aqua science engineers inc.

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April 17, 1992

FINAL REPORT
of
METHODS & FINDINGS
for

ADDITIONAL SITE ASSESSMENT METHODS AND FINDINGS: SOIL BORING AND SAMPLING

at
21065 Foothill Blvd.
Hayward, Ca.

Prepared for: Mr. Roy Breitenbach
2358 Loma Vista Drive
Prescott, AZ 86301

Submitted by: AQUA SCIENCE ENGINEERS, INC.
1041 Shary Circle
Concord, CA 94518

REGISTERED PROFESSIONAL ENGINEER
DAVID M. SCHULTZ
No. 38738
Exp 4-92
CIVIL
STATE OF CALIFORNIA

aqua science engineers inc.

April 21, 1992

Mr. Scott Seery
Alameda County Health Care Services
Department of Environmental Health
80 Swan Way, Rm. 210
Oakland, CA 94621

Re: Final Report: Additional Site Assessment Methods and Findings
21065 Foothill Blvd., Hayward, California.

Mr. Seery,

Please find enclosed a copy of Aqua Science Engineers final report of Additional Site Assessment Methods and Findings performed at the site 21065 Foothill Blvd., in Hayward. We are submitting this final report for review and comments by your department.

Quarterly sampling of the groundwater monitoring well at this facility is scheduled to proceed directly. Your offices should receive a copy of the of sample results in mid May. No other work is planned at this facility.

Respectfully,
AQUA SCIENCE ENGINEERS, INC.

David C. Prull
Project Manager

cc. Mr. Roy Breitenbach
Rich Heitt, Regional Water Quality Control Board

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INTRODUCTION

Aqua Science Engineers, Inc. (ASE) was contracted by the property owner to drill three soil borings at the referenced site and sample soils for petroleum hydrocarbons as gasoline. This scope of work represents the second phase of site assessment activities conducted at "the site", 21065 Foothill Blvd, Hayward, Ca. (Figure 1: Site Location Map). A Preliminary Site Assessment, (ASE, February 12, 1992) composed of one soil boring to 45 feet and converted to a monitoring well was executed at an earlier date. Subsequent to review of the report on preliminary site investigations, the Alameda County Department of Health Services requested the performance of the additional investigative activities documented herein.

The current property owner, Mr. Roy Breitenbach, Prescott, Ariz. leases commercial/warehouse space at this 15,000 sq.ft. site located near the southwest corner of the intersection of Foothill Boulevard and Mattox Road. The site is relatively flat although it drops of slightly along the east boundary where the property fronts onto Foothill Boulevard. The site is bounded on the southeast by other commercial space and on the northwest by residential property. Local topography slopes gently downhill to the west-southwest where the site is located along the crest of low hills near the intersection of Foothill Boulevard and Highway 580.

The site history with regards to contaminated site assessment activities begins in October of 1991 with the removal of a single underground fuel storage facility last containing gasoline. The UST was located near the center of the property (Figure 2: Site Plan). Associated soil sampling conducted at the time of tank removal indicated detectable levels of Total Petroleum Hydrocarbons (TPH) and fuel fractions Benzene, Toluene, Ethylbenzene, and Xylenes (BTEX) in the vicinity of the removed tank. TPH concentrations were reported at 1300 parts per million (ppm); Benzene at 320 parts per billion (ppb), Toluene at 11000 ppb, Ethylbenzene at 2700 ppb and Xylenes at 85000 ppb. Tank removal and soil sampling was performed by Decon Environmental, Hayward, CA. Documentation of the precise depth and location of soil samples was not made available to ASE.

An excavation of petroleum hydrocarbon contaminated soil was undertaken by Decon Environmental, Hayward, CA in November of 1991. An additional 30 cubic yards of contaminated soil were removed from the tank excavation. Documents detailing the total depth of excavation were not made available to ASE. Six (6) soil samples from the pit walls and floor were obtained and analyzed for TPH as gasoline and BTEX. Analysis indicated non-detectable concentrations in all samples for all constituents analyzed. The limits of detection were reported at 1 ppm and 3 ppb for TPH gasoline and fractions, respectively. Copies of tables of previously performed soil tests can be found in Appendix A (Appendix A: Previous Investigative Data).

On January 30, 1991 Aqua Science Engineers mobilized a rotary drill to the site and completed one soil boring to a depth of 44 feet below grade. A two inch groundwater monitoring well was installed in the boring and select samples of soil and groundwater were analyzed for TPH gasoline and fractions. All samples, (3) soil and (1) water, were reported by a State certified lab to be free of petroleum hydrocarbons and fractions at or above the detection limit (Preliminary Site Assessment, ASE, February, 12, 1992).

The purpose of the project detailed herein was to determine whether site soils at the soil boring locations have been impacted by petroleum hydrocarbon contamination previously identified following tank removal.

A brief workplan detailing the scope of work performed was prepared and submitted to the Alameda County Department of Health Services. Upon approval by the Alameda County Department of Health and permitting with the Alameda County Flood Control and Water Conservation District Zone 7, site investigations were initiated on April 13, 1992.

DRILLING PROCEDURES

A brief workplan consisting of a written scope of work and site map showing the location of proposed borings was prepared and submitted to the Alameda County Department of Health Services. The workplan was approved by Mr. Scott Seery of the Alameda County Department of Health prior to permitting the boring program with the Alameda County Flood Control and Water Conservation District Zone 7 (Appendix B: Permits).

Three soil borings denoted B1, B2, and B3 were performed at the site in accordance with the approved workplan. The borings are located within 8 feet of the former tank excavation along an arc bounding the former tank pit on the east side (Figure 2: Site Plan).

A Mobile Drill B-61 hydraulic rotary drill with 4.25" I.D. X 8" O.D. hollow stem augers was used to drill the borings B1, B2, and B3 to 20 feet, 15 feet and 15 feet depth below grade respectfully. Samples were collected on five foot intervals in a 2" by 18" split spoon sampler using a down hole hammer. The borings were backfilled with a neat portland cement and bentonite mixture. (Appendix C: Boring Logs).

Soil excavated by the augers was placed onto plastic sheeting and left on site. The drill rig and augers were high pressure hot washed prior to arrival on site, and the augers were again washed on site after drilling. Steam cleaning and sampler cleaning rinsates were temporarily contained then disposed of on site.

