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175 Bernal Road • Suite 200  
San Jose, California 95119 USA  
408.224.4724 800.477.7411  
Fax 408.225.8506

December 5, 2003  
Project No. SJ45-30L-1.000G

Alameda County  
DEC 09 2003  
Environmental Health

Mr. Scott Seery  
Environmental Health Services – Environmental Protection  
Alameda County Health Care Services Agency  
1131 Harbor Bay Parkway, Suite 250  
Alameda, California 94502-6577

Re: **Quarterly Monitoring Report – Fourth Quarter 2003**  
**Shell-branded Service Station**  
**4530 Las Positas Road**  
**Livermore, California**

Dear Mr. Seery:

Delta Environmental Consultants, Inc. (Delta), on behalf of Shell Oil Products US (Shell), has prepared the following fourth quarter 2003 groundwater monitoring and sampling report for the above referenced site. Groundwater sampling was performed by Blaine Tech Services (Blaine), at the direction of Delta. A site location map is included as Figure 1.

#### **QUARTERLY GROUND WATER MONITORING PROGRAM**

Groundwater monitoring wells were gauged and sampled by Blaine on October 21, 2003. Depth to groundwater was measured in Wells MW-1 through MW-4. Groundwater elevation data are presented on Figure 2.

Groundwater samples were collected from Wells MW-1 through MW-4. Samples were submitted by Blaine to Severn Trent Laboratories, Inc. (STL) in Pleasanton, California for analysis for total purgeable petroleum hydrocarbons as gasoline (TPH-G); benzene, toluene, ethylbenzene, and total xylenes (BTEX); and the five fuel oxygenates methyl tert-butyl ether (MTBE), diisopropyl ether (DIPE), ethyl-t-butyl ether (ETBE), tert-amyl methyl ether (TAME), and tert-butanol (TBA); ethanol; 1, 2-dichloroethane (1, 2-DCA), ethylene dibromide (EDB) using EPA Method 8260B. Samples are also analyzed for methanol using EPA Method 8015Mod. Benzene and MTBE concentrations are presented on Figure 3.

Blaine's groundwater monitoring and sampling report, which includes historical and current groundwater elevation data, historical and current analytical results, and field data records for the current monitoring event, is included as Attachment A.

**DISCUSSION**

The groundwater gradient on October 21, 2003 was complex. No clear groundwater flow direction could be established

All analytes were below laboratory detection limits for all site wells for the second quarter in a row.

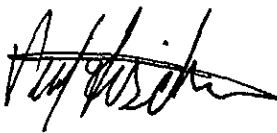
Delta proposes that DIPE, ETBE, TAME, TBA, ethanol, 1,2-DCA, and EDB be removed from the list of analyses. DIPE, ETBE, TAME, and TBA have never been detected in five quarters of monitoring. Ethanol, 1,2-DCA, and EDB were analyzed for the first time in the second quarter and have been below laboratory detection limits since sampling began.

**REMARKS**

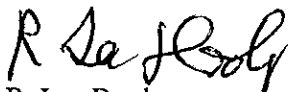
The recommendations contained in this report represent Delta's professional opinions based upon the currently available information and are arrived at in accordance with currently acceptable professional standards. This report is based upon a specific scope of work requested by the client. The Contract between Delta and its client outlines the scope of work, and only those tasks specifically authorized by that contract or outlined in this report were performed. This report is intended only for the use of Delta's Client and anyone else specifically listed on this report. Delta will not and cannot be liable for unauthorized reliance by any other third party. Other than as contained in this paragraph, Delta makes no express or implied warranty as to the contents of this report.

Please call if you have any questions regarding the contents of this letter.

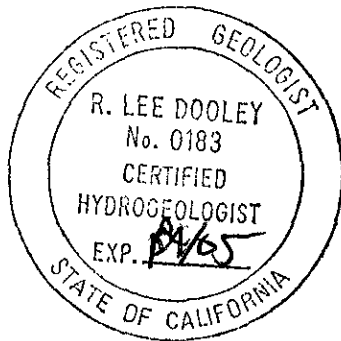
Sincerely,  
**Delta Environmental Consultants, Inc.**



Vera Fischer  
Staff Geologist



R. Lee Dooley  
Senior Hydrogeologist  
CHG 0183



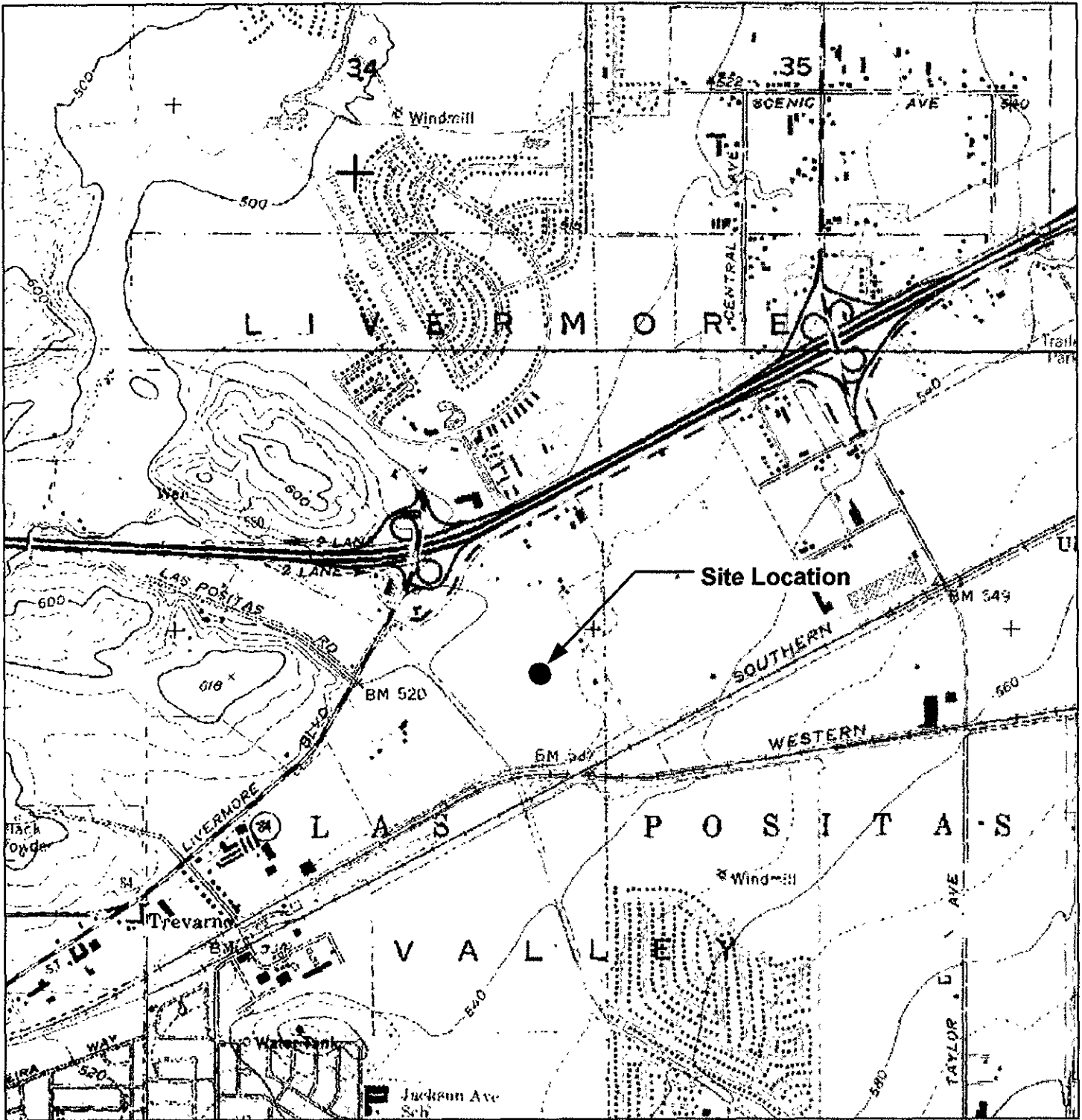
December 5, 2003

Page 3

**Attachments:** Figure 1 – Site Location Map  
Figure 2 – Groundwater Elevation Contour Map  
Figure 3 – Benzene and MTBE Concentration Map

