



Wilanco, Inc.

P.O. Box 8117
Berkeley, California 94707
Phone: (510) 525-3750
Fax: (510) 525-9058

November 17, 1995

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

RE: Soil Sampling, Monitoring Well Installation and Initial Groundwater
Sampling at 1081-1085 Eastshore Highway (formerly 1077 Eastshore
Frontage Road, Albany California).

Dear Ms. Shin;

Enclosed please find one copy of the report resulting from
implementation of the workplan dated August 15, 1995 for the installation of
one monitoring well and for the initial (first quarterly) sampling of two of the
monitoring wells at the above described location.

Sincerely,

A handwritten signature in black ink that reads "John W. Piggott". The signature is written in a cursive, flowing style.

John W. Piggott
President

cc: Gary Lowe

RECEIVED
NOV 21 1995
5:12 PM



SOIL SAMPLING
MONITORING WELL INSTALLATION
AND
INITIAL GROUNDWATER SAMPLING
AT
1081-1085 EASTSHORE HIGHWAY
(FORMERLY 1077 EASTSHORE FRONTAGE ROAD)
ALBANY, CALIFORNIA

NOVEMBER 17, 1995

FILED
PRODUCTION
SECTION
NOV 20 PM 2:15

CONTENTS

1.0	INTRODUCTION	1
1.1	PRESENT INVESTIGATION	1
2.0	FIELD OPERATIONS AND INVESTIGATIVE METHODS	2
2.1	Lithologic Logging	2
2.2	Soil Sampling	3
2.3	Monitoring Well Installation	3
2.4	Monitoring Well Purging and Sampling	4
3.0	RESULTS AND DISCUSSION	4
3.1	Geology and Borehole Lithology	4
3.2	Soil Analytical Results	5
3.3	Groundwater Flow Direction and Gradient	5
3.4	Groundwater Analytical Results	6
4.0	CONCLUSIONS AND RECOMMENDATIONS	7
5.0	PROFESSIONAL CERTIFICATION	8

LIST OF FIGURES

- 1 SITE LOCATION MAP
- 2 POTENTIOMETRIC SURFACE MAP OCTOBER 17, 1995

LIST OF ATTACHMENTS

- A Permits/Forms
- B Borehole Lithologic Logs
- C Soil Sample Analytical Results
- D Log of Well Sampling Activities
- E Groundwater Sample Analytical Results

ENVIRONMENTAL
PROTECTION
OCTOBER 20 PM 2:15



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

SOIL SAMPLING
MONITORING WELL INSTALLATION
AND
INITIAL GROUNDWATER SAMPLING
AT
1081-1085 EASTSHORE HIGHWAY
(FORMERLY 1077 EASTSHORE FRONTAGE ROAD)
ALBANY, CALIFORNIA

1.0 INTRODUCTION

The property at 1077 Eastshore Highway (aka Eastshore Frontage Road) in Albany, California was identified as an underground tank leak site by the Alameda County Health Care Services Agency, Department of Environmental Health, Environmental Protection Division (ACHCSA). The property is also known by Alameda County Assessor's Parcel Number 66-2686-5-18. The postal addresses for the property are currently recognized as 1073, 1077, 1081, and 1085 Eastshore Highway. The location of 1073-1085 Eastshore Highway property is shown in Figure 1. The six former underground storage tanks were removed in May of 1992 from the paved area south of the 1081 and west of 1085 addresses.

A workplan for the installation of an additional monitoring well was prepared and was submitted to ACHCSA on August 15, 1995. The ACHCSA approved the workplan in their letter ~~was~~ dated August 18, 1995. The property owner retained H₂OGEOL to conduct this investigation.

1.1 PRESENT INVESTIGATION

The purpose of this investigation is twofold: to determine, to the extent possible, the groundwater flow direction (more precisely direction of groundwater gradient, since the horizontal hydraulic conductivity anisotropy will remain unknown) in the Artificial Fill, Bay Mud, and underlying Merritt Sand and to ascertain the potential presence of underground storage tank derived petrochemicals. The chemicals analyzed and reported are: Total Extractable Petroleum Hydrocarbons as diesel (TPH-D) and Total Petroleum Hydrocarbons as Gasoline (TPH-G), along with the associated aromatic hydrocarbons benzene (B), toluene (T), ethylbenzene (E), and total xylene isomers (X), which are collectively referred to as BTEX.

The present investigation focused on the area in the vicinity of the gasoline tank (Tank Cluster #2) remedial excavation and consisted of drilling one soil sampling borehole to a depth of about seven feet and collecting a soil sample from immediately above the first encountered groundwater; drilling deeper at the same borehole and installation of an additional monitoring well, designated MW-4, to a depth of about fifteen; and collecting and analyzing groundwater samples from the new monitoring well and previously existing downgradient monitoring well "L".

A ZONE 7 Water Agency (also known as Zone 7 Alameda County Flood Control and Water Conservation District) Drilling Permit Application was filed on August 22, 1995 and issued on September 14, 1995. This permit was issued by telefax (Attachment A); the original permit was never received. Upon completion of the well construction, a California Department of Water Resources (DWR) form 188 was filled out for the new well and submitted to Zone 7 as required by the permit (the original DWR form 188 was also submitted to ZONE 7 as stipulated in previous permit cover letters. DWR forms 188 are also included in Attachment A.

2.0 FIELD OPERATIONS AND INVESTIGATIVE METHODS

Field investigations consisted of the installation of one borehole. A 4-inch diameter, 5.6 foot deep borehole was hand augered on October 11, 1995. The 5.6 foot deep borehole was dry and did not encounter groundwater on October 11, 1995, it was therefore allowed to sit open, though covered to avoid a safety hazard, overnight to ensure compliance with the last sentence of paragraph one of the ACHCSA August 18, 1995 workplan approval letter ("If at the time of drilling, the water table is noted to be shallower than 5-feet below ground surface, the proposed screen interval should be adjusted accordingly."). The 5.6 foot deep borehole was dry 07:30 on the morning of October 12, 1995.

The borehole was deepened to about fifteen feet, reamed to 6.25-inch diameter, and completed into monitoring well MW-4 on October 12, 1995.

2.1 Lithologic Logging

During augering of the borehole, soil characteristics were logged in the field by a geologist. Distinguishing features such as soil composition, color, texture, and unusual odors were noted. The soil characteristics were logged in the field according to the Unified Soil Classification System.

Logging began during the hand augering of the 4-inch soil sampling borehole. Logging continued when the monitoring well installation borehole was extended to final depth (14.7 feet). A borehole lithologic log with a well completion diagram is included in Attachment B.

2.2 Soil Sampling

The soil sampling borehole was drilled with 4-inch AMS soil augers. As indicated above, the soil sampling borehole was first augered to a depth of 5.6 feet and allowed to remain open overnight. Following commencement of augering the next morning, the hand augered borehole was advanced until an increase in moisture content indicated that the water table was being approached. First encountered water was at 6.85 ± 0.05 feet.

