the lack of sampling access beneath the storage container to date, the RAW also includes additional sampling to further characterize the soil beneath the storage container to determine the presence or absence of contamination. As discussed in the LCR, the soil adjacent north of the container is contaminated with lead, and soil adjacent south of the container is below the CG for lead. **Therefore, the estimated volume of soil to be removed is currently given as a range, with estimated volume of soil proposed for the removal action calculated as approximately 13 to 20 cubic yards or 15.6 to 39.6 tons.** This volume is an estimate which is based on limited sampling. Additional volume may need to be off-hauled pending post excavation confirmation sampling results.

The purpose of this section of the RAW is to identify and screen potential action alternatives that would best achieve the RAOs discussed in Section 1.1. The removal action alternatives that were considered for reduction of lead contaminated soil at the Site are:

- No Further Action
- Engineering and Institutional Controls
- Excavation and Off-site Disposal

6.1.1 EE/CA Alternative Evaluation Criteria

The criteria listed below were used during this evaluation process.

Effectiveness:

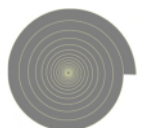
- Performance and reliability to eliminate or reduce the risk associated with the identified COC (in terms of toxicity, mobility, or volume) at the Site;
- Overall protection of public health and the environment (threshold factor); and
- Ability to meet the RAOs presented in Section 1.1.

Implementability:

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

Cost:

As discussed above in Section 6.0, since the proposed removal action at the Site will occur inside six months of the planning period, an Engineering Evaluation/Cost Analysis (EE/CA) is not required.



6.2 IDENTIFICATION AND ANALYSIS OF REMOVAL ACTION ALTERNATIVES

No Further Action Alternative:

The No Further Action (NFA) alternative has been included to provide a comparison to the removal alternative. The engineering alternative and the removal alternative. The NFA includes no institutional controls, remediation, or monitoring. Under the NFA, the lead contaminated soil would remain in place and current concentrations and risks would remain the same. No costs would be incurred as the NFA alternative would not require implementing any measures. Since the COC would remain in place with current conditions, this alternative is not considered effective.

Engineering and Institutional Controls Alternative:

Engineering controls (ECs) and institutional controls (ICs) can be used to reduce or eliminate potential exposure to COC in soil at the Site. ECs include development of a Capping System with paved areas and/or clean fill material, in conjunction with the development of an operation and maintenance plan. ICs generally include restricting access to the contaminated area, and the creation of a land-use covenant (LUC) which defines land-use limitations recorded in the county in which the land is located and must continue into perpetuity unless modified or terminated in accordance with the applicable regulations. Based on the relatively small volume of impacted soil, the likely need for annual inspections, and the limitation of future use at the Site, the engineering and institutional controls is not considered an effective alternative.

Excavation and Off-Site Disposal Alternative:

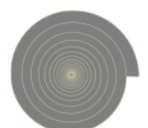
Excavation and offsite disposal is a well-proven, readily available technology that is a common method for remediation of low volumes of contaminated soil. Equipment and labor are readily available and excavation and offsite disposal is a relatively simple process with positive results.

Excavation and offsite disposal entails physically removing soil impacted by the COC, lead, from the Site and transporting this soil to an appropriate permitted landfill for disposal. Excavation and Off-site Disposal would require excavation equipment, soil removal, confirmation sampling, and transport of soil; engineering oversight is not anticipated. The estimated volume for the two areas discussed in Section 4.2 is provided as a range, due to the unavailability of access to the soil underneath a large storage container adjacent south of the contaminated soil area characterized.

The confirmed contamination area (AOC-1) is estimated to be 13 cubic yards or 15.6 tons of soil to be removed and off-hauled; the potential contamination area (AOC-2) is estimated to be a maximum of 20 cubic yards or 24 tons. A conservative volume estimate of both AOCs combined is 33 cubic yards or 39.6 tons total. However, it should be noted that additional volume may need to be removed and off hauled based on the results of the confirmation sampling.

Effectiveness of Excavation and Off-Site Disposal Alternative:

The RAW covers the characterized AOC-1 area of confirmed contamination and will require testing of soil underneath the storage container (AOC-2) upon moving it as part of the RAW to characterize the underlying soil for lead. The goals and objectives of the proposed RA are presented in Section 5.0. The CGs for the identified contamination are described in Section 5.0. The Excavation and Off-



site Disposal alternative would effectively remove the soil currently impacted by lead onsite and transport to an appropriate landfill for disposal. Disposing the contaminated soil would reduce the potential long-term human health risks.

The proposed Excavation and Off-Site Disposal alternative would potentially decrease effectiveness during the short-term construction phase as a result of dust generated during excavation activities which could impact workers and nearby residential occupants. In addition, there would be potential short-term impacts from transportation, soil staging, and decontamination activities. Fugitive dust mitigation measures to limit exposure to workers and nearby residential receptors will be implemented. Off-Site transportation of soil will require a short-term increase in traffic; however, traffic controls will be implemented to limit construction related traffic impacts. The proposed Excavation and Off-site Disposal alternative is considered an effective short- and long-term alternative.

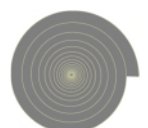
Implementability of Excavation and Off-Site Disposal Alternative:

The Excavation and Off-Site Disposal alternative utilizes readily available equipment and manpower. Contaminated soil required to be excavated and hauled off-site can be stockpiled on-site until loaded and transported. There are numerous licensed hazardous waste haulers available. As indicated on the Plate 5 (Appendix A), there are adequate ingress/egress, soil staging, and decontamination locations and routes on site. Ingress/egress is planned for the entrance located off of Pacific Avenue in the northeast corner of the Site. **The proposed areas indicated on Plate 5 may have variances pending input from the RA contractor.** There are two disposal facilities that accept California (non-RCRA) Hazardous (Class I) waste. Adequate capacity exists at the facilities to accommodate the estimated volume of 33 cubic yards or 39.6 tons of soil. However, it should be noted that this volume is an estimate which is based on limited sampling. Additional volume may need to be removed and off hauled pending post-excavation confirmation sampling results. The proposed removal action will be conducted in accordance with protocols of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). The proposed Excavation and Off-Site Disposal of impacted soil is considered implementable.

6.3 DESCRIPTION OF RECOMMENDED REMEDY

The recommended RA remedy, as deemed preferable by the District, consists of the excavation, transport, and off-site disposal of soil containing elevated concentrations of California (non-RCRA) Hazardous lead at the Site. The activities that would be conducted to implement the RA activities are anticipated to be completed in two phases and are described below:

- Temporarily remove the chain-link fencing located adjacent north of the Site to allow for access;
- Delineate with GPS the excavation area of AOC-1;
- Private utility locate the excavation area and contact USA Dig;
- **Relocation of the large metal storage container to gain access to the AOC-2 soil beneath is a priority for the early phase of the RA;**



- Perform soil sampling to characterize the AOC-2 soil area for lead and have analyzed as an expedited order;
- Excavation of approximately 13 cy of soil at the location of AOC-1 (Phase I) and load directly for transport to Class I landfill;
- Collect confirmation soil samples from the AOC-1 excavation area and compare confirmation data to the CGs. If needed, excavate additional volume of soil until the CGs are met;
- Excavation of up to approximately 20 cy of soil at the location of AOC-2 (Phase 2) may be required pending soil characterization results;
- If AOC-2 soil is non-hazardous but elevated, the soil will be stockpiled temporarily, if soil is hazardous the soil will be loaded directly for transport to a Class I landfill;
- Collect confirmation soil samples from the excavated AOC-2 area and compare confirmation data to the CGs. If needed, excavate additional volume of soil until the CGs are met.
- The District will import clean fill as needed; and
- Preparation of a removal action report.

For California hazardous (non-RCRA) waste disposal the nearest Class I Landfill is Waste Management – Kettleman Hills Hazardous Waste Facility, located at 35251 Old Skyline Road, Kettleman City, CA 93239.

7.0 APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS

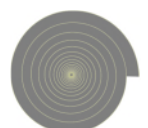
Applicable or Relevant and Appropriate Requirements are considered as three separate categories: (1) chemical-specific, (2) location-specific, and (3) action-specific and are dependent on whether the requirement is triggered by the presence of chemical(s) or emissions, by a protected location, or by a particular action.

This section discusses the applicable or relevant and appropriate requirements (ARARs) for the proposed soil excavation and off-site disposal. The ARARs for the proposed project are limited to chemical-specific ARARs and action-specific ARARs based on the previous investigations of the Site conducted by our firm indicate the presence of California (non-RCRA) hazardous lead in soil exceeding the site-specific CG of 80 mg/kg. The most effective remedial action has been determined to be removal consisting of soil excavation and off-site disposal. A description of select ARARs are discussed below.

7.1 CHEMICAL-SPECIFIC ARARS

7.1.1 Risk Screening Levels

Department of Toxic Substances Control has developed modified Screening Levels (DTSC-SLs) presented in DTSC's Office of Human and Ecological Risk (HERO) guidance document Human Health Risk Assessment (HHRA) Note 3 (HERO, June 2020). If a DTSC-SL is not established, analytical sampling results were compared to Regional Screening Levels (RSLs) established by the



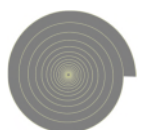
USEPA Region 9 (USEPA, May 2021). The applicable DTSC-SL for lead is 80 mg/kg, which is the cleanup goal for the COC lead.

7.1.2 Air Quality Management

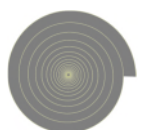
The California Air Resources Board (ARB) and the U.S. EPA have adopted ambient (outdoor) air quality standards. These legal limits on ambient air pollution are designed to protect the health and welfare of Californians. The California Health and Safety Code Section 39606 provides the authority for the San Joaquin Valley Air Pollution Control District (SJVAPCD). There are no SJVAPCD permits required for the planned RA activities. However, the District shall comply with all the applicable dust control measures specified in the San Joaquin Valley Air Pollution Control District Regulation VII (Fugitive Dust Rules).

The following procedures will be adhered to by the construction contractor(s) in accordance with Regulation VIII practices:

- Visible Dust Emissions (VDE) from construction, demolition, excavation, or other earthmoving activities related to the Project shall be limited to 20% opacity or less, as defined in Rule 8011.
- Pre-water all land clearing, grubbing, scraping, excavation, land leveling, grading, cut and fill, and phase earthmoving.
- Apply water, chemical/organic stabilizer/suppressant, or vegetative ground cover to all disturbed areas, including unpaved roads.
- Restrict vehicular access to the disturbance area during periods of inactivity.
- Apply water or chemical/organic stabilizers/suppressants, construct wind barriers and/or cover exposed potentially dust-generating materials.
- When materials are transported off-site, stabilize, and cover all materials to be transported and maintain six inches of freeboard (i.e., minimum vertical distance between the top of the load and the top of the trailer) space from the top of the container.
- Remove carryout and track out of soil materials on a daily basis unless it extends more than 50 feet from site; carryout and track out extending more than 50 feet from the site shall be removed immediately. The use of dry rotary brushes is expressly prohibited except where preceded or accompanied by sufficient wetting to limit the visible dust emissions. Use of blower devices is expressly forbidden. If the Project would involve more than 150 construction vehicle trips per day onto the public street, additional restrictions specified in Section 5.8 of Rule 8041 shall apply.
- Traffic speeds on unpaved roads shall be limited to 15 mph.
- During construction, all earth moving activities shall cease during periods of high winds (i.e., greater than 30 mph). To assure compliance with this measure, grading activities are subject to periodic inspections by LUSD staff.



- Construction equipment shall be kept in proper operating condition, including proper engine tuning and exhaust control systems.
- Areas following clearing, grubbing and/or grading shall receive appropriate BMP treatments (e.g., re-vegetation, mulching, covering with tarps, etc.) to prevent fugitive dust generation.
- All exposed soil or material stockpiles that will not be used within 3 days shall be enclosed, covered, or watered twice daily, or shall be stabilized with approved nontoxic chemical soil binders at a rate to be determined by the on-site construction supervisor.
- Unpaved access roads shall be stabilized via frequent watering, non-toxic chemical stabilization, temporary paving, or equivalent measures at a rate to be determined by the on-site construction supervisor.
- Trucks transporting materials to and from the site shall allow for at least two feet of freeboard. Alternatively, trucks transporting materials shall be covered.
- Where visible soil material is tracked onto adjacent public paved roads, the paved roads shall be swept, and debris shall be returned to the construction site or transported off site for disposal.
- Wheel washers, dirt knock-off grates/mats, or equivalent measures shall be installed within the construction site where vehicles exit unpaved roads onto paved roads.
- Diesel powered construction equipment shall be maintained in accordance with manufacturer's requirements and shall be retrofitted with diesel particulate filters where available and practicable.
- Heavy duty diesel trucks and gasoline powered equipment shall be turned off if idling is anticipated to last for more than 5 minutes.
- Where feasible, the construction contractor shall use alternatively fueled construction equipment, such as electric or natural gas-powered equipment or biofuel.
- Heavy construction equipment shall use low NOx diesel fuel to the extent that it is readily available at the time of construction.
- The construction contractor shall maintain signage along the construction perimeter with the name and telephone number of the individual in charge of implementing the construction emissions mitigation plan, and with the telephone number of the SJVAPCD's complaint line. The contractor's representative shall maintain a log of any public complaints and corrective actions taken to resolve complaints.
- During grading and site preparation activities, exposed soil areas shall be stabilized via frequent watering, non-toxic chemical stabilization, or equivalent measures at a rate to be determined by the on-site construction supervisor.



- During windy days when fugitive dust can be observed leaving the construction site, additional applications of water shall be required at a rate to be determined by the onsite construction supervisor.

Dust control measures and monitoring activities will be implemented at the Site. Site action levels were considered based on the Cal-OSHA permissible exposure levels (PELs) for the COC lead. The permissible exposure level for dust is 10 mg/m³. Therefore, assuming that total dust present in the air contains the maximum concentration for the COC lead (250 mg/kg) identified at the Site, then site worker exposure levels can be calculated as follows:

$$\text{Exposure Level (mg/m}^3\text{)} = \frac{\text{soil concentration (mg/kg)} \times \text{total dust PEL (mg/m}^3\text{)}}{1,000,000 \text{ (mg/kg)}}$$

Whereas the dust exposure levels for the COC lead is as follows:

$$\text{Lead: } 0.0025 \text{ mg/m}^3 = \frac{250 \text{ mg/kg} \times 10 \text{ mg/m}^3}{1,000,000 \text{ mg/kg}}$$

Comparing the calculated dust exposure levels for lead compared to their respective PEL shows that the air level for the exclusion zone is protective of site worker health. Calculated dust exposure levels are presented in Table 2 below:

Table 2. Dust Exposure Levels

Chemical of Concern	Calculated Dust Exposure Level ^(a)	CAL/OSHA PEL
Lead	0.0025 mg/m ³	0.05 mg/m ³

Notes:

PEL – permissible exposure limit (8-hour, time weighted average (TWA))

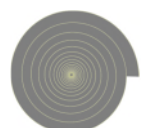
(a) Calculated using 10 mg/m³ total dust

The calculated dust exposure based on the most elevated COC is well below the permissible exposure limit for the CAL/OSHA PEL, therefore, Fugitive Dust Control Measures are considered appropriate mitigation for the RA.

7.1.3 Health and Safety Plan (HSP)

All contractors will be responsible for operating in accordance with the most current requirements of Title 8, California Code of Regulations, section 5192 (8 CCR 5192) and Title 29, Code of Federal Regulations, section 1910.120 (29 CFR 1910.120), Standards for Hazardous Waste Operations and Emergency Response (HAZWOPER). Onsite 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 shall operate in compliance with all California OSHA requirements.

A site-specific HASP has been prepared for the Site in accordance with current health and safety standards as specified by the federal and California OSHAs.



The provisions of the HASP are mandatory for all personnel of the project proponent and its contractors who are at the Site. Subcontractors doing fieldwork in association with this SRP must either adopt and abide by the HASP or shall develop their own safety plans which, at a minimum, meet the requirements of the HASP. All onsite personnel shall read the HASP and sign the "Plan Acceptance Form" (Attachment "B" of the HASP) before starting Site activities.

7.2 ACTION-SPECIFIC ARARS

7.2.1 Waste Management

(AOC-1) Confirmed Contamination Area

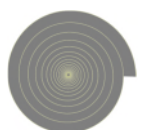
Excavated soil from AOC-1 during Phase 1 of the RA will be directly deposited into a truck for transport to the appropriate landfill. Based on the estimated maximum soil volume of 13 cubic yards or 15.6 tons, one truck and trailer load is anticipated. If the confirmation soil sample results indicate further excavation is required, the excavated soil may be temporarily stockpiled on Site under appropriate cover.

Potential Contamination Area (Beneath Storage Container) (AOC-2)

If soil sampling performed in the area cleared of the storage bin is reported elevated for lead, excavated soil from AOC-2 will either be directly deposited into a truck for transport to the appropriate landfill, or temporarily stockpiled on Site under appropriate cover.

Waste Classification

Waste classification and landfill approval will be obtained prior to transporting soil off the Site. Known concentrations of lead classified as California (non-RCRA) hazardous waste within AOC-1 will be disposed of at the Kettleman Hills Class I Landfill Facility. If sampled soil from beneath the newly accessed soil underlain by the storage container does not exceed the total threshold limit concentration (TTLC) for lead within the AOC-2, then no excavation and disposal will be required. If the soil samples within the AOC-2 is detected at concentrations that exceed the TTLC, the soil sample will be classified as California (non-RCRA) hazardous waste. If detected concentrations of the lead is has a trigger value of 50 mg/kg for lead the sample will be analyzed for the soluble threshold limit concentration (STLC) by the California Waste Extraction Test (WET); if detected lead concentrations report a concentration of 1,000 or greater, a toxicity characteristic leaching procedure (TCLP) analysis will be performed to determine the appropriate waste classification and waste disposal facility. The values for waste characterization of lead is listed below:



<u>Compound</u>	<u>TTL</u>	<u>STLC</u>	<u>TCLP</u>
Lead	1,000 mg/kg	5 mg/L	5 mg/L

Because the soil in the AOC-1 is classified as California (non-RCRA) hazardous waste, the District is required to have a California EPA identification number for the disposal of the waste. Persons who generate, transport, or dispose of hazardous waste generally must have an identification number (ID), which is used to identify the hazardous waste handler and to track the waste from its point of origin to its final disposal (referred to as “cradle to grave”). The District currently has an active permanent federal ID for the Lodi High School last updated on July 11, 2022 and can be found at the DTSC Hazardous Waste Tracking System Website:

<https://hwts.dtsc.ca.gov/facility/CAR000055483>

Hazardous Materials Transportation Act standards pertaining to transporters of hazardous waste, 40 CFR Parts 106-180 are applicable and relevant, since contaminated soil will be moved by way of public highways. Any shipment of hazardous wastes in California will be transported by a registered hazardous waste hauler under a uniform hazardous waste manifest. Land ban requirements will also be followed as necessary.

