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**Alameda County  
Environmental Health**



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August 15, 2012

Mr. Jerry Wickham  
Hazardous Materials Specialist  
Alameda County Environmental Health  
1131 Harbor Bay Parkway, Suite 250  
Alameda, CA 94502-6577

**Subject: Second Quarter 2012 Status Report  
1619 1st Street, Livermore, California  
Tesoro No. 67076 (Former Beacon 3604); ACEH Case No. RO0434**

Dear Mr. Wickham:

Enclosed please find a copy of the quarterly status report for the subject site located at 1619 1st Street in Livermore, California. This report is submitted by Arctos Environmental on behalf of Tesoro Environmental Resources Company.

Based on my inquiry of the person or persons directly responsible for gathering the information contained in this report, I believe the information was prepared by qualified personnel who properly gathered and evaluated the information, and that the information submitted is, to the best of my knowledge and belief, true, correct, and complete. Please feel free to call me at 253/896-8700 or Scott Stromberg of Arctos Environmental at 510/525-2180 with questions.

Sincerely,

A handwritten signature in blue ink, appearing to read "Jeffrey M. Baker".

Jeffrey M. Baker, P.E.  
Supervisor, Environmental  
Compliance & Remediation  
Tesoro Environmental Resources Company

Attachments

CC: Arctos – Scott Stromberg



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15 August 2012  
Project No. 01LV

Jerry Wickham  
Hazardous Materials Specialist  
Alameda County Environmental Health  
1131 Harbor Bay Parkway, Suite 250  
Alameda, California 94502-6577

**Subject: Second Quarter 2012 Status Report  
1619 1st Street, Livermore, California  
Tesoro No. 67076 (Former Beacon 3604); ACEH Case No. RO0434**

Dear Mr. Wickham:

Arctos Environmental (Arctos), on behalf of Tesoro Environmental Resources Company (Tesoro), has prepared this letter report summarizing project tasks completed during the second quarter 2012 at the subject site (Figure 1).

### **Executive Summary**

During June 2012, Arctos installed, developed, and sampled offsite downgradient monitoring wells MW-12 and DW-9 in accordance with a work plan dated 6 April 2012 and approved in a 16 April 2012 letter from Alameda County Environmental Health (ACEH). Three soil borings were also advanced off site and grab groundwater samples were attempted in each boring. The highest soil impacts were present at a depth of 50 to 65 feet below grade, which was consistent with the onsite source area. Groundwater concentrations were consistent with existing monitoring wells.

A semiannual groundwater monitoring event was conducted on 7 to 11 May and 14 June 2012 for all site monitoring wells. There was an average 3-foot increase in water levels since the first quarter 2012. Onsite groundwater concentrations have decreased significantly in response to operation of soil vapor extraction (SVE) and oxygen injection systems (wells TP-1 and TP-2) and an in situ chemical oxidation (ISCO) pilot test. Petroleum hydrocarbon concentrations decreased by at least 87 percent at monitoring well DW-8, located approximately 26 feet downgradient of ISCO injection well IP-9, since the fourth quarter 2010.

The SVE system operated at 100 percent uptime. During operation, 70 pounds of petroleum hydrocarbons were removed through volatilization and up to 550 pounds of

hydrocarbons were estimated to have been degraded by biodegradation. Mass removal by the SVE system was limited by high water levels.

The oxygen injection system operated at 100 percent uptime. The average dissolved oxygen (DO) concentration at the monitoring wells was 7.4 milligrams per liter (mg/l) within 10 feet of the active injection wells.

During the third quarter 2012, Tesoro will (1) continue operation of the SVE and oxygen injection systems, (2) continue to monitor groundwater wells in the vicinity of an ISCO pilot test, and (3) design an expanded ISCO pilot test for onsite and offsite impacts.

### **Site Background**

The site description and background are included in Arctos's "In Situ Chemical Oxidation (ISCO) Pilot Test Report" dated 16 March 2012 (Arctos, 2012).

### **Groundwater Monitoring**

Arctos's subcontractor, Environmental Field Services, LLC (EFS), of Patterson, California, performed a semiannual groundwater monitoring event from 7 to 11 May and 14 June 2012. Samples were collected from wells MW-1 through MW-12, DW-1 through DW-9, TP-1, TP-2, VW-2, and IP-1 through IP-10 (Figure 2) in accordance with the site monitoring plan (Attachment A). In addition, samples collected from wells MW-2, MW-7, MW-11, DW-8, IP-1, and IP-8 through IP-10 were analyzed for additional analytes in accordance with the ISCO pilot test work plan (Arctos, 2011). Groundwater monitoring was performed in accordance with the guidelines of the California Underground Storage Tank Regulations, Title 23, Division 3, Chapter 16, California Code of Regulations. Groundwater sampling quality assurance/quality control (QA/QC) procedures are in Attachment A. Field data sheets are in Attachment B.

### **Analytical Program**

Groundwater and vapor samples were analyzed in accordance with the analytical plans in Attachments A and C, respectively.

### **Groundwater Results**

Groundwater elevations were approximately 430 to 438 feet above mean sea level (MSL; 36 to 40 feet below ground surface [bgs]). Water levels increased an average of 3 feet compared to the first quarter 2012 and were an average of 8 feet lower than water levels in the second quarter 2011 (Table 1). The water level data indicate that the general direction of water flow is toward the northwest with an estimated gradient of

0.019 (1 foot/53 feet; Figure 2). The gradient is consistent with historical data collected since 1993 (Attachment D).

During the second quarter 2012, the highest total petroleum hydrocarbons as gasoline (TPHg) and benzene concentrations of 50,000 and 2,400 micrograms per liter ( $\mu\text{g/l}$ ), respectively, were at well IP-8, located downgradient of the underground storage tanks (USTs). The previously reported highest TPHg and benzene concentrations of 82,000 and 4,300  $\mu\text{g/l}$ , respectively, were at well DW-8 in fourth quarter 2011. During the second quarter, well DW-8 had TPHg and benzene concentrations of 11,000 and 500  $\mu\text{g/l}$ , respectively. Well DW-8 is located in P Street downgradient of the ISCO pilot test conducted in the fourth quarter 2011.

The highest methyl tert-butyl ether (MTBE) concentration of 220  $\mu\text{g/l}$  was at well MW-2, located in the northwest portion of the site downgradient of the current dispenser islands. The highest tert-butyl alcohol (TBA) concentration of 430  $\mu\text{g/l}$  was at well DW-2, located off site and downgradient of the current dispenser islands. The previously reported highest MTBE and TBA concentrations were at wells TP-1 and TP-2, located downgradient of the current dispenser islands. During the second quarter, petroleum hydrocarbons were not detected in well TP-2 and well TP-1 had MTBE and TBA concentrations of 28 and 27  $\mu\text{g/l}$ , respectively. Both TP-1 and TP-2 are at their historically lowest concentrations.

During the second quarter 2012, injection wells IP-1 through IP-10 were sampled. Compared to the second quarter 2011, concentrations of TPHg, benzene, and MTBE decreased or remained stable in all injection wells except IP-8. TPHg, benzene, and MTBE were not detected in wells IP-3 through IP-7 because of continued oxygen injection in these wells. Injection well IP-8 was impacted by the ISCO pilot test and continues to be disconnected from the oxygen injection system to monitor the effects of the pilot test.

The highest offsite TPHg, benzene, and MTBE concentrations of 11,000, 1,200, and 150  $\mu\text{g/l}$ , respectively, were at well MW-6 at the northwest intersection of 1st Street and P Street. Wells MW-12 and DW-9 are the farthest downgradient wells installed as a shallow and deep well cluster during the second quarter 2012. TPHg, benzene, MTBE, and TBA were detected in new deep well DW-9 at concentrations of 8,300, 89, 36, and 80  $\mu\text{g/l}$ , respectively. TPHg and benzene were detected in new shallow well MW-12 at concentrations of 6,900 and 8.5  $\mu\text{g/l}$ , respectively. MTBE and TBA were not detected in well MW-12. All offsite benzene concentrations are below the RWQCB's environmental screening level (ESL) of 1,800  $\mu\text{g/l}$  for evaluation of potential vapor intrusion concerns.

Groundwater analytical results are summarized in Tables 2 and 3. Figures 3, 4, and 5 show isoconcentration contours for TPHg, benzene, and MTBE, respectively. Historical analytical results are in Attachment E, and the laboratory reports and the chain-of-custody forms are in Attachment F.

### ISCO Pilot Test Monitoring

During the fourth quarter 2011, Arctos conducted an ISCO pilot test in well IP-9. The oxidant caused an increase in hexavalent chromium concentrations at well IP-9. From the fourth quarter 2011 to the second quarter 2012, hexavalent chromium concentrations in well IP-9 decreased from 90 to 60 µg/l. Monitoring well DW-8, located 26 feet downgradient of well IP-9, had a detection of hexavalent chromium of 2.2 µg/l in the second quarter. Hexavalent chromium was not detected in any of the other wells within the ISCO pilot test area.

Relative to the baseline results, concentrations of TPHg and benzene in downgradient well DW-8 have also decreased by over 85 percent in the second quarter. The RegenOx™ chemical oxidant has proven to be effective at desorbing petroleum hydrocarbons from soil and destroying hydrocarbons in groundwater. During the third quarter 2012, Arctos will design an expanded ISCO pilot test to occur on and off site. ISCO pilot test groundwater monitoring results are summarized in Table 4.

### Source Area Remediation

#### SVE System

From 1 to 17 April 2012, the SVE system operated on wells MW-1, MW-11, TP-1, TP-2, and VW-2. On 17 April, Arctos turned off well MW-1 because water levels had increased and submerged the well screen. The remaining SVE wells operated through 30 June. The SVE wells are described below.

Well	Well Location	Well Diameter (inches)	Screen Interval (feet bgs)
MW-1	SW corner in equipment area	4	34 - 54
MW-11	SW corner adjacent to USTs	4	28 - 43
TP-1	NW corner north of dispensers	2	28 - 43
TP-2	NW corner north of dispensers	2	28 - 43
VW-2	NW corner west of dispensers	2	22 - 37

The SVE system influent was monitored frequently with a field photoionization detector and monthly by laboratory analysis of soil gas samples. The SVE system was monitored to

document and optimize hydrocarbon mass removal from the soil. Table 5 summarizes the laboratory analytical results for influent SVE system samples.

Influent TPHg concentrations ranged from 37 parts per million by volume (ppmv; 19 June) to 110 ppmv (17 April). Hydrocarbon mass removal rates were limited by high water levels. Water levels began decreasing in May 2012 and are expected to continue decreasing during the third quarter 2012. During the second quarter 2012, the SVE system operated at an average flow rate of 38 standard cubic feet per minute and an average vacuum of 3.4 inches of mercury (in. Hg).

Hydrocarbon mass was removed from the subsurface through (1) volatilization caused by the SVE system and (2) in situ bioremediation from increased oxygen levels. The daily rate of hydrocarbon mass removal by volatilization was calculated from influent soil gas sample results and field flow measurements. Mass removal by biodegradation was calculated using equations adapted from a U.S. Environmental Protection Agency guidance document (EPA, 1995). SVE influent soil gas analytical results and SVE system parameters used for these calculations are summarized in Tables 5 and 6, respectively. The following is a summary of the operating conditions for the system during the second quarter 2012.

Operation Period	Operating Wells	Operating Time (days)	Average Vacuum (in. Hg)	Average Mass Removal Rate (pounds/day)	Mass Removed <sup>(a)</sup> (pounds)
4/1 to 4/17	MW-1, MW-11, VW-2, TP-1, TP-2	17	3.5	1.4	20
4/17 to 6/30	MW-11, VW-2, TP-1, TP-2	74	3.4	0.7	50

(a) Mass removed by volatilization only.

During the second quarter 2012, approximately 70 pounds of hydrocarbons were removed by the SVE system through volatilization and up to 550 pounds of hydrocarbons were estimated to have been degraded by biodegradation. The total hydrocarbon mass removed by the SVE system to date is estimated to be 35,800 pounds or approximately 5,510 gallons (at a density of 6.5 pounds per gallon). Compared to the second quarter 2010, when the SVE system began operation, concentrations of TPHg and benzene have decreased by over 96 percent in wells MW-11, TP-1, TP-2, and VW-2. Concentrations of TPHg and benzene have remained stable in well MW-1, which operates sporadically because of fluctuating water levels. Figures 6, 7, and 8 show soil vapor influent concentrations, mass removal by volatilization, and mass removal by biodegradation, respectively. Soil vapor sampling procedures are in Attachment C.

### Oxygen Injection System

The oxygen injection system operated at 100 percent uptime during the second quarter 2012. The system delivered oxygen to the subsurface in pulsed intervals to increase oxygen levels while decreasing the potential for “pushing” dissolved hydrocarbons away from injection wells. The oxygen purity was approximately 95 percent and the average flow rate was 35 standard cubic feet per hour.

During the second quarter 2012, oxygen was injected into wells IP-2 through IP-5 for 32 minutes at a time and wells IP-6 and IP-7 for 52 minutes at a time. Wells IP-1 and IP-8 through IP-10 remained shut down for ISCO pilot test monitoring. During the second quarter 2012, DO was monitored in the operating injection wells and monitoring wells DW-1, MW-1, MW-2, MW-11, TP-1, TP-2, and VW-2. Average DO was approximately 5.8 mg/l at the injection wells and approximately 7.4 mg/l at the monitoring wells located within 10 feet of active injection wells. Average DO at the injection wells increased from approximately 4.2 mg/l in April and May 2012 to 9.1 mg/l in June 2012. In June 2012, DO in well IP-6 increased above 10 mg/l for the first time since April 2011. DO will continue to be monitored during the third quarter 2012. DO readings are summarized in Attachment G.

### **Offsite Investigation Activities**

#### Well Installation

During the second quarter 2012, Arctos installed two offsite monitoring wells adjacent to each other and screened in shallow and deep intervals as described in a work plan dated 6 April 2012 and approved in a 16 April 2012 letter from ACEH. The objective of the monitoring wells was to monitor downgradient migration of petroleum hydrocarbon-impacted groundwater in the deep and shallow intervals. The completed scope of work included the following tasks:

- Obtained a permit from Zone 7 Water Agency for well installation (Attachment H)
- Marked the boring locations and notified Underground Service Alert to identify subsurface utilities
- Updated the site-specific health and safety plan and monitored health and safety during field activities
- Installed shallow and deep offsite monitoring wells, designated as MW-12 and DW-9, respectively (Figure 2)
- Placed auger cuttings and wastewater into 55-gallon drums for offsite treatment and disposal

- Developed the monitoring wells
- Submitted well completion reports to Zone 7 Water Agency (Attachment I).

#### Field Procedures

Gregg Drilling & Testing, Inc. (Gregg Drilling), of Martinez, California, drilled the soil boring for the deep monitoring well on 4 June 2012 using a hollow-stem auger rig. Soil samples were collected at 5 feet below grade and 5-foot intervals thereafter for visual logging, vapor screening, and laboratory analysis. Gregg Drilling drilled the soil boring for the shallow monitoring well on 5 June 2012 using a hollow-stem auger rig. Soil samples were not collected.

The shallow monitoring well was designed to monitor the water quality in the upper zones of the aquifer and maintain exposed well screen during periods of high water levels. The deep monitoring well was designed to monitor the water quality in the lower zones of the aquifer beneath the shallow monitoring well screen interval and above the regional aquitard. The monitoring wells were constructed using 4-inch-diameter, flush-threaded Schedule 40 polyvinyl chloride (PVC) casings. Wells MW-12 and DW-9 were screened from 25 to 45 and 50 to 60 feet below grade, respectively, using 0.020-inch slotted PVC screen. The boring and well construction logs are in Attachment J. Drilling and well installation QA/QC procedures are in Attachment K.

#### Well Development

Gregg Drilling developed wells MW-12 and DW-9 on 8 June 2012 by surging, bailing, and pumping to (1) remove fines from the filter pack and well screen and (2) reduce sediment in the water. A minimum of 10 casing volumes of water was removed from the wells. The well development logs are in Attachment L.

#### Soil Borings

On 4 and 5 June 2012, Gregg Drilling advanced three borings (designated DB-8 through DB-10) using a truck-mounted cone penetration testing (CPT) rig (Figure 2). The borings were advanced northwest of the site to depths ranging from approximately 92 to 115 feet below grade. The borings were logged continuously using measurements of cone bearing, sleeve friction, and pore water pressure. The boring logs and field investigation and QA/QC procedures are in Attachment J and K, respectively.

#### Grab Groundwater Sampling

Arctos attempted to collect grab groundwater samples from borings DB-8 through DB-10. Samples were collected from discrete intervals in boring DB-8 at 52 to 57 feet below grade and from boring DB-9 at 50 to 55 feet below grade. An insufficient amount of groundwater entered the sampling chamber from boring DB-10 at 50 to 55 feet below grade. Grab groundwater sampling procedures are in Attachment K.



### Site Surveying

On 12 June 2012, Cross Land Surveying, Inc., of San Jose, California, surveyed the new wells and borings. The well and boring locations were measured to the nearest 1/10 foot and elevation to the nearest 1/100 foot relative to MSL at the ground surface. The elevation was based on City of Livermore Benchmark K2-741 (elevation of 467.835 feet above MSL) at the intersection of South P Street and Railroad Avenue in Livermore, California. The survey data are reflected on Figure 2. The site survey report is in Attachment M.

### **Offsite Investigation Results**

#### Soil Samples

The subsurface soil encountered during drilling generally consisted of the following intervals.

<b>Depth (feet below ground surface)</b>	<b>Soil Description</b>
0 to 20	Sands and gravels
20 to 30	Silts and sandy silts
30 to 70	Sands, gravels, and cemented sands
70 to 80	Silts and cemented sands
80 to 110	Sandy silts, silts, and clays
110 to 115	Sands and cemented sands

The regional aquitard was observed in boring DB-8 from approximately 80 to 110 feet below grade and consisted of sandy silts, silts, and clays. A lithologic cross section is shown on Figure 9.

TPHg was detected in soil samples collected from the boring for well DW-9 at depths ranging from 50 to 75 feet below grade. The highest TPHg concentration of 260 milligrams per kilogram was detected at a depth of 60 feet below grade. MTBE was not detected in any soil samples collected from the boring for well DW-9. TPHg and benzene were not detected between 0 and 45 feet below grade, or at 80 feet below grade. Soil analytical results are in Table 7. The laboratory report and the chain-of-custody form are in Attachment F.

#### Groundwater Samples

On 14 June 2012, EFS collected groundwater samples from wells MW-12 and DW-9 after the wells were installed and developed. TPHg was detected at concentrations of 6,900 and 8,300 µg/l in wells MW-12 and DW-9, respectively. Based on historical site data for offsite deep monitoring wells, TPHg concentrations are typically highest just after

well installation and then decrease (Attachment E). Wells MW-12 and DW-9 will be monitored during the third quarter 2012 and quarterly thereafter.

Grab groundwater samples were collected from borings DB-8 and DB-9. Concentrations of TPHg, benzene, and MTBE were not detected in groundwater collected from boring DB-8 in the interval 52 to 57 feet below grade, located west of deep monitoring well DW-5. TPHg, benzene, and MTBE were detected at concentrations of 18,000, 610, and 180 µg/l, respectively, from boring DB-9 in the interval 50 to 55 feet below grade, located approximately 40 feet upgradient of deep well DW-7. All offsite benzene concentrations were below the RWQCB's ESL of 1,800 µg/l for evaluation of potential vapor intrusion concerns. These and existing site data were used to estimate the lateral and vertical extent of the offsite TPHg plume, shown on Figure 9. The laboratory report and the chain-of-custody form are in Attachment F.

## Conclusions

Results of the groundwater sampling, SVE operation, and oxygen injection system operation indicate the following conclusions:

1. Onsite groundwater concentrations have decreased following SVE, oxygen injection, and ISCO injection activities.
2. Mass removal by the SVE system was limited by high water levels and low influent concentrations. Petroleum hydrocarbon concentrations in wells MW-11, VW-2, TP-1, and TP-2 have decreased over 96 percent since the second quarter 2010.
3. Oxygen demand is being met in groundwater surrounding the injection wells with an average DO concentration of 7.4 mg/l at monitoring wells located within 10 feet of active oxygen injection wells.
4. Based on the results of offsite investigation activities, the highest soil and groundwater impacts are located at depths of approximately 50 to 65 feet below grade, consistent with the onsite source area. Downgradient groundwater concentrations are consistent with the previous results and all offsite benzene concentrations are below the ESL for potential vapor intrusion concerns.

## Recommendations

Based on the activities completed during this quarter, Arctos recommends the following tasks during the third quarter of 2012:

- Continue operation of the SVE and oxygen injection systems
- Continue to monitor downgradient, offsite monitoring wells MW-12 and DW-9
- Continue to monitor ISCO pilot test groundwater monitoring wells in accordance with the work plan
- Design an expanded ISCO pilot test for onsite and offsite impacts.

If you have questions or comments, please call Scott Stromberg or Mike Purchase at 510/525-2180.

Very truly yours,

**ARCTOS ENVIRONMENTAL**



Scott Stromberg  
Senior Staff Geologist



Michael P. Purchase, P.E.  
Principal Engineer



Copy: Jeffrey M. Baker, P.E. – Tesoro Companies, Inc.  
Colleen Winey – Zone 7 Water Agency

Attachments: Table 1 – Well and Groundwater Elevations  
Table 2 – Groundwater Analytical Results  
Table 3 – Groundwater Analytical Results – Injection Wells  
Table 4 – ISCO Pilot Test General Chemistry Concentrations  
Table 5 – SVE Influent Analytical Results  
Table 6 – SVE System Parameters  
Table 7 – Soil Analytical Results  
Figure 1 – Site Location Map  
Figure 2 – Groundwater Elevation Contours  
Figure 3 – TPHg Concentration Contours  
Figure 4 – Benzene Concentration Contours  
Figure 5 – MTBE Concentration Contours  
Figure 6 – Soil Vapor Influent Concentrations  
Figure 7 – Mass Removal by Volatilization  
Figure 8 – Mass Removal by Biodegradation  
Figure 9 – Geologic Cross Section A-A' with TPHg Concentration Contours  
Attachment A – Groundwater Sampling QA/QC Procedures

Attachment B – Field Data Sheets  
Attachment C – Soil Vapor Sampling QA/QC Procedures  
Attachment D – Historical Well and Groundwater Elevations  
Attachment E – Historical Groundwater Analytical Results  
Attachment F – Laboratory Analytical Reports and Chain-of-Custody Forms  
Attachment G – Oxygen System Monitoring Results  
Attachment H – Zone 7 Water Agency Well Installation Permit  
Attachment I – Zone 7 Water Agency Well Completion Reports  
Attachment J – Boring and Well Construction Logs  
Attachment K – Well Installation and Field Investigation QA/QC Procedures  
Attachment L – Well Development Logs  
Attachment M – Site Survey Report  
Attachment N – Waste Manifests

## References

Arctos Environmental, 2011. *Work Plan for ISCO Pilot Test, 1619 1st Street, Livermore, California, Tesoro No. 67076 (Former Beacon 3604); ACEH Case No. RO0000434, 9 September.*

Arctos Environmental, 2012. *In Situ Chemical Oxidation (ISCO) Pilot Test Report, Tesoro Site No. 67076 (Former Beacon 3604), 1619 1st Street, Livermore, California, 16 March.*

Arctos Environmental, 2012. *Work Plan for Downgradient Well Installation, 1619 1st Street, Livermore, California, Tesoro No. 67076 (Former Beacon 3604); ACEH Case No. RO0000434, 6 April.*

U.S. Environmental Protection Agency, 1995. *Bioventing Principles and Practice, Volume II: Bioventing Design.*

**TABLE 1**

**WELL AND GROUNDWATER ELEVATIONS  
TESORO - LIVERMORE, 67076**

<b>Well No.</b>	<b>Date of Measurement</b>	<b>Depth to Water (feet below casing)</b>	<b>PVC Casing Elevation<sup>(a)</sup> (feet MSL)</b>	<b>Water Table Elevation<sup>(b)</sup> (feet MSL)</b>
MW-1	4/25/11	27.73	474.21 <sup>(c)</sup>	446.48
	8/3/11	31.57		442.64
	10/10/11	33.12		441.09
	1/31/12	36.11		438.10
	5/7/12	36.14		438.07
MW-2	4/25/11	28.49	472.98	444.49
	8/3/11	32.40		440.58
	10/10/11	33.51		439.47
	1/31/12	39.52		433.46
	5/7/12	36.89		436.09
MW-3	4/25/11	27.60	473.37	445.77
	8/3/11	31.69		441.68
	10/10/11	33.96		439.41
	1/31/12	39.05		434.32
	5/7/12	36.03		437.34
MW-4	4/25/11	28.69	473.64	444.95
	8/3/11	32.01		441.63
	10/10/11	34.49		439.15
	1/31/12	38.91		434.73
	5/7/12	36.24		437.40
MW-5	4/25/11	29.03	472.67	443.64
	8/3/11	33.18		439.49
	10/10/11	35.58		437.09
	1/31/12	39.80		432.87
	5/7/12	37.29		435.38
MW-6	4/25/11	30.72	471.93	441.21
	8/3/11	34.95		436.98
	10/10/11	37.45		434.48
	1/31/12	42.15		429.78
	5/7/12	39.11		432.82
MW-7	4/25/11	27.75	472.33	444.58
	8/3/11	31.36		440.97

TABLE 1

WELL AND GROUNDWATER ELEVATIONS  
TESORO - LIVERMORE, 67076

Well No.	Date of Measurement	Depth to Water (feet below casing)	PVC Casing Elevation <sup>(a)</sup> (feet MSL)	Water Table Elevation <sup>(b)</sup> (feet MSL)
MW-7 (cont.)	10/10/11	33.63	472.33	438.70
	1/31/12	38.74		433.59
	5/7/12	35.97		436.36
MW-8	4/25/11	28.72	471.18	442.46
	8/3/11	33.09		438.09
	10/10/11	35.69		435.49
	1/31/12	40.08		431.10
	5/7/12	37.38		433.80
MW-9	4/25/11	30.64	470.78	440.14
	8/3/11	35.17		435.61
	10/10/11	37.64		433.14
	1/31/12	42.06		428.72
	5/7/12	39.43		431.35
MW-10	4/25/11	29.63	471.63	442.00
	8/3/11	33.26		438.37
	10/10/11	35.62		436.01
	1/31/12	39.67		431.96
	5/7/12	38.14		433.49
MW-11	4/25/11	27.31	472.96 <sup>(c)</sup>	445.65
	8/3/11	31.11		441.85
	10/10/11	33.27		439.69
	1/31/12	34.36		438.60
	5/7/12	31.61		441.35
MW-12	6/14/12	40.62	469.77	429.15
VW-2	4/25/11	25.43	472.57 <sup>(c)</sup>	447.14
	8/3/11	26.82		445.75
	10/10/11	33.29		439.28
	1/31/12	32.19		440.38
	5/7/12	31.50		441.07
VW-3	4/25/11	27.81	474.38	446.57
	8/3/11	28.93		445.45
	10/10/11	33.66		440.72
	1/31/12	DRY <sup>(d)</sup>		--
	5/7/12	DRY		--

**TABLE 1**

**WELL AND GROUNDWATER ELEVATIONS  
TESORO - LIVERMORE, 67076**

<b>Well No.</b>	<b>Date of Measurement</b>	<b>Depth to Water (feet below casing)</b>	<b>PVC Casing Elevation<sup>(a)</sup> (feet MSL)</b>	<b>Water Table Elevation<sup>(b)</sup> (feet MSL)</b>
TP-1	4/25/11	28.23	472.64 <sup>(c)</sup>	444.41
	8/3/11	31.85		440.79
	10/10/11	31.60		441.04
	1/31/12	35.43		437.21
	5/7/12	34.70		437.94
TP-2	4/25/11	28.30	472.78 <sup>(c)</sup>	444.48
	8/3/11	31.59		441.19
	10/10/11	32.14		440.64
	1/31/12	34.32		438.46
	5/7/12	34.41		438.37
DW-1	4/25/11	27.96	472.85	444.89
	8/3/11	31.96		440.89
	10/10/11	34.40		438.45
	1/31/12	39.39		433.46
	5/7/12	36.35		436.50
DW-2	4/25/11	30.69	471.61	440.92
	8/3/11	35.00		436.61
	10/10/11	37.44		434.17
	1/31/12	42.19		429.42
	5/7/12	39.10		432.51
DW-3	4/25/11	30.45	470.33	439.88
	8/3/11	34.71		435.62
	10/10/11	37.00		433.33
	1/31/12	42.10		428.23
	5/7/12	38.70		431.63
DW-4	4/25/11	30.12	468.48	438.36
	8/3/11	34.54		433.94
	10/10/11	36.60		431.88
	1/31/12	42.10		426.38
	5/7/12	38.26		430.22
DW-5	4/25/11	30.59	471.86	441.27
	8/3/11	34.64		437.22

**TABLE 1**

**WELL AND GROUNDWATER ELEVATIONS  
TESORO - LIVERMORE, 67076**

<b>Well No.</b>	<b>Date of Measurement</b>	<b>Depth to Water (feet below casing)</b>	<b>PVC Casing Elevation<sup>(a)</sup> (feet MSL)</b>	<b>Water Table Elevation<sup>(b)</sup> (feet MSL)</b>
DW-5 (cont.)	10/10/11	37.00	471.86	434.86
	1/31/12	42.31		429.55
	5/7/12	38.98		432.88
DW-6	4/25/11	31.32	471.77	440.45
	8/3/11	35.63		436.14
	10/10/11	38.09		433.68
	1/31/12	42.69		429.08
	5/7/12	39.82		431.95
DW-7	4/25/11	30.82	470.07	439.25
	8/3/11	35.19		434.88
	10/10/11	37.55		432.52
	1/31/12	42.35		427.72
	5/7/12	39.30		430.77
DW-8	4/25/11	27.23	472.31	445.08
	8/3/11	31.14		441.17
	10/10/11	33.41		438.90
	1/31/12	38.69		433.62
	5/7/12	35.52		436.79
DW-9	6/14/12	40.85	469.80	428.95

- (a) Elevation of PVC well casing (north edge) surveyed relative to mean sea level (MSL).  
Wells were surveyed by Cross Land Surveying, Inc., per AB 2886 requirements.  
Benchmark K2-741, elevation is 467.835 feet above MSL.
- (b) Water Table Elevation = (Casing Elevation - Depth to Water)
- (c) Wells were resurveyed by Cross Land Surveying, Inc., per AB 2886 requirements, on 19 October 2010 after remediation system construction.  
Benchmark K2-741, elevation is 467.835 feet above MSL.
- (d) Depth of groundwater assumed to be below screened interval; well had 6 inches or less of water.



TABLE 2

**GROUNDWATER ANALYTICAL RESULTS  
TESORO - LIVERMORE, 67076**

Monitoring Well	Sample Date	TPHg <sup>(a)</sup> (µg/l)	Benzene <sup>(a)</sup> (µg/l)	Toluene <sup>(a)</sup> (µg/l)	Ethylbenzene <sup>(a)</sup> (µg/l)	Total Xylenes <sup>(a)</sup> (µg/l)	MTBE <sup>(a)</sup> (µg/l)	DIPE <sup>(a)</sup> (µg/l)	ETBE <sup>(a)</sup> (µg/l)	TAME <sup>(a)</sup> (µg/l)	TBA <sup>(a)</sup> (µg/l)	Methanol <sup>(a)</sup> (µg/l)	Ethanol <sup>(a)</sup> (µg/l)	1,2-DCA <sup>(a)</sup> (µg/l)	EDB <sup>(a)</sup> (µg/l)
MW-1	4/25/11	130	ND<0.5 <sup>(b)</sup>	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5
	8/3/11	1,500	2.0	15	44	86	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5
	10/11/11	2,300	6.0	30	15	64	ND<0.5	ND<0.5	ND<0.5	ND<0.5	10	ND<50	ND<8	ND<0.5	ND<0.5
	1/31/12	1,700	1.6	11	26	89	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<100	ND<0.5	ND<0.5
	5/9/12	3,300	2.2	5.5	52	89	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<100	ND<5	ND<0.5	ND<0.5
MW-2	4/28/11	13,000	1,400	100	470	670	450	ND<2.5	ND<2.5	4.6	200	ND<250	ND<50	ND<2.5	ND<2.5
	8/4/11	16,000	1,900	200	430	820	660	ND<3	ND<3	5.7	420	ND<1,500	ND<30	ND<3	ND<3
	10/11/11	7,000	810	110	200	430	370	ND<1.5	ND<1.5	3.3	170	ND<250	ND<15	ND<1.5	ND<1.5
	2/1/12	14,000	1,200	130	440	650	340	ND<2.5	ND<2.5	5.4	170	ND<800	ND<25	ND<2.5	ND<2.5
	5/11/12	14,000	1,200	140	490	1,000	220	ND<2.5	ND<2.5	2.7	120	ND<250	ND<25	ND<2.5	ND<2.5
MW-3	4/25/11	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5
	8/4/11	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5
	10/10/11	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5
	1/31/12	ND<50	ND<0.5	0.67	7.1	3.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5
	5/7/12	74	ND<0.5	0.56	1.9	7.7	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5
MW-4	4/26/11	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5
	8/4/11	NS <sup>(c)</sup>	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	10/11/11	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5
	1/31/12	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	5/7/12	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5
MW-5	4/25/11	190	ND<0.5	ND<0.5	0.80	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5
	8/4/11	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	10/10/11	160	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5
	1/31/12	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	5/8/12	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5

TABLE 2

**GROUNDWATER ANALYTICAL RESULTS  
TESORO - LIVERMORE, 67076**

Monitoring Well	Sample Date	TPHg <sup>(a)</sup> (µg/l)	Benzene <sup>(a)</sup> (µg/l)	Toluene <sup>(a)</sup> (µg/l)	Ethylbenzene <sup>(a)</sup> (µg/l)	Total Xylenes <sup>(a)</sup> (µg/l)	MTBE <sup>(a)</sup> (µg/l)	DIPE <sup>(a)</sup> (µg/l)	ETBE <sup>(a)</sup> (µg/l)	TAME <sup>(a)</sup> (µg/l)	TBA <sup>(a)</sup> (µg/l)	Methanol <sup>(a)</sup> (µg/l)	Ethanol <sup>(a)</sup> (µg/l)	1,2-DCA <sup>(a)</sup> (µg/l)	EDB <sup>(a)</sup> (µg/l)
MW-6	4/27/11	8,500	870	28	180	67	1,200	ND<2.5	ND<2.5	10	1,100	ND<250	ND<25	ND<2.5	ND<2.5
	8/4/11	6,300	600	17	58	16	650	ND<1.5	ND<1.5	7.8	1,000	ND<600	ND<15	ND<1.5	ND<1.5
	10/11/11	10,000	1,000	60	160	66	370	ND<2.5	ND<2.5	3.1	860	ND<250	ND<25	ND<2.5	ND<2.5
	1/31/12	5,200	370	6.7	5.1	12	84	ND<0.9	ND<0.9	ND<0.9	1,500	ND<90	ND<10	ND<0.9	ND<0.9
	5/10/12	11,000	1,200	60	140	69	150	ND<0.9	ND<0.9	ND<2	290	ND<250	ND<9	ND<0.9	ND<0.9
MW-7	4/26/11	1,200	3.3	0.59	1.6	1.3	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5
	8/4/11	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	10/10/11	1,900	3.5	1.2	0.79	1.6	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5
	1/31/12	1,700	1.5	0.55	6.0	1.1	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5
	5/9/12	1,600	1.4	0.79	1.4	0.95	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5
MW-8	4/25/11	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5
	8/4/11	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	10/10/11	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5
	1/31/12	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	5/7/12	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5
MW-9	4/26/11	1,300	14	ND<0.5	2.8	0.71	23	ND<0.5	ND<0.5	ND<0.5	26	ND<50	ND<5	ND<0.5	ND<0.5
	8/4/11	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	10/11/11	470	ND<0.5	ND<0.5	ND<0.5	ND<0.5	3.0	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5
	1/31/12	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	5/8/12	2,500	12	1.1	9.0	3.0	7.4	ND<0.5	ND<0.5	ND<0.5	8.8	ND<50	ND<5	ND<0.5	ND<0.5
MW-10	4/25/11	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5
	8/4/11	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	10/10/11	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5
	1/31/12	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	5/7/12	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5
MW-11	4/28/11	20,000	300	920	450	4,300	ND<5	ND<5	ND<5	ND<5	ND<25	ND<500	ND<50	ND<5	ND<5
	8/4/11	15,000	96	370	240	2,800	ND<4	ND<4	ND<4	ND<4	ND<20	ND<400	ND<40	ND<4	ND<4

TABLE 2

**GROUNDWATER ANALYTICAL RESULTS  
TESORO - LIVERMORE, 67076**

Monitoring Well	Sample Date	TPHg <sup>(a)</sup> (µg/l)	Benzene <sup>(a)</sup> (µg/l)	Toluene <sup>(a)</sup> (µg/l)	Ethylbenzene <sup>(a)</sup> (µg/l)	Total Xylenes <sup>(a)</sup> (µg/l)	MTBE <sup>(a)</sup> (µg/l)	DIPE <sup>(a)</sup> (µg/l)	ETBE <sup>(a)</sup> (µg/l)	TAME <sup>(a)</sup> (µg/l)	TBA <sup>(a)</sup> (µg/l)	Methanol <sup>(a)</sup> (µg/l)	Ethanol <sup>(a)</sup> (µg/l)	1,2-DCA <sup>(a)</sup> (µg/l)	EDB <sup>(a)</sup> (µg/l)
MW-11 (cont.)	10/25/11	18,000	130	500	319	2,900	ND<0.5	ND<0.5	ND<0.5	ND<0.5	18	ND<50	ND<10	ND<0.5	ND<0.5
	2/1/12	13,000	380	710	83	2,400	ND<2.5	ND<2.5	ND<2.5	ND<2.5	ND<15	ND<250	ND<50	ND<2.5	ND<2.5
	5/11/12	1,100	3.8	15	6.7	150	0.52	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<8	ND<0.5	ND<0.5
MW-12	6/14/12	6,900	8.5	2.2	96	22	ND<0.9	ND<0.9	ND<0.9	ND<0.9	ND<5	ND<90	ND<9	ND<0.9	ND<0.9
VW-2	4/28/11	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5
	8/4/11	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	10/10/11	ND<50	ND<0.5	ND<0.5	ND<0.5	0.51	0.79	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5
	1/31/12	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	5/7/12	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	0.83	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5
VW-3	4/25/11	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5
	8/4/11	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	10/10/11	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5
	1/31/12	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	5/7/12	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
TP-1	4/28/11	6,600	350	64	170	730	2,600	ND<5	ND<5	15	1,400	ND<500	ND<50	ND<5	ND<5
	8/4/11	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	10/11/11	2,000	32	4.3	49	220	1,500	ND<3	ND<3	9.7	1,000	ND<800	ND<30	ND<3	ND<3
	1/31/12	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	5/8/12	590	1.6	ND<0.5	7.1	22	28	ND<0.5	ND<0.5	ND<0.5	27	ND<80	ND<5	ND<0.5	ND<0.5
TP-2	4/28/11	130	1.6	ND<0.5	1.5	5.2	350	ND<0.5	ND<0.5	1.3	630	ND<50	ND<5	ND<0.5	ND<0.5
	8/4/11	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	10/11/11	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	120	ND<0.5	ND<0.5	ND<0.5	380	ND<50	ND<5	ND<0.5	ND<0.5
	1/31/12	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	5/7/12	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5
DW-1	4/28/11	72	2.2	5.7	2.0	9.3	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5
	8/4/11	55	0.57	ND<0.5	0.92	1.2	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5
	10/11/11	180	3.0	1.0	5.1	10	0.77	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5

TABLE 2

**GROUNDWATER ANALYTICAL RESULTS  
TESORO - LIVERMORE, 67076**

Monitoring Well	Sample Date	TPHg <sup>(a)</sup> (µg/l)	Benzene <sup>(a)</sup> (µg/l)	Toluene <sup>(a)</sup> (µg/l)	Ethylbenzene <sup>(a)</sup> (µg/l)	Total Xylenes <sup>(a)</sup> (µg/l)	MTBE <sup>(a)</sup> (µg/l)	DIPE <sup>(a)</sup> (µg/l)	ETBE <sup>(a)</sup> (µg/l)	TAME <sup>(a)</sup> (µg/l)	TBA <sup>(a)</sup> (µg/l)	Methanol <sup>(a)</sup> (µg/l)	Ethanol <sup>(a)</sup> (µg/l)	1,2-DCA <sup>(a)</sup> (µg/l)	EDB <sup>(a)</sup> (µg/l)
DW-1 (cont.)	2/1/12	2,500	23	6.4	85	190	3.6	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5
	5/9/12	2,000	24	5.6	75	160	2.9	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5
DW-2	4/27/11	1,900	78	2.6	2.6	5.6	200	ND<0.5	ND<0.5	2.2	590	ND<300	ND<5	ND<0.5	ND<0.5
	8/4/11	4,400	420	10	24	13	160	ND<0.5	ND<0.5	2.1	500	ND<100	ND<10	ND<0.5	ND<0.5
	10/11/11	2,700	110	5.0	4.0	11	170	ND<0.5	ND<0.5	1.9	440	ND<100	ND<5	ND<0.5	ND<0.5
	1/31/12	4,400	220	7.0	15	8.9	130	ND<0.5	ND<0.5	1.2	400	ND<50	ND<5	ND<0.5	ND<0.5
	5/10/12	2,200	140	8.6	0.63	15	98	ND<0.5	ND<0.5	1.1	430	ND<200	ND<8	ND<0.5	ND<0.5
DW-3	4/27/11	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5
	8/4/11	310	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5
	10/10/11	120	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5
	1/31/12	1,300	1.0	ND<0.5	19	15	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5
	5/8/12	750	1.2	ND<0.5	5.4	4.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<80	ND<5	ND<0.5	ND<0.5
DW-4	4/26/11	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5
	8/4/11	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	10/10/11	ND<50	ND<0.5	0.67	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5
	1/31/12	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	5/7/12	ND<50	ND<0.5	ND<0.5	ND<0.5	0.98	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5
DW-5	4/27/11	710	8.0	ND<0.5	4.3	2.1	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5
	8/4/11	6,100	76	3.7	110	97	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<20	ND<0.5	ND<0.5
	10/10/11	6,800	59	4.7	140	150	ND<1.5	ND<1.5	ND<1.5	ND<1.5	ND<7	ND<150	ND<15	ND<1.5	ND<1.5
	1/31/12	8,200	130	5.9	170	180	ND<1.5	ND<1.5	ND<1.5	ND<1.5	ND<7	ND<150	ND<200	ND<1.5	ND<1.5
	5/10/12	11,000	100	6.8	320	380	ND<1.5	ND<1.5	ND<1.5	ND<1.5	ND<7	ND<150	ND<20	ND<1.5	ND<1.5
DW-6	4/27/11	3,100	8.8	2.4	12	8.2	6.2	ND<0.5	ND<0.5	ND<0.5	19	ND<50	ND<8	ND<0.5	ND<0.5
	8/4/11	2,900	4.2	0.95	6.0	4.9	6.5	ND<0.5	ND<0.5	ND<0.5	24	ND<50	ND<8	ND<0.5	ND<0.5
	10/10/11	1,500	4.1	3.3	3.0	3.3	4.9	ND<0.5	ND<0.5	ND<0.5	20	ND<50	ND<5	ND<0.5	ND<0.5
	1/31/12	4,700	13	2.4	51	12	8.1	ND<0.5	ND<0.5	ND<0.5	28	ND<50	ND<80	ND<0.5	ND<0.5
	5/10/12	2,600	7.8	1.6	12	5.2	4.6	ND<0.5	ND<0.5	ND<0.5	17	ND<50	ND<5	ND<0.5	ND<0.5

TABLE 2

GROUNDWATER ANALYTICAL RESULTS  
TESORO - LIVERMORE, 67076

Monitoring Well	Sample Date	TPHg <sup>(a)</sup> (µg/l)	Benzene <sup>(a)</sup> (µg/l)	Toluene <sup>(a)</sup> (µg/l)	Ethylbenzene <sup>(a)</sup> (µg/l)	Total Xylenes <sup>(a)</sup> (µg/l)	MTBE <sup>(a)</sup> (µg/l)	DIPE <sup>(a)</sup> (µg/l)	ETBE <sup>(a)</sup> (µg/l)	TAME <sup>(a)</sup> (µg/l)	TBA <sup>(a)</sup> (µg/l)	Methanol <sup>(a)</sup> (µg/l)	Ethanol <sup>(a)</sup> (µg/l)	1,2-DCA <sup>(a)</sup> (µg/l)	EDB <sup>(a)</sup> (µg/l)
DW-7	4/27/11	1,600	120	4.6	4.2	6.7	95	ND<0.5	ND<0.5	1.0	170	ND<200	ND<5	ND<0.5	ND<0.5
	8/4/11	1,400	83	2.5	4.4	5.2	97	ND<0.5	ND<0.5	1.0	160	ND<80	ND<5	ND<0.5	ND<0.5
	10/11/11	400	45	1.1	0.80	1.6	90	ND<0.5	ND<0.5	0.89	180	ND<50	ND<5	ND<0.5	ND<0.5
	1/31/12	7,800	380	14	170	59	120	ND<0.5	ND<0.5	1.3	300	ND<150	ND<50	ND<0.5	ND<0.5
	5/10/12	940	47	1.6	6.1	5.2	120	ND<0.5	ND<0.5	1.1	280	ND<50	ND<5	ND<0.5	ND<0.5
DW-8	4/28/11	72,000	5,200	10,000	1,900	12,000	ND<10	ND<10	ND<10	ND<10	56	ND<1,000	ND<100	ND<10	ND<10
	8/4/11	65,000	2,900	8,100	650	10,000	ND<20	ND<20	ND<20	ND<20	ND<90	ND<2,000	ND<200	ND<20	ND<20
	10/25/11	82,000	4,300	10,000	1,900	12,000	ND<4	ND<4	ND<4	ND<4	58	ND<400	ND<40	ND<4	ND<4
	2/1/12	52,000	2,500	5,200	1,900	8,200	ND<9	ND<9	ND<9	ND<9	ND<50	ND<900	ND<90	ND<9	ND<9
	5/11/12	11,000	500	1,000	300	1,200	ND<2.5	ND<2.5	ND<2.5	ND<2.5	25	ND<250	ND<25	ND<2.5	ND<2.5
DW-9	6/14/12	8,300	89	2.4	21	96	36	ND<1.5	ND<1.5	ND<1.5	80	ND<150	ND<15	ND<1.5	ND<1.5

(a) Total petroleum hydrocarbons as gasoline (TPHg), benzene, toluene, ethylbenzene, xylenes, methyl tert-butyl ether (MTBE), di-isopropyl ether (DIPE), ethyl tert-butyl ether (ETBE), tert-amyl methyl ether (TAME), tert-butyl alcohol (TBA), methanol, ethanol, 1,2-dichloroethane (1,2-DCA), and 1,2-dibromoethane (EDB) analyzed by EPA Method 8260; reported in micrograms per liter (µg/l).

(b) ND - Not detected at the reporting limit listed.

(c) NS - Not sampled.

