Ro-324

GET
Geo Environmental Technologies

3275 Stevens Creek Blvd. #208
San Jose, CA 95117
408-241-1798
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FEB 19 2002

OFFSITE ASSESSMENT AND INSTALLATION OF GROUNDWATER MONITORING WELLS

Livermore Gas and Mini Mart
160 Holmes Street
Livermore, California

Prepared For:

Manwel and Samira Shuwayhat

Prepared by:

Geo Environmental Technology
3275 Stevens Creek Blvd., Suite 208
San Jose, CA 95117

Costas Orountiotis — Date 2/8/02
Project Manager

Kenneth L. Meleen — Date 02/11/02
Senior Registered Engineer

REGISTERED PROFESSIONAL ENGINEER
KENNETH L. MELEEN
C017487
EXP 06/30/05
CIVIL
STATE OF CALIFORNIA

February 8, 2002

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OFFSITE ASSESSMENT

Livermore Gas and Mini Mart
160 Holmes Street
Livermore, California

1.0 INTRODUCTION

This report presents the results of a downgradient offsite assessment of the Livermore Gas and Mini Mart (LGMM), 160 Holmes Street Livermore, California. The work was requested by Ms. Eva Chu of the Alameda County Environmental Health Services (ACEHS). The ACEHS directives are attached in Appendix A. Work was performed on behalf of Manwel and Samira Shuwayhat, the responsible parties associated with the subject site.

The objectives of the investigation were three fold: 1) to delineate the offsite extent of groundwater contamination, 2) to determine the offsite local gradient and 3) to collect data needed to implement a previously discussed pump test and MTBE treatment feasibility study. To this effect a groundwater extraction well was installed on site during this assessment.

The property is an old gas station that has been recently upgraded; it is located on the corner of First and Holmes Streets (the property is bound by First, Second and Holmes Streets). The site location and adjacent streets are presented on the Site Vicinity Map (Figure 1). The locations of the existing and new groundwater monitoring and extraction wells are presented on the Site Plan (Figure 2).

2.0 PAST WORK ON SITE

On 2/26/99, a soil boring was advanced in the northern section of the property, about 10 feet from the edge of First Street sidewalk, to log the soil profile and determine depth to groundwater. A groundwater grab sample was collected and analyzed for Total Petroleum Hydrocarbons as gasoline (TPHg), benzene, toluene, ethyl-benzene, total xylenes (BTEX) and methyl tertiary butyl ether (MTBE). The sample was found to be impacted by petroleum hydrocarbons (TPHg: 100,000 ug/l, Benzene: 6,100 ug/l, MTBE: 60,000). The results were communicated to the Livermore-Pleasanton Fire Department (LPFD) and a UST Unauthorized Release Report was generated.

On 4/5/99, three gasoline and one diesel USTs, associated dispensers and piping were removed, manifested and disposed, under permit by the LPFD. The pit was over-excavated and samples were collected from native soil beneath the USTs; sample analysis indicated the presence of petroleum hydrocarbons in soil. Total Petroleum

Hydrocarbons as diesel (TPHd) were detected at low levels (61 mg/kg) in the soil stockpile but not beneath the diesel tank; Total Petroleum Hydrocarbons as gasoline (TPHg) concentrations ranged from not detectable to 80 mg/kg in all samples; MTBE concentrations ranged from 24 to 110 mg/kg.

On 5/20/99 soil samples were collected beneath the dispenser islands. TPHg was found beneath the east dispenser island in varying concentrations ranging from 32 mg/kg to 6,500 mg/kg; TPHd beneath the diesel dispenser was detected at 1300 mg/kg; no MTBE was detected beneath the dispenser islands.

On 7/26/00, soil borings were drilled onsite to an approximate depth of 30-feet below ground surface (bgs). Soil samples were collected for analyses. Upon completion of drilling activities, the soil borings were converted to groundwater monitoring wells (MW1, MW2 and MW3) by installing 2-inch diameter, Schedule 40, factory threaded polyvinyl chloride (PVC) slotted 0.010-inch well casings. The slotted interval extends from 15 to 30 feet bgs. The wells were sampled on 8/11/00 and analyzed for TPHd, TPHg, BTEX and MTBE. The sample results indicated significant hydrocarbon impact in the groundwater. Directly downgradient well MW1 had concentrations of TPHg and MTBE of 170,000 ug/L and 320,000 ug/L respectively. A "Well Installation Report" was issued by ETIC Engineering on 9/22/00.

On 10/19/00 the monitoring wells were sampled as part of a quarterly sampling program. MW1 remained impacted with 17,000 ug/L TPHd, 170,000 ug/L TPHg, 200,000 ug/L MTBE and 8,400 ug/L Benzene. Crossgradient well MW2 contained 1,300 ug/L TPHd, 3,400 ug/L TPHg, 1,900 ug/L MTBE and 150 ug/L Benzene. Upgradient well MW3 contained no TPHd, TPHg, BTEX or MTBE above detection limits. As directed by Ms. Chu of the ACEHS, the samples were also analyzed for fuel oxygenates, confirming the presence of MTBE. Geo Environmental Technology (GET) issued a "Quarterly Monitoring Report" on January 31, 2001.

Soil borings were advanced offsite using geoprobe technology on 2/2/01. Boring B1 was placed at the proposed location for an extraction well on site and contained 650,000 ug/l of TPHg and 290,000 ug/l of MTBE. No contaminants were found adjacent to the Livermore Inn north of the site, however groundwater in borings advanced within Hanson Park to the northwest was impacted by TPHg (12,000 ug/l) and MTBE (16,000 ug/l).

On 2/22/01 the monitoring wells were sampled again. MW1 contained 11,000 ug/L TPHd, 82,000 ug/L TPHg, 190,000 ug/L MTBE and 5,100 ug/L Benzene. Crossgradient well MW2 contained 880 ug/L TPHd, 7,600 ug/L TPHg, 2,200 ug/L MTBE and 25 ug/L Benzene. Upgradient well MW3 again contained no TPHd, TPHg, BTEX or MTBE above detection limits. GET issued a "Quarterly Monitoring Report" on March 12, 2001.

Cumulative depth to water values and laboratory analytical results for all monitoring wells are presented in Table 2 and fuel oxygenate analytical results are presented as Table 3.

The three 30-foot deep monitoring wells have not been included in the quarterly sampling for the last three quarters of 2001; GET personnel attempted to sample these shallow wells on 5/30/01, 8/22/01 and 11/14/01, however the wells were dry each time.

3.0 SITE CONTACTS

The following is a listing of site contacts and phone numbers.

UST Operator:	Livermore Gas and Mini Mart Attention: Manwel and Samira Shuwayhat 160 Holmes Street Livermore, CA 94520 Phone: (925) 455-4212
Local Oversight Agency:	ACEHS Attention: Eva Chu 1131 Harbor Bay Parkway, Suite 250 Alameda, CA 94502 Phone: (510) 567-6700
Environmental consultant:	Geo Environmental Technologies Attention: Costas Orountiotis 3275 Stevens Creek Boulevard, Suite 208 San Jose, CA 95117 Phone: (408) 241-1798

4.0 METHODS AND PROCEDURES

Geo Environmental Technology obtained a well installation permit (21173) from the Zone 7 Water Agency. A copy of the well permit is presented in Appendix A. Well locations were marked by GET and cleared for the presence of underground utilities by Underground Services Alert (USA Dig Alert # 338369). Encroachment permit ENO10568 (Appendix A) was obtained from the City of Livermore prior to offsite work.

4.1 Soil Boring Installation and Sample Collection

On October 29, 2001, a soil boring was drilled to an approximate depth of 55-feet below ground surface (bgs) using truck-mounted, nominal 10-inch outer diameter, continuous flight, hollow stem auger drilling equipment. The boring was located approximately 8 feet north of monitoring well MW1. This first boring drilled (later converted to extraction well EX1) was sampled continuously from 10-feet bgs to 55-feet bgs; first water was encountered at about 44' bgs, and quickly rose to 38' bgs. Soil stratigraphy conformed to previously described lithology: 11'-17': tightly packed sandy clay, 17'-22': sands and gravel, 22'-30': clay, 30'-32': gravel and 33'-55': sands and gravel.

Soil samples were obtained using Standard Penetration sampling techniques. A 2½ inch outside diameter, modified California split-barrel sampler, lined with clean 2-inch outside diameter brass sleeves, was used to collect the soil samples. The sampler was driven into undisturbed soil ahead of the augers by dropping a 130-pound (lb) hammer for a vertical distance of 36-inches. The sampler was decontaminated prior to each use, by washing in tri-sodium phosphate solution, then followed with a triple fresh water rinse. Subsurface soil conditions were characterized by examining soil cuttings and from the soil samples that were collected. The soil boring log for extraction well EX1 is presented in Appendix B.

Work continued on October 30, 2001, with the installation of wells MW4 in the center of Hanson Park and MW6 in the traffic island between Hanson Park and the hospital; work was completed on October 31, 2001 with the installation of monitoring well MW5 in the front landscape area of Noah's Bagels' property.

4.2 Laboratory Analysis of Soil Samples

Based on the findings of the offsite geoprobe investigation of 2/2/01, offsite soil is not impacted and there was no need that soil samples be analyzed.

4.3 Monitoring Well Construction

Upon completion of drilling activities, the soil borings were converted to 6-inch diameter groundwater extraction well EX1 and 2-inch diameter, monitoring wells MW4, MW5 and MW6 by installing Schedule 40, factory threaded and slotted 0.010-inch polyvinyl chloride (PVC) casing. The slotted interval in well EX1 extended from 30.0 to 55.0 feet bgs. The slotted interval in wells MW4, MW5 and MW6 extended from 15.0 to 45.0 feet bgs. Slip caps were attached to the bottom the slotted casings with a 1/2-inch screw.

Number 2/12-filter sand was placed in the annulus between the slotted pipes and the borehole wall. Sand pack extended from the total depth of each boring to 2-feet above the top of the screened interval. Two feet of bentonite pellets were placed over the top of the sand pack and hydrated using water to initiate expansion. The rest of each borehole was filled using cement slurry. Locking expansion well caps were installed on each well casing to minimize the probability of foreign materials entering the casing. The top of each well casing was protected by a traffic-rated well box equipped with tamper resistant (bolted) covers. Well construction diagrams are presented in Appendix B. Well construction details are presented in Table 1. Soil cuttings and cleanout water were placed in twelve open-top, 55-gallon drums, pending profile and disposal.

4.4 Monitoring Well Development and Purging

On November 14, 2001, depth to water (DTW) was measured to the nearest 0.01 ft. Depth to water data is presented on Table 2. The monitoring wells were then purged by pumping approximately 5-casing volumes per well; extraction well EX1 was not purged because of its close proximity to dry well MW1 which contained floating product.

Prior to development each well was checked for floating product using a new and unused disposable bailer. Water extracted from the wells was stored at the site in 55-gallon drums pending disposal.

4.5 Laboratory Analysis of Groundwater Samples

Following purging on 11/14/01, the wells were sampled for TPHg and BTEX using EPA Method 8015/8020, TPHd using EPA Method 8015M and for fuel oxygenates using EPA Method 8260.

The groundwater sample containers (40 ml VOA and 1-liter amber bottles) were labeled, then placed in a pre-cooled container to minimize the loss of volatile constituents. Minimum information on the labels included the project name, number, date and time of sampling, sample identification and the identity of the sampler.

Sample data was entered on a Chain of Custody (COC) document that accompanied the samples while onsite and during transport to Chromalab Inc. a State of California CLEP laboratory, for the requisite analysis.

No free product was noted in any of the wells at the time of development and sampling. Wells MW1, MW2 and MW3 remained dry. Results in the new deeper wells were as follows:

Water samples from extraction well EX1 contained, as expected, significant levels of TPHd (2,000 ug/l), TPHg (13,000 ug/l) and MTBE (2,000 ug/l).

Water samples from monitoring well MW4, located in Hanson Park contained 90 ug/l TPHd, 510 ug/l TPHg and 14 ug/l MTBE; TBA was also detected at 6.7 ug/l.

Water samples from monitoring well MW5, located in Noah's Bagels lot contained no TPHd or TPHg at instrument detection levels and 6.8 ug/l MTBE.

Water samples from monitoring well MW6, located in the landscaped traffic island west of Hanson Park, contained no TPHd, TPHg, or MTBE at instrument detection levels.

Groundwater sample analytical results are shown on Figure 3 and tabulated on Table 2. The fuel oxygenates are tabulated on Table 3. Copies of the COC document and laboratory analyticals are presented in Appendix C.

5.0 GROUNDWATER GRADIENT

Following installation of the groundwater monitoring wells, the elevations of the wells were surveyed. Casing and groundwater elevations are presented on figure 4. Survey results were used in determining the elevation of the groundwater and in developing the local gradient. Survey worksheet is presented in Appendix D.

Based on the well survey and DTW measurements taken on 11/14/01, the groundwater direction of flow off site is due north, towards Noah's Bagels. The gradient proximal to the site, is approximately 0.0118 ft/ft. The groundwater gradient and direction are presented on Figure 4. Shallow wells MW1, MW2 and MW3 were not used for the site gradient, because they were dry at the time.

6.0 RECOMMENDATIONS

Based on the data obtained during the installation of wells EX1, MW4, MW5 and MW6, GET recommends the following:

1) Monitor groundwater in the newly installed monitoring wells on a quarterly basis. The next quarterly groundwater-monitoring event is tentatively scheduled for 2/27/02, with a 10-day window of opportunity.