7.2.2 Stormwater Discharge

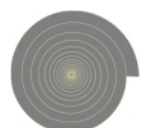
The total acreage of the areas to be disturbed during the removal action is less than 1-acre, therefore, a National Pollutant Discharge Elimination System (NPDES) General Permit is not required for the RA. However, Petralogix will employ the following Best Management Practices (BMPs) during the removal activities at the Site to reduce the potential for storm water pollution:

During Construction:

- Removal of existing vegetation will only occur when absolutely necessary.
- Temporary vegetation (seed and planting) for erosion control on slopes where construction is not immediately planned.
- Protect downslope drainage courses, streams, and storm drains with hay bales, temporary drainage swales, silt fences, berms or storm drain inlet filters.
- Use check dams or ditches to divert runoff around excavations and graded areas.
- Cover stockpiles and excavated soils with secured tarps or plastic sheeting.
- Properly monitor and maintain all erosion and sediment controls.
- Properly report failures of erosion and sediment controls to the local storm water authority.

General Business Practices:

- Schedule excavation and grading work for dry weather.
- Perform major equipment repairs away from job site.



- When refueling or when vehicle/equipment maintenance must be done on site, work within a completely bermed area away from storm drains.
- Do not use diesel oil to lubricate or clean parts.

7.2.3 Quality Assurance Project Plan (QAPP)

Quality assurance/quality control measures that will be used during project execution are documented in the QAPP as Appendix D. Quality assurance/quality control measures will be used during project execution. The QAPP will assure that Site field and analytical data collected meet project Data Quality Objectives (DQOs) and RAOs to support decisions for the Site as an unrestricted for residential land use site.

7.2.4 Others

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

8.0 REMOVAL ACTION IMPLEMENTATION

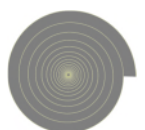
Data from the investigation of the Site indicates lead is in soil at concentrations exceeding the DTSC-SLs. Site-specific CGs of 80 mg/kg for lead have been adopted for this removal action and are presented in **Section 5.2**. The most effective remedial action has been determined to be removal consisting of soil excavation and off-site disposal to an appropriate landfill. Removal activities will be performed by Petralogix under the supervision of a California-registered Geologist or Professional Civil Engineer.

All removal, transportation and disposal will be performed in accordance with all applicable federal, state, and local laws, regulations, and ordinances. Field operations shall follow the suggested operational guidelines to prevent cross-media transfer of contaminants, as specified in "Best Management Practices (BMP) for Soils Treatment Technologies" (U.S.EPA 530-R-97-007).

Removal may begin as soon as July 2022. Plates 3 and Plate 4 illustrate the excavation areas, as well as the sampling points for the previous investigations. The contaminated areas will be excavated to a depth of approximately 1 to 1.5 feet bgs.

8.1 FIELD DOCUMENTATION

Petralogix will be responsible for maintaining a field logbook during the course of the RA activities. The field logbook will serve to document observations, personnel onsite, equipment arrival and departure times, and other vital project information.



8.1.1 Field Logbooks

Field logbooks will document where, when, how, and from whom any vital project information was obtained. Field logbook entries will be complete and accurate enough to reconstruct field activities. Corrections will be initialed and dated. No entries will be obliterated, erased, or rendered unreadable.

Entries in the field logbook will include the following for each fieldwork date:

- Project Site name and address
- Recorder's name and title
- Time of arrival/entry on Site and time of departure
- Other personnel onsite
- A summary of any onsite meetings
- Quantity of impacted soils excavated and in truckloads
- Names of transporters and proposed disposal facilities
- Copies or numbers of manifests for tracking
- Deviations from the RAW or HSP

8.1.2 Photographs

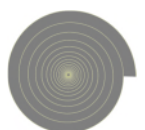
Photographs will be taken of the excavation area(s), confirmation sample collection locations, and other areas of interest at the Site to document the RA. The photographs will serve to verify information entered in the field logbook.

8.2 SITE PREPARATION AND SECURITY MEASURES

Prior to equipment mobilization for the proposed removal action, Site preparation activities may include site inspections, surveying, boundary staking, sampling, demarcation of hot spots, improvement of access by **removal of fencing, relocation of the metal storage container (AOC-2) to allow for soil sampling to characterize underlying soil for lead contamination**, utility connections or disconnections, and security fencing installation if needed.

Due to the location at the Lodi High School, which is currently under construction for Modernization, the excavation activities will occur at a time when the school is closed (i.e., during a calendar break) to ensure trespassers or unauthorized personnel are not allowed near work areas. Other security measures will include, but are not limited to:

- Posting notices.
- Limiting access to the Site to authorized personnel only.
- Installing barrier fencing if needed to restrict access to sensitive areas such as exclusion zones.



8.2.1 Utility Clearance

Clearance of remaining utilities and other hazardous underground obstacles should be conducted prior to initiating any soil excavation activities. It should be noted that AOC-1 is located adjacent to a concrete slab with ground mounted transformers installed and private utility locating may be necessary. At a minimum, the utility clearance will include a 48-hour notification to Underground Services Alert (USA).

8.2.2 Delineation of Excavation Areas

Delineation of Confirmed Contamination Area - AOC-1

Based on the findings of the previous PEA investigation and subsequent lead characterization sampling, the extent and volume of the contaminated area in AOC-1 has been sufficiently delineated, with the estimated volume 13 cubic yards or 15.6 tons. The area that delineates the AOC-1 will be delineated by Petralogix prior to commencement of removal activities. A GPS will be used to locate the areas based on the PEA and subsequent sampling event (February 9, 2022). The areas to be excavated shall be called the "excavation zone" and will be marked (as the exclusion zone) in the field by Petralogix with stakes and/or high visibility paint.

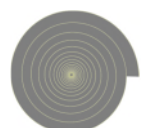
Delineation of Potential Contamination Area (Beneath Storage Container) - AOC-2

The known contamination area (AOC-1) is north of a large (40 ft x 8 ft) storage container, with the soil underlying potentially contaminated. The soil adjacent south of the storage container was characterized during the sampling event by Petralogix on February 9, 2022, and this area did not have elevated levels of lead. **The storage container relocation is a priority at the beginning of remediation activities to allow for characterization of the soil for lead contamination and delineation as needed.** The lead results will be compared to the CG of 80 mg/kg, and to the STLC trigger of 50 mg/kg. The soil sampling results will determine the delineation and excavation area, if any, of the AOC-2. If AOC-2 is contaminated, the areas to be excavated shall be called the "excavation zone" and will be marked (as the exclusion zone) in the field by Petralogix with stakes and/or high visibility paint. Maximum volume of soil estimated from the potential contamination area is 20 cubic yards or 24 tons if the entire underlying area is elevated with lead above the CG down to 1.5 feet bgs, which is considered a conservative estimate.

8.3 EXCAVATION

Soil excavation activities will be performed by licensed hazardous materials contractor and personnel with training in hazardous waste operations (40-hour OSHA Training and up to date 8-hour OSHA Refresher Training). In addition, California OSHA's Construction Safety Orders will be followed as appropriate.

For **AOC - 1** the soil will be excavated and immediately loaded into truck to be transported to the Class I landfill located in Kettleman City. To enable systematic review of the excavation area recommended for cleanup, the removal of the contaminated soil will be conducted by beginning in one corner and proceeding evenly across the area. The anticipated maximum depth is 1 to 1.5 feet



below ground surface and the estimated quantity is 13 cubic yards. The work zone for AOC-1 is presented in Plate 3.

For **AOC-2** the excavation area will be determined during the RA activities. **The relocation of the storage container will be a priority at the beginning of the RA activities in order to expose the underlying soil for sampling and analysis.** Soil samples obtained will be submitted to the laboratory with an expedited turnaround. Based on the rush order analysis for lead results, the area will be delineated as appropriate. To enable systematic review of the excavation area recommended for cleanup, the removal of the contaminated soil will be conducted by beginning in one corner and proceeding evenly across the area. The anticipated maximum depth is 1 to 1.5 feet below ground surface and the conservative estimated quantity is 20 cubic yards. The work zone for AOC-2 is presented in Plate 4.

Soil will be removed with a backhoe, shovels or other types of earth moving equipment, as necessary. The excavation and off-site disposal will comply with applicable ARARs as discussed in Section 7.0. For example, excavation areas will be controlled to avoid dust generation with physical barriers (such as perimeter fencing with tarps) and soil wetting. Each excavation area will be secured, and water will be used to control any fugitive dust from blowing onto other properties. The Site will be controlled, and no excavation will be conducted in times of high wind conditions (e.g., wind speed in excess of 25 miles per hour).

8.3.1 Confined Space Entry Requirements

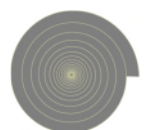
For the proposed removal action, confined-space entry procedures do not apply. Whenever compliance is necessary, the site-specific HASP will be updated.

8.3.2 Soil Staging and Storage Operations

Soil excavated from the AOC-1 will be placed immediately into the truck for transport to the Kettleman Hills Class I Landfill located in Kettleman City. In the event that AOC-1 and/or AOC-2 requires soil staging, the soil staging process will be monitored to ensure excessive dust is not created. As soil is excavated, it may be temporarily stored at staging areas on-site until off-site transportation and disposal are available. At the staging areas, excavated soil will be placed on an impermeable barrier base (plastic sheeting) and covered with tarps or other proper materials to prevent any run-on and/or dust generation. As an alternate, 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 and properly labeled with hazardous waste signs until off-site transportation and disposal are ready for loading. In no case should the waste storage be longer than 90 days after its generation. Direct loading may take place concurrently with excavation operations, with access of loaders to the stockpile from outside of the excavation areas, while excavation operations deposit impacted soil from the excavation areas to the staging areas.

Excavation is estimated to last up to 5 days. Excavated soil stockpiles will be covered with plastic sheeting or other proper materials during non-excavation hours. 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.

All trucks will be checked after final cleaning in the form of a final visual inspection. Tires, undercarriage, open truck surfaces, and bumper regions shall be specially checked to ensure that amounts of track-in/track-out cross contamination will be limited to as little as possible.

8.3.3 Waste Segregation Operations

The California (non-RCRA) hazardous waste lead contaminated soil located in AOC-1 will be directly loaded into trucks for transport, however, if this is not feasible during operations, the soil will be stockpiled/staged. For soil excavation procedures, prior to stockpiling/staging, the excavated soil will be segregated to the extent possible to avoid any mixture of hazardous and non-hazardous soils. This segregation will minimize the amount of hazardous soils generated and its associated disposal cost. The soil segregation will be based upon criteria for hazardous and non-hazardous soils and the available sampling data. California (non-RCRA) hazardous soils will be transported to the licensed Class 1 landfill: Kettleman Hills Facility, located in Kettleman City.

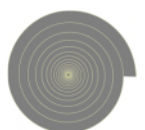
The soil underlying the metal storage container (AOC-2) has not been characterized. This area will be excavated in a different phase (Phase 2) and will therefore remain segregated from the known contaminated soil (AOC-1). Based on analytical results, the soil may need to be excavated and stockpiled/staged.

8.3.4 Decontamination Area

Entry to the contaminated areas should be limited to avoid unnecessary exposure and related transfer of contaminants. Excavation equipment, transportation vehicles, and personnel leaving the exclusion zone will enter the decontamination zone. The decontamination zone will be used to remove soil, debris, and dust from equipment, transportation vehicles, and personnel prior to leaving the work zones. The decontamination of equipment and transportation includes wet and dry methods. Dry methods are the primary means of decontamination and scraping to remove soil, debris, and dust. If dry methods are not effective, wet methods may be utilized, such as pressure washing. Buckets with non-phosphate detergent and tap water will be provided for the triple-rinse method of cleaning re-useable hand-held equipment. Decontamination of personnel may include the removal and disposal of PPE (rubber gloves, etc.).

Prior to leaving the Site, all truck loads will be inspected to ensure that the exterior of trucks is clean and clear of excess soil and debris, **and that the truck is properly covered**. Each truck load will maintain the necessary documents for transport and disposal of waste. A documentation of each truckload will be recorded in the field logbook by Petralogix, which will be maintained for the duration of the removal action activities.

The decontamination areas will be located as follows on Plate 5, and vehicles going to and from these areas will use the same ingress and egress as discussed in Section 6.2 Decontamination areas will not be located more than 100 feet from the excavation areas themselves, to ensure limited soil cross contamination.



8.3.5 Excavation Plan

Initial Excavation:

The excavation plan has been designated into two adjacent areas of concern (AOCs) which will likely be excavated in phases (Phase I and Phase 2), due to the lack of soil characterization of the area underlying the storage container, which will need to be relocated and underlying soil sampled prior to excavating. The two areas are identified as follows:

- AOC – 1: Confirmed Contamination Area (13 cy); and
- AOC – 2: Potential Contamination Area (Beneath Storage Container) (20 cy)

The total depth of each AOC is approximately 1.5 feet, resulting in an estimated total between 13 to 33 cubic yards of excavated soil (conservative estimate pending soil sampling results of nine sample locations planned for analysis of soil underlying storage container). These AOC locations are presented on Plates 3 and 4.

Each AOC will be demarcated with white or orange marking paint by Petralogix. The RA contractor will use a backhoe or excavator to remove contaminated soil from the AOCs. Soil excavated from AOC – 1 will be placed directly into a truck or trailer for transport to a Class I Landfill. The volume of soil excavated from AOC – 1 is estimated at 13 cubic yards.

Soil removed from AOC – 2 (Phase 2) will be excavated using a backhoe or excavator to remove contaminated soil (if any). The soil shall either be directly loaded into a truck to off-haul same day to the appropriate landfill or transported to a soil staging area on Site where it will be covered with plastic and labeled prior to off-haul. The maximum volume estimated from AOC – 2 is estimated at 20 cubic yards.

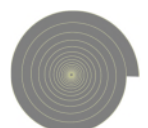
Confirmation Excavation/Over Excavation:

Additional excavation may be necessary depending on the results of confirmation sampling. Should COCs be detected above CGs in confirmation samples, over-excavation will be required. In the event of a sidewall confirmation sample exceeding the CG, additional soil in a five-foot radius will be removed in that direction to the current excavation depth, and a new sidewall sample will be collected. In the event of a pit bottom sample exceeding the CG, soil will be over-excavated and an additional one-foot depth for a circular area five feet in radius centered on the previous sample. A new pit bottom and three sidewall samples will be collected in this event. Each over-excavation event could result in an additional three to six yards of soil excavated.

Excavation areas and the soil staging areas will be controlled to avoid dust generation using water as a dust suppressant as discussed in Section 7.1.2.

8.4 METEOROLOGICAL AND AIR MONITORING

Fugitive dust emissions control measures will be implemented to comply with the San Joaquin Valley Air Pollution Control District Regulation VII (Fugitive Dust Rules). Due to the small scope and



short duration of the project, Air and Meteorological monitoring utilizing specialized data collection equipment is not anticipated.

8.4.1 Air Monitoring

Visual observation will be used for subjective air monitoring by Petralogix staff during all Site activities in which contaminated, or potentially contaminated materials are being disturbed or handled. Petralogix will assign a staff member on site daily to perform the following:

- Monitoring dust at locations throughout the Site. The Site air monitoring appointee will have the authority to stop-work in the event that on-Site activities generate dust levels that exceed the Site or community action levels. No specific regulatory wind velocity restrictions for soil excavation in the subject area were found to exist. However, a self-imposed action level for work stoppage will be set at a sustained wind velocity of 25 mph, as recommended by DTSC.
- Coordinate general Site safety activities including all daily hazard communication, safety practices and procedure briefings.
- Oversight of personal decontamination practices.
- General Site safety leadership, support and recordkeeping activities.

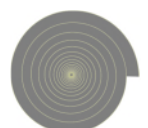
8.4.2 Meteorological Monitoring

If required, on-site ambient weather conditions (wind speed and direction, and relative humidity) may be monitored by three concurrent methods; an on-site met station, real-time internet weather locations, and the National Weather Service (if a local station can provide data relevant to the Site). . Due to the relatively small scope and short duration of the project, Air and Meteorological monitoring utilizing specialized data collection equipment is not anticipated.

8.5 DUST CONTROL PLAN

The RA contractor will implement appropriate procedures to control the generation of airborne dusts during the course of the soil removal activities. Such procedures will include, but will not be limited to, the following:

- The RA contractor will control dust generation by spraying water prior to daily work activities, during excavation/loading activities (as necessary), and at truck staging locations (as necessary). Watering equipment will be continuously available to provide dust mitigation as needed.
- All removal activities will cease in the event wind conditions change creating an uncontrollable dust condition.
- Visual dust monitoring will be observed around the AOCs during soil removal operations. Particular emphasis will be placed on monitoring any visible dust emissions that may affect the nearby residences to the west and north of the excavation.



8.5 SAMPLING AND ANALYSIS PLAN

AOC – 2 Potential Contamination Area (Beneath Storage Container)

The soil underlying the metal storage container adjacent to the known contamination will be sampled for soil characterization upon the relocation of the storage container at the start of the RA. Plate 4 indicates the nine (9) proposed lead characterization sampling locations. Each location will discretely analyze a surface sample (0.5 ft bgs) for lead with orders at the laboratory for an expedited, one-day turn around. In addition, each location will have a sample collected at 1 foot below ground surface and placed on hold pending the surface analysis results. The proposed sample locations are presented in Plate 4.

Confirmation Soil Sampling and Analysis Plan

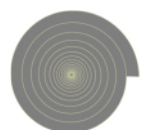
Confirmation soil samples will be collected when the extent of planned excavation activities has been completed. Soil samples will be collected from the bottom and side walls of each excavation area. In general, sampling will be conducted at a frequency of one sample for every 250 square feet of excavation bottom. Sidewall confirmation sampling will be conducted at a frequency of one sample per every 20 – 25 linear feet of continuous sidewall or one sample per sidewall if less than 25 linear feet. Excavation floor confirmation samples will be collected at a depth of 0 to 6 inches. Additionally, the sidewall confirmation sample will be collected at a depth of approximately 6 inches from the top edge of the sidewalls. If the confirmation soil samples do not meet the established cleanup goals, additional rounds of over-excavation and reconfirmation sampling may be necessary until all the cleanup goals have been met. Proposed confirmation sample locations are presented on Plate 4, with the caveat that there may be significant variance during the actual confirmation sampling event.