TABLE 3

GROUNDWATER ANALYTICAL RESULTS - INJECTION WELLS  
TESORO - LIVERMORE, 67076

Monitoring Well	Sample Date	TPHg <sup>(a)</sup> (µg/l)	Benzene <sup>(a)</sup> (µg/l)	Toluene <sup>(a)</sup> (µg/l)	Ethylbenzene <sup>(a)</sup> (µg/l)	Total Xylenes <sup>(a)</sup> (µg/l)	MTBE <sup>(a)</sup> (µg/l)	DIPE <sup>(a)</sup> (µg/l)	ETBE <sup>(a)</sup> (µg/l)	TAME <sup>(a)</sup> (µg/l)	TBA <sup>(a)</sup> (µg/l)	Methanol <sup>(a)</sup> (µg/l)	Ethanol <sup>(a)</sup> (µg/l)	1,2-DCA <sup>(a)</sup> (µg/l)	EDB <sup>(a)</sup> (µg/l)
IP-1	7/23/08	62,000	2,100	6,800	2,700	11,000	16	ND<15 <sup>(b)</sup>	ND<15	ND<15	ND<70	ND<1,500	ND<150	ND<15	ND<15
	10/13/08	55,000	3,100	3,300	2,300	7,700	ND<15	ND<15	ND<15	ND<15	98	ND<1,500	ND<150	ND<15	ND<15
	5/5/10 <sup>(c)</sup>	33,000	900	1,500	1,400	5,000	ND<7	ND<7	ND<7	ND<7	ND<40	ND<700	ND<70	ND<7	ND<7
	4/27/11	24,000	750	2,200	420	4,800	ND<7	ND<7	ND<7	ND<7	ND<40	ND<700	ND<70	ND<7	ND<7
	2/1/12	15,000	370	350	600	1,300	ND<2	ND<2	ND<2	ND<2	16	ND<200	ND<20	NS <sup>(d)</sup>	NS
	5/9/12	16,000	580	850	800	2,100	ND<2	ND<2	ND<2	ND<2	12	ND<200	ND<20	ND<2	ND<2
IP-2	7/23/08	5,500	160	43	130	350	10	ND<0.9	ND<0.9	ND<0.9	ND<5	ND<90	ND<9	ND<0.9	ND<0.9
	10/13/08	13,000	1,900	58	600	630	180	ND<0.9	ND<0.9	9.4	46	ND<90	ND<20	ND<0.9	ND<0.9
	5/5/10 <sup>(c)</sup>	2,700	66	220	61	240	3.3	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5
	4/26/11	350	8.9	1.7	4.7	5.7	0.90	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5
	5/8/12	340	10	4.8	6.3	13	2.4	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5
IP-3	7/23/08	1,100	23	14	7.5	90	32	ND<0.5	ND<0.5	ND<0.5	32	ND<50	ND<5	ND<0.5	ND<0.5
	10/13/08	1,700	83	4.7	11	54	72	ND<0.5	ND<0.5	0.84	71	ND<50	ND<8	ND<0.5	ND<0.5
	5/5/10 <sup>(c)</sup>	430 <sup>(e)</sup>	6.4	22	4.9	21	3.9	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<80	ND<5	ND<0.5	ND<0.5
	4/26/11	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5
	5/8/12	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5
IP-4	7/23/08	7,600	130	45	240	750	940	ND<1.5	ND<1.5	6.9	890	ND<150	ND<15	ND<1.5	ND<1.5
	10/13/08	4,200	110	11	78	310	3,700	ND<1.5	ND<1.5	7.1	15,000	ND<2,000	ND<15	ND<1.5	ND<1.5
	5/6/10 <sup>(c)</sup>	190	5.4	25	6.9	29	3.4	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5
	4/26/11	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	1.1	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5
	5/8/12	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	5.3	ND<0.5	ND<0.5
IP-5	7/23/08	2,000 <sup>(e)</sup>	3.0	17	5.1	31	4.4	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5
	10/13/08	720	14	13	8.7	32	19	ND<0.5	ND<0.5	ND<0.5	26	ND<50	ND<5	ND<0.5	ND<0.5
	5/6/10 <sup>(c)</sup>	270	5.7	25	5.9	29	20	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<80	ND<5	ND<0.5	ND<0.5
	4/26/11	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	0.72	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5
	5/8/12	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5
IP-6	7/23/08	4,400	260	78	98	340	180	ND<0.5	ND<0.5	1.6	190	ND<80	ND<9	ND<0.5	ND<0.5
	10/13/08	1,400	150	1.6	1.5	3.5	7.4	ND<0.5	ND<0.5	ND<0.5	10	ND<50	ND<50	ND<0.5	ND<0.5

TABLE 3

GROUNDWATER ANALYTICAL RESULTS - INJECTION WELLS  
TESORO - LIVERMORE, 67076

Monitoring Well	Sample Date	TPHg <sup>(a)</sup> (µg/l)	Benzene <sup>(a)</sup> (µg/l)	Toluene <sup>(a)</sup> (µg/l)	Ethylbenzene <sup>(a)</sup> (µg/l)	Total Xylenes <sup>(a)</sup> (µg/l)	MTBE <sup>(a)</sup> (µg/l)	DIPE <sup>(a)</sup> (µg/l)	ETBE <sup>(a)</sup> (µg/l)	TAME <sup>(a)</sup> (µg/l)	TBA <sup>(a)</sup> (µg/l)	Methanol <sup>(a)</sup> (µg/l)	Ethanol <sup>(a)</sup> (µg/l)	1,2-DCA <sup>(a)</sup> (µg/l)	EDB <sup>(a)</sup> (µg/l)
IP-6 (cont.)	5/5/10 <sup>(c)</sup>	8,000 <sup>(e)</sup>	24	100	18	98	0.51	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<80	ND<5	ND<0.5	ND<0.5
	4/27/11	ND<50	1.1	0.66	ND<0.5	0.71	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5
	5/8/12	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5
IP-7	7/23/08	4,200	190	12	99	190	49	ND<0.9	ND<0.9	1.1	58	ND<90	ND<9	ND<0.9	ND<0.9
	10/13/08	6,000	350	6.6	150	60	97	ND<0.9	ND<0.9	2.5	76	ND<90	ND<50	ND<0.9	ND<0.9
	5/5/10 <sup>(c)</sup>	33,000	49	62	38	69	14	ND<0.9	ND<0.9	ND<0.9	20	ND<90	ND<9	ND<0.9	ND<0.9
	4/27/11	220	8.1	0.69	3.4	1.50	0.95	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5
	5/8/12	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5
IP-8	12/16/08	120,000	7,800	20,000	3,500	16,000	ND<40	ND<40	ND<40	ND<40	ND<200	ND<4,000	ND<400	ND<40	ND<40
	5/5/10 <sup>(c)</sup>	83,000	3,900	13,000	2,400	14,000	ND<25	ND<25	ND<25	ND<25	ND<150	ND<2,500	ND<250	ND<25	ND<25
	4/28/11	13,000	620	2,000	240	2,200	ND<3	ND<3	ND<3	ND<3	27	ND<300	ND<30	ND<3	ND<3
	2/1/12	67,000	2,900	7,300	1,400	11,000	ND<15	ND<15	ND<15	ND<15	ND<70	ND<1,500	ND<150	NS	NS
	5/9/12	50,000	2,400	4,900	790	8,600	ND<9	ND<9	ND<9	ND<9	ND<50	ND<900	ND<90	ND<9	ND<9
IP-9	12/16/08	110,000	7,800	23,000	2,800	16,000	ND<40	ND<40	ND<40	ND<40	ND<200	ND<4,000	ND<400	ND<40	ND<40
	5/5/10 <sup>(c)</sup>	92,000	6,000	19,000	2,500	14,000	ND<40	ND<40	ND<40	ND<40	ND<200	ND<4,000	ND<400	ND<40	ND<40
	4/28/11	38,000	1,400	4,300	860	6,000	ND<6	ND<6	ND<6	ND<6	38	ND<600	ND<60	ND<6	ND<6
	2/1/12	19,000	180	1,200	640	3,100	ND<3	ND<3	ND<3	ND<3	ND<15	ND<300	ND<30	NS	NS
	5/9/12	10,000	14	180	270	780	ND<1.5	ND<1.5	ND<1.5	ND<1.5	ND<7	ND<150	ND<15	ND<1.5	ND<1.5
IP-10	2/11/09	8,100	29	58	170	1,200	ND<1.5	ND<1.5	ND<1.5	ND<1.5	ND<7	ND<150	ND<20	ND<1.5	ND<1.5
	5/3/10 <sup>(c)</sup>	3,600	73	80	140	240	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<20	ND<0.5	ND<0.5
	4/26/11	4,300	28	140	110	330	ND<0.5	ND<0.5	ND<0.5	ND<0.5	10	ND<50	ND<8	ND<0.5	ND<0.5
	2/1/12	3,200	8.2	4.6	93	2.0	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<20	NS	NS
	5/9/12	3,900	24	38	110	58	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<20	ND<0.5	ND<0.5

- (a) Total petroleum hydrocarbons as gasoline (TPHg), benzene, toluene, ethylbenzene, xylenes, methyl tert-butyl ether (MTBE), di-isopropyl ether (DIPE), ethyl tert-butyl ether (ETBE), tert-amyl methyl ether (TAME), tert-butyl alcohol (TBA), 1,2-dichloroethane (1,2-DCA), and 1,2-dibromoethane (EDB) analyzed by EPA Method 8260; reported in micrograms per liter ( µg/l).
- (b) ND - Not detected at the reporting limit listed.
- (c) Baseline remediation system values.
- (d) NS - Not sampled.
- (e) Primarily compounds not found in typical Gasoline.

TABLE 4

**ISCO PILOT TEST GENERAL CHEMISTRY CONCENTRATIONS  
TESORO - LIVERMORE, 67076**

Monitoring Well	Sample Date	Nitrate <sup>(a)</sup> (mg/l)	Sulfate <sup>(a)</sup> (mg/l)	Arsenic <sup>(b)</sup> (mg/l)	Chromium <sup>(b)</sup> (mg/l)	Iron <sup>(b)</sup> (mg/l)	Manganese <sup>(b)</sup> (mg/l)	Sodium <sup>(b)</sup> (mg/l)	Hex Chrome <sup>(c)</sup> (µg/l)	Fe(2+) <sup>(d)</sup> (mg/l)	CO <sub>2</sub> <sup>(e)</sup> (µg/l)	CH <sub>4</sub> <sup>(e)</sup> (µg/l)	Alk <sup>(f)</sup> (mg/l)	TDS <sup>(g)</sup> (mg/l)
MW-11	9/20/11	ND<0.1 <sup>(h)</sup>	30	ND<0.015	0.0056	1.8	3.6	67	ND<1	ND<0.1	90,300	36.0	702	840
	10/25/11	ND<0.5	85	ND<0.015	0.011	3.2	2.8	290	ND<1	ND<0.1	60,100	55.1	1,200	1,520
	11/17/11	ND<0.1	170	0.030	0.010	2.9	1.2	740	ND<1	ND<0.15	1,870	6.52	1,630	2,340
	12/14/11	0.12	140	0.021	0.034	9.6	0.84	540	2.6	ND<0.1	29,200	10.1	316	2,270
	2/1/12	ND<0.1	76	0.14	1.6	680	36	470	ND<1	ND<0.1	170 <sup>(i)</sup>	27.4	1,430	1,640
	5/11/12	0.34	14	ND<0.015	0.050	15	2.8	210	ND<1	0.11	140 <sup>(i)</sup>	99.1	771	870
MW-2	12/15/11	ND<0.1	23	ND<0.015	0.026	7.4	2.2	51	ND<1	ND<0.1	64,200	2,040	574	540
	2/1/12	ND<0.1	7.6	0.030	0.18	55	5.9	52	ND<1	ND<0.1	100 <sup>(i)</sup>	3,080	562	655
	5/11/12	ND<0.1	12	ND<0.015	0.098	29	5.5	46	ND<1	ND<0.1	120 <sup>(i)</sup>	1,670	496	600
MW-7	12/15/11	ND<0.1	6.5	ND<0.015	0.32	88	5.4	58	ND<1	ND<0.1	28,100	1,080	433	515
	5/9/12	ND<0.1	7.3	0.037	0.36	110	7.1	59	ND<1	ND<0.1	55 <sup>(i)</sup>	1,210	377	540
IP-1	9/20/11	ND<0.1	3.9	ND<0.015	ND<0.005	1.3	2.6	34	ND<1	ND<0.1	24,000	474	369	483
	10/25/11	ND<0.5	11	ND<0.015	0.018	2.6	2.4	64	ND<1	ND<0.1	20,600	311	378	557
	11/17/11	ND<0.1	24	0.02	0.012	3.9	3.8	93	ND<1	ND<0.1	34,300	1,180	576	660
	12/15/11	0.20	26	0.015	0.017	5.5	3.3	110	ND<1	0.11	12,800	916	580	620
	2/1/12	ND<0.1	1.2	ND<0.015	ND<0.005	2.0	3.6	73	ND<1	ND<0.1	72 <sup>(i)</sup>	1,130	542	635
	5/9/12	ND<0.1	ND<0.5	ND<0.015	0.011	5.8	3.7	76	ND<1	ND<0.1	96 <sup>(i)</sup>	1,060	530	650
IP-8	9/20/11	0.17	10	ND<0.015	ND<0.005	0.54	2.0	35	ND<1	ND<0.1	6,930	49.6	229	350
	10/25/11	ND<0.5	44	ND<0.015	ND<0.005	1.6	3.8	140	ND<1	ND<0.1	12,300	109	692	1,020
	11/17/11	ND<0.1	69	ND<0.015	0.011	3.2	3.3	160	ND<1	ND<0.1	4,470	184	795	960
	11/22/11	0.31	34	ND<0.015	0.011	2.9	2.4	81	ND<1	ND<0.1	32,800	1,150	562	715
	12/14/11	0.24	52	ND<0.015	0.023	6.2	3.7	110	ND<1	ND<0.1	11,800	80.6	650	920
	2/1/12	ND<0.1	42	ND<0.015	0.036	11	3.0	110	ND<1	ND<0.1	48 <sup>(i)</sup>	262	688	890
	5/9/12	ND<0.1	26	ND<0.015	0.0098	3.1	2.5	100	ND<1	ND<0.1	44 <sup>(i)</sup>	143	686	925
IP-9	9/20/11	ND<0.1	11	ND<0.015	ND<0.005	0.34	1.1	41	ND<1	ND<0.1	10,100	64.6	305	413
	10/25/11	ND<2.5	630	0.24	0.21	50	0.92	4,700	84	ND<0.1	935	7.51	9,770	12,200



TABLE 4

**ISCO PILOT TEST GENERAL CHEMISTRY CONCENTRATIONS  
TESORO - LIVERMORE, 67076**

Monitoring Well	Sample Date	Nitrate <sup>(a)</sup> (mg/l)	Sulfate <sup>(a)</sup> (mg/l)	Arsenic <sup>(b)</sup> (mg/l)	Chromium <sup>(b)</sup> (mg/l)	Iron <sup>(b)</sup> (mg/l)	Manganese <sup>(b)</sup> (mg/l)	Sodium <sup>(b)</sup> (mg/l)	Hex Chrome <sup>(c)</sup> (µg/l)	Fe(2+) <sup>(d)</sup> (mg/l)	CO <sub>2</sub> <sup>(e)</sup> (µg/l)	CH <sub>4</sub> <sup>(e)</sup> (µg/l)	Alk <sup>(f)</sup> (mg/l)	TDS <sup>(g)</sup> (mg/l)
IP-9 (cont.)	11/17/11	2.5	710	0.16	0.15	34	0.54	8,500	79	ND<0.15	14,500	3.88	18,700	21,300
	11/22/11	ND<0.5	300	0.049	0.017	1.8	0.10	1,500	12	ND<0.1	1,080	302	3,010	3,960
	12/14/11	ND<2	1,400	0.42	0.15	30	0.65	18,000	90	ND<0.1	5,130	5.12	35,100	44,300
	2/1/12	0.76	850	0.56	0.074	9.2	0.14	7,200	79	ND<0.1	ND<5 <sup>(i)</sup>	54.0	14,000	20,400
	5/9/12	0.62	620	0.66	0.074	12	0.14	4,600	60	ND<0.1	ND<5 <sup>(i)</sup>	59.4	9,490	7,480
IP-10	9/20/11	ND<0.1	26	ND<0.015	ND<0.005	0.46	1.4	48	ND<1	ND<0.1	5,530	39.0	290	483
	10/25/11	ND<0.5	37	ND<0.015	ND<0.005	0.79	4.2	74	ND<1	ND<0.1	15,500	139	390	625
	11/17/11	ND<0.1	34	ND<0.015	0.015	4.2	2.8	96	ND<1	ND<0.1	26,700	711	458	510
	12/14/11	ND<0.1	31	ND<0.015	ND<0.01	3.2	3.5	92	ND<1	ND<0.1	14,000	644	455	640
	2/1/12	ND<0.1	21	ND<0.015	ND<0.005	0.54	2.8	64	ND<1	ND<0.1	36 <sup>(i)</sup>	237	353	505
	5/9/12	ND<0.1	4.2	ND<0.015	ND<0.005	1.0	3.0	66	ND<1	ND<0.1	46 <sup>(i)</sup>	478	368	530
DW-8	9/20/11	ND<0.1	6.7	ND<0.015	ND<0.005	1.9	2.8	45	ND<1	ND<0.1	27,600	1,110	502	615
	10/25/11	ND<0.5	85	ND<0.015	ND<0.005	1.4	1.2	100	ND<1	ND<0.1	16,000	519	564	780
	11/17/11	ND<0.1	48	ND<0.015	ND<0.005	0.76	1.5	92	ND<1	ND<0.1	19,100	140	591	610
	11/22/11	ND<0.1	24	ND<0.015	0.031	9.1	2.4	64	ND<1	0.16	23,200	1,480	498	560
	12/15/11	ND<0.1	36	ND<0.015	ND<0.005	0.88	2.4	78	ND<1	ND<0.1	19,100	1,210	510	560
	2/1/12	ND<0.1	37	ND<0.015	0.0055	1.9	3.0	90	ND<1	ND<0.1	51 <sup>(i)</sup>	1,170	598	795
	5/11/12	ND<0.1	14	ND<0.015	ND<0.005	0.12	0.14	77	2.2	ND<0.1	ND<5 <sup>(i)</sup>	306	195	330

- (a) Nitrate and sulfate analyzed by EPA Method 300.0; reported in milligrams per liter (mg/l).  
(b) Arsenic, chromium, iron, manganese, and sodium analyzed by EPA Method 6010B; reported in mg/l.  
(c) Hexavalent chromium (Hex Chrome) analyzed by EPA Method 7199; reported in micrograms per liter (µg/l).  
(d) Ferrous Iron (Fe (2+)) analyzed by Standard Method 3500-Fe D; reported in mg/l.  
(e) Carbon dioxide (CO<sub>2</sub>) and methane (CH<sub>4</sub>) analyzed by RSK-175M; reported in µg/l.  
(f) Total alkalinity as CaCO<sub>3</sub> analyzed by Standard Method 2320B; reported in mg/l.  
(g) Total dissolved solids (TDS) analyzed by Standard Method 2540 C; reported in mg/l.  
(h) ND - Not detected at the reporting limit listed.  
(i) CO<sub>2</sub> analyzed by Standard Method 4500 C; reported in mg/l.

TABLE 5

**SVE INFLUENT ANALYTICAL RESULTS  
TESORO - LIVERMORE, 67076**

Sample ID	Date	TPHg <sup>(a)</sup> (ppmv)	Benzene <sup>(a)</sup> (ppmv)	Toluene <sup>(a)</sup> (ppmv)	Ethylbenzene <sup>(a)</sup> (ppmv)	Xylenes <sup>(a)</sup> (ppmv)	MTBE <sup>(a)</sup> (ppmv)	Methane <sup>(b)</sup> (%)	Carbon Dioxide <sup>(b)</sup> (%)	Carbon Monoxide <sup>(b)</sup> (%)	Oxygen <sup>(b)</sup> (%)	Nitrogen <sup>(b)</sup> (%)
SVE-Influent-0	6/29/10	5,300	16	20	45	110	75	-- <sup>(c)</sup>	--	--	--	--
SVE-Influent-1	6/29/10	4,700	15	12	36	90	58	0.58	3.6	ND<0.5 <sup>(d)</sup>	16.4	79.4
SVE-Influent	6/30/10	3,200	12	20	30	76	60	--	--	--	--	--
SVE-Influent	7/1/10	3,400	12	22	34	84	68	ND<0.5	4.0	ND<0.5	15.9	80.1
SVE-Influent	7/6/10	4,000	9.4	24	36	92	87	ND<0.5	4.3	ND<0.5	16.1	79.5
SVE-Influent	7/8/10	7,500	14	25	44	110	87	ND<0.5	5.3	ND<0.5	13.5	81.0
SVE-Influent	7/14/10	4,200	7.0	22	29	82	50	ND<0.5	5.5	ND<0.5	15.5	78.9
SVE-Influent	7/28/10	3,000	3.5	15	20	64	34	ND<0.5	4.0	ND<0.5	17.4	78.6
SVE-Manifold	8/5/10	4,800	4.4	12	20	66	28	ND<0.5	5.3	ND<0.5	12.1	82.4
SVE-Manifold	8/18/10	4,300	4.3	12	19	72	29	ND<0.5	5.2	ND<0.5	13.2	81.5
SVE-Manifold	9/7/10	1,100	2.2	6.2	4.8	26	10	ND<0.5	4.1	ND<0.5	17.6	78.3
SVE-Manifold	9/16/10	1,600	3.2	8.3	7.6	44	13	ND<0.5	4.0	ND<0.5	17.6	78.4
SVE-Manifold	9/29/10	1,800	2.8	5.6	6.1	34	12	ND<0.5	3.6	ND<0.5	15.4	81.0
SVE-Manifold	10/7/10	2,100	6.1	8.8	7.3	36	11	ND<0.5	3.6	ND<0.5	18.1	78.2
SVE-Manifold	10/13/10	2,100	7.8	10	6.1	32	8.9	ND<0.5	3.4	ND<0.5	16.8	79.7
SVE-Manifold	12/8/10	2,500	2.6	6.4	4.8	28	5.4	ND<0.5	4.7	ND<0.5	23.8	71.4
SVE-Manifold	12/14/10	1,700	2.1	5.4	5.2	30	4.9	ND<0.5	4.1	ND<0.5	18.3	77.6
SVE-Manifold	12/21/10	640	0.91	4.1	3.9	26	3.8	ND<0.5	2.2	ND<0.5	20.1	77.7
SVE-Manifold	12/29/10	150	ND<0.05	ND<0.05	ND<0.05	0.09	ND<0.05	ND<0.5	2.3	ND<0.5	19.2	78.4
SVE-Manifold	1/12/11	280	ND<0.05	ND<0.05	ND<0.05	0.09	--	ND<0.5	3.5	ND<0.5	18.5	77.9
SVE-Manifold	3/4/11	620	ND<0.1	ND<0.09	ND<0.08	0.1	--	ND<0.5	5.1	ND<0.5	46.6	48.3
SVE-Manifold	3/9/11	440	ND<0.1	ND<0.09	ND<0.08	ND<0.08	ND<0.1	ND<0.5	4.2	ND<0.5	24.6	71.2

TABLE 5

**SVE INFLUENT ANALYTICAL RESULTS  
TESORO - LIVERMORE, 67076**

Sample ID	Date	TPHg <sup>(a)</sup> (ppmv)	Benzene <sup>(a)</sup> (ppmv)	Toluene <sup>(a)</sup> (ppmv)	Ethylbenzene <sup>(a)</sup> (ppmv)	Xylenes <sup>(a)</sup> (ppmv)	MTBE <sup>(a)</sup> (ppmv)	Methane <sup>(b)</sup> (%)	Carbon Dioxide <sup>(b)</sup> (%)	Carbon Monoxide <sup>(b)</sup> (%)	Oxygen <sup>(b)</sup> (%)	Nitrogen <sup>(b)</sup> (%)
SVE-Manifold	3/30/11	5.2	ND<0.05	ND<0.05	ND<0.05	ND<0.05	ND<0.1	ND<0.5	3.3	ND<0.5	22.9	73.8
SVE-Manifold	4/19/11	38	ND<0.05	ND<0.05	ND<0.05	ND<0.05	ND<0.1	ND<0.5	4.6	ND<0.5	18.9	76.5
SVE-Manifold	4/28/11	150	ND<0.05	ND<0.05	ND<0.05	ND<0.05	ND<0.1	ND<0.5	4.8	ND<0.5	17.5	77.6
SVE-Manifold	5/12/11	280	ND<0.06	ND<0.05	ND<0.05	ND<0.05	ND<0.1	ND<0.5	4.7	ND<0.5	17.2	78.1
SVE-Manifold	5/25/11	330	0.15	0.13	ND<0.05	0.10	ND<0.1	ND<0.5	5.1	ND<0.5	16.4	78.5
SVE-Manifold	6/8/11	340	0.082	ND<0.05	ND<0.05	0.084	ND<0.1	ND<0.5	4.5	ND<0.5	15.9	79.6
SVE-Manifold	6/16/11	370	0.12	0.052	0.059	0.15	ND<0.1	ND<0.5	5.3	ND<0.5	15.0	79.7
SVE-Manifold	6/16/11	360	0.19	ND<0.07	ND<0.06	0.13	ND<0.1	ND<0.5	5.3	ND<0.5	15.0	79.7
SVE-Manifold	6/16/11	370	0.20	0.083	0.056	0.18	ND<0.1	ND<0.5	4.8	ND<0.5	15.6	79.6
SVE-Manifold	6/27/11	310	0.22	0.11	ND<0.05	0.18	ND<0.1	ND<0.5	4.7	ND<0.5	16.5	78.9
SVE-Manifold	7/7/11	130	ND<0.05	ND<0.05	ND<0.05	ND<0.05	ND<0.1	ND<0.5	4.5	ND<0.5	18.3	77.2
SVE-Manifold	7/13/11	78	ND<0.05	ND<0.05	ND<0.05	ND<0.05	ND<0.1	ND<0.5	4.9	ND<0.5	18.4	76.7
SVE-Manifold	7/27/11	88	ND<0.05	ND<0.05	ND<0.05	ND<0.05	ND<0.1	ND<0.5	4.4	ND<0.5	19.0	76.6
SVE-Manifold	8/9/11	87	ND<0.05	ND<0.05	ND<0.05	ND<0.05	ND<0.1	ND<0.5	4.2	ND<0.5	19.6	76.2
SVE-Manifold	8/23/11	92	ND<0.05	ND<0.05	ND<0.05	ND<0.05	ND<0.1	ND<0.5	4.3	ND<0.5	19.7	76.0
SVE-Manifold	9/1/11	140	ND<0.05	ND<0.05	ND<0.05	ND<0.05	ND<0.1	ND<0.5	4.2	ND<0.5	19.5	76.3
SVE-Manifold	9/1/11	310	0.086	0.29	0.14	1.5	ND<0.1	ND<0.5	3.6	ND<0.5	22.9	73.5
SVE-Manifold	9/15/11	310	0.32	1.2	0.16	4.3	ND<0.1	ND<0.5	2.8	ND<0.5	20.1	77.1
SVE-Manifold	9/27/11	360	0.24	0.94	0.16	3.4	ND<0.1	ND<0.5	2.7	ND<0.5	20.3	77.1
SVE-Manifold	10/20/11	130	ND<0.05	0.15	0.085	1.3	0.11	ND<0.5	2.7	ND<0.5	21.8	75.5
SVE-Catox Influent <sup>(e)</sup>	11/10/11	110	ND<0.05	0.10	ND<0.05	0.83	ND<0.1	ND<0.5	2.7	ND<0.5	21.3	76.1
SVE-Manifold	11/21/11	190	ND<0.05	0.071	ND<0.05	0.75	0.10	ND<0.5	2.7	ND<0.5	20.4	76.9

**TABLE 5**

**SVE INFLUENT ANALYTICAL RESULTS  
TESORO - LIVERMORE, 67076**

Sample ID	Date	TPHg <sup>(a)</sup> (ppmv)	Benzene <sup>(a)</sup> (ppmv)	Toluene <sup>(a)</sup> (ppmv)	Ethylbenzene <sup>(a)</sup> (ppmv)	Xylenes <sup>(a)</sup> (ppmv)	MTBE <sup>(a)</sup> (ppmv)	Methane <sup>(b)</sup> (%)	Carbon Dioxide <sup>(b)</sup> (%)	Carbon Monoxide <sup>(b)</sup> (%)	Oxygen <sup>(b)</sup> (%)	Nitrogen <sup>(b)</sup> (%)
SVE-Manifold	12/7/11	170	ND<0.05	ND<0.05	ND<0.05	0.42	ND<0.1	ND<0.5	2.5	ND<0.5	20.8	76.7
SVE-Manifold	12/19/11	250	ND<0.05	ND<0.05	ND<0.05	0.57	0.12	ND<0.5	2.6	ND<0.5	21.6	75.7
SVE-Manifold	1/5/12	450	0.082	0.063	0.063	1.1	0.23	ND<0.5	2.5	ND<0.5	21.5	76.0
SVE-Manifold	1/23/12	490	0.074	0.051	0.062	1.0	0.36	ND<0.5	2.0	ND<0.5	22.0	75.9
SVE-Manifold	1/26/12	530	0.067	ND<0.05	0.052	0.87	0.34	ND<0.5	1.8	ND<0.5	21.6	76.7
SVE-Manifold	1/26/12	800	0.78	2.0	0.35	3.6	ND<0.1	ND<0.5	1.6	ND<0.5	22.3	76.1
SVE-Manifold	2/2/12	440	0.90	1.9	0.16	4.4	ND<0.1	ND<0.5	0.99	ND<0.5	22.6	76.4
SVE-Manifold	2/16/12	430	0.29	1.2	0.16	4.0	ND<0.1	ND<0.5	0.93	ND<0.5	22.5	76.5
SVE-Manifold	2/28/12	380	0.11	0.60	0.10	2.7	ND<0.07	ND<0.5	0.96	ND<0.5	22.4	76.6
SVE-Manifold	3/14/12	250	0.056	0.48	0.086	1.8	ND<0.1	ND<0.5	0.82	ND<0.5	22.6	76.6
SVE-Manifold	4/4/12	74	0.060	0.49	0.089	1.6	ND<0.1	ND<0.5	0.51	ND<0.5	21.8	77.7
SVE-Manifold	4/17/12	110	0.19	1.5	0.24	3.9	ND<0.1	ND<0.5	0.60	ND<0.5	21.5	77.9
SVE-Manifold	5/16/12	43	0.056	0.34	0.063	1.5	ND<0.1	ND<0.5	0.55	ND<0.5	21.4	78.0
SVE-Manifold	6/19/12	37	ND<0.05	0.13	ND<0.05	0.99	ND<0.1	ND<0.5	ND<0.5	ND<0.5	21.6	77.9

- (a) Total petroleum hydrocarbons as gasoline (TPHg), benzene, toluene, ethylbenzene, xylenes, and methyl tert-butyl ether (MTBE), analyzed by EPA Method 8260; reported in parts per million by volume (ppmv).
- (b) Fixed gases analyzed by Method ASTM D-1946; reported in percent (%).
- (c) "--" - Not analyzed.
- (d) ND - Not detected at the reporting limit listed.
- (e) SVE manifold influent vapor sample damaged during shipping to lab. Results of total well inlet and recirculation air used for data analysis.

TABLE 6

**SVE SYSTEM PARAMETERS  
TESORO - LIVERMORE, 67076**

Influent Sample Number	Sample Date	Hours of Operation (hours)	Days of Operation (Days)	TPHg Concentration (ppmv)	Differential Pressure (in. wc)	Temp (°F)	Vacuum (in. Hg)	Standard Flow (scfm)	Volatilization	Biological	
									Mass Removal Rate (lbs/day)	Concentration of Carbon Dioxide (%)	Mass Removal Rate (lbs/day)
1	6/29/10	8.7	0.4	5,300	-- <sup>(a)</sup>	--	1.5	63 <sup>(b)</sup>	124	--	NA <sup>(c)</sup>
2	6/29/10	13	0.5	4,700	--	--	1.3	63 <sup>(b)</sup>	110	3.6	117
3	6/30/10	31	1	3,200	0.03	71	1.5	63 <sup>(b)</sup>	75	--	NA
4	7/1/10	56	2	3,400	0.05	72	1.5	63 <sup>(b)</sup>	80	4.0	130
5	7/6/10	175	7	4,000	0.04	69	1.5	63 <sup>(b)</sup>	94	4.3	139
6	7/8/10	200	8	7,500	0.03	73	1.5	63 <sup>(b)</sup>	176	5.3	171
7	7/14/10	343	14	4,200	1.25	90	1.5	81	127	5.5	230
8	7/28/10	625	26	3,000	0.62	68	1.5	59	65	4.0	122
9	8/5/10	793	33	4,800	0.73	68	1.0	65	115	5.3	177
10	8/18/10	985	41	4,300	0.64	71	1.0	60	97	5.2	162
11	9/7/10	1,309	55	1,100	2.05	75	1.6	106	43	4.1	222
12	9/16/10	1,473	61	1,600	0.81	76	1.4	67	40	4.0	136
13	9/29/10	1,628	68	1,800	0.08	89	1.5	21	14	3.6	38
14	10/7/10	1,821	76	2,100	0.26	69	1.5	38	30	3.6	70
15	10/13/10	1,866	78	2,100	0.09	76	3.3	21	16	3.4	36
16	12/8/10	1,912	80	2,500	1.02	53	2.4	74	69	4.7	178
17	12/14/10	2,051	85	1,700	1.45	58	2.1	89	56	4.1	187
18	12/21/10	2,221	93	640	0.78	59	2.1	65	15	2.2	72
19	12/29/10 <sup>(d)</sup>	2,412	101	150	0.35	49	4.1	41	2.3	2.3	48
20	1/12/11	2,748	115	280	--	54	4.2	14 <sup>(e)</sup>	1.5	3.5	26
21	3/4/11	2,922	122	620	--	63	5.9	15	3.5	5.1	40
22	3/9/11	3,040	127	440	--	68	2.4	13	2.1	4.2	28

TABLE 6

SVE SYSTEM PARAMETERS  
TESORO - LIVERMORE, 67076

Influent Sample Number	Sample Date	Hours of Operation (hours)	Days of Operation (Days)	TPHg Concentration (ppmv)	Differential Pressure (in. wc)	Temp (°F)	Vacuum (in. Hg)	Standard Flow (scfm)	Volatilization	Biological	
									Mass Removal Rate (lbs/day)	Concentration of Carbon Dioxide (%)	Mass Removal Rate (lbs/day)
23	3/30/11	3,539	147	5.2	--	55	2.4	12	0.02	3.3	20
24	4/19/11	4,020	168	38	--	63	2.3	12	0.2	4.6	29
25	4/28/11	4,238	177	150	--	65	2.3	15	0.9	4.8	38
26	5/12/11	4,570	190	280	--	60	2.4	14	1.5	4.7	34
27	5/25/11	4,885	204	330	--	66	2.4	11	1.4	5.1	29
28	6/8/11	5,219	217	340	--	64	2.4	9	1.2	4.5	21
29	6/16/11	5,410	225	370	--	68	2.4	9	1.2	5.3	24
30	6/16/11	5,412	225	360	--	73	4.1	15	2.0	5.3	42
31	6/16/11	5,416	226	370	--	83	4.0	13	1.7	4.8	32
32	6/27/11	5,676	237	310	--	71	4.0	16	1.8	4.7	38
33	7/7/11	5,918	247	130	--	91	4.0	15	0.7	4.5	35
34	7/13/11	6,062	253	78	--	72	4.1	16	0.5	4.9	41
35	7/27/11	6,395	266	88	--	74	4.0	16	0.5	4.4	35
36	8/9/11	6,709	280	87	--	75	4.0	16	0.5	4.2	35
37	8/23/11	7,015	292	92	--	83	4.0	15	0.5	4.3	33
38	9/1/11	7,227	301	140	--	66	4.0	20	1.0	4.2	43
39	9/1/11	7,231	301	310	--	74	3.6	14	1.6	3.6	25
40	9/15/11	7,566	315	310	--	70	3.6	17	2.0	2.8	25
41	9/27/11	7,857	327	360	--	81	3.5	13	1.7	2.7	17
42	10/20/11	8,379	349	130	--	74	3.6	20	1.0	2.7	28
43	11/10/11	8,867	369	110	--	60	3.7	11	0.5	2.7	16
44	11/21/11	9,131	380	190	--	57	3.7	17	1.2	2.7	23
45	12/7/11	9,513	396	170	--	54	3.7	16	1.0	2.5	21

TABLE 6

SVE SYSTEM PARAMETERS  
TESORO - LIVERMORE, 67076

Influent Sample Number	Sample Date	Hours of Operation (hours)	Days of Operation (Days)	TPHg Concentration (ppmv)	Differential Pressure (in. wc)	Temp (°F)	Vacuum (in. Hg)	Standard Flow (scfm)	Volatilization	Biological	
									Mass Removal Rate (lbs/day)	Concentration of Carbon Dioxide (%)	Mass Removal Rate (lbs/day)
46	12/19/11	9,798	408	250	--	51	3.7	--	--	2.6	26
47	1/5/12	10,208	425	450	--	53	3.6	22	3.6	2.5	28
48	1/23/12	10,638	443	490	--	51	3.4	33	5.9	2.0	34
49	1/26/12	10,710	446	530	--	55	3.6	30	6.0	1.8	27
50	1/26/12	10,711	446	800	--	56	3.6	52	15	1.6	43
51	2/2/12	10,878	453	440	--	52	3.6	51	8.4	1.0	25
52	2/16/12	11,215	467	430	--	56	3.5	54	8.6	0.9	25
53	2/28/12	11,501	479	380	--	56	3.3	54	7.6	1.0	26
54	3/14/12	11,862	494	250	--	60	3.4	51	4.7	0.8	21
55	4/4/12	12,365	515	74	--	57	3.5	50	1.4	0.5	12
56	4/17/12	12,676	528	110	--	60	3.7	26	1.1	0.6	7.7
57	5/16/12	13,378	557	43	--	74	3.4	38	0.6	0.6	10
58	6/19/12	14,189	591	37	--	76	3.2	38	0.5	0.3	4.2

- (a) "--" - Not sampled, analyzed, or collected.
- (b) An average flow rate was used due to inaccurate system parameter readings.
- (c) NA - Not applicable.
- (d) Only operating on well VW-2 due to high water levels.
- (e) Flow measurements taken with a TSI anemometer for better accuracy at low flow rates.

TABLE 7

**SOIL ANALYTICAL RESULTS  
TESORO - LIVERMORE, 67076**

Boring	Depth (feet)	Sample Date	TPHg <sup>(a)</sup> (mg/kg)	Benzene <sup>(a)</sup> (mg/kg)	Toluene <sup>(a)</sup> (mg/kg)	Ethylbenzene <sup>(a)</sup> (mg/kg)	Total Xylenes <sup>(a)</sup> (mg/kg)	MTBE <sup>(a)</sup> (mg/kg)	DIPE <sup>(a)</sup> (mg/kg)	ETBE <sup>(a)</sup> (mg/kg)	TAME <sup>(a)</sup> (mg/kg)	TBA <sup>(a)</sup> (mg/kg)
DW-5	30	11/23/09	ND<1 <sup>(b)</sup>	ND<0.005	ND<0.005	ND<0.005	ND<0.005	ND<0.005	-- <sup>(c)</sup>	--	--	--
	50	11/23/09	ND<1	ND<0.005	ND<0.005	ND<0.005	ND<0.005	ND<0.005	--	--	--	--
DW-6	60	11/24/09	2.7	ND<0.005	ND<0.005	0.0098	0.0074	ND<0.005	--	--	--	--
DW-7	15	11/25/09	ND<1	ND<0.005	ND<0.005	ND<0.005	ND<0.005	ND<0.005	--	--	--	--
DW-8	35	4/13/11	ND<1	ND<0.005	ND<0.005	ND<0.005	ND<0.005	ND<0.005	ND<0.005	ND<0.005	ND<0.005	ND<0.005
	40	4/13/11	24	0.0087	ND<0.005	0.039	0.0099	ND<0.005	ND<0.005	ND<0.005	ND<0.005	ND<0.005
	45	4/13/11	ND<1	0.077	0.0066	0.14	0.12	ND<0.005	ND<0.005	ND<0.005	ND<0.005	ND<0.005
	50	4/13/11	120	1.8	0.15	2.5	0.31	ND<0.025	ND<0.025	ND<0.025	ND<0.025	ND<0.15
	55	4/13/11	76	0.37	1.6	1.0	4.7	ND<0.03	ND<0.03	ND<0.03	ND<0.03	ND<0.15
	60	4/13/11	2,400	6.6	110	42	210	ND<0.25	ND<0.25	ND<0.25	ND<0.25	ND<1.5
	65	4/13/11	150	0.28	0.67	1.0	6.6	ND<0.005	ND<0.005	ND<0.005	ND<0.005	ND<0.015
	70	4/13/11	14	0.10	0.13	0.35	0.22	ND<0.005	ND<0.005	ND<0.005	ND<0.005	ND<0.005
	75	4/13/11	3.1	0.021	0.19	0.14	0.63	ND<0.005	ND<0.005	ND<0.005	ND<0.005	ND<0.005
	85	4/13/11	ND<1	ND<0.005	ND<0.005	ND<0.005	0.0084	ND<0.005	ND<0.005	ND<0.005	ND<0.005	ND<0.005
90	4/13/11	ND<1	ND<0.005	ND<0.005	ND<0.005	ND<0.005	ND<0.005	ND<0.005	ND<0.005	ND<0.005	ND<0.005	
DW-9	5	6/4/12	ND<1	ND<0.005	ND<0.005	ND<0.005	ND<0.005	ND<0.005	ND<0.005	ND<0.005	ND<0.005	ND<0.005
	15	6/4/12	ND<1	ND<0.005	ND<0.005	ND<0.005	ND<0.005	ND<0.005	ND<0.005	ND<0.005	ND<0.005	ND<0.005
	20	6/4/12	ND<1	ND<0.005	ND<0.005	ND<0.005	ND<0.005	ND<0.005	ND<0.005	ND<0.005	ND<0.005	ND<0.005
	30	6/4/12	ND<1	ND<0.005	ND<0.005	ND<0.005	ND<0.005	ND<0.005	ND<0.005	ND<0.005	ND<0.005	ND<0.005
	40	6/4/12	ND<1	ND<0.005	ND<0.005	ND<0.005	ND<0.005	ND<0.005	ND<0.005	ND<0.005	ND<0.005	ND<0.005
	45	6/4/12	ND<1	ND<0.005	ND<0.005	ND<0.005	ND<0.005	ND<0.005	ND<0.005	ND<0.005	ND<0.005	ND<0.005
	50	6/4/12	72	0.10	ND<0.025	1.4	1.6	ND<0.025	ND<0.025	ND<0.025	ND<0.025	ND<0.15
	60	6/4/12	260	ND<0.05	ND<0.05	1.2	0.46	ND<0.05	ND<0.05	ND<0.05	ND<0.05	ND<0.25
	65	6/4/12	70	ND<0.005	ND<0.005	0.069	0.037	ND<0.005	ND<0.005	ND<0.005	ND<0.005	0.0070
70	6/4/12	ND<1	ND<0.005	ND<0.005	0.13	0.087	ND<0.005	ND<0.005	ND<0.005	ND<0.005	ND<0.15	

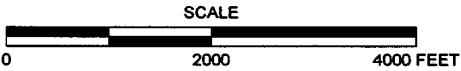
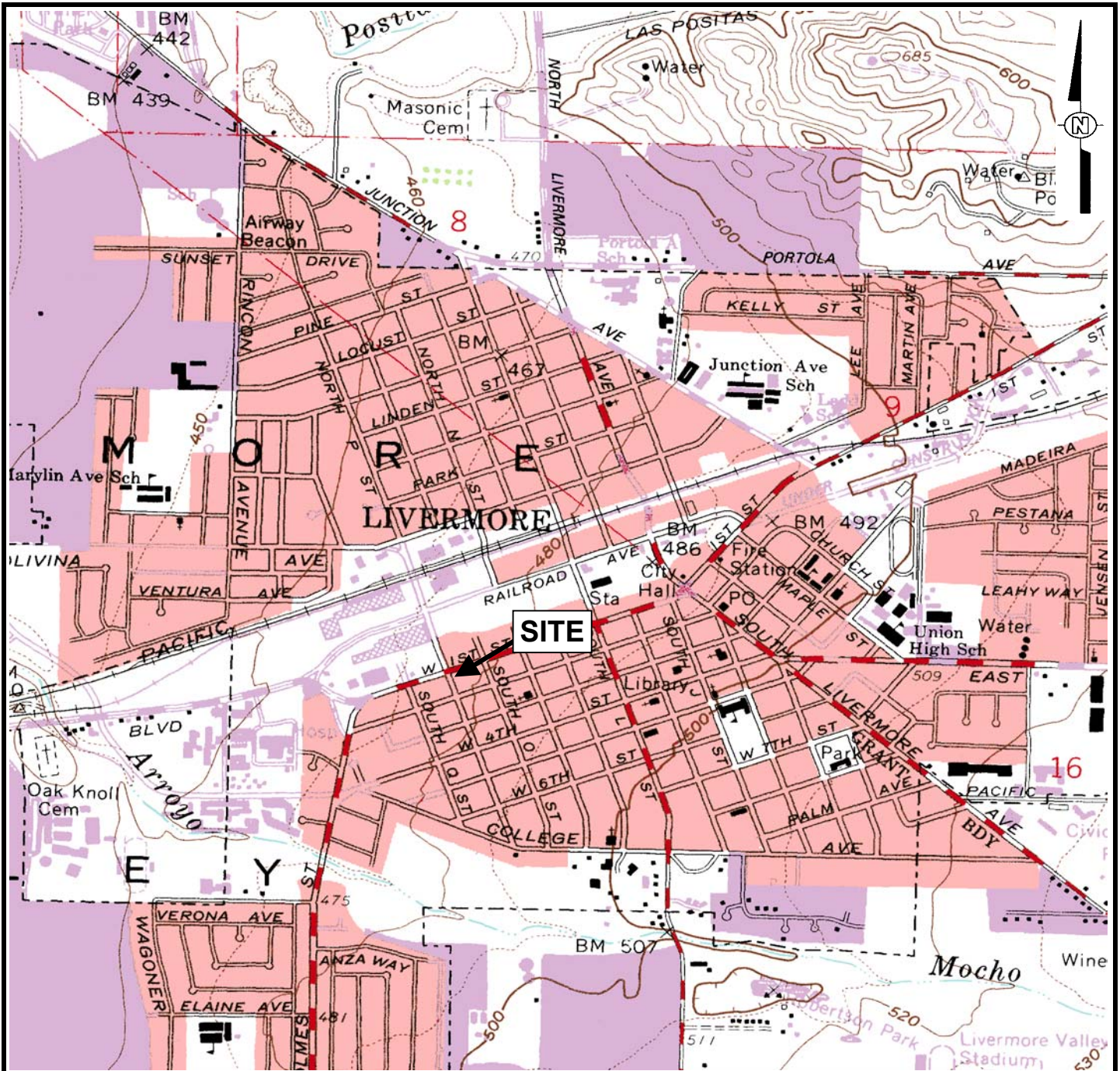


**TABLE 7**

**SOIL ANALYTICAL RESULTS  
TESORO - LIVERMORE, 67076**

<b>Boring</b>	<b>Depth (feet)</b>	<b>Sample Date</b>	<b>TPHg<sup>(a)</sup> (mg/kg)</b>	<b>Benzene<sup>(a)</sup> (mg/kg)</b>	<b>Toluene<sup>(a)</sup> (mg/kg)</b>	<b>Ethylbenzene<sup>(a)</sup> (mg/kg)</b>	<b>Total Xylenes<sup>(a)</sup> (mg/kg)</b>	<b>MTBE<sup>(a)</sup> (mg/kg)</b>	<b>DIPE<sup>(a)</sup> (mg/kg)</b>	<b>ETBE<sup>(a)</sup> (mg/kg)</b>	<b>TAME<sup>(a)</sup> (mg/kg)</b>	<b>TBA<sup>(a)</sup> (mg/kg)</b>
DW-9	75	6/4/12	28	0.028	ND<0.005	0.18	0.13	ND<0.005	ND<0.005	ND<0.005	ND<0.005	ND<0.025
(cont.)	80	6/4/12	ND<1	ND<0.005	ND<0.005	0.0089	0.0055	ND<0.005	ND<0.005	ND<0.005	ND<0.005	ND<0.005

- (a) Total petroleum hydrocarbons as gasoline (TPHg), benzene, toluene, ethylbenzene, xylenes, methyl tert-butyl ether (MTBE), di-isopropyl ether (DIPE), ethyl tert-butyl ether (ETBE), tert-amyl methyl ether (TAME), and tert-butyl alcohol (TBA), analyzed by EPA Method 8260B; reported in micrograms per kilogram (mg/kg).
- (b) ND - Not detected at the reporting limit listed.
- (c) "--" - Not analyzed.