SITE GEOLOGY

Soil types encountered during drilling were logged by an ASE civil engineer using observations of drill spoils, observations made by the driller and samples of soils collected down the hole using standard methods. The first encountered soil type at all three boring locations was thin layer (1.5 feet to 2.5 feet thick) of mildly consolidated alluvial deposits of silty clay. At a depth of approximately 3 feet below grade the soil type changed abruptly to a moderately dense sandy soil described as a weathered form of metamorphic (granitic) rock and gravels with a minor amount of silt and clay filling abundant fractures amid the course grained materials. Increased density and hardness of the soil materials encountered from about 5 feet below grade to the boring terminus was evident, sampler refusal was encountered at several sample depths. Samples retrieved from sampling efforts below the depth of approximately 5 feet showed larger rock fragments, angular fractures in many planes, moist silt and clayey silts in fracture voids, numerous metal oxides, crystalline nodes.

The soils encountered as drilling progressed were logged by the ASE civil engineer using the Unified Soil Classification System (USCS) (Appendix D: Unified Soil Classification System). The surface cover at the boring locations varied from 8" portland concrete to soil to 1" asphaltic concrete. From grade to about 3 feet depth the soils were clay fill, dark brown to black, silty 15%, damp to moist, stiff, (CL). Between 2.5 feet and 5.5 feet depth, the native materials were found to be sands, course to very fine, medium to fine angular gravels 40%, clayey silts 10%, mildly dense, (SP). Between 5 feet and 20 feet depth, the native materials were weathered metamorphic mafic rock, tan brown, v. fine to course grained, clayey silt matrix 10-20%, hard, fractured, iron oxide and manganese oxide nodes abundant (rock).

No fuel product odors were noted at any time during drilling of the bore holes. Groundwater was not encountered in the course of the boring. Groundwater has been measured in an adjacent well (MW-1) at 37 feet below grade.

SOIL SAMPLING PROCEDURES

Undisturbed soil samples were obtained from the borings at 5 foot intervals to 16.0 feet (21.5 feet in B1) depth with a California modified split spoon sampler and a 140 lb. drop hammer. The sampler was advanced ahead of the auger tip by successive blows from the down hole hammer. The samples were collected into pre-cleaned 2" X 6" brass liners, and used for visual soils classification and certified chemical analysis.

Select sample tubes were sealed with aluminum foil, plastic caps and tape, permanently labeled, then placed into a cooler with wet ice for transport to a State Certified Hazardous Waste Analytical Lab following chain of custody procedures. The samplers and liners were cleaned immediately prior to each use with a TSP solution and rinsed with tap water in plastic buckets. Cleaning rinsates were temporarily contained then disposed of on site.

SOIL SAMPLE ANALYSES

Nine selected soil samples were submitted to and analyzed at a State Certified Hazardous Waste Analytical Lab (Geochem Labs, Milpitas). The samples were analyzed for the following constituents using EPA methods approved by the Regional Water Quality Control Board: total petroleum hydrocarbons (TPH) as gasoline with aromatic volatile hydrocarbons Benzene, Toluene, Ethylbenzene and Xylenes (BTEX). Soil samples obtained from B1 at 10.0 feet, 15.0 feet and 20.5 feet depth yielded non-detectable results for all sample analysis. Soil samples obtained from B2 at 5.5 feet, 10.0 feet and 15.5 feet yielded non-detectable results for all sample analysis. Soil samples form B3 at 5.5 feet, 11.0 feet and 15.5 feet yielded non-detectable results for all sample analysis (Appendix E: Soil Sample Analysis).

TABLE ONE: RESULTS OF SOIL SAMPLE ANALYSES (4-17-92)

Sample #	TPH gas mg/kg	benzene ug/kg	toluene ug/kg	ethyl benzene ug/kg	total xylenes ug/kg
B1-10.0	N.D.	N.D.	N.D.	N.D.	N.D.
B1-15.0	N.D.	N.D.	N.D.	N.D.	N.D.
B1-20.5	N.D.	N.D.	N.D.	N.D.	N.D.
B2-5.5	N.D.	N.D.	N.D.	N.D.	N.D.
B2-10.0	N.D.	N.D.	N.D.	N.D.	N.D.
B2-15.5	N.D.	N.D.	N.D.	N.D.	N.D.
B3-5.5	N.D.	N.D.	N.D.	N.D.	N.D.
B3-11.0	N.D.	N.D.	N.D.	N.D.	N.D.
B3-15.5	N.D.	N.D.	N.D.	N.D.	N.D.

mg/kg = parts per million
ug/kg = parts per billion
N.D. = Not Detected

CONCLUSIONS

Three soil borings was drilled and soil sampled at the commercial/warehouse space, 21065 Fremont Boulevard, Hayward, Ca. Soil samples were analyzed at a State Certified lab for petroleum hydrocarbon products as gasoline and fractions.

This work was performed for the property owner as per Alameda County Department of Health direction and in accordance with Regional Water Quality Control Board guidelines. In addition to a soil boring/monitoring well installation performed at an earlier date, this soil sampling plan was conducted in response to the detection of petroleum hydrocarbons in soil following the removal of an underground storage tank last containing gasoline. Soil contamination detected at the time of tank closure was removed through excavation and subsequent landfill disposal. Confirmation sampling performed at the time of soil excavation reported non-detectable concentrations of petroleum hydrocarbons and fractions in excavation sidewall and bottom samples. Likewise, the preliminary assessment composed of a soil boring and groundwater monitoring well within ten feet of the former tank yielded non-detectable concentrations of petroleums and fractions.

The purpose of the project was to assess shallow soils near the former excavation site for petroleum hydrocarbon contamination which may remain after previous remedial action.

Soil borings were advanced with hollow stem auger equipment and soil samples were taken for visual classification and certified chemical analysis. Soils were sampled during drilling at 5 foot intervals to 15 feet depth (B2 and B3) and to 20 foot depth in B1. No fuel product odors were noted during drilling or sampling. Three discrete soil samples were obtained in the elevations between 5 feet and the boring terminus. The samples were submitted for chemical analysis at a State Certified Hazardous Waste Analytical Lab.

Certified chemical analysis of soil samples indicated a distinct lack of the chemicals of interest, namely TPH as gas and BTEX at the sampling locations.

