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**ENVIRONMENTAL ENGINEERING, INC**  
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February 13, 2008

Mr. Jerry Wickham  
Alameda County  
Department of Environmental Health Services  
1131 Harbor Bay Parkway, Suite 250  
Alameda, California 94502-6577

Subject: **StID#3337**  
Site Address: 3609 International Blvd., Oakland, California

Dear Mr. Wickham:

SOMA's "Multi-Phase Extraction Pilot Test" for the subject property has been uploaded to the State's GeoTracker database and Alameda County's FTP site for your review.

Thank you for your time in reviewing our report. If you have any questions or comments, please call me at (925) 734-6400.

Sincerely,

Mansour Sepehr, Ph.D., PE  
Principal Hydrogeologist

Enclosure

cc: Mr. Abolghassem Razi w/report enclosure  
Tony's Express Auto Service

Mr. Vince Tong w/report enclosure  
Traction International



**Multi-Phase Extraction Pilot Test**  
**3609 International Boulevard**  
**Oakland, California**

**February 13, 2007**

**Project 2334**

**Prepared for:**  
**Abolghassem Razi**  
**3609 International Boulevard**  
**Oakland, California 94601**

## CERTIFICATION

SOMA Environmental Engineering, Inc. has prepared this document on behalf of Mr. Abolghassem Razi, current property owner of 3609 International Boulevard, Oakland, California. It was prepared in compliance with directives of the Alameda County Environmental Health Services in correspondence dated November 21, 2007. This document presents SOMA's Multi-Phase Extraction Pilot Test performed at the site between December 3 and December 7, 2007.



Mansour Sepehr, Ph.D., P.E.  
Principal Hydrogeologist



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# **1. INTRODUCTION**

On behalf of the property owner, Mr. Abolghassem Razi, SOMA Environmental Engineering, Inc. (SOMA) has prepared this Multi-Phase Extraction (MPE) Pilot Test Report for the property located at 3609 International Boulevard, Oakland, California (Site). This document has been prepared in compliance with directives of the Alameda County Environmental Health Services (ACEHS) in correspondence dated November 21, 2007.

## **2. PHYSICAL SETTING AND HISTORY**

### **2.1 Site Location and Description**

Tony's Express Auto Service is located on the Site at the intersection of 3609 International Boulevard and 36th Avenue, as shown in Figure 1. The Site is located in an area of commercial and residential use. The station no longer has an auto repair facility. Figure 2 shows the location of the main service station, dispenser islands, underground storage tanks (USTs), the on-site and off-site groundwater monitoring wells, and neighboring properties.

### **2.2 Site Background**

In July 1993, Soil Tech Engineering removed one single-walled 10,000-gallon gasoline tank and one single-walled 6,000-gallon gasoline tank along with a 550-gallon waste oil tank from the Site. Three double-walled USTs replaced these tanks. Currently, one 10,000-gallon double-walled gasoline UST and two 6,000-gallon double-walled gasoline USTs are beneath the Site. UST locations are shown in Figure 2.

### **2.3 Previous Environmental Assessments and Remediation Background**

In December 1997, Western Geo-Engineers (WEGE) conducted additional investigations and groundwater monitoring events. Groundwater monitoring results indicated elevated levels of petroleum hydrocarbons and methyl tertiary-butyl ether (MtBE) in the groundwater.

In April 1999, Mr. Razi, the owner, retained SOMA to conduct groundwater monitoring, prepare a risk-based corrective action (RBCA) report and a corrective action plan (CAP) report, and perform soil and groundwater remediation at the Site. RBCA study results indicated that the Site was a high-risk groundwater contamination site; therefore, soil and groundwater in on- and off-site areas warranted remedial action.

The former USTs were determined to be the source of petroleum hydrocarbons in groundwater. Following CAP report recommendations, installation of a French drain began in late August 1999; in July 2000, SOMA installed a vapor extraction system. The French drain and groundwater treatment system prevent further migration of the chemically impacted groundwater, while the vapor extraction system remediates impacted soil.

On July 25, 2003, SOMA installed an additional on-site extraction pump in the western French drain riser. The extraction pump was installed to create a capture zone in the region around the USTs and to contain off-site migration in the southwestern corner of the Site.

On April 1, 2005, SOMA conducted a pilot test to evaluate use of ozone sparging to actively remediate groundwater at the Site. Based on test results, the sediment was determined to be permeable enough to allow for operation of an ozone sparging system.

On February 22, 2006 to March 6, 2006, SOMA oversaw installation of an air sparging system to supplement the vapor extraction system.

On February 5, 2007, an extraction well, EX-1, was installed within the UST cavity due to continued detection of contaminants within this region. The well diameter is 4 inches with an approximate depth of 20 feet. SOMA began extracting groundwater from EX-1 in April 2007.

SOMA continues to perform quarterly groundwater monitoring events at the Site.

### **3. SITE GEOLOGY AND HYDROGEOLOGY**

Groundwater over the period of record for quarterly monitoring at the Site has been encountered at depths ranging between 7 and 14 feet. Figure 2 shows locations of on- and off-site groundwater monitoring wells. Groundwater flows from north to south with an average gradient of 0.014 ft/ft. Hydraulic conductivity of the saturated sediments ranges between 1.5 and 18.3 feet per day. Groundwater flow velocity ranges between 22 and 267 feet per year.

#### **3.1 Smear Zone**

A smear zone is developed as mobile light fuel hydrocarbons (light non-aqueous phase liquids [LNAPL]) are released to the water table, spread laterally as a non-wetting phase in soils below the water table, and are distributed vertically through the upper aquifer during seasonal water table fluctuations. As smearing continues, the LNAPL become trapped as discontinuous ganglia within soil pores

of the upper aquifer. Thus, the smear zone is an area of intimate contact between LNAPL and groundwater, representing a long-term source for dissolved-phase hydrocarbons in the groundwater.

SOMA's review of boring logs for MW-1 and MW-3 disclosed the presence of a hydrocarbon smear zone above, at, and below the capillary fringe. The smear zone represents an area of contamination identified as light gray, gray to blue-green gray staining of soils above, at, and below the capillary fringe, accompanied by moderate to strong hydrocarbon odor. Over the period of record for quarterly monitoring at the Site, groundwater samples collected from monitoring wells MW-1 and MW-3 have consistently exhibited elevated levels of dissolved-phase constituents. The presence of dissolved-phase constituents in the groundwater suggests that the smear zone at these locations is potentially a source of the dissolved-phase hydrocarbons in the samples collected from these wells. Figure 2 shows locations of groundwater monitoring wells.

## **4. MULTI-PHASE EXTRACTION PILOT TEST**

The purpose of the MPE pilot test is to determine the feasibility of dewatering the smear zone and removing LNAPL through vacuum-enhanced volatilization. Smear zone dewatering is critical to MPE success. Pilot testing is required to determine air/water yields necessary to completely expose the smear zone for successful mass removal of volatile organic compounds (VOCs) from the subsurface. In addition, the vacuum zone of influence (ZOI) will be determined using vacuum measurements collected at observation wells.

MPE systems have two primary configurations; dual-phase extraction (DPE) and two-phase extraction (TPE). DPE utilizes separate mechanical systems for pumping groundwater and extracting soil vapor from the smear zone. TPE utilizes a single vacuum pump to extract both groundwater and soil vapor through small-diameter drop tube (stinger) piping inserted in the well. The most cost-effective MPE configuration is determined by aquifer permeability and the corresponding yield of both air and water. The water production rate needed to dewater the smear zone, and the induced vacuum generated for soil vapor extraction, will determine if DPE or TPE is appropriate. If the water production rate is high (>2 gpm/well), then DPE would be the system of choice. If the water production rate is low (<2 gpm/well), then TPE would be the system of choice.

### **4.1 Pre-Test Activities**

Prior to initiating field activities, SOMA prepared a site-specific health and safety plan (HASP), a requirement of the Occupational Safety and Health Administration (OSHA) "Hazardous Waste Operation and Emergency Response"



guidelines (29 CFR 1910.120) and the California Occupational Safety and Health Administration (Cal/OSHA) "Hazardous Waste Operation and Emergency Response" guidelines (CCR Title 8, section 5192). The HASP is designed to address safety provisions during field activities and protect the field crew from physical and chemical hazards resulting from drilling and sampling. The HASP establishes personnel responsibilities, general safe work practices, field procedures, personal protective equipment standards, decontamination procedures, and emergency action plans. The HASP was reviewed by field staff and contractors prior to beginning field operations at the Site.

## **4.2 Pilot Test Summary**

SOMA performed an MPE pilot test at the Site between December 3 and 7, 2007. Current groundwater monitoring wells were utilized as the extraction wells and the vacuum observation wells. MW-1 and MW-3 were utilized as extraction wells and observation wells when not in use as an extraction well. MW-2, MW-6, MW-7, and MW-8 were utilized as vacuum observation wells (well locations in Figure 2).

The MPE pilot test was performed using a self-contained mobile treatment system (MTS), equipped with electrical generator, propane tank, air compressors, liquid ring vacuum pump rated at 25-horsepower and 428-standard cubic feet per minute (scfm), electrical/pneumatic submersible pumps, air/water separator vessel, discharge hoses and traffic-rated hose ramps, downhole stingers, and a thermal/catalytic oxidizer for vapor abatement. The oxidizer operates under a valid various locations BAAQMD permit. Both soil vapor and groundwater were extracted from the subsurface. Extracted groundwater was discharged into an existing treatment system.

Physical and chemical parameters including applied vacuum, soil vapor extraction flow rates, oxidizer temperature, volume of groundwater extracted, VOC concentrations, and induced vacuum, were monitored, measured and recorded. Induced vacuum in the observation wells was measured using magnehellic vacuum gauges fitted to airtight well caps. VOC concentrations in the extracted soil vapor stream were continuously monitored using a photoionization detector (PID) calibrated to hexane. MPE pilot test operational data is presented in Table 1. Extraction well data is presented in Tables 2 and 3 (MW-3 and MW-1). Field data sheets are presented in Appendix C. Extracted soil vapor sample were collected from MW-3 and MW-1 during MPE pilot testing. Table 4 lists sample identifiers and analysis results.

### **4.2.1 Extraction Well MW-3**

Pilot testing at MW-3 began at 13:30 on December 3, 2007 and was terminated at 11:00 on December 5, 2007. Testing time at MW-3 was 2,730 minutes, or 45.5

hours. During pilot testing, induced vacuum was measured at observation wells MW-1, MW-2, MW-6, and MW-7 located approximately 35, 30, 55, and 35 feet, respectively, from MW-3.

#### **4.2.2 Extraction Well MW-1**

Pilot testing at MW-1 began at 12:00 on December 5, 2007 and was terminated at 12:00 on December 7, 2007. Testing time at MW-1 was 2,910 minutes, or 48.5 hours. During pilot testing, induced vacuum was measured at observation wells MW-3, MW-6, MW-7, and MW-8 located approximately 35, 75, 30, and 35 feet, respectively, from MW-1.

### **4.3 Pilot Test Results**

#### **4.3.1 Extraction Well MW-3**

During pilot testing at MW-3, applied vacuum ranged from 24 to 25 inches of mercury, and vapor extraction flow rate ranged from 19 to 31 scfm (Table 1). VOC concentrations in the extracted soil vapor stream ranged from 975 parts per million vapor (ppmv) as hexane to 7,150 ppmv (Tables 1 and 2, Figure 3). Approximately 2,524 gallons of groundwater (Table 1) were extracted at a rate of 0.92 gallon per minute (gpm).

Note:

Although groundwater levels were measured at the observation well, drawdown could not be estimated because of precipitation during the week influencing data recorded (Table 1).

Induced vacuum was measured in MW-1, MW-2, MW-6, and MW-7. Vacuum was detected only from MW-2 with values ranging from a peak of 0.6 inches of water near the beginning of pilot testing to 0.32 inches of water toward the end of pilot testing at MW-3 (Table 1).

Note:

Induced vacuum was measured in EX-1 (Table 1) during extraction from MW-3. See section 4.7.

#### **4.3.2 Extraction Well MW-1**

During pilot testing at MW-1, applied vacuum ranged from 23 to 24 inches of mercury, and vapor extraction flow rates ranged from 25 to 44 scfm (Table 1). VOC concentrations in the extracted soil vapor stream ranged from 1,050 ppmv as hexane to 8,300 ppmv (Tables 1 and 2, Figure 4). Approximately 1,469 gallons of groundwater (Table 1) were extracted at a rate of 0.5 gpm.

Note:

Although groundwater levels were measured at the observation well, drawdown could not be estimated because of precipitation during the week influencing data recorded (Table 1).

Induced vacuum was measured in MW-3, MW-6, MW-7, and MW-8. Vacuum was detected from MW-3 and MW-8. Vacuum from MW-3 reached a peak value of 0.05 inches of water at the end of pilot testing from MW-1. Vacuum from MW-8 ranged from 0.3 inches of water near the end of pilot testing reaching a peak value of 3.0 inches of water at the end of pilot testing from MW-1.

Note:

Induced vacuum was measured in EX-1 (Table 1) during extraction from MW-1. See section 4.7.

#### **4.4 Soil Vapor Sample Laboratory Analytical Results**

Influent soil vapor samples were collected through a sampling port located on the vacuum pump discharge manifold. Thermal oxidizer stack vapor samples were collected through a sampling port located at the top of the stack. The air samples were submitted under chain-of-custody (COC) documentation to a California state-certified analytical laboratory (Air Toxics Ltd.) and analyzed for total petroleum hydrocarbons as gasoline (TPH-g) using USEPA Analytical Method TO-3; and for benzene, toluene, ethylbenzene, total xylenes (collectively termed BTEX), MtBE, tertiary-butyl alcohol (TBA), and fuel oxygenates diisopropyl ether (DIPE), ethyl tertiary-butyl ether (ETBE), and tertiary-amyl methyl ether (TAME), using USEPA Analytical Method TO-15. Soil vapor analytical results are presented in Table 4. Certified laboratory analytical reports and COC documentation are included in Appendix B.

##### **4.4.1 Extraction Well MW-3**

Two influent soil vapor samples were taken from MW-3 during extraction. The first influent sample was taken during the first 24 hours of operation with the second sample taken near the end of pilot testing at MW-3 (Table 4).

TPH-g, BTEX, and MtBE concentrations were detected in the soil vapor samples collected from MW-3. Concentrations of fuel oxygenates were below laboratory-detection limits at MW-3.

The first influent soil vapor sample revealed concentrations of TPH-g at 9,200,000 micrograms per cubic meter ( $\mu\text{g}/\text{m}^3$ ), benzene at 76,000  $\mu\text{g}/\text{m}^3$ , toluene at 12,000  $\mu\text{g}/\text{m}^3$ , ethylbenzene at 55,000  $\mu\text{g}/\text{m}^3$ , and total xylenes at 162,000  $\mu\text{g}/\text{m}^3$ . In the same sample, MtBE was detected at 1,900  $\mu\text{g}/\text{m}^3$ .

In the second sample, TPH-g at 5,300,000  $\mu\text{g}/\text{m}^3$ , benzene at 76,000  $\mu\text{g}/\text{m}^3$ , toluene at 33,000  $\mu\text{g}/\text{m}^3$ , ethylbenzene at 10,000  $\mu\text{g}/\text{m}^3$ , and total xylenes at 41,400  $\mu\text{g}/\text{m}^3$ . In the same sample, MtBE concentrations fell below laboratory-detection limits.

A vapor sample collected at the oxidizer stack was used to demonstrate compliance with BAAQMD various locations permit. Removal efficiencies exceed 98.5 percent, demonstrating compliance. Removal efficiencies are listed in Table 4.

#### **4.4.2 Extraction Well MW-1**

Two influent soil vapor samples were taken during extraction from MW-1. The first influent sample was taken during the first 24 hours of operation with the second sample taken near the end of pilot testing at MW-1 (Table 4).

TPH-g and BTEX concentrations were detected in the soil vapor samples collected from MW-3. Concentrations of fuel oxygenates including MtBE were below laboratory-detection limits at MW-1.

The first influent soil vapor sample revealed concentrations of TPH-g at 4,700,000  $\mu\text{g}/\text{m}^3$ , benzene at 3,400  $\mu\text{g}/\text{m}^3$ , toluene at 2,100  $\mu\text{g}/\text{m}^3$ , ethylbenzene at 7,000  $\mu\text{g}/\text{m}^3$ , and total xylenes at 17,800  $\mu\text{g}/\text{m}^3$ .

In the second sample, TPH-g at 4,900,000  $\mu\text{g}/\text{m}^3$ , benzene at 2,900  $\mu\text{g}/\text{m}^3$ , toluene at 1,400  $\mu\text{g}/\text{m}^3$ , ethylbenzene at 4,300  $\mu\text{g}/\text{m}^3$ , and total xylenes at 10,900  $\mu\text{g}/\text{m}^3$ .

A vapor sample collected at the oxidizer stack was used to demonstrate compliance with BAAQMD various locations permit. Removal efficiencies exceed 98.5 percent, demonstrating compliance. Removal efficiencies are listed in Table 4.

#### **4.5 Soil Vapor Removal**

Estimated VOC mass removal rates and VOC mass removed for the pilot test are presented in Tables 2 and 3 for MW-3 and MW-1, respectively. The estimated total mass of TPH-g, benzene and MtBE removed during the pilot test is presented in Table 4.

Total VOC mass removed was estimated using flow rates during the pilot test, total volume of air extracted during the pilot test, and VOC concentrations in ppmv as hexane measured by the PID during the pilot test. The estimated total

mass of VOCs removed from the soil vapor extracted from wells MW-3 and MW-1 was 64 lbs, with 32 lbs from MW-3 and 32 lbs from MW-1.

The total VOC mass removal rate in lbs/day is estimated by dividing the estimated VOC mass removed during the pilot test by the elapsed time for the pilot test. For the pilot tests conducted on MW-3 and MW-1, the estimated total VOC mass removal rate was approximately 16 lbs/day.

The total mass of TPH-g, benzene and MtBE removed by the pilot test is estimated using the soil vapor analytical results for the pilot test and the median flow rate for the extraction wells. The estimated total mass of TPH-g removed from extracted soil vapor by the pilot tests conducted on wells MW-3 and MW-1 was 64 lbs; of benzene removed, 0.31 lbs; and of MtBE removed, 0.0092 lbs.

**\*Note**

The discrepancy between the estimated total mass of VOCs removed and the total mass of TPH-g, benzene, and MtBE removed is based on the difference between PID measurements as hexane and laboratory analyses of the extracted vapor stream. The concentrations based on laboratory analysis are representative only of that moment in the pilot test at which the extracted vapor stream was sampled. Since the laboratory analytical results are not representative of the entire length of the pilot test, unlike the PID measurements which are collected continuously over the length of the pilot test, the total mass of VOCs removed as measured by PID is used to estimate mass removals.

#### **4.6 Smear Zone Dewatering**

Steady-state dewatering of the smear zone at wells MW-3 and MW-1 was achieved and maintained during the pilot test by vacuum. Dewatering was achieved by opening the dilution control valve at the extraction well to allow atmospheric air into the well casing, accelerating the removal of water from the well casing by vacuum. As the stinger was advanced into the well casing, water was removed by vacuum. As water was removed, vacuum was reestablished in the well casing and the stinger was advanced farther into the well casing. When the stinger reached the base of the well casing, and water ceased to be removed by vacuum, the stinger was elevated off the bottom of the well to maintain steady-state groundwater flow into the well and to maximize mass removal rate out of the well, and then the dilution control valve was closed. At MW-3 and MW-1, steady-state dewatering was achieved when the dilution control valve was closed 1 hour into pilot testing at each well (Tables 2 and 3). The estimated groundwater extraction rate for the pilot test at MW-3 based on gallons extracted and elapsed time (Table 1) was 0.92 gpm. The estimated groundwater extraction rate for the pilot test at MW-1 was 0.5 gpm.

## 4.7 Zone of Influence

The ZOI for the MPE pilot test is estimated by determining pressure change in observation wells versus distance from the extraction well at the end of the pilot test (EPA 1995). The log of vacuum pressure measured in the observation well at the end of pilot testing is plotted versus the distance from the MPE well. Figure 5 illustrates this plot for extraction wells MW-3 and MW-1. The data points describe straight lines. The lines intersect the pressure axis at 0.1 inches of water and the distance axis to estimate the MPE ZOI. For pilot testing using MW-3, MPE ZOI is up to 35 ft. For pilot testing using MW-1 MPE ZOI is up to 42 ft. The MPE ZOI is plotted on Figure 6, centered on monitoring wells MW-3 and MW-1.

Note:

Although induced vacuum was measured in EX-1, EX-1 data was not considered in MPE ZOI calculations because it is set at a different depth than the surrounding monitoring/observation wells and it is within a tank pit cavity.

## 5. CONCLUSIONS AND RECOMMENDATIONS

### 5.1 Conclusions

The estimated total mass of VOCs removed by the MPE pilot test was determined to be 64 lbs. The estimated total VOC mass removal rate for the MPE pilot test was determined to be 16 lbs/day at wells MW-3 and MW-1 over 94 hours.

Table 5 lists analysis results for groundwater samples collected from wells MW-3 and MW-1 prior to and after the MPE pilot test. Certified laboratory analytical reports and COC documentation are included in Appendix B. Analytical results reveal that concentrations of TPH-g, toluene, ethylbenzene, and total xylenes increased following MPE pilot testing at MW-3. However, concentrations of benzene and MtBE decreased in MW-3 following the MPE test. Concentrations of TPH-g, BTEX, and MtBE in MW-1 increased following MPE pilot testing. Increased concentrations of dissolved hydrocarbon constituents suggest that significant fuel hydrocarbon constituents are adsorbed to the smear zone in proximity to wells MW-3 and MW-1. Decreased concentrations of dissolved hydrocarbon constituents suggest that MPE is effective in stripping and removing fuel hydrocarbon constituents from the smear zone in proximity to MW-3 and MW-1.

## 5.2 Recommendations

SOMA proposes the use of MPE using an MTS to extract fuel hydrocarbons from the smear zone. An MTS rather than a dedicated permanent treatment system is proposed to conduct the MPE events. SOMA recommends monthly MPE events at the Site using wells MW-3 and MW-1 as extraction wells until extracted soil vapor concentrations are equivalent, or asymptotic, from one MPE event to the next. Each MPE event would extend over a 5-day period. Separate monthly events are recommended over continuous operation because mass removals generated by intermittent operation or pulsing tend to be greater than mass removals obtained by continuous operation. In addition to the substantial cost savings using an MTS versus a dedicated permanent system, the MTS will provide the flexibility to extract from other wells on the Site if necessary. Additionally, groundwater extracted during each event would be routed through the existing groundwater treatment system for treatment and disposal. BAAQMD permitting requirements for operation of an MTS at the Site are already fulfilled. A permanent system may be objectionable to nearby residential neighborhoods due to elevated noise levels generated by a permanent system in operation. Lastly, regardless of the initial capital costs for a permanent system, the monthly costs for each MPE event using an MTS would be less than the combined monthly O&M and utilities costs for a permanent system (Table 6).

To prevent further migration of dissolved-phase hydrocarbons and help restore the beneficial use of groundwater beneath on- and off-site areas, the existing groundwater treatment system already operating on the Site will be utilized.

Groundwater samples would be collected from the extraction wells before and after each MPE event and analyzed for dissolved-phase hydrocarbons in the same manner as for quarterly groundwater monitoring/sampling events at the Site. Analytical results would be used to evaluate the effectiveness of MPE in reducing dissolved-phase constituents in the groundwater and, consequently, in stripping and removing liquid-phase hydrocarbons adsorbed to the smear zone. Upon reaching asymptotic conditions, and when dissolved-phase constituent concentrations have dropped below the Environmental Screening Levels, a Closure Report will be submitted requesting that no further action be undertaken at the Site.