**REFERENCE**  
 7.5 MINUTE USGS TOPOGRAPHIC MAP OF  
 LIVERMORE, CALIFORNIA QUADRANGLE  
 DATE: 1961, PHOTOREVISED 1980  
 SCALE = 1:24,000

<b>ARCTOS ENVIRONMENTAL</b>			
<b>TESORO - LIVERMORE</b>			
<b>SITE LOCATION MAP</b>			
PROJECT NO. 01LV	DRAWN BY MP	CHECKED BY MP	APPROVED BY JG
FILE NO. Site Map.xls		<b>FIGURE 1</b>	

7/5/2012 12:13PM 01LV11B-20416.dwg



Legend

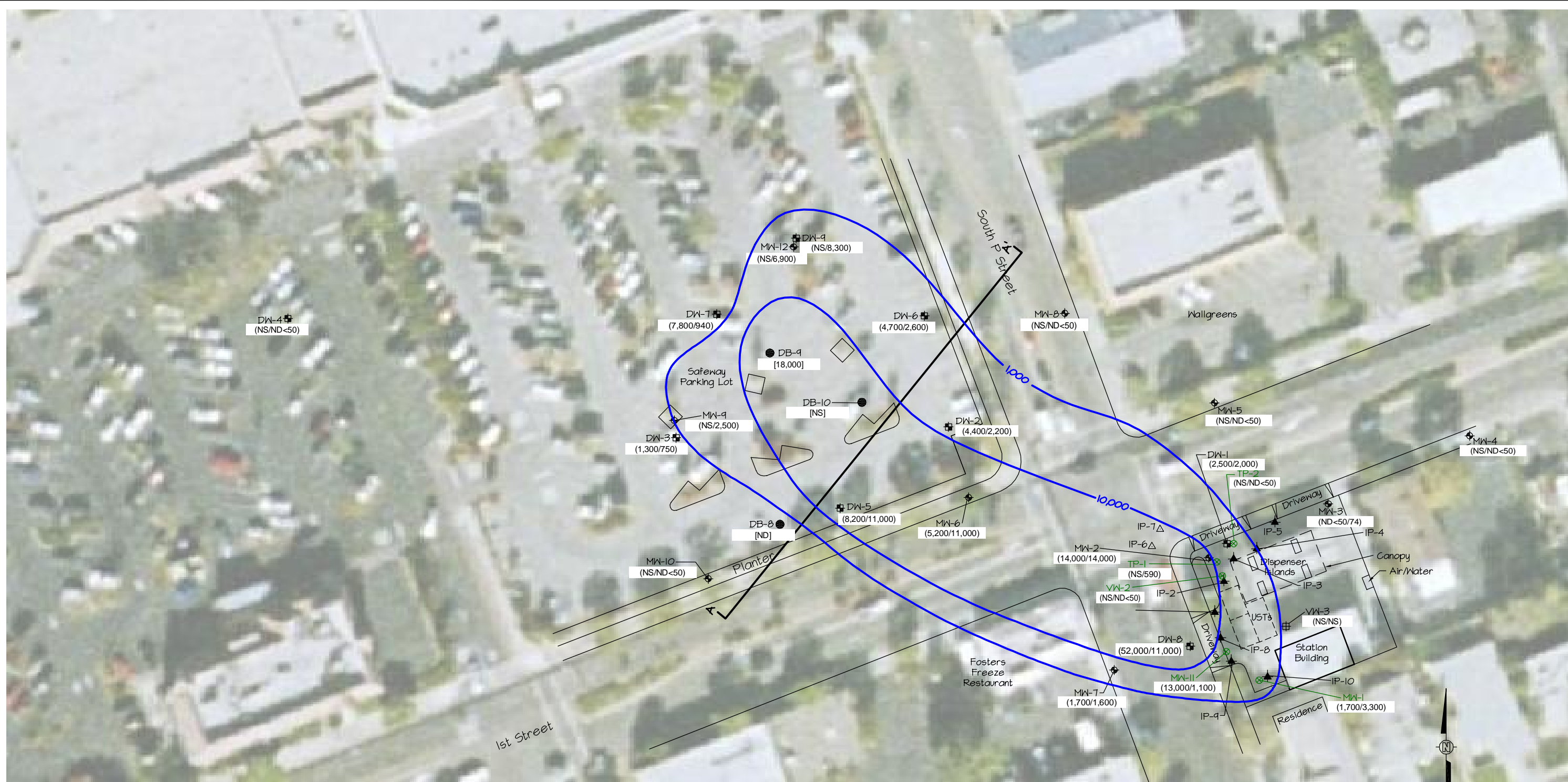
- MW-7 Groundwater Monitoring Well
- DW-1 Deep Groundwater Monitoring Well
- IP-1 Injection Well
- IP-6 Angled Injection Well Screen
- VN-2 Vapor Extraction Well
- TP-2 Monitoring Well/Vapor Extraction Well
- (438.07) Groundwater Elevation (Feet, MSL) Measured 7 May 2012
- 431 Groundwater Elevation Contour
- \* Groundwater Elevation Not Used for Contours
- NM Groundwater Elevation Not Measured



REVISION	REVISIONS			
	NO.	BY	DATE	DESCRIPTION
<b>16</b>	11	MY	5/13/11	First Quarter 2011 Monitoring Report
	12	MY	8/15/11	Second Quarter 2011 Monitoring Report
	13	MY	11/15/11	Third Quarter 2011 Monitoring Report
	14	MY	2/15/12	Fourth Quarter 2011 Monitoring Report
	15	MY	5/15/12	First Quarter 2012 Monitoring Report
	16	MY	8/15/12	Second Quarter 2012 Monitoring Report

ARCTOS ENVIRONMENTAL			
TESORO - LIVERMORE			
<b>GROUNDWATER ELEVATION CONTOURS</b>			
PROJECT NO. OILV	DRAWN BY MY	CHECKED BY MP	APPROVED BY JPG
FILE NO. OILV11B-20416.DWG		FIGURE 2	

7/26/2012 4:44PM 01LV11B-20516.dwg



**Legend**

- MW-7 Groundwater Monitoring Well
- DW-1 Deep Groundwater Monitoring Well
- IP-1 Injection Well
- IP-6 Angled Injection Well Screen
- VW-2 Vapor Extraction Well
- TP-2 Monitoring Well/Vapor Extraction Well

(1,700/3,300) Previous Quarter/Current Quarter Total Petroleum Hydrocarbons as Gasoline (TPHg) Results in µg/L

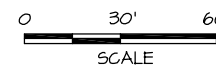
1,000 TPHg Concentration Contour (µg/L), Queried Where Uncertain

ND Not Detected

NS Not Sampled

DB-8 Soil Boring with 55-Foot Grab Groundwater Sample  
TPHg Results in µg/L

A A' Geologic Cross Section A-A'



REVISION	NO.	BY	DATE	DESCRIPTION
	12	MY	8/15/11	Second Quarter 2011 Monitoring Report
	13	MY	11/15/11	Third Quarter 2011 Monitoring Report
	14	MY	2/15/12	Fourth Quarter 2011 Monitoring Report
	15	MY	5/15/12	First Quarter 2012 Monitoring Report
	16	MY	8/15/12	Second Quarter 2012 Monitoring Report

ARCTOS ENVIRONMENTAL			
TESORO - LIVERMORE			
<b>TPHg CONCENTRATION CONTOURS</b>			
PROJECT NO. OILV	DRAWN BY MY	CHECKED BY MP	APPROVED BY JPG
FILE NO. OILV11B-20516.DWG		FIGURE 3	



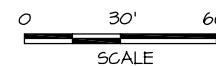
Legend

- MW-7 Groundwater Monitoring Well
- DW-1 Deep Groundwater Monitoring Well
- IP-1 Injection Well
- IP-6 Angled Injection Well Screen
- VW-2 Vapor Extraction Well
- TP-2 Monitoring Well/Vapor Extraction Well

(1.6/2.2) Previous Quarter/Current Quarter Benzene Results in µg/L

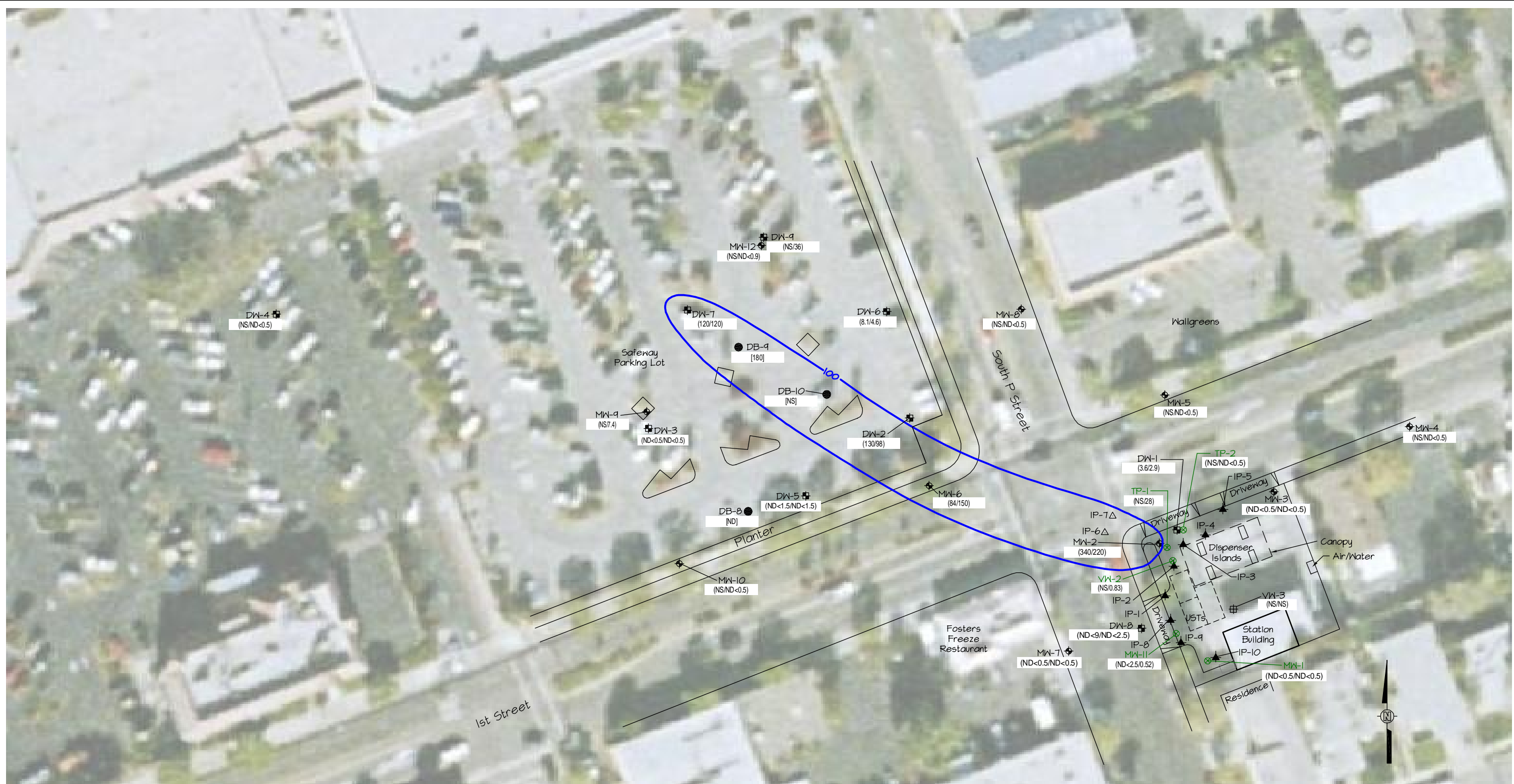
1,000 Benzene Concentration Contour (µg/L), Queried Where Uncertain

- ND Not Detected
- NS Not Sampled
- DB-8 Soil Boring with 55-Foot Grab Groundwater Sample Benzene Results in µg/L



REVISION	REVISIONS		
	NO.	BY	DATE
16	12	MY	8/15/11
	13	MY	11/15/11
	14	MY	2/15/12
	15	MY	5/15/12
	16	MY	8/15/12

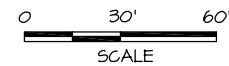
ARCTOS ENVIRONMENTAL			
TESORO - LIVERMORE			
<b>BENZENE CONCENTRATION CONTOURS</b>			
PROJECT NO. OILV	DRAWN BY MY	CHECKED BY MP	APPROVED BY JPG
FILE NO. OILVIB-20616.DWG		FIGURE 4	



7/26/2012 4:51PM 01LV11B-20716.dwg

- Legend**
- MW-7 Groundwater Monitoring Well
  - DW-1 Deep Groundwater Monitoring Well
  - IP-1 Injection Well
  - IP-6 Angled Injection Well Screen
  - VW-2 Vapor Extraction Well
  - TP-2 Monitoring Well/Vapor Extraction Well

- (ND<0.5/ND<0.5) Previous Quarter/Current Quarter Methyl Tert-Butyl Ether (MTBE) Results in  $\mu\text{g/L}$
- 100 MTBE Concentration Contour ( $\mu\text{g/L}$ ), Queried Where Uncertain
- ND Not Detected
- NS Not Sampled
- DB-8 Soil Boring with 55-Foot Grab Groundwater Sample
- [ND] MTBE Results in  $\mu\text{g/L}$

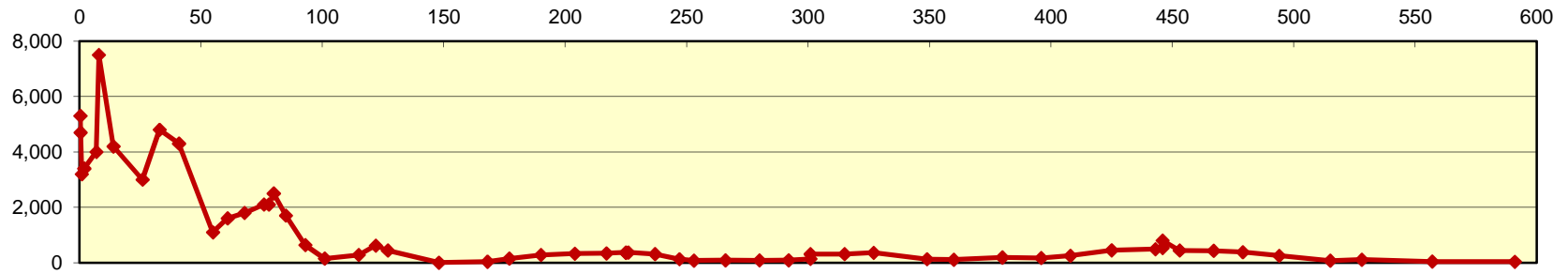


REVISION	REVISIONS			
	NO.	BY	DATE	DESCRIPTION
<b>16</b>	12	MY	8/15/11	Second Quarter 2011 Monitoring Report
	13	MY	11/15/11	Third Quarter 2011 Monitoring Report
	14	MY	2/15/12	Fourth Quarter 2011 Monitoring Report
	15	MY	5/15/12	First Quarter 2012 Monitoring Report
	16	MY	8/15/12	Second Quarter 2012 Monitoring Report

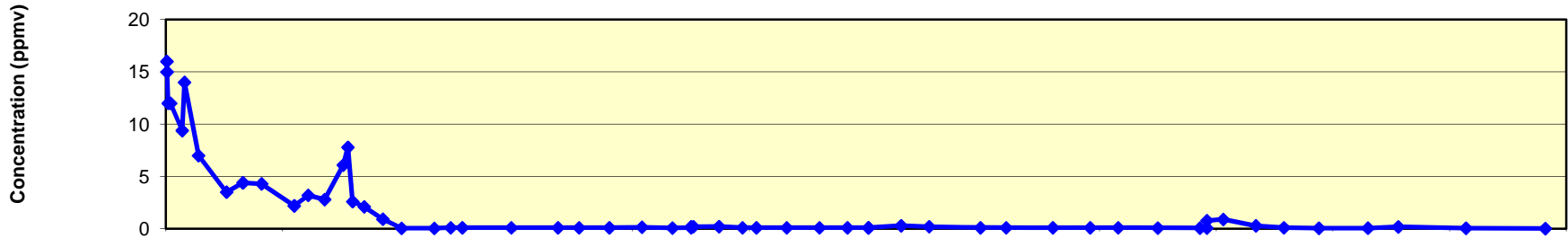
ARCTOS ENVIRONMENTAL			
TESORO - LIVERMORE			
<b>MTBE CONCENTRATION CONTOURS</b>			
PROJECT NO. OILV	DRAWN BY MY	CHECKED BY MP	APPROVED BY JPG
FILE NO. O1LV11B-20716.DWG		FIGURE 5	

### TPHg

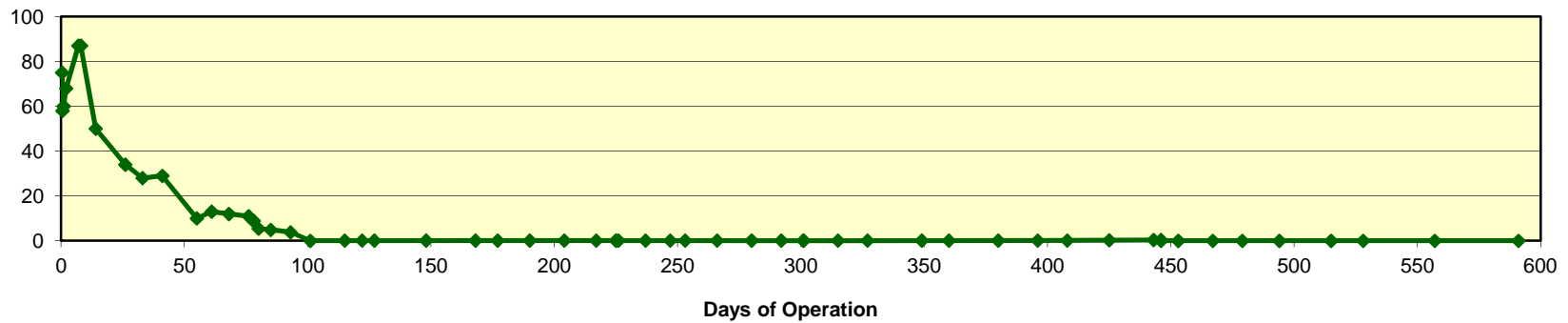
Days of Operation



### Benzene

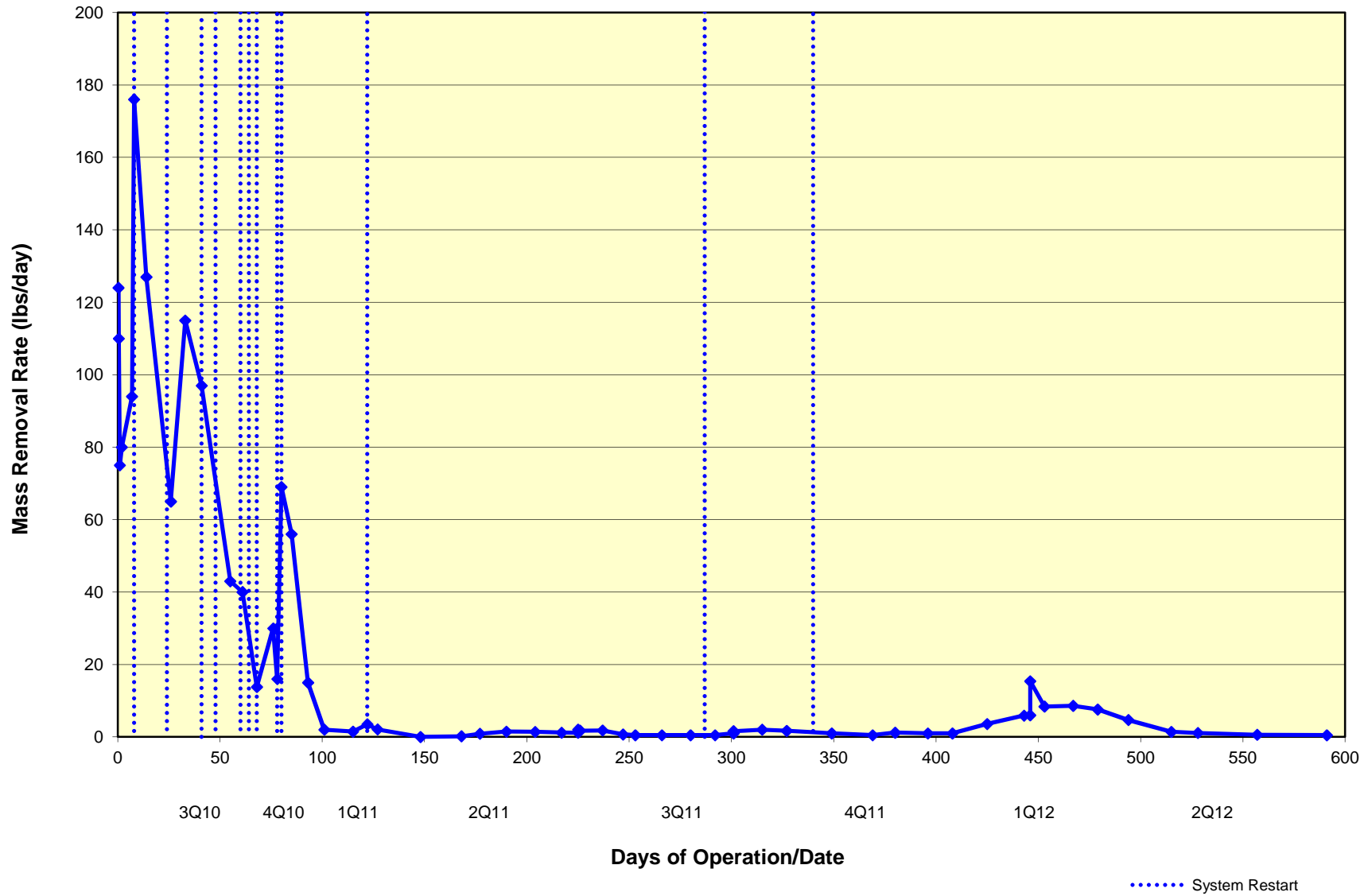


### MTBE



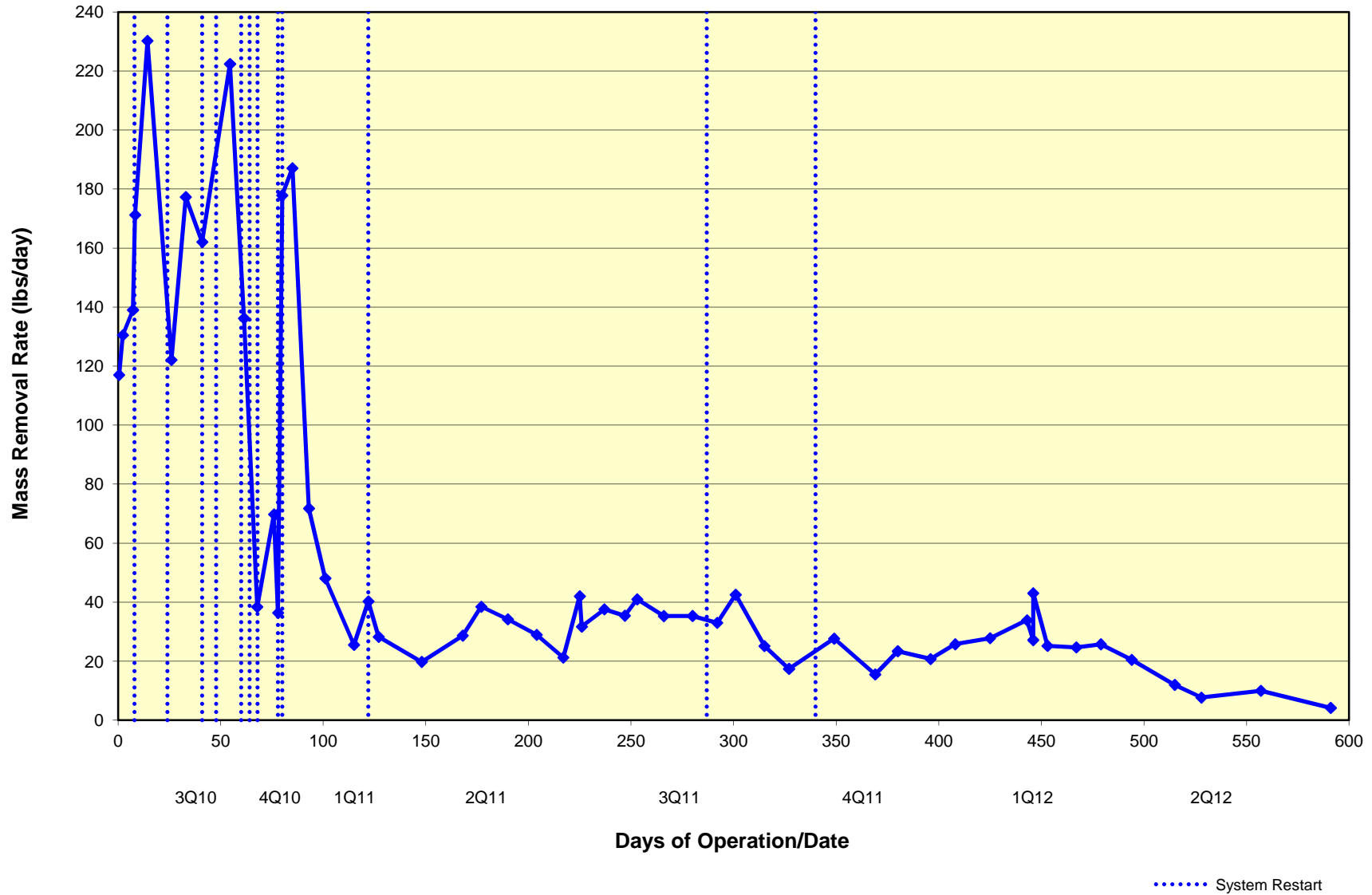
—◆— TPHg —◆— Benzene —◆— MTBE

HYDROCARBON MASS REMOVED BY VOLATILIZATION = 7,780 lbs

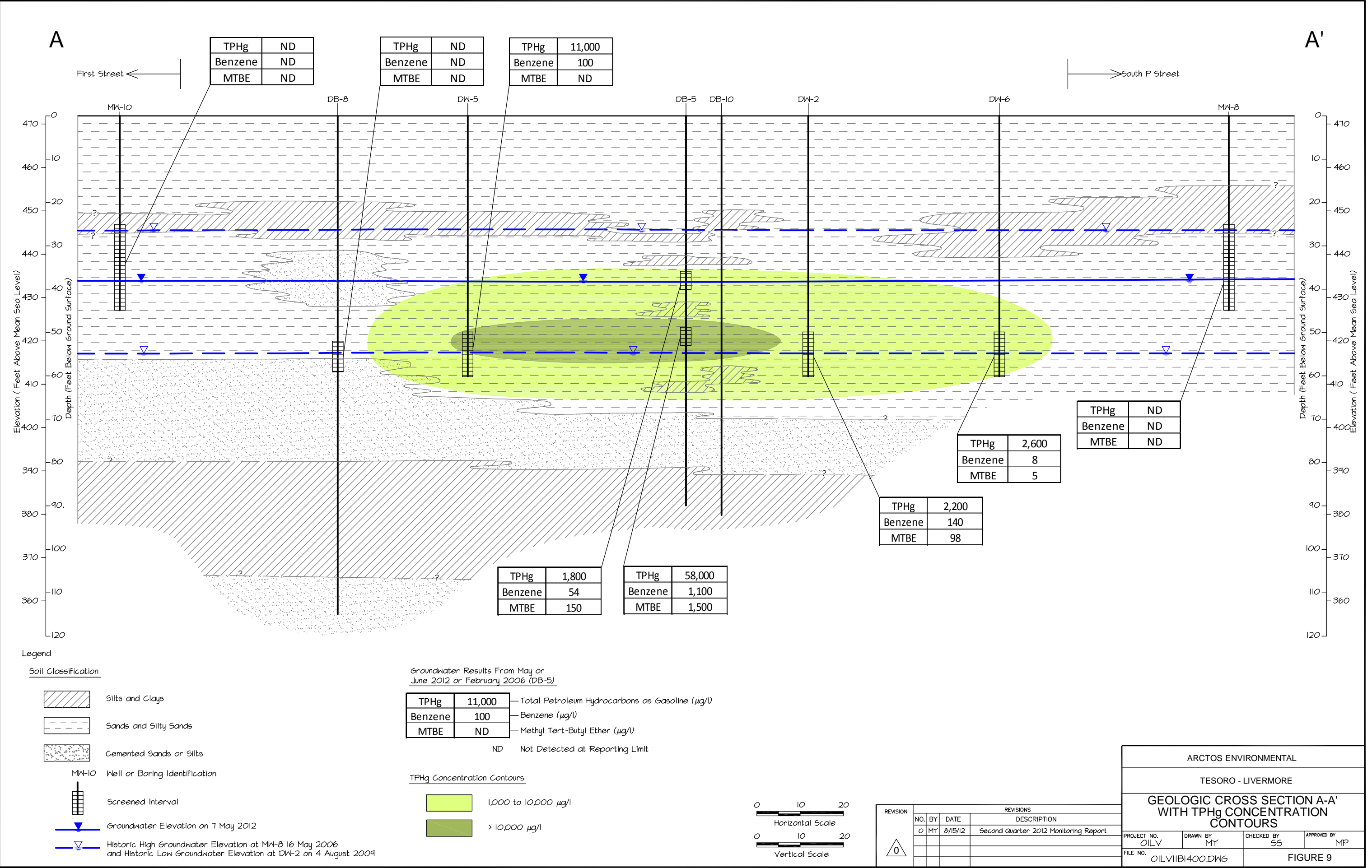




HYDROCARBON MASS REMOVED BY BIODEGRADATION = 28,050 lbs



7/18/2012 3:18PM 01LV11B1400.dwg

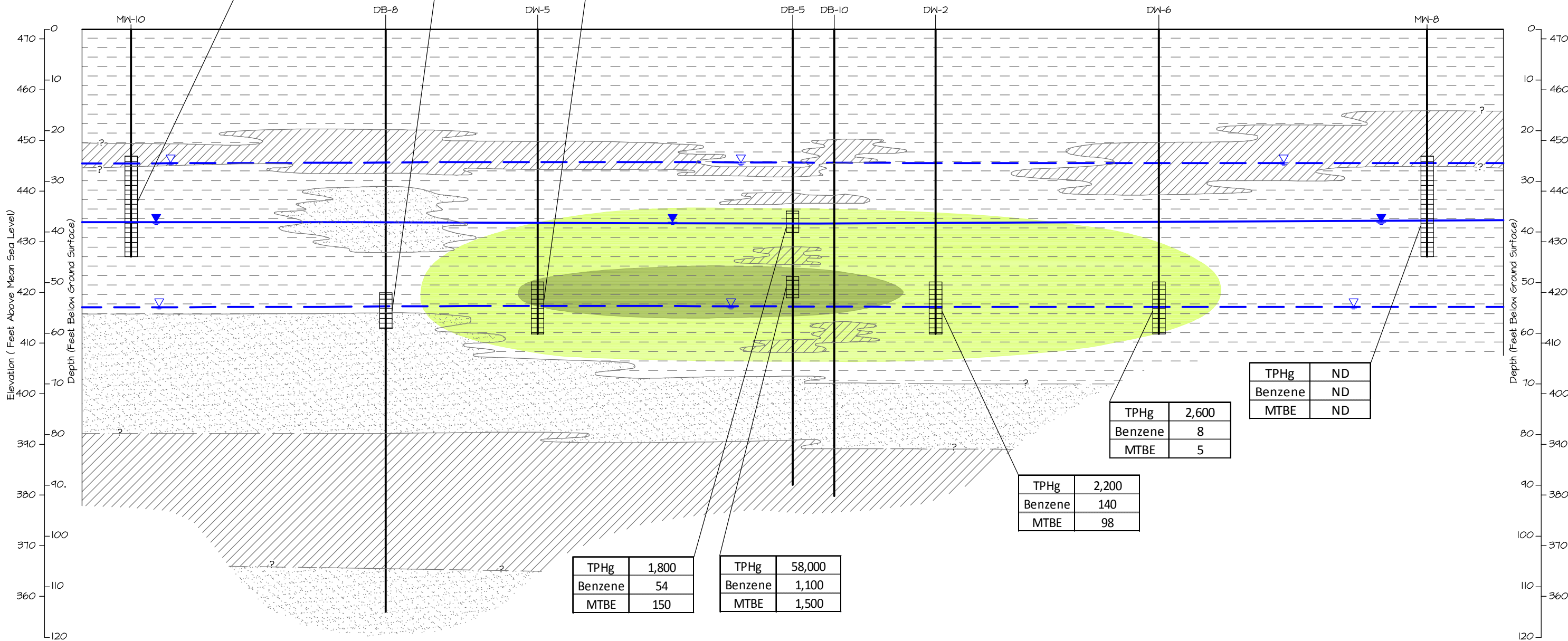


A

A'




First Street ←

→ South P Street



Legend


Soil Classification

-  Silts and Clays
-  Sands and Silty Sands
-  Cemented Sands or Silts

MW-10 Well or Boring Identification

 Screened Interval

 Groundwater Elevation on 7 May 2012



 Historic High Groundwater Elevation at MW-8 16 May 2006 and Historic Low Groundwater Elevation at DW-2 on 4 August 2009

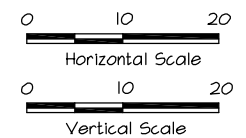
Groundwater Results From May or June 2012 or February 2006 (DB-5)

TPHg	11,000	Total Petroleum Hydrocarbons as Gasoline ( $\mu\text{g/l}$ )
Benzene	100	Benzene ( $\mu\text{g/l}$ )
MTBE	ND	Methyl Tert-Butyl Ether ( $\mu\text{g/l}$ )

ND Not Detected at Reporting Limit

TPHg Concentration Contours

-  1,000 to 10,000  $\mu\text{g/l}$
-  > 10,000  $\mu\text{g/l}$



REVISION	REVISIONS			
	NO.	BY	DATE	DESCRIPTION
0	MY	01/15/12	Second Quarter 2012 Monitoring Report	

ARCTOS ENVIRONMENTAL			
TESORO - LIVERMORE			
<b>GEOLOGIC CROSS SECTION A-A' WITH TPHg CONCENTRATION CONTOURS</b>			
PROJECT NO. OILV	DRAWN BY MY	CHECKED BY SS	APPROVED BY MP
FILE NO. OILV11B1400.DWG		FIGURE 9	

**ATTACHMENT A**  
**GROUNDWATER SAMPLING QA/QC PROCEDURES**

## ATTACHMENT A

### GROUNDWATER SAMPLING QA/QC PROCEDURES

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#### Monitoring Plan

In accordance with the California State Water Resources Control Board's (SWRCB) Resolution No. 2009-0042, referenced in Alameda Environmental Health's 23 July 2009 letter to Tesoro Environmental Resources Company (Tesoro), Arctos Environmental (Arctos) proposed to reduce the monitoring and sampling frequency to semiannually in the second quarter 2009 status report. Select wells will continue to be monitored quarterly to assess the effectiveness of the groundwater remediation system according to the following groundwater monitoring plan:

Well Designation	Location	Sampling Frequency
MW-1 and MW-3	Upgradient	Quarterly
MW-2, MW-11, and DW-1	Source area	
MW-6, MW-12, DW-2, DW-3, DW-5, DW-6, DW-7, DW-8, and DW-9	Downgradient	
MW-4 and VW-3	Upgradient	Semiannually (2nd and 4th quarters)
TP-1, TP-2, and VW-2	Source area	
MW-5 and MW-7	Cross gradient	
MW-8, MW-9, MW-10, and DW-4	Downgradient	

#### Analytical Plan

The groundwater samples were analyzed by Kiff Analytical LLC, a State-certified laboratory in Davis, California, for total petroleum hydrocarbons as gasoline; benzene, toluene, ethylbenzene, and total xylenes; methyl tert-butyl ether; and other oxygenates using Environmental Protection Agency (EPA) Method 8260B.

Arctos, as Tesoro's Authorized Responsible Party for the site, also electronically submitted the groundwater monitoring results to the SWRCB. The data were submitted in the State-mandated Electronic Data Format, in accordance with Assembly Bill 2886 requirements for underground storage tank sites in California.

#### Purge-and-Bail Sampling Procedures

The depth to groundwater and total well depth were measured before sampling using an electronic water well sounder. The sequence of well sampling depended on the level of contamination in each well, if known, and was determined before sampling. Sampling occurred beginning at the well with the lowest contaminant concentration and ending at the well with the highest contaminant concentration. Before sampling, at least 3 casing volumes were purged from each monitoring well using a submersible pump. Throughout

purging, pH, conductivity, turbidity, and temperature were measured and recorded for the evacuated groundwater. These measurements were used to confirm that the well was purged sufficiently. Water samples were generally collected after the measurements of pH, conductivity, and temperature had stabilized to within 10 percent of the previous readings. Copies of the well purging and sampling logs are in Attachment B.

Sampling was performed with a new 1-1/2-inch-diameter disposable polyethylene bailer suspended from new nylon line. The bailer was equipped with a bottom-release device. Groundwater was collected with the bailer from just below the water surface in each monitoring well. Water samples were collected from the bailers in new 40-milliliter glass bottles provided by the analytical laboratory. The samples were collected so that no headspace was present in each bottle. The preservatives necessary for the analyses performed were provided in the glass bottles by the analytical laboratory.

The collected water samples were placed in sealable plastic bags and packed on ice in a portable ice chest immediately after collection. Samples were delivered within 24 to 48 hours to the analytical laboratory. Additional quality assurance/quality control (QA/QC) procedures, including the use of sample identification labels and chain-of-custody forms, were followed to track sample collection and delivery.

## **General Field QA/QC Procedures**

### Chain-of-Custody Records

Chain-of-custody records were completed before samples were packaged for shipment. One copy of these records was placed in the project file. A second copy accompanied samples during transportation to the laboratory. The individual in the analytical laboratory who accepted responsibility for samples signed and dated the chain-of-custody record.

### Equipment Decontamination Procedures

Field equipment was decontaminated between sampling events using the following procedures:

1. Rinsed with water using a brush to remove soil and mud.
2. Washed with non-phosphate detergent and water using a brush.
3. Rinsed with deionized or distilled water.
4. Rinsed again with deionized or distilled water.
5. Air dried.

### Personal Decontamination Procedures

At a minimum, field personnel followed the following decontamination procedures:

1. Wore appropriate gloves.
2. Washed hands thoroughly with soap and water.
3. Avoided unnecessary contact with groundwater.

The site health and safety plan (HSP) was reviewed for site-specific personal decontamination procedures.

### Wastewater and Solid Waste Storage and Disposal

Small volumes of used wash and rinse solutions were collected during field work and transported to a central decontamination area. This wastewater was stored in a holding tank. The Project Manager determined the appropriate disposal method for this wastewater. Waste manifests this quarter are in Attachment N.

Solid wastes such as used personal protective equipment, paper towels, trash bags, and any other solid debris were collected for disposal. Because the sampled groundwater was not a hazardous waste, the solid wastes were disposed with the onsite trash.

### Field Investigation Documentation Procedures

Field personnel followed documentation procedures developed for site investigation work. The procedures served to (1) provide a record of the activities performed in the field and (2) permit identification of samples and tracking of their status in the field, during shipment, and at the laboratory. All documentation was recorded with waterproof ink. Groundwater sampling activities were documented on daily field reports and on well purge and sample logs.

### Health and Safety

Arctos used a site-specific HSP with procedures that were followed by field personnel for equipment safety, medical surveillance, personal protection, air quality monitoring, exposure control, emergency response, and general work practices during field activities. Before beginning work at the site, a site safety meeting was conducted. Field personnel reviewed the HSP and signed the accompanying acknowledgment form before initiating field activities. Field personnel were required to comply with the HSP throughout performance of site assessment activities.

### Analytical QA/QC Procedures

Laboratory analytical QA/QC procedures included (1) preparing and analyzing laboratory samples to assess the performance of the analytical laboratory and (2) conducting data validation in accordance with the protocols described below. QC samples prepared by the laboratory included method blanks, matrix spike and matrix spike duplicates, and laboratory control samples.

The laboratory results were reviewed in general accordance with EPA guidelines for data validation. The data validation process included reviewing laboratory results for the following parameters:

- Completeness of the data package
- Compliance with EPA-required holding times
- Agreement of dilution factors with reported detection limits
- Presence or absence of analytes in the method blanks
- Agreement of duplicate samples
- Percent recovery and relative percent difference results for matrix spike and matrix spike duplicate analyses
- Percent recovery results for laboratory control samples.

**ATTACHMENT B**  
**FIELD DATA SHEETS**



# Field Data Sheet

Date: 5/7/2012

Project Name: Tesoro #67076

Project Number: 01LV

Technician: C. Arroyo

Location: Livermore, CA

Global ID : T0600101410

Well ID	Casing Diameter	Total Depth	DTP	DTW	Thickness	Comments
MW-1	4"	54.55	-	36.14	-	
MW-2	4"	54.1	-	36.89	-	
MW-3	4"	52.9	-	36.03	-	
MW-4	2"	46.8	-	36.24	-	
MW-5	2"	46.27	-	37.29	-	
MW-6	2"	47.65	-	39.11	-	
MW-7	2"	46.8	-	35.97	-	
MW-8	2"	44.5	-	37.38	-	
MW-9	2"	44.58	-	39.43	-	
MW-10	2"	45.1	-	38.14	-	
MW-11	4"	42.85	-	31.61	-	
DW-1	4"	64.75	-	36.35	-	
DW-2	4"	59.84	-	39.1	-	
DW-3	4"	59.74	-	38.7	-	
DW-4	4"	70.04	-	38.26	-	
DW-5	4"	59.8	-	38.98	-	
DW-6	4"	60.15	-	39.82	-	
DW-7	4"	65.2	-	39.3	-	
DW-8	4"	64.65	-	35.52	-	
TP-1	2"	43.22	-	34.7	-	
TP-2	2"	41.21	-	34.41	-	
VW-2	2"	36.78	-	31.5	-	
VW-3	2"	36.34	-	36.2	-	not enough water to sample



# Groundwater Sampling Form

Project Name: Tesoro #67076 Project Number: 01LV  
 Location: Livermore, CA Date: 5/9/12  
 Well Number: MW-1 Well Integrity: Good  
 Technician: C. Arroyo / A. Sciaky Ambient Conditions: Cool

Well Volume Calculation						
Well Casing Diameter (in.)	Total Well Depth	Depth to Ground-water (GW)	Linear Feet of GW	Gallons Per Linear Foot	1 Well Volume (gal.)	
2	-	=	X	0.17	=	
3	-	=	X	0.38	=	
④	54.55	36.14	18.41	X	0.66	= 12.15
4.5	-	=	X	0.83	=	
6	-	=	X	1.5	=	

### Groundwater Surface Inspection

Floating Product (ft)(in.): NO Sheen/Iridescence: NO Odor: NO

### Groundwater Purging Purge Method

Submersible Pump     
  Honda Pump     
  Hand Bail     
  Grab Sample

Volumes Purged	Volume Purge (gal.)	Time	Conductivity (uS/cm)	tds (ppm)	ORP	DO mg/l	pH	Temp.(°C)
0	Int.	0615	1054	756	156.6	.52	6.41	20.11
1	12	0621	1083	775	110.8	.49	6.78	20.20
2	24	0627	1041	745	20.0	1.91	6.93	20.23
3	36	-	-	-	-	-	-	-
4								
5								
6								
7								
8								
9								
10								

Dry

### Groundwater Sampling

**Water Level Recovery:** Depth to GW (ft.)  
 (I) Initially: 36.14  
 (P) After Purging: 53.49  
 P- 0.8(P-I) = 39.61      80% Recovery  
 (S) Before Sampling: 37.12  
 Sampled 80% - 100%: yes

**Sample Containers:**  
 500 ml polypropylene \_\_\_\_\_  
 1 liter(L), amber glass \_\_\_\_\_  
 40ml VOA: 3      HCL \_\_\_\_\_  
 250 ml glass \_\_\_\_\_  
 250 ml polypropylene \_\_\_\_\_

Sample Date: 5/9/12 Time: 0935 Turbidity (NTU): 193  
 Sampling Equipment: Disposable Bailer  
 Calibrate Date: 5/7/12

Comments: well went dry at 3:2 volume, 6 gallons in (30 gal.)

## Groundwater Sampling Form

Project Name: Tesoro #67076 Project Number: 01LV  
 Location: Livermore, CA Date: 5/10/12  
 Well Number: MW-2 Well Integrity: Good  
 Technician: C. Arroyo / A. Sciaky Ambient Conditions: COOL

Well Volume Calculation						
Well Casing Diameter (in.)	Total Well Depth	Depth to Ground-water (GW)	Linear Feet of GW	Gallons Per Linear Foot	1 Well Volume (gal.)	
2	-	=	X	0.17	=	
3	-	=	X	0.38	=	
④	54.10	36.89	17.21	X 0.66	=	11.35
4.5	-	=	X	0.83	=	
6	-	=	X	1.5	=	

### Groundwater Surface Inspection

Floating Product (ft)(in.): NO Sheen/Iridescence: NO Odor: NO

### Groundwater Purging Purge Method

Submersible Pump       Honda Pump       Hand Bail       Grab Sample

Volumes Purged	Volume Purge (gal.)	Time	Conductivity (uS/cm)	tds <sup>g/L</sup> (ppm)	ORP	DO mg/l	pH	Temp.(°C)
0	Int.	0655	1279	1907	-156.2	1.63	6.86	20.97
1	11.5	0706	1301	1909	-146.6	6.43	6.67	21.35
2	23	0718	1298	1908	-166.8	2.31	6.64	21.27
3	34.5	0726	1300	1909	-174.2	0.83	6.65	21.25
4								
5								
6								
7								
8								
9								
10								

### Groundwater Sampling

**Water Level Recovery:** Depth to GW (ft.)  
 (I) Initially: 36.89  
 (P) After Purging: 43.06  
 P- 0.8(P-I) = 38.12      80% Recovery  
 (S) Before Sampling: 37.49  
 Sampled 80% - 100%: YES

**Sample Containers:**  
 500 ml polypropylene  
 1 liter(L), amber glass <sup>poly</sup> 1      None  
 40ml VOA 7      HCL  
 250 ml glass 1      H2SO4  
 250 ml polypropylene 4/1      NO2/HNO3

Sample Date: 5/10/12 Time: 0915 Turbidity (NTU): 86.1  
 Sampling Equipment: Disposable Bailor  
 Calibrate Date: 5/7/12

Comments: \_\_\_\_\_

# Groundwater Sampling Form

Project Name: Tesoro #67076 Project Number: 01LV  
 Location: Livermore, CA Date: 5/7/12  
 Well Number: MW-3 Well Integrity: Good  
 Technician: C. Arroyo / A. Sciaky Ambient Conditions: 0001

Well Volume Calculation					
Well Casing Diameter (in.)	Total Well Depth	Depth to Ground-water (GW)	Linear Feet of GW	Gallons Per Linear Foot	1 Well Volume (gal.)
2	-	=	X	0.17	=
3	-	=	X	0.38	=
④ 4	52.90	36.03	16.87	X 0.66	= 11.13
4.5	-	=	X	0.83	=
6	-	=	X	1.5	=

### Groundwater Surface Inspection

Floating Product (ft)(in.): NO Sheen/Iridescence: NO Odor: NO

### Groundwater Purging Purge Method

Submersible Pump       Honda Pump       Hand Bail       Grab Sample

Volumes Purged	Volume Purge (gal.)	Time	Conductivity (uS/cm)	g/L tds (ppm)	ORP	DO mg/l	pH	Temp.(°C)
0	Int.	0956	1219	806	49.7	.97	6.98	20.53
1	11	1002	1149	815	71.2	.56	7.05	20.61
2	22	1007	1133	805	70.1	.45	7.07	20.61
3	33	1011	1130	801	69.9	.45	7.03	20.60
4								
5								
6								
7								
8								
9								
10								

### Groundwater Sampling

**Water Level Recovery:**      **Sample Containers:**  
 Depth to GW (ft.)      No.      Preservation  
 (I) Initially      36.03      500 ml polypropylene  
 (P) After Purging      43.90      1 liter(L), amber glass  
 P- 0.8(P-I) =      37.60      80% Recovery      40ml VOA      3      HCL  
 (S) Before Sampling      37.01      250 ml glass  
 Sampled 80% - 100%      yes      250 ml polypropylene  
  
 Sample Date :      5/7/12      Time: 1050      Turbidity (NTU): 198  
 Sampling Equipment :      Disposable Bailer  
 Calibrate Date:      5/7/12  
  
 Comments: \_\_\_\_\_

# Groundwater Sampling Form

Project Name: Tesoro #67076 Project Number: 01LV  
 Location: Livermore, CA Date: 5/7/12  
 Well Number: MW-4 Well Integrity: Good  
 Technician: C. Arroyo / A. Sciaky Ambient Conditions: warm

Well Volume Calculation					
Well Casing Diameter (in.)	Total Well Depth	Depth to Ground-water (GW)	Linear Feet of GW	Gallons Per Linear Foot	1 Well Volume (gal.)
②	46.80	36.24	10.56 X	0.17	= 1.79
3	-	=	X	0.38	=
4	-	=	X	0.66	=
4.5	-	=	X	0.83	=
6	-	=	X	1.5	=

### Groundwater Surface Inspection

Floating Product (ft)(in.): NO Sheen/Iridescence: NO Odor: NO

### Groundwater Purging Purge Method

Submersible Pump      Honda Pump      Hand Bail      Grab Sample

Volumes Purged	Volume Purge (gal.)	Time	Conductivity (uS/cm)	tds (ppm) <sup>g/L</sup>	ORP	DO mg/l	pH	Temp.(°C)
0	Int.	1345	1338	1936	86.4	40	7.84	21.34
1	2	1348	1320	1938	62.0	45	7.57	20.57
2	4	1351	1308	1930	37.5	70	7.49	20.55
3	6	1354	1296	1925	15.9	69	7.47	20.32
4								
5								
6								
7								
8								
9								
10								

### Groundwater Sampling

**Water Level Recovery:**      **Depth to GW (ft.)**      **Sample Containers:**

(I) Initially	<u>46.80</u>		500 ml polypropylene
(P) After Purging	<u>49.24</u>		1 liter(L), amber glass
P- 0.8(P-I) =	<u>47.23</u>	80% Recovery	40ml VOA
(S) Before Sampling	<u>47.13</u>		250 ml glass
Sampled 80% - 100%	<u>50.5</u>		250 ml polypropylene

Sample Date: 5/7/12 Time: 1410 Turbidity (NTU): 31.6

Sampling Equipment: Disposable Bailer

Calibrate Date: 5/7/12

Comments: \_\_\_\_\_

## Groundwater Sampling Form

Project Name: Tesoro #67076 Project Number: 01LV  
 Location: Livermore, CA Date: 5/8/12  
 Well Number: MW-5 Well Integrity: Good  
 Technician: C. Arroyo / A. Sciaky Ambient Conditions: cool

Well Volume Calculation						
Well Casing Diameter (in.)	Total Well Depth	Depth to Ground-water (GW)	Linear Feet of GW	Gallons Per Linear Foot	1 Well Volume (gal.)	
2	46.27	37.29	8.98 X	0.17	=	1.52
3	-	=	X	0.38	=	
4	-	=	X	0.66	=	
4.5	-	=	X	0.83	=	
6	-	=	X	1.5	=	

### Groundwater Surface Inspection

Floating Product (ft)(in.): No Sheen/Iridescence: No Odor: No

### Groundwater Purging Purge Method

Submersible Pump      Honda Pump      Hand Bail      Grab Sample

Volumes Purged	Volume Purge (gal.)	Time	Conductivity (uS/cm)	tds <sup>g/L</sup> (ppm)	ORP	DO mg/l	pH	Temp.(°C)
0	Int.	0940	1293	.429	19.2	2.38	7.31	20.08
1	1.5	0942	1338	.954	5.4	2.14	7.13	20.50
2	3	0945	1344	.954	4.3	1.58	7.17	20.57
3	4.5	0947	1349	.955	2.6	1.84	7.16	20.61
4								
5								
6								
7								
8								
9								
10								

### Groundwater Sampling

**Water Level Recovery:**      **Sample Containers:**  
 Depth to GW (ft.)      No.      Preservation  
 (I) Initially      37.29      500 ml polypropylene      \_\_\_\_\_  
 (P) After Purging      46.20      1 liter(L), amber glass      \_\_\_\_\_  
 P- 0.8(P-I) =      39.07      80% Recovery      40ml VOA      3      HCL  
 (S) Before Sampling      47.32      250 ml glass      \_\_\_\_\_  
 Sampled 80% - 100%      No      250 ml polypropylene      \_\_\_\_\_  
 Sample Date :      5/8/12      Time: 1155      Turbidity (NTU): +1000  
 Sampling Equipment :      Disposable Bailer  
 Calibrate Date:      5/7/12  
 Comments:      2 hour sample limit

## Groundwater Sampling Form

**Project Name:** Tesoro #67076 **Project Number:** 01LV  
**Location:** Livermore, CA **Date:** 5/10/12  
**Well Number:** MW-6 **Well Integrity:** Good  
**Technician:** C. Arroyo / A. Sciaky **Ambient Conditions:** COOL

Well Volume Calculation					
Well Casing Diameter (in.)	Total Well Depth	Depth to Ground-water (GW)	Linear Feet of GW	Gallons Per Linear Foot	1 Well Volume (gal.)
②	47.65	39.11	8.54 X	0.17	= 1.45
3	-	=	X	0.38	=
4	-	=	X	0.66	=
4.5	-	=	X	0.83	=
6	-	=	X	1.5	=

### Groundwater Surface Inspection

**Floating Product (ft)(in.):** NO **Sheen/Iridescence:** NO **Odor:** NO

### Groundwater Purging Purge Method

Submersible Pump      Honda Pump      Hand Bail      Grab Sample

Volumes Purged	Volume Purge (gal.)	Time	Conductivity (uS/cm)	tds (ppm) <sup>g/L</sup>	ORP	DO mg/l	pH	Temp.(°C)
0	Int.	1010	2210	1.524	-173.7	.50	7.74	21.88
1	1.5	1011	1544	1.085	-145.6	.70	7.33	21.13
2	3	1012	1515	1.067	-124.2	.68	7.08	21.01
3	4.5	1014	1467	1.039	-119.4	.72	7.11	20.72
4								
5								
6								
7								
8								
9								
10								

### Groundwater Sampling

**Water Level Recovery:** **Depth to GW (ft.)**  
 (I) Initially 39.11  
 (P) After Purging 40.55  
 P - 0.8(P-I) = 39.39      80% Recovery  
 (S) Before Sampling 39.39  
 Sampled 80% - 100% YES

**Sample Containers:**  
 500 ml polypropylene \_\_\_\_\_  
 1 liter(L), amber glass poly      1      None  
 40ml VOA      5      HCL  
 250 ml glass      1      H2SO4  
 250 ml polypropylene      2      None

**Sample Date:** 5/10/12      **Time:** 1020      **Turbidity (NTU):** 861  
**Sampling Equipment:** Disposable Bailer  
**Calibrate Date:** 5/7/12

**Comments:** \_\_\_\_\_



## Groundwater Sampling Form

Project Name: Tesoro #67076 Project Number: 01LV  
 Location: Livermore, CA Date: 5/10/12  
 Well Number: MW-7 Well Integrity: Good  
 Technician: C. Arroyo / A. Sciaky Ambient Conditions: Cool

Well Volume Calculation						
Well Casing Diameter (in.)	Total Well Depth	Depth to Ground-water (GW)	Linear Feet of GW	Gallons Per Linear Foot	1 Well Volume (gal.)	
②	46.80	- 35.97 =	10.83 X	0.17	= 1.84	
3	-	=	X	0.38	=	
4	-	=	X	0.66	=	
4.5	-	=	X	0.83	=	
6	-	=	X	1.5	=	

### Groundwater Surface Inspection

Floating Product (ft)(in.): NO Sheen/Iridescence: NO Odor: NO

### Groundwater Purging Purge Method

Submersible Pump      Honda Pump      Hand Bail      Grab Sample

Volumes Purged	Volume Purge (gal.)	Time	Conductivity (uS/cm)	tds <sup>g/L</sup> (ppm)	ORP	DO mg/l	pH	Temp.(°C)
0	Int.	0644	1006	.731	-198.4	.93	7.35	19.44
1	2	0649	1069	.766	-175.8	.66	7.07	20.17
2	4	0653	1078	.771	-157.4	.78	7.07	20.22
3	6	0656	1085	.780	-138.5	.91	7.10	19.98
4								
5								
6								
7								
8								
9								
10								

### Groundwater Sampling

Water Level Recovery:

Depth to GW (ft.)