2) Proceed with the pump test and MTBE feasibility test (TBA was found at almost laboratory detection levels). Perform a soil vapor extraction test, while the shallow wells remain dry.

3) Present a copy of this report to Ms. Eva Chu, Alameda County Environmental Health Service.

4) Present a copy of well completion details to Wyman Hong, Zone 7 Water Agency.

TABLE 1 - Well Consrtruction Detail

Livermore Gas and Minimart, 160 Holmes, Livermore, California

Well Number	Date Installed	Total Depth (feet bgs)	Borehole Diameter (inches)	Casing Diameter (inches)	Slot (inch)	Interval					DTW 11/14/01 (feet)
						Screen (feet)	Blank Casing (feet)	Sand Pack (feet)	Bentonite Seal (feet)	Cement Grout (feet)	
MW-1	07/26/00	30	8	2	0.01	30-15	15-0.5	30-13	13-11	11-1.0	20.49
MW-2	07/26/00	30	8	2	0.01	30-15	15-0.5	30-13	13-11	11-1.0	20.35
MW-3	07/26/00	30	8	2	0.01	30-15	15-0.5	30-13	13-11	11-1.0	20.97
MW-4	10/30/01	50	10	2	0.01	50-20	20-0.5	50-18	18-16	16-0.5	33.84
MW-5	10/30/01	50	10	2	0.01	50-20	20-0.5	50-18	18-16	16-0.5	34.94
MW-5	10/30/01	50	10	2	0.01	50-20	20-0.5	50-18	18-16	16-0.5	33.88
EX1	10/30/01	55	10	6	0.01	55-30	30-0.5	55-28	28-26	26-0.5	33.41

Notes: bgs Below ground surface
DTW Depth to water

TABLE 2 - Groundwater Analytical Results

Livermore Gas and Minimart, 160 Holmes, Livermore, California

Well ID.	Date	DTW (feet)	TPHd (µg/L)	TPHg (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethyl-Benzene (µg/L)	Xylenes (µg/L)	MtBE (µg/L)
MW1	08/11/00		57,000	170,000	6,400	7,600	4,200	9,700	320,000
	10/19/00	21.94	17,000	170,000	8,400	3,200	2,700	10,000	200,000
	02/22/01	22.91	11,000	82,000	5,100	1,000	13,000	8,700	190,000
	05/30/01	Dry							
	11/14/01	Dry							
MW2	08/11/00		1,900	4,500	220	52	160	170	3,000
	10/19/00	21.80	1,300	3,400	150	21	100	70	1,900
	02/22/01	22.87	880	7,600	25	< 10	69	25	2,200
	05/30/01	Dry							
	11/14/01	Dry							
MW3	08/11/00		260	59	< 0.50	< 0.50	< 0.50	< 0.50	< 5.0
	10/19/00	22.45	< 65	< 50	< 0.50	< 0.50	< 0.50	< 0.50	< 5.0
	02/22/01	23.51	100	< 50	< 0.50	< 0.50	< 0.50	< 0.50	< 5.0
	05/30/01	Dry							
	11/14/01	Dry							
MW-4	11/14/01	33.84	90	510	4	<0.50	<0.50	<0.50	14
MW-5	11/14/01	34.94	<66	<50	<0.50	<0.50	<0.50	<0.50	8.2
MW-6	11/14/01	33.88	<50	<50	<0.50	<0.50	<0.50	<0.50	<5.0
EX1	11/14/01	33.41	2,000	13,000	180	1,000	330	3,200	2,200

Notes:

DTW Depth to Groundwater Elevation

TPHg Total Petroleum Hydrocarbons as gasoline

TPHd Total Petroleum Hydrocarbons as diesel

µg/L Micrograms per liter

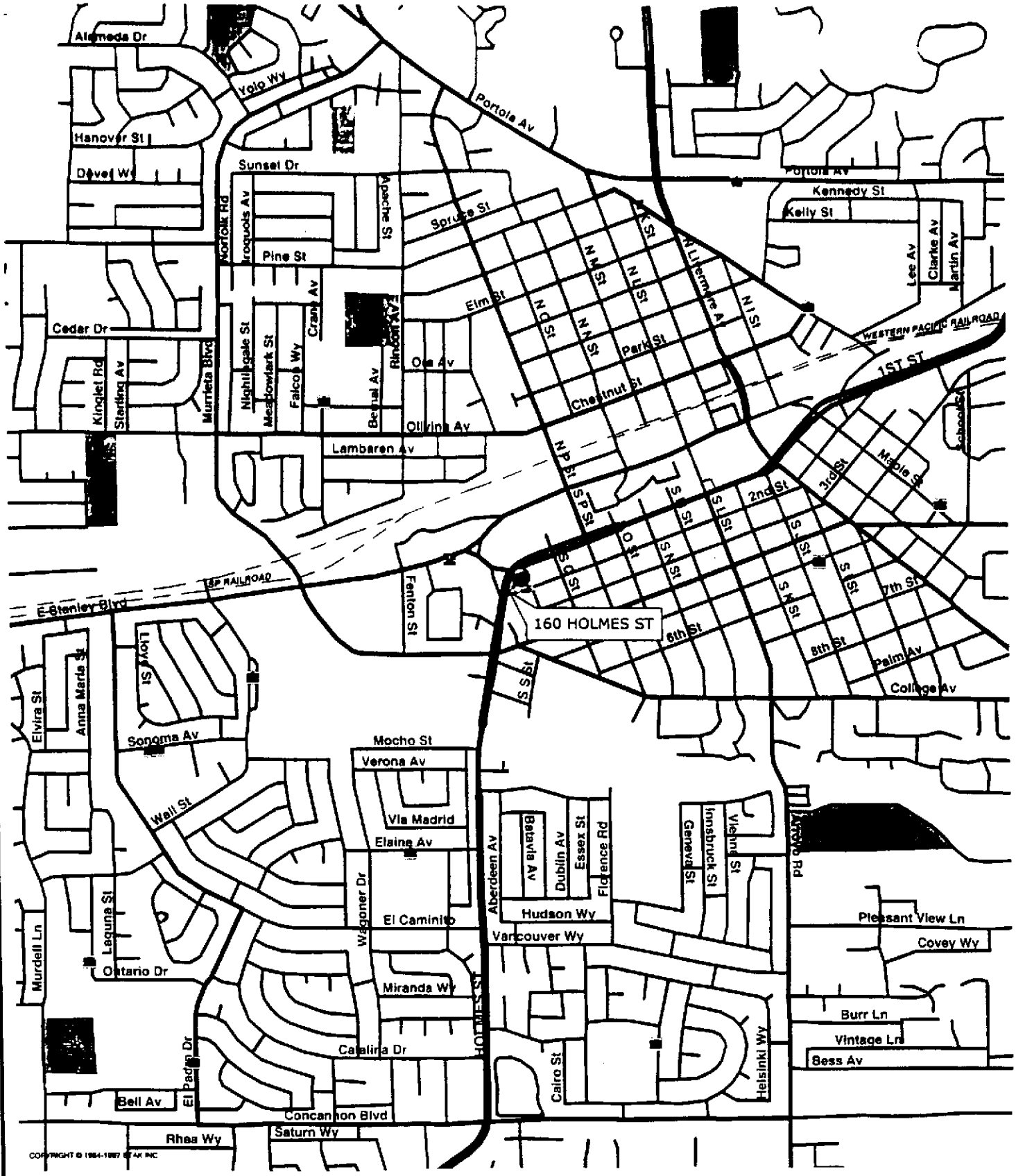
MTBE Methyl tertiary butyl ether

TABLE 3 - Fuel Oxygenates

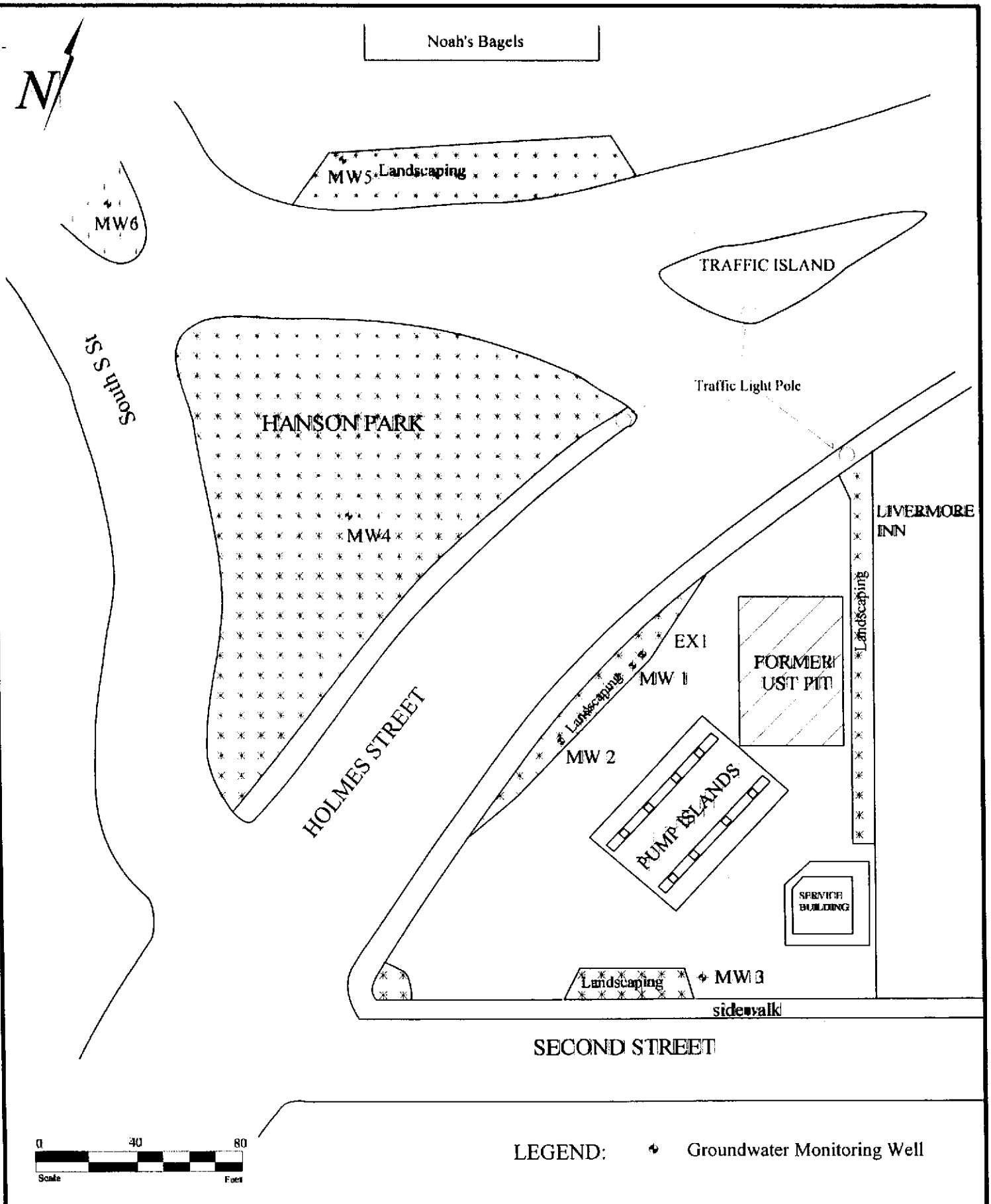
Livermore Gas and Minimart, 160 Holmes, Livermore, California

Well ID.	Date sampled	Diisopropyl Ether (µg/L)	Ethyl-t-butyl Ether (µg/L)	Methyl-t-butyl Ether (µg/L)	Tert-Amyl Methyl Ether (µg/L)	Tert-Butanol (µg/L)
MW1	10/19/00	< 2000	< 2000	180,000	< 2000	< 2000
MW2	10/19/00	< 40	< 40	1,800	< 40	< 40
MW3	10/19/00	< 1	< 1	< 1	< 1	< 1
MW4	11/14/01	<10	<5.0	14	<5.0	6.7
MW5	11/14/01	<10	<5.0	8.2	<5.0	<5.0
MW6	11/14/01	<10	<5.0	<5.0	<5.0	<5.0
EX1	11/14/01	<250	<250	2,200	<250	<250

