TRANSMITTAL FORM

ALLCAL PROPERTY SERVICES

ENVIRONMENTAL INVESTIGATIONS • HOME INSPECTIONS

TO: BARNEY CHAN
ALAMEDA COUNTY HEALTH

FROM: JOHN MRAKOVICH

WE ARE SENDING YOU ☒ ATTACHED ☐ UNDER SEPARATE COVER
VIA _____ THE FOLLOWING ITEMS:

☐ LETTER(S) ☐ PROPOSAL(S) ☐ TABLE(S) ☐ FIGURE(S)
☐ SPECIFICATION(S) ☐ CHANGE ORDER(S) ☐ REPORT(S)
☒ WORKPLAN

COPIES	DATED	DESCRIPTION
1	2/22/96	GROUNDWATER INVESTIGATION, 2001
		FRUITVALE AVE., OAKLAND

THESE ARE TRANSMITTED FOR:
☐ YOUR REVIEW AND COMMENT
☒ YOUR REQUEST
☐ YOUR APPROVAL
☐ _____
☐ YOUR FILES
☐ APPROVED AS SUBMITTED
☐ APPROVED AS NOTED

REMARKS: _____

CC: _____

SIGNATURE: John Mrakovich

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ALLCAL PROPERTY SERVICES
ENVIRONMENTAL INVESTIGATIONS • HOME INSPECTIONS

February 22, 1996

Mr. Fidel Casillas
2094 Harrington Avenue
Oakland, CA 94601

Re: Workplan for a Groundwater Investigation at 2001 Fruitvale Avenue in Oakland, CA 94601

Dear Mr. Casillas:

AllCal Property Services, Inc. (ALLCAL) is pleased to submit this workplan for a groundwater investigation at the subject site. The Alameda County Health Care Services Agency (ACHCSA) required this workplan in their January 25, 1996 letter.

BACKGROUND

On January 3, 1996, ALLCAL conducted a preliminary soil and groundwater investigation at the subject site. The purpose of the investigation was to assess the vadose zone soil and groundwater for hydrocarbon and lead contamination. Based on a Shell Oil Company (Shell) plot plan, provided by the law office of Trump, Alioto, Trump & Prescott, ALLCAL drilled 5 soil borings (SB-1 through SB-5, see attached Figure 1) and collected 20 soil and 2 "grab" groundwater samples beneath some potential sources for contamination. These sources, as described on the plot plan, were 2 dispenser islands, 2 underground fuel storage tank complexes, and a sump containing 2-inch suction fuel lines and a selective manifold. The groundwater samples were collected from beneath the 2 former underground fuel storage tank complexes.

All soil and groundwater samples were analyzed for total petroleum hydrocarbons as gasoline (TPHG) and for benzene, toluene, ethylbenzene, and xylenes (BTEX). Selected soil samples were additionally analyzed for total petroleum hydrocarbons as diesel (TPHD) and total lead.

The investigation detected chemicals in both the soil and groundwater. The highest concentration of chemicals detected in the soil was 830 parts per million (ppm) as TPHG. The highest concentration of chemicals detected in the groundwater was 40,000 parts per billion (ppb) as TPHD. In both cases, the chemicals were not clearly identifiable as gasoline or diesel and may be Stoddard solvent.

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In the soil, a gasoline chromatogram pattern was seen only in soil boring SB-4 at a depth of about 19 feet and a concentration of 5.0 ppm; the gasoline appeared to be strongly aged.

In the groundwater, a gasoline chromatogram pattern was seen only in the boring of SB-1 at a concentration of 1,300 ppb.

No diesel chromatogram pattern was seen in any of the soil and groundwater samples analyzed for TPHD, and total lead appears to be insignificant.

The contamination detected in the above preliminary investigation was generally near the bottom of the borings and close to the groundwater table. The groundwater may contain a contaminant plume which is transferring contamination to the soil matrix as the water table fluctuates up and down in response to seasonal rainfall and recharge. Groundwater was encountered within a depth range of about 21.5 to 23 feet.

The scope of work presented below is proposed as a further investigation of the soil and groundwater.

PROPOSED SCOPE OF WORK

A review of the ACHCSA fuel leaks list indicates that no nearby groundwater monitoring wells are present to establish groundwater gradient at the subject site; consequently, the following scope of work includes the construction of 3 groundwater monitoring wells so that gradient can be documented.

As a further investigation of soil and groundwater contamination, ALLCAL proposes the following scope of work:

- Obtain well installation permits.
- Drill 3 soil borings for installing groundwater monitoring wells.
- Collect soil samples from each boring at approximately 5-foot depth intervals, changes in lithology, and occurrence of apparent soil contamination for construction of a boring log and for potential selection for chemical analysis.
- At a minimum, analyze the vadose zone soil sample nearest to groundwater in each boring for TPHG and BTEX.
- Convert each boring into a 2-inch diameter casing groundwater monitoring well.

- Survey the elevation of top-of-casing (TOC) of each well relative to mean sea level (MSL).
- Develop, purge, and sample groundwater from each well.
- Analyze the groundwater samples and 1 trip blank sample for TPHG and BTEX.
- Prepare a letter report.

Details of the proposed scope of work are presented below.

Predrilling Activities:

Before commencing drilling activities, ALLCAL will: (1) obtain well installation permits from the Alameda County Flood Control and Water Conservation District, Water Resources Management Zone 7, (2) visit the site to mark the proposed groundwater monitoring well locations, and (3) contact Underground Service Alert.

Rationale for Location of Wells:

Based on a review of topographic gradient in the vicinity of the site and a telephone conversation with a representative of the ACHCSA, direction of groundwater flow is estimated to be southwesterly. Based on a southwesterly direction of groundwater flow, ALLCAL proposes to install 3 groundwater monitoring wells at the locations shown in attached Figure 2.

