aqua science engineers inc.

Final Report of
Methods and Findings

for a

PRELIMINARY SITE INVESTIGATION
including
SOIL BORINGS AND SOIL SAMPLE ANALYSES,
GROUNDWATER MONITORING WELL DRILLING, INSTALLATION, SAMPLING

at
5293 Crow Canyon Rd.
Castro Valley, Ca.

submitted by

Aqua Science Engineers
San Ramon, Ca.
July 23, 1990

INTRODUCTION

Aqua Science Engineers (ASE) was contracted by the property owner to drill and sample 11 soil borings, of which three were converted into groundwater monitoring wells at the vacant lot located at 5293 Crow Canyon Rd., Castro Valley, Ca. (Figure 1). The scope of work performed closely follows the ASE Workplan - Proposal for Soil and Groundwater Investigation Services at 5293 Crow Canyon Rd., dated February 11, 1990. Approval of the scope of the workplan was given by the Alameda County Health Care Services Agency on March 14, 1990, (Appendix A). The scope of work reflects the minimum amount of investigation required to define the vertical and lateral extent of soil and groundwater contamination.

The following report details the investigative methods used and the findings of the investigation. The investigation was mandated by earlier soil sampling and analysis related to underground fuel and waste oil storage tank removals. This sampling and analysis, conducted in February, 1989, showed that site soils had been impacted by petroleum hydrocarbon products.

Prior to February 1989, the site was utilized as a gasoline filling and auto service station. In February, 1989, ASE removed three 8,000 gallon gasoline tanks and one 500 gallon waste oil tank from 5293 Crow Canyon Rd., Castro Valley. Seven soil samples obtained from beneath the tank inverts yelded Total Petroleum Hydrocarbons (TPH) as gasoline concentrations within the gasoline tankpit from non-detectable (ND) to 980 parts per million (ppm). Levels of benzene, toluene, ethylbenzene, and total xylenes (BTEX) were measurable in all seven samples. A soil sample from beneath the waste oil tank (separate pit) showed 35 ppm total oil and grease (TOG) and detectable amounts of BTEX. An eighth soil sample from the stockpiled soils contained 84 ppm TPH as gas and 775 ppm TOG. the stockpiled soil remains onsite at this time, and the tankpit excavations remain open.

Currently, the site is vacant and enclosed by chain link fence. The pump island bases remain in place. The ground surface is not covered by pavement. Topograghic relief at the site is fairly low, having been leveled by construction equipment in the distant past. Topographic relief in the area surrounding the site is steeply downhill toward the south, southeast, and Crow Canyon Creek. The site rests on Cretaceous marine sedimentary deposits of the Panoche Formation (Preliminary Geologic Map of the Hayward Quadrangle, Alameda and Contra Costa Counties, by Mr. Thomas Dibblee, Jr., 1980, U.S.G.S. open file report 80-540)

DRILLING PROCEDURES

Prior to site investigation activities, a hazardous materials site safety plan was formulated (Appendix B). The plan was reviewed with all onsite personnel immediately preceding the implimentation of investigation activity.

Between April and May, 1990, a Mobile Drill B-61 or B-57 hydraulic rotary drill with 8 inch hollow stem augers was used to drill 11 soil borings. Soil boring #1 (SB-1) through SB-9 (lacking SB-5), were drilled to 20 feet depth each from the pump islands, along the product piping, and around the gasoline tankpit (Figure 2). Three soil borings were drilled to between 30.5 feet and 60 feet depth, then converted into groundwater monitoring wells MW-1, MW-2 and MW-3. Into each boring a 2 inch I.D. schedule 40 PVC monitoring well was installed. A permit from the Alameda County Flood Control and Water Conservation District, Zone 7, was obtained prior to monitoring well drilling (Appendix C).

Do... more like 25' due south.

MW-1 was drilled and installed about 40 feet southwest of the dispenser islands in what was assumed to be the downgradient direction from the islands and possibly the gas tankpit. The boring was advanced down to 40 feet depth, then allowed to stand open overnite for a water check, which proved to be marginal. On the following day the well was drilled to 55 feet total depth and the casing installed.

MW-2 was placed north of the product piping in the northeast portion of the site near the northern property line, in what was considered an upgradient direction from the piping and the tankpits. Drilling proceeded to 30.5 feet total depth, then the well was installed.

The location of MW-3 was designed to monitor groundwater in the vicinity of and downgradient from the waste oil tankpit, so it is located about 25 feet south and west of the pit. The well was initially drilled to 45 feet depth, then left to stand open overnight for a water check, which was negative. The borehole was furthered to 60 feet depth and the well installed.

Prior to arrival onsite, as well as between borings, the drill rig and all downhole tools were high pressure hot washed. Decon rinseates were contained in a plastic lined pit and allowed to evaporate.

SITE GEOLOGY

The site rests on Cretaceous marine sedimentary rocks of the Panoche Formation. These clay shale, argillaceous to silty rocks, with thin sandstone beds dip steeply toward the west-southwest. The surrounding area is comprised of northwesterly trending folded and faulted rocks of the Panoche Formation. The northwest trending East Chabot Fault trace lies about 1.5 miles southwest of the site. The axis of the Niles Syncline lies about 2,000 feet southwest of the site.

The soils and rocks encountered as drilling progressed were logged by an ASE geologist using the United Soil Classification System (USCS) (Appendix D). From grade to just a few feet depth, the soils are Panoche rocks which have weathered in place. Below just a few feet depth are well indurated claystone, siltstone, and sandstone beds from a few inches to a few feet in thickness.

During drilling of SB-1 through SB-9 it was noted that at most locations free groundwater was encountered at about 15 to 18 feet depth, with the exception of SB-7, which was dry to 20 feet depth. Overnight, the water levels in the borings rose up to about 7 to 9 feet depth below grade, excepting SB-7. Gasoline odors described as slight to strong were noted during drilling of all of the borings at depths ranging from 5 feet to 15 feet.

At MW-1 groundwater was negligable down to about 40 feet depth. Free groundwater was encountered at about 43 feet depth.

In MW-2 free groundwater was found at about 18 feet depth and rose to about 9 feet depth.

MW-3 was found to be dry down to about 45 feet depth. Groundwater was encountered at about 50 feet depth and rose in the well up to about 16 feet depth.

WELL CONSTRUCTION PROCEDURES

Upon drilling to total depth, a 2" I.D. schedule 40 PVC well was installed through the augers from grade to total depth (Appendix D). The well casing was high pressure hot washed prior to installation. Machine slotted well screen (0.02") with a threaded bottom cap was followed by flush threaded blank casing, bringing the well up to grade. A locking top cap was screwed into the top of the well for security. The wells were sanded with washed #3 sand through the augers, from total depth up to 2 feet above the top of the perforated casing. Two feet of bentonite pellets were placed above the sand, followed with water for activation of the pellets. The remainder of the borings were filled to grade with cement, and steel stovepipe well covers were emplaced to protect the wells.

MW-1 was screened from 50 feet total depth up to 35 feet depth. The wellscreen in MW-2 was placed between 30 feet total depth and 15 feet depth. MW-3 has the wellscreen located between 60 feet and 40 feet depth.

SAMPLING PROCEDURES

Undisturbed soil samples were obtained at five foot intervals with a California modified split spoon sampler and a 140 lb. drop hammer into 2" X 6" precleaned brass tubes and sealed with plastic caps and tape. The sampler and sample tubes were cleaned with a TSP solution and rinsed with tap water between samplings. The samples were put into a cooler with ice and transported to a State Certified Hazardous Waste Analytical Laboratory for certified analysis following chain of custody procedures (Appendix E). An Organic Vapor Meter (OVM-PID) was used to screen the soil samples obtained during drilling of SB-1 through SB-9. The meter was used only to determine the presence of volatile hydrocarbons and not to quantify any contamination detected. The OVM readings proved to be much higher than confirming analyses values given by a State Certified Hazardous Waste Analytical Laboratory.

The completed wells were developed with an airlift pump, then sampled with dedicated disposable bailers by Sampling Specialists on June 1, 1990. The field log and sampling log detailing the procedures of the development/sampling are in Appendix D. No odors or petroleum sheen were detected during the development/sampling. The groundwater samples were obtained for analysis at a State Certified Hazardous Waste Analytical Lab.

SAMPLE ANALYSIS

All of the soil samples and groundwater samples were analyzed for TPH as gasoline using EPA method 8015 modified, and benzene, toluene, ethyl benzene, and total xylenes (BTEX) distinction using EPA method 8020/602. The groundwater sample from MW-3 was additionally analyzed for chlorinated hydrocarbons using EPA method 601, polynuclear aromatics using EPA method 625, chlorinated pesticieds using EPA method 608, and priority pollutant metals using EPA method 6010.

Soil samples from five feet depth yeilded gasoline concentrations ranging from nondetectable in SB-3, SB-6, SB-9, to 7.8 ppm in SB-2, to 110 ppm in SB-1, up to 390 ppm in SB-8. At the ten foot depth level, gasoline was N.D. in SB-1, SB-2, SB-3, SB-4, SB-7, SB-8, 66 ppm in SB-9, up to 79 ppm in SB-6 (Table 2). TPH as gas and BTEX were not detected in any soil sample obtained from below 15 feet depth. Several soil samples which were N.D. for TPH as gasoline did contain measurable levels of BTEX.

Benzene values for samples with detectable concentrations of TPH as gas ranged from 23 parts per billion (ppb) (SB-6,10′) to 4,300 ppb (SB-8,5′). Toluene in these samples ranged from 5.1 ppb (SB-2,5′) to 4,000 ppb (SB-8,5′). Ethylbenzene existed at from 97 ppb (SB-2,5′) to 2,800 ppb (SB-8,5′). Total xylenes were detected at from 5.5 ppb (SB-2,5′) to 5,300 ppb (SB-8,5′). Soil sample SB-8, 5′ contained the highest levels of all constituents identified.
At 15 feet and 20 feet depth, no soil sample yielded detectable levels of TPH as gas, though SB-8, 15′ showed 49 ppb benzene, 20 ppb toluene, 7.5 ppbethylbenzene, 15 ppb xylenes.

Groundwater samples from all three wells were N.D. for the constituents sought.

TABLE 1
SAMPLE ANALYTICAL RESULTS

SAMPLE #	GASOLINE	BENZENE	TOLUENE	ETHYL BENZENE	TOTAL XYLENES
	mg/kg	ug/kg	ug/kg	ug/kg	ug/kg
SB-1, 5′	110	2,500	1,200	690	1,300
SB-1, 10′	N.D.	780	44	19	18
SB-1, 15′	N.D.	N.D.	N.D.	N.D.	N.D.
SB-1, 20′	N.D.	N.D.	N.D.	N.D.	N.D.
SB-2, 5′	7.8	240	5.1	97	5.5
SB-2, 10′	N.D.	N.D.	N.D.	N.D.	N.D.
SB-2, 20′	N.D.	N.D.	N.D.	N.D.	N.D.
SB-3, 5′	N.D.	90	N.D.	16	10
SB-3, 10′	N.D.	N.D.	N.D.	N.D.	N.D.
SB-3, 15′	N.D.	N.D.	N.D.	N.D.	N.D.
SB-4, 10′	N.D.	N.D.	N.D.	N.D.	N.D.
SB-4, 15′	N.D.	N.D.	N.D.	N.D.	N.D.
SB-4, 20′	N.D.	6.3	N.D.	N.D.	N.D.
SB-6, 5′	N.D.	N.D.	N.D.	N.D.	N.D.
SB-6, 10′	79	23	10	330	310
SB-6, 15′	N.D.	N.D.	N.D.	N.D.	N.D.
SB-7, 10′	N.D.	N.D.	N.D.	N.D.	N.D.
SB-7, 15′	N.D.	N.D.	N.D.	N.D.	N.D.
SB-7, 20′	N.D.	N.D.	N.D.	N.D.	N.D.
SB-8, 5′	390	4,300	4,000	2,800	5,300
SB-8, 10′	N.D.	37	11	N.D.	5.4
SB-8, 15′	N.D.	49	20	7.5	15
SB-8, 20′	N.D.	N.D.	N.D.	N.D.	N.D.
SB-9, 5′	N.D.	N.D.	N.D.	N.D.	N.D.
SB-9, 10′	66	190	85	170	320
SB-9, 15′	N.D.	N.D.	N.D.	N.D.	N.D.
MW-1, 5′	N.D.	N.D.	N.D.	N.D.	N.D.
MW-1, 10′	N.D.	N.D.	N.D.	N.D.	N.D.
MW-1, 15′	N.D.	N.D.	N.D.	N.D.	N.D.
MW-1, 20′	N.D.	N.D.	N.D.	N.D.	N.D.
MW-1, 40′	N.D.	N.D.	N.D.	N.D.	N.D.

Water Samples

	GASOLINE Diesel	EPA 601	EPA 602	EPA 608	EPA 625
	mg/l	ug/l	ug/l	ug/l	ug/l
MW-1	N.D. NA	~~N.D.~~	~~N.D.~~	~~N.D.~~	~~N.D.~~ NA
MW-2	N.D. NA	~~N.D.~~	~~N.D.~~	~~N.D.~~	~~N.D.~~ NA
MW-3	N.D. ND	N.D.	N.D.	N.D.	N.D. ND

All analyzed for EPA 625

N.D. - not detected

GROUNDWATER GRADIENT DETERMINATION

Markings at top of casing on each of the three wells were surveyed to a known benchmark by Major's Engineering on July 12, 1990. The wells were marked by Sampling Specialists at the time of water level measurement. Top of casing for each well was found to be between 303.21 feet above mean sea level (MSL) (MW-1) and 304.66 feet above MSL (MW-3). Corresponding water level elevations were between 287.74 feet above MSL (MW-1) and 294.56 feet above MSL (MW-2) at the time of measurement. The geometry of the water table between the three well locations indicates groundwater flow to the southwest at XX, which is approximately parallel to the down dip direction of the site rocks.

CONCLUSIONS

A soil and groundwater contamination investigation was conducted at the site of a previously removed gasoline filling and auto service station located at 5293 Castro Valley Blvd. in Castro Valley, Ca. Soil samples obtained in February, 1989, from beneath the inverts of three removed 8,000 gallon gasoline tanks and one removed 500 gallon waste oil tank showed that site soils had been impacted by petroleum hydrocarbon products. These findings led to the requirement by the Alameda County Health Care Services Agency that a preliminary site investigation be conducted to determine the vertical and lateral extent of soil and groundwater contamination resulting from the previous operation of the underground tankage.

Eleven soil borings were advanced down to from 20 to 60 feet depth below grade at the relatively flat, vacant site. The site rests upon steeply dipping Cretaceous marine sedimentary rocks of the Panoche Formation which are distinctly bedded from a few inches to a few feet in thichness. Three of the borings were converted into groundwater monitoring wells ranging from 30.5 feet to 60 feet depth below grade.

Soil borings #1-9 (SB-1 to SB-9, lacking SB-5) were all drilled to 20 feet depth from the vicinity of the dispenser islands, along product piping, and around the gasoline tankpit. SB-8 and SB-9 were drilled at distances of about 50 feet in assumed dopwngradient directions from the dispenser islands, and the gasoline tankpit, respectively. Groundwater was encountered in these borings at from about 15 feet to 19 feet depth, with static levels at about 7 to 9 feet depth below grade. SB-7 was dry to 21 feet depth.

It was apparent from the soil borings that measureable petroleum hydrocarbon contamination existed at distances from the gas tankpit and product piping of at least 60 feet. The three monitoring wells were then drilled in locations approximating those outlined in the ASE Workplan - Proposal For Soil and Groundwater Investigation Services of Feb. 11, 1990. Monitoring Well #2 (MW-2) was drilled and installed as an assumed upgradient well instead of near the tankpit. The three wells have differing construction specifications resultant from varying hydrogeologic conditions which are apparent at the site. In MW-1, moistening was noted at about 17 feet depth but first free groundwater was encountered at about 42 feet depth. Free groundwater was encountered in MW-2 at about 18 feet depth. MW-3, near the waste oil tankpit, was dry to about 50 feet depth. These observations were verified by overnight water checks in open borehole.

The soils were sampled at 5 foot intervals and submitted to a State Certified Hazardous Waste Analytical Laboratory following chain of custody procedures. The samples were analyzed for TPH as gasoline with BTEX distinction (EPA methods 8015 modified, 8020). The samples yelided TPH as gasoline with BTEX concentrations ranging from N.D. in several samples to 390 ppm gasoline, 4,300 ppb benzene, 4,000 ppb toluene, 2,800 ppb ethylbenzene, and 5,300 ppb xylenes in sample SB-8, 5'.

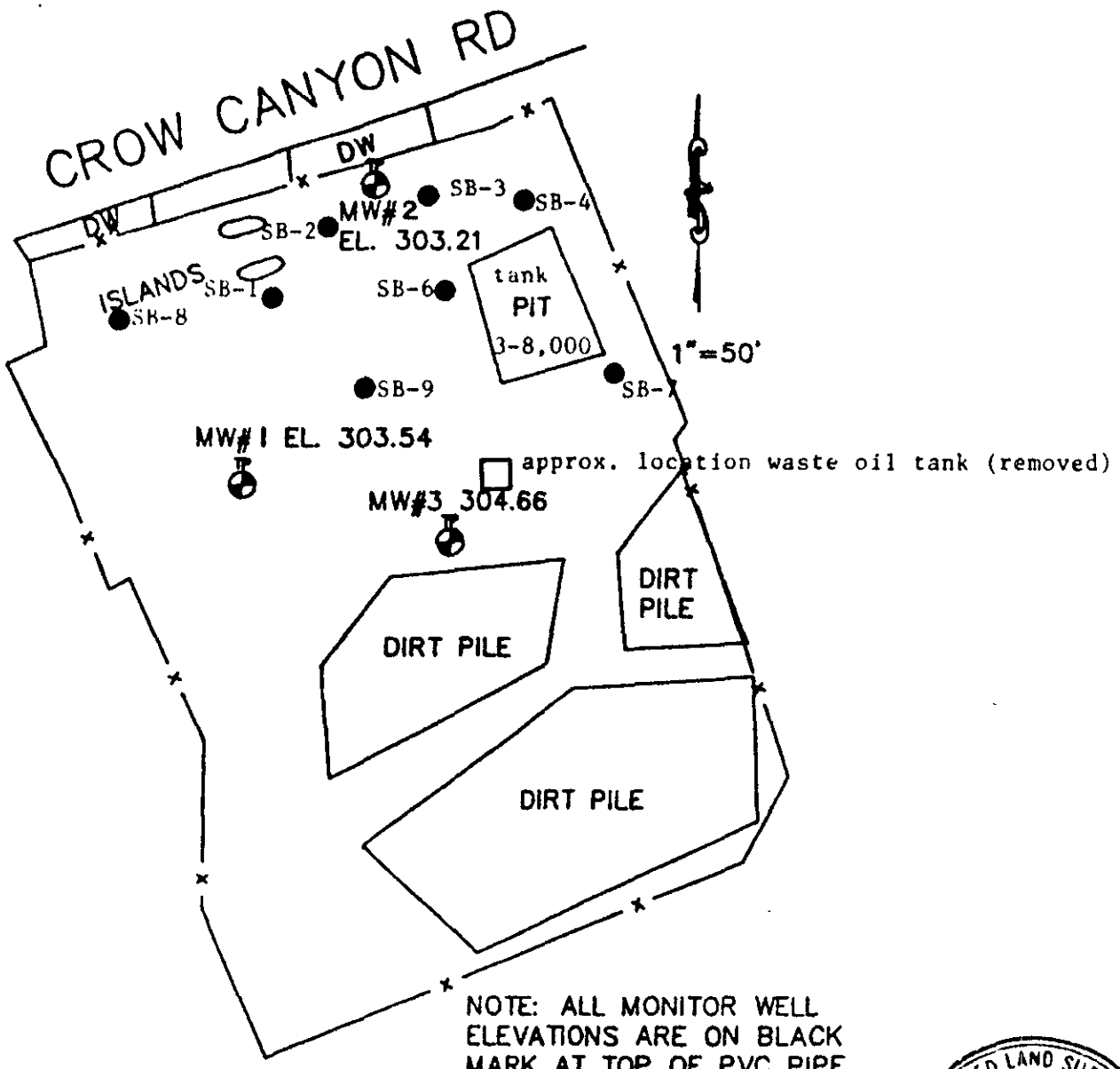
The wells were developed with an air lift pump and sampled with disposable dedicated ballers. Groundwater samples were submitted following chain of custody procedues to a State Certified Laboratory for TPH as gas with BTEX (EPA methods 8015, 602). Groundwater from MW-3 was additionally analyzed using EPA methods 601, 608, 625, 6010, 7470, due to the well's proximity to the waste oil tankpit. All groundwater samples analyzed N.D. for all hydrocarbon constituents of interest. MW-3 did contain 0.004 ppm cadmium and 0.027 ppm zinc.