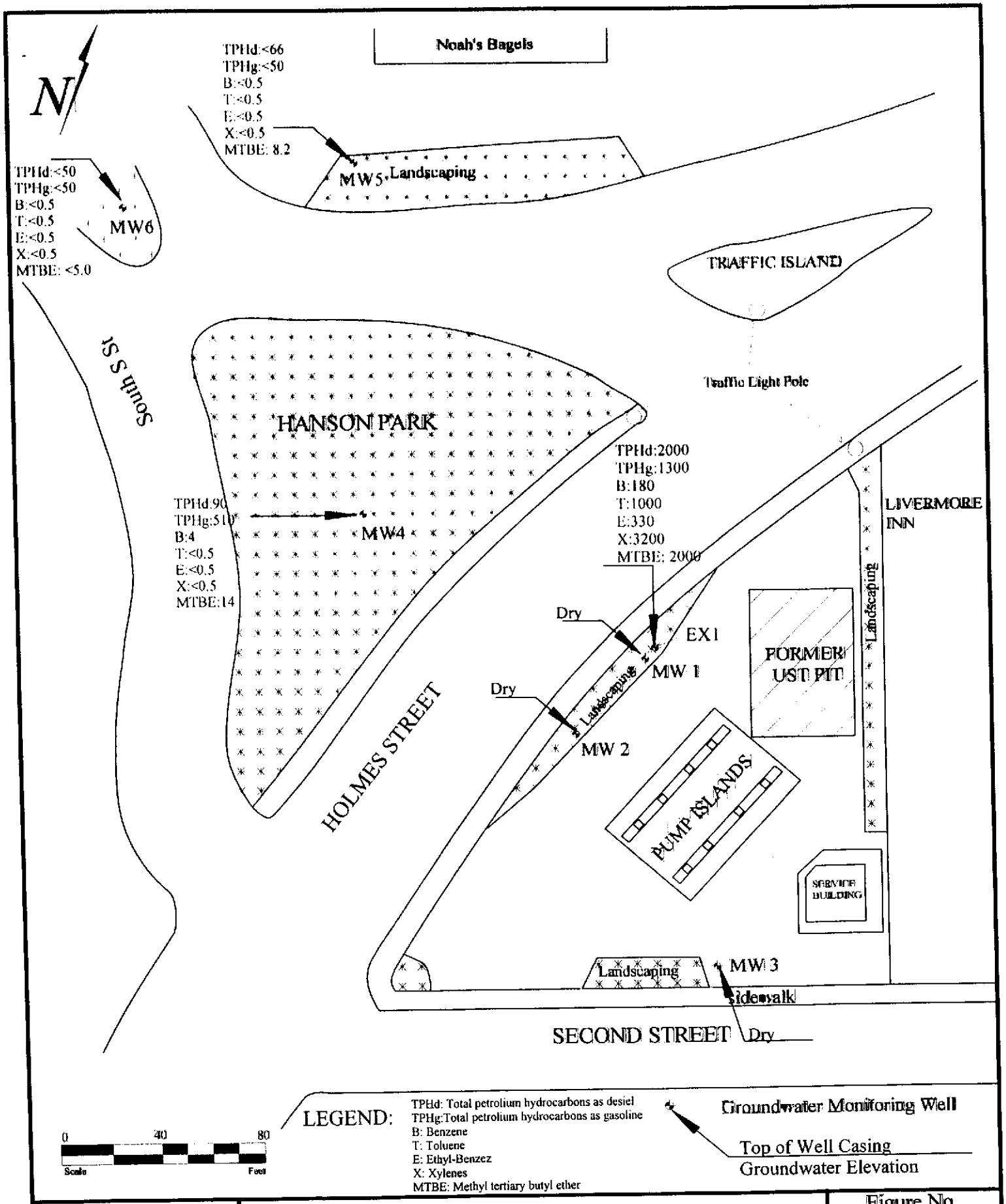
Note: µg/L = Micrograms per liter



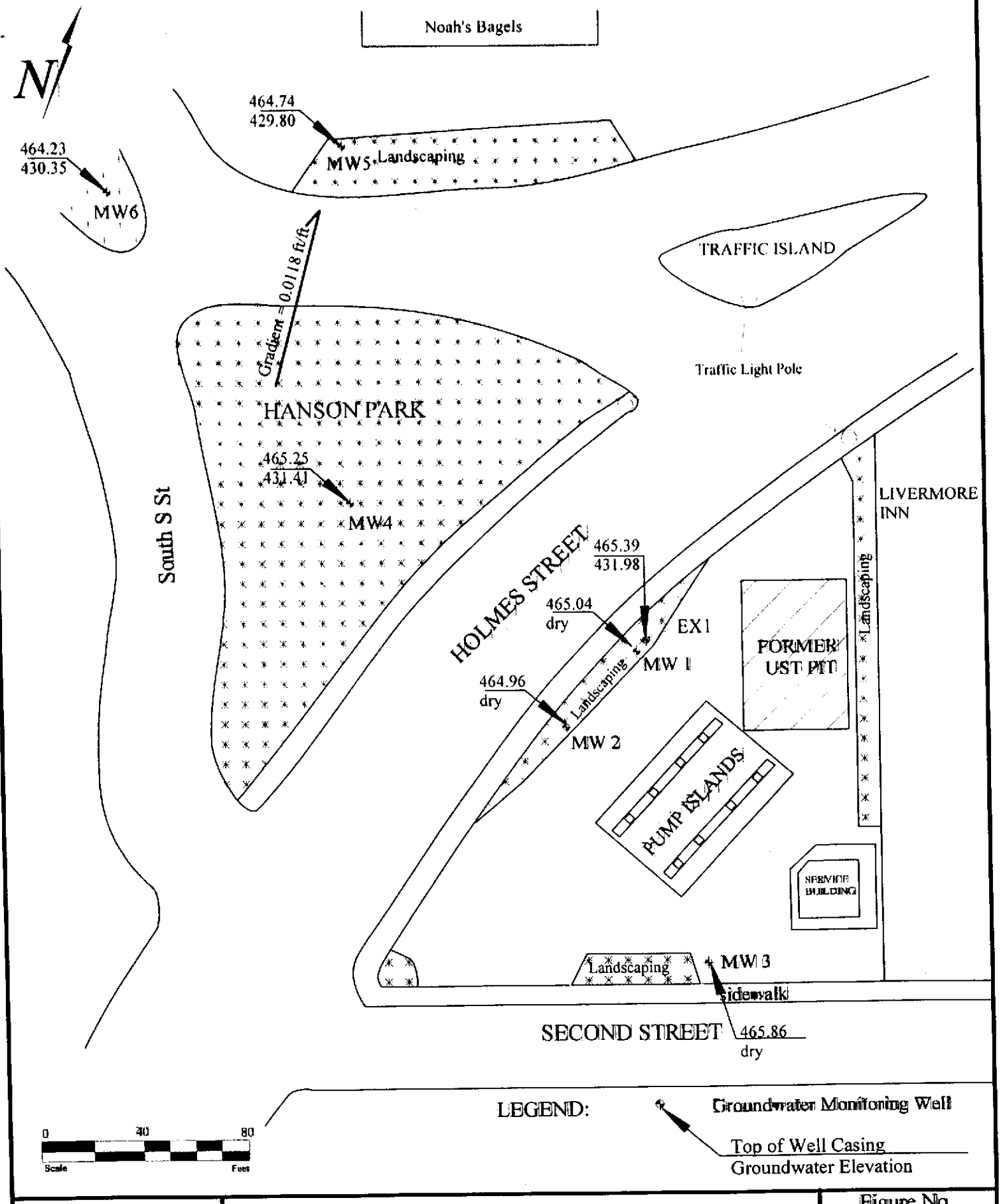
Geo Environmental Technologies	SITE VICINITY MAP Livermore Gas and Minimart 160 Homes Street, Livermore, CA	Figure No. 1 Project Manwel



Geo Environmental Technologies	Site Plan Livermore Gas and Minimart 160 Homes Street, Livermore, CA	Figure No. 2 Project Manwel



Geo Environmental Technologies	Groundwater Analyticals Livermore Gas and Minimart 160 Homes Street, Livermore, CA	Figure No. 3 Project Manwel



Geo Environmental Technologies	Groundwater Direction and Gradient Livermore Gas and Minimart 160 Homes Street, Livermore, CA	Figure No. 4 Project Manwel

APPENDIX A

Well Construction Permit
ACEHS Directives

RO0000324

Mr. Manwel Shuwyahat
Livermore Gas and Mini Mart
160 Holmes Street
Livermore, CA 94550

RE: Workplan Approval for 160 Holmes Street, Livermore, CA

Dear Mr. Shuwyahat:

I have completed review of Geo Environmental Technologies' (GET) August 2001 *Workplan: Additional Investigation Extraction Well Installation*, a report prepared for the above referenced site. GET's proposal to install offsite groundwater monitoring wells and an onsite groundwater extraction well is acceptable. The offsite wells will help to delineate the extent of the contaminant plume. The extraction well will be used to perform an aquifer pump test and MTBE treatment study.

Be advised that as of January 2002, all monitoring wells need to be surveyed using latitude/longitude coordinants to sub-meter accuracy. In addition, all future laboratory analytical results need to be filed electronically with the State Water Resources Control Board. A hard copy of the lab results is still required by this office.

Field work should commence within 60 days of the date of this letter, **or by November 28, 2001.** Please provide at least 72 hours advance notice of field activities. If you have any questions, I can be reached at (510) 567-6762.

eva chu
Hazardous Materials Specialist

email: Costas Orountiotis

holmes9

RO0000324

February 12, 2002

Mr. Manwel Shuwyahat
Livermore Gas and Mini mart
160 Holmes Street
Livermore, CA 94550

RE: Workplan for 160 Holmes Street, Livermore, CA

Dear Mr. Shuwyahat:

I have completed review of Geo Environmental Technologies' (GET) May 2001 *Downgradient Investigation of Groundwater* report prepared for the above referenced site. Two onsite and three offsite borings were advanced to delineate the lateral extent of groundwater contamination. Based on the results of this investigation, GET recommended the installation of permanent offsite groundwater monitoring wells and one onsite extraction well.

GET's recommendations are appropriate at this time. Please provide a workplan for the installation of permanent groundwater monitoring wells. The workplan is due within 45 days of the date of this letter, or **by July 17, 2001.** If you have any questions, I can be reached at (510) 567-6762.

eva chu
Hazardous Materials Specialist

email: Costas Orountiotis

holmes-8

ZONE 7 WATER AGENCY

5997 PARKSIDE DRIVE PLEASANTON, CALIFORNIA 94588-5127 VOICE (925) 484-2600 X235
FAX (925) 462-3914

DRILLING PERMIT APPLICATION

FOR APPLICANT TO COMPLETE

LOCATION OF PROJECT 160 Holmes Street
Livermore, CA
94550

California Coordinates Source _____ ft. Accuracy± _____ ft.
CCN _____ ft. CCE _____ ft.
APN 097 0082 007

CLIENT
Name Manuel Shuwayhat
Address 54 Wolfe Canyon Phone _____
City Kentfield CA Zip 94904

APPLICANT
Name Geo Environmental Tech Fax 408 347-7675
Address 3275 Stevens Creek Phone 408-241-7848
City Blvd #208 Zip 95117
city San Jose CA

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 Monitoring	☒

DRILLING METHOD:

Mud Rotary	☐	Air Rotary	☐	Auger	☒
Cable	☐	Other	☐		

DRILLER'S LICENSE NO. C57 - 484288

WELL PROJECTS
Drill Hole Diameter 8 in. Maximum
Casing Diameter 2 in. Depth 50 ft.
Surface Seal Depth 20 ft. Number 4

GEOTECHNICAL PROJECTS
Number of Borings _____ Maximum
Hole Diameter _____ In. Depth _____ ft.

ESTIMATED STARTING DATE 10-29-01
ESTIMATED COMPLETION DATE 10-30-01

I hereby agree to comply with all requirements of this permit and Alameda County Ordinance No. 73-68.
APPLICANT'S SIGNATURE [signature] Date 10/26/01

FOR OFFICE

PERMIT NUMBER _____
WELL NUMBER _____
APN _____

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 SUPPLY WELLS
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.
3. An access port at least 0.5 inches in diameter is required on the wellhead for water level measurements.
4. A sample port is required on the discharge pipe near the wellhead.

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 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.

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

F. WELL DESTRUCTION. See attached.

G. SPECIAL CONDITIONS

Approved _____ Date _____
Wyman Hong

8/6/99

Applicant

City of Livermore
Community Development Department
1052 S. Livermore Avenue
Livermore, CA 94550
(925) 373-5240

Encroachment
Permit No. EN010568

PERMIT TO DO WORK IN ACCORDANCE WITH CHAPTER 12.08 OF THE LIVERMORE MUNICIPAL CODE AND SPECIFICATIONS AS ADOPTED BY THE CITY OF LIVERMORE AND ANY SPECIAL REQUIREMENTS SHOWN OR LISTED HEREIN.

Applicant/Permittee:
Name: GEO ENVIRONMENTAL
Address: 3275 STEVENS CREEK BL #208
SAN JOSE, CA, 95117
Phone: (408) 248-1798

Receipt No"
Permit Fee: $27.00
Inspection Fee: $23.00
Bond: $0.00

Total: $50.00

Contractor:
Name: GEO ENVIRONMENTAL
Address: 3275 STEVENS CREEK BL #208
SAN JOSE, CA, 95117
Phone: (408) 248-1798

PLEASE READ THIS PERMIT CAREFULLY. KEEP IT AT THE WORK SITE. TO ARRANGE FOR INSPECTION, PHONE (925) 373-5240 AT LEAST 24 HOURS BEFORE YOU START WORK.

JOB LOCATION: , HANSEN PARK AND HOLMES/SOUTH S. ST.

DESCRIPTION OF WORK: BORE 1" DIAMETER TEST CYLINDER BEHIND SIDEWALK IN HANSEN PARK AND IN TRAFFIC ISLAND AT INTERSECTION OF HOLMES AND SOUTH S. ST.

Length of Excavation: N/A L.F. Width: N/A L.F. Depth: N/A L.F.

Attention is directed to the General Provisions printed on the reverse side of this permit and to the attached special requirements (to be determined as needed by the Engineering Division).

Prosecution of Work: All work authorized by the permit shall be performed in a workmanlike, diligent, and expeditous manner, and must be completed to the satisfaction of the Director of Public Works.