## 6. REFERENCES

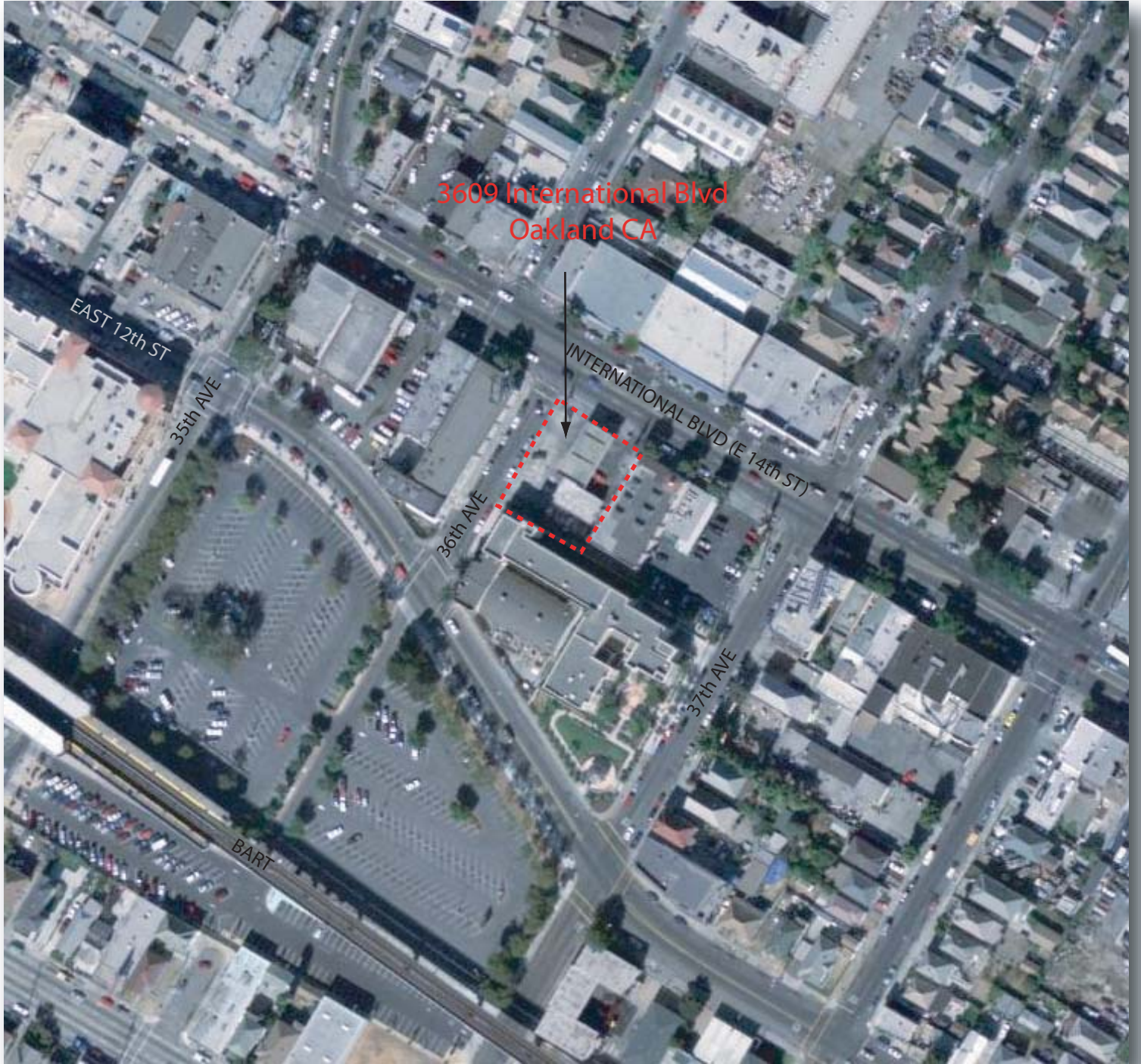
Environmental Protection Agency, Manual, September 1995. "Bioventing Principles and Practice, Volumes 1 and 2."

SOMA Environmental Engineering, Inc., May 3, 2007. "Extraction Well Installation Report, 3609 International Boulevard, Oakland, California."

SOMA Environmental Engineering, Inc., October 11, 2007. "Third Quarter 2007 Groundwater Monitoring and Groundwater Remediation System Operation Report, 3609 International Boulevard, Oakland, California."



# FIGURES



3609 International Blvd  
Oakland CA

EAST 12th ST

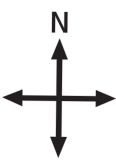
35th AVE

36th AVE

37th AVE

INTERNATIONAL BLVD (E 14th ST)

BART

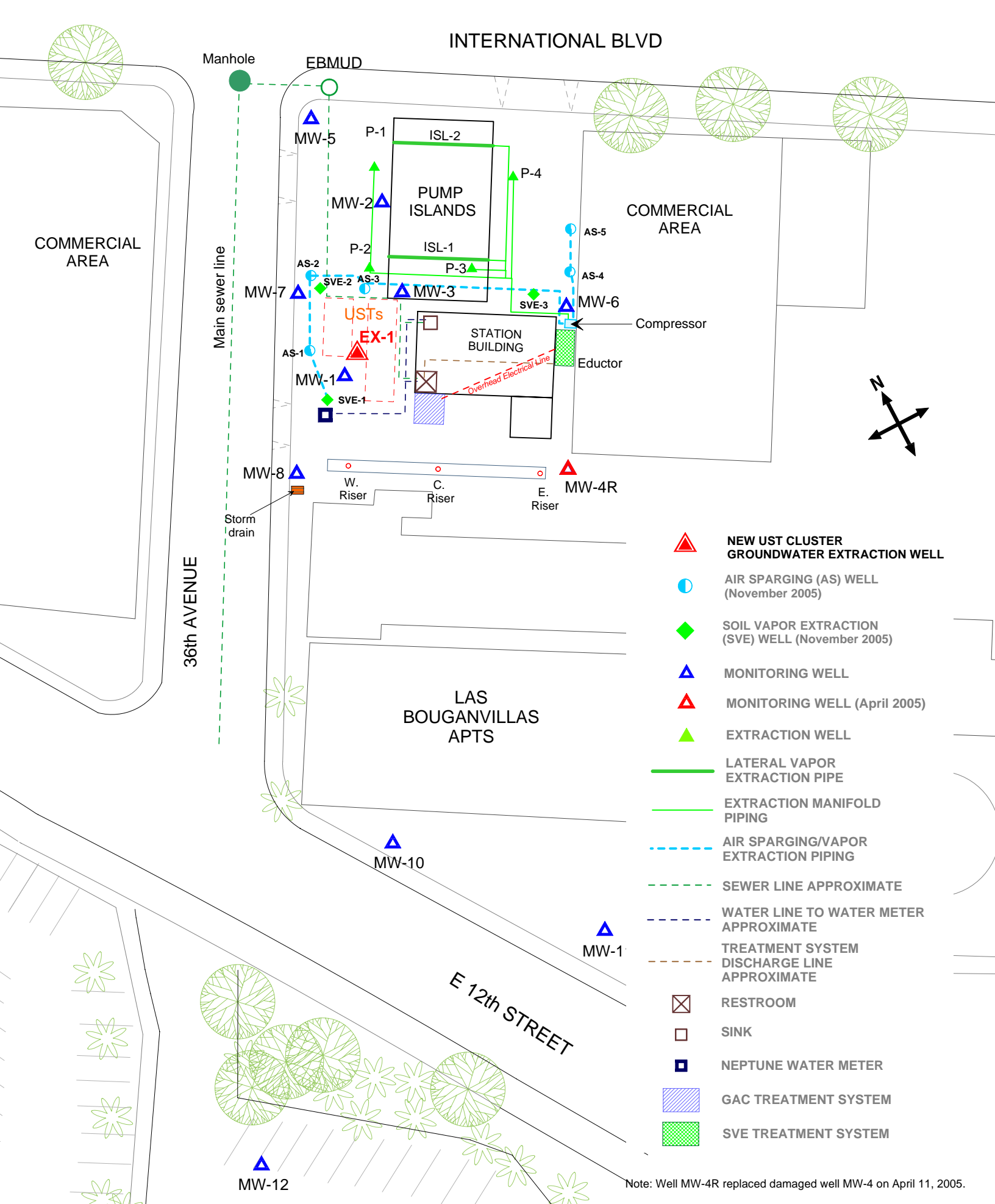


approximate scale in feet



Figure 1: Site vicinity map.





approximate scale in feet

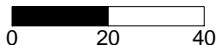


Figure 2: Site map showing the location of all monitoring wells.

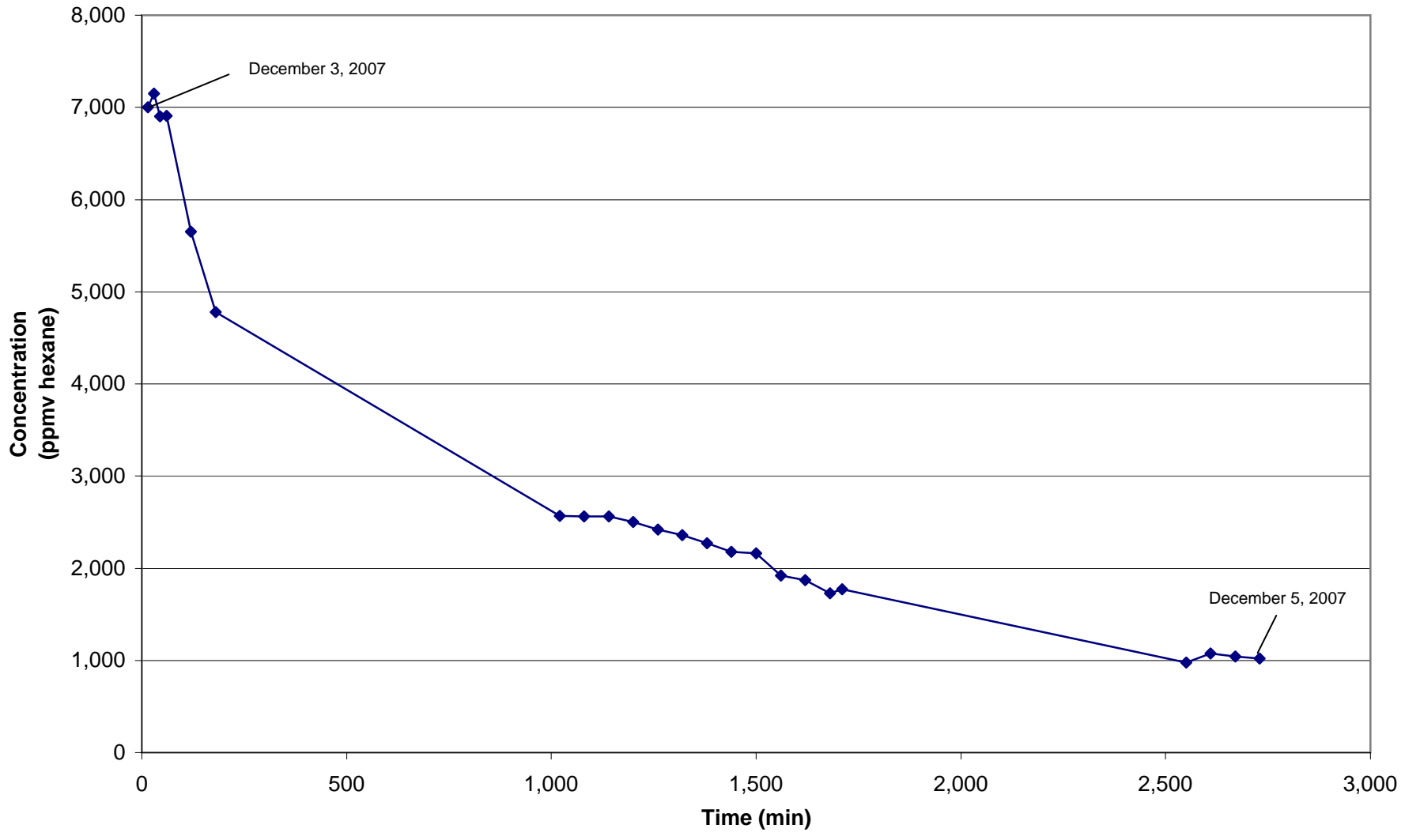


Figure 3: December 2007 Pilot Test PID Concentrations, MW-3

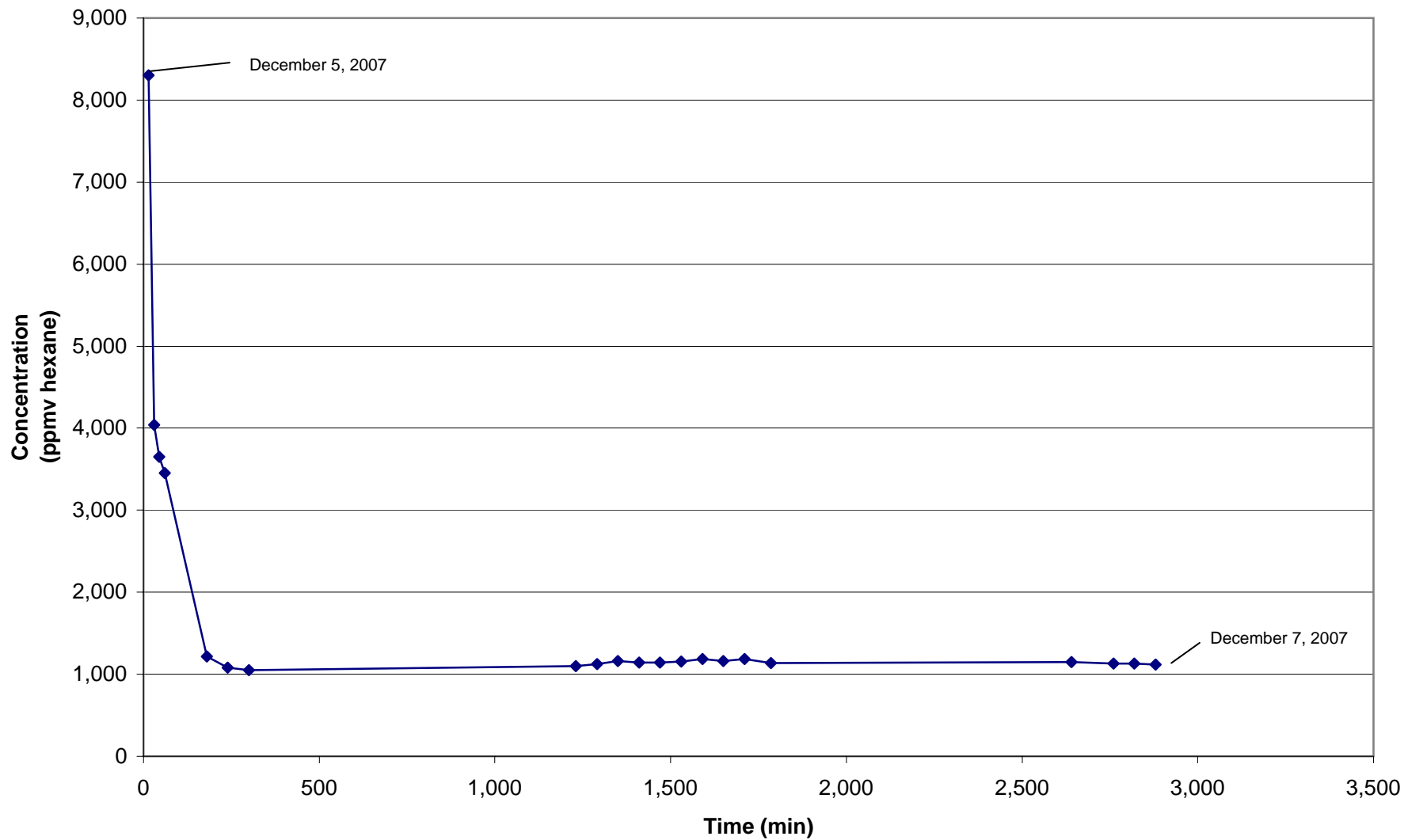


Figure 4: December 2007 Pilot Test PID Concentrations, MW-1

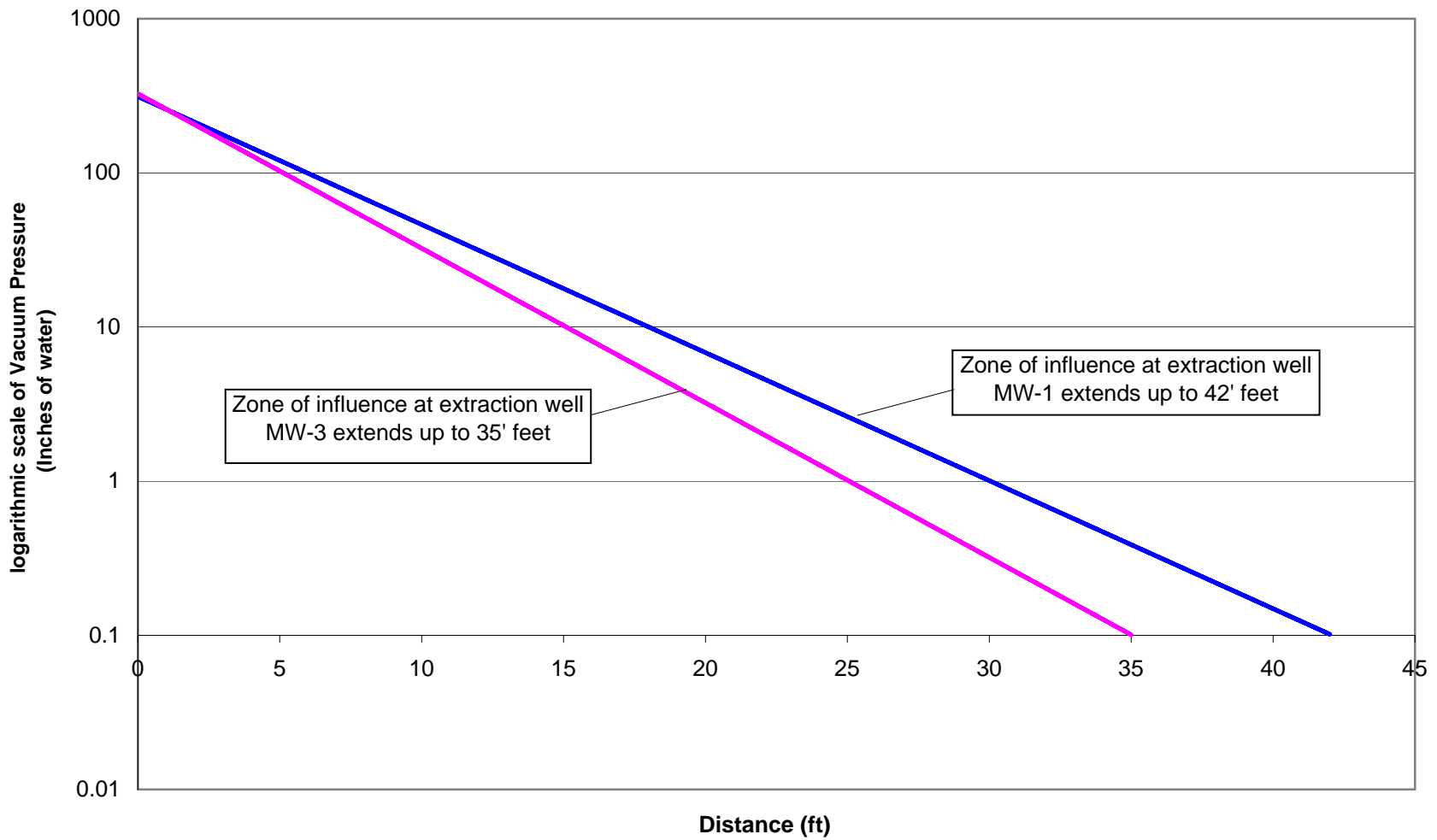
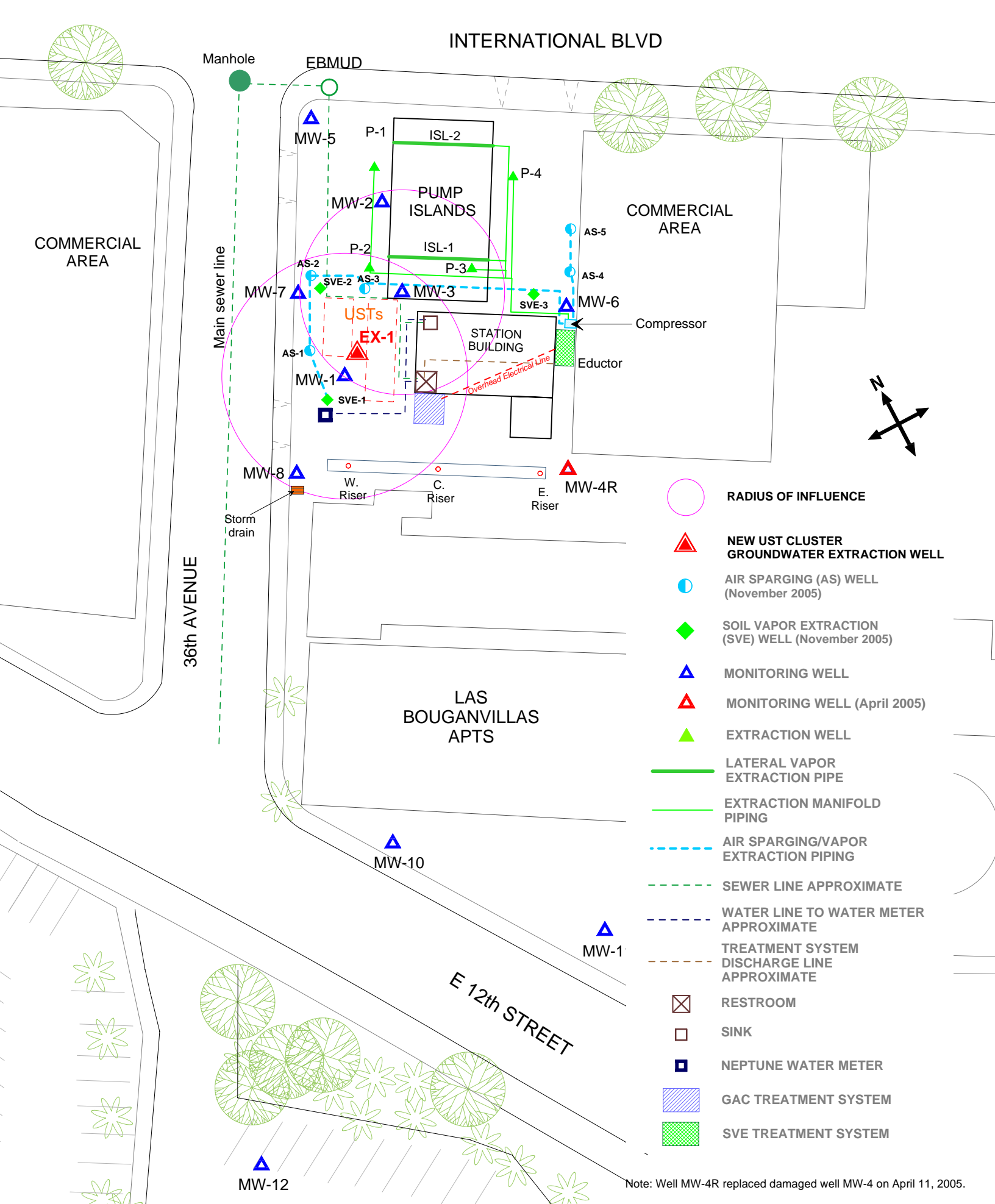


Figure 5: December 2007 Pilot Test Zone of Influence, MW-3 and MW-1



approximate scale in feet

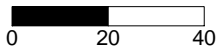


Figure 6: Zone of Influence Site Map Centering MW-3 and MW-1

# **TABLES**



**Table 1**  
**December 2007 MPE Pilot Test**  
**Operational Data**

3609 International Boulevard  
Oakland, California

DATE	TIME	PID (ppmv)	WELL MANIFOLD VACUUM (In of Hg)	OXIDIZER TEMPERATURE (°F)	WELL FIELD VAPOR FLOW RATE (scfm)	TOTAL SYSTEM VAPOR FLOW RATE (scfm)	DILUTION AIR FLOW RATE (scfm)	SYSTEM (BLOWER) VACUUM (In of Hg)	SYSTEM TOTALIZER READING (gallons)	MW-1		MW-2		MW-6		MW-7		COMMENTS	
										DTW (feet. bgs)	Vacuum (In of H <sub>2</sub> O)	DTW (feet. bgs)	Vacuum (In of H <sub>2</sub> O)	DTW (feet. bgs)	Vacuum (In of H <sub>2</sub> O)	DTW (feet. bgs)	Vacuum (In of H <sub>2</sub> O)		
12/3/2007	1330																	collected Pre-GW sample from MW-1,3; begin extraction from MW-3	
	1345	7,000	24.6	1,582	19	19	0	28.2	0	13.16	0	13	0.6	13.51	0	12.62	0		
	1400	7,150	24.8	1,611	22	22	0	28	0										
	1415	6,900	24.4	1,620	22	22	0	28	36										
	1430	6,910	24.4	1,629	22	22	0	28	36	13.21	0	13.05	0.48	13.67	0	12.76	0		
	1445																		
	1500																		
	1530	5,650	24.4	1,601	22	22	0	28	142	13.21	0	12.48	0.26	13.69	0	12.83	0		
	1630	4,780	25	1,584	22	22	0	28	212	13.23	0	12.68	0.25	13.7	0	12.85	0		
	12/4/2007	630	2,570	24.4	1,538	22	22	0	28	1,106	13.24	0	12.73	0.32	13.67	0	12.9		0
	730	2,560	24.4	1,545	22	22	0	28	1,174										
	830	2,560	24.4	1,543	25	25	0	27.8	1,212										
	930	2,500	24.4	1,539	22	22	0	28	1,276										
	1030	2,420	24.3	1,546	23	23	0	27.9	1,344										
	1130	2,360	24.3	1,536	23	23	0	27.9	1,378	13.21	0	12.65	0.33			12.85	0		
	1230	2,270	24.3	1,547	23	23	0	27.9	1,446										
	1330	2,180	24.3	1,539	25	25	0	27.8	1,490	13.2	0	12.63	0.33	13.64	0	12.82	0		
	1430	2,160	24.2	1,535	27	27	0	27.7	1,547										
	1530	1,919	24.1	1,535	27	27	0	27.7	1,615	13.16	0	12.62	0.32	13.63	0	12.8	0		
	1630	1,870	24.1	1,535	28	28	0	27.6	1,648										
	1730	1,728	24.1	1,530	27	27	0	27.7	1,682	13.17	0	12.59	0.33	13.62	0	12.79	0		
	1800	1,770	24.1	1,527	28	28	0	27.6	1,716										

