

July 17, 1997

Alameda County Health Care Services Agency
1131 Harbor Bay Parkway, Room 250
Alameda, California 94502-6577

Alton Project No. 41-0115-50

ATTN: MS. AMY LEECH

SITE: FORMER MOBIL STATION 04-334
2492 CASTRO VALLEY BOULEVARD
CASTRO VALLEY, CALIFORNIA

RE: SITE ASSESSMENT WORK PLAN

STIP #
1549



Dear Ms. Leech:

Alton Geoscience submits this site assessment workplan for former Mobil Station 04-334 located at 2492 Castro Valley Boulevard in Castro Valley, California (Figure 1) in accordance with the requirements of the Alameda County Health Care Services Agency (ACHCSA), and the California Regional Water Quality Control Board, San Francisco Bay Region (CRWQCB-SFB) request dated June 23, 1996.

1.0 OBJECTIVES

The proposed site assessment activities will be performed to:

- Characterize the lateral and vertical extent of the hydrocarbon concentrations in soil beneath the site; and
- Characterize the lateral extent of dissolved-phase hydrocarbons beneath the site.

2.0 SITE DESCRIPTION

Present Site Use: The site is currently a Jiffy Lube automobile service facility.

Past Site Use: The site was previously operated as a service station by GP Petroleum from 1956 to 1969. In 1956 two 6,000 gallon UST's and one waste oil tank was installed. The service station was then operated by Mobil Oil from 1969 to 1983. An 8,000 gallon UST was installed in 1971. Three UST's were removed sometime prior to November 1983.

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- Future Site Use:** The site is expected to continue its present use as a Jiffy Lube.
- Adjacent Properties:** The subject site lies in a predominantly commercial district. To the west lies a Big-O Tire retail facility. To the east, across Stanton Avenue from the subject site is a British Petroleum service station (former Thrifty Oil Company service station). To the north of the subject site is a daycare facility and to the south, across Castro Valley Boulevard is a Wendy's Restaurant.
- Geography:** The site is located on the northwest corner of the intersection of Castro Valley Boulevard and Stanton Avenue. The subject site is situated on gently sloping, northeast trending topography, and is located near the base of the northeast flank of a series of low lying northwest trending foothills separating Castro Valley from Hayward (KEI, 1992).
- Geology:** The subject site is underlain by Quaternary-age alluvium. Mapped bedrock outcrops adjacent to the site include the marine Panoche Formation (Kpc), which is described as a conglomerate with a sandstone matrix and the Knoxville Formation (Jkk), which is described as micaceous shale with thin beds of sandstone (USGS 1980).
- Hydrogeology:** Near surface groundwater at the Unocal service station located southwest of the subject site averages between 6 and 10 fbg. Groundwater flow is generally directed to the east-northeast at a gradient of 0.016 ft/ft (Kaprealian Engineering, Inc., 1992).

3.0 PLANNED SITE ASSESSMENT ACTIVITIES

3.1 PRE-FIELD WORK ACTIVITIES

Boring permits and property access will be acquired prior to drilling. Underground Service Alert (USA) will be notified approximately 5 days prior to field activities, and a geophysical survey will be performed to identify potentially interfering underground utilities at the proposed drilling locations.

3.2 DRILLING AND SOIL SAMPLING

Up to five soil borings will be advanced to approximately 16 fbg, 3 feet below first groundwater, to collect soil and groundwater samples for laboratory analysis. Each boring will be hand augered to an approximate depth of 4.5 fbg. Borings will be advanced from approximately 4.5 fbg to the total depth of each soil boring using a Geoprobe rig equipped with 2-inch-diameter drilling rods and a cone-shaped bottom tip. Samples will be collected continuously beginning at approximately 5 fbg to the total depth of each soil boring for soil description and field hydrocarbon vapor screening. Select samples will be submitted to a state-certified laboratory for analysis.

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wo The location of each soil boring takes into consideration the locations of the former fuel UST cluster and associated product piping, and the former waste oil UST. In addition, the qualitative findings of the geotechnical investigation for the subject site dated November 15, 1983 by Judd Hull and Associates and soil and groundwater analytical results from the investigation at the former Thrifty Oil east of the site were taken into account when choosing soil boring locations (see Figure 2 for the approximate boring locations). The number and location of all borings may be adjusted based on field screening results and site access. Refer to Appendix A for general field procedures pertaining to soil sample collection.

Select soil samples will be analyzed for the following:

- total petroleum hydrocarbons (TPH-G) using the EPA Method 8015 modified for gasoline;
- benzene, toluene, ethylbenzene, and total xylenes (BTEX) using EPA Method 8020;
- total petroleum hydrocarbons (TPH-D) using the EPA Method 8015 modified for diesel;

In addition, the soil boring in the waste oil tank area will be analyzed for:

- Total oil and grease (TOG) by EPA Method 5520
- Halogenated volatile organic compounds (HVOC) using EPA Method 8010;
- CAM 17 (Title 22) metals using EPA Method 200.7.

3.3 GROUNDWATER SAMPLING

yes A "grab-type" groundwater sample will be collected from each boring using a decontaminated, small diameter bailer. One-inch-diameter PVC well casing may be temporarily installed into each boring to facilitate the collection of a grab groundwater sample. Selected groundwater samples will be analyzed for the following:

- TPH-G using the EPA Method 8015 modified for gasoline;
- BTEX using EPA Method 8020;
- MTBE using EPA Method 8020A, confirmed by 8240 in the highest detected sample; and
- TPH-D using the EPA Method 8015 modified for diesel;

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In addition, groundwater from the soil boring in the waste oil tank area will be analyzed for:

- Total oil and grease (TOG) by EPA Method 5520; and
- HVOC using EPA Method 8010.

All laboratory analyses will be performed by a state-certified laboratory. Chain of Custody protocol will be followed for all samples selected for analysis, thus providing a continuous record of sample possession prior to actual analysis. Refer to Appendix A for general field procedures pertaining to the collection of grab-type water samples.

3.4 SOIL BORING SEALING

Following the completion of soil and groundwater sampling each of the soil borings will be sealed in accordance with Zone 7 Water Agency guidelines. Using a tremie pipe, an oxygen releasing compound (Regenis ORC[™]) slurry will be placed from the bottom of the boring to approximately two feet above the static groundwater level in each boring. Neat cement will be placed from the top of the ORC[™] slurry to the surface. The upper two feet may contain a curing agent to accelerate hardening.

3.5 SOIL AND GROUNDWATER DISPOSAL

Soil waste and waste water generated will be stored onsite in DOT approved drums pending disposal to an approved disposal/recycling facility. Waste manifests will be prepared for proper transport and disposal of the soil and water.

3.6 INITIAL SITE ASSESSMENT REPORT

A report on the initial site assessment activities, that will include boring logs, laboratory analysis results, findings, and conclusions, will be prepared and submitted to the ACHSCA, and RWQCB.

4.0 WORK SCHEDULE

Planned activities will be performed according to the following estimated completion schedule:

- Expected agency approval of workplan: within three to four weeks of submittal.
- Drill borings: within three to four weeks of workplan approval, subject to site access from property owner and/or tenants.
- Submit initial site assessment report: within six weeks of completion of field activities.

Site Assessment Work Plan

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5.0 SITE HEALTH AND SAFETY PLAN

A site health and safety plan designed to promote project personnel safety and preparedness during the activities described in this work plan is included in Appendix B.

6.0 LIST OF ATTACHMENTS

- References
- Figure 1: Site Vicinity Map
- Figure 2: Site Plan with Proposed Boring Locations
- Appendix A: General Field Procedures
- Appendix B: Site Health and Safety Plan

If you have any questions regarding this work plan, please call us at (510) 606-9150.

