



July 30, 2001

Mr. Barney Chan
ACHCSA
1131 Harbor Bay Parkway, Suite 250
Alameda, CA 94502

AUG 02 2001

Subject: Monitoring Well and Pump Installation
245 8th Street
Oakland, California
AEI Project No. 4332

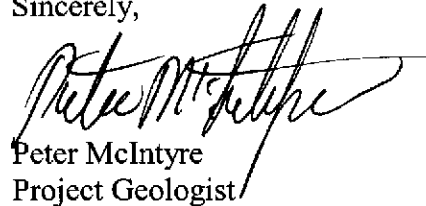
#263

Dear Mr. Chan:

Enclosed is a copy of our report documenting the well and pump installation activities at the above referenced property.

Please call me at (925) 283-6000 if you have any questions.

Sincerely,



Peter McIntyre
Project Geologist

July 31, 2001

AUG 02 2001

**MONITORING WELL
AND
PUMP INSTALLATION REPORT**

245 8th Street
Oakland, California

AEI Project No. 4332

Prepared For

Mr. Victor Lum
Vic's Automotive
245 8th Street
Oakland, CA 94607

Prepared By

AEI Consultants
3210 Old Tunnel Road, Suite B
Lafayette, CA 94549
(925) 283-6000

AEI

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1.0 INTRODUCTION

AEI Consultants (AEI) has prepared this report on behalf of Mr. Victor Lum and documents the groundwater investigation and pump system installation performed at the property located at 245 8th Street in Oakland, California (Figure 1). The project has been performed in accordance with the requirements of the Alameda County Health Care Services Agency (ACHCSA) to further investigate the extent of hydrocarbon impacted groundwater in the vicinity of the property. In addition, a free product recovery system has been installed to remove non-aqueous phase liquid (NAPL) hydrocarbons from the water table.

2.0 SITE DESCRIPTION AND BACKGROUND

The property (hereafter referred to as the "site") is located in a commercial and residential area of Oakland. The site is a lot on the south corner of Alice Street and 8th Street and is currently developed with a gasoline station and auto repair facility. Refer to Figure 2 for a visual description of the site.

Between June 1993 and August 1994, AEI removed a total of seven (7) underground storage tanks (UST) from the property. The tanks consisted of four (4) 1,000 gallon and two (2) 6,000 gallon gasoline tanks and one (1) 250 gallon waste oil tank. The former locations of the tanks are shown on Figure 2. Impacted soil was removed from beneath the former tank area. Groundwater was encountered beneath the former 6,000 gallon tanks. NAPL was observed on the water table beneath the southern tank. The excavated soil was transported to an appropriate disposal facility and the excavation was backfilled with clean fill material.

Two groundwater monitoring wells (MW-1 and MW-2) were installed in July 1995. The first two episodes of monitoring revealed Total Petroleum Hydrocarbons (TPH) as gasoline and benzene up to 210,000 µg/l and 720 µg/l, respectively, in MW-2. Floating gasoline product, a NAPL, was discovered in MW-1, which ranged from 1.20 to 4.39 feet thick between December 1995 and March 1996.

Three soil borings (SB-1 through SB-3) were advanced in August 1996. Groundwater samples collected from each of the borings contained TPH as gasoline and benzene ranging from 120,000 to 140,000 µg/l and from 12,000 to 19,000 µg/l, respectively. MTBE was also present in all three samples, up to 27,000 µg/l. Although NAPL was not observed in the field, the laboratory observed immiscible sheen. Manual bailing and pumping of NAPL from MW-1 and monitoring of MW-2 occurred intermittently through 1997.

in SB-3

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3.0 GEOLOGY AND HYDROGEOLOGY

According to logs of the two soil borings recently advanced by AEI, the near surface native sediments beneath the site consist of fine to medium sand, ranging from clean to silty and clayey. Saturation was observed during the drilling at approximately 20 feet bgs in each boring. Static groundwater existed in the constructed wells at 15 to 16 feet below ground surface (bgs).

The site is located at 29 feet above Mean Sea Level (MSL). The site is flat; however, the topography of the area slopes gently to the southwest. Water level measurements were made during the first groundwater monitoring and sampling episode conducted on February 2, 2001. ~~Static groundwater level ranged between 11.67 and 12.61 feet above MSL.~~ Elevations of the tops of the well casings were surveyed relative to MSL by David Logan (California Professional Land Surveyor No. 5003) in July 2001.

The water level measurements were collected in order to calculate the hydraulic gradient and groundwater flow direction. Based on these measurements, ~~groundwater beneath the site flows to the south/southeast.~~ The hydraulic gradient was calculated as 0.0074 ft/ft. Refer to Table 1 for groundwater elevation data and to Figure 3 for a water table contour map.

4.0 PERMITS

A workplan was prepared for and approved by the ACHCSA for the scope of work described herein. Permits were obtained from the Alameda County Public Works Agency, Water Resources Section, for the installation of ~~two groundwater monitoring wells at the site.~~ Refer to Appendix A for well permitting documentation.

5.0 WELL INSTALLATION AND CONSTRUCTION

On May 25, 2001 a total of two (2) soil borings were advanced. The borings were converted to monitoring wells MW-3 and MW-4. Refer to Figure 3 for locations of the wells. The borings were advanced with a hydraulic rotary drill rig running 10 ½ inch O.D. diameter hollow-stem augers. Cuttings generated during the well installation activities were stored on-site in sealed, labeled 55-gallon drums.

~~Each boring was advanced to 25 feet bgs.~~ Soil samples were collected at five foot intervals from each boring to characterize the sediments of the site and for possible chemical analysis. The borings were logged using the Unified Soil Classification System. Detailed logs of the soil borings are presented in Appendix B. Soil samples were sealed within brass liners with Teflon tape and plastic end caps and stored over ice during transportation to the laboratory.

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The wells were constructed of 4" diameter Schedule 40 flush threaded PVC well casing. Each well was constructed with 15 feet of factory slotted 0.020 well screen fitted with flush threaded end cap. The remainder of the well was constructed with blank casing to ground surface. The casing was installed through the hollow augers. 2/16 Monterey sand was poured through the auger to form a sand pack from the bottom of the well to 2 feet above the slotted well screen. A 1.5 foot layer of bentonite pellets was placed above the sand and hydrated with tap water, to form a seal against the cement grout slurry. The remainder of the boring was filled to 0.5 feet below grade with neat cement grout. A flush mounted traffic rated well box was installed over the casing, and an expanding, locking inner cap was placed on the casing top. Refer to the boring logs (Appendix B) for a visual description of well construction details.

6.0 WELL DEVELOPMENT AND SAMPLING

The two newly installed wells were developed on June 6, 2001. The wells were first surged using a surge block to loosen any accumulated fines from the well screen and sand pack. The wells were then pumped, until clear, with a minimum of 10 well volumes removed. Well MW-3 pumped freely during the development; however, well MW-4 ran dry several times during development.

The first episode of groundwater monitoring and sample collection occurred on June 29, 2001. Prior to the collection of samples, the wells were opened and water levels from the top of the casings were measured with an electric water level meter. Wells MW-1 and MW-2 were checked for free product using an interface meter. Each of the three wells not containing free product (MW-2 through MW-4) were then purged and sampled. Approximately 3 well volumes of water were purged from each well using a submersible purge pump. During the purging of the wells, the following parameters were monitored: temperature, pH, and total dissolved solids (TDS). Once water volumes returned to within 90% of their original volume, a sample was collected from each well. Refer to Appendix C for Groundwater Well Sampling Field Forms, which include details on the sampling of each well.