Attachment A – Groundwater Monitoring and Sampling Report, November 26, 2003

cc: Karen Petryna, Shell Oil Products US, Burbank  
Chuck Headlee, RWQCB - San Francisco Bay Region, Oakland  
Livermore-Pleasanton Fire Department, Livermore



GENERAL NOTES:  
 Base Map from: DeLorme Yarmouth, ME 04096  
 Source Data: USGS



QUADRANGLE LOCATION

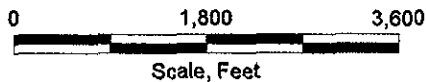


FIGURE 1  
 SITE LOCATION MAP

SHELL-BRANDED SERVICE STATION  
 4530 Las Positas Road  
 Livermore, California

PROJECT NO. SJ45-30L-1.000G	DRAWN BY VF 9/28/03
FILE NO. SJ45-30L-1.000G	PREPARED BY VF
REVISION NO.	REVIEWED BY



North

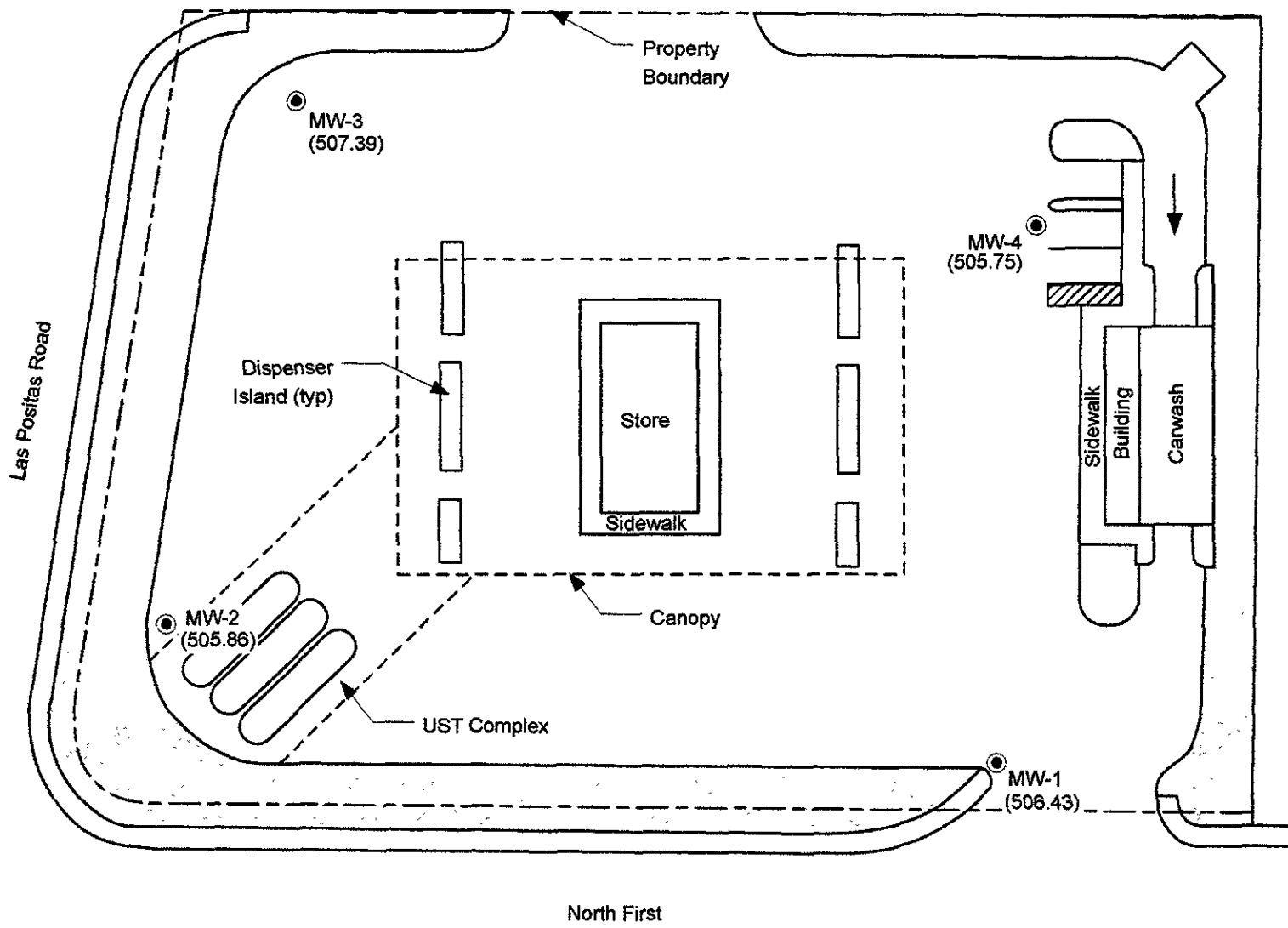


FIGURE 2

GROUNDWATER ELEVATION MAP, OCTOBER 21, 2003

SHELL-BRANDED SERVICE STATION  
4530 Las Positas Road  
Livermore, California

**LEGEND**

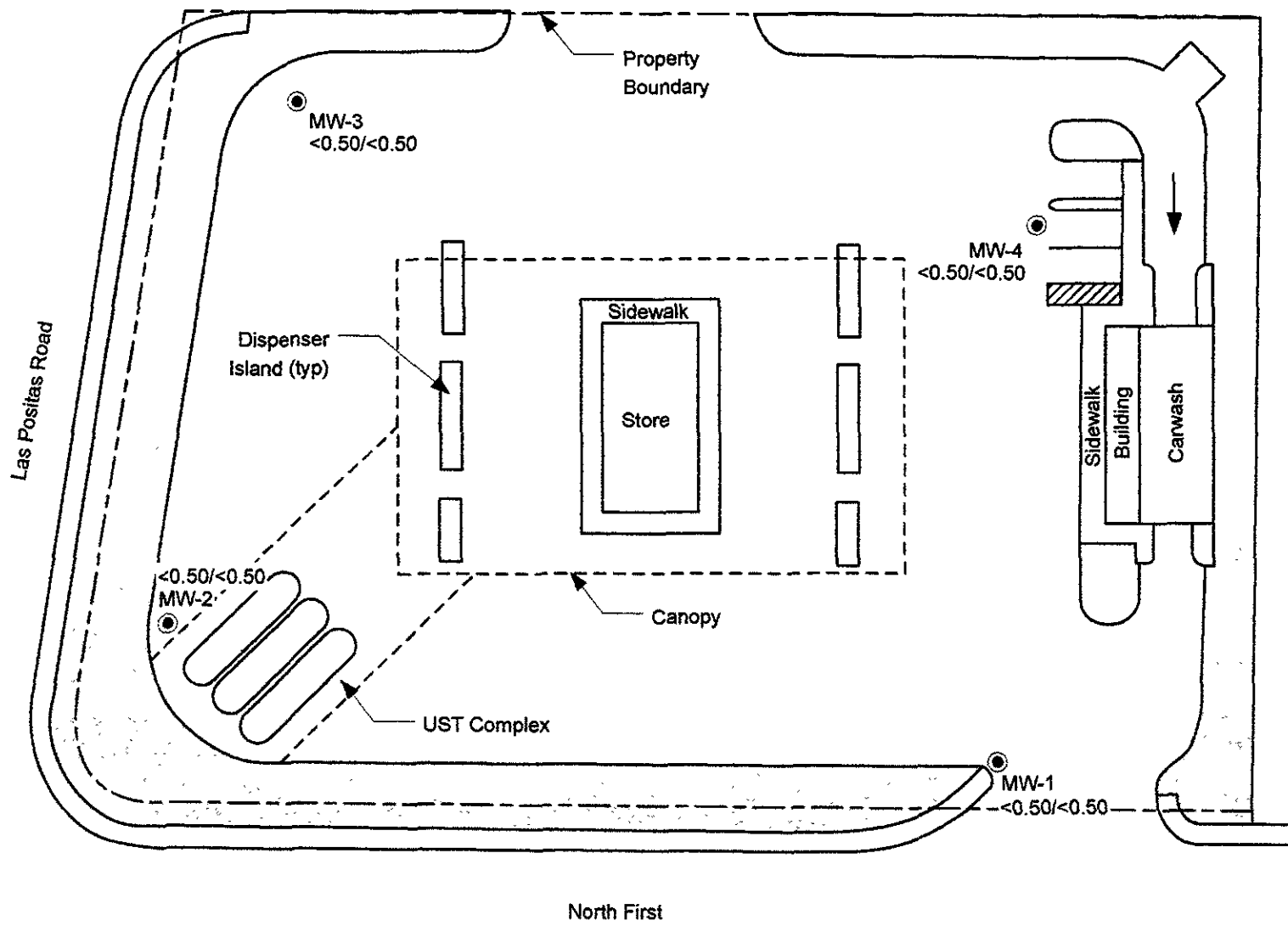
- MW-2 ● **GROUNDWATER MONITORING WELL**
- (507.22) **GROUNDWATER ELEVATION (MSL), 7/17/03**
- **PLANTER**



APPROX. SCALE

PROJECT NO. SJ45-30L-1.000G	DRAWN BY VF 9/30/03
FILE NO. SJ45-30-1.000G	PREPARED BY VF
REVISION NO. 1	REVIEWED BY





**LEGEND**

- MW-2 ● **GROUNDWATER MONITORING WELL**
- **PLANTER**
- <0.50/<0.50 **BENZENE/MTBE (UG/L), 10/21/03**



APPROX. SCALE

**FIGURE 3**  
**BENZENE AND MTBE CONCENTRATION MAP,**  
**OCTOBER 21, 2003**

**SHELL-BRANDED SERVICE STATION**  
 4530 Las Positas Road  
 Livermore, California

PROJECT NO. SJ45-30L-1.000G	DRAWN BY VF 9/30/03
FILE NO. SJ45-30-1.000G	PREPARED BY VF
REVISION NO. 1	REVIEWED BY



**Attachment A**

---

**GROUNDWATER MONITORING AND SAMPLING REPORT**

**BLAINE**  
TECH SERVICES, INC.



1680 ROGERS AVENUE  
SAN JOSE, CA 95112-1105  
(408) 573-7771 FAX  
(408) 573-0555 PHONE  
CONTRACTOR'S LICENSE #746684  
www.blainetech.com

November 26, 2003

Karen Petryna  
Shell Oil Products US  
P.O. Box 7869  
Burbank, CA 91510-7869

Fourth Quarter 2003 Groundwater Monitoring at  
Shell-branded Service Station  
4530 Las Positas Road  
Livermore, CA

Monitoring performed on October 21, 2003

---

Groundwater Monitoring Report **031021-PC-1**

This report covers the routine monitoring of groundwater wells at this Shell-branded facility. In accordance with standard procedures that conform to Regional Water Quality Control Board requirements, routine field data collection includes depth to water, total well depth, thickness of any separate immiscible layer, water column volume, calculated purge volume (if applicable), elapsed evacuation time (if applicable), total volume of water removed (if applicable), and standard water parameter instrument readings. Sample material is collected, contained, stored, and transported to the laboratory in conformance with EPA standards. Purgewater (if applicable) is, likewise, collected and transported to the Martinez Refining Company.