Liability and Damages: The permittee shall be responsible for all liability imposed by law for personal injury or property damage which may arise out of the work permitted and done by permittee under this permit, or which may arise out of the failure on the part of the permittee to perform his obligations under said permit in respect to maintenance and encroachment. The permittee shall protect and indemnify the City of Livermore, its officers and employees, and save them harmless in every way from all action at law for damage or injury to persons or property that may arise out of or be occasioned in any way because of his operations as provided in this permit.

Signature of Permittee:
By: [signature]
Date: 10/29/01

City Engineer
By: [signature]
Date of Issue: 10/29/01

Work Completed:
Date: _____ Inspector: _____

City of Livermore
Community Development Department
1052 S. Livermore Avenue
Livermore, CA 94550
(925) 373-5240

Encroachment Permit No. EN010568

SPECIAL REQUIREMENTS APPLICABLE TO WORK ASSOCIATED WITH

JOB LOCATION: *, HANSEN PARK AND HOLMES/SOUTH S. ST.*

DESCRIPTION OF WORK: *BORE 1" DIAMETER TEST CYLINDER BEHIND SIDEWALK IN HANSEN PARK AND IN TRAFFIC ISLAND AT INTERSECTION OF HOLMES AND SOUTH S. ST.*

1: See Attached Drawing/Plans

2: All work shall be completed between the hours of 9 a.m. and 3 p.m.

3: All lane closures/ traffic control shall be done per Cal Trans Standards.

4: Contractor shall repair/replace all damaged curb, gutter and sidewalk damaged as a result of current work being completed per the City Livermore Standard Details.

5: Pedestrian access must be maintained at all times, including if necessary, escorting pedestrians through the work area.

6: Traffic control shall be completed per Cal Trans Standards and any additional requirements deemed necessary by the City Engineer.

7: Cal Trans permit required for work withinHighway 84 (First Street) right-of-way.

APPENDIX B

Boring Logs
Well Construction Diagrams

WELL DETAILS

PROJECT NUMBER Manwel

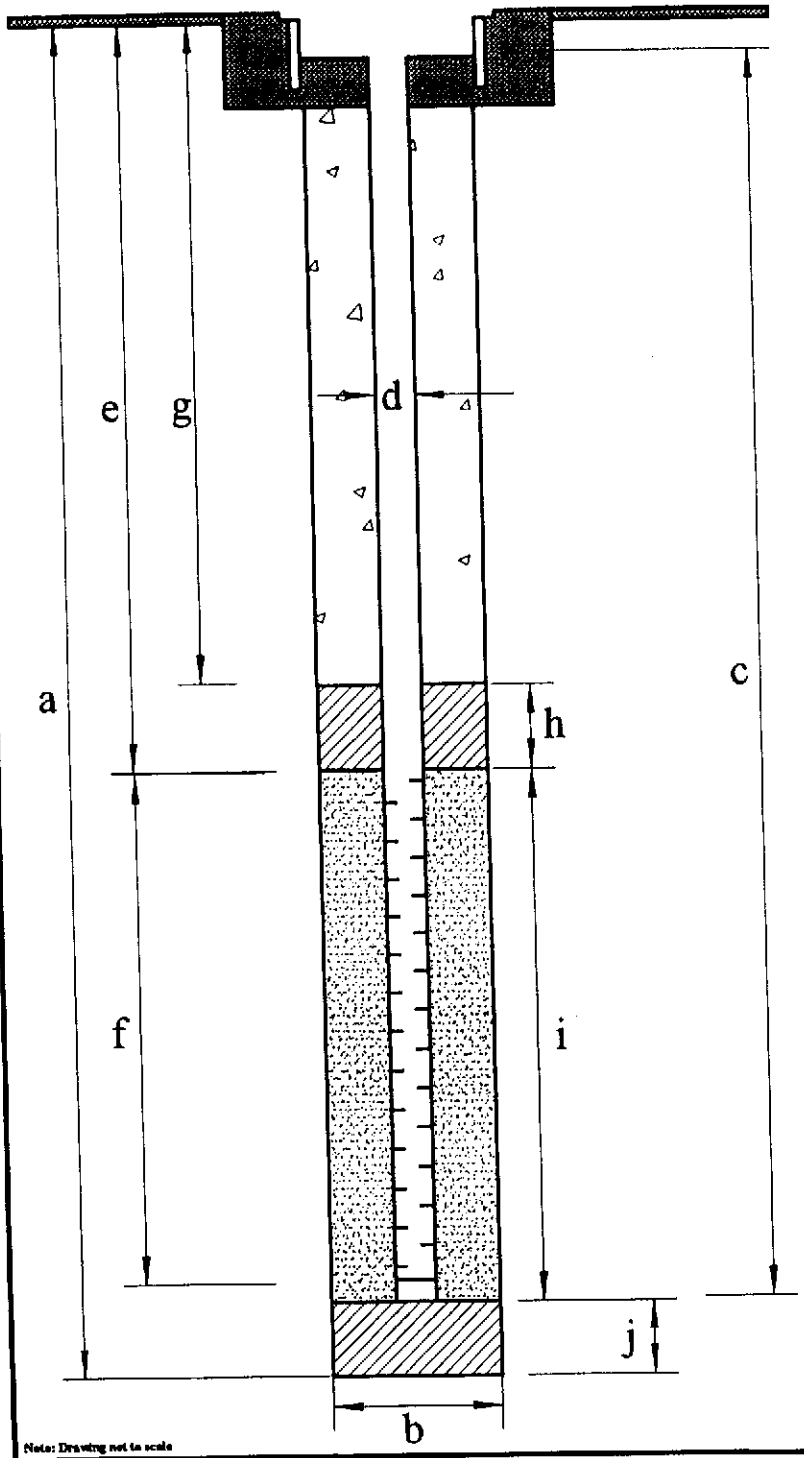
BORING/WELL NUMBR EX1

DRILLER Exploration Geoservices

PROJECT NAME Offsite wells

WELL PERMIT NUMBER 2-1173

DATE 9-21-01



Note: Drawing not to scale

EXPLORATORY BORINGS

a. Total depth 55 ft

b. Diameter 10 in
Drilling method: Hollow stem auger

WELL CONSTRUCTION

c. Casing length 55 ft
Material: Schedule 40 PVC

d. Diameter 6 in

e. Depth to top perforations 30 ft

f. Perforated length 25 ft

Perforated interval from 30 to 55 ft
Perforated type: Factory slotted
Perforation size: 0.010 in

g. Surface seal 26 ft
Seal material: Sand/Cement slurry

h. Seal 2 ft
Seal material: Bentonite

i. Gravel pack 27 ft
Pack material: No. 2/12 sand

j. Bottom seal ____ ft
Seal material: -

GET

Figure No.
EX1

WELL DETAILS

PROJECT NUMBER Manwel

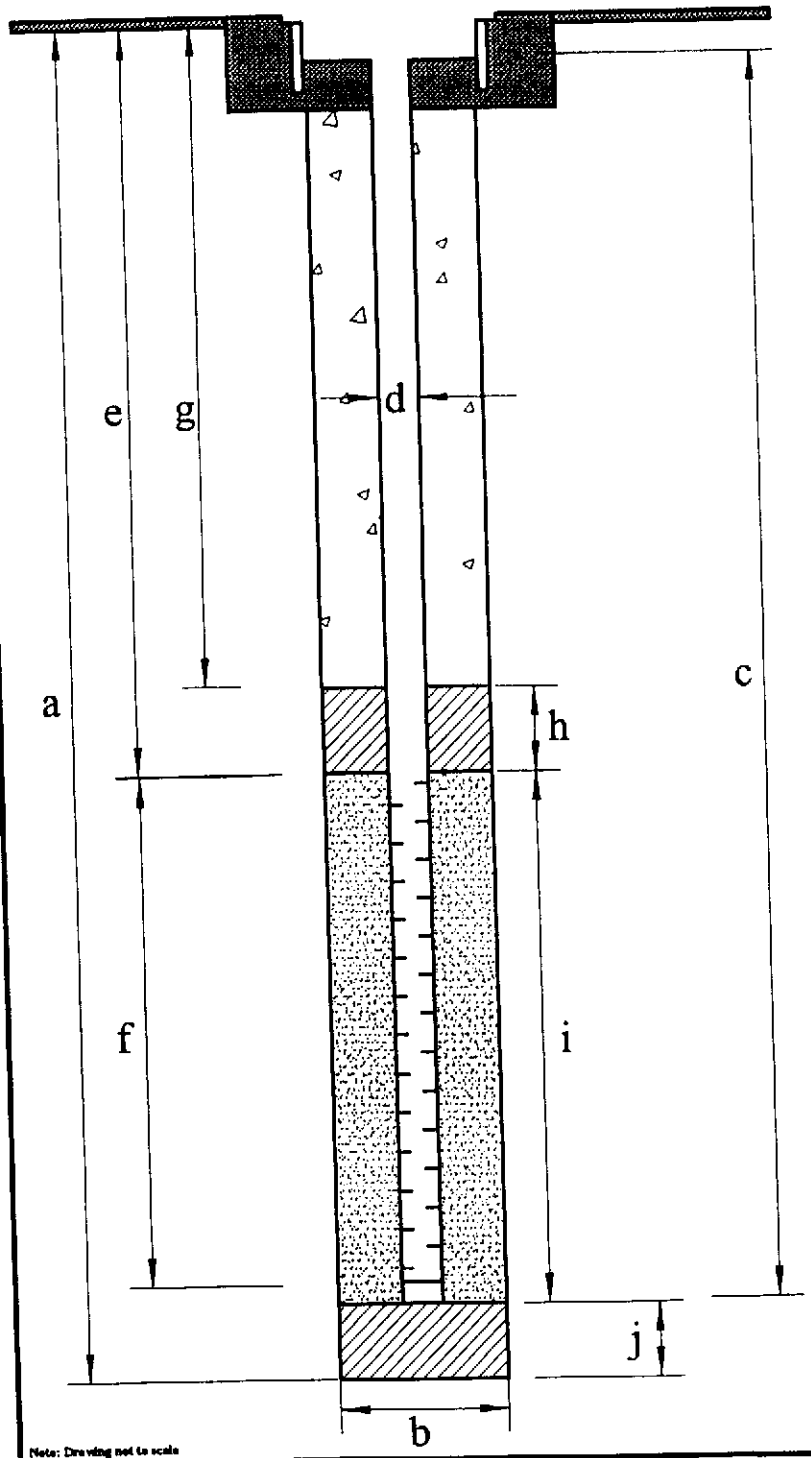
BORING/WELL NUMBR MW4

DRILLER Exploration Geoservices

PROJECT NAME Offsite wells

WELL PERMIT NUMBER 2-1173

DATE 9-21-01



Note: Drawing not to scale

EXPLORATORY BORINGS

a. Total depth 50 ft

b. Diameter 8 in
Drilling method: Hollow stem auger

WELL CONSTRUCTION

c. Casing length 50 ft
Material: Schedule 40 PVC

d. Diameter 2 in

e. Depth to top perforations 20 ft

f. Perforated length 30 ft

Perforated interval from 20 to 50 ft
Perforated type: Factory slotted
Perforation size: 0.010 in