Groundwater monitoring well MW-1 is proposed to be located southwesterly from the 2 former underground fuel tank complexes in the estimated downgradient direction of groundwater flow. Groundwater monitoring well MW-2 is proposed to be located in a northerly direction from the 2 former underground fuel tank complexes and in the area of former and proposed (by Shell) underground waste oil tanks. Soil and groundwater samples obtained from this location will be, additionally, tested for waste oil and metals. Groundwater monitoring well MW-3 is proposed to be located in the estimated upgradient direction from the 2 former underground fuel tank complexes and will evaluate the potential of upgradient contaminant sources impacting the subject site.

Soil Boring and Sampling Procedures:

The exploratory boring for each monitoring well will be drilled by a State of California licensed water well driller (C-57 Water Well Driller contractor's license) using 8-inch diameter, hollow-stem, auger drilling equipment. The augers will be steam-cleaned before drilling each boring to minimize the potential of cross-contamination between borings or introducing offsite

contamination to the initial boring. Representative soil samples will be collected for chemical analyses in the vadose zone at approximately 5-foot depth intervals below the ground surface, at changes in lithology, and the occurrence of apparent hydrocarbon contamination by advancing a California split-spoon sampler, equipped with 2-inch diameter by 6-inch long brass tubes, into the undisturbed soil beyond the tip of the augers. The sampling equipment will be cleaned before each sampling event by washing with a trisodium phosphate solution and rinsing in tap water.

Drill cuttings will be stored on site, contained in 55-gallon steel drums. The stored cuttings will be labeled to show contents, date stored, suspected contaminant, date of removal, company name, contact person, and telephone number. **Disposal of the cuttings is your responsibility. After the cuttings are characterized by chemical analysis, ALLCAL will provide** recommendations and, upon your request, **assist you in remediation or disposal of the cuttings, or both, in an appropriate manner as an additional work item.**

Detailed boring logs will be prepared from auger return material and split-spoon samples. The soil will be logged according to the Unified Soil Classification System by a California Registered Geologist.

Attached Appendices A and B document ALLCAL's protocols relative to hollow-stem auger drilling and soil sampling procedures, and waste handling and decontamination procedures, respectively.

Soil Sample Selection for Chemical Analyses:

All vadose zone soil samples will be field-screened for the presence of apparent hydrocarbon soil contamination based on visible hydrocarbon stains, odors, and headspace analysis for volatile organic compounds using a Gastech, Inc., Trace-Techtor hydrocarbon vapor tester (HVT). Headspace analysis will be conducted by partially filling a quart-size plastic bag with a soil sample, sealing the bag air tight, and warming the bag to promote volatilization of hydrocarbons, if any, into the air space of the bag. The headspace of the bag will be sampled by the HVT and the response recorded in ppm.

Samples containing apparent hydrocarbon contamination will be selected for chemical analysis. If no contamination is apparent, the sample nearest to groundwater will be selected for chemical analysis.

Selected samples will be preserved in the brass tubes by quickly covering the open ends with Teflon sheeting or aluminum foil and capping with plastic end-caps. The tubes will be labeled to show site name, project number, date and time collected, sample name

and depth, and sampler name; sealed in quart-size plastic bags; and placed in an iced-cooler for transport to a California Department of Health Services (DHS) certified laboratory accompanied by chain-of-custody documentation.

Attached Appendix C documents ALLCAL's protocol relative to sample handling procedures.

Proposed Chemical Analyses for Soil:

Soil samples are proposed to be analyzed for TPHG and BTEX by the DHS Method and the United States Environmental Protection Agency (EPA) Method 8020, respectively. **Soil samples selected for chemical analysis from the boring of well MW-2 will additionally be analyzed for total oil & grease (O&G) by EPA Method 418.1 and for the metals cadmium, chromium, nickel, lead, and zinc (LUFT** Metals) by EPA Method 6010 & 7000 series.

Proposed Well Installation Procedure:

Based on an estimated depth of about 21 feet to groundwater, the exploratory borings are proposed to be drilled to a depth of about 30 feet. Each boring will be converted into a groundwater monitoring well by installing 2-inch diameter, flush-threaded, schedule 40, polyvinyl chloride casing and 0.010-inch machine-slotted screen. The exact depth of each boring and screen length will be determined by the geologic profile, depth of groundwater, and whether the groundwater is confined or unconfined. If groundwater is unconfined, the screen is proposed to extend about 5 feet above and about 10 feet below the water table surface. The length of screen below the water table surface may be less than 10 feet if an aquiclude/aquitard is encountered. If groundwater is confined, the screen length will extend from the upper contact of the aquifer to a maximum depth of 10 feet. If the aquifer is less than 10 feet thick, the screen length will equal the thickness of the aquifer. A sand pack of Number 2/12 filter sand will be placed in the annular space from the bottom of the boring to a maximum of 2 feet above the top of the screened interval. Approximately 1 foot of bentonite will be placed above the sand pack followed by a neat cement slurry seal. A traffic rated, bolt-locked, vault box will be set in concrete to protect the well. A water tight locking well cap with lock will be installed on each well casing.

A California licensed professional engineer or land surveyor will survey the elevation of each well's TOC relative to MSL.

Attached Appendix D documents ALLCAL's protocol relative to groundwater monitoring well construction procedures.

Proposed Well Development Procedure:

The monitoring wells will be developed a minimum of 48 hours after well construction is completed. Before development, depth-to-water will be measured from the TOC to the nearest foot using an electronic water level meter. Each well will be checked for floating product using a dedicated polyethylene bailer. If floating product is present, the thickness of product in the bailer will be measured and recorded to the nearest .05 inch and ALLCAL may recommend that removal of floating product should commence as soon as possible.

Each well will be developed by using a 1.7-inch, positive displacement, PVC hand pump; or by bailing with a PVC bailer until the well is free of sand, silt, and turbidity or no further improvement is apparent.

Development water will be stored on site in 55-gallon steel drums labeled to show contents, date filled, suspected contaminant, company name, contact person, and telephone number. Disposal of the drummed water is your responsibility. After the water is characterized by chemical analysis, ALLCAL will provide recommendations to you and, upon your request, assist you in remediation or disposal of the fluids, or both, in an appropriate manner as an additional work item.