Basic field information is presented alongside analytical values excerpted from the laboratory report in the cumulative table of **WELL CONCENTRATIONS**. The full analytical report for the most recent samples and the field data sheets are attached to this report.

At a minimum, Blaine Tech Services, Inc. field personnel are certified on completion of a forty-hour Hazardous Materials and Emergency Response training course per 29 CFR 1910.120. Field personnel are also enrolled in annual eight-hour refresher courses.



Blaine Tech Services, Inc. conducts sampling and documentation assignments of this type as an independent third party. Our activities at this site consisted of objective data and sample collection only. No interpretation of analytical results, defining of hydrological conditions or formulation of recommendations was performed.

Please call if you have any questions.

Yours truly,

Leon Gearhart  
Project Coordinator

LG/jt

attachments: Cumulative Table of WELL CONCENTRATIONS  
Certified Analytical Report  
Field Data Sheets

cc: Garrett Haertel  
Delta Environmental  
175 Bernal Road, Suite 200  
San Jose, CA 95119



Solving environment-related business problems worldwide

175 Bernal Road • Suite 200  
San Jose, California 95119 USA

408.224.4724 800.477.7411  
Fax 408.225.8506

Alameda County

DEC 09 2003

Environmental Health

www.deltaenv.com

**Facsimile Transmittal**

To: Alameda County Environmental Health Services Date: 12/8/2003  
1131 Harbor Bay Pkwy  
Alameda CA 94502 Job No: SJ45-30L-1.000G

Attn: Mr. Scott Secry

We are sending the following items:

Date	Copies	Description
5-Dec-03	1	Quarterly Monitoring Report - Fourth Quarter 2003
		Shell-branded Service Station
		4530 Las Positas Road
		Livermore, CA

These are transmitted:

- For your Information   
  For action specified below   
  For review and comment   
  For your use   
  As requested

**Facsimile Transmittal**

Copies to: By: Vera Fischer  
Title: Staff Geologist

The information contained in this transmission is confidential and only intended for the addressee. If you are not the intended recipient, you are hereby notified that any disclosure, copying, distribution or action taken in reliance on the contents of this facsimile transmittal is strictly prohibited. If you have received this facsimile in error, please call us immediately to arrange for the return of these documents.