g. Surface seal 16 ft
Seal material: Sand/Cement slurry

h. Seal 2 ft
Seal material: Bentonite

i. Gravel pack 32 ft
Pack material: No. 2/12 sand

j. Bottom seal ____ ft
Seal material: ____

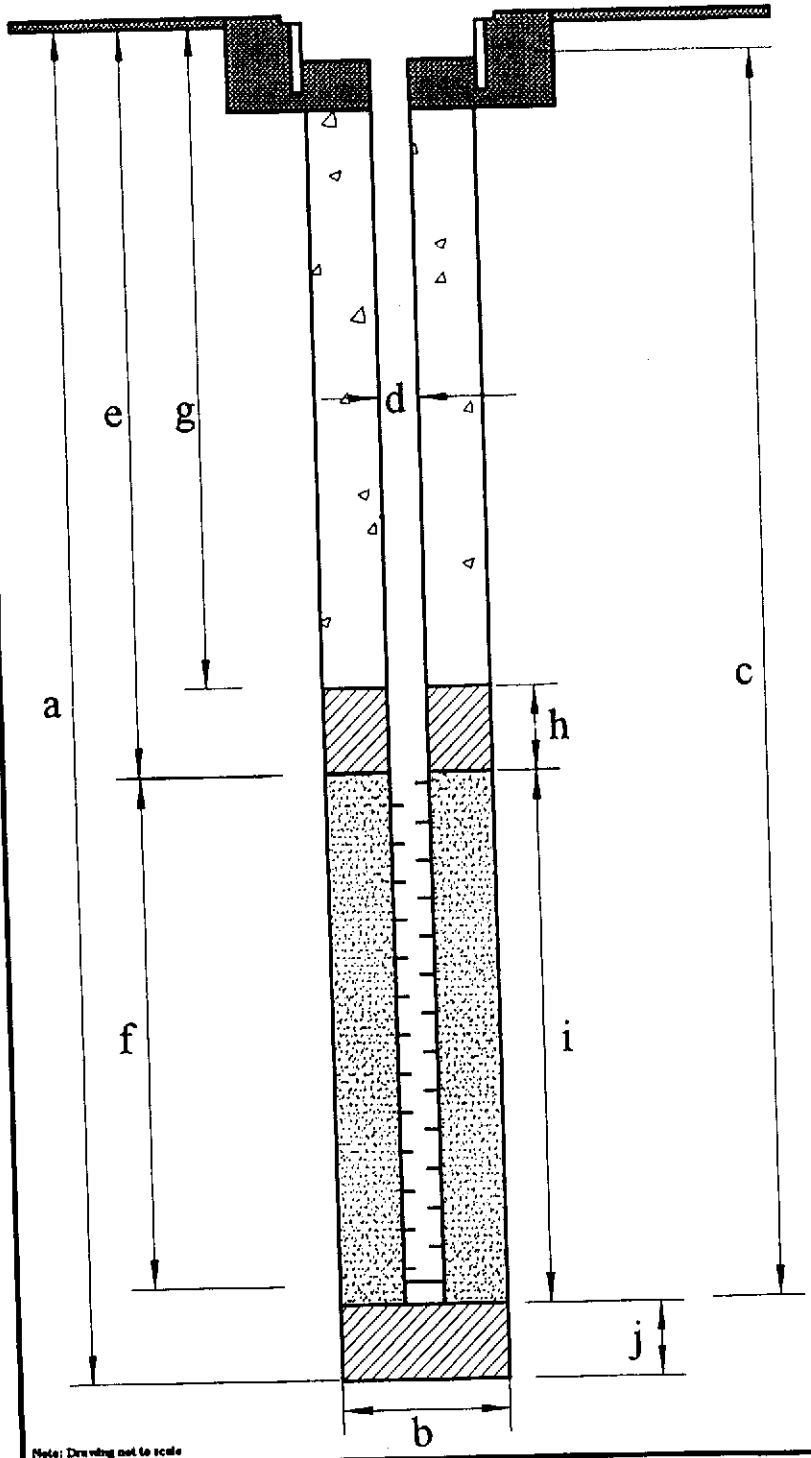
GET

Figure No.
MW4

WELL DETAILS

PROJECT NUMBER Manwel
BORING/WELL NUMBR MW5
DRILLER Exploration Geoservices

PROJECT NAME offsite wells
WELL PERMIT NUMBER 2-1173
DATE 9-21-01



Note: Drawing not to scale

EXPLORATORY BORINGS

a. Total depth 50 ft

b. Diameter 8 in
Drilling method: Hollow stem auger

WELL CONSTRUCTION

c. Casing length 50 ft
Material: Schedule 40 PVC

d. Diameter 2 in

e. Depth to top perforations 20 ft

f. Perforated length 30 ft

Perforated interval from 20 to 50 ft
Perforated type: Factory slotted
Perforation size: 0.010 in

g. Surface seal 16 ft
Seal material: Sand/Cement slurry

h. Seal 2 ft
Seal material: Bentonite

i. Gravel pack 32 ft
Pack material: No. 2/12 sand

j. Bottom seal ____ ft
Seal material ____

GET

Figure No.
MW5

WELL DETAILS

PROJECT NUMBER Manwel

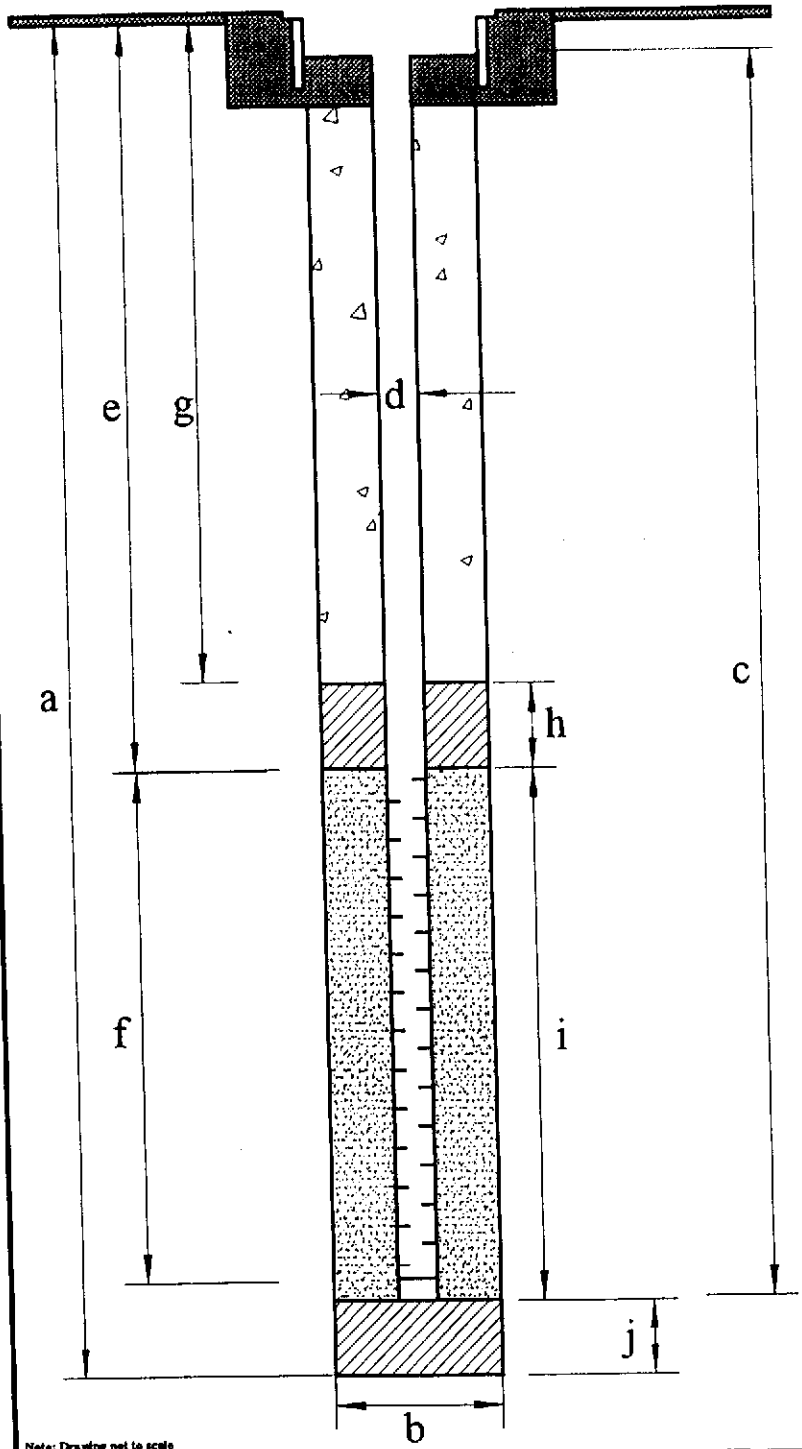
BORING/WELL NUMBR MW 6

DRILLER Exploration Geoservices

PROJECT NAME Offsite wells

WELL PERMIT NUMBER 2-1173

DATE 9-21-01



Note: Drawing not to scale

EXPLORATORY BORINGS

a. Total depth 50 ft

b. Diameter 8 in

Drilling method: Hollow stem auger

WELL CONSTRUCTION

c. Casing length 50 ft

Material: Schedule 40 PVC

d. Diameter 2 in

e. Depth to top perforations 20 ft

f. Perforated length 30 ft

Perforated interval from 20 to 50 ft

Perforated type: Factory slotted

Perforation size: 0.010 in

g. Surface seal 16 ft

Seal material: Sand/Cement slurry

h. Seal 2 ft

Seal material: Bentonite

i. Gravel pack 32 ft

Pack material: No. 2/12 sand

j. Bottom seal ____ ft

Seal material -

GET

Figure No.

MW 6

CONFIDENTIAL

STATE OF CALIFORNIA·DWR
WELL COMPLETION REPORT
(WELL LOGS)

REMOVED

CONFIDENTIAL

STATE OF CALIFORNIA·DWR
WELL COMPLETION REPORT
(WELL LOGS)

REMOVED

CONFIDENTIAL

STATE OF CALIFORNIA·DWR
WELL COMPLETION REPORT
(WELL LOGS)

REMOVED

CONFIDENTIAL

STATE OF CALIFORNIA·DWR
WELL COMPLETION REPORT
(WELL LOGS)

REMOVED

APPENDIX C

Groundwater Analytical Results

Reference #: 10470

CHROMALAB, INC.

Environmental Services (SDB) (DOHS 1094)

1220 Quarry Lane • Pleasanton, California 94566-4756
(925) 484-1919 • Fax (925) 484-1096

2001-11-1358

Chain of Custody

DATE 11/14/01 PAGE 1 OF 1

PROJ. MGR	Costas Orountiotis
COMPANY	Geo-Environmental Technologies
ADDRESS	3275 Stevens Creek blvd. #208
	San Jose, CA 95517
SAMPLERS (SIGNATURE)	(PHONE NO.) (408) 241-1798 (FAX NO.) 248-7685

ANALYSIS REPORT

SAMPLE ID	DATE	TIME	MATRIX	PRESERV.	TPH-(EPA 8015,8020) ☒Gas w/ ☒BTEX ☐MTBE	PURGEABLE AROMATICS BTEX (EPA 8020)	TPH-Diesel (EPA 8015M)	TEPH (EPA 8015M) ☐Diesel ☐M.O. ☐Other	PURGEABLE HALOCARBONS (HVOCs) (EPA 8010)	VOLATILE ORGANICS (VOCs) (EPA 8260)	SEMIVOLATILES (EPA 8270)	Oil & Grease ☐Petrol ☐Total ☐1664	Fuel Oxygenates	☐ PESTICIDES(EPA 8080) ☐ PCB'S (EPA 8080)	PNA's by ☐ 8270 ☐ 8310	☐ Spec. Cond. ☐ TSS ☐ TDS	LUFT METALS: Cd, Cr, Pb, Ni, Zn	CAM 17 METALS (EPA 6010/7470/7471)	TOTAL LEAD	☐ W.E.T. (STLC) ☐ TCLP	☐ Hexavalent Chromium ☐ pH (24 hr hold time for H20)				NUMBER OF CONTAINERS
MW 4	11/14/01		H_2O	✓	X		X						X												3
MW 5	"		"	✓	X		X						X												3
MW 6	"		"	✓	X		X						X												3
EX 1	"		"	✓	X		X						X												3
MW 1	Dry																								
MW 2	Dry																								
MW 3	Dry																								

PROJECT INFORMATION

PROJECT NAME: Manwel
PROJECT NUMBER: Manwel
P.O. #: Offsite wells

SAMPLE RECEIPT

TOTAL NO. OF CONTAINERS: 12
HEAD SPACE:
TEMPERATURE: 4.0°C
CONFORMS TO RECORD:

TAT	STANDARD 5-DAY			24	48	72	OTHER

SPECIAL INSTRUCTIONS/COMMENTS:

Report: ☐ Routine ☐ Level 2 ☐ Level 3 ☐ Level 4 ☐ Electronic Report

RELINQUISHED BY 1.
(SIGNATURE) (TIME)
C. OROUNTIOTIS
(PRINTED NAME) (DATE)
G.E.T. 11/15/01
(COMPANY)

RECEIVED BY 1.
(SIGNATURE) 1227 (TIME)
B Moran 11/16/01
(PRINTED NAME) (DATE)
STL-CL
(COMPANY)

RELINQUISHED BY 2
(SIGNATURE) (TIME)
(PRINTED NAME) (DATE)
(COMPANY)

RECEIVED BY 2
(SIGNATURE) (TIME)
(PRINTED NAME) (DATE)
(COMPANY)

RELINQUISHED BY 3
(SIGNATURE) 1715 (TIME)
B. Moran 11/16/01
(PRINTED NAME) (DATE)
STL-CL
(COMPANY)

RECEIVED BY (LABORATORY) 3
Denise Harrington
(SIGNATURE) (TIME)
D. Harrington 1715
(PRINTED NAME) (DATE)
STL-CL 11/16/01
(LAB)

Submission #: 2001-11-0358

Date: November 29, 2001

SEVERN TRENT SERVICES

STL Chromalab
1220 Quarry Lane
Pleasanton, CA 94566

Tel 925 484 1919
Fax 925 484 1096
www.stl-inc.com
www.chromalab.com

CA DHS ELAP#1094

Geo Enviromental Technologies

3275 Stevens Creek Blvd
#208
San Jose, CA 95117

Mr. Costas Orountiotis

Project: Manwell
Manwel

Dear Mr. Orountiotis

Attached is our report for your samples received on Friday November 16, 2001
This report has been reviewed and approved for release. Reproduction of this report is permitted only in its entirety.

The report contains a Case Narrative detailing sample receipt and analysis.