(I) Initially 35.97  
 (P) After Purging 41.86  
 P - 0.8(P-I) = 37.14      80% Recovery  
 (S) Before Sampling 35.97  
 Sampled 80% - 100% Yes

Sample Containers:

No.	Preservation
500 ml polypropylene	
1 liter(L), <del>amber glass</del> poly	1      None
40ml VOA	7      HCL
250 ml glass	
250 ml polypropylene	4/1      None/HANDS

Sample Date : 5/10/12 Time: 1000

Turbidity (NTU): 413

Sampling Equipment : Disposable Bailor

Calibrate Date: 5/7/12

Comments: \_\_\_\_\_

## Groundwater Sampling Form

Project Name: Tesoro #67076 Project Number: 01LV  
 Location: Livermore, CA Date: 5/7/12  
 Well Number: MW-8 Well Integrity: Good  
 Technician: C. Arroyo / A. Sciaky Ambient Conditions: COOL

Well Volume Calculation					
Well Casing Diameter (in.)	Total Well Depth	Depth to Ground-water (GW)	Linear Feet of GW	Gallons Per Linear Foot	1 Well Volume (gal.)
2	44.50	37.38	7.12 X	0.17	= 1.21
3	-	=	X	0.38	=
4	-	=	X	0.66	=
4.5	-	=	X	0.83	=
6	-	=	X	1.5	=

### Groundwater Surface Inspection

Floating Product (ft)(in.): NO Sheen/Iridescence: NO Odor: NO

### Groundwater Purging Purge Method

Submersible Pump      Honda Pump      Hand Bail      Grab Sample

Volumes Purged	Volume Purge (gal.)	Time	Conductivity (uS/cm)	tds (ppm) <sup>2/L</sup>	ORP	DO mg/l	pH	Temp.(°C)
0	Int.	1029	1191	826	56.6	4.32	7.61	21.66
1	1	1030	1173	820	57.2	3.34	7.39	21.76
2	2	1031	1180	824	62.8	3.14	7.37	21.38
3	3	1032	1184	831	55.6	2.33	7.26	21.18
4								
5								
6								
7								
8								
9								
10								

### Groundwater Sampling

**Water Level Recovery:**      **Depth to GW (ft.)**      **Sample Containers:**

(I) Initially	<u>37.38</u>		
(P) After Purging	<u>39.94</u>		
P- 0.8(P-I) =	<u>37.89</u>	80% Recovery	
(S) Before Sampling	<u>37.64</u>		
Sampled 80% - 100%	<u>Yes</u>		

Sample Date: 5/7/12 Time: 1040 Turbidity (NTU): 429

Sampling Equipment: Disposable Bailer

Calibrate Date: 5/7/12

Comments: \_\_\_\_\_

## Groundwater Sampling Form

Project Name: Tesoro #67076 Project Number: 01LV  
 Location: Livermore, CA Date: 5/8/12  
 Well Number: MW-9 Well Integrity: Good  
 Technician: C. Arroyo / A. Sciaky Ambient Conditions: Warm

Well Volume Calculation					
Well Casing Diameter (in.)	Total Well Depth	Depth To Ground-water (GW)	Linear Feet of GW	Gallons Per Linear Foot	1 Well Volume (gal.)
②	44.58	39.43	5.15 X	0.17	= .87
3	-	=	X	0.38	=
4	-	=	X	0.66	=
4.5	-	=	X	0.83	=
6	-	=	X	1.5	=

### Groundwater Surface Inspection

Floating Product (ft)(in.): NO Sheen/Iridescence: NO Odor: NO

### Groundwater Purging Purge Method

Submersible Pump      Honda Pump      Hand Bail      Grab Sample

Volumes Purged	Volume Purge (gal.)	Time	Conductivity (uS/cm)	tds (ppm)	ORP	DO mg/l	pH	Temp.(°C)
0	Int.	1130	1355	932	-94.0	1.16	7.38	22.13
1	1	1131	1346	933	-107.0	.62	7.08	21.77
2	2	1133	1293	899	-109.0	.90	7.06	21.59
3	3	1135	1296	899	-115.6	1.40	7.02	21.69
4								
5								
6								
7								
8								
9								
10								

### Groundwater Sampling

**Water Level Recovery:**      **Depth to GW (ft.)**      **Sample Containers:**

(I) Initially	<u>39.43</u>		
(P) After Purging	<u>43.02</u>		
P- 0.8(P-I) =	<u>40.14</u>	80% Recovery	
(S) Before Sampling	<u>39.86</u>		
Sampled 80% - 100%	<u>Yes</u>		

Sample Date: 5/8/12 Time: 1245 Turbidity (NTU): 55.1

	No.	Preservation
500 ml polypropylene		
1 liter(L), <del>amber glass</del>	<u>1</u>	<u>None</u>
40ml VOA	<u>5</u>	<u>NCL</u>
250 ml glass	<u>1</u>	<u>H<sub>2</sub>SO<sub>4</sub></u>
250 ml polypropylene	<u>2</u>	<u>None</u>

Sampling Equipment: Disposable Bailer  
 Calibrate Date: 5/7/12

Comments: \_\_\_\_\_

## Groundwater Sampling Form

Project Name: Tesoro #67076 Project Number: 01LV  
 Location: Livermore, CA Date: 5/7/12  
 Well Number: MW-10 Well Integrity: Good  
 Technician: C. Arroyo / A. Sciaky Ambient Conditions: warm

Well Volume Calculation					
Well Casing Diameter (in.)	Total Well Depth	Depth to Ground-water (GW)	Linear Feet of GW	Gallons Per Linear Foot	1 Well Volume (gal.)
②	45.10	38.14	6.96 X	0.17	= 1.18
3	-	=	X	0.38	=
4	-	=	X	0.66	=
4.5	-	=	X	0.83	=
6	-	=	X	1.5	=

### Groundwater Surface Inspection

Floating Product (ft)(in.): NO Sheen/Iridescence: NO Odor: NO

### Groundwater Purging Purge Method

Submersible Pump      Honda Pump      Hand Bail      Grab Sample

Volumes Purged	Volume Purge (gal.)	Time	Conductivity (uS/cm)	tds <sup>g/L</sup> (ppm)	ORP	DO mg/l	pH	Temp.(°C)
0	Int.	1052	1618	1122	65.6	2.91	7.62	21.49
1	1	1054	1579	1117	49.4	3.96	7.67	20.92
2	2	1055	1578	1118	53.0	3.71	7.58	20.75
3	3	1056	1578	1122	55.7	2.99	7.57	20.54
4								
5								
6								
7								
8								
9								
10								

### Groundwater Sampling

**Water Level Recovery:** Depth to GW (ft.)  
 (I) Initially 38.14  
 (P) After Purging 39.21  
 P- 0.8(P-I) = 38.35      80% Recovery  
 (S) Before Sampling 38.24  
 Sampled 80% - 100% 42.9

**Sample Containers:**  
 500 ml polypropylene  
 1 liter(L), amber glass  
 40ml VOA      3  
 250 ml glass      HCL  
 250 ml polypropylene

Sample Date: 5/7/12 Time: 1110 Turbidity (NTU): 86.2  
 Sampling Equipment: Disposable Bailer  
 Calibrate Date: 5/7/12

Comments: \_\_\_\_\_

## Groundwater Sampling Form

Project Name: Tesoro #67076 Project Number: 01LV  
 Location: Livermore, CA Date: 5/19/12  
 Well Number: AW-11 Well Integrity: Good  
 Technician: C. Arroyo / A. Sciaky Ambient Conditions: Cool

Well Volume Calculation					
Well Casing Diameter (in.)	Total Well Depth	Depth to Ground-water (GW)	Linear Feet of GW	Gallons Per Linear Foot	1 Well Volume (gal.)
2	-	=	X	0.17	=
3	-	=	X	0.38	=
④	42.85	31.61	= 11.24 X	0.66	= 7.41
4.5	-	=	X	0.83	=
6	-	=	X	1.5	=

### Groundwater Surface Inspection

Floating Product (ft)(in.): No Sheen/Iridescence: No Odor: No

### Groundwater Purging Purge Method

Submersible Pump       Honda Pump       Hand Bail       Grab Sample

Volumes Purged	Volume Purge (gal.)	Time	Conductivity (uS/cm)	tds (ppm) <sup>g/L</sup>	ORP	DO mg/l	pH	Temp.(°C)
0	Int.	0630	1386	990	112.5	5.75	7.61	20.19
1	7.5	0636	1378	991	112.1	5.37	7.46	19.94
2	15	0642	-	-	-	-	-	-
3	22.5	0649	-	-	-	-	-	-
4								
5								
6								
7								
8								
9								
10								

### Groundwater Sampling

**Water Level Recovery:** Depth to GW (ft.)      **Sample Containers:**

(I) Initially	<u>31.61</u>	500 ml polypropylene	No.	Preservation
(P) After Purging	<u>40.89</u>	1 liter(L), amber glass	<u>1</u>	<u>None</u>
P - 0.8(P-I) =	<u>33.96</u>	40ml VOA	<u>7</u>	<u>HCL</u>
(S) Before Sampling	<u>32.38</u>	250 ml glass	<u>1</u>	<u>H<sub>2</sub>SO<sub>4</sub></u>
Sampled 80% - 100%	<u>yes</u>	250 ml polypropylene	<u>4/1</u>	<u>None/HNO<sub>3</sub></u>

Sample Date: 5/11/12 Time: 0900 Turbidity (NTU): 116  
 Sampling Equipment: Disposable Bailer  
 Calibrate Date: 5/7/12

Comments: Well went dry at 2nd volume, 6 gallons in (14 gal.)

## Groundwater Sampling Form

Project Name: Tesoro #67076 Project Number: 01LV  
 Location: Livermore, CA Date: 5/9/12  
 Well Number: DW-1 Well Integrity: Good  
 Technician: C. Arroyo / A. Sciaky Ambient Conditions: Warm

Well Volume Calculation						
Well Casing Diameter (in.)	Total Well Depth	Depth To Ground-water (GW)	Linear Feet of GW	Gallons Per Linear Foot	1 Well Volume (gal.)	
2	-	=	X	0.17	=	
3	-	=	X	0.38	=	
④	64.75	36.35	=	28.40	X	= 18.74
4.5	-	=	X	0.83	=	
6	-	=	X	1.5	=	

### Groundwater Surface Inspection

Floating Product (ft)(in.): No Sheen/Iridescence: No Odor: No

### Groundwater Purging Purge Method

Submersible Pump       Honda Pump       Hand Bail       Grab Sample

Volumes Purged	Volume Purge (gal.)	Time	Conductivity (uS/cm)	tds <sup>g/L</sup> (ppm)	ORP	DO mg/l	pH	Temp.(°C)
0	Int.	1220	1033	1725	18.0	3.41	7.42	21.16
1	19	1231	1040	1727	30.1	7.92	7.45	21.28
2	38	1239	1054	1738	30.5	6.48	7.34	21.22
3	57	1252	1042	1731	1.9	4.39	7.36	21.21
4								
5								
6								
7								
8								
9								
10								

### Groundwater Sampling

Water Level Recovery: 36.35 Depth to GW (ft.)  
 (I) Initially 51.60  
 (P) After Purging 49.26 80% Recovery  
 P- 0.8(P-I) = 37.01  
 (S) Before Sampling 725  
 Sampled 80% - 100%

Sample Date: 5/9/12 Time: 1435  
 Sampling Equipment: Disposable Bailor  
 Calibrate Date: 5/7/12

Sample Containers:  
 500 ml polypropylene  
 1 liter(L), ~~amber glass~~ Poly 1 No. None Preservation  
 40ml VOA 5 HCL  
 250 ml glass 1 H<sub>2</sub>SO<sub>4</sub>  
 250 ml polypropylene 2 None

Turbidity (NTU): 43.9

Comments: \_\_\_\_\_

## Groundwater Sampling Form

Project Name: Tesoro #67076 Project Number: 01LV  
 Location: Livermore, CA Date: 5/10/12  
 Well Number: DW-2 Well Integrity: Good  
 Technician: C. Arroyo / A. Sciaky Ambient Conditions: COOL

Well Volume Calculation						
Well Casing Diameter (in.)	Total Well Depth	Depth to Ground-water (GW)	Linear Feet of GW	Gallons Per Linear Foot	1 Well Volume (gal.)	
2	-	=	X	0.17	=	
3	-	=	X	0.38	=	
<u>4</u>	<u>59.84</u>	<u>39.10</u>	<u>20.74</u>	<u>0.66</u>	=	<u>13.68</u>
4.5	-	=	X	0.83	=	
6	-	=	X	1.5	=	

### Groundwater Surface Inspection

Floating Product (ft)(in.): NO Sheen/Iridescence: NO Odor: NO

### Groundwater Purging Purge Method

Submersible Pump     
  Honda Pump     
  Hand Bail     
  Grab Sample

Volumes Purged	Volume Purge (gal.)	Time	Conductivity (uS/cm)	tds <sup>g/L</sup> (ppm)	ORP	DO mg/l	pH	Temp.(°C)
0	Int.	<u>0715</u>	<u>1225</u>	<u>885</u>	<u>-142.4</u>	<u>.95</u>	<u>7.22</u>	<u>20.7</u>
1	<u>14</u>	<u>0724</u>	<u>1261</u>	<u>886</u>	<u>-142.5</u>	<u>.31</u>	<u>6.97</u>	<u>21.12</u>
2	<u>28</u>	<u>0734</u>	<u>1265</u>	<u>887</u>	<u>-144.5</u>	<u>.25</u>	<u>6.94</u>	<u>21.17</u>
3	<u>42</u>	<u>0743</u>	<u>1264</u>	<u>886</u>	<u>-145.7</u>	<u>.23</u>	<u>6.93</u>	<u>21.18</u>
4								
5								
6								
7								
8								
9								
10								

### Groundwater Sampling

Water Level Recovery:      Sample Containers:

Depth to GW (ft.) (I) Initially: <u>39.10</u> (P) After Purging: <u>49.61</u> P- 0.8(P-I) = <u>41.20</u> 80% Recovery (S) Before Sampling: <u>40.69</u> Sampled 80% - 100%: <u>yes</u>	No.      Preservation 500 ml polypropylene 1 liter(L), amber glass <sup>poly</sup> <u>1</u> <u>None</u> 40ml VOA <u>5</u> <u>HCL</u> 250 ml glass <u>1</u> <u>H2SO4</u> 250 ml polypropylene <u>2</u> <u>None</u>
---	--

Sample Date: 5/10/12      Time: 1015      Turbidity (NTU): 28.6  
 Sampling Equipment: Disposable Bailor  
 Calibrate Date: 5/7/12

Comments: \_\_\_\_\_

## Groundwater Sampling Form

Project Name: Tesoro #67076 Project Number: 01LV  
 Location: Livermore, CA Date: 5/8/12  
 Well Number: DW-3 Well Integrity: Good  
 Technician: C. Arroyo / A. Sciaky Ambient Conditions: Hot

Well Volume Calculation					
Well Casing Diameter (in.)	Total Well Depth	Depth To Ground-water (GW)	Linear Feet of GW	Gallons Per Linear Foot	1 Well Volume (gal.)
2	-	=	X	0.17	=
3	-	=	X	0.38	=
④	59.74	36.70	21.04	0.66	= 73.86
4.5	-	=	X	0.83	=
6	-	=	X	1.5	=

### Groundwater Surface Inspection

Floating Product (ft)(in.): No Sheen/Iridescence: No Odor: No

### Groundwater Purging Purge Method

Submersible Pump      Honda Pump      Hand Bail      Grab Sample

Volumes Purged	Volume Purge (gal.)	Time	Conductivity (uS/cm)	g/L tds (ppm)	ORP	DO mg/l	pH	Temp.(°C)
0	Int.	1317	1225	.825	-19.4	1.99	7.24	23.01
1	14	1324	1146	.779	-145.7	.34	7.64	22.77
2	28	1333	1165	.792	-152.6	.16	7.38	22.71
3	42	1343	1171	.796	-158.5	.12	7.31	22.72
4								
5								
6								
7								
8								
9								
10								

### Groundwater Sampling

**Water Level Recovery:** Depth to GW (ft.)     **Sample Containers:**

(I) Initially <u>36.70</u> (P) After Purging <u>57.62</u> P- 0.8(P-I) = <u>42.48</u> 80% Recovery (S) Before Sampling <u>39.11</u> Sampled 80% - 100% <u>yes</u>	500 ml polypropylene _____ 1 liter(L), amber glass _____ 40ml VOA <u>3</u> HCL 250 ml glass _____ 250 ml polypropylene _____
--	--

Sample Date: 5/8/12 Time: 1430 Turbidity (NTU): 26.7  
 Sampling Equipment: Disposable Bailor  
 Calibrate Date: 5/7/12

Comments: \_\_\_\_\_



## Groundwater Sampling Form

Project Name: Tesoro #67076 Project Number: 01LV  
 Location: Livermore, CA Date: 5/7/12  
 Well Number: DW-4 Well Integrity: Good  
 Technician: C. Arroyo / A. Sciaky Ambient Conditions: warm

Well Volume Calculation					
Well Casing Diameter (in.)	Total Well Depth	Depth To Ground-water (GW)	Linear Feet of GW	Gallons Per Linear Foot	1 Well Volume (gal.)
2	-	=	X	0.17	=
3	-	=	X	0.38	=
<u>(4)</u>	<u>7004</u>	<u>3826</u>	<u>3178</u>	<u>0.66</u>	<u>= 20.97</u>
4.5	-	=	X	0.83	=
6	-	=	X	1.5	=

### Groundwater Surface Inspection

Floating Product (ft)(in.): No Sheen/Iridescence: No Odor: No

### Groundwater Purging Purge Method

Submersible Pump       Honda Pump       Hand Bail       Grab Sample

Volumes Purged	Volume Purge (gal.)	Time	Conductivity (uS/cm)	Tds <sup>g/L</sup> (ppm)	ORP	DO mg/l	pH	Temp.(°C)
0	<u>Int.</u>	<u>1739</u>	<u>1010</u>	<u>.645</u>	<u>52.6</u>	<u>3.42</u>	<u>7.77</u>	<u>21.94</u>
1	<u>21</u>	<u>1250</u>	<u>1002</u>	<u>.642</u>	<u>51.6</u>	<u>.20</u>	<u>7.22</u>	<u>21.92</u>
2	<u>42</u>	<u>1301</u>	<u>1003</u>	<u>.642</u>	<u>37.6</u>	<u>.15</u>	<u>7.20</u>	<u>21.93</u>
3	<u>63</u>	<u>1313</u>	<u>1002</u>	<u>.642</u>	<u>13.7</u>	<u>.14</u>	<u>7.21</u>	<u>21.95</u>
4								
5								
6								
7								
8								
9								
10								

### Groundwater Sampling

Water Level Recovery: \_\_\_\_\_ Sample Containers: \_\_\_\_\_  
 Depth to GW (ft.) \_\_\_\_\_ No. \_\_\_\_\_ Preservation \_\_\_\_\_  
 (I) Initially 3826 500 ml polypropylene \_\_\_\_\_  
 (P) After Purging 5145 1 liter(L), amber glass \_\_\_\_\_  
 P- 0.8(P-I) = 40.89 80% Recovery 40ml VOA 3 HCL \_\_\_\_\_  
 (S) Before Sampling 3993 250 ml glass \_\_\_\_\_  
 Sampled 80% - 100% Yes 250 ml polypropylene \_\_\_\_\_  
 Sample Date: 5/7/12 Time: 1400 Turbidity (NTU): 64.1  
 Sampling Equipment: Disposable Bailer  
 Calibrate Date: 5/7/12

Comments: \_\_\_\_\_

# Groundwater Sampling Form

Project Name: Tesoro #67076 Project Number: 01LV  
 Location: Livermore, CA Date: 5/10/12  
 Well Number: DW-5 Well Integrity: Good  
 Technician: C. Arroyo / A. Sciaky Ambient Conditions: cool

Well Volume Calculation					
Well Casing Diameter (in.)	Total Well Depth	Depth to Ground-water (GW)	Linear Feet of GW	Gallons Per Linear Foot	1 Well Volume (gal.)
2	-	=	X	0.17	=
3	-	=	X	0.38	=
④	59.80	38.98	20.82	X 0.66	= 13.74
4.5	-	=	X	0.83	=
6	-	=	X	1.5	=

### Groundwater Surface Inspection

Floating Product (ft)(in.): No Sheen/Iridescence: No Odor: No

### Groundwater Purging Purge Method

Submersible Pump Honda Pump Hand Bail Grab Sample

Volumes Purged	Volume Purge (gal.)	Time	Conductivity (uS/cm)	tds (ppm)	ORP	DO mg/l	pH	Temp.(°C)
0	Int.	0900	1047	729	-134.6	128	7.44	21.43
1	14	0908	1068	741	-213.0	110	7.22	21.71
2	28	0916	1075	745	-224.3	109	7.13	21.74
3	42	0922	1074	748	-223.9	108	7.10	21.74
4								
5								
6								
7								
8								
9								
10								

### Groundwater Sampling

Water Level Recovery: 80% Recovery Sample Containers: 3  
 Depth to GW (ft.):  
 (I) Initially 38.98 500 ml polypropylene  
 (P) After Purging 47.38 1 liter(L), amber glass  
 P- 0.8(P-I) = 41.96 40ml VOA  
 (S) Before Sampling 41.02 250 ml glass  
 Sampled 80% - 100% 42.5 250 ml polypropylene

Sample Date: 5/10/12 Time: 1000 Turbidity (NTU): 189  
 Sampling Equipment: Disposable Bailer  
 Calibrate Date: 5/7/12

Comments: \_\_\_\_\_

# Groundwater Sampling Form

Project Name: Tesoro #67076 Project Number: 01LV  
 Location: Livermore, CA Date: 5/10/12  
 Well Number: DW-6 Well Integrity: Good  
 Technician: C. Arroyo / A. Sciaky Ambient Conditions: Cool

Well Volume Calculation					
Well Casing Diameter (in.)	Total Well Depth	Depth to Ground-water (GW)	Linear Feet of GW	Gallons Per Linear Foot	1 Well Volume (gal.)
2	-	=	X	0.17	=
3	-	=	X	0.38	=
④	60.15	39.82	20.33	0.66	= 13.41
4.5	-	=	X	0.83	=
6	-	=	X	1.5	=

### Groundwater Surface Inspection

Floating Product (ft)(in.): No Sheen/Iridescence: No Odor: No

### Groundwater Purging Purge Method

Submersible Pump     
  Honda Pump     
  Hand Bail     
  Grab Sample

Volumes Purged	Volume Purge (gal.)	Time	Conductivity (uS/cm)	tds (ppm) <u>9/4</u>	ORP	DO mg/l	pH	Temp.(°C)
0	Int.	0747	1084	1762	-196.0	.76	7.22	21.03
1	13.5	0755	1115	1773	-215.0	.14	7.06	21.72
2	27	0803	1123	1778	-208.6	.13	7.04	21.80
3	40.5	0810	1123	1780	-208.0	.13	7.02	21.66
4								
5								
6								
7								
8								
9								
10								

### Groundwater Sampling

**Water Level Recovery:**      **Sample Containers:**

Depth to GW (ft.) (I) Initially <u>39.82</u> (P) After Purging <u>48.16</u> P- 0.8(P-I) = <u>41.48</u> 80% Recovery (S) Before Sampling <u>41.29</u> Sampled 80% - 100% <u>Yes</u>	No.      Preservation 500 ml polypropylene _____ 1 liter(L), amber glass _____ 40ml VOA <u>3</u> <u>HCL</u> 250 ml glass _____ 250 ml polypropylene _____
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Sample Date: 5/10/12      Time: 0850      Turbidity (NTU): 284  
 Sampling Equipment: Disposable Bailer  
 Calibrate Date: 5/7/12

Comments: \_\_\_\_\_

# Groundwater Sampling Form

Project Name: Tesoro #67076 Project Number: 01LV  
 Location: Livermore, CA Date: 5/10/12  
 Well Number: DW-7 Well Integrity: Good  
 Technician: C. Arroyo / A. Sciaky Ambient Conditions: cool

Well Volume Calculation					
Well Casing Diameter (in.)	Total Well Depth	Depth to Ground-water (GW)	Linear Feet of GW	Gallons Per Linear Foot	1 Well Volume (gal.)
2	-	=	X	0.17	=
3	-	=	X	0.38	=
4	65.20	34.30	25.90	0.66	17.09
4.5	-	=	X	0.83	=
6	-	=	X	1.5	=

### Groundwater Surface Inspection

Floating Product (ft)(in.): No Sheen/Iridescence: No Odor: No

### Groundwater Purging Purge Method

Submersible Pump     
  Honda Pump     
  Hand Bail     
  Grab Sample

Volumes Purged	Volume Purge (gal.)	Time	Conductivity (uS/cm)	g/L tds (ppm)	ORP	DO mg/l	pH	Temp.(°C)
0	Int.	0824	1234	.856	-187.6	16	6.98	21.80
1	17	0835	1225	.842	-204.0	10	6.93	22.12
2	34	0846	1223	.841	-199.6	10	6.92	22.15
3	51	0854	1220	.838	-197.9	10	6.91	22.20
4								
5								
6								
7								
8								
9								
10								

### Groundwater Sampling

**Water Level Recovery:**      **Sample Containers:**  
 Depth to GW (ft.)      No.      Preservation  
 (I) Initially      34.30      500 ml polypropylene  
 (P) After Purging      56.22      1 liter(L), amber glass poly 1      None  
 P- 0.8(P-I) =      42.68      40ml VOA      5      HCL  
 (S) Before Sampling      42.41      250 ml glass      1      H2SO4  
 Sampled 80% - 100%      Yes      250 ml polypropylene      2      None  
  
 Sample Date: 5/10/12      Time: 1035      Turbidity (NTU): 38.1  
 Sampling Equipment: Disposable Bailor  
 Calibrate Date: 5/7/12  
 Comments: \_\_\_\_\_

## Groundwater Sampling Form

**Project Name:** Tesoro #67076 **Project Number:** 01LV  
**Location:** Livermore, CA **Date:** 5/11/12  
**Well Number:** DW-8 **Well Integrity:** Good  
**Technician:** C. Arroyo / A. Sciaky **Ambient Conditions:** 001

Well Volume Calculation					
Well Casing Diameter (in.)	Total Well Depth	Depth to Ground-water (GW)	Linear Feet of GW	Gallons Per Linear Foot	1 Well Volume (gal.)
2	-	=	X	0.17	=
3	-	=	X	0.38	=
④	64.65	35.52	29.13	0.66	19.22
4.5	-	=	X	0.83	=
6	-	=	X	1.5	=

### Groundwater Surface Inspection

**Floating Product (ft)(in.):** NO **Sheen/Iridescence:** NO **Odor:** NO

### Groundwater Purging Purge Method

Submersible Pump     
  Honda Pump     
  Hand Bail     
  Grab Sample

Volumes Purged	Volume Purge (gal.)	Time	Conductivity (uS/cm)	tds (ppm)	ORP	DO mg/l	pH	Temp.(°C)
0	Int.	0730	1516	1,056	-294.5	.15	8.64	20.70
1	19.5	0739	1442	1,020	-287.4	.11	8.64	20.85
2	39	0748	1545	1,084	-244.5	.10	7.66	20.84
3	58.5	0759	1554	1,049	-243.8	.11	7.53	20.86
4								
5								
6								
7								
8								
9								
10								

### Groundwater Sampling

**Water Level Recovery:** Depth to GW (ft.) Sample Containers:

(I) Initially <u>35.52</u> (P) After Purging <u>48.22</u> P - 0.8(P-I) = <u>38.06</u> 80% Recovery (S) Before Sampling <u>37.48</u> Sampled 80% - 100% <u>yes</u>	500 ml polypropylene 1 liter(L), amber glass Poly <u>1</u> 40ml VOA <u>7</u> 250 ml glass 250 ml polypropylene <u>4/1</u>	No.      Preservation _____ _____ _____ _____ _____
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**Sample Date:** 5/11/12      **Time:** 0920      **Turbidity (NTU):** 14.3  
**Sampling Equipment:** Disposable Bailer  
**Calibrate Date:** 5/7/12

**Comments:** \_\_\_\_\_

## Groundwater Sampling Form

Project Name: Tesoro #67076 Project Number: 01LV  
 Location: Livermore, CA Date: 5/18/12  
 Well Number: TP-1 Well Integrity: Good  
 Technician: C. Arroyo / A. Sciaky Ambient Conditions: warm

Well Volume Calculation						
Well Casing Diameter (in.)	Total Well Depth	Depth to Ground-water (GW)	Linear Feet of GW	Gallons Per Linear Foot	1 Well Volume (gal.)	
2	43.22	34.70	8.52 X	0.17	=	1.44
3	-	=	X	0.38	=	
4	-	=	X	0.66	=	
4.5	-	=	X	0.83	=	
6	-	=	X	1.5	=	

### Groundwater Surface Inspection

Floating Product (ft)(in.): NO Sheen/Iridescence: NO Odor: NO

### Groundwater Purging Purge Method

Submersible Pump      Honda Pump      Hand Bail      Grab Sample

Volumes Purged	Volume Purge (gal.)	Time	Conductivity (uS/cm)	g/L tds (ppm)	ORP	DO mg/l	pH	Temp. (°C)
0	Int.	1420	1262	863	-6.1	1165	7.95	22.45
1	1.5	1422	1217	855	23.4	1253	7.72	21.34
2	3	1424	1211	852	31.1	1340	7.38	21.03
3	4.5	1425	1224	864	35.7	1329	7.20	20.90
4								
5								
6								
7								
8								
9								
10								

### Groundwater Sampling

Water Level Recovery:      Sample Containers:

Depth to GW (ft.) (I) Initially <u>34.70</u> (P) After Purging <u>36.84</u> P- 0.8(P-I) = <u>35.12</u> 80% Recovery (S) Before Sampling <u>35.03</u> Sampled 80% - 100% <u>yes</u>  Sample Date : <u>5/18/12</u> Time: <u>1440</u> Sampling Equipment : <u>Disposable Bailer</u> Calibrate Date: <u>5/7/12</u>	No.      Preservation 500 ml polypropylene 1 liter(L), amber glass 40ml VOA <u>3</u> <u>HCL</u> 250 ml glass 250 ml polypropylene  Turbidity (NTU): <u>71000</u>
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Comments: well has negative pressure

## Groundwater Sampling Form

Project Name: Tesoro #67076 Project Number: 01LV  
 Location: Livermore, CA Date: 5/7/12  
 Well Number: TP-2 Well Integrity: Good  
 Technician: C. Arroyo / A. Sciaky Ambient Conditions: Warm

Well Volume Calculation						
Well Casing Diameter (in.)	Total Well Depth	Depth to Ground-water (GW)	Linear Feet of GW	Gallons Per Linear Foot	1 Well Volume (gal.)	
②	41.21	34.41	6.80 X	0.17	=	115
3	-	=	X	0.38	=	
4	-	=	X	0.66	=	
4.5	-	=	X	0.83	=	
6	-	=	X	1.5	=	

### Groundwater Surface Inspection

Floating Product (ft)(in.): No Sheen/Iridescence: No Odor: No

### Groundwater Purging Purge Method

Submersible Pump      Honda Pump      Hand Bail      Grab Sample

Volumes Purged	Volume Purge (gal.)	Time	Conductivity (uS/cm)	tds <sup>g/L</sup> (ppm)	ORP	DO mg/l	pH	Temp.(°C)
0	Int.	1200	1323	1927	65.4	8.23	8.26	21.07
1	1	1201	1302	1920	71.7	10.72	7.73	20.86
2	2	1202	1287	1915	74.9	12.44	7.56	20.66
3	3	1203	1297	1913	77.5	13.74	7.36	21.03
4								
5								
6								
7								
8								
9								
10								

### Groundwater Sampling

**Water Level Recovery:** Depth to GW (ft.)  
 (I) Initially: 34.41  
 (P) After Purging: 36.22  
 P - 0.8(P-I) = 34.77      80% Recovery  
 (S) Before Sampling: 34.63  
 Sampled 80% - 100%: Yes

**Sample Containers:**  
 500 ml polypropylene  
 1 liter(L), amber glass  
 40ml VOA      3  
 250 ml glass      HCL  
 250 ml polypropylene

Sample Date: 5/7/12      Time: 1215      Turbidity (NTU): 1000  
 Sampling Equipment: Disposable Bailer  
 Calibrate Date: 5/7/12

Comments: \_\_\_\_\_

## Groundwater Sampling Form

Project Name: Tesoro #67076 Project Number: 01LV  
 Location: Livermore, CA Date: 5/7/12  
 Well Number: VW-2 Well Integrity: Good  
 Technician: C. Arroyo / A. Sciaky Ambient Conditions: Warm

Well Volume Calculation					
Well Casing Diameter (in.)	Total Well Depth	Depth to Ground-water (GW)	Linear Feet of GW	Gallons Per Linear Foot	1 Well Volume (gal.)
②	36.78	31.50	5.28 X	0.17	= .89
3	-	=	X	0.38	=
4	-	=	X	0.66	=
4.5	-	=	X	0.83	=
6	-	=	X	1.5	=

### Groundwater Surface Inspection

Floating Product (ft)(in.): No Sheen/Iridescence: No Odor: No

### Groundwater Purging Purge Method

Submersible Pump      Honda Pump      Hand Bail      Grab Sample

Volumes Purged	Volume Purge (gal.)	Time	Conductivity (uS/cm)	g/L tds (ppm)	ORP	DO mg/l	pH	Temp.(°C)
0	Int.	1133	1186	829	69.7	10.44	8.12	21.33
1								
2								
3								
4								
5								
6								
7								
8								
9								
10								

### Groundwater Sampling

Water Level Recovery: 31.50 Depth to GW (ft.)      Sample Containers:

	No.	Preservation		
(I) Initially			500 ml polypropylene	
(P) After Purging			1 liter(L), amber glass	
P- 0.8(P-I) =			40ml VOA	3
(S) Before Sampling			250 ml glass	HCL
Sampled 80% - 100%			250 ml polypropylene	

Sample Date: 5/7/12 Time: 1135 Turbidity (NTU): 11000  
 Sampling Equipment: Disposable Bailer  
 Calibrate Date: 5/7/12

Comments: \_\_\_\_\_



## Groundwater Sampling Form

Project Name: Tesoro #67076 Project Number: 01LV  
 Location: Livermore, CA Date: 5/7/12  
 Well Number: VW-3 Well Integrity: Good  
 Technician: C. Arroyo / A. Sciaky Ambient Conditions: WARM

Well Volume Calculation						
Well Casing Diameter (in.)	Total Well Depth	Depth to Ground-water (GW)	Linear Feet of GW	Gallons Per Linear Foot	1 Well Volume (gal.)	
(2)	36.34	36.20	0.14 X	0.17	= 0.02	
3	-	=	X	0.38	=	
4	-	=	X	0.66	=	
4.5	-	=	X	0.83	=	
6	-	=	X	1.5	=	

### Groundwater Surface Inspection

Floating Product (ft)(in.): None Sheen/Iridescence: - Odor: -

### Groundwater Purging Purge Method

Submersible Pump      Honda Pump      Hand Bail      Grab Sample

Volumes Purged	Volume Purge (gal.)	Time	Conductivity (uS/cm)	tds (g/l)	ORP	DO mg/l	pH	Temp.(°C)
0	Int.	-	-	-	-	-	-	-
1								
2								
3								
4								
5								
6								
7								
8								
9								
10								

### Groundwater Sampling

**Water Level Recovery:** Depth to GW (ft.)  
 (I) Initially: 36.20  
 (P) After Purging: -  
 P - 0.8(P-I) = -      80% Recovery  
 (S) Before Sampling: -  
 Sampled 80% - 100%: -

**Sample Containers:**  
 500 ml polypropylene  
 1 liter(L), amber glass  
 40ml VOA  
 250 ml glass  
 125 ml polypropylene

Sample Date: NS      Time: NS      Turbidity (NTU): NM

Sampling Equipment: -  
 Calibrate Date: 5/7/12

Comments: Not enough water to sample.

## Groundwater Sampling Form

Project Name: Tesoro #67076 Project Number: 01LV  
 Location: Livermore, CA Date: 5/9/12  
 Well Number: IP-1 Well Integrity: Good  
 Technician: C. Arroyo / A. Sciaky Ambient Conditions: COOL

Well Volume Calculation						
Well Casing Diameter (in.)	Total Well Depth	Depth to Ground-water (GW)	Linear Feet of GW	Gallons Per Linear Foot	1 Well Volume (gal.)	
②	64.45	36.18	28.27 X	0.17	= 4.80	
3	-	=	X	0.38	=	
4	-	=	X	0.66	=	
4.5	-	=	X	0.83	=	
6	-	=	X	1.5	=	

### Groundwater Surface Inspection

Floating Product (ft)(in.): NO Sheen/Iridescence: NO Odor: NO

### Groundwater Purging Purge Method

Submersible Pump      Honda Pump      Hand Bail      Grab Sample

Volumes Purged	Volume Purge (gal.)	Time	Conductivity (uS/cm)	tds <sup>g/L</sup> (ppm)	ORP	DO mg/l	pH	Temp.(°C)
0	Int.	0733	1182	.849	-28.3	1.27	7.21	19.97
1	5	0738	1171	.847	-138.5	2.07	7.24	19.70
2	10	0744	1202	.868	-162.5	5.26	7.13	19.80
3	15	0749	1229	.892	-159.9	2.78	7.16	19.51
4								
5								
6								
7								
8								
9								
10								

### Groundwater Sampling

Water Level Recovery:

Depth to GW (ft.)

(I) Initially 36.18  
 (P) After Purging 43.28  
 P- 0.8(P-I) = 37.60      80% Recovery  
 (S) Before Sampling 36.18  
 Sampled 80% - 100% yes

Sample Containers:

	No.	Preservation
500 ml polypropylene		
1 liter(L), amber glass poly	1	None
40ml VOA	7	HCL
250 ml glass	<del>4</del>	<del>None</del>
250 ml polypropylene	4/1	None/HNO <sub>3</sub>

Sample Date: 5/9/12 Time: 1010

Turbidity (NTU): 214

Sampling Equipment: Disposable Bailor

Calibrate Date: 5/7/12

Comments: \_\_\_\_\_

# Groundwater Sampling Form

**Project Name:** Tesoro #67076 **Project Number:** 01LV  
**Location:** Livermore, CA **Date:** 5/8/12  
**Well Number:** IP-2 **Well Integrity:** Good  
**Technician:** C. Arroyo / A. Sciaky **Ambient Conditions:** Warm

Well Volume Calculation						
Well Casing Diameter (in.)	Total Well Depth	Depth to Ground-water (GW)	Linear Feet of GW	Gallons Per Linear Foot	1 Well Volume (gal.)	
②	64.54	37.21	27.33 X	0.17	= 4.64	
3	-	=	X	0.38	=	
4	-	=	X	0.66	=	
4.5	-	=	X	0.83	=	
6	-	=	X	1.5	=	

### Groundwater Surface Inspection

**Floating Product (ft)(in.):** NO **Sheen/Iridescence:** NO **Odor:** NO

### Groundwater Purging Purge Method

Submersible Pump      Honda Pump      Hand Bail      Grab Sample

Volumes Purged	Volume Purge (gal.)	Time	Conductivity (uS/cm)	tds <sup>g/l</sup> (ppm)	ORP	DO mg/l	pH	Temp.(°C)
0	Int.	1205	1098	1755	44.2	24.88	7.97	22.11
1	5	1211	1073	1752	37.5	23.62	7.77	21.23
2	10	1218	1120	1768	51.2	11.44	7.60	22.38
3	15	1223	1084	1766	47.9	15.42	7.56	20.89
4								
5								
6								
7								
8								
9								
10								

### Groundwater Sampling

**Water Level Recovery:** **Depth to GW (ft.)**  
 (I) Initially 37.21  
 (P) After Purging 44.61  
 P- 0.8(P-I) = 38.69      80% Recovery  
 (S) Before Sampling 37.46  
 Sampled 80% - 100% Yes

**Sample Containers:**  
 500 ml polypropylene \_\_\_\_\_  
 1 liter(L), amber glass \_\_\_\_\_  
 40ml VOA 3      HCL \_\_\_\_\_  
 250 ml glass \_\_\_\_\_  
 250 ml polypropylene \_\_\_\_\_

**Sample Date :** 5/8/12      **Time:** 1305      **Turbidity (NTU):** 386

**Sampling Equipment :** Disposable Bailor  
**Calibrate Date:** 5/7/12

**Comments:** \_\_\_\_\_

## Groundwater Sampling Form

Project Name: Tesoro #67076 Project Number: 01LV  
 Location: Livermore, CA Date: 5/8/12  
 Well Number: IP-3 Well Integrity: Good  
 Technician: C. Arroyo / A. Sciaky Ambient Conditions: 0001

Well Volume Calculation						
Well Casing Diameter (in.)	Total Well Depth	Depth to Ground-water (GW)	Linear Feet of GW	Gallons Per Linear Foot	1 Well Volume (gal.)	
②	64.70	36.41	28.29 X	0.17	= 4.80	
3	-	=	X	0.38	=	
4	-	=	X	0.66	=	
4.5	-	=	X	0.83	=	
6	-	=	X	1.5	=	

### Groundwater Surface Inspection

Floating Product (ft)(in.): No Sheen/Iridescence: No Odor: No

### Groundwater Purging Purge Method

Submersible Pump      Honda Pump      Hand Bail      Grab Sample

Volumes Purged	Volume Purge (gal.)	Time	Conductivity (uS/cm)	tds (ppm)	ORP	DO mg/l	pH	Temp.(°C)
0	Int.	0622	1020	733	107.7	20.26	7.19	20.00
1	5	0633	983	722	85.7	12.28	7.62	18.93
2	10	0643	984	717	80.9	7.04	7.58	19.35
3	15	0651	988	717	79.6	7.49	7.56	19.59
4								
5								
6								
7								
8								
9								
10								

### Groundwater Sampling

**Water Level Recovery:**      **Sample Containers:**  
 Depth to GW (ft.)      No.      Preservation  
 (I) Initially      36.41      500 ml polypropylene  
 (P) After Purging      42.80      1 liter(L), amber glass  
 P- 0.8(P-I) =      37.69      80% Recovery      40ml VOA      3      HCL  
 (S) Before Sampling      37.12      250 ml glass  
 Sampled 80% - 100%      Yes      250 ml polypropylene  
 Sample Date :      5/8/12      Time: 0720      Turbidity (NTU): 85.6  
 Sampling Equipment :      Disposable Bailer  
 Calibrate Date:      5/7/12

Comments: \_\_\_\_\_

## Groundwater Sampling Form

Project Name: Tesoro #67076 Project Number: 01LV  
 Location: Livermore, CA Date: 5/8/12  
 Well Number: IP-4 Well Integrity: Good  
 Technician: C. Arroyo / A. Sciaky Ambient Conditions: cool

Well Volume Calculation					
Well Casing Diameter (in.)	Total Well Depth	Depth to Ground-water (GW)	Linear Feet of GW	Gallons Per Linear Foot	1 Well Volume (gal.)
②	64.75	36.30	28.45 X	0.17	= 4.83
3	-	=	X	0.38	=
4	-	=	X	0.66	=
4.5	-	=	X	0.83	=
6	-	=	X	1.5	=

### Groundwater Surface Inspection

Floating Product (ft)(in.): No Sheen/Iridescence: No Odor: No

### Groundwater Purging Purge Method

Submersible Pump      Honda Pump      Hand Bail      Grab Sample

Volumes Purged	Volume Purge (gal.)	Time	Conductivity (uS/cm)	g/L tds (ppm)	ORP	DO mg/l	pH	Temp.(°C)
0	Int.	0701	970	719	105.8	8.04	7.76	18.84
1	5	0709	971	703	96.3	6.30	7.74	19.71
2	10	0716	976	710	88.3	3.86	7.65	19.36
3	15	0725	979	710	81.0	3.44	7.60	19.54
4								
5								
6								
7								
8								
9								
10								

### Groundwater Sampling

**Water Level Recovery:**      **Sample Containers:**  
 Depth to GW (ft.)      No.      Preservation  
 (I) Initially      36.30      500 ml polypropylene      \_\_\_\_\_  
 (P) After Purging      39.41      1 liter(L), amber glass      \_\_\_\_\_  
 P- 0.8(P-I) =      36.92      80% Recovery      40ml VOA      3      HCL  
 (S) Before Sampling      36.91      250 ml glass      \_\_\_\_\_  
 Sampled 80% - 100%      42.5      250 ml polypropylene      \_\_\_\_\_  
 Sample Date :      5/8/12      Time: 0745      Turbidity (NTU): 103  
 Sampling Equipment :      Disposable Bailer  
 Calibrate Date:      5/7/12

Comments: \_\_\_\_\_

## Groundwater Sampling Form

Project Name: Tesoro #67076 Project Number: 01LV  
 Location: Livermore, CA Date: 5/8/12  
 Well Number: IP-5 Well Integrity: Good  
 Technician: C. Arroyo / A. Sciaky Ambient Conditions: cool

Well Volume Calculation						
Well Casing Diameter (in.)	Total Well Depth	Depth to Ground-water (GW)	Linear Feet of GW	Gallons Per Linear Foot	1 Well Volume (gal.)	
②	64.27	- 36.90	= 27.37 X	0.17	= 4.65	
3	-	-	= X	0.38	=	
4	-	-	= X	0.66	=	
4.5	-	-	= X	0.83	=	
6	-	-	= X	1.5	=	

### Groundwater Surface Inspection

Floating Product (ft)(in.): No Sheen/Iridescence: No Odor: No

### Groundwater Purging Purge Method

Submersible Pump      Honda Pump      Hand Bail      Grab Sample

Volumes Purged	Volume Purge (gal.)	Time	Conductivity (uS/cm)	g/L tds (ppm)	ORP	DO mg/l	pH	Temp.(°C)
0	Int.	0735	954	1702	1232	5.78	8.15	19.17
1	4.5	0742	975	1708	95.9	27.41	8.21	19.52
2	9	0744	985	1717	86.0	26.57	8.17	19.38
3	13.5	0757	1015	1735	91.0	14.71	8.00	19.66
4								
5								
6								
7								
8								
9								
10								

### Groundwater Sampling

Water Level Recovery:

Depth to GW (ft.)

(I) Initially 36.90  
 (P) After Purging 42.21  
 P- 0.8(P-I) = 37.96      80% Recovery  
 (S) Before Sampling 37.17  
 Sampled 80% - 100% Yes

Sample Containers:

No.	Preservation
500 ml polypropylene	
1 liter(L), amber glass	
40ml VOA	<u>3</u>
250 ml glass	<u>HCL</u>
250 ml polypropylene	

Sample Date : 5/8/12 Time: 0820

Turbidity (NTU): 873

Sampling Equipment : Disposable Bailer

Calibrate Date: 5/7/12

Comments: \_\_\_\_\_

## Groundwater Sampling Form

Project Name: Tesoro #67076 Project Number: 01LV  
 Location: Livermore, CA Date: 5/18/12  
 Well Number: IP-6 Well Integrity: Good  
 Technician: C. Arroyo / A. Sciaky Ambient Conditions: Good

Well Volume Calculation						
Well Casing Diameter (in.)	Total Well Depth	Depth to Ground-water (GW)	Linear Feet of GW	Gallons Per Linear Foot	1 Well Volume (gal.)	
②	71.60	39.70	31.90 X	0.17	= 5.42	
3	-	=	X	0.38	=	
4	-	=	X	0.66	=	
4.5	-	=	X	0.83	=	
6	-	=	X	1.5	=	

### Groundwater Surface Inspection

Floating Product (ft)(in.): No Sheen/Iridescence: No Odor: No

### Groundwater Purging Purge Method

Submersible Pump      Honda Pump      Hand Bail      Grab Sample

Volumes Purged	Volume Purge (gal.)	Time	Conductivity (uS/cm)	tds <sup>g/l</sup> (ppm)	ORP	DO mg/l	pH	Temp.(°C)
0	Int.	0850	1044	744	-139.5	4.55	7.78	20.42
1	5.5	0857	1037	742	-180.2	2.73	7.34	20.21
2	11	0904	1021	737	-161.1	2.91	7.50	19.81
3	16.5	0913	1034	739	-147.5	3.37	7.43	20.25
4								
5								
6								
7								
8								
9								
10								

### Groundwater Sampling

Water Level Recovery:

Depth to GW (ft.)

