

P.O. Box 8117 Berkeley, California 94707 Phone: (510) 525-3750

Fax: (510) 525-9058

August 15, 1995

Ms. Juliet Shin Senior Hazardous Materials Specialist Alameda County Health Care Services Agency Department of Environmental Health Hazardous Materials Division 1131 Harbor Bay Parkway, 2nd Floor Alameda, California 94502-6577

Work plan to install one groundwater monitoring well at 1977 1081-1085 RE: Eastshore Frontage Road, Albany, California.

Dear Ms. Shin;

Enclosed please find the referenced work plan which you requested. The plan embraces the additional data and requirements we discussed at your office on May 12, 1995.

You should find everything in order and the plan complete. I look forward to your early approval in order that we may proceed to closure.

If you have any questions please call Gary Lowe at (510) 373-9211.

Sincerely,

John W. Piggott **Property Owner**



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Ms. Juliet Shin Senior Hazardous Materials Specialist Alameda County Health Care Services Agency Department of Environmental Health Hazardous Materials Division 1131 Harbor Bay Parkway, 2nd Floor Alameda, California 94502-6577 August 15, 1995

RE: Work plan to install one groundwater monitoring well at \$\\\\ \frac{4077 Eastshore}{208/-108} \) \(\text{Fastshore} \) Frontage Road, Albany, California.

Dear Ms. Shin;

H₂OGEOL has been retained by Mr. John W. Piggott, of Wilanco, Inc., to prepare a work plan, and conduct the ensuing investigation, to install one groundwater monitoring well in the vicinity of a gasoline tank removal and soil contamination remediation excavation (remedial excavation) at the property known as 1077 Eastshore Frontage Road in Albany, California. This letter serves as that work plan.

The work plan provides information following the format of "Appendix A - Work plan for Initial Subsurface Investigation" of the "TRI-REGIONAL BOARD STAFF RECOMMENDATIONS FOR PRELIMINARY EVALUATION AND INVESTIGATION OF UNDERGROUND TANK SITES." Much of the information requested in "Appendix A" has previously been submitted by ENSR Consulting and Engineering (ENSR) to Alameda County Health Care Services Agency, or is otherwise unavailable to H2OGEOL.

The following reports were reviewed for the preparation of this workplan.

- Aqua Resources, Inc., 1986, Characterization Study of the Site at 1077 Eastshore Highway, Berkeley, California and the Adjacent Industrial Right-of-Way to the East, February 28. (ARI, 1986)
- Engineering-Science, 1986, Phase I Site Characterization for 1077

 Eastshore Highway Site, Albany, California, August. (E-S, 1986a)
- Engineering-Science, 1986, Phase II Site Characterization for 1077
 Eastshore Highway Site, Albany, California, October. (E-S, 1986b)
- ENSR Consulting and Engineering, 1992, Phase II Site Assessment Report at 1073-1085 Eastshore Highway, Albany, California, October 02. (ENSR, 1992)
- ENSR Consulting and Engineering, 1993, Wilanco Tank Removal Report, June 17. (ENSR, 1993)

I. Introduction

A. Statement of Scope of Work

The scope of work for the investigation to be conducted through implementation of this work plan is to ascertain apparent groundwater flow direction and gradient and the presence of dissolved Total Extractable Petroleum Hydrocarbons as diesel, TPH-D); Total Petroleum Hydrocarbons as gasoline, (TPH-G); and the aromatic hydrocarbons benzene (B), toluene (T), ethylbenzene (E), and total xylene isomers (X), which are collectively referred to as BTEX, in groundwater as encountered in the indicated monitoring well to be installed in the vicinity of the gasoline tank (Tank Cluster #2) remedial excavation. The presence of these constituents in a single soil sample from the intermittent vadose zone in the monitoring well borehole will also be determined. Existing downgradient monitoring well "L" will also be monitored for TPH-D and TPH-G + BTEX.

B. Site Location

The project site is located at 1077 Eastshore Frontage Road, in Albany, California. The property is located east of Interstate 80 (Eastshore freeway) and west of the Southern Pacific Railroad Right-of-Way and north of Codornices Creek. The site location is shown on Figure 1. The remedial excavation was located near the southeastern corner of the building closest to Eastshore Frontage Road. This location is shown on Figure 2.