The soil samples were collected from the bottom of the augered boreholes using an AMS slide hammer to drive a core sampler. A 6-inch long brass soil sample retaining cylinder was housed within the core sampler. When the sampler was extracted from the borehole and disassembled, the brass cylinder was removed. The ends of the brass cylinder were covered with aluminum foil and a tight fitting "cap plug" was affixed to each end so as to ensure air tightness. The sealed tube was labeled and then placed onto ice (water frozen in a 2-liter plastic bottle) in an ice chest while awaiting transport to Superior Analytical Laboratory, Inc., of Martinez, California, a state certified laboratory, for analysis following proper chain of custody documentation (Attachment C along with the laboratory analytical report).

2.3 Monitoring Well Installation

Well construction commenced after the hand augered borehole was reamed to its final diameter. A ten foot section of flush threaded 2-inch inside diameter schedule 40 PVC well casing and slotted screen was installed into the monitoring well borehole. The well was constructed with screen factory slotted to 0.020-inch. Sand (RMC Lonestar, No.3) was poured into the annulus from the ground surface until the sand was 0.55 foot above the screen. After the required amount of sand was added to the annulus, a 0.3 foot bentonite chip seal was placed above the sand pack. The bentonite chips were hydrated with potable water poured from the surface. A neat cement seal was added to prevent infiltration of the sand pack from surface runoff. The well was secured with a cap and traffic rated box set onto concrete and sloped to drain away from the lid. The monitoring well was constructed as follows:

WELL CONSTRUCTION DETAILS

Well Number	Borehole Diameter (inches)	Casing/Screen Diameter (inches)	Total Borehole Depth (feet)	Total Well Depth (feet)	Screened Interval (feet)
MW-4	6.25	2	14.7	14.21	4.7-13.7

The monitoring well was developed on October 12, 1995 by the surge and pump technique during installation of the sand filterpack. Well development continued until the turbidity was lowered to a point where the amount of sediment in the produced water would not interfere with the laboratory analytical procedures. Development occurred prior to the placement of the bentonite and the pouring of the neat cement grout seal. This sequence was followed to ensure that the sandpack was settled to its final depth. Since development occurred prior to grouting, there could be no effect on the seal by well development (the usual reason for waiting from 48 to 72 hours between installation and development of monitoring wells).

The location of monitoring well MW-4 is shown on Figure 2 along with previously existing monitoring wells MW-K, MW-L, and MW-N

2.4 Monitoring Well Purging and Sampling

The two monitoring wells (MW-4 and MW-L) to be sampled were purged on October 17, 1995 by pumping with an "ES-60" submersible pump marketed for monitoring well purging by Enviro-Tech Services Co. of Martinez, California. Field measured water quality parameters were measured using a Cambridge Scientific Industries Hydac™ Conductivity Temperature pH Tester. Well purging activities and the field measured water quality parameters are documented in Attachment D. For each well, purging continued until specific conductance stabilized to +/- 5% on consecutive readings.

Groundwater samples for TPH-D (nonvolatile) analysis were collected in one liter amber bottles directly from the end of the pump discharge tubing prior to removal from the well. The purge pump was slowly removed from each well while running to allow a sweeping of the wellbore, preventing significant surging of the wellbore and drainage of the discharge tubing into the well. Groundwater samples for TPH-G plus BTEX analysis were collected using a precleaned Teflon™ bailer suspended from a new nylon twine line, and emptied through a precleaned Teflon™ peacock type bottom emptying device into 40-mL glass vials with Teflon™ septum lids, in duplicate.

Groundwater sample bottles were labeled and placed in an ice chest with 2 Liter plastic bottles containing ice. Chain-of-Custody forms were filled out and were delivered with the ice chest to Superior Analytical Laboratory, Inc. of Martinez, California, a state certified laboratory. Laboratory reports and Chain-of-Custody documentation are contained in Attachment E.

3.0 RESULTS AND DISCUSSION

3.1 Geology and Borehole Lithology

Below the surface concrete and underlying asphalt surface, and their respective baserock layers, the monitoring well borehole encountered clayey sand/sandy clay fill with fragments of bricks, glass bottles, porcelain jars, cast iron, and other decay resistant

trash to a depth of 6.85 feet. At this depth groundwater was first encountered in a decayed vegetation mat. An oil-like hydrocarbon odor (definitely not a gasoline or aged gasoline-like odor) was noted at this depth. The single soil sample was collected from about the 6.5 to 7 foot depth.

Below the decayed vegetation mat, a dark olive gray clay was next encountered, followed by a greenish gray sandy clay and clay to a depth of about 13.5 feet. This was underlain by a roughly one foot thick black silty clay with abundant root hairs followed in depth by a black very stiff clay. The borehole was terminated in this black very stiff clay, as logs of nearby boreholes suggested that the Merritt Sand would be encountered immediately below the black very stiff clay.

3.2 Soil Analytical Results

The soil sample was submitted to Superior Analytical Laboratory, Inc. for analysis of TPH-D by U.S. EPA Method 3550/8015M; for TPH-G by U.S. EPA Method 5030/8015M, and for BTEX by U.S. EPA Method 8020. The laboratory report and Chain-of-Custody documentation is contained in Attachment C.

The soil sample analytical results were reported by the laboratory as containing:

TPH-D	18	mg/Kg
TPH-G	<1	mg/Kg
Benzene	<5	µg/Kg
Toluene	<5	µg/Kg
Ethylbenzene	<5	µg/Kg
Total Xylenes	<5	µg/Kg

Note: 1.0 mg/Kg = 1,000 µg/Kg; also 1 mg/Kg is about 1 part per million (1 ppm) and 1.0 µg/Kg is about 1 part per billion (1 ppb).

3.3 Groundwater Flow Direction and Gradient

The regional shallow groundwater flow beneath the filled Bay margins in the Albany/Berkeley area is toward the channelized portions of natural drainages and the nearby waters of San Francisco Bay. Local perturbations caused by recharge/discharge from/to cultural features results in a complex pattern of shallow groundwater flow directions.

Depth to water in four monitoring wells was measured to +/- 0.01 feet using a Solinst Model 101 water level meter on October 17, 1995. The depth to water was converted to potentiometric surface elevation by subtracting the measured depths to water from the casing top elevation. This information is presented below.

WELL AND GROUNDWATER ELEVATIONS
OCTOBER 17, 1995

Well Number	Top of Casing Elevation (feet, msl)	Time of Depth measurement	Depth to Water (feet)	Groundwater Surface Elevation (feet, msl)
MW-4	8.58	09:49	6.57	2.01
MW-K	8.43	10:01	5.74	2.69
MW-L	7.64	09:53	5.78	1.86
MW-N	8.96	09:56	6.02	2.94

The approximate average groundwater flow direction for the set of largest possible triangles with a well at each apex is S 16.4° W at a gradient of 0.00530. Figure 2 is a potentiometric surface map showing well locations and groundwater surface contours as measured on October 17, 1995. Groundwater flow is toward Codornices Creek, the channel of which is at about the elevation of the bottom of the Artificial Fill.

