HILLMANN
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SOIL MANAGEMENT PLAN

700 NORTH SUNNYSIDE AVENUE, SIERRA MADRE, CALIFORNIA 91024

Prepared For:

Toll Brothers
9301 Corbin Avenue, Suite 1200
Irvine, California 92612

Hillmann Project Number C3-10722

January 27, 2026
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Written By:
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1.0 INTRODUCTION

Hillmann Consulting, LLC (Hillmann) has prepared this Soil Management Plan (SMP) for the proposed development at 700 North Sunnyside Avenue, Sierra Madre, California 91024. The Subject Property includes two (2) parcels that together occupy approximately 20 acres and is a part of a larger retreat center. The Subject Property is located in the northern portion of a primarily residential area with residences located to the west and south of the site **(Figure 1).** The layout of the site is depicted on **Figure 2**. The objective of this SMP is to provide a framework for handling contaminated soil that could conceivably be encountered during grading and excavation.

2.0 BACKGROUND

The Subject Property Records indicate the Property has been used as agricultural land until 1964 and an orchard was present at the small northeast corner until circa 2020. Additionally, Hillmann noted that historical records identified a former 500-gallon leaded gasoline UST located at a north adjoining maintenance building that was removed in 1992. During the removal of the UST, soil samples were taken at the base of the UST and the dispenser island and were analyzed for Total Petroleum Hydrocarbons (TPH), Benzene, Toluene, Ethylbenzene, Total Xylenes and Organic Lead. The results of the soil analysis reported non-detect for the constituents analyzed. Based on these results, the Los Angeles County Public Works Department granted the site a Closure Certification on January 4, 1993.

Due to the concern of hazardous substances released from historical operations, in June 2020, Stantec conducted and completed a Limited Phase II Subsurface Investigation at the Property that included shallow soil boring in thirty-three (30) targeted locations across the site, that were composited into eight (8) soil samples. Additionally, two (2) soil vapor borings were advanced to 5 feet and samples were collected along the border of the maintenance building where the former UST was located and tested for VOCs by USEPA TO-15. The soil samples were analyzed for organochlorine pesticides by EPA Method 8081A and arsenic/lead by EPA. Results from the composite soil sampling indicated that no organochlorine pesticides were detected in any of the soil samples collected from the areas of historical agricultural activities. The heavy metals analysis indicated several detections of heavy metals. Most notably lead was detected with a max concentration of 32 milligrams per kilogram (mg/Kg) and arsenic with a max concentration of 5.8 mg/Kg. The detected concentrations were compared against the United States Environmental Protection Agency (USEPA) Regional Screening Level (RSL) for residential use of 480 mg/kg for lead, and also below the Department of Toxic Substances Control (DTSC) Human and Ecological Risk Office (HERO) residential screening level of 80 mg/kg for lead. The concentration of arsenic is above the USEPA RSL for residential use of 0.68 mg/kg, but within the DTSC's established Southern California background concentration of 12 milligrams per kilogram (mg/kg).

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use. Based on the results of the soil vapor investigation, the consultant for the prior owner concluded that no additional sampling was warranted, and that the property was suitable for residential development. Hillmann concurs with that assessment of those results.

In January 2026, Hillmann conducted an additional subsurface investigation on the Subject Property. The investigation was conducted at the request of the owners due to recent fires in the area having affected structures nearby and on the Subject Property. Given the potential impacts on the shallow soil due to contamination from ash and debris generated by the high-temperature combustion of electrical equipment, appliance, plastics, wood, lead-based paint, and other household materials, Hillmann proposes conducting confirmation sampling on the property. The sampling was conducted in accordance with the recommended guidelines established by the California Department of Public Health (CDPH) and CalRecycle.

On January 12, 2026, Hillmann conducted shallow soil sampling at the Subject Property, which included the advancement of eighty-nine (89) soil borings. Samples were collected using a hand auger, shovel, or soil sampling spatula. Five-point composite samples were collected from 0 to 6 inches below ground surface, and four-point composite samples were collected from 0.5 to 1.5 feet below ground surface. Five-point composites were collected in areas proximal to ash footprints of former structures along the western property boundary and former maintenance structures, while four-point composites were collected in other areas to characterize background metal concentrations. Composite samples were prepared in the field by combining material from five (5) or four (4) adjacent sampling locations into a single sample container, with approximately equal weight and volume from each discrete location. All soil samples were placed into laboratory-supplied jars, sealed with plastic end caps, and stored on ice prior to laboratory analysis. Five-point composites were analyzed for Title 22 metals (EPA Method 6020), including arsenic, cobalt, and lead, as well as benzo(a)pyrene and naphthalene (EPA Method 8270C) and dioxin toxic equivalency (Dioxin-TEQ; EPA Method 8290). Four-point composites were analyzed for Title 22 metals by EPA Method 6020, including arsenic, cobalt, and lead.

The results from heavy metal analysis indicated low level detections of arsenic, cobalt, and lead. However, none of the shallow samples had concentrations greater than current residential screening levels or background levels in the case of arsenic. The results of the SVOCs and Dioxins indicated non-detect values for both Benzo(a) Pyrene and Naphthalene in all the fire sample results. Dioxins were found in all the fire samples, however only one (1) sample FS-2 was found to be above residential screening levels for Dioxin TEQ. Based on the laboratory analysis results Hillmann recommended supplemental soil sampling within the areas surrounding the grid FS-2.

On January 20, 2026, in order to further delineate the potential horizontal impacts as a result of the fires, Hillmann conducted supplemental soil sampling in the areas denoted by S-1 and S-2. The sampling was conducted in accordance with the recommended guidelines established by the California Department of Public Health (CDPH) and CalRecycle. Samples were collected using a hand auger, shovel, or soil sampling spatula from 0 to 6 inches below ground surface, Ten (10) soil borings were advanced in the areas of S-1 and S-2 and composited into two (2) samples, S-1R and S-2R, respectively. The samples were analyzed for dioxin toxic equivalency (Dioxin-TEQ; EPA Method 8290). The results of the Dioxin analysis indicated that both, S-1R and S-2R had detectable concentrations of dioxins, however, neither sample showed concentrations above

the applicable residential screening levels. **Table 1** shows the reported concentrations compared to their applicable screening levels. The full analytical results of the soil sampling events are available in **Appendix B.**

Based on the results of the shallow soil sampling, Hillmann recommends spot excavation in the area of FS-2, coupled with confirmation testing and proper handling and disposal of the dioxin contaminated material. If the results from confirmation testing indicate the material has been adequately removed, the grading plan for the site can be initiated and performed under the guidance of a Soil Management Plan (SMP) for the site that provides a framework for handling impacted soil that conceivably could be encountered during site excavation activities.

Therefore, it was recommended that a Soil Management Plan be developed and implemented during construction activities to address proper response actions in the event that any impacted soils are encountered during redevelopment.

3.0 SOIL MANAGEMENT PROCEDURES FOR CONSTRUCTION

The following procedures will be implemented during site construction to minimize impacts to the environment and to protect workers during on-site activities. This SMP will be implemented during excavation and site grading tasks.

