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Alameda County  
Environmental Health

# **REQUEST FOR CASE CLOSURE**

## **EMERYVILLE MARINA UST SITE 3310 POWELL STREET EMERYVILLE, CALIFORNIA**

**Alameda County Fuel Leak Case No. RO0000267  
Geotracker Global ID T0600101590**

Prepared for

**City of Emeryville  
Public Works Department  
1333 Park Avenue  
Emeryville, CA94608**

December 5, 2008

Prepared by

**OTG**

**Enviroengineering  
Solutions, Inc.**

464 19<sup>th</sup> Street, Suite 206  
Oakland, CA 94612

December 5, 2008

Ms. Barbara J. Jakub, P.G.  
Hazardous Materials Specialist  
Alameda County Environmental Health  
1131 Harbor Bay Parkway, Suite 250  
Alameda, CA 94502

Reference: ACEH Fuel Leak Case No. RO0000267, Geotracker Global ID T0600101590

Subject: Request for Case Closure of Emeryville Marina UST Site  
3310 Powell Street, Emeryville, California

Dear Ms. Jakub:

On behalf of the City of Emeryville, OTG Enviroengineering Solutions, Inc. (OTG) is pleased to submit this report requesting case closure for the Emeryville Marina UST site, located at 3310 Powell Street, Emeryville, California. This report is prepared in response to a 24 June 2008 letter from Alameda County Environmental Health (ACEH) to the City of Emeryville. The report presents an overview of site background information, previous environmental investigation data, September 2008 groundwater monitoring and underground utility survey results, and discussions and recommendation for case closure.

### Certification

"I declare, under penalty of perjury, that the information and/or recommendations contained in the attached document or report is true and correct to the best of my knowledge".

Please contact the undersigned at (510) 465-8982 if you have questions or comments.

Sincerely,  
*OTG EnviroEngineering Solutions, Inc.*



Xinggang Tong, PhD, PE  
Project Manager



cc: Mr. Maurice Kaufman, City of Emeryville

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## 1 INTRODUCTION

In a June 24, 2008 letter to the City of Emeryville (the City), Alameda County Environmental Health (ACEH) requested additional environmental tasks to be performed at the Emeryville Marina site, where fuel underground storage tanks (USTs) have been operated since 1972. The City retained OTG Enviroengineering Solutions, Inc. (OTG) to address the ACEH's concerns. This report presents an overview of site background information, previous environmental investigation data, September 2008 groundwater monitoring and underground utility survey results, and discussions and recommendation for case closure.

### Site Contact Information:

Site Address:  
3310 Powell Street  
Emeryville, CA 94608

Site Operator:  
Emeryville Sport Fishing  
Attention: Mr. Craig Stone  
c/o The City of Emeryville  
3310 Powell Street  
Emeryville, CA 94608  
Phone (510) 654-3716  
Fax (510)654-4879  
Email: [Emeryville@marinasintl.com](mailto:Emeryville@marinasintl.com)

Site Owner:  
City of Emeryville  
Attention: Mr. Maurice Kaufman  
Public Works Director  
1333 Park Avenue  
Emeryville, CA 94608  
Phone (510)596-4300  
Fax (510)596-4389  
Email: [mkaufman@ci.emeryville.ca.us](mailto:mkaufman@ci.emeryville.ca.us)

Site Consultant:  
OTG Enviroengineering Solutions, Inc.  
Attention: Mr. Xinggang Tong, PhD, PE  
464 19<sup>th</sup> Street, Suite 206  
Oakland, CA 94612  
Phone (510) 465-8982  
Fax (510) 868-0667  
Email: [xtong@otgenv.com](mailto:xtong@otgenv.com)

## 2. BACKGROUND

As shown on Figure 1, the narrow strip of land into the San Francisco Bay (west of Highway 80) was originally part of the Bay that was filled from around 1954 through 1960s. The land at the UST location has an elevation of about 14 feet above mean sea level and has a width of only approximately 300 feet at high tide from the eastern shoreline to the western shoreline. The Marina was constructed in 1972 and the original USTs were also placed in service in the same year (interview with Mr. Don Gussler – the Harbor Master on November 12, 2008). The original USTs were constructed of single-wall steel material and consisted of one 2,500-gallon unleaded gasoline UST, one 10,000-gallon unleaded gasoline UST, and two 10,000-gallon diesel USTs. Their location is shown on Figure 2.

The four original single-walled USTs and associated piping were removed in April 1992 and were replaced with a 20,000-gallon double-walled steel and fiberglass UST and associated double-contained piping. The new UST is divided into three compartments: a 5,000-gallon gasoline compartment, a 15,000-gallon diesel compartment, and a 5,000-gallon compartment currently unused.

At the time of removal of the original single-walled USTs, a groundwater sample was collected from the excavation pit and two soil samples were collected from floor at both ends of each of the four USTs (Tank Project Engineering, April 24, 1992). The water sample and the eight soil samples were analyzed for total petroleum hydrocarbons (TPH) as gasoline (TPHg) and as diesel (TPHd) and for benzene, toluene, ethyl benzene, and total xylenes (BTEX).

Groundwater analytical results are summarized in Table 1 and soil data are presented in Table 2. The groundwater sample reported 46,115 ug/L TPHg, 12,700 ug/L TPHd, 5 ug/L benzene, 30.6 ug/L toluene, 8.4 ug/L ethyl benzene, and 61.8 ug/L total xylenes. The highest concentrations reported among the eight soil samples were 172 mg/kg TPHg, 0.025 mg/kg benzene, 0.0064 mg/kg ethyl benzene, and 0.045 mg/kg total xylenes. TPHd and toluene were not detected at or above their respective reporting limits of 10 mg/kg and 0.005 mg/kg from the eight soil samples.

On April 8, 1993, a 2-inch diameter monitoring well (MW-1) was installed approximately 5 feet north of the UST location by Environmental Science & Engineering, Inc. (ESE, May 6, 1993). Its location is shown on Figure 2. The well has the total depth of 18.5 feet, with 0.02-inch slots screen from 3.5 feet to 18.5 feet below ground surface (bgs). The static groundwater level was at 4.5 feet bgs at the time of well installation. Pieces of bricks, metal, and wood were found in the boring below six inches of gravels to the bottom of the boring (18.5 feet bgs), confirming human filling nature of the land. Soil samples were not collected for laboratory chemical analysis during the well installation. The well was sampled on April 13, 1993, for TPHg, TPHd, and BTEX analyses and results are included in Table 1. No free-phase product was observed during the well purging and sampling activities. TPHg and TPHd were reported at 170 ug/L and 4,000 ug/L, respectively. BTEX were not detected at or above their reporting limit of 0.5 ug/L.