Over-excavation Sampling Plan

Over-excavation may be necessary if the established cleanup goals are not met. Over-excavation at identified location will generally consist of an additional vertical excavation of 1 foot from bottom of excavation samples and 5 feet lateral from sidewall samples. The actual over-excavation depths and distances will be based on the reported concentrations of COC (for example, a reported concentration considered highly elevated may warrant a great excavation depth and distance). Confirmation samples for over-excavations will be collected at the frequency of one sample every 15 linear feet from the excavation sidewalls and one sample every 150 feet from the over-excavated bottom. Over-excavated sidewall confirmation samples will be collected approximately 6 inches from the top ledge of the sidewall, and approximately 6 inches below the bottom.

8.5.1 Analytical Parameters

Lead will be analyzed by McCampbell Analytical Laboratories (Pittsburg, CA) by EPA Method SW6020. If needed due to analytical results that trigger STLC and TCLP (50 mg/kg and 100 mg/kg, respectively), then the samples will also be analyzed for STLC and TCLP to determine if the soil is



California or Federal hazardous waste. The lab provided reporting limit for lead is 0.10 mg/kg and well below the CG of 80 mg/kg.

8.5.2 Collection Methods

Confirmation soil sampling will be performed using Level D personal protective equipment. Samples will be obtained with a decontaminated hand auger or shovel, or by a direct push Geoprobe with continuous soil core rods advanced in the soil to appropriate depth(s) and transferred to clean laboratory-supplied containers. Prior to collection of each soil sample, all reusable equipment will be decontaminated in accordance with the following triple rinse method steps using Liquinox detergent:

- 1) Detergent wash
- 2) Tap water rinse
- 3) Distilled water rinse

8.5.3 Sample Preservation and Shipment

Soil samples will be placed in laboratory-provided glass jars. No preservatives are necessary for planned analyses. Soil samples will be placed on ice and transported under chain-of-custody documentation to McCampbell Analytical Laboratories in Pittsburg, California. Samples will be delivered to the lab on the same day collected, if time permits, and no later than the day following collection. In the event the samples are delivered the day after they are collected, the samples will be secured under proper chain of custody documentation until delivery.

8.5.4 Sample Documentation

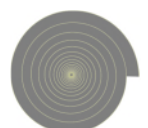
Chain-of-custody records are used to document sample collection and shipment to laboratory for possible chemical analysis. All sample shipments for analyses will be accompanied by a chain-of-custody form.

Each sample will be uniquely identified on laboratory-provided labels. Sample documentation will be maintained as follows:

- Field notebook to include:
 - o Sample I.D. numbers
 - o Sample collection Date/Time
 - o Latitude and Longitude determined from GPS unit
 - o Field staff
 - o Any other appropriate details determined in the field
- Flags will be placed at each sample collection location.

8.6 TRANSPORTATION PLAN FOR OFF-SITE DISPOSAL

The waste material will have a waste profile approved before soil is transported off-site for lawful disposal. Based on the analytical results from the PEA and subsequent soil characterization, the



removed soil form AOC – 1 will be disposed of as California (non-RCRA) hazardous waste to the Kettleman Hills Class I Landfill located in Kettleman City:

Landfill Facility (California non-RCRA Hazardous Waste)

Kettleman Hills Facility
35251 Old Skyline Road
P.O. Box 471
Kettleman City, CA 93239

If there is COC detected in the currently uncharacterized soil underlying the metal storage container, the waste will be profiled and disposed of at the appropriate landfill. If the waste is non-hazardous, it would be appropriate to dispose of at the Republic Services, Inc. Class II Landfill located in Livermore:

Landfill Facility (non-Hazardous)

Republic Services, Inc.
4001 N Vasco Road
Livermore, CA 94551

It is not anticipated that dump trucks will be required to stage prior to entering the soil loading area. Because the RA will occur outside of the school being in session, the trucks are permitted to stage in the north student parking lot, adjacent north to the remediation Site. No trucks will be allowed to stage on Pacific Avenue located adjacent to Lodi High School.

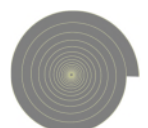
8.6.1 Requirements of Transporters

The removal contractor will be responsible for subcontracting with a qualified and licensed waste transporter. The selected waste transporter will be a California Registered Hazardous Waste Hauler and will be fully licensed and insured to transport non-hazardous and/or hazardous soil as necessary. The transporter will provide the environmental consultant with a current copy of their California Registered Hazardous Waste Transporter certification and proof of insurance.

8.6.2 Shipment Documentation

Hazardous Waste Shipment. For excavated soil that is profiled as a hazardous waste, the Uniform Hazardous Waste Manifest form will be used to document the movement of hazardous waste soils from the point of generation to the point of disposal. Prior to transporting the excavated soil off-site, an authorized representative of the District or its designated representative will sign each hazardous waste manifest. The hazardous waste hauler will sign the manifest and distribute one signed copy to the removal action contractors site manager. **The removal action contractor's site manager will maintain a copy of the hazardous waste manifest for each truckload on-site until removal action is complete. All haul manifest copies will be issued to the District and Petralogix Engineering, Inc., directly (within 24 hours).**

Non-Hazardous Waste. For any excavated soil that is profiled as non-hazardous waste, a proper shipping document (such as invoice, waste ticket) of the hauler will be used to document and



accompany each shipment. The removal contractor will maintain a copy of the shipping document for each truckload onsite until completion of the removal action.

8.7 BACKFILL AND SITE RESTORATION

After excavation activities are complete, Petralogix will survey the extents of the final excavation area(s) with a GPS unit for documentation. Excavations will be backfilled with clean import fill that complies with NPS standards and compacted to site specifications as needed

8.7.1 Borrow Source Evaluation

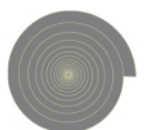
If imported fill is required for the site restoration, evaluation of the import soils for presence of contaminants must be concluded prior to their consideration for use as replacement fill at the Site. A reasonable approach to confirming the absence of chemical contaminants for any potential fill sources is to follow DTSC's *Fact Sheet on Import Fill Material* dated 2001. The Fact Sheet is attached as Appendix E.

8.7.2 Site Restoration

Site restoration may include backfilling the excavation areas with clean soil through grading operations and returning any surface features to their current condition. Other site restoration considerations includes, but is not limited to, returning the storage container back to the original position, and the fencing will be reinstalled.

8.8 Variance

As conditions in the field may vary, it may become necessary to implement minor modifications to removal action workplan as presented in this RAW. Field personnel will notify the project manager when deviations from this RAW are necessary. Modifications to the approved RAW will be documented in the field logbook and in the Report of Completion for this RAW.



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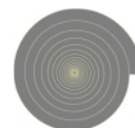
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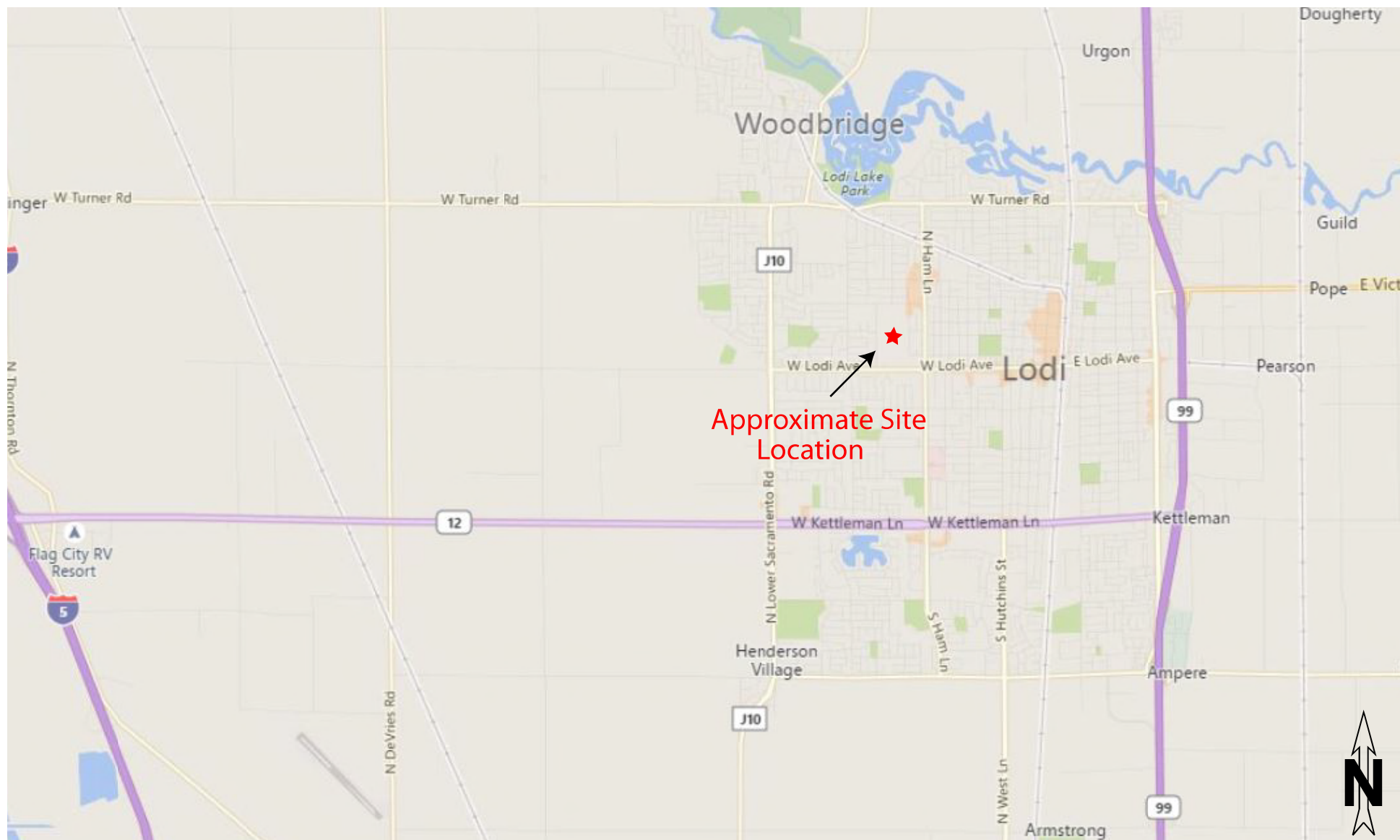
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APPENDIX A



Source: Bing Maps, 2018



Vicinity Map

3 S PACIFIC AVENUE & 31 N PACIFIC AVENUE
LODI, CA 95632

DATE: July 2022

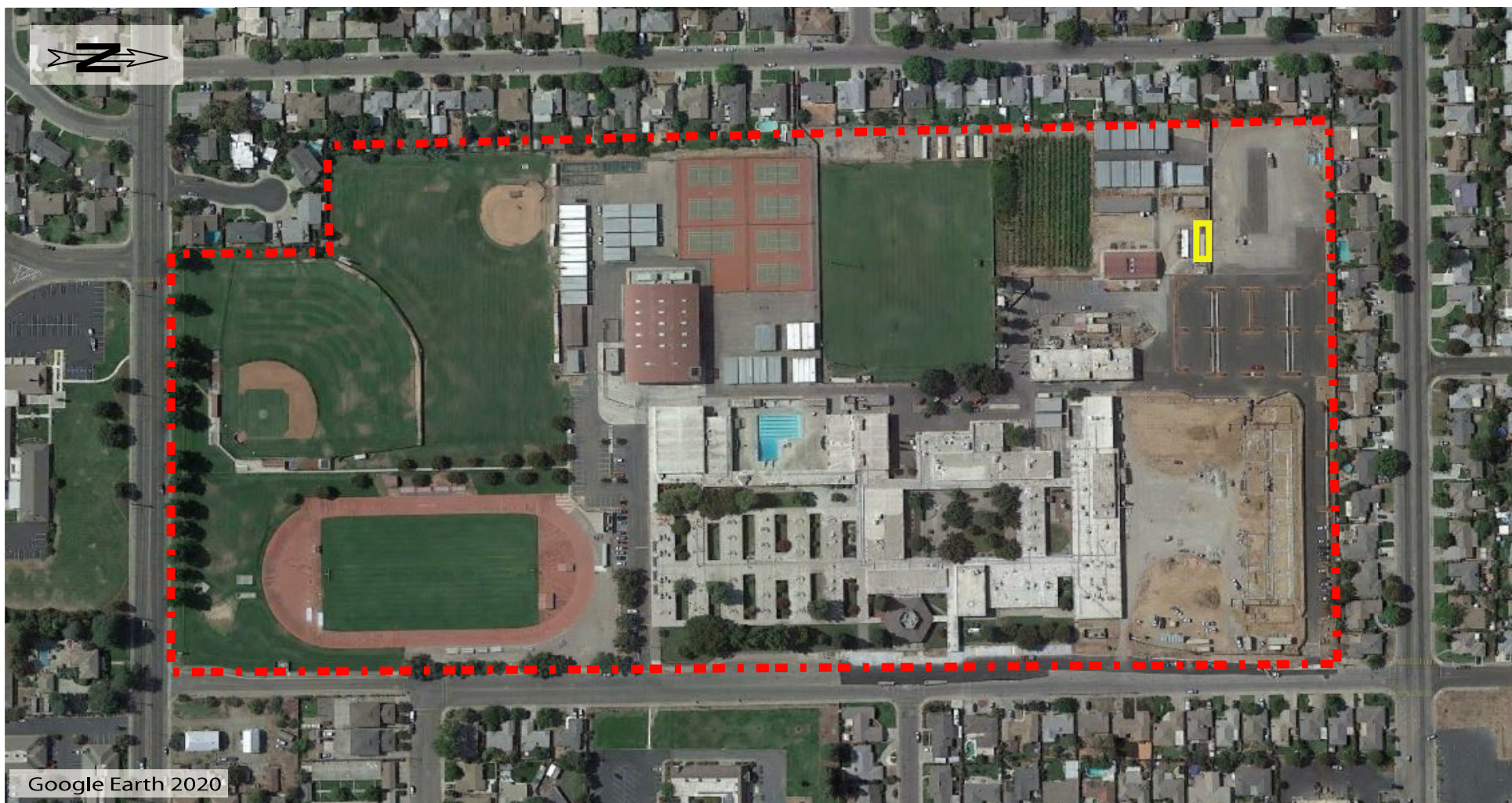
JOB NUMBER: 2021-00086

SCALE: Not to Scale

DRAWN BY: TS

CHECKED BY: DK

PLATE: 1



Google Earth 2020

LEGEND

- - - Approximate Boundary - Lodi High School
- Remediation/Excavation Area



Lodi High School Site Map

3 S PACIFIC AVENUE
LODI, CA 95632

DATE: July 2022

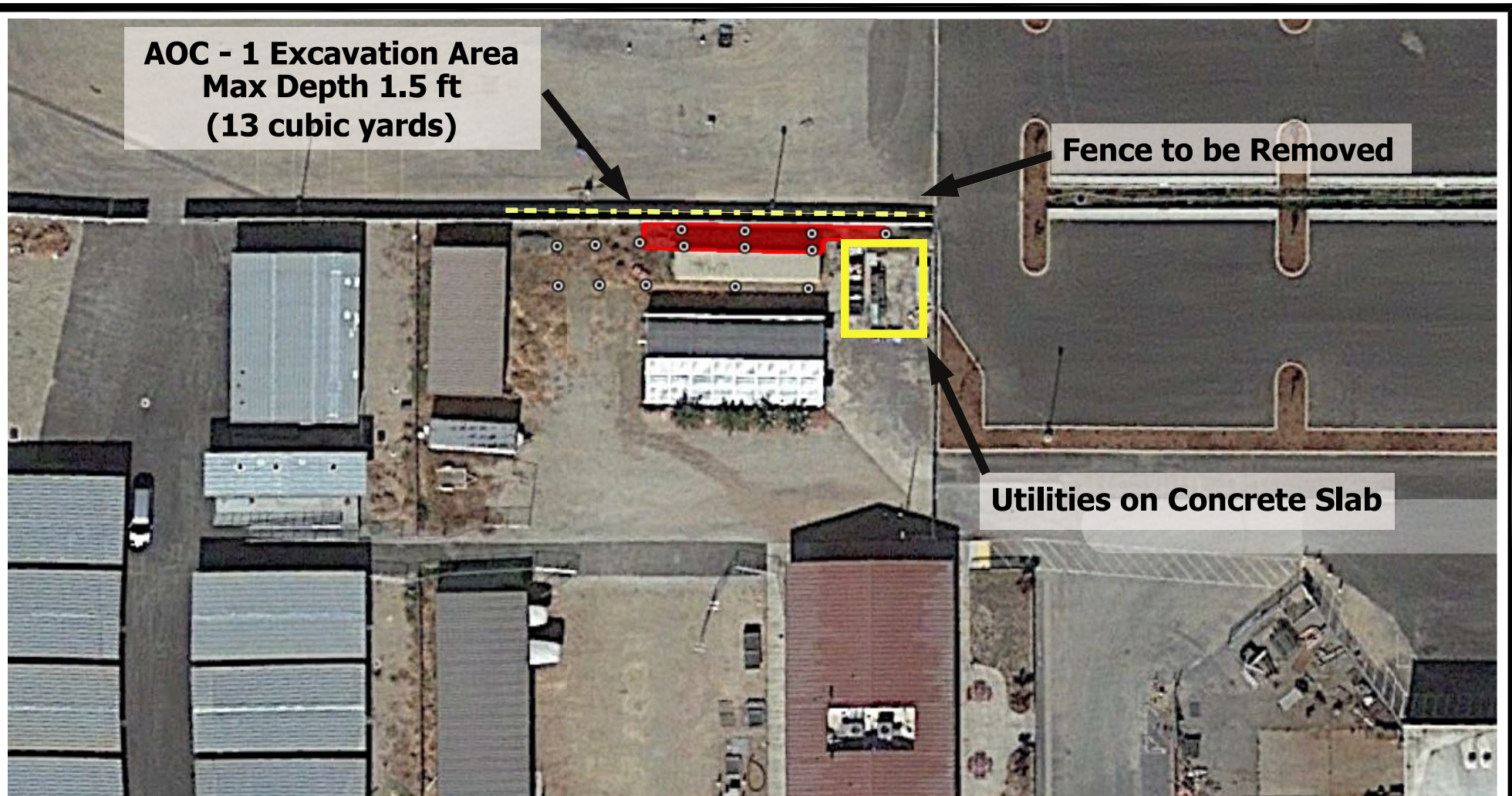
JOB NUMBER: 2022-00008

SCALE: Not to Scale

DRAWN BY: TS

CHECKED BY: DK

PLATE: 2



LEGEND

- AOC-1 Remediation/Excavation Area
- ⊙ Lead Characterization Sample Locations (PEA & February 2022 Sampling Events)