**Table 1**  
**December 2007 MPE Pilot Test**  
**Operational Data**

3609 International Boulevard  
Oakland, California

DATE	TIME	PID (ppmv)	WELL MANIFOLD VACUUM (In of Hg)	OXIDIZER TEMPERATURE (°F)	WELL FIELD VAPOR FLOW RATE (scfm)	TOTAL SYSTEM VAPOR FLOW RATE (scfm)	DILUTION AIR FLOW RATE (scfm)	SYSTEM (BLOWER) VACUUM (In of Hg)	SYSTEM TOTALIZER READING (gallons)	MW-1		MW-2		MW-6		MW-7		COMMENTS
										DTW (feet, bgs)	Vacuum (In of H <sub>2</sub> O)	DTW (feet, bgs)	Vacuum (In of H <sub>2</sub> O)	DTW (feet, bgs)	Vacuum (In of H <sub>2</sub> O)	DTW (feet, bgs)	Vacuum (In of H <sub>2</sub> O)	
12/5/2007	800	975	24	1,508	31	31	0	27.4	2,390	13.13	0	12.57	0.32	13.72	0	12.73	0	EX-1 vac = 0.03 EX-1 vac = 0.03
	900	1,075	24	1,514	35	35	0	27.2	2,457	13.14	0	12.58	0.32	13.73	0	12.74	0	
	1000	1,040	24	1,515	31	31	0	27.4	2,490	13.14	0	12.58	0.32	13.73	0	12.74	0	
	1100	1,020	24	1,515	31	31	0	27.4	2,524									
	1200																	stop extraction from MW-3; begin extraction from MW-1 EX-1 vac = 0.05
	1215	8,300	24	1,604	25	25	0	27.8	2,558	14.59		13.62		12.7		12.43		
	1230	4,040	24	1,591	31	31	0	27.4	2,558	14.1	0.03	13.6	0	12.7	0	12.52	0.35	
	1245	3,650	24	1,584	31	31	0	27.4	2,558	14.04	0.03	13.6	0	12.7	0	12.53	0.3	
	1300	3,450	24	1,575	31	31	0	27.4	2,591	14	0.03	13.6	0	12.7	0	12.53	0.3	
	1500	1,215	24	1,509	31	31	0	27.4	2,658	14	0	13.6	0	12.71	0	12.53	0.9	
1600	1,080	24	1,509	31	31	0	27.4	2,691										
1700	1,050	23.6	1,508	35	35	0	27.2	2,720	13.11	0.03	13.6	0	12.71	0	12.53	0.9		
12/6/2007	830	1,100	23.2	1,510	41	41	0	26.8	3,186	13.71	0.03	13.6	0	12.7	0	12.65	1.2	
	930	1,125	23.8	1,514	41	41	0	26.8	3,219									
	1030	1,161	23.5	1,515	41	41	0	26.8	3,252	13.73	0.03	13.6	0	12.73	0	12.67	1.3	
	1130	1,143	23.5	1,508	41	41	0	26.8	3,285									
	1230	1,142	23.5	1,503	43	43	0	26.7	3,318	13.72	0.03	13.6	0	12.7	0	12.51	2	
	1330	1,157	23.5	1,505	44	44	0	26.6	3,318									
	1430	1,186	23.4	1,505	44	44	0	26.6	3,350	13.69	0.03	13.6	0	12.69	0	12.54	2.3	
	1530	1,159	23.4	1,505	41	41	0	26.8	3,383									
	1630	1,183	23.4	1,506	43	43	0	26.7	3,416	13.68	0.035	13.6	0	12.61	0	11.37	2.8	
	1745	1,135	23.4	1,498	44	44	0	26.6	3,449	13.66	0.035	13.6	0	12.63	0	12.39	2.3	
12/7/2007	800	1,150	22.8	1,523	44	44	0	26.6	3,844	13.6	0.05	13.37	0	12.52	0	12.34	3	
	1000	1,130	23.6	1,524	44	44	0	26.6	3,910	13.55	0.05	13.37	0	12.4	0	12.55	3	
	1100	1,130	23	1,521	44	44	0	26.6	3,910									
	1200	1,116	23.6	1,523	44	44	0	26.6	3,993									

Totalizer readings = 3,993 gallons  
Total time of test = 5,640 minutes = 94 hours

- Notes
- ppmv parts per million vapor
  - In of Hg inches of mercury
  - In of H<sub>2</sub>O inches of water
  - °F degrees Fahrenheit
  - scfm standard cubic feet per minute

**Table 2**  
**December 2007 MPE Pilot Test**  
**Extraction Data and VOC Mass Removal Rate**

3609 International Boulevard  
 Oakland, California

WELL	COMMENT	DATE	CLOCK TIME	INCREMENTAL TIME	ELAPSED TIME	Q			PID		MASS REMOVAL			
						minutes	minutes	SCFM	ft <sup>3</sup> of extracted air	Moles of extracted air	ppmv as hexane	VOC mole %	lb VOC mass removal as hexane	lbs/min
MW-3	START	12/3/2007	1330	0										
			1345	15	15	19	281	0.7410	7,000	0.0070	0.4471	0.0298	43	
			1400	15	30	22	328	0.8666	7,150	0.0072	0.5341	0.0356	51	
			1415	15	45	22	328	0.8666	6,900	0.0069	0.5154	0.0344	49	
			1430	15	60	22	328	0.8666	6,910	0.0069	0.5162	0.0344	50	
			1445	0	60									
		1500	0	60										
		1530	60	120	22	22	1,314	3.4664	5,650	0.0057	1.6882	0.0281	41	
		1630	60	180	22	22	1,314	3.4664	4,780	0.0048	1.4283	0.0238	34	
		STEADY-STATE	12/4/2007	630	840	1,020	22	18,393	48.5294	2,570	0.0026	10.7509	0.0128	18
				730	60	1,080	22	1,314	3.4664	2,560	0.0026	0.7649	0.0127	18
				830	60	1,140	25	1,504	3.9688	2,560	0.0026	0.8758	0.0146	21
				930	60	1,200	22	1,314	3.4664	2,500	0.0025	0.7470	0.0125	18
				1030	60	1,260	23	1,409	3.7176	2,420	0.0024	0.7755	0.0129	19
				1130	60	1,320	23	1,409	3.7176	2,360	0.0024	0.7563	0.0126	18
				1230	60	1,380	23	1,409	3.7176	2,270	0.0023	0.7274	0.0121	17
				1330	60	1,440	25	1,504	3.9688	2,180	0.0022	0.7458	0.0124	18
				1430	60	1,500	27	1,599	4.2200	2,160	0.0022	0.7857	0.0131	19
				1530	60	1,560	27	1,599	4.2200	1,919	0.0019	0.6981	0.0116	17
			1630	60	1,620	28	1,695	4.4712	1,870	0.0019	0.7207	0.0120	17	
			1730	60	1,680	27	1,599	4.2200	1,728	0.0017	0.6286	0.0105	15	
			1800	30	1,710	28	847	2.2356	1,770	0.0018	0.3411	0.0114	16	
			800	840	2,550	31	26,390	69.6309	975	0.0010	5.8521	0.0070	10	
			900	60	2,610	35	2,075	5.4761	1,075	0.0011	0.5074	0.0085	12	
			1000	60	2,670	31	1,885	4.9736	1,040	0.0010	0.4459	0.0074	11	
		STOP	12/5/2007	1100	60	2,730	31	1,885	4.9736	1,020	0.0010	0.4373	0.0073	10
	TOTAL				2,730		71,725	189			32	0.0116	17	
	MEDIAN					23			2,360	0.0024				

Notes  
 Q volumetric flow rate  
 SCFM standard cubic feet per minute  
 ft<sup>3</sup> cubic feet per minute  
 VOC volatile organic compounds  
 PID photo-ionization detector  
 ppmv parts per million vapor

**DERIVATION OF MASS REMOVAL RATE**  
 ppmv as hexane/1,000,000 = VOC mole %  
 ft<sup>3</sup> of extracted air/(379 ft<sup>3</sup> air/lb-mole air) = moles of extracted air  
 (moles of extracted air)(VOC mole %)(86.2 lb/lb-mole hexane) = lbs of VOC removed as hexane  
 (lbs of VOC mass removed as hexane)(elapsed time) = lbs/min of VOC removed as hexane  
 (lbs/min of VOC removed as hexane)(60 min/1 hour)(24 hours/1 day) = lbs/day of VOC removed as hexane

**Table 3**  
**December 2007 MPE Pilot Test**  
**Extraction Data and VOC Mass Removal Rate**

3609 International Boulevard  
Oakland, California

WELL	COMMENT	DATE	CLOCK TIME	INCREMENTAL TIME	ELAPSED TIME	Q			PID		MASS REMOVAL			
						minutes	minutes	SCFM	ft <sup>3</sup> of extracted air	Moles of extracted air	ppmv as hexane	VOC mole %	lb VOC mass removal as hexane	lbs/min
MW-1	START	12/5/2007	1200	0	0									
	STEADY-STATE		1215	15	15	25	376	0.9922	8,300	0.0083	0.7099	0.0473	68	
			1230	15	30	31	471	1.2434	4,040	0.0040	0.4330	0.0289	42	
			1245	15	45	31	471	1.2434	3,650	0.0037	0.3912	0.0261	38	
			1300	15	60	31	471	1.2434	3,450	0.0035	0.3698	0.0247	35	
		1500	120	180	31	3,770	9.9473	1,215	0.0012	1.0418	0.0087	13		
		1600	60	240	31	1,885	4.9736	1,080	0.0011	0.4630	0.0077	11		
		1700	60	300	35	2,075	5.4761	1,050	0.0011	0.4956	0.0083	12		
		12/6/2007	830	930	1,230	41	38,072	100.4537	1,100	0.0011	9.5250	0.0102	15	
		930	60	1,290	41	2,456	6.4809	1,125	0.0011	0.6285	0.0105	15		
		1030	60	1,350	41	2,456	6.4809	1,161	0.0012	0.6486	0.0108	16		
	1130	60	1,410	41	2,456	6.4809	1,143	0.0011	0.6385	0.0106	15			
	1230	60	1,470	43	2,551	6.7321	1,142	0.0011	0.6627	0.0110	16			
	1330	60	1,530	44	2,647	6.9833	1,157	0.0012	0.6965	0.0116	17			
	1430	60	1,590	44	2,647	6.9833	1,186	0.0012	0.7139	0.0119	17			
	1530	60	1,650	41	2,456	6.4809	1,159	0.0012	0.6475	0.0108	16			
	1630	60	1,710	43	2,551	6.7321	1,183	0.0012	0.6865	0.0114	16			
	1745	75	1,785	44	3,308	8.7291	1,135	0.0011	0.8540	0.0114	16			
	12/7/2007	800	855	2,640	44	37,715	99.5121	1,150	0.0012	9.8646	0.0115	17		
	1000	120	2,760	44	5,293	13.9666	1,130	0.0011	1.3604	0.0113	16			
	1100	60	2,820	44	2,647	6.9833	1,130	0.0011	0.6802	0.0113	16			
	1200	60	2,880	44	2,647	6.9833	1,116	0.0011	0.6718	0.0112	16			
		<b>TOTAL</b>				2,880		119,424	315			32	0.0112	16
		<b>MEDIAN</b>					41			1,150	0.0012			

Notes  
Q volumetric flow rate  
SCFM standard cubic feet per minute  
ft<sup>3</sup> cubic feet per minute  
VOC volatile organic compounds  
PID photo-ionization detector  
ppmv parts per million vapor

**DERIVATION OF MASS REMOVAL RATE**

ppmv as hexane/1,000,000 = VOC mole %  
ft<sup>3</sup> of extracted air/(379 ft<sup>3</sup> air/lb-mole air) = moles of extracted air  
(moles of extracted air)(VOC mole %)(86.2 lb/lb-mole hexane) = lbs of VOC removed as hexane  
(lbs of VOC mass removed as hexane)(elapsed time) = lbs/min of VOC removed as hexane  
(lbs/min of VOC removed as hexane)(60 min/1 hour)(24 hours/1 day) = lbs/day of VOC removed as hexane

**Table 4**

**December Pilot Test  
Mass Removal**

3609 International Boulevard  
Oakland, California

Extraction Well	Vapor Sample ID	Collection Date/Time	USEPA TO-3 MODIFIED	USEPA TO-15 MODIFIED								Q (CFM)	Mass Removal Rate (lbs/day) (TPHg/benzene/MtBE)	Total Test time (minutes/days)	Total Mass Removed (lbs) (TPHg/benzene/MtBE)	
			TPHg (ug/m <sup>3</sup> )	Benzene (ug/m <sup>3</sup> )	MtBE (ug/m <sup>3</sup> )	Toluene (ug/m <sup>3</sup> )	Ethyl benzene (ug/m <sup>3</sup> )	Total Xylenes (ug/m <sup>3</sup> )	DIPE (ug/m <sup>3</sup> )	ETBE (ug/m <sup>3</sup> )	TAME (ug/m <sup>3</sup> )					TBA (ug/m <sup>3</sup> )
MW-3	Influent	12/4/07 @ 1015	9,200,000(a)	76,000(b)	1,900(b)	12,000(b)	55,000(b)	162,000(b)	<1,000(b)	<1,000(b)	<1,000(b)	<760(b)	23	14.96/0.16/0.0029	2,730/1.90	28.42(e) / 0.30(e) / 0.0055(e)
MW-3	Influent	12/5/07 @ 1000	5,300,000(c)	76,000(c)	<900(c)	33,000(c)	10,000(c)	41,400(c)	<1,000(c)	<1,000(c)	<1,000(c)	<760(c)				
MW-3	Stack	12/4/07 @ 1000	<7,000(d)	16(d)	<18(d)	150(d)	<17(d)	125(d)	<21(d)	<21(d)	<21(d)	<15	N/A	N/A	N/A	N/A
<b>REMOVAL EFFICIENCIES</b>			99.9239%	99.9789%	99.0526%	98.7500%	99.9691%	99.9228%	97.9000%	97.9000%	97.9000%	98.0263%				
MW-1	Influent	12/6/07 @ 0900	4,700,000(b)	3,400(c)	<900(c)	2,100(c)	7,000(c)	17,800(c)	<1,000(c)	<1,000(c)	<1,000(c)	<760(c)	41	17.66/0.0065/0.0019	2,880/2	35.31(e) / 0.013(e) / 0.0037(e)
MW-1	Influent	12/7/07 @ 0815	4,900,000(b)	2,900(c)	<900(c)	1,400(c)	4,300(c)	10,900(c)	<1,000(c)	<1,000(c)	<1,000(c)	<760(c)				
MW-1	Stack	12/6/07 @ 0855	3,500(d)	<16(d)	<19(d)	130(d)	<17(d)	102(d)	<21(d)	<21(d)	<82(d)	<15(d)	N/A	N/A	N/A	N/A
<b>REMOVAL EFFICIENCIES</b>			99.9255%	99.5294%	97.8889%	93.8095%	99.7571%	99.4270%	97.9000%	97.9000%	91.8000%	98.0263%				

**Notes**

- CFM cubic feet per minute
- lbs/day pounds per day
- ug/m<sup>3</sup> micrograms per cubic meter
- DIPE di-isopropyl ether
- ETBE ethyl tertiary butyl ether
- TAME methyl tertiary amyl ether
- TBA tertiary butyl alcohol
- (a) dilution factor 5000
- (b) dilution factor 1000
- (c) dilution factor 500
- (d) dilution factor 10
- (e) average value

**DERIVATION OF MASS REMOVAL RATE**

$$\begin{aligned}
 &(\text{ug/m}^3) [(1\text{mg}/1000\text{ug}) (1\text{m}^3/1000\text{ L})] = \text{mg/L} \\
 &(\text{mg/L}) (28.32\text{ L}/1\text{ ft}^3) ([Q]\text{ ft}^3/\text{min}) = \text{mg/min} \\
 &(\text{mg/min}) (1\text{g}/1000\text{mg}) (1\text{kg}/1000\text{g}) (60\text{min}/1\text{hr}) (24\text{hr}/1\text{day}) = \text{kg/day} \\
 &(\text{kg/day}) (2.2\text{lbs}/1\text{kg}) = \text{lbs/day}
 \end{aligned}$$

**DERIVATION OF TOTAL MASS REMOVED**

$$\begin{aligned}
 &\text{Total time of test} = \text{days (Tables 1, 2 and 3)} \\
 &(\text{mass removal rate [lbs/day]})(\text{total time of test [days]}) = \text{Total Removed (lbs)}
 \end{aligned}$$

**DERIVATION OF REMOVAL EFFICIENCIES**

$$\text{Influent sample concentration} / \text{STACK sample concentration}$$

**Table 5**

**Dissolved-Phase Hydrocarbon Concentrations  
Pre- and Post-MPE Pilot Test**

3609 International Boulevard  
Oakland, California

Monitoring Well	Date	MPE Event	TPH-g (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethyl benzene (µg/L)	Total Xylenes (µg/L)	MtBE (µg/L)
<b>MW-3</b>	12/3/2007	Pilot Test	2,040	2,200	<22	115	33	25
	12/7/2007	Pilot Test	4,610	785	57.1	275	262	6
<b>MW-1</b>	12/3/2007	Pilot Test	839	9	<2	1	<2.5	4
	12/7/2007	Pilot Test	2,270	20	6	34.3	50	11

Notes:

TPHg = Total petroleum hydrocarbons as gasoline

MTBE = methyl-tertiary-butyl ether

ug/l - Micrograms per liter

**Table 6**

**Multi-Phase Extraction  
Comparative Costs  
Permanent Installation versus MTS**

3609 International Boulevard  
Oakland, California

COST ITEM	PERMANENT INSTALLATION			MTS	
<b>Equipment and Installation Cost</b>  <b>Equipment Cost</b> liquid-ring pump, oxidizer, air/water separator, extracted water treatment (carbon polish)  <b>Installation Cost</b> compound construction control panel (100 amp)  <b>EQUIPMENT/INSTALLATION COST TOTAL</b>	\$175,000   \$12,000  <b>\$189,000</b>				Unit rented from Golden Gate Remediation Technology  N/A - MTS is mobile unit
<b>Utilities Installation Cost</b>  <b>Natural Gas Service for Oxidizer (PG&amp;E)</b> trenching, conveyance piping hookup and meter  <b>Alternative Propane Service for Oxidizer</b> tank setup, installation of traffic bollards line install to oxidizer  <b>UTILITIES INSTALLATION COST TOTAL</b>		\$18,000  \$12,000  <b>\$30,000</b>			N/A - MTS has onboard propane tank
<b>Monthly Utilities Costs (continuous operation)</b>  electrical service  natural gas service  alternative propane service  <b>MONTHLY UTILITIES COST TOTAL</b> <b>ELECTRICAL + NATURAL GAS</b> <b>ELECTRICAL + PROPANE</b>			\$5,500  \$4,000  \$4,500  <b>\$9,500</b> <b>\$10,000</b>		N/A - MTS not operated continuously N/A - MTS not operated continuously N/A - MTS not operated continuously
<b>Monthly O&amp;M</b>  labor/equipment/supplies/vehicle  laboratory analyses  <b>MONTHLY O&amp;M COST TOTAL</b>				\$3,000  \$600  <b>\$3,600</b>	N/A - MTS not operated continuously N/A - MTS not operated continuously
<b>Monthly Utilities and O&amp;M Total Cost</b> <b>ELECTRIC + NATURAL GAS</b> <b>ELECTRIC + PROPANE</b>				<b>\$13,100</b> <b>\$13,600</b>	
<b>MPE EVENT COST (5 DAY EVENT/MONTH)</b>					<b>\$12,500 (5 days @ \$2,500/day)</b>

# **APPENDIX A**

## **Boring Logs**



Logged By Noori Ameli		Exploratory Boring Log		Boring No. B-14	
Date Drilled 8/30/95		Approx. Elevation		Boring Diameter 8-inch	
Drilling Method Mobile drill rig B-40L			Sampling Method		
Depth, Ft.	Sample No.	Field Test for Total Ionization	Penetration Resistance Blows/6"	Unified Soil Classification	DESCRIPTION
1					6-inch concrete. Very dark grey silty pea gravelly clay, hard. Munsell Soil Color: HUE 10YR 3/1
2					
3					
4					
5	B-14-5			CL	Color gets lighter to dark greyish-brown silty clay, hard. Munsell Soil Color: HUE 10YR 4/2 Dark greyish-brown silty clay, hard. Munsell Color: HUE 10YR 4/2
6					
7					
8					
9					Color gets lighter to brown silty clay, hard. Munsell Soil Color: HUE 10YR 4/3
10	B-14-10			CL	Color changes to olive-grey silty clay, hard. Munsell Soil Color: HUE 5Y 4/2
11					
12					
13					
14					
15					▽ First groundwater encountered at 15 feet. Olive-grey silty clay, stiff, moist, hard. Munsell Soil Color: HUE 5Y 4/2
16					Boring terminated at 15 feet.
Remarks					

Logged By: Noori Ameli		Exploratory Boring Log		Boring No: STMW-4	
Date Drilled: 8/30/95		Approx. Elevation		Boring Diameter: 8-inch	
Drilling Method: Mobile drill rig B-40L			Sampling Method		
Depth, Ft.	Sample No.	Field Test for Total Ionization	Penetration Resistance Blows/6"	Unified Soil Classification	DESCRIPTION
1					2-inch asphalt, 10-inch dark brown baserock. Munsell Soil Color: HUE 10YR 4/3
2					Very dark grey silty pea gravelly clay, stiff. Munsell Soil Color: HUE 10YR 3/1
3					
4					
5					Very dark grey silty clay, hard. Munsell Soil Color: HUE 10YR 3/1
6					Color gets lighter to dark brown silty clay, hard. Munsell Soil Color: HUE 10YR 3/3
7					
8	STMW-4-8			CL	Brown silty clay, hard. Munsell Soil Color: HUE 10YR 4/3
9					
10					
11					
12					
13					
14					
15					Color changes to dark olive-grey silty clay, hard, very light petroleum odor. Munsell Soil Color: HUE 5Y 3/2
16					∇ First groundwater encountered at 16 feet.
Remarks					

Logged By Noori Ameli	Exploratory Boring Log	Boring No STMW-4
Date Drilled 8/30/95	Approx. Elevation	Boring Diameter 8-inch

Drilling Method Mobile drill rig B-40L	Sampling Method
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Depth, Ft.	Sample No.	Field Test for Total Ionization	Penetration Resistance Blows/ft	Unified Soil Classification	DESCRIPTION
17					Color changes to dark olive-grey silty clay, hard, very light petroleum odor. Munsell Soil Color: HUE 5Y 3/2
18					
19					Color changes to dark greyish-brown silty clay, hard, light petroleum odor.
20					Munsell Soil Color: HUE 2.5Y 4/2
21					
22					
23					
24					
25					
26					
27					Dark greyish-brown fine sandy clay, moist, light petroleum odor, stiff.
28					Munsell Soil Color: HUE 2.5Y 4/2
29					Boring terminated at 27 feet.
30					
31					
32					