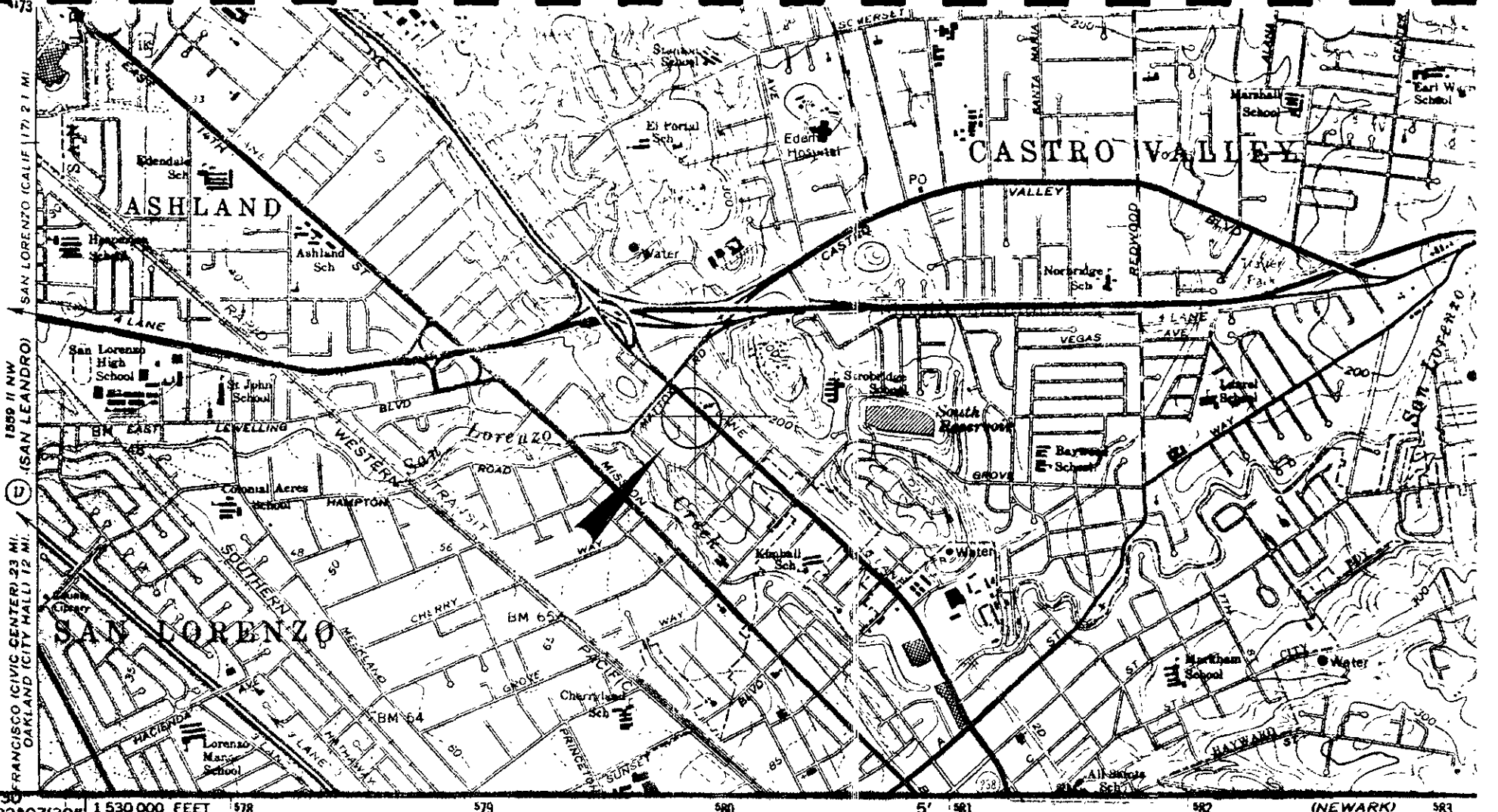
RECOMMENDATIONS

As per current RWQCB guidelines, the existing groundwater monitoring well should be monitored quarterly for one year and the sample results distributed to the Alameda County Department of Health and the RWQCB. Should the well analyze "clean" for the constituents of interest for four consecutive quarters a petition to discontinue groundwater sampling and properly abandon the well may be in order.

LIMITATIONS

This report has been prepared for the exclusive use of Mr. Roy Breitenbach for this project only. The analysis and conclusions in this report are based on conditions encountered at the time of our field activities, information provided to us, and our experience and engineering judgement.

Our work has been performed in a manner consistent with that of care and skill ordinarily exercised by members of the profession currently practicing under similar conditions in the area. No other warranty express or implied, is made.



Mapped, edited, and published by the Geological Survey

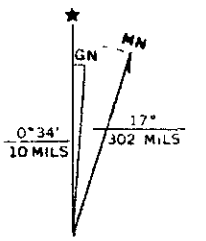
Control by USGS, USC&GS, USCE, and Alameda County

Topography from aerial photographs by photogrammetric methods and by planetable surveys 1947. Revised from aerial photographs taken 1958. Field check 1959

Polyconic projection
10,000-foot grid based on California coordinate system, zone 3
1000-meter Universal Transverse Mercator grid ticks, zone 10, shown in blue 1927 North American Datum
To place on the predicted North American Datum 1983 move the projection lines 14 meters north and 95 meters east as shown by dashed corner ticks

Red tint indicates areas in which only landmark buildings are shown

There may be private inholdings within the boundaries of the National or State reservations shown on this map



UTM GRID AND 1980 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET

Revisions shown in purple and woodland compiled from aerial photographs taken 1979 and other source data This information not field checked. Map edited 1980