3.4 Groundwater Analytical Results

The groundwater surface at monitoring wells MW-4 and MW-L were checked for free product, observation of sheen, and odor. No free product or sheen was found at MW-L. Groundwater from monitoring well MW-4 possessed several 0.5 to 1 millimeter macroglobules of floating hydrocarbons.

Groundwater samples were submitted to Superior Analytical Laboratory, Inc. for analysis of TPH-D by U.S. EPA Method 3510/8015M; for TPH-G by U.S. EPA Method 5030/8015M and for BTEX by method 602/8020. The laboratory report and Chain-of-Custody documentation is contained in Attachment E.

A comparison is made with maximum contaminant levels (MCLs) as listed in: Marshack, Jon B., D. Env., May, 1993, A Compilation of Water Quality Goals, California Regional Water Quality Control Board, Central Valley Region.

Groundwater samples from both monitoring wells was reported as containing TPH-Diesel: 440 µg/L at MW-4 and 180 µg/L at MW-L.

The gasoline fuel constituent (TPH-G+BTEX) analyses were reported as N.D. for MW-4. The groundwater sample from MW-L contained 1.3 µg/L benzene and trace ethylbenzene (0.6 µg/L) and total xylene isomers (0.5 µg/L). Fuel hydrocarbon constituents are summarized as follows, with all concentrations are expressed in micrograms per liter (µg/L):

Well	TPH-D	TPH-G	Benzene	Toluene	Ethyl- benzene	Total Xylenes
MW-4	440	<50	<0.5	<0.5	<0.5	<0.5
MW-L	180	<50	1.3	<0.5	0.6	0.5
California*Primary MCL's	na	na	1	na	680	1,750
US E.P.A.*Primary MCL's	na	na	5	1,000	700	10,000

The only fuel hydrocarbon exceeding an identified published regulatory threshold is benzene in groundwater from monitoring well MW-L, and then only marginally (1.3 compared to 1.0).

4.0 CONCLUSIONS AND RECOMMENDATIONS

The soil sample collected near the groundwater interface from the borehole for MW-4 in the vicinity of the gasoline tank (Tank Cluster #2) remedial excavations was found not to contain gasoline derived petroleum hydrocarbons. Diesel range hydrocarbon compounds were found at 18 mg/Kg, well below a concentrations of concern (> 100 ppm).

MW-4 is downgradient, and immediately adjacent to the gasoline tank remedial excavation. Groundwater samples from this monitoring well was found not to contain detectable concentrations of gasoline derived petroleum hydrocarbons. The groundwater sample from MW-4 was found to contain 440 µg/L Diesel range hydrocarbon compounds.

MW-L is downgradient, and immediately adjacent to the diesel tank cluster remedial excavation. Benzene at a concentration minusculely above the MCL, as well as barely detectable concentrations of ethylbenzene and total xylene isomers were reported.

As specified in the ACHCSA August 18, 1995 workplan approval letter, TPH-D, TPH-G and the aromatic hydrocarbons (BTEX) should be monitored quarterly. The Second consecutive quarter will occur during the week of January 08, 1996; the Third during the week of April 08, 1996; and the Fourth during the week of July 08, 1996. unforeseen circumstances may alter this schedule slightly.

5.0 PROFESSIONAL CERTIFICATION

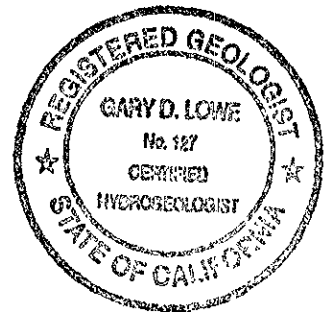
This report on an additional borehole/monitoring well installation at the property at 1081-1085 Eastshore Highway in Albany, California has been prepared by H₂OGEOL A GroundWater Consultancy, by and under the professional supervision of the sole proprietor. The findings, recommendations, specifications, or professional opinions are presented after being investigated and prepared in accordance with generally accepted professional environmental hydrogeologic and groundwater monitoring practice. This report incorporates information developed by Aqua Resources, Inc., Engineering-Science, ENSR Consulting and Engineering, and Ron Archer, civil Engineer, Inc. Incorporation of information developed and or reported by others does not necessarily mean that the undersigned accepts that information as valid. There is no other warranty, either expressed or implied.

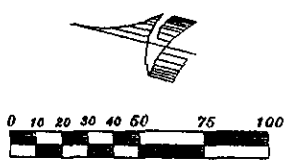
This report was prepared by:



A handwritten signature in black ink, appearing to read "Gary D. Lowe", written over a horizontal line.

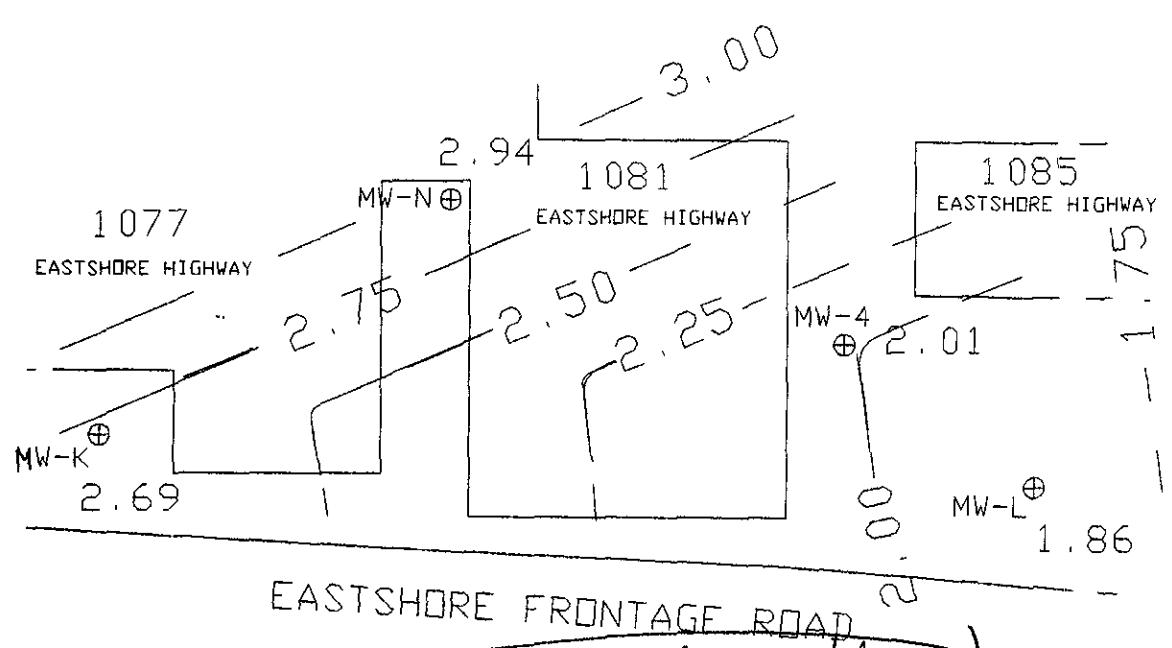
Gary D. Lowe, R.G., C.E.G., C.H.
Principal, Hydrogeologist
H₂OGEOL A GroundWater Consultancy





MW-N Monitoring Well name/Number
 ⊕ Monitoring Well Location
 2.94 Groundwater Surface Elevation
 at monitoring well

— 3.00 Potentiometric Surface Contour
 and Contour Elevation



GRADIENT = 0.00530 Feet/Foot

DIRECTION OF GRADIENT = S 16.4°W
 (Approximate groundwater flow direction,
 uncorrected for hydraulic conductivity anisotropy).