C. Background

Background information concerning the remedial excavation was provided by ENSR, 1993.

D. Site History

The available site history is summarized by ENSR, 1993, and in your letter dated April 11, 1995 to Mr. Piggott. Additional site history information is unavailable to H₂OGEOL.

II. Site Description

A. Vicinity description and hydrogeologic setting

The ground surface slopes gently northward (Figure 1) toward a now filled predevelopment tidal flat.

As described by ENSR, 1992, the 1077 Eastshore Frontage Road property "is located in the Coast Range Geologic Provence of California on the eastern edge of the San Francisco Bay The site was constructed on man-made fill placed over Holocene aged (B)ay mud The regional movement of groundwater is generally toward the west in the direction of the San Francisco Bay. This groundwater movement is influenced by gravity pulling groundwater from higher elevations toward San Francisco Bay. This groundwater (flow) may also be influenced by Codornices Creek, to the south of the site." The Bay mud has a thickness of from 1 to 10 feet and is underlain by the Merritt sand.

The man-made fill referred to by ENSR, 1992, was placed in the late 19th and early 20th centuires. According to E-S 1986a, the uppermost six feet is composed of "clean fill (silts and clays with minor sands and gravel) that overlies a section of dirty fill (sandy clay with large fragments of brick, wood, crockery, metal, etc.)."

Groundwater was encountered in the remedial excavations and in boreholes at a depth of about 8 to 9 feet beneath the ground surface.

Eight monitoring wells have been installed at the 1077 Eastshore Frontage Road property. Five (MW-J, MW-K, MW-L, MW-N, and MW-N, the designation 'MW-' being added by ENSR) were installed by Aqua Resources, Inc. (ARI, 1986) and three (MW-1, MW-2, and MW-3) by ENSR Consulting and Engineering (ENSR, 1992). The approximate locations of these wells is shown on Figure 3.

Determination of groundwater flow direction from these wells is complicated by the presence of controlling surface water features (San Francisco Bay, Codornices Creek), by cultural feature (a major East Buy Municipal Utility District sewer pipeline near the east edge of the property) that hydraulically isolates some of the wells (MW-1, MW-2, MW-3, and MW-M are within the utility corridor and may be in connection with high permeability pipeline backfill), and by a lack of a consistent well head reference elevations on wells J, K, L, and M.

Diurnal variations in groundwater surface elevation were reported for June 20, 1986 by E-S, 1986a. E-S provided graphs of diurnal variations (as elevation versus time) and reported elevations in an appendix. E-S did not record their well head reference elevation in their report. The only discussion provided by E-S was gradient and direction in a relative since, i.e., from well to well.

For the three wells that encompass the tank removal excavation area (K, L, and N), the even houred groundwater flow direction and gradient determined from the E-S, 1986a, data are approximately as follows:

± 08:00	S54°W	0.00052
± 10:00	S25°W	0.00087
± 12:00	S36°W	0.00061
± 14:00	S34°W	0.00086
± 16:00	S47°W	0.00054
± 18:00	S54°W	0.00052
± 20:00	S69°₩	0.00049

Average S46°W 0.00063

The range in groundwater flow direction between 0800 and 2000 hours on June 20, 1986 was South 25 to 69 degrees West at a gradient of from 0.0005 to 0.0009.

B. Vicinity map (including wells located on-site or on adjoining lots, as well as any nearby streams).

Figure 1 is a topographic map of the area around 1077 Eastshore Frontage Road. A well inventory covering the vicinity was not prepared. The approximate locations of the on site wells is shown on Figure 3.

C. Site map to include; ...

A surveyed site map is not available. Figures 2 and 3 are site sketchs showing available information.

D. Existing soil contamination and excavation results.

The available information concerning soil contamination and excavation results was summarized by ENSR, 1993, and in your letter dated April 11, 1995 to Mr. Piggott. Additional site history information is unavailable to H₂OGEOL.

III. Plan for determining extent of soil contamination on site.

Sub-items A-D address excavations. The presence of TPH-D, and TPH-G + BTEX in a single soil sample from the intermittent vadose zone in the proposed monitoring well borehole will be determined.

- IV. Plan for determining groundwater contamination.
- A. Placement and rational for location of monitoring wells, including a map to scale.