Attached Appendix E documents ALLCAL's protocol relative to groundwater monitoring well development procedures.

Proposed Groundwater Sampling Procedure:

After a minimum of 48 hours after well development, depth to stabilized water will be measured in each well and recorded as discussed above under Proposed Well Development Procedure and the well will be sampled.

Prior to sampling, each well will be purged a minimum of 3 wetted well volumes with a dedicated polyethylene bailer. Since dedicated bailers will be used for each well sampled, no decontamination will be necessary between sampling events. Temperature, pH, and electrical conductivity will be monitored and purging will continue until they are stabilized. After purging is completed, water samples will be collected in sterilized glass vials having Teflon-lined screw caps, immediately sealed in the vials, and labeled to include: date, time, sample location, project number, and sampler name. The samples will be immediately stored in an iced-cooler for transport to a DHS certified laboratory accompanied by chain-of-custody documentation.

Attached Appendix F documents ALLCAL's protocol relative to groundwater monitoring well sampling procedures. Attached Appendices B and G document ALLCAL's protocols relative to waste handling and decontamination procedures, and quality assurance and quality control procedures, respectively.

Purge water will be stored on site in labeled 55-gallon drums. After the drummed water is characterized by chemical analysis, ALLCAL will provide recommendations and, upon request, assist you in remediation or disposal of the fluids, or both, in an appropriate manner as an additional work item.

Proposed Chemical Analyses for Groundwater:

The water samples and a trip blank sample are proposed to be analyzed for TPHG and BTEX by the DHS Method and EPA Method 8020, respectively. A trip blank sample is required by regulators for quality control. The water sample collected from well MW-2 is, additionally, proposed to be analyzed for O&G by EPA Method 418.1 and LUFT Metals by EPA Method 6010 & 7000 series.

Groundwater Gradient Evaluation:

The groundwater gradient will be evaluated by triangulation. The stabilized depth-to-water in the wells, when subtracted from their respective TOC, will provide the groundwater elevations on the dates measured. From this information, the groundwater gradient and flow direction will be calculated.

Letter Report:

The information collected, analytical results, and ALLCAL's conclusions and recommendations will be summarized in a letter report. The report will describe the work performed and include: copies of all required permits, a detailed site plan showing location of the installed monitoring wells, graphic boring logs, graphic monitoring well construction details, a groundwater gradient map, and copies of certified analytical reports and chains-of-custody.

Site Safety Plan:

A Site Safety Plan for conducting work under this workplan is attached.

Time Schedule:

The projected time schedule for implementation of the activities described in this workplan is presented below. The schedule reflects a relatively problem-free program. However, delays in the workplan review, permitting, or laboratory analyses could

lengthen the project schedule. Access difficulties, adverse weather, and regulator review could also delay the proposed time schedule. ALLCAL will make every effort to adhere to the project schedule.

Week 1: Workplan submitted for Regulator Approval.

Week 2: Regulator approval received. ALLCAL applies for drilling permit, subcontracts driller, and notifies Underground Service Alert.

Week 3: ALLCAL installs 3 groundwater monitoring wells and submits soil samples for chemical analyses.

Week 4: ALLCAL develops and samples 3 groundwater monitoring wells and submits groundwater samples for chemical analyses.

Week 5: ALLCAL receives soil and water chemical analyses, interprets data, and writes letter report.

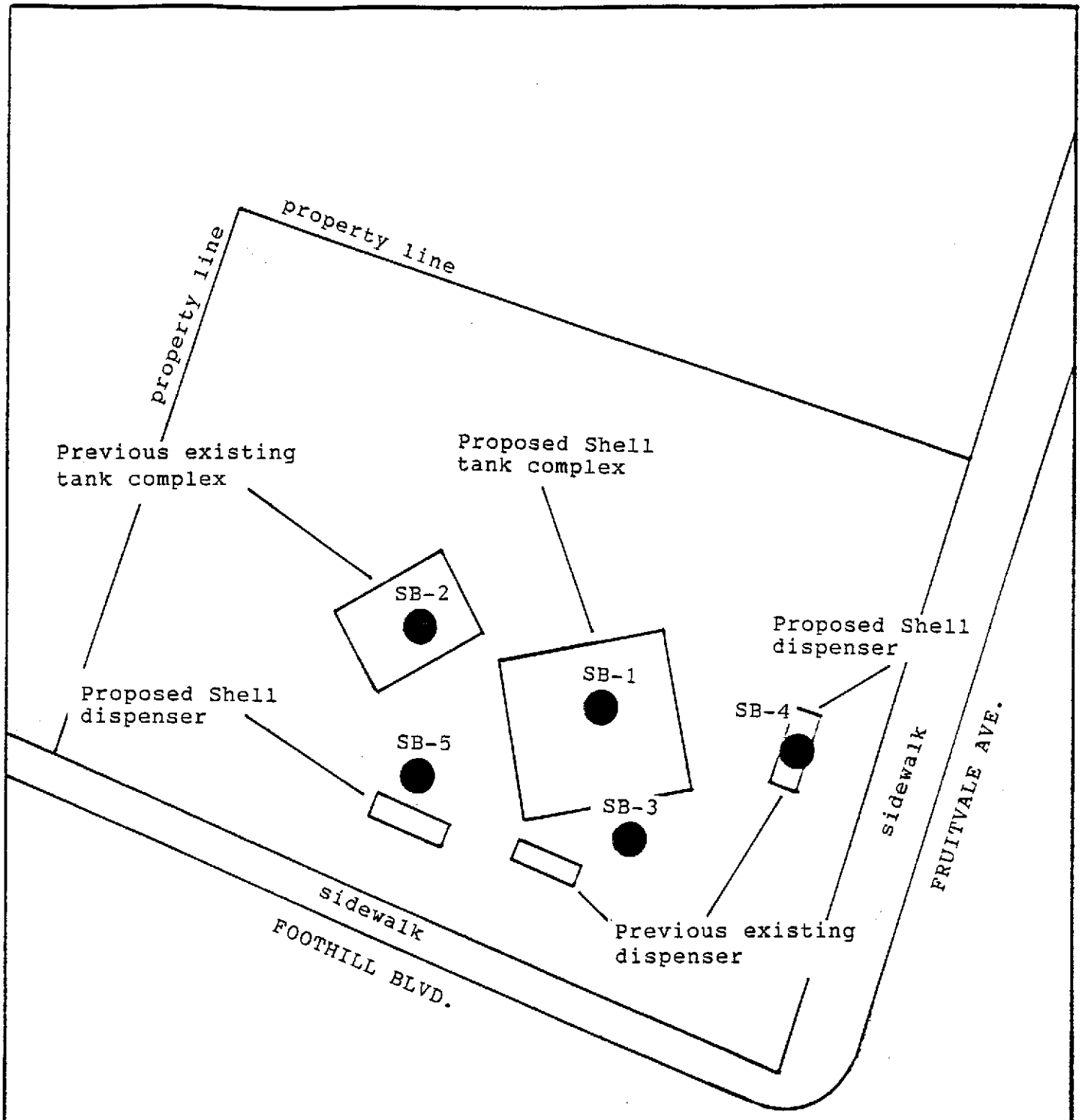
Week 6: ALLCAL submits letter report to client.