Please note that any unused portion of the samples will be discarded after December 31, 2001 unless you have requested otherwise.
We appreciate the opportunity to be of service to you. If you have any questions, please call me at (925) 484-1919.
You can also contact me via email. My email address is: vvancil@chromalab.com

Sincerely,

Vincent Vancil
Project Manager

Submission #: 2001-11-0358

SEVERN TRENT SERVICES

Fuel Oxygenates by 8260B

STL Chromalab
1220 Quarry Lane
Pleasanton, CA 94566

Tel 925 484 1919
Fax 925 484 1096
www.stl-inc.com
www.chromalab.com

CA DHS ELAP#1094

Geo Enviromental Technologies	☒ 3275 Stevens Creek Blvd #208 San Jose, CA 95117
Attn: Costas Orountiotis	Phone: (408) 241-1798 Fax: (408) 248-7685
Manwell	Project: Manwel

Samples Reported

Sample ID	Matrix	Date Sampled	Lab #
MW 4	Water	11/14/2001	1
MW 5	Water	11/14/2001	2
MW 6	Water	11/14/2001	3
EX 1	Water	11/14/2001	4

Submission #: 2001-11-0358

SEVERN TRENT SERVICES

Fuel Oxygenates by 8260B

Geo Enviromental Technologies

Attn: Costas Orountiotis

Test Method: 8260B

Prep Method: 5030B

STL Chromalab
1220 Quarry Lane
Pleasanton, CA 94566

Tel 925 484 1919
Fax 925 484 1096
www.stl-inc.com
www.chromalab.com

CA DHS ELAP#1094

Sample ID:	**MW 4**	Lab Sample ID:	2001-11-0358-001
Project:	Manwell Manwel	Received:	11/16/2001 17:15
		Extracted:	11/20/2001 14:55
Sampled:	11/14/2001	QC-Batch:	2001/11/20-01.27
Matrix:	Water		

Compound	Result	Rep.Limit	Units	Dilution	Analyzed	Flag
tert-Butyl alcohol (TBA)	6.7	5.0	ug/L	1.00	11/20/2001 14:55	
Methyl tert-butyl ether (MTBE)	14	5.0	ug/L	1.00	11/20/2001 14:55	
Di-isopropyl Ether (DIPE)	ND	10	ug/L	1.00	11/20/2001 14:55	
Ethyl tert-butyl ether (ETBE)	ND	5.0	ug/L	1.00	11/20/2001 14:55	
tert-Amyl methyl ether (TAME)	ND	5.0	ug/L	1.00	11/20/2001 14:55	
Surrogate(s)						
1,2-Dichloroethane-d4	108.7	76-114	%	1.00	11/20/2001 14:55	

Submission #: 2001-11-0358

SEVERN TRENT SERVICES

Fuel Oxygenates by 8260B

Geo Enviromental Technologies

Attn: Costas Orountiotis

Test Method: 8260B

Prep Method: 5030B

STL Chromalab
1220 Quarry Lane
Pleasanton, CA 94566

Tel 925 484 1919
Fax 925 484 1096
www.stl-inc.com
www.chromalab.com

CA DHS ELAP#1094

Sample ID:	**MW 5**	Lab Sample ID:	2001-11-0358-002
Project:	Manwell Manwel	Received:	11/16/2001 17:15
		Extracted:	11/20/2001 16:13
Sampled:	11/14/2001	QC-Batch:	2001/11/20-01.27
Matrix:	Water		

Compound	Result	Rep.Limit	Units	Dilution	Analyzed	Flag
tert-Butyl alcohol (TBA)	ND	5.0	ug/L	1.00	11/20/2001 16:13	
Methyl tert-butyl ether (MTBE)	8.2	5.0	ug/L	1.00	11/20/2001 16:13	
Di-isopropyl Ether (DIPE)	ND	10	ug/L	1.00	11/20/2001 16:13	
Ethyl tert-butyl ether (ETBE)	ND	5.0	ug/L	1.00	11/20/2001 16:13	
tert-Amyl methyl ether (TAME)	ND	5.0	ug/L	1.00	11/20/2001 16:13	
Surrogate(s)						
1,2-Dichloroethane-d4	103.5	76-114	%	1.00	11/20/2001 16:13	"S"

Submission #: 2001-11-0358

SEVERN TRENT SERVICES

Fuel Oxygenates by 8260B

Geo Enviromental Technologies

Attn: Costas Orountiotis

Test Method: 8260B

Prep Method: 5030B

STL Chromalab
1220 Quarry Lane
Pleasanton, CA 94566

Tel 925 484 1919
Fax 925 484 1096
www.stl-inc.com
www.chromalab.com

CA DHS ELAP#1094

Sample ID:	MW 6	Lab Sample ID:	2001-11-0358-003
Project:	Manwell Manwel	Received:	11/16/2001 17:15
		Extracted:	11/20/2001 16:41
Sampled:	11/14/2001	QC-Batch:	2001/11/20-01.27
Matrix:	Water		

Compound	Result	Rep.Limit	Units	Dilution	Analyzed	Flag
tert-Butyl alcohol (TBA)	ND	5.0	ug/L	1.00	11/20/2001 16:41	
Methyl tert-butyl ether (MTBE)	ND	5.0	ug/L	1.00	11/20/2001 16:41	
Di-Isopropyl Ether (DIPE)	ND	10	ug/L	1.00	11/20/2001 16:41	
Ethyl tert-butyl ether (ETBE)	ND	5.0	ug/L	1.00	11/20/2001 16:41	
tert-Amyl methyl ether (TAME)	ND	5.0	ug/L	1.00	11/20/2001 16:41	
Surrogate(s)						
1,2-Dichloroethane-d4	113.3	76-114	%	1.00	11/20/2001 16:41	

Submission #: 2001-11-0358

SEVERN TRENT SERVICES

Fuel Oxygenates by 8260B

Geo Enviromental Technologies

Attn: Costas Orountiotis

Test Method: 8260B

Prep Method: 5030B

STL Chromalab
1220 Quarry Lane
Pleasanton, CA 94566

Tel 925 484 1919
Fax 925 484 1096
www.stl-inc.com
www.chromalab.com

CA DHS ELAP#1094

Sample ID:	EX 1	Lab Sample ID:	2001-11-0358-004
Project:	Manwell Manwel	Received:	11/16/2001 17:15
		Extracted:	11/28/2001 17:26
Sampled:	11/14/2001	QC-Batch:	2001/11/28-01.27
Matrix:	Water		

Sample/Analysis Flag: o (See Legend & Note section)

Compound	Result	Rep.Limit	Units	Dilution	Analyzed	Flag
tert-Butyl alcohol (TBA)	ND	250	ug/L	50.00	11/28/2001 17:26	
Methyl tert-butyl ether (MTBE)	2200	250	ug/L	50.00	11/28/2001 17:26	
Di-Isopropyl Ether (DIPE)	ND	500	ug/L	50.00	11/28/2001 17:26	
Ethyl tert-butyl ether (ETBE)	ND	250	ug/L	50.00	11/28/2001 17:26	
tert-Amyl methyl ether (TAME)	ND	250	ug/L	50.00	11/28/2001 17:26	
Surrogate(s)						
1,2-Dichloroethane-d4	108.6	76-114	%	50.00	11/28/2001 17:26	

Submission #: 2001-11-0358

SEVERN TRENT SERVICES

Gas/BTEX by 8015M/8021

STL Chromalab
1220 Quarry Lane
Pleasanton, CA 94566

Tel 925 484 1919
Fax 925 484 1096
www.stl-inc.com
www.chromalab.com

CA DHS ELAP#1094

Geo Enviromental Technologies	✉ 3275 Stevens Creek Blvd #208 San Jose, CA 95117
Attn: Costas Orountiotis	Phone: (408) 241-1798 Fax: (408) 248-7685
Manwell	Project: Manwel

Samples Reported

Sample ID	Matrix	Date Sampled	Lab #
MW 4	Water	11/14/2001	1
MW 5	Water	11/14/2001	2
MW 6	Water	11/14/2001	3
EX 1	Water	11/14/2001	4

Submission #: 2001-11-0358

SEVERN TRENT SERVICES

Gas/BTEX by 8015M/8021

Geo Enviromental Technologies

Test Method: 8021B
8015M

Attn: Costas Orountiotis

Prep Method: 5030

STL Chromalab
1220 Quarry Lane
Pleasanton, CA 94566

Tel 925 484 1919
Fax 925 484 1096
www.stl-inc.com
www.chromalab.com

CA DHS ELAP#1094

Sample ID:	MW 4	Lab Sample ID:	2001-11-0358-001
Project:	Manwell Manwel	Received:	11/16/2001 17:15
		Extracted:	11/21/2001 22:19
Sampled:	11/14/2001	QC-Batch:	2001/11/21-01.01
Matrix:	Water		

Compound	Result	Rep.Limit	Units	Dilution	Analyzed	Flag
Gasoline	510	50	ug/L	1.00	11/21/2001 22:19	g
Benzene	4.0	0.50	ug/L	1.00	11/21/2001 22:19	
Toluene	ND	0.50	ug/L	1.00	11/21/2001 22:19	
Ethyl benzene	ND	0.50	ug/L	1.00	11/21/2001 22:19	
Xylene(s)	ND	0.50	ug/L	1.00	11/21/2001 22:19	
Surrogate(s)						
Trifluorotoluene	95.9	58-124	%	1.00	11/21/2001 22:19	
4-Bromofluorobenzene-FID	69.2	50-150	%	1.00	11/21/2001 22:19	

Submission #: 2001-11-0358

SEVERN TRENT SERVICES

Gas/BTEX by 8015M/8021

Geo Enviromental Technologies

Test Method: 8021B
8015M

Attn: Costas Orountiotis

Prep Method: 5030

STL Chromalab
1220 Quarry Lane
Pleasanton, CA 94566

Tel 925 484 1919
Fax 925 484 1096
www.stl-inc.com
www.chromalab.com

CA DHS ELAP#1094

Sample ID:	MW 5	Lab Sample ID:	2001-11-0358-002
Project:	Manwell Manwel	Received:	11/16/2001 17:15
		Extracted:	11/21/2001 22:49
Sampled:	11/14/2001	QC-Batch:	2001/11/21-01.01
Matrix:	Water		

Compound	Result	Rep.Limit	Units	Dilution	Analyzed	Flag
Gasoline	ND	50	ug/L	1.00	11/21/2001 22:49	
Benzene	ND	0.50	ug/L	1.00	11/21/2001 22:49	
Toluene	ND	0.50	ug/L	1.00	11/21/2001 22:49	
Ethyl benzene	ND	0.50	ug/L	1.00	11/21/2001 22:49	
Xylene(s)	ND	0.50	ug/L	1.00	11/21/2001 22:49	
Surrogate(s)						
Trifluorotoluene	79.7	58-124	%	1.00	11/21/2001 22:49	
4-Bromofluorobenzene-FID	65.1	50-150	%	1.00	11/21/2001 22:49	

Submission #: 2001-11-0358

SEVERN TRENT SERVICES

Gas/BTEX by 8015M/8021

Geo Enviromental Technologies

Attn: Costas Orountiotis

Test Method: 8021B 8015M

Prep Method: 5030

STL Chromalab
1220 Quarry Lane
Pleasanton, CA 94566

Tel 925 484 1919
Fax 925 484 1096
www.stl-inc.com
www.chromalab.com

CA DHS ELAP#1094

Sample ID:	MW 6	Lab Sample ID:	2001-11-0358-003
Project:	Manwell Manwel	Received:	11/16/2001 17:15
		Extracted:	11/27/2001 12:20
Sampled:	11/14/2001	QC-Batch:	2001/11/27-01.01
Matrix:	Water		

Compound	Result	Rep.Limit	Units	Dilution	Analyzed	Flag
Gasoline	ND	50	ug/L	1.00	11/27/2001 12:20	
Benzene	ND	0.50	ug/L	1.00	11/27/2001 12:20	
Toluene	ND	0.50	ug/L	1.00	11/27/2001 12:20	
Ethyl benzene	ND	0.50	ug/L	1.00	11/27/2001 12:20	
Xylene(s)	ND	0.50	ug/L	1.00	11/27/2001 12:20	
Surrogate(s)						
Trifluorotoluene	100.4	58-124	%	1.00	11/27/2001 12:20	
4-Bromofluorobenzene-FID	75.7	50-150	%	1.00	11/27/2001 12:20	

Submission #: 2001-11-0358

SEVERN TRENT SERVICES

Gas/BTEX by 8015M/8021

Geo Enviromental Technologies

Test Method: 8021B
8015M

Attn: Costas Orountiotis

Prep Method: 5030

STL Chromalab
1220 Quarry Lane
Pleasanton, CA 94566

Tel 925 484 1919
Fax 925 484 1096
www.stl-inc.com
www.chromalab.com

CA DHS ELAP#1094

Sample ID:	EX 1	Lab Sample ID:	2001-11-0358-004
Project:	Manwell Manwel	Received:	11/16/2001 17:15
		Extracted:	11/27/2001 14:20
Sampled:	11/14/2001	QC-Batch:	2001/11/27-01.01
Matrix:	Water		

Compound	Result	Rep.Limit	Units	Dilution	Analyzed	Flag
Gasoline	13000	5000	ug/L	100.00	11/27/2001 14:20	
Benzene	180	50	ug/L	100.00	11/27/2001 14:20	
Toluene	1000	50	ug/L	100.00	11/27/2001 14:20	
Ethyl benzene	330	50	ug/L	100.00	11/27/2001 14:20	
Xylene(s)	3200	50	ug/L	100.00	11/27/2001 14:20	
Surrogate(s)						
Trifluorotoluene	104.6	58-124	%	1.00	11/27/2001 14:20	
4-Bromofluorobenzene-FID	75.7	50-150	%	1.00	11/27/2001 14:20	

Submission #: 2001-11-0358

SEVERN TRENT SERVICES

Diesel

STL Chromalab
1220 Quarry Lane
Pleasanton, CA 94566

Tel 925 484 1919
Fax 925 484 1096
www.stl-inc.com
www.chromalab.com

CA DHS ELAP#1094

Geo Enviromental Technologies	☒ 3275 Stevens Creek Blvd #208 San Jose, CA 95117
Attn: Costas Orountiotis	Phone: (408) 241-1798 Fax: (408) 248-7685
Manwell	Project: Manwel