POTENTIOMETRIC SURFACE MAP
 OCTOBER 17, 1996
 1077-1085 EASTSHORE HIGHWAY
 ALBANY, CALIFORNIA

FIGURE
 2



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

ATTACHMENT A

PERMITS/FORMS

**ZONE 7 WATER AGENCY
DRILLING PERMIT APPLICATION/
PERMIT No. 95590**

AND

**CALIFORNIA DEPARTMENT OF WATER RESOURCES
FORM 188
No. 158547 FOR MW-4**



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

ATTACHMENT B

BOREHOLE LITHOLOGIC LOGS

**NEW WELL MW-4
AND
PREVIOUSLY EXISTING WELLS
MW-K
MW-L
MW-N**



A GROUND WATER CONSULTANCY

BOREHOLE LITHOLOGIC LOG

BOREHOLE No. MW-4 Sheet 1 of 1

Project No.:	Date:	10/11-12/95	Drilling Co.:	ASE Drilling	Drill Model:	Iwan Auger
Client:	Wilanco, Inc.		Drilling Method:	Hand Operation	Borehole Diameter:	6.25-in
Location:	1077 Eastshore Frontage Road		Ground Surface Elevation:	11.1	Datum:	ground surface
	Albany, California		Borehole MW-4 was completed as a monitoring well MW-4			
Logged by:	GDL	Driller:	RCV/GDL			

Water Level	Dry, > 5.6 Ft.	6.67 Ft.	
Time	7:30	9:49	
Date	10/12/95	10/17/96	

Sampling Blowcounts	PID/FID HNU/OVA reading	Depth test	Sample Soil Sample Number	Graphic Soil Symbol	USCS Soil Symbol
		1			Fill
		2			Fill
		3			Fill
		4			Clay
		5			Fill
		6			Fill
		7	6.5-7 Ft.		CL
		8			CL
		9			CL
		10			CL
		11			CL
		12			CL
		13			CL
		14			CL
		15			CL
		16			
		17			
		18			
		19			
		20			
		21			
		22			
		23			
		24			
		25			

Field Soil Description	
Concrete	Well completed with 12-inch traffic rated type cover.
Baserock - sand, crushed rock, broken/crushed brick and asphalt	
Distinct horizontal asphalt layer .2 feet thick	
Dark olive 5Y 3/2 silty clay with gravel & brick.	
Dark olive 5Y 3/2 clayey sand, dry	
Neat Cement Grout	
Reddish brown 5YR 4/3 clayey sand, glass bottle bottoms at 3.2, & 3.8 Ft.	Bentonite Seal
Clay	
Dark olive 5Y 3/2 / Reddish brown 5YR 4/3 gravelly, sandy clay with cast iron, brick and porcelain fragments at 5.2 feet.	
First Encountered Water at 6.85 Feet. Hydrocarbon odor to water.	▼
Dark olive gray 5Y 3/2 clay with abundant vegetation remains	
Beginning at 8.2 feet, increasing sand content with depth. to 9.3 feet	
Greenish gray 5GY 5/1 sandy clay with brown root hairs	
Greenish gray 5GY 5/1 clay	
Greenish gray 5GY 5/1 stiff clay	LONESTAR No 3 Sand
Black 7.5YR 2/6 silty clay with abundant vegetation fragments.	
Black 7.5YR 2/6 very stiff clay.	Total Well Depth = 14.21 Feet. (below reference mark)

2-inch PVC casing and screen, screen openings = 0.020 inch

Total Depth 14.7 (below grade)

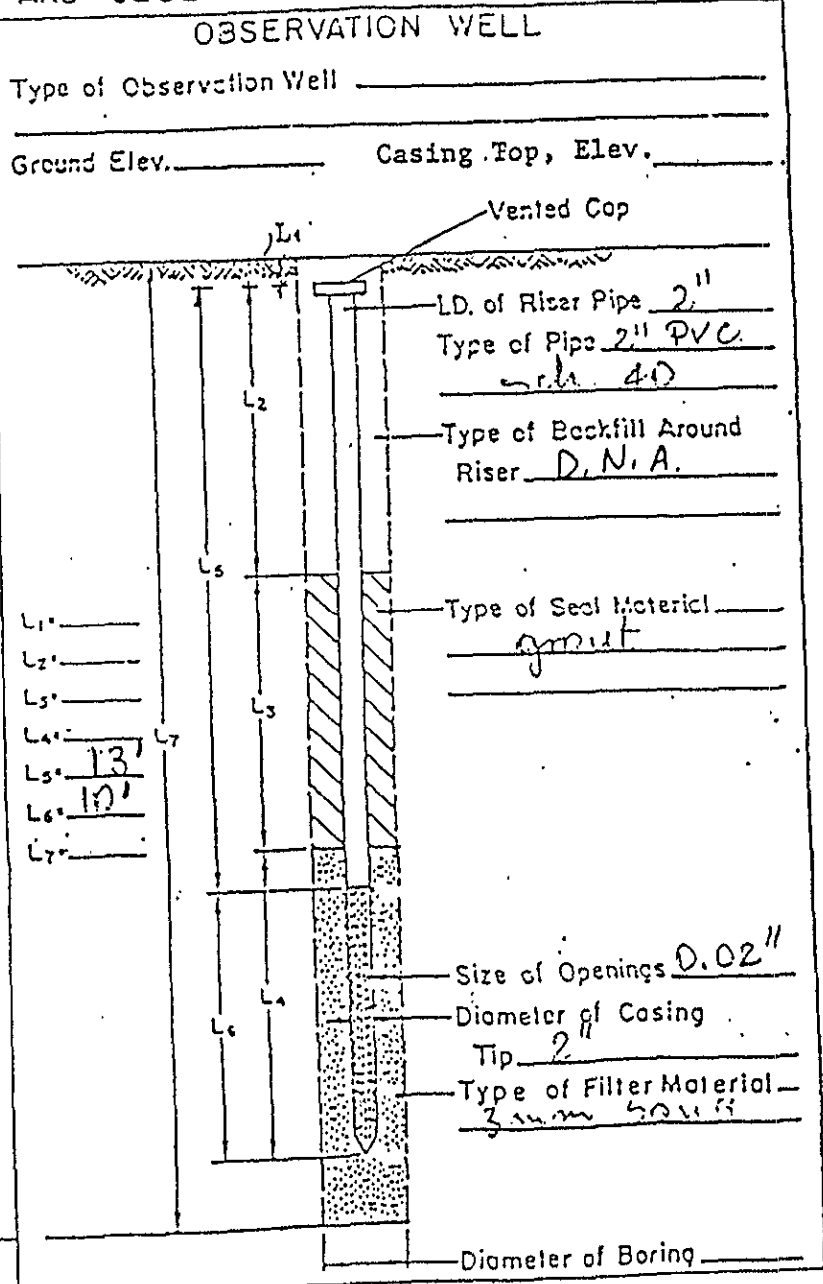
OBSERVATION WELL INSTALLATION REPORT

Observation Well No. K
 Location Barkeley
 Date 12. Dec. 85 Time 12:30 AM
 Installed By John Carver