Remarks

Logged By: Noori Ameli		Exploratory Boring Log		Boring No. STMW-5	
Date Drilled 8/30/95		Approx. Elevation		Boring Diameter 8-inch	
Drilling Method Mobile drill rig B-40L			Sampling Method		
Depth, Ft.	Sample No.	Field Test for Total Ionization	Penetration Resistance Blows/6"	Unified Soil Classification	DESCRIPTION
1					6-inch concrete. Very dark grey silty clay, hard. Munsell Soil Color: HUE 10YR 3/1
2					
3					
4					
5	STMW-5-5			CL	Color gets lighter to very dark greyish-brown silty clay with minor gravel, hard. Munsell Soil Color: HUE 10YR 3/2
6					
7					Color gets lighter to dark greyish-brown silty clay, hard. Munsell Soil Color: HUE 2.5Y 4/2
8					
9					
10	STMW-5-10			CL	Color changes to dark olive-grey silty clay, hard. Munsell Soil Color: HUE 5Y 3/2
11					
12					Color changes to dark greyish-brown silty clay, hard. Munsell Soil Color: HUE 2.5Y 4/2
13					
14					
15					
16					
Remarks					

Lopped By <b>Noori Ameli</b>		Exploratory Boring Log		Boring No <b>STMW-5</b>	
Date Drilled <b>8/30/95</b>		Approx. Elevation		Boring Diameter <b>8-inch</b>	
Drilling Method <b>Mobile drill rig B-40L</b>			Sampling Method		
Depth, Ft.	Sample No.	Field Test for Total Ionization	Penetration Resistance Blowing	Unified Soil Classification	DESCRIPTION
17					Very light petroleum odor.
18					
19					
20					
21					<u>∇</u> First groundwater encountered at 21 feet. Dark greyish-brown silty pea gravelly clay, stiff, moist. Munsell Soil Color: HUE 2.5Y 4/2
22					
23					
24					
25					
26					Boring terminated at 26 feet.
27					
28					
29					
30					
31					
32					
Remarks					

Logged By: <b>Noori Ameli</b>		Exploratory Boring Log		Boring No. <b>STMW-6</b>	
Date Drilled <b>8/31/95</b>		Approx. Elevation		Boring Diameter <b>8-inch</b>	
Drilling Method <b>Mobile drill rig B-40L</b>			Sampling Method		
Depth, Ft.	Sample No.	Field Test For Total Ionization	Penetration Resistance Blows/6"	Unified Soil Classification	DESCRIPTION
1					6-inch concrete, 4-inch dark brown baserock. Munsell Soil Color: HUE 10YR 4/3 Very dark grey silty clay, hard. Munsell Soil Color: HUE 10YR 3/1
2					
3					Color changes to dark olive-grey silty clay, hard. Munsell Soil Color: HUE 5Y 3/2
4					
5	STMW-6-5			CL	Dark olive-grey silty clay, hard. Munsell Soil Color: HUE 5Y 3/2
6					
7					
8					Color gets lighter to dark greyish-brown silty clay, hard. Munsell Soil Color: HUE 2.5Y 4/2
9					
10	STMW-6-10			CL	Dark greyish-brown silty clay, hard. Munsell Soil Color: HUE 2.5Y 4/2
11					
12					
13					
14					
15					Very light petroleum odor.
16					
Remarks					

Logged By Noori Ameli	Exploratory Boring Log	Boring No STMW-6
Date Drilled 8/31/95	Approx. Elevation	Boring Diameter 8-inch

Drilling Method Mobile drill rig B-40L	Sampling Method
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Depth, Ft.	Sample No.	Field Test for Total Ionization	Penetration Resistance Blows/5'	Unified Soil Classification	DESCRIPTION
17					∇ First groundwater encountered at 17 feet.
18					Dark greyish-brown fine sandy clay, hard, very light petroleum odor. Munsell Soil Color: HUE 2.5Y 4/2
19					
20					
21					Dark greyish-brown fine sandy gravelly clay, wet, stiff.
22					Munsell Soil Color: HUE 2.5Y 4/2
23					
24					
25					
26					Dark greyish-brown fine sandy gravelly clay, wet, stiff. Munsell Soil Color: HUE 2.5Y 4/2
27					Boring terminated at 26 feet.
28					
29					
30					
31					
32					

Remarks

Logged By: NOORI Ameli		Exploratory Boring Log		Boring No. STMW-7	
Date Drilled 8/31/95		Approx. Elevation		Boring Diameter 8-inch	
Drilling Method Mobile drill rig B-40L			Sampling Method		
Depth, Ft.	Sample No.	Field Test for Total Ionization	Penetration Resistance Blow/6"	Unified Soil Classification	DESCRIPTION
1					6-inch concrete, very dark grey silty clay with minor pea gravel, hard. Munsell Soil Color: HUE 10YR 3/1
2					
3					
4					
5	STMW-7-5			CL	Very dark grey silty clay with minor pea gravel, hard. Munsell Soil Color: HUE 10YR 3/1
6					
7					Color changes to dark olive-grey silty clay, hard. Munsell Soil Color: HUE 5/Y 3/2
8					
9					
10	STMW-7-10			CL	Color gets lighter to olive-grey silty clay, hard. Munsell Soil Color: HUE 5Y 4/2
11					
12					
13					
14					
15					
16					▽ First groundwater encountered at 16 feet.
Remarks					



Logged By Noori Ameli		Exploratory Boring Log		Boring No STMW-7	
Date Drilled 8/31/95		Approx. Elevation		Boring Diameter 8-inch	
Drilling Method Mobile drill rig B-40L			Sampling Method		
Depth, Ft.	Sample No.	Field Test for Total Ignition	Penetration Resistance Blows/5'	Unified Soil Classification	DESCRIPTION
17					Olive-grey fine sandy clay, stiff, very light petroleum odor, moist. Munsell Soil Color: HUE 5Y 4/2
18					
19					Olive-grey sandy pea gravelly clay, stiff, very light petroleum odor, wet. Munsell Soil Color: HUE 5Y 4/2
20					
21					
22					
23					
24					
25					
26					Boring terminated at 26 feet.
27					
28					
29					
30					
31					
32					
Remarks					

Logged By: Noori Ameli		Exploratory Boring Log		Boring No. SIMW-8	
Date Drilled 8/30/95		Approx. Elevation		Boring Diameter 8-inch	
Drilling Method Mobile drill rig B-40L			Sampling Method		
Depth, Ft.	Sample No.	Field Test for Total Ionization	Penetration Resistance Blows/5'	Unified Soil Classification	DESCRIPTION
1					2-inch asphalt, 6-inch dark brown baserock. Munsell Soil Color: HUE 10YR 4/3
2					Very dark grey silty clay with minor pea gravel, hard. Munsell Soil Color: HUE 10YR 3/1
3					
4	SIMW-8-4			CL	Color changes to dark olive-grey silty clay, hard. Munsell Soil Color: HUE 5Y 3/2
5					
6					
7					
8	SIMW-8-8			CL	Color gets lighter to olive-grey silty clay, hard. Munsell Soil Color: HUE 5Y 4/2
9					
10					
11					
12					
13					
14					
15					∇ First groundwater encountered at 15 feet. Olive-grey silty clay, moist, light petroleum odor, hard. Munsell Soil Color: HUE 5Y 4/2
16					
Remarks					

Logged By NOORI Ameli		Exploratory Boring Log		Boring No STMW-8	
Date Drilled 8/31/95		Approx. Elevation		Boring Diameter 8-inch	
Drilling Method Mobile drill rig B-40L			Sampling Method		
Depth, Ft.	Sample No.	Field Test for Total Ionization	Penetration Resistance Blows/ft	Unified Soil Classification	DESCRIPTION
17					Olive-grey silty clay, moist, light petroleum odor, hard. Munsell Soil Color: HUE 5Y 4/2
18					
19					
20					
21					Color gets lighter to dark greyish-brown silty fine sandy clay, stiff, wet, light petroleum odor. Munsell Soil Color: HUE 2.5Y 4/2
22					
23					Dark greyish-brown sandy gravelly clay, stiff, wet, Light petroleum odor. Munsell Soil Color: HUE 2.5Y 4/2
24					
25					
26					
27					Boring terminated at 27 feet.
28					
29					
30					
31					
32					
Remarks					

Logged By: Noori Ameli	Exploratory Boring Log	Boring No. B-1
Date Drilled: 8/19/93	Approx. Elevation	Boring Diameter 8-inch

Drilling Method Mobile drill rig B-40L	Sampling Method
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Depth, Ft.	Sample No.	Field Test for Total Ionization	Penetration Resistance Blows/6"	Unified Soil Classification	DESCRIPTION
1				CL	6-inches dark yellowish-brown baserock. Munsell Color: HUE 10YR 3/4 Very dark grey silty pea gravelly clay, hard, mild petroleum odor.
2					Munsell Color: HUE 5Y 3/1
3				CL	Color gets lighter to dark olive-grey silty clay, stiff.
4					Munsell Color: HUE 5Y 3/2
5	B-1-5			CL	Dark olive-grey silty clay, stiff.
6					Munsell Color: HUE 5Y 3/2
7					
8				CL	Dark olive-grey silty gravelly clay, stiff, light petroleum odor.
9					Munsell Color: HUE 5Y 3/2
10	B-1-10			CL	Color gets lighter to olive-grey silty clay, stiff, mild petroleum odor.
11					Munsell Color: HUE 5Y 4/2
12					
13					
14					
15	B-1-15			CL	Olive-grey silty clay, mild petroleum odor.
16					Munsell Color: HUE 5Y 4/2

Remarks
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Logged By: <b>Noori Ameli</b>		Exploratory Boring Log		Boring No. <b>B-1</b>	
Date Drilled: <b>8/19/93</b>		Approx. Elevation		Boring Diameter <b>8-inch</b>	
Drilling Method <b>Mobile drill rig B-40L</b>			Sampling Method		
Depth, Ft.	Sample No.	Field Test for Total Ionization	Penetration Resistance Blows/Ft.	Unified Soil Classification	DESCRIPTION
17				CL	Color changes to olive-brown silty clay, very light petroleum odor, damp. Munsell Color: HUE 2.5 Y 4/4
18					
19					▽ First groundwater encountered at 19 feet.
20				CL	Olive-brown silty clay, mild petroleum odor, wet. Munsell Color: HUE 2.5Y 4/4 Boring terminated at 20 feet.
21					
22					
23					
24					
25					
26					
27					
28					
29					
30					
31					
32					
Remarks					

Logged By: Noori Ameli		Exploratory Boring Log		Boring No. B-2/SIMW-2	
Date Drilled: 8/19/93		Approx. Elevation		Boring Diameter 8-inch	
Drilling Method Mobile drill rig B-40L			Sampling Method		
Depth, Ft.	Sample No.	Field Test for Total Ionization	Penetration Resistance Blows/6"	Unified Soil Classification	DESCRIPTION
1				CL	6-inches dark yellowish-brown baserock. Munsell Color: HUE 10YR 3/4 Very dark grey silty pea gravelly clay, hard. Munsell Color: HUE 5Y 3/1
2					
3				CL	Color gets lighter to dark olive-grey silty clay, stiff. Munsell Color: HUE 5Y 3/2
4					
5	B-2-6			CL	Dark olive-grey silty clay, stiff. Munsell Color: HUE 5Y 3/2
6					
7					
8					
9				CL	Color changes to olive-brown silty clay, stiff, mild petroleum odor. Munsell Color: HUE 2.5Y 4/4
10					
11					
12	B-2-12			CL	Olive-brown silty clay, stiff, stronger petroleum odor. Munsell Color: HUE 2.5Y 4/4
13					
14					
15					
16					▽ First groundwater encountered at 16 feet.
Remarks					

Logged By: <b>Noori Ameli</b>		Exploratory Boring Log		Boring No <b>B-2/STMW-2</b>	
Date Drilled: <b>8/19/93</b>		Approx. Elevation		Boring Diameter <b>8-inch</b>	
Drilling Method <b>Mobile dirll rig B-40L</b>				Sampling Method	
Depth, Ft.	Sample No.	Field Test for Total Ionization	Penetration Resistance Blow/ft	Unified Soil Classification	DESCRIPTION
17				CL	Olive-brown silty clay, stiff, strong petroleum odor, wet. Munsell Color: HUE 2.5Y 4/4
18					
19					
20					
21					
22					
23					
24					
25					
26					
27					
28					
29					
30				CL	Olive-brown silty clay, stiff, strong petroleum odor, wet, yellowish-brown sheen on the water. Munsell Color: HUE 2.5Y 4/4
31					Boring terminated at 30 feet.
32					
Remarks					

Logged By: Noori Ameli		Exploratory Boring Log		Boring No. B-3/P-1	
Date Drilled: 8/19/93		Approx. Elevation		Boring Diameter 8-inch	
Drilling Method Mobile drill rig B-40L			Sampling Method		
Depth, Ft.	Sample No.	Field Test for Total Ionization	Penetration Resistance Blows/6"	Unified Soil Classification	DESCRIPTION
1				cl	6-inches dark yellowish-brown baserock. Munsell Color: HUE 10YR 3/4 Very dark grey silty pea gravelly clay, hard. Munsell Color: HUE 5Y 3/1
2					
3					
4					
5	B-3-5			cl	Color gets lighter to dark olive-grey silty clay, stiff. Munsell Color: HUE 5Y 3/2
6					
7					
8				cl	Color changes to olive-brown silty clay, stiff, very light petroleum odor. Munsell Color: HUE 5Y 3/2
9					
10	B-3-10			cl	Color changes to olive silty clay, stiff, light petroleum odor. Munsell Color: HUE 5Y 4/3
11					
12					
13					
14					
15	B-3-15			CL	Olive silty clay, stiff, mild petroleum odor, damp. Munsell Color: HUE 5Y 4/3 Boring terminated at 15 feet.
16					
Remarks					



Logged By: Noori Ameli		Exploratory Boring Log		Boring No. B-4	
Date Drilled: 8/19/93		Approx. Elevation		Boring Diameter 8-inch	
Drilling Method Mobile drill rig B-40L			Sampling Method		
Depth, Ft.	Sample No.	Field Test for Total Ionization	Penetration Resistance Blow/6"	Unified Soil Classification	DESCRIPTION
1				CL	6-inches dark yellowish-brown baserock. Munsell Color: HUE 10YR 3/4 Very dark grey silty pea gravell clay, hard. Munsell Color: HUE 5Y 3/1
2					
3					
4					
5	B-4-5			CL	Color gets lighter to dark olive-grey silty clay, stiff. Munsell Color: HUE 5Y 3/2
6					
7					
8					
9					
10	B-4-10			CL	Color changes to olive silty clay, stiff, very light petroleum odor. Munsell Color: HUE 5Y 4/3
11					
12					
13					
14					
15	B-4-15			CL	Olive silty clay, stiff, very light petroleum odor. Munsell Color: HUE 5Y 4/3 Boring terminated at 15 feet.
16					
Remarks					

Logged By: Noori Ameli	Exploratory Boring Log	Boring No. B-5
Date Drilled: 8/19/93	Approx. Elevation	Boring Diameter 8-inch
Drilling Method Mobile drill rig B-40L		Sampling Method

Depth, Ft.	Sample No.	Field Test for Total Ionization	Penetration Resistance Blows/6"	Unified Soil Classification	DESCRIPTION
1				CL	6-inches dark yellowish-brown baserock. Munsell Color: HUE 10YR 3/4
2					Very dark grey silty pea gravelly clay, hard. Munsell color: HUE 5Y 3/1
3					
4					
5	B-5-5			CL	Color gets lighter to dark olive-grey silty clay, stiff. Munsell Color: HUE 5Y 3/2
6					
7					
8					
9					
10	B-5-10			CL	Color changes to olive silty clay, stiff. Munsell Color: HUE 5Y 4/3
11					
12					
13					
14					
15	.5B-5-15			CL	Olive silty clay, stiff, damp. Munsell Color: HUE 5Y 4/3 Boring terminated at 15 feet.
16					

Remarks

Logged By: <b>Noori Ameli</b>	Exploratory Boring Log	Boring No. <b>B-5</b>
Date Drilled: <b>8/19/93</b>	Approx. Elevation	Boring Diameter <b>8-inch</b>

Drilling Method <b>Mobile drill rig B-40L</b>	Sampling Method
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Depth, Ft.	Sample No.	Field Test for Total Ionization	Penetration Resistance Blows/6"	Unified Soil Classification	DESCRIPTION
1				CL	6-inches dark yellowish-brown baserock. Munsell Color: HUE 10YR 4/3 Very dark grey silty pea gravelly clay, hard. Munsell Color: HUE 5Y 3/1
2					
3					
4					
5	B-5-5			CL	Color gets lighter to dark olive-grey silty clay, silty. Munsell Color: HUE 5Y 3/2
6					
7					
8					
9					
10	B-5-10			CL	Color changes to olive silty clay, stiff. Munsell Color: HUE 5Y 4/5
11					
12					
13					
14					
15	B-5-15			CL	Olive silty clay, stiff, damp. Munsell Color: HUE 5Y 4/3 Boring terminated at 15 feet.
16					

Remarks

Logged By: Noori Ameli	Exploratory Boring Log	Boring No. B-6/P-3
Date Drilled: 8/20/93	Approx. Elevation	Boring Diameter 8-inch
Drilling Method Mobile drill rig B-40L		Sampling Method

Depth, Ft.	Sample No.	Field Test for Total Ionization	Penetration Resistance Blows/6"	Unified Soil Classification	DESCRIPTION
1				CL	6-inches dark yellowish-brown baserock. Munsell Color: HUE 10YR 3/4
2					Very dark grey silty pea gravelly clay, hard. Munsell Color: HUE 5Y 3/1
3					Mild petroleum odor.
4					
5	B-6-5			CL	Color changes to dark olive-grey silty clay, stiff, mild petroleum odor. Munsell Color: HUE 5Y 3/2
6					
7					
8					
9					
10	B-6-10			CL	Color changes to very dark greyish-brown silty clay, stiff, strong petroleum odor. Munsell Color: HUE 2.5Y 3/2
11				CL	Very dark greyish-brown silty clay, stiff, strong petroleum odor. Munsell Color: HUE 2.5Y 3/2
12				CL	Color gets lighter to dark greyish-brown silty clay, strong petroleum odor, stiff.
13					Munsell Color: HUE 2.5Y 4/2
14	B-6-14			CL	Dark greyish-brown silty clay, stiff, mild petroleum odor, damp. Munsell Color: HUE 2.5Y 4/2
15					
16					∇ First groundwater encountered at 16 feet. Boring terminated at 16 feet.

Remarks

Logged By: <b>Noori Ameli</b>	Exploratory Boring Log	Boring No. <b>B-7/SIMW-3</b>
Date Drilled: <b>8/20/93</b>	Approx. Elevation	Boring Diameter <b>8-inches</b>

Drilling Method <b>Mobile drill rig B-40L</b>	Sampling Method
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Depth, Ft.	Sample No.	Field Test for Total Ionization	Penetration Resistance Blows/6"	Unified Soil Classification	DESCRIPTION
1				CL	6-inches dark yellowish-brown baserock. Munsell Color: HUE 10YR 3/4 Very dark grey silty pea gravelly clay, hard, light sewage odor.
2					Munsell Color: HUE 5Y 3/1
3					
4					
5	B-7-5			CL	Color changes to dark olive-grey silty clay, stiff. Munsell Color: HUE 5Y 3/2
6					
7					
8					
9					
10	B-7-10			CL	Color gets lighter to olive-grey silty clay, stiff, light petroleum odor. Munsell Color: HUE 5Y 4/2
11					
12					
13					
14	B-7-14			CL	Olive-brown silty clay, stiff, light petroleum odor. Munsell Color: HUE 2.5Y 4/4
15					
16					<u>∇</u> First groundwater encountered at 16 feet.

Remarks

Logged By: Noori Ameli		Exploratory Boring Log		Boring No. B-7/STMW-3	
Date Drilled: 8/23/93		Approx. Elevation		Boring Diameter 8-inch	
Drilling Method Mobile drill rig B-40L			Sampling Method		
Depth, Ft.	Sample No.	Field Test for Total Ionization	Penetration Resistance Blows/Ft.	Unified Soil Classification	DESCRIPTION
17				CL	Olive-brown silty clay, stiff, light petroleum odor. Munsell Color: HUE 2.5Y 4/4
18					
19					
20					
21					
22					
23					
24					
25					
26					
27					
28					
29					
30				CL	Olive-brown silty clay, stiff, strong petroleum odor, wet, yellowish sheen on the water. Munsell Color: HUE 2.5Y 4/4 Boring terminated at 30 feet.
31					
32					
Remarks					

Logged By Noori Ameli		Exploratory Boring Log		Boring No. B-8/P-2	
Date Drilled 8/20/93		Approx. Elevation		Boring Diameter 8-inch	
Drilling Method Mobile drill rig B-40L			Sampling Method		
Depth, Ft.	Sample No.	Field Test for Total Ionization	Penetration Resistance Blows/Ft.	Unified Soil Classification	DESCRIPTION
1				CL	6-inches dark yellowish-brown baserock. Munsell Color: HUE 10YR 3/4 Very dark grey silty pea gravelly clay, hard. Munsell Color: HUE 5Y 3/1
2					
3					
4					
5	B-8-5			CL	Color changes to dark olive-grey silty clay, stiff. Munsell Color: HUE 5Y 3/2
6					
7					
8					
9					
10	B-8-10			CL	Color changes to olive-grey silty clay, stiff, light petroleum odor. Munsell Color: HUE 5Y 4/2
11					
12					
13					
14	B-8-14			CL	Olive-grey silty clay, stiff, light petroleum odor, damp. Munsell Color: HUE 5Y 4/2
15				CL	Olive-grey silty clay, stiff, mild petroleum odor, moist. Munsell Color: HUE 5Y 4/2
16					∇ First groundwater encountered at 16 feet. Boring terminated at 16 feet.
Remarks					

Logged By: Noori Ameli		Exploratory Boring Log		Boring No. B-9	
Date Drilled: 8/20/93		Approx. Elevation		Boring Diameter 8-inch	
Drilling Method Mobile drill rig B-40L			Sampling Method		
Depth, Ft.	Sample No.	Field Test for Total Ionization	Penetration Resistance Blows/Ft.	Unified Soil Classification	DESCRIPTION
1				CL	6-inch dark yellowish-brown baserock. Munsell Color: HUE 10YR 3/4 Very dark grey silty pea gravelly clay, hard. Munsell Color: HUE 5Y 3/1
2					
3					
4					
5	B-9-5			CL	Color changes to dark olive-grey silty clay, stiff. Munsell Color: HUE 5Y 3/2
6					
7					
8				CL	Color changes to olive-grey silty clay, stiff, light petroleum odor. Munsell Color: HUE 5Y 4/2
9					
10	B-9-10			CL	Olive-grey silty clay, stiff, light petroleum odor. Munsell Color: HUE 5Y 4/2
11					
12					
13					
14	B-9-14			CL	Olive-grey silty clay, stiff, light petroleum odor, damp. Munsell Color: HUE 5Y 4/2
15				CL	Olive-grey silty clay, stiff, mild petroleum odor, moist. Munsell Color: HUE 5Y 4/2
16					∇ First groundwater encountered at 16 feet. Boring terminated at 16 feet.
Remarks					



Logged By Noori Ameli		Exploratory Boring Log		Boring No. B-10	
Date Drilled 8/20/93		Approx. Elevation		Boring Diameter 8-inch	
Drilling Method Mobile drill rig B-40L			Sampling Method		
Depth, Ft.	Sample No.	Field Test for Total Ionization	Penetration Resistance Blows/FL	Unified Soil Classification	DESCRIPTION
1				CL	6-inches dark yellowish-brown baserock. Munsell Color: HUE 10YR 3/4 Very dark grey silty pea gravelly clay, hard. Munsell Color: HUE 5Y 3/1
2					
3					
4					
5	B-10-5			CL	Color changes to dark olive-grey silty clay, stiff. Munsell Color: HUE 5Y 3/2
6					
7				CL	Color changes to olive-grey silty clay, stiff. Munsell Color: HUE 5Y 4/2
8					
9					
10	B-10-10			CL	Olive-grey Silty clay, stiff. Munsell Color: HUE 5Y 4/2
11					
12					
13					
14	B-10-14			CL	Color changes to olive-brown silty clay, stiff, light petroleum odor. Munsell Color: HUE 2.5Y 4/4
15				CL	Olive-brown silty clay, stiff, light petroleum odor. Munsell Color: HUE 2.5Y 4/4
16					∇ First groundwater encountered at 16 feet. Boring terminated at 16 feet.
Remarks					