Samples Reported

Sample ID	Matrix	Date Sampled	Lab #
MW 4	Water	11/14/2001	1
MW 5	Water	11/14/2001	2
MW 6	Water	11/14/2001	3
EX 1	Water	11/14/2001	4

Submission #: 2001-11-0358

SEVERN TRENT SERVICES

Diesel

Geo Enviromental Technologies

Attn: Costas Orountiotis

Test Method: 8015M

Prep Method: 3510/8015M

STL Chromalab
1220 Quarry Lane
Pleasanton, CA 94566

Tel 925 484 1919
Fax 925 484 1096
www.stl-inc.com
www.chromalab.com

CA DHS ELAP#1094

Sample ID:	MW 4	Lab Sample ID:	2001-11-0358-001
Project:	Manwell Manwel	Received:	11/16/2001 17:15
		Extracted:	11/26/2001 12:28
Sampled:	11/14/2001	QC-Batch:	2001/11/26-02.10
Matrix:	Water		

Sample/Analysis Flag: rl (See Legend & Note section)

Compound	Result	Rep.Limit	Units	Dilution	Analyzed	Flag
Diesel	90	65	ug/L	1.30	11/27/2001 15:27	ndp
Surrogate(s)						
o-Terphenyl	91.1	60-130	%	1.30	11/27/2001 15:27	

Submission #: 2001-11-0358

SEVERN TRENT SERVICES

Diesel

Geo Enviromental Technologies

Attn: Costas Orountiotis

Test Method: 8015M

Prep Method: 3510/8015M

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Pleasanton, CA 94566

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Fax 925 484 1096
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www.chromalab.com

CA DHS ELAP#1094

Sample ID:	**MW 5**	Lab Sample ID:	2001-11-0358-002
Project:	Manwell Manwel	Received:	11/16/2001 17:15
		Extracted:	11/26/2001 12:28
Sampled:	11/14/2001	QC-Batch:	2001/11/26-02.10
Matrix:	Water		

Sample/Analysis Flag: rl (See Legend & Note section)

Compound	Result	Rep.Limit	Units	Dilution	Analyzed	Flag
Diesel	ND	66	ug/L	1.32	11/28/2001 04:01	
Surrogate(s)						
o-Terphenyl	95.8	60-130	%	1.32	11/28/2001 04:01	

Submission #: 2001-11-0358

SEVERN TRENT SERVICES

Diesel

Geo Enviromental Technologies

Attn: Costas Orountiotis

Test Method: 8015M

Prep Method: 3510/8015M

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CA DHS ELAP#1094

Sample ID:	MW 6	Lab Sample ID:	2001-11-0358-003
Project:	Manwell Manwel	Received:	11/16/2001 17:15
		Extracted:	11/26/2001 12:28
Sampled:	11/14/2001	QC-Batch:	2001/11/26-02.10
Matrix:	Water		

Compound	Result	Rep.Limit	Units	Dilution	Analyzed	Flag
Diesel	ND	50	ug/L	1.00	11/28/2001 04:39	
Surrogate(s)						
o-Terphenyl	95.4	60-130	%	1.00	11/28/2001 04:39	

Submission #: 2001-11-0358

SEVERN TRENT SERVICES

Diesel

Geo Enviromental Technologies

Attn: Costas Orountiotis

Test Method: 8015M

Prep Method: 3510/8015M

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CA DHS ELAP#1094

Sample ID:	EX 1	Lab Sample ID:	2001-11-0358-004
Project:	Manwell Manwel	Received:	11/16/2001 17:15
		Extracted:	11/26/2001 12:28
Sampled:	11/14/2001	QC-Batch:	2001/11/26-02.10
Matrix:	Water		

Compound	Result	Rep.Limit	Units	Dilution	Analyzed	Flag
Diesel	2000	50	ug/L	1.00	11/28/2001 05:17	ndp
Surrogate(s)						
o-Terphenyl	95.6	60-130	%	1.00	11/28/2001 05:17	

Submission #: 2001-11-0358

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CA DHS ELAP#1094

Diesel

Batch QC report

Test Method: 8015M

Prep Method: 3510/8015 M

Method Blank **Water** **QC Batch # 2001/11/26-02.10**

MB: 2001/11/26-02.10-001

Date Extracted: 11/26/2001 12:28

Compound	Result	Rep.Limit	Unit	Analyzed	Flag
Diesel	ND	50	ug/L	11/27/2001 12:56	
Surrogate(s)					
o-Terphenyl	96.0	60-130	%	11/27/2001 12:56	

Submission #: 2001-11-0358

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CA DHS ELAP#1094

Diesel

Batch QC report

Test Method: 8015M Prep Method: 3510/8015M

Laboratory Control Spike (LCS/LCSD)		**Water**		**QC Batch # 2001/11/26-02.10**	
LCS:	2001/11/26-02.10-002	Extracted:	11/26/2001 12:28	Analyzed:	11/27/2001 13:34
LCSD:	2001/11/26-02.10-003	Extracted:	11/26/2001 12:28	Analyzed:	11/27/2001 14:12

Compound	Conc. [ug/L]		Exp.Conc. [ug/L]		Recovery [%]		RPD	Ctrl.Limits [%]		Flags	
	LCS	LCSD	LCS	LCSD	LCS	LCSD	[%]	Recovery	RPD	LCS	LCSD
Diesel	1040	974	1250	1250	83.2	77.9	6.6	60-130	25		
Surrogate(s)											
o-Terphenyl	23.3	23.0	20.0	20.0	116.5	115.0		60-130	0		

SEVERN TRENT SERVICES

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CA DHS ELAP#1094

Diesel

Legend & Notes

Test Method: 8015M Prep Method: 3510/8015M

Analysis Flags

rl

Reporting limits raised due to reduced sample size.

Analyte Flags

ndp

Hydrocarbon reported does not match the pattern of our Diesel standard

Submission #: 2001-11-0358

SEVERN TRENT SERVICES

Fuel Oxygenates by 8260B

Batch QC report

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CA DHS ELAP#1094

Test Method: 8260B Prep Method: 5030B

Method Blank	**Water**	**QC Batch # 2001/11/20-01.27**
MB: 2001/11/20-01.27-005		Date Extracted: 11/20/2001 10:21

Compound	Result	Rep.Limit	Unit	Analyzed	Flag
tert-Butyl alcohol (TBA)	ND	5.0	ug/L	11/20/2001 10:21	
Methyl tert-butyl ether (MTBE)	ND	5.0	ug/L	11/20/2001 10:21	
Di-isopropyl Ether (DIPE)	ND	10.0	ug/L	11/20/2001 10:21	
Ethyl tert-butyl ether (ETBE)	ND	5.0	ug/L	11/20/2001 10:21	
tert-Amyl methyl ether (TAME)	ND	5.0	ug/L	11/20/2001 10:21	
Surrogate(s)					
1,2-Dichloroethane-d4	98.9	76-114	%	11/20/2001 10:21	

Submission #: 2001-11-0358

SEVERN TRENT SERVICES

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CA DHS ELAP#1094

Fuel Oxygenates by 8260B

Batch QC report

Test Method: 8260B Prep Method: 5030B

Method Blank	**Water**	**QC Batch # 2001/11/28-01.27**
MB: 2001/11/28-01.27-005		Date Extracted: 11/28/2001 11:30

Compound	Result	Rep.Limit	Unit	Analyzed	Flag
tert-Butyl alcohol (TBA)	ND	5.0	ug/L	11/28/2001 11:30	
Methyl tert-butyl ether (MTBE)	ND	5.0	ug/L	11/28/2001 11:30	
Di-isopropyl Ether (DIPE)	ND	10.0	ug/L	11/28/2001 11:30	
Ethyl tert-butyl ether (ETBE)	ND	5.0	ug/L	11/28/2001 11:30	
tert-Amyl methyl ether (TAME)	ND	5.0	ug/L	11/28/2001 11:30	
Surrogate(s)					
1,2-Dichloroethane-d4	108.9	76-114	%	11/28/2001 11:30	

Submission #: 2001-11-0358

SEVERN TRENT SERVICES

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CA DHS ELAP#1094

Fuel Oxygenates by 8260B

Batch QC report

Test Method: 8260B Prep Method: 5030B

Laboratory Control Spike (LCS/LCSD)		**Water**		**QC Batch # 2001/11/20-01.27**
LCS:	2001/11/20-01.27-003	Extracted:	11/20/2001 09:35	Analyzed: 11/20/2001 09:35
LCSD:	2001/11/20-01.27-004	Extracted:	11/20/2001 09:57	Analyzed: 11/20/2001 09:57

Compound	Conc. [ug/L]		Exp.Conc. [ug/L]		Recovery [%]		RPD	Ctrl.Limits [%]		Flags	
	LCS	LCSD	LCS	LCSD	LCS	LCSD	[%]	Recovery	RPD	LCS	LCSD
Methyl tert-butyl ether	20.8	20.4	25.0	25.0	83.2	81.6	1.9	65-165	20		
Surrogate(s)											
1,2-Dichloroethane-d4	508	505	500	500	101.6	101.0		76-114			

Submission #: 2001-11-0358

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Fuel Oxygenates by 8260B

Batch QC report

Test Method: 8260B Prep Method: 5030B

Laboratory Control Spike (LCS/LCSD)		**Water**		**QC Batch # 2001/11/28-01.27**
LCS:	2001/11/28-01.27-003	Extracted:	11/28/2001 10:36	Analyzed: 11/28/2001 10:36
LCSD:	2001/11/28-01.27-004	Extracted:	11/28/2001 11:04	Analyzed: 11/28/2001 11:04

Compound	Conc. [ug/L]		Exp.Conc. [ug/L]		Recovery [%]		RPD	Ctrl.Limits [%]		Flags	
	LCS	LCSD	LCS	LCSD	LCS	LCSD	[%]	Recovery	RPD	LCS	LCSD
Methyl tert-butyl ether	22.8	23.0	25.0	25.0	91.2	92.0	0.9	65-165	20		
Surrogate(s)											
1,2-Dichloroethane-d4	561	563	500	500	112.2	112.6		76-114			

Submission #: 2001-11-0358

SEVERN TRENT SERVICES

Fuel Oxygenates by 8260B

Batch QC Report

Test Method: 8260B Prep Method: 5030B

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Matrix Spike (MS / MSD)	**Water**	**QC Batch # 2001/11/20-01.27**	
Sample ID: **MW 4 >> MS**		Lab ID:	2001-11-0358-001
MS: 2001/11/20-01.27-014	Extracted: 11/20/2001 15:23	Analyzed:	11/20/2001 15:23
		Dilution:	1
MSD: 2001/11/20-01.27-015	Extracted: 11/20/2001 15:48	Analyzed:	11/20/2001 15:48
		Dilution:	1

Compound	Conc. [ug/L]			Exp.Conc. [ug/L]		Recovery [%]		RPD	Ctrl.Limits [%]		Flags	
	MS	MSD	Sample	MS	MSD	MS	MSD	[%]	Recovery	RPD	MS	MSD
Methyl tert-butyl	37.5	37.5	13.9	25.0	25.0	94.4	94.4	0.0	65-165	20		
Surrogate(s)												
1,2-Dichloroethane	570	571		500	500	114.	114.1		76-114			

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Fuel Oxygenates by 8260B

Legend & Notes

Test Method: 8260B Prep Method: 5030B

Analysis Flags

o Reporting limits were raised due to high level of analyte present in the sample.