RECOMMENDATIONS

The groundwater monitoring wells should be sampled quarterly for a period of one year. If chemical constituents continue to be absent from groundwater samples throughout the year, sampling can probably be discontinued and the wells properly abandoned.

MICHAEL J. MAJORS CIVIL ENGINEERS, INC.

Figure 1
Site Plan



NOTE: ALL MONITOR WELL ELEVATIONS ARE ON BLACK MARK AT TOP OF PVC PIPE.

● denotes soil boring/sampling location

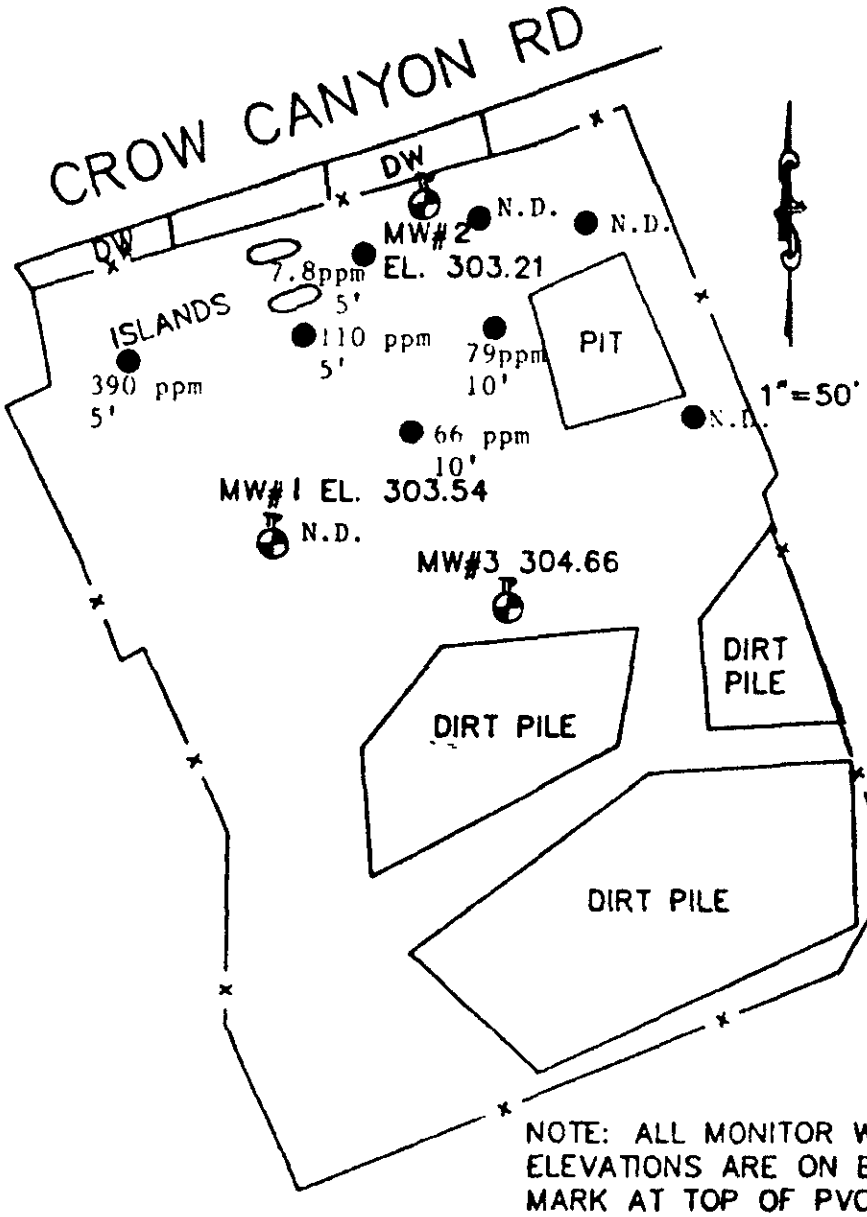
BM BRASS DISK IN TOP OF CURB AT THE MOST EASTERLY CURB RETURN AT CROW CANYON ROAD AND SAN SIMEON PLACE. ELEV. : 307.73 FEET

LICENSED LAND SURVEYOR
C.R. PELSER
LS 4624
EXPIRES
STATE OF CALIFORNIA

Drawn DE Job 4307-01 Checked DE

Scale 1"=50' Date 7-16-90 Parcel

Figure 2
Highest TPH as Gasoline Values, Soil Samples



NOTE: ALL MONITOR WELL ELEVATIONS ARE ON BLACK MARK AT TOP OF PVC PIPE.

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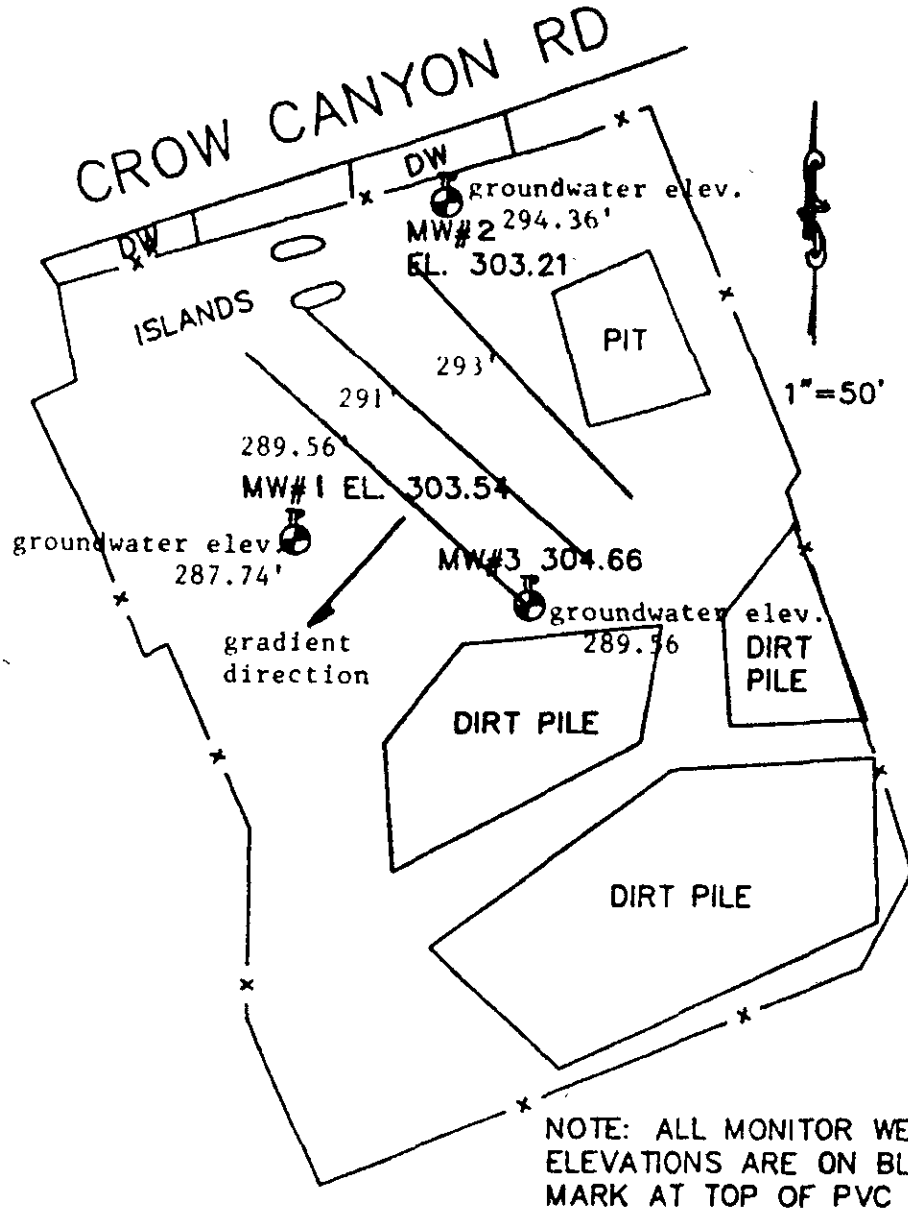
Drawn DE Job 4307-01 Checked DE

Scale 1"=50' Date 7-16-90 Parcel

MICHAEL J. MAJORS CIVIL ENGINEERS, INC.

Figure 3
Groundwater Gradient
May 30, 1990



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APPENDIX A
DOCUMENTATION OF EVENTS
LEADINC TO INVESTIGATION

aqua science engineers inc.

Feb. 11, 1990

Mr. Frank Ramos
c/o Mr. Richard P. Flynn
1630 N. Main St., Suite 134
Walnut Creek, Ca. 94596-4609

Re: Workplan-Proposal for Soil and Groundwater Investigation Services at 5293 Crow Canyon Rd., Castro Valley

Dear Mr. Ramos,

The following is Aqua Science Engineer's workplan-proposal for a preliminary site assessment to be conducted at the site referenced above. The scope of work was developed from the Regional Board Staff Recommendations for Initial Evaluation and Investigation of Underground Tanks of June 2, 1988, revised April, 1989. The format for the proposal is from the Workplan for Initial Subsurface Investigation, Proposal Format attachment that accompanied recent correspondence from the Alameda County Dept. of Environmental Health, Hazardous Materials Program offices.

I. INTRODUCTION

A. Statement of Work Scope:
A soil and groundwater investigation is to be conducted at 5293 Crow Canyon Rd. in Castro Valley, Ca., as a result of earlier investigative activities at the site. The site assessment has been mandated by May 8, 1989 correspondence from the Alameda County Dept. of Environmental Health, Hazardous Materials Program. The May 8 letter requires that the vertical and horizontal extent of gasoline and waste oil contamination in the soils and groundwater be determined (Appendix A). Prior to commencement of monitoring well drilling, well construction permits will be obtained from Alameda County Water District, Zone 7.

B. Site Location:
The site is located on the southern side of Crow Canyon Rd., east of Castro Valley (Figure 1). From the southern property line the topography slopes steeply downhill toward the southeast and Crow Canyon Creek which flows to the southwest at the bottom of Crow Canyon.

C,D. Background and Site History:
A Shell gasoline station operated at the subject site prior to February, 1989, when three 8,000 gallon gasoline tanks and one 500 gallon waste oil were removed by Aqua Science Engineers. The details of the tank removals and associated sampling are summarized in the project report of March 10, 1989 (Appendix B).

An estimate of the amount of fuel products lost into the soils was not made. To date, no other investigative work has been performed at the site.

II. SITE DESCRIPTION

A. Vicinity Description and Hydrogeologic Setting:
The site rests upon Cretaceous marine sedimentary deposits of the Panoche Formation. The sandstone and claystone beds dip steeply to the southwest and the

axis of the Niles Syncline less than 1/2 mile away. Surrounding the valley are Cretaceous marine deposits of the Panoche and Knoxville Formations. The surrounding area is comprised of northwest trending folds and faults, including the East Chabot Fault which lies about one mile to the southwest of the site.

B, C. Vicinity Map:
Though the gas station has been removed, Figure 2 gives the approximate layout of those facilities, as well as the locations of proposed borings and monitoring wells.

D. Existing Soil Contamination and Excavation
Initial soil samples were obtained from the backhoe bucket by driving 2" X 6" brass tubes into the soil until they were full. The tubes were sealed with aluminum foil, teflon caps, and tape, then placed into a cooler with ice. They were transported following chain of custody procedures to a State Certified laboratory with the documentation and results contained in Appendix B.

Groundwater was not encountered in the tankpit excavation, which was excavated to about 13 feet depth. Near surface soils are of the same composition as the sedimentary rocks described above, and were hard.

The soil samples were obtained from beneath the gasoline tank inverts at 13 feet depth and from beneath the wasted oil tank at 7 feet depth.

Six samples of the soils/rock beneath the tanks yeilded concentrations of Total Petroleum Hydrocarbons (TPH) as gasoline ranging from non-detectable to 980 parts per million (ppm) and 35 ppm total oil and grease in the tankpit soil sample (Table 1). Benzene concentrations ranged from nondetectable to 4,000 parts per billion (ppb), ethylbenzene from 5 ppb to 17,000 ppb. Toluene was detected at between 100 ppb to 35,000 ppb, with total xylenes between 20 ppb and 75,000 ppb.

No underground utilities were encountered during the tank removal, though Underground Service Alert will be notified before commencement of further investigative work.

Soil excavated from the tankpits was piled onsite where it exists today. A stockpile soil sample was analyzed and the results included in Table 1.

To date, the only permits required for the site have been those related to the tank removals and they are included in the tank removal summary report in Appendix B. Monitoring well construction permits will be obtained from Zone 7 before monitoring well drilling is initiated.

III. Plan For Determining the Extent of Soil Contamination On Site

The plan for determining the extent of soil and groundwater contamination includes drilling, sampling, and analysis of soils and groundwater at the site.

A. Describe Method/Technique For Determining Extent of Contamination Within the Excavation:

Boring Methods, Numbers, Locations, Abandonment

To determine the extent of soil and groundwater contamination present near the excavation and around the site, up to 10 borings are proposed, three of which

will be converted to monitoring wells if groundwater is encountered at or above 45 feet drilling depth. A Mobile B-61 or B-57 hydraulic rotary drilling rig with 8 inch hollow stem augers will be used to drill all borings. At all proposed monitoring well locations, drilling will proceed to 45 feet depth.

Upon encountering groundwater at less than 45 feet drilling depth, a monitoring well (MW-1) will be drilled to a maximum of 65 feet and installed about 25-35 feet southwest of the dispenser islands. MW-2 will be placed near the southwest corner of the gasoline tank pit. MW-3 will be located within 5 feet of the waste oil tankpit. If groundwater is not encountered, the borings will backfilled with Portland cement pumped through a tremmie hose from 45 feet depth up to original grade.

Seven soil borings (SB-1 through SB-7) will be drilled to 20 feet maximum depth. SB-1,2,3,4 will be drilled at points along the plumbing between the gas tanks and the dispenser islands. SB-5,6,7 will be drilled along the perimeter of the tankpit. Figure 2 shows the location of all proposed borings.

The seven soil borings will be backfilled with Portland cement which will be pumped through a tremmie hose from the bottom of each boring up to original grade.

Soil Classification and Sampling Methods

Each boring will be continuously logged on site by a geologist using the United Soil Classification System. Undisturbed soil samples will be taken at 5 foot intervals with a hammer driven California Split Spoon sampler as drilling progresses. The samples will be collected in precleaned 2" X 6" brass tubes and sealed with plastic caps and tape. All sampling equipment will be cleaned with a brush in a bucket of TSP solution and rinsed twice between samplings. The drilling rig and augers will be high pressure hot washed before arriving on site and between borings.

C. Describe Methods/Criteria for Screening Soil and Storing Soil

The existing soil stockpile is known to contain detectable levels of petroleum hydrocarbons. Soil samples obtained during drilling will be screened with an organic vapor analyzer in the field and all samples yeilding a positive reading of any kind will be submitted for analysis.

Soil cuttings generated during drilling will be stored on site on plastic sheeting and covered with plastic sheeting pending lab analyses for later disposal. On-site treatment of contaminated soils is not a part of the workplan. Once the soil has been chemically characterized, proper disposal at a Class I, II, or Class III waste facility can be arranged at additional cost, to be determined after the characterizaton of the cuttings. It may be necessary to contract a hazardous waste hauler, manifest the soils properly, and dispose of the soils as hazardous waste.

D. Security Measures

The site is currently fenced across Crow Canyon Rd. A working area will be established with barricades and warning tape around the drill rig. Within the working area only authorized personnel will be allowed.

IV. Plan For Determining Groundwater Contamination

A. Placement and Rationale For Monitoring Well Placement

Upon encountering groundwater at 45 feet depth or less, MW-1 will be installed to 65 feet maximum depth about 25-35 feet southwest of the pump islands. MW-3 will be drilled and installed as MW-1 within 5 feet of the waste oil tankpit, with MW-2 established on the southwest corner of the gasoline tankpit. The three wells are located to allow good triangulation of survey points in a groundwater gradient determination, as well as to obtain sample points from specific areas of concern, as noted above.

B. Monitoring Well Drilling and Installation Specs.

Monitoring wells MW-1, 2, 3 will be drilled as described above. All three wells will be constructed of 2 inch Schedule 40 PVC casing, with up to 20 feet of .010" slotted schedule 40 PVC, with the top of the screened interval extending about 5 feet above encountered water level to account for seasonal groundwater level fluctuations (Figure 3). The well casing will be inserted through the augers, followed by #3 washed sand through the augers in 1 to 2 foot lifts up to at least 2 feet above the perforated casing. One foot of bentonite pellets will be placed above the sand and activated with some water. The seal will be finished up to the surface with cement, and a locking cap and surface cover will be installed.

Soil samples will be collected at 5 foot intervals, starting at 5 feet depth, obtained as described above.

C. Groundwater Sampling Plans

The wells will be developed by the bailing of water into drums until the water appears to be reasonably clear. The water's clearness will be determined subjectively as bailing proceeds. The wells will be sampled as per Pratt Consulting Company's Monitoring Well Protocol of April, 1989 (Appendix B). All soil and groundwater samples to be submitted for analysis will be immediately placed into a cooler with ice and submitted to a State Certified Analytical Laboratory following chain of custody procedures for TPH as gasoline with BTXE distinction using EPA methods 8015/8020/602. Samples from MW-2 and SB-7 will be additionally analyzed for total oil and grease (method 503d & e), TPH as diesel, priority metals (ICAP/AA), PCB, PCP, PNA and creosote (EPA method 625/627/8270), and chlorinated hydrocarbons using EPA method 8010/601.

Laboratory analysis reports will have QA/QC data on the report itself, and groundwater samples will be analyzed with a duplicate and a blank. Purged water will be stored on site in drums until laboratory analyses are available.

The tops of well casings will be surveyed to an established benchmark by a State Registered Land Surveyor to within 0.01 foot. Free product and sheen will be measured either with an interface probe which will measure the thickness of floating product, or with an acryilic bailer which will be lowered slowly to the water surface and filled about half full for direct observation of sheen and odor. Water level measurements will be taken as per Pratt Consulting Co. protocol noted above.

Chain of custody documentation shall accompany every soil and groundwater sample from the site to the laboratory.

V. Site Safety

Prior to commencement of investigative activities each day, a site safety meeting will be held at the designated command post which will be a vehicle which is proximal to the working area. Emergency procedures to follow in case of fire or severe injury or explosion will be outlined at site safety meetings. The hazards of the known or suspected chemicals on site will be explained at these meetings. Level D protection is the anticipated maximum amount of protection needed. A site safety plan which conforms to Part 1910.120 (i) (2) of 29 CFR will be on site at all times.

A working area will be established with barricades and warning tape to delineate the zone where hardhats, steel toed shoes must be worn, and where unauthorized personnel will not be allowed.

Drilling will not be conducted during lightning storms. If, during drilling, product odors emanating from the hole are deemed to be substantial, drilling personnel will wear Tyvek suits and rubber gloves. Respirators equipped with organic vapor cartridges may be worn as well under these drilling conditions.