**WELL CONCENTRATIONS**  
**Shell-branded Service Station**  
**4530 Las Positas Road**  
**Livermore, CA**

Well ID	Date	TPPH (ug/L)	B (ug/L)	T (ug/L)	E (ug/L)	X (ug/L)	MTBE 8260 (ug/L)	TOC (MSL)	Depth to Water (ft.)	GW Elevation (MSL)
---------	------	----------------	-------------	-------------	-------------	-------------	------------------------	--------------	----------------------------	--------------------------

MW-1	07/09/2002	<50	<0.50	<0.50	<0.50	<0.50	<0.50	519.86	13.13	506.73
MW-1	10/25/2002	<50	<0.50	<0.50	<0.50	<0.50	<0.50	519.86	13.17	506.69
MW-1	01/24/2003	<50	<0.50	<0.50	<0.50	<0.50	<0.50	519.86	12.80	507.06
MW-1	04/15/2003	<50	<0.50	<0.50	<0.50	<1.0	<0.50	519.86	12.64	507.22
MW-1	07/17/2003	<50	<0.50	<0.50	<0.50	<1.0	<0.50	519.86	13.25	506.61
<b>MW-1</b>	<b>10/21/2003</b>	<b>&lt;50</b>	<b>&lt;0.50</b>	<b>&lt;0.50</b>	<b>&lt;0.50</b>	<b>&lt;1.0</b>	<b>&lt;0.50</b>	<b>519.86</b>	<b>13.43</b>	<b>506.43</b>

MW-2	07/09/2002	<50	<0.50	<0.50	<0.50	<0.50	<0.50	518.50	12.41	506.09
MW-2	10/25/2002	<50	<0.50	<0.50	<0.50	<0.50	<0.50	518.50	12.34	506.16
MW-2	01/24/2003	<50	<0.50	<0.50	<0.50	<0.50	<0.50	518.50	11.56	506.94
MW-2	04/15/2003	<50	<0.50	<0.50	<0.50	<1.0	<0.50	518.50	11.38	507.12
MW-2	07/17/2003	<50	<0.50	<0.50	<0.50	<1.0	<0.50	518.50	13.45	505.05
<b>MW-2</b>	<b>10/21/2003</b>	<b>&lt;50</b>	<b>&lt;0.50</b>	<b>&lt;0.50</b>	<b>&lt;0.50</b>	<b>&lt;1.0</b>	<b>&lt;0.50</b>	<b>518.50</b>	<b>12.64</b>	<b>505.86</b>

MW-3	07/09/2002	<50	<0.50	<0.50	<0.50	<0.50	<0.50	518.93	11.58	507.35
MW-3	10/25/2002	<50	<0.50	<0.50	<0.50	<0.50	<0.50	518.93	11.17	507.76
MW-3	01/24/2003	<50	<0.50	<0.50	<0.50	<0.50	<0.50	518.93	11.18	507.75
MW-3	04/15/2003	<50	<0.50	<0.50	<0.50	<1.0	<0.50	518.93	11.25	507.68
MW-3	07/17/2003	<50	<0.50	<0.50	<0.50	<1.0	<0.50	518.93	11.39	507.54
<b>MW-3</b>	<b>10/21/2003</b>	<b>&lt;50</b>	<b>&lt;0.50</b>	<b>&lt;0.50</b>	<b>&lt;0.50</b>	<b>&lt;1.0</b>	<b>&lt;0.50</b>	<b>518.93</b>	<b>11.54</b>	<b>507.39</b>

MW-4	07/09/2002	<50	<0.50	<0.50	<0.50	<0.50	470	519.44	13.42	506.02
MW-4	10/25/2002	<50	<0.50	<0.50	<0.50	<0.50	22	519.44	13.42	506.02
MW-4	01/24/2003	<50	<0.50	<0.50	<0.50	<0.50	<0.50	519.44	13.07	506.37
MW-4	04/15/2003	<50	<0.50	<0.50	<0.50	<1.0	2.0	519.44	12.93	506.51
MW-4	07/17/2003	<50	<0.50	<0.50	<0.50	<1.0	<0.50	519.44	13.51	505.93

**WELL CONCENTRATIONS**  
**Shell-branded Service Station**  
**4530 Las Positas Road**  
**Livermore, CA**

Well ID	Date	TPPH (ug/L)	B (ug/L)	T (ug/L)	E (ug/L)	X (ug/L)	MTBE 8260 (ug/L)	TOC (MSL)	Depth to Water (ft.)	GW Elevation (MSL)
MW-4	10/21/2003	<50	<0.50	<0.50	<0.50	<1.0	<0.50	519.44	13.69	505.75

Abbreviations:

TPPH = Total petroleum hydrocarbons as gasoline by EPA Method 8260B.

BTEX = Benzene, toluene, ethylbenzene, xylenes by EPA Method 8260B.

MTBE = Methyl-tertiary-butyl ether

TOC = Top of Casing Elevation

GW = Groundwater

ug/L = Parts per billion

MSL = Mean sea level

ft = Feet

<n = Below detection limit

NA = Not applicable

Notes:

Survey data provided by KHM Environmental Management, Inc.

**Blaine Tech Services, Inc.**

November 04, 2003

1680 Rogers Avenue  
San Jose, CA 95112-1105

Attn.: Leon Gearhart

Project#: 031021-PC1

Project: 97464710

Site: 4530 Las Positas Rd., Livermore

Dear Mr. Gearhart,

Attached is our report for your samples received on 10/21/2003 15:26

This report has been reviewed and approved for release. Reproduction of this report is permitted only in its entirety.

Please note that any unused portion of the samples will be discarded after 12/05/2003 unless you have requested otherwise.

We appreciate the opportunity to be of service to you. If you have any questions, please call me at (925) 484-1919.

You can also contact me via email. My email address is: [vvancil@stl-inc.com](mailto:vvancil@stl-inc.com)

Sincerely,



Vincent Vancil  
Project Manager

Severn Trent Laboratories, Inc.

STL San Francisco \* 1220 Quarry Lane, Pleasanton, CA 94566

Tel 925 484 1919 Fax 925 484 1096 \* [www.stl-inc.com](http://www.stl-inc.com) \* CA DHS ELAP# 2496

Gas/BTEX Fuel Oxygenates by 8260B (C6-C12)

Blaine Tech Services, Inc.