(I) Initially 39.70  
 (P) After Purging 46.29  
 P- 0.8(P-I) = 41.01      80% Recovery  
 (S) Before Sampling 39.96  
 Sampled 80% - 100% Yes

Sample Containers:

No.	Preservation
500 ml polypropylene	
1 liter(L), amber glass	
40ml VOA	3
250 ml glass	HCL
250 ml polypropylene	

Sample Date: 5/18/12 Time: 0930

Turbidity (NTU): 2.10

Sampling Equipment: Disposable Bailer

Calibrate Date: 5/7/12

Comments:

## Groundwater Sampling Form

Project Name: Tesoro #67076 Project Number: 01LV  
 Location: Livermore, CA Date: 5/8/12  
 Well Number: IP-7 Well Integrity: Good  
 Technician: C. Arroyo / A. Sciaky Ambient Conditions: cool

Well Volume Calculation					
Well Casing Diameter (in.)	Total Well Depth	Depth to Ground-water (GW)	Linear Feet of GW	Gallons Per Linear Foot	1 Well Volume (gal.)
②	71.34	41.87	29.47	0.17	5.01
3	-	=	X	0.38	=
4	-	=	X	0.66	=
4.5	-	=	X	0.83	=
6	-	=	X	1.5	=

### Groundwater Surface Inspection

Floating Product (ft)(in.): NO Sheen/Iridescence: NO Odor: NO

### Groundwater Purging Purge Method

Submersible Pump      Honda Pump      Hand Bail      Grab Sample

Volumes Purged	Volume Purge (gal.)	Time	Conductivity (uS/cm)	tds <sup>g/L</sup> (ppm)	ORP	DO mg/l	pH	Temp.(°C)
0	Int.	1020	1067	760	-92.1	5.78	7.90	20.46
1	5	1026	1035	735	-33.2	5.39	7.71	20.57
2	10	1032	1053	747	-32.2	4.02	7.53	20.59
3	15	1036	1047	745	-26.3	4.32	7.59	20.49
4								
5								
6								
7								
8								
9								
10								

### Groundwater Sampling

**Water Level Recovery:**      **Sample Containers:**  
 Depth to GW (ft.)      No.      Preservation  
 (I) Initially      41.87      500 ml polypropylene      \_\_\_\_\_  
 (P) After Purging      52.74      1 liter(L), amber glass      \_\_\_\_\_  
 P- 0.8(P-I) =      44.04      80% Recovery      40ml VOA      3      NCL  
 (S) Before Sampling      42.96      250 ml glass      \_\_\_\_\_  
 Sampled 80% - 100%      yes      250 ml polypropylene      \_\_\_\_\_  
 Sample Date :      5/8/12      Time: 1145      Turbidity (NTU): 348  
 Sampling Equipment :      Disposable Bailer  
 Calibrate Date:      5/7/12

Comments: \_\_\_\_\_



## Groundwater Sampling Form

Project Name: Tesoro #67076 Project Number: 01LV  
 Location: Livermore, CA Date: 5/9/12  
 Well Number: IP-8 Well Integrity: Good  
 Technician: C. Arroyo / A. Sciaky Ambient Conditions: Cool

Well Volume Calculation					
Well Casing Diameter (in.)	Total Well Depth	Depth to Ground-water (GW)	Linear Feet of GW	Gallons Per Linear Foot	1 Well Volume (gal.)
②	64.45	37.03	= 27.42	X 0.17	= 4.66
3	-	=	X	0.38	=
4	-	=	X	0.66	=
4.5	-	=	X	0.83	=
6	-	=	X	1.5	=

### Groundwater Surface Inspection

Floating Product (ft)(in.): NO Sheen/Iridescence: Yes Odor: Yes

### Groundwater Purging Purge Method

Submersible Pump      Honda Pump      Hand Bail      Grab Sample

Volumes Purged	Volume Purge (gal.)	Time	Conductivity (uS/cm)	tds <sup>s/L</sup> (ppm)	ORP	DO mg/l	pH	Temp.(°C)
0	Int.	0845	1697	1.221	-22.5	1.92	8.67	19.94
1	5	0851	1553	1.116	47.2	20.65	7.68	19.98
2	10	0857	1558	1.123	65.5	18.88	7.49	19.83
3	15	0902	1573	1.121	71.2	17.99	7.44	19.70
4								
5								
6								
7								
8								
9								
10								

### Groundwater Sampling

Water Level Recovery:      Depth to GW (ft.)      Sample Containers:

	No.	Preservation
(I) Initially <u>37.03</u>		
(P) After Purging <u>46.20</u>		
P- 0.8(P-I) = <u>39.86</u> 80% Recovery		
(S) Before Sampling <u>37.03</u>		
Sampled 80% - 100% <u>429</u>		
500 ml polypropylene		
1 liter(L), amber glass <sup>poly</sup>	<u>1</u>	<u>None</u>
40ml VOA	<u>7</u>	<u>HCL</u>
250 ml glass		
250 ml polypropylene	<u>4 / 1</u>	<u>None / HNE3</u>

Sample Date : 5/9/12 Time: 1100 Turbidity (NTU): 116  
 Sampling Equipment : Disposable Bailer  
 Calibrate Date: 5/7/12

Comments: \_\_\_\_\_

# Groundwater Sampling Form

Project Name: Tesoro #67076 Project Number: 01LV  
 Location: Livermore, CA Date: 5/9/12  
 Well Number: IP-9 Well Integrity: Good  
 Technician: C. Arroyo / A. Sciaky Ambient Conditions: COOL

Well Volume Calculation					
Well Casing Diameter (in.)	Total Well Depth	Depth to Ground-water (GW)	Linear Feet of GW	Gallons Per Linear Foot	1 Well Volume (gal.)
②	64.75	37.03	27.72 X	0.17	= 4.71
3	-	=	X	0.38	=
4	-	=	X	0.66	=
4.5	-	=	X	0.83	=
6	-	=	X	1.5	=

### Groundwater Surface Inspection

Floating Product (ft)(in.): NO Sheen/Iridescence: ~~NO~~ Yes Odor: ~~NO~~ Yes

### Groundwater Purging Purge Method

Submersible Pump      Honda Pump      Hand Bail      Grab Sample

Volumes Purged	Volume Purge (gal.)	Time	Conductivity (uS/cm)	tds <sup>g/L</sup> (ppm)	ORP	DO mg/l	pH	Temp.(°C)
0	Int.	0815	16021	11.80	-93.6	5.42	11.02	18.92
1	5	0821	16457	11.96	-95.8	5.73	10.97	19.46
2	10	0826	16312	11.00	-63.3	6.62	11.00	19.15
3	15	0830	18455	11.97	-65.9	8.62	11.02	19.41
4		1						
5								
6								
7								
8								
9								
10								

### Groundwater Sampling

**Water Level Recovery:**      **Sample Containers:**  
 Depth to GW (ft.)      No.      Preservation  
 (I) Initially      37.03      500 ml polypropylene  
 (P) After Purging      43.20      1 liter(L), ~~amber glass~~ poly      1      None  
 P- 0.8(P-I) =      39.26      80% Recovery      40ml VOA      7      HCL  
 (S) Before Sampling      37.14      250 ml glass  
 Sampled 80% - 100%      Yes      250 ml polypropylene      4/1      None / HNO3  
 Sample Date :      5/9/12      Time: 1040      Turbidity (NTU): 598  
 Sampling Equipment :      Disposable Bailor  
 Calibrate Date:      5/7/12

Comments: \_\_\_\_\_

## Groundwater Sampling Form

Project Name: Tesoro #67076 Project Number: 01LV  
 Location: Livermore, CA Date: 5/9/12  
 Well Number: IP-10 Well Integrity: Good  
 Technician: C. Arroyo / A. Sciaky Ambient Conditions: cool

Well Volume Calculation					
Well Casing Diameter (in.)	Total Well Depth	Depth to Ground-water (GW)	Linear Feet of GW	Gallons Per Linear Foot	1 Well Volume (gal.)
②	63.02	36.24	= 26.78 X	0.17	= 4.55
3	-	=	X	0.38	=
4	-	=	X	0.66	=
4.5	-	=	X	0.83	=
6	-	=	X	1.5	=

### Groundwater Surface Inspection

Floating Product (ft)(in.): No Sheen/Iridescence: No Odor: No

### Groundwater Purging Purge Method

Submersible Pump      Honda Pump      Hand Bail      Grab Sample

Volumes Purged	Volume Purge (gal.)	Time	Conductivity (uS/cm)	tds <sup>g/L</sup> (ppm)	ORP	DO mg/l	pH	Temp.(°C)
0	Int.	0707	961	712	-164.2	2.52	7.36	18.57
1	4.5	0712	970	711	-167.1	2.80	7.26	19.05
2	9	0718	982	721	-176.0	3.32	7.28	18.99
3	13.5	0722	990	729	-178.0	3.21	7.34	18.72
4								
5								
6								
7								
8								
9								
10								

### Groundwater Sampling

Water Level Recovery:

Depth to GW (ft.)

(I) Initially 36.24  
 (P) After Purging 44.68  
 P- 0.8(P-I) = 37.92      80% Recovery  
 (S) Before Sampling 36.38  
 Sampled 80% - 100% Yes

Sample Containers:

No.	Preservation
500 ml polypropylene	
1 liter(L), <del>amber glass</del> poly	<u>1</u> <u>None</u>
40ml VOA	<u>7</u> <u>HCL</u>
250 ml glass	
250 ml polypropylene	<u>4/1</u> <u>None / HNO<sub>3</sub></u>

Sample Date: 5/9/12 Time: 0945

Turbidity (NTU): 28.6

Sampling Equipment: Disposable Bailer

Calibrate Date: 5/7/12

Comments:

# Daily Field Report

Date: May 7-11 2012  
Company: Orion Environmental  
Contact: Matthew Nelson  
Project Name: Tesoro #67076  
Location: Livermore, Ca

Prepared by:  
Environmental Field Services, LLC  
Peter Arroyo  
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Patterson Ca, 95363  
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## Notes:

Arrive on-site, check in with attendant, locate & open wells, allow wells to equilibrate.

Wells were gauged using a Solonist water level meter (TD & DTW). (see Field Data Sheet)

YSI meter was calibrated with Quick Cal solution.

All equipment was decontaminated between each use, using water & Alcanox.

Monitoring wells were purged with a submersible pump, speeds controlled with a ball valve for minimum drawdown. Disposable tubing was used for each well & discarded after each use.

Wells were purged in sampling sequence, to the best of our ability.

PH, Cond, Temp., DO, ORP & tds readings were taken for each volume of water purged.

Turbidity readings were taken at time of sampling.

Samples were taken using a new disposable bailer for each well. Samples were packed in bubble wrap & zip loc bags that were labeled. Samples were picked up by a Kiff Analytical courier each day of sampling.

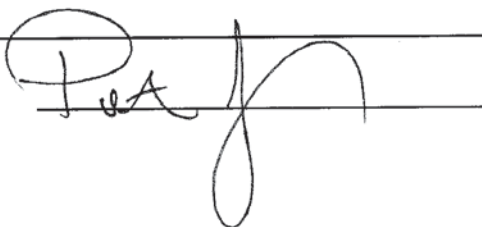
Purge water was stored in self contained tank & was off loaded to Excel Environmental for disposal daily. A total of 700 gallons was removed from the site.

Please see groundwater sampling form for each wells data.

All wells secure, no purge water drums on-site, all trash removed before departing site.

All wells were sampled this quarter except VW-3, did not have enough water to sample.

Signature:



# Field Data Sheet

Date: 6/14/2012

Project Name: Tesoro #67076

Project Number: 01LV

Technician: C. Arroyo

Location: Livermore, CA

Global ID : T0600101410

Well ID	Casing Diameter	Total Depth	DTP	DTW	Thickness	Comments
MW-4	2"	46.8	-	38.26	-	
MW-5	2"	-	-	-	-	sidewalk closed due to construction
MW-6	2"	47.65	-	40.95	-	
MW-7	2"	46.8	-	37.27	-	
MW-8	2"	-	-	-	-	construction around area, no access
MW-9	2"	44.58	-	40.95	-	
MW-10	2"	45.1	-	38.71	-	
MW-11	4"	42.85	-	33.32	-	
MW-12	4"	44.63	-	40.62	-	
DW-2	4"	59.84	-	41.1	-	
DW-3	4"	59.74	-	40.59	-	
DW-4	4"	70.04	-	40.32	-	
DW-5	4"	59.8	-	40.68	-	
DW-6	4"	60.15	-	41.81	-	
DW-7	4"	65.2	-	41.28	-	
DW-8	4"	64.65	-	37.18	-	
DW-9	4"	59.7	-	40.85	-	

## Groundwater Sampling Form

Project Name:	<u>Tesoro #67076</u>	Project Number:	<u>01LV</u>
Location:	<u>Livermore, CA</u>	Date:	<u>6/14/12</u>
Well Number:	<u>MW-12</u>	Well Integrity:	<u>Good</u>
Technician:	<u>C. Arroyo / A. Sciaky</u>	Ambient Conditions:	<u>Cool</u>

Well Volume Calculation					
Well Casing Diameter (in.)	Total Well Depth	Depth to Ground-water (GW)	Linear Feet of GW	Gallons Per Linear Foot	1 Well Volume (gal.)
2	-	=	X	0.17	=
3	-	=	X	0.38	=
4	44.63	40.62	4.01	0.66	2.64
4.5	-	=	X	0.83	=
6	-	=	X	1.5	=

### Groundwater Surface Inspection

Floating Product (ft)(in.): None      Sheen/Iridescence: No      Odor: No

### Groundwater Purging Purge Method

Submersible Pump      Honda Pump      Hand Bail      Grab Sample

Volumes Purged	Volume Purge (gal.)	Time	Conductivity (uS/cm)	tds (g/l)	ORP	DO mg/l	pH	Temp.(°C)
0	Int.	10:15	1006	0.694	-54.5	1.33	7.27	22.01
1	3	10:18	993	0.691	-43.8	1.29	7.3	21.58
2	6	10:21	979	0.679	-49.9	1.13	6.94	21.69
3	9	10:26	974	0.671	-50.2	1.06	6.96	21.68
4								
5								
6								
7								
8								
9								
10								

### Groundwater Sampling

<p><b>Water Level Recovery:</b></p> <p style="margin-left: 20px;">Depth to GW (ft.)</p> <p>(I) Initially <u>40.62</u></p> <p>(P) After Purging <u>44.01</u></p> <p>P- 0.8(P-I) = <u>41.29</u>      80% Recovery</p> <p>(S) Before Sampling <u>41.12</u></p> <p>Sampled 80% - 100% <u>yes</u></p> <p>Sample Date : <u>6/14/12</u>      Time: <u>10:50</u></p> <p>Sampling Equipment : <u>Disposable Bailer</u></p> <p>Calibrate Date: <u>6/14/12</u></p>	<p><b>Sample Containers:</b></p> <table border="0" style="width: 100%;"> <tr> <td style="width: 60%;"></td> <td style="width: 10%; text-align: center;">No.</td> <td style="width: 30%;">Preservation</td> </tr> <tr> <td>500 ml polypropylene</td> <td></td> <td></td> </tr> <tr> <td>1 liter(L), amber glass</td> <td></td> <td></td> </tr> <tr> <td>40ml VOA</td> <td style="text-align: center;">3</td> <td style="text-align: center;">HCL</td> </tr> <tr> <td>250 ml glass</td> <td></td> <td></td> </tr> <tr> <td>125 ml polypropylene</td> <td></td> <td></td> </tr> </table> <p>Turbidity (NTU): <u>&lt;1000</u></p>		No.	Preservation	500 ml polypropylene			1 liter(L), amber glass			40ml VOA	3	HCL	250 ml glass			125 ml polypropylene		
	No.	Preservation																	
500 ml polypropylene																			
1 liter(L), amber glass																			
40ml VOA	3	HCL																	
250 ml glass																			
125 ml polypropylene																			

Comments: \_\_\_\_\_

## Groundwater Sampling Form

Project Name:	<u>Tesoro #67076</u>	Project Number:	<u>01LV</u>
Location:	<u>Livermore, CA</u>	Date:	<u>6/14/12</u>
Well Number:	<u>DW-9</u>	Well Integrity:	<u>Good</u>
Technician:	<u>C. Arroyo / A. Sciaky</u>	Ambient Conditions:	<u>Cool</u>

Well Volume Calculation					
Well Casing Diameter (in.)	Total Well Depth	Depth to Ground-water (GW)	Linear Feet of GW	Gallons Per Linear Foot	1 Well Volume (gal.)
2	-	=	X	0.17	=
3	-	=	X	0.38	=
4	59.7	40.85	18.85	0.66	12.44
4.5	-	=	X	0.83	=
6	-	=	X	1.5	=

### Groundwater Surface Inspection

Floating Product (ft)(in.): None      Sheen/Iridescence: No      Odor: No

### Groundwater Purging Purge Method

Submersible Pump      Honda Pump      Hand Bail      Grab Sample

Volumes Purged	Volume Purge (gal.)	Time	Conductivity (uS/cm)	tds (g/l)	ORP	DO mg/l	pH	Temp.(°C)
0	Int.	9:40	993	0.678	-45.9	1.51	7.07	21.97
1	12.5	9:48	944	0.661	-67.7	1.03	6.88	21.31
2	25	9:57	942	0.66	-70.6	1.39	6.85	21.19
3	37.5	10:08	939	0.658	-73.3	2.21	6.88	21.25
4								
5								
6								
7								
8								
9								
10								

### Groundwater Sampling

<b>Water Level Recovery:</b> Depth to GW (ft.) (I) Initially <u>40.85</u> (P) After Purging <u>42.1</u> P- 0.8(P-I) = <u>41.1</u> 80% Recovery (S) Before Sampling <u>40.93</u> Sampled 80% - 100% <u>yes</u>	<b>Sample Containers:</b> 500 ml polypropylene 1 liter(L), amber glass 40ml VOA <u>3</u> 250 ml glass 125 ml polypropylene
Sample Date : <u>6/14/12</u> Time: <u>10:15</u> Turbidity (NTU): <u>21.6</u> Sampling Equipment : <u>Disposable Bailer</u> Calibrate Date: <u>6/14/12</u>	No.      Preservation _____ _____ _____ _____
Comments: _____ _____ _____	

# Daily Field Report

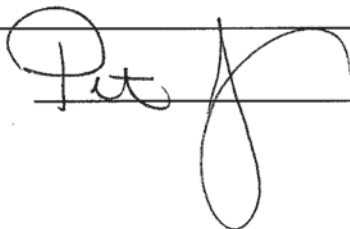
Date: June 14 2012  
Company: Orion Environmental  
Contact: Matthew Nelson  
Project Name: Tesoro #67076  
Location: Livermore, Ca

Prepared by:  
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Peter Arroyo  
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Fax: (209) 892-1190  
www.environmentalfieldwork.com

## Notes:

Wells were gauged using a Solonist water level meter (TD & DTW). (see Field Data Sheet )  
YSI meter was calibrated with Quick Cal solution.  
All equipment was decontaminated between each use, using water & Alcanox.  
Monitoring wells were purged with a submersible pump, speeds controlled with a ball valve for minimum drawdown. Disposable tubing was used for each well & discarded after each use.  
PH, Cond, Temp., DO, ORP & tds readings were taken for each volume of water purged.  
Turbidity readings were taken at time of sampling.  
Samples will be analyzed for Tphg/BTEX/MTBE, 7 Oxy's & Lead Scavengers.  
Samples were taken using a new disposable bailer for each well. Samples were packed in bubble wrap & zip loc bags that were labeled. Samples were picked up by a Kiff Analytical courier.  
Purge water was stored in self contained tank & was off loaded to Excel Environmental.  
A total of 60 gallons was removed from the site.  
Please see groundwater sampling form for each wells data.  
All wells secure, no purge water drums on-site, all trash removed before departing site.  
Due to construction in the area MW-5 & MW-8 were not gauged, area was coned off, no access.

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





**ATTACHMENT C**  
**SOIL VAPOR SAMPLING QA/QC PROCEDURES**

## ATTACHMENT C

### SOIL VAPOR SAMPLING QA/QC PROCEDURES

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#### Vapor Sample Collection

Vapor samples were collected using a vacuum chamber with a Tedlar bag. Sample lines were 1/4-inch-diameter Teflon or new vinyl tubing with a length not exceeding 10 feet. Generally, the length of tubing was the minimum necessary to connect the sample source to the sampling apparatus. Samples bags were made of Tedlar film with a minimum thickness of 0.002 inches.

An airtight rigid vacuum chamber was used when the bags were filled by applying vacuum. The chamber was opaque (to decrease sample degradation due to ultraviolet light) except for a small window that allowed the sampler to check the condition of the bag during sampling. The chamber had the necessary couplings to connect with sample bags, sample line, and vacuum line and a flow control valve to shut off the flow to the bag. The chamber was also equipped with a vacuum relief valve to protect both the bag and container. An oil-less vacuum pump with a minimum capacity of 2 liters per minute was used. If it was necessary to observe the sampling rate, a rotameter (or equivalent) flowmeter was used with a range of 0.05 to 1.0 liter per minute. All connections were leak checked before collecting gas samples. To leak check the connections, a Tedlar bag was placed inside the rigid container with the valve on the bag closed. The vacuum pump was turned on and the vacuum monitored until 15 inches of water column was maintained.

The following procedures were followed when collecting a vapor sample for laboratory analysis:

1. Assemble the sample train and check the connections for leaks.
2. Place an open Tedlar bag inside the vacuum chamber and connect both the Tedlar bag and vacuum line to the sample train.
3. Turn on the vacuum pump and open the desired sample port or wellhead valve.
4. Wait for the sample line to be purged of 3 to 5 casing volumes.
5. Switch the vacuum line from the sample train to the chamber and allow the chamber vacuum to inflate the Tedlar bag.
6. Fill the Tedlar bag to approximately 80 percent capacity.
7. Close the sample port and turn off the vacuum pump.

8. Release the vacuum on the chamber by disconnecting the vacuum line.
9. Open the chamber and close the Tedlar bag.

Once collected, vapor samples were stored and shipped in an opaque container free of sharp edges, metal closures, or staples to protect the integrity of the Tedlar bag. Vapor samples collected in Tedlar bags were analyzed by a State-certified analytical laboratory within 72 hours of collection.

### **Analytical Plan**

The vapor samples were submitted to Kiff Analytical LLC, a State-certified laboratory in Davis, California, and analyzed for the following parameters:

- Total petroleum hydrocarbons as gasoline; benzene, toluene, ethylbenzene, and total xylenes; and methyl tert-butyl ether using Environmental Protection Agency Method 8260B
- Fixed gases (oxygen, nitrogen, methane, and carbon dioxide) by American Society for Testing and Materials Method D1946 or equivalent.

#### Analytical Quality Assurance Quality Control (QA/QC) Procedures

Laboratory analytical QA/QC procedures are described in Attachment A.

**ATTACHMENT D**  
**HISTORICAL WELL AND GROUNDWATER ELEVATIONS**

TABLE D-1

HISTORICAL WELL AND GROUNDWATER ELEVATIONS  
TESORO - LIVERMORE, 67076

Well No.	Date of Measurement	Depth to Water (feet below casing)	PVC Casing Elevation <sup>(a)</sup> (feet MSL)	Water Table Elevation <sup>(b)</sup> (feet MSL)
MW-1	6/1/93	37.50	474.29	436.79
	6/22/93	38.46		435.83
	10/6/93	42.22		432.07
	1/13/94	34.52		439.77
	3/30/94	31.93		442.36
	4/25/94	33.49		440.80
	8/12/94	41.03		433.26
	12/14/94	38.63		435.66
	2/10/95	30.80		443.49
	6/15/95	25.46		448.83
	9/26/95	31.05		443.24
	12/15/95	28.11		446.18
	3/21/96	17.67		456.62
	6/13/96	22.86		451.43
	9/16/96	30.04		444.25
	12/2/96	26.74		447.55
	3/7/97	20.84		453.45
	6/12/97	28.71		445.58
	9/29/97	33.91		440.38
	12/1/97	34.88		439.41
	3/19/98	19.83		454.46
	5/29/98	21.57		452.72
	9/15/98	31.68		442.61
	11/30/98	36.80		437.49
	1/17/99	30.02		444.27
	6/10/99	29.30		444.99
	9/7/99	31.41		442.88
12/13/99	32.95	441.34		
3/13/00	25.74	448.55		
6/12/00	28.24	446.05		
11/10/00	30.56	443.73		

TABLE D-1

**HISTORICAL WELL AND GROUNDWATER ELEVATIONS  
TESORO - LIVERMORE, 67076**

<b>Well No.</b>	<b>Date of Measurement</b>	<b>Depth to Water (feet below casing)</b>	<b>PVC Casing Elevation<sup>(a)</sup> (feet MSL)</b>	<b>Water Table Elevation<sup>(b)</sup> (feet MSL)</b>
MW-1	12/31/00	31.71	474.29	442.58
(cont.)	3/27/01	30.43		443.86
	6/30/01	36.61		437.68
	9/26/01	45.10		429.19
	12/18/01	39.39		434.90
	3/18/02	38.24		436.05
	8/21/02	36.71		436.05
	12/3/02	36.85		437.44
	3/4/03	33.72		440.57
	6/10/03	31.31		442.98
	9/9/03	35.05		439.24
	12/23/03	30.15		444.14
	3/23/04	26.61		447.68
	5/10/04	30.31		443.98
	8/4/04	34.77		439.52
	11/4/04	33.93		440.36
	1/12/05	27.82		446.47
	5/2/05	24.87		449.42
	7/19/05	29.26		445.03
	11/21/05	31.15		443.14
	2/9/06	26.24		448.05
	5/16/06	24.87		449.42
	8/9/06	31.64		442.65
	11/8/06	31.16		443.13
	2/14/07	30.00		444.29
	5/17/07	33.75		440.54
	8/2/07	40.00		434.29
	11/12/07	48.55		425.74
	2/14/08	34.74	439.55	
	5/8/08	36.15	438.14	
	7/23/08	45.76	428.53	

TABLE D-1

**HISTORICAL WELL AND GROUNDWATER ELEVATIONS  
TESORO - LIVERMORE, 67076**

<b>Well No.</b>	<b>Date of Measurement</b>	<b>Depth to Water (feet below casing)</b>	<b>PVC Casing Elevation<sup>(a)</sup> (feet MSL)</b>	<b>Water Table Elevation<sup>(b)</sup> (feet MSL)</b>
MW-1 (cont.)	10/13/08	51.00	474.29	423.29
	2/11/09	48.69		425.60
	4/27/09	41.90		432.39
	8/4/09	51.44		422.85
	12/8/09	39.87		434.42
	2/11/10	35.20		439.09
	5/3/10	31.23		443.06
	8/2/10	34.56		474.21 <sup>(c)</sup>
	11/2/10	37.04	437.17	
	2/1/11	32.51	441.70	
	4/25/11	27.73	446.48	
	8/3/11	31.57	442.64	
	10/10/11	33.12	441.09	
	1/31/12	36.11	438.10	
	5/7/12	36.14	438.07	
MW-2	6/1/93	38.02	472.98	434.96
	6/22/93	39.07		433.91
	10/6/93	43.72		429.26
	1/13/94	35.85		437.13
	3/30/94	32.82		440.16
	4/25/94	34.76		438.22
	8/12/94	44.33		428.65
	12/14/94	40.00		432.98
	2/10/95	32.16		440.82
	6/15/95	25.93		447.05
	9/26/95	32.42		440.56
	12/15/95	29.41		443.57
	3/21/96	17.47		455.51
	6/13/96	23.69		449.29
	9/16/96	31.24		441.74
12/2/96	26.90	446.08		

TABLE D-1

**HISTORICAL WELL AND GROUNDWATER ELEVATIONS  
TESORO - LIVERMORE, 67076**

<b>Well No.</b>	<b>Date of Measurement</b>	<b>Depth to Water (feet below casing)</b>	<b>PVC Casing Elevation<sup>(a)</sup> (feet MSL)</b>	<b>Water Table Elevation<sup>(b)</sup> (feet MSL)</b>
MW-2 (cont.)	3/7/97	21.33	472.98	451.65
	6/12/97	29.94		443.04
	9/29/97	34.22		438.76
	12/1/97	35.94		437.04
	3/19/98	20.34		452.64
	5/29/98	22.63		450.35
	9/15/98	32.30		440.68
	11/30/98	36.90		436.08
	1/17/99	30.17		442.81
	6/10/99	29.98		443.00
	9/7/99	31.85		441.13
	12/13/99	33.72		439.26
	3/13/00	26.54		446.44
	6/12/00	28.44		444.54
	11/10/00	31.31		441.67
	12/31/00	32.68		440.30
	3/27/01	30.81		442.17
	6/30/01	37.58		435.40
	9/26/01	44.97		428.01
	12/18/01	40.67		432.31
	3/18/02	38.94		434.04
	6/5/02	36.45		436.53
	8/21/02	37.15		435.83
	12/3/02	36.76		436.22
	3/4/03	33.60		439.38
	6/10/03	32.89		440.09
	9/9/03	35.45		437.53
	12/23/03	31.79		441.19
3/23/04	28.25	444.73		
5/10/04	30.91	442.07		
8/4/04	35.36	437.62		



TABLE D-1

HISTORICAL WELL AND GROUNDWATER ELEVATIONS  
TESORO - LIVERMORE, 67076

Well No.	Date of Measurement	Depth to Water (feet below casing)	PVC Casing Elevation <sup>(a)</sup> (feet MSL)	Water Table Elevation <sup>(b)</sup> (feet MSL)
MW-2	11/4/04	34.92	472.98	438.06
(cont.)	1/12/05	29.46		443.52
	5/2/05	25.61		447.37
	7/19/05	30.11		442.87
	11/21/05	32.04		440.94
	2/9/06	27.11		445.87
	5/17/06	25.18		447.80
	8/9/06	32.69		440.29
	11/8/06	33.21		439.77
	2/14/07	31.27		441.71
	5/17/07	34.40		438.58
	8/2/07	41.23		431.75
	11/12/07	48.22		424.76
	2/14/08	36.31		436.67
	5/8/08	36.70		436.28
	7/23/08	45.78		427.20
	10/13/08	51.30		421.68
	2/11/09	48.90		424.08
	4/27/09	42.62		430.36
	8/4/09	51.83		421.15
	12/8/09	40.82		432.16
	2/11/10	36.54		436.44
	5/3/10	32.44		440.54
	8/2/10	35.34		437.64
	11/2/10	38.15		434.83
	2/1/11	33.40		439.58
	4/25/11	28.49	444.49	
	8/3/11	32.40	440.58	
	10/10/11	33.51	439.47	
	1/31/12	39.52	433.46	
	5/7/12	36.89	436.09	

TABLE D-1

HISTORICAL WELL AND GROUNDWATER ELEVATIONS  
TESORO - LIVERMORE, 67076

Well No.	Date of Measurement	Depth to Water (feet below casing)	PVC Casing Elevation <sup>(a)</sup> (feet MSL)	Water Table Elevation <sup>(b)</sup> (feet MSL)
MW-3	6/1/93	36.18	473.37	437.19
	6/22/93	37.11		436.26
	10/6/93	41.15		432.22
	1/13/94	33.95		439.42
	3/30/94	30.97		442.40
	4/25/94	32.46		440.91
	8/12/94	41.72		431.65
	12/14/94	37.62		435.75
	2/10/95	29.96		443.41
	6/15/95	23.66		449.71
	9/26/95	29.62		443.75
	12/15/95	27.10		446.27
	3/21/96	15.85		457.52
	6/13/96	21.31		452.06
	9/16/96	28.62		444.75
	12/2/96	25.55		447.82
	3/7/97	19.77		453.60
	6/12/97	27.67		445.70
	9/29/97	29.60		443.77
	12/1/97	33.37		440.00
	3/19/98	18.76		454.61
	5/29/98	20.64		452.73
	9/15/98	30.70		442.67
	11/30/98	34.96		438.41
	1/17/99	28.81		444.56
	6/10/99	28.10		445.27
	9/7/99	30.38		442.99
	12/13/99	31.46		441.91
3/13/00	24.28	449.09		
6/12/00	26.80	446.57		
11/10/00	29.47	443.90		

TABLE D-1

**HISTORICAL WELL AND GROUNDWATER ELEVATIONS  
TESORO - LIVERMORE, 67076**

<b>Well No.</b>	<b>Date of Measurement</b>	<b>Depth to Water (feet below casing)</b>	<b>PVC Casing Elevation<sup>(a)</sup> (feet MSL)</b>	<b>Water Table Elevation<sup>(b)</sup> (feet MSL)</b>
MW-3 (cont.)	12/31/00	31.38	473.37	441.99
	3/27/01	29.94		443.43
	6/30/01	37.54		435.83
	9/26/01	45.17		428.20
	12/18/01	39.41		433.96
	3/18/02	37.73		435.64
	6/5/02	35.35		438.02
	8/21/02	36.21		437.16
	12/3/02	35.62		437.75
	3/4/03	32.75		440.62
	6/10/03	31.26		442.11
	9/9/03	34.72		438.65
	12/23/03	30.47		442.90
	3/23/04	26.67		446.70
	5/10/04	30.25		443.12
	8/4/04	34.70		438.67
	11/4/04	33.94		439.43
	1/12/05	28.21		445.16
	5/2/05	24.56		448.81
	7/19/05	29.39		443.98
	11/21/05	31.30		442.07
	2/9/06	26.21		447.16
	5/16/06	24.36		449.01
	8/9/06	31.90		441.47
	11/8/06	31.30		442.07
	2/14/07	30.20		443.17
5/17/07	33.64	439.73		
8/2/07	41.74	431.63		
11/12/07	47.41	425.96		
2/14/08	34.73	438.64		
5/8/08	35.60	437.77		

TABLE D-1

HISTORICAL WELL AND GROUNDWATER ELEVATIONS  
TESORO - LIVERMORE, 67076

Well No.	Date of Measurement	Depth to Water (feet below casing)	PVC Casing Elevation <sup>(a)</sup> (feet MSL)	Water Table Elevation <sup>(b)</sup> (feet MSL)
MW-3 (cont.)	7/23/08	45.00	473.37	428.37
	10/13/08	50.70		422.67
	2/11/09	47.81		425.56
	4/27/09	41.18		432.19
	8/4/09	51.89		421.48
	12/8/09	39.50		433.87
	2/11/10	35.19		438.18
	5/3/10	31.39		441.98
	8/2/10	34.61		438.76
	11/2/10	37.20		436.17
	2/1/11	32.59		440.78
	4/25/11	27.60		445.77
	8/3/11	31.69		441.68
	10/10/11	33.96		439.41
	1/31/12	39.05		434.32
5/7/12	36.03	437.34		
MW-4	3/30/94	31.56	473.64	442.08
	4/25/94	32.73		440.91
	8/12/94	41.61		432.03
	12/14/94	38.11		435.53
	2/10/95	30.50		443.14
	6/15/95	23.63		450.01
	9/26/95	29.70		443.94
	12/15/95	27.56		446.08
	3/21/96	15.63		458.01
	6/13/96	21.07		452.57
	9/16/96	28.99		444.65
	12/2/96	26.04		447.60
	3/7/97	19.69		453.95
	6/12/97	28.04		445.60
	9/29/97	29.91		443.73

TABLE D-1

HISTORICAL WELL AND GROUNDWATER ELEVATIONS  
TESORO - LIVERMORE, 67076

Well No.	Date of Measurement	Depth to Water (feet below casing)	PVC Casing Elevation <sup>(a)</sup> (feet MSL)	Water Table Elevation <sup>(b)</sup> (feet MSL)
MW-4 (cont.)	12/1/97	33.88	473.64	439.76
	3/19/98	18.67		454.97
	5/29/98	20.16		453.48
	9/15/98	30.46		443.18
	11/30/98	34.50		439.14
	1/17/99	28.30		445.34
	6/10/99	27.60		446.04
	9/7/99	30.79		442.85
	12/13/99	31.60		442.04
	3/13/00	24.35		449.29
	6/12/00	26.91		446.73
	11/10/00	29.71		443.93
	12/31/00	31.79		441.85
	3/27/01	29.98		443.66
	6/30/01	36.88		436.76
	9/26/01	43.87		429.77
	12/18/01	39.30		434.34
	3/18/02	37.75		435.89
	6/5/02	35.68		437.96
	8/21/02	36.58		437.06
	12/3/02	35.90		437.74
	3/4/03	32.73		440.91
	6/10/03	31.20		442.44
	9/9/03	34.64		439.00
	12/23/03	31.30		442.34
	3/23/04	26.71		446.93
	5/10/04	30.33		443.31
	8/4/04	34.87		438.77
11/4/04	34.28	439.36		
1/12/05	28.67	444.97		
5/2/05	24.46	449.18		

TABLE D-1

**HISTORICAL WELL AND GROUNDWATER ELEVATIONS  
TESORO - LIVERMORE, 67076**

<b>Well No.</b>	<b>Date of Measurement</b>	<b>Depth to Water (feet below casing)</b>	<b>PVC Casing Elevation<sup>(a)</sup> (feet MSL)</b>	<b>Water Table Elevation<sup>(b)</sup> (feet MSL)</b>
MW-4 (cont.)	7/19/05	29.36	473.64	444.28
	11/21/05	31.80		441.84
	2/9/06	26.34		447.30
	5/16/06	24.30		449.34
	8/9/06	32.05		441.59
	11/8/06	32.85		440.79
	2/14/07	30.46		443.18
	5/17/07	33.92		439.72
	8/2/07	40.68		432.96
	11/12/07	DRY <sup>(d)</sup>		--
	2/14/08	34.53		439.11
	5/8/08	35.55		438.09
	7/23/08	43.87		429.77
	10/13/08	DRY		--
	2/11/09	DRY		--
	4/27/09	40.64		433.00
	8/4/09	DRY		--
	12/8/09	39.46		434.18
	2/11/10	35.31		438.33
	5/3/10	31.55		442.09
8/2/10	35.15	438.49		
11/2/10	37.55	436.09		
2/1/11	32.86	440.78		
4/25/11	28.69	444.95		
8/3/11	32.01	441.63		
10/10/11	34.49	439.15		
1/31/12	38.91	434.73		
5/7/12	36.24	437.40		
MW-5	3/30/94	32.07	472.67	440.60
	4/25/94	33.65		439.02
	8/12/94	42.73		429.94

TABLE D-1

**HISTORICAL WELL AND GROUNDWATER ELEVATIONS  
TESORO - LIVERMORE, 67076**

<b>Well No.</b>	<b>Date of Measurement</b>	<b>Depth to Water (feet below casing)</b>	<b>PVC Casing Elevation<sup>(a)</sup> (feet MSL)</b>	<b>Water Table Elevation<sup>(b)</sup> (feet MSL)</b>
MW-5	12/14/94	38.89	472.67	433.78
(cont.)	2/10/95	31.44		441.23
	6/15/95	24.99		447.68
	9/26/95	30.20		442.47
	12/15/95	28.56		444.11
	3/21/96	16.82		455.85
	6/13/96	22.61		450.06
	9/16/96	29.78		442.89
	12/2/96	26.51		446.16
	3/7/97	21.91		450.76
	9/29/97	31.74		440.93
	12/1/97	34.05		438.62
	3/19/98	20.93		451.74
	5/29/98	21.30		451.37
	9/15/98	31.32		441.35
	11/30/98	35.44		437.23
	1/17/99	29.59		443.08
	6/10/99	28.05		444.62
	9/7/99	31.11		441.56
	12/13/99	32.66		440.01
	3/13/00	25.87		446.80
	6/12/00	28.15		444.52
	11/10/00	30.05		442.62
	12/31/00	31.81		440.86
	3/27/01	30.57		442.10
	6/30/01	37.24		435.43
	9/26/01	44.53		428.14
	12/18/01	40.65		432.02
	3/18/02	38.75	433.92	
	6/5/02	36.21	436.46	
	8/21/02	36.76	435.91	

TABLE D-1

HISTORICAL WELL AND GROUNDWATER ELEVATIONS  
TESORO - LIVERMORE, 67076

Well No.	Date of Measurement	Depth to Water (feet below casing)	PVC Casing Elevation <sup>(a)</sup> (feet MSL)	Water Table Elevation <sup>(b)</sup> (feet MSL)
MW-5 (cont.)	12/3/02	36.12	472.67	436.55
	3/4/03	32.90		439.77
	6/10/03	33.04		439.63
	9/9/03	34.20		438.47
	12/23/03	31.38		441.29
	3/23/04	27.51		445.16
	5/10/04	31.12		441.55
	8/4/04	35.09		437.58
	11/4/04	34.34		438.33
	1/12/05	29.19		443.48
	5/2/05	25.31		447.36
	7/19/05	30.49		442.18
	11/21/05	32.35		440.32
	2/9/06	27.19		445.48
	5/16/06	25.30		447.37
	8/9/06	32.68		439.99
	11/8/06	32.22		440.45
	2/14/07	34.00		438.67
	5/17/07	34.29		438.38
	8/2/07	41.72		430.95
	11/12/07	DRY		--
	2/14/08	35.66		437.01
	5/8/08	36.60		436.07
	7/23/08	DRY		--
	10/13/08	DRY		--
	2/11/09	DRY		--
	4/27/09	42.50		430.17
8/4/09	DRY	--		
12/8/09	39.92	432.75		
2/11/10	36.62	436.05		
5/3/10	32.89	439.78		



TABLE D-1

HISTORICAL WELL AND GROUNDWATER ELEVATIONS  
TESORO - LIVERMORE, 67076

Well No.	Date of Measurement	Depth to Water (feet below casing)	PVC Casing Elevation <sup>(a)</sup> (feet MSL)	Water Table Elevation <sup>(b)</sup> (feet MSL)
MW-5 (cont.)	8/2/10	36.16	472.67	436.51
	11/2/10	38.75		433.92
	2/1/11	32.77		439.90
	4/25/11	29.03		443.64
	8/3/11	33.18		439.49
	10/10/11	35.58		437.09
	1/31/12	39.80		432.87
	5/7/12	37.29		435.38
MW-6	3/30/94	33.38	471.93	438.55
	4/25/94	35.49		436.44
	8/12/94	45.14		426.79
	12/14/94	40.99		430.94
	2/10/95	33.34		438.59
	6/15/95	26.88		445.05
	9/26/95	33.55		438.38
	12/15/95	30.32		441.61
	3/21/96	18.89		453.04
	6/13/96	24.62		447.31
	9/16/96	32.64		439.29
	12/2/96	27.42		444.51
	3/7/97	22.13		449.80
	6/12/97	31.02		440.91
	9/29/97	35.77		436.16
	12/1/97	37.14		434.79
	3/19/98	21.10		450.83
	5/29/98	23.26		448.67
	9/15/98	33.50		438.43
	11/30/98	38.73		433.20
1/17/99	32.05	439.88		
6/10/99	31.44	440.49		
9/7/99	33.94	437.99		

TABLE D-1

HISTORICAL WELL AND GROUNDWATER ELEVATIONS  
TESORO - LIVERMORE, 67076

Well No.	Date of Measurement	Depth to Water (feet below casing)	PVC Casing Elevation <sup>(a)</sup> (feet MSL)	Water Table Elevation <sup>(b)</sup> (feet MSL)
MW-6 (cont.)	12/13/99	35.84	471.93	436.09
	3/13/00	28.45		443.48
	6/12/00	30.52		441.41
	11/10/00	32.99		438.94
	12/31/00	34.95		436.98
	3/27/01	32.72		439.21
	6/30/01	39.86		432.07
	9/26/01	DRY		--
	12/18/01	43.36		428.57
	3/18/02	41.29		430.64
	6/5/02	38.85		433.08
	8/21/02	39.02		432.91
	12/3/02	38.76		433.17
	3/4/03	35.13		436.80
	6/10/03	34.15		437.78
	9/9/03	37.66		434.27
	12/23/03	33.43		438.50
	3/23/04	29.96		441.97
	5/10/04	32.98		438.95
	8/4/04	37.02		434.91
	11/4/04	37.03		434.90
	1/12/05	32.01		439.92
	5/2/05	27.30		444.63
	7/19/05	32.27		439.66
	11/21/05	33.23		438.70
	2/9/06	29.07		442.86
	5/17/06	27.23		444.70
8/9/06	35.22	436.71		
11/8/06	33.41	438.52		
2/14/07	33.43	438.50		
5/17/07	36.50	435.43		

TABLE D-1

HISTORICAL WELL AND GROUNDWATER ELEVATIONS  
TESORO - LIVERMORE, 67076

Well No.	Date of Measurement	Depth to Water (feet below casing)	PVC Casing Elevation <sup>(a)</sup> (feet MSL)	Water Table Elevation <sup>(b)</sup> (feet MSL)
MW-6 (cont.)	8/2/07	42.24	471.93	429.69
	11/12/07	DRY		--
	2/14/08	38.67		433.26
	5/8/08	38.50		433.43
	7/23/08	DRY		--
	10/13/08	DRY		--
	2/11/09	DRY		--
	4/27/09	44.87		427.06
	8/4/09	DRY		--
	12/8/09	43.02		428.91
	2/11/10	38.89		433.04
	5/3/10	34.56		437.37
	8/2/10	37.87		434.06
	11/2/10	40.45		431.48
	2/1/11	35.73		436.20
	4/25/11	30.72		441.21
	8/3/11	34.95		436.98
	10/10/11	37.45		434.48
	1/31/12	42.15		429.78
5/7/12	39.11	432.82		
MW-7	3/30/94	31.98	472.33	440.35
	4/25/94	33.56		438.77
	8/12/94	43.35		428.98
	12/14/94	39.34		432.99
	2/10/95	32.11		440.22
	6/15/95	25.51		446.82
	9/26/95	31.43		440.90
	12/15/95	28.97		443.36
	3/21/96	17.36		454.97
	6/13/96	23.47		448.86
	9/16/96	31.35		440.98

TABLE D-1

HISTORICAL WELL AND GROUNDWATER ELEVATIONS  
TESORO - LIVERMORE, 67076

Well No.	Date of Measurement	Depth to Water (feet below casing)	PVC Casing Elevation <sup>(a)</sup> (feet MSL)	Water Table Elevation <sup>(b)</sup> (feet MSL)
MW-7 (cont.)	12/2/96	27.11	472.33	445.22
	3/7/97	21.33		451.00
	6/12/97	29.90		442.43
	9/29/97	34.37		437.96
	12/1/97	36.46		435.87
	3/19/98	20.33		452.00
	5/29/98	22.30		450.03
	9/15/98	32.54		439.79
	11/30/98	37.96		434.37
	1/17/99	31.04		441.29
	6/10/99	29.89		442.44
	9/7/99	32.38		439.95
	12/13/99	33.98		438.35
	3/13/00	27.09		445.24
	6/12/00	28.76		443.57
	11/10/00	31.54		440.79
	12/31/00	32.76		439.57
	3/27/01	30.97		441.36
	6/30/01	37.50		434.83
	9/26/01	45.11		427.22
	12/18/01	41.13		431.20
	3/18/02	39.22		433.11
	6/5/02	36.55		435.78
	8/21/02	36.81		435.52
	12/3/02	36.52		435.81
	3/4/03	32.60		439.73
	6/10/03	31.33		441.00
	9/9/03	34.71		437.62
12/23/03	30.80	441.53		
3/23/04	26.41	445.92		
5/10/04	29.86	442.47		

TABLE D-1

HISTORICAL WELL AND GROUNDWATER ELEVATIONS  
TESORO - LIVERMORE, 67076

Well No.	Date of Measurement	Depth to Water (feet below casing)	PVC Casing Elevation <sup>(a)</sup> (feet MSL)	Water Table Elevation <sup>(b)</sup> (feet MSL)
MW-7 (cont.)	8/4/04	34.06	472.33	438.27
	11/4/04	34.12		438.21
	1/12/05	28.83		443.50
	5/2/05	24.66		447.67
	7/19/05	29.07		443.26
	11/21/05	30.42		441.91
	2/9/06	26.15		446.18
	5/16/06	24.44		447.89
	8/9/06	31.77		440.56
	11/8/06	31.14		441.19
	2/14/07	30.39		441.94
	5/17/07	33.31		439.02
	8/2/07	37.09		435.24
	11/12/07	DRY		--
	2/14/08	36.51		435.82
	5/8/08	36.00		436.33
	7/23/08	44.42		427.91
	10/13/08	DRY		--
	2/11/09	DRY		--
	4/27/09	41.80		430.53
	8/4/09	DRY		--
	12/17/09	39.26		433.07
	2/11/10	36.18		436.15
	5/3/10	31.80		440.53
	8/2/10	34.31		438.02
	11/2/10	36.68		435.65
2/1/11	32.66	439.67		
4/25/11	27.75	444.58		
8/3/11	31.36	440.97		
10/10/11	33.63	438.70		

TABLE D-1

HISTORICAL WELL AND GROUNDWATER ELEVATIONS  
TESORO - LIVERMORE, 67076

Well No.	Date of Measurement	Depth to Water (feet below casing)	PVC Casing Elevation <sup>(a)</sup> (feet MSL)	Water Table Elevation <sup>(b)</sup> (feet MSL)
MW-7 (cont.)	1/31/12	38.74	472.33	433.59
	5/7/12	35.97		436.36
MW-8	12/23/03	32.01	471.18	439.17
	3/23/04	28.50		442.68
	5/10/04	31.44		439.74
	8/4/04	35.11		436.07
	11/4/04	34.77		436.41
	1/12/05	29.66		441.52
	5/2/05	25.91		445.27
	7/19/05	30.56		440.62
	11/21/05	32.48		438.70
	2/9/06	27.40		443.78
	5/16/06	25.60		445.58
	8/9/06	32.77		438.41
	11/8/06	32.10		439.08
	2/14/07	30.94		440.24
	5/17/07	34.14		437.04
	8/2/07	41.24		429.94
	11/12/07	DRY		--
	2/14/08	35.55		435.63
	5/8/08	36.64		434.54
	7/23/08	DRY		--
	10/13/08	DRY		--
	2/11/09	DRY		--
4/27/09	DRY	--		
8/4/09	DRY	--		
12/17/09	39.92	431.26		
2/11/10	36.72	434.46		
5/3/10	32.81	438.37		
8/2/10	36.08	435.10		
11/2/10	38.44	432.74		

TABLE D-1

HISTORICAL WELL AND GROUNDWATER ELEVATIONS  
TESORO - LIVERMORE, 67076

Well No.	Date of Measurement	Depth to Water (feet below casing)	PVC Casing Elevation <sup>(a)</sup> (feet MSL)	Water Table Elevation <sup>(b)</sup> (feet MSL)
MW-8 (cont.)	2/1/11	34.11	471.18	437.07
	4/25/11	28.72		442.46
	8/3/11	33.09		438.09
	10/10/11	35.69		435.49
	1/31/12	40.08		431.10
	5/7/12	37.38		433.80
MW-9	12/23/03	34.03	470.78	436.75
	3/23/04	30.01		440.77
	5/10/04	33.61		437.17
	8/4/04	37.47		433.31
	11/4/04	37.44		433.34
	5/2/05	27.73		443.05
	7/19/05	32.90		437.88
	11/21/05	34.15		436.63
	2/9/06	29.44		441.34
	5/16/06	27.50		443.28
	8/9/06	35.85		434.93
	11/8/06	34.18		436.60
	2/14/07	34.00		436.78
	5/17/07	36.88		433.90
	8/2/07	44.11		426.67
	11/12/07	DRY		--
	2/14/08	39.32		431.46
	5/8/08	38.90		431.88
	7/23/08	DRY		--
	10/13/08	DRY		--
2/11/09	DRY	--		
4/27/09	43.79	426.99		
8/4/09	DRY	--		
12/8/09	43.61	427.17		
2/11/10	39.48	431.30		

TABLE D-1

HISTORICAL WELL AND GROUNDWATER ELEVATIONS  
TESORO - LIVERMORE, 67076

Well No.	Date of Measurement	Depth to Water (feet below casing)	PVC Casing Elevation <sup>(a)</sup> (feet MSL)	Water Table Elevation <sup>(b)</sup> (feet MSL)
MW-9 (cont.)	5/3/10	34.96	470.78	435.82
	8/2/10	38.00		432.78
	11/2/10	40.30		430.48
	2/1/11	35.97		434.81
	4/25/11	30.64		440.14
	8/3/11	35.17		435.61
	10/10/11	37.64		433.14
	1/31/12	42.06		428.72
	5/7/12	39.43		431.35
MW-10	12/23/03	33.80	471.63	437.83
	3/23/04	28.68		442.95
	5/10/04	32.15		439.48
	8/4/04	36.40		435.23
	11/4/04	36.21		435.42
	1/12/05	31.64		439.99
	5/2/05	27.01		444.62
	7/19/05	31.59		440.04
	11/21/05	32.96		438.67
	2/9/06	28.56		443.07
	5/16/06	26.83		444.80
	8/9/06	34.37		437.26
	11/8/06	33.41		438.22
	2/14/07	32.81		438.82
	5/17/07	35.85		435.78
	8/2/07	43.46		428.17
	11/12/07	DRY		--
	2/14/08	39.71		431.92
	5/8/08	37.55		434.08
	7/23/08	DRY		--
10/13/08	DRY	--		
2/11/09	DRY	--		



TABLE D-1

HISTORICAL WELL AND GROUNDWATER ELEVATIONS  
TESORO - LIVERMORE, 67076

Well No.	Date of Measurement	Depth to Water (feet below casing)	PVC Casing Elevation <sup>(a)</sup> (feet MSL)	Water Table Elevation <sup>(b)</sup> (feet MSL)
MW-10 (cont.)	4/27/09	45.10	471.63	426.53
	8/4/09	44.52		427.11
	12/8/09	42.80		428.83
	2/11/10	39.74		431.89
	5/3/10	33.97		437.66
	8/2/10	36.12		435.51
	11/2/10	38.30		433.33
	2/1/11	34.63		437.00
	4/25/11	29.63		442.00
	8/3/11	33.26		438.37
	10/10/11	35.62		436.01
	1/31/12	39.67		431.96
	5/7/12	38.14		433.49
MW-11	12/16/08	DRY	473.26	--
	2/11/09	DRY		--
	4/27/09	DRY		--
	8/4/09	DRY		--
	12/8/09	40.25		433.01
	2/11/10	NM <sup>(e)</sup>		--
	5/3/10	31.36		441.90
	8/2/10	31.94	472.96 <sup>(c)</sup>	441.02
	11/2/10	36.98		435.98
	2/1/11	32.30		440.66
	4/25/11	27.31		445.65
	8/3/11	31.11		441.85
	10/10/11	33.27		439.69
	1/31/12	34.36		438.60
	5/7/12	31.61		441.35
MW-12	6/14/12	40.62	469.77	429.15
VW-2	8/4/04	34.13	473.28	439.15
	11/4/04	34.75		438.53