The groundwater samples were collected from each well using clean disposable bailers. Water was poured from the bailers into 40 ml VOA vials and capped so no head space or air bubbles were visible within the sample containers. The samples were labeled and placed on ice and transported under chain of custody protocol for analysis to McCampell Analytical Inc. (DOHS Certification Number 1644) of Pacheco, California.

7.0 SAMPLE ANALYTICAL RESULTS

A total of four (4) soil samples and three (3) groundwater samples were analyzed during this project. Each sample was analyzed for TPH as gasoline (EPA Method 5030/8015), benzene,

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toluene, ethyl-benzene and xylenes (BTEX), and methyl tertiary butyl ether (MTBE) by (EPA Method 5030/8020). The groundwater sample from MW-2 was reanalyzed for fuel oxygenates, including MTBE, by EPA method 8260B.

No concentrations of petroleum hydrocarbons were detected in any of the soil samples analyzed. Refer to Table 1 and to Appendix D for soil sample analytical documents.

1.63 ~~ppm~~ of NAPL was present in MW-1. TPH as gasoline, benzene, and MTBE were detected in MW-2 at 69,000 µg/l, 7,200 µg/l, and 4,400µg/l, respectively. TPH as gasoline was detected in MW-4 at 550 µg/l. No detectable concentrations of hydrocarbon were present in MW-3. Refer to Table 3 and to Appendix D for groundwater sample analytical documents.

8.0 NAPL RECOVERY SYSTEM INSTALLATION

A NAPL recovery system was installed in MW-1 in July 2001. The system consists of a bladder pump suspended above the water table. The product intake port is located on a water/NAPL interface float, designed to minimize the amount of water removed from the well. The pump is operated by a 4 horsepower compressor at an operating pressure of between 80 and 120 pounds per square inch (psi). The compressor only runs between 8:00 am and 6:00 pm, to minimize disturbance to the residents of the area. The recovered liquid is stored in a 55-gallon drum. The drum is equipped with a high-level shutoff valve, which cuts off the air supply to the pump.

9.0 SUMMARY AND RECOMMENDATIONS

This project consisted of the installation of an additional two groundwater monitoring wells and a NAPL recovery system. The recent episode of groundwater monitoring confirmed a groundwater flow direction to the south/southeast. NAPL and dissolved phase hydrocarbons appear to be limited in lateral extent to the north and east.

The thickness of NAPL present in MW-1 remained since 1998, when recovery ceased, providing a constant source for continued dissolution of hydrocarbons into the groundwater system. Recovery of this NAPL will continue with the recently installed system. Recovery rates and change in NAPL thickness will be reported with subsequent monitoring reports. Sampling of the three other wells will continue on a quarterly basis. The next episode is scheduled for September 2001.

Based on the results of the August 1997 investigation, it is evident that the NAPL has spread to the west and south of the site, as has the dissolved phase plume. Additional off-site monitoring wells will be necessary to assess the extent of the impacted groundwater. Proposed locations for additional wells and/or temporary borings will be presented after groundwater flow direction has been confirmed with at least one additional monitoring episode.

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10.0 REPORT LIMITATIONS AND SIGNATURES


This report presents a summary of work completed by AEI, including observations and descriptions of site conditions. Where appropriate, it includes analytical results for samples taken during the course of the work. The number and location of samples are chosen to provide required information, but it cannot be assumed that they are entirely representative of all areas not sampled. All conclusions and recommendations are based on these analyses, observations, and the governing regulations. Conclusions beyond those stated and reported herein should not be inferred from this document.

These services were performed in accordance with generally accepted practices in the environmental engineering and consulting field that existed at the time and location of the work.

Sincerely,



Peter McIntyre
Project Geologist



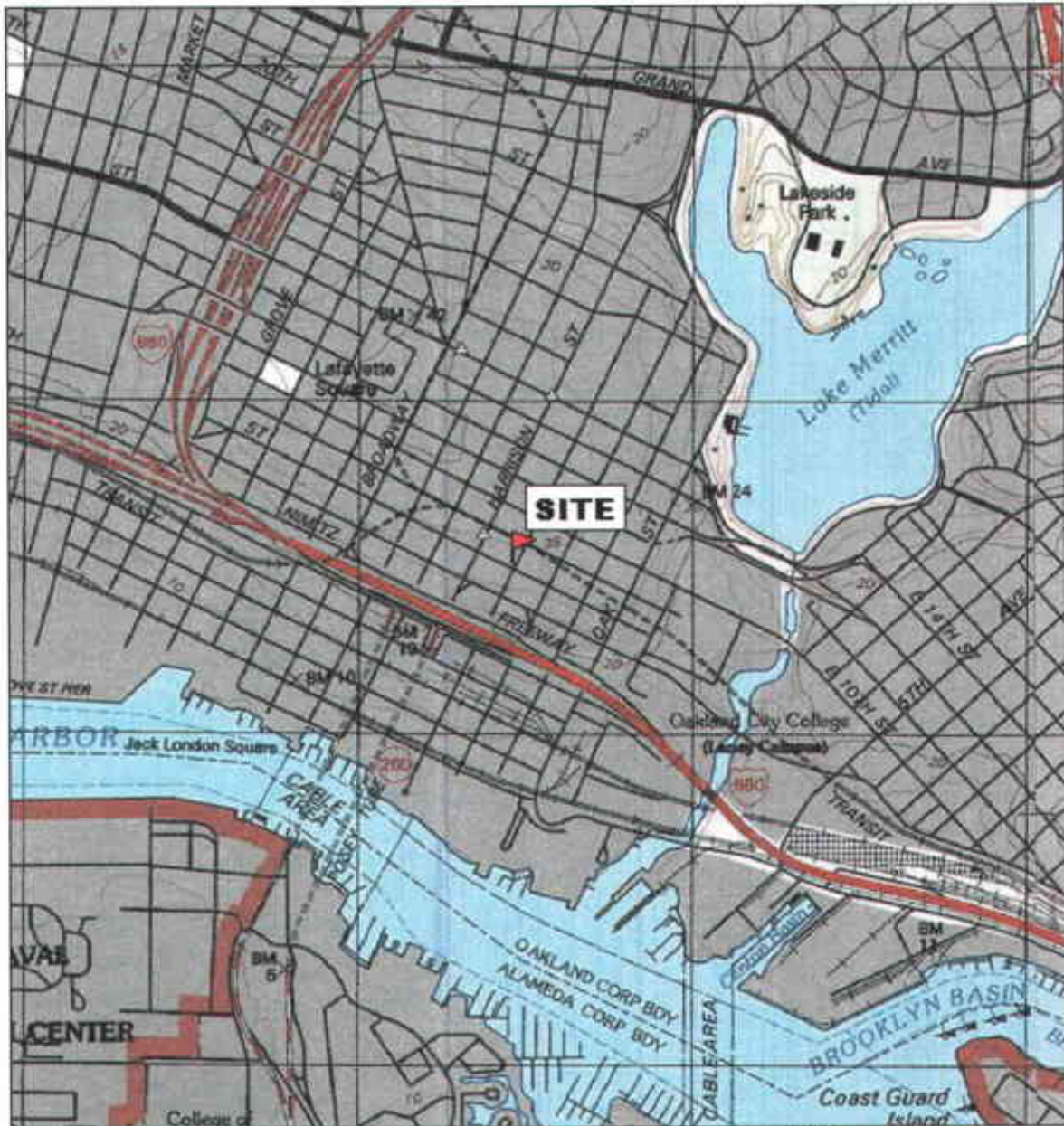
Joseph P. Derhake, PE
Senior Project Engineer, Principal