### 3. SEPTEMBER 2008 GROUNDWATER MONITORING

MW-1 was redeveloped by surge-and-bail method on September 15, 2008. Field log sheet is included in Appendix A. A total of 45 gallons of groundwater was removed and stored in a Department of Transportation (DOT) rated 55-gallon steel drum, which was labeled and left on site pending analytical results for disposal.

Field monitoring of MW-1 was conducted on September 19, 2008 by OTG staff. Prior to purging, its static groundwater level was measured at 5.18 feet bgs using a Solinist™ water level sounder. A total of eight gallons of water was removed from the well, which equaled to 3.6 times of the well casing volume. The purged water was monitored for pH, temperature, specific conductance, and visual turbidity/color. All readings were recorded on the field sampling log, which is included in Appendix A. All purging and sampling equipment used were made of new, disposable materials requiring no decontamination prior to usage. The well was sampled using a new disposable polyethylene (PE) bailer. For quality control purposes, a field trip blank was included and treated as an independent sample for chemical analysis.

Curtis & Tompkins, Ltd. (C&T) of Berkeley, California, provided sample containers. Filled sample bottles were labeled, packed, and stored in an iced-cooler, and were delivered to C&T under chain-of-custody protocols. Analyses included EPA Method 8015B for TPHg and TPHd and EPA Method 8260B for BTEX, methyl tertiary butyl ether (MTBE), ethyl tertiary butyl ether (ETBE), di-isopropyl ether (DIPE), tertiary amyl methyl ether (TAME), tertiary butyl alcohol (TBA), ethylene dibromide (EDB), 1,2-dichloroethane (1,2-DCA), and ethanol. Analytical results are summarized in Table 1.

The analytical data received from C&T was found to be of acceptable quality. The laboratory analytical reports are included as Appendix B.

Purge and decontamination water was contained in a DOT-rated 55-gallon drum, which was left on site. The drum will be sent to an off-site treatment/disposal facility for final disposition.

#### Monitoring Results

- TPHg and TPHd were reported at 430 ug/L and 110 ug/L, respectively, which are significantly below their respective Environmental Screen Levels (ESLs) of 5,000 ug/L and 2,500 ug/L for groundwater that is not a current or potential source of drinking water (RWQCB, November 2007).
- Benzene, toluene, ethyl benzene, and xylenes were reported at 0.8, 9.7, 2.1, and 12.7 ug/L, respectively, which are also significantly below their respective ESLs of 540, 400, 300, and 5,300 ug/L.
- Except MTBE, which was detected at 4.6 ug/L and which has an ESL value of 1,800 ug/L, no other fuel oxygenates were detected at or above their respective reporting limits. 1,2-dibromoethane (EDB) and 1,2-dichloroethane (1,2-DCA) were also below their reporting limit of 0.5 ug/L.

#### **4. SURVEY OF UNDERGROUND UTILITIES**

As shown on Figure 2, there are many underground utilities in the immediate vicinity of the USTs. Between Powell Street and the USTs, there are electric power conduit, telephone conduit, fire alarm conduit, television conduit, and water line. Between the USTs and the eastern shoreline, there are electric power conduits, sanitary sewer, and water line. A water line also appears passing through the UST location. Since the shallow groundwater elevation varies between 4.15 feet bgs (as measured on April 13, 1993) and 5.18 feet bgs (as measured on September 15, 2008), trenches of some underground utilities may at least be partially located in the shallow groundwater zone. Furthermore, since the land is only approximately 300 feet wide at the UST location, the shallow groundwater is likely subject to tidal influence and the groundwater may be even shallower at high tides.

The combined impact of tidal fluctuation and preferential paths through these underground utility trenches is an increased rate of dilution, which is one of the main forces in natural attenuation. As demonstrated by the latest groundwater analytical results from MW-1, concentrations of petroleum hydrocarbons (TPHg, TPHd, and individual constituents) have been naturally attenuated to the levels less than one-tenth of their respective ESLs (Table 1). Thus, any potential UST-related contaminations in the underground utility trenches may have also been naturally attenuated to the levels significantly below their respective ESLs and should not be of any further concern.

#### **5. REQUEST FOR CASE CLOSURE**

The four original single-walled USTs, which contributed to the reported petroleum hydrocarbon contamination, were removed in April 1992. The new UST is a double-walled steel and fiberglass construction with leak detections conforming to the current UST regulation. Free-phase product in soil and groundwater was never observed during the USTs removal and from the monitoring well MW-1. In fact, the eight soil samples collected from excavation floor (5 feet bgs) at both ends of each of the four original USTs had concentrations of all analyzed constituents of petroleum hydrocarbons below their corresponding ESLs (Table 2). Concentrations of petroleum hydrocarbons in groundwater as measured in MW-1 on September 19, 2008, have also attenuated to the levels of less than one-tenth of their respective ESLs (Table 1). For this site, it is appropriate to use ESLs for commercial site and for groundwater that is not a current or potential source of drinking water as references, since the site is into the San Francisco Bay and the shallow groundwater is heavily influenced by sea water.

After the leaking source was removed in April 1992, the residual petroleum hydrocarbons beneath the site have since been naturally attenuated to the levels of significantly below ESLs as demonstrated by the latest groundwater monitoring results. Natural attenuation includes biodegradation, dilution (by diffusion and convection), and volatilization. The following factors are likely contributed to the high dilution rate at this site:

- The land is created by filling the bay. The heterogeneous nature of fill materials (bricks, metal, and wood etc. observed in drill cuttings from MW-1) suggests the



existence of potentially numerous preferential pathways through which the shallow groundwater could easily exchange with the sea water.

- Many underground utilities exist within the narrow strip of land. At least one water line passes through (or closely next to) the UST area and leads to the shoreline. The shallow groundwater could easily exchange with the sea water through these utility trenches.
- The land is only approximately 300 feet wide at the UST location and it is surrounded by the bay on two sides. The bay water level fluctuates several feet between high tides and low tides. This tidal fluctuation creates a strong movement of the shallow groundwater on land through the utility trenches and other preferential pathways formed during the land filling.

The net effect of the above factors is a high rate of natural attenuation at the site.