Groundwater flow is anticipated to be southwest. Therefore, one monitoring well will be placed in a confirmed downgradient direction from the gasoline tank removal/remedial excavation. That monitoring well will be placed near the southwest corner of the remedial excavation. This locations is shown on Figure 4.

- B. Drilling method for construction of monitoring wells, including decontamination procedures.
- 1. Expected depth and diameter of monitoring wells,

The monitoring wells will be about 15 feet deep and will be constructed of 2-inch inside diameter material.

2. Date of expected drilling.

Uncertain, possibly mid to late September, 1995.

3. Method and location of soil sampling boreholes.

The monitoring well borehole will be sampled for logging purposes and will be drilled either by hand operated Iwan auger or by hollow stem auger. If the borehole is drilled by hand auger the well will be constructed under arrangement with ASE Drilling of Livermore, CA C-57 629340. If the borehole will be drilled by hollow stem auger, the well will be constructed by V & W Drilling of Rio Vista, CA C-57 658786. The location is shown on attached Figure 4. Cross contamination prevention will be by tri-sodium phosphate wash or by steam cleaning/high pressure washing.

4. Casing type, diameter, screen interval, and pack and slot sizing technique.

Casing and screen will be made of flush threaded PVC, 2-inch inside diameter. Screen will be set from about 5 to 15 feet below ground surface. Depths will be adjusted depending on the depth at which groundwater is first encountered. Sand pack will be No. 3 Monterey Sand or No. 8 Silica Resources Sand to about one half foot above the screen. Slot size will be 0.020-inch. Sizing technique will be by experience of the C.E.G. conducting borehole logging. Boreholes that encounter clay would require 0.005-inch openings by the DOHS method, however, sizes less than 0.020-inch tend to clog readily and to swell shut through adsorption of hydrocarbons, if present.

5. Depth and type of seal.

Depth of seal will be from above the filterpack to just below the ground surface. The lowermost half foot of the seal will be comprised of bentonite pellets. The remainder of the seal will be a neat cement grout.

6. Construction diagram for wells.

A well construction diagram will be provided for each well as a part of the borehole log.

7. Development method and criteria for determination of adequacy of development.

Well development will be by the surge and bail and/or surge and pump technique. A vented surge block will be used in the screened interval and the well will be bailed and/or pumped to remove groundwater and entrained fines. Well development will continue until the turbidity has lowered to a point where there will be no suspended sediment interference with the laboratory analytical procedure for TPH-D, and TPH-G + BTEX.

8. Plans for disposal of cuttings and development water.

Drilling cuttings will be placed in 55 Gallon drums and disposed by DECON Environmental Services, Inc. Well development water will be placed in 55 Gallon drums and disposed by DECON Environmental Services, Inc.

9. Surveying plans for wells (requirements include surveying to established benchmark to 0.01 foot).

The wells (the new well, MW-4, and existing wells MW-K, MW-L, and MW-N) will be surveyed by Ron Archer (RPE, Civil No. 23721), Civil Engineer, Inc. of Pleasanton, California.

C. Groundwater sampling plans (include plans for sampling any onsite domestic wells)

The new well, MW-4, and existing well MW-L will be sampled. Water level measurements will be made in the new well, MW-4, and existing wells MW-K, MW-L, and MW-N.

1. Water level measurement procedure.

Depth to water below the surveyed casing reference mark will be measured with an electric sounding line to an accuracy of 0.01 feet.

Methods for free product measurement, observation of sheen and odor.

Depth to top of fluid will be measured with a sounding bell. Product thickness is the difference between depth to water and depth to fluid. Product will also be checked with a clear acrylic bailer. The sample retrieved will be used to check to sheen and odor.

Well purging procedure.

The monitoring wells will be purged of no less than one casing volume by bailing or by pumping. If the wells are capable of sustaining a discharge rate of 0.5 gallons per minute, purging will continue until no less than three casing volumes have been removed. The field parameters pH, temperature, and specific conductance will be monitored.

4. Well purge water disposal plans.

Well purge water will be placed in 55 Gallon drums and disposed by DECON Environmental Services, Inc.

5. Sample collection procedures.

All groundwater samples will be cooled to 4°C.