Distribution: Mr. Victor Lum
245 8th Street
Oakland, CA 94607

Mr. Barney Chan, ACHCSA
1131 Harbor Bay Parkway, Suite 250
Alameda, CA 94502

AEI

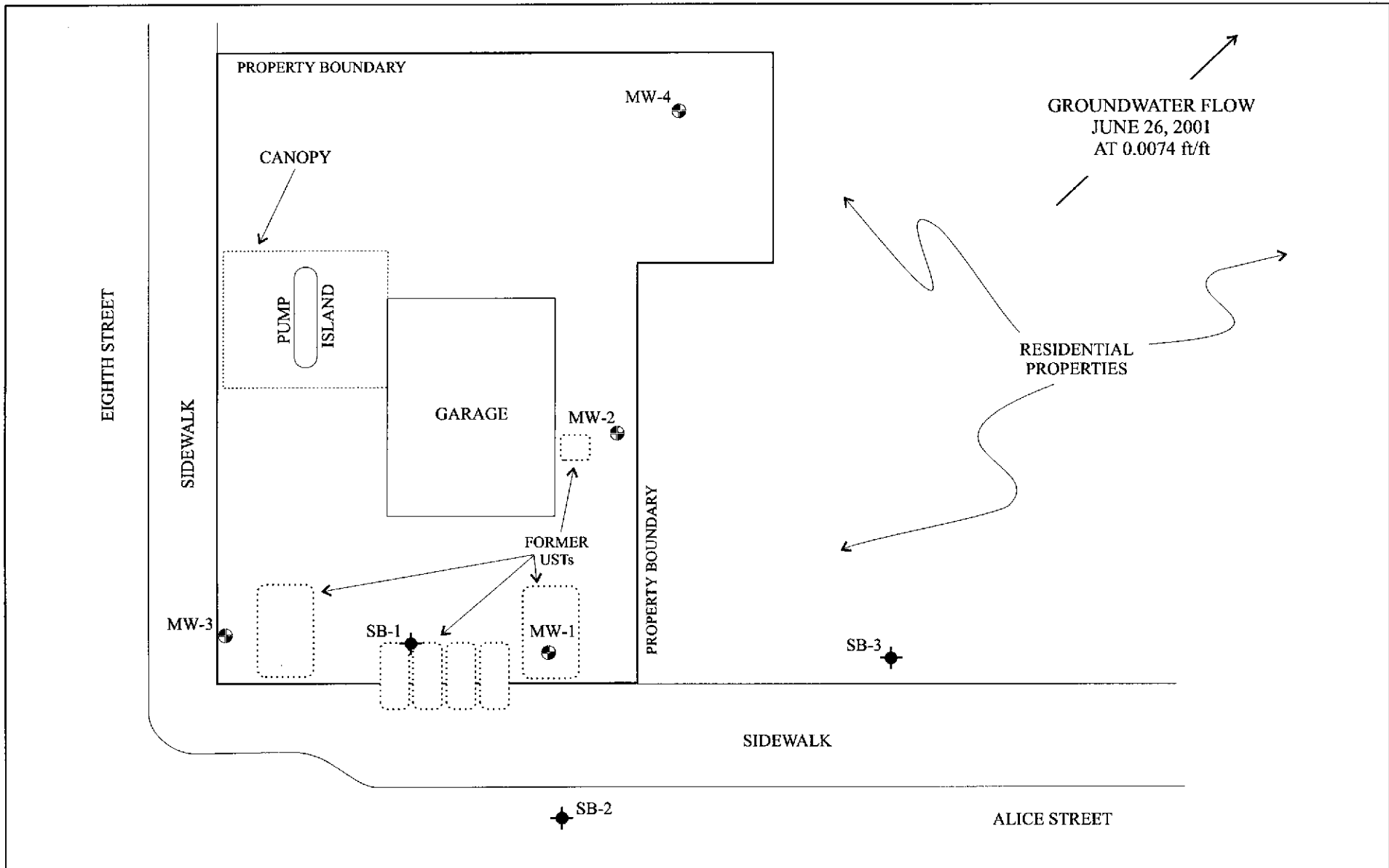


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<p>AEI CONSULTANTS 3210 OLD TUNNEL RD. STE B. LAFAYETTE, CA</p>	
<p>SITE LOCATION MAP</p>	
<p>245 8th STREET OAKLAND, CALIFORNIA</p>	<p>FIGURE 1 PROJECT NO. 4332</p>