Soil Sample Locations - Lead
AOC - 1 Remediation Area
3 S PACIFIC AVENUE
LODI, CA 95632

DATE: July 2022
JOB NUMBER: 2022-00008
SCALE: Not to Scale
DRAWN BY: TS
CHECKED BY: DK
PLATE: 3



**AOC - 2 Excavation Area
(Storage Container)
Max Depth 1.5 ft/20 cy**

LEGEND

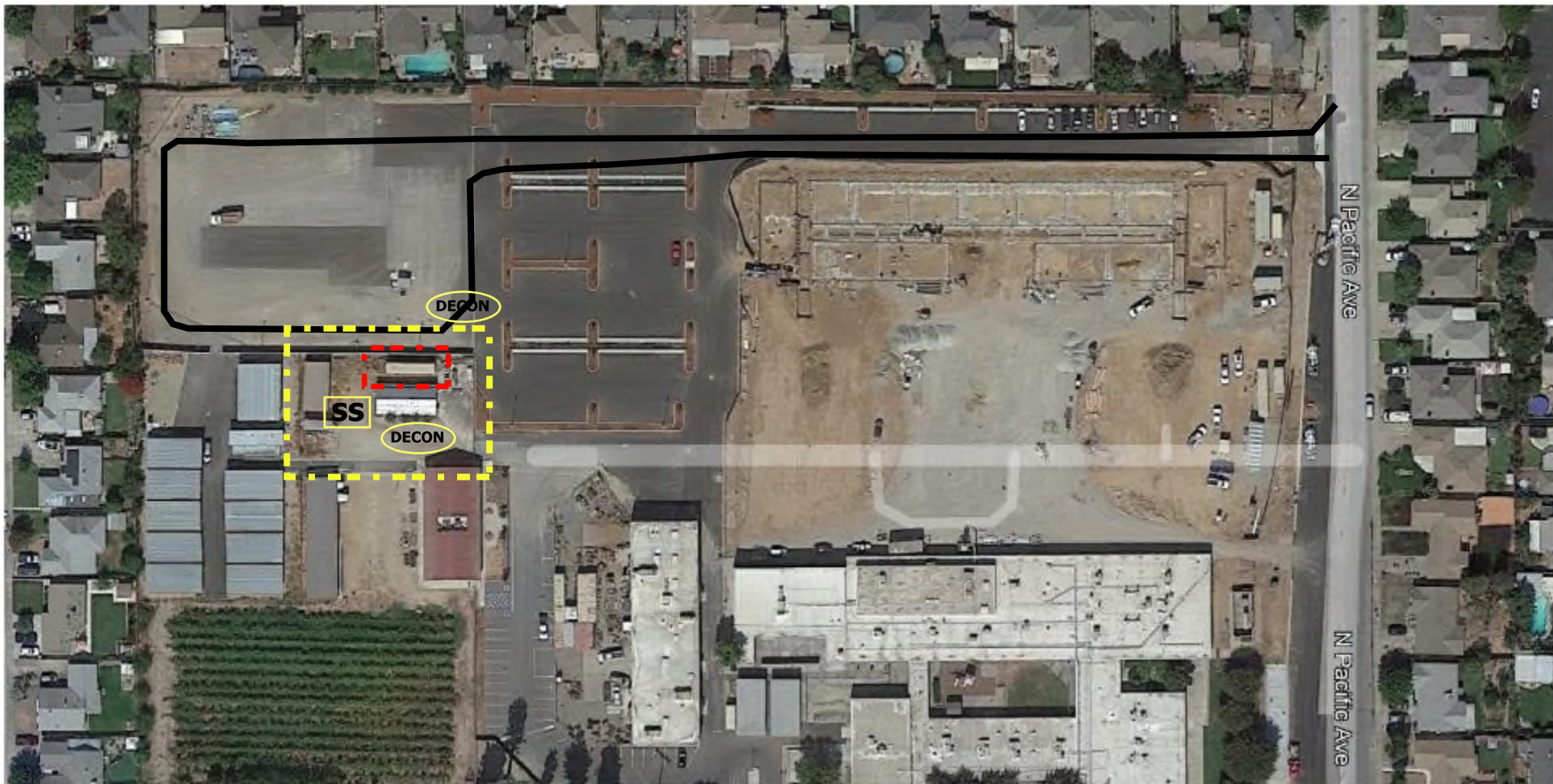
-  AOC-2 Maximum Anticipated Remediation/Excavation Area
-  Proposed Lead Characterization Sample Locations



**Proposed Soil Sample Locations - Lead
AOC - 2 Remediation Area**

3 S PACIFIC AVENUE
LODI, CA 95632

DATE: July 2022
JOB NUMBER: 2022-00008
SCALE: Not to Scale
DRAWN BY: TS
CHECKED BY: DK
PLATE: 4



EXPLANATION

- - - Excavation Area
- Path of Travel
- - - Exclusion Zone
- SS Soil Staging Area
- DECON Decontamination Areas



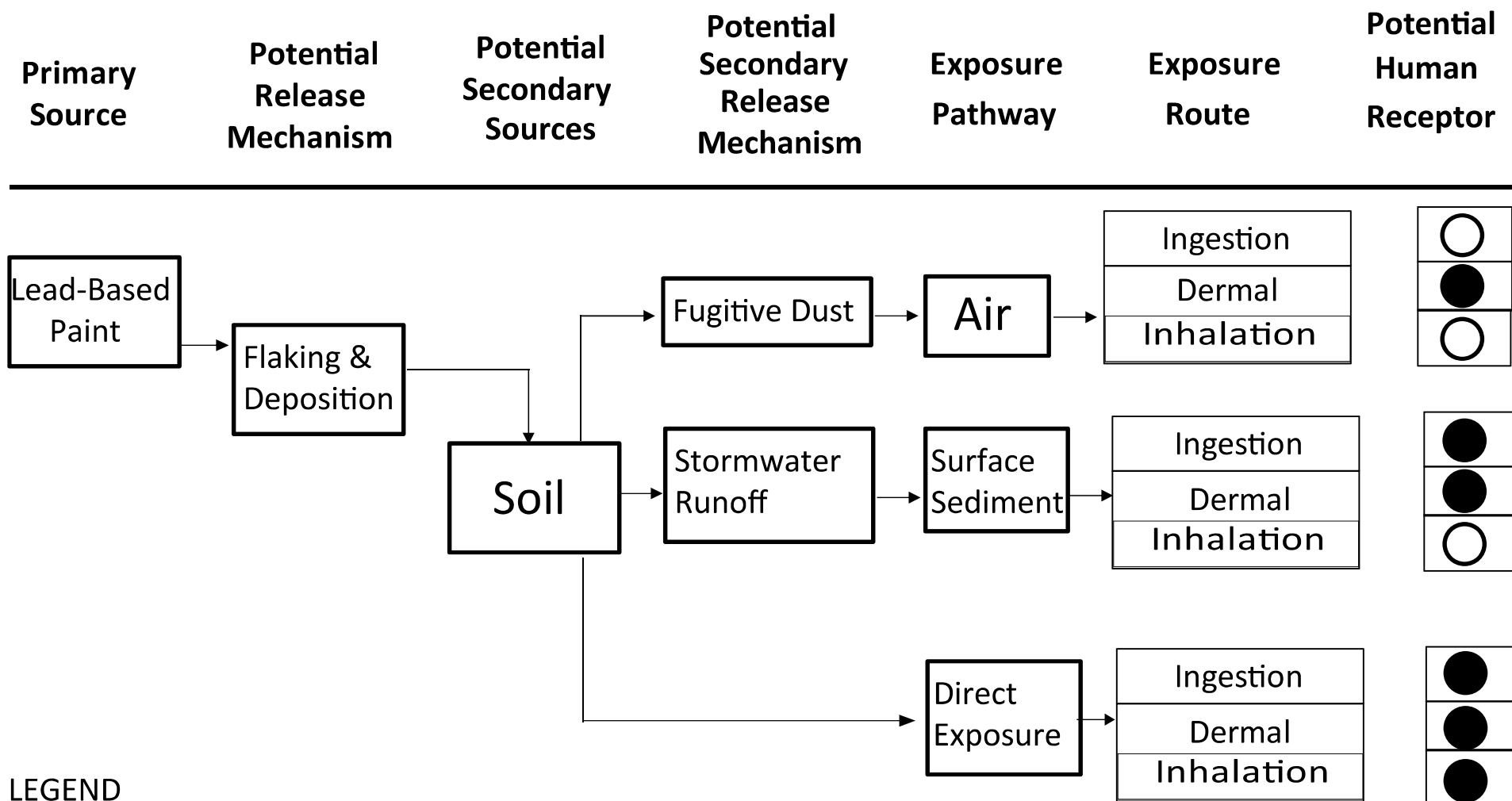
Ingress/Egress, Soil Staging, and Decontamination Area Map

3 S PACIFIC AVENUE
LODI, CA 95632

DATE: July 2022
JOB NUMBER: 2022-00008
SCALE: Not to Scale
DRAWN BY: TS
CHECKED BY: DK
PLATE: 5



APPENDIX B



LEGEND

- Incomplete Exposure Pathway
- Potentially Complete Exposure Pathway



Conceptual Site Model
 3 S PACIFIC AVENUE & 31 N PACIFIC AVENUE
 LODI, CA 95632

DATE: July 2022
 JOB NUMBER: 2022-00008
 SCALE: Not to Scale
 DRAWN BY: TS
 CHECKED BY: DK
 PLATE:



**HEALTH AND SAFETY PLAN
FOR
REMOVAL ACTION WORKPLAN
LODI HIGH SCHOOL – CAMPUS MODERNIZATION
PROJECT
3 S PACIFIC AVENUE & 31 N PACIFIC AVENUE
LODI, CALIFORNIA**

Prepared for:

Lodi Unified School District
1305 E. Vine Street
Lodi, California 95240

Prepared by:

Petralogix Engineering, Inc.
26675 Bruella Road
Galt, California 95632

July 2022

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B.Sc. Geology, GIT No. 685

Daniel E. Kramer, President
Professional Geologist No. 86

**HEALTH AND SAFETY PLAN
LODI HIGH SCHOOL**

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ATTACHMENT A

Directions to Nearest Urgent Care

ATTACHMENT B

Directions to Nearest Emergency Room

**HEALTH AND SAFETY PLAN
FOR
PRELIMINARY ENVIRONMENTAL ASSESSMENT**

**LODI HIGH SCHOOL – CAMPUS
MODERNIZATION PROJECT
3 S PACIFIC AVENUE & 31 N PACIFIC AVENUE**

LODI , CALIFORNIA

OUR PROJECT NO: 2021-00086

1.0 INTRODUCTION

1.1 General Information

A Removal Action will be conducted at the site by Petralogix Engineering Inc. (Petralogix) under the oversight of the Department of Toxic Substances Control (DTSC). A Removal Action Workplan has been prepared for the project.

This Health and Safety Plan (HASP) specifies the procedures and protective measures that will be employed to ensure the health and safety of the individuals working in and around the Site, and those who reside and/or work near the Site.

The purpose of this HASP is to provide site-specific safety information and procedures. Site-specific information and procedures contained herein include: a brief overview of site hazards, chemicals of concern, action levels, initial levels of personal protective equipment to be used for various site activities, decontamination procedures, air monitoring procedures, and emergency resources and information.

1.2 Scope and Applicability of the Health and Safety Plan

The provisions of this HASP are mandatory for all Petralogix personnel and subcontractors. Subcontractors doing fieldwork in association with the PEA either adopt and abide by this HASP or shall develop their own safety plans that, at a minimum, meet the requirements of this HASP. All onsite personnel shall read this plan before starting site activities. In addition, personnel will operate in accordance with the most current requirements of Title 8 California Code of Regulations, Section 5192 (T8 CCR Section 5192), *Standards for Hazardous Waste Operations and Emergency Response* (HAZWOPER).

Onsite personnel are responsible for operating in accordance with all applicable regulations of the Division of Occupational Safety & Health (Cal/OSHA) outlined in T8 CCR General Industry and Construction Safety Orders.

1.3 About this Health and Safety Plan

The text of this Health and Safety Plan is based on a model Health and Safety Plan written by the Department of Toxic Substances Control (DTSC; 2003) and provided by that agency. The example document has been modified to reflect conditions specific to this project.

2.0 SITE DESCRIPTION

The Site is currently the Lodi High School Removal Action Project area which is within the boundary of the Student Agricultural Area located south of the Student Parking Lot.

3.0 ROLES AND RESPONSIBILITIES

Personnel anticipated to be onsite at various times during site activities include:

- Project Manager
- Project Geologist
- Field Team Leader
- Other on-site personnel, including subcontractors

3.1 Responsibilities of the Field Team Leader

The Field Team Leader will direct the site activities. The Field Team Leader has the primary responsibility for ensuring that all personnel are aware of:

- Names of personnel and alternates responsible for site safety and health.
- Safety, health, and other hazards present onsite.
- Use of personal protective equipment (PPE) and ensuring that the equipment is available.
- Work practices by which the employee can reduce risks from hazards.
- Safe use of engineering controls and equipment onsite.
- Medical surveillance requirements, including recognition of symptoms which might indicate overexposure to hazards.
- Site control measures, decontamination procedures, site standard operating procedures, and the contingency plan and responses to emergencies including the necessary PPE.

The Field Team Leader is also responsible for ensuring that all employees have received at least 40 hours of health and safety instruction (offsite), and three days of actual field experience under the direct supervision of a trained experienced supervisor. Workers who may be exposed to unique or special hazards shall be provided additional training.

The Field Team Leader also monitors the performance of personnel to ensure that mandatory health and safety procedures are being followed and corrects any performances that do not comply with the HASP. Copies of health and safety training

certificates must be available for review by the Field Team Leader and Site Health and Safety Officer.

If unforeseen site conditions or emergencies occur, the Field Team Leader shall ensure that the medical surveillance program is implemented as required by T8 CCR 5192. Additional responsibilities may include:

- Consulting with the Project Manager and/or other personnel.
- Preparation and submittal of any and all project reports — includes progress, accident, incident, contractual, etc.
- Monitoring personnel decontamination to ensure that all personnel are complying with the established decontamination procedures.

3.2 Responsibilities of the Project Manager

The responsibilities of the Site Health and Safety Officer include:

- Ensure that a copy of the HASP is maintained onsite during all field activities
- Advise the Field Team Leader on all health and safety-related matters involved onsite.
- Direct and ensure that the safety program is being correctly followed in the field, including the proper use of personal protective equipment.
- Ensure that field personnel observe the appropriate work zones and decontamination procedures.
- Report any safety violations to the Field Team Leader.

Conduct and document safety briefings during field activities.

3.3 Responsibilities of Onsite Field Personnel

The responsibilities of the Site Health and Safety Officer include:

- All personnel going onsite must be thoroughly briefed on anticipated hazards and trained on equipment to be worn, safety procedures to be followed, emergency procedures, and communications.
- Visual contact must be maintained between pairs onsite and site safety personnel. Field personnel should remain close together to assist each other during emergencies.
- All field personnel should use their senses to alert themselves to potentially dangerous situations that they should avoid, e.g., presence of strong and irritating or nauseating odors.
- Personnel should practice unfamiliar operations prior to doing the actual procedures in the field.
- Field personnel shall be familiar with the physical characteristics of the site, including:
 - Wind direction in relation to contamination zones
 - Accessibility to associates, equipment and vehicles

- Communications
- Operation zones
- Site access
- Nearest water sources
- The number of personnel and equipment in the contaminated area must be kept to a minimum, consistent with effective site operations.
- Procedures for leaving a contaminated area must be planned and implemented before going onsite in accordance with the site HASP.
- All visitors to the job site must comply with the HASP procedures. Personal protection equipment may be modified for visitors depending on the situation. Modifications must be approved by the Project Manager or Field Team Leader.

4.0 TRAINING AND MEDICAL REQUIREMENTS

Only authorized personnel with at least of 40 hours health and safety training meeting the requirements of HAZWOPER (T8 CCR Section 5192) and three days of supervised field experience are permitted to participate in hazardous materials components of the fieldwork. As applicable, all personnel working with hazardous materials shall have the required annual HAZWOPER refresher training. All site personnel must be able to provide training documentation.

5.0 DESCRIPTION OF FIELD WORK

Field work will include implementation of the removal action workplan. Soil samples will be collected by shoveling, hand auguring and/or by utilizing a direct push Geoprobe drill rig. Excavation will be by excavator and front loader as appropriate. Trucks will be onsite to receive contaminated waste for off haul to an appropriate landfill.

6.0 JOB HAZARD ANALYSIS

The following hazards to site workers from the subject project have been identified during the preparation of this HASP: chemical hazards due to soil contaminated with lead, physical hazards due to heat and stress, severe weather hazards, and potential heavy equipment hazards.

Potential hazards to off-site receptors from the subject project are limited to airborne dust that may contain soil contaminants.

6.1 Chemical Hazards

The constituents that may be encountered in soils are hazardous levels of lead.

6.2 Physical Hazards

Field personnel should be aware of and act to minimize dangers associated with physical hazards typically encountered during site activities. These hazards include heat-related illnesses, uneven terrain, slippery surfaces, and lifting. Personnel will walk at all times. Running greatly increases the probability of slips, trips, and falls.

6.2.1 Procedures for Hot Weather

Safety problems are common to hot environments because heat tends to promote accidents due to objects slipping from sweaty palms, dizziness, fatigue, tremors, or visual distortions from fogged safety glasses.