A groundwater sample for TPH-G + BTEX will be pulled from the monitoring well within a teflonTM bailer. The TPH-G + BTEX sample will be transferred to a 40-mL VOA vial (containing HCl to pH <2 as a preservative) with a teflonTM septum lid through a bottom emptying device affixed to the bailer.

6. Sample analyses to be used

For soil samples:

- U.S. EPA Method 3550/8015 for TPH-D.
- U.S. EPA Method 5030/8015M for TPH-G and 8020 for BTEX.

For groundwater samples:

- U.S. EPA Method 3550/8015 for TPH-D.
- U.S. EPA Method 5030/8015M for TPH-G and 8020/602 for BTEX.

7. Quality assurance plan.

Field sampling will be performed by an experienced groundwater sampler. Samples will be stored and transported in an ice chest maintained at 4° C. Samples will be delivered to the laboratory under chain-of-custody documentation. While at the laboratory the sample tracking and analysis will follow the laboratory's approved quality assurance protocol.

8. Chain of Custody Procedures.

Sample numbers etc., and analytical request information will be entered on the chain-of-custody form. The sample collector will sign the form when transferring the sample to the laboratory personnel. The laboratory personnel will sign the form upon receipt of the sample.

V. Include a site safety plan.

A site safety plan is provided in Attachment A.

This concludes the work plan for a groundwater investigation at 1077 Eastshore Frontage Road, Albany, California that includes the installation of one monitoring well and the sampling of two monitoring wells.

Please do not hesitate to call me at (510) 373-9211 should you have any questions.