If you have any questions regarding the above scope of work, please contact me at (510) 581-2320.

Sincerely,

John V. Mrakovich

John V. Mrakovich, Ph.D.
Registered Geologist Number 4665



SB-1 ● Name and location of soil boring

0 20

APPROXIMATE SCALE (ft)

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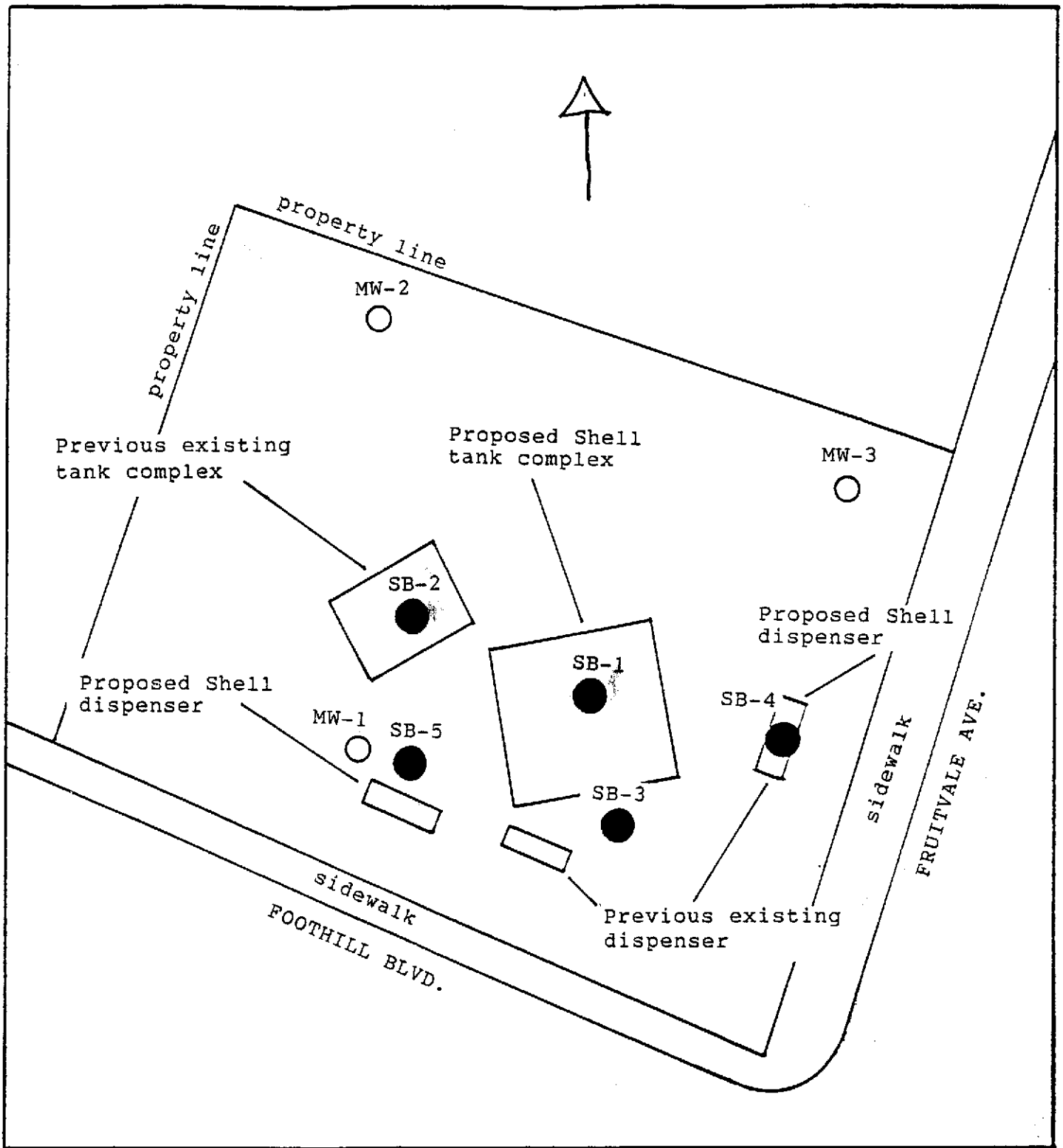
SITE PLAN

2001 FRUITVALE AVE.
OAKLAND, CA

FIGURE 1



SB-1
● Name and location of soil boring

MW-1
○ Proposed name and location of groundwater monitoring well

0 20

APPROXIMATE SCALE (ft)

ALLCAL PROPERTY SERVICES

SITE PLAN

2001 FRUITVALE AVE.
OAKLAND, CA

FIGURE 2

APPENDIX A

HOLLOW-STEM AUGER DRILLING AND SOIL SAMPLING PROCEDURES

Undisturbed soil samples will be recovered from soil without introducing liquids into the borings. Soil samples as core or cutting will be taken continuously from ground surface to termination depth, or through the aquifer zone of interest for lithologic logging.