Logged By Noori Ameli		Exploratory Boring Log		Boring No. B-11/STMW-1	
Date Drilled 8/20/93		Approx. Elevation		Boring Diameter 8-inch	
Drilling Method Mobile drill rig B-40L			Sampling Method		
Depth, Ft.	Sample No.	Field Test for Total Ionization	Penetration Resistance Blows/Ft.	Unified Soil Classification	DESCRIPTION
1				CL	6-inches dark yellowish-brown baserock. Munsell Color: HUE 10YR 3/4 Very dark grey silty pea gravelly clay, hard. Munsell Color: HUE 5y 3/1
2					
3					
4					
5	B-11-5			CL	Color changes to dark olive-grey silty clay, stiff. Munsell Color: HUE 5Y 3/2
6				CL	Color changes to olive-grey silty clay, stiff. Munsell Color: HUE 5Y 4/2
7					
8					
9					
10	B-11-10			CL	Olive-grey silty clay, stiff, very light petroleum odor. Munsell Color: HUE 5Y 4/2
11					
12					Mild petroleum odor.
13					
14	B-11-14			CL	Olive-grey silty clay, stiff, strong petroleum odor, damp. Munsell Color: HUE 5Y 4/2
15				CL	Olive-grey silty clay, stiff, strong petroleum odor, moist. Munsell Color: HUE 5Y 4/2
16					<u>∇</u> First groundwater encountered at 16 feet.
Remarks					

Logged By <b>Noori Ameli</b>		Exploratory Boring Log		Boring No. <b>B-11/STMW-1</b>	
Date Drilled. <b>8/23/93</b>		Approx. Elevation		Boring Diameter <b>8-inch</b>	
Drilling Method <b>Mobile drill rig B-40L</b>				Sampling Method	
Depth, Ft.	Sample No.	Field Test for Total Ionization	Penetration Resistance Blows/Ft.	Unified Soil Classification	DESCRIPTION
17				CL	Olive-grey silty clay, stiff, strong petroleum odor, moist. Munsell Color: HUE 5Y 4/2
18					
19					
20					
21					
22					
23					
24					
25					
26					
27					
28					
29					
30				CL	Olive-grey silty clay, stiff, strong petroleum odor, wet, yellowish-brown sheen on the water. Munsell Color: HUE 5Y 4/2
31					Boring terminated at 30 feet.
32					
Remarks					

Logged By Noori Ameli		Exploratory Boring Log		Boring No. B-12	
Date Drilled 8/20/93		Approx. Elevation		Boring Diameter 8-inch	
Drilling Method Mobile drill rig B-40L			Sampling Method		
Depth, Ft.	Sample No.	Field Test for Total Ionization	Penetration Resistance Blows/Ft.	Unified Soil Classification	DESCRIPTION
1				CL	6-inches dark yellowish-brown baserock. Munsell Color: HUE 10YR 3/4 Very dark grey silty pea gravelly clay, hard. Munsell Color: HUE 5Y 3/1
2					
3					
4					
5	B-12-5			CL	Color changes to dark grey silty pea gravelly clay, stiff. Munsell Color: HUE 5Y 3/2
6					
7					
8				CL	Color changes to olive-grey silty clay, stiff. Munsell Color: HUE 5Y 4/2
9					
10	B-12-10			CL	Olive-grey silty clay, stiff, very light petroleum odor. Munsell Color: HUE 5Y 4/2
11					
12					
13					
14	B-12-14			CL	Olive-grey silty clay, stiff, light petroleum odor. Munsell Color: HUE 5Y 4/2 Boring terminated at 14 feet.
15					
16					
Remarks					

Logged By: <b>Noori Ameli</b>	Exploratory Boring Log	Boring No. <b>B-13/P4</b>
Date Drilled: <b>8/24/93</b>	Approx. Elevation	Boring Diameter <b>8-inch</b>
Drilling Method <b>Mobile drill rig B-40L</b>		Sampling Method

Depth, Ft.	Sample No.	Field Test for Total Ionization	Penetration Resistance Blows/6"	Unified Soil Classification	DESCRIPTION
1				CL	6-inches dark yellowish-brown baserock. Munsell Color: HUE 10YR 3/4 Very dark grey silty pea gravelly clay, hard. Munsell Color: HUE 5Y 3/1
2					
3					
4					
5	B-13-5			CL	Color gets lighter to dark olive-grey silty clay, hard. Munsell Color: HUE 5Y 3/2
6					
7				CL	Color changes to dark greyish-brown silty clay, stiff. Munsell Color: HUE 2.5Y 4/2
8					
9					
10	B-13-10			CL	Dark greyish-brown silty clay, stiff. Munsell Color: HUE 2.5Y 4/2
11					
12				CL	Color changes to olive silty clay, stiff, light petroleum odor.
13					Munsell Color: HUE 5Y 4/3
14	B-13-14			CL	Olive silty clay, stiff, mild petroleum odor. Munsell Color: HUE 5Y 4/3
15				CL	Olive silty pea gravelly clay, stiff, mild petroleum odor. Munsell Color: HUE 5Y 4/3
16					Boring terminated at 15 feet.

Remarks



PROJECT: 2332

DATE DRILLED: 02/05/2007

SITE LOCATION: 3609 International Blvd.  
Oakland, CA

CASING ELEVATION:

DRILLER: Gregg Drilling

DEPTH TO GW: 10 feet bgs

DRILLING METHOD: Hollow Stem Auger (HSA)

T.O.C. TO SCREEN: 5 feet

BORING DIAMETER: 10"

SCREEN LENGTH: 15 feet

LOGGED BY: E. Hightower

APPROVED BY: M. Sepehr, Ph.D., P.E.

PID ppm	DEPTH	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	SPLIT SPOON CORE	SAMPLED	GW LEVEL	BLOWCOUNTS	WELL DIAGRAM
	5		GW	Gravel (GW), : Dark grey; loose; moist; medium grained; strong petroleum hydrocarbon (PHC) odor.					
	10						▽		
	15								
	20		CL	Sandy Clay (CL), 7.5YR4/2: Brown; medium stiff; moist; fine-grained sand; mottling throughout (2.5Y4/3); strong PHC odor.					
	25								

COMMENTS:

# **APPENDIX B**

## **Certified Laboratory Analytical Reports Chain-of-Custody Documentation**

# CHAIN OF CUSTODY FORM

**TORRENT Lab.**

**PAL** Pacific Analytical Laboratory

851 West Midway Ave., Suite 201B

Alameda, CA 94501

510-864-0364 Telephone

510-864-0365 Fax

**PAE**

Login#

Project No: 2334				Sampler: Jesse Acedillo				Analyses/Method				
Project Name: 3609 International Blvd. Oakland, CA				Report To: Jesse Acedillo				TD-3 - TPH GAS BTEX AMBE TO-15 - 5 organics				
				Company: SOMA Environmental Engineering, Inc.								
Turnaround Time: Standard				Tel: 925-734-6400 Fax: 925-734-6401								
0712034		Sampling Date/Time		Matrix		# of Containers		Preservatives				
Lab No.	Sample ID	Date	Time	Soil	Water	Waste	AIR	HCL	H <sub>2</sub> SO <sub>4</sub>	HNO <sub>3</sub>	ICE	Field Notes
01A	MW-1 Stack	12/6/07	0855				X					Soil vapor/ remediation X X
02A	MW-1 Influx	12/6/07	0900				X					Soil vapor/ remediation X X
03A	MW-1 Influx	12/7/07	0815				X					Soil vapor/ remediation X X
Sampler Remarks:				Relinquished by:		Date/Time:		Received by:		Date/Time:		
TORRENT Lab EDF Req'd				Jesse Acedillo		12/7/07 @ 1030		Chris N. [Signature]		12/7/07 1040		
				Chris N. [Signature]		12/7/07 1220		[Signature]		12/7/07 12:20		

@ 12/10/07





December 14, 2007

Jesse Acedillo  
Soma Environmental Engineering, Inc.  
6620 Owens Dr. Suite A  
Pleasanton, CA 94588

TEL: 925-734-6400

FAX

RE: 2334

Order No.: 0712034

Dear Jesse Acedillo:

Torrent Laboratory, Inc. received 3 samples on 12/7/2007 for the analyses presented in the following report.

All data for associated QC met EPA or laboratory specification(s) except where noted in the case narrative.

Torrent Laboratory, Inc. is certified by the State of California, ELAP #1991. If you have any questions regarding these tests results, please feel free to contact the Project Management Team at (408)263-5258;ext: 204.

Sincerely,

  
Laboratory Director

  
Date



# TORRENT LABORATORY, INC.

483 Sinclair Frontage Road • Milpitas, CA • Phone: (408) 263-5258 • Fax: (408) 263-8293

Visit us at [www.torrentlab.com](http://www.torrentlab.com) email: [analysis@torrentlab.com](mailto:analysis@torrentlab.com)

**Report prepared for:** Jesse Acedillo  
Soma Environmental Engineering, Inc.

**Date Received:** 12/7/2007  
**Date Reported:** 12/14/2007

**Client Sample ID:** MW-1 Stack  
**Sample Location:** 3609 International Blvd  
**Sample Matrix:** AIR  
**Date/Time Sampled** 12/6/2007 8:55:00 AM

**Lab Sample ID:** 0712034-001  
**Date Prepared:**

Parameters	Analysis Method	Date Analyzed	RL	Dilution Factor	MRL	Result	Units	Analytical Batch
Benzene	TO-15	12/7/2007	0.5	10	5.0	ND	ppbv	P14815
Ethyl Benzene	TO-15	12/7/2007	0.5	10	5.0	ND	ppbv	P14815
Ethyl tert-butyl ether (ETBE)	TO-15	12/7/2007	0.5	10	5.0	ND	ppbv	P14815
Isopropyl ether (DIPE)	TO-15	12/7/2007	0.5	10	5.0	ND	ppbv	P14815
m,p-Xylene	TO-15	12/7/2007	1	10	10	13	ppbv	P14815
MTBE	TO-15	12/7/2007	0.5	10	5.0	ND	ppbv	P14815
o-xylene	TO-15	12/7/2007	0.5	10	5.0	ND	ppbv	P14815
t-Butyl alcohol (t-Butanol)	TO-15	12/7/2007	0.5	10	5.0	ND	ppbv	P14815
tert-Amyl methyl ether (TAME)	TO-15	12/7/2007	0.5	10	5.0	ND	ppbv	P14815
Toluene	TO-15	12/7/2007	0.5	10	5.0	7.1	ppbv	P14815
Surr: 4-Bromofluorobenzene	TO-15	12/7/2007	0	10	65-135	102	%REC	P14815
Benzene	TO-15	12/7/2007	1.6	10	16	ND	µg/m <sup>3</sup>	P14815
Ethyl Benzene	TO-15	12/7/2007	1.67	10	17	ND	µg/m <sup>3</sup>	P14815
Ethyl tert-butyl ether (ETBE)	TO-15	12/7/2007	2.09	10	21	ND	µg/m <sup>3</sup>	P14815
Isopropyl ether (DIPE)	TO-15	12/7/2007	2.09	10	21	ND	µg/m <sup>3</sup>	P14815
m,p-Xylene	TO-15	12/7/2007	2.05	10	20	55	µg/m <sup>3</sup>	P14815
MTBE	TO-15	12/7/2007	1.81	10	18	ND	µg/m <sup>3</sup>	P14815
o-xylene	TO-15	12/7/2007	2.7	10	27	ND	µg/m <sup>3</sup>	P14815
t-Butyl alcohol (t-Butanol)	TO-15	12/7/2007	1.515	10	15	ND	µg/m <sup>3</sup>	P14815
tert-Amyl methyl ether (TAME)	TO-15	12/7/2007	2.09	10	21	ND	µg/m <sup>3</sup>	P14815
Toluene	TO-15	12/7/2007	1.89	10	19	ND	µg/m <sup>3</sup>	P14815
Surr: 4-Bromofluorobenzene	TO-15	12/7/2007	0	10	65-135	102	%REC	P14815
Gasoline	TO-3(MOD)	12/8/2007	100	10	1000	ND	ppbv	G14815
Note: The reporting limits were raised due to insufficient sample volume.								
Gasoline	TO-3(MOD)	12/8/2007	352	10	3500	ND	µg/m <sup>3</sup>	R14815

**Client Sample ID:** MW-1 Influent  
**Sample Location:** International Blvd  
**Sample Matrix:** AIR  
**Date/Time Sampled** 12/6/2007 9:00:00 AM

**Lab Sample ID:** 0712034-002  
**Date Prepared:**

Parameters	Analysis Method	Date Analyzed	RL	Dilution Factor	MRL	Result	Units	Analytical Batch
Benzene	TO-15	12/7/2007	0.5	500	250	1100	ppbv	P14815
Ethyl Benzene	TO-15	12/7/2007	0.5	500	250	1600	ppbv	P14815
Ethyl tert-butyl ether (ETBE)	TO-15	12/7/2007	0.5	500	250	ND	ppbv	P14815
Isopropyl ether (DIPE)	TO-15	12/7/2007	0.5	500	250	ND	ppbv	P14815
m,p-Xylene	TO-15	12/7/2007	1	500	500	3300	ppbv	P14815
MTBE	TO-15	12/7/2007	0.5	500	250	ND	ppbv	P14815
o-xylene	TO-15	12/7/2007	0.5	500	250	640	ppbv	P14815
t-Butyl alcohol (t-Butanol)	TO-15	12/7/2007	0.5	500	250	ND	ppbv	P14815
tert-Amyl methyl ether (TAME)	TO-15	12/7/2007	0.5	500	250	ND	ppbv	P14815
Toluene	TO-15	12/7/2007	0.5	500	250	860	ppbv	P14815
Surr: 4-Bromofluorobenzene	TO-15	12/7/2007	0	500	65-135	102	%REC	P14815

Note: The reporting limits were raised due to high concentration of non-target analytes.

Benzene	TO-15	12/7/2007	1.6	500	800	3400	µg/m <sup>3</sup>	P14815
Ethyl Benzene	TO-15	12/7/2007	1.67	500	840	7000	µg/m <sup>3</sup>	P14815
Ethyl tert-butyl ether (ETBE)	TO-15	12/7/2007	2.09	500	1000	ND	µg/m <sup>3</sup>	P14815
Isopropyl ether (DIPE)	TO-15	12/7/2007	2.09	500	1000	ND	µg/m <sup>3</sup>	P14815
m,p-Xylene	TO-15	12/7/2007	2.05	500	1000	15000	µg/m <sup>3</sup>	P14815
MTBE	TO-15	12/7/2007	1.81	500	900	ND	µg/m <sup>3</sup>	P14815
o-xylene	TO-15	12/7/2007	2.7	500	1400	2800	µg/m <sup>3</sup>	P14815
t-Butyl alcohol (t-Butanol)	TO-15	12/7/2007	1.515	500	760	ND	µg/m <sup>3</sup>	P14815
tert-Amyl methyl ether (TAME)	TO-15	12/7/2007	2.09	500	1000	ND	µg/m <sup>3</sup>	P14815
Toluene	TO-15	12/7/2007	1.89	500	940	2100	µg/m <sup>3</sup>	P14815
Surr: 4-Bromofluorobenzene	TO-15	12/7/2007	0	500	65-135	102	%REC	P14815

Gasoline	TO-3(MOD)	12/8/2007	100	1000	100000	1340000x	ppbv	G14815
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Note: x - Does not match typical gasoline pattern. Reported value contains a significant amount of non-gasoline hydrocarbons responded within gasoline quantitative range.

Gasoline	TO-3(MOD)	12/8/2007	352	1000	350000	4700000x	µg/m <sup>3</sup>	R14815
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**Client Sample ID:** MW-1 Influent  
**Sample Location:** 3609 International Blvd  
**Sample Matrix:** AIR  
**Date/Time Sampled** 12/7/2007 8:15:00 AM

**Lab Sample ID:** 0712034-003  
**Date Prepared:**

Parameters	Analysis Method	Date Analyzed	RL	Dilution Factor	MRL	Result	Units	Analytical Batch
Benzene	TO-15	12/7/2007	0.5	500	250	920	ppbv	P14815
Ethyl Benzene	TO-15	12/7/2007	0.5	500	250	980	ppbv	P14815
Ethyl tert-butyl ether (ETBE)	TO-15	12/7/2007	0.5	500	250	ND	ppbv	P14815
Isopropyl ether (DIPE)	TO-15	12/7/2007	0.5	500	250	ND	ppbv	P14815
m,p-Xylene	TO-15	12/7/2007	1	500	500	2200	ppbv	P14815
MTBE	TO-15	12/7/2007	0.5	500	250	ND	ppbv	P14815
o-xylene	TO-15	12/7/2007	0.5	500	250	360	ppbv	P14815
t-Butyl alcohol (t-Butanol)	TO-15	12/7/2007	0.5	500	250	ND	ppbv	P14815
tert-Amyl methyl ether (TAME)	TO-15	12/7/2007	0.5	500	250	ND	ppbv	P14815
Toluene	TO-15	12/7/2007	0.5	500	250	580	ppbv	P14815
Surr: 4-Bromofluorobenzene	TO-15	12/7/2007	0	500	65-135	102	%REC	P14815

Note: The reporting limits were raised due to high concentration of non-target analytes.

Benzene	TO-15	12/7/2007	1.6	500	800	2900	µg/m <sup>3</sup>	P14815
Ethyl Benzene	TO-15	12/7/2007	1.67	500	840	4300	µg/m <sup>3</sup>	P14815
Ethyl tert-butyl ether (ETBE)	TO-15	12/7/2007	2.09	500	1000	ND	µg/m <sup>3</sup>	P14815
Isopropyl ether (DIPE)	TO-15	12/7/2007	2.09	500	1000	ND	µg/m <sup>3</sup>	P14815
m,p-Xylene	TO-15	12/7/2007	2.05	500	1000	9400	µg/m <sup>3</sup>	P14815
MTBE	TO-15	12/7/2007	1.81	500	900	ND	µg/m <sup>3</sup>	P14815
o-xylene	TO-15	12/7/2007	2.7	500	1400	1500	µg/m <sup>3</sup>	P14815
t-Butyl alcohol (t-Butanol)	TO-15	12/7/2007	1.515	500	760	ND	µg/m <sup>3</sup>	P14815
tert-Amyl methyl ether (TAME)	TO-15	12/7/2007	2.09	500	1000	ND	µg/m <sup>3</sup>	P14815
Toluene	TO-15	12/7/2007	1.89	500	940	1400	µg/m <sup>3</sup>	P14815
Surr: 4-Bromofluorobenzene	TO-15	12/7/2007	0	500	65-135	102	%REC	P14815

Gasoline	TO-3(MOD)	12/8/2007	100	1000	100000	1390000x	ppbv	G14815
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Note: x - Does not match typical gasoline pattern. Reported value contains a significant amount of non-gasoline hydrocarbons responded within gasoline quantitative range.

Gasoline	TO-3(MOD)	12/8/2007	352	1000	350000	4900000x	µg/m <sup>3</sup>	R14815
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**Definitions, legends and Notes**

Note	Description
ug/kg	Microgram per kilogram (ppb, part per billion).
ug/L	Microgram per liter (ppb, part per billion).
mg/kg	Milligram per kilogram (ppm, part per million).
mg/L	Milligram per liter (ppm, part per million).
LCS/LCSD	Laboratory control sample/laboratory control sample duplicate.
MDL	Method detection limit.
MRL	Modified reporting limit. When sample is subject to dilution, reporting limit times dilution factor yields MRL.
MS/MSD	Matrix spike/matrix spike duplicate.
N/A	Not applicable.
ND	Not detected at or above detection limit.
NR	Not reported.
QC	Quality Control.
RL	Reporting limit.
% RPD	Percent relative difference.
a	pH was measured immediately upon the receipt of the sample, but it was still done outside the holding time.
sub	Analyzed by subcontracting laboratory, Lab Certificate #

**CLIENT:** Soma Environmental Engineering, Inc.  
**Work Order:** 0712034  
**Project:** 2334

**ANALYTICAL QC SUMMARY REPORT**

**BatchID: G14815**

Sample ID <b>MB-G</b>	SampType: <b>MBLK</b>	TestCode: <b>TO-3Gas (MO</b>	Units: <b>ppbv</b>	Prep Date: <b>12/8/2007</b>	RunNo: <b>14815</b>						
Client ID: <b>ZZZZZ</b>	Batch ID: <b>G14815</b>	TestNo: <b>TO-3(MOD)</b>	Analysis Date: <b>12/8/2007</b>	SeqNo: <b>213048</b>							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Gasoline	ND	100									

Sample ID <b>LCS-G</b>	SampType: <b>LCS</b>	TestCode: <b>TO-3Gas (MO</b>	Units: <b>ppbv</b>	Prep Date: <b>12/8/2007</b>	RunNo: <b>14815</b>						
Client ID: <b>ZZZZZ</b>	Batch ID: <b>G14815</b>	TestNo: <b>TO-3(MOD)</b>	Analysis Date: <b>12/8/2007</b>	SeqNo: <b>213049</b>							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Gasoline	554.0	100	500	0	111	50	150				

Sample ID <b>LCSD-G</b>	SampType: <b>LCSD</b>	TestCode: <b>TO-3Gas (MO</b>	Units: <b>ppbv</b>	Prep Date: <b>12/8/2007</b>	RunNo: <b>14815</b>						
Client ID: <b>ZZZZZ</b>	Batch ID: <b>G14815</b>	TestNo: <b>TO-3(MOD)</b>	Analysis Date: <b>12/8/2007</b>	SeqNo: <b>213050</b>							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Gasoline	564.0	100	500	0	113	50	150	554	1.79	30	

**Qualifiers:** E Value above quantitation range      H Holding times for preparation or analysis exceeded      J Analyte detected below quantitation limits  
 ND Not Detected at the Reporting Limit      R RPD outside accepted recovery limits      S Spike Recovery outside accepted recovery limits

**CLIENT:** Soma Environmental Engineering, Inc.  
**Work Order:** 0712034  
**Project:** 2334

## ANALYTICAL QC SUMMARY REPORT

**BatchID: P14815**

Sample ID <b>BLK</b>	SampType: <b>MBLK</b>	TestCode: <b>TO-15 Petrol</b>	Units: <b>ppbv</b>	Prep Date: <b>12/7/2007</b>	RunNo: <b>14815</b>						
Client ID: <b>ZZZZZ</b>	Batch ID: <b>P14815</b>	TestNo: <b>TO-15</b>		Analysis Date: <b>12/7/2007</b>	SeqNo: <b>213027</b>						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Benzene	ND	0.50									
Ethyl Benzene	ND	0.50									
Ethyl tert-butyl ether (ETBE)	ND	0.50									
Isopropyl ether (DIPE)	ND	0.50									
m,p-Xylene	ND	1.0									
MTBE	ND	0.50									
o-xylene	ND	0.50									
t-Butyl alcohol (t-Butanol)	ND	0.50									
tert-Amyl methyl ether (TAME)	ND	0.50									
Toluene	ND	0.50									
Surr: 4-Bromofluorobenzene	21.14	0	20	0	106	65	135				

Sample ID <b>LCS</b>	SampType: <b>LCS</b>	TestCode: <b>TO-15 Petrol</b>	Units: <b>ppbv</b>	Prep Date: <b>12/7/2007</b>	RunNo: <b>14815</b>						
Client ID: <b>ZZZZZ</b>	Batch ID: <b>P14815</b>	TestNo: <b>TO-15</b>		Analysis Date: <b>12/7/2007</b>	SeqNo: <b>213028</b>						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Benzene	20.07	0.50	20	0	100	50	150				
Ethyl Benzene	20.88	0.50	20	0	104	50	150				
Ethyl tert-butyl ether (ETBE)	19.90	0.50	20	0	99.5	50	150				
Isopropyl ether (DIPE)	20.32	0.50	20	0	102	50	150				
m,p-Xylene	41.24	1.0	40	0	103	50	150				
MTBE	19.96	0.50	20	0	99.8	50	150				
o-xylene	20.52	0.50	20	0	103	50	150				
t-Butyl alcohol (t-Butanol)	18.68	0.50	20	0	93.4	50	150				
tert-Amyl methyl ether (TAME)	22.19	0.50	20	0	111	50	150				
Toluene	21.81	0.50	20	0	109	50	150				
Surr: 4-Bromofluorobenzene	20.38	0	20	0	102	65	135				

**Qualifiers:** E Value above quantitation range      H Holding times for preparation or analysis exceeded      J Analyte detected below quantitation limits  
 ND Not Detected at the Reporting Limit      R RPD outside accepted recovery limits      S Spike Recovery outside accepted recovery limits