Concentrations of petroleum hydrocarbons in groundwater as measured in MW-1 on September 19, 2008, have attenuated to the levels of less than one-tenth of their respective ESLs.

Therefore, we respectfully request the closure of this case and the permission to destroy the monitoring well MW-1.

## 6. REFERENCES

Alameda County Environmental Health, *Fuel Leak Case No. RO0000267 and Geotracker Global ID T0600101590, City of Emeryville, 3310 Powell St, Emeryville, CA*, Letter dated June 24, 2008.

San Francisco Bay Regional Water Quality Control Board, *Screening for Environmental Concerns at Sites with Contaminated Soil and Groundwater*, Interim Final, November 2007.

Environmental Science & Engineering, Inc., *Emeryville Marina Fuel Tank Farm, Emeryville, CA*, May 6, 1993.

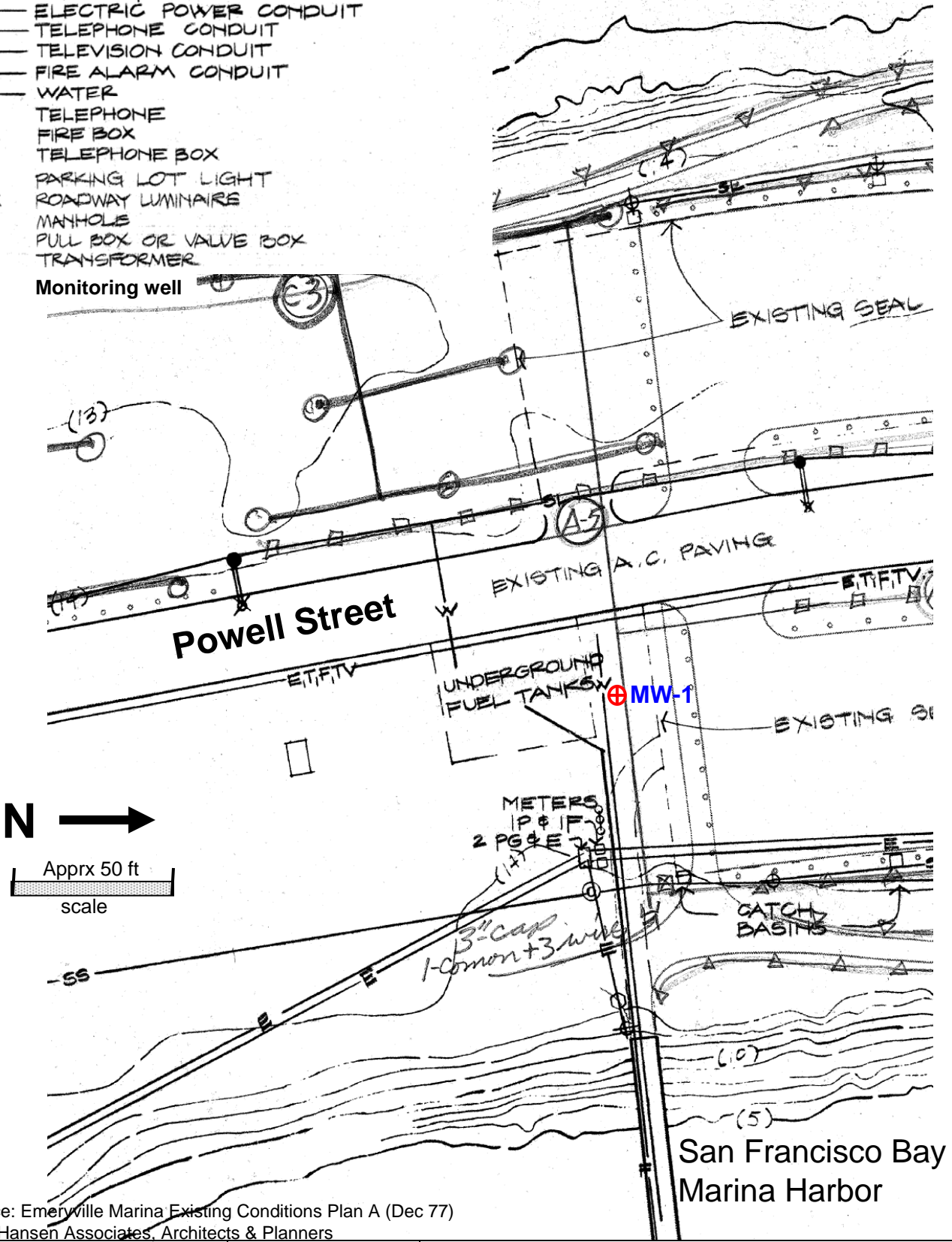
Tank Project Engineering, no subject, April 24, 1992.



# EXISTING UTILITIES LEGEND

- SL — STREET LIGHT CONDUIT
- SS — SANITARY SEWER
- E — ELECTRIC POWER CONDUIT
- T — TELEPHONE CONDUIT
- TV — TELEVISION CONDUIT
- F — FIRE ALARM CONDUIT
- W — WATER
- T — TELEPHONE
- F — FIRE BOX
- P — TELEPHONE BOX
- ⊕ — PARKING LOT LIGHT
- ⊙ — ROADWAY LUMINAIRE
- ⊙ — MANHOLE
- — PULL BOX OR VALVE BOX
- — TRANSFORMER
- ⊕ — Monitoring well

San Francisco Bay



Source: Emeryville Marina Existing Conditions Plan A (Dec 77)  
 Jens Hansen Associates, Architects & Planners

Table 1  
Groundwater Analytical Data  
3310 Powell Street, Emeryville, CA

Chemicals	Unit	ESL *	MW-1 4/13/1993	MW-1 9/19/2008	Trip Blank 9/19/2008	W-1** 4/15/1992
TPH gas	ug/L	5,000	170	430		46,115
TPH diesel	ug/L	2,500	4,000	110 (y)		12,700
Benzene	ug/L	540	ND (0.5)	0.8	ND (0.5)	5
Toluene	ug/L	400	ND (0.5)	9.7	ND (0.5)	30.6
Ethylbenzene	ug/L	300	ND (0.5)	2.1	ND (0.5)	8.4
total Xylenes	ug/L	5,300	ND (0.5)	12.7	ND (0.5)	61.8
MTBE	ug/L	1,800		4.6	ND (0.5)	
DIPE	ug/L			ND (0.5)	ND (0.5)	
ETBE	ug/L			ND (0.5)	ND (0.5)	
TAME	ug/L			ND (0.5)	ND (0.5)	
TBA	ug/L	50,000		ND (10)	ND (10)	
1,2-Dichloroethane	ug/L	200		ND (0.5)	ND (0.5)	
1,2-Dibromoethane	ug/L	150		ND (0.5)	ND (0.5)	
Ethanol	ug/L			ND (1000)	ND (1000)	
y: sample exhibits chromatographic pattern which does not resemble standard						
Monitoring well MW-1 was installed by Environmental Science & Engineering, Inc. on April 8, 1993.						
* ESLs are for groundwater is not a current or potential source of drinking water (RWQCB, Nov 2007)						
** W-1 was taken within excavation pit of tank replacement in April 1992.						