GARY D. LOWE

No. 1859

CERTIFIED

ENGINEERING

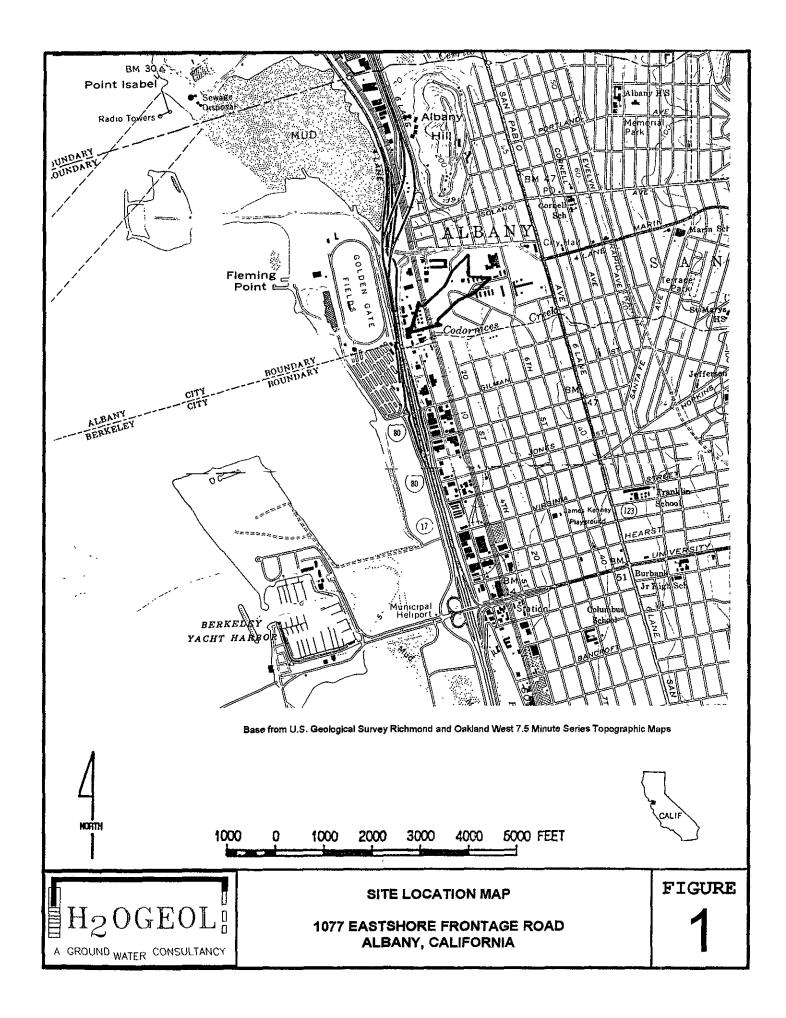
GEOLOGIST

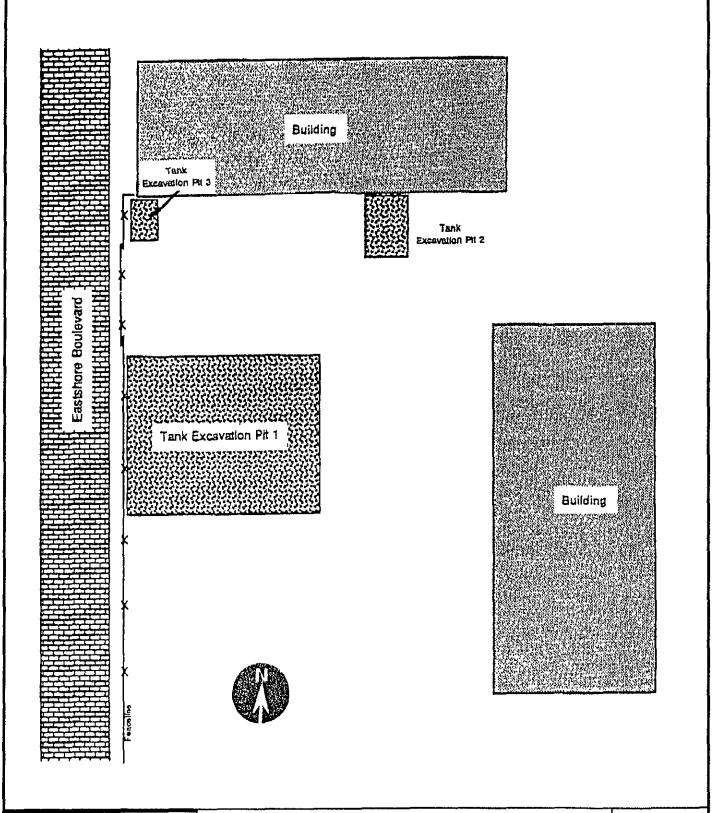
OF CALIF

Sincerely,

Gary D. Lowe, R.G., C.E.G. Principal, Hydrogeologist

xc: Mr. John W. Piggott, Wilanco, Inc., P.O. Box 8117 Berkeley California 94563



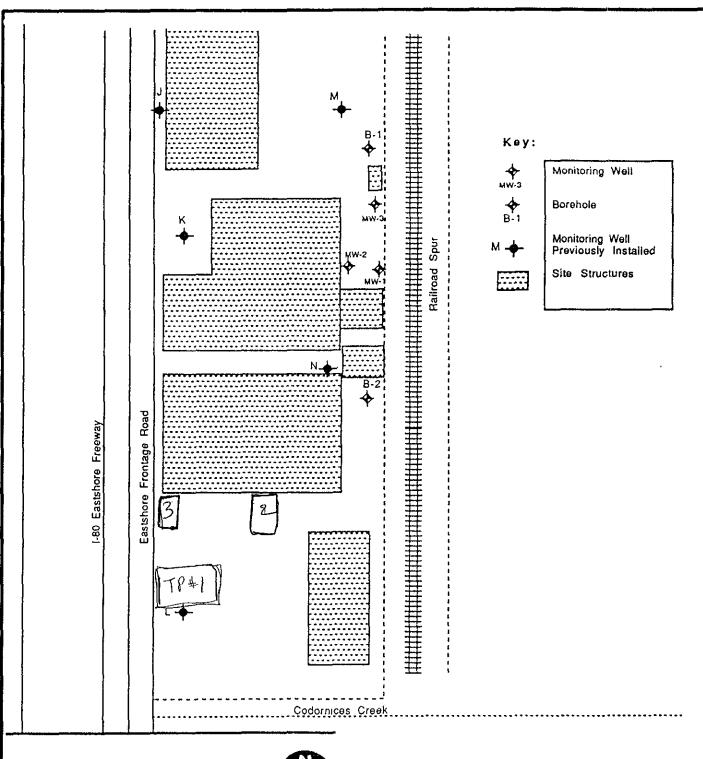




TANK REMOVAL/REMEDIAL EXCAVATION PIT LOCATION MAP (from ENSR, June 17, 1993, Figure 2) 1077 EASTSHORE FRONTAGE ROAD ALBANY, CALIFORNIA