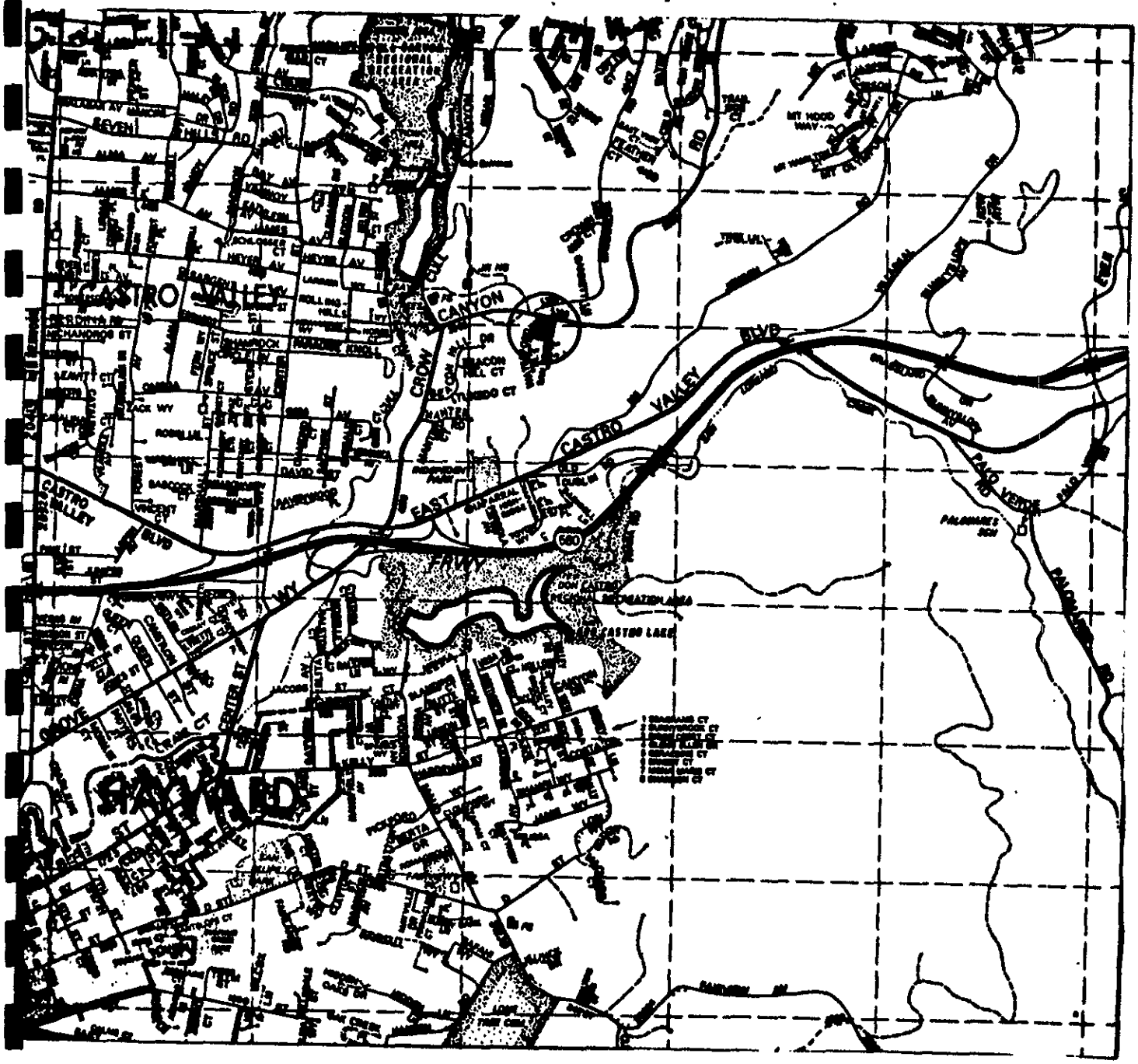
The closest hospital is Laurel Hospital which is reached by traveling south on Crow Canyon Rd. to Castro Valley Blvd. where you drive west, turning north onto Lake Chabot Rd. and continuing about two blocks to the hospital on the left. Another nearby hospital is John Muir Emergi-center reached by traveling notheast on Crow Canyon Rd. to the intersection with Porter Dr. The hospital is there on the northwest corner of the intersection.

REPORTING

A complete report of methods, findings, and conclusions will be submitted to the client for forwarding to all appropriate agencies within 30 days of the completion of the investigation. The report will be submitted under the seal of a State Registered Civil Engineer, Mr. Greg Burg (#36208). Mr. Burg has implimented and managed dozens of tank removal, site investigation, and soil remediation projects for ASE since his arrival at ASE in 1987.

Figure 1

Site Location Map



Site Location

1 inch = 2,200 feet

from Thomas Bros.

Figure 2

Site Plan at 5293 Crow Canyon Road, Castro Valley

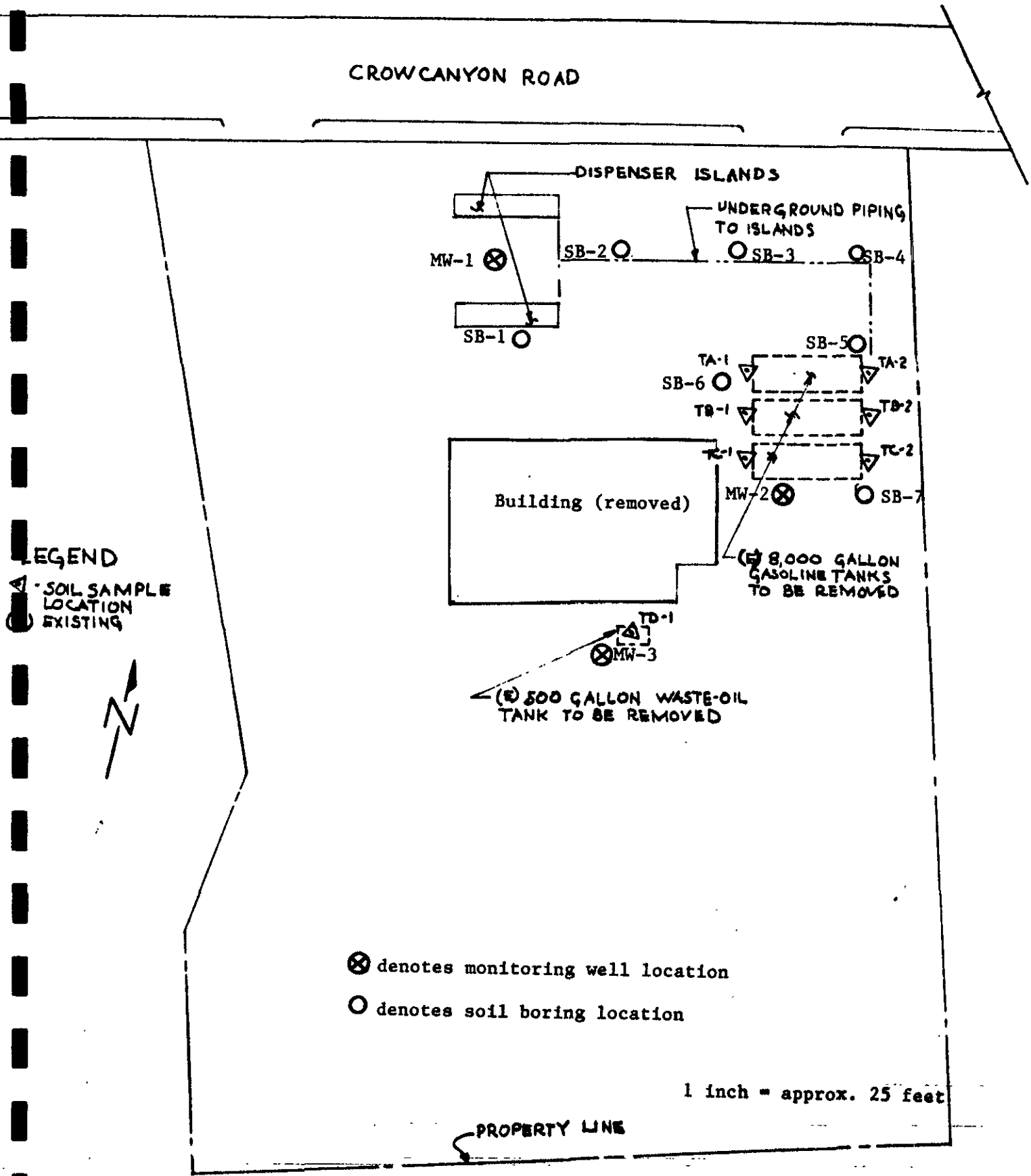
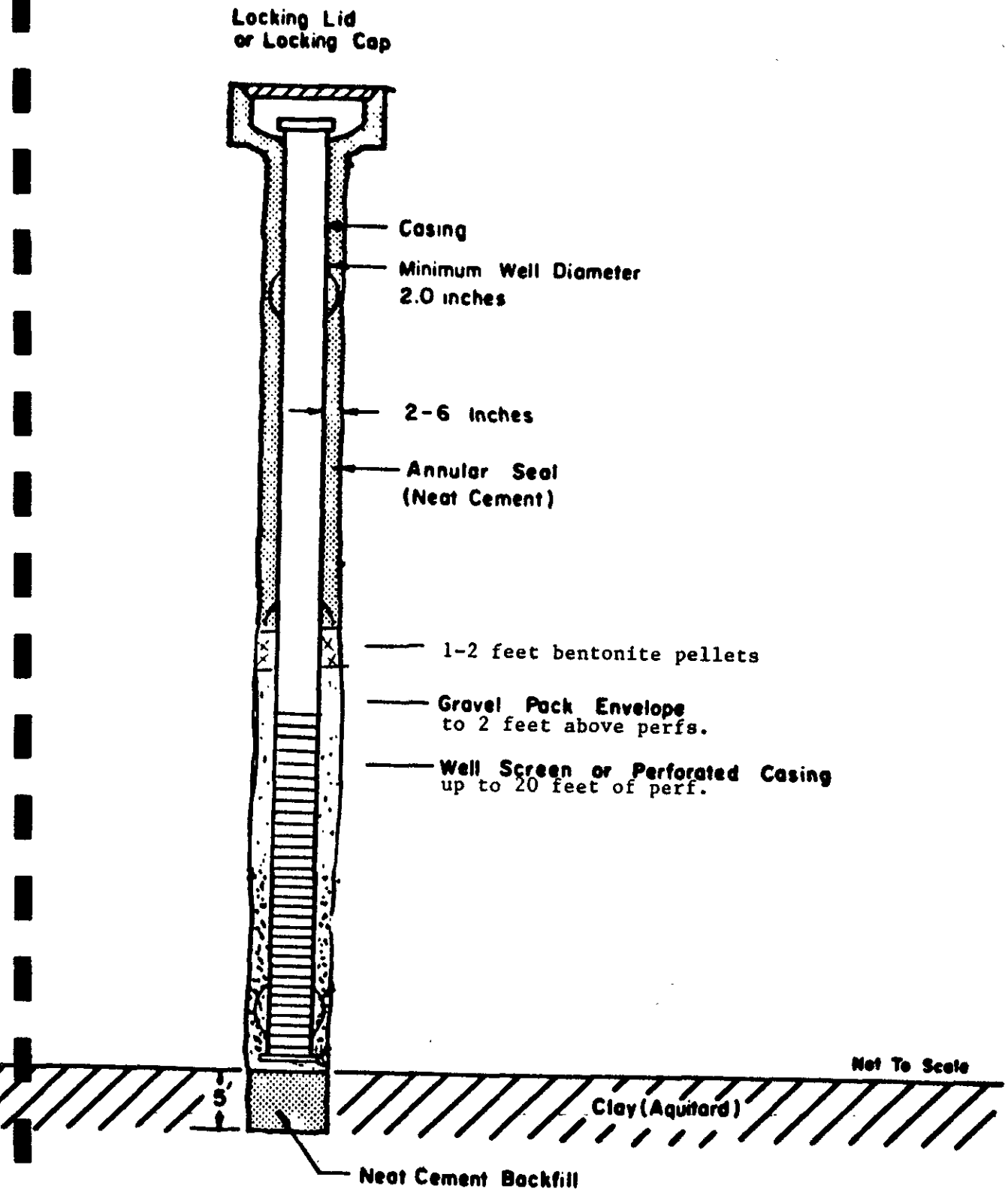


Figure 3

Typical Monitoring Well



TYPICAL MONITORING FACILITY

APPENDIX A
AGENCY CORRESPONDENCE

ALAMEDA COUNTY
HEALTH CARE SERVICES
AGENCY
DAVID J. KEARS, Agency Director

DEPARTMENT OF ENVIRONMENTAL HEALTH
Hazardous Materials Program
80 Swan Way, Rm 200
Oakland, CA 94621
(415) 271-4320

May 8, 1989

Mr. Dan Denine
Lakeshore Financial
2100 Lakeshore Ave., Ste. B 444-6658
Oakland, CA 94606

RE: SOIL CONTAMINATION AT 5293 CROW CANYON ROAD, CASTRO VALLEY:
REQUEST FOR PRELIMINARY SITE ASSESSMENT

Dear Mr. Denine:

Our office has completed review of the Aqua Terra Engineers, Inc. report dated March 10, 1989 involving soil sampling and subsequent laboratory analyses following closure February 10, 1989 of four (4) underground storage tanks (UST) at the referenced site. This report identifies substantial soil contamination approaching 1000 ppm of total petroleum hydrocarbons as gasoline (TPH-G) in close proximity to the northernmost fuel UST. An additional composite sample collected from stockpiled material also indicates contamination by total oil and grease (TOG) up to 775 ppm. Contamination exceeding 100 ppm is identified by the Regional Water Quality Control Board - San Francisco Bay Region (RWQCB) as a "confirmed release."

Due to this site's "confirmed release" status, additional investigative work must be performed to further define the extent of vertical and lateral impact upon groundwater and soils resulting from the noted contamination. The information gathered by this investigation must be used to determine an appropriate course of action to remediate the site. This preliminary site assessment should be conducted in accordance with the RWQCB Staff Recommendations for Initial Evaluation and Investigation of Underground Tanks. The major elements of such an investigation are summarized in the attached Appendix A.

In order to proceed with a site investigation, you should obtain professional services from a reputable engineering/geotechnical consulting firm. The responsibility of your consultant is to submit for review a proposal outlining planned activities pertinent

to meeting the criteria outlined in this letter and the attached Appendix A. Once the preliminary site assessment has been completed, a technical report summarizing site related activities and conclusions must be submitted to this office and the RWQCB. All reports and proposals must be submitted under seal of a California-Certified Engineering Geologist, California-Registered Geologist, or California- Registered Civil Engineer.

This office will oversee the site assessment for the referenced site. This oversight will include our review and comment on work proposals, and technical guidance on appropriate investigative approaches. However, the issuance of monitoring well installation permits will be through Zone 7. The RWQCB may choose to take over as lead agency if it is determined following the site assessment that there has been a substantial impact upon groundwater.

Please submit a Preliminary Site Assessment proposal within 30 days of the receipt of this letter. Accompanying this proposal must be a check totalling $831 to help defer the cost of our review of this plan and our oversight of the remediation process. This check should be made out to the County of Alameda. A copy of this proposal should also be sent to the RWQCB (Attn: Scott Hugenberger) for their review.

If you have any questions, please call Scott Seery, Hazardous Materials Specialist, at 415/271-4320.

Sincerely,

Rafat A. Shahid, Chief
Hazardous Materials Program

RAS:SOS:mam

cc: Howard Hatayama, DHS
Scott Hugenberger, RWQCB
Bob Bohman, Castro Valley Fire Dept.
Gil Jensen, Alameda County District Attorney, Consumer and Environmental Protection Division
Pari Miraftabi, Alameda County Building and Inspection Dept.
Scott Seery, Alameda County Hazardous Materials Program
Files

Enclosure

ALAMEDA COUNTY
HEALTH CARE SERVICES
AGENCY
DAVID J. KEARS, Agency Director

DEPARTMENT OF ENVIRONMENTAL HEALTH
Hazardous Materials Program
80 Swan Way, Rm. 200
Oakland, CA 94621
(415) 271-4320

December 21, 1989

Mr. Greg Gouvea
Aqua Science Engineers, Inc.
P. O. Box 535
San Ramon, CA 94583

RE: SOIL/GROUNDWATER WORKPLAN PROPOSAL, 5293 CROW CANYON RD., CASTRO VALLEY

Dear Mr. Gouvea:

This letter is in response to our review of the November 22, 1989 Aqua Science Engineers, Inc. workplan proposal for the investigation of subsurface contamination at the referenced site, as submitted under cover dated November 26, 1989. The noted workplan may be approved for this stage of site contaminant assessment providing the following issues are resolved to the satisfaction of this office:

1) All reports and proposals must be submitted under seal of a California-Registered Geologist, -Certified Engineering Geologist, or -Registered Civil Engineer. Include a statement of qualifications;

2) The locations of proposed borings 4, 5, 6, and 7 are not clear. Section III, A/B of the report conflicts with the schematic representation of boring locations as depicted in Figure 2;

3) Provide a well construction diagram. Presumably, the referenced "Figure 4" (Sec. IV, B) is such a diagram but was not included with this submittal;

4) Based upon local topography and surface drainage in proximity to the site, the approximate groundwater flow direction is presumed to be to the southwest, or towards Crow Creek. Therefore, it is recommended that the location of proposed monitoring well MW-1 be moved approximately 25-35 feet to the

south-southwest from its current location. This will place MW-1 somewhat southwest of the southern-most dispenser island, potentially better suited to identify contaminants in groundwater derived from leaks beneath, or in proximity to, either dispenser island;

5) Provide assurance that wells will be surveyed, including surveying to an established benchmark to an accuracy of 0.01 feet;

6) Describe how well screened intervals will accommodate expected seasonal fluctuation in groundwater levels;

7) Describe methods for free product measurement, and observation of sheen and/or odor. This topic was not discussed in the referenced Pratt Consulting Company monitoring protocol (Appendix B);

8) Soil samples collected from MW-2 during boring advancement as well as water samples collected after development should also be analyzed for: TPH-D; priority metals (ICAP/AA); PCB, PCP, PNA and creosote (EPA method 8270). These tests are in addition to TPH-G and TOG (Method 503 A/D & E) analyses previously cited in this proposal. Further, be certain that the method used for TPH-G/D detection is that outlined by the LUFT program (GC/FID);

9) Please be certain that the proposed Site Safety Plan adheres to guidelines specified under Part 1910.120 (i)(2) of 29 CFR;

10) Provide assurance that wells will be constructed under appropriate Zone 7 permits;

11) A proposal addressing the proper disposal of stockpiled soil remaining on-site must be made.

Please submit, in a timely fashion, a response which adequately addresses the previous list of items. This submittal may be in the form of an addendum to the November 22 proposal. Additionally, please submit copies of all reports, proposals and addenda to the RWQCB (Attn: Lester Feldman), including the November 22 proposal.

Should you have any questions, please call me at 415/271-4320.

Sincerely,

Scott O. Seery
Hazardous Materials Specialist

SOS:mam

cc: Rafat A. Shahid, Assistant Agency Director, Alameda County Department of Environmental Health
Lester Feldman, RWQCB
Howard Hatayama, DHS
Mike Hood, Alameda County Building and Inspection Department
Bob Bohman, Castro Valley Fire Dept.
Gil Jensen, Alameda County District Attorney, Consumer and Environmental Protection Division
Richard Flynn, Esq.
Frank Ramos
Files

APPENDIX B
PREVIOUS INVESTIGATIVE WORKS

March 10, 1989

PROJECT REPORT

UNDERGROUND STORAGE TANK REMOVAL ASSESSMENT AT 5293 CROW CANYON ROAD, CASTRO VALLEY, CALIFORNIA

Prepared for:

Dan Dineen
Lakeshore Financial
2100 Lakeshore Avenue
Oakland, Ca. 94606

Submitted by:

Aqua Science Engineers
2500 Old Crow Canyon Rd. # 121
San Ramon, CA 94583

TABLE OF CONTENTS

1. INTRODUCTION

This report documents activities related to removal of the underground storage tanks located at 5293 Crow Canyon Road, Castro Valley, California.

Our scope of work consisted of the following:

1. Collecting soil samples at each end of the tanks to be removed and submit the samples to a state-certified laboratory for analysis of total petroleum hydrocarbons (TPH) and BTX using approved EPA Methods.

2. Submit a report to the client presenting results.

2. INVESTIGATIVE METHODS AND FIELD EXPLORATION

On February 10, 1989, Aqua Science Engineers obtained soil samples from under the storage tanks removed at 5293 Crow Canyon Road, Castro Valley, California. Soil samples were collect by driving a 4-inch by 2-inch brass tube into the soil using a wooden mallet. The samples were secured using aluminum foil, teflon caps, and sealed with duct tape.

The odor of petroleum products was present in the soil after removal of the tanks. Samples were collected at approximately thirteen (13) feet below grade at each end of the gasoline tanks and approximately seven (7) feet below grade for the waste oil tank. Also, four samples were collected from the excavated material.

The native soil was classified as a fractured sandstone and the backfill material as sand.

No groundwater was encountered during the excavation.

The samples were refrigerated and shipped to Pace Laboratories, Inc. in Novato, Ca. The gasoline samples were prepared and analyzed for TPH (light) and BTXE. The waste oil sample was analyzed for TPH (light & heavy), BTEX, and oil & grease.

The tanks were hauled as hazardous waste under manifest to Erickson, Inc. in Richmond for disposal. A copy of the manifest forms are in Appendix A.

3. DISCUSSION AND CONCLUSIONS

The results of laboratory analysis show contamination is present around the tank pit. TPH (Total Petroleum Hydrocarbons) concentrations at the end of the pit are 980 ppm as gasoline. A copy of the certified laboratory results is included as Appendix B.

An investigation into the vertical and lateral extent of contamination will be required. A workplan will need to be developed to define how the contaminated soil will be remediated; this plan must be submitted to Alameda County Health Hazardous Materials Division (Larry Seto) for approval.