3.1 Soil Monitoring

Based on the past use of the Property, it is possible that volatile contaminants may be present in the soil that could impact the environment and on-site workers during excavation tasks. A potential health and safety hazard posed by this project is the possibility of inhalation of volatile vapors and dusts that could be released from the soil and/or soil gas and could potentially contain hazardous constituents. Due to the possibly of exposure, excavations conducted in contaminated areas should be conducted by qualified personnel with a minimum of 40-hour HAZWOPER Training.

The greatest potential for exposure exists during excavation and grading, where fugitive vapors and dusts could be admitted to the atmosphere and personnel could come in contact with vapors containing these constituents. The following steps will be taken to mitigate this potential risk.

During excavation tasks, a photo-ionization detector (PID) shall be on site at all times during grading. The PID shall be maintained in good working order, and shall be calibrated by the manufacturer at least once every three months and by experienced personnel on a daily basis. The calibration of the device shall be verified using hexane or isobutylene calibration gas at the beginning of each working day. In the event that inconsistent or erratic readings are experienced, or the PID becomes otherwise inoperable, all excavation activities will cease until it is repaired or replaced.

All monitoring shall be conducted by an environmental professional or trained personnel who are proficient in the use of the PID. All monitoring shall be conducted at a distance no more than 3 inches above the soil surface using the PID. Monitoring shall be initially conducted at a

minimum frequency of one reading every fifteen minutes. Upon detection of VOC contamination, monitoring shall be conducted at a minimum rate of one reading for every five cubic yards excavated. All readings shall be taken no later than three minutes after each load of soil is excavated. Written records of PID monitoring and calibrations shall be kept in a format approved by the SCAQMD. The certification on all records shall be signed and dated on the day the measurements are observed. Upon detection of VOC-contaminated soil (defined by PID readings 50 ppm or greater), the SCAQMD shall be notified within 24 hours.

Although not expected during this project, any VOC-contaminated soil greater than 1000 ppmV shall be immediately stockpiled, covered with plastic sheeting and stored separately from non-VOC-contaminated soil. Once excavated, contaminated soil under these conditions will be considered contaminated at all times and will not be backfilled. A VOC-contaminated stockpile shall not contain more than 500 cubic yards of soil. If the PID measurement is greater than 50 ppm, but less than 1000 ppm, the affected work area and load of soil shall be sprayed with water to suppress vapors. The contaminated soil in stockpiles shall be covered with plastic sheeting and secured so that no portion of the contaminated soil is exposed to the atmosphere. If the PID measurement is greater than 1000 ppm, excavation shall be halted and the SCAQMD will be notified within one hour.

Although VOCs may be present, the primary contaminants of concern during excavation activities are dioxins and heavy metals (primarily arsenic and lead) in soil dust as a result of the recent fires. To minimize potential exposure and migration, affected soils and active work areas will be immediately sprayed with water to reduce dust dispersal in air. Any contaminated soil that is stockpiled will be covered with plastic sheeting and remain covered and undisturbed until sampled or removed from the site.

Soil segregated as potentially impacted, including soils exhibiting PID reading greater than ppmV, visible discoloration, or other indication of impact regardless of PID response, will be managed conservatively and treated as potentially impacted material. Impacted soil stockpiles will be sampled at a frequency of one sample per 250 cubic yards for waste profiling to support appropriate handling and disposal. The waste samples will be analyzed for Total Petroleum Hydrocarbons (TPH) as gasoline, diesel, and motor oil ranges; Volatile Organic Compounds (VOCs) via EPA Method 8260; Semi-Volatile Organic Compounds (SVOCs) via EPA Method 8270; Title 22 Metals; Pesticides and Polychlorinated Biphenyls (PCBs).

All segregated impacted soils will be removed from the site unless specifically approved for on-site reuse. Any soils meeting the criteria for hazardous waste will be disposed of in accordance with all applicable regulatory requirements

3.2 Soil Sampling

If the soil monitoring program indicates any areas of impacted soil, the location will be carefully marked with temporary flags and an area of 25 feet by 25 feet will be cordoned off. The native soil in the cordoned area will be sampled by establishing a rough grid and obtaining four (4) soil samples from a depth of 1-2 feet below the current grade level. Additionally, one sample will be taken from 0 to 6 inches below grade in the potentially impacted area.

The samples will be obtained using hand drilling tools that will be carefully marked within the cordoned area with temporary flags. The objective of this initial portion of the program is to provide a reasonable indication on the lateral extent of potentially impacted soil before exposure of potentially significant contamination. This program will also be useful in determining if a false positive has been encountered.

Soil samples will be preserved using ice pending delivery to the laboratory. Proper chain of custody will be observed from sample collection through laboratory analysis. The deeper samples at 1-2 feet will be laboratory analyzed for Total Petroleum Hydrocarbons (TPH) as gasoline, diesel, and motor oil ranges and VOCs by EPA Methods 8015M and 8260B, for benzo(a)pyrene and naphthalene (EPA Method 8270C), as well as for arsenic and lead (Title 22 CAM). The shallow samples at 0-6 inches below grade will be analyzed for dioxin toxic equivalency (Dioxin-TEQ; EPA Method 8290), benzo(a)pyrene and naphthalene (EPA Method 8270C) as well as arsenic and lead (Title 22 CAM). These results will be made available so that decisions can be made regarding the significance of the potential contamination and the need for additional and deeper sampling.

3.3 Removal of Dioxin Impacted Soil at Location FS-2

Soil analytical results indicate that dioxin concentrations at sample location FS-2 exceeded the applicable residential screening level of 4.8E-06 established by the EPA Region IX Regional Screening Levels for residential soil. To address this exceedance, approximately 100 cubic yards of impacted soil are planned for removal from the vicinity as FS-2. The area of the targeted location is approximately 40 feet by 115 feet and the excavation will extend laterally and vertically until confirmation sampling indicates that residual soil concentrations are below the established screening levels. An environmental professional will collect confirmation samples base and sidewalls of the excavation to verify that cleanup goals have been achieved. The location of sample FS-2 is depicted in **Figure 3**.

If any confirmation sample results exceed the cleanup target concentrations, additional excavation will be conducted in the affected area until confirmation sampling verifies that remaining soils meet the target criteria. The excavated dioxin-impacted soils will be stockpiled on-site on plastic-lined areas, covered with plastic sheeting, and subsequently containerized in sealed, DOT-approved bins for off-site transport or hauled off by covered truck.

The waste soil will be transported under manifest by a licensed hazardous waste hauler to an appropriately permitted disposal facility. All excavation and handling activities will be conducted in accordance with site-specific health and safety and dust control protocols to minimize potential exposure and prevent the spread of impacted soil. Upon confirmation that all verification samples are below the applicable screening levels, a technical memorandum will be prepared summarizing the excavation and confirmation sampling activities conducted for the removal of dioxin-impacted soil, with attached laboratory results and waste manifest documentation.