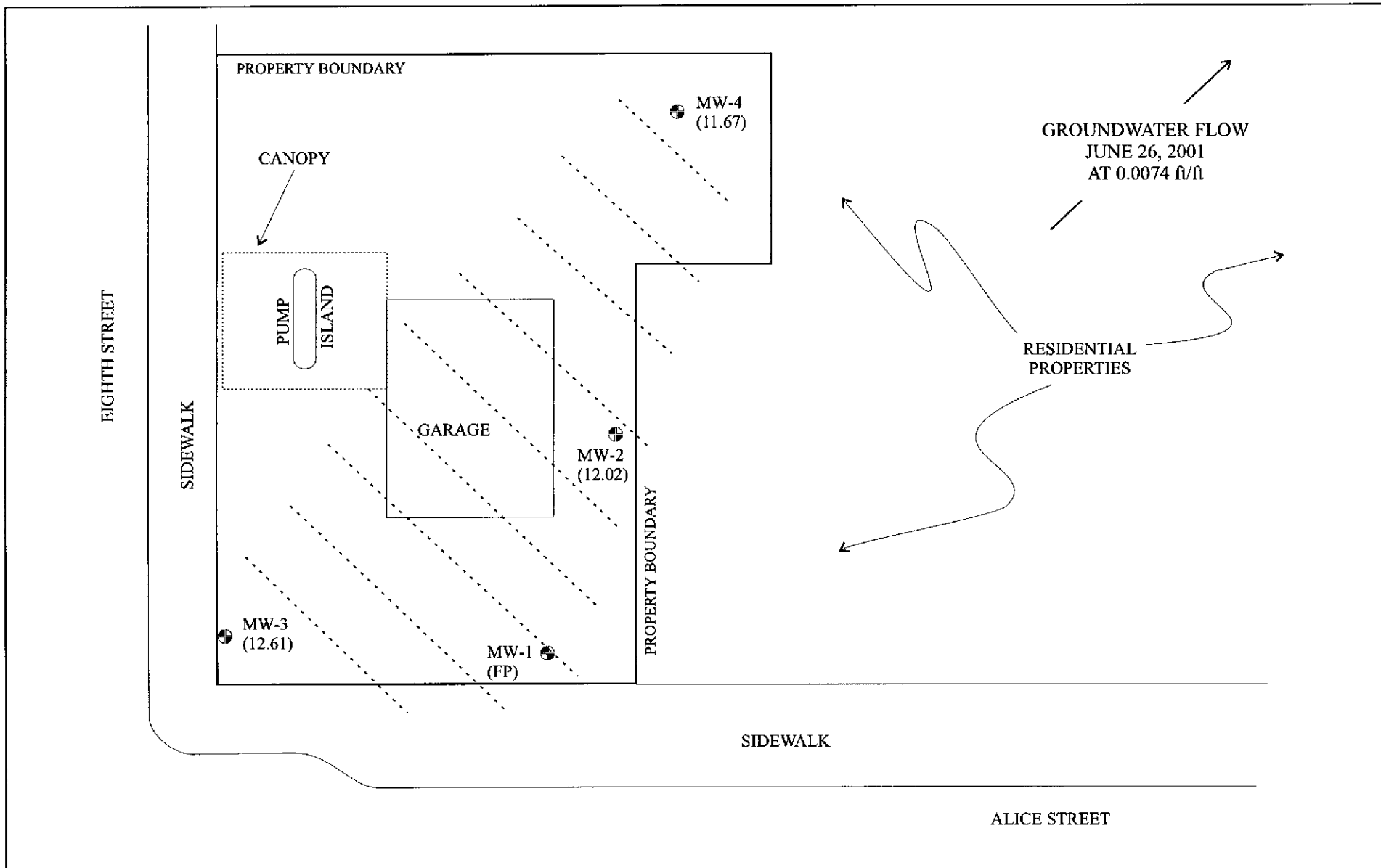
AEI CONSULTANTS
 3210 OLD TUNNEL ROAD, SUITE B, LAFAYETTE, CA

SITE PLAN

245 8th STREET OAKLAND, CALIFORNIA	FIGURE 2 PROJECT NO. 4332
---------------------------------------	-------------------------------------



-  MONITORING WELLS
-  BORING LOCATIONS
ADVANCED 8/9/96
- SCALE: 1 in = 25 ft



AEI CONSULTANTS
3210 OLD TUNNEL ROAD, SUITE B, LAFAYETTE, CA

WATER TABLE CONTOURS

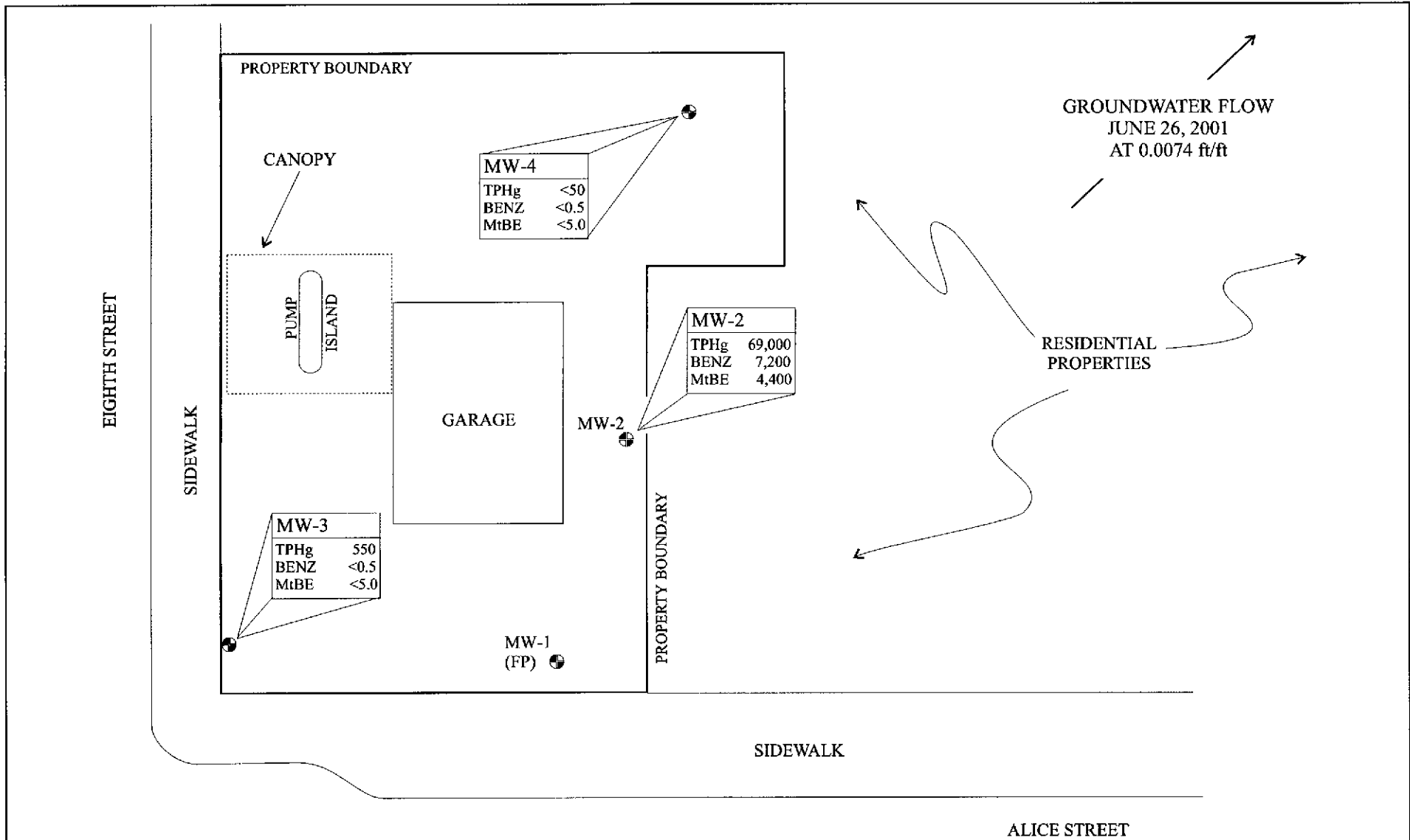
245 8th STREET
OAKLAND, CALIFORNIA

FIGURE 3
PROJECT NO. 4332



● MONITORING WELLS WITH WATER TABLE ELEVATIONS EXPRESSED IN FEET ABOVE MEAN SEA LEVEL (FP = Floating Product)

SCALE: 1 in = 25 ft



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DISSOLVED HYDROCARBONS

245 8th STREET OAKLAND, CALIFORNIA	FIGURE 4 PROJECT NO. 4332
---------------------------------------	-------------------------------------



● MONITORING WELLS:
HYDROCARBON CONCENTRATION
EXPRESSED IN ug/l IN WATER

SCALE: 1 in = 25 ft

TPHg = Total Petroleum Hydrocarbons
as gasoline
BENZ = Benzene
MtBE = Methyl tert-Butyl Ether
FP = Floating Product (NAPL)

Table 1
Groundwater Elevation Data

Well ID	Date Collected	Well Elevation (ft msl)	Depth to Water (ft)	Groundwater Elevation (ft amsl)	Depth to LNAPL (ft)	LNAPL Thickness (ft)
MW-1	6/29/2001	27.73	16.52	*	14.89	1.63
MW-2	6/29/2001	28.16	16.14	12.02	-	-
MW-3	6/29/2001	29.21	16.60	12.61	-	-
MW-4	6/29/2001	29.38	17.71	11.67	-	-

* = Measured groundwater level effected by LNAPL presence, not used to calculated water table elevation