Sierra Diesel
 hollow stem
 Installation Boring advanced to 24 ft. Augers withdrawn and bentonite pellets added to plug bottom. 1 ft. of 3 mm sand filter pack placed inside. After augers removed, grout seal placed.

LOG OF BORING AND OBSERVATION WELL

Interval	Description
	5" concrete
	18" gravel
	4" sand
	20" air
	Bay mud to 17'



1) Bentonite plug from 24' to 23'
 2) Water level 6.2 ft measured from casing top (approximate values)
 Inspected By _____



OBSERVATION WELL INSTALLATION REPORT

Project: Sierra Diesel Observation Well No: L
 Type of Rig: Shallow steel Installed By: Holm Over Location: _____
 Date: Dec 12 Time: 9:30

Method of Installation: Boring advanced to 15'. Annulars with 1" sand bentonite pellets added to plug bottom. Lost casing and 3" mud sand. Filter pack placed inside auger. After auger removed, "grout" seal placed.

LOG OF BORING AND OBSERVATION WELL

BORING			OBSERVATION WELL		
Depth In Ft.	Cored Interval	Description	Type of Observation Well	Ground Elev.	Casing Top, Elev.
25		4" asphalt			
		10" gravel			
		2" sand			
30		24" clay			
		Bay Mud to 15'			
35		Total depth of well 15'			
40					

Vented Cap LD. of Riser Pipe <u>2"</u> Type of Pipe <u>Sch. 40 PVC</u> Type of Backfill Around Riser <u>D.N.A.</u> Type of Seal Material <u>grout</u> Size of Openings <u>0.02"</u> Diameter of Casing Tip <u>2"</u> Type of Filter Material <u>3mm sand</u> Diameter of Boring _____	
---	--

Remarks: 1) bottom of the well sealed with 1' of bentonite
2) Water level 5.5 ft measured from top of casing (Approximate value)

Inspected By: _____

CLIENT Williams & Lane/SDDA

TEST HOLE NUMBER N

LOCATION 1077 Eastshore Hwy., Albany

DATE 6/10/86

SURFACE ELEVATION 11.43

DEPTH TO WATER 6'

HOLE DIAMETER 8 Inches

DRILLING METHOD Hollow Stem Auger

DRILLER Aqua Science Engineers

GEOLOGIST K. Chesick/N. Siler

GEOLOGIC LOG

WELL CONSTRUCTION	DEPTH (Feet)	Lithologic Description	Sample	Blow Counts per 6" Depth (Standard Hammer)
Cement grout (0-2 ft)		Damp crumbly brown green clay, minor sand and pebbles-wood fragments		
Bentonite Seal (2-3.5ft)		Damp crumbly grey clay with debris and minor pebbles	Split Spoon	2-3-2
Monterey Sand #3 (3.5-24ft)		Moist black organic sandy silty clay heavy solvent odor Saturated stiff sandy silty dark grey clay minor pebbles solvent odor		
Bentonite Plug (24.0-24.5ft)		Saturated stiff grey clay, solvent odor		
		Saturated grey clay with fragments of very stiff green clay. Slight solvent odor.		
		Very stiff green sandy silty clay with layers of saturated grey clay		
		Tan silty sandy clay extruded as slurry		
		Bottom of Hole		



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

ATTACHMENT C

SOIL SAMPLE ANALYTICAL RESULTS

**SUPERIOR ANALYTICAL LABORATORY, INC.
LABORATORY NUMBER 20293**



Superior

Analytical Laboratory



Superior

Analytical Laboratory

H2OGEOL A GROUNDWATER CONSULTANCY
P.O. BOX 2165
LIVERMORE, CA 94551

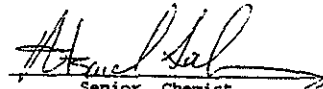
Date: October 20, 1995

Attn: GARY D. LOWE

Laboratory Number : 20293

Project Number/Name : 1077

This report has been reviewed and
approved for release.


Senior Chemist
Account Manager

Customer Service: (800) 521-6109 • Laboratory: (510) 313-0850 • Facsimile: (510) 229-0916
Post Office Box 2648 • 835 Arnold Drive • Suite #106 • Martinez, California 94553
1555 Burke Street • Suite A • San Francisco, California 94124

H2OGEOL A GROUNDWATER CONSULTANCY
Attn: GARY D. LOWE

Project 1077
Reported on October 20, 1995

Gasoline Range Petroleum Hydrocarbons and BTXE
by EPA SW-846 5030/8015H/8020
Gasoline Range quantitated as all compounds from C6-C10

Chronology

Laboratory Number 20293

Sample ID	Sampled	Received	Extract.	Analyzed	QC Batch	LAB #
HW-4 6.5-7	10/12/95	10/13/95	10/20/95	10/20/95	BJ171.05	01

QC Samples

QC Batch #	QC Sample ID	TypeRef.	Matrix	Extract.	Analyzed
BJ171.05-01	Method Blank	MS	Soil	10/17/95	10/17/95
BJ171.05-02	Laboratory Spike	LS	Soil	10/17/95	10/17/95
BJ171.05-03	Laboratory Spike Duplicate	LSD	Soil	10/17/95	10/17/95
BJ171.05-04	1210-004	MS 20300-04	Soil	10/17/95	10/17/95
BJ171.05-05	1210-004	MSD 20300-04	Soil	10/17/95	10/17/95



Superior
Analytical Laboratory

H2OGEOL A GROUNDWATER CONSULTANCY
Attn: GARY D. LOWE

Project 1077
Reported on October 20, 1995

Gasoline Range Petroleum Hydrocarbons and BTX
by EPA SW-846 5030/8015M/8020
Gasoline Range quantitated as all compounds from C6-C10

LAB ID	Sample ID	Matrix	Dil.Factor	Moisture
20293-01	MW-4 6.5-7	Soil	1.0	-

RESULTS OF ANALYSIS

Compound	20293-01 Conc. RL mg/kg
Gasoline_Range	ND 1
Benzene	ND 0.005
Toluene	ND 0.005
Ethyl Benzene	ND 0.005
Xylenes	ND 0.005