Four samples were collected from the excavated material and a composite analysis completed to determine levels of contamination. This shows that high concentrations of oil & grease are present and that levels of gasoline are low. Additional samples should be collected and analyzed to develop the work plan for remediation, which is outside the scope of this report.

The results of this investigation represent conditions at the time and location at which samples were collected and for the parameters analyzed in the laboratory. It does not fully characterize the site for contamination resulting from other sources or parameters not analyzed.

TABLE 1 - SOIL SAMPLE ANALYSIS - TANK REMOVAL

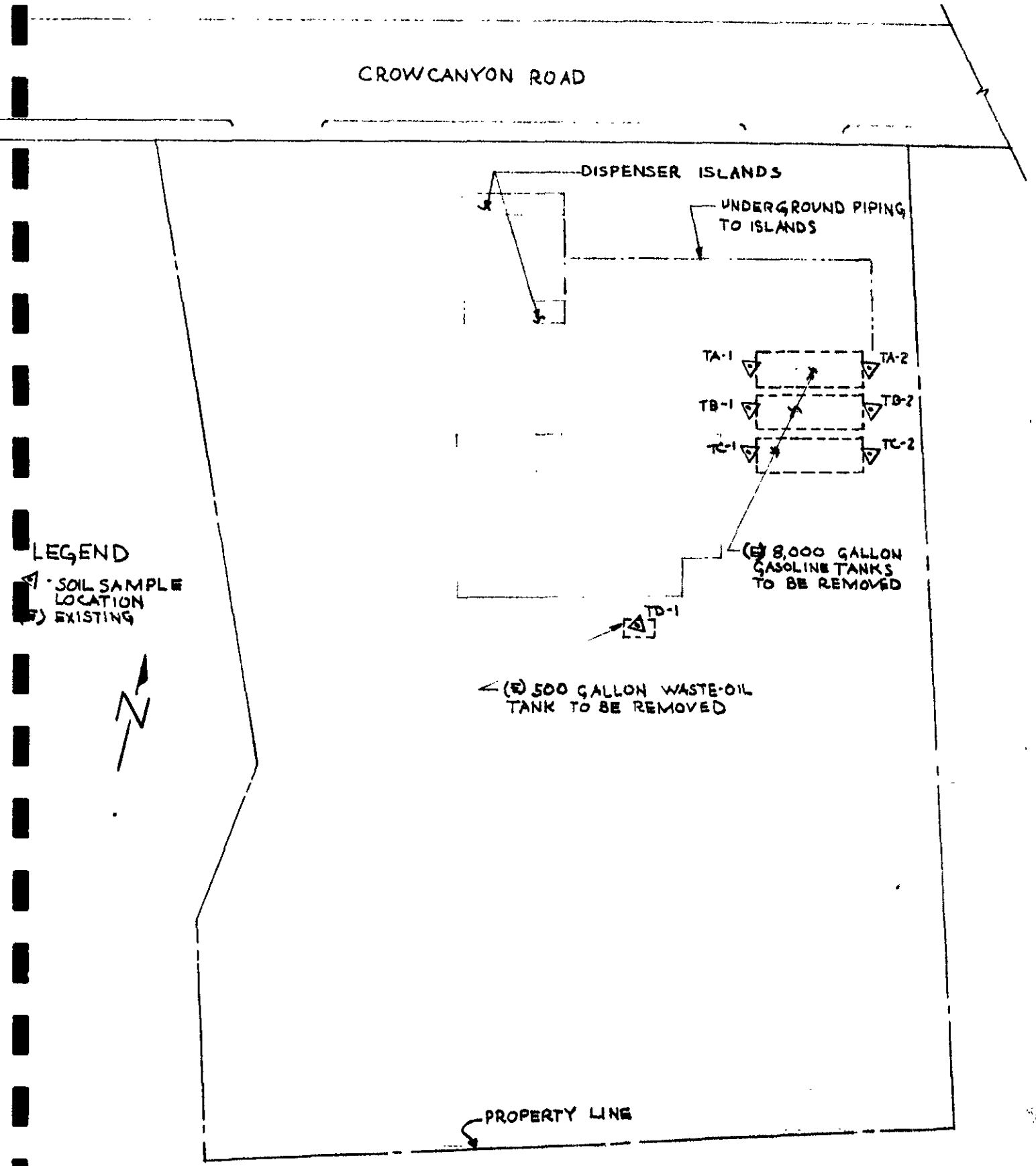
Sample ID Chemical Compound	TA-1 (ppm)	TA-2 (ppm)	TB-1 (ppm)	TB-2 (ppm)	TC-1 (ppm)	TC-2 (ppm)	TD-1 (ppm)
TPH (light)	980.0	210.0	78.0	75.0	ND	19.0	ND
TPH (diesel)	NA	NA	NA	NA	NA	NA	ND
Benzene	4.0	<0.08	0.05	<0.04	ND	0.013	0.007
Ethylbenzene	17.0	0.34	0.29	0.13	0.015	0.022	0.005
Toluene	35.0	0.29	0.26	0.12	0.010	0.035	0.017
Xylenes	75.0	0.27	0.64	0.19	0.062	0.310	0.020
Oil & Grease	NA	NA	NA	NA	NA	NA	35.0

NA - Not Applicable
ND - Not Detected

TABLE 2 - SOIL SAMPLE ANALYSIS - STOCKPILE

Sample ID Chemical Analysis	Composite S1 to S4 (ppm)
TPH (light)	84.0
Oil & Grease	775.0

4. Site Plan at 5293 Crow Canyon Road, Castro Valley



APPENDIX A
HAZARDOUS WASTE MANIFEST FORM

Print or type. (Form designed for use on elite (12-pitch typewriter).

Sacramento, California

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No. CAC900137005 — Manifest Document No.

2. Page 1 of 1 — Information in the shaded areas is not required by Federal law.

3. Generator's Name and Mailing Address: LAKESHORE FINANCIAL 2100 LAKESHORE AV OAK. CALIF 94610 (Site 5253 Grand Ave)

A. State Manifest Document Number: 87005572

4. Generator's Phone: 415 444-6658

B. State Generator's ID:

5. Transporter 1 Company Name: ROGERS JR. & EGUIA — 6. US EPA ID Number: CAD048624910

C. State Transporter's ID: 400513

D. Transporter's Phone: 415-589-2015

7. Transporter 2 Company Name — 8. US EPA ID Number

E. State Transporter's ID:

F. Transporter's Phone:

9. Designated Facility Name and Site Address: 255 PARR BLVD RICHMOND CA ERICKSON INC. — 10. US EPA ID Number: CAD009461392

G. State Facility's ID:

H. Facility's Phone: 415-235-1593

11. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)	12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol	I. Waste No.
a. WASTE EMPTY STORAGE TANKS CAL. REGULATED WASTE ONLY	002	TP	02000	P	State 512 / EPA/Other NONE
b.					State / EPA/Other
c.					State / EPA/Other
d.					State / EPA/Other

J. Additional Descriptions for Materials Listed Above: EMPTY GASOLINE TANK # 1532 [illegible]

K. Handling Codes for Wastes Listed Above: a. b. c. d.

15. Special Handling Instructions and Additional Information: GLOVES & SAFETY GLASSES

16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations.

If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; OR, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.

Printed/Typed Name	Signature	Month	Day	Year
MARTIN W. CLARK	Martin W. Clark	12	01	89

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Month	Day	Year
TOM HOMER	Tom Homer	12	01	89

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Month	Day	Year

19. Discrepancy Indication Space

20. Facility Owner or Operator Certification of receipt of hazardous materials covered by this manifest except as noted in item 18.

Printed/Typed Name	Signature	Month	Day	Year

GENERATOR — TRANSPORTER — FACILITY

8022 A (1/87)
8022-22
(88) Previous editions are obsolete.

Blue: GENERATOR SENDS THIS COPY TO DOHS WITHIN 30 DAYS
To: P.O. Box 400, Sacramento, CA 95802

INSTRUCTIONS ON THE BACK

Approved OMB No. 2050-0039 (Expires 9-30-90)
Please print or type. (Form designed for use on elite (12-pitch typewriter).

Sacramento, California

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No. CAC000187005 | Manifest Document No.

2. Page 1 of | Information in the shaded areas is not required by Federal law.

3. Generator's Name and Mailing Address
LAKESHORE FINANCIAL
2100 LAKESHORE AV OAK

Site
CASTRO VALLEY
5193 CROW CANYON RD

4. Generator's Phone (415) 444-6658

5. Transporter 1 Company Name: ROGERS TR. + EQUIPMENT
6. US EPA ID Number: CAD048624910

7. Transporter 2 Company Name
8. US EPA ID Number

9. Designated Facility Name and Site Address
ERICKSON INC.
235 PARR BLVD
RICHMOND
10. US EPA ID Number: CAD009466397

A. 8700505
B. State Generator's ID
C. State Transporter's ID
D. Transporter's Phone 415-235-2205
E. State Transporter's ID
F. Transporter's Phone
G. State Facility's ID
H. Facility's Phone 415-235-1393

11. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)	12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol	I. Waste No.
a. WASTE EMPTY STORAGE TANKS CAL. REGULATED WASTE ONLY	002	TP	10550	P	State 512 / EPA/Other NONE
b.					State / EPA/Other
c.					State / EPA/Other
d.					State / EPA/Other

J. Additional Descriptions for Materials Listed Above
#1 EMPTY GASOLINE TANK #1534
#2 EMPTY OIL TANK #1535

K. Handling Codes for Wastes Listed Above
a. b.

15. Special Handling Instructions and Additional Information
GLOVES & SAFETY GLASSES

16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations.

If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; OR, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.

Printed/Typed Name	Signature	Month Day Year
MARTIN W. CLARK	Martin W. Clark	1 12 1989

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Month Day Year
JOHN H ALLEN	J H Allen	01 12 1989

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Month Day Year

19. Discrepancy Indication Space

20. Facility Owner or Operator Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.

Printed/Typed Name	Signature	Month Day Year

GENERATOR — TRANSPORTER — FACILITY

8022 A (1/87)
PA 700-22
(9-88) Previous editions are obsolete.

Blue: GENERATOR SENDS THIS COPY TO DOHS WITHIN 30 DAYS
To: P.O. Box 400, Sacramento, CA 95802

INSTRUCTIONS ON THE BACK

APPENDIX B
LABORATORY ANALYSIS AND CHAIN-OF-CUSTODY FORM

pace laboratories, inc
FORMERLY WESCO LABORATORIES

REPORT OF LABORATORY ANALYSIS

Offices:
Minneapolis, Minnesota
Tampa, Florida
Coralville, Iowa
Novato, California

AquaScience Engineers, Inc.
2500 Old Crow Canyon Rd.
Suite 121
San Ramon, CA 94583

March 02, 1989
PACE Project Number: 490213.506

Attn: Mr. Terry Carter

Re: Lakeshore Financial

Date Sample(s) Collected: 02/10/89
Date Sample(s) Received: 02/13/89

PACE Sample Number: / Parameter	Units	MDL	70659 TA-1	70660 TA-2	70661 TB-1
ORGANIC ANALYSIS					
INDIVIDUAL PARAMETERS					
Petroleum Fuels, Purgeable, as Gasoline (EPA Method 8015, Modified)	mg/kg	3.0	980	210	78
PURGEABLE AROMATIC COMPOUNDS, EPA 8020					
Benzene	mg/kg	0.004	4.0	LT 0.08	0.05
Ethylbenzene	mg/kg	0.004	17	0.34	0.29
Toluene	mg/kg	0.004	35	0.29	0.26
Xylenes, Total	mg/kg	0.004	75	0.27	0.64

MDL Method Detection Limit, Estimated Value.
LT Compound not detected at or below LT value, dilution required.

pace laboratories, inc.
FORMERLY WESCO LABORATORIES

REPORT OF LABORATORY ANALYSIS

Offices:
Minneapolis, Minnesota
Tampa, Florida
Coralville, Iowa
Novato, California

March 02, 1989
PACE Project Number: 490213.506

PACE Sample Number: Parameter	Units	MDL	70662 TB-2	70663 TC-1	70664 TC-2
ORGANIC ANALYSIS					
INDIVIDUAL PARAMETERS					
Petroleum Fuels, Purgeable, as Gasoline (EPA Method 8015, Modified)	mg/kg	3.0	75	ND	19
PURGEABLE AROMATIC COMPOUNDS, EPA 8020					
Benzene	mg/kg	0.004	LT 0.04	ND	0.013
Ethylbenzene	mg/kg	0.004	0.13	0.015	0.022
Toluene	mg/kg	0.004	0.12	0.010	0.035
Xylenes, Total	mg/kg	0.004	0.19	0.062	0.31

MDL Method Detection Limit, Estimated Value.
ND Not detected at or above the MDL.
LT Compound not detected at or below LT value, dilution required.

11 Digital Drive □ Novato, CA 94949 □ Phone (415) 883-6100

March 02, 1989
PACE Project Number: 490213.506

PACE Sample Number:			70665
			TD-1
Parameter	Units	MDL	Waste Oil
ORGANIC ANALYSIS			
INDIVIDUAL PARAMETERS			
Petroleum Fuels, Purgeable, as Gasoline (EPA Method 8015, Modified)	mg/kg	3.0	ND
PURGEABLE AROMATIC COMPOUNDS, EPA 8020			
Benzene	mg/kg	0.004	0.007
Ethylbenzene	mg/kg	0.004	0.005
Toluene	mg/kg	0.004	0.017
Xylenes, Total	mg/kg	0.004	0.020
EXTRACTABLE FUELS			
Extractable Fuels, as Diesel	mg/kg	10	ND
Soxhlet Extraction Date Started			02-15-89
TOTAL OIL AND GREASE (GRAV. EPA 9071)			
Total Oil and Grease (Freon Extractable)	mg/kg wet	10	35
Date Extracted			2-14-89

MDL Method Detection Limit, Estimated Value.
ND Not detected at or above the MDL.

pace laboratories, inc.
FORMERLY WESCO LABORATORIES

REPORT OF LABORATORY ANALYSIS

Offices:
Minneapolis, Minnesota
Tampa, Florida
Coralville, Iowa
Novato, California

Mr. Terry Carter
Page 4

March 02, 1989
PACE Project Number: 490213.506

Parameter	Units	MDL	70670 COMPOSITE S1-1 to S1-4
PACE Sample Number:			
ORGANIC ANALYSIS			
INDIVIDUAL PARAMETERS			
Petroleum Fuels, Purgeable, as Gasoline (EPA Method 8015, Modified)	mg/kg	3.0	84
TOTAL OIL AND GREASE (GRAV. EPA 9071)			
Total Oil and Grease (Freon Extractable)	mg/kg wet	10	775
Date Extracted			2-14-89

MDL Method Detection Limit, Estimated Value.

Approval:

Wasfi Y. Attalla, Ph.D
Project Manager for
PACE Laboratories

Douglas E. Oram, Ph.D
Technical Reviewer for
PACE Laboratories

pace laboratories, inc.

Offices:
Minneapolis, Minnesota
Tampa, Florida
Coralville, Iowa
Novato, California

REPORT OF LABORATORY ANALYSIS

AquaScience Engineers, Inc.
2500 Old Crow Canyon Rd.
Suite 121
San Ramon, CA 94583

April 14, 1989
PACE Project Number: 490412500

Attn: Mr. Greg Gouvea

D. Dineen

Date Sample(s) Collected: 04/12/89
Date Sample(s) Received: 04/12/89

PACE Sample Number: / Parameter	Units	MDL	721530 SS-1	721540 SS-2	721550 SS-3
ORGANIC ANALYSIS					
INDIVIDUAL PARAMETERS					
Purgeable Fuels, as Gasoline (EPA 8015)	mg/kg wet	1.0	ND	36	ND
PURGEABLE AROMATIC COMPOUNDS, EPA 8020					
Benzene	mg/kg	0.005	ND	0.13	ND
Ethylbenzene	mg/kg	0.005	ND	0.33	ND
Toluene	mg/kg	0.005	0.006	0.33	0.007
Xylenes, Total	mg/kg	0.005	ND	2.4	ND

MDL Method Detection Limit
ND Not detected at or above the MDL.

Approval:

Lisa J. Petersen
Project Manager for
PACE Laboratories

Douglas E. Oram, Ph.D.
Technical Reviewer for
PACE Laboratories

490213.506

CC0280

* P.O. Box 535, San Ramon, CA 94583-0535

aqua science engineers inc.

(415) 820-9391

Project Name: LAKESHORE FINANCIAL Site: 5293 CROW CANYON RD Date: FEB 10, 1989 Laboratory: PACE

Sample ID	Sample/Container Type	Analyze/ Hold	Analyze For:	Method - Detection Limit	Notes/Remarks
TA1	S/BT	A	TPH LIGHT, BTEX		10 day turnaround
TA2					
TB1					
TB2					
TC1					
TC2			TPH LIGHT, BTEX		
TD1 WASTE OIL	B	A	TPH LIGHT, BTEX TPH HEAVY OIL & GREASE		10day turnaround
SI-1		A/H			
SI-2			TPH LIGHT		24hr turnaround TPH
SI-3			OIL & GREASE		10 day turnaround OIL & GREASE COLLATE FOR ONE ANALYSIS ON SI-1 thru SI-4
SI-4	S/BT	A/H			

S = Soil W = Water O = Other
G = Glass BT = Brass Tube P = Plastic V = Vial O = Other

Chain of Custody

1. Sampled by: Gregory Burns
2. Courier:
3. Received by Lab: Eshaan
   Date: 2/13/89 Time: 2:35pm
4. Received in Office: Date:

- ☐ = Collate all samples for single analysis.
- ☐ = Collate and analyze two top samples and if clean, do not analyze other sample.
- ☐ = Call ASE for instructions.
- ☐ = See attached protocol.

APPENDIX B
HAZARDOUS MATERIALS SITE
SAFETY PLAN

AQUA SCIENCE ENGINEERS, INC.
HEALTH AND SAFETY PLAN

A. GENERAL DESCRIPTION

Site: ABANDONED GASOLINE STATION AT 5293 CROW CANYON ROAD, CASTRO VALLEY

Location: SEE ENCLOSED MAP

Plan Prepared by: MICHAEL D. DIRK Date: 4/17/90

Plan Approved by: GREG GOUVEA Date: 4/17/90

Objectives: SITE INVESTIGATION OF SOILS AND GROUNDWATER

Proposed Start Date of Project: APRIL 23, 1990

Background Review Done ?: Complete: XXX Preliminary:

Overall Hazard: Serious:
Moderate:
Low:
Unknown: XXX

B. SITE/WASTE CHARACTERISTICS

Waste Type(s): Solid: XXX
Liquid: XXX
Sludge:
Gas:

Characteristics: SOIL OR GROUNDWATER BEARING CONTAMINATES TO BE DETERMINED

Facility Description: CURRENTLY A VACANT LOT, NO RESTRICTIONS ON HEAD SPACE

Facility Address: 5293 CROW CANYON ROAD, CASTRO VALLEY

Status: SITE IS A VACANT LOT, PREVIOUS STRUCTURES HAVE BEEN REMOVED

Site History: PREVIOUSLY A SHELL OIL CO. GASOLINE STATION

CHEMICAL HAZARDS
Potential chemical hazards include skin and eye contact and inhalation or exposure to potentially toxic concentrations of chemical vapors. Toxic compounds that may exist at the site are listed below, with descriptions of specific health effects of each.

1. BENZENE

a. Colorless, highly flammable liquid with aromatic odor.
b. High exposure levels may cause acute restlessness, convulsions, depression, respiratory failure. Benzene is a suspected carcinogen.
c. Permissable exposure level (PEL) for a time weighted average (TWA) over an eight hour period is 1.0 ppm.

2. TOLUENE

a. Colorless, flammable liquid with a benzene-like odor.
b. High exposure levels may cause weakness, fatigue, dizziness, headache or confusion (less toxic then benzene).
c. PEL for an eight hour TWA is 100 ppm.

3. XYLENE

a. Colorless, flammable liquid with aromatic odors.
b. High exposure levels may cause dizziness, excitement, incoherency or narcosis.
c. PEL for an eight hour TWA is 100 ppm.

4. ETHYLBENZENE

a. Clear, colorless, highly flammable liquid with characteristic odor.
b. High exposure levels may cause irritation to skin, nose and throat, dizziness, constriction in chest, loss of conciousness, respiratory failure.
c. PEL for an eight hour TWA is 100 ppm.