3.4 Dust Control

To minimize dust during excavation and soil handling, the following procedures will be observed.

- Water all active construction areas at least twice daily or as necessary to prevent visible dust plumes from migrating outside of the site limits.
- Mist or spray water while loading transportation vehicles.
- Minimize drop heights while loading transportation vehicles.
- Use tarpaulins or other effective covers for trucks carrying soils that travel on public streets.
- Apply water 3 times daily, or apply non-toxic soil stabilizers on all unpaved access roads, parking areas, and staging areas.
- Sweep all paved access routes parking areas and staging areas daily, if visibly soiled.

3.5 Containment and Decontamination

If impacted soil is encountered during construction activities and remediation is required, the following decontamination and soil containment measures shall be implemented during excavation, handling, and remediation activities:

- Haul trucks shall be staged outside of excavation areas to the extent practicable.
- To prevent the tracking of impacted soil beyond excavation areas or off-site, all vehicles and equipment operating within areas of impacted soil shall be decontaminated at designated tire and/or equipment washing stations prior to exiting such areas.
- Decontamination procedures shall include visual inspection of vehicles and equipment and, as necessary, physical removal of adhered soil and debris prior to washing.
- Excavation equipment and hand tools shall be decontaminated over soil stockpiles or within waste containers, where feasible, to allow wash water and residual materials to be co-managed with impacted soil.
- Solid or liquid decontamination residues that cannot be co-managed with impacted soil shall be collected and placed in appropriate containers for lawful off-site transportation, treatment, and disposal in accordance with applicable regulations.
- All vehicles and equipment shall be inspected prior to departing the site to verify that no impacted soil remains.
- Decontamination pads, tire and equipment washing stations, mud mats, and adjacent roadway conditions shall be routinely inspected and properly maintained to prevent deterioration and the potential spread of impacted soil.

3.6 Erosion Control

A Storm Water Pollution Prevention Plan (SWPPP) will be developed by the site contractor prior to initiation of site work that details procedures for minimizing erosion. The SWPPP will include elements such as silt traps and hay bales to minimize surface water runoff from the site into storm drains. Berms will be used to control runoff, and soil stockpiles will be covered during the rainy season (November through March) to minimize sediment runoff.

3.7 Soil Stockpile Management

Temporary stockpiling of excavated soil may be necessary throughout site construction. Soil stockpiled at the site will be lightly sprayed with water as needed to minimize dust. To the extent practical, the soil stockpiles will be covered with plastic sheeting or other similar material at times when not in active use. When a soil stockpile is uncovered during the rainy season, it will be surrounded by hay bales and/or silt traps to minimize sediment runoff.

3.8 Soil Disposal

Site development has been designed to minimize the generation of excess soil; therefore, soil requiring off-site disposal is not anticipated. Although not anticipated at this time, if excess soil is generated from the site, the excess soil will be profiled to determine appropriate disposal options. Handling and disposal of the soil will be conducted in accordance with all applicable state and federal laws.

3.9 Site Access Control

The construction site will be fenced to control pedestrian or vehicular entry, except at controlled points (i.e., gates). Gates will be closed and locked during non-construction hours. "No-trespassing" signs will be posted every 500 feet along the fencing.

4.0 SOIL MANAGEMENT FOLLOWING DEVELOPMENT

Following site development, the soil will be covered by asphalt pavement or grass (in the swale areas) and it is unlikely that the soil will be accessed, with the exception of future maintenance work on subsurface utilities. The removal of any impacted soil during construction tasks will minimize possible health risks to future maintenance workers at the site, which should not pose an unacceptable carcinogenic or non-carcinogenic risk.

Although the grass-covered common areas should not present an unacceptable risk to human health for visitors or trespassers, it is prudent that the grass-covered swale areas be well maintained. Therefore, the swale areas will be inspected quarterly to visually observe the condition of the grass cover. Large areas of exposed soil (e.g., areas larger than several feet in diameter) should be reseeded as quickly as practical.
Annual inspections of the paved parking areas will be performed to observe whether breaches in the pavement that may allow prolonged access to site soil are visible. If observed, the breach would be repaired such that the soil cover is maintained.

5.0 CONTINGENCY PLAN

A Contingency Plan for this site is not warranted. The purpose of a Contingency Plan is to present response actions to an emergency situation. The possibility of exposure to site soil or groundwater while breaches in the pavement or grassy areas are being repaired would more than likely not present a situation requiring an emergency response.

6.0 HEALTH AND SAFETY GUIDLINES

A health and safety plan for site construction will be developed by the site contractor before initiation of the development activities. It is not anticipated that the minor soil gas contamination identified at the site would pose an unacceptable health risk to construction workers or nearby receptors during construction or future maintenance workers, visitors or trespassers after construction. However, the health and safety plan for the site includes contingencies for this case and is included in **Appendix A**.

TABLE 1

Summary of Soil Sampling Results (mg/Kg)

Sample ID	Arsenic	Cobalt	Lead	Benzo(a) Pyrene	Naphthalene	Dioxin_TEQ
Sampled January 12, 2026						
FS-1	<1.0	8.27	27.9	<0.25	<0.25	1.01E-06
FS-2	<1.0	8.61	10.1	<0.25	<0.25	**1.58E-05**
FS-3	<1.0	7.69	10.4	<0.25	<0.25	8.46E-07
FS-4	<1.0	6.56	8.75	<0.25	<0.25	3.56E-07
FS-5	<1.0	9.41	14.9	<0.25	<0.25	1.69E-07
FS-6	<1.0	12.3	16.5	<0.25	<0.25	1.32E-07
FS-7	<1.0	7.95	16.7	<0.25	<0.25	2.1E-07
FS-8	3.09	8.84	17.2	<0.25	<0.25	1.25E-06
FS-9	<1.0	6.67	11.7	<0.25	<0.25	4.22E-07
S-1	<1.0	7.78	10.1	NM	NM	NM
S-2	<1.0	10.5	6.51	NM	NM	NM
S-3	<1.0	9.33	12.7	NM	NM	NM
S-4	<1.0	9.82	8.87	NM	NM	NM
S-5	<1.0	7.73	14.6	NM	NM	NM
S-6	<1.0	8.29	14.7	NM	NM	NM
S-7	<1.0	8.38	14.0	NM	NM	NM
S-8	<1.0	8.60	9.94	NM	NM	NM
S-9	1.28	10.1	15.8	NM	NM	NM
S-10	<1.0	9.06	13.3	NM	NM	NM
S-11	<1.0	8.43	21.4	NM	NM	NM
Sampled January 20, 2026						
S-1R	NM	NM	NM	NM	NM	2.27E-07
S-2R	NM	NM	NM	NM	NM	1.34E-07
Residential RSL[1]	***0.68***	***23***	***80***	***0.11***	***2.0***	***4.8E-06***
Commercial RSL[2]	***3.0***	***350***	***320***	***2.1***	***8.6***	***2.2E-05***
TIER 1 ESLs[3]	***0.032***	***22***	***32***	***0.11***	***3.0E-02***	***4.8E-06***
DTSC HERO NOTE 3 SL[4]	***0.11***	***--***	***80***	***0.11***	***2.0***	***0.0001***
DTSC Background[5]	****12***	***--***	***--***	***--***	***--***	***--***

Notes: ND - Not Detected. ND - Not Detected NM – Not Measured. SL – Screening Level. PR – Pending Result
EPA Regional Screening Levels (RSLs) are human health risk-based screening levels used by EPA and DTSC in residential and commercial settings.