Attn.: Leon Gearhart

1680 Rogers Avenue

San Jose, CA 95112-1105

Phone: (408) 573-0555 Fax: (408) 573-7771

Project: 031021-PC1

97464710

Received: 10/21/2003 15:26

Site: 4530 Las Positas Rd., Livermore

Samples Reported

Sample Name	Date Sampled	Matrix	Lab #
MW-1	10/21/2003 09:30	Water	1
MW-2	10/21/2003 10:15	Water	2
MW-3	10/21/2003 11:47	Water	3
MW-4	10/21/2003 11:25	Water	4

Gas/BTEX Fuel Oxygenates by 8260B (C6-C12)

Blaine Tech Services, Inc.  
Attn.: Leon Gearhart

1680 Rogers Avenue  
San Jose, CA 95112-1105  
Phone: (408) 573-0555 Fax: (408) 573-7771

Project: 031021-PC1  
97464710

Received: 10/21/2003 15:26

Site: 4530 Las Positas Rd., Livermore

Prep(s):	5030B	Test(s):	8260B
Sample ID:	MW-1	Lab ID:	2003-10-0756 - 1
Sampled:	10/21/2003 09:30	Extracted:	10/30/2003 02:58
Matrix:	Water	QC Batch#:	2003/10/29-02.65

Compound	Conc.	RL	Unit	Dilution	Analyzed	Flag
Gasoline	ND	50	ug/L	1.00	10/30/2003 02:58	
Benzene	ND	0.50	ug/L	1.00	10/30/2003 02:58	
Toluene	ND	0.50	ug/L	1.00	10/30/2003 02:58	
Ethylbenzene	ND	0.50	ug/L	1.00	10/30/2003 02:58	
Total xylenes	ND	1.0	ug/L	1.00	10/30/2003 02:58	
tert-Butyl alcohol (TBA)	ND	5.0	ug/L	1.00	10/30/2003 02:58	
Methyl tert-butyl ether (MTBE)	ND	0.50	ug/L	1.00	10/30/2003 02:58	
Di-isopropyl Ether (DIPE)	ND	2.0	ug/L	1.00	10/30/2003 02:58	
Ethyl tert-butyl ether (ETBE)	ND	2.0	ug/L	1.00	10/30/2003 02:58	
tert-Amyl methyl ether (TAME)	ND	2.0	ug/L	1.00	10/30/2003 02:58	
1,2-DCA	ND	0.50	ug/L	1.00	10/30/2003 02:58	
EDB	ND	0.50	ug/L	1.00	10/30/2003 02:58	
Ethanol	ND	50	ug/L	1.00	10/30/2003 02:58	
<b>Surrogate(s)</b>						
1,2-Dichloroethane-d4	83.6	76-130	%	1.00	10/30/2003 02:58	
Toluene-d8	100.0	78-115	%	1.00	10/30/2003 02:58	

Gas/BTEX Fuel Oxygenates by 8260B (C6-C12)

Blaine Tech Services, Inc.

Attn.: Leon Gearhart

1680 Rogers Avenue  
San Jose, CA 95112-1105  
Phone: (408) 573-0555 Fax: (408) 573-7771

Project: 031021-PC1  
97464710

Received: 10/21/2003 15:26

Site: 4530 Las Positas Rd., Livermore

Prep(s):	5030B	Test(s):	8260B
Sample ID:	MW-2	Lab ID:	2003-10-0756 - 2
Sampled:	10/21/2003 10:15	Extracted:	10/30/2003 03:21
Matrix:	Water	QC Batch#:	2003/10/29-02.65

Compound	Conc.	RL	Unit	Dilution	Analyzed	Flag
Gasoline	ND	50	ug/L	1.00	10/30/2003 03:21	
Benzene	ND	0.50	ug/L	1.00	10/30/2003 03:21	
Toluene	ND	0.50	ug/L	1.00	10/30/2003 03:21	
Ethylbenzene	ND	0.50	ug/L	1.00	10/30/2003 03:21	
Total xylenes	ND	1.0	ug/L	1.00	10/30/2003 03:21	
tert-Butyl alcohol (TBA)	ND	5.0	ug/L	1.00	10/30/2003 03:21	
Methyl tert-butyl ether (MTBE)	ND	0.50	ug/L	1.00	10/30/2003 03:21	
Di-isopropyl Ether (DIPE)	ND	2.0	ug/L	1.00	10/30/2003 03:21	
Ethyl tert-butyl ether (ETBE)	ND	2.0	ug/L	1.00	10/30/2003 03:21	
tert-Amyl methyl ether (TAME)	ND	2.0	ug/L	1.00	10/30/2003 03:21	
1,2-DCA	ND	0.50	ug/L	1.00	10/30/2003 03:21	
EDB	ND	0.50	ug/L	1.00	10/30/2003 03:21	
Ethanol	ND	50	ug/L	1.00	10/30/2003 03:21	
<b>Surrogate(s)</b>						
1,2-Dichloroethane-d4	86.3	76-130	%	1.00	10/30/2003 03:21	
Toluene-d8	98.1	78-115	%	1.00	10/30/2003 03:21	



Gas/BTEX Fuel Oxygenates by 8260B (C6-C12)

Blaine Tech Services, Inc.

Attn.: Leon Gearhart

1680 Rogers Avenue  
San Jose, CA 95112-1105  
Phone: (408) 573-0555 Fax: (408) 573-7771

Project: 031021-PC1  
97464710

Received: 10/21/2003 15:26

Site: 4530 Las Positas Rd., Livermore

Prep(s):	5030B	Test(s):	8260B
Sample ID:	MW-3	Lab ID:	2003-10-0756 - 3
Sampled:	10/21/2003 11:47	Extracted:	10/30/2003 03:43
Matrix:	Water	QC Batch#:	2003/10/29-02.65

Compound	Conc.	RL	Unit	Dilution	Analyzed	Flag
Gasoline	ND	50	ug/L	1.00	10/30/2003 03:43	
Benzene	ND	0.50	ug/L	1.00	10/30/2003 03:43	
Toluene	ND	0.50	ug/L	1.00	10/30/2003 03:43	
Ethylbenzene	ND	0.50	ug/L	1.00	10/30/2003 03:43	
Total xylenes	ND	1.0	ug/L	1.00	10/30/2003 03:43	
tert-Butyl alcohol (TBA)	ND	5.0	ug/L	1.00	10/30/2003 03:43	
Methyl tert-butyl ether (MTBE)	ND	0.50	ug/L	1.00	10/30/2003 03:43	
Di-isopropyl Ether (DIPE)	ND	2.0	ug/L	1.00	10/30/2003 03:43	
Ethyl tert-butyl ether (ETBE)	ND	2.0	ug/L	1.00	10/30/2003 03:43	
tert-Amyl methyl ether (TAME)	ND	2.0	ug/L	1.00	10/30/2003 03:43	
1,2-DCA	ND	0.50	ug/L	1.00	10/30/2003 03:43	
EDB	ND	0.50	ug/L	1.00	10/30/2003 03:43	
Ethanol	ND	50	ug/L	1.00	10/30/2003 03:43	
<b>Surrogate(s)</b>						
1,2-Dichloroethane-d4	89.4	76-130	%	1.00	10/30/2003 03:43	
Toluene-d8	97.6	78-115	%	1.00	10/30/2003 03:43	

Gas/BTEX Fuel Oxygenates by 8260B (C6-C12)

Blaine Tech Services, Inc.