TABLE D-1

HISTORICAL WELL AND GROUNDWATER ELEVATIONS  
TESORO - LIVERMORE, 67076

Well No.	Date of Measurement	Depth to Water (feet below casing)	PVC Casing Elevation <sup>(a)</sup> (feet MSL)	Water Table Elevation <sup>(b)</sup> (feet MSL)
VW-2 (cont.)	1/12/05	29.35	473.28	443.93
	5/2/05	25.34		447.94
	7/19/05	29.76		443.52
	11/21/05	31.81		441.47
	2/9/06	27.21		446.07
	5/17/06	25.26		448.02
	8/9/06	31.74		441.54
	11/8/06	33.52		439.76
	2/14/07	30.77		442.51
	5/17/07	33.17		440.11
	8/2/07	36.33		436.95
	11/12/07	DRY		--
	2/14/08	35.55		437.73
	5/8/08	35.31		437.97
	7/23/08	DRY		--
	10/13/08	DRY		--
	2/11/09	DRY		--
	4/27/09	DRY		--
	8/4/09	DRY		--
	12/8/09	DRY		--
	2/11/10	NM	--	
	5/3/10	31.84	441.44	
	8/2/10	33.15	472.57 <sup>(c)</sup>	439.42
	11/2/10	DRY		--
	2/1/11	32.80		439.77
	4/25/11	25.43		447.14
	8/3/11	26.82		445.75
	10/10/11	33.29		439.28
1/31/12	32.19	440.38		
5/7/12	31.50	441.07		

TABLE D-1

HISTORICAL WELL AND GROUNDWATER ELEVATIONS  
TESORO - LIVERMORE, 67076

Well No.	Date of Measurement	Depth to Water (feet below casing)	PVC Casing Elevation <sup>(a)</sup> (feet MSL)	Water Table Elevation <sup>(b)</sup> (feet MSL)
VW-3	8/4/04	32.89	474.38	441.49
	11/4/04	34.78		439.60
	1/12/05	29.51		444.87
	5/2/05	24.79		449.59
	7/19/05	28.91		445.47
	11/21/05	31.07		443.31
	2/9/06	26.60		447.78
	5/16/06	24.19		450.19
	8/9/06	30.53		443.85
	11/8/06	31.62		442.76
	2/14/07	30.48		443.90
	5/17/07	31.70		442.68
	8/2/07	35.55		438.83
	11/12/07	DRY		--
	2/14/08	DRY		--
	5/8/08	34.80		439.58
	7/23/08	DRY		--
	10/13/08	DRY		--
	2/11/09	DRY		--
	4/27/09	DRY		--
	8/4/09	DRY		--
	12/8/09	DRY		--
	2/11/10	DRY		--
	5/3/10	31.85		442.53
	8/2/10	34.72		439.66
	11/2/10	DRY		--
2/1/11	32.56	441.82		
4/25/11	27.81	446.57		
8/3/11	28.93	445.45		
10/10/11	33.66	440.72		

TABLE D-1

HISTORICAL WELL AND GROUNDWATER ELEVATIONS  
TESORO - LIVERMORE, 67076

Well No.	Date of Measurement	Depth to Water (feet below casing)	PVC Casing Elevation <sup>(a)</sup> (feet MSL)	Water Table Elevation <sup>(b)</sup> (feet MSL)
VW-3	1/31/12	DRY		--
(cont.)	5/7/12	DRY		--
TP-1	7/19/05	29.91	472.82	442.91
	11/21/05	32.28		440.54
	2/9/06	28.02		444.80
	5/17/06	25.18		447.64
	8/9/06	32.81		440.01
	11/8/06	32.02		440.80
	2/14/07	33.59		439.23
	5/17/07	33.52		439.30
	8/2/07	40.30		432.52
	11/12/07	DRY		--
	2/14/08	36.17		436.65
	5/8/08	36.17		436.65
	7/23/08	DRY		--
	10/13/08	DRY		--
	2/11/09	DRY		--
	4/27/09	DRY		--
	8/4/09	DRY		--
	12/8/09	41.39		431.43
	2/11/10	NM		--
	5/3/10	32.32	440.50	
	8/2/10	33.96	472.64 <sup>(c)</sup>	438.68
	11/2/10	37.46		435.18
2/1/11	33.01	439.63		
4/25/11	28.23	444.41		
8/3/11	31.85	440.79		
10/10/11	31.60	441.04		
1/31/12	35.43	437.21		
5/7/12	34.70	437.94		

TABLE D-1

HISTORICAL WELL AND GROUNDWATER ELEVATIONS  
TESORO - LIVERMORE, 67076

Well No.	Date of Measurement	Depth to Water (feet below casing)	PVC Casing Elevation <sup>(a)</sup> (feet MSL)	Water Table Elevation <sup>(b)</sup> (feet MSL)	
TP-2	7/19/05	29.67	472.93	443.26	
	11/21/05	31.43		441.50	
	2/9/06	27.27		445.66	
	5/17/06	25.00		447.93	
	8/9/06	31.74		441.19	
	11/8/06	32.80		440.13	
	2/14/07	30.32		442.61	
	5/17/07	33.28		439.65	
	8/2/07	39.35		433.58	
	11/12/07	DRY		--	
	2/14/08	35.62		437.31	
	5/8/08	36.62		436.31	
	7/23/08	DRY		--	
	10/13/08	DRY		--	
	2/11/09	DRY		--	
	4/27/09	DRY		--	
	8/4/09	DRY		--	
	12/8/09	40.08		432.85	
	2/11/10	NM		--	
	5/3/10	31.85		441.08	
	8/2/10	33.57		472.78 <sup>(c)</sup>	439.21
	11/2/10	37.35			435.43
	2/1/11	32.79	439.99		
4/25/11	28.30	444.48			
8/3/11	31.59	441.19			
10/10/11	32.14	440.64			
1/31/12	34.32	438.46			
5/7/12	34.41	438.37			
DW-1	5/22/08	37.30	472.85		435.55
	7/23/08	45.55			427.30
	10/13/08	51.40		421.45	

TABLE D-1

HISTORICAL WELL AND GROUNDWATER ELEVATIONS  
TESORO - LIVERMORE, 67076

Well No.	Date of Measurement	Depth to Water (feet below casing)	PVC Casing Elevation <sup>(a)</sup> (feet MSL)	Water Table Elevation <sup>(b)</sup> (feet MSL)
DW-1 (cont.)	2/11/09	48.28	472.85	424.57
	4/27/09	41.74		431.11
	8/4/09	52.22		420.63
	12/8/09	39.79		433.06
	2/11/10	35.57		437.28
	5/3/10	31.70		441.15
	8/2/10	34.76		438.09
	11/2/10	37.49		435.36
	2/1/11	32.83		440.02
	4/25/11	27.96		444.89
	8/3/11	31.96		440.89
	10/10/11	34.40		438.45
	1/31/12	39.39		433.46
	5/7/12	36.35		436.50
DW-2	5/22/08	39.80	471.61	431.81
	7/23/08	48.25		423.36
	10/13/08	53.40		418.21
	2/11/09	51.50		420.11
	4/27/09	44.71		426.90
	8/4/09	54.67		416.94
	12/8/09	42.88		428.73
	2/11/10	38.63		432.98
	5/3/10	34.46		437.15
	8/2/10	37.72		433.89
	11/2/10	40.50		431.11
	2/1/11	35.66		435.95
	4/25/11	30.69		440.92
	8/3/11	35.00		436.61
	10/10/11	37.44		434.17
1/31/12	42.19	429.42		
5/7/12	39.10	432.51		

TABLE D-1

HISTORICAL WELL AND GROUNDWATER ELEVATIONS  
TESORO - LIVERMORE, 67076

Well No.	Date of Measurement	Depth to Water (feet below casing)	PVC Casing Elevation <sup>(a)</sup> (feet MSL)	Water Table Elevation <sup>(b)</sup> (feet MSL)
DW-3	5/22/08	40.20	470.33	430.13
	7/23/08	49.09		421.24
	10/13/08	54.62		415.71
	2/11/09	51.96		418.37
	4/27/09	45.17		425.16
	8/4/09	56.32		414.01
	12/8/09	42.92		427.41
	2/11/10	38.75		431.58
	5/3/10	34.51		435.82
	8/2/10	35.59		434.74
	11/2/10	40.00		430.33
	2/1/11	35.50		434.83
	4/25/11	30.45		439.88
	8/3/11	34.71		435.62
	10/10/11	37.00		433.33
	1/31/12	42.10		428.23
5/7/12	38.70	431.63		
DW-4	5/22/08	40.20	468.48	428.28
	7/23/08	49.50		418.98
	10/13/08	54.90		413.58
	2/11/09	51.71		416.77
	4/27/09	45.10		423.38
	8/4/09	56.46		412.02
	12/8/09	42.26		426.22
	2/11/10	37.98		430.50
	5/3/10	34.04		434.44
	8/2/10	36.94		431.54
	11/2/10	39.50		428.98
	2/1/11	35.11		433.37
	4/25/11	30.12		438.36
	8/3/11	34.54		433.94

TABLE D-1

HISTORICAL WELL AND GROUNDWATER ELEVATIONS  
TESORO - LIVERMORE, 67076

Well No.	Date of Measurement	Depth to Water (feet below casing)	PVC Casing Elevation <sup>(a)</sup> (feet MSL)	Water Table Elevation <sup>(b)</sup> (feet MSL)
DW-4 (cont.)	10/10/11	36.60	468.48	431.88
	1/31/12	42.10		426.38
	5/7/12	38.26		430.22
DW-5	12/8/09	43.05	471.86	428.81
	2/11/10	38.93		432.93
	5/3/10	34.55		437.31
	8/2/10	37.56		434.30
	11/2/10	40.00		431.86
	2/1/11	35.57		436.29
	4/25/11	30.59		441.27
	8/3/11	34.64		437.22
	10/10/11	37.00		434.86
	1/31/12	42.31		429.55
	5/7/12	38.98		432.88
DW-6	12/8/09	43.50	471.77	428.27
	2/11/10	39.22		432.55
	5/3/10	35.15		436.62
	8/2/10	38.35		433.42
	11/2/10	40.09		431.68
	2/1/11	36.35		435.42
	4/25/11	31.32		440.45
	8/3/11	35.63		436.14
	10/10/11	38.09		433.68
	1/31/12	42.69		429.08
	5/7/12	39.82		431.95
DW-7	12/8/09	43.01	470.07	427.06
	2/11/10	38.70		431.37
	5/3/10	34.64		435.43
	8/2/10	37.82		432.25
	11/2/10	40.42		429.65
	2/1/11	35.76		434.31



TABLE D-1

**HISTORICAL WELL AND GROUNDWATER ELEVATIONS  
TESORO - LIVERMORE, 67076**

Well No.	Date of Measurement	Depth to Water (feet below casing)	PVC Casing Elevation <sup>(a)</sup> (feet MSL)	Water Table Elevation <sup>(b)</sup> (feet MSL)
DW-7 (cont.)	4/25/11	30.82	470.07	439.25
	8/3/11	35.19		434.88
	10/10/11	37.55		432.52
	1/31/12	42.35		427.72
	5/7/12	39.30		430.77
DW-8	4/25/11	27.23	472.31	445.08
	8/3/11	31.14		441.17
	10/10/11	33.41		438.90
	1/31/12	38.69		433.62
	5/7/12	35.52		436.79
DW-9	6/14/12	40.85	469.80	428.95
MW-A	1/17/99	30.13	NM	--
MW-B	1/17/99	30.29	NM	--
MW-C	1/17/99	30.60	NM	--
MW-D	1/17/99	31.32	NM	--
MW-E	1/17/99	31.36	NM	--
MW-W	1/17/99	30.91	NM	--
IP-1	7/23/08	45.49	473.16	427.67
	10/13/08	51.30		421.86
	5/3/10 <sup>(f)</sup>	33.80		439.36
	4/25/11	27.97	473.06 <sup>(c)</sup>	445.09
	1/31/12	39.26		433.80
	5/7/12	36.18		436.88
IP-2	7/23/08	46.83	473.21	426.38
	10/13/08	51.40		421.81
	5/3/10 <sup>(f)</sup>	32.00		441.21
	4/25/11	28.04	473.06 <sup>(c)</sup>	445.02
	5/7/12	37.21		435.85
IP-3	7/23/08	45.47	472.97	427.50
	10/13/08	51.11		421.86
	5/3/10 <sup>(f)</sup>	31.68		441.29

TABLE D-1

**HISTORICAL WELL AND GROUNDWATER ELEVATIONS  
TESORO - LIVERMORE, 67076**

Well No.	Date of Measurement	Depth to Water (feet below casing)	PVC Casing Elevation <sup>(a)</sup> (feet MSL)	Water Table Elevation <sup>(b)</sup> (feet MSL)
IP-3 (cont.)	4/25/11	28.07	473.05 <sup>(c)</sup>	444.98
	5/7/12	36.41		436.64
IP-4	7/23/08	44.55	473.02	428.47
	10/13/08	50.89		422.13
	5/3/10 <sup>(f)</sup>	31.61		441.41
	4/25/11	27.93	473.10 <sup>(c)</sup>	445.17
	5/7/12	36.30		436.80
IP-5	7/23/08	44.70	473.06	428.36
	10/13/08	51.06		422.00
	5/3/10 <sup>(f)</sup>	31.60		441.46
	4/25/11	27.80	473.05 <sup>(c)</sup>	445.25
	5/7/12	36.90		436.15
IP-6	7/23/08	49.91	472.73	422.82
	10/13/08	55.63		417.10
	5/3/10 <sup>(f)</sup>	34.98		437.75
	4/25/11	30.60	472.43 <sup>(c)</sup>	441.83
	5/7/12	39.70		432.73
IP-7	7/23/08	51.45	472.86	421.41
	10/13/08	57.23		415.63
	5/3/10 <sup>(f)</sup>	35.75		437.11
	4/25/11	31.51	472.43 <sup>(c)</sup>	440.92
	5/7/12	41.87		430.56
IP-8	12/16/08	50.48	473.13	422.65
	5/3/10 <sup>(f)</sup>	33.34		439.79
	4/25/11	28.07	473.22 <sup>(c)</sup>	445.15
	1/31/12	39.45		433.77
	5/7/12	36.25		436.97
IP-9	12/16/08	52.51	473.47	420.96
	5/3/10 <sup>(f)</sup>	31.79		441.68
	4/25/11	27.84	473.35 <sup>(c)</sup>	445.51

TABLE D-1

HISTORICAL WELL AND GROUNDWATER ELEVATIONS  
TESORO - LIVERMORE, 67076

Well No.	Date of Measurement	Depth to Water (feet below casing)	PVC Casing Elevation <sup>(a)</sup> (feet MSL)	Water Table Elevation <sup>(b)</sup> (feet MSL)
IP-9 (cont.)	1/31/12	39.37	473.35	433.98
	5/7/12	37.03		436.32
IP-10	2/11/09	48.77	473.78	425.01
	5/3/10 <sup>(f)</sup>	32.23		441.55
	4/25/11	27.79		473.88 <sup>(c)</sup>
	1/31/12	39.24	434.64	
	5/7/12	36.24	437.64	

- (a) Elevation of PVC well casing (north edge) surveyed relative to mean sea level (MSL).  
Wells were surveyed by Cross Land Surveying, Inc., per AB 2886 requirements.  
Benchmark K2-741, elevation is 467.835 feet above MSL.
- (b) Water Table Elevation = (Casing Elevation - Depth to Water)
- (c) Wells were resurveyed by Cross Land Surveying, Inc., per AB 2886 requirements, on 19 October 2010 after remediation system construction.  
Benchmark K2-741, elevation is 467.835 feet above MSL.
- (d) Depth of groundwater assumed to be below screened interval; well had 6 inches or less of water.
- (e) NM - Not measured.
- (f) Baseline remediation system values.

**ATTACHMENT E**  
**HISTORICAL GROUNDWATER ANALYTICAL RESULTS**

**TABLE E-1**  
**HISTORICAL GROUNDWATER ANALYTICAL RESULTS**  
**TESORO - LIVERMORE, 67076**

Monitoring Well	Sample Date <sup>(a)</sup>	TPHg <sup>(b)</sup> (µg/l)	Benzene <sup>(b)</sup> (µg/l)	Toluene <sup>(b)</sup> (µg/l)	Ethylbenzene <sup>(b)</sup> (µg/l)	Xylenes <sup>(b)</sup> (µg/l)	MTBE <sup>(b)</sup> (µg/l)	DIPE <sup>(b)</sup> (µg/l)	ETBE <sup>(b)</sup> (µg/l)	TAME <sup>(b)</sup> (µg/l)	TBA <sup>(b)</sup> (µg/l)	Methanol <sup>(b)</sup> (µg/l)	Ethanol <sup>(b)</sup> (µg/l)	1,2-DCA <sup>(b)</sup> (µg/l)	EDB <sup>(b)</sup> (µg/l)
MW-1	6/1/93	27,000	2,200	400	ND<0.5 <sup>(c)</sup>	4,900	-- <sup>(d)</sup>	--	--	--	--	--	--	--	--
	6/22/93	87,000	8,000	10,000	260	10,000	--	--	--	--	--	--	--	--	--
	10/6/93	40,000	4,700	6,500	740	5,300	--	--	--	--	--	--	--	--	--
	1/13/94	9,400	1,300	9,500	110	850	--	--	--	--	--	--	--	--	--
	3/30/94	NS <sup>(e)</sup>	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	4/25/94	11,000	1,500	1,800	290	1,700	--	--	--	--	--	--	--	--	--
	8/12/94	11,000	550	330	260	1,400	--	--	--	--	--	--	--	--	--
	12/14/94	11,000	1,000	1,200	320	1,500	--	--	--	--	--	--	--	--	--
	2/10/95	9,300	1,200	1,500	280	1,500	--	--	--	--	--	--	--	--	--
	6/15/95	140	5.6	ND<0.5	ND<0.5	ND<0.5	--	--	--	--	--	--	--	--	--
	9/26/95	410	140	ND<0.5	ND<0.5	43	--	--	--	--	--	--	--	--	--
	12/15/95	740	250	ND<1.3	ND<1.3	87	--	--	--	--	--	--	--	--	--
	3/21/96	ND<50	0.52	ND<0.5	ND<0.5	0.51	--	--	--	--	--	--	--	--	--
	6/13/96	240	ND<0.5	ND<0.5	ND<0.5	ND<0.5	--	--	--	--	--	--	--	--	--
	9/16/96	720	70	ND<0.5	1.0	5.1	ND<5	--	--	--	--	--	--	--	--
	12/2/96	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	--	--	--	--	--	--	--	--
	3/7/97	600	6.7	ND<0.5	1.2	1.8	ND<5	--	--	--	--	--	--	--	--
	6/12/97	18,000	180	800	410	1,800	ND<5	--	--	--	--	--	--	--	--
	9/29/97	350	120	1.5	ND<0.5	12	ND<5	--	--	--	--	--	--	--	--
	12/1/97	ND<50	7.0	ND<0.5	ND<0.5	ND<0.5	ND<5	--	--	--	--	--	--	--	--
3/19/98	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	--	--	--	--	--	--	--	--	
5/29/98	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	--	--	--	--	--	--	--	--	
9/15/98	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	--	--	--	--	--	--	--	--	
11/30/98	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	--	--	--	--	--	--	--	--	
1/17/99	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	--	--	--	--	--	--	--	--	
6/10/99	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	--	--	--	--	--	--	--	--	
9/7/99	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	--	--	--	--	--	--	--	--	

**TABLE E-1**  
**HISTORICAL GROUNDWATER ANALYTICAL RESULTS**  
**TESORO - LIVERMORE, 67076**

Monitoring Well	Sample Date <sup>(a)</sup>	TPHg <sup>(b)</sup> (µg/l)	Benzene <sup>(b)</sup> (µg/l)	Toluene <sup>(b)</sup> (µg/l)	Ethylbenzene <sup>(b)</sup> (µg/l)	Xylenes <sup>(b)</sup> (µg/l)	MTBE <sup>(b)</sup> (µg/l)	DIPE <sup>(b)</sup> (µg/l)	ETBE <sup>(b)</sup> (µg/l)	TAME <sup>(b)</sup> (µg/l)	TBA <sup>(b)</sup> (µg/l)	Methanol <sup>(b)</sup> (µg/l)	Ethanol <sup>(b)</sup> (µg/l)	1,2-DCA <sup>(b)</sup> (µg/l)	EDB <sup>(b)</sup> (µg/l)
MW-1 (cont.)	12/13/99	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	--	--	--	--	--	--	--	--
	3/13/00	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	--	--	--	--	--	--	--	--
	6/12/00	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	--	--	--	--	--	--	--	--
	11/10/00	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	--	--	--	--	--	--	--	--
	12/31/00	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	--	--	--	--	--	--	--	--
	3/27/01	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	--	--	--	--	--	--	--	--
	6/30/01	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	--	--	--	--	--	--	--	--
	9/26/01	90	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	--	--	--	--	--	--	--	--
	12/18/01	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	--	--	--	--	--	--	--	--
	11/4/04	4,500	2.5	5.8	79	140	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5
	1/12/05	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5
	5/2/05	78	0.80	0.70	0.86	2.4	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<40	ND<5	ND<0.5	ND<0.5
	7/19/05	290	ND<0.5	ND<0.5	4.0	4.1	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5
	11/21/05	370	ND<0.5	ND<0.5	0.75	1.3	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5
	2/9/06	140	ND<0.5	ND<0.5	0.67	1.0	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5
	5/16/06	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5
	8/9/06	100	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5
	11/8/06	400	ND<0.5	ND<0.5	1.7	1.9	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5
	2/14/07	410	ND<0.5	ND<0.5	2.2	2.2	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5
	5/17/07	2,300	ND<0.5	0.66	17	21	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<8	--	--
	8/2/07	580	5.7	0.64	6.8	12	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5
	11/12/07	750	0.85	2.7	4.2	9.3	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<20	ND<0.5	ND<0.5
	2/14/08	1,700	3.3	17	38	83	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5
	5/8/08	620	1.8	ND<0.5	12	12	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5
	7/23/08	270	0.52	ND<0.5	3.9	1.8	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<80	ND<5	ND<0.5	ND<0.5
	10/13/08	730	ND<0.5	ND<0.5	0.68	0.80	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<10	ND<0.5	ND<0.5
2/11/09	2,100	4.1	8.1	18	36	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<50	ND<0.5	ND<0.5	

**TABLE E-1**  
**HISTORICAL GROUNDWATER ANALYTICAL RESULTS**  
**TESORO - LIVERMORE, 67076**

Monitoring Well	Sample Date <sup>(a)</sup>	TPHg <sup>(b)</sup> (µg/l)	Benzene <sup>(b)</sup> (µg/l)	Toluene <sup>(b)</sup> (µg/l)	Ethylbenzene <sup>(b)</sup> (µg/l)	Xylenes <sup>(b)</sup> (µg/l)	MTBE <sup>(b)</sup> (µg/l)	DIPE <sup>(b)</sup> (µg/l)	ETBE <sup>(b)</sup> (µg/l)	TAME <sup>(b)</sup> (µg/l)	TBA <sup>(b)</sup> (µg/l)	Methanol <sup>(b)</sup> (µg/l)	Ethanol <sup>(b)</sup> (µg/l)	1,2-DCA <sup>(b)</sup> (µg/l)	EDB <sup>(b)</sup> (µg/l)
MW-1 (cont.)	4/27/09	2,800	9.9	34	94	170	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<8	ND<0.5	ND<0.5
	8/4/09	890	ND<0.5	ND<0.5	1.7	1.4	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<8	ND<0.5	ND<0.5
	12/8/09	3,200	16	18	81	110	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<80	ND<20	ND<0.5	ND<0.5
	2/11/10	1,300	3.7	1.7	13	6.7	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<20	ND<0.5	ND<0.5
	5/5/10	710	2.2	0.92	5.9	2.8	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5
	8/3/10	1,200	2.4	3.7	22	23	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5
	11/3/10	1,100	7.3	34	18	67	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5
	2/1/11	200	ND<0.5	ND<0.5	0.81	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5
	4/25/11	130	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5
	8/3/11	1,500	2.0	15	44	86	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5
	10/11/11	2,300	6.0	30	15	64	ND<0.5	ND<0.5	ND<0.5	ND<0.5	10	ND<50	ND<8	ND<0.5	ND<0.5
	1/31/12	1,700	1.6	11	26	89	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<100	ND<0.5	ND<0.5
5/9/12	3,300	2.2	5.5	52	89	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<100	ND<5	ND<0.5	ND<0.5	
MW-2	6/1/93	170,000	20,000	21,000	3,300	18,000	--	--	--	--	--	--	--	--	--
	6/22/93	160,000	19,000	22,000	3,500	18,000	--	--	--	--	--	--	--	--	--
	10/6/93	110,000	17,000	17,000	3,000	15,000	--	--	--	--	--	--	--	--	--
	1/13/94	93,000	20,000	19,000	2,300	14,000	--	--	--	--	--	--	--	--	--
	3/30/94	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	4/25/94	41,000	9,600	7,300	840	7,800	--	--	--	--	--	--	--	--	--
	8/12/94	59,000	11,000	11,000	2,300	11,000	--	--	--	--	--	--	--	--	--
	12/14/94	63,000	13,000	13,000	2,200	12,000	--	--	--	--	--	--	--	--	--
	2/10/95	63,000	12,000	12,000	2,200	11,000	--	--	--	--	--	--	--	--	--
	6/15/95	61,000	11,000	12,000	1,900	11,000	--	--	--	--	--	--	--	--	--
	9/26/95	61,000	9,400	11,000	2,300	12,000	--	--	--	--	--	--	--	--	--
	12/15/95	48,000	8,000	8,300	2,200	12,000	--	--	--	--	--	--	--	--	--
	3/21/96	48,000	8,000	7,700	2,400	12,000	--	--	--	--	--	--	--	--	--
	6/13/96	33,000	7,300	8,800	1,900	12,000	ND<250	--	--	--	--	--	--	--	--
9/16/96	8,600	510	640	180	1,300	ND<250	--	--	--	--	--	--	--	--	
12/2/96	29,000	4,400	4,000	1,300	6,100	ND<130	--	--	--	--	--	--	--	--	

**TABLE E-1**  
**HISTORICAL GROUNDWATER ANALYTICAL RESULTS**  
**TESORO - LIVERMORE, 67076**

Monitoring Well	Sample Date <sup>(a)</sup>	TPHg <sup>(b)</sup> (µg/l)	Benzene <sup>(b)</sup> (µg/l)	Toluene <sup>(b)</sup> (µg/l)	Ethylbenzene <sup>(b)</sup> (µg/l)	Xylenes <sup>(b)</sup> (µg/l)	MTBE <sup>(b)</sup> (µg/l)	DIPE <sup>(b)</sup> (µg/l)	ETBE <sup>(b)</sup> (µg/l)	TAME <sup>(b)</sup> (µg/l)	TBA <sup>(b)</sup> (µg/l)	Methanol <sup>(b)</sup> (µg/l)	Ethanol <sup>(b)</sup> (µg/l)	1,2-DCA <sup>(b)</sup> (µg/l)	EDB <sup>(b)</sup> (µg/l)
MW-2 (cont.)	3/7/97	13,000	1,800	1,100	270	2,000	ND<250	--	--	--	--	--	--	--	--
	6/12/97	68,000	7,800	6,600	2,300	11,000	ND<500	--	--	--	--	--	--	--	--
	9/29/97	15,000	1,500	97	740	1,800	ND<250	--	--	--	--	--	--	--	--
	12/1/97	13,000	900	37	860	2,400	ND<250	--	--	--	--	--	--	--	--
	3/19/98	42,000	5,000	3,600	2,000	8,300	ND<250	--	--	--	--	--	--	--	--
	5/29/98	68,000	5,600	4,700	2,400	11,000	ND<250	--	--	--	--	--	--	--	--
	9/15/98	36,000	3,900	1,200	1,400	7,800	ND<250	--	--	--	--	--	--	--	--
	11/30/98	16,000	2,200	59	1,200	1,500	ND<250	--	--	--	--	--	--	--	--
	1/17/99	30,000	4,000	2,200	2,100	9,500	ND<250	--	--	--	--	--	--	--	--
	6/10/99	70,000	6,300	1,800	3,600	14,000	ND<500	--	--	--	--	--	--	--	--
	9/7/99	42,000	3,800	840	1,900	8,000	150	--	--	--	--	--	--	--	--
	12/13/99	14,000	1,400	87	690	110	34	--	--	--	--	--	--	--	--
	3/13/00	38,000	2,400	2,300	1,600	6,400	2,400	--	--	--	--	--	--	--	--
	6/12/00	56,000	4,000	950	2,300	7,200	ND<50	--	--	--	--	--	--	--	--
	11/10/00	35,000	5,100	850	1,500	3,200	230	--	--	--	--	--	--	--	--
	12/31/00	21,000	3,200	420	1,300	1,200	440	--	--	--	--	--	--	--	--
	3/27/01	3,500	420	64	16	280	120	--	--	--	--	--	--	--	--
	6/30/01	1,200	88	4.5	65	37	29	--	--	--	--	--	--	--	--
	9/26/01	53,000	8,500	1,500	2,400	4,600	270	--	--	--	--	--	--	--	--
	12/18/01	26,000	5,400	900	1,500	2,200	430	--	--	--	--	--	--	--	--
	1/22/02	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	3/18/02	4,200	240	7.3	200	53	89	--	--	--	--	--	--	--	--
	6/5/02	25,000	3,500	390	1,400	2,400	550	--	--	--	--	--	--	--	--
8/21/02	10,000	1,200	32	620	300	160	--	--	--	--	--	--	--	--	
12/3/02	3,700	110	2.5	130	11	29	--	--	--	--	--	--	--	--	
3/4/03	8,700	1,100	77	350	540	230	ND<0.5	ND<0.5	ND<10	21	ND<150	ND<5	ND<0.5	ND<0.5	
6/10/03	6,300	660	35	190	120	410	ND<2.5	ND<2.5	ND<5	ND<25	ND<250	ND<25	ND<2.5	ND<2.5	



**TABLE E-1**  
**HISTORICAL GROUNDWATER ANALYTICAL RESULTS**  
**TESORO - LIVERMORE, 67076**

Monitoring Well	Sample Date <sup>(a)</sup>	TPHg <sup>(b)</sup> (µg/l)	Benzene <sup>(b)</sup> (µg/l)	Toluene <sup>(b)</sup> (µg/l)	Ethylbenzene <sup>(b)</sup> (µg/l)	Xylenes <sup>(b)</sup> (µg/l)	MTBE <sup>(b)</sup> (µg/l)	DIPE <sup>(b)</sup> (µg/l)	ETBE <sup>(b)</sup> (µg/l)	TAME <sup>(b)</sup> (µg/l)	TBA <sup>(b)</sup> (µg/l)	Methanol <sup>(b)</sup> (µg/l)	Ethanol <sup>(b)</sup> (µg/l)	1,2-DCA <sup>(b)</sup> (µg/l)	EDB <sup>(b)</sup> (µg/l)
MW-2 (cont.)	9/9/03	6,900	500	ND<20	360	29	9,500	ND<20	ND<20	60	ND<200	ND<2,000	ND<200	ND<20	ND<20
	12/23/03	22,000	4,900	1,300	720	2,300	1,700	ND<20	ND<20	21	ND<200	ND<2,000	ND<200	ND<20	ND<20
	3/23/04	45,000	5,200	1,500	1,800	5,000	750	ND<20	ND<20	34	ND<200	ND<2,000	ND<200	ND<20	ND<20
	5/10/04	7,300	1,000	51	240	290	1,800	ND<5	ND<5	14	ND<50	ND<500	ND<50	ND<5	ND<5
	8/4/04	45,000	7,200	1,900	1,800	5,100	2,500	ND<25	ND<25	31	ND<250	ND<2,500	ND<250	ND<25	ND<25
	11/4/04	27,000	4,400	1,100	840	2,200	3,500	ND<9	ND<9	29	ND<50	ND<900	ND<90	ND<9	ND<9
	1/12/05	16,000	1,900	640	570	1,500	1,900	ND<4	ND<4	19	28 <sup>(f)</sup>	ND<400	ND<40	ND<4	ND<4
	5/2/05	44,000	5,200	1,100	1,800	4,800	2,200	ND<20	ND<20	30	ND<200	ND<2,000	ND<200	ND<20	ND<20
	7/20/05	21,000	3,000	500	1,000	1,500	4,400	ND<7	ND<7	32	74 <sup>(f)</sup>	ND<700	ND<70	ND<7	ND<7
	11/22/05	33,000	4,400	880	1,200	2,600	2,200	ND<9	ND<9	19	480	ND<900	ND<90	ND<9	ND<9
	2/9/06	25,000	3,300	720	1,300	2,200	2,500	ND<7	ND<7	27	490	ND<700	ND<70	ND<7	ND<7
	5/17/06	22,000	3,200	240	1,200	2,100	4,600	ND<7	ND<7	46	1,000	ND<700	ND<70	ND<7	ND<7
	8/9/06	34,000	4,200	830	1,300	2,400	2,900	ND<9	ND<9	25	1,600	ND<900	ND<90	ND<9	ND<9
	11/8/06	27,000	3,600	300	1,200	1,800	1,500	ND<9	ND<9	15	1,100	ND<900	ND<90	ND<9	ND<9
	2/14/07	36,000	4,600	740	1,600	2,100	1,800	ND<5	ND<5	20	910	ND<700	ND<50	ND<5	ND<5
	5/17/07	37,000	7,400	680	1,900	2,400	3,000	ND<9	ND<9	24	2,600	ND<4,000	ND<90	--	--
	8/2/07	37,000	4,200	500	1,800	2,200	1,300	ND<9	ND<9	18	1,200	ND<2,000	ND<90	ND<9	ND<9
	11/12/07	25,000	5,900	120	1,700	820	1,400	ND<15	ND<15	16	720	ND<1,500	ND<150	ND<15	ND<15
	2/14/08	31,000	5,400	450	1,900	2,000	1,200	ND<15	ND<15	16	410	ND<1,500	ND<150	ND<15	ND<15
	5/8/08	29,000	3,200	620	1,400	1,700	580	ND<5	ND<5	10	210	ND<1,000	ND<50	ND<5	ND<5
	7/23/08	25,000	3,800	220	1,600	1,000	780	ND<5	ND<5	14	470	ND<900	ND<50	ND<5	ND<5
	10/13/08	31,000	7,600	160	1,800	440	1,600	ND<9	ND<9	20	710	ND<1,500	ND<90	ND<9	ND<9
	2/11/09	22,000	4,400	120	1,500	430	650	ND<9	ND<9	12	330	ND<3,000	ND<90	ND<9	ND<9
4/28/09	28,000	3,400	600	1,500	1,700	380	ND<8	ND<8	8.1	150	ND<1,000	ND<80	ND<8	ND<8	
8/4/09	30,000	5,800	170	1,500	370	1,400	ND<9	ND<9	18	670	ND<3,000	ND<90	ND<9	ND<9	
12/8/09	24,000	3,100	200	1,200	830	520	ND<7	ND<7	8.0	250	ND<700	ND<70	ND<7	ND<7	
2/12/10	19,000	2,900	440	940	1,300	820	ND<7	ND<7	9.5	400	ND<700	ND<70	ND<7	ND<7	

TABLE E-1

**HISTORICAL GROUNDWATER ANALYTICAL RESULTS  
TESORO - LIVERMORE, 67076**

Monitoring Well	Sample Date <sup>(a)</sup>	TPHg <sup>(b)</sup> (µg/l)	Benzene <sup>(b)</sup> (µg/l)	Toluene <sup>(b)</sup> (µg/l)	Ethylbenzene <sup>(b)</sup> (µg/l)	Xylenes <sup>(b)</sup> (µg/l)	MTBE <sup>(b)</sup> (µg/l)	DIPE <sup>(b)</sup> (µg/l)	ETBE <sup>(b)</sup> (µg/l)	TAME <sup>(b)</sup> (µg/l)	TBA <sup>(b)</sup> (µg/l)	Methanol <sup>(b)</sup> (µg/l)	Ethanol <sup>(b)</sup> (µg/l)	1,2-DCA <sup>(b)</sup> (µg/l)	EDB <sup>(b)</sup> (µg/l)
MW-2 (cont.)	5/3/10	26,000	3,100	870	1,100	2,200	530	ND<7	ND<7	8.0	370	ND<700	ND<70	ND<7	ND<7
	8/3/10	19,000	2,000	150	840	730	280	ND<4	ND<4	4.4	200	ND<400	ND<40	ND<4	ND<4
	11/4/10	13,000	2,000	160	420	390	540	ND<4	ND<4	5.7	510	ND<400	ND<40	ND<4	ND<4
	2/2/11	10,000	1,600	130	320	410	410	ND<4	ND<4	4.2	410	ND<400	ND<40	ND<4	ND<4
	4/28/11	13,000	1,400	100	470	670	450	ND<2.5	ND<2.5	4.6	200	ND<250	ND<50	ND<2.5	ND<2.5
	8/4/11	16,000	1,900	200	430	820	660	ND<3	ND<3	5.7	420	ND<1,500	ND<30	ND<3	ND<3
	10/11/11	7,000	810	110	200	430	370	ND<1.5	ND<1.5	3.3	170	ND<250	ND<15	ND<1.5	ND<1.5
	2/1/12	14,000	1,200	130	440	650	340	ND<2.5	ND<2.5	5.4	170	ND<800	ND<25	ND<2.5	ND<2.5
5/11/12	14,000	1,200	140	490	1,000	220	ND<2.5	ND<2.5	2.7	120	ND<250	ND<25	ND<2.5	ND<2.5	
MW-3	6/1/93	270	4.6	ND<0.5	ND<0.5	1.9	--	--	--	--	--	--	--	--	--
	6/22/93	160	8.2	ND<0.5	ND<0.5	0.72	--	--	--	--	--	--	--	--	--
	10/6/93	740	57	110	24	120	--	--	--	--	--	--	--	--	--
	1/13/94	83	2.6	0.67	0.78	4.2	--	--	--	--	--	--	--	--	--
	3/30/94	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	4/25/94	60	0.75	3.2	0.50	3.6	--	--	--	--	--	--	--	--	--
	8/12/94	310	7.3	14	2.6	13	--	--	--	--	--	--	--	--	--
	12/14/94	75	ND<0.5	ND<0.5	ND<0.5	ND<0.5	--	--	--	--	--	--	--	--	--
	2/10/95	96	1.4	ND<0.5	ND<0.5	1.8	--	--	--	--	--	--	--	--	--
	6/15/95	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	--	--	--	--	--	--	--	--	--
	9/26/95	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	--	--	--	--	--	--	--	--	--
	12/15/95	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	--	--	--	--	--	--	--	--	--
	11/4/04	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	6.4	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5
	1/12/05	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	4.4	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5
	5/2/05	140	ND<0.5	ND<0.5	ND<0.5	0.81	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5
	7/19/05	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	1.6	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5
	11/21/05	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	3.4	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5
2/9/06	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	2.9	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5	
5/16/06	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5	
8/9/06	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	1.4	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5	

TABLE E-1

**HISTORICAL GROUNDWATER ANALYTICAL RESULTS  
TESORO - LIVERMORE, 67076**

Monitoring Well	Sample Date <sup>(a)</sup>	TPHg <sup>(b)</sup> (µg/l)	Benzene <sup>(b)</sup> (µg/l)	Toluene <sup>(b)</sup> (µg/l)	Ethylbenzene <sup>(b)</sup> (µg/l)	Xylenes <sup>(b)</sup> (µg/l)	MTBE <sup>(b)</sup> (µg/l)	DIPE <sup>(b)</sup> (µg/l)	ETBE <sup>(b)</sup> (µg/l)	TAME <sup>(b)</sup> (µg/l)	TBA <sup>(b)</sup> (µg/l)	Methanol <sup>(b)</sup> (µg/l)	Ethanol <sup>(b)</sup> (µg/l)	1,2-DCA <sup>(b)</sup> (µg/l)	EDB <sup>(b)</sup> (µg/l)
MW-3 (cont.)	11/8/06	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	0.71	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5
	2/14/07	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	1.4	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5
	5/17/07	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	0.54	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	--	--
	8/2/07	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5
	11/12/07	190	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5
	2/14/08	240	ND<0.5	ND<0.5	ND<0.5	ND<0.5	0.83	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5
	5/8/08	57	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5
	7/23/08	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5
	10/13/08	280	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	61	ND<5	ND<0.5	ND<0.5
	2/11/09	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5
	4/27/09	ND<50	ND<0.5	ND<0.5	ND<0.5	0.64	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5
	8/4/09	190	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5
	12/8/09	150	3.6	1.1	2.4	2.6	0.82	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<50	ND<0.5	ND<0.5
	2/11/10	61	ND<0.5	ND<0.5	ND<0.5	ND<0.5	0.52	ND<0.5	ND<0.5	ND<0.5	ND<5	53	ND<5	ND<0.5	ND<0.5
	5/6/10	ND<50	ND<0.5	1.0	ND<0.5	0.95	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5
	8/3/10	74	2.4	5.5	0.96	8.8	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5
	11/3/10	ND<50	ND<0.5	2.5	ND<0.5	3.8	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5
	2/1/11	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5
	4/25/11	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5
8/4/11	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5	
10/10/11	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5	
1/31/12	ND<50	ND<0.5	0.67	7.1	3.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5	
5/7/12	74	ND<0.5	0.56	1.9	7.7	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5	
MW-4	3/30/94	120	4.2	15	2.5	26	--	--	--	--	--	--	--	--	--
	4/25/94	65	ND<0.5	1.8	ND<0.5	2.1	--	--	--	--	--	--	--	--	--
	8/12/94	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	--	--	--	--	--	--	--	--	--
	12/14/94	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	--	--	--	--	--	--	--	--	--
	2/10/95	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	--	--	--	--	--	--	--	--	--
6/15/95	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	--	--	--	--	--	--	--	--	--	

**TABLE E-1**  
**HISTORICAL GROUNDWATER ANALYTICAL RESULTS**  
**TESORO - LIVERMORE, 67076**

Monitoring Well	Sample Date <sup>(a)</sup>	TPHg <sup>(b)</sup> (µg/l)	Benzene <sup>(b)</sup> (µg/l)	Toluene <sup>(b)</sup> (µg/l)	Ethylbenzene <sup>(b)</sup> (µg/l)	Xylenes <sup>(b)</sup> (µg/l)	MTBE <sup>(b)</sup> (µg/l)	DIPE <sup>(b)</sup> (µg/l)	ETBE <sup>(b)</sup> (µg/l)	TAME <sup>(b)</sup> (µg/l)	TBA <sup>(b)</sup> (µg/l)	Methanol <sup>(b)</sup> (µg/l)	Ethanol <sup>(b)</sup> (µg/l)	1,2-DCA <sup>(b)</sup> (µg/l)	EDB <sup>(b)</sup> (µg/l)	
MW-4 (cont.)	9/26/95	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	--	--	--	--	--	--	--	--	--	
	12/15/95	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	--	--	--	--	--	--	--	--	--	
	11/4/04	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5	
	1/12/05	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5	
	5/2/05	ND<50	1.8	1.1	1.4	4.4	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5	
	7/19/05	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5	
	11/21/05	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5	
	2/9/06	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5	
	5/16/06	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5	
	8/9/06	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5	
	11/8/06	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5	
	2/14/07	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5	
	5/17/07	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	--	--	
	8/2/07	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5	
	11/12/07	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	2/14/08	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5	
	5/8/08	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5	
	7/23/08	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5	
	10/13/08	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	2/11/09	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
4/27/09	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5		
8/4/09	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	
12/8/09	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5		
2/11/10	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	
5/4/10	ND<50	2.4	1.8	2.3	4.8	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5		
8/3/10	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	
11/3/10	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5		

**TABLE E-1**  
**HISTORICAL GROUNDWATER ANALYTICAL RESULTS**  
**TESORO - LIVERMORE, 67076**

Monitoring Well	Sample Date <sup>(a)</sup>	TPHg <sup>(b)</sup> (µg/l)	Benzene <sup>(b)</sup> (µg/l)	Toluene <sup>(b)</sup> (µg/l)	Ethylbenzene <sup>(b)</sup> (µg/l)	Xylenes <sup>(b)</sup> (µg/l)	MTBE <sup>(b)</sup> (µg/l)	DIPE <sup>(b)</sup> (µg/l)	ETBE <sup>(b)</sup> (µg/l)	TAME <sup>(b)</sup> (µg/l)	TBA <sup>(b)</sup> (µg/l)	Methanol <sup>(b)</sup> (µg/l)	Ethanol <sup>(b)</sup> (µg/l)	1,2-DCA <sup>(b)</sup> (µg/l)	EDB <sup>(b)</sup> (µg/l)
MW-4 (cont.)	2/1/11	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	4/26/11	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5
	8/4/11	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	10/11/11	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5
	1/31/12	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	5/7/12	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5
MW-5	3/30/94	7,500	1,300	20	ND<13	160	--	--	--	--	--	--	--	--	--
	4/25/94	6,500	1,100	41	130	740	--	--	--	--	--	--	--	--	--
	8/12/94	4,000	420	2.9	41	98	--	--	--	--	--	--	--	--	--
	12/14/94	4,800	660	ND<2.5	33	13	--	--	--	--	--	--	--	--	--
	2/10/95	5,200	490	ND<13	23	19	--	--	--	--	--	--	--	--	--
	6/15/95	460	ND<0.5	ND<0.5	ND<0.5	ND<0.5	--	--	--	--	--	--	--	--	--
	9/26/95	1,400	61	ND<0.5	3.1	ND<0.5	--	--	--	--	--	--	--	--	--
	12/15/95	2,100	77	1.5	10	1.5	--	--	--	--	--	--	--	--	--
	3/21/96	930	35	2.0	2.0	18	--	--	--	--	--	--	--	--	--
	6/13/96	610	38	0.72	1.9	2.0	ND<5	--	--	--	--	--	--	--	--
	9/16/96	380	29	ND<0.5	0.95	ND<0.5	ND<5	--	--	--	--	--	--	--	--
	12/2/96	200	1.1	0.64	ND<0.5	ND<0.5	ND<5	--	--	--	--	--	--	--	--
	3/7/97	520	74	ND<0.5	0.58	1.5	ND<5	--	--	--	--	--	--	--	--
	6/12/97	140	5.3	ND<0.5	ND<0.5	ND<0.5	ND<5	--	--	--	--	--	--	--	--
	9/29/97	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	--	--	--	--	--	--	--	--
	12/1/97	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	--	--	--	--	--	--	--	--
	3/19/98	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	--	--	--	--	--	--	--	--
	5/29/98	540	4.1	ND<0.5	ND<0.5	0.52	ND<5	--	--	--	--	--	--	--	--
	9/15/98	67	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	--	--	--	--	--	--	--	--
	11/30/98	430	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	--	--	--	--	--	--	--	--
1/17/99	500	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	--	--	--	--	--	--	--	--	
6/10/99	66	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	--	--	--	--	--	--	--	--	
9/7/99	820	46	1.7	10	21	ND<5	--	--	--	--	--	--	--	--	

TABLE E-1

HISTORICAL GROUNDWATER ANALYTICAL RESULTS  
TESORO - LIVERMORE, 67076

Monitoring Well	Sample Date <sup>(a)</sup>	TPHg <sup>(b)</sup> (µg/l)	Benzene <sup>(b)</sup> (µg/l)	Toluene <sup>(b)</sup> (µg/l)	Ethylbenzene <sup>(b)</sup> (µg/l)	Xylenes <sup>(b)</sup> (µg/l)	MTBE <sup>(b)</sup> (µg/l)	DIPE <sup>(b)</sup> (µg/l)	ETBE <sup>(b)</sup> (µg/l)	TAME <sup>(b)</sup> (µg/l)	TBA <sup>(b)</sup> (µg/l)	Methanol <sup>(b)</sup> (µg/l)	Ethanol <sup>(b)</sup> (µg/l)	1,2-DCA <sup>(b)</sup> (µg/l)	EDB <sup>(b)</sup> (µg/l)
MW-5 (cont.)	12/13/99	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	--	--	--	--	--	--	--	--
	3/13/00	270	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	--	--	--	--	--	--	--	--
	6/12/00	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	--	--	--	--	--	--	--	--
	11/10/00	2,200	42	1.1	25	30	8.6	--	--	--	--	--	--	--	--
	12/31/00	1,300	21	ND<0.5	4.3	2.6	10	--	--	--	--	--	--	--	--
	3/27/01	1,200	11	ND<0.5	2.6	ND<0.5	21	--	--	--	--	--	--	--	--
	6/30/01	1,400	4.8	ND<0.5	1.5	0.56	14	--	--	--	--	--	--	--	--
	9/26/01	660	ND<0.5	ND<0.5	ND<0.5	ND<0.5	3.0	--	--	--	--	--	--	--	--
	12/18/01	240	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	--	--	--	--	--	--	--	--
	1/22/02	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	3/18/02	890	0.65	ND<0.5	ND<0.5	ND<0.5	3.1	--	--	--	--	--	--	--	--
	6/5/02	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	8/21/02	2,100	20	ND<0.5	63	4.0	7.0	--	--	--	--	--	--	--	--
	12/3/02	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	3/4/03	490	10	ND<0.5	2.2	ND<0.5	1.0	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5
	6/10/03	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	9/9/03	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5
	12/23/03	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	3/23/04	440	2.3	ND<0.5	1.0	5.9	2.4	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5
	5/10/04	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	8/4/04	160	ND<0.5	ND<0.5	ND<0.5	0.71	0.94	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5
	11/4/04	290	0.74	ND<0.5	0.58	1.3	0.61	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5
	1/12/05	300	ND<0.5	ND<0.5	0.51	1.6	0.73	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5
	5/2/05	120	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5
	7/20/05	330	ND<0.5	ND<0.5	ND<0.5	ND<0.5	1.1	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5
	11/21/05	210	ND<0.5	ND<0.5	ND<0.5	ND<0.5	1.2	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5
2/9/06	ND<50	ND<0.5	ND<0.5	0.63	1.0	1.0	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5	