All well elevations are measured from the top of the casing

Table 2
Soil Sample Analytical Data

Sample ID	Date Collected	TPHg mg/kg	MTBE mg/kg	Benzene mg/kg	Toluene mg/kg	Ethylbenzene mg/kg	Xylenes mg/kg
MW-3 15'	5/25/01	<1.0	<0.05	<0.005	<0.005	<0.005	<0.005
MW-3 20'	5/25/01	<1.0	<0.05	<0.005	<0.005	<0.005	<0.005
MW-4 15'	5/25/01	<1.0	<0.05	<0.005	<0.005	<0.005	<0.005
MW-4 20'	5/25/01	<1.0	<0.05	<0.005	<0.005	<0.005	<0.005
MDL		1.0	0.05	0.005	0.005	0.005	0.005

ND not detected

mg/kg milligrams per kilogram

TPHg total petroleum hydrocarbons as gasoline

MTBE methy tertiary butyl ether

MDL = method detection limit

* = These samples were reanalyzed for fuel oxygenated by EPA method 8260

Table 3
Groundwater Sample Analytical Data

Well/Sample ID	Date Collected	NAPL thickness (ft)	TPHg $\mu\text{g/L}$	MTBE $\mu\text{g/L}$	Benzene $\mu\text{g/L}$	Toluene $\mu\text{g/L}$	Ethylbenzene $\mu\text{g/L}$	Xylenes $\mu\text{g/L}$
MW-1	6/29/01	1.63	ns/fp	ns/fp	ns/fp	ns/fp	ns/fp	ns/fp
MW-2	6/29/01	0.0	69,000	4400*	7,200	6,100	1,500	7,000
MW-3	6/29/01	0.0	550	<5.0	<0.5	3.1	3.2	1.2
MW-4	6/29/01	0.0	<50	<5.0	<0.5	<0.5	<0.5	<0.5
MDL			50	5.0	0.5	0.5	0.5	0.5

$\mu\text{g/L}$ micrograms per liter

TPHg total petroleum hydrocarbons as gasoline

MTBE methyl tertiary butyl ether

* samples analyzed by EPA Method 8260, all others non detect (refer to laboratory report)

MDL = method detection limit

ns/fp = not sampled / free product

Note = Historical Groundwater elevation and quality data for wells MW-1 and MW-2 was not available



ALAMEDA COUNTY PUBLIC WORKS AGENCY

WATER RESOURCES SECTION
399 ELMHURST ST. BAYWARD CA 94544-1395
PHONE (510) 670-4554 MARLON MACALLANES/FRANK CODD (510) 670-5783
FAX (510) 782-1939

DRILLING PERMIT APPLICATION

FOR APPLICANT TO COMPLETE

FOR OFFICE USE

LOCATION OF PROJECT 245 8th Street
Oakland CA 94607

PERMIT NUMBER W01-269
WELL NUMBER _____
APN _____

PERMIT CONDITIONS

Circled Permit Requirements Apply

CLIENT
Name Mr Vic Lum
Address 245 8th St Phone 510 933 9014
City Oakland Zip 94607

A. GENERAL

1. A permit application should be submitted so as to arrive at the ACPWA office five days prior to proposed starting date.
2. Submit to ACPWA within 60 days after completion of permitted original Department of Water Resources-Well Completion Report.
3. Permit is void if project not begun within 90 days of approval date.

APPLICANT
Name Peter McIntyre of AEI Consultants Fax 925 612 1925
Address 3210 9th Ave Phone 925 6000
City Suite 13 Zip 94607

B. WATER SUPPLY WELLS

1. Minimum surface seal thickness is two inches of cement grout placed by tremie.
2. Minimum seal depth is 30 feet for municipal and industrial wells or 20 feet for domestic and irrigation wells unless a lesser depth is specially approved.

TYPE OF PROJECT

Well Construction	<input type="checkbox"/>	Geotechnical Investigation	<input type="checkbox"/>
Cathodic Protection	<input type="checkbox"/>	Geostl	<input type="checkbox"/>
Water Supply	<input type="checkbox"/>	Contamination	<input type="checkbox"/>
Monitoring	<input checked="" type="checkbox"/>	Well Destruction	<input type="checkbox"/>

C. GROUNDWATER MONITORING WELLS INCLUDING PIEZOMETERS

1. Minimum surface seal thickness is two inches of cement grout placed by tremie.
2. Minimum seal depth for monitoring wells is the maximum depth practicable or 30 feet.

PROPOSED WATER SUPPLY WELL USE

New Domestic	<input type="checkbox"/>	Replacement Domestic	<input type="checkbox"/>
Municipal	<input type="checkbox"/>	Irrigation	<input type="checkbox"/>
Industrial	<input type="checkbox"/>	Other	<input type="checkbox"/>

D. GEOTECHNICAL

Backfill bore hole by tremie with cement grout or cement grout/sand mixture. Upper two-three feet replaced in kind or with compacted cuttings.

DRILLING METHOD:

Mud Rotary	<input type="checkbox"/>	Air Rotary	<input type="checkbox"/>	Auger	<input checked="" type="checkbox"/>
Cable	<input type="checkbox"/>	Other	<input type="checkbox"/>		

E. CATHODIC

Fill hole annular zone with concrete placed by tremie.

DRILLER'S NAME Spectrum Exploration

DRILLER'S LICENSE NO. 512 268 (CST)

F. WELL DESTRUCTION

Send a map of work site. A separate permit is required for wells deeper than 43 feet.

WELL PROJECTS

Drill Hole Diameter	<u>12</u> in.	Maximum Depth	<u>25</u> ft.
Casing Diameter	<u>9</u> in.	Owner's Well Number	<u>MW-3</u>
Surface Seal Depth	<u>7</u> ft.		

G. SPECIAL CONDITIONS

NOTE: One application must be submitted for each well or well destruction. Multiple borings on one application are acceptable for geotechnical and contamination investigations.

GEOTECHNICAL PROJECTS

Number of Borings	_____	Maximum Depth	_____ ft.
Itala Diameter	_____ in.		

ESTIMATED STARTING DATE 5/21/01
ESTIMATED COMPLETION DATE 5/21/01

APPROVED [Signature] DATE 5-7-01

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

APPLICANT'S SIGNATURE [Signature] DATE 5/7/01

PLEASE PRINT NAME Peter McIntyre Rev. 3-11-00



ALAMEDA COUNTY PUBLIC WORKS AGENCY

WATER RESOURCES SECTION

395 ELMHURST ST. HAYWARD CA. 94544-1398
PHONE (510) 870-8854 MARLON MAGALLANES/FRANK COBB (510) 870-8783
FAX (510) 782-1939

DRILLING PERMIT APPLICATION

FOR APPLICANT TO COMPLETE

LOCATION OF PROJECT 245 8th St
Oakland 94607

CLIENT Name Vic Lam
Address 245 8th St Phone 925-981-9811
City Oakland Zip 94607

APPLICANT Name Peter McIntyre of AEI
Address 2210 Oakland Ave Phone 925-832-9221 (925)
City Lakewood Zip 94593

TYPE OF PROJECT

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

PROPOSED WATER SUPPLY WELL USE

New Domestic Replacement Domestic
Municipal Irrigation
Industrial Other

DRILLING METHOD:

Mud Rotary Air Rotary Auger
Cable Other

DRILLER'S NAME Spectrum Exploration

DRILLER'S LICENSE NO. 512 268 (CST)

WELL PROJECTS

Drill Hole Diameter 12 in. Maximum Depth 25 ft.
Casing Diameter 12 in. Owner's Well Number MW-4
Surface Seal Depth 5 ft.