**DTSC Background Concentration is based on a statistical study of sites throughout southern California. This concentration may be used as a screening level for anthropogenic and naturally occurring levels of arsenic in soil in southern California - Values modified by DTSC HHRA Note 3. Please refer to the lab report for complete results.*

[1]EPA Region IX Regional Screening Levels for residential soil (November 2024)
[2]EPA Region IX Regional Screening Levels for industrial soil (November 2024)
[3]San Francisco Bay Regional Water Quality Control Board Tier 1 Environmental Screening Levels (ESLs) (July 2025)
[4]DTSC HERO Human Health Risk Assessment (HHRA) NOTE 3 Screening Levels in Soil, Residential (April 2025)
[5]DTSC HHRA Note Number 11 Southern California Ambient Arsenic Screening Level (December 2020)

FIGURES

FIGURE 1

General Site Plan
700 North Sunnyside Avenue
Sierra Madre, California

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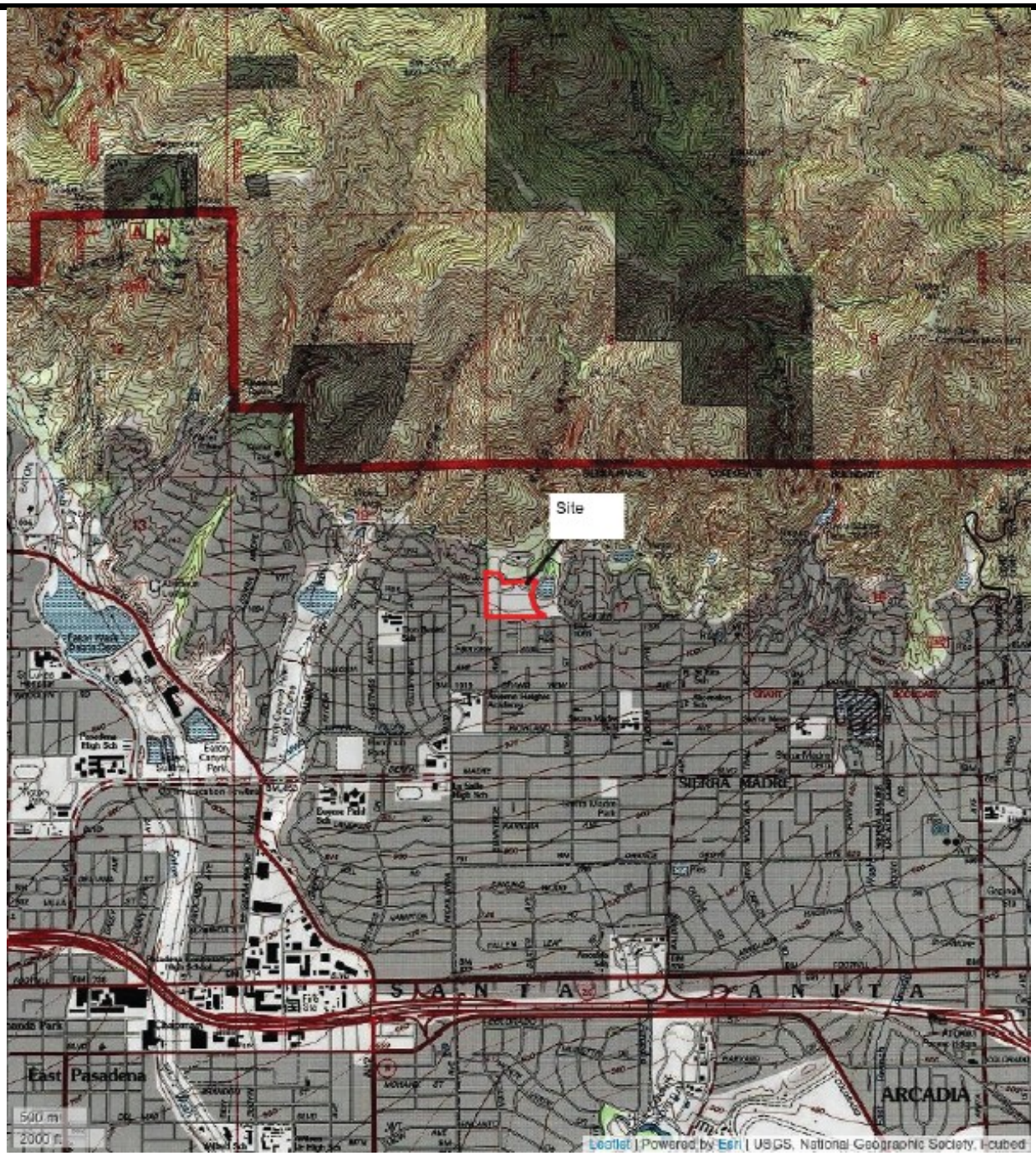