X104

Sincerely,

ALTON GEOSCIENCE



Tom Seeliger
Project Geologist



Matthew W. Katen, RG
Senior Project Geologist



cc: Cherine Foutch, Mobil Marketing and Refining
Ellen Thompson, Jiffy Lube International
Brian Clairmon, California Lubricants
Eddy So, RWQCB, San Francisco Bay Region

REFERENCES

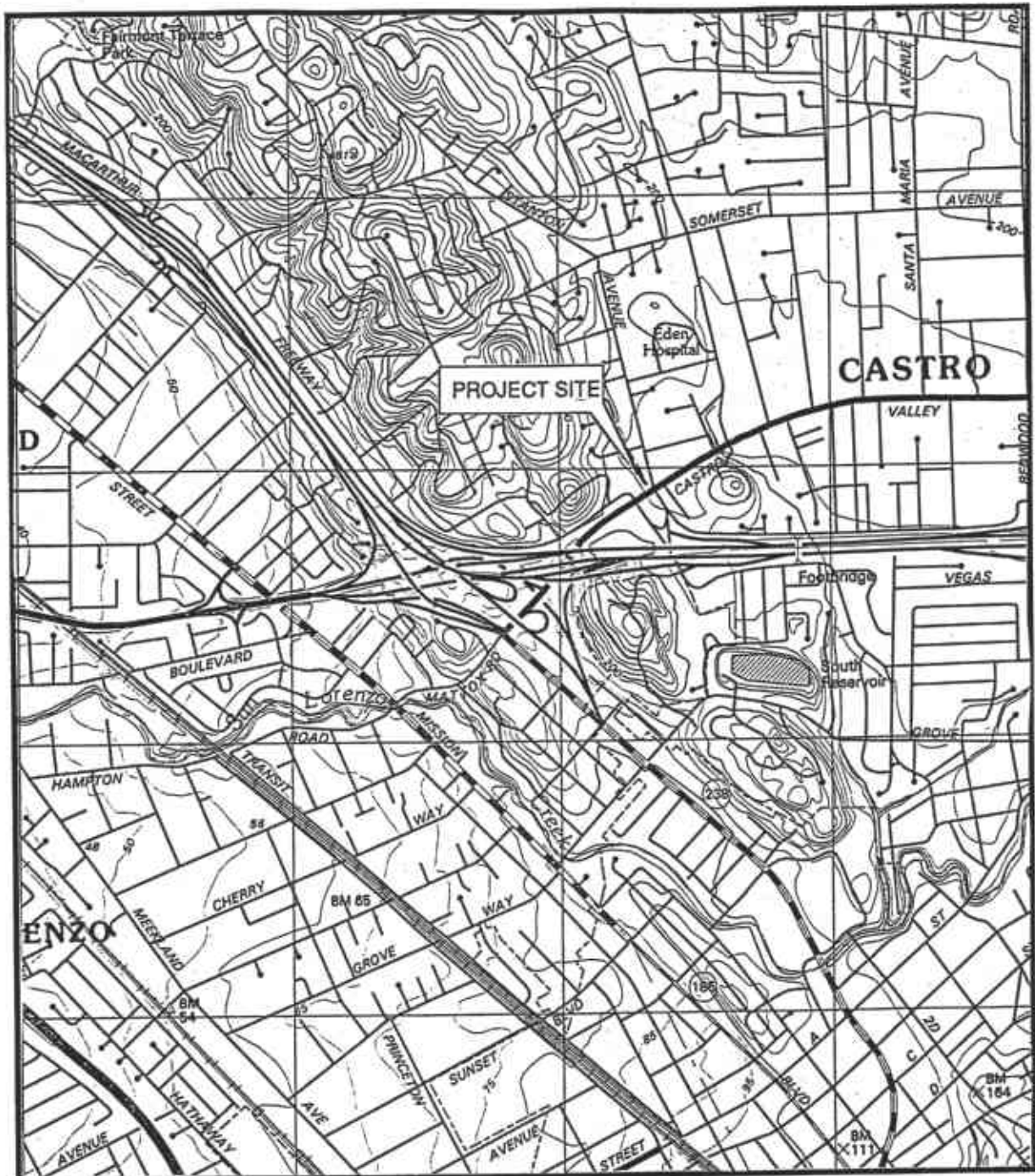
Alameda County Health Care Services Agency, June 26, 1996, Letter, Mobil Station 04-334 located at 2492 Castro Valley Boulevard, Castro Valley, CA 94546.

Alisto Engineering Group, February 3, 1994, Work Plan for Preliminary Site Investigation, Former Mobil Station 04-334, 2492 Castro Valley Boulevard, Castro Valley, California.

Kaprealian Engineering Inc, December 21, 1992, Site Closure Report for Unocal Service Station #3072, 2445 Castro Valley Boulevard, Castro Valley, California.

Giles Engineering Associates, Inc., June 26, 1986, Geotechnical Engineering Exploration and Analysis, Proposed Jiffy Lube, Castro Valley Boulevard and Stanton Avenue, Castro Valley Boulevard and Stanton Avenue, Castro Valley, California.

Thrifty Oil Company, December 30, 1992, Third Quarter Report, 1992, Thrifty Oil Co. Station #054, 2504 Castro Valley Boulevard, Castro Valley, California.



SCALE 1:24,000



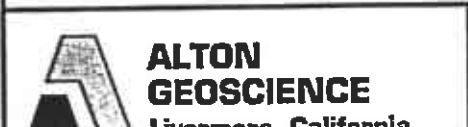
Quadrangle location

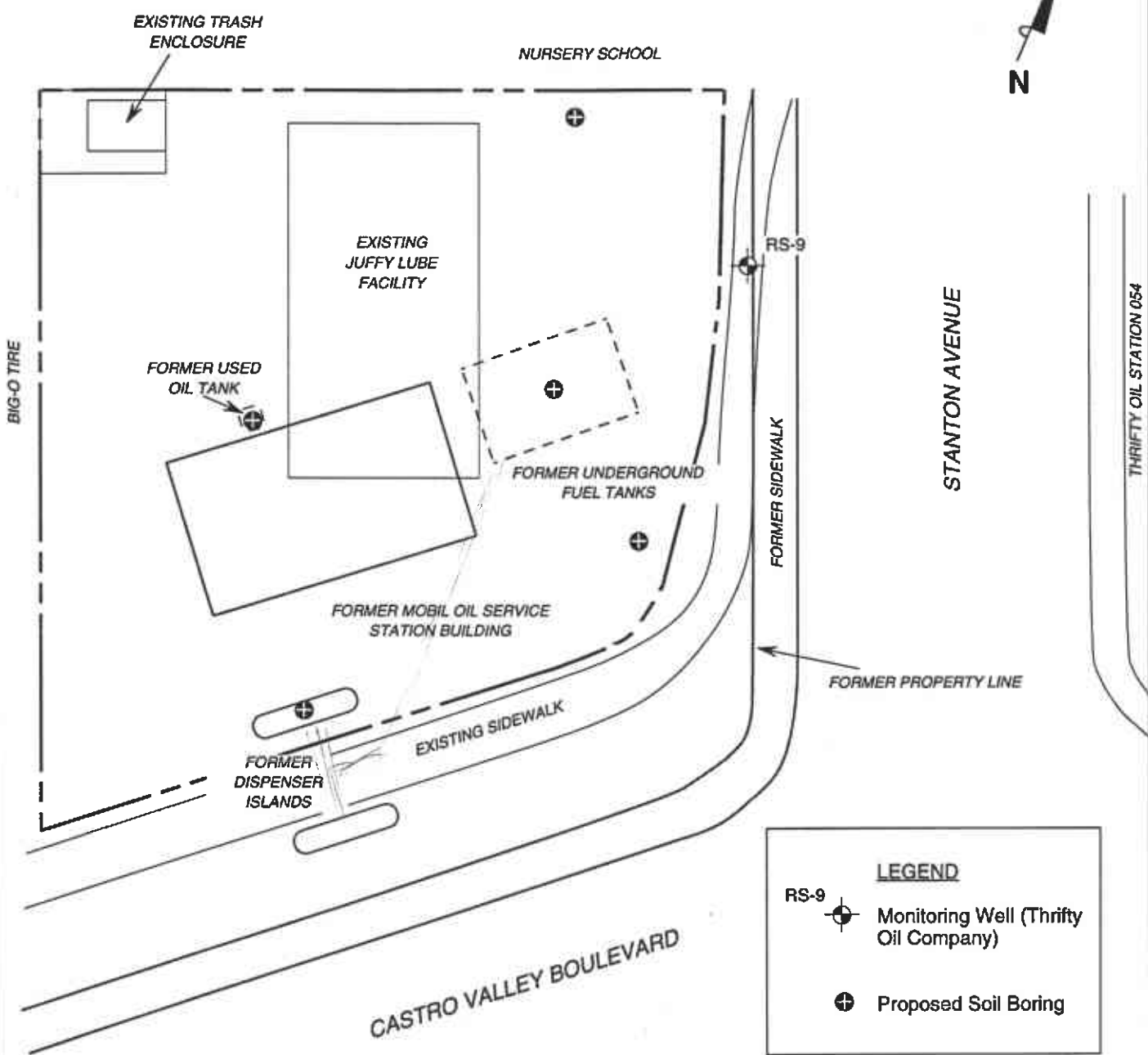
Source: U.S.G.S. Map
Hayward Quadrangle
California
7.5 Minute Series