TABLE E-1

**HISTORICAL GROUNDWATER ANALYTICAL RESULTS  
TESORO - LIVERMORE, 67076**

Monitoring Well	Sample Date <sup>(a)</sup>	TPHg <sup>(b)</sup> (µg/l)	Benzene <sup>(b)</sup> (µg/l)	Toluene <sup>(b)</sup> (µg/l)	Ethylbenzene <sup>(b)</sup> (µg/l)	Xylenes <sup>(b)</sup> (µg/l)	MTBE <sup>(b)</sup> (µg/l)	DIPE <sup>(b)</sup> (µg/l)	ETBE <sup>(b)</sup> (µg/l)	TAME <sup>(b)</sup> (µg/l)	TBA <sup>(b)</sup> (µg/l)	Methanol <sup>(b)</sup> (µg/l)	Ethanol <sup>(b)</sup> (µg/l)	1,2-DCA <sup>(b)</sup> (µg/l)	EDB <sup>(b)</sup> (µg/l)	
MW-5 (cont.)	5/16/06	140	ND<0.5	ND<0.5	ND<0.5	ND<0.5	0.79	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5	
	8/9/06	220	ND<0.5	ND<0.5	ND<0.5	ND<0.5	7.8	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5	
	11/8/06	120	ND<0.5	ND<0.5	ND<0.5	ND<0.5	2.4	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5	
	2/14/07	200	ND<0.5	ND<0.5	ND<0.5	1.1	2.1	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5	
	5/17/07	140	ND<0.5	ND<0.5	ND<0.5	ND<0.5	1.4	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	--	--	
	8/2/07	85	ND<0.5	ND<0.5	ND<0.5	ND<0.5	1.9	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5	
	11/12/07	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	2/14/08	980	ND<0.5	ND<0.5	2.1	ND<0.5	1.0	ND<0.5	ND<0.5	ND<0.5	34	ND<50	ND<5	ND<0.5	ND<0.5	
	5/8/08	580	ND<0.5	ND<0.5	1.8	ND<0.5	0.60	ND<0.5	ND<0.5	ND<0.5	6.1	ND<50	ND<5	ND<0.5	ND<0.5	
	7/23/08	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	10/13/08	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	2/11/09	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	4/27/09	250	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5	
	8/4/09	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	12/9/09	140	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5	
	2/11/10	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	5/6/10	220	ND<0.5	ND<0.5	2.2	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5	
	8/3/10	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	11/3/10	100	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5	
	2/2/11	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
4/25/11	190	ND<0.5	ND<0.5	0.80	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5		
8/4/11	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	
10/10/11	160	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5		
1/31/12	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	
5/8/12	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5		
MW-6	3/30/94	63,000	21,000	8,600	1,700	12,000	--	--	--	--	--	--	--	--	--	
	4/25/94	77,000	22,000	12,000	2,300	16,000	--	--	--	--	--	--	--	--	--	
	8/12/94	65,000	12,000	8,100	2,200	16,000	--	--	--	--	--	--	--	--	--	
	12/14/94	65,000	18,000	9,500	2,200	14,000	--	--	--	--	--	--	--	--	--	

**TABLE E-1**  
**HISTORICAL GROUNDWATER ANALYTICAL RESULTS**  
**TESORO - LIVERMORE, 67076**

Monitoring Well	Sample Date <sup>(a)</sup>	TPHg <sup>(b)</sup> (µg/l)	Benzene <sup>(b)</sup> (µg/l)	Toluene <sup>(b)</sup> (µg/l)	Ethylbenzene <sup>(b)</sup> (µg/l)	Xylenes <sup>(b)</sup> (µg/l)	MTBE <sup>(b)</sup> (µg/l)	DIPE <sup>(b)</sup> (µg/l)	ETBE <sup>(b)</sup> (µg/l)	TAME <sup>(b)</sup> (µg/l)	TBA <sup>(b)</sup> (µg/l)	Methanol <sup>(b)</sup> (µg/l)	Ethanol <sup>(b)</sup> (µg/l)	1,2-DCA <sup>(b)</sup> (µg/l)	EDB <sup>(b)</sup> (µg/l)
MW-6 (cont.)	2/10/95	63,000	21,000	8,400	2,000	14,000	--	--	--	--	--	--	--	--	--
	6/15/95	75,000	20,000	11,000	2,100	15,000	--	--	--	--	--	--	--	--	--
	9/26/95	62,000	15,000	9,600	1,700	12,000	--	--	--	--	--	--	--	--	--
	12/15/95	61,000	15,000	9,000	2,300	15,000	--	--	--	--	--	--	--	--	--
	3/21/96	65,000	18,000	9,800	2,400	16,000	--	--	--	--	--	--	--	--	--
	6/13/96	29,000	8,600	3,300	2,200	12,000	ND<250	--	--	--	--	--	--	--	--
	9/16/96	42,000	6,400	1,800	2,100	11,000	ND<250	--	--	--	--	--	--	--	--
	12/2/96	28,000	3,000	1,100	970	8,300	ND<500	--	--	--	--	--	--	--	--
	3/7/97	12,000	2,000	190	520	2,300	ND<250	--	--	--	--	--	--	--	--
	6/12/97	37,000	3,900	470	1,600	6,200	ND<100	--	--	--	--	--	--	--	--
	9/29/97	34,000	3,500	370	1,600	5,200	ND<100	--	--	--	--	--	--	--	--
	12/1/97	20,000	2,100	ND<10	1,200	2,200	ND<100	--	--	--	--	--	--	--	--
	3/19/98	24,000	2,900	460	1,100	3,400	ND<100	--	--	--	--	--	--	--	--
	5/29/98	38,000	3,500	700	1,800	5,200	ND<100	--	--	--	--	--	--	--	--
	9/15/98	22,000	1,900	110	1,400	3,000	ND<100	--	--	--	--	--	--	--	--
	11/30/98	9,900	770	16	820	710	ND<100	--	--	--	--	--	--	--	--
	1/17/99	14,000	2,200	160	1,700	3,600	ND<100	--	--	--	--	--	--	--	--
	6/10/99	22,000	1,600	160	1,400	2,900	5.5	--	--	--	--	--	--	--	--
	9/7/99	17,000	1,400	33	1,300	1,800	ND<50	--	--	--	--	--	--	--	--
	12/13/99	16,000	790	9.2	840	780	ND<25	--	--	--	--	--	--	--	--
	3/13/00	16,000	790	85	780	1,600	ND<25	--	--	--	--	--	--	--	--
	6/12/00	24,000	1,100	150	1,300	2,300	5,600	--	--	--	--	--	--	--	--
	11/10/00	13,000	440	7.0	760	350	1,000	--	--	--	--	--	--	--	--
	12/31/00	12,000	680	8.0	820	190	1,400	--	--	--	--	--	--	--	--
3/27/01	14,000	330	17	940	670	380	--	--	--	--	--	--	--	--	
6/30/01	750	45	0.93	47	14	54	--	--	--	--	--	--	--	--	
9/26/01	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	



**TABLE E-1**  
**HISTORICAL GROUNDWATER ANALYTICAL RESULTS**  
**TESORO - LIVERMORE, 67076**

Monitoring Well	Sample Date <sup>(a)</sup>	TPHg <sup>(b)</sup> (µg/l)	Benzene <sup>(b)</sup> (µg/l)	Toluene <sup>(b)</sup> (µg/l)	Ethylbenzene <sup>(b)</sup> (µg/l)	Xylenes <sup>(b)</sup> (µg/l)	MTBE <sup>(b)</sup> (µg/l)	DIPE <sup>(b)</sup> (µg/l)	ETBE <sup>(b)</sup> (µg/l)	TAME <sup>(b)</sup> (µg/l)	TBA <sup>(b)</sup> (µg/l)	Methanol <sup>(b)</sup> (µg/l)	Ethanol <sup>(b)</sup> (µg/l)	1,2-DCA <sup>(b)</sup> (µg/l)	EDB <sup>(b)</sup> (µg/l)
MW-6 (cont.)	12/18/01	43,000	3,800	350	1,900	3,000	900	--	--	--	--	--	--	--	--
	1/22/02	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	3/18/02	33,000	2,600	120	1,800	2,800	740	--	--	--	--	--	--	--	--
	6/5/02	10,000	1,100	16	700	180	600	--	--	--	--	--	--	--	--
	8/21/02	10,000	1,200	23	710	290	370	--	--	--	--	--	--	--	--
	12/3/02	16,000	1,700	63	970	630	1,500	--	--	--	--	--	--	--	--
	3/4/03	16,000	1,700	25	1,200	40	7,700	ND<20	ND<20	ND<70	ND<200	ND<2,000	ND<200	ND<200	ND<20
	6/10/03	9,500	860	15	380	47	2,600	ND<5	ND<5	18	ND<50	ND<500	ND<50	ND<50	ND<5
	9/9/03	11,000	1,000	16	630	120	2,500	ND<5	ND<5	20	52	ND<500	ND<50	ND<50	ND<5
	12/23/03	18,000	2,100	41	1,100	390	4,900	ND<10	ND<10	42	ND<100	ND<1,000	ND<100	ND<100	ND<10
	3/23/04	24,000	1,400	71	1,500	2,000	7,500	ND<20	ND<20	66	ND<200	ND<2,000	ND<200	ND<200	ND<20
	5/10/04	6,500	550	ND<10	71	43	3,700	ND<10	ND<10	31	ND<100	ND<1,000	ND<100	ND<100	ND<10
	8/4/04	8,200	990	19	300	120	3,300	ND<5	ND<5	23	ND<50	ND<500	ND<50	ND<50	ND<5
	11/4/04	9,600	1,100	30	320	160	2,200	ND<4	ND<4	18	22	ND<400	ND<40	ND<40	ND<4
	1/12/05	12,000	1,100	34	600	500	3,600	ND<4	ND<4	31	30	ND<400	ND<40	ND<40	ND<4
	5/2/05	14,000	630	22	610	920	4,000	ND<10	ND<10	32	120	ND<3,000	ND<100	ND<100	ND<10
	7/20/05	9,800	1,200	21	340	150	1,800	ND<2.5	ND<2.5	14	140	ND<500	ND<25	ND<25	ND<2.5
	11/21/05	6,600	150	26	580	640	100	ND<1	ND<1	ND<1	13	ND<100	ND<10	ND<10	ND<1
	2/9/06	7,100	340	11	370	360	910	ND<2	ND<2	9.3	120	ND<200	ND<20	ND<20	ND<2
	5/17/06	7,100	270	5.1	320	290	930	ND<2	ND<2	8.4	260	ND<200	ND<20	ND<20	ND<2
	8/9/06	5,800	440	7.5	120	45	670	ND<2	ND<2	7.3	380	ND<2,000	ND<50	ND<50	ND<2
	11/8/06	9,200	990	37	390	140	310	ND<2	ND<2	3.2	110	ND<200	ND<20	ND<20	ND<2
	2/14/07	5,900	480	10	73	23	1,600	ND<2	ND<2	14	1,100	ND<500	ND<20	ND<20	ND<2
5/17/07	3,700	240	3.4	30	10	770	ND<0.5	ND<0.5	9.2	800	ND<2,000	ND<5	--	--	
8/2/07	15,000	1,800	120	980	510	310	ND<2.5	ND<2.5	3.0	180	ND<250	ND<25	ND<25	ND<2.5	
11/12/07	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	
2/14/08	14,000	2,000	63	750	190	810	ND<2.5	ND<2.5	7.7	600	ND<250	ND<25	ND<25	ND<2.5	

**TABLE E-1**  
**HISTORICAL GROUNDWATER ANALYTICAL RESULTS**  
**TESORO - LIVERMORE, 67076**

Monitoring Well	Sample Date <sup>(a)</sup>	TPHg <sup>(b)</sup> (µg/l)	Benzene <sup>(b)</sup> (µg/l)	Toluene <sup>(b)</sup> (µg/l)	Ethylbenzene <sup>(b)</sup> (µg/l)	Xylenes <sup>(b)</sup> (µg/l)	MTBE <sup>(b)</sup> (µg/l)	DIPE <sup>(b)</sup> (µg/l)	ETBE <sup>(b)</sup> (µg/l)	TAME <sup>(b)</sup> (µg/l)	TBA <sup>(b)</sup> (µg/l)	Methanol <sup>(b)</sup> (µg/l)	Ethanol <sup>(b)</sup> (µg/l)	1,2-DCA <sup>(b)</sup> (µg/l)	EDB <sup>(b)</sup> (µg/l)
MW-6 (cont.)	5/8/08	15,000	1,700	59	700	130	540	ND<2.5	ND<2.5	5.9	410	ND<2,000	ND<25	ND<2.5	ND<2.5
	7/23/08	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	10/13/08	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	2/11/09	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	4/28/09	16,000	2,200	160	860	230	320	ND<2.5	ND<2.5	3.8	580	ND<1,000	ND<25	ND<2.5	ND<2.5
	8/4/09	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	12/9/09	15,000	2,100	96	800	160	340	ND<5	ND<5	ND<5	460	ND<2,000	ND<50	ND<5	ND<5
	2/12/10	21,000	2,500	140	1,000	240	540	ND<5	ND<5	6.0	460	ND<500	ND<50	ND<5	ND<5
	5/4/10	17,000	2,100	120	780	260	820	ND<5	ND<5	8.6	450	ND<500	ND<50	ND<5	ND<5
	8/3/10	21,000	2,700	120	690	250	730	ND<5	ND<5	7.4	480	ND<500	ND<50	ND<5	ND<5
	11/2/10	12,000	1,600	57	410	120	240	ND<2.5	ND<2.5	2.7	160	ND<250	ND<25	ND<2.5	ND<2.5
	2/2/11	15,000	1,600	89	460	150	350	ND<2.5	ND<2.5	3.7	310	ND<250	ND<25	ND<2.5	ND<2.5
	4/27/11	8,500	870	28	180	67	1,200	ND<2.5	ND<2.5	10	1,100	ND<250	ND<25	ND<2.5	ND<2.5
	8/4/11	6,300	600	17	58	16	650	ND<1.5	ND<1.5	7.8	1,000	ND<600	ND<15	ND<1.5	ND<1.5
	10/11/11	10,000	1,000	60	160	66	370	ND<2.5	ND<2.5	3.1	860	ND<250	ND<25	ND<2.5	ND<2.5
1/31/12	5,200	370	6.7	5.1	12	84	ND<0.9	ND<0.9	ND<0.9	1,500	ND<90	ND<10	ND<0.9	ND<0.9	
5/10/12	11,000	1,200	60	140	69	150	ND<0.9	ND<0.9	ND<2	290	ND<250	ND<9	ND<0.9	ND<0.9	
MW-7	3/30/94	43,000	7,200	2,400	1,600	11,000	--	--	--	--	--	--	--	--	--
	4/25/94	30,000	3,900	1,000	940	6,900	--	--	--	--	--	--	--	--	--
	8/12/94	30,000	3,800	1,400	1,300	7,500	--	--	--	--	--	--	--	--	--
	12/14/94	31,000	3,600	1,200	900	6,400	--	--	--	--	--	--	--	--	--
	2/10/95	27,000	4,000	900	890	5,100	--	--	--	--	--	--	--	--	--
	6/15/95	17,000	920	680	740	4,100	--	--	--	--	--	--	--	--	--
	9/26/95	7,000	200	150	170	810	--	--	--	--	--	--	--	--	--
	12/15/95	11,000	350	170	540	1,900	--	--	--	--	--	--	--	--	--
	3/21/96	12,000	320	100	730	2,500	--	--	--	--	--	--	--	--	--
	6/13/96	5,900	98	19	370	620	ND<50	--	--	--	--	--	--	--	--
	9/16/96	7,800	140	43	440	590	ND<25	--	--	--	--	--	--	--	--
12/2/96	6,300	87	29	290	430	ND<50	--	--	--	--	--	--	--	--	

**TABLE E-1**  
**HISTORICAL GROUNDWATER ANALYTICAL RESULTS**  
**TESORO - LIVERMORE, 67076**

Monitoring Well	Sample Date <sup>(a)</sup>	TPHg <sup>(b)</sup> (µg/l)	Benzene <sup>(b)</sup> (µg/l)	Toluene <sup>(b)</sup> (µg/l)	Ethylbenzene <sup>(b)</sup> (µg/l)	Xylenes <sup>(b)</sup> (µg/l)	MTBE <sup>(b)</sup> (µg/l)	DIPE <sup>(b)</sup> (µg/l)	ETBE <sup>(b)</sup> (µg/l)	TAME <sup>(b)</sup> (µg/l)	TBA <sup>(b)</sup> (µg/l)	Methanol <sup>(b)</sup> (µg/l)	Ethanol <sup>(b)</sup> (µg/l)	1,2-DCA <sup>(b)</sup> (µg/l)	EDB <sup>(b)</sup> (µg/l)
MW-7 (cont.)	3/7/97	4,500	35	19	360	470	ND<25	--	--	--	--	--	--	--	--
	6/12/97	3,900	29	5.2	170	48	ND<5	--	--	--	--	--	--	--	--
	9/29/97	6,100	56	9.0	340	190	ND<25	--	--	--	--	--	--	--	--
	12/1/97	6,500	24	ND<2.5	400	250	ND<25	--	--	--	--	--	--	--	--
	3/19/98	2,000	20	ND<2.5	73	79	ND<25	--	--	--	--	--	--	--	--
	5/29/98	5,700	22	7.3	290	350	ND<25	--	--	--	--	--	--	--	--
	9/15/98	1,700	15	ND<2.5	44	5.1	ND<25	--	--	--	--	--	--	--	--
	11/30/98	4,800	42	12	270	640	ND<25	--	--	--	--	--	--	--	--
	1/17/99	3,400	33	ND<5	200	190	ND<50	--	--	--	--	--	--	--	--
	6/10/99	1,700	7.8	1.5	23	4.1	ND<5	--	--	--	--	--	--	--	--
	9/7/99	1,900	9.7	2.1	70	2.9	ND<5	--	--	--	--	--	--	--	--
	12/13/99	1,900	8.0	1.1	10	1.1	ND<5	--	--	--	--	--	--	--	--
	3/13/00	1,500	7.5	ND<0.5	6.7	2.9	ND<5	--	--	--	--	--	--	--	--
	6/12/00	1,200	5.4	ND<0.5	5.2	1.0	ND<5	--	--	--	--	--	--	--	--
	11/10/00	1,000	3.9	ND<0.5	ND<0.5	ND<0.5	ND<0.5	--	--	--	--	--	--	--	--
	12/31/00	620	1.8	ND<0.5	ND<0.5	ND<0.5	ND<0.5	--	--	--	--	--	--	--	--
	3/27/01	1,200	4.8	ND<0.5	6.7	0.94	ND<0.5	--	--	--	--	--	--	--	--
	6/30/01	2,800	10	1.7	75	170	ND<0.5	--	--	--	--	--	--	--	--
	9/26/01	1,900	16	0.89	2.3	25	ND<0.5	--	--	--	--	--	--	--	--
	12/18/01	3,000	13	0.88	3.4	3.4	ND<0.5	--	--	--	--	--	--	--	--
	1/22/02	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	3/18/02	3,100	7.3	1.5	38	110	ND<0.5	--	--	--	--	--	--	--	--
	6/5/02	1,800	7.6	1.0	39	20	ND<0.5	--	--	--	--	--	--	--	--
8/21/02	3,300	7.6	0.70	85	36	ND<0.5	--	--	--	--	--	--	--	--	
12/3/02	1,700	5.4	ND<0.5	15	5.5	ND<0.5	--	--	--	--	--	--	--	--	
3/4/03	440	1.8	ND<0.5	0.54	2.9	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5	
6/10/03	550	0.80	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5	

**TABLE E-1**  
**HISTORICAL GROUNDWATER ANALYTICAL RESULTS**  
**TESORO - LIVERMORE, 67076**

Monitoring Well	Sample Date <sup>(a)</sup>	TPHg <sup>(b)</sup> (µg/l)	Benzene <sup>(b)</sup> (µg/l)	Toluene <sup>(b)</sup> (µg/l)	Ethylbenzene <sup>(b)</sup> (µg/l)	Xylenes <sup>(b)</sup> (µg/l)	MTBE <sup>(b)</sup> (µg/l)	DIPE <sup>(b)</sup> (µg/l)	ETBE <sup>(b)</sup> (µg/l)	TAME <sup>(b)</sup> (µg/l)	TBA <sup>(b)</sup> (µg/l)	Methanol <sup>(b)</sup> (µg/l)	Ethanol <sup>(b)</sup> (µg/l)	1,2-DCA <sup>(b)</sup> (µg/l)	EDB <sup>(b)</sup> (µg/l)	
MW-7 (cont.)	9/9/03	120	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5	
	12/23/03	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5	
	3/23/04	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5	
	5/10/04	67	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5	
	8/4/04	2,600	2.5	ND<0.5	36	31	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5	
	11/4/04	1,600	2.0	ND<0.5	16	16	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5	
	1/12/05	830	1.6	ND<0.5	15	12	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5	
	5/2/05	710	ND<0.5	ND<0.5	0.75	0.52	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5	
	7/20/05	1,400	1.1	ND<0.5	9.2	8.6	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5	
	11/21/05	1,100	0.56	ND<0.5	3.4	23	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5	
	2/9/06	270	ND<0.5	ND<0.5	1.2	0.98	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5	
	5/16/06	930	0.84	ND<0.5	10	7.9	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5	
	8/9/06	650	ND<0.5	ND<0.5	1.2	1.0	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5	
	11/8/06	800	ND<0.5	ND<0.5	1.0	0.62	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5	
	2/14/07	800	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5	
	5/17/07	700	ND<0.5	ND<0.5	ND<0.5	0.71	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	--	--	
	8/2/07	3,200	1.3	ND<0.5	50	120	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5	
	11/12/07	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	2/14/08	1,600	1.2	ND<0.5	4.5	1.0	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5	
	5/8/08	1,400	2.2	0.74	2.8	0.93	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5	
	7/23/08	2,300	3.9	1.4	8.9	5.4	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5	
	10/13/08	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	2/11/09	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
4/28/09	4,500	7.4	3.8	33	7.3	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5		
8/4/09	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	
12/17/09	4,500	6.7	3.4	27	8.8	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<80	ND<8	ND<0.5	ND<0.5		
2/11/10	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	

**TABLE E-1**  
**HISTORICAL GROUNDWATER ANALYTICAL RESULTS**  
**TESORO - LIVERMORE, 67076**

Monitoring Well	Sample Date <sup>(a)</sup>	TPHg <sup>(b)</sup> (µg/l)	Benzene <sup>(b)</sup> (µg/l)	Toluene <sup>(b)</sup> (µg/l)	Ethylbenzene <sup>(b)</sup> (µg/l)	Xylenes <sup>(b)</sup> (µg/l)	MTBE <sup>(b)</sup> (µg/l)	DIPE <sup>(b)</sup> (µg/l)	ETBE <sup>(b)</sup> (µg/l)	TAME <sup>(b)</sup> (µg/l)	TBA <sup>(b)</sup> (µg/l)	Methanol <sup>(b)</sup> (µg/l)	Ethanol <sup>(b)</sup> (µg/l)	1,2-DCA <sup>(b)</sup> (µg/l)	EDB <sup>(b)</sup> (µg/l)
MW-7 (cont.)	5/6/10	3,600	7.9	3.6	14	6.4	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<8	ND<0.5	ND<0.5
	8/3/10	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	11/3/10	2,100	4.6	1.3	16	3.3	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5
	2/2/11	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	4/26/11	1,200	3.3	0.59	1.6	1.3	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5
	8/4/11	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	10/10/11	1,900	3.5	1.2	0.79	1.6	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5
	1/31/12	1,700	1.5	0.55	6.0	1.1	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5
5/9/12	1,600	1.4	0.79	1.4	0.95	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5	
MW-8	9/5/03	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	--	--	--	--
	12/23/03	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	7.3	ND<0.5	ND<0.5
	3/23/04	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5
	5/10/04	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5
	8/4/04	ND<50	ND<0.5	ND<0.5	ND<0.5	0.86	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5
	11/4/04	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5
	1/12/05	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5
	5/2/05	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5
	7/19/05	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5
	11/21/05	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5
	2/9/06	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	0.57	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5
	5/16/06	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5
	8/9/06	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5
	11/8/06	ND<50	1.2	1.9	ND<0.5	0.66	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5
	2/14/07	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5
	5/17/07	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	--	--
	8/2/07	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5
	11/12/07	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
2/14/08	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5	
5/8/08	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5	

TABLE E-1

HISTORICAL GROUNDWATER ANALYTICAL RESULTS  
TESORO - LIVERMORE, 67076

Monitoring Well	Sample Date <sup>(a)</sup>	TPHg <sup>(b)</sup> (µg/l)	Benzene <sup>(b)</sup> (µg/l)	Toluene <sup>(b)</sup> (µg/l)	Ethylbenzene <sup>(b)</sup> (µg/l)	Xylenes <sup>(b)</sup> (µg/l)	MTBE <sup>(b)</sup> (µg/l)	DIPE <sup>(b)</sup> (µg/l)	ETBE <sup>(b)</sup> (µg/l)	TAME <sup>(b)</sup> (µg/l)	TBA <sup>(b)</sup> (µg/l)	Methanol <sup>(b)</sup> (µg/l)	Ethanol <sup>(b)</sup> (µg/l)	1,2-DCA <sup>(b)</sup> (µg/l)	EDB <sup>(b)</sup> (µg/l)	
MW-8 (cont.)	7/23/08	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	
	10/13/08	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	
	2/11/09	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	
	4/27/09	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	
	8/4/09	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	
	12/17/09	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5
	2/11/10	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	5/6/10	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5
	8/3/10	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	11/3/10	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5
	2/2/11	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	4/25/11	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5
	8/4/11	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	10/10/11	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5
1/31/12	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	
5/7/12	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5	
MW-9	9/5/03	3,400	23	1.5	110	10	10	ND<0.5	ND<0.5	ND<0.5	ND<5	--	--	--	--	
	12/23/03	1,100	2.4	ND<0.5	0.80	0.80	2.1	ND<0.5	ND<0.5	ND<0.5	5.9	ND<50	ND<5	ND<0.5	ND<0.5	
	3/23/04	760	8.5	ND<0.5	4.9	0.95	18	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5	
	5/10/04	1,100	4.4	ND<0.5	1.3	0.67	11	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5	
	8/4/04	1,200	3.4	0.59	16	7.6	6.1	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5	
	11/4/04	610	0.52	ND<0.5	1.3	ND<0.5	2.0	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5	
	1/12/05	1,400	1.6	0.55	5.5	1.1	2.4	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5	
	5/2/05	1,500	10	0.55	6.7	1.1	27	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5	
	7/20/05	1,800	5.5	0.69	12	1.6	10	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5	
	11/21/05	1,200	0.94	ND<0.5	1.4	ND<0.5	3.3	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5	
	2/9/06	1,200	2.8	0.51	6.4	0.84	4.4	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5	
5/16/06	1,600	3.8	0.57	12	1.8	4.9	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5		
8/9/06	760	ND<0.5	ND<0.5	1.0	ND<0.5	2.6	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5		

**TABLE E-1**  
**HISTORICAL GROUNDWATER ANALYTICAL RESULTS**  
**TESORO - LIVERMORE, 67076**

Monitoring Well	Sample Date <sup>(a)</sup>	TPHg <sup>(b)</sup> (µg/l)	Benzene <sup>(b)</sup> (µg/l)	Toluene <sup>(b)</sup> (µg/l)	Ethylbenzene <sup>(b)</sup> (µg/l)	Xylenes <sup>(b)</sup> (µg/l)	MTBE <sup>(b)</sup> (µg/l)	DIPE <sup>(b)</sup> (µg/l)	ETBE <sup>(b)</sup> (µg/l)	TAME <sup>(b)</sup> (µg/l)	TBA <sup>(b)</sup> (µg/l)	Methanol <sup>(b)</sup> (µg/l)	Ethanol <sup>(b)</sup> (µg/l)	1,2-DCA <sup>(b)</sup> (µg/l)	EDB <sup>(b)</sup> (µg/l)
MW-9 (cont.)	11/8/06	1,700	1.7	0.53	6.7	1.4	1.7	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5
	2/14/07	1,000	ND<0.5	ND<0.5	0.51	ND<0.5	0.51	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5
	5/17/07	870	ND<0.5	ND<0.5	0.54	ND<0.5	0.93	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	--	--
	8/2/07	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	11/12/07	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	2/14/08	3,300	68	2.1	110	7.8	16	ND<0.5	ND<0.5	ND<0.5	13	ND<50	ND<5	ND<0.5	ND<0.5
	5/8/08	1,200	8.2	0.52	4.0	0.74	5.9	ND<0.5	ND<0.5	ND<0.5	5.4	ND<50	ND<5	ND<0.5	ND<0.5
	7/23/08	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	10/13/08	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	2/11/09	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	4/27/09	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	8/4/09	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	12/9/09	1,200	ND<0.5	ND<0.5	ND<0.5	ND<0.5	1.4	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5
	2/11/10	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	5/4/10	2,700	120	7.0	35	14	44	ND<0.5	ND<0.5	0.52	31	ND<200	ND<5	ND<0.5	ND<0.5
	8/3/10	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	11/3/10	430	1.1	ND<0.5	ND<0.5	ND<0.5	4.4	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5
	2/2/11	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	4/26/11	1,300	14	ND<0.5	2.8	0.71	23	ND<0.5	ND<0.5	ND<0.5	26	ND<50	ND<5	ND<0.5	ND<0.5
8/4/11	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	
10/11/11	470	ND<0.5	ND<0.5	ND<0.5	ND<0.5	3.0	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5	
1/31/12	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	
5/8/12	2,500	12	1.1	9.0	3.0	7.4	ND<0.5	ND<0.5	ND<0.5	8.8	ND<50	ND<5	ND<0.5	ND<0.5	
MW-10	9/5/03	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	--	--	--	--
	12/23/03	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5
	3/23/04	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5
	5/10/04	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5
	8/4/04	ND<50	ND<0.5	ND<0.5	ND<0.5	0.61	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5
	11/4/04	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5

**TABLE E-1**  
**HISTORICAL GROUNDWATER ANALYTICAL RESULTS**  
**TESORO - LIVERMORE, 67076**

Monitoring Well	Sample Date <sup>(a)</sup>	TPHg <sup>(b)</sup> (µg/l)	Benzene <sup>(b)</sup> (µg/l)	Toluene <sup>(b)</sup> (µg/l)	Ethylbenzene <sup>(b)</sup> (µg/l)	Xylenes <sup>(b)</sup> (µg/l)	MTBE <sup>(b)</sup> (µg/l)	DIPE <sup>(b)</sup> (µg/l)	ETBE <sup>(b)</sup> (µg/l)	TAME <sup>(b)</sup> (µg/l)	TBA <sup>(b)</sup> (µg/l)	Methanol <sup>(b)</sup> (µg/l)	Ethanol <sup>(b)</sup> (µg/l)	1,2-DCA <sup>(b)</sup> (µg/l)	EDB <sup>(b)</sup> (µg/l)
MW-10 (cont.)	1/12/05	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5
	5/2/05	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5
	7/19/05	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5
	11/21/05	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5
	2/9/06	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5
	5/16/06	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5
	8/9/06	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5
	11/8/06	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5
	2/14/07	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5
	5/17/07	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	--	--
	8/2/07	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5
	11/12/07	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	2/14/08	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5
	5/8/08	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5
	7/23/08	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	10/13/08	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	2/11/09	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	4/27/09	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	8/4/09	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	12/9/09	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5
2/11/10	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	
5/6/10	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5	
8/3/10	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	
11/2/10	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5	
2/2/11	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	
4/25/11	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5	



TABLE E-1

HISTORICAL GROUNDWATER ANALYTICAL RESULTS  
TESORO - LIVERMORE, 67076

Monitoring Well	Sample Date <sup>(a)</sup>	TPHg <sup>(b)</sup> (µg/l)	Benzene <sup>(b)</sup> (µg/l)	Toluene <sup>(b)</sup> (µg/l)	Ethylbenzene <sup>(b)</sup> (µg/l)	Xylenes <sup>(b)</sup> (µg/l)	MTBE <sup>(b)</sup> (µg/l)	DIPE <sup>(b)</sup> (µg/l)	ETBE <sup>(b)</sup> (µg/l)	TAME <sup>(b)</sup> (µg/l)	TBA <sup>(b)</sup> (µg/l)	Methanol <sup>(b)</sup> (µg/l)	Ethanol <sup>(b)</sup> (µg/l)	1,2-DCA <sup>(b)</sup> (µg/l)	EDB <sup>(b)</sup> (µg/l)
MW-10 (cont.)	8/4/11	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	10/10/11	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5
	1/31/12	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	5/7/12	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5
MW-11	12/16/08	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	2/11/09	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	4/27/09	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	8/4/09	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	12/8/09	100,000	6,100	9,000	3,100	20,000	3.3	ND<0.5	ND<0.5	ND<0.5	25	ND<200	ND<20	ND<0.5	ND<0.5
	2/11/10	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	5/3/10	62,000	3,600	5,900	2,600	12,000	ND<15	ND<15	ND<15	ND<15	ND<70	ND<1,500	ND<150	ND<15	ND<15
	8/3/10	53,000	2,800	3,800	2,100	10,000	ND<15	ND<15	ND<15	ND<15	ND<70	ND<1,500	ND<150	ND<15	ND<15
	11/4/10	59,000	2,100	5,400	1,400	12,000	ND<15	ND<15	ND<15	ND<15	ND<70	ND<1,500	ND<150	ND<15	ND<15
	2/2/11	20,000	210	610	560	3,600	ND<5	ND<5	ND<5	ND<5	38	ND<500	ND<50	ND<5	ND<5
	4/28/11	20,000	300	920	450	4,300	ND<5	ND<5	ND<5	ND<5	ND<25	ND<500	ND<50	ND<5	ND<5
	8/4/11	15,000	96	370	240	2,800	ND<4	ND<4	ND<4	ND<4	ND<20	ND<400	ND<40	ND<4	ND<4
	10/25/11	18,000	130	500	319	2,900	ND<0.5	ND<0.5	ND<0.5	ND<0.5	18	ND<50	ND<10	ND<0.5	ND<0.5
2/1/12	13,000	380	710	83	2,400	ND<2.5	ND<2.5	ND<2.5	ND<2.5	ND<15	ND<250	ND<50	ND<2.5	ND<2.5	
5/11/12	1,100	3.8	15	6.7	150	0.52	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<8	ND<0.5	ND<0.5	
MW-12	6/14/12	6,900	8.5	2.2	96	22	ND<0.9	ND<0.9	ND<0.9	ND<0.9	ND<5	ND<90	ND<9	ND<0.9	ND<0.9
VW-2	8/4/04	5,700	480	ND<20	600	ND<20	12,000	ND<20	ND<20	110	ND<90	ND<2,000	ND<200	ND<20	ND<20
	11/4/04	5,800	340	ND<20	38	ND<20	10,000	ND<20	ND<20	120	ND<90	ND<2,000	ND<200	ND<20	ND<20
	1/12/05	3,800	210	ND<5	90	54	2,900	ND<5	ND<5	33	26 <sup>(f)</sup>	ND<500	ND<50	ND<5	ND<5
	5/2/05	2,600	84	ND<2	13	7.0	960	ND<2	ND<2	12	57	ND<500	ND<20	ND<2	ND<2
	7/20/05	6,200	240	13	290	480	6,600	ND<2	ND<2	56	59 <sup>(f)</sup>	ND<2,000	ND<20	ND<2	ND<2
	11/21/05	3,100	100	ND<9	22	10	5,300	ND<9	ND<9	54	76 <sup>(f)</sup>	ND<900	ND<90	ND<9	ND<9
	2/9/06	3,500	140	ND<25	130	36	12,000	ND<25	ND<25	65	2,800	ND<2,500	ND<250	ND<25	ND<25
	5/17/06	1,800	90	2.6	39	11	1,200	ND<2.5	ND<2.5	12	700	ND<250	ND<25	ND<2.5	ND<2.5
	8/9/06	4,300	86	3.5	200	16	2,500	ND<2.5	ND<2.5	28	2,800	ND<5,000	ND<25	ND<2.5	ND<2.5
	11/8/06	3,200	46	3.1	10	4.8	1,500	ND<3	ND<3	11	7,100	ND<800	ND<30	ND<3	ND<3
2/14/07	3,300	75	4.6	50	82	580	ND<2	ND<2	7.0	4,100	ND<500	ND<20	ND<2	ND<2	

**TABLE E-1**  
**HISTORICAL GROUNDWATER ANALYTICAL RESULTS**  
**TESORO - LIVERMORE, 67076**

Monitoring Well	Sample Date <sup>(a)</sup>	TPHg <sup>(b)</sup> (µg/l)	Benzene <sup>(b)</sup> (µg/l)	Toluene <sup>(b)</sup> (µg/l)	Ethylbenzene <sup>(b)</sup> (µg/l)	Xylenes <sup>(b)</sup> (µg/l)	MTBE <sup>(b)</sup> (µg/l)	DIPE <sup>(b)</sup> (µg/l)	ETBE <sup>(b)</sup> (µg/l)	TAME <sup>(b)</sup> (µg/l)	TBA <sup>(b)</sup> (µg/l)	Methanol <sup>(b)</sup> (µg/l)	Ethanol <sup>(b)</sup> (µg/l)	1,2-DCA <sup>(b)</sup> (µg/l)	EDB <sup>(b)</sup> (µg/l)	
VW-2 (cont.)	5/17/07	3,500	51	7.3	17	24	100	ND<2.5	ND<2.5	ND<2.5	7,100	ND<250	ND<25	--	--	
	8/2/07	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	
	11/12/07	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	
	2/14/08	5,700	180	14	150	120	530	ND<2.5	ND<2.5	4.1	5,000	ND<250	ND<25	ND<2.5	ND<2.5	
	5/8/08	3,000	40	3.8	32	34	270	ND<1.5	ND<1.5	2.7	4,500	ND<250	ND<15	ND<1.5	ND<1.5	
	7/23/08	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	10/13/08	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	2/11/09	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	4/27/09	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	8/4/09	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	12/9/09	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	2/11/10	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	5/5/10	2,800	130	6.1	170	130	1,300	ND<2.5	ND<2.5	12	1,700	ND<250	ND<25	ND<2.5	ND<2.5	
	8/3/10	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	11/4/10	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	2/2/11	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	4/28/11	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5
	8/4/11	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
10/10/11	ND<50	ND<0.5	ND<0.5	ND<0.5	0.51	0.79	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5	
1/31/12	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	
5/7/12	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	0.83	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5	
VW-3	8/4/04	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5	
	11/4/04	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5	
	1/12/05	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5	
	5/2/05	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5	
	7/20/05	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5	
	11/21/05	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5	
	2/9/06	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5	
5/16/06	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5		

**TABLE E-1**  
**HISTORICAL GROUNDWATER ANALYTICAL RESULTS**  
**TESORO - LIVERMORE, 67076**

Monitoring Well	Sample Date <sup>(a)</sup>	TPHg <sup>(b)</sup> (µg/l)	Benzene <sup>(b)</sup> (µg/l)	Toluene <sup>(b)</sup> (µg/l)	Ethylbenzene <sup>(b)</sup> (µg/l)	Xylenes <sup>(b)</sup> (µg/l)	MTBE <sup>(b)</sup> (µg/l)	DIPE <sup>(b)</sup> (µg/l)	ETBE <sup>(b)</sup> (µg/l)	TAME <sup>(b)</sup> (µg/l)	TBA <sup>(b)</sup> (µg/l)	Methanol <sup>(b)</sup> (µg/l)	Ethanol <sup>(b)</sup> (µg/l)	1,2-DCA <sup>(b)</sup> (µg/l)	EDB <sup>(b)</sup> (µg/l)	
VW-3 (cont.)	8/9/06	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5	
	11/8/06	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5	1,100	
	2/14/07	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5	
	5/17/07	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	--	--	
	8/2/07	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5	
	11/12/07	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	2/14/08	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	5/8/08	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5	
	7/23/08	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	10/13/08	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	2/11/09	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	4/27/09	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	8/4/09	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	12/9/09	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	2/11/10	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	5/6/10	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5	
	8/3/10	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	11/4/10	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	2/2/11	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	4/25/11	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5	
8/4/11	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	
10/10/11	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5		
1/31/12	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	
5/7/12	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	
TP-1	7/20/05	42,000	2,800	1,100	1,700	4,800	12,000	ND<20	ND<20	92	130	ND<2,000	ND<200	ND<20	ND<20	
	11/22/05	36,000	2,100	290	1,400	2,600	11,000	ND<20	ND<20	70	810	ND<2,000	ND<200	ND<20	ND<20	
	2/9/06	19,000	1,400	230	990	1,700	8,900	ND<15	ND<15	72	2,200	ND<1,500	ND<150	ND<15	ND<15	
	5/17/06	20,000	1,400	200	920	1,800	9,200	ND<20	ND<20	37	2,500	ND<10,000	ND<200	ND<20	ND<20	
	8/9/06	28,000	1,600	150	1,200	2,200	13,000	ND<15	ND<15	84	4,900	ND<2,500	ND<150	ND<15	ND<15	

**TABLE E-1**  
**HISTORICAL GROUNDWATER ANALYTICAL RESULTS**  
**TESORO - LIVERMORE, 67076**

Monitoring Well	Sample Date <sup>(a)</sup>	TPHg <sup>(b)</sup> (µg/l)	Benzene <sup>(b)</sup> (µg/l)	Toluene <sup>(b)</sup> (µg/l)	Ethylbenzene <sup>(b)</sup> (µg/l)	Xylenes <sup>(b)</sup> (µg/l)	MTBE <sup>(b)</sup> (µg/l)	DIPE <sup>(b)</sup> (µg/l)	ETBE <sup>(b)</sup> (µg/l)	TAME <sup>(b)</sup> (µg/l)	TBA <sup>(b)</sup> (µg/l)	Methanol <sup>(b)</sup> (µg/l)	Ethanol <sup>(b)</sup> (µg/l)	1,2-DCA <sup>(b)</sup> (µg/l)	EDB <sup>(b)</sup> (µg/l)
TP-1 (cont.)	11/8/06	20,000	1,100	78	990	1,600	6,800	ND<15	ND<15	47	4,400	ND<8,000	ND<150	ND<15	ND<15
	2/14/07	15,000	820	37	810	1,000	8,300	ND<15	ND<15	58	8,500	ND<4,000	ND<150	ND<15	ND<15
	5/17/07	16,000	850	35	810	1,200	6,700	ND<10	ND<10	42	12,000	ND<2,000	ND<100	--	--
	8/2/07	15,000	2,000	100	970	630	3,400	ND<7	ND<7	25	4,000	ND<700	ND<70	ND<7	ND<7
	11/12/07	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	2/14/08	18,000	1,100	49	1,200	910	7,000	ND<15	ND<15	58	4,200	ND<1,500	ND<150	ND<15	ND<15
	5/8/08	12,000	890	54	770	380	2,500	ND<5	ND<5	22	3,400	ND<2,500	ND<50	ND<5	ND<5
	7/23/08	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	10/13/08	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	2/11/09	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	4/27/09	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	8/4/09	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	12/17/09	10,000	690	19	700	45	1,000	ND<2.5	ND<2.5	8.8	2,900	ND<250	ND<25	ND<2.5	ND<2.5
	2/11/10	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	5/5/10	15,000	2,100	360	1,100	620	3,400	ND<8	ND<8	27	4,500	ND<800	ND<80	ND<8	ND<8
	8/3/10	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	11/3/10	14,000	1,000	270	280	1,600	4,500	ND<8	ND<8	28	4,800	ND<800	ND<80	ND<8	ND<8
	2/2/11	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	4/28/11	6,600	350	64	170	730	2,600	ND<5	ND<5	15	1,400	ND<500	ND<50	ND<5	ND<5
8/4/11	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	
10/11/11	2,000	32	4.3	49	220	1,500	ND<3	ND<3	9.7	1,000	ND<800	ND<30	ND<3	ND<3	
1/31/12	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	
5/8/12	590	1.6	ND<0.5	7.1	22	28	ND<0.5	ND<0.5	ND<0.5	27	ND<80	ND<5	ND<0.5	ND<0.5	
TP-2	7/20/05	26,000	1,800	1,100	1,100	2,500	63,000	ND<150	ND<150	400	ND<700	ND<15,000	ND<1,500	ND<150	ND<150
	11/22/05	16,000	1,200	140	840	820	52,000	ND<90	ND<90	340	1,200	ND<9,000	ND<900	ND<90	ND<90
	2/9/06	2,700	94	2.9	28	14	1,200	ND<2.5	ND<2.5	13	1,600	ND<250	ND<25	ND<2.5	ND<2.5
	5/17/06	31,000	2,200	1,100	1,500	3,300	87,000	ND<90	ND<90	680	4,800	ND<15,000	ND<1,500	ND<90	ND<90
	8/9/06	14,000	1,400	86	1,200	830	56,000	ND<2.5	ND<2.5	350	2,800	ND<4,000	ND<25	ND<2.5	ND<2.5
	11/8/06	16,000	1,300	ND<90	930	370	38,000	ND<90	ND<90	280	3,600	ND<40,000	ND<900	ND<90	ND<90

**TABLE E-1**  
**HISTORICAL GROUNDWATER ANALYTICAL RESULTS**  
**TESORO - LIVERMORE, 67076**

Monitoring Well	Sample Date <sup>(a)</sup>	TPHg <sup>(b)</sup> (µg/l)	Benzene <sup>(b)</sup> (µg/l)	Toluene <sup>(b)</sup> (µg/l)	Ethylbenzene <sup>(b)</sup> (µg/l)	Xylenes <sup>(b)</sup> (µg/l)	MTBE <sup>(b)</sup> (µg/l)	DIPE <sup>(b)</sup> (µg/l)	ETBE <sup>(b)</sup> (µg/l)	TAME <sup>(b)</sup> (µg/l)	TBA <sup>(b)</sup> (µg/l)	Methanol <sup>(b)</sup> (µg/l)	Ethanol <sup>(b)</sup> (µg/l)	1,2-DCA <sup>(b)</sup> (µg/l)	EDB <sup>(b)</sup> (µg/l)
TP-2 (cont.)	2/14/07	22,000	1,900	230	1,700	1,600	53,000	ND<90	ND<90	400	2,800	ND<20,000	ND<900	ND<90	ND<90
	5/17/07	ND<25,000	2,400	51	1,500	510	69,000	ND<2	ND<0.5	550	4,300	ND<25,000	ND<5	--	--
	8/2/07	10,000	1,200	ND<25	640	140	14,000	ND<25	ND<25	110	16,000	ND<10,000	ND<250	ND<25	ND<25
	11/12/07	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	2/14/08	12,000	920	28	850	740	17,000	ND<25	ND<25	120	5,900	ND<4,000	ND<250	ND<25	ND<25
	5/8/08	7,400	710	10	510	110	6,400	ND<8	ND<8	64	5,200	ND<12,000	ND<80	ND<8	ND<8
	7/23/08	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	10/13/08	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	2/11/09	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	4/27/09	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	8/4/09	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	12/17/09	7,200	950	ND<25	77	ND<25	13,000	ND<25	ND<25	130	20,000	ND<2,500	ND<250	ND<25	ND<25
	2/11/10	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	5/6/10	6,400	740	ND<25	450	130	14,000	ND<25	ND<25	130	9,900	ND<2,500	ND<250	ND<25	ND<25
	8/3/10	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	11/4/10	4,900	230	82	150	630	980	ND<5	ND<5	6.3	14,000	ND<500	ND<50	ND<5	ND<5
	2/2/11	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	4/28/11	130	1.6	ND<0.5	1.5	5.2	350	ND<0.5	ND<0.5	1.3	630	ND<50	ND<5	ND<0.5	ND<0.5
	8/4/11	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
10/11/11	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	120	ND<0.5	ND<0.5	ND<0.5	380	ND<50	ND<5	ND<0.5	ND<0.5	
1/31/12	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	
5/7/12	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5	
DW-1	5/22/08	5,100	470	150	210	570	100	ND<0.9	ND<0.9	0.98	76	ND<90	ND<9	ND<0.9	ND<0.9
	7/23/08	560	43	5.2	18	40	16	ND<0.5	ND<0.5	ND<0.5	21	ND<100	ND<5	ND<0.5	ND<0.5
	10/13/08	2,800	370	15	120	78	140	ND<0.5	ND<0.5	1.2	220	ND<300	ND<80	ND<0.5	ND<0.5
	2/11/09	520	45	5.3	32	31	42	ND<0.5	ND<0.5	ND<0.5	43	ND<100	ND<8	ND<0.5	ND<0.5
	4/28/09	2,700	250	36	160	190	86	ND<0.5	ND<0.5	0.84	120	ND<50	ND<5	ND<0.5	ND<0.5
	8/5/09	2,100	330	17	87	53	220	ND<0.5	ND<0.5	2.0	310	ND<50	ND<5	ND<0.5	ND<0.5
	12/8/09	6,200	560	63	400	490	140	ND<0.5	ND<0.5	1.1	200	ND<200	ND<8	ND<0.5	ND<0.5

**TABLE E-1**  
**HISTORICAL GROUNDWATER ANALYTICAL RESULTS**  
**TESORO - LIVERMORE, 67076**

Monitoring Well	Sample Date <sup>(a)</sup>	TPHg <sup>(b)</sup> (µg/l)	Benzene <sup>(b)</sup> (µg/l)	Toluene <sup>(b)</sup> (µg/l)	Ethylbenzene <sup>(b)</sup> (µg/l)	Xylenes <sup>(b)</sup> (µg/l)	MTBE <sup>(b)</sup> (µg/l)	DIPE <sup>(b)</sup> (µg/l)	ETBE <sup>(b)</sup> (µg/l)	TAME <sup>(b)</sup> (µg/l)	TBA <sup>(b)</sup> (µg/l)	Methanol <sup>(b)</sup> (µg/l)	Ethanol <sup>(b)</sup> (µg/l)	1,2-DCA <sup>(b)</sup> (µg/l)	EDB <sup>(b)</sup> (µg/l)
DW-1 (cont.)	2/12/10	2,000	200	36	130	150	49	ND<0.5	ND<0.5	ND<0.5	58	ND<200	ND<5	ND<0.5	ND<0.5
	5/4/10	1,800	160	27	110	140	21	ND<0.5	ND<0.5	ND<0.5	41	ND<100	ND<5	ND<0.5	ND<0.5
	8/2/10	1,400	53	11	67	78	8.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5
	11/4/10	ND<50	0.90	ND<0.5	0.70	1.3	0.54	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5
	2/2/11	58	1.9	ND<0.5	2.0	2.5	0.52	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5
	4/28/11	72	2.2	5.7	2.0	9.3	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5
	8/4/11	55	0.57	ND<0.5	0.92	1.2	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5
	10/11/11	180	3.0	1.0	5.1	10	0.77	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5
	2/1/12	2,500	23	6.4	85	190	3.6	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5
5/9/12	2,000	24	5.6	75	160	2.9	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5	
DW-2	5/22/08	11,000	1,300	170	460	230	620	ND<2.5	ND<2.5	9.6	870	ND<400	ND<25	ND<2.5	ND<2.5
	7/23/08	7,600	980	44	180	55	420	ND<2	ND<2	5.7	720	ND<200	ND<20	ND<2	ND<2
	10/13/08	7,300	910	23	120	18	280	ND<1.5	ND<1.5	3.1	650	ND<2,000	ND<50	ND<1.5	ND<1.5
	2/11/09	8,000	1,100	31	230	46	290	ND<2.5	ND<2.5	3.9	600	ND<800	ND<25	ND<2.5	ND<2.5
	4/28/09	5,800	500	27	110	55	330	ND<1	ND<1	4.4	600	ND<400	ND<10	ND<1	ND<1
	8/4/09	6,800	910	19	37	27	200	ND<1	ND<1	2.7	530	ND<200	ND<10	ND<1	ND<1
	12/9/09	6,600	450	14	55	34	210	ND<0.9	ND<0.9	2.6	410	ND<200	ND<9	ND<0.9	ND<0.9
	2/11/10	4,500	340	14	44	25	320	ND<0.9	ND<0.9	3.9	520	ND<300	ND<9	ND<0.9	ND<0.9
	5/4/10	2,300	110	7.1	17	16	350	ND<0.9	ND<0.9	4.1	550	ND<200	ND<9	ND<0.9	ND<0.9
	8/2/10	3,800	420	22	21	28	300	ND<0.9	ND<0.9	3.5	600	ND<300	ND<20	ND<0.9	ND<0.9
	11/2/10	2,600	230	7.0	11	4.0	300	ND<0.5	ND<0.5	3.3	660	ND<300	ND<8	ND<0.5	ND<0.5
	2/1/11	3,300	220	6.8	18	10	210	ND<0.5	ND<0.5	2.7	620	ND<300	ND<5	ND<0.5	ND<0.5
	4/27/11	1,900	78	2.6	2.6	5.6	200	ND<0.5	ND<0.5	2.2	590	ND<300	ND<5	ND<0.5	ND<0.5
	8/4/11	4,400	420	10	24	13	160	ND<0.5	ND<0.5	2.1	500	ND<100	ND<10	ND<0.5	ND<0.5
	10/11/11	2,700	110	5.0	4.0	11	170	ND<0.5	ND<0.5	1.9	440	ND<100	ND<5	ND<0.5	ND<0.5
1/31/12	4,400	220	7.0	15	8.9	130	ND<0.5	ND<0.5	1.2	400	ND<50	ND<5	ND<0.5	ND<0.5	
5/10/12	2,200	140	8.6	0.63	15	98	ND<0.5	ND<0.5	1.1	430	ND<200	ND<8	ND<0.5	ND<0.5	
DW-3	5/22/08	4,700	8.7	2.1	120	200	0.86	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5
	7/23/08	2,800	8.1	1.4	94	100	2.8	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5
	10/13/08	4,100	59	10	160	70	1.9	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<80	ND<0.5	ND<0.5