FIGURE 1

SITE VICINITY MAP
700 North Sunnyside Avenue
Sierra Madre, California

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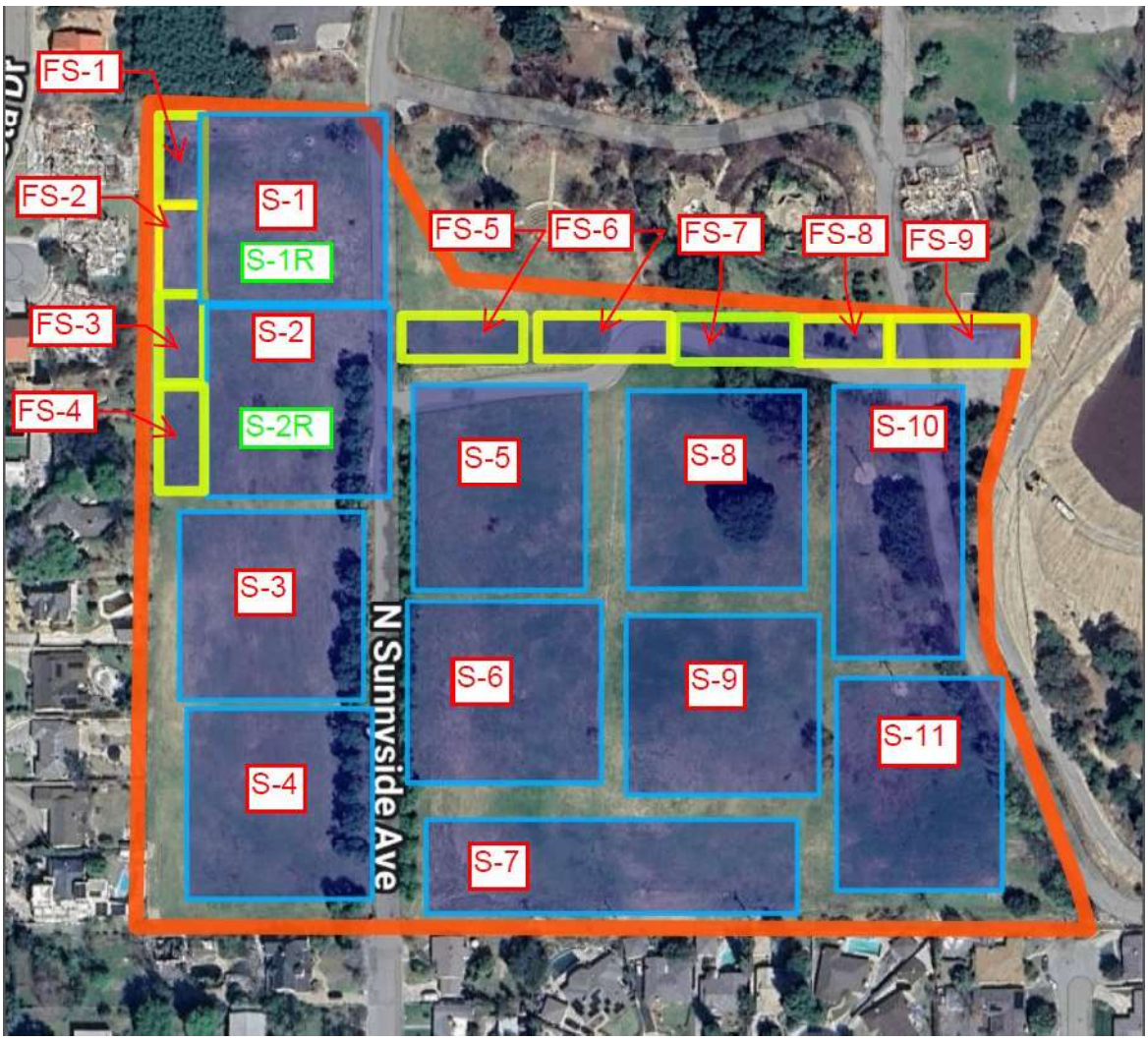

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700 North Sunnyside Avenue
Sierra Madre, California 91024

Hillmann Project No: C3-10722

PROJECT TITLE:

700 North Sunnyside Avenue

Client:

Toll Brothers

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IRVINE, CA 92612
TEL: (818) 332-7246

NOTES

Legend

FS-	=	Sampling Area of Fire Samples; 5-pt Composites; January 12th, 2026
S-	=	Sampling Area of Heavy Metal Samples; 4-pt Composites; January 12th, 2026
S-XR	=	Additional Fire Samples; January 20th, 2026

CONTRACTOR MUST VERIFY ALL QUANTITIES BEFORE BIDDING

TITLE:

Soil Sampling Map

DATE ISSUED:

DRAWING SCALE: NTS

Drawing Number:

Sheet: of

APPENDIX A
Health and Safety Plan

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HEALTH AND SAFETY PLAN
SUBJECT PROPERTY
700 North Sunnyside Avenue
Sierra Madre, California 91024

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The results from heavy metal analysis indicated low level detections of arsenic, cobalt, and lead. However, none of the shallow samples had concentrations greater than current residential screening levels or background levels in the case of arsenic. The results of the SVOCs and Dioxins indicated non-detect values for both Benzo(a) Pyrene and Naphthalene in all the fire sample results. Dioxins were found in all the fire samples, however only one (1) sample FS-2 was found to be above residential screening levels for Dioxin TEQ. Based on the laboratory analysis results Hillmann recommended supplemental soil sampling within the areas surrounding the grid FS-2.

On January 20, 2026, in order to further delineate the potential horizontal impacts as a result of the fires, Hillmann conducted supplemental soil sampling in the areas denoted by S-1 and S-2. The sampling was conducted in accordance with the recommended guidelines established by the California Department of Public Health (CDPH) and CalRecycle. Ten (10) soil borings were advanced in the areas of S-1 and S-2 and composited into two (2) samples, S-1R and S-2R, respectively. The samples were analyzed for dioxin toxic equivalency (Dioxin-TEQ; EPA Method 8290). The results of the Dioxin analysis indicated that both, S-1R and S-2R had detectable concentrations of dioxins, however, neither sample showed concentrations above the applicable residential screening levels.

Based on the results of the shallow soil sampling, Hillmann recommends spot excavation in the area of FS-2, coupled with confirmation testing and proper handling and disposal of the dioxin contaminated material. If the results from confirmation testing indicate the material has been adequately removed, the grading plan for the site can be initiated and performed under the guidance of a Soil Management Plan (SMP) for the site that provides a framework for handling impacted soil that conceivably could be encountered during site excavation activities.

This health and safety plan is a supplement to the Soil Management Plan, which describes the procedures for screening and handling of potentially contaminated soil. The soil excavation and handling work will be conducted by a qualified contractor.

KEY PERSONNEL

A Site Safety Officer (SSO) and/or Project Manager (PM) should be assigned to manage the health and safety of workers and nearby residents during the excavation activities. This individual should have completed 40 hours of comprehensive health and safety training, which meets the requirements of Title 29 Code of Federal Regulations (29 CFR 1910.120) and is current with refresher training.

The Project Manager (PM) is responsible for generating, organizing, and compiling the Site Safety and Health Plan (SSHP), which describes all planned field activities and potential hazards that may be encountered at the site. The PM is also responsible for assuring that adequate training and safety briefing(s) for the project is provided to the project team.

The SSO's health and safety responsibilities include:

- Following the SSHP.
- Reporting to the PM any unsafe conditions or practices.
- Reporting to the PM all facts pertaining to incidents, which result in injury or exposure to toxic materials.

HAZARD ANALYSIS

The potential hazards to personnel working at this site have been identified as chemical contamination associated with small localized releases of petroleum from existing piping and dioxin impacted dust from grading activities as well as the physical hazards of working outdoors around construction equipment. Each potential hazard relative to possible exposure is described below.

Chemical Contamination

The primary health and safety hazard posed by this project is the potential of chemical contamination from inhalation of dust that potentially contain hazardous constituents that could be released from the soil. The principal constituents of concern include dioxin compounds, petroleum-related VOCs and heavy metals (primarily arsenic and lead) from soil.

Certain Dioxin compounds have been classified as "human carcinogens". These contaminants can cause cardiovascular disease, diabetes, cancer, porphyria, endometriosis, early menopause, reduced testosterone and thyroid hormones, altered immunologic response, skin, tooth, and nail abnormalities, altered growth factor signaling, and altered metabolism.