VICINITY MAP

Former Mobil Station 04-334
2492 Castro Valley Boulevard
Castro Valley, California

FIGURE 1





LEGEND

RS-9 Monitoring Well (Thrifty Oil Company)

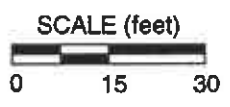
Proposed Soil Boring

SITE PLAN

Former Mobil Station 04-334
 2492 Castro Valley Boulevard
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FIGURE 2

SOURCE:
 Allsto Engineering Group



APPENDIX A
GENERAL FIELD PROCEDURES

APPENDIX A

GENERAL FIELD PROCEDURES

Descriptions of the general field procedures used during site investigation and monitoring activities are presented below. For an overview of protocol, refer to the appropriate section(s).

GEOPROBE SOIL SAMPLING

Soil sampling points are driven into the soil using hydraulically-actuated "direct-push" and percussion equipment. The soil sampling points consist of 1.5-inch-diameter hollow steel rods fitted with a reverse-threaded or sliding hardened drive point. Borings will be grouted to ground surface with a cement/bentonite slurry.

Soil samples are obtained for soil description, field hydrocarbon vapor screening, and possible laboratory analysis. Soil samples are retrieved from the borings using a 3-foot-long, 2-inch diameter continuous-core split-barrel sampler lined with six 1.5-inch-diameter stainless steel/brass sample tubes or a 3-foot-long acetate liner.

During drilling activities, soil adjacent to the laboratory sample is screened for combustible vapors using a combustible gas indicator (CGI) or equivalent field instrument. For each hydrocarbon vapor screening event, a stainless steel tube is filled approximately 1/3 full with the soil sample, capped at both ends, and shaken. The probe is then inserted through a small opening in the cap, and a reading is taken after approximately 15 seconds and recorded on the boring log. The remaining soil recovered is removed from the sample insert or sampler, and described in accordance with the Unified Soil Classification System. For each sampling interval, field estimates of soil type, density/consistency, moisture, color, and grading are recorded on the boring logs.

SOIL SAMPLE HANDLING

Upon retrieval, soil samples are immediately removed from the sampler, sealed with Teflon sheeting and polyurethane caps, and wrapped with tape. Each sample is labeled with the project number, boring/well number, sample depth, geologist's initials, and date of collection. After the samples have been labeled and documented in the chain of custody record, they are placed in a cooler with ice at approximately 4 degrees Celsius ($^{\circ}\text{C}$) prior to and during transport to a state-certified laboratory for analysis. Samples not selected for immediate analysis may be transported in a cooler with ice and archived in a frostless refrigerator at approximately 4°C for possible future testing.

GROUNDWATER SAMPLING

Temporary groundwater sampling points are driven approximately one to three feet into groundwater using hydraulically-actuated "direct-push" and percussion equipment. The groundwater sampling points consist of 1.5-inch-diameter hollow steel rods fitted with a reverse-threaded or sliding hardened drive point. At the selected depth, the rods are retracted slightly exposing a steel inner well screen to open formation groundwater. If no water is readily available for sampling, the hollow steel rods will be removed from the hole and temporary 1-inch-diameter well screen will be inserted. A decontaminated stainless steel bailer is inserted down the center of the well screen to obtain a "grab-type" groundwater sample for analysis. The 1.5-inch-diameter holes are grouted to ground surface with cement/bentonite slurry.

FLUID LEVEL MONITORING

Fluid levels are monitored in the wells using an electronic interface probe with conductance sensors. The presence of liquid-phase hydrocarbons is verified using a hydrocarbon-reactive paste. The depth to liquid-phase hydrocarbons and water is measured relative to the well box top or top of casing. Well box or casing elevations are surveyed to within 0.02 foot relative to a county or city bench mark.

DECONTAMINATION

Drive points, rods, core barrel, and bailers are decontaminated using Liqui-nox solution followed by tap water rinses onsite and prior to their mobilization to the site.

CHAIN OF CUSTODY PROTOCOL

Chain of custody protocol is followed for all soil and ground water samples selected for laboratory analysis. The chain of custody form(s) accompanies the samples from the sampling locality to the laboratory, providing a continuous record of possession prior to analysis.

APPENDIX B

SITE HEALTH AND SAFETY PLAN

SITE HEALTH AND SAFETY PLAN

Site Assessment Activities
Former Mobil Station 04-334
2492 Castro Valley Boulevard
Castro Valley, California

1.0 PLAN SUMMARY

This Site Health and Safety Plan (SHSP) establishes responsibilities, requirements, and procedures for the protection of personnel while performing activities at the above-referenced site. This site-specific plan conforms with the Alton Geoscience Corporate Health and Safety Plan, Hazard Communication Program, and Injury and Illness Prevention Program (IIPP).

During site work, the use of proper health and safety procedures, in accordance with applicable Cal/OSHA regulations shall be required. Site-specific conditions may necessitate modification of the SHSP; however, except in emergency situations no deviations from the plan may be implemented without the prior notification and approval of the Site Safety Officer (SSO).

2.0 SITE INFORMATION

This SHSP considers the physical, chemical, and environmental hazards that may be encountered during work activities at the site. Operations associated with this SHSP will be conducted in accordance with an approved workplan. Any changes required or made to the planned activities will be immediately communicated to site personnel by the SSO. Summary information for this project is provided in the following table.

Workplan dated:	July 9, 1997
Principal activities:	Drill geoprobe soil borings and collect soil and groundwater grab samples.
Site description (see Attachment A for site map):	The site is currently a Jiffy Lube automobile service facility. The site was previously a Mobil service station prior to 1983.
Approximate depth to groundwater:	13 feet below grade
Contaminants of concern	Hydrocarbons in soil and groundwater (see Attachment B).

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3.0 SITE SAFETY AUTHORITY

Contact information and names of authorized personnel are listed below. A description of responsibilities follows.

Role	Name	Company	Telephone
Site Safety Officer	Tom Seeliger	Alton Geoscience	(800) 383-4038 pgr
Alternate Site Safety Officer	Chris Callegari	Alton Geoscience	(800) 365-8025 pgr
Project Manager	Tom Seeliger	Alton Geoscience	(510) 606-9150 ext 104
Supervisor/Offsite Coordinator	Matt Katen	Alton Geoscience	(510) 606-9150 ext 103
Local IIPP Coordinator	Matt Katen	Alton Geoscience	(510) 606-9150 ext 103
Client Contact	Cherine Foutch	Mobil	(510) 625-1173

Site Safety Officer: The SSO is responsible for briefing site personnel on potential physical and chemical hazards prior to work start-up, during operations, and whenever other health and safety matters need to be addressed. The SSO will be in charge of conducting the daily Tailgate Safety Meetings. The SSO will see that this SHSP is available onsite and is understood and signed by personnel entering the site. The SSO is also responsible for implementing emergency response procedures when necessary. In the event the SSO is unable to perform these duties, the Alternate SSO will be responsible.