FIGURE

2



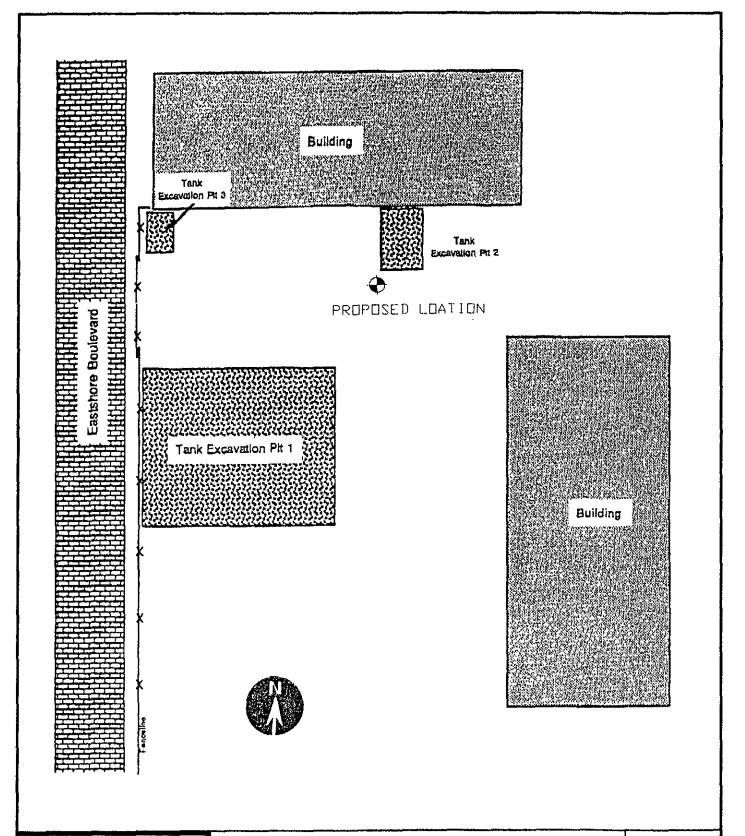




APPROXIMATE LOCATION OF EXISTING WELLS

(from ENSR, October 02, 1992, Figure 1) 1077 EASTSHORE FRONTAGE ROAD ALBANY, CALIFORNIA FIGURE

3





PROPOSED MONITORING WELL LOCATION

1077 EASTSHORE FRONTAGE ROAD ALBANY, CALIFORNIA

FIGURE

4



P.O.Box 2165 - Livermore California 94551 510 373-9211

ATTACHMENT A

SITE SAFETY PLAN FOR 1077 Eastshore Frontage Road ALBANY, CALIFORNIA



P.O.Box 2165 • Livermore, California 94551 • 510-373-9211

SITE SAFETY PLAN FOR

1077 EASTSHORE FRONTAGE ROAD ALBANY, CALIFORNIA

1.0 PURPOSE AND SCOPE

This site safety plan (SSP) establishes the basic safety guidelines and requirements for the installation of one monitoring well at the property located at 1077 Eastshore Frontage Road in Albany, California. The SSP addresses hazards that may be encountered during this project. Field activities are anticipated to occur in mid to late September, 1995.

The provisions set forth in this SSP shall apply to any parties contracted to Mr. John Piggott, including, but not limited to H2OGEOL and any team member yet to be selected for borehole drilling. All personnel working for Mr. Piggott at the job site must read this SSP and sign the attached Compliance Agreement before entering the work area. All persons, or firms, working on site are responsible for their own accident reporting.

All persons performing monitoring well installation services will be properly trained and will be in compliance with 29 CFR 1910.120 for 40 hour basic training and will have had a current 8-hour refresher course.

Because they are properly trained field personnel may deviate from the safety provisions set forth in this SSP, but only to increase safety.

2.0 SAFETY PERSONNEL

All persons working for Mr. Piggott are responsible for job safety. The geologist at the site, Mr. Gary D. Lowe, R.G., C.E.G. will serve as Site Safety Officer. As such, he is responsible for informing all personnel working on site of the contents of the SSP. His responsibilities include making sure everyone has adequate safety supplies and equipment. Mr. Lowe is responsible for insuring proper decontamination/contamination reduction procedures are observed.