Submission #: 2001-11-0358

SEVERN TRENT SERVICES

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CA DHS ELAP#1094

Gas/BTEX by 8015M/8021

Batch QC report

Test Method: 8015M
8021B

Prep Method: 5030

Method Blank	**Water**	**QC Batch # 2001/11/21-01.01**
MB: 2001/11/21-01.01-003		Date Extracted: 11/21/2001 08:06

Compound	Result	Rep.Limit	Unit	Analyzed	Flag
Gasoline	ND	50	ug/L	11/21/2001 08:06	
Benzene	ND	0.5	ug/L	11/21/2001 08:06	
Toluene	ND	0.5	ug/L	11/21/2001 08:06	
Ethyl benzene	ND	0.5	ug/L	11/21/2001 08:06	
Xylene(s)	ND	0.5	ug/L	11/21/2001 08:06	
Surrogate(s)					
Trifluorotoluene	87.9	58-124	%	11/21/2001 08:06	
4-Bromofluorobenzene-FID	76.7	50-150	%	11/21/2001 08:06	

Submission #: 2001-11-0358

SEVERN TRENT SERVICES

Gas/BTEX by 8015M/8021

Batch QC report

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CA DHS ELAP#1094

Test Method: 8015M
8021B

Prep Method: 5030

Method Blank **Water** **QC Batch # 2001/11/27-01.01**

MB: 2001/11/27-01.01-003 Date Extracted: 11/27/2001 08:29

Compound	Result	Rep.Limit	Unit	Analyzed	Flag
Gasoline	ND	50	ug/L	11/27/2001 08:29	
Benzene	ND	0.5	ug/L	11/27/2001 08:29	
Toluene	ND	0.5	ug/L	11/27/2001 08:29	
Ethyl benzene	ND	0.5	ug/L	11/27/2001 08:29	
Xylene(s)	ND	0.5	ug/L	11/27/2001 08:29	
Surrogate(s)					
Trifluorotoluene	100.1	58-124	%	11/27/2001 08:29	
4-Bromofluorobenzene-FID	80.4	50-150	%	11/27/2001 08:29	

Submission #: 2001-11-0358

SEVERN TRENT SERVICES

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CA DHS ELAP#1094

Gas/BTEX by 8015M/8021

Batch QC report

Test Method: 8021B Prep Method: 5030

Laboratory Control Spike (LCS/LCSD)		**Water**		**QC Batch # 2001/11/21-01.01**	
LCS:	2001/11/21-01.01-004	Extracted:	11/21/2001 08:36	Analyzed:	11/21/2001 08:36
LCSD:	2001/11/21-01.01-005	Extracted:	11/21/2001 09:06	Analyzed:	11/21/2001 09:06

Compound	Conc. [ug/L]		Exp.Conc. [ug/L]		Recovery [%]		RPD	Ctrl.Limits [%]		Flags	
	LCS	LCSD	LCS	LCSD	LCS	LCSD	[%]	Recovery	RPD	LCS	LCSD
Benzene	99.9	98.2	100.0	100.0	99.9	98.2	1.7	77-123	20		
Toluene	103	101	100.0	100.0	103.0	101.0	2.0	78-122	20		
Ethyl benzene	102	102	100.0	100.0	102.0	102.0	0.0	70-130	20		
Xylene(s)	305	300	300	300	101.7	100.0	1.7	75-125	20		
Surrogate(s)											
Trifluorotoluene	562	554	500	500	112.4	110.8		58-124			

Submission #: 2001-11-0358

SEVERN TRENT SERVICES

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CA DHS ELAP#1094

Gas/BTEX by 8015M/8021

Batch QC report

Test Method: 8015M Prep Method: 5030

Laboratory Control Spike (LCS/LCSD)		**Water**		**QC Batch # 2001/11/21-01.01**	
LCS:	2001/11/21-01.01-006	Extracted:	11/21/2001 09:36	Analyzed:	11/21/2001 09:36
LCSD:	2001/11/21-01.01-007	Extracted:	11/21/2001 10:06	Analyzed:	11/21/2001 10:06

Compound	Conc. [ug/L]		Exp.Conc. [ug/L]		Recovery [%]		RPD	Ctrl.Limits [%]		Flags	
	LCS	LCSD	LCS	LCSD	LCS	LCSD	[%]	Recovery	RPD	LCS	LCSD
Gasoline	524	523	500	500	104.8	104.8	0.2	75-125	20		
Surrogate(s)											
4-Bromofluorobenzene-	381	382	500	500	76.2	76.4		50-150			

Submission #: 2001-11-0358

SEVERN TRENT SERVICES

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CA DHS ELAP#1094

Gas/BTEX by 8015M/8021

Batch QC report

Test Method: 8021B Prep Method: 5030

Laboratory Control Spike (LCS/LCSD)		**Water**		**QC Batch # 2001/11/27-01.01**
LCS:	2001/11/27-01.01-004	Extracted:	11/27/2001 08:59	Analyzed: 11/27/2001 08:59
LCSD:	2001/11/27-01.01-005	Extracted:	11/27/2001 09:30	Analyzed: 11/27/2001 09:30

Compound	Conc. [ug/L]		Exp.Conc. [ug/L]		Recovery [%]		RPD	Ctrl.Limits [%]		Flags	
	LCS	LCSD	LCS	LCSD	LCS	LCSD	[%]	Recovery	RPD	LCS	LCSD
Benzene	104	105	100.0	100.0	104.0	105.0	1.0	77-123	20		
Toluene	109	109	100.0	100.0	109.0	109.0	0.0	78-122	20		
Ethyl benzene	110	108	100.0	100.0	110.0	108.0	1.8	70-130	20		
Xylene(s)	321	322	300	300	107.0	107.3	0.3	75-125	20		
Surrogate(s)											
Trifluorotoluene	582	596	500	500	116.4	119.2		58-124			

Submission #: 2001-11-0358

SEVERN TRENT SERVICES

Gas/BTEX by 8015M/8021

Batch QC report

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Test Method: 8015M Prep Method: 5030

Laboratory Control Spike (LCS/LCSD)		**Water**		**QC Batch # 2001/11/27-01.01**	
LCS:	2001/11/27-01.01-006	Extracted:	11/27/2001 10:00	Analyzed:	11/27/2001 10:00
LCSD:	2001/11/27-01.01-007	Extracted:	11/27/2001 10:30	Analyzed:	11/27/2001 10:30

Compound	Conc. [ug/L]		Exp.Conc. [ug/L]		Recovery [%]		RPD	Ctrl.Limits [%]		Flags	
	LCS	LCSD	LCS	LCSD	LCS	LCSD	[%]	Recovery	RPD	LCS	LCSD
Gasoline	481	485	500	500	96.2	97.0	0.8	75-125	20		
Surrogate(s)											
4-Bromofluorobenzene-	353	354	500	500	70.6	70.8		50-150			

Submission #: 2001-11-0358

SEVERN TRENT SERVICES

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CA DHS ELAP#1094

Gas/BTEX by 8015M/8021

Legend & Notes

Test Method: 8015M
8021B

Prep Method: 5030

Analyte Flags

g

Hydrocarbon reported in the gasoline range does not match our gasoline standard.

APPENDIX D

Well Survey Data

11-14-01 New well surveying Manuel

	FS	BS	HI	DTW	Casing Elev	Gw
MW1		5.41	470.45		465.04	
MW4	5.2			33.84	465.25	431.41
MW5	5.71			3494	464.74	429.8
MW6	6.22			33.88	464.23	430.3
EW1	5.06			33.41	465.39	431.98

MW1 - dry

MW2 dry

MW3 dry

99-05-1208

Reference #: 46162

CHROMALAB, INC.

Environmental Services (SDG) (DOHS 1094)

1220 Quarry Lane • Pleasanton, California 94566-4756
510/484-1919 • Facsimile 510/484-1096

Chain of Custody

DATE 5/20/99 PAGE 1 OF 1

PROJ MGR C. Orountiotis
COMPANY ETIC Engineering
ADDRESS 3275 Stevens Creek Blvd., #315
San Jose, CA 95117
SAMPLER'S (SIGNATURE) Calvin D Pierce
(PHONE NO.) (408) 244-7202
(FAX NO.) (408) 244-7277

ANALYSIS REPORT

SAMPLE ID.	DATE	TIME	MATRIX	PRESERV.	TPH-(EPA 8015, 8020) & Gas w/ BTEX & MTBE	PURGEABLE AROMATICS BTEX (EPA 8020)	TPH-Diesel (EPA 8015M)	TEPH (EPA 8015M) ☐Kerosene, ☐Bunker Oil, ☐	PURGEABLE HALOCARBONS (EPHVOCs) (EPA 8010)	VOLATILE ORGANICS (VOCs) (EPA 8260)	SEMIVOLATILES (EPA 8270)	TOTAL OIL AND GREASE (SM 5520 B+F, E+F)		☐ PESTICIDES (EPA 8080) ☐ PCB's (EPA 8080)	PNA's by ☐ 8270 ☐ 8310	☐ Spec. Cond. ☐ TSS ☐ TDS	LUFT METALS: Cd, Cr, Pb, Ni, Zn	CAM 17 METALS (EPA 6010/7470/7471)	TOTAL LEAD	☐ W.E.T. (STLC) ☐ TCLP	☐ Hexavalent Chromium ☐ pH (24 hr hold time for H2O)				NUMBER OF CONTAINERS
Dispenser 1			Soil		X																				1
" 2					X																				1
" 3					X																				1
" 4					X																				1
" 5					X																				1
" 6					X																				1
Dicel-D					X	TPH	X																		1
						Ext																			

PROJECT INFORMATION
PROJECT NAME Manuel
PROJECT NUMBER
P.O.# ET 854

SAMPLE RECEIPT
TOTAL NO. OF CONTAINERS 7
HEAD SPACE
TEMPERATURE
CONFORMS TO RECORD

TAT: STANDARD 5 DAY | 24 | 48 | 72 | OTHER

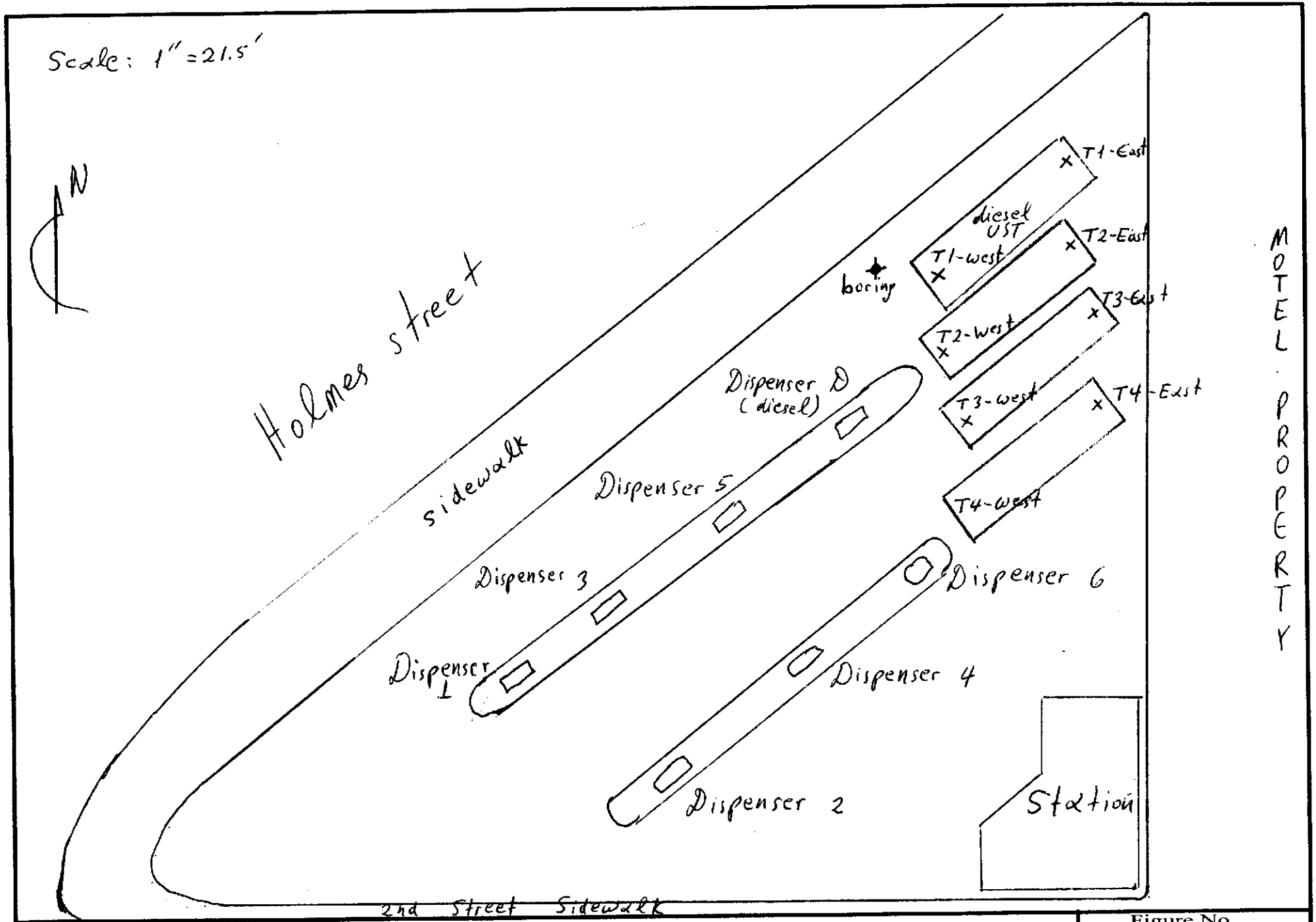
Report: ☐ Routine ☐ Level 2 ☐ Level 3 ☐ Level 4 ☐ Electronic Report

SPECIAL INSTRUCTIONS/COMMENTS:

RELINQUISHED BY 1	RELINQUISHED BY 2	RELINQUISHED BY 3
(SIGNATURE) Calvin D Pierce (TIME)	(SIGNATURE) Evan Wilson (TIME)	(SIGNATURE) (TIME)
(PRINTED NAME) Calvin D Pierce (DATE) 5/20/99	(PRINTED NAME) Evan Wilson (DATE) 5/21	(PRINTED NAME) (DATE)
(COMPANY) ALLEN Eng & Const. Inc	(COMPANY) World courier	(COMPANY)
RECEIVED BY 1	**RECEIVED BY 2**	**RECEIVED BY (LABORATORY) 3**
(SIGNATURE) Evan Wilson (TIME)	(SIGNATURE) (TIME)	(SIGNATURE) (TIME) 16:05
(PRINTED NAME) (DATE) 5/21/99	(PRINTED NAME) (DATE)	(PRINTED NAME) (DATE) 05-21
(COMPANY)	(COMPANY)	(LAB)

TURNAROUND TIME

P. 001
TEL: 510 484 1096
JUL. -20' 99 (TUE) 16:34 CHROMALAB, INC.



ETIC Engineering Inc

Site Plan
Livermore Gas ang Minimart
160 Holmes Avenue
Livermore, CA

Figure No.

Project No.