SCALE 1:24000

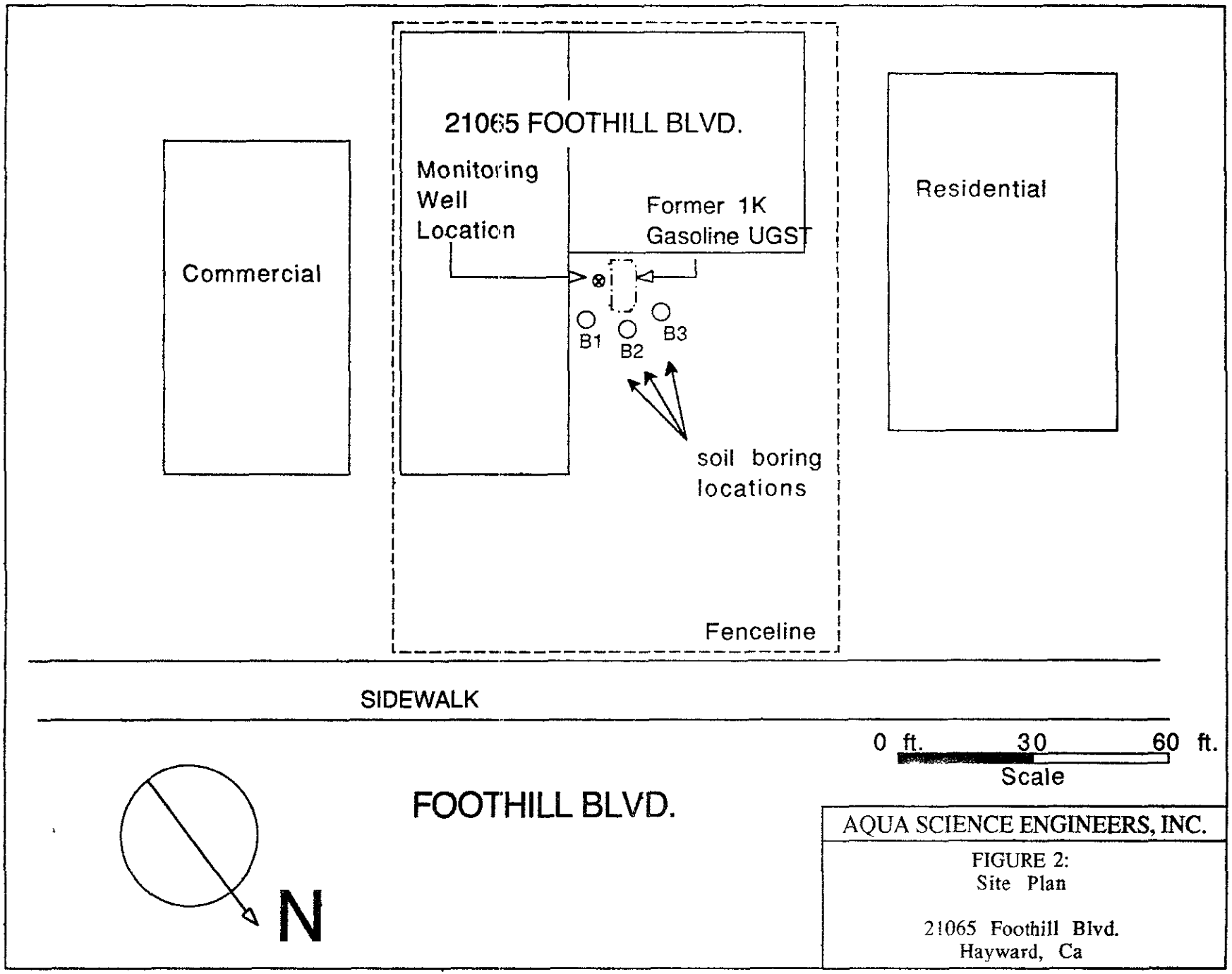
1 0 1/2
1000 0 1000 2000 3000 4000
1 5 0

CONTOUR INTERVAL 20 FEET

AQUA SCIENCE ENGINEERS, INC.

FIGURE 1:
Site Location Map

21065 Foothill Blvd.
Hayward, Ca



AQUA SCIENCE ENGINEERS, INC.

FIGURE 2:
Site Plan

21065 Foothill Blvd.
Hayward, Ca

APPENDIX A - Previous Investigative Data

DECON
ENVIRONMENTAL SERVICES, INC.

December 18, 1991

Mr. Roy Breitenbach
9986 East Fanfol Drive
Scottsdale, AR 85258

RE: UNDERGROUND TANK REMOVAL PROJECT AT 21065 FOOTHILL BOULEVARD IN HAYWARD, CALIFORNIA

Dear Mr. Breitenbach:

The purpose of this letter is to summarize our activities at 21065 Foothill Boulevard in Hayward.

On October 30, 1991, DECON Environmental Services, Inc. (DECON) removed from 21065 Foothill Boulevard in Hayward, California, a 1,000 gallon underground storage tank. Excavation work for this tank began on October 28, 1991.

Under the direction of Pamela Evans, Alameda County Health Department, DECON took two samples from the soil beneath the tank. The samples results, forwarded to you in our letter dated November 5, 1991, showed the presences of petroleum hydrocarbons (BTE&X and total petroleum hydrocarbons, gasoline range).

Shortly after receiving the sample results, DECON returned to the excavation and removed approximately 30 additional yards of soil. Under the direction of Alameda County Health Department, DECON took six samples from the excavation, two from the floor of the excavation, and one from the each sidewall. All six samples showed non-detectable levels of petroleum hydrocarbons. We forwarded the sample results to you in our letter dated December 13, 1991.

After receipt of the analytical results, and in accordance with Alameda County Health Department policies, DECON backfilled the excavation. the excavation area will be paved once the stockpile of soil from the excavation is removed.

26102 Eden Landing Road, Suite 4 Hayward, CA 94545 (415) 732-6444 Fax (415) 782-8584 CL#545726

It is our understanding that Alameda County Health Department policies do not require you to perform any further remedial work (such as groundwater monitoring) with respect to the excavation. This is based on the latest soil analyses from the excavation showing non-detectable levels of petroleum hydrocarbons. The stockpiled soil however, may require remediation and/or removal. DECON is not aware of the condition of the site in areas other than the excavation itself.

If you have any questions regarding the above, please do not hesitate to contact me.

Sincerely,

Anthony Cappella
Project Manager

AC/emt

Superior Precision Analytical, Inc.
1555 Burke, Unit I • San Francisco, California 94124 • (415) 647-2081 / fax (415) 821-7123

C E R T I F I C A T E O F A N A L Y S I S

LABORATORY NO.: 54279
CLIENT: Decon Environmental Services
CLIENT JOB NO.: BREITENBACH

DATE RECEIVED: 10/31/91
DATE REPORTED: 11/07/91

ANALYSIS FOR BENZENE, TOLUENE, ETHYL BENZENE & XYLENES
by EPA SW-846 Methods 5030 and 8020

LAB #	Sample Identification	Concentration(ug/kg) Benzene	Toluene	Ethyl Benzene	Xylenes
1	669-01	ND<3	9	5	160
2	669-02	320	11000	2700	85000

ug/kg - parts per billion (ppb)

Minimum Detection Limit in Soil: 3.0ug/kg

QAQC Summary:
Daily Standard run at 20ug/L: %DIFF 8020 = <15%
MS/MSD Average Recovery = 92% ; Duplicate RPD = 2.9%

Richard Srnec Ph.D.