**CLIENT:** Soma Environmental Engineering, Inc.  
**Work Order:** 0712034  
**Project:** 2334

## ANALYTICAL QC SUMMARY REPORT

**BatchID: P14815**

Sample ID	SampType:	TestCode:	Units:	Prep Date:	RunNo:						
<b>LCSD</b>	<b>LCSD</b>	<b>TO-15 Petrol</b>	<b>ppbv</b>	<b>12/7/2007</b>	<b>14815</b>						
Client ID: <b>ZZZZZ</b>	Batch ID: <b>P14815</b>	TestNo: <b>TO-15</b>		Analysis Date: <b>12/7/2007</b>	SeqNo: <b>213029</b>						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	19.61	0.50	20	0	98.0	50	150	20.07	2.32	0	
Ethyl Benzene	20.50	0.50	20	0	103	50	150	20.88	1.84	0	
Ethyl tert-butyl ether (ETBE)	19.84	0.50	20	0	99.2	50	150	19.9	0.302	0	
Isopropyl ether (DIPE)	21.58	0.50	20	0	108	50	150	20.32	6.01	0	
m,p-Xylene	40.39	1.0	40	0	101	50	150	41.24	2.08	0	
MTBE	20.08	0.50	20	0	100	50	150	19.96	0.599	0	
o-xylene	20.28	0.50	20	0	101	50	150	20.52	1.18	0	
t-Butyl alcohol (t-Butanol)	19.44	0.50	20	0	97.2	50	150	18.68	3.99	0	
tert-Amyl methyl ether (TAME)	22.86	0.50	20	0	114	50	150	22.19	2.97	0	
Toluene	21.40	0.50	20	0	107	50	150	21.81	1.90	0	
Surr: 4-Bromofluorobenzene	20.26	0	20	0	101	65	135	0	0	0	

**Qualifiers:** E Value above quantitation range      H Holding times for preparation or analysis exceeded      J Analyte detected below quantitation limits  
 ND Not Detected at the Reporting Limit      R RPD outside accepted recovery limits      S Spike Recovery outside accepted recovery limits



**CLIENT:** Soma Environmental Engineering, Inc.  
**Work Order:** 0712034  
**Project:** 2334

## ANALYTICAL QC SUMMARY REPORT

**BatchID: R14815**

Sample ID <b>MB-TED</b>	SampType: <b>MBLK</b>	TestCode: <b>TO-14 (Tedlar</b>	Units: <b>ppbv</b>	Prep Date: <b>12/8/2007</b>	RunNo: <b>14815</b>						
Client ID: <b>ZZZZZ</b>	Batch ID: <b>R14815</b>	TestNo: <b>TO-14</b>		Analysis Date: <b>12/8/2007</b>	SeqNo: <b>212967</b>						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Benzene	ND	0.28									
Ethyl Benzene	ND	0.090									
Isopropanol	ND	0.40									
m,p-xylene	ND	0.11									
MTBE	ND	0.14									
o-xylene	ND	0.14									
Toluene	ND	0.14									
Surr: 4-Bromofluorobenzene	19.91	0	20	0	99.6	65	135				

Sample ID <b>LCS-TED</b>	SampType: <b>LCS</b>	TestCode: <b>TO-14 (Tedlar</b>	Units: <b>ppbv</b>	Prep Date: <b>12/7/2007</b>	RunNo: <b>14815</b>						
Client ID: <b>ZZZZZ</b>	Batch ID: <b>R14815</b>	TestNo: <b>TO-14</b>		Analysis Date: <b>12/7/2007</b>	SeqNo: <b>212968</b>						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Benzene	17.73	0.28	20	0	88.6	50	150				
Ethyl Benzene	22.37	0.090	20	0	112	50	150				
Isopropanol	20.57	0.40	20	0	103	50	150				
m,p-xylene	43.73	0.11	40	0	109	50	150				
MTBE	23.03	0.14	20	0	115	50	150				
o-xylene	22.07	0.14	20	0	110	50	150				
Toluene	20.06	0.14	20	0	100	50	150				
Surr: 4-Bromofluorobenzene	17.87	0	20	0	89.4	50	150				

Sample ID <b>LCSD-TED</b>	SampType: <b>LCSD</b>	TestCode: <b>TO-14 (Tedlar</b>	Units: <b>ppbv</b>	Prep Date: <b>12/7/2007</b>	RunNo: <b>14815</b>						
Client ID: <b>ZZZZZ</b>	Batch ID: <b>R14815</b>	TestNo: <b>TO-14</b>		Analysis Date: <b>12/7/2007</b>	SeqNo: <b>212969</b>						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Benzene	20.90	0.28	20	0	104	50	150	17.73	16.4	25	
Ethyl Benzene	22.90	0.090	20	0	114	50	150	22.37	2.34	25	
Isopropanol	21.29	0.40	20	0	106	50	150	20.57	3.44	0	
m,p-xylene	45.94	0.11	40	0	115	50	150	43.73	4.93	25	
MTBE	26.08	0.14	20	0	130	50	150	23.03	12.4	0	

**Qualifiers:** E Value above quantitation range      H Holding times for preparation or analysis exceeded      J Analyte detected below quantitation limits  
 ND Not Detected at the Reporting Limit      R RPD outside accepted recovery limits      S Spike Recovery outside accepted recovery limits

**CLIENT:** Soma Environmental Engineering, Inc.  
**Work Order:** 0712034  
**Project:** 2334

## ANALYTICAL QC SUMMARY REPORT

**BatchID: R14815**

Sample ID	LCSD-TED	SampType:	LCSD	TestCode:	TO-14 (Tedlar)	Units:	ppbv	Prep Date:	12/7/2007	RunNo:	14815			
Client ID:	ZZZZZ	Batch ID:	R14815	TestNo:	TO-14			Analysis Date:	12/7/2007	SeqNo:	212969			
Analyte		Result		PQL	SPK value	SPK Ref Val		%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
o-xylene		22.44		0.14	20	0		112	50	150	22.07	1.66	25	
Toluene		20.63		0.14	20	0		103	50	150	20.06	2.80	25	
Surr: 4-Bromofluorobenzene		18.34		0	20	0		91.7	50	150	0	0	0	

**Qualifiers:** E Value above quantitation range      H Holding times for preparation or analysis exceeded      J Analyte detected below quantitation limits  
 ND Not Detected at the Reporting Limit      R RPD outside accepted recovery limits      S Spike Recovery outside accepted recovery limits



483 Sinclair Frontage Road  
 Milpitas, CA 95035  
 Phone: 408.263.5258  
 FAX: 408.263.8293  
 www.torrentlab.com

# CHAIN OF CUSTODY

LAB WORK ORDER NO

0712024

NOTE: SHADED AREAS ARE FOR TORRENT, LAB USE ONLY

Company Name: SOMA Environmental Engr., Inc. Location of Sampling: 3609 International Blvd, Oakland, CA  
 Address: 6620 Owens Dr. Suite A Purpose: Soil Vapor Extraction + Remediation  
 City: Pleasanton State: CA Zip Code: 94588 Special Instructions / Comments:  
 Telephone: 925.734.6400 FAX: 925.734.6401  
 REPORT TO: Jesse Acedillo SAMPLER: Jesse Acedillo P.O.#: 2334 EMAIL: jacedillo@somaenv.com

TURNAROUND TIME: Standard

- 10 Work Days    3 Work Days    Noon - Nxt Day  
 7 Work Days    2 Work Days    2 - 8 Hours  
 5 Work Days    1 Work Day    Other

- SAMPLE TYPE:
- Storm Water    Air  
 Waste Water    Other  
 Ground Water    Soil  
Soil Vapor

- REPORT FORMAT:
- QC Level IV  
 EDF  
 Excel / EDD

TO-3  
 TPH gas  
 TO-15  
 MTBE,  
 S oxygenates

ANALYSIS REQUESTED

LAB ID	CLIENT'S SAMPLE I.D.	DATE / TIME SAMPLED	MATRIX	# OF CONT	CONT TYPE	TO-3	TO-15	REMARKS
01A	MW-3 Stack	12/4/07 1000		1	Tedlar Bag	X	X	
02A	MW-3 Influent	12/4/07 1015		1	Tedlar Bag	X	X	
03A	MW-3 Influent	12/5/07 1000		1	Tedlar BAG	X	X	

Relinquished By: <u>Jesse Acedillo</u> Print: <u>Jesse Acedillo</u>	Date: <u>12/5/07</u>	Time: <u>1106</u>	Received By: <u>[Signature]</u> Print: <u>Anil</u>	Date: <u>12.5.07</u>	Time: <u>11.06</u>
2 Relinquished By: _____ Print: _____	Date: _____	Time: _____	Received By: _____ Print: _____	Date: _____	Time: _____

Were Samples Received in Good Condition?  Yes  NO    Samples on Ice?  Yes  NO    Method of Shipment \_\_\_\_\_    Sample seals intact?  Yes  NO  N/A

NOTE: Samples are discarded by the laboratory 30 days from date of receipt unless other arrangements are made.    Page \_\_\_\_\_ of \_\_\_\_\_

Log In By: \_\_\_\_\_ Date: \_\_\_\_\_    Log In Reviewed By: \_\_\_\_\_ Date: \_\_\_\_\_



December 12, 2007

Jesse Acedillo  
Soma Environmental Engineering, Inc.  
6620 Owens Dr. Suite A  
Pleasanton, CA 94588

TEL: 925-734-6400

FAX:

RE: 2334

Order No.: 0712024

Dear Jesse Acedillo:

Torrent Laboratory, Inc. received 3 samples on 12/5/2007 for the analyses presented in the following report.

All data for associated QC met EPA or laboratory specification(s) except where noted in the case narrative.

Torrent Laboratory, Inc. is certified by the State of California, ELAP #1991. If you have any questions regarding these tests results, please feel free to contact the Project Management Team at (408)263-5258;ext: 204.

Sincerely,

  
Laboratory Director

12/12/07  
Date



# TORRENT LABORATORY, INC.

483 Sinclair Frontage Road • Milpitas, CA • Phone: (408) 263-5258 • Fax: (408) 263-8293

Visit us at [www.torrentlab.com](http://www.torrentlab.com) email: [analysis@torrentlab.com](mailto:analysis@torrentlab.com)

**Report prepared for:** Jesse Acedillo  
Soma Environmental Engineering, Inc.

**Date Received:** 12/5/2007  
**Date Reported:** 12/12/2007

**Client Sample ID:** MW-3 Stack  
**Sample Location:** 3609 International Blvd., Oakland  
**Sample Matrix:** AIR  
**Date/Time Sampled** 12/4/2007

**Lab Sample ID:** 0712024-001  
**Date Prepared:**

Parameters	Analysis Method	Date Analyzed	RL	Dilution Factor	MRL	Result	Units	Analytical Batch
Benzene	TO-15	12/5/2007	0.5	10	5.0	5.0	ppbv	R14787
Ethyl Benzene	TO-15	12/5/2007	0.5	10	5.0	ND	ppbv	R14787
Ethyl tert-butyl ether (ETBE)	TO-15	12/5/2007	0.5	10	5.0	ND	ppbv	R14787
Isopropyl ether (DIPE)	TO-15	12/5/2007	0.5	10	5.0	ND	ppbv	R14787
m,p-Xylene	TO-15	12/5/2007	1	10	10	22	ppbv	R14787
MTBE	TO-15	12/5/2007	0.5	10	5.0	ND	ppbv	R14787
o-xylene	TO-15	12/5/2007	0.5	10	5.0	6.4	ppbv	R14787
t-Butyl alcohol (t-Butanol)	TO-15	12/5/2007	0.5	10	5.0	ND	ppbv	R14787
tert-Amyl methyl ether (TAME)	TO-15	12/5/2007	0.5	10	5.0	ND	ppbv	R14787
Toluene	TO-15	12/5/2007	0.5	10	5.0	40	ppbv	R14787
Surr: 4-Bromofluorobenzene	TO-15	12/5/2007	0	10	65-135	94.2	%REC	R14787

Note: The reporting limits were raised due to insufficient sample volume.

Benzene	TO-15	12/5/2007	1.6	10	16	16	µg/m <sup>3</sup>	R14787
Ethyl Benzene	TO-15	12/5/2007	1.67	10	17	ND	µg/m <sup>3</sup>	R14787
Ethyl tert-butyl ether (ETBE)	TO-15	12/5/2007	2.09	10	21	ND	µg/m <sup>3</sup>	R14787
Isopropyl ether (DIPE)	TO-15	12/5/2007	2.09	10	21	ND	µg/m <sup>3</sup>	R14787
m,p-Xylene	TO-15	12/5/2007	2.05	10	20	97	µg/m <sup>3</sup>	R14787
MTBE	TO-15	12/5/2007	1.81	10	18	ND	µg/m <sup>3</sup>	R14787
o-xylene	TO-15	12/5/2007	2.7	10	27	28	µg/m <sup>3</sup>	R14787
t-Butyl alcohol (t-Butanol)	TO-15	12/5/2007	1.515	10	15	ND	µg/m <sup>3</sup>	R14787
tert-Amyl methyl ether (TAME)	TO-15	12/5/2007	2.09	10	21	ND	µg/m <sup>3</sup>	R14787
Toluene	TO-15	12/5/2007	1.89	10	19	150	µg/m <sup>3</sup>	R14787
Surr: 4-Bromofluorobenzene	TO-15	12/5/2007	0	10	65-135	94.2	%REC	R14787

Gasoline	TO-3(MOD)	12/6/2007	100	20	2000	ND	ppbv	G14787
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Note: See comment for TO-15 Petroleum.

Gasoline	TO-3(MOD)	12/6/2007	352	20	7000	ND	µg/m <sup>3</sup>	G14787
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**Client Sample ID:** MW-3 Influent  
**Sample Location:** 3609 International Blvd., Oakland  
**Sample Matrix:** AIR  
**Date/Time Sampled** 12/4/2007

**Lab Sample ID:** 0712024-002  
**Date Prepared:**

Parameters	Analysis Method	Date Analyzed	RL	Dilution Factor	MRL	Result	Units	Analytical Batch
Benzene	TO-15	12/6/2007	0.5	1000	500	24000	ppbv	R14787
Ethyl Benzene	TO-15	12/6/2007	0.5	500	250	13000	ppbv	R14787
Ethyl tert-butyl ether (ETBE)	TO-15	12/6/2007	0.5	500	250	ND	ppbv	R14787
Isopropyl ether (DIPE)	TO-15	12/6/2007	0.5	500	250	ND	ppbv	R14787
m,p-Xylene	TO-15	12/6/2007	1	500	500	33000	ppbv	R14787
MTBE	TO-15	12/6/2007	0.5	500	250	540	ppbv	R14787
o-xylene	TO-15	12/6/2007	0.5	500	250	5000	ppbv	R14787
t-Butyl alcohol (t-Butanol)	TO-15	12/6/2007	0.5	500	250	ND	ppbv	R14787
tert-Amyl methyl ether (TAME)	TO-15	12/6/2007	0.5	500	250	ND	ppbv	R14787
Toluene	TO-15	12/6/2007	0.5	500	250	3200	ppbv	R14787
Surr: 4-Bromofluorobenzene	TO-15	12/6/2007	0	500	65-135	99.6	%REC	R14787
Surr: 4-Bromofluorobenzene	TO-15	12/6/2007	0	1000	65-135	95.8	%REC	R14787
Benzene	TO-15	12/6/2007	1.6	1000	1600	76000	µg/m <sup>3</sup>	R14787
Ethyl Benzene	TO-15	12/6/2007	1.67	500	840	55000	µg/m <sup>3</sup>	R14787
Ethyl tert-butyl ether (ETBE)	TO-15	12/6/2007	2.09	500	1000	ND	µg/m <sup>3</sup>	R14787
Isopropyl ether (DIPE)	TO-15	12/6/2007	2.09	500	1000	ND	µg/m <sup>3</sup>	R14787
m,p-Xylene	TO-15	12/6/2007	2.05	500	1000	140000	µg/m <sup>3</sup>	R14787
MTBE	TO-15	12/6/2007	1.81	500	900	1900	µg/m <sup>3</sup>	R14787
o-xylene	TO-15	12/6/2007	2.7	500	1400	22000	µg/m <sup>3</sup>	R14787
t-Butyl alcohol (t-Butanol)	TO-15	12/6/2007	1.515	500	760	ND	µg/m <sup>3</sup>	R14787
tert-Amyl methyl ether (TAME)	TO-15	12/6/2007	2.09	500	1000	ND	µg/m <sup>3</sup>	R14787
Toluene	TO-15	12/6/2007	1.89	500	940	12000	µg/m <sup>3</sup>	R14787
Surr: 4-Bromofluorobenzene	TO-15	12/6/2007	0	1000	65-135	95.8	%REC	R14787
Surr: 4-Bromofluorobenzene	TO-15	12/6/2007	0	500	65-135	99.6	%REC	R14787
Gasoline	TO-3(MOD)	12/6/2007	100	5000	500000	2600000x	ppbv	G14787
Note: x - Although TPH as Gasoline constituents are present, results are elevated due to the presence of non-target compounds within the gasoline range.								
Gasoline	TO-3(MOD)	12/6/2007	352	5000	1800000	9200000x	µg/m <sup>3</sup>	G14787

<b>Client Sample ID:</b>	MW-3 Influent	<b>Lab Sample ID:</b>	0712024-003
<b>Sample Location:</b>	3609 International Blvd., Oakland	<b>Date Prepared:</b>	
<b>Sample Matrix:</b>	AIR		
<b>Date/Time Sampled</b>	12/5/2007		

Parameters	Analysis Method	Date Analyzed	RL	Dilution Factor	MRL	Result	Units	Analytical Batch
Benzene	TO-15	12/5/2007	0.5	500	250	24000	ppbv	R14787
Ethyl Benzene	TO-15	12/5/2007	0.5	500	250	2300	ppbv	R14787
Ethyl tert-butyl ether (ETBE)	TO-15	12/5/2007	0.5	500	250	ND	ppbv	R14787
Isopropyl ether (DIPE)	TO-15	12/5/2007	0.5	500	250	ND	ppbv	R14787
m,p-Xylene	TO-15	12/5/2007	1	500	500	7900	ppbv	R14787
MTBE	TO-15	12/5/2007	0.5	500	250	ND	ppbv	R14787
o-xylene	TO-15	12/5/2007	0.5	500	250	1700	ppbv	R14787
t-Butyl alcohol (t-Butanol)	TO-15	12/5/2007	0.5	500	250	ND	ppbv	R14787
tert-Amyl methyl ether (TAME)	TO-15	12/5/2007	0.5	500	250	ND	ppbv	R14787
Toluene	TO-15	12/5/2007	0.5	500	250	8700	ppbv	R14787
Surr: 4-Bromofluorobenzene	TO-15	12/5/2007	0	500	65-135	93.7	%REC	R14787
Benzene	TO-15	12/5/2007	1.6	500	800	76000	µg/m <sup>3</sup>	R14787
Ethyl Benzene	TO-15	12/5/2007	1.67	500	840	10000	µg/m <sup>3</sup>	R14787
Ethyl tert-butyl ether (ETBE)	TO-15	12/5/2007	2.09	500	1000	ND	µg/m <sup>3</sup>	R14787
Isopropyl ether (DIPE)	TO-15	12/5/2007	2.09	500	1000	ND	µg/m <sup>3</sup>	R14787
m,p-Xylene	TO-15	12/5/2007	2.05	500	1000	34000	µg/m <sup>3</sup>	R14787
MTBE	TO-15	12/5/2007	1.81	500	900	ND	µg/m <sup>3</sup>	R14787
o-xylene	TO-15	12/5/2007	2.7	500	1400	7400	µg/m <sup>3</sup>	R14787
t-Butyl alcohol (t-Butanol)	TO-15	12/5/2007	1.515	500	760	ND	µg/m <sup>3</sup>	R14787
tert-Amyl methyl ether (TAME)	TO-15	12/5/2007	2.09	500	1000	ND	µg/m <sup>3</sup>	R14787
Toluene	TO-15	12/5/2007	1.89	500	940	33000	µg/m <sup>3</sup>	R14787
Surr: 4-Bromofluorobenzene	TO-15	12/5/2007	0	500	65-135	93.7	%REC	R14787
Gasoline	TO-3(MOD)	12/6/2007	100	500	50000	1520000x	ppbv	G14787
Note: x - Although TPH as Gasoline constituents are present, results are elevated due to the presence of non-target compounds within the gasoline range.								
Gasoline	TO-3(MOD)	12/6/2007	352	500	180000	5300000x	µg/m <sup>3</sup>	G14787

**CLIENT:** Soma Environmental Engineering, Inc.  
**Work Order:** 0712024  
**Project:** 2334

**ANALYTICAL QC SUMMARY REPORT**

**BatchID: G14787**

Sample ID: <b>MB-G</b>	SampType: <b>MBLK</b>	TestCode: <b>TO-3Gas (MO</b>	Units: <b>ppbv</b>	Prep Date: <b>12/6/2007</b>	RunNo: <b>14787</b>						
Client ID: <b>ZZZZZ</b>	Batch ID: <b>G14787</b>	TestNo: <b>TO-3(MOD)</b>	Analysis Date: <b>12/6/2007</b>	SeqNo: <b>212730</b>							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Gasoline ND 100

Sample ID: <b>LCS-G</b>	SampType: <b>LCS</b>	TestCode: <b>TO-3Gas (MO</b>	Units: <b>ppbv</b>	Prep Date: <b>12/5/2007</b>	RunNo: <b>14787</b>						
Client ID: <b>ZZZZZ</b>	Batch ID: <b>G14787</b>	TestNo: <b>TO-3(MOD)</b>	Analysis Date: <b>12/5/2007</b>	SeqNo: <b>212764</b>							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Gasoline 1189 100 1000 0 119 50 150

Sample ID: <b>LCSD-G</b>	SampType: <b>LCSD</b>	TestCode: <b>TO-3Gas (MO</b>	Units: <b>ppbv</b>	Prep Date: <b>12/6/2007</b>	RunNo: <b>14787</b>						
Client ID: <b>ZZZZZ</b>	Batch ID: <b>G14787</b>	TestNo: <b>TO-3(MOD)</b>	Analysis Date: <b>12/6/2007</b>	SeqNo: <b>212765</b>							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Gasoline 1200 100 1000 0 120 50 150 1189 0.887 30

**Qualifiers:** 3 Recovery of the MS and/or MSD was out of control due to 4 The MS/MSD RPD was out of control due to matrix inter Q Spike recovery and RPD control limits do not apply result  
R RPD outside accepted recovery limits S Spike Recovery outside accepted recovery limits



**CLIENT:** Soma Environmental Engineering, Inc.  
**Work Order:** 0712024  
**Project:** 2334

## ANALYTICAL QC SUMMARY REPORT

**BatchID: R14787**

Sample ID: <b>MB</b>	SampType: <b>MBLK</b>	TestCode: <b>TO-15</b>	Units: <b>ppbv</b>	Prep Date: <b>12/5/2007</b>	RunNo: <b>14787</b>						
Client ID: <b>ZZZZZ</b>	Batch ID: <b>R14787</b>	TestNo: <b>TO-15</b>		Analysis Date: <b>12/5/2007</b>	SeqNo: <b>212525</b>						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Benzene	ND	0.50									
Ethyl Benzene	ND	0.50									
m,p-Xylene	ND	0.50									
MTBE	ND	0.50									
o-xylene	ND	0.50									
Toluene	ND	0.50									
Surr: 4-Bromofluorobenzene	21.95	0	20	0	110	50	150				

Sample ID: <b>LCS</b>	SampType: <b>LCS</b>	TestCode: <b>TO-15</b>	Units: <b>ppbv</b>	Prep Date: <b>12/5/2007</b>	RunNo: <b>14787</b>						
Client ID: <b>ZZZZZ</b>	Batch ID: <b>R14787</b>	TestNo: <b>TO-15</b>		Analysis Date: <b>12/5/2007</b>	SeqNo: <b>212526</b>						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Benzene	19.57	0.50	20	0	97.8	50	150				
Ethyl Benzene	21.44	0.50	20	0	107	50	150				
m,p-Xylene	41.96	0.50	40	0	105	50	150				
MTBE	20.39	0.50	20	0	102	50	150				
o-xylene	20.94	0.50	20	0	105	50	150				
Toluene	22.47	0.50	20	0	112	50	150				
Surr: 4-Bromofluorobenzene	21.04	0	20	0	105	50	150				

Sample ID: <b>LCSD</b>	SampType: <b>LCSD</b>	TestCode: <b>TO-15</b>	Units: <b>ppbv</b>	Prep Date: <b>12/6/2007</b>	RunNo: <b>14787</b>						
Client ID: <b>ZZZZZ</b>	Batch ID: <b>R14787</b>	TestNo: <b>TO-15</b>		Analysis Date: <b>12/6/2007</b>	SeqNo: <b>212527</b>						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

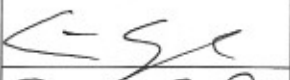
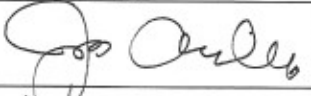

Benzene	18.43	0.50	20	0	92.2	50	150	19.57	6.00	30	
Ethyl Benzene	19.73	0.50	20	0	98.6	50	150	21.44	8.31	30	
m,p-Xylene	39.00	0.50	40	0	97.5	50	150	41.96	7.31	30	
MTBE	18.68	0.50	20	0	93.4	50	150	20.39	8.75	30	
o-xylene	19.30	0.50	20	0	96.5	50	150	20.94	8.15	30	
Toluene	20.44	0.50	20	0	102	50	150	22.47	9.46	30	
Surr: 4-Bromofluorobenzene	18.68	0	20	0	93.4	50	150	0	0	30	

**Qualifiers:** 3 Recovery of the MS and/or MSD was out of control due to matrix inter R RPD outside accepted recovery limits 4 The MS/MSD RPD was out of control due to matrix inter S Spike Recovery outside accepted recovery limits Q Spike recovery and RPD control limits do not apply result

# CHAIN OF CUSTODY FORM

**PAL** Pacific Analytical Laboratory  
 851 West Midway Ave., Suite 201B  
 Alameda, CA 94501  
 510-864-0364 Telephone  
 510-864-0365 Fax

PAL  
 Login# 7120004

Project No: 2334				Sampler: Eric Gassner - Wellbore				Analyses/Method																											
Project Name: 3609 International Blvd. Oakland, CA				Report To: Jesse Acedillo								TPH-2, BTEX, MTBE																							
Turnaround Time: Standard				Company: SOMA Environmental Engineering, Inc.												02600																			
				Tel: 925-734-6400 Fax: 925-734-6401																															
		Sampling Date/Time		Matrix			# of Containers	Preservatives																											
Lab No.	Sample ID	Date	Time	Soil	Water	Waste		HCL	H <sub>2</sub> SO <sub>4</sub>	HNO <sub>3</sub>	ICE	Field Notes																							
	MW-1	12/03/07	1134		X		4VOA	X			X																								
	MW-3	12/03/07	1145		X		4VOA	X			X																								
Sampler Remarks:				Relinquished by:				Date/Time:				Received by:				Date/Time:																			
EDF Req'd								12/3/07 6:20pm								12/3/07 6:20pm																			
																								12/4/07 1612				V. Vazquez				12/4/07 16:25			

19 December 2007

Mansour Sepehr  
SOMA Environmental Engineering Inc.  
6620 Owens Drive, Suite A  
Pleasanton, CA 94588

RE: 3609 International Blvd, Oakland

Work Order Number: 7120004

This Laboratory report has been reviewed for technical correctness and completeness. This entire report was reviewed and approved by the Laboratory Director or the Director's designee, as verified by the following signature.