5. PRIORITY POLLUTANT METALS
(tested for)

CADMIUM

a. Appearance and odor may vary with specific compound.
b. High exposure levels may cause pulmonay edema, tight chest, chills, muscle aches. Cadmium is a suspected carcinogen
c. PEL for an eight hour TWA is 0.2 mg/cubic meter (airborn)

CHROMIUM

a. Appearance and odor may vary with specific compound.
b. High exposure levels have a histologic of fibrosis of the lungs, with similar sypmtoms as Cadmium. Chromium is a suspected carcinogen
c. PEL for and eight hour TWA is 1 mg/cubic meter (airborn)

COPPER

a. An odorless solid, in concentrations may appear light greenish.
b. High exposure levels may cause irritation to the mucous membranes, coughing and a metal taste
c. PEL for an eight TWA is 1 mg/cubic meter (airborn)

LEAD

a. Appearance and odor may vary with specific compounds.
b. High exposure levels may cause listless weakness, extreme paleness, anemia.
c. PEL for an eight hour TWA is 0.05 mg/cubic meter (airborn)

NICKEL

a. Appearance and odor may vary with specific compounds.
b. High exposure levels may cause sesitized dermititus, allergic asthma. Nickel is a suspected carcinogen.
c. PEL for an eight hour TWA is 1mg/cubic meter (airborn)

ZINC
(oxide fumes)

a. Appearance as a white fume, with a sweet metal odor/taste.
b. High exposure levels may cause tight chest, fever, chills, low pulmonary function, vomiting.
c. PEL for an eight hour TWA is 5 mg/cubic meter (airborn)

C. HAZARD EVALUATION

Parameter: PROPERTY LINES

PHYSICAL HAZARDS

Other on-site hazards may include physical injuries due to the proximity of workers to engine-driven heavy equipment and tools. Heavy equipment used during drilling or excavation may include any of the moving parts of the drill rig, backhoe or other equipment as part of soil investigation, removal or subsequent backfilling operations. Only trained personnel will operate machines, tools, and equipment; all equipment will be kept clean and in good repair. Safety apparel required around heavy equipment will include a hardhat and steel-toed boots. The perimeter of an excavation may be shored and/or sloped to create acceptably stable walls for personnel entry. No smoking will be observed within the actual work area. All work will be performed in accordance with OSHA guidelines. The project site may be enclosed by fencing if conditions warrant additional protection of the public.

1. USE SAFETY EQUIPMENT, MASK RESPIRATOR WITH NIOSH APPROVED C-21 CARTRIDGE FOR ORGANIC VAPORS, AS NECESSARY.

2. HAVE DRY CHEMICAL MODEL PA-200 A-B-C FIRE EXTINGUISHER PRESENT.

3. HAVE 100 LBS GRANULAR SORBENT MATERIAL AVAILABLE FOR POTENTIAL SPILLAGE.

LEVEL OF PROTECTION

Regular surveys of the site and knowledge of anticipated hazards will determine the level of protection and the proper safety procedures to be employed. The workers coming into contact with excavated materials will wear coveralls (disposable or not as determined by the survey), disposable latex gloves, hardhat, and eye protection. The level of protection for personnel working in the area will be upgraded if the organic vapor levels in an equipment operators' breathing zone exceeds 0.5 ppm above background levels continuously for more then five minutes. In this event, personnel protective equipment will include double cartridge respirator filters for organic vapors in addition to hadhat, gloves, steel-toed boots and coveralls. Work will cease, equipment shut down, and personnel will withdraw from the area if either (1) the organic vapor concentration in the operators' breathing zone exceeds 200 ppm for 5 minutes, or (2) the organic vapor concentration two feet above an excavation exceeds 2,000 ppm or 25% of the lower explosive limit. If work proceeds in an environment where organic vapor concentrations exceed 200 ppm, a self-contained breathing apparatus or airline respirator will be utilized by personnel.

SITE ENTRY PROCEDURES

All personnel entering the work zone will be qualified field personnel wearing the proper level of protection. Eating, drinking, smoking and any other practices which increase the probability of hand-to-mouth transfer contamination is prohibited in the work zone. All field personnel will be instructed to thoroughly wash their hands and face upon leaving the work area. A First Aid kit and at least one 20-pound A-B-C fire extinguisher will be available at the site.

DECONTAMINATION PROCEDURES

Specific equipment and personnel decontamination areas will be designated by the Health and Safety Officer/Project Manager at the start of the project. To prevent the transfer of contamination from the work site into clean areas, all tools will be cleaned adequately prior to removal from the work zone. All disposable protective clothing will be put into plastic bags and disposed of in a proper manner. In the event of a medical emergency, the injured party will be taken through decontamination procedures, if possible. However, the procedures may be omitted when it may aggrevate or cause further harm to the injured party. A member of the work team will accompany the injured party to the medical facility to advise on matters concerning chemical exposure.

Site Secured: FENCING SURROUNDS THE PROPERTY AT THIS TIME

Perimeter Establishment: ENFORCED BY FENCING

Personal Protection:
Level of Protection: A _____ B _____ C_____ D _xX_

Modifications: PROTECTIVE CLOTHING MAY BE MODIFIED AFTER INITAL BORINGS GIVE INDICATION OF CONTAMINANT LEVELS

SPECIAL CONDITIONS: NO SPECIAL CONDITIONS

Site Entry: STREET LEVEL ENTRY, SITE IS ENCLOSED BY GATED FENCE
Decontamination-
Personnel: AS PER EPA GUIDELINES AS NECESSARY
Equipment: AS PER EPA GUIDELINES AS NECESSARY
Work Limitations (time, weather): NONE

D. EMERGENCY INFORMATION

In the event of an injury or suspected chemical exposure, the first responsibilty of the Project Manager will be to prevent further injury. This objective will normally require an immediate stop to work until the situation is remedied. The Project Manager may order evacuation of the work party.
Other primary responsibilities in the event of accident will be first aid and the decontamination of injured team member(s). The injured party will be moved to a designated safe evacuation area and initial first aid will be rendered.

ACUTE EXPOSURE SYMPTOMS AND FIRST AID

EXPOSURE ROUTE	SYMPTOMS	FIRST AID
Skin	Dermatitus	Wash immediately with soap and water, contact ambulance if evacuation is necessary.
Eye	Irritation	Flush with water, transport directly to emergency room, if necessary.
Inhalation	Vertigo, tremor	Move person to fresh air, cover source of chemicals.
Ingestion	Nausea, vomiting	Call Poison Control Center, arrange transport to emergency medical facility.

Local Resources:

Ambulance: 911
Poison Control: SF (415) 476-6600
SJ (800) 792-0720
Hospital Emergency Room: (415) 838-0809
Police: 911
Fire: 911

Emergency routes: RIGHT from jobsite CROW CANYON RD. towards San Ramon
LEFT on PORTER DRIVE into emergency entrance

Hospital: John Muir Occupational Health Services
205 Porter Drive, San Ramon, Ca 94583
(415) 838-0809

AQUA SCIENCE ENGINEERS, INC.

HAZARDOUS MATERIALS SITE SAFETY PLAN

The below signed personnel have read this plan, understand its contents, and agree to follow the guidelines set forth.

EMPLOYEE NAME (PRINT)	SIGNATURE	DATE
Chris St Pierre	Chris St Pierre	4-17-90
Gary Ackerman	GARY Ackerman	4-17-90
Doug Malone	Doug Malone	4-17-90
Rusty Jones	Rusty Jones	4-17-90

APPENDIX C
MONITORING WELL PERMIT

ALAMEDA COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT

5997 PARKSIDE DRIVE ♦ PLEASANTON, CALIFORNIA 94566 ♦ (415) 484-2600

GROUNDWATER PROTECTION ORDINANCE PERMIT APPLICATION

FOR APPLICANT TO COMPLETE

1) LOCATION OF PROJECT vacant lot
5293 Crow Canyon Rd.
Castro Valley

2) CLIENT
Name Mr. Frank Ramos
Address 2391 Grove Way Phone 881-9286
City Castro Valley Zip 94546

3) APPLICANT
Name Aqua Science Eng.
Address 2500 Old Crow Canyon Rd. #121 Phone 820-9391
City ~~Castro Va~~ San Ramon Zip 94583

4) DESCRIPTION OF PROJECT
Water Well Construction ___ Geotechnical Investigation
Cathodic Protection ___ General
Well Destruction ___ Contamination X

5) PROPOSED WATER WELL USE
Domestic ___ Industrial ___ Irrigation ___
Municipal ___ Monitoring X Other ___

6) PROPOSED CONSTRUCTION
Drilling Method:
Mud Rotary ___ Air Rotary ___ Auger X
Cable ___ Other ___

DRILLER'S LICENSE NO. 487000

WELL PROJECTS
Drill Hole Diameter 8 in. Maximum
Casing Diameter 2 in. Depth 50 ft.
Surface Seal Depth 0-20 ft. Number 3

GEOTECHNICAL PROJECTS
Number of Borings 8 Maximum
Hole Diameter 8 in. Depth 20 ft.

7) ESTIMATED STARTING DATE 4-16-90
ESTIMATED COMPLETION DATE 4-19-90

8) I hereby agree to comply with all requirements of this permit and Alameda County Ordinance No. 73-68.

APPLICANT'S SIGNATURE [signature] Date 4-13-90

FOR OFFICE USE

PERMIT NUMBER 90249
LOCATION NUMBER

PERMIT CONDITIONS

Circled Permit Requirements Apply

(A.) GENERAL
1. A permit application should be submitted so as to arrive at the Zone 7 office five days prior to proposed starting date.
2. Submit to Zone 7 within 60 days after completion of permitted work the original Department of Water Resources Water Well Drillers Report or equivalent for well projects, or drilling logs and location sketch for geotechnical projects.
3. Permit is void if project not begun within 90 days of approval date.

(B.) WATER WELLS, INCLUDING PIEZOMETERS
1. Minimum surface seal thickness is two inches of cement grout placed by tremie.
2. Minimum seal depth is 50 feet for municipal and industrial wells or 20 feet for domestic, irrigation, and monitoring wells unless a lesser depth is specially approved.

(C.) GEOTECHNICAL. Backfill bore hole with compacted cuttings or heavy bentonite and upper two feet with compacted material. In areas of known or suspected contamination, tremied cement grout shall be used in place of compacted cuttings.

D. CATHODIC. Fill hole above anode zone with concrete placed by tremie.

E. WELL DESTRUCTION. See attached.

Approved Wyman Hong Date 17 Apr 90
Wyman Hong

21989

APPENDIX D
BORING / WELL COMPLETION LOGS

PROJECT: 5293 Crow Canyon Rd., Castro Valley

LOG OF SOIL BORING # SB-1

depth ft.	SOILS DESCRIPTION	GRAPHIC SYMBOL	BACKFILL DETAILS	OVM	REMARKS
0	clay, tan-orange brown, silty 20%, v. fine sand <10%, dry, (CL)		neat cement bentonite grout 0-20.5 feet		
5	clay, rusty brown, Fe oxides, silty 20%, mildly indurated, dry, (CL)			2,780	strong gasoline odor soil sample 5-6.5'
9	claystone, dk. olive green-gray, silty v.fine sandy laminae, bedded 0.5-2cm, hard, dry				
10				39	soil sample 10-10.5' sl. odor
15	siltstone, dk. gray, clayey20%, hard, friable, bedded 0.5-3cm., dry			29	sample 15-15.5' no odor
19	siltstone, dk. gray and lt. gray, beds 1-10mm, sand v. fine <10%, wet				▽ approx. 20'
20	Bottom of hole			<1	sample 20-20.5' no odor

AQUA SCIENCE ENGINEERS Logged By: G. Gouvea Date Logged: 4-2-90 Figure #

PROJECT: 5293 Crow Canyon Rd., Castro Valley

LOG OF SOIL BORING # SB-2

depth ft.	SOILS DESCRIPTION	GRAPHIC SYMBOL	BACKFILL DETAILS	OVM	REMARKS
0			0		
1	siltstone, olive tan brown, v. fine sandy 20-30%, hard, dry				
2					
3			neat cement bentonite grout 0-20.5 feet		
4					
5	siltstone, dk. olive gray, clayey 20%, very fine sand 10%, bedded 5-20 cm., hard, dry			700	mod. gasoline odor soil sample 5-6.5'
6					
7					
8					
9					
10	sandstone, olive tan rusty, fine to med. gr., silty 10-20%, clay <10%, bedded 0.5-2cm. hard, dry			337	soil sample 10-10.5' sl. odor
11					
12					
13					
14					
15	siltstone, dk. gray, clayey 20%, v. fine sandy 10-20%, bedded 0.5-2 cm., hard, dry			2	sample 15-15.5' no odor
16					
17					
18					
19					▽ approx. 19'
20	as above			<1	sample 20-20.5' no odor
	Bottom of hole				
21					
22					

AQUA SCIENCE ENGINEERS Logged By: G. Gouvea Date Logged: 4-2-90 Figure #

PROJECT: 5293 Crow Canyon Rd., Castro Valley

LOG OF SOIL BORING # SB-3

depth ft.	SOILS DESCRIPTION	GRAPHIC SYMBOL	BACKFILL DETAILS	OVM	REMARKS
0					
1	clay and silt, dk. brown gray, sandy v. fine 10-20%, dry, (CL)				
2					
3	siltstone, dk. gray, olive brown laminae, v. fine sandy 10%, hard, dry		neat cement bentonite grout 0-15 feet		3' mod. gas odor
4					
5				20	sl. gasoline odor
6					soil sample 5-5.5'
7					
8					
9					
10	sandstone, olive tan gray, fine to med. gr., silty 10-20%, clay 10%, hard, dry			19	soil sample 10-10.5' sl. odor
11					
12					
13	siltstone, dk. olive gray, sandy v. fine 10-20%, hard, damp				
14					
15	moist — Bottom of hole			<1	sample 14.5-15' ▽ approx. 15'
16					
17					
18					
19					
20					
21					
22					

AQUA SCIENCE ENGINEERS Logged By: G. Gouvea Date Logged: 4-2-90 Figure #

PROJECT: 5293 Crow Canyon Rd., Castro Valley

LOG OF SOIL BORING # SB-4

depth ft.	SOILS DESCRIPTION	GRAPHIC SYMBOL	BACKFILL DETAILS	OVM	REMARKS
0			0		
1	clay, silt, sand, olive tan brown, dry				
2					
3			neat cement bentonite grout 0-20 feet		
4					
5	sandstone, orange tan brown, fine to med gr. silty 10-20%, hard, dry			<1	no odor soil sample 5'
6					
7					
8					
9	siltstone and sandstone, interbedded, dk. olive gray to orange tan brown, sandstone fine to med. gr. fractured, mod. friable, dry				
10			10	<1	soil sample 10'
11					
12					
13					
14					
15			15	<1	sample 15' no odor
16	sandstone and siltstone, interbedded 1 mm to 3 cm, lt. gray and v. dk. gray, sandstone v. fine to fine gr., silty 10-20%, siltstone beds 1 mm. to 1cm., hard, friable, fractures with pyrite mineralization, slickensides				
17					
18					
19					▽ approx. 19'
20	Bottom of hole		20	<1	sample 20' no odor
21					
22					

AQUA SCIENCE ENGINEERS Logged By: G. Gouvea Date Logged: 4-3-90 Figure #

PROJECT: 5293 Crow Canyon Rd., Castro Valley

LOG OF SOIL BORING # SB-6

depth ft.	SOILS DESCRIPTION	GRAPHIC SYMBOL	BACKFILL DETAILS	OVM	REMARKS
0					
1	siltstone, olive tan gray to dk. olive gray, sandy v. fine 10-20%, clayey 10%, hard, friable, dry				
2				<1	
3			neat cement bentonite grout 0-20 feet		
4					
5				30	soil sample 5'
6					
7					
8					strong gas odor
9	siltstone, green gray to olive tan brown, sandy v. fine 20%, faintly bedded, hard, dry				
10				over-range	sample 10'
11					
12					
13					
14	siltstone, dk. gray, as above				
15				9	sample 15'
16					
17	siltstone, lt. gray and v. dk. gray, sandy v. fine 10%in bedding planes, bedded 1-10mm				
18	pyrite mineralization in fractures, hard, dry				
19					▽ approx. 19'
20	Bottom of hole			<1	
21					
22					

AQUA SCIENCE ENGINEERS Logged By: G. Gouvea Date Logged: 4-3-90 Figure #

PROJECT: 5293 Crow Canyon Rd., Castro Valley

LOG OF SOIL BORING # SB-7

depth ft.	SOILS DESCRIPTION	GRAPHIC SYMBOL	BACKFILL DETAILS	OVM	REMARKS
0					
1	clay, rusty olive tan brown, silty 30-40%, sand v. fine 10%, damp, soft				
2					
3			neat cement bentonite grout 0-20 feet		
4					
5				<1	no odor soil sample 5'
6					
7	claystone and siltstone, interbedded, olive tan gray-rusty, bedded few mm. to 3 cm., dry to damp, hard				
8					
9					
10				<1	sample 10' no odor
11					
12					
13					
14	claystone and siltstone, interbedded, sandy v. fine 10%, hard, dry				
15				<1	sample 15' no odor
16					
17					
18	claystone and siltstone, interbedded, olive tan brown, bedded few mm. to 5 cm., sandy v. fine 10%, hard, dry				
19					
20	Bottom of hole			<1	sample 20' no odor
21					
22					

AQUA SCIENCE ENGINEERS Logged By: G. Gouvea Date Logged: 4-3-90 Figure #

PROJECT: 5293 Crow Canyon Rd., Castro Valley

LOG OF SOIL BORING # SB-8

depth ft.	SOILS DESCRIPTION	GRAPHIC SYMBOL	BACKFILL DETAILS	OVM	REMARKS
0					
1	clay, dk. olive gray green, silty 20-30%, v. fine sandy,10%, hard, dry				
2					
3			neat cement bentonite grout 0-20 feet		
4					
5	clay, olive tan brown -rusty, silty 20-30%, v. fine sandy 10%, hard, dry			over-range	soil sample 5' gasoline odor
6					
7					
8					
9	siltstone, dk. olive gray green w/rusty v. fine sandy laminae, 1-2mm., sand fine gr. 20-30%, clay 10-20%, hard, dry				
10				127	sample 10' sl. odor
11					
12					
13					
14					
15	sandstone, dk. olive tan gray, black silty laminae 1-2 mm. hard			<1	sample 15' sl. odor
16					
17					
18					
19					
20				26	sample 20' no odor
	Bottom of hole				
21					
22					

AQUA SCIENCE ENGINEERS Logged By: G. Gouvea Date Logged: 4-2-90 Figure #

PROJECT: 5293 Crow Canyon Rd., Castro Valley

LOG OF SOIL BORING # SB-9

depth ft.	SOILS DESCRIPTION	GRAPHIC SYMBOL	BACKFILL DETAILS	OVM	REMARKS
0					
1	clay and silt, mixed, olive brown, sandy <10%, damp, soft				
2					
3	claystone and siltstone, interbedded, dk. olive gray brown, bedded few cm., fractured with FeOx in fractures		neat cement bentonite grout 0-20 feet		
4					
5				<1	soil sample 5'
6					
7					
8					
9					strong gas odor
10				3,120	sample 10'
11					
12					
13					
14					
15	siltstone, lt. gray and v. dk. gray, bedded 1-10mm, sandy v. fine <10%, slickensides, fracture zone 17.5-20 feet, moist			<1	sample 15'
16					
17					
18					
19					▽ approx. 19'
20	Bottom of hole			<1	no odor
21					
22					

AQUA SCIENCE ENGINEERS Logged By: G. Gouvea Date Logged: 4-3-90 Figure #

PROJECT: 5293 Crow Canyon Rd., Castro Valley

MONITORING WELL # MW-1

depth ft.	SOILS DESCRIPTION	GRAPHIC SYMBOL	WELL COMPLETION	REMARKS
0			0 locking top cap	
2	silt, sand, gravel, tan red brown, sand fine to med. gr., 20-30%, clayey 20%, dry, loose		2" sched 40 PVC blank stovepipe well cover	
4	sandstone and siltstone, interbedded, tan orange brown, ss fine to med. gr., bedded 1-3 cm., siltstone is sandy, v. fine 20-30%, clayey 10%, dry, hard			soil sample 4.5-5' gasoline odor mod. 7'
6				
8	siltstone and claystone, interbedded, dk. gray, sandy v. fine 10%, hard, dry			
10			10	sample 9.5-11', no odor
12			portland cement	
14	siltstone, claystone, sandstone, interbedded, claystone is dk. gray, silt- and sandstone are lt. gray, mixed as bioturbated, ss 20-30%, bedded 1-5 cm., hard, dry			sample 14.5-15.5', no odor
16				▼ approx 15'
18				19'- 30 min. water check negative
20	claystone, dk. gray, sandy v. fine 10% mostly in bedding planes, bedded 1-3 cm, dry		20	sample 19.5-21', no odor
22				
24				
26	claystone, dk. gray, silty 10-20%, sandy v. fine <10%, dry, hard, bedded 1-3 cm.		26	sample 24.5-26', no odor
28			bentonite pellets	
30	siltstone and sandstone, interbedded, dk. gray and lt. gray, respectively, ss fine to med. gr., v. hard, bedded 1-3 cm.			sample 29.5-30', no odor
32				
34				
36			36	sampler refusal 35' 30 min. water check negative
38	siltstone and sandstone, as above,			
40	siltstone and sandstone, interbedded, dk. gray and lt. gray, sandstone fine to med. gr., siltstone sandy v. fine 10%, clayey 20%, hard, moist		40 #2/12 sand	sample 39.5-40', no odor, moistening
42			2" sched 40 PVC, 0.01" slotted	▽ approx 42'
44				