Table 2  
 Results of Soil Samples Collected During UST Replacement in April 1992  
 3310 Powell Street, Emeryville, CA

Sample ID	Date of Sampling	Depth (ft, bgs)	TPH gas mg/kg	TPH diesel mg/kg	Benzene mg/kg	Toluene mg/kg	Ethyl benzene mg/kg	Xylenes mg/kg	Sample Location (samples were taken during UST replacement in 1992)
S-1	4/15/1992	5	4.7	ND (10)	ND (0.005)	ND (0.005)	ND (0.005)	ND (0.005)	west end of former UST #4
S-2	4/15/1992	5	5.7	ND (10)	ND (0.005)	ND (0.005)	ND (0.005)	ND (0.005)	west end of former UST #3
S-3	4/15/1992	5	172	ND (10)	0.013	ND (0.005)	0.0055	ND (0.005)	west end of former UST #2
S-4	4/15/1992	5	45	ND (10)	0.025	ND (0.005)	0.0064	0.045	west end of former UST #1
S-5	4/15/1992	5	ND (1)	ND (10)	ND (0.005)	ND (0.005)	ND (0.005)	ND (0.005)	east end of former UST #1
S-6	4/15/1992	5	ND (1)	ND (10)	ND (0.005)	ND (0.005)	ND (0.005)	ND (0.005)	east end of former UST #2
S-7	4/15/1992	5	ND (1)	ND (10)	ND (0.005)	ND (0.005)	ND (0.005)	ND (0.005)	east end of former UST #3
S-8	4/15/1992	5	ND (1)	ND (10)	ND (0.005)	ND (0.005)	ND (0.005)	ND (0.005)	east end of former UST #4
ESL (commercial)		<=10	450	150	0.26	29	33	100	
ESLs are for groundwater is not a current or potential source of drinking water (RWQCB, Nov 2007)									

## **APPENDIX A**

Field Logs for Well Redevelopment and Sampling  
September 2008

**FIELD SAMPLING LOG SHEET** *Well Development*

**WELL ID** *MW-1* **Date of Sampling** *Sept. 15, 2008*

Site Location 3310 Powell Street, Emeryville, CA 94608

Project # 08EMV02 Task # 1000 Title: Groundwater Monitoring

OTG Project Manager Xinggang Tong Phone # (510) 465-8982

Client: City of Emeryville Public Works Department

Client Contact Mr. Maurice Kaufman Phone # (510)596-4334

Laboratory:

Well Diameter 2" 3" 4" 6" other Well Material: sch 40 PVC, sch 80 PVC, other

Is well secured? Yes no Bolt size: Type of lock/Lock #

Comments:

Purge Method: PE/PVC disp bailer, Teflon bailer, Centrifugal pump, Peristaltic pump, Grundfos pump, Other

Pump lines: NA, New, Dedicated, Cleaned Bailer line: NA, New, Dedicated, Cleaned

Method of cleaning pump: NA, Alconox, Liqui-nox, Tap water DI rinse, other

Method of cleaning Bailer: NA, Alconox, Liqui-nox, Tap water DI rinse, other

Sampling method: PE/PVC disp bailer, Teflon bailer, Peristaltic pump, other

pH meter serial # H19811-5 Spec cond meter serial # H198115 Calibrated at:

Water level meter: Solinst Serial # 39506 P.I.D. reading: ppm at well head

*Total Depth as measured: 17.60'*

**Water level before purging (TOC, ft)** *5.18* Water level prior to sampling

*17.6 (TD) - 5.18 (TOC) = 12.42 ft of water x k (0.163) = 2.02 gallons/CV x 3 (# of CV) = 6.1 gallons*

*k = 0.163 (2" well), k = 0.653 (4" well), k = 1.02 (5" well), k = 1.46 (6" well), k = 2.61 (8" well)*

**FIELD WATER QUALITY PARAMETERS**

Time	Discharge (gallons)	pH	Temp (°C)	Specific conductivity (mS or <u>uS</u> )	Turbidity (NTU)	D.O. (mg/L)	Color	Comments
10:15	2.0	6.7	21.6	3530			grey	<i>no petro odor</i>
10:40	5.0	6.5	21.6	3160			grey	<i>anaerobic mud odor</i>
11:25	12.0	6.6	21.4	3430			grey	"
13:15	30.0	6.5	19.9	5210			grey	"
14:10	40.0	6.6	20.7	3890			light grey	"
14:45	45.0	6.6	20.7	3790			light grey	"
<i>surge &amp; bail for well development</i>								

Total discharge: *45* gallons Casing volumes removed: *22.3*

Handling of purge & rinsate water: stored in labeled 55-gallon DOT drum & left on site

Date/time sampled: QA: duplicate, Eq. blank, trip blank, other

Sample containers filled: 3 40-ml glass vials with HCl preservative for 5 VOCs by EPA 8260

Recorded by: *Xinggang Tong* Signature: *[Signature]* Date: *9/15/08*



**FIELD SAMPLING LOG SHEET**

<b>WELL ID</b> MW-1		<b>Date of Sampling</b> 9/19/08	
Site Location 3310 Powell Street, Emeryville, CA 94608			
Project # 08EMV02	Task # 1000	Title: Groundwater Monitoring	
OTG Project Manager Xinggang Tong		Phone # (510) 465-8982	
Client: City of Emeryville Public Works Department			
Client Contact Mr. Maurice Kaufman		Phone # (510)596-4334	
Laboratory: <u>Curtis A Tompkins</u>			
Well Diameter <u>2"</u> 3" 4" 6" other		Well Material: <u>sch 40 PVC</u> , sch 80 PVC, other	
Is well secured? <u>Yes</u> no Bolt size:		Type of lock/Lock #	
Comments:			
Purge Method: <u>PE/PVC disp bailer</u> , Teflon bailer, Centrifugal pump, Peristaltic pump, Grundfos pump, Other			
Pump lines: <u>NA</u> , New, Dedicated, Cleaned		Bailer line: <u>NA</u> , New, Dedicated, Cleaned	
Method of cleaning pump: <u>NA</u> , Alconox, Liqui-nox, Tap water DI rinse, other			
Method of cleaning Bailer: <u>NA</u> , Alconox, Liqui-nox, Tap water DI rinse, other			
Sampling method: <u>PE/PVC disp bailer</u> , Teflon bailer, Peristaltic pump, other			
pH meter serial # H19811-5		Spec cond meter serial # H198115	Calibrated at: <u>2:15 Pm, 9/19/08</u>
Water level meter: Solinst Serial # 39506		P.I.D. reading: ppm at well head	