Benzene and naphthalene have been classified as "potential occupational carcinogens". This contaminant can cause skin and eye irritation, as well as, respiratory problems, fatigue, nausea, and abdominal pain. Target organs, which may be affected, are the central nervous system, respiratory system, eyes, blood, bone marrow and skin.

Additional constituents of concern are lead and arsenic, which have been classified as “heavy metal contaminants”. These contaminants can cause swelling of the face, nausea, vomiting, stomach pain, muscle aches, or diarrhea. Target organs, which may be affected, are the central nervous system, respiratory system, gastrointestinal tract, renal system, eyes, blood, bone marrow and skin

Tables 1 and **2** present a summary of the chemical exposure limits and characteristics associated with them.

The greatest potential for exposure exists during excavation, when fugitive vapors, dust or particulates could be admitted to the atmosphere during excavation activities. Personnel could come in contact with vapors, dust, and particulates containing these constituents.

Physical Hazards

On-site non-chemical hazards include working around heavy equipment, noise, and possible heat stress. While working at the site, the field personnel must be aware of heavy equipment movement and general traffic. Field personnel will exercise extreme caution around the equipment during testing. Noise levels around operating equipment may exceed a comfortable range in which case ear plugs will be utilized.

Presence of unauthorized personnel: Care will be taken to not allow any unauthorized person entrance to the area around the equipment on site.

Lifting hazards: Field personnel are instructed to wear a back-belt when lifting items weighing greater than 40 lbs; lift by bending at the knees and using leg muscles. When lifting heavy items, use the buddy system or a mechanical lifting device. Never twist or jerk your body while lifting. Use gloves when lifting sharp or abrasive objects, or where splinters are possible.

Noise hazards: Field personnel are instructed to wear hearing protection anytime they are conducting work near operating equipment, or anytime that the ambient noise level is sufficiently loud to require the employee to raise his/her voice to be heard.

Electrical hazards: Field personnel are instructed to take the proper precautions when handling or working on any electrical device on site. The following general steps should be taken at all times:

- Maintain appropriate distance from overhead utilities (20 feet minimum clearance from power lines; 10 feet minimum distance from shielded power lines).
- Use ground fault circuit interrupters as required.
- Always use three pronged plugs and extension cords.
- Follow all code requirements for electrical installations.

Hand and Power Tool hazards: All field personnel are required to implement the following general safety precautions when using any handheld or power tools:

- Keep the tools sharp, clean and properly maintained -worn tools can contribute to slips and breaks that can cause injury to personnel and damage to onsite equipment
- Do not use tools to perform tasks for which they were not intended
- Use proper eye protection when using any power tool.
- Inspect each power tool prior to use for damaged parts, loose fittings and frayed or damaged electrical cords. If damaged, do not use the tool until it has been repaired or replaced.
- No adjustments should be made to a power tool while it is plugged in.
- Always use the proper guards or shields when using power tools. NEVER use homemade handles or extensions.

Hot Work or Welding: Field personnel are advised that these activities have a potential to lead to a fire. Therefore, fire suppression equipment should be maintained in the work area. Steps should be taken to ensure that all flammable materials are protected from sources of ignition.

Slip, Trip, Fall hazards: Field personnel are instructed to inspect the work area for hazards prior to commencing work. These include uneven terrain, sloped areas, wet or slick areas, and areas covered with loose material. If slip, trip or fall hazards, they should be communicated to all employees at the work site and marked, if possible, with warning signs, cones and/or caution tape.

Fire hazards: To avoid fire and explosion, smoking or use of other flammable devices will NOT be permitted within the barricaded area. A fire extinguisher is to be maintained on site at all times.

Traffic hazards: Vehicular traffic is open to the public in the site vicinity. All work areas should be coned off prior to commencing work. Additionally, all field personnel should wear reflective safety vests and be cautious of vehicular traffic.

Mobile Heavy Equipment: More than 100 people each year are killed by mobile heavy equipment - including backhoes/excavators, mobile cranes, road grading and surfacing machinery, loaders, bulldozers, and tractors - on construction sites. These are the main causes of death:

Workers on foot are struck by equipment, usually when it's backing up or changing direction.

Equipment rolls over and kills the operator while on a slope or when equipment is loaded or unloaded from a flatbed/lowboy truck.

Operators or mechanics are run over or caught in equipment when the brakes aren't set, equipment is left in gear, wheel chocks are not used, or the equipment and controls aren't locked out.

Workers on foot or in a trench are crushed by falling equipment loads, backhoe buckets, or other moving parts.

Protect Yourself

Allow only **trained and experienced operators to operate heavy equipment.**

Be sure operators and mechanics are trained by qualified persons* experienced with the model of heavy equipment being used.

Rent or buy only heavy equipment that has rollover protective structures (**ROPSs**) and seat belts.

Use only flatbed/lowboy trucks and ramps that are suitable for **transporting** heavy equipment.

Ensure that a copy of the **operating manual** is on all machinery or available to the operator.

Identify the hazards of overhead and underground **power lines and utilities** and establish procedures for working around them. Before excavation begins, use the one-call system for utility cutoffs.

Make sure the manufacturer's **safety features** work.

Set a limited access zone and/or a swing radius for each piece of equipment.

Provide training on equipment hand signals.

Provide trained spotters or signal persons to alert operators to workers or pedestrians in the blind spots of the equipment - including workers in trenches or manholes.

As a heavy-equipment operator, you should:

Review operating, safety, and shutdown procedures in the operator's manual before you work with a new piece of equipment.

Check/inspect the equipment and controls every day before you begin work.

To **prevent slips and falls**, keep grease and fluids off the walking/working surfaces and use 3 points of contact when entering and exiting equipment (such as 2 hands and 1 foot).

To **prevent rollovers**, do not travel or work parallel to steep grades or embankments or on unstable soil.

If possible, operate heavy equipment that has a ROPS and fasten the seatbelt. (Don't use a seatbelt if you must use equipment that has no ROPS, because you may have to jump clear during a rollover.)

If equipment is rolling over or out of control, do not jump if it has a ROPS and seatbelt; you have a better chance of riding it out with a ROPS and your seat belt fastened.

Always put the transmission in park, shut off the motor, set the brakes, and perform any other needed **shutdown procedures**/lockout of controls and/or attachments before working on or around the equipment.

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*OSHA says a qualified person...by extensive knowledge, training, and experience can...solve...problems related to the subject matter....

Protect Others

To protect other workers or pedestrians:

Do not back up unless you are sure no one is behind you. Use mirrors, where appropriate.

Do not depend only on backup alarms. They are not always heard on noisy construction sites.

Use barriers to separate workers on foot, pedestrians, and vehicles from moving equipment, where possible.

When loading or unloading materials, make sure that only essential workers are in the area and have a spotter/signal person to let you know where they are. No one should be under a suspended load.

Never allow other workers to ride on equipment.

Don't speed; be extra careful around other traffic, hills, obstacles, and curves.