Borings will be drilled with a hollow-stem auger and sampled with a California or modified California-type split-spoon sampler. Soil samples will be of sufficient volume to perform the analyses which may be required, including replicate analyses.

Soil from all borings will be described in detail using the Unified Soil Classification System and will be logged by a geologist, civil engineer, or engineering geologist who is registered or certified by the State of California and is experienced in the use of the Unified Soil Classification System. All wet zones above the free water zone will be noted and logged.

Soil samples will be collected in decontaminated brass or stainless steel sampling tubes in the split-spoon. Sediment traps will be used when unconsolidated sand and gravel fall from the sampler during retrieval. The brass tubes will be cut apart using a clean knife. The ends of the tubes will be covered with a thin sheet of Teflon tape or aluminum foil beneath plastic end caps. The samples will be stored on ice at a temperature of 4 degrees Celsius. In the Alameda County Water District, the samples will be stored on dry ice.

Drill cuttings will be stored on site in 55-gallon drums or covered with plastic sheeting. Analytical results will be submitted immediately to the site owner for determination of appropriate disposal procedures. The soil borings not completed as wells will be backfilled with a cement grout.

APPENDIX B

WASTE HANDLING AND DECONTAMINATION PROCEDURES

Decontamination: Any drilling, sampling, or field equipment that comes into contact with soil or groundwater will be decontaminated prior to its use at the site and after each incident of contact with the soil or groundwater being investigated. Decontamination is essential to obtain samples that are representative of environmental conditions and to accurately characterize the extent of soil and groundwater contamination. Hollow-stem auger flights, the drill bit, and all other soil boring devices will be steam-cleaned between the drilling of each boring.

All sample equipment, including the split-spoon sampler and brass or stainless-steel tubes, will be cleaned by washing with trisodium phosphate or Alconox detergent, followed by rinsing with tap water. Where required by specific regulatory guidelines, a nonphosphate detergent will be used.

Waste Handling: Waste materials generated during site characterization activities will be handled and stored as hazardous waste and will be stored on site in appropriately labeled containers. Waste materials anticipated include: excavated soil, drill cuttings, development and purge water, water generated during aquifer testing, water generated during decontamination, and used personnel protection equipment such as gloves and Tyvek. The site owner will be responsible for providing the storage containers and will be responsible for the disposal of the waste materials. Drill cuttings from individual borings will be stored separately in drums or covered by plastic sheeting, and the appropriate disposal procedure will be determined by the site owner following receipt of the soil sample analytical results. Storage containers will be labeled to show material stored, known or suspected contaminant, date stored, expected removal date, company name, contact, and telephone number.

APPENDIX C

SAMPLE HANDLING PROCEDURES

Soil and groundwater samples will be packaged carefully to avoid breakage or contamination and will be delivered to the laboratory in an iced-cooler. Sample bottle/sleeve lids will not be mixed. All sample lids will stay with the original containers.

Samples will be stored in iced-coolers to maintain custody, control temperature, and prevent breakage during transportation to the laboratory. Ice, blue ice, or dry ice (dry ice will be used for preserving soil samples collected for the Alameda County Water District) will be used to cool samples during transport to the laboratory. Water samples will be cooled with crushed ice. In the Alameda County Water District, water samples will be buried in the crushed ice with a thermometer, and the laboratory will be requested to record thermometer temperature at the time of receipt.

Each sample will be identified by affixing a label on the container(s). This label will contain the site identification, sample identification number, date and time of sample collection, and the collector's initials.

Soil samples collected in brass or stainless-steel tubes will be preserved by covering the ends with Teflon tape and capping with plastic end-caps. The tubes will be labeled, sealed in quart-size bags, and placed in an iced-cooler for transport to the laboratory.

All groundwater sample containers will be precleaned and will be obtained from a State Department of Health Services certified analytical laboratory.

A chain-of-custody form will be completed for all samples and accompany the sample cooler to the laboratory. All sample transfers will be documented in the chain-of-custody. All field personnel are personally responsible for sample collection and the care and custody of collected samples until the samples are transferred or properly dispatched.

The custody record will be completed by the field technician or professional who has been designated as being responsible for sample shipment to the appropriate laboratory. The custody record will include the following information: site identification, name of person collecting the sample(s), date and time sample(s) were collected, type of sampling conducted (composite/grab), location of sampling station, number and type of containers used, and signature of the person relinquishing samples to another person with the date and time of transfer noted.

GROUNDWATER MONITORING WELL CONSTRUCTION PROCEDURES

Casing Diameter: The minimum diameter of well casings will be 2 inches (nominal).

Borehole Diameter: The diameter of the borehole will be a minimum of 4 inches and a maximum of 12 inches greater than the diameter of the well casing.

Willow (Unconfined Zone) Wells: When groundwater is encountered or known to be within 45 feet of the ground surface, the borehole will be advanced through the aquifer to an underlying competent aquitard. The competency of the aquitard may be tested by sampling 5 feet into the underlying aquitard and backfilling the excess hole with either bentonite pellets or neat cement placed by tremie pipe method. An aquitard found to be less than 5 feet thick, may be assumed to represent a local lens. The screened interval will begin a minimum of 5 feet above the saturated zone and extend the full thickness of the aquifer or no more than 20 feet into the saturated zone, whichever is reached first. The well screen will not extend into the aquitard, nor will the screened interval exceed 25 feet in length.

Deep (Confined Zone) Wells: Any monitoring well to be screened below an upper aquifer will be installed as a double-cased well. A steel conductor casing will be placed through the upper water-bearing zone to prevent aquifer cross-contamination.