GEOTECHNICAL PROJECTS

Number of Borings _____ Maximum Depth _____ ft.
Hole Diameter _____ in.

ESTIMATED STARTING DATE 5/17/01
ESTIMATED COMPLETION DATE 5/21/01

I hereby agree to comply with all requirements of this permit and Alameda County Ordinance No. 73-88.

APPLICANT'S SIGNATURE Peter McIntyre DATE 5/17/01

PLEASE PRINT NAME Peter McIntyre Rev. 5-13-00

FOR OFFICE USE

PERMIT NUMBER W01-270
WELL NUMBER _____
APN _____

PERMIT CONDITIONS

Circled Permit Requirements Apply

A. GENERAL

1. A permit application should be submitted so as to arrive at the ACPWA office five days prior to proposed starting date.
2. Submit to ACPWA within 60 days after completion of permitted original Department of Water Resources-Well Completion Report.
3. Permit is void if project not begun within 90 days of approval date.

B. WATER SUPPLY WELLS

1. Minimum surface seal thickness is two inches of cement grout placed by tremie.
2. Minimum seal depth is 30 feet for municipal and industrial wells or 20 feet for domestic and irrigation wells unless a lesser depth is specially approved.

C. GROUNDWATER MONITORING WELLS - INCLUDING PIEZOMETERS

1. Minimum surface seal thickness is two inches of cement grout placed by tremie.
2. Minimum seal depth for monitoring wells is the maximum depth practicable or 20 feet.

D. GEOTECHNICAL

Backfill bore hole by tremie with cement grout or cement grout and mixture. Upper two-three feet replaced in kind or with compacted cuttings.

E. CATHODIC

Fill hole anode zone with concrete placed by tremie.

F. WELL DESTRUCTION

Send a map of work site. A separate permit is required for wells deeper than 45 feet.

G. SPECIAL CONDITIONS

NOTE: One application must be submitted for each well or well destruction. Multiple borings on one application are acceptable for geotechnical and contamination investigations.

APPROVED

DATE 5-17-01

Project No: 4332

Sheet: 1 of 1

Project Name: LUM

Log of Borehole: MW-3

Client: VIC'S AUTOMOTIVE

Location: NORTH CORNER

Depth (ft)	USCS		Subsurface Description	Sample Data				Well Data	Remarks
	Symbol	Label		Sample Label	Type	Blow/ft	Recovery		
0			Ground Surface						
1			SAND Fine to medium clean sand						
2									
3									
4									
5		SM	Silty sand, damp						PID = 0 ppm
6				MW-3 5'	SS	38	100		No hydrocarbon (HC) odor
7									
8									
9									
10		SM	Sand with clay and silt						PID = 0 ppm
11				MW-3 10'	SS	22	70		No HC odor
12									
13									
14									
15		SC	Clay increasing						Same as above
16				MW-3 15'	SS	54	100		
17									
18									
19									
20		SP	Sand - few fines						Strong HC odor
21				MW-3 20'	SS	49	100		PID = 253 ppm
22									
23									
24									
25		SP	Fine to med sand, saturated						
26				MW-3 25'	SS	43	80		PID = 16 ppm
27			End of Borehole						
28									

Drill Date 5/25/01

Reviewed by: EW

AEI Consultants

Drill Method: HOLLOW AUGER

Logged by: PJM

3210 Old Tunnel Road, Suite B

Total Depth: 25

Lafayette, CA 94549

Depth to Water: 20.5

(925) 283-6000

Project No: 4332

Sheet: 1 of 1

Project Name: LUM

Log of Borehole: MW-4

Client: VIC'S AUTOMOTIVE

Location: SOUTH CORNER

Depth (ft)	USCS		Subsurface Description	Sample Data				Well Data	Remarks
	Symbol	Label		Sample Label	Type	Blow/ft	Recovery		
0			Ground Surface						
0-1			FILL						
1-2			CONCRETE SLAB						
2-3			SAND						
3-25		SM	Fine sand with few fines						
5				MW-4 5'	SS	8	100		PID = 0 ppm
10		SC	Clayey sand						
11				MW-4 10'	SS	33	<10		No recovery
15		SC	Fine to med sand, low clay, damp						
16				MW-4 15'	SS	25	100		PID = 0 ppm No HC odor
20		SP	Fine to med sand, clean						
21			Saturated	MW-4 20'	SS	39	100		No HC odor PID = 102 ppm
25		SP							
26				MW-4 25'	SS	35	<20		No recovery PID = 93 ppm
27			End of Borehole						
28									

Drill Date 5/25/01

Reviewed by: EW

AEI Consultants

Drill Method: HOLLOW AUGER

Logged by: PJM

3210 Old Tunnel Road, Suite B

Total Depth: 25

Lafayette, CA 94549

Depth to Water: 20

(925) 283-6000

**AEI CONSULTANTS - GROUNDWATER MONITORING WELL FIELD
SAMPLING FORM**

Monitoring Well Number: MW-1

Project Name: LUM	Date of Sampling: 6/29/01
Job Number: 4332	Name of Sampler: PJM / OA
Project Address: 245 8th Street, Oakland	

MONITORING WELL DATA

Well Casing Diameter (2"/4"/6")	4"
Seal at Grade -- Type and Condition	Good
Well Cap & Lock -- OK/Replace	OK
Elevation of Top of Casing	27.63
Depth of Well	25
Depth to LNAPL	14.89
Depth to water	16.52

LNAPL thickness – 1.63 feet

Appearance of Purge Water	Well not purged
---------------------------	-----------------

GROUNDWATER SAMPLES

Number of Samples/Container Size

Time	Vol Remvd (gal)	Temp (deg C)	pH	Cond (mS)	Comments

COMMENTS (i.e., sample odor, well recharge time & percent, etc.)

Product recovery (Spoiler™) system installed

LNAPL – light non-aqueous phase liquid (floating product)

TD - Total Depth of Well

DTW - Depth To Water

**AEI CONSULTANTS - GROUNDWATER MONITORING WELL FIELD
SAMPLING FORM**

Monitoring Well Number: MW-2

Project Name: LUM	Date of Sampling: 6/29/01
Job Number: 4332	Name of Sampler: PJM / OA
Project Address: 245 8th Street, Oakland	

MONITORING WELL DATA

Well Casing Diameter (2"/4"/6")	2"
Seal at Grade -- Type and Condition	Good
Well Cap & Lock -- OK/Replace	OK
Elevation of Top of Casing	28.16
Depth of Well	25
Depth to Water	16.14
Water Elevation	12.02
Three Well Volumes (gallons)*	
2" casing: (TD - DTW)(0.16)(3)	4.25
4" casing: (TD - DTW)(0.65)(3)	
6" casing: (TD - DTW)(1.44)(3)	
Actual Volume Purged (gallons)	6
Appearance of Purge Water	Murky (green)

GROUNDWATER SAMPLES

Number of Samples/Container Size	(2)-40 ml VOAs
----------------------------------	----------------

Time	Vol Remvd (gal)	Temp (deg C)	pH	Cond (mS)	Comments
	1.5	19.8	7.08		
	3	18.9	7.08		
	6	18.6	7.07		

COMMENTS (i.e., sample odor, well recharge time & percent, etc.)