Sincerely,



---

Maiid Akhavan  
Laboratory Director



SOMA Environmental Engineering Inc.  
6620 Owens Drive, Suite A  
Pleasanton CA, 94588

Project: 3609 International Blvd, Oakland  
Project Number: 2334  
Project Manager: Mansour Sepehr

**Reported:**  
19-Dec-07 19:02

**ANALYTICAL REPORT FOR SAMPLES**

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
MW-1	7120004-01	Water	03-Dec-07 11:34	04-Dec-07 16:25
MW-3	7120004-02	Water	03-Dec-07 11:45	04-Dec-07 16:25



SOMA Environmental Engineering Inc.  
6620 Owens Drive, Suite A  
Pleasanton CA, 94588

Project: 3609 International Blvd, Oakland  
Project Number: 2334  
Project Manager: Mansour Sepehr

**Reported:**  
19-Dec-07 19:02

**Volatile Organic Compounds by EPA Method 8260B**  
**Pacific Analytical Laboratory**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>MW-1 (7120004-01) Water    Sampled: 03-Dec-07 11:34    Received: 04-Dec-07 16:25</b>									
<b>Gasoline (C6-C12)</b>	<b>839</b>	50.0	ug/l	1	BL71301	04-Dec-07	13-Dec-07	EPA 8260B	
<b>Benzene</b>	<b>8.83</b>	0.500	"	"	"	"	"	"	
<b>Ethylbenzene</b>	<b>0.830</b>	0.500	"	"	"	"	"	"	
m&p-Xylene	ND	2.00	"	"	"	"	"	"	
o-xylene	ND	0.500	"	"	"	"	"	"	
Toluene	ND	2.00	"	"	"	"	"	"	
<b>MTBE</b>	<b>3.99</b>	0.500	"	"	"	"	"	"	
<i>Surrogate: 4-Bromofluorobenzene</i>		101 %	70-130	"	"	"	"	"	
<i>Surrogate: Dibromofluoromethane</i>		109 %	70-130	"	"	"	"	"	
<i>Surrogate: Perdeuterotoluene</i>		105 %	70-130	"	"	"	"	"	
<b>MW-3 (7120004-02) Water    Sampled: 03-Dec-07 11:45    Received: 04-Dec-07 16:25</b>									
<b>Gasoline (C6-C12)</b>	<b>2040</b>	550	ug/l	11	BL71301	04-Dec-07	13-Dec-07	EPA 8260B	
<b>Benzene</b>	<b>2200</b>	5.50	"	"	"	"	"	"	
<b>Ethylbenzene</b>	<b>115</b>	5.50	"	"	"	"	"	"	
<b>m&amp;p-Xylene</b>	<b>24.0</b>	22.0	"	"	"	"	"	"	
<b>o-xylene</b>	<b>8.76</b>	5.50	"	"	"	"	"	"	
Toluene	ND	22.0	"	"	"	"	"	"	
<b>MTBE</b>	<b>25.4</b>	5.50	"	"	"	"	"	"	
<i>Surrogate: 4-Bromofluorobenzene</i>		97.6 %	70-130	"	"	"	"	"	
<i>Surrogate: Dibromofluoromethane</i>		110 %	70-130	"	"	"	"	"	
<i>Surrogate: Perdeuterotoluene</i>		104 %	70-130	"	"	"	"	"	



SOMA Environmental Engineering Inc.  
6620 Owens Drive, Suite A  
Pleasanton CA, 94588

Project: 3609 International Blvd, Oakland  
Project Number: 2334  
Project Manager: Mansour Sepehr

Reported:  
19-Dec-07 19:02

**Volatile Organic Compounds by EPA Method 8260B - Quality Control**  
**Pacific Analytical Laboratory**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch BL71301 - EPA 5030 Water MS**

**Blank (BL71301-BLK1)**

Prepared & Analyzed: 13-Dec-07

Surrogate: 4-Bromofluorobenzene	47.2		ug/l	50.0		94.4	70-130			
Surrogate: Dibromofluoromethane	54.9		"	50.0		110	70-130			
Surrogate: Perdeuterotoluene	51.9		"	50.0		104	70-130			
Gasoline (C6-C12)	ND	50.0	"							
Benzene	ND	0.500	"							
Ethylbenzene	ND	0.500	"							
m&p-Xylene	ND	2.00	"							
o-xylene	ND	0.500	"							
Toluene	ND	2.00	"							
MTBE	ND	0.500	"							

**LCS (BL71301-BS1)**

Prepared & Analyzed: 13-Dec-07

Surrogate: 4-Bromofluorobenzene	38.7		ug/l	50.0		77.4	70-130			
Surrogate: Dibromofluoromethane	37.0		"	50.0		74.0	70-130			
Surrogate: Perdeuterotoluene	44.5		"	50.0		89.0	70-130			
Gasoline (C6-C12)	2310	50.0	"	2000		116	70-130			
Benzene	132	0.500	"	100		132	70-140			
Toluene	91.5	2.00	"	100		91.5	70-130			
MTBE	121	0.500	"	100		121	70-130			

**LCS Dup (BL71301-BSD1)**

Prepared & Analyzed: 13-Dec-07

Surrogate: 4-Bromofluorobenzene	38.9		ug/l	50.0		77.8	70-130			
Surrogate: Dibromofluoromethane	38.0		"	50.0		76.0	70-130			
Surrogate: Perdeuterotoluene	45.0		"	50.0		90.0	70-130			
Gasoline (C6-C12)	2260	50.0	"	2000		113	70-130	2.19	20	
Benzene	137	0.500	"	100		137	70-140	3.72	20	
Toluene	92.5	2.00	"	100		92.5	70-130	1.09	20	
MTBE	106	0.500	"	100		106	70-130	13.2	20	



SOMA Environmental Engineering Inc.  
6620 Owens Drive, Suite A  
Pleasanton CA, 94588

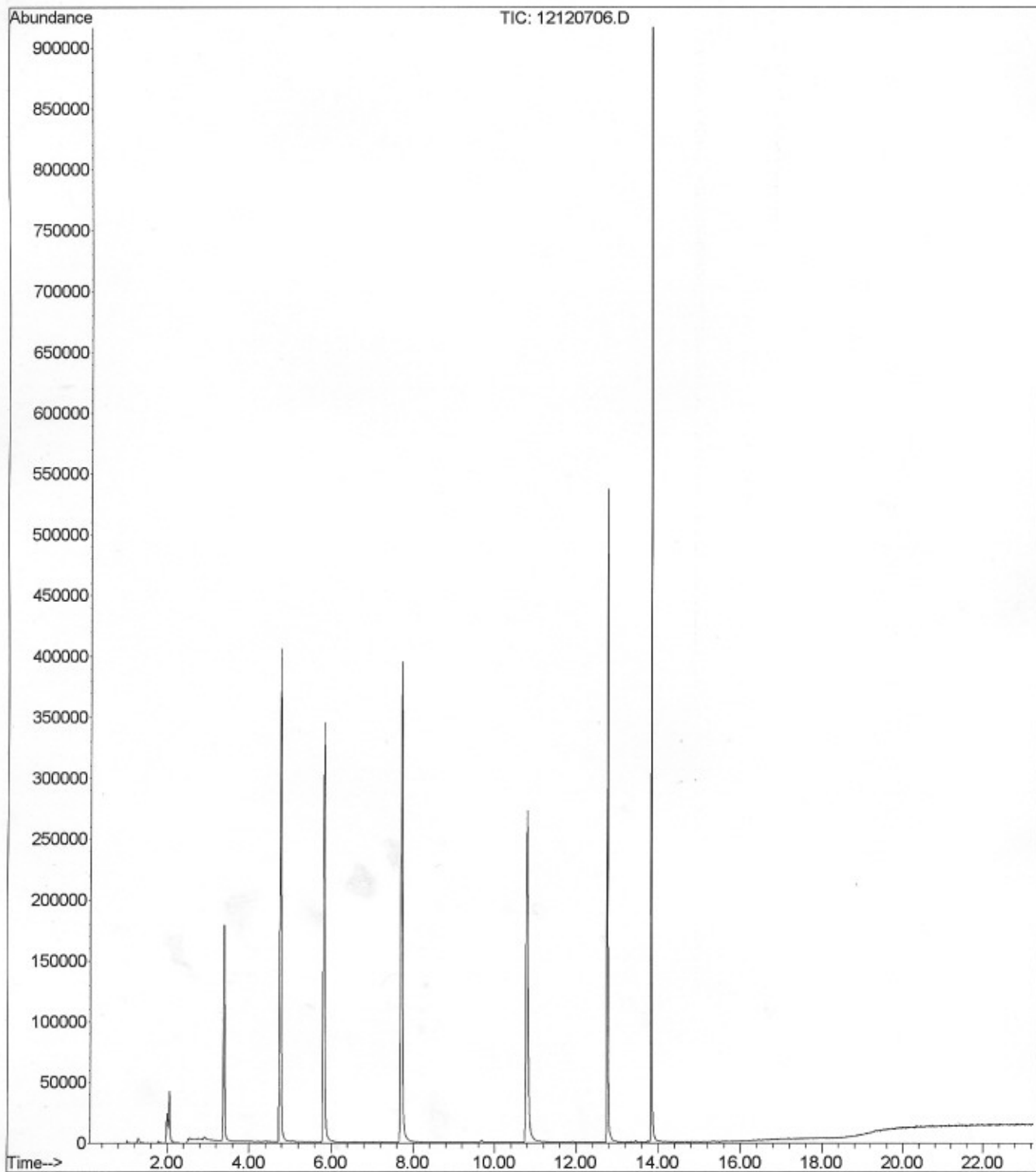
Project: 3609 International Blvd, Oakland  
Project Number: 2334  
Project Manager: Mansour Sepehr

**Reported:**  
19-Dec-07 19:02

### Notes and Definitions

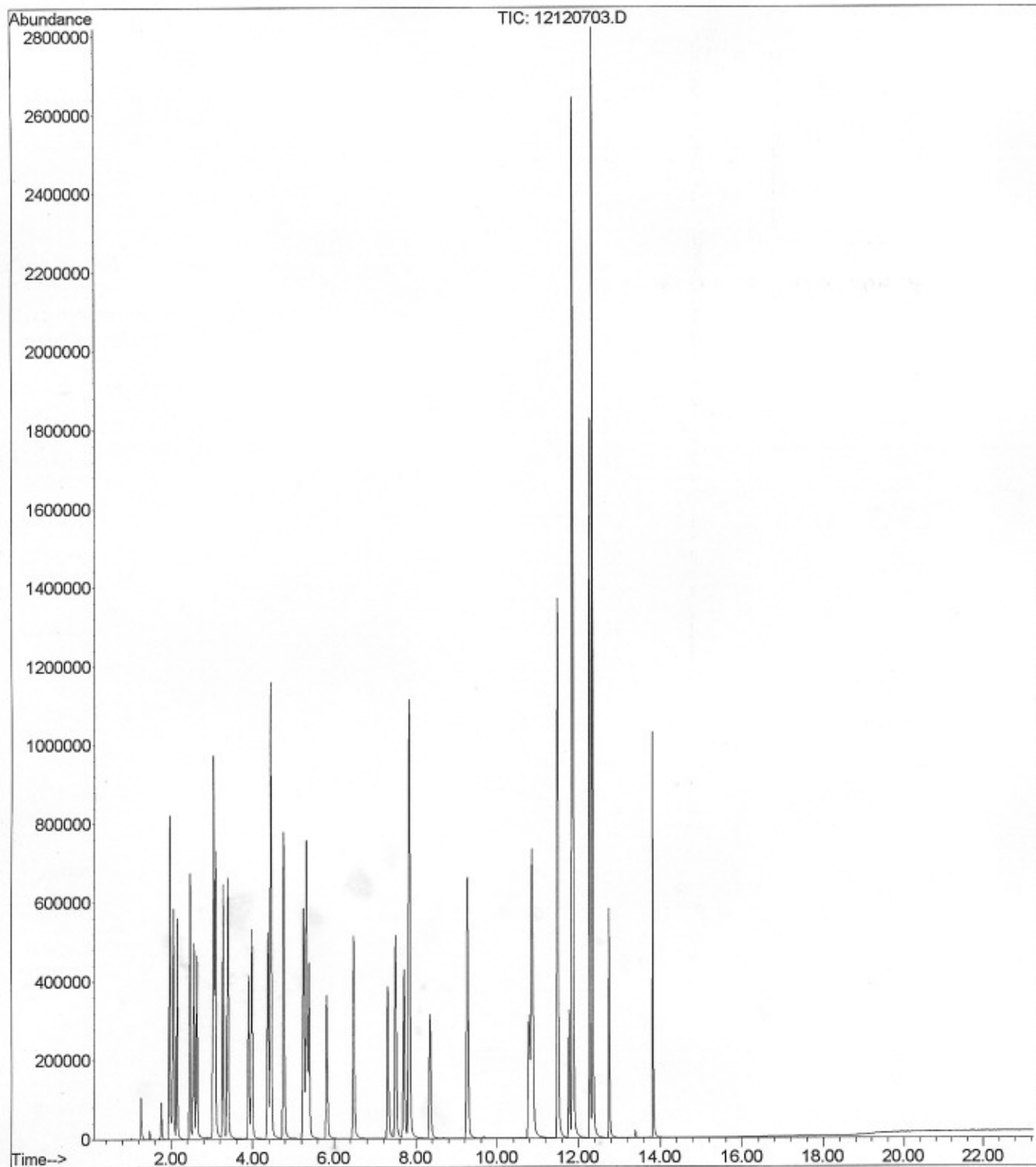
DET Analyte DETECTED  
ND Analyte NOT DETECTED at or above the reporting limit  
NR Not Reported  
dry Sample results reported on a dry weight basis  
RPD Relative Percent Difference

File : C:\MSDCHEM\1\DATA\2007-Dec-12-1920.b\12120706.D  
Operator : dh  
Acquired : 12 Dec 2007 10:19 pm using AcqMethod OXY21506.M  
Instrument : PAL GCMS  
Sample Name: BL71301-BLK1  
Misc Info :  
Vial Number: 6

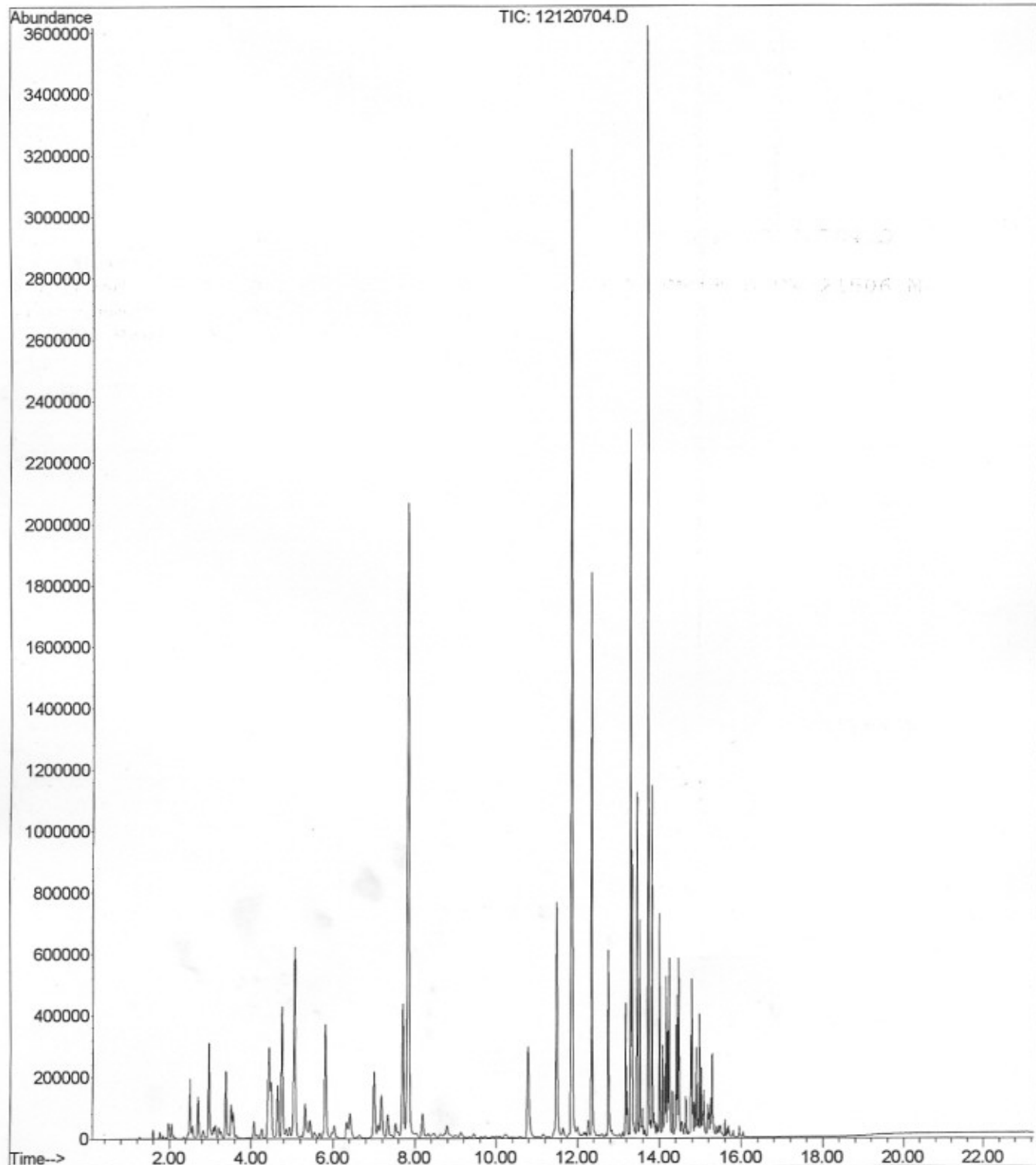




File :C:\MSDChem\1\DATA\2007-Dec-12-1920.b\12120703.D  
Operator : dh  
Acquired : 12 Dec 2007 8:47 pm using AcqMethod OXY21506.M  
Instrument : PAL GCMS  
Sample Name: BL71301-BS1@voc  
Misc Info :  
Vial Number: 3



File : C:\MSDCHEM\1\DATA\2007-Dec-12-1920.b\12120704.D  
Operator : dh  
Acquired : 12 Dec 2007 9:18 pm using AcqMethod OXY21506.M  
Instrument : PAL GCMS  
Sample Name: BL71301-BS1@gas  
Misc Info :  
Vial Number: 4



# CHAIN OF CUSTODY FORM

**PAL** Pacific Analytical Laboratory  
 851 West Midway Ave., Suite 201B  
 Alameda, CA 94501  
 510-864-0364 Telephone  
 510-864-0365 Fax

PAL  
 Login# 7120008

Project No: 2334				Sampler: Eric Gassner-Wollwage					Analyses/Method									
Project Name: 3609 International Blvd Oakland, CA				Report To: Jesse Acedillo					TPH BTEX, M, BE 02608									
Turnaround Time: Standard				Company: SOMA Environmental Engineering, Inc.														
				Tel: 925-734-6400 Fax: 925-734-6401														
		Sampling Date/Time		Matrix			# of Containers	Preservatives										
Lab No.	Sample ID	Date	Time	Soil	Water	Waste		HCL	H <sub>2</sub> SO <sub>4</sub>	HNO <sub>3</sub>	ICE	Field Notes						
	MW-1	12/7/07	1246		X		4 VOAS	X			X	X	X					
	MW-3	"	1243		X		"	X			X	X	X					
Sampler Remarks:				Relinquished by:			Date/Time:		Received by:			Date/Time:						
EDF Reg'd				C. S. [Signature]			12/7/07 @ 13:35		V. Vasquez			12/7/07 13:50 p.						

19 December 2007

Mansour Sepehr  
SOMA Environmental Engineering Inc.  
6620 Owens Drive, Suite A  
Pleasanton, CA 94588

RE: 3609 International Blvd, Oakland

Work Order Number: 7120008

This Laboratory report has been reviewed for technical correctness and completeness. This entire report was reviewed and approved by the Laboratory Director or the Director's designee, as verified by the following signature.