Accidents appear to occur more frequently in hot environments than in more moderate conditions. Working in a hot environment lowers an individual's mental alertness and physical performance. Increased body temperature and physical discomfort promote irritability and other emotional states that can cause workers to overlook safety procedures and divert their attention from hazardous tasks.

Personal health and safety for heat stress/heat stroke include:

- Drink plenty of water
- Wear loose, non-restrictive clothing and hat/cap
- Stay in shade as much as possible to keep cool (use vehicle and AC as necessary)
- Use sunscreen and chapstick as needed

6.2.2 Health Problems

Heat stress, heat-related illness, and heat-related disorders are three terms used interchangeably to express health problems associated with exposure to hot environments. Heat stress is the term used herein. Excessive exposure to a hot work environment can bring about a variety of heat-induced disorders. Several of the more common disorders, in decreasing order of severity, are briefly described below:

Heat Stroke

Heat stroke, a true life-threatening emergency, has mortality ranging from 20% to 70%. Heat stroke is sometimes called sunstroke, although the sun is not required for its onset. The condition results when the heat-regulating mechanisms of the body break down and fail to cool the body sufficiently. The body becomes overheated, with temperature rising to between 105° and 110° F; no sweating occurs in about half the victims. The buildup of heat and inadequate cooling can damage brain cells and may cause permanent disability or death. Central nervous system dysfunction is virtually universal at temperatures higher than 113° F. It first becomes apparent as confusion, lethargy, or agitation and may progress to seizure and coma.

There are two basic kinds of heat stroke. Classic heat stroke, in which people lose the ability to sweat, generally affects inactive people who are in hot environments. Exertional heat stroke, in which victims retain the ability to sweat, usually occurs during periods of physical exertion and muscle stress.

Heat stroke commonly occurs during times of high temperatures combined with high humidity and low wind velocity.

Some signs and symptom of heat stroke include the following:

- Temperature of 105° F or higher
- Hot, reddish skin; skin can be wet or dry, since approximately half of all heat stroke victims sweat profusely
- Initially constricted pupils, later becoming dilated
- Tremors
- Mental confusion and anxiety
- Initially deep, rapid breathing that sounds like snoring; breathing becomes shallow and weak as damage progresses
- Headache
- Dry mouth
- Shortness of breath
- Loss of appetite, nausea, or vomiting
- Increasing dizziness and weakness
- Convulsions, sudden collapse, and possible unconsciousness
- Seizures

Left untreated, a patient may likely die.

Emergency care of heat stroke is aimed at immediately cooling the body. Emergency care includes the following:

- Remove the patient, when possible, from the source of heat.
 - Call an ambulance.
 - Remove as much of the patient's clothing as possible or reasonable, pour cool water over his/her body (avoiding the nose and mouth), fan the patient briskly, and shade from the sun if he/she is still outdoors. Wrapping a wet sheet around the patient's body and then directing an electric fan at the patient are also good ways of cooling. Cool the patient more slowly if he/she starts to shiver since that produces heat.
 - Elevate the patient's head and shoulders slightly during cooling, and make sure that he/she is comfortable.
 - Never give the patient stimulants or hot drinks.
- If proper precautions are taken, heat stroke is completely preventable. Exertion should be limited when temperatures and humidity are high, and activities in direct sunlight should

If proper precautions are taken, heat stroke is completely preventable. Exertion should be limited when temperatures and humidity are high, and activities in direct sunlight should be avoided. Adequate hydration is an absolute necessity and may be the single most important prerequisite for avoiding heat illness. Both fluids and electrolytes should be replaced after any activity in the heat; water itself is usually sufficient during exertion.

A period of acclimatization is recommended before vigorous activity is undertaken. At least two weeks in a hot environment are needed to bring heat control mechanisms to maximum efficiency, and even this period may be inadequate if temperature and exertion are extreme.

Heat Exhaustion

Heat exhaustion, the most common heat injury, occurs in an otherwise fit person who is involved in extreme physical exertion in a hot, humid environment. This condition results from a serious disturbance of the blood flow, similar to the circulatory disturbance of shock. Heat exhaustion is, in fact, a mild state of shock brought on by the pooling of blood in the vessels just below the skin, causing blood to flow away from the major organs of the body. Due to prolonged and profuse sweating, the body loses large quantities of salt and water. When the water is not adequately replaced, blood circulation diminishes, affecting brain, heart, and lung functions. Heat exhaustion is sometimes, though not always, accompanied by heat cramps due to salt loss.

There are two basic kinds of heat exhaustion. The first is salt depletion (sodium depletion), which occurs when un-acclimatized individuals exert themselves and drink enough water but do not replace the sodium. Second, there is water depletion, which occurs when individuals do not drink enough water during extreme heat. This type of heat exhaustion is characterized by extreme anxiety and agitation, intense thirst, headache, weakness, fever, lack of muscle coordination, and decreased sweating.

The most critical problem in heat exhaustion is dehydration; salt loss poses an additional problem. Heat exhaustion normally strikes those who are poorly acclimatized and who suddenly participate in strenuous exercise in a hot climate. Their water and salt levels become unbalanced: either the salt depletion is greater than the water depletion, or vice versa.

Primary signs and symptoms of heat exhaustion are much like flu symptoms. They include the following:

- Headache, giddiness, and extreme weakness
- Nausea and possible vomiting
- Dizziness and faintness
- Profuse sweating
- Loss of appetite
- Fatigue
- Diarrhea
- Dilated pupils
- Weak and rapid pulse
- Rapid, shallow breathing
- Pale, cool, sweaty skin, usually ashen gray in color
- Possible heat cramps or muscle aches

While the signs and symptoms of heat exhaustion may seem similar to those of heat stroke to the casual observer or to an uninformed patient, there are some distinct differences, which will help make the correct evaluation.

The two most reliable and distinct differences are the condition of the skin and the body temperature. In heat stroke, the skin is flushed and hot to the touch; patients experiencing heat exhaustion usually have wet or clammy, pale, cool skin. Body temperature in a patient with heat stroke can soar above 105° F; in a victim of heat exhaustion, it usually stays at normal or sometimes even dips below normal.

Emergency care for a person who is experiencing heat exhaustion includes the following:

- Move the patient to a cool place away from the source of heat, but make sure he/she does not become chilled. Apply cold, wet compresses to the skin, and fan the patient lightly.
- Have the patient lie down. Raise the feet 8 to 12 inches and lower the head to help increase blood circulation to the brain. Remove as much of the patient's clothing as possible and loosen what you cannot remove. Help make the patient as comfortable as possible.
- If the patient is fully conscious, administer cool water at the rate of one-half glassful every 15 minutes for one hour.
- If the patient is unconscious, remove his clothing and sponge with cool water.
- If the patient vomits, stop giving him fluids and transport immediately to a hospital, where he/she can receive intravenous fluids.

There are two ways to prevent heat exhaustion. If un-acclimated, do not overexert the body. Keep persons well hydrated with liquids that can replace the electrolytes lost in sweat and have frequent rest periods in cool places.

CAUTION: PEOPLE WITH HEART PROBLEMS OR THOSE ON “LOW-SODIUM” DIETS WHO WORK IN HOT ENVIRONMENTS SHOULD CONSULT A PHYSICIAN ABOUT POTENTIAL HEALTH PROBLEMS.

Heat Cramps

Heat cramps are muscular spasms that occur when the body loses too much salt during profuse sweating, when not enough salt is taken into the body, when calcium levels are low, and when too much water is consumed. Occasionally, heat cramps also can be caused by overexerting muscles, inadequate stretching or warm-up, and lactic acid buildup in poorly conditioned muscles. Heat cramps can be mild or extremely painful. When the body becomes low on salt and water, the patient interprets it as thirst. To quench the thirst, he/she consumes large quantities of water without replacing the salt.

Heat cramps usually occur in the arms, legs, or abdomen (the major complaint may be severe abdominal pain) and are often a signal of approaching heat exhaustion. Hot weather is not necessarily a prerequisite to heat cramps. A person who exercises strenuously in cold weather and perspires may develop heat cramps if he/she drinks water but does not replace salt. Heat cramps result when blood calcium levels are too high in proportion to those of blood sodium. To function properly, the muscles need a strict balance of water, calcium, and sodium; whenever that balance is disrupted, regardless of temperature, muscular contraction malfunctions, and heat cramps may result. Cramping occurs when the muscle contracts without relaxing again; the muscle remains firm in a knotted configuration, leaving a cavity at its origin.

Some signs and symptoms of heat cramps are as follows:

- Severe muscular cramps and pain, especially of the legs, calves, and abdomen
- Faintness and dizziness
- A stiff, boardlike abdomen
- Possible nausea and vomiting
- Normal mental status and consciousness

Emergency care of heat cramps is as follows:

- If the patient is in a hot environment, remove him from the heat immediately.
- To relieve pain, try gently stretching the involved muscle groups. Manipulate or push the knotted muscle mass back to its normal position.

To prevent heat cramps, the out-of-shape or un-acclimated should not overexert themselves. Take frequent breaks in cool places. Before any strenuous activities are undertaken, warm up with exercises. Keep well hydrated and drink liquids that can replenish electrolytes.

Fainting

A worker who is not accustomed to hot environments and who stands immobile in the heat can faint. Due to the body's attempts to control internal temperature, enlarged blood vessels in the skin and lower part of the body may pool blood rather than returning it to the heart. Upon lying down, the worker should soon recover. Keeping slightly active should prevent blood from pooling and further fainting.

Heat Rash

Heat rash is likely to occur in hot, humid environments where sweat does not readily evaporate from the skin, leaving it wet most of the time. Sweat ducts become plugged, and a skin rash can develop. When the rash is extensive or complicated by infection, heat rash can be very uncomfortable and may reduce a worker's performance. The worker can prevent this condition by taking breaks and resting in a cool place, changing into dry clothes, and regularly bathing and drying the skin.

Transient Heat Fatigue

Transient heat fatigue refers to the temporary state of discomfort and mental or psychological strain arising from prolonged heat exposure. Workers unaccustomed to the heat are particularly susceptible and can suffer, to varying degrees, a decline in task performance, coordination, alertness, and vigilance. The severity of transient heat fatigue can be lessened by a period of gradual adjustment to the hot environment (heat acclimatization).

6.2.3 Preparing for Work in the Heat

One of the best ways to reduce the heat stress in workers is to minimize the heat in the workplace. However, heat production is difficult to control in some environments, such as outdoors where exposure to various weather conditions is likely, and when wearing personal protective clothing.

Humans, to a large extent, can acclimate to the heat. Adjusting to heat under normal circumstances usually takes five to seven days, during which time the body will undergo a series of changes that will make continued exposure to heat more endurable.

Gradual exposure to heat gives the body time to become accustomed to higher environmental temperatures. Heat stress is more likely to occur among workers who have not been given time to adjust to working in the heat, among workers who have been away from hot environments, or among workers who have never been exposed to hot environments. Hot weather in the summer is likely to affect the worker who is not acclimatized to heat. Likewise, workers who return to work after a leisurely vacation or extended illness can be affected by the heat in the work environment. Under such circumstances, the worker should be allowed to gradually reacclimatize.

Heat stress also depends, in part, on the amount of heat the worker's body produces while doing a job. The amount of heat produced during hard, steady work is much higher than that produced during intermittent or light work. Ways of reducing the potential for heat stress are to make the job less strenuous, lessen its duration, or provide adequate or longer breaks.

Number and Duration of Exposures - Rather than be exposed to heat for extended periods of time during the course of a job, workers should, wherever possible, be permitted to distribute the work load evenly over the day and incorporate work-rest cycles. Work-rest cycles give the body an opportunity to get rid of excess heat, slow down the production of internal body heat, and provide greater blood flow to the skin.

Workers employed outdoors are especially subject to weather changes. A hot spell or rising humidity can create overly stressful conditions.

Scheduling/Work Rotation — When possible, do the most demanding tasks in cooler parts of the day, morning, and evening. Also, begin work shifts earlier in the day, or start later in the afternoon. Labor-intensive tasks may be spread out over a greater number of days. Use less intensive tasks to fill in the rest of the day.

Rest Areas — Providing cool rest areas in hot work environments considerably reduces the stress of working there. Shaded areas should be as close to the work area as possible. Individual work periods should not be lengthened in favor of prolonged rest periods. Shorter but frequent work-rest cycles benefit the worker most.

Drinking Water — In the course of a day a worker may produce as much as 2 to 3 gallons of sweat. Because so many heat disorders involve excessive dehydration of the body, it is essential that water intake be about equal to the amount of sweat produced. Most workers exposed to hot conditions drink less fluids than needed due to an insufficient thirst drive. Therefore, a worker should not depend on thirst to signal when and how much to drink. Instead, the worker should drink one cup of fluids every 15 to 20 minutes. There is no optimum temperature of drinking water, but most people tend not to drink warm or very cold fluids as readily as they will cool ones. Whatever the temperature, the water must be palatable and readily available. Individual drinking cups should be provided — never use a common drinking cup.

Heat acclimatized workers lose much less salt in their sweat than do workers who are not adjusted. The average American diet contains sufficient salt for acclimatized workers even when sweat production is high. If for some reason, salt replacement is required, the best way to compensate is to add a little extra salt to the food. Salt tablets **MUST NOT** be used.

6.3 Severe Weather

Fieldwork shall not be conducted when lightning can be seen, or thunder heard from the work area. When lightning and/or thunder occur, employees are to cease work, perform emergency personal and equipment decontamination as needed, then seek shelter.

During extreme weather conditions, the Field Team Leader shall use his or her best judgment and has the authority to stop fieldwork or dismiss workers for the day. Examples of conditions that may warrant work stoppage include: tornado warnings, high winds, hail, flooding, and ice storms.

6.4 Heavy Equipment Safety

Fieldwork shall not be conducted when lightning can be seen, or thunder heard from the work area. When lightning and/or thunder occur, employees are to cease work, perform emergency personal and equipment decontamination as needed, then seek shelter.

Any equipment defects that affect safety will be corrected by Petralogix or its subcontractors in a timely manner so a personnel hazard is not created. When defects make continued operation hazardous to personnel, the defective equipment will be taken out of service and placed in the designated area for repair. Once tagged out, continued use of equipment is

prohibited until the defects are repaired. Defects on self-propelled mobile equipment affecting safety, which are not corrected immediately, will be reported to the Field Team Leader. The Field Team Leader will keep a log that will include the date the defect was reported, the equipment's identification, a description of the defect, and the date of repair.

Equipment repairs or maintenance will be performed only after the power is off, and the equipment is blocked against hazardous motion. Equipment motion or activation is permitted to the extent that adjustments or testing cannot be performed without doing so, provided that people are effectively protected from hazardous motion.

Operators of self-propelled mobile equipment will maintain control of the equipment while it is moving. Operating speeds will be consistent with conditions of roadways, grades, clearances, visibility, traffic, and the type of equipment used. Equipment will be operated at speeds that permit stopping in no more than half the visibility distance.

People will not be transported:

- in or on dippers, clamshells or buckets
- in beds of mobile equipment
- on top of loads in mobile equipment
- outside cabs, equipment operator's stations, and beds of mobile equipment
- to or from work areas in overcrowded equipment (i.e., the vehicle will not carry more people than the number of seats on that vehicle)

All self-propelled mobile equipment will be equipped with a service brake system capable of stopping and holding the equipment with its typical load on the maximum grade it travels (this does not apply to equipment that was not originally equipped with brakes). If equipped, the parking brake on self-propelled mobile equipment will be capable of holding the equipment under typical load condition on the maximum travel grade.

All braking systems installed on self-propelled mobile equipment will be maintained in a functional condition.

Front-end loaders and bulldozers should have protection from falling objects.

Seat belts meeting the requirements of SAE J386, Operator Restraint Systems for Off-Road Work Machines, 1985, will be provided and worn in haulage trucks. Seat belts will be maintained in functional condition and replaced when necessary to assure proper performance.

Mobile equipment will not be left unattended unless the controls are placed in the park position, the parking brake, if provided, is set, and the ignition turned off.

People will not work on top of, under, or from mobile equipment in a raised position until the equipment has been blocked or secured to prevent it from rolling or falling accidentally.

Care will be taken to locate all overhead power lines before excavation begins. Under no circumstances should any part of the mobile equipment be positioned within the minimum clearance from exposed and energized electrical wires. The equipment operator will ensure there is sufficient overhead clearance (i.e., no part of the equipment will hit or touch any overhead obstruction when raised nor will it hit or touch any object while being raised) before raising any part of the equipment through careful preplanning.

6.5 Trenching and Excavation

All operations involving excavation or trenching will be performed in accordance with Cal/OSHA Regulations for excavations (T8 CCR 1539 –1541.1). An excavation is considered to be any man-made cut, cavity, trench, or depression in an earth surface, formed by earth removal.

No personnel will be allowed to enter an unshored or unsloped excavation that is deeper than 5 feet. Personnel must obtain approval from the Project Health and Safety Officer before entering any excavation. All excavation activities must be performed at a minimum under the direction of a competent person.

Underground Utilities

The contractor is responsible for clearance of remaining utilities and other hazardous underground obstacles prior to initiating any soil intrusion or subsurface investigation activities. The estimated location of utility installations, such as sewer, fuel, gas, phone cable, communication cable, TV cable, electrical, potable/sanitary water, or any other underground installations that reasonably may be expected to be encountered during excavation work, shall be determined prior to opening an excavation. When excavation operations approach the estimated location of underground installations, the exact location of the installations shall be determined by safe and acceptable means.

At a minimum, the utility clearance must include a 48-hour notification of the Underground Service Alert (USA) (prior to the work commencing) and a site visit. The site visit may include a geophysical survey, e.g., using a pipe and cable locator, or a hand-auger operation down to 5 feet below ground surface, as appropriate to clear each intrusive boring or cutting location.

This HASP is not designed to protect personnel entering excavations requiring protective systems. If it becomes necessary for someone to enter such an excavation, the Project Manager must request the Site Health and Safety Officer to develop an acceptable entry procedure, which may include shoring the sides of the excavation.

Inspections

Daily inspections of excavations, the adjacent areas, and protective systems will be made to determine if a situation exists that could result in possible cave-ins, failure of protective systems, hazardous atmospheres, or other hazardous conditions. An inspection will be conducted prior to the start of fieldwork and as needed throughout the shift.

Inspections will also be made after every rainstorm to ensure that no water accumulation has occurred. Employees shall not work in excavations where water has accumulated, unless adequate precautions are taken to protect employees against the hazards posed by water accumulation. The precautions necessary to protect employees adequately vary with each situation but could include

special support or shield systems to protect from cave-ins, water removal to control the level of accumulating water, or use of a safety harness and lifeline.