AQUA SCIENCE ENGINEERS Logged By: G. Gouvea Date Logged: 4-17-90 Figure #

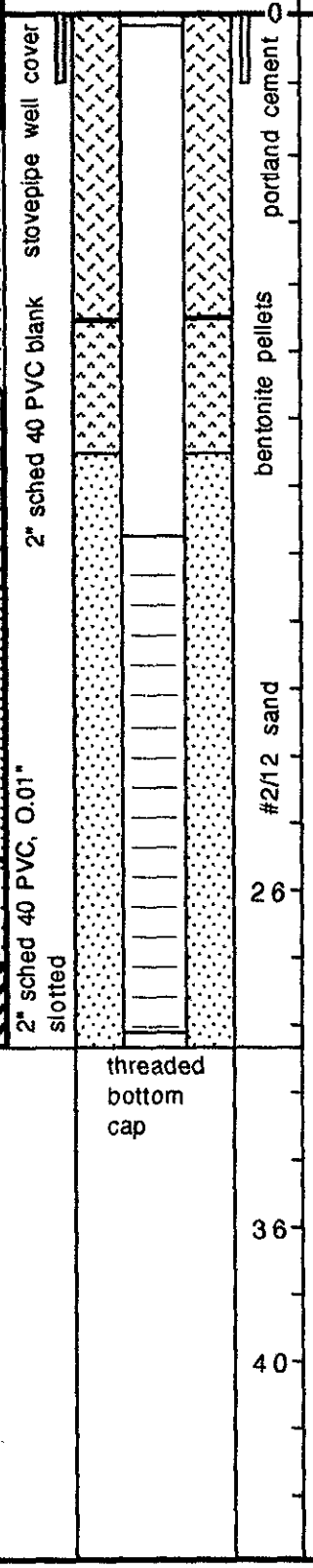
PROJECT: 5293 Crow Canyon Rd., Castro Valley			MONITORING WELL # MW-1
depth ft.	SOILS DESCRIPTION	GRAPHIC SYMBOL	WELL COMPLETION / REMARKS
46	as above		well completion details preceding
48	siltstone and claystone, interbedded, dk. gray and lt. gray, siltstone is sandy v. fine 10%, claystone silty 20%, v. hard		
50	Bottom of hole		threaded bottom cap
52			
54			
56			
58			
60			

AQUA SCIENCE ENGINEERS Logged By: G. Gouvea Date Logged: 4-18-90 Figure #

PROJECT: 5293 Crow Canyon Rd., Castro Valley

MONITORING WELL # MW-2

depth ft.	SOILS DESCRIPTION	GRAPHIC SYMBOL	WELL COMPLETION	REMARKS
0			0	
2	silt, tan brown, sandy v. fine to fine 20%, dry			locking top cap
4				
6	sandstone, olive tan brown, fine gr., silty 20-30%, bedded few cm., dry hard			gasoline odor mod. 5-6'
8				
10				9 feet
12	siltstone, dk. gray and lt. gray, sandy v. fine 20-30%, bedded few cm., damp			
14				
16				
18				19 feet
20	siltstone and sandstone, interbedded, dk. gray and lt. gray, respectively, siltstone is v. fine sandy 10%, crumbly, ss is silty 30% bedded few cm., wet, hard			
22				
24				
26	sandstone, lt. gray, v. fine to fine gr., silty 20-30%, few siltstone interbeds few cm., wet			
28				
30	claystone, dk. gray, silty 20%, bedded as above, hard			
32				
34				
36				
38				
40				
42				
44				



AQUA SCIENCE ENGINEERS Logged By: G. Gouvea Date Logged: 4-26-90 Figure #

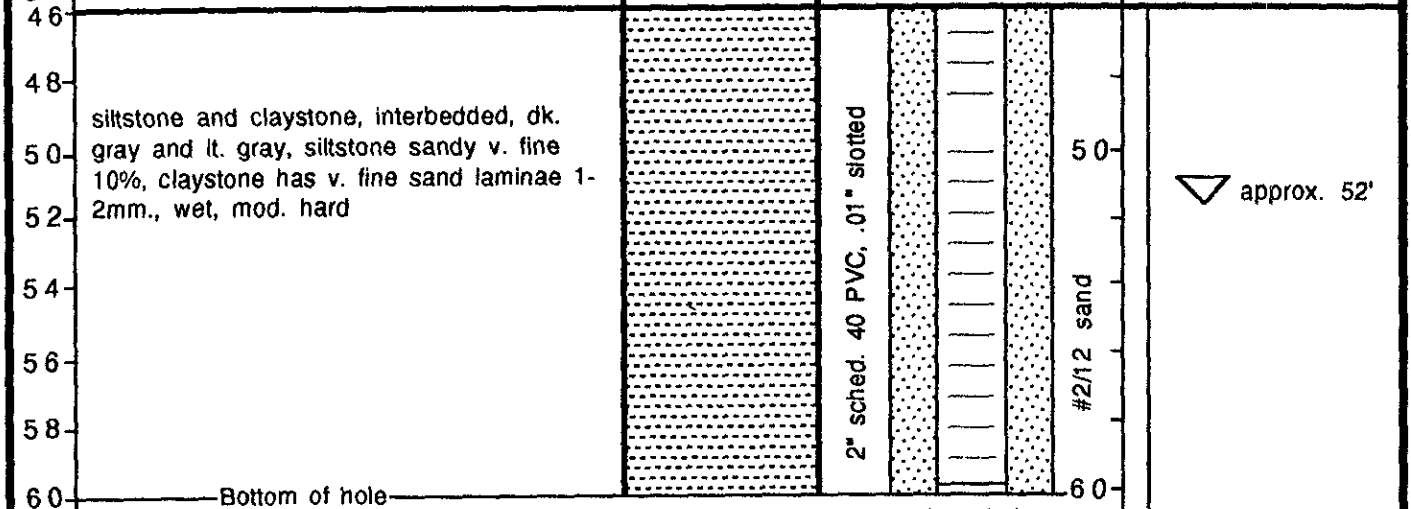
PROJECT: 5293 Crow Canyon Rd., Castro Valley

MONITORING WELL # MW-3

depth ft.	SOILS DESCRIPTION	GRAPHIC SYMBOL	WELL COMPLETION	REMARKS
0			0 stovepipe well cover	locking top cap
2	silt, clay,sand, gravel, tan brown, sand fine to med. gr., 20%, clay 20%, gravel "pea" 10%,dry			
4	sandstone and siltstone, interbedded, tan orange brown, ss fine to med. gr., bedded 1-3 cm., siltstone is sandy, v. fine 20-30%, clayey 10%, dry, hard			gasoline odor mod. to strong 5-12'
8	claystone, dk. gray, silty 30%, sandy v. fine 10%, hard, dry			
10			10 portland cement	
12				
14	siltstone, claystone, sandstone, interbedded, claystone is dk. gray, silt- and sandstone are lt. gray, mixed as bioturbated, ss 20-30%, bedded 1-5 cm., hard, dry			approx 15'
18				
20	claystone, dk. gray, v. fine sandy laminae 1-few mm., bedded 1-3 cm, dry		20 2" sched 40 PVC blank	
22				
24				
26			26	
28				
30			30	
32				
34	siltstone and sandstone, interbedded, dk. gray and lt. gray, respectively, ss fine to med. gr., v. hard, bedded few cm., siltstone clayey 20%		bentonite pellets	
36				
38				
40			40	overnight water check negative
42	siltstone and sandstone, interbedded, dk. gray and lt. gray, sandstone fine to med. gr., siltstone clayey 10%, sandy v. fine 10%, hard, dry		#2/12 sand 2" sched 40 PVC, 0.01" slotted	
44				

AQUA SCIENCE ENGINEERS Logged By: G. Gouvea Date Logged: 5-2-90 Figure #

PROJECT: 5293 Crow Canyon Rd., Castro Valley		MONITORING WELL # MW-3	
depth ft. / SOILS DESCRIPTION	GRAPHIC SYMBOL	WELL COMPLETION	REMARKS



AQUA SCIENCE ENGINEERS	Logged By: G. Gouvea	Date Logged: 5-6-90	Figure #

APPENDIX E
SAMPLE ANALYSES,
CHAIN OF CUSTODY DOCUMENTATION,
MONITORING WELL SAMPLING PROTOCOL

CHROMALAB, INC.

Analytical Laboratory
Specializing in GC-GC/MS

- Environmental Analysis
- Hazardous Waste (#238)
- Drinking Water (#955)
- Waste Water
- Consultation

April 10, 1990 ChromaLab File No.: 0490016

AQUA SCIENCE ENGINEERS, INC.

Attn: Greg Gouvea

RE: Nine soil samples for Gasoline/BTEX analysis

Project Name: F. RAMOS
Duration of Analysis: April 4-10, 1990

RESULTS:

Sample No.	Gasoline (mg/Kg)	Benzene (µg/Kg)	Toluene (µg/Kg)	Ethyl Benzene (µg/Kg)	Total Xylenes (µg/Kg)
SB-1,5'	110	2500	1200	690	1300
SB-1,10'	N.D.	780	44	19	18
SB-1,15'	N.D.	N.D.	N.D.	N.D.	N.D.
SB-1,20'	N.D.	N.D.	N.D.	N.D.	N.D.
SB-2,5'	7.8	240	5.1	97	5.5
SB-2,10'	N.D.	N.D.	N.D.	N.D.	N.D.
SB-2,20'	N.D.	N.D.	N.D.	N.D.	N.D.
SB-3,5'	N.D.	90	N.D.	16	10
SB-3,10'	N.D.	N.D.	N.D.	N.D.	N.D.
BLANK	N.D.	N.D.	N.D.	N.D.	N.D.
SPIKE RECOVERY	102.5%	92.8%	98.3%	99.6%	95.2%
DETECTION LIMIT	2.5	5.0	5.0	5.0	5.0
METHOD OF ANALYSIS	MOD.8015	8020	8020	8020	8020

CHROMALAB, INC.

David Duong
Senior Chemist

Eric Tam
Laboratory Director

2239 Omega Road,#1 • San Ramon, California 94583
415/831-1788 • Facsimile 415/831-8798

CHROMALAB, INC.

Analytical Laboratory
Specializing in GC-GC/MS

- Environmental Analysis
- Hazardous Waste (#238)
- Drinking Water (#955)
- Waste Water
- Consultation

April 10, 1990 ChromaLab File No.: 0490017

AQUA SCIENCE ENGINEERS, INC.

Attn: Greg Gouvea

RE: Nine soil samples for Gasoline/BTEX analysis

Project Name: F. RAMOS
Duration of Analysis: April 4-9, 1990

RESULTS:

Sample No.	Gasoline (mg/Kg)	Benzene (µg/Kg)	Toluene (µg/Kg)	Ethyl Benzene (µg/Kg)	Total Xylenes (µg/Kg)
SB-12(3),15'	N.D.	N.D.	N.D.	N.D.	N.D.
SB-4,10'	N.D.	N.D.	N.D.	N.D.	N.D.
SB-4,15'	N.D.	N.D.	N.D.	N.D.	N.D.
SB-4,20'	N.D.	6.3	N.D.	N.D.	N.D.
SB-6,5'	N.D.	N.D.	N.D.	N.D.	N.D.
SB-6,14(10)'	79	23	10	330	310
SB-6,15'	N.D.	N.D.	N.D.	N.D.	N.D.
SB-7,10'	N.D.	N.D.	N.D.	N.D.	N.D.
SB-7,15'	N.D.	N.D.	N.D.	N.D.	N.D.
BLANK	N.D.	N.D.	N.D.	N.D.	N.D.
SPIKE RECOVERY	102.5%	92.8%	98.3%	99.6%	95.2%
DETECTION LIMIT	2.5	5.0	5.0	5.0	5.0
METHOD OF ANALYSIS	MOD.8015	8020	8020	8020	8020

CHROMALAB, INC.

David Duong
Senior Chemist

Eric Tam
Laboratory Director

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CHROMALAB, INC.

Analytical Laboratory
Specializing in GC-GC/MS

- Environmental Analysis
- Hazardous Waste (#238)
- Drinking Water (#955)
- Waste Water
- Consultation

April 10, 1990 ChromaLab File No.: 0490018

AQUA SCIENCE ENGINEERS, INC.

Attn: Greg Gouvea

RE: Eight soil samples for Gasoline/BTEX analysis

Project Name: F. RAMOS
Duration of Analysis: April 4-9, 1990

RESULTS:

Sample No.	Gasoline (mg/Kg)	Benzene (µg/Kg)	Toluene (µg/Kg)	Ethyl Benzene (µg/Kg)	Total Xylenes (µg/Kg)
SB-7,20'	N.D.	N.D.	N.D.	N.D.	N.D.
SB-8,5'	390	4300	4000	2800	5300
SB-8,10'	N.D.	37	11	N.D.	5.4
SB-8,15'	N.D.	49	20	7.5	15
SB-8,20'	N.D.	N.D.	N.D.	N.D.	N.D.
SB-9,5'	N.D.	N.D.	N.D.	N.D.	N.D.
SB-9,10'	66	190	85	170	320
SB-9,15'	N.D.	N.D.	N.D.	N.D.	N.D.
BLANK	N.D.	N.D.	N.D.	N.D.	N.D.
SPIKE RECOVERY	102.5%	92.8%	98.3%	99.6%	95.2%
DETECTION LIMIT	2.5	5.0	5.0	5.0	5.0
METHOD OF ANALYSIS	MOD.8015	8020	8020	8020	8020

CHROMALAB, INC.

David Duong
Senior Chemist

Eric Tam
Laboratory Director

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Analytical Laboratory
Specializing in GC-GC/MS

- Environmental Analysis
- Hazardous Waste (#238)
- Drinking Water (#955)
- Waste Water
- Consultation

April 24, 1990 ChromaLab File No.: 0490063

AQUA SCIENCE ENGINEERS, INC.

Attn: Greg Gouvea

RE: Five soil samples for Gasoline/BTEX analysis

Project Name: F. RAMOS
Duration of Analysis: April 22-24, 1990

RESULTS:

Sample No.	Gasoline (mg/Kg)	Benzene (µg/Kg)	Toluene (µg/Kg)	Ethyl Benzene (µg/Kg)	Total Xylenes (µg/Kg)
MW-1,5'	N.D.	N.D.	N.D.	N.D.	N.D.
MW-1,10'	N.D.	N.D.	N.D.	N.D.	N.D.
MW-1,15'	N.D.	N.D.	N.D.	N.D.	N.D.
MW-1,20'	N.D.	N.D.	N.D.	N.D.	N.D.
MW-1,40'	N.D.	N.D.	N.D.	N.D.	N.D.
BLANK	N.D.	N.D.	N.D.	N.D.	N.D.
SPIKE RECOVERY	102.5%	92.8%	98.3%	99.6%	95.2%
DETECTION LIMIT	2.5	5.0	5.0	5.0	5.0
METHOD OF ANALYSIS	MOD.8015	8020	8020	8020	8020

ChromaLab, Inc.

David Duong
Senior Chemist

Eric Tam
Laboratory Director

APR 28 1990

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415/831-1788 • Facsimile 415/831-8798

aqua science engineers inc.

Aqua Scienc CHROMALAB FILE # 490016 91

P.O. Box 535, Sc

Chain of Custo

DATE 4-3-90 PAGE 1 OF 2

PROJ. ~~F. Ramos~~ Greg Gouvea

COMPANY Aqua Science

ADDRESS San Ramon

SAMPLERS (SIGNATURE) (PHONE NO.)

Greg Gouvea 415 920 9391

ANALYSIS REQUEST

SAMPLE ID.	DATE	TIME	MATRIX	LAB ID.	TPH - Gasoline (EPA 5030)	TPH - Gasoline (5030) w/BTEX (EPA 602, 8020)	TPH - Diesel (EPA 3510, 3550)	PURGEABLE AROMATICS BTEX (EPA 602, 8020)	PURGEABLE HALOCARBONS (EPA 601, 8010)	VOLATILE ORGANICS (EPA 624, 8240)	BASE/NEUTRALS, ACIDS (EPA 625/627, 8270)	TOTAL OIL & GREASE (EPA 5030E)	PESTICIDES/PCB (EPA 608, 8080)	PHENOLS (EPA 604, 8040)			METALS: Cd, Cr, Pb, Zn	CAM METALS (18) w/Cr VI	PRIORITY POLLUTANT METALS (13)					
SB-1, 5'	4-2908-3		Soil			X																		
SB-1, 10'	" "	"	"			X																		
SB-1, 15'	" "	"	"			X																		
SB-1, 20'	" "	"	"			X																		
SB-2, 5'	" "	"	"			X																		
SB-2, 10'	" "	"	"			X																		
SB-2, 20'	" "	"	"			X																		
SB-3, 5'	" "	"	"			X																		
SB-3, 10'	" "	"	"			X																		

PROJECT INFORMATION	
PROJECT	F. Ramos
PO NO.	
SHIPPING ID NO.	
VIA:	

SAMPLE RECEIPT	
TOTAL NO. OF CONTAINERS	9
CHAIN OF CUSTODY SEALS	
REC'D GOOD CONDITION/COLD	✓
CONFORMS TO RECORD	✓
LAB NO.	

SPECIAL INSTRUCTIONS/COMMENTS:

standard turnaround

RELINQUISHED BY 1.	RELINQUISHED BY 2.	RELINQUISHED BY
(Signature) Greg Gouvea (Time) 16:35	(Signature) (Time)	(Signature) (Tim
(Printed Name) Greg Gouvea (Date) 4-3-90	(Printed Name) (Date)	(Printed Name) (Da
(Company) Aqua Science	(Company)	(Company)
RECEIVED BY 1.	**RECEIVED BY 2.**	**RECEIVED BY (LABORATORY)**
(Signature) (Time)	(Signature) (Time)	(Signature) 4-3-90 16:35 (Tim
(Printed Name) (Date)	(Printed Name) (Date)	(Printed Name) (Da
(Company)	(Company)	(LAB)

aqua science engineers inc.

Aqua Science Engi

P.O. Box 535, San Ram

CHROMALAB FILE # 490017

Chain of Custo

DATE 4-3-90 PAGE 2 OF 2

PROJ. F. Ramos Greenwood

COMPANY Aqua Science

ADDRESS San Ramon

SAMPLERS (SIGNATURE) (PHONE NO.)

415 820 9391

SAMPLE ID	DATE	TIME	MATRIX	LAB ID.
SB-12(3), 15'	4-2-90	15:00	Soil	
SB-4, 10'	4-3-90	8-5	"	
SB-4, 15'	" "	"	"	
SB-4, 20'	" "	"	"	
SB-6, 5'	" "	"	"	
SB-6, 14(10)'	" "	"	"	
SB-6, 15'	" "	"	"	
SB-7, 10'	" "	"	"	
SB-7, 15'	" "	"	"	

ANALYSIS REQUEST

TPH - Gasoline (EPA 5030)	TPH - Gasoline (5030) w/BTEX (EPA 602, 8020)	TPH - Diesel (EPA 3510, 3550)	PURGEABLE AROMATICS BTEX (EPA 602, 8020)	PURGEABLE HALOCARBONS (EPA 601, 8010)	VOLATILE ORGANICS (EPA 624, 8240)	BASE/NEUTRALS, ACIDS (EPA 624/627, 8270)	TOTAL OIL & GREASE (EPA 5030E)	PESTICIDES/PCB (EPA 608, 8080)	PHENOLS (EPA 604, 8040)			METALS: Cd, Cr, Pb, Zn	CAM METALS (18) w/Cr VI	PRIORITY POLLUTANT METALS (13)					
	X																		
	X																		
	X																		
	X																		
	X																		
	X																		
	X																		
	X																		
	X																		

PROJECT INFORMATION	
PROJECT	F. Ramos
PO NO.	
SHIPPING ID NO.	
VIA.	