Laboratory Director

Superior Precision Analytical, Inc.
1555 Burke, Unit I • San Francisco, California 94124 • (415) 647-2081 / fax (415) 821-7123

C E R T I F I C A T E O F A N A L Y S I S

LABORATORY NO.: 54279
CLIENT: Decon Environmental Services
CLIENT JOB NO.: BREITENBACH

DATE RECEIVED: 10/31/91
DATE REPORTED: 11/07/91

ANALYSIS FOR TOTAL PETROLEUM HYDROCARBONS
by Modified EPA SW-846 Method 5030 and 8015

LAB #	Sample Identification	Concentration (mg/kg) Gasoline Range
1	669-01	4
2	669-02	1300

mg/kg - parts per million (ppm)
Minimum Detection Limit for Gasoline in Soil: 1mg/kg

QAQC Summary:
Daily Standard run at 2mg/L: %DIFF Gasoline = <15%
MS/MSD Average Recovery = 92%: Duplicate RPD = 3.1%

Richard Srna, Ph.D.

Laboratory Director

Superior Precision Analytical, Inc.
825 Arnold Drive, Suite 114 • Martinez, California 94553 • (510) 229-1512 / fax (510) 229-1526

CERTIFICATE OF ANALYSIS

LABORATORY NO.: 84357
CLIENT: Decon Environmental Services
CLIENT JOB NO.: 669

DATE RECEIVED: 11/11/91
DATE REPORTED: 11/18/91
DATE SAMPLED : 11/11/91

ANALYSIS FOR TOTAL PETROLEUM HYDROCARBONS
by MODIFIED EPA SW-846 METHOD 5030 and 8015

LAB #	Sample Identification	Concentration (mg/Kg) Gasoline Range
1	669-1111-1	ND<1
2	669-1111-2	ND<1
3	669-1111-3	ND<1
4	669-1111-4	ND<1
5	669-1111-5	ND<1
6	669-1111-6	ND<1

mg/Kg - parts per million (ppm)

Method Detection Limit for Gasoline in Soil: 1 mg/Kg

QAQC Summary:

Daily Standard run at 2mg/L: RPD Gasoline = <15
MS/MSD Average Recovery = 98%: Duplicate RPD = 3

Richard Srna, Ph.D.

Laboratory Director

Superior Precision Analytical, Inc.
825 Arnold Drive, Suite 114 • Martinez, California 94553 • (510) 229-1512 / fax (510) 229-1526

C E R T I F I C A T E O F A N A L Y S I S

LABORATORY NO.: 84357
CLIENT: Decon Environmental Services
CLIENT JOB NO.: 669

DATE RECEIVED: 11/11/91
DATE REPORTED: 11/18/91
DATE SAMPLED : 11/11/91

ANALYSIS FOR BENZENE, TOLUENE, ETHYL BENZENE & XYLENES
by EPA SW-846 Methods 5030 and 8020

LAB #	Sample Identification	Concentration(ug/Kg) Benzene	Toluene	Ethyl Benzene	Xylenes
1	669-1111-1	ND<3	ND<3	ND<3	ND<3
2	669-1111-2	ND<3	ND<3	ND<3	ND<3
3	669-1111-3	ND<3	ND<3	ND<3	ND<3
4	669-1111-4	ND<3	ND<3	ND<3	ND<3
5	669-1111-5	ND<3	ND<3	ND<3	ND<3
6	669-1111-6	ND<3	ND<3	ND<3	ND<3

ug/Kg - parts per billion (ppb)

Method Detection Limit in Soil: 3 ug/Kg

QAQC Summary:

Daily Standard run at 20ug/L: RPD = <15%
MS/MSD Average Recovery = 90%: Duplicate RPD = < 1

Richard Srna, Ph.D.
Laboratory Director

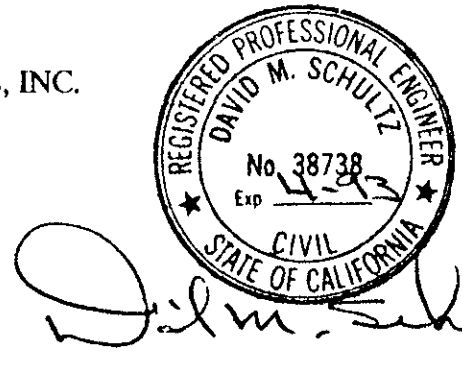
aqua science engineers inc.

FINAL REPORT
of
METHODS & FINDINGS
for

PRELIMINARY SITE ASSESSMENT METHODS AND FINDINGS: SOIL BORING AND SAMPLING, GROUNDWATER MONITORING WELL DRILLING, INSTALLATION, SAMPLING

at
21065 Foothill Blvd.
Hayward, Ca.

submitted by
AQUA SCIENCE ENGINEERS, INC.
Concord, CA 94518



Breitenbach- February 12, 1992

TABLE ONE: RESULTS OF SOIL SAMPLE ANALYSES (1-30-92)

Sample #	TPH gas mg/kg	benzene ug/kg	toluene ug/kg	ethyl benzene ug/kg	total xylenes ug/kg
MW-1,6'	N.D.	N.D.	N.D.	N.D.	N.D.
MW-1,10.5'	N.D.	N.D.	N.D.	N.D.	N.D.
MW-1, 15'	N.D.	N.D.	N.D.	N.D.	N.D.

TABLE TWO: RESULTS OF WATER SAMPLE ANALYSES (2-3-92)

Sample #	TPH gas mg/l	benzene ug/l	toluene ug/l	ethyl benzene ug/l	total xylenes ug/l
MW-1A	N.D.	N.D.	N.D.	N.D.	N.D.

mg/kg and mg/l = parts per million
ug/kg and ug/l = parts per billion
N.D. = Not Detected

CONCLUSIONS

One soil boring was drilled and sampled, then converted into a groundwater monitoring well (MW-1) at the commercial/warehouse space, 21065 Fremont Boulevard, Hayward, Ca. The well was developed and sampled. Soil and groundwater samples were analyzed at a State Certified lab for petroleum hydrocarbon products as gasoline and fractions.