<b>Water level before purging (TOC, ft)</b> <u>5.15</u>	<b>Water level prior to sampling</b> <u>5.21</u>
$18.5(\text{TD}) - 5.15(\text{TOC}) = 13.35 \text{ ft of water} \times k (0.163) = 2.2 \text{ gallons/CV} \times 3 (\# \text{ of CV}) = 6.6 \text{ gallons}$	
k = 0.163 (2" well), k = 0.653 (4" well), k = 1.02 (5" well), k = 1.46 (6" well), k = 2.61 (8" well)	

**FIELD WATER QUALITY PARAMETERS**

Time	Discharge (gallons)	pH	Temp (°C)	Specific conductivity (mS or <u>uS</u> )	Turbidity (NTU)	D.O. (mg/L)	Color	Comments
3:15 Pm	2.0	7.01	20.7	3270			light gray	no petro odor
3:25 Pm	3.0	7.02	20.5	3370			↓	↓
3:35 Pm	4.0	7.03	20.5	3410			↓	↓
3:42 Pm	5.0	7.03	20.4	3380			↓	↓
3:50 Pm	6.0	7.04	20.4	3390			↓	↓
3:57 Pm	7.0	7.04	20.4	3410			↓	↓
4:05 Pm	8.0	7.04	20.4	3380			↓	↓

Total discharge: <u>8</u> gallons	Casing volumes removed: <u>3.6</u>
Handling of purge & rinsate water: stored in labeled 55-gallon DOT drum & left on site	
Date/time sampled: <u>9/19/08, 4:30 Pm</u>	QA: duplicate, Eq. blank, trip blank, other
Sample containers filled: <u>6 @ 40-ml glass vials with HCl preservative for VOCs by EPA 8260 &amp; TPH gas</u> <u>2 one-liter amber glass for TPH diesel</u>	
Recorded by: <u>Xinggang Tong</u>	Signature: <u>[Signature]</u> Date: <u>9/19/08</u>

## **APPENDIX B**

Laboratory Analytical Reports for  
September 19, 2008 Groundwater Sample



Curtis & Tompkins, Ltd., Analytical Laboratories, Since 1878

2323 Fifth Street, Berkeley, CA 94710, Phone (510) 486-0900

Laboratory Job Number 206201

ANALYTICAL REPORT

OTG Enviroengineering Solutions, Inc  
464 19th Street Suite 206  
Oakland, CA 94612

Project : 08EMV02  
Location : Emeryville Marina UST  
Level : II

Sample ID

MW-1

TRIP BLANK

Lab ID

206201-001

206201-002

This data package has been reviewed for technical correctness and completeness. Release of this data has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signatures. The results contained in this report meet all requirements of NELAC and pertain only to those samples which were submitted for analysis. This report may be reproduced only in its entirety.

Signature: \_\_\_\_\_

Project Manager

Date: 09/30/2008

Signature: \_\_\_\_\_

Senior Program Manager

Date: 09/30/2008

CASE NARRATIVE

Laboratory number: 206201  
Client: OTG Enviroengineering Solutions, Inc  
Project: 08EMV02  
Location: Emeryville Marina UST  
Request Date: 09/19/08  
Samples Received: 09/19/08

This hardcopy data package contains sample and QC results for two water samples, requested for the above referenced project on 09/19/08. The samples were received cold and intact.

TPH-Purgeables and/or BTXE by GC (EPA 8015B):

No analytical problems were encountered.

TPH-Extractables by GC (EPA 8015B):

No analytical problems were encountered.

Volatile Organics by GC/MS (EPA 8260B):

No analytical problems were encountered.

**Curtis & Tompkins, Ltd.**

Analytical Laboratory Since 1878

2323 Fifth Street  
Berkeley, CA 94710  
(510) 486-0900 Phone  
(510) 486-0532 Fax

# CHAIN OF CUSTODY

C & T LOGIN #: 206201

Sampler: Xinggang Tong

Report To: Xi Tong

Project No.: 08EMV02

Project Name: Emeryville Marina UST Company: OTG Environmental Engineering Solutions

Project P.O.: \_\_\_\_\_ Telephone: (510) 465-8982

Turnaround Time: 5-day Fax: xtong@otgenv.com

**Analysis**

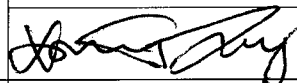
Lab No.	Sample ID.	Sampling Date Time	Matrix			# of Containers	Preservative			
			Soil	Water	Waste		HCL	H <sub>2</sub> SO <sub>4</sub>	HNO <sub>3</sub>	ICE
1	MW-1	9/19/08 9/18/08, 4:30pm		X		8				
2	Trip Blank			X		1				


TPH diesel with Silica Gel Cleanup	TPH gas	EPA 8260 for BTEX + fuel oxygenates + EDB + 1,2-DCA + ethanol								
X	X	X								
		X								

EDB = ethylene dibromide  
1,2-DCA = 1,2-dichloroethane  
Fuel oxygenates:  
MTBE, ETBE, DIPE, TAME & TBA

Notes:

SAMPLE RECEIPT  
 Intact    Cold  
 On Ice    Ambient  
 Preservative Correct?  
 Yes    No    N/A

RELINQUISHED BY:  
  
 DATE / TIME: 9/19/08 5:50pm

RECEIVED BY:  
  
 DATE / TIME: 9-19-08 5:50pm

SIGNATURE

**Total Volatile Hydrocarbons**

Lab #:	206201	Location:	Emeryville Marina UST
Client:	OTG Enviroengineering Solutions, Inc	Prep:	EPA 5030B
Project#:	08EMV02	Analysis:	EPA 8015B
Field ID:	MW-1	Batch#:	142723
Matrix:	Water	Sampled:	09/19/08
Units:	ug/L	Received:	09/19/08
Diln Fac:	1.000	Analyzed:	09/20/08