The conductor casing will be installed in the following manner: A large diameter borehole (typically 18 inches) will be drilled until it is determined that the first competent aquitard has been reached. A low carbon steel conductor casing will be placed in the borehole to the depth drilled. Centralizers will be used to center the casing in the borehole. The annular space between the conductor casing and the formation will be cement-grouted from

bottom to top by tremie pipe method. The grout will be allowed to set for a minimum of 72 hours.

Drilling may continue inside the conductor casing, with a drill bit of smaller diameter than the conductor casing. If additional known aquifers are to be fully penetrated, the procedure can be repeated with successively smaller diameter conductor casings.

The bottom of the well screen in a confined aquifer will be determined by presence or lack of a competent (5 foot) aquitard as described above. The screened interval in a confined zone will extend across the entire saturated zone of the aquifer or up to a length of 20 feet, which ever is less. The screened zone and filter pack will not cross-connect to another aquifer.

Casing Materials: Well casing will be constructed of materials that have the least potential for affecting the quality of the water sample. The most suitable material for a particular installation will depend upon the parameters to be monitored. Acceptable materials include PVC, stainless steel, or low carbon steel.

Casing Joints: Joints will be connected by flush threaded couplers. Organic bonding compounds and solvents will not be used on joints.

Well Screen Slots: Well screen will be factory slotted. The size of the slots will be selected to allow sufficient groundwater flow to the well for sampling, minimize the passage of formation materials into the well, and ensure sufficient structural integrity to prevent the collapse of the intake structure.

Casing Bottom Plug: The bottom of the well casing will be permanently plugged, either by flush threaded screw-on or friction cap. Friction caps will be secured with stainless steel

set screws. No organic solvents or cements will be applied.

Filter Pack Material: Filter envelope materials will be durable, water worn, and washed clean of silt, dirt, and foreign matter. Sand-size particles will be screened silica sand. Particles will be well rounded and graded to an appropriate size for retention of aquifer materials.

Bentonite Seal Material: Bentonite will be pure and free of additives that may effect groundwater quality. Bentonite will be hydrated with clean water.

Grout Seal Material: Cement grout will consist of a proper mixture if Type 1/11 Portland cement, hydrated with clean water. Up to 3% bentonite may be added to the mixture to control shrinkage.

Decontamination: All downhole tools, well casings, casing fittings, screens, and all other components that are installed in the well will be thoroughly cleaned immediately before starting each well installation. When available, each component will be cleaned with a high temperature, high pressure washer for a minimum of five minutes. When a washer is not available, components will be cleaned with water and detergent or tri-sodium phosphate, rinsed in clean water, than rinsed in distilled water.

Soil and water sampling equipment and material used to construct the wells will not donate to, capture, mask, nor alter the chemical composition of the soil and groundwater.

Drilling Methods: Acceptable drilling methods include solid and hollow-stem auger, percussion, direct circulation mud and air rotary, and reverse rotary. The best alternative is that which minimizes the introduction of foreign materials or fluids. If drilling fluid is employed, drilling fluid additives will be limited to inorganic and non-hazardous compounds. Compressed air

introduced to the borehole will be adequately filtered to remove oil and particulates.

Casing Installation: The casing will be set under tension to ensure straightness. Centralizers will be used where necessary to prevent curvature or stress to the casing.

Sand Pack Installation: The sand pack will be installed so as to avoid bridging and the creation of void spaces. The tremie pipe method will be used where installation conditions or local regulations require. Drilling mud, when used, will be thinned prior to pack placement. The sand pack will cover the entire screened interval and rise a minimum of two feet above the highest perforation.

Bentonite Seal Placement: The bentonite seal will be placed by a method that prevents bridging. Bentonite pellets can be placed by free fall if proper sinking through annular water can be assured. Bentonite slurry will be placed by the tremie pipe method from the bottom upward. The bentonite seal should not be less than 1 foot in thickness above the sand pack.

Grout Seal Placement: The cement grout mixture will be hydrated with clean water and thoroughly mixed prior to placement. If substantial groundwater exists in the bore hole, the grout will be placed by tremie pipe method from the bottom upward. In a dry borehole, the grout may be surface poured. Grout will be placed in one continuous lift and will extend to the surface or to the well vault if the wellhead is completed below grade. A minimum

of 5 feet of grout seal will be installed, unless impractical due to the willow nature of the well.

Surface Completion: The wellhead will be protected from fluid

entry, accidental damage, unauthorized access, and vandalism. A watertight cap will be installed on the well casing. Access to the casing will be controlled by a keyed lock.

Wellheads completed below grade will be completed in a concrete and/or steel vault, installed to drain surface runoff away from the vault.

Well Identification: Each well will be identified by well number, owner, and type of installation. Construction data, including depth, hole and casing diameter, and screened interval will be noted.

GROUNDWATER MONITORING WELL DEVELOPMENT PROCEDURES

INTRODUCTION

Newly installed groundwater monitoring wells will be developed to restore natural hydraulic conductivity of the formation, remove sediments from well casing and filter pack, stabilize the filter pack and aquifer material, and promote turbidity-free groundwater samples.

Wells may be developed by bailing, mechanical pumping, air lift pumping, surging, swabbing, or an effective combination of methods. Wells will be developed until the water is free of sand, silt, and turbidity or no further improvement is achieved.

In some cases where low permeability materials are involved or the drilling mud used fails to respond to cleanup, initial development pumping may immediately dewater the well casing and thereby inhibit development. When this occurs, clean, potable grade water may be introduced into the well, followed by surging of the introduced waters with a surge block. This operation will be followed by pumping. The procedure may be repeated as required to establish full development.

METHODOLOGY

Seal Stabilization: Cement and bentonite annular seals will set and cure not less then 24 hours prior to well development.