Attn.: Leon Gearhart

1680 Rogers Avenue  
San Jose, CA 95112-1105  
Phone: (408) 573-0555 Fax: (408) 573-7771

Project: 031021-PC1  
97464710

Received: 10/21/2003 15:26

Site: 4530 Las Positas Rd., Livermore

Prep(s):	5030B	Test(s):	8260B
Sample ID:	MW-4	Lab ID:	2003-10-0756 - 4
Sampled:	10/21/2003 11:25	Extracted:	10/30/2003 04:52
Matrix:	Water	QC Batch#:	2003/10/29-02.65

Compound	Conc.	RL	Unit	Dilution	Analyzed	Flag
Gasoline	ND	50	ug/L	1.00	10/30/2003 04:52	
Benzene	ND	0.50	ug/L	1.00	10/30/2003 04:52	
Toluene	ND	0.50	ug/L	1.00	10/30/2003 04:52	
Ethylbenzene	ND	0.50	ug/L	1.00	10/30/2003 04:52	
Total xylenes	ND	1.0	ug/L	1.00	10/30/2003 04:52	
tert-Butyl alcohol (TBA)	ND	5.0	ug/L	1.00	10/30/2003 04:52	
Methyl tert-butyl ether (MTBE)	ND	0.50	ug/L	1.00	10/30/2003 04:52	
Di-isopropyl Ether (DIPE)	ND	2.0	ug/L	1.00	10/30/2003 04:52	
Ethyl tert-butyl ether (ETBE)	ND	2.0	ug/L	1.00	10/30/2003 04:52	
tert-Amyl methyl ether (TAME)	ND	2.0	ug/L	1.00	10/30/2003 04:52	
1,2-DCA	ND	0.50	ug/L	1.00	10/30/2003 04:52	
EDB	ND	0.50	ug/L	1.00	10/30/2003 04:52	
Ethanol	ND	50	ug/L	1.00	10/30/2003 04:52	
<b>Surrogate(s)</b>						
1,2-Dichloroethane-d4	80.4	76-130	%	1.00	10/30/2003 04:52	
Toluene-d8	99.8	78-115	%	1.00	10/30/2003 04:52	

Gas/BTEX Fuel Oxygenates by 8260B (C6-C12)

Blaine Tech Services, Inc.

Attn.: Leon Gearhart

1680 Rogers Avenue  
San Jose, CA 95112-1105  
Phone: (408) 573-0555 Fax: (408) 573-7771

Project: 031021-PC1  
97464710

Received: 10/21/2003 15:26

Site: 4530 Las Positas Rd., Livermore

Batch QC Report

Prep(s): 5030B  
Method Blank  
MB: 2003/10/29-02.65-034

Water

Test(s): 8260B  
QC Batch # 2003/10/29-02.65  
Date Extracted: 10/29/2003 23:34

Compound	Conc.	RL	Unit	Analyzed	Flag
Gasoline	ND	50	ug/L	10/29/2003 23:34	
Benzene	ND	0.5	ug/L	10/29/2003 23:34	
Toluene	ND	0.5	ug/L	10/29/2003 23:34	
Ethylbenzene	ND	0.5	ug/L	10/29/2003 23:34	
Total xylenes	ND	1.0	ug/L	10/29/2003 23:34	
tert-Butyl alcohol (TBA)	ND	5.0	ug/L	10/29/2003 23:34	
Methyl tert-butyl ether (MTBE)	ND	0.5	ug/L	10/29/2003 23:34	
Di-isopropyl Ether (DIPE)	ND	2.0	ug/L	10/29/2003 23:34	
Ethyl tert-butyl ether (ETBE)	ND	2.0	ug/L	10/29/2003 23:34	
tert-Amyl methyl ether (TAME)	ND	2.0	ug/L	10/29/2003 23:34	
1,2-DCA	ND	0.5	ug/L	10/29/2003 23:34	
EDB	ND	0.5	ug/L	10/29/2003 23:34	
Ethanol	ND	50	ug/L	10/29/2003 23:34	
<b>Surrogates(s)</b>					
1,2-Dichloroethane-d4	80.3	76-130	%	10/29/2003 23:34	
Toluene-d8	91.5	78-115	%	10/29/2003 23:34	

Gas/BTEX Fuel Oxygenates by 8260B (C6-C12)

Blaine Tech Services, Inc.

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San Jose, CA 95112-1105  
Phone: (408) 573-0555 Fax: (408) 573-7771

Project: 031021-PC1  
97464710

Received: 10/21/2003 15:26

Site: 4530 Las Positas Rd., Livermore

Batch QC Report

Prep(s): 5030B

Test(s): 8260B

Laboratory Control Spike

Water

QC Batch # 2003/10/29-02.65

LCS 2003/10/29-02.65-049

Extracted: 10/29/2003

Analyzed: 10/29/2003 22:49

LCSD 2003/10/29-02.65-012

Extracted: 10/29/2003

Analyzed: 10/29/2003 23:12

Compound	Conc. ug/L		Exp.Conc.	Recovery %		RPD	Ctrl.Limits %		Flags	
	LCS	LCSD		LCS	LCSD		%	Rec.	RPD	LCS
Benzene	23.8	25.2	25.0	95.2	100.8	5.7	69-129	20		
Toluene	25.1	25.2	25.0	100.4	100.8	0.4	70-130	20		
Methyl tert-butyl ether (MTBE)	21.2	21.8	25.0	84.8	87.2	2.8	65-165	20		
<b>Surrogates(s)</b>										
1,2-Dichloroethane-d4	428	428	500	85.6	85.6		76-130			
Toluene-d8	496	479	500	99.2	95.8		78-115			

Gas/BTEX Fuel Oxygenates by 8260B (C6-C12)

Blaine Tech Services, Inc.  
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San Jose, CA 95112-1105  
Phone: (408) 573-0555 Fax: (408) 573-7771

Project: 031021-PC1  
97464710

Received: 10/21/2003 15:26

Site: 4530 Las Positas Rd., Livermore

Batch QC Report			
Prep(s):	5030B		Test(s): 8260B
<b>Matrix Spike (MS / MSD)</b>		<b>Water</b>	<b>QC Batch # 2003/10/29-02.65</b>
MW-3 >> MS			Lab ID: 2003-10-0756 - 003
MS: 2003/10/29-02.65-006		Extracted: 10/30/2003	Analyzed: 10/30/2003 04:06
			Dilution: 1.00
MSD: 2003/10/29-02.65-029		Extracted: 10/30/2003	Analyzed: 10/30/2003 04:29
			Dilution: 1.00

Compound	Conc. ug/L		Spk.Level	Recovery %			Limits %		Flags		
	MS	MSD		Sample	ug/L	MS	MSD	RPD	Rec.	RPD	MS
Benzene	22.9	28.8	ND	25.0	91.6	115.2	22.8	69-129	20		mso
Toluene	24.5	27.9	ND	25.0	98.0	111.6	13.0	70-130	20		
Methyl tert-butyl ether	21.9	22.8	ND	25.0	87.6	91.2	4.0	65-165	20		
<b>Surrogate(s)</b>											
1,2-Dichloroethane-d4	427	423		500	85.5	84.6		76-130			
Toluene-d8	492	490		500	98.4	98.0		78-115			

Alcohols by GC-FID

Blaine Tech Services, Inc.

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Phone: (408) 573-0555 Fax: (408) 573-7771

Project: 031021-PC1  
97464710

Received: 10/21/2003 15:26

Site: 4530 Las Positas Rd., Livermore

Samples Reported

Sample Name	Date Sampled	Matrix	Lab #
MW-1	10/21/2003 09:30	Water	1
MW-2	10/21/2003 10:15	Water	2
MW-3	10/21/2003 11:47	Water	3
MW-4	10/21/2003 11:25	Water	4

Alcohols by GC-FID

Blaine Tech Services, Inc.