3.0 SITE HAZARD ANALYSIS/CHARACTERIZATION

The expected potential hazards to personnel in the work area and at the site are:

Physical injury from equipment operated at the job site Heat stress Fire or explosion Exposure to chemical hazards

Preventing heat stress is particularly important, because a person who suffers from heat stress or stroke may be subject to additional heat injuries.

The proposed work does not appear to present any potential health risk to workers, the surrounding community, or the environment if the provisions of this SSP are properly implemented.

3.1 Physical Hazards

The potential for physical injury exists from the operation of any machinery, including the drilling rig. Use of steel-toed boots, hard hats or caps, and safety glasses will be required when in the work area.

The potential for noise hazards exist whenever the noise exceeds the CAL-OSHA permissible exposure level of 90 dB. Noise level protection shall be available to all personnel within the job site in the event noise levels exceed individual comfort levels.

The risk of physical injury can be increase due to decreased visibility, hearing, and dexterity whenever protective equipment is used.

3.2 Heat Stress

Project implementation is expected to occur in mid to late September, 1995. The potential for heat stress exists. Signs and symptoms of heat stress are:

Heat rash from continuous exposure to heat and/or humid air.

Heat cramps are caused by heavy sweating with inadequate electrolyte replacement. Signs and symptoms are muscle spasms, heavy sweating, dizziness, nausea, and fainting.

Heat exhaustion occurs from increased stress on various body organs including inadequate blood circulation due to cardiovascular capability or dehydration. Signs and symptoms include pale, cool, moist skin; heavy sweating; dizziness, nausea, and fainting.

Heat stroke is the most serious because body temperature regulation fails, and body temperature rises to critical levels. The victims body must be cooled immediately to lessen the risk of serious injury or death. Competent medical help must be obtained. Sign and symptoms include red, hot, usually dry skin; lack of or reduced perspiration; nausea; dizziness and confusion; strong rapid pulse; and coma.

3.3 Fire Hazards

The potential for fire or explosion exists whenever flammable liquids or vapors are present above the lower explosion limit (LEL) concentration and sufficient oxygen is present to support combustion. These condition include vehicular fuel. General drilling operations in materials suspected of containing flammable substances may pose a fire hazard. A fire extinguisher will be located in the drill rig and the site safety officer's vehicle.

3.4 Chemical Hazards

The hazardous chemicals that <u>may</u> be encountered at the site are petroleum hydrocarbons, including the volatile aromatic hydrocarbons benzene, toluene, ethylbenzene, and xylene isomers. A summary of the relevant chemical, physical, and toxicological properties for each potentially encountered hazardous chemical is listed below.

Trace to minor concentrations of these chemicals may be present adsorbed on soil particles or dissolved in groundwater. If a free petroleum phase is present these chemicals could be present as a part of that organic phase.

Ingestion of contaminants will be controlled by prohibiting eating, drinking, smoking, and chewing in the work area. In addition, workers will be instructed to wash their hands and face before engaging in any of the above activities after they leave the work area.

Adsorption of contaminants will be controlled by requiring workers to wear long-sleeved shirts or coveralls, rubber and/or cotton work gloves, and safety glasses.

BENZENE

Benzene may occur as a trace constituent is soils and groundwater. In its pure form benzene is a colorless liquid with an aromatic odor. It is a relatively volatile chemical with a vapor pressure of 75 mm Hg @ 68°F. The flash point of benzene is only 12°F, thus classifying

benzene as a flammable liquid. Benzene is recognized by the National Institute of Occupational Safety and Health (NIOSH) as a potential human carcinogen.

Benzene can enter the body through four routes of exposure: inhalation, adsorption, ingestion and injection. Target organs are the blood, central nervous system, skin, bone marrow, eyes, and respiratory system. Acute exposure effects include irritation of the eyes, nose, and respiratory system as well as headache, nausea, staggered gait, depression, and abdominal pain. The chronic effect of overexposure is the potential for cancer. The permissible exposure level (PEL) for benzene is 10.0 ppm.

TOLUENE

Toluene may occur as a trace constituent is soils and groundwater. In its pure form toluene is a colorless liquid with an aromatic odor. It is less volatile than benzene, with a vapor pressure of 22 mm Hg @ 68°F.