Project Manager: The Project Manager (PM), in coordination with the SSO, is responsible for implementing health and safety requirements, including seeing that the SHSP is prepared and available onsite. The PM is the central point of contact for the SSO, Client, and Field Personnel, and has overall responsibility for site operations.

Field Personnel: Field Personnel are responsible for understanding and complying with this SHSP. Field Personnel include both Alton employees and Subcontractors hired by Alton Geoscience. Field Personnel are required to participate in briefings prior to commencement of site work; attend daily Tailgate Safety Meetings; and acknowledge receipt and understanding of the SHSP by signing the Compliance Log at the end of this plan.

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Supervisor/Offsite Coordinator: The Supervisor/Offsite Coordinator, typically the Alton branch manager, should be contacted when mobilization of support from an Alton office is needed, and in case of an emergency requiring offsite assistance.

4.0 SITE CONTROL

Site control requires the establishment of a regulated area with designated work zones, evacuation protocol, location of medical assistance, site security, and communication guidelines that include a "Buddy System."

4.1 REGULATED AREA(S)

Each site will have an established Exclusion Zone with controlled access, and a Support Zone. Supervision and strict control of access to regulated areas is necessary to protect site personnel as well as the public.

Exclusion Zone: (*a.k.a. "Hot Zone"*) This is the area where personnel may be subject to chemical or physical hazards. It is the zone of known or suspected contamination, where equipment operation and/or environmental sampling will take place. The Exclusion Zone is to be clearly identified and isolated with cones, barricades, or high visibility caution tape. Personnel working in the Exclusion Zone will at a minimum use Level D personal protective equipment as described in **Section 7.0**.

The outer boundary of the Exclusion Zone (*"Hot Line"*) will be established by the SSO, so that sufficient area is available to conduct operations while providing a protective buffer for persons and property outside the zone.

Support Zone: (*a.k.a. "Safe Zone"*) This is the area outside the Exclusion Zone where administrative and other support functions are located. Adverse exposure to contaminants and physical hazards are unlikely in the Support Zone.

4.2 EVACUATION PROTOCOL

Evacuation protocol and routes from the site will be established by the SSO, and communicated to Field Personnel during the Tailgate Safety Meeting(s) prior to initiating work. Evacuation protocol will be implemented as needed in emergency situations. In the event of an evacuation, personnel will meet at a preestablished location and the SSO will do a "head count" to see that everyone has left the hazard area.

Emergency Response procedures are outlined in **Section 12.0**. Directions to the nearest medical facilities are provided in **ATTACHMENT C**.

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4.3 SITE SECURITY

Appropriate security measures will be established in coordination with the site owner/operator and communicated to site personnel. The objective of these measures is to (1) protect the public from potential exposure to physical/chemical hazards; (2) avoid public interference with personnel and safe work practices; and (3) prevent theft or vandalism of equipment at the site.

4.4 COMMUNICATION

Communication is an important aspect of the site control program as well as the entire SHSP. Personnel should keep in mind that hazard assessment is a continuous process, and any potentially unsafe condition must be reported immediately to the SSO.

Onsite personnel will use the "Buddy System" and maintain communication or visual contact between team members during site operations. The Buddy System is used to provide assistance, monitor for chemical exposure and heat stress, and obtain emergency assistance for coworkers when necessary.

Site personnel will be familiar with the following emergency hand signals:

- | | |
|--|-------------------------------------|
| Hand gripping throat: | Can't breathe. Respirator problems. |
| Grip team member's wrist or both hands on team member's waist: | Leave site immediately, no debate! |
| Thumbs up: | Yes. I'm alright. I understand. |
| Thumbs down: | No. Negative. |

5.0 HAZARD ASSESSMENT

Hazard assessment is essential for establishing hazard reduction measures. Hazard assessment will consist primarily of site inspections and monitoring. Known operational hazards (heavy equipment, overhead lines, etc.) and site characterization data (contaminant location, concentration, etc.) are also considered in the assessment. The following is a list of potential hazards associated with the activities planned for this site:

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<u>Physical Hazards</u>	Heavy equipment Overhead lines and underground utilities Explosion and fire Traffic - vehicular and pedestrian Tripping, slipping, and falling Head, foot, eye, and back injuries Falling objects Sharp objects Electrical equipment Welding Excavation, borings
<u>Chemical Hazards</u>	Gasoline / benzene, toluene, ethylbenzene, xylenes (BTEX) Environmental samples, soil cuttings, decontamination water, dust (nuisance, silica)
<u>Environmental Hazards</u>	Noise exposure - heavy equipment operation Weather - heat, cold, rain, fog Biological - plants, animals/insects, pathogens
<u>Confined Spaces</u>	Hazardous atmospheres (Oxygen content; flammable, explosive, or toxic gases) Engulfment potential Restricted movement; limited space for entry/exit

Walk-through safety inspections will be conducted by the SSO daily and as conditions change. Inspection results will be communicated to the work crews during the morning Tailgate Safety Meetings and as needed.

6.0 HAZARD REDUCTION

Personnel are required to exercise reasonable caution at all times during work activities. Failure to follow safety protocols and/or continued negligence of health and safety policies will result in expulsion of a crew member from the site and may result in termination of employment. In general, the potential for hazardous situations will be reduced by the following activities:

Implementing engineering controls

Using personal protective equipment

Performing air monitoring

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Engineering Controls, corresponding to the hazard assessment for work at this site, are outlined below in Sections 6.1 through 6.4. Personal protective equipment (PPE) and air monitoring guidelines are outlined in Sections 7.0 and 8.0, respectively.

6.1 PHYSICAL HAZARDS AND CONTROLS

Heavy Equipment

The operation and use of heavy equipment presents the greatest potential for injury to personnel. To minimize these hazards, designated routes and specific traffic patterns will be established. Trucks will use spotters for backing. If personnel need to approach heavy equipment during operation, they will observe the following protocols: make eye contact with the operator, signal the operator to cease heavy equipment activity, and then approach the equipment to inform operator of intentions.

Only equipment that is in safe working order will be used. Only qualified personnel will be allowed to operate heavy equipment. Subcontractors will supply proof of qualifications to operate the equipment. Those crew members directly involved in spotting for the operator will be the only personnel allowed within the operating radius of the heavy equipment. Other personnel will remain at a safe distance from these operations.

Overhead Lines and Underground Utilities

When operating heavy equipment (such as cranes or drill rigs) near overhead power lines, care will be taken to ensure that the crane boom and rigging maintain a distance of *at least 10 feet* from the power lines. A USA utility mark-out is required and will be performed prior to drilling, construction, or excavation to mark/clear underground utilities. In addition, the first 5 feet of soil borings will be excavated using an air-knife or hand auger.

Explosion and Fire

Liquid petroleum products readily vaporize from standing pools or saturated soil. Ignition sources pose an explosion and fire hazard (e.g., engines, impact sparking, and heat or arc from inappropriate equipment or instrumentation). A direct-reading combustible gas indicator (CGI) will be used to evaluate the possible formation of flammable atmospheres in and around the work area (See Section 8.0: Air Monitoring).

Emergency services (911) are to be called immediately in case of a fire or explosion. A portable fire extinguisher will be kept onsite for use on small fires only. Only personnel trained in the proper use of fire extinguishers are authorized to use the onsite fire extinguisher.

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Traffic - Vehicular and Pedestrian

Work to be conducted in the public right-of-way requires an approved traffic control plan and traffic control setup and operation. Project personnel are required to follow state and local traffic laws. Vehicles driven by company personnel will yield to bikes and pedestrians, and at railroad crossings.