Type: SAMPLE                      Lab ID: 206201-001

Analyte	Result	RL
Gasoline C7-C12	430	50

Surrogate	%REC	Limits
Trifluorotoluene (FID)	98	61-149
Bromofluorobenzene (FID)	93	65-146

Type: BLANK                      Lab ID: QC461224

Analyte	Result	RL
Gasoline C7-C12	ND	50

Surrogate	%REC	Limits
Trifluorotoluene (FID)	102	61-149
Bromofluorobenzene (FID)	99	65-146

ND= Not Detected  
 RL= Reporting Limit

## Batch QC Report

Total Volatile Hydrocarbons			
Lab #:	206201	Location:	Emeryville Marina UST
Client:	OTG Enviroengineering Solutions, Inc	Prep:	EPA 5030B
Project#:	08EMV02	Analysis:	EPA 8015B
Type:	LCS	Diln Fac:	1.000
Lab ID:	QC461225	Batch#:	142723
Matrix:	Water	Analyzed:	09/20/08
Units:	ug/L		

Analyte	Spiked	Result	%REC	Limits
Gasoline C7-C12	1,000	1,013	101	78-120

Surrogate	%REC	Limits
Trifluorotoluene (FID)	111	61-149
Bromofluorobenzene (FID)	97	65-146

## Batch QC Report

Total Volatile Hydrocarbons			
Lab #:	206201	Location:	Emeryville Marina UST
Client:	OTG Enviroengineering Solutions, Inc	Prep:	EPA 5030B
Project#:	08EMV02	Analysis:	EPA 8015B
Field ID:	ZZZZZZZZZZ	Batch#:	142723
MSS Lab ID:	206184-001	Sampled:	09/18/08
Matrix:	Water	Received:	09/19/08
Units:	ug/L	Analyzed:	09/20/08
Diln Fac:	1.000		

Type: MS Lab ID: QC461227

Analyte	MSS Result	Spiked	Result	%REC	Limits
Gasoline C7-C12	18.67	2,000	2,197	109	65-120

Surrogate	%REC	Limits
Trifluorotoluene (FID)	130	61-149
Bromofluorobenzene (FID)	104	65-146

Type: MSD Lab ID: QC461228

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
Gasoline C7-C12	2,000	2,221	110	65-120	1	20

Surrogate	%REC	Limits
Trifluorotoluene (FID)	128	61-149
Bromofluorobenzene (FID)	104	65-146

RPD= Relative Percent Difference







### Total Extractable Hydrocarbons

Lab #: 206201	Location: Emeryville Marina UST
Client: OTG Enviroengineering Solutions, Inc	Prep: EPA 3520C
Project#: 08EMV02	Analysis: EPA 8015B
Field ID: MW-1	Batch#: 142940
Matrix: Water	Sampled: 09/19/08
Units: ug/L	Received: 09/19/08
Diln Fac: 1.000	Prepared: 09/25/08

Type: SAMPLE Analyzed: 09/27/08  
 Lab ID: 206201-001 Cleanup Method: EPA 3630C

Analyte	Result	RL
Diesel C10-C24	110 Y	50

Surrogate	%REC	Limits
Hexacosane	99	58-127

Type: BLANK Analyzed: 09/26/08  
 Lab ID: QC462144 Cleanup Method: EPA 3630C

Analyte	Result	RL
Diesel C10-C24	ND	50

Surrogate	%REC	Limits
Hexacosane	88	58-127

Y= Sample exhibits chromatographic pattern which does not resemble standard  
 ND= Not Detected  
 RL= Reporting Limit

## Batch QC Report

Total Extractable Hydrocarbons			
Lab #:	206201	Location:	Emeryville Marina UST
Client:	OTG Enviroengineering Solutions, Inc	Prep:	EPA 3520C
Project#:	08EMV02	Analysis:	EPA 8015B
Matrix:	Water	Batch#:	142940
Units:	ug/L	Prepared:	09/25/08
Diln Fac:	1.000	Analyzed:	09/26/08

Type: BS Cleanup Method: EPA 3630C  
 Lab ID: QC462145

Analyte	Spiked	Result	%REC	Limits
Diesel C10-C24	2,500	2,132	85	52-120

Surrogate	%REC	Limits
Hexacosane	89	58-127

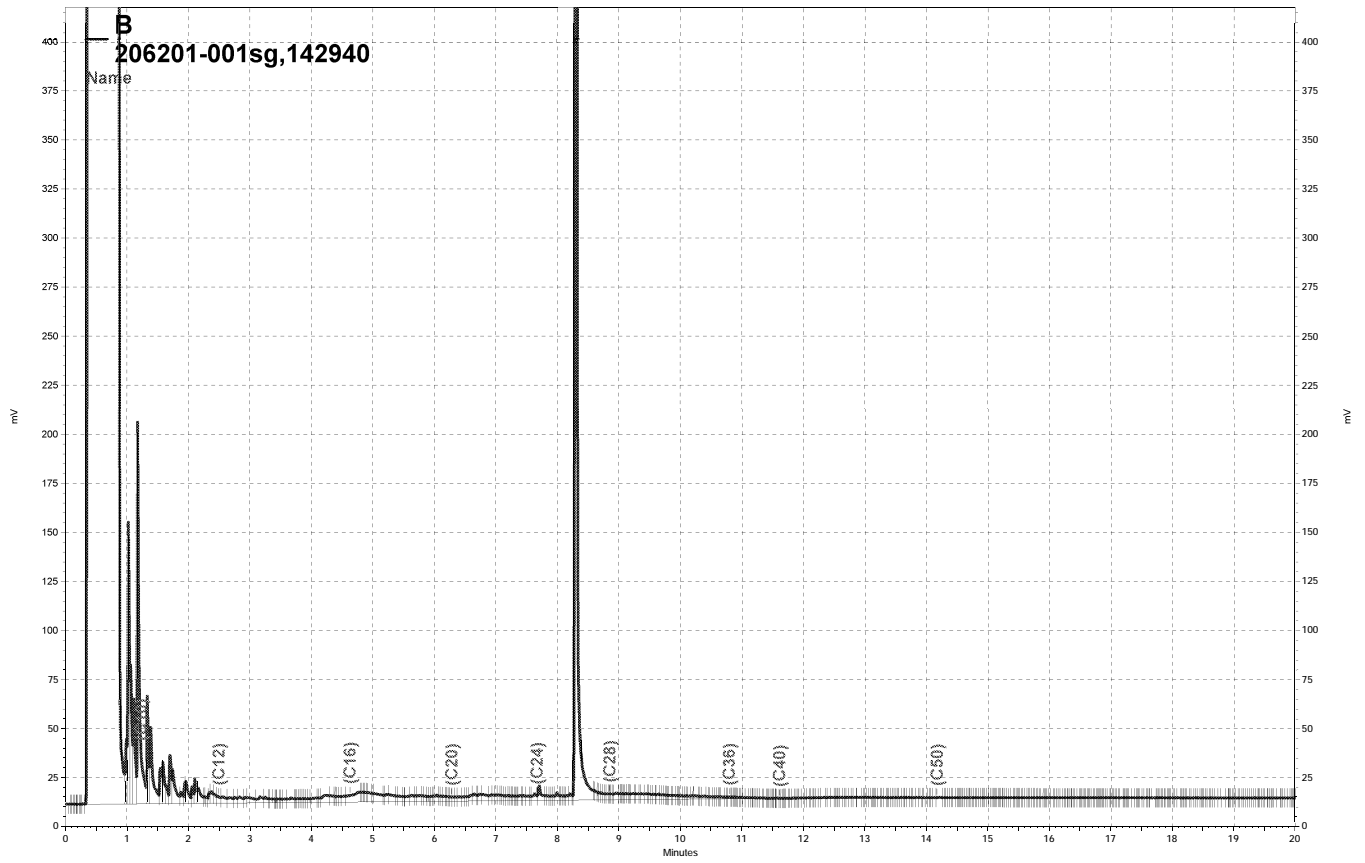
Type: BSD Cleanup Method: EPA 3630C  
 Lab ID: QC462146