Strong hydrocarbon odor, sheen present

TD - Total Depth of Well
DTW - Depth To Water

AEI CONSULTANTS - GROUNDWATER MONITORING WELL FIELD SAMPLING FORM					
Monitoring Well Number: MW-3					
Project Name: LUM			Date of Sampling: 6/29/01		
Job Number: 4332			Name of Sampler: PJM / OA		
Project Address: 245 8th Street, Oakland					
MONITORING WELL DATA					
Well Casing Diameter (2"/4"/6")			4"		
Seal at Grade -- Type and Condition			Good		
Well Cap & Lock -- OK/Replace			OK		
Elevation of Top of Casing			29.21		
Depth of Well			25		
Depth to Water			16.60		
Water Elevation			12.61		
Three Well Volumes (gallons)*					
2" casing: (TD - DTW)(0.16)(3)					
4" casing: (TD - DTW)(0.65)(3)			16.4		
6" casing: (TD - DTW)(1.44)(3)					
Actual Volume Purged (gallons)			16		
Appearance of Purge Water			Clear		
GROUNDWATER SAMPLES					
Number of Samples/Container Size			(2)-40 ml VOAs		
Time	Vol Remvd (gal)	Temp (deg C)	pH	Cond (mS)	Comments
					Meter malfunction
COMMENTS (i.e., sample odor, well recharge time & percent, etc.)					
No sheen or odor					

TD - Total Depth of Well
DTW - Depth To Water

AEI CONSULTANTS - GROUNDWATER MONITORING WELL FIELD SAMPLING FORM					
Monitoring Well Number: MW-4					
Project Name: LUM			Date of Sampling: 6/29/01		
Job Number: 4332			Name of Sampler: PJM / OA		
Project Address: 245 8th Street, Oakland					
MONITORING WELL DATA					
Well Casing Diameter (2"/4"/6")			4"		
Seal at Grade -- Type and Condition			Good		
Well Cap & Lock -- OK/Replace			OK		
Elevation of Top of Casing			29.38		
Depth of Well			25		
Depth to Water			17.71		
Water Elevation			11.67		
Three Well Volumes (gallons)*					
2" casing: (TD - DTW)(0.16)(3)					
4" casing: (TD - DTW)(0.65)(3)			14.2		
6" casing: (TD - DTW)(1.44)(3)					
Actual Volume Purged (gallons)			12		
Appearance of Purge Water			Clear, runs dry twice during purging		
GROUNDWATER SAMPLES					
Number of Samples/Container Size					
Time	Vol Remvd (gal)	Temp (deg C)	pH	Cond (mS)	Comments
	1	22.3	6.95		
	6	18.0	6.96		
	10	20.5	7.00		
COMMENTS (i.e., sample odor, well recharge time & percent, etc.)					
No product sheen or HC odor					

TD - Total Depth of Well
DTW - Depth To Water



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<http://www.mccampbell.com> E-mail: main@mccampbell.com

All Environmental, Inc. 3210 Old Tunnel Road, Suite B Lafayette, CA 94549-4157	Client Project ID: #4332; LUM	Date Sampled: 05/25/01
		Date Received: 05/25/01
	Client Contact: Peter McIntyre	Date Extracted: 05/25/01
	Client P.O:	Date Analyzed: 05/25/01

06/04/2001

Dear Peter:

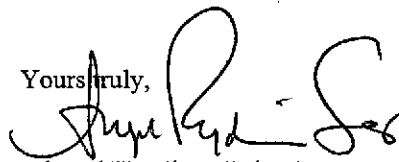
Enclosed are:

- 1). the results of 4 samples from your #4332; LUM project,
- 2). a QC report for the above samples
- 3). a copy of the chain of custody, and
- 4). a bill for analytical services.

All analyses were completed satisfactorily and all QC samples were found to be within our control limits.

If you have any questions please contact me. McCampbell Analytical Laboratories strives for excellence in quality, service and cost. Thank you for your business and I look forward to working with you again.

Yours truly,



Edward Hamilton, Lab Director



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		Date Received: 05/25/01
	Client Contact: Peter McIntyre	Date Extracted: 05/25/01
	Client P.O:	Date Analyzed: 05/25/01

Gasoline Range (C6-C12) Volatile Hydrocarbons as Gasoline*, with Methyl tert-Butyl Ether* & BTEX*


EPA methods 5030, modified 8015, and 8020 or 602; California RWQCB (SF Bay Region) method GCFID(5030)

Lab ID	Client ID	Matrix	TPH(g) ⁺	MTBE	Benzene	Toluene	Ethyl-benzene	Xylenes	% Recovery Surrogate
68404	MW-3 15'	S	ND	ND	ND	ND	ND	ND	108
68405	MW-3 20'	S	ND	ND	ND	ND	ND	ND	111
68406	MW-4 15'	S	ND	ND	ND	ND	ND	ND	93
68407	MW-4 20'	S	ND	ND	ND	ND	ND	ND	107
Reporting Limit unless otherwise stated; ND means not detected above the reporting limit	W		50 ug/L	5.0	0.5	0.5	0.5	0.5	
	S		1.0 mg/kg	0.05	0.005	0.005	0.005	0.005	

* water and vapor samples are reported in ug/L, wipe samples in ug/wipe, soil and sludge samples in mg/kg, and all TCLP and SPLP extracts in ug/L

* cluttered chromatogram; sample peak coelutes with surrogate peak

*The following descriptions of the TPH chromatogram are cursory in nature and McCampbell Analytical is not responsible for their interpretation: a) unmodified or weakly modified gasoline is significant; b) heavier gasoline range compounds are significant(aged gasoline?); c) lighter gasoline range compounds (the most mobile fraction) are significant; d) gasoline range compounds having broad chromatographic peaks are significant; biologically altered gasoline?; e) TPH pattern that does not appear to be derived from gasoline (?); f) one to a few isolated peaks present; g) strongly aged gasoline or diesel range compounds are significant; h) lighter than water immiscible sheen is present; i) liquid sample that contains greater than ~5 vol. % sediment; j) no recognizable pattern.

 Edward Hamilton, Lab Director



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QC REPORT

Date: 05/25/01-05/26/01 Matrix: Soil

Extraction: TTLC

Compound	Concentration: ug/kg				%Recovery		RPD
	Sample	MS	MSD	Amount Spiked	MS	MSD	

SampleID: 52201

Instrument:

GC-7

Surrogate1	0.000	102.000	103.000	100.00	102	103	1.0
Xylenes	0.000	0.293	0.292	0.30	98	97	0.3
Ethyl Benzene	0.000	0.095	0.094	0.10	95	94	1.1
Toluene	0.000	0.098	0.098	0.10	98	98	0.0
Benzene	0.000	0.095	0.099	0.10	95	99	4.1
MTBE	0.000	0.102	0.106	0.10	102	106	3.8
GAS	0.000	0.967	0.968	1.00	97	97	0.1

SampleID: 51701

Instrument:

GC-11 A

Surrogate1	0.000	106.000	107.000	100.00	106	107	0.9
TPH (diesel)	0.000	320.000	325.000	300.00	107	108	1.6

$$\% \text{ Recovery} = \frac{(MS - \text{Sample})}{\text{Amount Spiked}} \cdot 100$$

$$RPD = \frac{(MS - MSD)}{(MS + MSD)} \cdot 100$$

RPD means Relative Percent Deviation



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All Environmental, Inc. 3210 Old Tunnel Road, Suite B Lafayette, CA 94549-4157	Client Project ID: #4332; LUM	Date Sampled: 06/29/01
		Date Received: 06/29/01
	Client Contact: Peter McIntyre	Date Extracted: 06/29/01
	Client P.O:	Date Analyzed: 06/29/01

07/13/2001

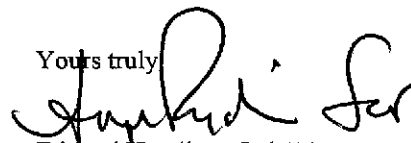
Dear Peter:

Enclosed are:

- 1). the results of 3 samples from your #4332; LUM project,
- 2). a QC report for the above samples
- 3). a copy of the chain of custody, and
- 4). a bill for analytical services.