Toluene is a flammable liquid with a flash point of 40°F.

Toluene can enter the body through all four routs of exposure. Target organs include the central nervous system, liver, kidneys, and skin. Acute exposure effects include fatigue, dizziness, headache, euphoria, dilated pupils, and paralysis. The PEL in 200 ppm.

ETHYLBENZENE

Ethylbenzene may occur as a trace constituent is soils and groundwater. In its pure form ethylbenzene is a colorless liquid with an aromatic odor. It has a low volatility with a vapor pressure of 7.1 mm Hg @ 68°F. It is a flammable liquid with a flash point of 59°F.

Ethylbenzene can enter the body through all four routs of exposure. Target organs include the central nervous system, eyes, upper respiratory system, and skin. Acute exposure effects include irritation of the eyes and mucous membranes, nose, and respiratory system, headache, nausea, staggered gait, dermatitis, narcosis, and coma. The PEL in 100 ppm.

XYLENE ISOMERS

Xylene isomers may occur as a trace constituent is soils and groundwater. In pure form xylene isomers are a colorless liquid with an aromatic odor. It has a low volatility with a vapor pressure of 8 mm Hg @ 68°F (average). It is a flammable liquid with a flash point of 81°F.

Xylene isomers can enter the body through all four routs of exposure. Target organs include the central nervous system, eyes, gastrointestinal tract, blood, liver, kidneys, and skin. Acute exposure effects include dizziness, excitement, drowsiness, incoordination, abdominal pain, vomiting, and irritation of the eyes nose, and throat. The PEL in 100 ppm.

4.0 EXPOSURE MONITORING PLAN

The monitoring well will be constructed in an open area with free air circulation. Visual and odoriferous concentrations would have to be present before an ambient air concentration exceeding 100 ppm for 15 minutes could be approached. Air monitoring is not necessary.

All persons working for Mr. Piggott will be wearing standard cotton and/or synthetic work clothes. Monitoring for heat stress will consist of personnel constantly observing each other for any of the heat stress symptoms discussed in Section 3.2.

No dust monitoring will be performed because none of the tasks in this project are expected to generate large quantities of dust.

No noise monitoring will be performed, because none of the tasks in this project are expected to generate over 90 dB permissible exposure limit or the 85 dB action level. Ear noise protection shall be available to all personnel.

5.0 PERSONAL PROTECTIVE EQUIPMENT

Level "D" personal protection is expected to be the highest level required to complete the monitoring well installation, development, and sampling. Modified level "C" equipment and supplies will be made available if needed.

6.0 SITE CONTROL

The site is in a parking lot. Understood work zones will be used and physical demarcation will be provided. Public access will be controlled to the extent possible.

7.0 DECONTAMINATION MEASURES

Field personnel shall wash their hands and face at the buildings faucets or restroom before leaving the site.

8.0 EMERGENCY RESPONSE PLAN

In the event of an accident resulting in physical injury, first aid will be administered and the injured worker will be transported to Alta Bates Medical Center's emergency services at 2450 Ashby Avenue in Berkeley (540-4444). Transport will be by calling 911, as recommended by local police and emergency personnel. In no event shall a seriously injured person be transported to a hospital in a private automobile.

For minor injuries the hospital can be reached by leaving the site and turning left (south) onto Eastshore Frontage Road, then right (west) onto Gilman Street, then left (south) onto Interstate 80. Follow I-80 south to the Ashby exit, follow Ashby east toward the Berkeley Hills, past Telegraph Avenue and turn right past Colby into the hospital grounds. Follow the signs to emergency admittance. 1995 Thomas Brothers Alameda County, Page 4 C2.

In the event of a fire the local fire department will be notified by dialing 911.



P.O.Box 2165 • Livermore, California 94551 • 510-373-9211

COMPLIANCE AGREEMENT

EACH OF THE UNDERSIGNED HAS READ THE SITE SAFETY PLAN AND FULLY UNDERSTANDS THE POTENTIAL HAZARDS ASSOCIATED WITH MONITORING WELL INSTALLATION AND DEVELOPMENT AT 1077 EASTSHORE FRONTAGE ROAD, ALBANY, CALIFORNIA.

NAME	SIGNATURE	EMPLOYER/COMPANY	DATE
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