SAMPLE RECEIPT	
TOTAL NO. OF CONTAINERS	9
CHAIN OF CUSTODY SEALS	
REC'D GOOD CONDITION/COLD	
CONFORMS TO RECORD	
LAB NO.	

SPECIAL INSTRUCTIONS/COMMENTS:

5-day turn

RELINQUISHED BY 1.	RELINQUISHED BY 2.	RELINQUISHED BY
(Signature) (Time) 16:35	(Signature) (Time)	(Signature) (Time)
(Printed Name) (Date) 4-3-90	(Printed Name) (Date)	(Printed Name) (Date)
(Company) Aqua Science	(Company)	(Company)
RECEIVED BY 1.	**RECEIVED BY 2.**	**RECEIVED BY (LABORATORY)**
(Signature) (Time)	(Signature) (Time)	(Signature) (Time) 16:35
(Printed Name) (Date)	(Printed Name) (Date)	(Printed Name) 4-3-90 (Date)
(Company)	(Company)	(LAB)

CHROMALAB, INC.

2239 Omega R[illegible]
415/831-

CHROMALAB FILE # 490018

Chain of Custo

DATE 4-3-90 PAGE 3 OF 7

PROJ. MGR. Greg Bowra
COMPANY Aqua Science
ADDRESS San Ramon,

SAMPLERS (SIGNATURE) Greg Bowra (PHONE NO.) 415 820 9391

ANALYSIS REQUEST

SAMPLE ID.	DATE	TIME	MATRIX	LAB ID.	TPH - Gasoline (EPA 5030)	TPH - Gasoline (5030) w/BTEX (EPA 602, 8020)	TPH - Diesel (EPA 3510, 3550)	PURGEABLE AROMATICS BTEX (EPA 602, 8020)	PURGEABLE HALOCARBONS (EPA 601, 8010)	VOLATILE ORGANICS (EPA 624, 8240)	BASE/NEUTRALS, ACIDS (EPA 625/627, 8270)	TOTAL OIL & GREASE (EPA 5030E)	PESTICIDES/PCB (EPA 608, 8080)	PHENOLS (EPA 604, 8040)			METALS: Cd, Cr, Pb, Zn	CAM METALS (18) w/Cr VI	PRIORITY POLLUTANT METALS (13)					
SB-7, 20'	4-3-90	8:5	Soil			X																		
SB-8, 5'	"	"	"			X																		
SB-8, 10'	"	"	"			X																		
SB-8, 15'	"	"	"			X																		
SB-8, 20'	"	"	"			X																		
SB-9, 5'	"	"	"			X																		
SB-9, 10'	"	"	"			X																		
SB-9, 15'	"	"	"			X																		

PROJECT INFORMATION

PROJECT: F. Ramos
PO NO.
SHIPPING ID. NO.
VIA:

SAMPLE RECEIPT

TOTAL NO. OF CONTAINERS 8
CHAIN OF CUSTODY SEALS
REC'D GOOD CONDITION/COLD
CONFORMS TO RECORD
LAB NO.

SPECIAL INSTRUCTIONS/COMMENTS:

5-day turn

RELINQUISHED BY 1.	RELINQUISHED BY 2.	RELINQUISHED BY
(Signature) 16:35 (Time)	(Signature) (Time)	(Signature) (T
(Printed Name) 4-3-90 (Date)	(Printed Name) (Date)	(Printed Name) (
(Company) Aqua Science	(Company)	(Company)
RECEIVED BY 1.	RECEIVED BY 2.	RECEIVED BY (LABORATORY):
(Signature) (Time)	(Signature) (Time)	(Signature)
(Printed Name) (Date)	(Printed Name) (Date)	(Printed Name) Yan Kewng Tam
(Company)	(Company)	(LAB) CHROMALAB

aqua science engineers inc.

CHROMALAB FILE # 490063

415-820-9391

Chain of Custo

DATE 4-17-90 PAGE 1 OF 1

PROJ. F. Ramos Castro Valley
COMPANY Aqua Science
ADDRESS San Ramon

SAMPLERS (SIGNATURE) (PHONE NO.) 4158209391

ANALYSIS REQUEST

SAMPLE ID.	DATE	TIME	MATRIX	LAB ID.	TPH - Gasoline (EPA 5030)	TPH - Gasoline (5030) w/BTEX (EPA 602, 8020)	TPH - Diesel (EPA 3510, 3550)	PURGEABLE AROMATICS BTEX (EPA 602, 8020)	PURGEABLE HALOCARBONS (EPA 601, 8010)	VOLATILE ORGANICS (EPA 624, 8240)	BASE/NEUTRALS, ACIDS (EPA 624/627, 8270)	TOTAL OIL & GREASE (EPA 5030B)	PESTICIDES/PCB (EPA 608, 8080)	PHENOLS (EPA 604, 8040)			METALS: Cd, Cr, Pb, Zn	CAM METALS (18) w/Cr VI	PRIORITY POLLUTANT METALS (13)					
MW-1, 5'	4-17	13:00	soil			X																		
MW-1, 10'	4-17	13:30	"			X																		
MW-1, 15'	" "	14:00	"			X																		
MW-1, 20'	" "	14:30	"			X																		
MW-1, 40'	" "	15:30	"			X																		

PROJECT INFORMATION

PROJECT F. Ramos
PO NO.
SHIPPING ID NO.
VIA:

SAMPLE RECEIPT

TOTAL NO. OF CONTAINERS	5
CHAIN OF CUSTODY SEALS	/
REC'D GOOD CONDITION/COLD	/
CONFORMS TO RECORD	/
LAB NO.	

SPECIAL INSTRUCTIONS/COMMENTS:

5-day turn

RELINQUISHED BY 1.	RELINQUISHED BY 2.	RELINQUISHED BY
(Signature) 16:30 (Time)	(Signature) (Time)	(Signature) (Tim
(Printed Name) 4/17/90 (Date)	(Printed Name) (Date)	(Printed Name) (Da
(Company) Aqua Science	(Company)	(Company)
RECEIVED BY 1.	**RECEIVED BY 2.**	**RECEIVED BY (LABORATORY)**
(Signature) (Time)	(Signature) (Time)	(Signature) 16 (Tir
(Printed Name) (Date)	(Printed Name) (Date)	Yiu Keung Tam 4-17 (DA
(Company)	(Company)	(LAB) CHROMALAB, INC.

CHROMALAB, INC.

Analytical Laboratory
Specializing in GC-GC/MS

- Environmental Analysis
- Hazardous Waste (#238)
- Drinking Water (#955)
- Waste Water
- Consultation

June 13, 1990 ChromaLab File No.: 0690001

AQUA SCIENCE ENGINEERS, INC.

Attn: Greg Gouvea

RE: Three water samples for Gasoline/BTEX, Diesel and Oil & Grease analyses

Project Name: CASTRO VALLEY
Project Number: 1017-038-018
Date Sampled: June 1, 1990 Date Submitted: June 1, 1990
Date Extracted: June 1-9, 1990 Date Analyzed: June 1-9, 1990

RESULTS:

Sample No.	Gasoline (mg/L)	Diesel (mg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethyl Benzene (µg/L)	Total Xylenes (µg/L)	Oil & Grease (mg/L)
MW-1-C	N.D.	----	N.D.	N.D.	N.D.	N.D.	----
MW-2-A	N.D.	----	N.D.	N.D.	N.D.	N.D.	----
MW-3-B	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
BLANK	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
SPIKED RECOVERY	94.1%	92.3%	98.3%	101.0%	97.0%	98.9%	----
DUP. SPIKED RECOVERY	95.2%	114.0%	91.4%	90.1%	93.6%	109.5%	----
DETECTION LIMIT	0.5	0.5	1.0	1.0	1.0	1.0	10
METHOD OF ANALYSIS	5030/ 8015	3510/ 8015	602	602	602	602	503 A&E

ChromaLab, Inc.

David Duong
Senior Chemist

Eric Tam
Laboratory Director

RECEIVED
JUN 20 1990
AQUA SCIENCE ENG.

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CHROMALAB, INC.

Analytical Laboratory
Specializing in GC-GC/MS

- Environmental Analysis
- Hazardous Waste (#E694)
- Drinking Water (#955)
- Waste Water
- Consultation

June 14, 1990
AQUA SCIENCE ENGINEERS, INC.
Project Name: AQUA-CASTRO VALLEY
Date Sampled: May 30, 1990
Detection Limit: 1 µg/L

ChromaLab File No.: 0690001C
Attn: Greg Gouvea
Sample No.: MW-3-B
Date Submitted: June 1, 1990
Date of Analysis: June 8, 1990

601/8010	
Dichlorodifluoromethane	N.D.
Chloromethane	N.D.
Vinyl Chloride	N.D.
Bromomethane	N.D.
Chlorethane	N.D.
Trichlorofluoromethane	N.D.
1,1-Dichloroethene	N.D.
Methylene Chloride	N.D.
t-1,2-Dichloroethene	N.D.
c-1,2-Dichloroethene	N.D.
1,1-Dichloroethane	N.D.
Chloroform	N.D.
1,1,1-Trichloroethane	N.D.
Carbon Tetrachloride	N.D.
1,2-Dichloroethane	N.D.
Trichloroethene	N.D.
1,2-Dichloropropane	N.D.
Bromodichloromethane	N.D.
2-Chloroethylvinyl ether	N.D.
t-1,3-Dichloropropene	N.D.
Cis-1,3-Dichloropropene	N.D.
1,1,2-Trichloroethane	N.D.
1,1,2-Trichlorotrifluorethane	N.D.
Tetrachloroethene	N.D.
Dibromochloromethene	N.D.
Chlorobenzene	N.D.
Bromoform	N.D.
1,1,2,2-Tetrachloroethane	N.D.
1,3-Dichlorobenzene	N.D.
1,4-Dichlorobenzene	N.D.
1,2-Dichlorobenzene	N.D.

QA/QC:

*Sample blank concentration is none detected.

*Spiked recovery for Chloroethane is 99.9%, Trichloroethene is 89.7% Bromoform is 100.1% and 1,2-Dichlorobenzene is 101.7%

CHROMALAB, INC.

David Duong, Sr. Chemist

Eric Tam, Lab Director

RECEIVED
JUN 26 1990
AQUA SCIENCE ENG

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415/831-1788 • Facsimile 415/831-8798
Federal ID #68-0140157

CHROMALAB, INC.

Analytical Laboratory
Specializing in GC-GC/MS

- Environmental Analysis
- Hazardous Waste (#E694)
- Drinking Water (#955)
- Waste Water
- Consultation

ChromaLab File # 0690001

Project No.: 1017-038-018
Sample I.D.: MW 3-B
Method of Analysis: EPA 625 Matrix: water

COMPOUND NAME	Sample mg/L	MDL mg/L	Spike Recovery
2,4-DINITROTOLUENE	N.D.	0.01	-----
2,6-DINITROTOLUENE	N.D.	0.01	109.0%,108.5%
DIETHYL PHTHALATE	N.D.	0.01	-----
4-CHLORO-PHENYL PHENYL ETHER	N.D.	0.01	-----
FLUORENE	N.D.	0.01	-----
4-NITROANILINE	N.D.	0.05	-----
4,6-DINITRO-2-METHYL PHENOL	N.D.	0.05	-----
N-NITROSODIPHENYLAMINE	N.D.	0.01	-----
4-BROMOPHENYL PHENYL ETHER	N.D.	0.01	-----
HEXACHLOROBENZENE	N.D.	0.01	-----
PENTACHLOROPHENOL	N.D.	0.05	-----
PHENANTHRENE	N.D.	0.01	-----
ANTHRACENE	N.D.	0.01	-----
DI-N-BUTYL PHTHALATE	N.D.	0.01	-----
FLUORANTHENE	N.D.	0.01	-----
PYRENE	N.D.	0.01	103.8%, 99.7%
BUTYLBENZYLPHTHALATE	N.D.	0.01	-----
3,3'-DICHLOROBENZIDINE	N.D.	0.02	-----
BENZO(A)ANTHRACENE	N.D.	0.01	-----
BIS(2-ETHYLHEXYL)PHTHALATE	N.D.	0.01	-----
CHRYSENE	N.D.	0.01	105.8%,102.0%
DI-N-OCTYLPHTHALATE	N.D.	0.01	-----
BENZO(B)FLUORANTHENE	N.D.	0.01	-----
BENZO(K)FLUORANTHENE	N.D.	0.01	-----
BENZO(A)PYRENE	N.D.	0.01	-----
INDENO(1,2,3 C,D)PYRENE	N.D.	0.01	-----
DIBENZO(A,H)ANTHRACENE	N.D.	0.01	-----
BENZO(G,H,I)PERYLENE	N.D.	0.01	-----

*No Creosote or PCB detected. Detection Limit = 0.1 mg/L

ChromaLab, Inc.

David Duong
Senior Chemist

Eric Tam
Lab Director

2239 Omega Road, #1 • San Ramon, California 94583
415/831-1788 • Facsimile 415/831-8798
Federal ID #68-0140157

CHROMALAB, INC.

Analytical Laboratory
Specializing in GC-GC/MS

- Environmental Analysis
- Hazardous Waste (#E694)
- Drinking Water (#955)
- Waste Water
- Consultation

June 14, 1990 ChromaLab File # 0690001

Client: Aqua Science Engineers Attn: Greg Gouvea
Date Sampled: 5/30/90 Date Submitted: 6/01/90
Date Extracted: 6/13/90 Date Analyzed: 6/14/90

Project No.: 1017-038-018
Sample I.D.: MW 3-B
Method of Analysis: EPA 625 Matrix: water

COMPOUND NAME	Sample mg/L	MDL mg/L	Spike Recovery
PHENOL	N.D.	0.01	103.2%, 97.9%
BIS(2-CHLOROETHYL) ETHER	N.D.	0.01	-----
2-CHLOROPHENOL	N.D.	0.01	-----
1,3-DICHLOROBENZENE	N.D.	0.01	-----
1,4-DICHLOROBENZENE	N.D.	0.01	-----
BENZYL ALCOHOL	N.D.	0.02	-----
1,2-DICHLOROBENZENE	N.D.	0.01	-----
2-METHYLPHENOL	N.D.	0.01	-----
BIS(2-CHLOROISOPROPYL)ETHER	N.D.	0.01	-----
4-METHYLPHENOL	N.D.	0.01	114.2%,105.3%
N-NITROSO-DI-N-PROPYLAMINE	N.D.	0.01	-----
HEXACHLOROETHANE	N.D.	0.01	-----
NITROBENZENE	N.D.	0.01	-----
ISOPHORONE	N.D.	0.01	-----
2-NITROPHENOL	N.D.	0.01	-----
2,4-DIMETHYLPHENOL	N.D.	0.01	-----
BENZOIC ACID	N.D.	0.05	-----
BIS(2-CHLOROETHOXY)METHANE	N.D.	0.01	94.6%, 90.3%
2,4-DICHLOROPHENOL	N.D.	0.01	-----
1,2,4-TRICHLOROBENZENE	N.D.	0.01	-----
NAPHTHALENE	N.D.	0.01	-----
4-CHLOROANILINE	N.D.	0.02	-----
HEXACHLOROBUTADIENE	N.D.	0.01	-----
4-CHLORO-3-METHYLPHENOL	N.D.	0.02	-----
2-METHYLNAPHTHALENE	N.D.	0.01	-----
HEXACHLOROCYCLOPENTADIENE	N.D.	0.01	-----
2,4,6-TRICHLOROPHENOL	N.D.	0.01	- - - - -
2,4,5-TRICHLOROPHENOL	N.D.	0.01	-----
2-CHLORONAPHTHALENE	N.D.	0.01	-----
2-NITROANILINE	N.D.	0.05	-----
DIMETHYL PHTHALATE	N.D.	0.01	-----
ACENAPHTHYLENE	N.D.	0.01	-----
3-NITROANILINE	N.D.	0.05	-----
ACENAPHTHENE	N.D.	0.01	113.2%,108.3%
2,4-DINITROPHENOL	N.D.	0.05	-----
4-NITROPHENOL	N.D.	0.05	-----
DIBENZOFURAN	N.D.	0.01	-----

(continued on next page)

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CHROMALAB, INC.

Analytical Laboratory
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- Environmental Analysis
- Hazardous Waste (#238)
- Drinking Water (#955)
- Waste Water
- Consultation

June 13, 1990

ChromaLab File No.: 0690001C

AQUA SCIENCE ENGINEERS, INC.
Project Name: CASTRO VALLEY
Sample No.: MW-3-B

Attn: Greg Gouvea
Project No.: 1017-038-018
Analysis Duration: 6/6-8/90

CHRLORINATED PESTICIDE ANALYSIS

Compounds	Concentration (µg/L)	Detection Limit (µg/L)	Spike Recovery
ALDRIN	N.D.	0.1	----
DIELDRIN	N.D.	0.1	93.2%
ENDRIN ALDEHYDE	N.D.	0.5	----
ENDRIN	N.D.	0.1	----
HEPTACHLOR	N.D.	0.1	----
HEPTACHLOR EPOXIDE	N.D.	0.1	----
p,p' - DDT	N.D.	0.5	92.0%
p,p' - DDE	N.D.	0.1	98.7%
p,p' - DDD	N.D.	0.5	----
ENDOSULFAN I	N.D.	0.5	----
ENDOSULFAN II	N.D.	0.5	----
α - BHC	N.D.	0.1	----
β - BHC	N.D.	0.1	----
γ - BHC (LINDANE)	N.D.	0.1	89.4%
δ - BHC	N.D.	0.1	----
ENDOSULFAN SULFATE	N.D.	1.0	----
p,p' - METHOXYCHLOR	N.D.	1.0	----
TOXAPHENE	N.D.	1.0	----
PCB's	N.D.	1.0	----
CHLORDANE	N.D.	1.0	----

CHROMALAB, INC.

David Duong
Senior Chemist

Eric Tam
Laboratory Director

2239 Omega Road, #1 • San Ramon, California 94583
415/831-1788 • Facsimile 415/831-8798

SAMPLING SPECIALISTS
A DIVISION OF PRATT CONSULTING COMPANY
COMPLETE WELL DEVELOPMENT SERVICES

CHROMALAB FILE # 690001

COMPLETE BAILING, PURGING AND SAMPLING SERVICE FOR
MONITORING, RECOVERY AND VADOSE WELLS IN THE FOLLOWING STATES:
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Walnut Creek, California 94596

12003 49th Street North
Building 307
Clearwater, Florida 34622

1-(415)-932-4356 Office
1-(415)-932-4256 Fax

CHAIN OF CUSTODY DOCUMENT

PROJECT NUMBER: 1017-038-018

PROJECT NAME: AQUA - CASTRO VALLEY

SAMPLERS SIGNATURE: MS & JP

CHECK FOR FIVE (5) DAY VERBAL/FAX SERVICE: * 100%

CHECK FOR EMERGENCY 24 HOUR VERBAL/FAX SERVICE: 200%

DATES	TIME	SAMPLE ID	NUMBER OF SAMPLE	TPH GAS BTEX	TPH DIESEL	TOTAL OIL GREASE	
5-30-90		MW-1-C	6	*			
5-30-90		MW-2-A	6	*			
5-30-90		MW-3-B	6	*	*	*	*NOTE*
CUSTOMER		FOR MW-3-B ONLY ALSO WANTS	1) CHLORINATED HYDROCARBONS (?601)				
			2) PNA & CREOSOTE				
			3) PRIORITY METALS				
			4) PCB & PCP (625-627?)				

RELINQUISHED BY:	DATE	TIME	RECEIVED BY:
Mike Spencer	06/01/90	8:40 AM	
RELINQUISHED BY:	DATE	TIME	RECEIVED BY:

FAX RESULTS ASAP TO JOHN PRATT AT 1-415-932-4256

BILL AQUASCIENCE ENGINEERS FOR ANALYSIS

RECEIVED
JUN 20 1990
AQUA SCIENCE ENG

MED-TOX ASSOCIATES, INC.

ENVIRONMENTAL & OCCUPATIONAL HEALTH SERVICES

3440 Vincent Road Pleasant Hill, CA 94523 • (415) 930-9090 • FAX# (415) 930-0256

LABORATORY ANALYSIS REPORT

CHROMALAB, INC.
2239 OMEGA ROAD, #1
SAN RAMON, CA 94583

ATTN: ERIC TAM

CLIENT PROJ. NO: 0690001

REPORT DATE: 06/20/90

DATE SAMPLED: 06/01/90

DATE RECEIVED: 06/01/90

MED-TOX JOB NO: 9006002

ANALYSIS OF: WATER SAMPLE FOR PRIORITY POLLUTANT METALS

See attached for results

Jack Sheets, Manager
Inorganic Laboratory

Results FAXed to Eric Tam 06/15/90

CHROMALAB, INC.