Access to work areas will be limited by the SSO to essential personnel. Delineators, barriers, and/or taping will be used to cordon off the work areas, and prevent pedestrian and vehicular traffic from entering the work zones.

Tripping, Slipping, and Falling

Personnel will be reminded daily to maintain sure footing on all surfaces. Use of safety harnesses is required for personnel working *6 feet or more* above any surface that does not have handrails (includes riding on manlifts). Work surfaces of unknown or suspect integrity will be strengthened or overlaid with a work platform capable of supporting personnel and equipment working in the area. To minimize tripping hazards caused by construction and other debris, material will be removed daily from the work areas and stockpiled in appropriate designated storage areas. This "housekeeping" effort will be enforced by the SSO at the end of each day.

Head, Foot, Eye, and Back Injuries

Hard hats, steel toe boots, and safety glasses will be worn during site operations. To avoid back injuries, personnel will be trained in and required to use proper equipment and lifting techniques for manual material handling.

Falling Objects

Equipment and material will be lowered to the ground "slowly" using a grapple and/or skip bucket. Personnel shall not work under this equipment; nor shall personnel other than the operator ride on the equipment.

Sharp Objects

Nails, wires, saws, and cutting equipment pose potential hazards such as cuts and punctures during site work. *Only appropriate work tools are to be used.* Personnel are required to exercise caution, and should wear leather work gloves when handling or operating cutting tools, saws, and other sharp objects. A consistent housekeeping effort at the site will also help to reduce hazards from sharp objects.

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Electrical Equipment

In order to prevent accidents caused by electric shock, electrical connections will be inspected on a daily basis. Equipment found to have frayed wiring or loose connections will be shut down and locked-out until a qualified electrician has effected repairs. Electrical equipment will be de-energized and tested before any electrical work is started. Equipment will be properly grounded prior to and during work.

In addition, ground fault circuit interrupters (GFCIs) will be installed whenever possible in each circuit between the power source and tool, unless the presence of a potentially explosive atmosphere precludes this procedure. In the event that generators are used to supply power, they will be equipped with GFCIs.

Welding Hazards

Personnel who perform or observe welding operations are required to use approved welding shields or glasses. This protective equipment will be inspected prior to each use for scratches and pits that could inhibit the ability to shield harmful ultraviolet light. Personnel are required to wear protective clothing to shield their skin from the harmful ultraviolet light produced by welding operations. Personnel working near welding operations that could ignite chemical protective clothing must wear flame-retardant outer apparel (Nomex or equivalent).

Excavation and Trenching

Excavations and/or trenching *5 feet or more* in depth will incorporate a system of shoring, sloping of the ground, benching, or other means, as provided in CCR Title 8 Construction Orders, to prevent caving. Excavations/trenching will be inspected daily by a qualified person, and after every rainstorm or other hazard-increasing occurrence. Excavations less than 5 feet deep shall also be inspected for indications of potentially hazardous ground movement.

When employees are working in trenches *4 feet or more* in depth, a safe means of access/egress shall be provided and located so that no more than 25 feet of lateral travel is necessary to reach the access/egress point.

No equipment will be allowed and no materials will be piled within *2 feet* of the edge of any trench or excavation. Adequate barrier protection shall be provided to keep mobile equipment and personnel from inadvertently falling into a trench or an excavation.

No excavation work shall take place below the level of the base of an adjacent foundation, retaining wall, or other structure until (1) a qualified person has characterized the situation as one that will not create a hazard to workers; or (2) adequate safety measures have been taken for the protection of workers.

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Workers shall not be permitted underneath loads handled by excavation or loading equipment. Soil excavation, handling, stockpiling, and backfilling will not be conducted under high-wind conditions. Under these conditions, the work area, excavated material, and unpaved roadways will be watered down until the surface is moist, and maintained in a moist condition to minimize dust.

6.2 CHEMICAL HAZARDS AND CONTROLS

Chemical Characteristics

Hazardous chemicals that may be encountered at this site include diesel and gasoline hydrocarbons. These chemicals are volatile, flammable, and moderately to extremely toxic when inhaled, ingested, or absorbed above certain concentrations. See **ATTACHMENT B** for specific exposure limits and basic toxicology information.

Personnel will use engineering controls and PPE (based on hazard assessment) to prevent chemical exposure.

Sample Collection

Workers who must come in direct contact with known or suspected contaminated soil or groundwater to collect samples are required to wear protective gloves and other PPE, as needed, to reduce the potential for exposure. Safety glasses will be worn to avoid potential splashing of chemicals into the eyes.

Soil Cuttings, Decontamination Water, and Dust

As with sample collection, precautions are to be followed for handling materials such as soil cuttings and cleaning/decontamination water. Exposure and potential inhalation of dust (nuisance, silica) will be minimized by wearing dust masks or other appropriate PPE/respiratory protection.

Disposition of Materials

Excavated soil will be stockpiled and covered, or stored in closed drums or roll-off bins. Purged water will be stored in closed drums or tanks. Drums, tanks, and/or roll-off bins containing soil or water will be labeled in accordance with the hazard communication standard and removed from the site in accordance with client-approved protocol.

Hygiene

Eating, smoking, and drinking is **NOT ALLOWED** in the work area. Site personnel will wash their hands, arms, and faces thoroughly prior to eating or drinking, and at the end of their shift. Food should never be stored where it may come into contact with, or be contaminated by, petroleum products or other toxic materials.

6.3 ENVIRONMENTAL HAZARDS AND CONTROLS

Noise Exposure

Hearing protection (ear plugs or ear muffs) will be worn when project personnel enter high-noise areas. The SSO should see that extra ear plugs are available onsite.

Heat Stress

Heat stress may be caused by the combination of ambient factors such as high air temperature, high relative humidity, and low air movement. This condition can result in heat rash, heat cramps, heat exhaustion, and/or heat stroke. It can impair worker coordination and judgement and directly impact health and safety. Heat stress is more likely when PPE is worn. Personnel are to drink plenty of water and take breaks (in shaded rest areas) as needed to help prevent heat stress. As part of the Buddy System, personnel should watch for signs and symptoms of heat stress in coworkers as well as themselves.

Cold Exposure

To guard against cold injury (frostbite and hypothermia), which is a danger when the temperature and wind-chill factor are low, employees will wear appropriate clothing, have warm shelter readily available, and maintain carefully scheduled work and rest periods.

Biological Hazards

Personnel will assess their surroundings for potential biological hazards, which may be posed by poisonous plants, insects, animals, and indigenous pathogens. Protective clothing and respiratory equipment can help reduce the chances of exposure. Thorough washing of any exposed body parts and equipment will help protect against infection from biological hazards. "*Universal Precautions*" (e.g., wearing latex gloves) must be taken any time there is potential for exposure to human blood, such as when an employee renders first aid to a coworker.

6.4 CONFINED SPACE HAZARDS

Confined space entry is NOT ANTICIPATED during the course of these operations. However, if such a situation is encountered, workers are prohibited from entering confined spaces until the company plan dealing with confined spaces has been implemented.

7.0 PERSONAL PROTECTIVE EQUIPMENT

7.1 LEVEL OF PROTECTION

Personnel are required to wear PPE appropriate for the task and anticipated exposure to known contaminants. Selection of PPE will be based on hazard assessment, task performance, and air monitoring. Based on the history of this site, the initial level of protection will be Level D. At a minimum, Level D PPE will consist of the following:

- Hardhat
at all times in work area
- Boots: chemical-resistant, steel toe and shank
at all times in work area
- Safety glasses, splash goggles, or hardhat with face shield
when there is risk of hazardous substances (sampling) or flying particles (drilling, excavation, etc.) getting into eyes
- Ear plugs / hearing protection
when high-noise equipment/drill rig is in operation
- Gloves: chemical-resistant
when handling soil cuttings or soil/water samples

Site personnel also are required to *be prepared* with the following items:

- Respirators: half-face, air-purifying with appropriate cartridges
- Dust masks
- Tyvek coveralls and other suitable protective clothing
- Traffic safety vest
- Leather work gloves and back brace/lifting belt

Air monitoring information will dictate when and if a site will be upgraded to Modified Level D (Level D plus respirator).