This work was performed for the property owner as per Alameda County Department of Health direction and in accordance with Regional Water Quality Control Board guidelines. The well installation follows directly from an earlier detection of petroleum hydrocarbon contaminated soil in the vicinity of a previously removed underground fuel storage tank last containing gasoline. Previously detected soil contamination was removed through excavation and landfill disposal. Confirming sample analysis performed at the time of soil excavation reported petroleum hydrocarbons and fractions not detected in excavation sidewall and bottom samples.

The purpose of the project was to ascertain the possible presence of earlier identified petroleum hydrocarbon contamination in shallow site groundwater near the former excavation site.

The boring was advanced with hollow stem auger equipment, and soil samples were taken for visual classification and certified chemical analysis. The well was installed by placing 2" schedule 40 PVC well casing through the augers to near total depth, followed by the emplacement of sand, bentonite, and cement, in that order, through the augers as well. The well specifications were based on field observations of subsurface soil and groundwater conditions.

The soils were sampled during drilling at 5 foot intervals to 15 feet depth and at 10 foot intervals from 20 to 44 feet total depth. Fuel product odors were not noted during drilling or sampling. Three discrete soil samples were obtained in the elevations between 5 feet and 15 feet below grade. The samples were submitted for chemical analysis at a State Certified Hazardous Waste Analytical Lab.

Development, purging and sampling of the well were performed. A groundwater sample was obtained for chemical analysis at a State Certified Hazardous Waste Analytical Lab.

Certified chemical analysis of soil and groundwater samples indicated a distinct lack of the chemicals of interest, namely TPH as gas and BTEX at the sampling locations.

The depth to free groundwater was measured at 37 feet depth below grade at the well site. At the time of groundwater sampling, site groundwaters at the well location had not been impacted by petroleum hydrocarbons.

RECOMMENDATIONS

As per current RWQCB guidelines, the well should be monitored quarterly for one year and the sample results distributed to the Alameda County Department of Health and the RWQCB. Should the well analyze "clean" for the constituents of interest for four consecutive quarters a petition to discontinue groundwater sampling and properly abandon the well may be in order.

LIMITATIONS

This report has been prepared for the exclusive use of Mr. Roy Breitenbach for this project only. The analysis and conclusions in this report are based on conditions encountered at the time of our field activities, information provided to us, and our experience and engineering judgement.

Our work has been performed in a manner consistent with that of care and skill ordinarily exercised by members of the profession currently practicing under similar conditions in the area. No other warranty express or implied, is made.

APPENDIX B - Permits

ALAMEDA COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT

5997 PARKSIDE DRIVE • PLEASANTON, CALIFORNIA 94588 • (510) 484-2600

DRILLING PERMIT APPLICATION

FOR APPLICANT TO COMPLETE

LOCATION OF PROJECT 21065 Foothill Blvd. Hayward, Ca.

CLIENT
Name Mr. Roy Breitenbach
Address 2354 Loma Vista Dr Phone 602-776-8995
City Prescott AZ Zip 86301

APPLICANT
Name Aqua Science Engineers, Inc.
Address 1041 Shary Circle Phone 510-685-6700
City Concord Zip 94518

TYPE OF PROJECT

Well Construction		Geotechnical Investigation	
Cathodic Protection	___	General	
Water Supply	___	Contamination	X
Monitoring	___	Well Destruction	___

PROPOSED WATER SUPPLY WELL USE n/a
Domestic ___ Industrial ___ Other ___
Municipal ___ Irrigation ___

DRILLING METHOD:
Mud Rotary ___ Air Rotary ___ Auger X
Cable ___ Other ___

DRILLER'S LICENSE NO. 487000

WELL PROJECTS
Drill Hole Diameter ~~0~~ in. Maximum
Casing Diameter ~~0~~ in. Depth ~~20~~ ft.
Surface Seal Depth ~~0~~ ft. Number ~~0~~

GEOTECHNICAL PROJECTS
Number of Borings 3 Maximum
Hole Diameter 7 in. Depth 20 ft.

ESTIMATED STARTING DATE 4-10-92
ESTIMATED COMPLETION DATE 4-10-92

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

APPLICANT'S SIGNATURE [signature] Date 4-8-92

FOR OFFICE USE

PERMIT NUMBER 92170
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 and irrigation wells unless a lesser depth is specially approved. Minimum seal depth for monitoring wells is the maximum depth practicable or 20 feet.

(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 9 Apr 92
Wyman Hong

51991

APPENDIX C - Boring Logs

PROJECT: Breitenbach- 21065 Foothill Blvd., Hayward, CA

LOG OF BORING # **B-1** sheet 1 of 1

DEPTH FEET	SOILS/ROCK DESCRIPTION	GRAPHIC LOG	BACKFILL DETAILS	REMARKS
0				
1	1" asphalt, 5" Brown Silt & Clay, mf gravel 50% (GW)		asphalt patch	
2	Drk. Brown. Blk. Clay, silty 15%, damp (CL)			no odors
3	Lt. Brown. Tan. cmf Sand, silty matrix < 10%,			
4	mf gravel 40%, mildly consolidated			
5	weathered metamorphic mafic (granitic) rock.			soil sample 5-6.0'
6	Lt. Brown. Tan. angular fragmented metamorphic		Portland Cement / Bentonite Grout	no odors (0 ppm)
7	(granitic) rock, silty matrix <10%, MnOx, FeOx,			
8	SiOx, moderately consolidated.			
9				
10	Lt Brown. Tan. angular fragmented metamorphic			soil sample 10-10.5'
11	(granitic) rock, silty matrix <10%, MnOx, FeOx,			no odors
12	SiOx, moderately consolidated.			
13				
14				
15	Lt. Brown. Tan. angular fragmented metamorphic			soil sample 15-15.5
16	(granitic) rock, silty matrix <10%, MnOx, FeOx,			no odors
17	SiOx, moderately consolidated.			
18				
19	Lt. Brown. Tan. angular fragmented metamorphic			
20	(granitic) rock, silty matrix <10%, MnOx, FeOx, SiOx, moderately consolidated. EOB 20'			soil sample 20-21.5'
21				no odors (0 ppm)
22				
23				
24				
25				
26				
27				
28				
29				
30				
31				
32				
33				
34				
35				

41 50 R

60 R

53 R

20 35 50

Logged by: D. Prull Date Logged: 4-13-92
Rig/Driller: B-61, West Hazmat

AQUA SCIENCE ENGINEERS, INC.