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
Diesel C10-C24	2,500	2,394	96	52-120	12	30

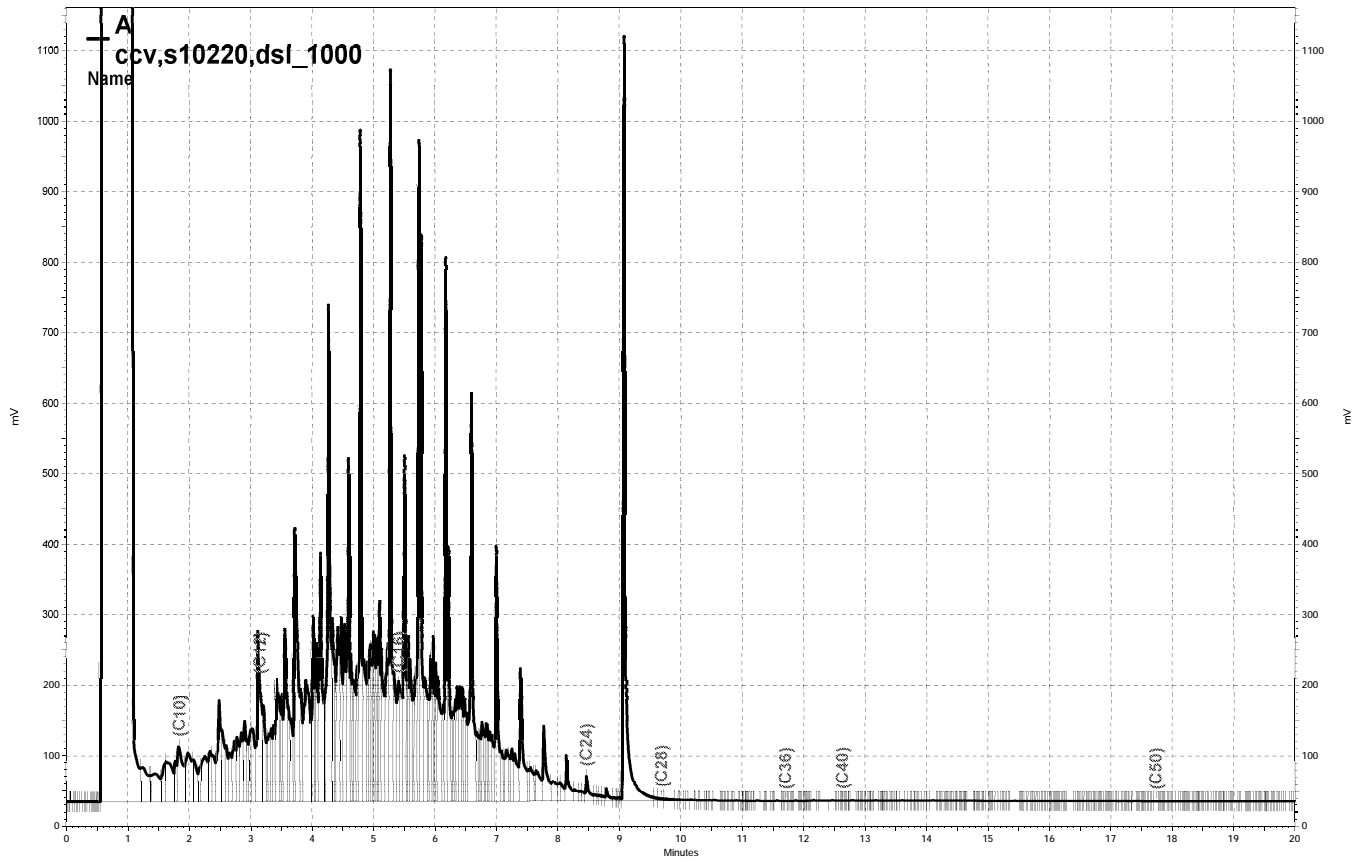
  

Surrogate	%REC	Limits
Hexacosane	99	58-127

RPD= Relative Percent Difference



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<b>BTXE &amp; Oxygenates</b>			
Lab #:	206201	Location:	Emeryville Marina UST
Client:	OTG Enviroengineering Solutions, Inc	Prep:	EPA 5030B
Project#:	08EMV02	Analysis:	EPA 8260B
Field ID:	MW-1	Batch#:	142801
Lab ID:	206201-001	Sampled:	09/19/08
Matrix:	Water	Received:	09/19/08
Units:	ug/L	Analyzed:	09/23/08
Diln Fac:	1.000		