7.2 RESPIRATOR SELECTION

For operations that require the use of a respirator, the SSO must verify that Field Personnel are medically approved to use respiratory equipment, fit tested, and trained in the proper use of air-purifying respirators. Site personnel are required have their respirator available and ready to use onsite. Only respirators that are NIOSH/MSHA approved are to be used.

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Air monitoring will be performed to assess airborne contaminant levels onsite, and to evaluate suitable respiratory protection. Workers will be required to wear half-face, air-purifying respirators with organic vapor cartridges under the following circumstances, as indicated by onsite air monitoring:

- If volatile organic compound (VOC) vapors in the work area continuously exceed the threshold limit value - time-weighted average (TLV-TWA) for gasoline (300 parts per million [ppm]).
- If, at any time, VOC vapors in the work area exceed the threshold limit value - short-term exposure limit (TLV-STEL) for gasoline (500 ppm).

TLV values for gasoline are derived from American Conference of Governmental Industrial Hygienists (ACGIH) standards. Similar precautions will be taken with regard to other toxic chemicals, such as BTEX components. See **ATTACHMENT B** for additional information and regulatory exposure limits.

7.3 REASSESSMENT OF PPE

The levels of protection listed above will be upgraded (or downgraded) based on changes in activities, changes in site conditions, measurements of direct-reading instruments (compared to action levels for contaminants), or other findings. Changes in the level of protection require the approval of the SSO.

8.0 AIR MONITORING

Monitoring will be conducted as needed to characterize airborne contaminant levels. The potential hazards associated with the presence of hydrocarbons include (1) personnel exposure to chemicals, and (2) possible formation of flammable atmospheres in and around the work area. Air sampling will be conducted in accordance with NIOSH, OSHA, or EPA methods. The SSO will check to see that air monitoring equipment brought onsite is properly calibrated prior to operation and recalibrated during the course of the day, as necessary.

8.1 ORGANIC VAPOR ANALYZER

A organic vapor analyzer (OVA) will be used for the monitoring of VOCs in the work area in accordance with the requirements outlined in Title 8 CCR 5192. Air monitoring will be conducted in the breathing zone of workers, and the data collected will be used to evaluate suitable respiratory protection against chemicals encountered. Refer to the Respirator Selection guidelines in **Section 7.2** for personal protection measures. Measurements will also be obtained periodically at the top of boreholes or excavation cavities, and during any construction activities in which hydrocarbon-affected soil is encountered; however, only breathing zone measurements will be used to determine whether PPE should be used or discontinued.

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8.2 COMBUSTIBLE GAS INDICATOR

A direct-reading, portable CGI that measures VOC concentrations in ppm, or as a percentage of the lower explosive limit (LEL), will be used to monitor airborne concentrations of VOCs and evaluate the possible formation of flammable atmospheres in and around the work area. Data will be used to monitor and evaluate vapor concentrations within or emanating from well bores, excavations, and contaminated soil that is stockpiled, moved, or loaded on or about the site. Measurements will be obtained periodically at the top of boreholes or excavation cavities throughout drilling or excavation operations, and during any construction activities in which hydrocarbon-affected soil is encountered. Periodic measurements also will be taken in areas that may contain an accumulation of combustible vapors.

In the event that CGI readings on the site exceed 10 percent of the LEL, work will be suspended, monitoring will be continued as needed to isolate the area of concern, and the following applicable environmental controls will be implemented:

1. Vapors from pooled petroleum product will be suppressed (if necessary) by spraying with foam, appropriate chemical suppressant, or carbon dioxide in gas form or dry ice.
2. Air movers will be used to ventilate the areas of concentration to below 10 percent LEL.
3. Contaminated soil will be covered with clean soil and/or sprayed with water or deodorizing chemicals in order to reduce vaporization of VOCs.

9.0 DECONTAMINATION

Due to the expected low levels and types of contaminants at the site, it is anticipated that personnel will not perform routine decontamination procedures when leaving the Exclusion Zone. Project activities will be initially conducted in Level D PPE. When decontamination is necessary, it will consist of the following:

- Removal of contaminated garments in an "inside out" manner at a designated decontamination station located at the step-off location where personnel routinely enter/exit the Exclusion Zone.
- Placement of contaminated garments in designated plastic bags or drums prior to disposal or transfer offsite. Labels in compliance with the hazard communication standard will be affixed to containers of contaminated debris and clothing.

10.0 PERSONNEL TRAINING

Personnel who will perform field activities shall meet the training requirements specified in the OSHA Hazardous Waste Operations and Emergency Response (HAZWOPER) Standard [29 CFR 1910.120 (e)]. Prior to commencement of work, the SSO will discuss the potential physical and chemical hazards associated with site operations, and review safe work practices with personnel. Personnel are required to acknowledge their understanding and willingness to comply with this SHSP before admission to the site by signing the Compliance Log at the end of the SHSP.

Other job-specific training required to perform tasks within this operation will be verified by the SSO. This training may include, but is not be limited to respirator fit testing, safe lifting techniques, confined spaces, hearing conservation, and proper fire fighting procedures.

11.0 MEDICAL PROGRAM

The site medical program has two main components: a baseline medical surveillance program, and emergency medical assistance procedures.

11.1 BASELINE MEDICAL SURVEILLANCE

Alton Geoscience has established a medical surveillance program to assess, monitor, and help protect the health of employees, in particular, employees who may be exposed to potentially hazardous substances during site work. Personnel will undergo medical examinations as follows:

Initial: Pre-employment / prior to any assignment involving work in a hazardous or potentially hazardous environment. The initial examination is used to establish a baseline picture of health against which future changes can be measured, and to identify any underlying illnesses or conditions that might be aggravated by chemical exposures or job activities.

Periodic: At least once every 12 months to measure changes in health status.

Upon notification: As soon as possible upon notification by an employee that they have developed signs or symptoms indicating possible overexposure to hazardous substances, or in response to an injury or exposure during an emergency situation.

Exit: At termination of employment.

11.2 EMERGENCY MEDICAL ASSISTANCE

An emergency medical assistance network will be established prior to work start-up. The nearest fire department, police, ambulance service, and hospital with an emergency room will be identified. See **ATTACHMENT C** for Emergency Services contact information. A vehicle shall be available onsite

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during work activities to transport injured personnel to the identified emergency medical facilities, if necessary. Company vehicles are to be equipped with a fire extinguisher and first aid kit.

12.0 EMERGENCY RESPONSE PLAN

The SSO will have controlling authority during an emergency. In the SSO's absence, the Alternate SSO will be in charge. See ATTACHMENT C for the name, location, and telephone number of emergency response organizations in the vicinity of the project site, and a map to the nearest hospital(s).

12.1 EMERGENCY PROCEDURES

In the event of an accident, injury, or other emergency, remember to:

Stop work and REMAIN CALM.

Move personnel to a safe location (evacuation plan).

Call 911 or notify other emergency facilities.

Address medical emergencies and apply first aid, if necessary.

Contain physical hazards.

(NOTE: Act only if hazard is minimal and you are trained to deal with the situation. Otherwise evacuate and wait for emergency services to arrive.)

Notify offsite supervisor and client, and initiate accident reporting procedures.

12.2 ACCIDENT REPORTING

In case of an accident, the SSO (or Alternate) will immediately notify the Supervisor/Offsite Coordinator at the nearest Alton office and later provide a report to the PM describing the following:

1. A description of the event (including date and time) that required notification of offsite personnel (i.e., medical facilities, fire department, police department) and the basis for that decision.
2. Date, time, and names of persons/agencies notified, and their response.
3. Details regarding personal injury and property damage, if any.
4. Resolution of incident and the corrective action involved.