7.0 PERSONAL PROTECTIVE EQUIPMENT

The level of employee protection for the work to be completed during site activities was determined by researching site conditions, reviewing planned activities, and identifying site-specific physical and chemical hazards.

7.1 Selection of Personal Protective Equipment

It is important that specified PPE protects against known and suspected site hazards. Protective equipment is selected based on the types, concentrations, and routes of personal exposure that may be encountered. In situations where the types of materials and possibilities of contact are unknown or the hazards are not clearly identifiable, a more subjective determination must be made of the PPE required, and greater emphasis is placed on experience and sound safety practices. As discussed above, PPE for site workers will be based on site history and on the activities to be performed there.

The initial level of PPE for all site work will be Level D. Level D protection consists of the following recommendations:

- Safety boots/shoes
- Safety glasses (as necessary)
- Latex gloves (during soil handling activities)
- Hard hat (during heavy equipment operation)
- Ear plugs (during heavy equipment operation)
- PPE requirements are subject to change as site information is updated or changes. If site conditions warrant, based on air monitoring results, upgrade to Level C or higher PPE, work will stop until the HASP is updated.

8.0 ILLUMINATION

Nighttime work activities are not anticipated; however, if nighttime work becomes necessary, illumination at the site will be supplemented in order to ensure safe working conditions. Supplemental lighting will be provided by mobile generator powered units.

9.0 METEOROLOGICAL MONITORING

Onsite ambient weather conditions (temperature, wind speed and direction, and relative humidity) may be monitored by the following methods; an onsite met station, real-time internet weather locations, and the National Weather Service (if a local station can provide data relevant to the site).

If required, onsite meteorological monitoring will be performed simultaneously with the excavation activities to ensure all necessary precautions have been taken. The meteorological tower, if required, will be equipped with sensors for measurement of temperature, relative humidity, wind speed, and wind direction. All sensors will be appropriately calibrated prior to the start of work.

10.0 STANDARD OPERATING PROCEDURES

10.1 Standard Safe Work Practices

Standard safe work practices required at the site include:

Eating, drinking, chewing gum or tobacco, smoking, or any other activity that increases the probability of hand-to-mouth transfer and ingestion of material is prohibited in any area designated as contaminated.

Hands and face must be thoroughly washed upon leaving the work area. Whenever decontamination procedures for outer garments are in effect, the entire body should be thoroughly washed as soon as practical after leaving the contamination reduction zone.

Contact with contaminated surfaces should be avoided. Whenever possible, do not walk through puddles, leachate, or discolored surfaces or lean, sit, or place equipment on drums, containers, or soil suspected of being contaminated.

Medicine and alcohol can exacerbate the effects from exposure to toxic operations where the potential for absorption, inhalation, or ingestion of toxic substances exists, unless specifically approved by a qualified physician. Consumption of alcoholic beverages is prohibited.

Adequate side and overhead clearance must be maintained to ensure the equipment booms do not touch or pass close to any overhead power lines or other overhead obstacles or obstructions.

“Dig-Alert” representatives shall be asked to identify all underground utilities. Utility lines should be marked using characteristic spray paint or labeled stakes.

10.2 General Rules of Conduct

The following general rules of conduct are required for anyone working on this project: Liquor, firearms, narcotics, tape recorders, and other contraband items are not permitted on the premises.

Any violation of local, state, or federal laws, or conduct outside the generally accepted moral standards of the community is prohibited.

Willfully damaging or destroying property, or removing records is forbidden.
Misappropriation or unauthorized alteration of any record is forbidden.

Gambling in any form, selling tickets or articles, taking orders, soliciting subscriptions, taking up collections, etc., is forbidden.

Compliance with posted signs and notices is required.

Boisterousness and noisy or offensive work habits, abusive language, or any oral, written, symbolic, or other communication that tends to disrupt work or morale of others is forbidden.
Fighting or threatening bodily harm to another is forbidden.

Defacing any property is forbidden.

Wearing shorts of any type and/or offensive logos, pictures, or phrases on clothing is forbidden. Shirts, shoes, and pants, slacks, or coverall-type garments will be worn at all times. People operating motor vehicles will obey all traffic regulations.

10.3 Injury/Illness

Reporting

OSHA Records Required.

Petralogix will maintain copies of required accident investigations, copies of the OSHA 301 and 300 Logs, hazard identification and abatement, and certification of employee safety training. A written report will be maintained on each recordable accident, injury or on-the-job illness. See Attachment D for Accident Report Form.

A record of each such injury or illness is recorded on OSHA Log and Summary of Occupational Injuries Form 300 according to its instructions. Supplemental records of each injury are maintained on OSHA Form 301, or state-specific Employers Report of Injury or Illness Form. Every year, a summary of all reported injuries or illnesses is posted no later than February 1, for three months, until May 1, on OSHA Form 300A. These records will be maintained by the contractor for five (5) years from the date of preparation.

The results of each investigation will be presented in writing and submitted for review to Petralogix or its insurance risk management advisors, and if the accident resulted in serious injury, to company attorneys. All accidents involving a death, multiple personnel injuries, lost time injury, or substantial property damage will be investigated.

The procedure may be directed by the attorneys to provide the most reliable evidence or description legally permissible. All investigations pursuant to the directions of legal counsel will be protected by all applicable privileges. The attorney will provide more detail on this topic during the investigation.

11.0 CONFINED SPACES

No confined space entry is anticipated at the site. A confined space protocol will be developed for Agency review and approval should conditions at the site change.

12.0 EXPOSURE MONITORING PLAN

Procedures for monitoring exposures to site workers and the community are discussed in the following sections.

12.1 Air Monitoring

Because the project will not generate significant quantities of fugitive dust, air monitoring is not proposed.

12.1.1 Site Dust Control and Monitoring

Because the project will not generate significant quantities of fugitive dust, dust control procedures and monitoring are not proposed.

12.2 Noise

Hearing protection devices will be available onsite at all times. Use of hearing protection devices will be required whenever equipment is operated.

Noise from on-site activities is not considered a hazard to the surrounding community.

12.3 Physical

Personnel will be visually monitored for signs of heat- or stress-related illnesses or for any injury from site activities.

13.0 DESCRIPTION OF SITE WORK ZONES

13.1 Work Areas

Should contamination be identified, work areas will be designated according to the recommendations in the U.S. Environmental Protection Agency's Standard Operating Safety Guides, revised June 1992. Three general zones of operation will be established in the field to reduce the potential for contaminant migration and risk of personnel exposure:

- exclusion zone
- contamination reduction zone
- support zone

The work areas will be defined by flagging. If required, temporary fencing may be used.

The exclusion zone is the area where contamination is identified. All personnel within it must use the prescribed levels of PPE. A checkpoint must be established at the exclusion zone's periphery to regulate the flow of personnel and equipment into and out of the area. Establishment of the exclusion zone boundary (hotline) is based upon the suspected presence of contaminated materials. The boundary may be adjusted based on subsequent observations and/or measurements of the contaminant concentrations and/or level of effort. Gross decontamination of personnel will occur in the work area, as required, with most personnel decontamination activities occurring in a decontamination area. Only authorized personnel with at least of 40 hours health and safety training meeting the HAZWOPER requirements and three days of supervised field experience are permitted within the exclusion and contamination reduction zones.

The person entering the exclusion zone must be accompanied by a person who is able to:

- Assist his or her partner.
- Observe his or her partner for signs of chemical or heat exposure.
- Periodically check the integrity of his or her partner's protective clothing.
- Notify the Site Field Team Leader, his representative, or others if emergency help is needed.

A decontamination area will serve as the contamination reduction zone for most Site activities and will serve as a buffer between the primary exclusion zone and the support zone. All decontamination procedures will be conducted in this area. Personnel will leave the support zone and enter the contamination reduction zone through a controlled access point. They must wear the prescribed PPE. Exiting the contamination reduction zone requires removing all contaminants through compliance with established decontamination procedures.

The support zone is the outermost area and is considered an uncontaminated or clean area. It contains the command post for field operations, first-aid station, sanitation station, and other supplies and equipment necessary to support the exclusion zone and the contamination reduction zone activities. Normal street clothes can be worn here.

13.2 Work Area Access

Petralogix's personnel, subcontractors, and other site visitors must agree to comply with this HASP, or equivalent health and safety requirements prior to site entry. Personnel failing to meet or abide by the provisions of this HASP, or equivalent health and safety procedures, shall be restricted from entering work areas.

If the Project Manager believes that Petralogix's personnel are in danger or others may be in danger because of activities being conducted, he/she has the authority to immediately suspend work and may instruct personnel to evacuate the area. Examples of situations when this may happen are:

- Severe weather conditions such as thunder or lightning.
- Extreme winds (e.g., in excess of 25 mph).
- Site conditions have changed, for whatever reason, such that the HASP does not adequately address the current situation.
- Safety precautions being used are inadequate for the situation.
- Personnel including NOA, subcontractors, or visitors, are or may be exposed to an immediate health hazard.

14.0 Decontamination

Personal Decontamination

Decontamination procedures, based on Level D protection, will consist of the following:

- Brushing heavily soiled boots.
- Removing gloves and depositing them in a designated container.
- Washing hands and face, and preferably showering as soon as practical.
- All disposable clothing and plastic sheeting used during activities will be properly disposed of in accordance with DTSC protocol.

Equipment Decontamination

All heavy equipment will be decontaminated by brushing as necessary. Decontamination of sampling equipment is discussed in the PEA workplan.

Decontamination of Injured Workers

Any personnel injured or exposed in the work zone will be decontaminated by the above personal decontamination procedures prior to removal from the work zone, if this is possible without incurring further injury.

15.0 Emergency Information

All hazardous waste site activities present a risk to onsite personnel. During routine operations, risk is minimized by establishing good work practices, staying alert, and using proper PPE. Unpredictable events such as physical injury, chemical exposure, or fire may occur and must be anticipated.

15.1 Site Resources

Communications

Site personnel will have cellular telephones for communication.

15.2 Pre-Emergency Planning

During the site briefing that is held daily, all site workers will be trained in and reminded of the provisions of the emergency response plan, communications systems, and evacuation routes. OSHA requires specialized training be given when handling specific materials, and that personnel be trained in the hazards specific to their job.

Contact Agency or Organization	Telephone
Ambulance	911
Lodi Fire Department	911
Lodi Police Department	911
Lodi Urgent Care	209- 333-2500
St. Joseph's Medical Center (ER)	209-943-2000

15.3 Emergency Procedures

Emergency procedures are to be followed if any of the following situations develop onsite:

- Any member of the field crew is involved in an accident or experiences any adverse effects or symptoms of exposure while onsite.
- A condition is discovered that suggests the existence of a situation more hazardous than anticipated.

The following emergency procedures should be followed:

- If any member of the field team experiences any effects or symptoms of exposure while on the scene, the entire field crew will immediately halt work and act according to the instructions provided by the Project Manager.
- Identifying any conditions that would suggest a situation more hazardous than anticipated will result in the suspension of work until the Project Manager has evaluated the situation and provided the appropriate instructions to the field team.

- If an accident occurs, the Site Field Team Leader is to complete an accident report form for submittal to the appropriate company official.
- If a member of the field crew suffers a personal injury, the Project Manager will call 911 (serious injury) to alert appropriate emergency response agencies or administer onsite first aid (minor injury) as the situation dictates. An Accident Report Form will be completed for any such incident.
- If a member of the field crew suffers a chemical exposure, the affected areas should be flushed immediately with copious amounts of clean water. If the situation dictates, the Site Health and Safety Officer should alert appropriate emergency response agencies, or personally ensure that the exposed individual is transported to the nearest medical treatment facility for prompt treatment. An Accident Report Form will be completed for any such incident.

16.0 DIRECTIONS TO HOSPITAL

The closest urgent care hospital is:

Lodi Urgent Care
1235 W Vine St. Suite 20
Lodi, CA
209-339-7600

Directions (Attachment A):

Start out going NORTH on S PACIFIC AVENUE
Turn RIGHT (EAST) onto W OAK STREET
Turn RIGHT (SOUTH) onto SOUTH HAM LANE
Turn LEFT (EAST) and ARRIVE AT 1235 W. VINE STREET
The distance is about 1-mile and the time is about three minutes.

The nearest 24-hour emergency room is:

St. Joseph's Medical Center
1800 N California St.
Stockton, CA 91800

Directions (Attachment B):

Start out going NORTH on S PACIFIC AVENUE
Turn RIGHT (EAST) onto W ELM STREET
Turn LEFT (NORTH) onto N HUTCHINS STREET
Turn RIGHT (EAST) onto W LOCKEFORD STREET
Turn RIGHT (SOUTH) onto N CHEROKEE LANE
Turn LEFT (EAST) onto E VICTOR ROAD
Take RAMP RIGHT and follow signs for CA-99 TOWARD FRESNO
At Exit 257A, take ramp RIGHT and follow signs for N WILSON WAY
Keep RIGHT to stay on N WILSON WAY
Turn LEFT onto WEST LANE/COUNTY HWY-13
Turn RIGHT onto N CALIFORNIA STREET
Arrive at 1800 N CALIFORNIA STREET
The distance is about 15 miles and the time is about twenty-five minutes.

17.0 SPILL CONTAINMENT

The need for spill containment is not anticipated to be an issue for this project because of the nature of the project. Should any hazardous material be spilled, it should be contained as well as possible according to methods which do not place site personnel at risk.

18.0 AUTHORIZED CHANGES TO THE HEALTH AND SAFETY PLAN

Any changes to this Health and Safety Plan must be approved in writing by the Project Manager. The documentation will become part of the project file.



ATTACHMENT A

- A Lodi High School, 3 S Pacific Ave, Lodi, CA 95242
- B Lodi Urgent Care, 1235 W Vine St Ste 20, Lodi, CA 95240

3 min , 0.9 miles

Light traffic (Leave at 9:48 AM)

Via S Pacific Ave, S Ham Ln

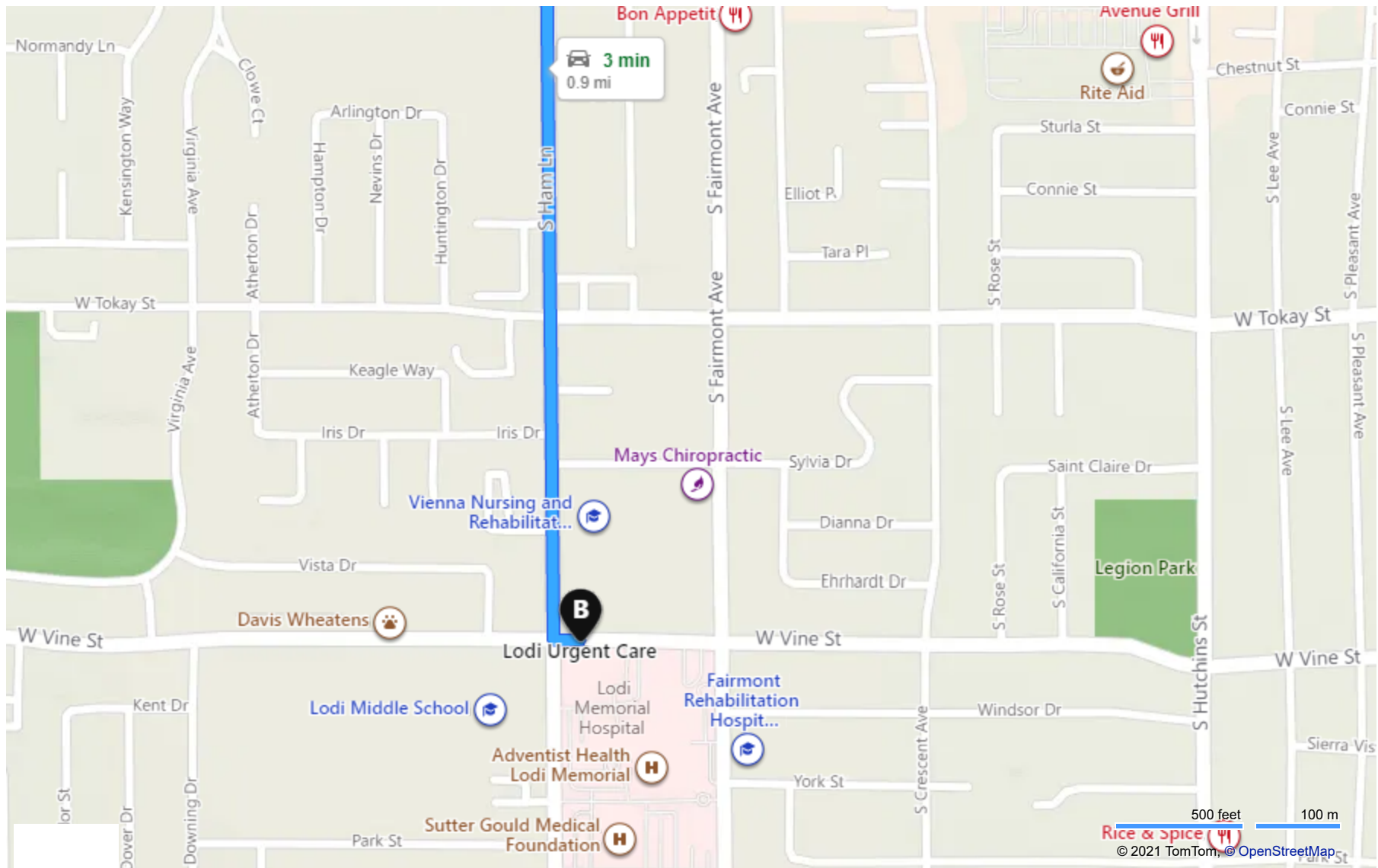
· Local roads



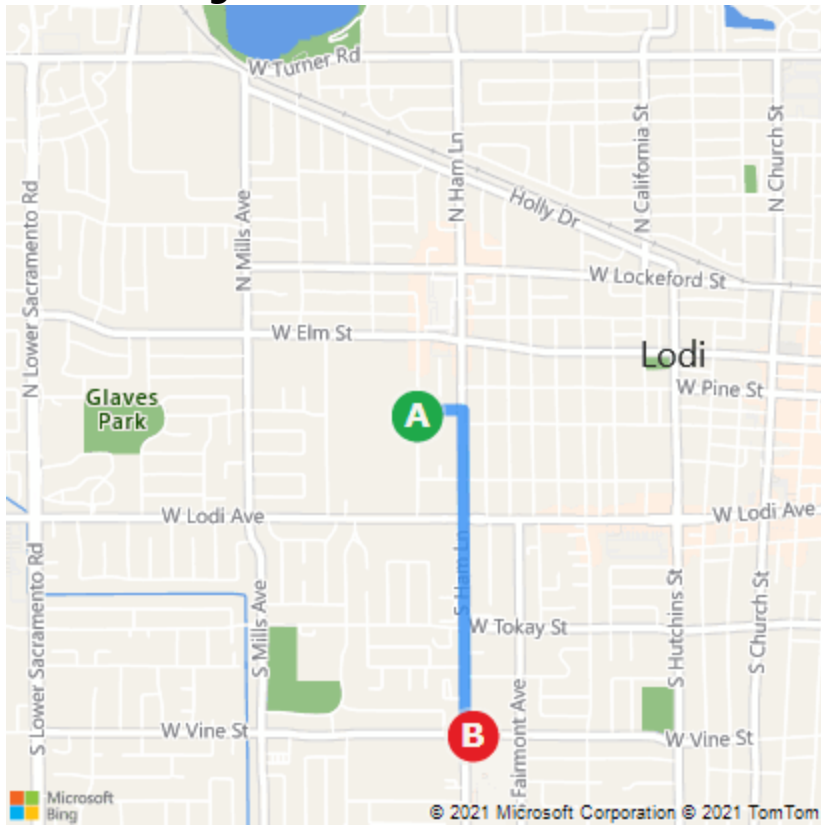
A Lodi High School

↑	1.	Head north on S Pacific Ave toward W Oak St	69 ft
↗	2.	Turn right onto W Oak St	0.1 mi
↗	3.	Turn right onto S Ham Ln	0.8 mi
↖	4.	Turn left onto W Vine St	105 ft
Arrive at W Vine St on the left			
	5.	The last intersection before your destination is S Ham Ln If you reach S Fairmont Ave, you've gone too far	