>> Surrogate Recoveries (%) <<
Trifluorotoluene (SS) 109



Superior
Analytical Laboratory

Gasoline Range Petroleum Hydrocarbons and BTX
by EPA SW-846 5030/8015M/8020
Gasoline Range quantitated as all compounds from C6-C10

Quality Assurance and Control Data

Laboratory Number: 20293
Method Blank(s)

BJ171.05-01
Conc. RL
mg/kg

Gasoline_Range	ND	1
Benzene	ND	0.005
Toluene	ND	0.005
Ethyl Benzene	ND	0.005
Xylenes	ND	0.005

>> Surrogate Recoveries (%) <<
Trifluorotoluene (SS) 101



Superior
Analytical Laboratory

Gasoline Range Petroleum Hydrocarbons and BTXE
by EPA SW-846 5030/8015M/8020
Gasoline Range quantitated as all compounds from C6-C10

Quality Assurance and Control Data

Laboratory Number: 20293

Compound	Sample conc.	SPK Level	SPK Result	Recovery %	Limits %	RPD %
For Soil Matrix (mg/kg)						
BJ171.05 02 / 03 - Laboratory Control Spikes						
Gasoline_Range		3.20	4/4	125/125	65-135	0
Benzene		0.200	0.22/0.22	110/110	65-135	0
Toluene		0.200	0.22/0.22	110/110	65-135	0
Ethyl Benzene		0.200	0.22/0.22	110/110	65-135	0
Xylenes		0.600	0.66/0.65	110/108	65-135	2

>> Surrogate Recoveries (%) <<
Trifluorotoluene (SS)

96/98 50-150

For Soil Matrix (mg/kg)
BJ171.05 04 / 05 - Sample Spiked: 20300 - 04

Gasoline_Range	ND	3.20	4/4	125/125	65-135	0
Benzene	ND	0.200	0.23/0.23	115/115	65-135	0
Toluene	ND	0.200	0.22/0.23	110/115	65-135	4
Ethyl Benzene	ND	0.200	0.22/0.22	110/110	65-135	0
Xylenes	ND	0.600	0.66/0.66	110/110	65-135	0

>> Surrogate Recoveries (%) <<
Trifluorotoluene (SS)

98/101 50-150

Definitions:

ND = Not Detected
RL = Reporting Limit
NA = Not Analysed
RPD = Relative Percent Difference
ug/L = parts per billion (ppb)
mg/L = parts per million (ppm)

ug/kg = parts per billion (ppb)
mg/kg = parts per million (ppm)



Superior
Analytical Laboratory

H2OGEOL A GROUNDWATER CONSULTANCY
Attn: GARY D. LOWE

Project 1077
Reported on October 23, 1995

Total Petroleum Hydrocarbons as Diesel
by EPA SW-846 Method 8015M
Diesel Range quantitated as all compounds from C10-C25

Chronology

Laboratory Number 20293

Sample ID	Sampled	Received	Extract.	Analyzed	QC Batch	LAB #
MW-4 6.5-7	10/12/95	10/13/95	10/19/95	10/20/95	BJ191.29	01

QC Samples

QC Batch #	QC Sample ID	TypeRef.	Matrix	Extract.	Analyzed
BJ191.29-01	Method Blank	MB	Soil	10/19/95	10/19/95
BJ191.29-02	Laboratory Spike	LS	Soil	10/19/95	10/19/95
BJ191.29-03	Laboratory Spike Duplicate	LSD	Soil	10/19/95	10/19/95
BJ191.29-04	MW-4 6.5-7	MS 20293-01	Soil	10/19/95	10/20/95
BJ191.29-05	MW-4 6.5-7	MSD 20293-01	Soil	10/19/95	10/20/95



Superior
Analytical Laboratory

H2OGEOL A GROUNDWATER CONSULTANCY
Attn: GARY D. LOWE

Project 1077
Reported on October 23, 1995

Total Petroleum Hydrocarbons as Diesel
by EPA SW-846 Method 8015M
Diesel Range quantitated as all compounds from C10-C25

LAB ID	Sample ID	Matrix	Dil.Factor	Moisture
20293-01	MW-4 6.5-7	Soil	1.0	-

RESULTS OF ANALYSIS

Compound	20293-01 Conc. RL mg/kg
Diesel:	18 1
>> Surrogate Recoveries (%) << Tetracosane	89



Superior
Analytical Laboratory

Total Petroleum Hydrocarbons as Diesel
by EPA SW-846 Method 8015M
Diesel Range quantitated as all compounds from C10-C25

Quality Assurance and Control Data

Laboratory Number: 20293
Method Blank(s)

BJ191.29-01
Conc. RL
mg/kg

Diesel:	ND	1
>> Surrogate Recoveries (%) << Tetracosane	56	



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

ATTACHMENT D

LOG OF WELL SAMPLING ACTIVITIES

LOG OF WELL SAMPLING ACTIVITIES

Well Identification: MW-L Project Name: 1077 Eastshore Frontage Rd, Albany, CA Date: 10/17/95

Sampled by: G. Lowe & R. Vorst Weather Conditions: Clear, 74°F, calm

Well Location: Southwest corner Well Casing Diameter: 2-inch Depth of Well Casing: 14.2

Measuring Point: Top of PVC casing Initial Depth to Water: 5.28 Final Depth to Water: Not measured

Casing Volume (1 vol./3 vol): 1.35/4.04 Well Borehole Volume: _____

Purging Method: Centrifugal Pump/Peristaltic Pump
Grundfos Submersible Pump
Centrifugal Pump/ES-60 Submersible
ES-60 Submersible Pump X
 Sampling Method: Peristaltic Pump
Grundfos Submersible Pump
ES-60 Submersible Pump
Teflon Bailor

Purging Rate: See below Total Discharge: 5.9 Casing Volumes Purged: 4.4

Comments: _____

Waste Water Disposal: To property site drum.

Starting Time: 11:50

Time Pump on: 11:34

Date	Time	Gal. Purged	pH	T deg. F	Diluted S.C.	Dil. Factor	S.C. (uS/cm)	Color
10/17/95	11:41	5.2 (empt)	7.05	72.1	16,860	x 2	=	Grey
"	11:45	5.4 (empt)	7.38	70.4	14,440	x 2	=	"
"	11:47	5.6 (empt)	7.44	70.2	14,530	x 2	=	"
"	11:49	5.7 (empt)	7.40	70.1	14,230	x 2	=	"
"	11:54	5.9 (empt)	7.44	70.1	14,190	x 2	=	"
:	:	:	:	:	:	x	=	:
:	:	:	:	:	:	x	=	:
:	:	:	:	:	:	x	=	:
:	:	:	:	:	:	x	=	:
:	:	:	:	:	:	x	=	:
:	:	:	:	:	:	x	=	:

Sample Identification: 1077MW-L Sample Time: 11:58

TURBIDITY ANALYSIS

Finishing Time: 12:03 Time Analyzed: _____ NTU Value: _____

LOG OF WELL SAMPLING ACTIVITIES

Well Identification: MW4 Project Name: 1077 Eastshore Frontage Rd, Albany, CA Date: 10/17/95

Sampled by: G. Lowe & R. Vorst Weather Conditions: Clear, 74°F, calm

Well Location: North side of property Well Casing Diameter: 2-inch Depth of Well Casing: 14.2

Measuring Point: Top of PVC casing Initial Depth to Water: 6.57 Final Depth to Water: Not measured

Casing Volume (1 vol./3 vol): 1.22/3.66 Well Borehole Volume: _____

Purging Method: Centrifugal Pump/Peristaltic Pump
Grundfos Submersible Pump
Centrifugal Pump/ES-60 Submersible
ES-60 Submersible Pump X
 Sampling Method: Peristaltic Pump
Grundfos Submersible Pump
ES-60 Submersible Pump
Teflon Bailor

Purging Rate: See below Total Discharge: 5.4 Casing Volumes Purged: 4.43

Comments: macro/coliform present

Waste Water Disposal: To property site drum.