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All incidents and near misses are to be investigated in accordance with Alton's IIPP. The Supervisor's Report of Accident is to be completed and submitted to the Human Resources department within 24 hours following any accident or injury.

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**SITE HEALTH AND SAFETY PLAN
COMPLIANCE LOG**

I have reviewed this Site Health and Safety Plan and understand the contents of the plan. I hereby agree to comply with all safety requirements outlined herein.

Signature: _____ Date: _____ Site Safety Officer,
Alton Geoscience, Inc.

Signature: _____ Date: _____ Alternate Safety Officer,
Alton Geoscience, Inc.

Signature: _____ Date: _____

Print Name: _____ Company: _____

Signature: _____ Date: _____

Print Name: _____ Company: _____

Signature: _____ Date: _____

Print Name: _____ Company: _____

Signature: _____ Date: _____

Print Name: _____ Company: _____

Signature: _____ Date: _____

Print Name: _____ Company: _____

Signature: _____ Date: _____

Print Name: _____ Company: _____

Site

ATTACHMENT A

SITE PLAN

Site _____

ATTACHMENT B
OCCUPATIONAL HEALTH GUIDELINES
AND TOXICOLOGICAL INFORMATION

Table B-1

OCCUPATIONAL HEALTH GUIDELINES AND TOXICOLOGICAL INFORMATION

Contaminant	ACGIH TLV-TWA (ppm)	NIOSH REL (ppm)	STEL (ppm)	OSHA PEL (ppm)	IDLH (ppm)	Routes of Exposure	Known or Suspected Carcinogen	Symptoms
Gasoline	300	n/a	500	n/a	n/a	Inhalation, Absorption, Ingestion, Contact	Yes	Irritation to eyes, skin, mucous membrane; dermatitis, headache, fatigue, blurred vision, dizziness, slurred speech, confusion, convulsions, aspiration
Benzene	10	0.1	1	1	500	Inhalation, Absorption, Ingestion, Contact	Yes	Irritation to eyes, skin, nose, resp system, giddiness, headache, nausea, staggered gait, fatigue, anorexia, weakness/exhaustion, dermatitis
Toluene	50	100	150	200	500	Inhalation, Absorption, Ingestion, Contact	No	Irritation to eyes, nose; fatigue, weakness, confusion, euphoria, dizziness, headache, dilated pupils, tears, nervousness, muscle fatigue, insomnia, dermatitis
Ethylbenzene	100	100	125	100	800	Inhalation, Ingestion, Contact	No	Irritation to eyes, skin, mucous membranes; headache, dermatitis, narcosis, coma
Xylenes (o,m,p.)	100	100	150	100	900	Inhalation, Absorption, Ingestion, Contact	No	Irritation to eyes, skin, nose, throat; dizziness, excitement, drowsiness, incoordination, staggering gait, nausea, vomiting, abdominal pain, dermatitis

TABLE KEY

ACGIH TLV-TWA	American Conference of Governmental Industrial Hygienists, Threshold Limit Value-Time Weighted Average
NIOSH REL	National Institute of Occupational Safety & Health, Recommended Exposure Limit
STEL	Short Term Exposure Limit (Gasoline STEL is by ACGIH; BTEX STELs are by NIOSH)
OSHA PEL	Occupational Safety and Health Administration, Permissible Exposure Limit
IDLH	Immediately Dangerous to Life and Health
ppm	parts per million
CNS	Central Nervous System
n/a	not available (i.e., no value has been established)

DEFINITIONS

Threshold Limit Value: Threshold limit values (TLVs) refer to airborne concentrations of substances and represent conditions under which it is believed nearly all workers may be repeatedly exposed, day after day, without adverse health effects.

Threshold Limit Value - Time Weighted Average: The time weighted average (TWA) is a concentration for a normal 8-hour workday and a 40-hour workweek, to which nearly all workers may be repeatedly exposed, day after day, without adverse effect. TLV-TWAs are established by the ACGIH.

Recommended Exposure Limit: Unless otherwise noted, the recommended exposure limit (REL) is a TWA concentration for up to a 10-hour workday during a 40-hour workweek. RELs are established by NIOSH to reduce or eliminate adverse occupational health effects.

Short Term Exposure Limit: A short term exposure limit (STEL) is defined as a 15-minute TWA exposure that should not be exceeded at any time during a workday. When compared to the REL (or TLV-TWA for ACGIH standards), the STEL allows the worker to be exposed to a higher concentration, BUT for a shorter period of time. Exposures above the REL up to the STEL should not be longer than 15 minutes and should not occur more than four times per day.

Permissible Exposure Limit: Permissible exposure limits (PELs) are TWA concentrations that must not be exceeded during any 8-hour work shift of a 40-hour workweek. PELs are established by OSHA (29 CFR 1910.1000).

Immediately Dangerous to Life and Health: Immediately dangerous to life and health (IDLH) values are established as concentrations from which a worker can escape within 30 minutes without suffering loss of life, irreversible health effects, or other deleterious effects that could prevent him/her from escaping the hazardous environment. The purpose of establishing an IDLH exposure concentration is to ensure that workers can escape from a given contaminated environment in the event of failure of respiratory protection equipment.

ATTACHMENT C

EMERGENCY SERVICES

PHONE NUMBERS, DIRECTIONS, AND LOCAL AREA MAP

EMERGENCY SERVICES

FACILITY / LOCATION

TELEPHONE

Emergency Situation911

Medical Facility #1 (*with Emergency Room*)

Eden Hospital
20103 Lake Chabot Rd.
Castro Valley, California

(510) 537-1234

East on Castro Valley Blvd. less than 0.25 mile to Lake Chabot Rd., turn left (north) onto Lake Chabot Rd., proceed less than 0.25 mile and the hospital will be on the left.

Fire Department

Alameda County Fire Department Station # 4
20336 San Niguel Ave.
Castro Valley, California

(510) 670-5884

Police Department

Alameda County Sheriff Department
Eden Township Substation
15001 Foothill Blvd,
San Leandro, California