All analyses were completed satisfactorily and all QC samples were found to be within our control limits. If you have any questions please contact me. McCampbell Analytical Laboratories strives for excellence in quality, service and cost. Thank you for your business and I look forward to working with you again.

Yours truly



Edward Hamilton, Lab Director



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All Environmental, Inc. 3210 Old Tunnel Road, Suite B Lafayette, CA 94549-4157	Client Project ID: #4332; LUM	Date Sampled: 06/29/01
		Date Received: 06/29/01
	Client Contact: Peter McIntyre	Date Extracted: 06/29/01
	Client P.O.:	Date Analyzed: 06/29/01

Gasoline Range (C6-C12) Volatile Hydrocarbons as Gasoline*, with Methyl tert-Butyl Ether* & BTEX*


EPA methods 5030, modified 8015, and 8020 or 602; California RWQCB (SF Bay Region) method GCFID(5030)

Lab ID	Client ID	Matrix	TPH(g) ⁺	MTBE	Benzene	Toluene	Ethyl-benzene	Xylenes	% Recovery Surrogate
71555	MW-2	W	69,000,a,h	4100	7200	6100	1500	7000	100
71556	MW-3	W	550,b,j	ND	ND	3.1	3.2	1.2	101
71557	MW-4	W	ND	ND	ND	ND	ND	ND	93
Reporting Limit unless otherwise stated; ND means not detected above the reporting limit	W		50 ug/L	5.0	0.5	0.5	0.5	0.5	
	S		1.0 mg/kg	0.05	0.005	0.005	0.005	0.005	

* water and vapor samples are reported in ug/L, wipe samples in ug/wipe, soil and sludge samples in mg/kg, and all TCLP and SPLP extracts in ug/L

* cluttered chromatogram; sample peak coelutes with surrogate peak

*The following descriptions of the TPH chromatogram are cursory in nature and McCampbell Analytical is not responsible for their interpretation: a) unmodified or weakly modified gasoline is significant; b) heavier gasoline range compounds are significant(aged gasoline?); c) lighter gasoline range compounds (the most mobile fraction) are significant; d) gasoline range compounds having broad chromatographic peaks are significant; biologically altered gasoline?; e) TPH pattern that does not appear to be derived from gasoline (?); f) one to a few isolated peaks present; g) strongly aged gasoline or diesel range compounds are significant; h) lighter than water immiscible sheen is present; i) liquid sample that contains greater than ~5 vol. % sediment; j) no recognizable pattern.

 Edward Hamilton, Lab Director



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All Environmental, Inc. 3210 Old Tunnel Road, Suite B Lafayette, CA 94549-4157	Client Project ID: #4332; LUM	Date Sampled: 06/29/01
		Date Received: 06/29/01
	Client Contact: Peter McIntyre	Date Extracted: 07/09-07/11/01
	Client P.O:	Date Analyzed: 07/09-07/11/01

Oxygenated Volatile Organics By GC/MS

EPA method 8260 modified

Lab ID	71555	Reporting Limit	
Client ID	MW-2		
Matrix	W	S	W
Compound	Concentration*	ug/kg	ug/L
Di-isopropyl Ether (DIPE)	ND<100	5.0	1.0
Ethyl tert-Butyl Ether (ETBE)	ND<100	5.0	1.0
Methyl-tert Butyl Ether (MTBE)	4400	5.0	1.0
tert-Amyl Methyl Ether (TAME)	ND<100	5.0	1.0
tert-Butanol	ND<500	25	5.0

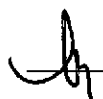
Surrogate Recoveries (%)

Dibromofluoromethane	97	
Comments:	h	

* water samples are reported in ug/L, soil and sludge samples in ug/kg, wipes in ug/wipe and all TCLP / STLC / SPLP extracts in ug/L
 ND means not detected above the reporting limit; N/A means surrogate not applicable to this analysis

(h) lighter than water immiscible sheen is present; (i) liquid sample that contains greater than ~5 vol. % sediment; (j) sample diluted due to high organic content

DHS Certification No. 1644

 Edward Hamilton, Lab Director



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QC REPORT

EPA 8015m + 8020

Date: 06/29/01-06/30/01

Matrix: Water

Compound	Concentration: ug/L			%Recovery		RPD
	Sample	MS	MSD	MS	MSD	

SampleID: 62001

Extraction: EPA 5030

Instrument: GC-7

Surrogate1	ND	96.0	96.0	100.00	96	96	0.0
Xylenes	ND	33.6	34.3	30.00	112	114	2.1
Ethylbenzene	ND	10.5	10.7	10.00	105	107	1.9
Toluene	ND	10.3	10.4	10.00	103	104	1.0
Benzene	ND	9.5	9.6	10.00	95	96	1.0
MTBE	ND	10.9	11.1	10.00	109	111	1.8
TPH (gas)	ND	116.7	117.4	100.00	117	117	0.6

SampleID: 62201

Extraction: EPA 3510

Instrument: GC-2 A

Surrogate1	ND	97.0	98.0	100.00	97	98	1.0
TPH (diesel)	ND	7825.0	7675.0	7500.00	104	102	1.9

$$\% \text{ Recovery} = \frac{(MS - \text{Sample})}{\text{Amount Spiked}} \cdot 100$$

$$RPD = \frac{(MS - MSD)}{(MS + MSD)} \cdot 2.100$$



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QC REPORT

VOCs (EPA 8240/8260)

Date: 07/09/01-07/10/01

Extraction: EPA 5030

Matrix: Water

Compound	Concentration: ug/L			%Recovery		RPD
	Sample	MS	MSD	MS	MSD	

SampleID: 70101

Instrument: GC-10

Surrogate	ND	91.0	90.0	100.00	91	90	1.1
tert-Amyl Methyl Ether	ND	9.3	9.3	10.00	93	93	0.0
Methyl tert-Butyl Ether	ND	9.4	9.4	10.00	94	94	0.0
Ethyl tert-Butyl Ether	ND	9.9	9.9	10.00	99	99	0.0
Di-isopropyl Ether	ND	10.6	10.7	10.00	106	107	0.9
Toluene	ND	9.6	9.7	10.00	96	97	1.0
Benzene	ND	10.1	10.2	10.00	101	102	1.0
Chlorobenzene	ND	10.3	10.4	10.00	103	104	1.0
Trichloroethane	ND	7.2	7.3	10.00	72	73	1.4
1,1-Dichloroethene	ND	12.1	12.2	10.00	121	122	0.8

$$\% \text{ Recovery} = \frac{(MS - \text{Sample})}{\text{Amount Spiked}} \cdot 100$$

$$\text{RPD} = \frac{(MS - \text{MSD})}{(MS + \text{MSD})} \cdot 2 \cdot 100$$