Decontamination: All well development tools and equipment will be thoroughly cleaned immediately before starting each well installation. When available, each component will be cleaned with a high temperature, high pressure washer for a minimum of five minutes. When a washer is not available, components will be cleaned with clean water, then rinsed with distilled water.

Development equipment will not donate to, capture, mask, nor alter the chemical composition of the soils and groundwater.

Introduction of Water: Initial development of wells in low permeability materials may dewater the casing and filter pack. When this occurs, clean, potable water will be introduced into the well to enhance development.

Bailing: Development will begin by bailing to remove heavy sediments from the well casing. Care will be taken to not damage the well bottom cap during lowering of the bailer.

Surging: Care will be exercised when using a surge block to avoid damaging the well screen and casing. When surging wells screened in coarse (sand/gravelly) aquifers, the rate of surge block lifting will be slow and constant. When surging wells screened in fine (silty) aquifers, more vigorous lifting may be required. Between surging episodes, wells will be bailed to remove accumulated sediments.

Pumping: Development pumping rates will be less than the recharge rate of the well in order to avoid de-watering.

Discharged Water Containment and Disposal: All water and sediment generated by well development will be stored in 55-gallon steel drums. Development water will be temporarily contained on site, pending sampling and laboratory analysis. All hazardous development water will be transported off site by a licensed transporter to a hazardous waste disposal or treatment facility. No hazardous development water will be released to the environment.

GROUNDWATER SAMPLING PROCEDURES

Groundwater monitoring wells will not be sampled until at least 48 hours after well development. Groundwater samples will be obtained using either a bladder pump, a clear Teflon bailer, or a dedicated polyethylene bailer. Prior to sampling, sampling equipment will be thoroughly decontaminated to prevent introduction of contaminants into the well and to avoid cross-contamination. Monitoring wells will be sampled after three to five wetted casing volumes of groundwater have been evacuated and after the ALLCAL sampling team leader determines that water representative of the formation is being obtained. The well will be purged until conductivity has been stabilized (three consecutive conductivity reading within 15% of one another). If the well is emptied before four to ten well volumes are removed, the sample will be taken when the water level in the well recovers to 80% of its initial water level or better.

ALLCAL will also measure the thickness of any floating product in the monitoring wells using a probe or clear bailer. The floating product will be measured after well development but prior to the collection of groundwater samples. If floating product is present in the well, ALLCAL will recommend to the client that product removal be commenced immediately and reported to the appropriate regulatory agency.

Unless specifically waived or changed by the local, prevailing regulatory agency, water samples will be handled and preserved according to the latest EPA methods as described in the Federal Register (Volume 44, No.233, Page 69544, Table 11) for the type of analysis to be performed.

MEASUREMENTS

Purged Water Parameter: During purging, discharged water will be measured for the following parameters.

Parameter	Units of Measurement
pH	Units
Electrical conductivity	Umhos
Temperature	Degrees F or C
Depth to Water	Feet/Tenths
Volume of Water Discharged	Gallons

Documentation: All parameter measurements will be documented in writing on ALLCAL development logs.

QUALITY ASSURANCE AND QUALITY CONTROL PROCEDURES

The overall objectives of the field sampling program include generation of reliable data that will support development of a remedial action plan. Sample quality will be checked by the use of proper sampling, handling, and testing methods. Additional sample quality control methods may include the use of background samples, equipment rinsate samples, and trip and field blanks. Chain-of-custody forms, use of a qualified laboratory, acceptable detection limits, and proper sample preservation and holding times also provide assurance of accurate analytical data.

A quality assurance and quality control (QA/QC) program may be conducted in the field to ensure that all samples collected and field measurements taken are representative of actual field and environmental conditions and that data obtained are accurate and reproducible. These activities and laboratory QA/QC procedures are described below.

Field Samples: Additional samples may be taken in the field to evaluate both sampling and analytical methods. Three basic categories of QA/QC samples that may be collected are trip blanks, field blanks, and duplicate samples.

Trip blanks are a check for cross-contamination during sample collection, shipment, and laboratory analysis. They are water samples that remain with the collected samples during transportation and are analyzed along with the field samples to check for residual contamination. Analytically confirmed organic-free water will be used for organic parameters and deionized water for metal parameters. Blanks will be prepared by the laboratory supplying the sample containers. The blanks will be numbered, packaged, and sealed in the same manner as the other samples. One trip blank will be used for each sample set of less than 20 samples. At least 5% blanks will be used for sets greater than 20 samples. The trip blank is not to be opened by either the sample collectors or the handlers.

The field blank is a water sample that is taken into the field and is opened and exposed at the sampling point to detect

contamination from air exposure. The water sample is poured into appropriate containers to simulate actual sampling conditions. Contamination due to air exposure can vary considerably from site to site.

The laboratory will not be informed about the presence of trip and field blanks, and false identifying numbers will be put on the labels.

Duplicate samples are identical sample pairs (collected in the same place and at the same time), placed in identical containers. For soils, adjacent sample liners will be analyzed. For the purpose of data reporting, one is arbitrarily designated the sample, and the other is designated as a duplicate sample. Both sets of results are reported to give an indication of the precision of sampling and analytical methods.

The laboratory's precision will be assessed without the laboratory's knowledge by labeling one of the duplicates with false identifying information. Data quality will be evaluated on the basis of the duplicate results.

Laboratory QA/QC: Execution of a strict QA/QC program is an essential ingredient in high-quality analytical results. By using accredited laboratory techniques and analytical procedures, estimates of the experimental values can be very close to the actual value of the environmental sample. The experimental value is monitored for its precision and accuracy by performing QC tests designed to measure the amount of random and systematic errors and to signal when correction of these errors is needed.

The QA/QC program describes methods for performing QC tests. These methods involve analyzing method blanks, calibration standards, check standards (both independent and the United States Environmental Protection Agency-certified standards), duplicates, replicates, and sample spikes. Internal QC also requires adherence to written methods, procedural documentation, and the observance of good laboratory practices.