(510) 667-7721

Poison Control Center

11925 Wilshire Boulevard
Los Angeles, California

(213) 484-5151

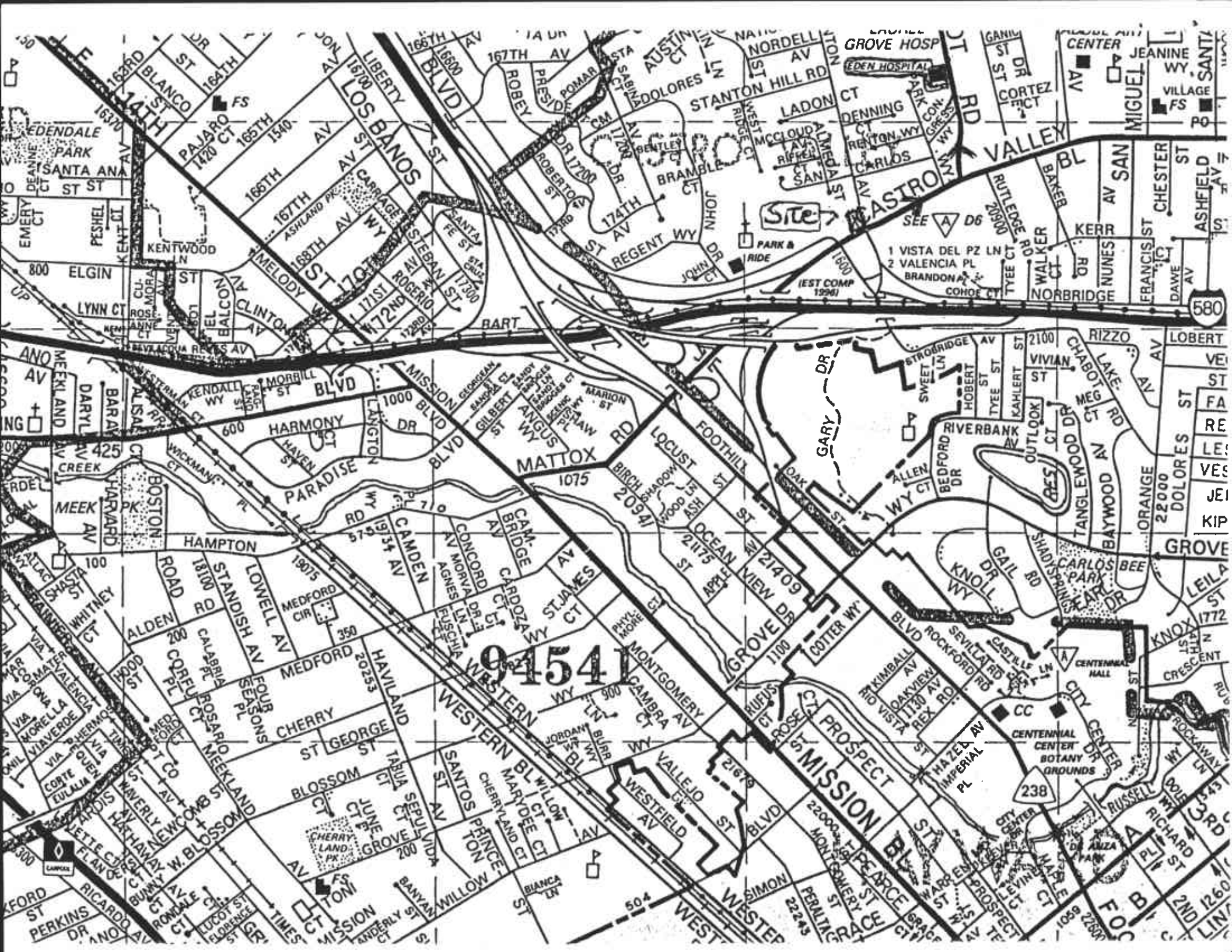
Office of Emergency Services Region 2

(510) 646-5908

USA Dig Alert

(800) 422-4133

LOCAL AREA MAP
with routes to hospital



94541

Site

SEE A D6
1 VISTA DEL PZ LN
2 VALENCIA PL
BRANDON A
CONHOE CT

238

580

504

1260

ALAMEDA CO.

ZIP

444

442

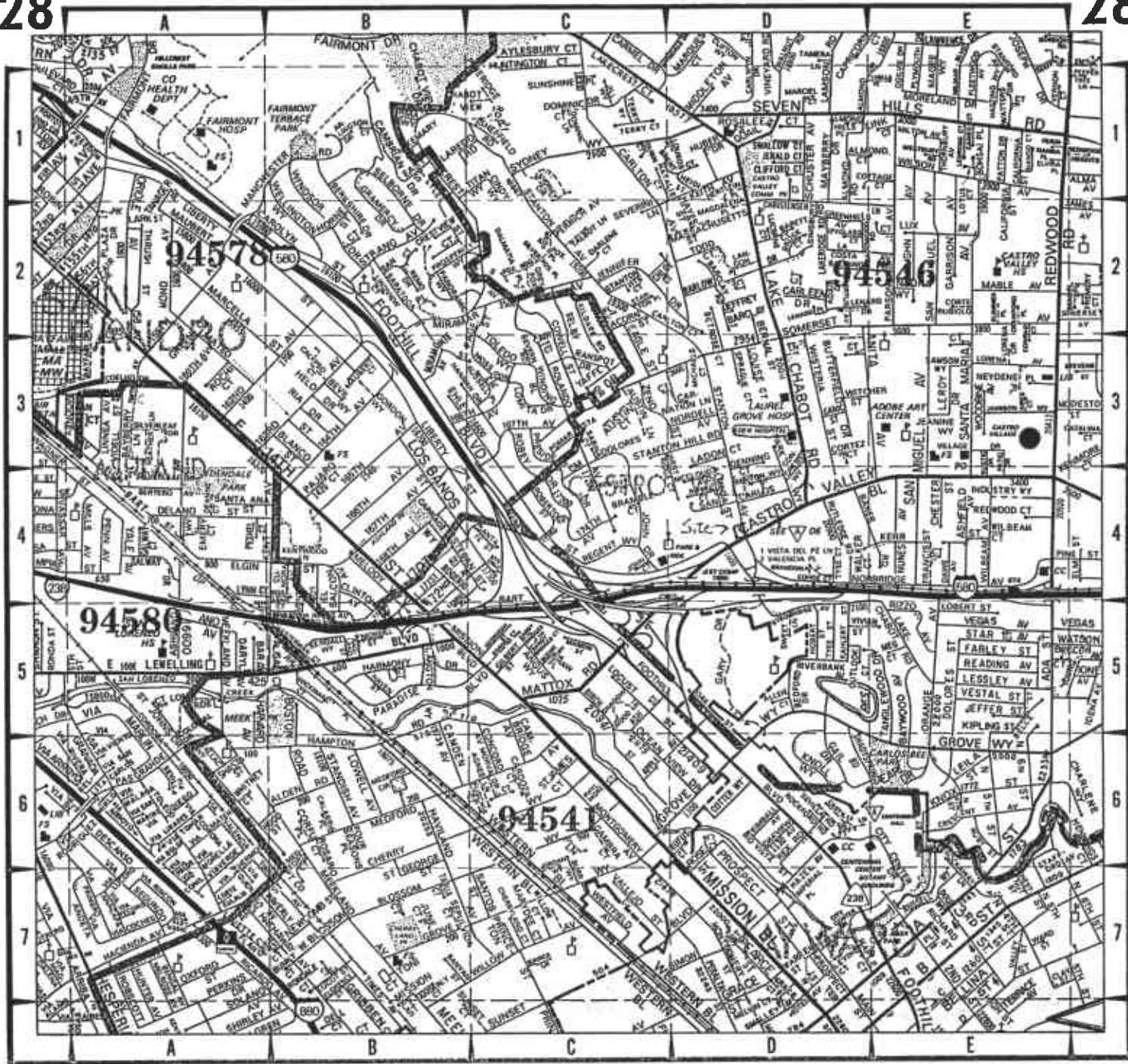
27

FOR CONTINUATION SEE MAP

DETAIL

434

432



1,530

1,533

FOR CONTINUATION SEE MAP 58

1,540

1,545

FOR CONTINUATION SEE MAP 31

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TAILGATE SAFETY MEETING CHECKLIST

Topics Covered

(Check off as discussed)

- Personnel training/qualifications:** Check cards for OSHA HAZWOPER 40-hour certification/8-hour-refresher training (other if appropriate).
- Supplies:** Indicate location of first aid kit, fire extinguisher, clean water supply (drinking, eye wash), and Site Health and Safety Plan (SHSP).
- Emergency services:** Discuss location of nearest telephone and directions to hospital. Map, directions, phone numbers provided at end of SHSP (Attachment C).
- Site background:** Discuss types, locations, and concentrations of chemicals found onsite, presence of free product, depth to groundwater, etc.
- Work activities:** Discuss scope of work for the day and activities to be performed.
- Potential hazards:** Discuss physical hazards (lifting, pinch points, traffic, working around machinery, etc.); chemical hazards (exposure limits, symptoms, air monitoring); and environmental hazards (heat stress, etc.).
- Air monitoring:** Necessary equipment is onsite and calibrated. Circle: CGI PID
- Personal protective equipment (PPE):** Discuss required level of protection. See that workers have appropriate PPE onsite; includes, but is not limited to, hardhat, steel-toe boots, safety glasses, ear plugs / hearing protection, respirator (with cartridges), gloves, traffic safety vest (other _____).
- Utilities:** Utilities have been cleared/marked by appropriate divisions.
- Traffic control (vehicular and pedestrian):** Work area is properly delineated and cordoned off from traffic.
- Compliance log:** SHSP has been reviewed and signed by site personnel.