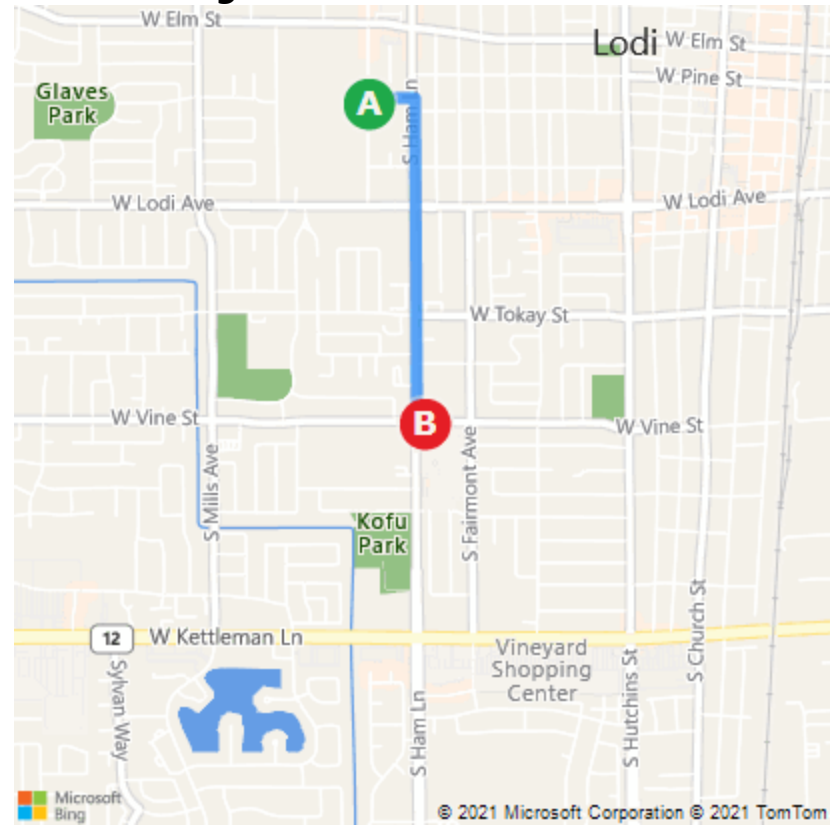
B Lodi Urgent Care



A Lodi High School, 3 S Pacific Ave, Lodi, CA...



B Lodi Urgent Care, 1235 W Vine St Ste 20, ...



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ATTACHMENT B

A

B

Lodi High School, 3 S Pacific Ave, Lodi, CA 95242

Emergency Room - St. Joseph's Medical Center, 1800 N California St, Stockton, CA 95204

23 min , 14.8 miles

Light traffic (Leave at 8:55 AM)

Via CA-99 S, N Wilson Way



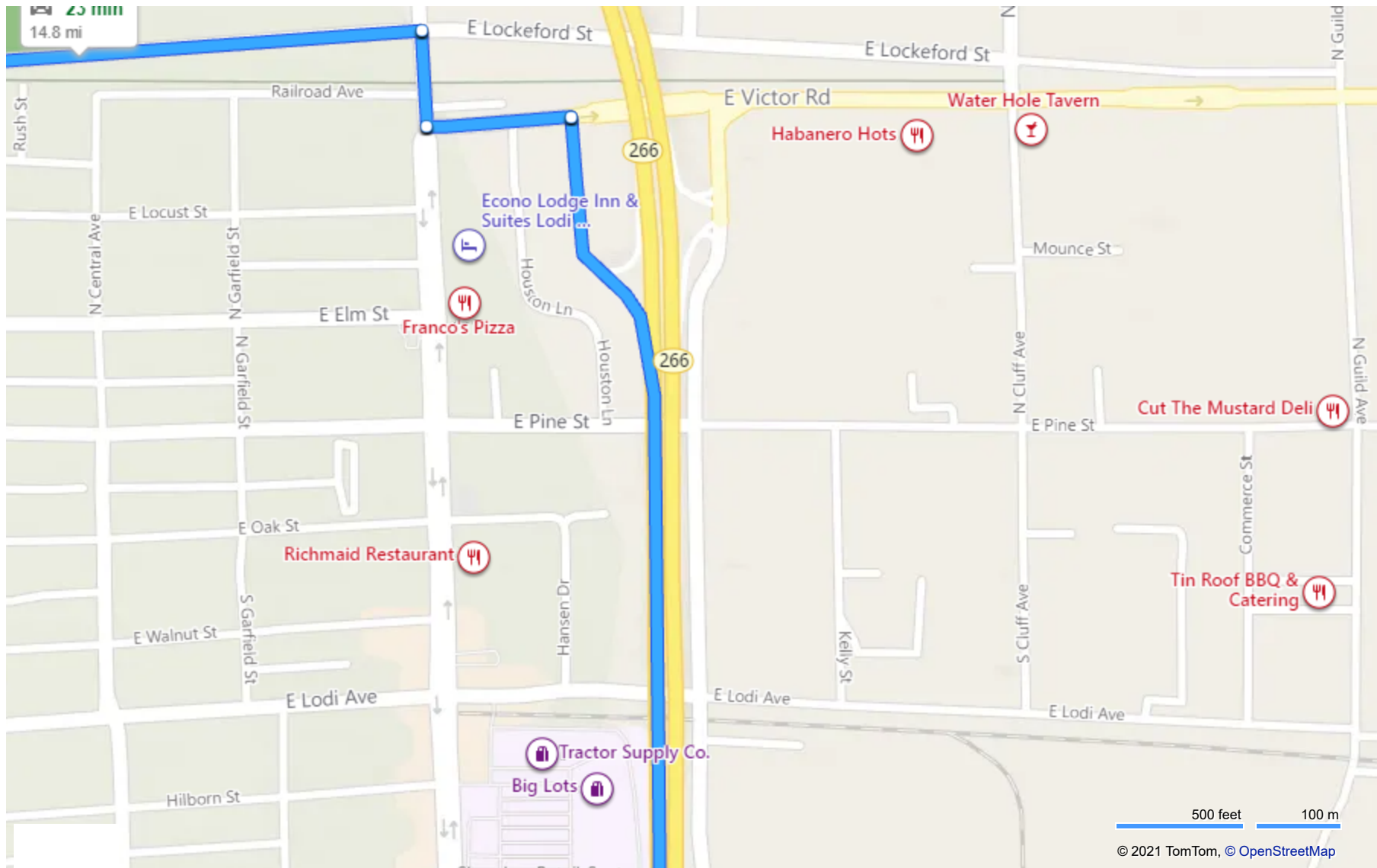
A

Lodi High School

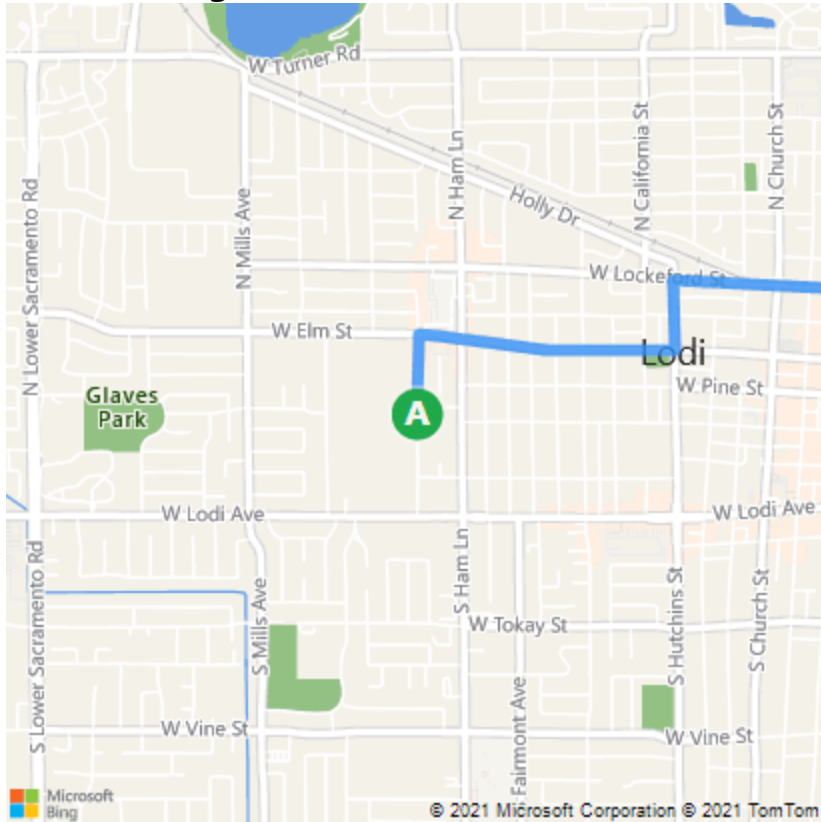
↑	1.	Head north on S Pacific Ave toward W Oak St	69 ft
↑	2.	Road name changes to N Pacific Ave	0.2 mi
↗	3.	Turn right onto W Elm St	0.6 mi
↖	4.	Turn left onto N Hutchins St	0.2 mi
↗	5.	Turn right onto W Lockeford St Mar-Val Food Stores on the corner	0.4 mi
↑	6.	Road name changes to E Lockeford St	0.6 mi
↗	7.	Turn right onto N Cherokee Ln	390 ft

	8. Turn left onto E Victor Rd Burger King on the corner	0.1 mi
	9. Take the ramp on the right for CA-99 and head toward Fresno Dayton Montgomery County on the corner	9.2 mi
	10. At Exit 257A , head right on the ramp for Wilson Way toward Central Stockton	0.2 mi
	11. Keep straight to get onto N Wilson Way	2.2 mi
	12. Turn right onto Bradford St	0.2 mi
	13. Turn left onto West Ln / County Hwy-J3	0.2 mi
	14. Turn right onto E Harding Way	0.6 mi
	15. Turn right onto N California St	0.1 mi
	Arrive at N California St on the right 16. The last intersection before your destination is E Maple St If you reach E Walnut St, you've gone too far	

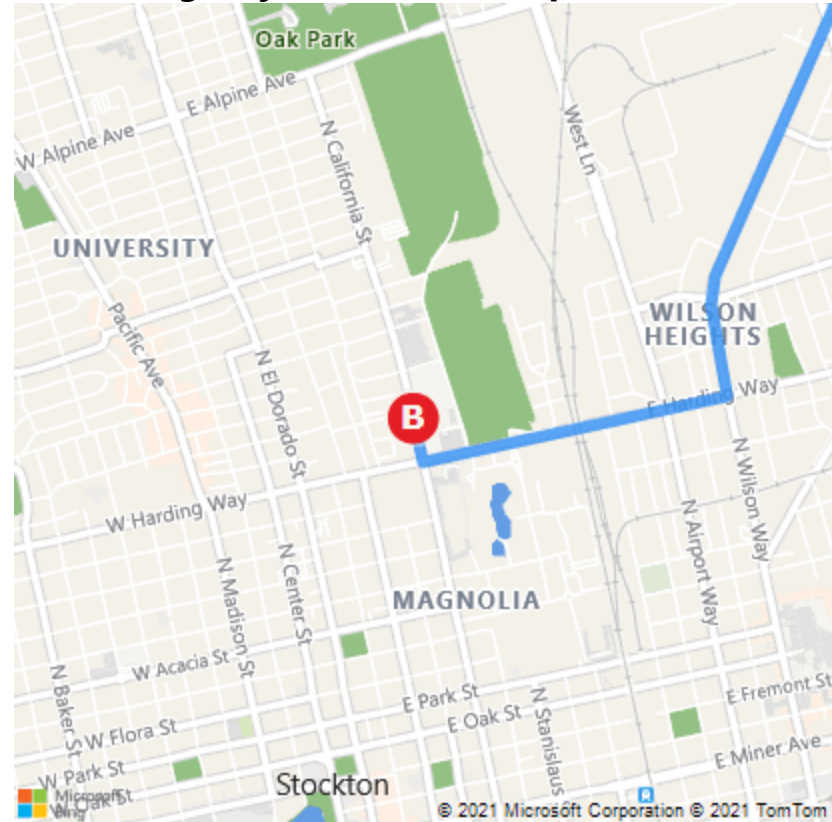
B Emergency Room - St. Joseph's Medical Center



A Lodi High School, 3 S Pacific Ave, Lodi, CA...



B Emergency Room - St. Joseph's Medical C...



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APPENDIX D



**QUALITY ASSURANCE PROJECT PLAN
REMOVAL ACTION WORKPLAN FOR THE
LODI HIGH SCHOOL - CAMPUS MODERNIZATION PROJECT
3 PACIFIC AVENUE & 31 N PACIFIC AVENUE
LODI, CALIFORNIA**



**PROJECT NUMBER: 2022-00008
JULY 15, 2022**

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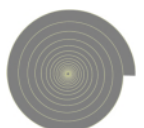


**QUALITY ASSURANCE PROJECT PLAN FOR PRELIMINARY ENVIRONMENTAL
ASSESSMENT
LODI HIGH SCHOOL – REMOVAL ACTION WORKPLAN PROJECT
3 PACIFIC AVENUE & 31 N PACIFIC AVENUE
LODI, CALIFORNIA**

The material and data in this report were prepared under the supervision and direction of the undersigned.

Tonya R. Scheftner, Project Geologist
B.Sc. Geology, GIT No. 685

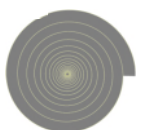
Daniel E. Kramer, President
Professional Geologist No. 865



**QUALITY ASSURANCE PROJECT PLAN
LODI HIGH SCHOOL REMOVAL ACTION WORKPLAN PROJECT**

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ATTACHMENT A

Quality Assurance Manual, McCampbell Analytical, Pittsburg, California

QUALITY ASSURANCE PROJECT PLAN

LODI HIGH SCHOOL – REMOVAL ACTION WORKPLAN PROJECT

LODI, CALIFORNIA

OUR PROJECT NO: 2022-00008

1.0 INTRODUCTION

This Quality Assurance Project Plan (QAPP) has been prepared by Petralogix Engineering Inc. (Petralogix) to address quality assurance (QA) and quality control (QC) policies associated with the collection of environmental data. Together with the workplan to which it is appended, this QAPP presents the plan for sampling and analysis performed under the direction of the California Environmental Protection Agency, Department of Toxic Substances Control (DTSC). U.S. Environmental Protection Agency (USEPA) policy requires a QAPP for all environmental data collection projects mandated or supported by the USEPA through regulations or other formalized means (USEPA, 2001). 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 at the site.

The sampling program is formally described in the workplan. This QAPP contains general and specific details regarding field sampling, laboratory, and analytical procedures. It 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 project decisions will be of the type and quality needed and expected for their intended purpose.

Guidelines followed in the preparation of this QAPP are described in EPA Requirements for Quality Assurance Plans for Environmental Data Operations, External Review Draft Final, EPA QA/R-5 (USEPA, 2001) and EPA Guidance for Quality Assurance Project Plans, EPA QA/G-5 (USEPA, 2002). Other documents that have been referenced in this plan include Guidance for the Data Quality Objectives Process, EPA QA/G-4 (USEPA, 2001) and Test Methods for Evaluating Solid Waste, Physical/Chemical Methods (USEPA, SW-846, Third Edition, 2014).

2.0 PROJECT DESCRIPTION

This section presents information concerning the proposed sampling activities, selected analytical parameters, data objectives, and the resulting project decisions. The workplan provides specifications for field activities

2.1 Analytical Scope

The planned sampling plan to be implemented, analytical methods to be utilized, and analytical laboratories to be retained are described in the workplan.

2.2 Data Use

Decisions to be made based upon 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. This data will be used to characterize the nature and extent of any found contamination, support risk assessment, 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 chemicals of potential concern (COPCs) are confirmed, the data will be used to further delineate the site with respect to the COPCs and to assess risk using accepted methods for determining potential carcinogenic and non-carcinogenic exposures. If results from the risk screening evaluations indicate no risks of exposure with respect to the proposed use of the property, then LUSD will use the data to support the conclusion that students and staff may occupy modernized areas built on the site. If the evaluation indicates unacceptable risks of exposure, then the data can be used by LUSD for further consideration of action. The data may be used in a similar manner to fulfill landfill acceptance criteria.

3.0 LABORATORY SERVICES

The primary offsite laboratory to be employed is listed in the workplan. The laboratory will perform analytical testing for the soil samples collected for this investigation. The laboratory project manager will report to Petralogix staff on all aspects of the sample analysis. In addition, Petralogix will 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 Quality Assurance Manuals, attached at the end of this document.