Starting Time: 12:03

Time Pump on: 12:05

Date	Time	Gal. Purged	pH	T deg. F	Diluted S.C.	Dil. Factor	S.C. (uS/cm)	Color
10/17/95	12:08	4.8 (empt)				x	=	
"	12:11	4.9 (empt)	6.96	72.6		x	= 16,320	Grey
"	12:14	5.1 (empt)	7.01	72.4		x	= 16,380	"
"	12:16	5.3 (empt)	6.91	73.0		x	= 16,210	"
"	12:18	5.4 (empt)	6.93	72.6		x	= 16,240	"
:	:	:	:	:	:	x	=	:
:	:	:	:	:	:	x	=	:
:	:	:	:	:	:	x	=	:
:	:	:	:	:	:	x	=	:
:	:	:	:	:	:	x	=	:
:	:	:	:	:	:	x	=	:

Sample Identification: 1077MW-4 Sample Time: 12:23

TURBIDITY ANALYSIS

Finishing Time: _____ Time Analyzed: _____ NTU Value: _____



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

ATTACHMENT E

GROUNDWATER SAMPLE ANALYTICAL RESULTS

**SUPERIOR ANALYTICAL LABORATORY, INC.
LABORATORY NUMBER 20316**



Superior

Analytical Laboratory

H2OGEOL A GROUNDWATER CONSULTANCY
P.O. BOX 2165
LIVERMORE, CA 94551

Attn: GARY D. LOWE

Laboratory Number : 20316

Date: October 27, 1995

Project Number/Name : 1077

This report has been reviewed and
approved for release.

Senior Chemist
Account Manager

Customer Service: (800) 521-6109 • Laboratory: (510) 313-0850 • Facsimile: (510) 229-0916
Post Office Box 2648 • 835 Arnold Drive • Suite #106 • Martinez, California 94553
1555 Burke Street • Suite A • San Francisco, California 94124



Superior

Analytical Laboratory

H2OGEOL A GROUNDWATER CONSULTANCY
Attn: GARY D. LOWE

Project 1077
Reported on October 23, 1995

Gasoline Range Petroleum Hydrocarbons and BTXE
by EPA SW-846 5030/8015M/8020
Gasoline Range quantitated as all compounds from C6-C10

Chronology

Laboratory Number 20316

Sample ID	Sampled	Received	Extract.	Analyzed	QC Batch	LAB #
MW-4	10/17/95	10/18/95	10/19/95	10/19/95	BJ191.04	01
MW-L	10/17/95	10/18/95	10/19/95	10/19/95	BJ191.04	02

QC Samples

QC Batch #	QC Sample ID	TypeRef.	Matrix	Extract.	Analyzed
BJ191.04-01	Method Blank	MB	Water	10/19/95	10/19/95
BJ191.04-02	Laboratory Spike	LS	Water	10/19/95	10/19/95
BJ191.04-03	Laboratory Spike Duplicate	LSD	Water	10/19/95	10/19/95
BJ191.04-04	DW1	MS 20315-01	Water	10/19/95	10/19/95
BJ191.04-05	DW1	MSD 20315-01	Water	10/19/95	10/19/95



Superior
Analytical Laboratory

H2OGEOL A GROUNDWATER CONSULTANCY
Attn: GARY D. LOWE

Project 1077
Reported on October 23, 1995

Gasoline Range Petroleum Hydrocarbons and BTXE
by EPA SW-846 5030/8015M/8020
Gasoline Range quantitated as all compounds from C6-C10

LAB ID	Sample ID	Matrix	Dil. Factor	Moisture
20316-01	MW-4	Water	1.0	-
20316-02	MW-L	Water	1.0	-

RESULTS OF ANALYSIS

Compound	20316-01		20316-02	
	Conc.	RL	Conc.	RL
	ug/L		ug/L	
Gasoline Range	ND	50	ND	50
Benzene	ND	0.5	1.3	0.5
Toluene	ND	0.5	ND	0.5
Ethyl Benzene	ND	0.5	0.6	0.5
Total Xylenes	ND	0.5	0.5	0.5

>> Surrogate Recoveries (%) <<
Trifluorotoluene (SS) 106 97



Superior
Analytical Laboratory

Gasoline Range Petroleum Hydrocarbons and BTXE
by EPA SW-846 5030/8015M/8020
Gasoline Range quantitated as all compounds from C6-C10

Quality Assurance and Control Data

Laboratory Number: 20316
Method Blank(s)

BJ191.04-01
Conc. RL
ug/L

Gasoline Range	ND	50
Benzene	ND	0.5
Toluene	ND	0.5
Ethyl Benzene	ND	0.5
Total Xylenes	ND	0.5

>> Surrogate Recoveries (%) <<
Trifluorotoluene (SS) 104



Superior
Analytical Laboratory

Gasoline Range Petroleum Hydrocarbons and BTXE
by EPA SW-846 5030/8015H/8020
Gasoline Range quantitated as all compounds from C6-C10

Quality Assurance and Control Data

Laboratory Number: 20316

Compound	Sample conc.	SPK Level	SPK Result	Recovery %	Limits %	RPD %
----------	--------------	-----------	------------	------------	----------	-------

For Water Matrix (ug/L)
BJ191.04 02 / 03 - Laboratory Control Spikes

Gasoline_Range		2000	2100/2000	105/100	65-135	5
Benzene		20	19/19	95/95	65-135	0
Toluene		20	19/19	95/95	65-135	0
Ethyl Benzene		20	19/19	95/95	65-135	0
Total Xylenes		60	58/57	97/95	65-135	2

>> Surrogate Recoveries (%) <<
Trifluorotoluene (SS)

123/123 50-150

For Water Matrix (ug/L)
BJ191.04 04 / 05 - Sample Spiked: 20315 - 01

Gasoline_Range	ND	2000	1831/2010	92/101	65-135	9
Benzene	ND	20	25/21	125/105	65-135	17
Toluene	ND	20	20/20	100/100	65-135	0
Ethyl Benzene	ND	20	20/20	100/100	65-135	0
Total Xylenes	ND	60	59/61	98/102	65-135	4