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Phone: (408) 573-0555 Fax: (408) 573-7771

Project: 031021-PC1  
97464710

Received: 10/21/2003 15:26

Site: 4530 Las Positas Rd., Livermore

Prep(s):	8015M Alcohols	Test(s):	8015Mod
Sample ID:	MW-1	Lab ID:	2003-10-0756 - 1
Sampled:	10/21/2003 09:30	Extracted:	11/3/2003 15:00
Matrix:	Water	QC Batch#:	2003/11/03-01.20

Compound	Conc.	RL	Unit	Dilution	Analyzed	Flag
Methanol	ND	0.50	mg/L	1.00	11/03/2003 16:16	
<b>Surrogate(s)</b>						
tert-Butyl alcohol	87.5	60-130	%	1.00	11/03/2003 16:16	

Alcohols by GC-FID

Blaine Tech Services, Inc.

Attn.: Leon Gearhart

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San Jose, CA 95112-1105  
Phone: (408) 573-0555 Fax: (408) 573-7771

Project: 031021-PC1  
97464710

Received: 10/21/2003 15:26

Site: 4530 Las Positas Rd., Livermore

Prep(s):	8015M Alcohols	Test(s):	8015Mod
Sample ID:	MW-2	Lab ID:	2003-10-0756 - 2
Sampled:	10/21/2003 10:15	Extracted:	11/3/2003 15:00
Matrix:	Water	QC Batch#:	2003/11/03-01.20

Compound	Conc.	RL	Unit	Dilution	Analyzed	Flag
Methanol	ND	0.50	mg/L	1.00	11/03/2003 16:27	
<b>Surrogate(s)</b> tert-Butyl alcohol	90.5	60-130	%	1.00	11/03/2003 16:27	



Alcohols by GC-FID

Blaine Tech Services, Inc.

Attn.: Leon Gearhart

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San Jose, CA 95112-1105  
Phone: (408) 573-0555 Fax: (408) 573-7771

Project: 031021-PC1  
97464710

Received: 10/21/2003 15:26

Site: 4530 Las Positas Rd., Livermore

Prep(s):	8015M Alcohols	Test(s):	8015Mod
Sample ID:	MW-3	Lab ID:	2003-10-0756 - 3
Sampled:	10/21/2003 11:47	Extracted:	11/3/2003 15:00
Matrix:	Water	QC Batch#:	2003/11/03-01.20

Compound	Conc.	RL	Unit	Dilution	Analyzed	Flag
Methanol	ND	0.50	mg/L	1.00	11/03/2003 16:39	
<b>Surrogate(s)</b>						
tert-Butyl alcohol	85.5	60-130	%	1.00	11/03/2003 16:39	

Alcohols by GC-FID

Blaine Tech Services, Inc.

Attn.: Leon Gearhart

1680 Rogers Avenue  
San Jose, CA 95112-1105  
Phone: (408) 573-0555 Fax: (408) 573-7771

Project: 031021-PC1  
97464710

Received: 10/21/2003 15:26

Site: 4530 Las Positas Rd., Livermore

Prep(s):	8015M Alcohols	Test(s):	8015Mod
Sample ID:	MW-4	Lab ID:	2003-10-0756 - 4
Sampled:	10/21/2003 11:25	Extracted:	11/3/2003 15:00
Matrix:	Water	QC Batch#:	2003/11/03-01.20

Compound	Conc.	RL	Unit	Dilution	Analyzed	Flag
Methanol	ND	0.50	mg/L	1.00	11/03/2003 16:50	
<i>Surrogate(s)</i>						
tert-Butyl alcohol	90.8	60-130	%	1.00	11/03/2003 16:50	

Alcohols by GC-FID

Blaine Tech Services, Inc.

Attn.: Leon Gearhart

1680 Rogers Avenue  
San Jose, CA 95112-1105  
Phone: (408) 573-0555 Fax: (408) 573-7771

Project: 031021-PC1  
97464710

Received: 10/21/2003 15:26

Site: 4530 Las Positas Rd., Livermore

**Batch QC Report**

Prep(s): 8015M Alcohols  
Method Blank  
MB: 2003/11/03-01.20-001

Water

Test(s): 8015Mod  
QC Batch # 2003/11/03-01.20  
Date Extracted: 11/03/2003 15:00

Compound	Conc.	RL	Unit	Analyzed	Flag
Methanol	ND	0.50	mg/L	11/03/2003 15:41	
Surrogates(s) tert-Butyl alcohol	78.2	60-130	%	11/03/2003 15:41	

Alcohols by GC-FID

Blaine Tech Services, Inc.  
Attn.: Leon Gearhart

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San Jose, CA 95112-1105  
Phone: (408) 573-0555 Fax: (408) 573-7771

Project: 031021-PC1  
97464710

Received: 10/21/2003 15:26

Site: 4530 Las Positas Rd., Livermore

**Batch QC Report**

Prep(s): 8015M Alcohols

Test(s): 8015Mod

Laboratory Control Spike

Water

QC Batch # 2003/11/03-01.20

LCS 2003/11/03-01.20-003

Extracted: 11/03/2003

Analyzed: 11/03/2003 15:53

LCSD 2003/11/03-01.20-004

Extracted: 11/03/2003

Analyzed: 11/03/2003 16:04

Compound	Conc. mg/L		Exp.Conc.	Recovery %		RPD	Ctrl.Limits %		Flags	
	LCS	LCSD		LCS	LCSD		%	Rec.	RPD	LCS
Methanol	55.4	59.5	50.0	110.8	119.0	7.1	60-130	25		
<i>Surrogates(s)</i> tert-Butyl alcohol	47.1	49.3	50	94.2	98.6		60-130	0		

LAB: STL

# SHELL Chain Of Custody Record

78668

Lab Identification (if necessary):

Address:

City, State, Zip:

Shell Project Manager to be invoiced:

- SCIENCE & ENGINEERING
- TECHNICAL SERVICES
- CRNE HOUSTON

Karen Petryna

2003-10-0756

INCIDENT NUMBER (S&E ONLY)

9 7 4 6 4 7 1 0

SAP or CRMT NUMBER (TS/CRMT)

DATE: 10/21/03

PAGE: 1 of 1

<b>Blaine Tech Services</b> 1680 Rogers Avenue, San Jose, CA 95112 Leon Gearhart 408-573-0555 408-573-7771 lgearhart@blainetech.com		LOCAL PHONE: <b>BTSS</b> SITE ADDRESS (Street and City): <b>4530 Las Positas Rd., Livermore</b> GLOBAL ID#: <b>pending</b> GARRETT HAERTEL (408)224-4724 ghaerfel@dellaenv.com P. Cornish lgearhart@blainetech.com	CONSULTANT PROJECT NO: <b>BTS-031021-PC1</b>
--	--	---	---

TURNAROUND TIME (BUSINESS DAYS):  
 10 DAYS  5 DAYS  72 HOURS  48 HOURS  24 HOURS  LESS THAN 24 HOURS

REQUESTED ANALYSIS

LA - RWOCB REPORT FORMAT  UST AGENCY:  
 LA - RWOCB CONFIRMATION: HIGHEST \_\_\_\_\_ HIGHEST per BORING \_\_\_\_\_ ALL \_\_\_\_\_  
 SPECIAL INSTRUCTIONS OR NOTES: CHECK BOX IF EDC IS NOT NEEDED

FIELD NOTES:  
 Container/Preservative  
 or PID Readings  
 or Laboratory Notes  
 3.1 °C  
 TEMPERATURE ON RECEIPT °C