Sincerely,



---

Maiid Akhavan  
Laboratory Director



SOMA Environmental Engineering Inc.  
6620 Owens Drive, Suite A  
Pleasanton CA, 94588

Project: 3609 International Blvd, Oakland  
Project Number: 2334  
Project Manager: Mansour Sepehr

**Reported:**  
19-Dec-07 19:28

**ANALYTICAL REPORT FOR SAMPLES**

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
MW-1	7120008-01	Water	07-Dec-07 12:46	07-Dec-07 13:44
MW-3	7120008-02	Water	07-Dec-07 12:43	07-Dec-07 13:44



SOMA Environmental Engineering Inc.  
6620 Owens Drive, Suite A  
Pleasanton CA, 94588

Project: 3609 International Blvd, Oakland  
Project Number: 2334  
Project Manager: Mansour Sepehr

**Reported:**  
19-Dec-07 19:28

**Volatile Organic Compounds by EPA Method 8260B**  
**Pacific Analytical Laboratory**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>MW-1 (7120008-01RE1) Water    Sampled: 07-Dec-07 12:46    Received: 07-Dec-07 13:44</b>									
<b>Gasoline (C6-C12)</b>	<b>2270</b>	50.0	ug/l	1	BL71301	09-Dec-07	17-Dec-07	EPA 8260B	
<b>Benzene</b>	<b>20.4</b>	0.500	"	"	"	"	"	"	
<b>Ethylbenzene</b>	<b>34.3</b>	0.500	"	"	"	"	"	"	
<b>m&amp;p-Xylene</b>	<b>36.5</b>	2.00	"	"	"	"	"	"	
<b>o-xylene</b>	<b>13.2</b>	0.500	"	"	"	"	"	"	
<b>Toluene</b>	<b>6.47</b>	2.00	"	"	"	"	"	"	
<b>MTBE</b>	<b>10.5</b>	0.500	"	"	"	"	"	"	
<i>Surrogate: 4-Bromofluorobenzene</i>		104 %		70-130	"	"	"	"	
<i>Surrogate: Dibromofluoromethane</i>		112 %		70-130	"	"	"	"	
<i>Surrogate: Perdeuterotoluene</i>		108 %		70-130	"	"	"	"	
<b>MW-3 (7120008-02) Water    Sampled: 07-Dec-07 12:43    Received: 07-Dec-07 13:44</b>									
<b>Gasoline (C6-C12)</b>	<b>4610</b>	550	ug/l	11	BL71301	09-Dec-07	14-Dec-07	EPA 8260B	
<b>Benzene</b>	<b>785</b>	5.50	"	"	"	"	"	"	
<b>Ethylbenzene</b>	<b>275</b>	5.50	"	"	"	"	"	"	
<b>m&amp;p-Xylene</b>	<b>179</b>	22.0	"	"	"	"	"	"	
<b>o-xylene</b>	<b>82.6</b>	5.50	"	"	"	"	"	"	
<b>Toluene</b>	<b>57.1</b>	22.0	"	"	"	"	"	"	
<b>MTBE</b>	<b>6.40</b>	5.50	"	"	"	"	"	"	
<i>Surrogate: 4-Bromofluorobenzene</i>		101 %		70-130	"	"	"	"	
<i>Surrogate: Dibromofluoromethane</i>		114 %		70-130	"	"	"	"	
<i>Surrogate: Perdeuterotoluene</i>		107 %		70-130	"	"	"	"	



SOMA Environmental Engineering Inc.  
6620 Owens Drive, Suite A  
Pleasanton CA, 94588

Project: 3609 International Blvd, Oakland  
Project Number: 2334  
Project Manager: Mansour Sepehr

Reported:  
19-Dec-07 19:28

**Volatile Organic Compounds by EPA Method 8260B - Quality Control**

**Pacific Analytical Laboratory**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch BL71301 - EPA 5030 Water MS**

**Blank (BL71301-BLK1)**

Prepared & Analyzed: 13-Dec-07

Surrogate: 4-Bromofluorobenzene	47.2		ug/l	50.0		94.4	70-130			
Surrogate: Dibromofluoromethane	54.9		"	50.0		110	70-130			
Surrogate: Perdeuterotoluene	51.9		"	50.0		104	70-130			
Gasoline (C6-C12)	ND	50.0	"							
Benzene	ND	0.500	"							
Ethylbenzene	ND	0.500	"							
m&p-Xylene	ND	2.00	"							
o-xylene	ND	0.500	"							
Toluene	ND	2.00	"							
MTBE	ND	0.500	"							

**LCS (BL71301-BS1)**

Prepared & Analyzed: 13-Dec-07

Surrogate: 4-Bromofluorobenzene	38.7		ug/l	50.0		77.4	70-130			
Surrogate: Dibromofluoromethane	37.0		"	50.0		74.0	70-130			
Surrogate: Perdeuterotoluene	44.5		"	50.0		89.0	70-130			
Gasoline (C6-C12)	2310	50.0	"	2000		116	70-130			
Benzene	132	0.500	"	100		132	70-140			
Toluene	91.5	2.00	"	100		91.5	70-130			
MTBE	121	0.500	"	100		121	70-130			

**LCS Dup (BL71301-BSD1)**

Prepared & Analyzed: 13-Dec-07

Surrogate: 4-Bromofluorobenzene	38.9		ug/l	50.0		77.8	70-130			
Surrogate: Dibromofluoromethane	38.0		"	50.0		76.0	70-130			
Surrogate: Perdeuterotoluene	45.0		"	50.0		90.0	70-130			
Gasoline (C6-C12)	2260	50.0	"	2000		113	70-130	2.19	20	
Benzene	137	0.500	"	100		137	70-140	3.72	20	
Toluene	92.5	2.00	"	100		92.5	70-130	1.09	20	
MTBE	106	0.500	"	100		106	70-130	13.2	20	



SOMA Environmental Engineering Inc.  
6620 Owens Drive, Suite A  
Pleasanton CA, 94588

Project: 3609 International Blvd, Oakland  
Project Number: 2334  
Project Manager: Mansour Sepehr

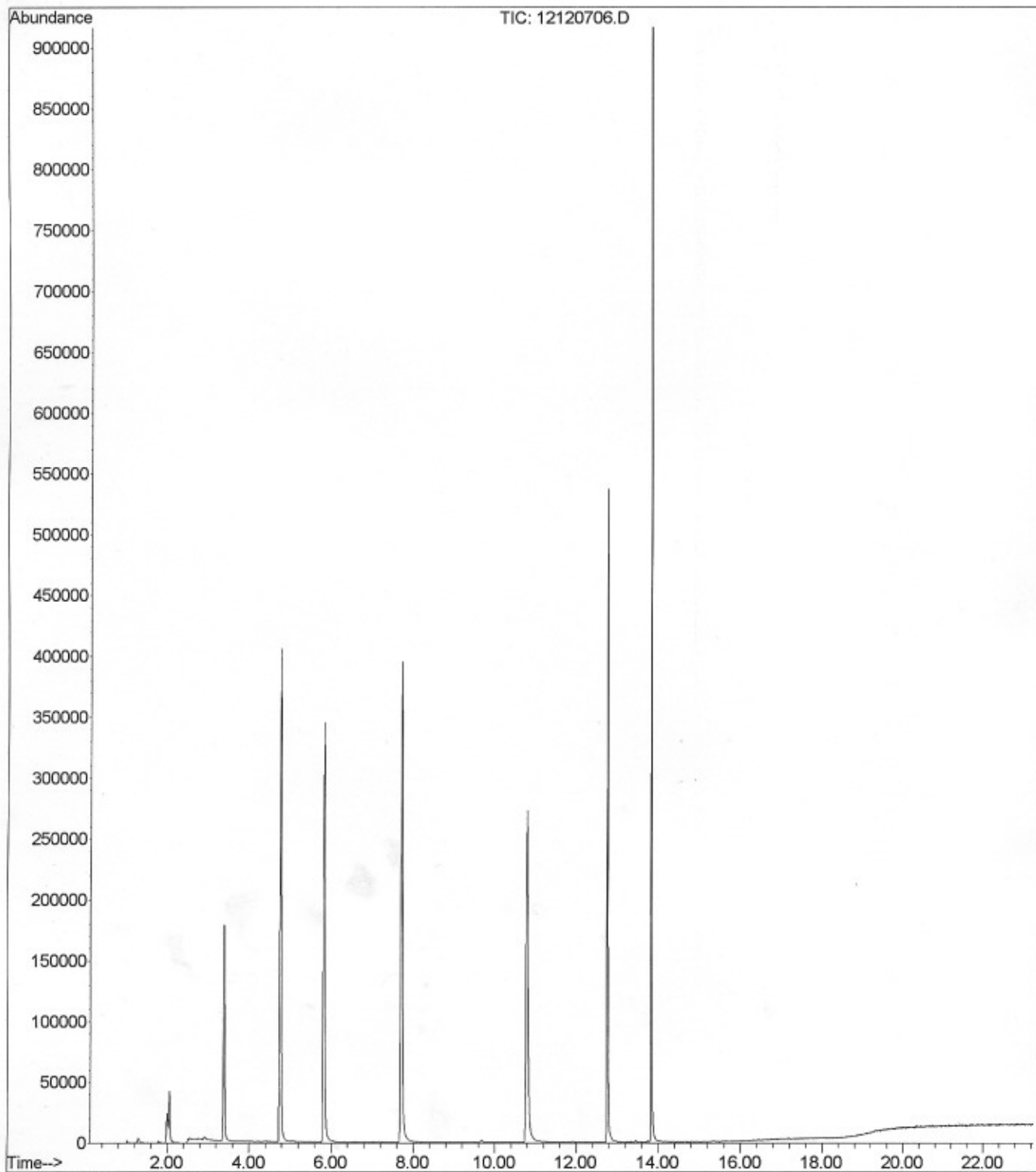
**Reported:**  
19-Dec-07 19:28

### Notes and Definitions

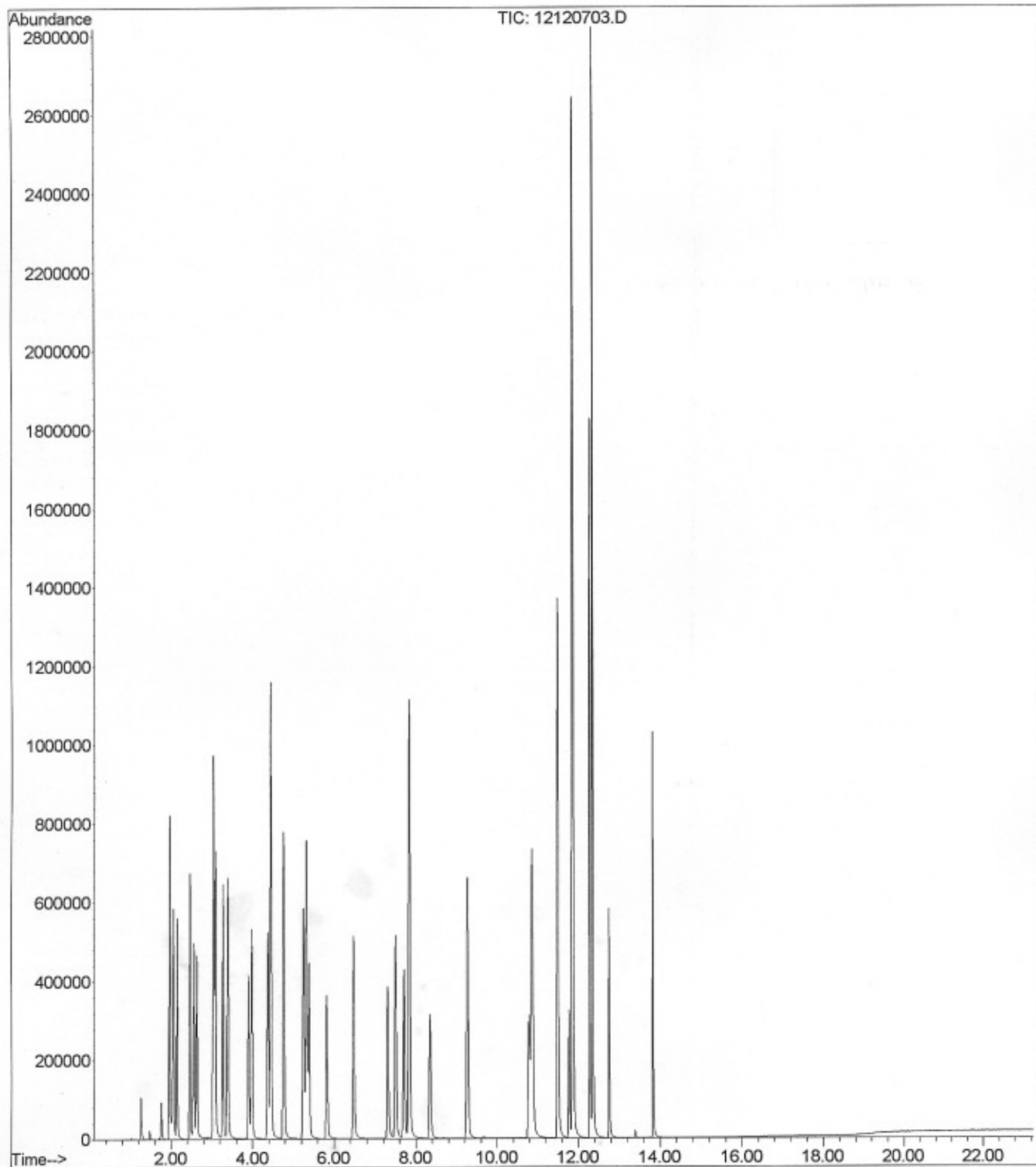
DET Analyte DETECTED  
ND Analyte NOT DETECTED at or above the reporting limit  
NR Not Reported  
dry Sample results reported on a dry weight basis  
RPD Relative Percent Difference



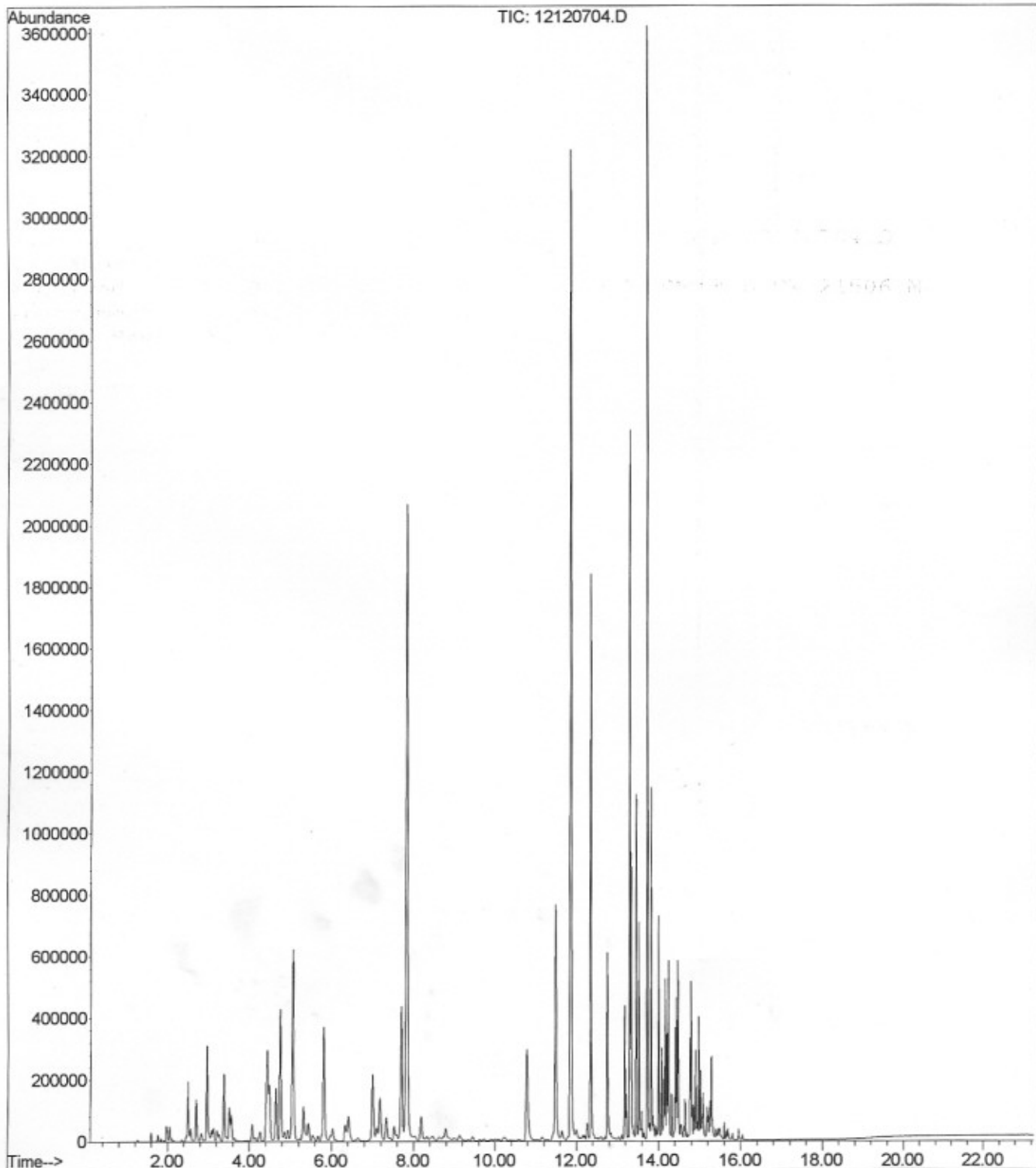
File : C:\MSDCHEM\1\DATA\2007-Dec-12-1920.b\12120706.D  
Operator : dh  
Acquired : 12 Dec 2007 10:19 pm using AcqMethod OXY21506.M  
Instrument : PAL GCMS  
Sample Name: BL71301-BLK1  
Misc Info :  
Vial Number: 6



File :C:\MSDChem\1\DATA\2007-Dec-12-1920.b\12120703.D  
Operator : dh  
Acquired : 12 Dec 2007 8:47 pm using AcqMethod OXY21506.M  
Instrument : PAL GCMS  
Sample Name: BL71301-BS1@voc  
Misc Info :  
Vial Number: 3



File :C:\MSDCHEM\1\DATA\2007-Dec-12-1920.b\12120704.D  
Operator : dh  
Acquired : 12 Dec 2007 9:18 pm using AcqMethod OXY21506.M  
Instrument : PAL GCMS  
Sample Name: BL71301-BS1@gas  
Misc Info :  
Vial Number: 4



# **APPENDIX C**

## **MPE Pilot Test Field Data Sheets**



SITE: Rino Gas Station and Mini Mart PERSONNEL: Jesse Acedillo  
 ADDRESS: 3609 International Blvd., Oakland, CA  
 PROJECT #: 2334

MTS OPERATIONAL DATA

DATE	TIME	OXIDIZER TEMPERATURE (F)	PUMP/AIR TEMPERATURE (F)	STINGER VACUUM (IN-Hg)	PUMP VACUUM (IN-Hg)	TOTAL FLOW (SCFM)	DILUTION FLOW (SCFM)	WELL FLOW (SCFM)	INFLUENT CONCENTRATION (PPMV)	WATER TOTALIZER
12/3/2007	1330	collected Pre-GW sample from MW-1,3; begin extraction from MW-3								
	1345	1582	169	24.6	28.2	19	0	19	7,000	0
	1400	1611	169	24.8	28	22	0	22	7,150	0
	1415	1620	170	24.4	28	22	0	22	6,900	36
	1430	1629	169	24.4	28	22	0	22	6,910	36
	1445									
	1500									
	1530	1601	171	24.4	28	22	0	22	5,650	142
	1630	1584	169	25	28	22	0	22	4,780	212
12/4/2007	630	1538	168	24.4	28	22	0	22	2,570	1,106
	730	1545	168	24.4	28	22	0	22	2,560	1,174
	830	1543	168	24.4	27.8	25	0	25	2,560	1,212
	930	1539	167	24.4	28	22	0	22	2,500	1,276
	1030	1546	167	24.3	27.9	23	0	23	2,420	1,344
	1130	1536	168	24.3	27.9	23	0	23	2,360	1,378
	1230	1547	168	24.3	27.9	23	0	23	2,270	1,446
	1330	1539	168	24.3	27.8	25	0	25	2,180	1,480
	1430	1535	169	24.2	27.7	27	0	27	2,160	1,547
	1530	1535	169	24.1	27.7	27	0	27	1,919	1,615
	1630	1535	168	24.1	27.6	28	0	28	1,870	1,648
	1730	1530	168	24.1	27.7	27	0	27	1,728	1,682



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	1800	1527	168	24.1	27.6	28	0	28	1,770	1,716
12/5/2007	800	1508	165	24	27.4	31	0	31	975	2,390
	900	1514	167	24	27.2	35	0	35	1,075	2,457
	1000	1515	169	24	27.4	31	0	31	1,040	2,490
	1100	1515	169	24	27.4	31	0	31	1,020	2,524
		stop extraction from MW-3; begin extraction from MW-1								
	1200									
	1215	1604	168	24	27.8	25	0	25	8,300	2,558
	1230	1591	168	24	27.4	31	0	31	4,040	2,558
	1245	1584	168	24	27.4	31	0	31	3,650	2,558
	1300	1575	168	24	27.4	31	0	31	3,450	2,591
	1500	1509	170	24	27.4	31	0	31	1,215	2,658
	1600	1509	169	24	27.4	31	0	31	1,080	2,691
	1700	1508	169	23.6	27.2	35	0	35	1,050	2,720
12/6/2007	830	1510	166	23.2	26.8	41	0	41	1,100	3,186
	930	1514	167	23.8	26.8	41	0	41	1,125	3,219
	1030	1515	169	23.5	26.8	41	0	41	1,161	3,252
	1130	1508	169	23.5	26.8	41	0	41	1,143	3,285
	1230	1503	169	23.5	26.7	43	0	43	1,142	3,318
	1330	1505	168	23.5	26.6	44	0	44	1,157	3,318
	1430	1505	170	23.4	26.6	44	0	44	1,186	3,350



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	1530	1505	169	23.4	26.8	41	0	41	1,159	3,383
	1630	1506	169	23.4	26.7	43	0	43	1,183	3,416
	1745	1498	170	23.4	26.6	44	0	44	1,135	3,449
12/7/2007	800	1523	166	22.8	26.6	44	0	44	1,150	3,844
	1000	1524	167	23.6	26.6	44	0	44	1,130	3,910
	1100	1521	170	23	26.6	44	0	44	1,130	3,910
	1200	1523	169	23.6	26.6	44	0	44	1,116	3,993
		collected Post-GW sample from MW-1,3								

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**MTS MONITORING POINT DATA**

DATE	TIME	WELL ID MW-1		WELL ID MW-2		WELL ID MW-3		WELL ID MW-6		WELL ID MW-7		WELL ID MW-8		WELL ID EX-1	
		VACCUM (IN WATER)	GW ELEVATION (FEET BELOW TOC)	VACCUM (IN WATER)	GW ELEVATION (FEET BELOW TOC)	VACCUM (IN WATER)	GW ELEVATION (FEET BELOW TOC)	VACCUM (IN WATER)	GW ELEVATION (FEET BELOW TOC)	VACCUM (IN WATER)	GW ELEVATION (FEET BELOW TOC)	VACCUM (IN WATER)	GW ELEVATION (FEET BELOW TOC)	VACCUM (IN WATER)	GW ELEVATION (FEET BELOW TOC)
		extraction from MW-3													
			13.10		12.9		13.55		13.51		12.62				
12/3/2007	1345	0	13.16	0.6	13			0	13.64	0	12.8				
	1430	0	13.21	0.48	13.05			0	13.67	0	12.76				
	1530	0	13.21	0.26	12.48			0	13.69	0	12.83				
	1630	0	13.23	0.25	12.68			0	13.7	0	12.85				
12/4/2007	900	0	13.24	0.32	12.73					0	12.9				
	1100	0	13.21	0.33	12.65			0	13.67	0	12.85				
	1300	0	13.20	0.33	12.63			0	13.64	0	12.82				
	1500	0	13.16	0.32	12.62			0	13.63	0	12.8				
	1700	0	13.17	0.33	12.59			0	13.62	0	12.79				
12/5/2007	730	0	13.13	0.32	12.57			0	13.72	0	12.73				
	930	0	13.14	0.32	12.58			0	13.73	0	12.74			0.03	
	1030	0	13.14	0.32	12.58			0	13.73	0	12.74			0.03	
		extraction from MW-1													
	1200		13.07				14.59		13.62		12.7		12.43		
	1215					0.03	14.13	0	13.6	0	12.7	0.35	12.52	0.05	
	1230					0.03	14.1	0	13.6	0	12.7	0.3	12.52		
	1245					0.03	14.04	0	13.6	0	12.7	0.3	12.53		
	1300					0.03	14	0	13.6	0	12.7	0.3	12.53		
	1500					0.03	13.57	0	13.6	0	12.71	0.9	12.53		
	1700					0.03	13.11	0	13.6	0	12.71	0.9	12.53		
12/6/2007	830					0.03	13.71	0	13.6	0	12.7	1.2	12.65		
	1030					0.03	13.73	0	13.6	0	12.73	1.3	12.67		
	1230					0.03	13.72	0	13.6	0	12.7	2	12.51		
	1430					0.03	13.69	0	13.6	0	12.69	2.3	12.54		
	1630					0.035	13.68	0	13.6	0	12.61	2.8	11.37		





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**MTS MONITORING POINT DATA**

DATE	TIME	WELL ID MW-1		WELL ID MW-2		WELL ID MW-3		WELL ID MW-6		WELL ID MW-7		WELL ID MW-8		WELL ID EX-1	
		VACCUM (IN WATER)	GW ELEVATION (FEET BELOW TOC)	VACCUM (IN WATER)	GW ELEVATION (FEET BELOW TOC)	VACCUM (IN WATER)	GW ELEVATION (FEET BELOW TOC)	VACCUM (IN WATER)	GW ELEVATION (FEET BELOW TOC)	VACCUM (IN WATER)	GW ELEVATION (FEET BELOW TOC)	VACCUM (IN WATER)	GW ELEVATION (FEET BELOW TOC)	VACCUM (IN WATER)	GW ELEVATION (FEET BELOW TOC)
	1800					0.035	13.88	0	13.6	0	12.63	2.3	12.39		
12/7/2007	800					0.05	13.6	0	13.37	0	12.52	3	12.34		
	1100					0.05	13.55	0	13.37	0	12.4	3	12.55	0.05	