PROJECT: Breitenbach- 21065 Foothill Blvd., Hayward, CA

LOG OF BORING # **B-2** sheet 1 of 1

DEPTH FEET	SOILS/ROCK DESCRIPTION	GRAPHIC LOG	BACKFILL DETAILS	REMARKS
0	3" Red Brown Silt and Clay, mf gravel <10% (CL)		Portland Cement / Bentonite Grout asphalt patch	
1				no odors
2	Drk. Brown. Blk. Clay, silty 15%, mf gavel < 10% damp (CL)			
3				
4	Lt. Brown. Tan. cmf Sand, silty matrix < 10%, mf gravel 40%, mildly consolidated			
5	weathered metamorphic mafic (granitic) rock.		19	soil sample 5-6.5'
6	Lt. Brown. Tan. angular fragmented metamorphic (granitic) rock silty matrix <10%, MnOx, FeOx,		20	no odors (0 ppm)
7	SiOx, moderately consolidated, weathered.		23	
8				
9				
10	Lt. Brown. Tan. angular fragmented metamorphic (granitic) rock, silty clay matrix <10%, MnOx,		60	soil sample 10-10.5'
11	FeOx, SiOx, moderately consolidated.		R	no odors
12				
13				
14	Lt. Brown. Tan. angular fragmented metamorphic (granitic) rock, silty matrix <10%, MnOx, FeOx,			
15	SiOx, moderately consolidated. EOB 15'		35	
16			57 R	soil sample 15-16.0 no odors (0 ppm)
17				
18				
19				
20				
21				
22				
23				
24				
25				
26				
27				
28				
29				
30				
31				
32				
33				
34				
35				

Logged by: D. Prull Date Logged: 4-13-92
Rig/Driller: B-61, West Hazmat

AQUA SCIENCE ENGINEERS, INC.

PROJECT: Breitenbach- 21065 Foothill Blvd., Hayward, CA

LOG OF BORING # B-3 sheet 1 of 1

DEPTH FEET	SOILS/ROCK DESCRIPTION	GRAPHIC LOG	BACKFILL DETAILS	REMARKS
0	8" Portland Concrete		Portland Cement / Bentonite Grout asphalt patch	
1	Drk. Brown. Blk. Clay, silty 15%, mf gavel < 10% damp (CL)			no odors
2				
3	Lt. Brown. Tan. cmf Sand, silty clay matrix < 10%, angular mf gravel 40%, mildly consolidated weathered metamorphic mafic (granitic) rock.			
4				
5			18	soil sample 5-6.5'
6	Lt. Brown. Tan angular fragmented metamorphic (granitic) rock, silty matrix <10%, MnOx, FeOx, SiOx, mildly consolidated.		25 27	no odors (0 ppm)
7				
8				
9				
10	Lt. Brown. Tan. angular fragmented metamorphic (granitic) rock, silty clay matrix <10%, MnOx, FeOx, SiOx, moderately consolidated.		39 41 37	soil sample 10-11.5'
11				no odors
12				
13				
14	Lt. Brown. Tan. angular fragmented metamorphic (granitic) rock, silty matrix <10%, MnOx, FeOx, SiOx, moderately consolidated.			
15	EOB 15'		37	
16			80 R	soil sample 15-16.0 (1 ppm)
17				
18				
19				
20				
21				
22				
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28				
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31				
32				
33				
34				
35				

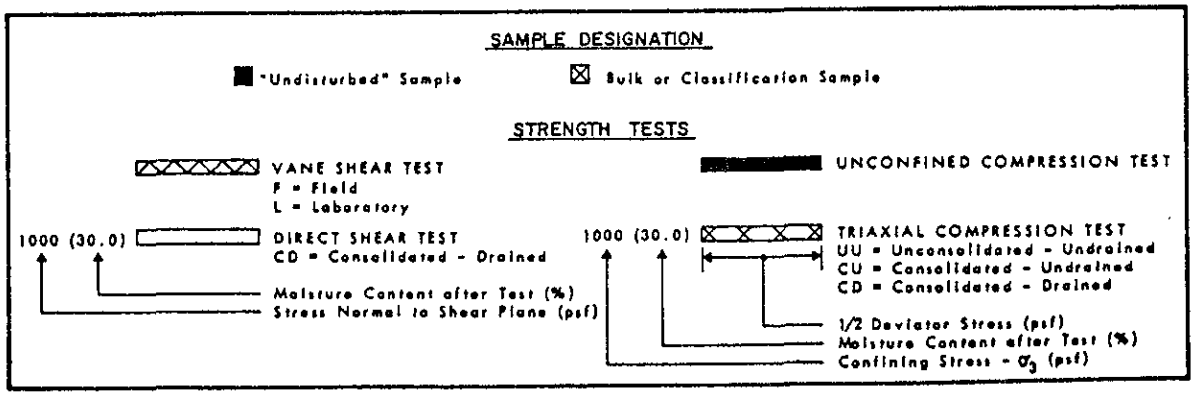
Logged by: D. Prull Date Logged: 4-13-92
Rig/Driller: B-61, West Hazmat

AQUA SCIENCE ENGINEERS, INC.