LAB USE ONLY	Field Sample Identification	SAMPLING		MATRIX	NO. OF CONT.	TPH - Gas, Purgeable	BTEX	MTBE (8024B - 5ppb RL)	MTBE (8280B - 0.5ppb RL)	Oxygenates (9) by (8260B)	Ethanol	Methanol	1,2-DCA	EDB
		DATE	TIME											
	MW-1	10/21/03	930	W	6	X	X			X	X	X	X	X
	MW-2	↓	1015	↓	6	X	X			X	X	X	X	X
	MW-3	↓	1147	↓	6	X	X			X	X	X	X	X
	MW-4	↓	1125	↓	6	X	X			X	X	X	X	X

Requested by (Signature): <u>[Signature]</u> Date: <u>10/21/03</u>	Received by (Signature): <u>[Signature]</u> Date: <u>10/26/03</u>	Time: <u>1526</u>
Requested by (Signature): <u>[Signature]</u> Date: <u>10/21/03</u>	Received by (Signature): <u>[Signature]</u> Date: <u>10/21/03</u>	Time: <u>1407</u>

LAB USE ONLY Write with ballpoint, Green to File Yellow and Pink to Client

O&O Graphic 17141 B&B-07/02





## SHELL WELL MONITORING DATA SHEET

BTS #: 031021-PC1	Site: 4530 Las Positas Rd. Livermore
Sampler: P. Cornish	Date: 10/21/03
Well I.D.: MW-1	Well Diameter: <u>2</u> 3 4 6 8
Total Well Depth (TD): 22.25	Depth to Water (DTW): 13.43
Depth to Free Product:	Thickness of Free Product (feet):
Referenced to: <u>VC</u> Grade	D.O. Meter (if req'd): YSI HACH
DTW with 80% Recharge [(Height of Water Column x 0.20) + DTW]: 15.19	

Purge Method: Bailer Disposable Bailer <input checked="" type="checkbox"/> Positive Air Displacement Electric Submersible	<u>B-82</u> Waterra Peristaltic Extraction Pump Other: _____	Sampling Method: <input checked="" type="checkbox"/> Bailer Disposable Bailer Extraction Port Dedicated Tubing Other: _____
--	---	---

$1.4$ (Gals.) X $3$ = $4.2$ Gals. I Case Volume      Specified Volumes      Calculated Volume	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Well Diameter</th> <th>Multiplier</th> <th>Well Diameter</th> <th>Multiplier</th> </tr> </thead> <tbody> <tr> <td>1"</td> <td>0.04</td> <td>4"</td> <td>0.65</td> </tr> <tr> <td>2"</td> <td>0.16</td> <td>6"</td> <td>1.47</td> </tr> <tr> <td>3"</td> <td>0.37</td> <td>Other</td> <td>radius<sup>2</sup> * 0.163</td> </tr> </tbody> </table>	Well Diameter	Multiplier	Well Diameter	Multiplier	1"	0.04	4"	0.65	2"	0.16	6"	1.47	3"	0.37	Other	radius <sup>2</sup> * 0.163
Well Diameter	Multiplier	Well Diameter	Multiplier														
1"	0.04	4"	0.65														
2"	0.16	6"	1.47														
3"	0.37	Other	radius <sup>2</sup> * 0.163														

Time	Temp (°F)	pH	Cond. (mS or <del>µS</del> )	Turbidity (NTUs)	Gals. Removed	Observations
918	68.5	6.7	1439	>1000	1.5	cloudy
921	69.1	6.7	1406	>1000	3.0	↓
925	69.4	6.7	1406	>1000	4.5	↓

Did well dewater? Yes  No  Gallons actually evacuated: 4.5

Sampling Date: 10/21/03 Sampling Time: 930 Depth to Water: 12.59

Sample I.D.: MW-1 Laboratory: STL Other: \_\_\_\_\_

Analyzed for: TPH-G BTEX MTBE TPH-D Other: see CDC

EB I.D. (if applicable): \_\_\_\_\_ @ \_\_\_\_\_ Time Duplicate I.D. (if applicable): \_\_\_\_\_

Analyzed for: TPH-G BTEX MTBE TPH-D Other: \_\_\_\_\_

D.O. (if req'd):	Pre-purge:	mg/L	Post-purge:	mg/L
O.R.P. (if req'd):	Pre-purge:	mV	Post-purge:	mV







## SHELL WELL MONITORING DATA SHEET

BTS #: 031021-PC1	Site: 4530 Las Positas Rd. Livermore
Sampler: P. Cornish	Date: 10/21/03
Well I.D.: MW-4	Well Diameter: <input checked="" type="radio"/> 2 3 4 6 8
Total Well Depth (TD): 22.6'	Depth to Water (DTW): 13.49'
Depth to Free Product:	Thickness of Free Product (feet):
Referenced to: <input checked="" type="radio"/> VCO Grade	D.O. Meter (if req'd): YSI HACH
DTW with 80% Recharge [(Height of Water Column x 0.20) + DTW]: 15.47'	

Purge Method:  Bailer       Watera      Sampling Method:  Bailer  
 Disposable Bailer       Peristaltic       Disposable Bailer  
 Positive Air Displacement       Extraction Pump       Extraction Port  
 Electric Submersible       Other \_\_\_\_\_       Dedicated Tubing

Other: \_\_\_\_\_

$\frac{1.4 \text{ (Gals.)} \times 3 \text{ Specified Volumes}}{1 \text{ Case Volume}} = 4.2 \text{ Gals. Calculated Volume}$	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Well Diameter</th> <th>Multiplier</th> <th>Well Diameter</th> <th>Multiplier</th> </tr> </thead> <tbody> <tr> <td>1"</td> <td>0.04</td> <td>4"</td> <td>0.65</td> </tr> <tr> <td>2"</td> <td>0.16</td> <td>6"</td> <td>1.47</td> </tr> <tr> <td>3"</td> <td>0.37</td> <td>Other</td> <td>radius<sup>2</sup> * 0.163</td> </tr> </tbody> </table>	Well Diameter	Multiplier	Well Diameter	Multiplier	1"	0.04	4"	0.65	2"	0.16	6"	1.47	3"	0.37	Other	radius <sup>2</sup> * 0.163
Well Diameter	Multiplier	Well Diameter	Multiplier														
1"	0.04	4"	0.65														
2"	0.16	6"	1.47														
3"	0.37	Other	radius <sup>2</sup> * 0.163														

Time	Temp (°F)	pH	Cond. (mS or $\mu$ S)	Turbidity (NTUs)	Gals. Removed	Observations
1111	78.6	7.0	1348	>1000	1.5	Muddy
						Well dewatered @ 1113 → DTW 15.39' @ 1118
1128	75.5	7.2	1396	>1000	-	CLOUDY

Did well dewater?  Yes    No    Gallons actually evacuated: 2.0

Sampling Date: 10/21/03    Sampling Time: 1125    Depth to Water: 15.10

Sample I.D.: MW-4    Laboratory:  ETX    Other \_\_\_\_\_

Analyzed for:  TPH-G  BTEX  MTBE  TPH-D    Other: see COC

EB I.D. (if applicable): @ \_\_\_\_\_ Time    Duplicate I.D. (if applicable):

Analyzed for: TPH-G BTEX MTBE TPH-D Other:					
D.O. (if req'd):	Pre-purge:	mg/L	Post-purge:	mg/L	
O.R.P. (if req'd):	Pre-purge:	mV	Post-purge:	mV	