4.0 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, 2001). DQOs specify the data type, quality, quantity, and uses needed to make decisions, and are the basis for designing data collection activities. The DQOs have been used to design the data collection activities presented in the RAW. 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 USEPA's seven-step DQO process (USEPA, 2006). The Project Manager will evaluate the project DQOs to determine if 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 can be summarized as follows:

State the Problem: The purpose of the sampling program is to assess the quality of soil at the proposed school site with regard to past uses of the site and vicinity.

Identify the Goal of the Study: The data obtained from the sampling and testing activities will be used to evaluate whether the soil meets DTSC's requirements as stated in the *Interim Guidance for*

Sampling Agricultural Fields for School Sites, Third Revision (2008) and other DTSC guidance for school assessment, such as 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 (DTSC 2006).

Identify Inputs to the Decision: Inputs to the decision will include results of analytical testing of soil from selected locations on the site.

Define the Study Boundaries: The boundaries of the field sampling and analysis program will be the Response Area designated in the DTSC's Site Approval.

Develop a Decision Rule: Decisions will be based upon laboratory results for the target constituents. If no valid detectable concentrations of target compounds are reported for the given samples, then a decision will be made that the site is fully characterized with respect to the compounds tested and no further sampling will be required. If target constituents are detected in the samples tested, then the data will be compiled for use in calculating the human health and ecological risk of exposure. The results of the risk evaluation will be used by LUSD to evaluate further actions.

Specify Limits on Decision Error: The results of all analytical testing will be subjected to data validation. 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 and assessing the necessity for reducing any risks posed by the potential contamination.

Optimize the Design: The workplan has been designed to provide the type and quantity of data needed to satisfy each of the aforementioned objectives. The workplan provides the specifications for the data collection activities, including the numbers of samples, respective locations, and sampling techniques. 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 quality control samples, such as duplicate control samples (LCSD or DCS), 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 quality control samples exceeds 30 percent, data will be qualified as described in the applicable 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, and X_2 is the larger 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). The percent recovery control limits are defined either by the analytical method or by the laboratory through use of statistical methods. 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 unspiked sample, and T is the true value of the spiked solution.

If specified in the workplan, field accuracy will be assessed through the analysis of field equipment and trip blanks. Analysis of blanks will monitor errors associated with the sampling process, field contamination, sample preservation, and sample handling. 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 or trip 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 represent 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 workplan, 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 soil, 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, determines 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 California Department of Health Services (CADOHS). This QAPP addresses comparability by specifying laboratory methods that are consistent with the current standards of practice as approved by the USEPA and CADOHS. Field methods are discussed in the workplan.

5.0 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 that 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 QC materials.

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, as necessary based on sampling methods, to monitor for contamination of samples in the field or the laboratory
- Collection and laboratory analysis of matrix spike, matrix spike duplicate, and field duplicate samples to evaluate precision and accuracy, and
- Attainment of completeness goals.

5.1.1 Equipment Decontamination

Prior to each sample collection, non-dedicated equipment will be washed in a solution of Liqui-Nox detergent or equivalent and water and rinsed once with tap water and once with distilled water. Cleaning will be conducted in such a manner so as to contain the water, which will be placed in appropriate containment vessels, labeled, sealed, and stored prior to disposal. Disposal methodologies will be contingent upon field observations and/or analytical results.

5.1.2 Standards

Standards used for calibration or to prepare samples will be certified by NIST, 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 will be labeled with expiration dates and will reference primary standard sources if applicable. Expired standards will be discarded.

5.1.3 Supplies

All supplies will 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 as needed.

5.1.4 Holding Time Compliance

Sample preparation and analysis will be completed within the required method holding times. 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 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-analyses.

5.1.5 Preventative Maintenance

Petralogix staff will be responsible for documenting the maintenance of all field equipment as prescribed in the manufacturer's specifications. Scheduled maintenance will be performed by trained personnel. The analytical laboratory is responsible for all analytical equipment calibration and maintenance as described in their laboratory QA Manual. Subcontractors are responsible for maintenance of all equipment needed to carry out subcontracted duties, and equipment rental providers are responsible for maintenance of equipment at the time of rental.

5.2 Quality Assurance and Quality Control (QA/QC) Samples

The purpose of this QA/QC program is to produce data of known quality that satisfy the project objectives and that 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 QC materials. QA/QC samples will be collected as part of the overall QA/QC program.

5.2.1 Matrix Spike Samples

Matrix spikes 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 sample. The sample is extracted and analyzed. The results of the analysis are compared with the known additions and a matrix spike recovery is calculated giving an evaluation of the accuracy of the extraction and analysis procedures. Matrix spike recoveries are reviewed to check that they are within acceptable range. However, the acceptable 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 twenty, or 5 percent of the primary field samples. Typically, matrix spikes 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.

5.2.2 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. Specific locations will be designated for collection of field duplicates prior to the start of field activities. Field duplicates will be collected at a frequency of at least 10 percent of the primary samples collected for each analyte of interest. The duplicate sample will be analyzed for all laboratory analyses requested for the primary sample collected. The precision goal for field duplicate analyses will be 100 percent relative percent difference for soil samples.

6.0 SAMPLING PROCEDURES

The defensibility of data is dependent 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 workplan.

6.2 Sample Containers, Preservation, and Holding Times

The laboratory will provide sample containers in sealed cases with cleanliness certifications.

Sample preparation and analysis will be completed within the required method holding times. 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 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-analyses.

Sample preservation both before and after relinquishment into laboratory custody will be compared to the acceptable preservation and holding methods described in this workplan. If any inconsistencies are detected, the data will be qualified as described in the applicable validation procedure.

6.3 Sample Handling and Storage

In the field, each soil sample container will be marked with the sampling location number and date and time of sample collection. All soil sample containers will be wiped with paper towels and securely packed, in a cooler on ice, in preparation for delivery to the laboratory.

Upon receipt of the samples, the laboratory will immediately notify Petralogix staff if conditions or problems are identified which require immediate resolution. Such conditions include container breakage, missing or improper chain-of-custody, 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. 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. If a professional courier service is used, 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 coolers, the cooler will be appropriately sealed before it is 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 chain-of-custody or similar forms.

7.0 ANALYTICAL PROCEDURES

7.1 Retention Time Windows

Retention times will be checked on a daily basis. Acceptance criteria for retention time windows are established in the referenced method. If the retention time falls outside the respective window, actions 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 reanalyzed.

7.2 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 40CFR 136 Appendix B (USEPA, 1990). USEPA requires that MDLs be established on an annual basis. MDLs must be less than applicable reporting limits for each target analyte.

8.0 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 notebooks, laptops, 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 Project 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. Documentation requirements for laboratory data are defined in *USEPA Region 9 Draft Laboratory Documentation Requirements for Data Validation (USEPA, 1997)*. The offsite laboratory reports will be consistent with USEPA Level IV documentation and include the following data and summary forms:

- Narrative, cross-reference, chain of custody, and method references
- Analytical results
- Surrogate recoveries (as applicable)
- Calibration summary
- Blank results
- Laboratory control sample recoveries
- Duplicate sample results or duplicate spike recoveries
- Sample spike recoveries
- Electronic submission upon request

Data validation criteria are derived from the *USEPA Contract Laboratory Program National Functional Guidelines for Organic and Inorganic Data Review (USEPA, 2007)*. The *National Functional Guidelines* provide specific data validation criteria that can be applied to data generated for this investigation.

The laboratory data will be reviewed for compliance with the applicable method and the quality of the data reported. The following summarizes the areas of data validation.

- Data Completeness
- Holding Times
- Calibrations
- Blanks
- Laboratory Control Samples
- Matrix Spike/Matrix Spike Duplicates
- Surrogates/Internal Standards (as applicable)
- Field Quality Control Samples
- Compound Identification and Quantification

The application of data validation criteria is a function of project specific DQOs. Petralogix staff will determine if the data quality objectives for the analytical data have been met.

9.0 REFERENCES

- DTSC, 2008. State of California Environmental Protection Agency, Department of Toxic Substances Control, Interim Guidance for Sampling Agricultural Fields for School Sites (Second Revision).
- 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.
- USEPA, 1990. Code of Federal Regulations, Title 40 – Protection of Environment. Office of the Federal Register. U.S. National Archives and Records Administration, Washington, D.C.
- USEPA, 2006. Guidance for the Data Quality Objectives Process. EPA QA/G-4. Office of Research and Development U.S. Environmental Protection Agency. Washington, D.C.
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- USEPA, 1997. Draft Laboratory Documentation Requirements for Data Validation. Document Control No. 9QA-07-90. U.S. Environmental Protection Agency, Region 9. San Francisco, California.
- USEPA, 2002. EPA Guidance for Quality Assurance Project Plans. EPA/600/R-98/018 (EPA QA/G-5). Office of Research and Development U.S. Environmental Protection Agency. Washington, D.C.
- USEPA, 2001. EPA Requirements for Quality Assurance Project Plans for Environmental Data Operations, External Review Draft Final. EPA/600/R-98/018 (EPA QA/G-5). Washington, D.C.



APPENDIX E

Information Advisory

Clean Imported Fill Material



October 2001

DEPARTMENT OF TOXIC SUBSTANCES CONTROL

It is DTSC's mission to restore, protect and enhance the environment, to ensure public health, environmental quality and economic vitality, by regulating hazardous waste, conducting and overseeing cleanups, and developing and promoting pollution prevention.

State of California



California
Environmental
Protection Agency



Executive Summary

This fact sheet has been prepared to ensure that inappropriate fill material is not introduced onto sensitive land use properties under the oversight of the DTSC or applicable regulatory authorities. Sensitive land use properties include those that contain facilities such as hospitals, homes, day care centers, and schools. This document only focuses on human health concerns and ecological issues are not addressed.

It identifies those types of land use activities that may be appropriate when determining whether a site may be used as a fill material source area. It also provides guidelines for the appropriate types of analyses that should be performed relative to the former land use, and for the number of samples that should be collected and analyzed based on the estimated volume of fill material that will need to be used. The information provided in this fact sheet is not regulatory in nature, rather is to be used as a guide, and in most situations the final decision as to the acceptability of fill material for a sensitive land use property is made on a case-by-case basis by the appropriate regulatory agency.

Introduction

The use of imported fill material has recently come under scrutiny because of the instances where contaminated soil has been brought onto an otherwise clean site. However, there are currently no established standards in the statutes or regulations that address environmental requirements for imported fill material. Therefore, the California Environmental Protection Agency, Department of Toxic Substances Control (DTSC) has prepared this fact sheet to identify procedures that can be used to minimize the possibility of introducing contaminated soil onto a site that requires imported fill material. Such sites include those that are undergoing site remediation, corrective action, and closure activities overseen by DTSC or the appropriate regulatory agency. These procedures may also apply to construction projects that will result in sensitive land uses. The intent of this fact sheet is to protect people who live on or otherwise use a sensitive land use property. By using this fact sheet as a guide, the reader will minimize the chance of introducing fill material that may result in potential risk to human health or the environment at some future time.

The energy challenge facing California is real. Every Californian needs to take immediate action to reduce energy consumption. For a list of simple ways you can reduce demand and cut your energy costs, see our website at www.dtsc.ca.gov.

Overview

Both natural and manmade fill materials are used for a variety of purposes. Fill material properties are commonly controlled to meet the necessary site specific engineering specifications. Because most sites requiring fill material are located in or near urban areas, the fill materials are often obtained from construction projects that generate an excess of soil, and from demolition debris (asphalt, broken concrete, etc.). However, materials from those types of sites may or may not be appropriate, depending on the proposed use of the fill, and the quality of the assessment and/or mitigation measures, if necessary. Therefore, unless material from construction projects can be demonstrated to be free of contami-

nation and/or appropriate for the proposed use, the use of that material as fill should be avoided.

Selecting Fill Material

In general, the fill source area should be located in nonindustrial areas, and not from sites undergoing an environmental cleanup. Nonindustrial sites include those that were previously undeveloped, or used solely for residential or agricultural purposes. If the source is from an agricultural area, care should be taken to insure that the fill does not include former agricultural waste process byproducts such as manure or other decomposed organic material. Undesirable sources of fill material include industrial and/or commercial sites where hazardous ma-

Potential Contaminants Based on the Fill Source Area

Fill Source:	Target Compounds
Land near to an existing freeway	Lead (EPA methods 6010B or 7471A), PAHs (EPA method 8310)
Land near a mining area or rock quarry	Heavy Metals (EPA methods 6010B and 7471A), asbestos (polarized light microscopy), pH
Agricultural land	Pesticides (Organochlorine Pesticides: EPA method 8081A or 8080A; Organophosphorus Pesticides: EPA method 8141A; Chlorinated Herbicides: EPA method 8151A), heavy metals (EPA methods 6010B and 7471A)
Residential/acceptable commercial land	VOCs (EPA method 8021 or 8260B, as appropriate and combined with collection by EPA Method 5035), semi-VOCs (EPA method 8270C), TPH (modified EPA method 8015), PCBs (EPA method 8082 or 8080A), heavy metals including lead (EPA methods 6010B and 7471A), asbestos (OSHA Method ID-191)

**The recommended analyses should be performed in accordance with USEPA SW-846 methods (1996). Other possible analyses include Hexavalent Chromium: EPA method 7199*

Recommended Fill Material Sampling Schedule

Area of Individual Borrow Area

Sampling Requirements

2 acres or less

Minimum of 4 samples

2 to 4 acres

Minimum of 1 sample every 1/2 acre

4 to 10 acres

Minimum of 8 samples

Greater than 10 acres

Minimum of 8 locations with 4 subsamples per location

Volume of Borrow Area Stockpile

Samples per Volume

Up to 1,000 cubic yards

1 sample per 250 cubic yards

1,000 to 5,000 cubic yards

4 samples for first 1000 cubic yards +1 sample per each additional 500 cubic yards

Greater than 5,000 cubic yards

12 samples for first 5,000 cubic yards + 1 sample per each additional 1,000 cubic yards

terials were used, handled or stored as part of the business operations, or unpaved parking areas where petroleum hydrocarbons could have been spilled or leaked into the soil. Undesirable commercial sites include former gasoline service stations, retail strip malls that contained dry cleaners or photographic processing facilities, paint stores, auto repair and/or painting facilities. Undesirable industrial facilities include metal processing shops, manufacturing facilities, aerospace facilities, oil refineries, waste treatment plants, etc. Alternatives to using fill from construction sites include the use of fill material obtained from a commercial supplier of fill material or from soil pits in rural or suburban areas. However, care should be taken to ensure that those materials are also uncontaminated.

Documentation and Analysis

In order to minimize the potential of introducing contaminated fill material onto a site, it is necessary

to verify through documentation that the fill source is appropriate and/or to have the fill material analyzed for potential contaminants based on the location and history of the source area. Fill documentation should include detailed information on the previous use of the land from where the fill is taken, whether an environmental site assessment was performed and its findings, and the results of any testing performed. It is recommended that any such documentation should be signed by an appropriately licensed (CA-registered) individual. If such documentation is not available or is inadequate, samples of the fill material should be chemically analyzed. Analysis of the fill material should be based on the source of the fill and knowledge of the prior land use.

Detectable amounts of compounds of concern within the fill material should be evaluated for risk in accordance with the DTSC Preliminary Endangerment Assessment (PEA) Guidance Manual. If

metal analyses are performed, only those metals (CAM 17 / Title 22) to which risk levels have been assigned need to be evaluated. At present, the DTSC is working to establish California Screening Levels (CSL) to determine whether some compounds of concern pose a risk. Until such time as these CSL values are established, DTSC recommends that the DTSC PEA Guidance Manual or an equivalent process be referenced. This guidance may include the Regional Water Quality Control Board's (RWQCB) guidelines for reuse of non-hazardous petroleum hydrocarbon contaminated soil as applied to Total Petroleum Hydrocarbons (TPH) only. The RWQCB guidelines should not be used for volatile organic compounds (VOCs) or semi-volatile organic compounds (SVOCS). In addition, a standard laboratory data package, including a summary of the QA/QC (Quality Assurance/Quality Control) sample results should also accompany all analytical reports.

When possible, representative samples should be collected at the borrow area while the potential fill material is still in place, and analyzed prior to removal from the borrow area. In addition to performing the appropriate analyses of the fill material, an appropriate number of samples should also be determined based on the approximate volume or area of soil to be used as fill material. The table above can be used as a guide to determine the number of samples needed to adequately characterize the fill material when sampled at the borrow site.

Alternative Sampling

A Phase I or PEA may be conducted prior to sampling to determine whether the borrow area may have been impacted by previous activities on the property. After the property has been evaluated, any sampling that may be required can be determined during a meeting with DTSC or appropriate regulatory agency. However, if it is not possible to analyze the fill material at the borrow area or determine that it is appropriate for use via a Phase I or PEA, it is recommended that one (1) sample per truckload be collected and analyzed for all com-

pounds of concern to ensure that the imported soil is uncontaminated and acceptable. (See chart on Potential Contaminants Based on the Fill Source Area for appropriate analyses). This sampling frequency may be modified upon consultation with the DTSC or appropriate regulatory agency if all of the fill material is derived from a common borrow area. However, fill material that is not characterized at the borrow area will need to be stockpiled either on or off-site until the analyses have been completed. In addition, should contaminants exceeding acceptance criteria be identified in the stockpiled fill material, that material will be deemed unacceptable and new fill material will need to be obtained, sampled and analyzed. Therefore, the DTSC recommends that all sampling and analyses should be completed prior to delivery to the site to ensure the soil is free of contamination, and to eliminate unnecessary transportation charges for unacceptable fill material.

Composite sampling for fill material characterization may or may not be appropriate, depending on quality and homogeneity of source/borrow area, and compounds of concern. Compositing samples for volatile and semivolatile constituents is not acceptable. Composite sampling for heavy metals, pesticides, herbicides or PAH's from unanalyzed stockpiled soil is also unacceptable, unless it is stockpiled at the borrow area and originates from the same source area. In addition, if samples are composited, they should be from the same soil layer, and not from different soil layers.

When very large volumes of fill material are anticipated, or when larger areas are being considered as borrow areas, the DTSC recommends that a Phase I or PEA be conducted on the area to ensure that the borrow area has not been impacted by previous activities on the property. After the property has been evaluated, any sampling that may be required can be determined during a meeting with the DTSC.

For further information, call Shahir Haddad, P.E. at (714) 484-5368.