APPENDIX D - Unified Soil Classification System

MAJOR DIVISIONS				TYPICAL NAMES
COARSE GRAINED SOILS (MORE THAN HALF IS LARGER THAN #200 SIEVE)	GRAVELS (MORE THAN HALF COARSE FRACTION IS LARGER THAN NO. 4 SIEVE SIZE)	CLEAN GRAVELS WITH LITTLE OR NO FINES	GW	WELL GRADED GRAVELS, GRAVEL - SAND MIXTURES
			GP	POORLY GRADED GRAVELS, GRAVEL - SAND MIXTURES
		GRAVELS WITH OVER 12% FINES	GM	SILTY GRAVELS, POORLY GRADED GRAVEL - SAND - SILT MIXTURES
			GC	CLAYEY GRAVELS, POORLY GRADED GRAVEL - SAND - CLAY MIXTURES
	SANDS (MORE THAN HALF COARSE FRACTION IS SMALLER THAN NO. 4 SIEVE SIZE)	CLEAN SANDS WITH LITTLE OR NO FINES	SW	WELL GRADED SANDS, GRAVELLY SANDS
			SP	POORLY GRADED SANDS, GRAVELLY SANDS
		SANDS WITH OVER 12% FINES	SM	SILTY SANDS, POORLY GRADED SAND - SILT MIXTURES
			SC	CLAYEY SANDS, POORLY GRADED SAND - CLAY MIXTURES
FINE GRAINED SOILS (MORE THAN HALF IS SMALLER THAN #200 SIEVE)	SILTS AND CLAYS LIQUID LIMIT LESS THAN 50		ML	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS, OR CLAYEY SILTS WITH SLIGHT PLASTICITY
			CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
			OL	ORGANIC CLAYS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY
	SILTS AND CLAYS LIQUID LIMIT GREATER THAN 50		MH	INORGANIC SILTS, MICACEOUS OR DIATOMACIOUS FINE SANDY OR SILTY SOILS, ELASTIC SILTS
			CH	INORGANIC CLAYS OF HIGH PLASTICITY, FAT CLAYS
			OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS
HIGHLY ORGANIC SOILS			Pt	PEAT AND OTHER HIGHLY ORGANIC SOILS

UNIFIED SOIL CLASSIFICATION SYSTEM



KEY TO TEST DATA

aqua science engineers inc.

UNIFIED SOIL CLASSIFICATION SYSTEM

APPENDIX E - Soil Sample Analyses

GEOCHEM LABS

Precision Environmental Analytical Laboratory

GCL # 0492025

Date: Apr. 15, 1992

AQUA SCIENCE ENGINEERS, INC.
Attn: David Prull
Re: Nine soil samples for Gasoline/BTEX analysis.

Project name: Breitenbach
Project number: 2934
Project Location: 21065 Foothill Blvd.

Date sampled:Apr. 13, 1992
Date submitted:Apr. 13, 1992
Date extracted:Apr. 13-14, 1992
Date analyzed:Apr. 13-14, 1992

RESULTS:

SAMPLE I.D.	Gasoline (mg/Kg)	Benzene (ug/Kg)	Toluene (ug/Kg)	Ethyl Benzene (ug/Kg)	Total Xylenes (ug/Kg)
B1-10.0	N.D.	N.D.	N.D.	N.D.	N.D.
B1-15.0	N.D.	N.D.	N.D.	N.D.	N.D.
B1-20.5	N.D.	N.D.	N.D.	N.D.	N.D.
B2-5.5	N.D.	N.D.	N.D.	N.D.	N.D.
B2-10.0	N.D.	N.D.	N.D.	N.D.	N.D.
B2-15.5	N.D.	N.D.	N.D.	N.D.	N.D.
B3-5.5	N.D.	N.D.	N.D.	N.D.	N.D.
B3-11.0	N.D.	N.D.	N.D.	N.D.	N.D.
B3-15.5	N.D.	N.D.	N.D.	N.D.	N.D.
Blank	N.D.	N.D.	N.D.	N.D.	N.D.
Spiked Recovery	98.2%	105.0%	82.3%	93.4%	83.3%
Duplicate spiked Recovery	100.4%	89.4%	95.4%	92.5%	87.1%
Detection limit	1.0	5.0	5.0	5.0	5.0
Method of Analysis	5030 / 8015	8020	8020	8020	8020

David Duong
Laboratory Director

Tel: 408-946-9636
Fax: 408-946-9663

aqua science engineers inc.

Aqua Science Engineers, Inc.
PO Box 535, San Ramon CA 94583
(415) 820-9391

Chain of Custody

DATE April 13/92 PAGE 1 OF 1

SAMPLERS (SIGNATURE) [signature] (PHONE NO.) (510)685-6700

PROJECT NAME BREITENBACH NO. 2534

ADDRESS 21085 FOOTHILL BLVD.

ANALYSIS REQUEST

SPECIAL INSTRUCTIONS:
STANDARD TURN

SAMPLE ID.	DATE	TIME	MATRIX	NO. OF SAMPLES	TPH- GASOLINE (EPA 5030/8015)	TPH- GASOLINE/BTEX (EPA 5030/8015-8020)	TPH- DIESEL (EPA 3510/8015)	PURGABLE AROMATICS (EPA 602/8020)	PURGABLE HALOCARBONS (EPA 601/8010)	VOLATILE ORGANICS (EPA 624/8240)	BASE/NUETRALS, ACIDS (EPA 625/8270)	OIL & GREASE (EPA 5520 E&F or B&F)	PCB (EPA 608/8080)	PHENOLS (EPA 604/8040)	LUFT METALS (5) (EPA 6010+7000)	PRIORITY POLLUT. (13) (EPA 6010 ICP + 7000)	TITLE 22 (CAM 17) (EPA 6010+7000)	TCLP (EPA 1311/1310)	STLC- CAM MET (EPA 1311/1310)	REACTIVITY CORROSIVITY IGNITABILITY
B1-5.5	4/13/92	8:40	S	1								HOLD								
B1-10.0	4/13/92	8:15	S	1		X														
B1-15.0	4/13/92	8:30	S	1		X														
B1-20.5	4/13/92	9:00	S	1		X														
B2-5.5	4/13/92	9:15	S	1		X														
B2-10.0	4/13/92	9:30	S	1		X														
B2-15.5	4/13/92	9:45	S	1		X														
B3-5.5	4/13/92	10:15	S	1		X														
B3-11.0	4/13/92	10:30	S	1		X														
B3-15.5	4/13/92	10:45	S	1		X														

1. RELINQUISHED BY:	1. RECEIVED BY:	2. RELINQUISHED BY:	2. RECEIVED BY LABORATORY:
[signature] 15:30			VICTOR DUONG
(signature) (time)	(signature) (time)	(signature) (time)	(signature) (time) 15:30
DAVID PRULL 4/13/92			[signature]
(printed name) (date)	(printed name) (date)	(printed name) (date)	(printed name) (date) 4/13/92
Company- ASE	Company-	Company-	Company GEOCHEM LABS