SITE HEALTH AND SAFETY PLAN

Site: **2001 Fruitvale Avenue**
Oakland, CA 94601

Plan Prepared by: **John Mrakovich** Date: **02/22/96**

1.0 KEY PERSONNEL AND RESPONSIBILITIES

Project Manager: **John Mrakovich**
Site Safety Manager: **John Mrakovich**
Alternate Site Safety Manager: **N/A**
Field Team Members: **N/A**

Agency Reps: **None**

2.0 JOB HAZARD ANALYSIS

2.1 OVERALL HAZARD EVALUATION

Hazard Level: High ( ) Moderate ( ) Low (X) Unknown ( )
Hazard Type: Liquid (X) Solid (X) Sludge ( ) Vapor/Gas (X)

Known or suspected hazardous materials present on site:

Gasoline chemicals.

Characteristics of hazardous materials included above (complete for each chemical presents):

MATERIAL #1

Corrosive ( ) Ignitable (X) Toxic (X) Reactive ( )
Volatile (X) Radioactive ( ) Biological Agent ( )

Exposure Routes: Inhalation (X) Ingestion (X) Contact (X)

2.2 JOB-SPECIFIC HAZARDS

For each labor category specify the possible hazards based on information available (eg., Task-driller, Hazards-trauma from drill rig accidents, etc.). For each hazard, indicate steps to be taken to minimize the hazard.

Driller/Helper/Geologist-Trauma from drilling rig accidents-

wear hard hat, gloves, steel-toed boots.

The following additional hazards are expected on site (i.e., snake infested area, extreme heat, etc.):

Temporary open boreholes.

Measures to minimize the effects of the additional hazards are:

Protect with barricades, caution tape, or traffic cones when unattended.

3.0 MONITORING PLAN

3.1 Air Monitoring Plan

Action levels for implementation of air monitoring. Action levels should be based on published data available on contaminants of concern. Action levels should be set by persons experienced in industrial hygiene.

Level (i.e., .5 ppm)	Action Taken (i.e., commence perimeter monitoring)
5 ppm	**Stop work in area until vapor level decreases.**

3.2 Air Monitoring Equipment

Outline the specific equipment to be used, calibration method, frequency of monitoring, locations to be monitored, and analysis of samples (if applicable).

Use GCI to monitor air at borings. Calibrate with hexane.

If air monitoring is not to be implemented for this site, explain why:

N/A

3.3 Personnel Monitoring (Include hierarchy of responsibilities decision making on the site)

N/A

4.0 PERSONAL PROTECTIVE EQUIPMENT (PPE)

Equipment used by employees for the site tasks and operations

being conducted. Be Specific (eg., hard hat, impact resistance goggles, other protective gloves, etc.).

Hard hat, protective gloves (when necessary), steel-toed boots.

5.0 SITE CONTROL AND SECURITY MEASURES

The following general work zone security guidelines should be implemented:

- Work zone shall be delineated with traffic cones.
- Boreholes shall be delineated with traffic cones when drilling and sampling activities are not actually taking place.
- Visitors will not be allowed to enter the work zone unless they have attended a project safety briefing.

6.0 DECONTAMINATION PROCEDURE

List the procedures and specific steps to be taken to decontaminate equipment and PPE.

Wash equipment with a trisodium phosphate or Alconox solution and rinse with clean potable water followed by deionized water.

7.0 TRAINING REQUIREMENTS

Prior to mobilization at the job site, employees will attend a safety briefing. The briefing will include the nature of the wastes and the site, donning personal protection equipment, decontamination procedures and emergency procedures.

8.0 MEDICAL SURVEILLANCE REQUIREMENTS

If any task requires a very high personnel protection level (OSHA Level A or B), personnel shall provide assurances that they have received a physical examination and they are fit to do the task. Also personnel will be instructed to look for any symptom of heat stress, heat stroke, heat exhaustion or any other unusual symptom. If there is any report of that kind it will be immediately followed through, and appropriate action will be taken.

9.0 STANDARD OPERATION PROCEDURES

AllCal Property Services, Inc. (ALLCAL) is responsible for the safety of its employees on site. Each contractor shall provide all the equipment necessary to meet safe operation practices and procedures for their personnel on site and be responsible for their safety.

A "Three Warning" system is utilized to enforce compliance with Health and Safety procedures practices which will be implemented at the site for worker safety:

- Eating, drinking, chewing gum or tobacco, and smoking will be allowed only in designated areas.
- Wash facilities will be utilized by workers in the work areas before eating, drinking, or use of the toilet facilities.
- Containers will be labeled identifying them as waste, debris, or contaminated clothing.
- All drilling work will comply with regulatory agency requirements.
- All site personnel will be required to wear hard hats and advised to take adequate measures for self protection.
- Any other action which is determined to be unsafe by the site safety officer will be taken.

10.0 CONFINED SPACE ENTRY PROCEDURES

No one is allowed to enter any confined space operation without proper safety measures. Specifically in case of an excavated tank pit no one should enter at any time.

11.0 EMERGENCY RESPONSE PLAN

Relevant phone numbers:

Person	Title/Phone No.
Fidel Casillas	Site Owner (510) 532-8055
John Mrakovich	Project Manager (510) 581-2320
Fire	911
Police	911
Ambulance	911

HEALTH AND SAFETY COMPLIANCE STATEMENT

I have received and read a copy of the project Health and Safety Plan.

I understand that I am required to have read the aforementioned document and have received proper training under the Occupational Safety and Health Act (29 CFR, Part 1910.120) prior to conducting site activities at the site.

Signature Date

Signature Date

Nearby Hospital:

Highland General Hospital
1411 East 31st Street
Oakland, CA
(510) 534-8055

Directions From Site:

Drive northeasterly on Fruitvale Avenue to East 27th Street. Turn left (northwesterly) onto East 27th Street and proceed to 19th Avenue. Turn right (northeasterly) on 19th Avenue and proceed to East 31st Street. Turn left (westerly) on East 31st Street and look for Hospital on the left-hand side.