Heat Stroke and Heat exhaustion: The potential for heat stress is a concern when field activities are performed on warm, sunny days, and is accentuated when chemical protective clothing is worn. Heat stress prevention measures and monitoring will be implemented if site temperatures are above 88 degrees Fahrenheit. Precautions to prevent heat stress will include work/rest cycles so rest periods are taken before excessive fatigue occurs, and regular intake of water to replace that lost from perspiration. To prevent dehydration, all workers will be required to drink fluids during work. An initial work/rest cycle of one hour work and fifteen minutes rest is recommended for protection of staff when the heat stress hazard is high. The recommended cycle will be adjusted up or down based upon worker monitoring, environmental conditions, and the judgement of the site safety officer.

At any time, field team members recognize the signs or symptoms of heat stress prior to a scheduled rest period, they will notify the SSO immediately in order that a rest period can be called. Heat stress, if not prevented, results in heat stress illnesses. Two critical illnesses, if not recognized and treated immediately, can become life threatening. These are heat exhaustion and heat stroke. Heat exhaustion will result if the prevention measures described above are not implemented. Ignoring the signs and symptoms of heat exhaustion will lead to the development of heat stroke. Heat stroke is an immediate, life-threatening condition that results because the body's heat regulation mechanisms shut down, and the body cannot cool itself sufficiently. As heat is excessively stored in the body, brain damage can result causing permanent disability or death.

The signs and symptoms of heat exhaustion are headache; dizziness; nausea; weakness; fainting; profuse sweating; loss of appetite; approximately normal body temperature; dilated pupils; weak and rapid pulse; shallow and rapid breathing; possible cramps in abdomen and extremities; difficulty walking; cool and sweaty skin to the touch; pale to ashen gray coloring.

First aid for heat exhaustion is as follows:

- Immediately remove victim to the support area, or if you are the victim, proceed to the support area.
- Decontaminate, if practical, before entering support area.
- Start cooling, but be careful not to cause a chill (i.e., and/or remove clothing as much as practical, especially chemical resistant clothing).
- Drink cool water slowly, but only if conscious and not in shock.
- If vomiting, and/or the signs and symptoms are not lessening within an hour, call for emergency help and/or transport the victim to emergency room.
- It is likely that a heat exhaustion victim will be unable to work for the remainder of the day.

The signs and symptoms of heat stroke are hot, dry skin to the touch; reddish coloring: body temperature >105°F; no sweating; mental confusion; deep, rapid breathing that sounds like snoring progressing to shallow, weak breathing; headache; dizziness; nausea; vomiting; weakness; dry mouth; convulsions, muscular twitching, sudden collapse, possible unconsciousness.

First aid for heat stroke is as follows:

- Immediately remove the victim to the support area; prior to entering the support area, remove and dispose the victim's chemical-resistant clothing.
- Cool the victim rapidly using whatever means are available, including: shade; opening up and/or removing clothing; soaking clothing/skin with water and fanning; placing victim in vehicle using air conditioning on maximum.
- Do not give drinking water to victim.
- Treat for shock, if needed.
- Transport the victim to the emergency room or call for emergency help; no exceptions for heat stroke victim.

PERSONAL PROTECTIVE EQUIPMENT

Based on the hazard analysis for this project, the following personal protective equipment (PPE) will be required and used. Changes to these specified items of PPE will not be made without the approval of the site safety officer.

Level D (modified) protection will be the minimum required protection during drilling. It will consist of long sleeve shirts, gloves, chemical resistant steel-toed safety boots, and hard hats.

In addition, goggles and/or safety glasses should be worn, but it is not a requirement. If at any time throughout the course of this job, there is a potential for more exposure to the personnel, half and/or full-face respirators (Level C) may be required. Work will halt, if possible, exposure warrants level B protection.

ENVIRONMENTAL MONITORING PLAN

The potential hazards identified in the hazard analysis portion of this plan determined the need for initial and/or ongoing monitoring for assessment of exposure to the hazards as follows:

A direct-reading instrument will be used to monitor air quality in around the work areas. The specific instrument will be a photo ionization detector with a detection limit of 0.1 ppm and a range of 1.0 to 3,000 ppm for organic compounds. Calibration is performed daily with a standard of 100 ppm hexane in air.

Air monitoring for background levels of air contamination will be performed prior to the start of testing activities. Background concentrations will be noted and used as the baseline or zero concentration.

Air monitoring during excavation will be conducted in the immediate breathing zones at minimum intervals of every 15 minutes, or more frequently if needed. The measurements will be logged, showing the time and the concentration of the airborne organic compounds. The primary contaminants of concern for this investigation are gasoline related constituents. Of these, benzene has the lowest Permissible Exposure limit (PEL) of 1 ppm. **Table 2** displays the PEL and Short-Term Exposure Limits (STEL), applicable for the volatile organic vapors that may be occurring at the site.

At any time during monitoring, if the concentration exceeds 10 ppmv, soil will be stockpiled and isolated from the rest of the pile. If the vapor concentration exceeds 100 ppmv on the PID for 1 minute or more within the work area during drilling or testing, PPE will be upgraded to include half-face respirators equipped with organic vapor canisters. Benzene will be the primary pollutant of concern. The use of respirators will be discontinued when the concentrations dissipate to the acceptable levels, as determined by the site safety officer. If at any time the VOC concentrations exceed 100 ppm over background, all drilling and or testing activities will cease and the personnel will stop work and determine measures of mitigating the high VOC levels until safe concentrations are established and work can safely be reinitiated.

SITE CONTROL MEASURES

The potential chemical and physical hazards have been identified in this SSHP; however, should unexpected conditions arise, the SSO will stop all work at the site and the Project Manager will be notified. Work will not be completed until the SSHP has been revised or re-evaluated, accordingly.

DECONTAMINATION

All workers will wash hands, arms and face after removing PPE and prior to leaving the site. Disposable items will be bagged for disposal along with other hazardous wastes removed from property. Sampling equipment will be decontaminated using a steam cleaner or three bucket wash. All heavy equipment should be steam cleaned prior to removal from the site, if necessary. There are no special emergency decontamination procedures anticipated for this project.

EMERGENCY PROCEDURES

In the event of an emergency on site, the SSO will direct the course of action. The SSO will call for emergency assistance if needed. As soon as practical, the SSO will contact the Project Manager. All staff assigned to this project will be briefed on the procedures and responsibilities for implementation. A map showing the location and route to the hospital is included as **Figure 1**. In the event of a medical emergency, 911 should be used.

The SSO is trained in first-aid and CPR. A first-aid kit and fire extinguisher are located in the field vehicle. The nearest telephone numbers to be used to call for assistance are listed below. A copy of this list will be posted in the support zone of the work area.