<b>Analyte</b>	<b>Result</b>	<b>RL</b>
tert-Butyl Alcohol (TBA)	ND	10
MTBE	4.6	0.5
Isopropyl Ether (DIPE)	ND	0.5
Ethyl tert-Butyl Ether (ETBE)	ND	0.5
1,2-Dichloroethane	ND	0.5
Benzene	0.8	0.5
Methyl tert-Amyl Ether (TAME)	ND	0.5
Ethanol	ND	1,000
Toluene	9.7	0.5
1,2-Dibromoethane	ND	0.5
Ethylbenzene	2.1	0.5
m,p-Xylenes	9.1	0.5
o-Xylene	3.6	0.5

<b>Surrogate</b>	<b>%REC</b>	<b>Limits</b>
Dibromofluoromethane	99	80-125
1,2-Dichloroethane-d4	113	80-137
Toluene-d8	99	80-120
Bromofluorobenzene	93	80-122

ND= Not Detected  
 RL= Reporting Limit

<b>BTXE &amp; Oxygenates</b>			
Lab #:	206201	Location:	Emeryville Marina UST
Client:	OTG Enviroengineering Solutions, Inc	Prep:	EPA 5030B
Project#:	08EMV02	Analysis:	EPA 8260B
Field ID:	TRIP BLANK	Batch#:	142801
Lab ID:	206201-002	Sampled:	09/19/08
Matrix:	Water	Received:	09/19/08
Units:	ug/L	Analyzed:	09/23/08
Diln Fac:	1.000		

<b>Analyte</b>	<b>Result</b>	<b>RL</b>
tert-Butyl Alcohol (TBA)	ND	10
MTBE	ND	0.5
Isopropyl Ether (DIPE)	ND	0.5
Ethyl tert-Butyl Ether (ETBE)	ND	0.5
1,2-Dichloroethane	ND	0.5
Benzene	ND	0.5
Methyl tert-Amyl Ether (TAME)	ND	0.5
Ethanol	ND	1,000
Toluene	ND	0.5
1,2-Dibromoethane	ND	0.5
Ethylbenzene	ND	0.5
m,p-Xylenes	ND	0.5
o-Xylene	ND	0.5

<b>Surrogate</b>	<b>%REC</b>	<b>Limits</b>
Dibromofluoromethane	100	80-125
1,2-Dichloroethane-d4	108	80-137
Toluene-d8	96	80-120
Bromofluorobenzene	102	80-122

ND= Not Detected  
 RL= Reporting Limit



**Batch QC Report**

<b>BTXE &amp; Oxygenates</b>			
Lab #:	206201	Location:	Emeryville Marina UST
Client:	OTG Enviroengineering Solutions, Inc	Prep:	EPA 5030B
Project#:	08EMV02	Analysis:	EPA 8260B
Matrix:	Water	Batch#:	142801
Units:	ug/L	Analyzed:	09/23/08
Diln Fac:	1.000		

Type: BS Lab ID: QC461552

Analyte	Spiked	Result	%REC	Limits
tert-Butyl Alcohol (TBA)	125.0	125.0	100	59-152
MTBE	25.00	25.45	102	70-125
Isopropyl Ether (DIPE)	25.00	25.22	101	67-126
Ethyl tert-Butyl Ether (ETBE)	25.00	26.42	106	69-127
1,2-Dichloroethane	25.00	26.37	105	78-132
Benzene	25.00	23.90	96	80-120
Methyl tert-Amyl Ether (TAME)	25.00	24.16	97	80-122
Toluene	25.00	26.29	105	80-120
1,2-Dibromoethane	25.00	24.85	99	80-120
Ethylbenzene	25.00	27.37	109	80-122
m,p-Xylenes	50.00	52.44	105	80-126
o-Xylene	25.00	25.80	103	80-120

Surrogate	%REC	Limits
Dibromofluoromethane	99	80-125
1,2-Dichloroethane-d4	99	80-137
Toluene-d8	101	80-120
Bromofluorobenzene	95	80-122

Type: BSD Lab ID: QC461553

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
tert-Butyl Alcohol (TBA)	125.0	142.0	114	59-152	13	20
MTBE	25.00	24.38	98	70-125	4	20
Isopropyl Ether (DIPE)	25.00	22.12	88	67-126	13	20
Ethyl tert-Butyl Ether (ETBE)	25.00	24.20	97	69-127	9	20
1,2-Dichloroethane	25.00	24.83	99	78-132	6	20
Benzene	25.00	21.02	84	80-120	13	20
Methyl tert-Amyl Ether (TAME)	25.00	24.09	96	80-122	0	20
Toluene	25.00	23.93	96	80-120	9	20
1,2-Dibromoethane	25.00	24.34	97	80-120	2	20
Ethylbenzene	25.00	24.02	96	80-122	13	20
m,p-Xylenes	50.00	48.81	98	80-126	7	20
o-Xylene	25.00	24.15	97	80-120	7	20

Surrogate	%REC	Limits
Dibromofluoromethane	94	80-125
1,2-Dichloroethane-d4	99	80-137
Toluene-d8	96	80-120
Bromofluorobenzene	97	80-122

RPD= Relative Percent Difference

**Batch QC Report**

<b>BTXE &amp; Oxygenates</b>			
Lab #:	206201	Location:	Emeryville Marina UST
Client:	OTG Enviroengineering Solutions, Inc	Prep:	EPA 5030B
Project#:	08EMV02	Analysis:	EPA 8260B
Type:	BLANK	Diln Fac:	1.000
Lab ID:	QC461554	Batch#:	142801
Matrix:	Water	Analyzed:	09/23/08
Units:	ug/L		

<b>Analyte</b>	<b>Result</b>	<b>RL</b>
tert-Butyl Alcohol (TBA)	ND	10
MTBE	ND	0.5
Isopropyl Ether (DIPE)	ND	0.5
Ethyl tert-Butyl Ether (ETBE)	ND	0.5
1,2-Dichloroethane	ND	0.5
Benzene	ND	0.5
Methyl tert-Amyl Ether (TAME)	ND	0.5
Ethanol	ND	1,000
Toluene	ND	0.5
1,2-Dibromoethane	ND	0.5
Ethylbenzene	ND	0.5
m,p-Xylenes	ND	0.5
o-Xylene	ND	0.5

<b>Surrogate</b>	<b>%REC</b>	<b>Limits</b>
Dibromofluoromethane	95	80-125
1,2-Dichloroethane-d4	101	80-137
Toluene-d8	92	80-120
Bromofluorobenzene	102	80-122

ND= Not Detected  
 RL= Reporting Limit