>> Surrogate Recoveries (%) <<
Trifluorotoluene (SS)

97/100 50-150

Definitions:

ND = Not Detected
RL = Reporting Limit
NA = Not Analysed
RPD = Relative Percent Difference
ug/L = parts per billion (ppb)
mg/L = parts per million (ppm)

ug/kg = parts per billion (ppb)
mg/kg = parts per million (ppm)



Superior
Analytical Laboratory

H2OGEOL A GROUNDWATER CONSULTANCY
Attn: GARY D. LOWE

Project 1077
Reported on October 27, 1995

Total Petroleum Hydrocarbons as Diesel
by EPA SW-846 Method 8015M
Diesel Range quantitated as all compounds from C10-C25

Chronology

Laboratory Number 20316

Sample ID	Sampled	Received	Extract.	Analyzed	QC Batch	LAB #
MW-4	10/17/95	10/18/95	10/23/95	10/25/95	BJ231.29	01
MW-L	10/17/95	10/18/95	10/23/95	10/25/95	BJ231.29	02

QC Samples

QC Batch #	QC Sample ID	TypeRef.	Matrix	Extract.	Analyzed
BJ231.29-01	Method Blank	MB	Water	10/23/95	10/25/95
BJ231.29-02	Laboratory Spike	LS	Water	10/23/95	10/25/95
BJ231.29-03	Laboratory Spike Duplicate	LSD	Water	10/23/95	10/25/95



Superior
Analytical Laboratory

H20GEOL A GROUNDWATER CONSULTANCY
Attn: GARY D. LOWE

Project 1077
Reported on October 27, 1995

Total Petroleum Hydrocarbons as Diesel
by EPA SW-846 Method 8015M

Diesel Range quantitated as all compounds from C10-C25

LAB ID	Sample ID	Matrix	Dil. Factor	Moisture
20316-01	MW-4	Water	1.0	-
20316-02	MW-L	Water	1.0	-

RESULTS OF ANALYSIS

Compound	20316-01		20316-02	
	Conc.	RL	Conc.	RL
	ug/L		ug/L	
Diesel:	440	50	180	50
>> Surrogate Recoveries (%) <<				
Tetracosane	88		86	



Superior
Analytical Laboratory

Total Petroleum Hydrocarbons as Diesel
by EPA SW-846 Method 8015M
Diesel Range quantitated as all compounds from C10-C25

Quality Assurance and Control Data

Laboratory Number: 20316
Method Blank(s)

BJ231.29-01
Conc. RL
ug/L

Diesel:	ND	50
>> Surrogate Recoveries (%) <<		
Tetracosane	84	



Superior Analytical Laboratory

Total Petroleum Hydrocarbons as Diesel
by EPA SW-846 Method 8015M
Diesel Range quantitated as all compounds from C10-C25

Quality Assurance and Control Data

Laboratory Number: 20316

Compound	Sample conc.	SPK Level	SPK Result	Recovery %	Limits %	RPD %
----------	--------------	-----------	------------	------------	----------	-------

For Water Matrix (ug/L)
BJ231.29 02 / 03 - Laboratory Control Spikes

Diesel:	1000	1340/1180	134/118	50-150	13	
-> Surrogate Recoveries (%) <<						
Tetracosane			92/90	50-150		

Definitions:
 ND = Not Detected
 RL = Reporting Limit
 NA = Not Analysed
 RPD = Relative Percent Difference
 ug/L = parts per billion (ppb)
 mg/L = parts per million (ppm)

ug/kg = parts per billion (ppb)
 mg/kg = parts per million (ppm)

20316

H ₂ OCEOL A GROUNDWATER CONSULTANCY						CHAIN OF CUSTODY																																																																										
P.O. BOX 2165 LIVERMORE, CALIFORNIA 94551-2165						DATE: 10/17/95 PAGE 1 of 1																																																																										
SAMPLER(S): Gary D. Lowe & Richard C. Vorst						Sample Source: Wilanco, Inc. 1077 Eastshore Frontage Road Albany, CA																																																																										
SAMPLER'S SIGNATURE: <i>[Signature]</i>						ANALYTE																																																																										
SAMPLE RECEIPT: TOTAL No. of CONTAINERS _____ CHAIN OF CUSTODY SEALS _____ RECD GOOD CONDITION/COLD _____ CONFORMS TO RECORD _____ LAB NO. _____						TPH-gasoline (EPA 8030/8015M) plus BTEX (EPA 602/8020)	TPH-diesel (EPA 3650/8015M)							NUMBER OF CONTAINERS																																																																		
<table border="1"> <thead> <tr> <th>SAMPLE ID.</th> <th>DATE</th> <th>TIME</th> <th>MATRIX</th> <th>LAB ID.</th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> </tr> </thead> <tbody> <tr> <td>1077/MW-4</td> <td>10/17/95</td> <td>12:23</td> <td>water</td> <td></td> <td>X</td> <td>X</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>3</td> </tr> <tr> <td>1077/MW-L</td> <td>10/17/95</td> <td>11:57</td> <td>water</td> <td></td> <td>x</td> <td>x</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>3</td> </tr> <tr> <td colspan="15" style="text-align: center;">A-11 Cool 7</td> </tr> <tr> <td colspan="15" style="text-align: right;">Please note special pricing per Quotation No. 95-00931 10-DAY TAT</td> </tr> </tbody> </table>															SAMPLE ID.	DATE	TIME	MATRIX	LAB ID.											1077/MW-4	10/17/95	12:23	water		X	X								3	1077/MW-L	10/17/95	11:57	water		x	x								3	A-11 Cool 7															Please note special pricing per Quotation No. 95-00931 10-DAY TAT					
SAMPLE ID.	DATE	TIME	MATRIX	LAB ID.																																																																												
1077/MW-4	10/17/95	12:23	water		X	X								3																																																																		
1077/MW-L	10/17/95	11:57	water		x	x								3																																																																		
A-11 Cool 7																																																																																
Please note special pricing per Quotation No. 95-00931 10-DAY TAT																																																																																
RELINQUISHED BY: <i>[Signature]</i>						RELINQUISHED BY: Laboratory Currier																																																																										
SIGNATURE: <i>[Signature]</i>						SIGNATURE: _____																																																																										
PRINTED NAME: Gary D. Lowe						PRINTED NAME: _____																																																																										
DATE: 10/17/95						DATE: _____																																																																										
COMPANY: H ₂ OCEOL						COMPANY: SUPERIOR ANALYTICAL																																																																										
RECEIVED BY: Laboratory Currier						RECEIVED BY LABORATORY: _____																																																																										
SIGNATURE: _____						SIGNATURE: <i>[Signature]</i>																																																																										
PRINTED NAME: _____						PRINTED NAME: Aden Horn																																																																										
DATE: _____						DATE: 10/17/95																																																																										
COMPANY: SUPERIOR ANALYTICAL						COMPANY: SUPERIOR ANALYTICAL																																																																										