The nearest hospital to the site is Saint Francis Medical Center. The telephone number of the hospital is shown below. **Name of Business**	**Telephone Number**
Fire or Police	911
USC Arcadia Hospital	(626) 898-8000
Hillmann Consulting – Ryan Terwilliger	(559)-905-6744

Hospital: USC Arcadia Hospital, 300 W Huntington Dr, Arcadia, CA 91007
Phone: (626) 898-8000

1. Head south on North Sunnyside Avenue
2. Turn right onto Fairview Avenue
3. Turn left onto N Michillinda Avenue
4. Turn left onto Colorado Blvd/ Historic Rte 66
5. Continue to follow Colorado Boulevard
6. Take a sharp right onto Huntington Drive
7. Turn left into hospital parking lot
8. Hospital is on right

I have reviewed a copy of the Health and Safety Plan for this project and am familiar with the hazards of this project.

Signature	Name	Company	Date
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

Name and Signature of Site Safety Officer

TABLE 1
Chemical Characteristics

Chemical	Highest Concentration Detected	Ionization Potential (eV)	OVA[1] Relative Response %
Dioxins	1.58 E-.05 (mg/Kg)	9.25	150
Arsenic	3.09 (mg/Kg)	NA	NA
Lead	27.9 (mg/Kg)	NA	NA
Benzene	1.8 (ug/m^3)	9.25	150
Ethylbenzene	2.6 (ug/m^3)	8.76	100
Toluene	31 (ug/m^3)	8.82	110
Xylene Isomers	5.7 (ug/m^3)	0.56-8.44	111/116
TCE	2.9 (ug/m^3)	9.47	70
Naphthalene	< 0.25 (mg/Kg)	8.14	--
Benzo (a) Pyrene	< 0.25 (mg/Kg)	7.10	--

Chemical Notes		TLV[2] (8 hr TWA) (ppm)	IDLH[3] Level (ppm)	Flammable Range %	ODOR[4] Threshold (ppm)
Dioxins	C, F	0.5	500	1.3-7.1	4.68
Arsenic	C	0.01 (mg/m^3)	5 (mg/m^3)	NA	NA
Lead	C	0.05 (mg/m^3)	100 (mg/m^3)	NA	NA
Benzene	C, F	1.0	2,000	1.3-7.1	4.68
Ethylbenzene	F	100	2,000	1.0-6.7	140
Toluene	F	100	2,000	1.3-6.7	0.17
Xylene Isomers	F	100	10,000	1.0-7.0	0.05
TCE	C	10	1,000	8.0 – 10.5	110
Naphthalene	C	10	250	0.9 – 5.9	0.084
Benzo (a) Pyrene	C	0.2 (mg/m^3)	80 (mg/m^3)	5.5 - 44	NA

[1]Century Organic Vapor Analyzer relative response to the compound in percent. [2]Threshold Limit Value as the airborne time-weighted average (TWA) published by the American Conference of Industrial Hygienists (ACGIH), 1988-1989 .[3.] Immediately Dangerous to Life and Health level as an airborne concentration published by the National Institute of Occupational Safety and Health (NIOSH), Publication Number 85-114, September 1985. [4.] From the CHRIS Manuals, Volumes I-III.C - Carcinogen; F - Flammable.

TABLE 2
Chemical Exposure Limits (ppm)

Contaminant	PEL		STEL	
	NIOSH	OSHA	NIOSH	OSHA
Dioxins	300	--	500	--
Arsenic	--	0.5 (mg/m^3)	--	--
Lead	--	50 (ug/m^3)	--	--
Gasoline	300	--	500	--
Benzene	0.1	10	1.0	5.0
Toluene	100	200	150	150
Ethylbenzene	100	100	125	125
Xylenes	--	100	--	150
TCE	--	100	--	200
Naphthalene	10	10	15	15
Benzo (a) Pyrene	--	0.2 (mg/m^3)	--	--

PEL (Permissible Exposure Limit) - Time-weighted average concentrations, similar to (and usually derived from) the Threshold Limit Values. *STEL (Short Term Exposure Limit)* - Average concentration permissible over a 10-minute period.

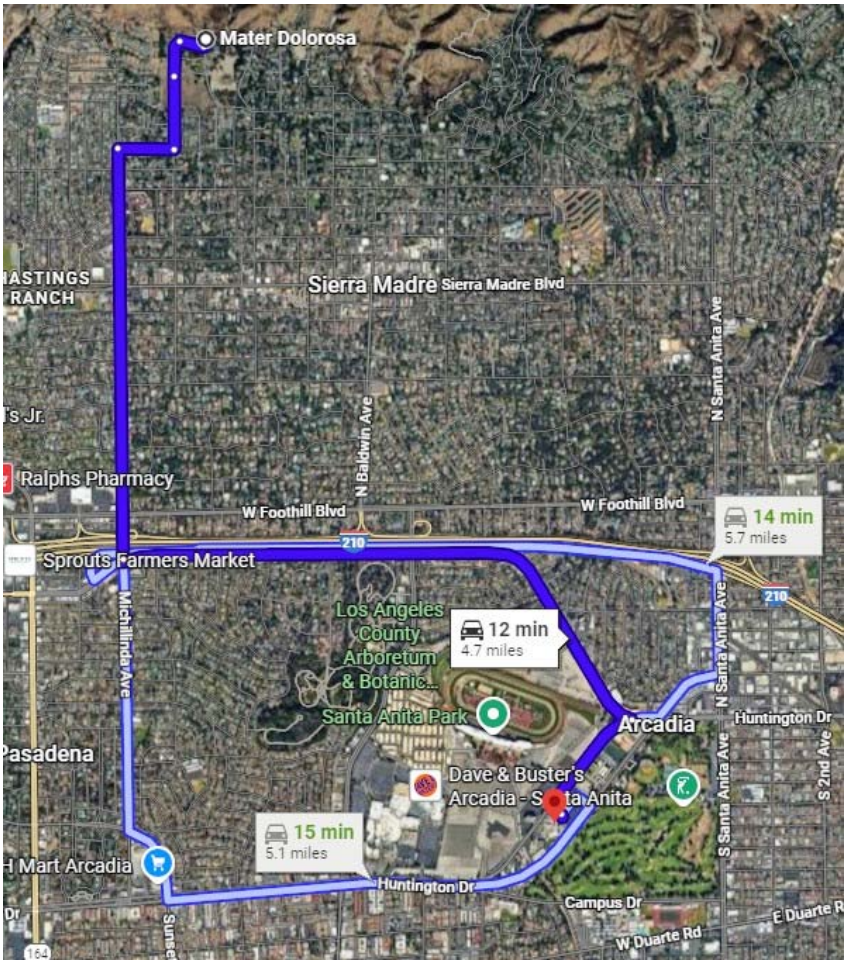

FIGURE 1
Route to Hospital

DIRECTIONS TO THE HOSPITAL

Hospital: USC Arcadia Hospital Emergency Room, 300 Huntington Dr, Arcadia, CA 91007
Phone: (626) 898-8000

1. Head south on North Sunnyside Avenue
2. Turn right onto Fairview Avenue
3. Turn left onto N Michillinda Avenue
4. Turn left onto Colorado Blvd/ Historic Rte 66
5. Continue to follow Colorado Boulevard
6. Take a sharp right onto Huntington Drive
7. Turn left into hospital parking lot
8. Hospital is on right