CLIENT ID: MW-B (?) MW-3
CLIENT JOB NO: 0690001
DATE RECEIVED: 06/01/90

MED-TOX LAB NO: 9006002-01A
MED-TOX JOB NO: 9006002
REPORT DATE: 06/20/90

PRIORITY POLLUTANT METALS IN WATER BY ICP

CODE	METAL	CONCENTRATION (mg/L)	DETECTION LIMIT (mg/L)	METHOD REFERENCE	INST.*
Ag	Silver	ND	0.01	6010	ICP
As	Arsenic	ND	0.03	6010	ICP
Be	Beryllium	ND	0.001	6010	ICP
Cd	Cadmium	0.004	0.002	6010	ICP
Cr	Chromium	ND	0.02	6010	ICP
Cu	Copper	ND	0.02	6010	ICP
Hg	Mercury	ND	0.0003	7470	Hg
Ni	Nickel	ND	0.01	6010	ICP
Pb	Lead	ND	0.02	6010	ICP
Sb	Antimony	ND	0.02	6010	ICP
Se	Selenium	ND	0.03	6010	ICP
Tl	Thallium	ND	0.03	6010	ICP
Zn	Zinc	0.027	0.005	6010	ICP

ND = Not Detected

* INST. = Instrument Number

CHROMALAB, INC.

2239 Omega Road, #1 • San Ramon, California 94583
415/831-1788 • Facsimile 415/831-8798

Chain of Custo

DATE 06/01 PAGE ____ OF ____

J. MGR. ____
MPANY ____
DDRESS ____

PLERS (SIGNATURE) (PHONE NO.)
831-1788

ANALYSIS REQUEST

SAMPLE ID.	DATE	TIME	MATRIX	LAB ID.	TPH - Gasoline (EPA 5030)	TPH - Gasoline (5030) w/BTEX (EPA 602, 8020)	TPH - Diesel (EPA 3510, 3550)	PURGEABLE AROMATICS BTEX (EPA 602, 8020)	PURGEABLE HALOCARBONS (EPA 601, 8010)	VOLATILE ORGANICS (EPA 624, 8240)	BASE/NEUTRALS, ACIDS (EPA 625/627, 8270)	TOTAL OIL & GREASE (EPA 5030E)	PESTICIDES/PCB (EPA 608, 8080)	PHENOLS (EPA 604, 8040)			METALS: Cd, Cr, Pb, Zn	CAM METALS (18) w/Cr VI	PRIORITY POLLUTANT METALS (13)						
MW-B	06/01/90	10:35	Water	01A															✓						

PROJECT INFORMATION

ECT: 0690001.
).
ING ID. NO.

SAMPLE RECEIPT

TOTAL NO. OF CONTAINERS	01
CHAIN OF CUSTODY SEALS	
REC'D GOOD CONDITION/COLD	
CONFORMS TO RECORD	
LAB NO.	9006002

IAL INSTRUCTIONS/COMMENTS:

Normal TAT

RELINQUISHED BY 1.
(Signature) David Duong (Time) 10:35 AM
(Printed Name) DAVID DUONG (Date) 06/01/90
(Company) CHROMALAB, INC.

RECEIVED BY 1.
(Signature) LaVon Stark (Time) 10:40
(Printed Name) L. Stark (Date) 6/1/90
(Company) Mad-Tox

RELINQUISHED BY 2.
(Signature) L Stark (Time) 1180
(Printed Name) L. Stark (Date) 6-1-90
(Company) Mad-Tox

RECEIVED BY 2.
(Signature) (Time)
(Printed Name) (Date)
(Company)

RELINQUISHED BY
(Signature) (Time)
(Printed Name) (Date)
(Company)

RECEIVED BY (LABORATORY)
Denise Harrington
(Signature) (Time)
DENISE HARRINGTON
(Printed Name) (Date)
MED-TOX
(Company) 6/1/90 1100

SAMPLING SPECIALISTS
A DIVISION OF PRATT CONSULTING COMPANY
COMPLETE WELL DEVELOPMENT SERVICES

ENVIRONMENTAL SAMPLE COLLECTION SPECIALISTS

COMPLETE BAILING, PURGING AND SAMPLING SERVICE FOR
MONITORING, RECOVERY AND VADOSE WELLS IN THE FOLLOWING STATES:
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Office Locations
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Walnut Creek, California 94596

12003 49th Street North
Building 307
Clearwater, Florida 34622

1-(415)-932-4356 Office
1-(415)-932-4256 Fax

July 12, 1990

Aqua Science Engineers, Inc.
Mr. Greg Gouvea
P.O.Box 535
San Ramon, California 94583-0535

Re: Quarterly Sampling Report - Castro Valley Facility - Castro Valley, California.

Dear Mr. Greg Gouvea,
This report presents the results of the quarterly groundwater monitoring of the existing wells by Sampling Specialists Company on May 30, 1990.

Sampling Specialists Company
Well Monitoring Procedure

The well manway and top of casing seals are first inspected for possible leaks into the well of surrounding standing water. Next using a liquid level indicator the depth to groundwater and casing bottom are recorded. Using a NEW BAILER CORD and a DISPOSABLE BAILER we collect the first draw of product from the well being careful to only let the bailer enter the groundwater halfway. After extracting the bailer we check for the amount of free-floating hydrocarbons if any or note the sheen. Then using our previous measurements to groundwater and casing bottom we calculate how much well column is in the water. We then multiply this number by .17 gallons per foot for 2" column, .66 gallons per foot for 4" column etc. Finally we multiply by 3 to calculate the number of gallons we bail before sample collection. After allowing the well to recover to at least 90% of it's pre-bailed groundwater level we again take a measurement to groundwater level prior to sampling. VOA's vials are filled first from the first draw from well and from the same sampler. Liters are then filled. Duplicates are always collected when VOA's vials are used. Samples are kept on ice and delivered to the state certified laboratory within 24 hours of collection.

* NOTE *
The practice of using new bailer cord and disposable bailers/samplers for each well eliminates the possibility of cross contamination.

Analysis Requested

The samples were delivered to the state certified laboratory of CHROMALAB, INC. in San Ramon, California. The analysis were for Total Petroleum Hydrocarbons as Gasoline with BTEX for all wells and additional analysis for MW-3. The analysis results and chain of custody are attached.

If you have any further questions or concerns please feel free to call our office.
Sincerely,
SAMPLING SPECIALISTS COMPANY

Mr. John T. Pratt
General Manager

1017-038-018

Special Services Include: 5-Day Standard Turnaround Time On Laboratory Analysis At No Additional Charge, Fax Results Upon Completion Of Analysis (If Requested), Full QA / QC Reports Included At No Additional Charge, Specialized Underground Tank And Associated Pipe Testing For Leaks And Repairs. Check For Other Services

SAMPLING SPECIALISTS
A DIVISION OF PRATT CONSULTING COMPANY
COMPLETE WELL DEVELOPMENT SERVICES

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July 12, 1990

Aqua Science Engineers, Inc.
Mr. Greg Gouvea
P.O.Box 535
San Ramon, California 94583-0535

Re: Well Development - Castro Valley Facility / Castro Valley, California.

Dear Mr. Greg Gouvea,

This report presents the results and findings of the well development activities that have been performed on the existing wells by Sampling Specialists Company on May 25-27, 1990.

Sampling Specialists Company
Well Developing Procedure

The well manway and top of casing seals are first inspected for possible leaks into the well of surrounding standing water. Next using a liquid level indicator the depth to groundwater and casing bottom are recorded. Using a NEW BAILER CORD and a DISPOSABLE BAILER we collect the first draw of product from the well being careful to only let the bailer enter the groundwater halfway. After extracting the bailer we check for the amount of free-floating hydrocarbons if any or note the sheen.

* NOTE *
The practice of using new bailer cord and disposable bailers / samplers for each well eliminates the possibility of cross contamination.

WELL DEVELOPMENT

All monitoring wells were developed to clean the well and to stabilize the sand, gravel, and aquifer materials around the screens or perforations. Well development is accomplished by bailing, mechanical or air lift pumping, surging, or swabbing. For this facility well development was achieved by surging the well

with a vented surge block and bringing sand and silt to surface with each stroke. We continue to development the well until the well if thoroughly developed and free of sand, silt, and turbidity. Care was taken not to damage the well screen or casing while swabbing or surging. Well developing was then followed by pumping. This procedure was repeated as required to establish full development.

If you have any questions or would like to discuss a specific site or well please call our office.

Sincerely,
PRATT CONSULTING COMPANY/
SAMPLING SPECIALISTS

Mr. John T. Pratt
General Manager

SAMPLING SPECIALISTS
A DIVISION OF PRATT CONSULTING COMPANY
COMPLETE WELL DEVELOPMENT SERVICES

ENVIRONMENTAL SAMPLE COLLECTION SPECIALISTS

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MONITORING WELL FIELD NOTES

AQUA-CASTRO VALLEY, CA	PROJECT NAME
1017-038-018	PROJECT NUMBER
05/30/90	DATE OF ACTIVITIES (SAMPLING OR DEVELOPMENT)
JP / MS	BY (SAMPLING TECHNICIANS)
MW-1	CLIENT'S MONITORING/RECOVERY/ VADOSE WELL NUMBER
CLIENT TO PROVIDE	TOP OF CASING ELEVATION (Provided By Client)
15.80'	DEPTH TO WATER FROM WELL CASING BEFORE BAILING
50'	TOTAL DEPTH OF USABLE COLUMN (TO NEAREST FOOT MARKING)
17.90'	DEPTH TO WATER FROM WELL CASING BEFORE SAMPLING
2"	DIAMETER OF MONITORING/RECOVERY/ VADOSE WELL
34.20'	AMOUNT OF WELL COLUMN IN WATER (INCLUDING OIL INTERFACE)
29.07 GALLONS	REQUIRED AMOUNT OF GROUNDWATER TO PURGE FROM WELL IS
35 GALLONS	APPROXIMATE AMOUNT GROUNDWATER REMOVED FROM WELL
STOVE PIPE	TYPE OF SEAL AT GRADE (VANDAL PROOF MANWAY LID/ELEVATED STOVEPIPE)
YES	IS SEAL AT GRADE WATER TIGHT
2" WING NUT PLUG	TYPE OF CAP
YES	IS CAP WATER TIGHT

5	NUMBER OF SAMPLES COLLECTED (40mil VOA FOR GAS/BTEX AND Liters For Diesel
NO	DID 40 mil VOA CONTAINERS HAVE HEADSPACE BEFORE DELIVERY TO LABORATORY
YES	WERE CONTAINERS KEPT ON ICE PRIOR TO BEING DELIVERED TO LABORATORY
YES	WAS THERE A QA / QC SAMPLER BLANK SAMPLE COLLECTED

(All Groundwater Samples Collected Are Kept On ice And Delivered To The Laboratory For Analysis In Less Than 24 Hours After being Collected)

NR	SAMPLE TEMPERATURE (F) (Special Request)
NR	SAMPLE PH LEVEL (Special Request)
NR	SPECIFIC GRAVITY OF SAMPLE (Special Request)
NA	CONDITION OF WATER DURING DEVELOPMENT (IF APPLIES)
SANDY	CONDITION OF WATER DURING INITIAL BAILING PERIOD
SANDY	CONDITION OF WATER FOR SAMPLE
NO	DID BAILED PRODUCT HAVE ANY TYPE OF PETROLEUM ODOR
	DOES WELL NEED REDEVELOPED
TPH/GAS/BTEX	TYPE OF ANALYSIS REQUESTED
NORMAL	TURNAROUND TIME REQUESTED
DISPOSABLE	TYPE OF BAILER USED
NO	WAS BAILER CLEANED IN FIELD

This monitoring well field guide is provided to give you the necessary answers to questions you might have concerning the condition of the well. Any recommendations that we make are solely based on knowledge gained from a visual inspection of the well during bailing and sampling. On request we would furnish a cost estimate to complete any recommendations that we made. If you have any further questions concerning this well please call our office for assistance.

SAMPLING SPECIALISTS
A DIVISION OF PRATT CONSULTING COMPANY
COMPLETE WELL DEVELOPMENT SERVICES

ENVIRONMENTAL SAMPLE COLLECTION SPECIALISTS

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1-(415)-932-4256 Fax

MONITORING WELL FIELD NOTES

AQUA-CASTRO VALLEY, CA	PROJECT NAME
1017-038-018	PROJECT NUMBER
05/30/90	DATE OF ACTIVITIES (SAMPLING OR DEVELOPMENT)
JP / MS	BY (SAMPLING TECHNICIANS)
MW-2	CLIENT'S MONITORING/RECOVERY/ VADOSE WELL NUMBER
CLIENT TO PROVIDE	TOP OF CASING ELEVATION (Provided By Client)
8.85'	DEPTH TO WATER FROM WELL CASING BEFORE BAILING
30'	TOTAL DEPTH OF USABLE COLUMN (TO NEAREST FOOT MARKING)
10.50'	DEPTH TO WATER FROM WELL CASING BEFORE SAMPLING
2"	DIAMETER OF MONITORING/RECOVERY/ VADOSE WELL
21.15'	AMOUNT OF WELL COLUMN IN WATER (INCLUDING OIL INTERFACE)
17.98 GALLONS	REQUIRED AMOUNT OF GROUNDWATER TO PURGE FROM WELL IS
25 GALLONS	APPROXIMATE AMOUNT GROUNDWATER REMOVED FROM WELL
STOVE PIPE	TYPE OF SEAL AT GRADE (VANDAL PROOF MANWAY LID/ELEVATED STOVEPIPE)
YES	IS SEAL AT GRADE WATER TIGHT
2" WING NUT PLUG	TYPE OF CAP
YES	IS CAP WATER TIGHT

5	NUMBER OF SAMPLES COLLECTED (40mil VOA FOR GAS/BTEX AND Liters For Diesel
NO	DID 40 mil VOA CONTAINERS HAVE HEADSPACE BEFORE DELIVERY TO LABORATORY
YES	WERE CONTAINERS KEPT ON ICE PRIOR TO BEING DELIVERED TO LABORATORY
YES	WAS THERE A QA / QC SAMPLER BLANK SAMPLE COLLECTED

(All Groundwater Samples Collected Are Kept On ice And Delivered To The Laboratory For Analysis In Less Than 24 Hours After being Collected)

NR	SAMPLE TEMPERATURE (F) (Special Request)
NR	SAMPLE PH LEVEL (Special Request)
NR	SPECIFIC GRAVITY OF SAMPLE (Special Request)
NA	CONDITION OF WATER DURING DEVELOPMENT (IF APPLIES)
SANDY	CONDITION OF WATER DURING INITIAL BAILING PERIOD
SANDY	CONDITION OF WATER FOR SAMPLE
NO	DID BAILED PRODUCT HAVE ANY TYPE OF PETROLEUM ODOR
	DOES WELL NEED REDEVELOPED
TPH/GAS/BTEX	TYPE OF ANALYSIS REQUESTED
NORMAL	TURNAROUND TIME REQUESTED
DISPOSABLE	TYPE OF BAILER USED
NO	WAS BAILER CLEANED IN FIELD

This monitoring well field guide is provided to give you the necessary answers to questions you might have concerning the condition of the well. Any recommendations that we make are solely based on knowledge gained from a visual inspection of the well during bailing and sampling. On request we would furnish a cost estimate to complete any recommendations that we made. If you have any further questions concerning this well please call our office for assistance.

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MONITORING WELL FIELD NOTES

AQUA-CASTRO VALLEY, CA	PROJECT NAME
1017-038-018	PROJECT NUMBER
05/30/90	DATE OF ACTIVITIES (SAMPLING OR DEVELOPMENT)
JP / MS	BY (SAMPLING TECHNICIANS)
MW-3	CLIENT'S MONITORING/RECOVERY/ VADOSE WELL NUMBER
CLIENT TO PROVIDE	TOP OF CASING ELEVATION (Provided By Client)
15.10'	DEPTH TO WATER FROM WELL CASING BEFORE BAILING
59'	TOTAL DEPTH OF USABLE COLUMN (TO NEAREST FOOT MARKING)
17.50'	DEPTH TO WATER FROM WELL CASING BEFORE SAMPLING
2"	DIAMETER OF MONITORING/RECOVERY/ VADOSE WELL
41.50'	AMOUNT OF WELL COLUMN IN WATER (INCLUDING OIL INTERFACE)
35.26 GALLONS	REQUIRED AMOUNT OF GROUNDWATER TO PURGE FROM WELL IS
40 GALLONS	APPROXIMATE AMOUNT GROUNDWATER REMOVED. FROM WELL
STOVE PIPE	TYPE OF SEAL AT GRADE (VANDAL PROOF MANWAY LID/ELEVATED STOVEPIPE)
YES	IS SEAL AT GRADE WATER TIGHT
2" WING NUT PLUG	TYPE OF CAP
YES	IS CAP WATER TIGHT

5	NUMBER OF SAMPLES COLLECTED (40mil VOA FOR GAS/BTEX AND Liters For Diesel
NO	DID 40 mil VOA CONTAINERS HAVE HEADSPACE BEFORE DELIVERY TO LABORATORY
YES	WERE CONTAINERS KEPT ON ICE PRIOR TO BEING DELIVERED TO LABORATORY
YES	WAS THERE A QA / QC SAMPLER BLANK SAMPLE COLLECTED

(All Groundwater Samples Collected Are Kept On ice And Delivered To The Laboratory For Analysis In Less Than 24 Hours After being Collected)

NR	SAMPLE TEMPERATURE (F) (Special Request)
NR	SAMPLE PH LEVEL (Special Request)
NR	SPECIFIC GRAVITY OF SAMPLE (Special Request)
NA	CONDITION OF WATER DURING DEVELOPMENT (IF APPLIES)
SANDY	CONDITION OF WATER DURING INITIAL BAILING PERIOD
SANDY	CONDITION OF WATER FOR SAMPLE
NO	DID BAILED PRODUCT HAVE ANY TYPE OF PETROLEUM ODOR
	DOES WELL NEED REDEVELOPED
TPH/GAS/BTEX/DIESEL	TYPE OF ANALYSIS REQUESTED
TOG / PRIORITY METALS / 625 / 627	
NORMAL	TURNAROUND TIME REQUESTED
DISPOSABLE	TYPE OF BAILER USED
NO	WAS BAILER CLEANED IN FIELD

This monitoring well field guide is provided to give you the necessary answers to questions you might have concerning the condition of the well. Any recommendations that we make are solely based on knowledge gained from a visual inspection of the well during bailing and sampling. On request we would furnish a cost estimate to complete any recommendations that we made. If you have any further questions concerning this well please call our office for assistance.

SAMPLING SPECIALISTS
A DIVISION OF PRATT CONSULTING COMPANY
COMPLETE WELL DEVELOPMENT SERVICES

CHROMALAB FILE # 690001

COMPLETE BAILING, PURGING AND SAMPLING SERVICE FOR
MONITORING, RECOVERY AND VADOSE WELLS IN THE FOLLOWING STATES:
CALIFORNIA, NEVADA, OREGON, WASHINGTON, ARIZONA, IDAHO AND UTAH

Office Locations
3146 Manor Avenue
Walnut Creek, California 94596

12003 49th Street North
Building 307
Clearwater, Florida 34622

1-(415)-932-4356 Office
1-(415)-932-4256 Fax

CHAIN OF CUSTODY DOCUMENT

PROJECT NUMBER: 1017-038-018

PROJECT NAME: AQUA - CASTRO VALLEY

SAMPLERS SIGNATURE: MS & JP

CHECK FOR FIVE (5) DAY VERBAL/FAX SERVICE: * 100%

CHECK FOR EMERGENCY 24 HOUR VERBAL/FAX SERVICE: 200%

DATES	TIME	SAMPLE ID	NUMBER OF SAMPLE	TPH GAS BTEX	TPH DIESEL	TOTAL OIL GREASE	
5-30-90		MW-1-C	6	*			
5-30-90		MW-2-A	6	*			
5-30-90		MW-3-B	6	*	*	*	(* NOTE * C?601)
CUSTOMER		FOR MW-3-B ONLY ALSO WANTS	1) CHLORINATED HYDROCARBONS				
			2) PNA & CREOSOTE				
			3) PRIORITY METALS				
			4)	PCB & POP (625-627?)			

RELINQUISHED BY:	DATE	TIME	RECEIVED BY:
Mike Sprague	06/01/90	8:40 AM	
RELINQUISHED BY:	DATE	TIME	RECEIVED BY:

FAX RESULTS ASAP TO JOHN PRATT AT 1-415-932-4256

BILL AQUASCIENCE ENGINEERS FOR ANALYSIS