**TABLE E-1**  
**HISTORICAL GROUNDWATER ANALYTICAL RESULTS**  
**TESORO - LIVERMORE, 67076**

Monitoring Well	Sample Date <sup>(a)</sup>	TPHg <sup>(b)</sup> (µg/l)	Benzene <sup>(b)</sup> (µg/l)	Toluene <sup>(b)</sup> (µg/l)	Ethylbenzene <sup>(b)</sup> (µg/l)	Xylenes <sup>(b)</sup> (µg/l)	MTBE <sup>(b)</sup> (µg/l)	DIPE <sup>(b)</sup> (µg/l)	ETBE <sup>(b)</sup> (µg/l)	TAME <sup>(b)</sup> (µg/l)	TBA <sup>(b)</sup> (µg/l)	Methanol <sup>(b)</sup> (µg/l)	Ethanol <sup>(b)</sup> (µg/l)	1,2-DCA <sup>(b)</sup> (µg/l)	EDB <sup>(b)</sup> (µg/l)	
DW-3 (cont.)	2/11/09	1,700	21	1.7	35	21	9.8	ND<0.5	ND<0.5	ND<0.5	16	ND<50	ND<10	ND<0.5	ND<0.5	
	4/27/09	1,800	16	2.3	26	10	3.0	ND<0.5	ND<0.5	ND<0.5	12	ND<50	ND<5	ND<0.5	ND<0.5	
	8/4/09	1,200	6.8	0.99	4.3	3.4	18	ND<0.5	ND<0.5	ND<0.5	35	ND<50	ND<5	ND<0.5	ND<0.5	
	12/9/09	2,200	24	5.9	56	29	ND<0.5	ND<0.5	ND<0.5	ND<0.5	7.2	ND<300	ND<20	ND<0.5	ND<0.5	
	2/11/10	700	9.5	2.0	18	6.2	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<80	ND<8	ND<0.5	ND<0.5	
	5/4/10	420	5.5	0.93	8.8	3.4	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<80	ND<5	ND<0.5	ND<0.5	
	8/2/10	640	4.0	ND<0.5	5.3	3.9	0.59	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5	
	11/3/10	170	0.85	ND<0.5	ND<0.5	0.59	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5	
	2/1/11	60	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5	
	4/27/11	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5	
	8/4/11	310	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5	
	10/10/11	120	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5	
	1/31/12	1,300	1.0	ND<0.5	19	15	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5	
5/8/12	750	1.2	ND<0.5	5.4	4.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<80	ND<5	ND<0.5	ND<0.5		
DW-4	5/22/08	1,200	4.2	8.6	16	200	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5	
	7/23/08	91	0.79	ND<0.5	6.5	7.4	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5	
	10/13/08	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	43	ND<0.5	ND<0.5	
	2/11/09	ND<50	0.68	ND<0.5	1.4	1.4	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5	
	4/27/09	ND<50	0.50	ND<0.5	1.1	1.0	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5	
	8/5/09	52	1.7	ND<0.5	1.4	0.83	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5	
	12/9/09	ND<50	3.0	ND<0.5	2.0	1.2	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5	
	2/11/10	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	5/6/10	180	3.3	3.7	13	20	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5	
	8/3/10	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	11/3/10	ND<50	0.70	4.0	0.59	5.9	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5	
	2/2/11	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	4/26/11	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5	
8/4/11	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	

**TABLE E-1**  
**HISTORICAL GROUNDWATER ANALYTICAL RESULTS**  
**TESORO - LIVERMORE, 67076**

Monitoring Well	Sample Date <sup>(a)</sup>	TPHg <sup>(b)</sup> (µg/l)	Benzene <sup>(b)</sup> (µg/l)	Toluene <sup>(b)</sup> (µg/l)	Ethylbenzene <sup>(b)</sup> (µg/l)	Xylenes <sup>(b)</sup> (µg/l)	MTBE <sup>(b)</sup> (µg/l)	DIPE <sup>(b)</sup> (µg/l)	ETBE <sup>(b)</sup> (µg/l)	TAME <sup>(b)</sup> (µg/l)	TBA <sup>(b)</sup> (µg/l)	Methanol <sup>(b)</sup> (µg/l)	Ethanol <sup>(b)</sup> (µg/l)	1,2-DCA <sup>(b)</sup> (µg/l)	EDB <sup>(b)</sup> (µg/l)
DW-4 (cont.)	10/10/11	ND<50	ND<0.5	0.67	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5
	1/31/12	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	5/7/12	ND<50	ND<0.5	ND<0.5	ND<0.5	0.98	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5
DW-5	12/9/09	15,000	140	25	200	960	ND<2.5	ND<2.5	ND<2.5	ND<2.5	ND<15	ND<250	ND<25	ND<2.5	ND<2.5
	2/11/10	1,600	37	2.5	36	21	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<80	ND<5	ND<0.5	ND<0.5
	5/4/10	2,100	69	2.9	41	18	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<80	ND<8	ND<0.5	ND<0.5
	8/2/10	12,000	240	9.4	350	280	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<10	ND<0.5	ND<0.5
	11/2/10	5,000	120	3.6	68	35	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<8	ND<0.5	ND<0.5
	2/1/11	3,800	70	2.5	37	18	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5
	4/27/11	710	8.0	ND<0.5	4.3	2.1	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5
	8/4/11	6,100	76	3.7	110	97	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<20	ND<0.5	ND<0.5
	10/10/11	6,800	59	4.7	140	150	ND<1.5	ND<1.5	ND<1.5	ND<1.5	ND<7	ND<150	ND<15	ND<1.5	ND<1.5
	1/31/12	8,200	130	5.9	170	180	ND<1.5	ND<1.5	ND<1.5	ND<1.5	ND<7	ND<150	ND<200	ND<1.5	ND<1.5
5/10/12	11,000	100	6.8	320	380	ND<1.5	ND<1.5	ND<1.5	ND<1.5	ND<7	ND<150	ND<20	ND<1.5	ND<1.5	
DW-6	12/9/09	6,200	33	4.3	100	43	9.7	ND<1	ND<1	ND<1	10	ND<100	ND<10	ND<1	ND<1
	2/11/10	4,800	18	3.0	44	15	14	ND<0.5	ND<0.5	ND<0.5	9.2	ND<80	ND<10	ND<0.5	ND<0.5
	5/4/10	4,600	13	3.5	29	17	5.6	ND<0.5	ND<0.5	ND<0.5	7.2	ND<80	ND<8	ND<0.5	ND<0.5
	8/2/10	4,500	13	4.4	54	14	5.9	ND<0.5	ND<0.5	ND<0.5	12	ND<50	ND<8	ND<0.5	ND<0.5
	11/2/10	5,200	20	4.2	47	13	8.9	ND<0.9	ND<0.9	ND<0.9	26	ND<90	ND<9	ND<0.9	ND<0.9
	2/1/11	4,000	11	2.9	32	11	6.0	ND<0.5	ND<0.5	ND<0.5	16	ND<50	ND<5	ND<0.5	ND<0.5
	4/27/11	3,100	8.8	2.4	12	8.2	6.2	ND<0.5	ND<0.5	ND<0.5	19	ND<50	ND<8	ND<0.5	ND<0.5
	8/4/11	2,900	4.2	0.95	6.0	4.9	6.5	ND<0.5	ND<0.5	ND<0.5	24	ND<50	ND<8	ND<0.5	ND<0.5
	10/10/11	1,500	4.1	3.3	3.0	3.3	4.9	ND<0.5	ND<0.5	ND<0.5	20	ND<50	ND<5	ND<0.5	ND<0.5
	1/31/12	4,700	13	2.4	51	12	8.1	ND<0.5	ND<0.5	ND<0.5	28	ND<50	ND<80	ND<0.5	ND<0.5
5/10/12	2,600	7.8	1.6	12	5.2	4.6	ND<0.5	ND<0.5	ND<0.5	17	ND<50	ND<5	ND<0.5	ND<0.5	
DW-7	12/9/09	10,000	500	20	310	110	160	ND<2	ND<2	ND<2	270	ND<200	ND<20	ND<2	ND<2
	2/12/10	12,000	590	23	440	120	190	ND<2	ND<2	2.4	290	ND<200	ND<20	ND<2	ND<2
	5/4/10	4,100	250	15	89	32	97	ND<0.5	ND<0.5	1.0	160	ND<80	ND<5	ND<0.5	ND<0.5
	8/3/10	3,500	280	13	49	30	130	ND<0.5	ND<0.5	1.3	220	ND<50	ND<5	ND<0.5	ND<0.5
	11/4/10	660	30	1.2	5.0	3.3	130	ND<0.5	ND<0.5	1.2	220	ND<50	ND<5	ND<0.5	ND<0.5
	2/2/11	760	43	1.8	9.4	4.0	91	ND<0.5	ND<0.5	0.76	160	ND<50	ND<5	ND<0.5	ND<0.5



**TABLE E-1**  
**HISTORICAL GROUNDWATER ANALYTICAL RESULTS**  
**TESORO - LIVERMORE, 67076**

Monitoring Well	Sample Date <sup>(a)</sup>	TPHg <sup>(b)</sup> (µg/l)	Benzene <sup>(b)</sup> (µg/l)	Toluene <sup>(b)</sup> (µg/l)	Ethylbenzene <sup>(b)</sup> (µg/l)	Xylenes <sup>(b)</sup> (µg/l)	MTBE <sup>(b)</sup> (µg/l)	DIPE <sup>(b)</sup> (µg/l)	ETBE <sup>(b)</sup> (µg/l)	TAME <sup>(b)</sup> (µg/l)	TBA <sup>(b)</sup> (µg/l)	Methanol <sup>(b)</sup> (µg/l)	Ethanol <sup>(b)</sup> (µg/l)	1,2-DCA <sup>(b)</sup> (µg/l)	EDB <sup>(b)</sup> (µg/l)
DW-7 (cont.)	4/27/11	1,600	120	4.6	4.2	6.7	95	ND<0.5	ND<0.5	1.0	170	ND<200	ND<5	ND<0.5	ND<0.5
	8/4/11	1,400	83	2.5	4.4	5.2	97	ND<0.5	ND<0.5	0.96	160	ND<80	ND<5	ND<0.5	ND<0.5
	10/11/11	400	45	1.1	0.80	1.6	90	ND<0.5	ND<0.5	0.89	180	ND<50	ND<5	ND<0.5	ND<0.5
	1/31/12	7,800	380	14	170	59	120	ND<0.5	ND<0.5	1.3	300	ND<150	ND<50	ND<0.5	ND<0.5
	5/10/12	940	47	1.6	6.1	5.2	120	ND<0.5	ND<0.5	1.1	280	ND<50	ND<5	ND<0.5	ND<0.5
DW-8	4/28/11	72,000	5,200	10,000	1,900	12,000	ND<10	ND<10	ND<10	ND<10	56	ND<1,000	ND<100	ND<10	ND<10
	8/4/11	65,000	2,900	8,100	650	10,000	ND<20	ND<20	ND<20	ND<20	ND<90	ND<2,000	ND<200	ND<20	ND<20
	10/25/11	82,000	4,300	10,000	1,900	12,000	ND<4	ND<4	ND<4	ND<4	58	ND<400	ND<40	ND<4	ND<4
	2/1/12	52,000	2,500	5,200	1,900	8,200	ND<9	ND<9	ND<9	ND<9	ND<50	ND<900	ND<90	ND<9	ND<9
	5/11/12	11,000	500	1,000	300	1,200	ND<2.5	ND<2.5	ND<2.5	ND<2.5	25	ND<250	ND<25	ND<2.5	ND<2.5
DW-9	6/14/12	8,300	89	2.4	21	96	36	ND<1.5	ND<1.5	ND<1.5	80	ND<150	ND<15	ND<1.5	ND<1.5
MW-A	1/17/99	5,800	1,700	85	65	320	ND<5	--	--	--	--	--	--	--	--
MW-B	1/17/99	4,400	240	30	21	39	ND<5	--	--	--	--	--	--	--	--
MW-C	1/17/99	1,800	0.80	ND<0.5	ND<0.5	0.55	ND<5	--	--	--	--	--	--	--	--
MW-D	1/17/99	5,600	1,600	130	66	220	ND<5	--	--	--	--	--	--	--	--
MW-E	1/17/99	5,700	1,600	180	180	310	ND<50	--	--	--	--	--	--	--	--
	6/10/99	5,000	1,300	130	320	450	ND<25	--	--	--	--	--	--	--	--
MW-W	1/17/99	23,000	7,600	760	1,400	5,000	ND<50	--	--	--	--	--	--	--	--
	6/10/99	16,000	4,100	420	1,300	4,000	ND<50	--	--	--	--	--	--	--	--
IP-1	7/23/08	62,000	2,100	6,800	2,700	11,000	16	ND<15	ND<15	ND<15	ND<70	ND<1,500	ND<150	ND<15	ND<15
	10/13/08	55,000	3,100	3,300	2,300	7,700	ND<15	ND<15	ND<15	ND<15	98	ND<1,500	ND<150	ND<15	ND<15
	5/5/10 <sup>(g)</sup>	33,000	900	1,500	1,400	5,000	ND<7	ND<7	ND<7	ND<7	ND<40	ND<700	ND<70	ND<7	ND<7
	4/27/11	24,000	750	2,200	420	4,800	ND<7	ND<7	ND<7	ND<7	ND<40	ND<700	ND<70	ND<7	ND<7
	2/1/12	15,000	370	350	600	1,300	ND<2	ND<2	ND<2	ND<2	16	ND<200	ND<20	NS	NS
	5/9/12	16,000	580	850	800	2,100	ND<2	ND<2	ND<2	ND<2	12	ND<200	ND<20	ND<2	ND<2
IP-2	7/23/08	5,500	160	43	130	350	10	ND<0.9	ND<0.9	ND<0.9	ND<5	ND<90	ND<9	ND<0.9	ND<0.9
	10/13/08	13,000	1,900	58	600	630	180	ND<0.9	ND<0.9	9.4	46	ND<90	ND<20	ND<0.9	ND<0.9
	5/5/10 <sup>(g)</sup>	2,700	66	220	61	240	3.3	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5
	4/26/11	350	8.9	1.7	4.7	5.7	0.90	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5
	5/8/12	340	10	4.8	6.3	13	2.4	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5

TABLE E-1

HISTORICAL GROUNDWATER ANALYTICAL RESULTS  
TESORO - LIVERMORE, 67076

Monitoring Well	Sample Date <sup>(a)</sup>	TPHg <sup>(b)</sup> (µg/l)	Benzene <sup>(b)</sup> (µg/l)	Toluene <sup>(b)</sup> (µg/l)	Ethylbenzene <sup>(b)</sup> (µg/l)	Xylenes <sup>(b)</sup> (µg/l)	MTBE <sup>(b)</sup> (µg/l)	DIPE <sup>(b)</sup> (µg/l)	ETBE <sup>(b)</sup> (µg/l)	TAME <sup>(b)</sup> (µg/l)	TBA <sup>(b)</sup> (µg/l)	Methanol <sup>(b)</sup> (µg/l)	Ethanol <sup>(b)</sup> (µg/l)	1,2-DCA <sup>(b)</sup> (µg/l)	EDB <sup>(b)</sup> (µg/l)
IP-3	7/23/08	1,100	23	14	7.5	90	32	ND<0.5	ND<0.5	ND<0.5	32	ND<50	ND<5	ND<0.5	ND<0.5
	10/13/08	1,700	83	4.7	11	54	72	ND<0.5	ND<0.5	0.84	71	ND<50	ND<8	ND<0.5	ND<0.5
	5/5/10 <sup>(g)</sup>	430 <sup>(h)</sup>	6.4	22	4.9	21	3.9	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<80	ND<5	ND<0.5	ND<0.5
	4/26/11	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5
	5/8/12	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5
IP-4	7/23/08	7,600	130	45	240	750	940	ND<1.5	ND<1.5	6.9	890	ND<150	ND<15	ND<1.5	ND<1.5
	10/13/08	4,200	110	11	78	310	3,700	ND<1.5	ND<1.5	7.1	15,000	ND<2,000	ND<15	ND<1.5	ND<1.5
	5/6/10 <sup>(g)</sup>	190	5.4	25	6.9	29	3.4	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5
	4/26/11	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	1.1	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5
	5/8/12	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	5.3	ND<0.5	ND<0.5
IP-5	7/23/08	2,000 <sup>(h)</sup>	3.0	17	5.1	31	4.4	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5
	10/13/08	720	14	13	8.7	32	19	ND<0.5	ND<0.5	ND<0.5	26	ND<50	ND<5	ND<0.5	ND<0.5
	5/6/10 <sup>(g)</sup>	270	5.7	25	5.9	29	20	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<80	ND<5	ND<0.5	ND<0.5
	4/26/11	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	0.72	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5
	5/8/12	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5
IP-6	7/23/08	4,400	260	78	98	340	180	ND<0.5	ND<0.5	1.6	190	ND<80	ND<9	ND<0.5	ND<0.5
	10/13/08	1,400	150	1.6	1.5	3.5	7.4	ND<0.5	ND<0.5	ND<0.5	10	ND<50	ND<50	ND<0.5	ND<0.5
	5/5/10 <sup>(g)</sup>	8,000 <sup>(h)</sup>	24	100	18	98	0.51	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<80	ND<5	ND<0.5	ND<0.5
	4/27/11	ND<50	1.1	0.66	ND<0.5	0.71	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5
	5/8/12	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5
IP-7	7/23/08	4,200	190	12	99	190	49	ND<0.9	ND<0.9	1.1	58	ND<90	ND<9	ND<0.9	ND<0.9
	10/13/08	6,000	350	6.6	150	60	97	ND<0.9	ND<0.9	2.5	76	ND<90	ND<50	ND<0.9	ND<0.9
	5/5/10 <sup>(g)</sup>	33,000	49	62	38	69	14	ND<0.9	ND<0.9	ND<0.9	20	ND<90	ND<9	ND<0.9	ND<0.9
	4/27/11	220	8.1	0.69	3.4	1.5	0.95	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5
	5/8/12	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<5	ND<0.5	ND<0.5
IP-8	12/16/08	120,000	7,800	20,000	3,500	16,000	ND<40	ND<40	ND<40	ND<40	ND<200	ND<4,000	ND<400	ND<40	ND<40
	5/5/10 <sup>(g)</sup>	83,000	3,900	13,000	2,400	14,000	ND<25	ND<25	ND<25	ND<25	ND<150	ND<2,500	ND<250	ND<25	ND<25
	4/28/11	13,000	620	2,000	240	2,200	ND<3	ND<3	ND<3	ND<3	27	ND<300	ND<30	ND<3	ND<3
	2/1/12	67,000	2,900	7,300	1400	11,000	ND<15	ND<15	ND<15	ND<15	ND<70	ND<1,500	ND<150	NS	NS
	5/9/12	50,000	2,400	4,900	790	8,600	ND<9	ND<9	ND<9	ND<9	ND<50	ND<900	ND<90	ND<9	ND<9

TABLE E-1

HISTORICAL GROUNDWATER ANALYTICAL RESULTS  
TESORO - LIVERMORE, 67076

Monitoring Well	Sample Date <sup>(a)</sup>	TPHg <sup>(b)</sup> (µg/l)	Benzene <sup>(b)</sup> (µg/l)	Toluene <sup>(b)</sup> (µg/l)	Ethylbenzene <sup>(b)</sup> (µg/l)	Xylenes <sup>(b)</sup> (µg/l)	MTBE <sup>(b)</sup> (µg/l)	DIPE <sup>(b)</sup> (µg/l)	ETBE <sup>(b)</sup> (µg/l)	TAME <sup>(b)</sup> (µg/l)	TBA <sup>(b)</sup> (µg/l)	Methanol <sup>(b)</sup> (µg/l)	Ethanol <sup>(b)</sup> (µg/l)	1,2-DCA <sup>(b)</sup> (µg/l)	EDB <sup>(b)</sup> (µg/l)
IP-9	12/16/08	110,000	7,800	23,000	2,800	16,000	ND<40	ND<40	ND<40	ND<40	ND<200	ND<4,000	ND<400	ND<40	ND<40
	5/5/10 <sup>(g)</sup>	92,000	6,000	19,000	2,500	14,000	ND<40	ND<40	ND<40	ND<40	ND<200	ND<4,000	ND<400	ND<40	ND<40
	4/28/11	38,000	1,400	4,300	860	6,000	ND<6	ND<6	ND<6	ND<6	38	ND<600	ND<60	ND<6	ND<6
	2/1/12	19,000	180	1,200	640	3,100	ND<3	ND<3	ND<3	ND<3	ND<15	ND<300	ND<30	NS	NS
	5/9/12	10,000	14	180	270	780	ND<1.5	ND<1.5	ND<1.5	ND<1.5	ND<7	ND<150	ND<15	ND<1.5	ND<1.5
IP-10	2/11/09	8,100	29	58	170	1,200	ND<1.5	ND<1.5	ND<1.5	ND<1.5	ND<7	ND<150	ND<20	ND<1.5	ND<1.5
	5/3/10 <sup>(g)</sup>	3,600	73	80	140	240	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<20	ND<0.5	ND<0.5
	4/26/11	4,300	28	140	110	330	ND<0.5	ND<0.5	ND<0.5	ND<0.5	10	ND<50	ND<8	ND<0.5	ND<0.5
	2/1/12	3,200	8.2	4.6	93	2.0	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<20	NS	NS
	5/9/12	3,900	24	38	110	58.0	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<20	ND<0.5	ND<0.5

- (a) Samples collected before July 2005 collected by others; data provided by Delta Environmental Consultants, Inc., Second Quarter 2005 Groundwater Monitoring Report dated 31 July 2005.
- (b) Total petroleum hydrocarbons as gasoline (TPHg), benzene, toluene, ethylbenzene, xylenes, methyl tert-butyl ether (MTBE), di-isopropyl ether (DIPE), ethyl tert-butyl ether (ETBE), tert-amyl methyl ether (TAME), tert-butyl alcohol (TBA), 1,2-dichloroethane (1,2-DCA), and 1,2-dibromoethane (EDB) analyzed by EPA Method 8260; reported in micrograms per liter ( µg/l).
- (c) ND - Not detected at the reporting limit listed.
- (d) "--" Not analyzed.
- (e) NS - Not sampled.
- (f) TBA results may be biased slightly high. A fraction of MTBE (typically less than 10 percent) converts to TBA during the analysis of water samples. This conversion effect is considered to be mathematically significant in samples that contain MTBE/TBA ratios of over 20:1.
- (g) Baseline remediation system values.
- (h) Primarily compounds not found in typical Gasoline.

**ATTACHMENT F**

**LABORATORY ANALYTICAL REPORTS AND  
CHAIN-OF-CUSTODY FORMS**

## Laboratory Results

Matt Nelson  
Orion Environmental  
3450 East Spring Street, Suite 212  
Long Beach, CA 90806

Subject : 7 Water Samples  
Project Name : TESORO LIVERMORE #67076  
Project Number : 01LV

Dear Mr. Nelson,

Chemical analysis of the samples referenced above has been completed. Summaries of the data are contained on the following pages. Sample(s) were received under documented chain-of-custody. US EPA protocols for sample storage and preservation were followed. Testing procedures comply with the 2003 NELAC and TNI 2009 standards. Laboratory results relate only to the samples tested. This report may be freely reproduced in full, but may only be reproduced in part with the express permission of Kiff Analytical, LLC. Kiff Analytical, LLC is certified by the State of California under the National Environmental Laboratory Accreditation Program (NELAP), lab # 08263CA. If you have any questions regarding procedures or results, please call me at 530-297-4800.

Sincerely,



Troy Turpen

Subject : 7 Water Samples  
Project Name : TESORO LIVERMORE #67076  
Project Number : 01LV

## Case Narrative

Matrix Spike/Matrix Spike Duplicate results associated with sample MW-4 for the analyte Sulfate were affected by the analyte concentration present in the un-spiked sample. Recoveries were calculated using data points beyond the calibration range.

Project Name : **TESORO LIVERMORE #67076**

Project Number : **01LV**

Sample : **MW-3**

Matrix : Water

Lab Number : 81189-01

Sample Date :05/07/2012

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date/Time Analyzed
Benzene	< 0.50	0.50	ug/L	EPA 8260B	05/08/12 09:20
<b>Toluene</b>	<b>0.56</b>	0.50	ug/L	EPA 8260B	05/08/12 09:20
<b>Ethylbenzene</b>	<b>1.9</b>	0.50	ug/L	EPA 8260B	05/08/12 09:20
<b>Total Xylenes</b>	<b>7.7</b>	0.50	ug/L	EPA 8260B	05/08/12 09:20
Methyl-t-butyl ether (MTBE)	< 0.50	0.50	ug/L	EPA 8260B	05/08/12 09:20
Diisopropyl ether (DIPE)	< 0.50	0.50	ug/L	EPA 8260B	05/08/12 09:20
Ethyl-t-butyl ether (ETBE)	< 0.50	0.50	ug/L	EPA 8260B	05/08/12 09:20
Tert-amyl methyl ether (TAME)	< 0.50	0.50	ug/L	EPA 8260B	05/08/12 09:20
Tert-Butanol	< 5.0	5.0	ug/L	EPA 8260B	05/08/12 09:20
Methanol	< 50	50	ug/L	EPA 8260B	05/08/12 09:20
Ethanol	< 5.0	5.0	ug/L	EPA 8260B	05/08/12 09:20
<b>TPH as Gasoline</b>	<b>74</b>	50	ug/L	EPA 8260B	05/08/12 09:20
1,2-Dichloroethane	< 0.50	0.50	ug/L	EPA 8260B	05/08/12 09:20
1,2-Dibromoethane	< 0.50	0.50	ug/L	EPA 8260B	05/08/12 09:20
1,2-Dichloroethane-d4 (Surr)	101		% Recovery	EPA 8260B	05/08/12 09:20
Toluene - d8 (Surr)	97.7		% Recovery	EPA 8260B	05/08/12 09:20

Project Name : **TESORO LIVERMORE #67076**

Project Number : **01LV**

Sample : **MW-8**

Matrix : Water

Lab Number : 81189-02

Sample Date :05/07/2012

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date/Time Analyzed
Benzene	< 0.50	0.50	ug/L	EPA 8260B	05/08/12 12:30
Toluene	< 0.50	0.50	ug/L	EPA 8260B	05/08/12 12:30
Ethylbenzene	< 0.50	0.50	ug/L	EPA 8260B	05/08/12 12:30
Total Xylenes	< 0.50	0.50	ug/L	EPA 8260B	05/08/12 12:30
Methyl-t-butyl ether (MTBE)	< 0.50	0.50	ug/L	EPA 8260B	05/08/12 12:30
Diisopropyl ether (DIPE)	< 0.50	0.50	ug/L	EPA 8260B	05/08/12 12:30
Ethyl-t-butyl ether (ETBE)	< 0.50	0.50	ug/L	EPA 8260B	05/08/12 12:30
Tert-amyl methyl ether (TAME)	< 0.50	0.50	ug/L	EPA 8260B	05/08/12 12:30
Tert-Butanol	< 5.0	5.0	ug/L	EPA 8260B	05/08/12 12:30
Methanol	< 50	50	ug/L	EPA 8260B	05/08/12 12:30
Ethanol	< 5.0	5.0	ug/L	EPA 8260B	05/08/12 12:30
TPH as Gasoline	< 50	50	ug/L	EPA 8260B	05/08/12 12:30
1,2-Dichloroethane	< 0.50	0.50	ug/L	EPA 8260B	05/08/12 12:30
1,2-Dibromoethane	< 0.50	0.50	ug/L	EPA 8260B	05/08/12 12:30
1,2-Dichloroethane-d4 (Surr)	99.1		% Recovery	EPA 8260B	05/08/12 12:30
Toluene - d8 (Surr)	97.7		% Recovery	EPA 8260B	05/08/12 12:30



Project Name : **TESORO LIVERMORE #67076**

Project Number : **01LV**

Sample : **MW-10**

Matrix : Water

Lab Number : 81189-03

Sample Date :05/07/2012

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date/Time Analyzed
Benzene	< 0.50	0.50	ug/L	EPA 8260B	05/08/12 13:01
Toluene	< 0.50	0.50	ug/L	EPA 8260B	05/08/12 13:01
Ethylbenzene	< 0.50	0.50	ug/L	EPA 8260B	05/08/12 13:01
Total Xylenes	< 0.50	0.50	ug/L	EPA 8260B	05/08/12 13:01
Methyl-t-butyl ether (MTBE)	< 0.50	0.50	ug/L	EPA 8260B	05/08/12 13:01
Diisopropyl ether (DIPE)	< 0.50	0.50	ug/L	EPA 8260B	05/08/12 13:01
Ethyl-t-butyl ether (ETBE)	< 0.50	0.50	ug/L	EPA 8260B	05/08/12 13:01
Tert-amyl methyl ether (TAME)	< 0.50	0.50	ug/L	EPA 8260B	05/08/12 13:01
Tert-Butanol	< 5.0	5.0	ug/L	EPA 8260B	05/08/12 13:01
Methanol	< 50	50	ug/L	EPA 8260B	05/08/12 13:01
Ethanol	< 5.0	5.0	ug/L	EPA 8260B	05/08/12 13:01
TPH as Gasoline	< 50	50	ug/L	EPA 8260B	05/08/12 13:01
1,2-Dichloroethane	< 0.50	0.50	ug/L	EPA 8260B	05/08/12 13:01
1,2-Dibromoethane	< 0.50	0.50	ug/L	EPA 8260B	05/08/12 13:01
1,2-Dichloroethane-d4 (Surr)	100		% Recovery	EPA 8260B	05/08/12 13:01
Toluene - d8 (Surr)	97.8		% Recovery	EPA 8260B	05/08/12 13:01

Project Name : **TESORO LIVERMORE #67076**

Project Number : **01LV**

Sample : **VW-2**

Matrix : Water

Lab Number : 81189-04

Sample Date :05/07/2012

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date/Time Analyzed
Benzene	< 0.50	0.50	ug/L	EPA 8260B	05/08/12 13:33
Toluene	< 0.50	0.50	ug/L	EPA 8260B	05/08/12 13:33
Ethylbenzene	< 0.50	0.50	ug/L	EPA 8260B	05/08/12 13:33
Total Xylenes	< 0.50	0.50	ug/L	EPA 8260B	05/08/12 13:33
<b>Methyl-t-butyl ether (MTBE)</b>	<b>0.83</b>	0.50	ug/L	EPA 8260B	05/08/12 13:33
Diisopropyl ether (DIPE)	< 0.50	0.50	ug/L	EPA 8260B	05/08/12 13:33
Ethyl-t-butyl ether (ETBE)	< 0.50	0.50	ug/L	EPA 8260B	05/08/12 13:33
Tert-amyl methyl ether (TAME)	< 0.50	0.50	ug/L	EPA 8260B	05/08/12 13:33
Tert-Butanol	< 5.0	5.0	ug/L	EPA 8260B	05/08/12 13:33
Methanol	< 50	50	ug/L	EPA 8260B	05/08/12 13:33
Ethanol	< 5.0	5.0	ug/L	EPA 8260B	05/08/12 13:33
TPH as Gasoline	< 50	50	ug/L	EPA 8260B	05/08/12 13:33
1,2-Dichloroethane	< 0.50	0.50	ug/L	EPA 8260B	05/08/12 13:33
1,2-Dibromoethane	< 0.50	0.50	ug/L	EPA 8260B	05/08/12 13:33
1,2-Dichloroethane-d4 (Surr)	101		% Recovery	EPA 8260B	05/08/12 13:33
Toluene - d8 (Surr)	98.0		% Recovery	EPA 8260B	05/08/12 13:33

Project Name : **TESORO LIVERMORE #67076**

Project Number : **01LV**

Sample : **TP-2**

Matrix : Water

Lab Number : 81189-05

Sample Date :05/07/2012

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date/Time Analyzed
Benzene	< 0.50	0.50	ug/L	EPA 8260B	05/08/12 14:05
Toluene	< 0.50	0.50	ug/L	EPA 8260B	05/08/12 14:05
Ethylbenzene	< 0.50	0.50	ug/L	EPA 8260B	05/08/12 14:05
Total Xylenes	< 0.50	0.50	ug/L	EPA 8260B	05/08/12 14:05
Methyl-t-butyl ether (MTBE)	< 0.50	0.50	ug/L	EPA 8260B	05/08/12 14:05
Diisopropyl ether (DIPE)	< 0.50	0.50	ug/L	EPA 8260B	05/08/12 14:05
Ethyl-t-butyl ether (ETBE)	< 0.50	0.50	ug/L	EPA 8260B	05/08/12 14:05
Tert-amyl methyl ether (TAME)	< 0.50	0.50	ug/L	EPA 8260B	05/08/12 14:05
Tert-Butanol	< 5.0	5.0	ug/L	EPA 8260B	05/08/12 14:05
Methanol	< 50	50	ug/L	EPA 8260B	05/10/12 03:10
Ethanol	< 5.0	5.0	ug/L	EPA 8260B	05/08/12 14:05
TPH as Gasoline	< 50	50	ug/L	EPA 8260B	05/08/12 14:05
1,2-Dichloroethane	< 0.50	0.50	ug/L	EPA 8260B	05/08/12 14:05
1,2-Dibromoethane	< 0.50	0.50	ug/L	EPA 8260B	05/08/12 14:05
1,2-Dichloroethane-d4 (Surr)	100		% Recovery	EPA 8260B	05/08/12 14:05
Toluene - d8 (Surr)	98.0		% Recovery	EPA 8260B	05/08/12 14:05

Project Name : **TESORO LIVERMORE #67076**

Project Number : **01LV**

Sample : **DW-4**

Matrix : Water

Lab Number : 81189-06

Sample Date :05/07/2012

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date/Time Analyzed
Benzene	< 0.50	0.50	ug/L	EPA 8260B	05/08/12 14:36
Toluene	< 0.50	0.50	ug/L	EPA 8260B	05/08/12 14:36
Ethylbenzene	< 0.50	0.50	ug/L	EPA 8260B	05/08/12 14:36
<b>Total Xylenes</b>	<b>0.98</b>	0.50	ug/L	EPA 8260B	05/08/12 14:36
Methyl-t-butyl ether (MTBE)	< 0.50	0.50	ug/L	EPA 8260B	05/08/12 14:36
Diisopropyl ether (DIPE)	< 0.50	0.50	ug/L	EPA 8260B	05/08/12 14:36
Ethyl-t-butyl ether (ETBE)	< 0.50	0.50	ug/L	EPA 8260B	05/08/12 14:36
Tert-amyl methyl ether (TAME)	< 0.50	0.50	ug/L	EPA 8260B	05/08/12 14:36
Tert-Butanol	< 5.0	5.0	ug/L	EPA 8260B	05/08/12 14:36
Methanol	< 50	50	ug/L	EPA 8260B	05/08/12 14:36
Ethanol	< 5.0	5.0	ug/L	EPA 8260B	05/08/12 14:36
TPH as Gasoline	< 50	50	ug/L	EPA 8260B	05/08/12 14:36
1,2-Dichloroethane	< 0.50	0.50	ug/L	EPA 8260B	05/08/12 14:36
1,2-Dibromoethane	< 0.50	0.50	ug/L	EPA 8260B	05/08/12 14:36
Trichloroethene	< 0.50	0.50	ug/L	EPA 8260B	05/08/12 14:36
Tetrachloroethene	< 0.50	0.50	ug/L	EPA 8260B	05/08/12 14:36
1,2-Dichloroethane-d4 (Surr)	100		% Recovery	EPA 8260B	05/08/12 14:36
Toluene - d8 (Surr)	98.6		% Recovery	EPA 8260B	05/08/12 14:36

Project Name : **TESORO LIVERMORE #67076**

Project Number : **01LV**

Sample : **MW-4**

Matrix : Water

Lab Number : 81189-07

Sample Date :05/07/2012

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date/Time Analyzed
<b>Nitrate as N</b>	<b>1.8</b>	0.10	mg/L	EPA 300.0	05/08/12 14:18
<b>Sulfate</b>	<b>64</b>	1.0	mg/L	EPA 300.0	05/08/12 16:12
Ferrous Iron	< 0.10	0.10	mg/L	SM 3500-Fe D	05/08/12 12:04
Benzene	< 0.50	0.50	ug/L	EPA 8260B	05/08/12 15:07
Toluene	< 0.50	0.50	ug/L	EPA 8260B	05/08/12 15:07
Ethylbenzene	< 0.50	0.50	ug/L	EPA 8260B	05/08/12 15:07
Total Xylenes	< 0.50	0.50	ug/L	EPA 8260B	05/08/12 15:07
Methyl-t-butyl ether (MTBE)	< 0.50	0.50	ug/L	EPA 8260B	05/08/12 15:07
Diisopropyl ether (DIPE)	< 0.50	0.50	ug/L	EPA 8260B	05/08/12 15:07
Ethyl-t-butyl ether (ETBE)	< 0.50	0.50	ug/L	EPA 8260B	05/08/12 15:07
Tert-amyl methyl ether (TAME)	< 0.50	0.50	ug/L	EPA 8260B	05/08/12 15:07
Tert-Butanol	< 5.0	5.0	ug/L	EPA 8260B	05/08/12 15:07
Methanol	< 50	50	ug/L	EPA 8260B	05/08/12 15:07
Ethanol	< 5.0	5.0	ug/L	EPA 8260B	05/08/12 15:07
TPH as Gasoline	< 50	50	ug/L	EPA 8260B	05/08/12 15:07
1,2-Dichloroethane	< 0.50	0.50	ug/L	EPA 8260B	05/08/12 15:07
1,2-Dibromoethane	< 0.50	0.50	ug/L	EPA 8260B	05/08/12 15:07
1,2-Dichloroethane-d4 (Surr)	102		% Recovery	EPA 8260B	05/08/12 15:07
Toluene - d8 (Surr)	98.5		% Recovery	EPA 8260B	05/08/12 15:07

**QC Report : Method Blank Data**

Project Name : **TESORO LIVERMORE #67076**

Project Number : **01LV**

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	< 0.50	0.50	ug/L	EPA 8260B	05/08/2012
Ethylbenzene	< 0.50	0.50	ug/L	EPA 8260B	05/08/2012
Toluene	< 0.50	0.50	ug/L	EPA 8260B	05/08/2012
Total Xylenes	< 0.50	0.50	ug/L	EPA 8260B	05/08/2012
Diisopropyl ether (DIPE)	< 0.50	0.50	ug/L	EPA 8260B	05/08/2012
Ethanol	< 5.0	5.0	ug/L	EPA 8260B	05/08/2012
Ethyl-t-butyl ether (ETBE)	< 0.50	0.50	ug/L	EPA 8260B	05/08/2012
Methanol	< 50	50	ug/L	EPA 8260B	05/08/2012
Methyl-t-butyl ether (MTBE)	< 0.50	0.50	ug/L	EPA 8260B	05/08/2012
Tert-Butanol	< 5.0	5.0	ug/L	EPA 8260B	05/08/2012
Tert-amyl methyl ether (TAME)	< 0.50	0.50	ug/L	EPA 8260B	05/08/2012
TPH as Gasoline	< 50	50	ug/L	EPA 8260B	05/08/2012
1,2-Dibromoethane	< 0.50	0.50	ug/L	EPA 8260B	05/08/2012
1,2-Dichloroethane	< 0.50	0.50	ug/L	EPA 8260B	05/08/2012
Tetrachloroethene	< 0.50	0.50	ug/L	EPA 8260B	05/08/2012
Trichloroethene	< 0.50	0.50	ug/L	EPA 8260B	05/08/2012
1,2-Dichloroethane-d4 (Surr)	102		%	EPA 8260B	05/08/2012
Toluene - d8 (Surr)	97.7		%	EPA 8260B	05/08/2012
Methanol	< 50	50	ug/L	EPA 8260B	05/09/2012

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Nitrate as N	<0.10	0.10	mg/L	EPA 300.0	05/08/2012
Sulfate	<0.50	0.50	mg/L	EPA 300.0	05/08/2012
Ferrous Iron	<0.10	0.10	mg/L	SM 3500-Fe D	05/08/2012

## QC Report : Matrix Spike/ Matrix Spike Duplicate

Project Name : **TESORO LIVERMORE #67076**Project Number : **01LV**

Parameter	Spiked Sample	Sample Value	Spike Level	Spike Dup. Level	Spiked Sample Value	Duplicate Spiked Sample Value	Units	Analysis Method	Date Analyzed	Spiked Sample Percent Recov.	Duplicate Spiked Sample Percent Recov.	Relative Percent Diff.	Spiked Sample Percent Recov. Limit	Relative Percent Diff. Limit
1,2-Dibromoethane	81189-01	<0.50	40.2	40.2	42.0	41.9	ug/L	EPA 8260B	5/8/12	104	104	0.286	80-120	25
1,2-Dichloroethane	81189-01	<0.50	40.0	40.0	41.3	41.1	ug/L	EPA 8260B	5/8/12	103	103	0.379	75.7-122	25
Benzene	81189-01	<0.50	40.0	40.0	40.9	39.5	ug/L	EPA 8260B	5/8/12	102	98.8	3.55	80-120	25
Diisopropyl ether	81189-01	<0.50	39.5	39.5	43.9	43.2	ug/L	EPA 8260B	5/8/12	111	109	1.70	80-120	25
Ethanol	81189-01	<5.0	100	100	118	114	ug/L	EPA 8260B	5/8/12	118	113	4.04	55.1-159	25
Ethyl-tert-butyl ether	81189-01	<0.50	40.0	40.0	41.9	42.1	ug/L	EPA 8260B	5/8/12	105	105	0.573	76.5-120	25
Ethylbenzene	81189-01	1.9	40.0	40.0	45.8	43.6	ug/L	EPA 8260B	5/8/12	110	104	4.98	80-120	25
Methanol	81189-01	<50	1000	1000	1360	1330	ug/L	EPA 8260B	5/8/12	136	133	2.12	53.2-147	25
Methyl-t-butyl ether	81189-01	<0.50	40.0	40.0	40.0	39.8	ug/L	EPA 8260B	5/8/12	100	99.5	0.456	69.7-121	25
P + M Xylene	81189-01	6.0	40.0	40.0	49.1	47.1	ug/L	EPA 8260B	5/8/12	108	103	4.67	76.8-120	25

## QC Report : Matrix Spike/ Matrix Spike Duplicate

Project Name : **TESORO LIVERMORE #67076**Project Number : **01LV**

Parameter	Spiked Sample	Sample Value	Spike Level	Spike Dup. Level	Spiked Sample Value	Duplicate Spiked Sample Value	Units	Analysis Method	Date Analyzed	Spiked Sample Percent Recov.	Duplicate Spiked Sample Percent Recov.	Relative Percent Diff.	Spiked Sample Percent Recov. Limit	Relative Percent Diff. Limit
Tert-Butanol														
	81189-01	<5.0	201	201	207	205	ug/L	EPA 8260B	5/8/12	103	102	0.901	80-120	25
Tert-amyl-methyl ether														
	81189-01	<0.50	39.4	39.4	41.0	41.0	ug/L	EPA 8260B	5/8/12	104	104	0.208	78.9-120	25
Tetrachloroethene														
	81189-01	<0.50	40.0	40.0	42.1	39.5	ug/L	EPA 8260B	5/8/12	105	98.8	6.27	77.0-120	25
Toluene														
	81189-01	0.56	40.0	40.0	42.2	40.3	ug/L	EPA 8260B	5/8/12	104	99.4	4.48	80-120	25
Trichloroethene														
	81189-01	<0.50	40.0	40.0	42.6	40.9	ug/L	EPA 8260B	5/8/12	106	102	4.09	80-120	25
Methanol														
	81186-03	<50	1000	1000	1010	1000	ug/L	EPA 8260B	5/9/12	101	100	0.754	53.2-147	25
Nitrate as N														
	81189-07	1.8	0.500	0.500	2.25	2.27	mg/L	EPA 300.0	5/8/12	92.4	96.5	0.917	85.0-115	10
<b>Sulfate</b>														
	81189-07	67	2.50	2.50	68.7	68.8	mg/L	EPA 300.0	5/8/12	<b>77.1</b>	<b>81.7</b>	0.164	85.0-115	10
Ferrous Iron														
	81189-07	< 0.10	0.252	0.252	0.252	0.253	mg/L	SM 3500-Fe D	5/8/12	95.9	96.3	0.396	70.0-130	25



**QC Report : Laboratory Control Sample (LCS)**Project Name : **TESORO LIVERMORE #67076**Project Number : **01LV**

Parameter	Spike Level	Units	Analysis Method	Date Analyzed	LCS Percent Recov.	LCS Percent Recov. Limit
1,2-Dibromoethane	40.2	ug/L	EPA 8260B	5/8/12	111	80-120
1,2-Dichloroethane	40.0	ug/L	EPA 8260B	5/8/12	109	75.7-122
Benzene	40.0	ug/L	EPA 8260B	5/8/12	107	80-120
Diisopropyl ether	39.5	ug/L	EPA 8260B	5/8/12	118	80-120
Ethanol	100	ug/L	EPA 8260B	5/8/12	114	55.1-159
Ethyl-tert-butyl ether	40.0	ug/L	EPA 8260B	5/8/12	116	76.5-120
Ethylbenzene	40.0	ug/L	EPA 8260B	5/8/12	116	80-120
Methanol	1000	ug/L	EPA 8260B	5/8/12	125	53.2-147
Methyl-t-butyl ether	40.0	ug/L	EPA 8260B	5/8/12	112	69.7-121
P + M Xylene	40.0	ug/L	EPA 8260B	5/8/12	113	76.8-120
TPH as Gasoline	507	ug/L	EPA 8260B	5/8/12	109	70.0-130
Tert-Butanol	201	ug/L	EPA 8260B	5/8/12	110	80-120
Tert-amyl-methyl ether	39.4	ug/L	EPA 8260B	5/8/12	117	78.9-120
Tetrachloroethene	40.0	ug/L	EPA 8260B	5/8/12	112	77.0-120
Toluene	40.0	ug/L	EPA 8260B	5/8/12	110	80-120
Trichloroethene	40.0	ug/L	EPA 8260B	5/8/12	112	80-120
Methanol	1000	ug/L	EPA 8260B	5/9/12	98.9	53.2-147
Nitrate as N	0.500	mg/L	EPA 300.0	5/8/12	96.0	85.0-115
Sulfate	2.50	mg/L	EPA 300.0	5/8/12	91.8	85.0-115

**QC Report : Laboratory Control Sample (LCS)**

Project Name : **TESORO LIVERMORE #67076**

Project Number : **01LV**

Parameter	Spike Level	Units	Analysis Method	Date Analyzed	LCS Percent Recov.	LCS Percent Recov. Limit
Ferrous Iron	0.252	mg/L	SM 3500-Fe D	5/8/12	97.0	70.0-130



2795 2nd Street, Suite 300  
 Davis, CA 95618  
 Lab: 530.297.4800  
 Fax: 530.297.4802

SRG # / Lab No.

81189

Page 1 of 1

Project Contact (Hardcopy or PDF To): **MATTHEW NELSON**

Company / Address: **3450 E. Spring St. #212 Long Beach, CA**

Phone Number: **562-988-2755**

Fax Number: **562-988-2759**

Project #: **01LV** P.O. #:

California EDF Report?  Yes  No

Sampling Company Log Code: **EFSP**

Global ID: **T0600101410**

EDF Deliverable To (Email Address): **mnelson@drionenv.com**

Bill to:

Project Name: **Tesoro Livermore # 67076**

Sampler Print Name: **Chris Arroyo**

Sampler Signature: *Chris Arroyo*

Project Address:  
**1619 First Street  
 Livermore, CA**

Sampling	Container	Preservative	Matrix
	40 ml VOA Sleeve Poly Glass Tedlar	HCl HNO <sub>3</sub> None H <sub>2</sub> SO <sub>4</sub>	Water Soil Air

Sample Designation	Date	Time	40 ml VOA	Sleeve	Poly	Glass	Tedlar	HCl	HNO <sub>3</sub>	None	H <sub>2</sub> SO <sub>4</sub>	Water	Soil	Air	MTBE @ 0.5 ppb (EPA 8260B)	BTEX (EPA 8260B)	TPH Gas (EPA 8260B)	5 Oxygenates (MTBE, DIPE, ETBE, TAME, TBA) (EPA 8260B)	7 Oxygenates (5 oxy + EIOH, MeOH) (EPA 8260B)	Lead Scav. (1,2 DCA & 1,2 EDB) (EPA 8260B)	Volatile Halocarbons (EPA 8260B)	Volatile Organics Full List (EPA 8260B)	Volatile Organics (EPA 524.2 Drinking Water)	TPH as Diesel (EPA 8015M)	TPH as Motor Oil (EPA 8015M)	Total Organic Carbon	CAM 17 Metals (EPA 200.7 / 6010)	5 Waste Oil Metals (Cd, Cr, Ni, Pb, Zn) (EPA 200.7 / 6010)	Mercury (EPA 245.1-7470-7474) COD (410.4)	Total Lead (EPA 200.7-6010) BOD (SM 5210B)	Wet Lead (EPA 200.7-6010) Fe (as Iron) (SM 3500-Fe-D)	TCF and PCE	Methane	Nitrate and Sulfate (300.0)	Alkalinity Total (SM 2320B)	TAT	
MW-3	5/7/12	1050	3					3				X			X	X	X	X	X																		<input type="checkbox"/> 12 hr
MW-8	5/7/12	1040	3					3				X			X	X	X	X	X																	<input type="checkbox"/> 24 hr	
MW-10	5/7/12	1110	3					3				X			X	X	X	X	X																	<input type="checkbox"/> 48 hr	
VW-2	5/7/12	1135	3					3				X			X	X	X	X	X																	<input type="checkbox"/> 72 hr	
TP-2	5/7/12	1215	3					3				X			X	X	X	X	X																	<input type="checkbox"/> 1 wk	
DW-4	5/7/12	1400	3					3				X			X	X	X	X	X														X				
MW-4	5/7/12	1410	5	2	1			5	2	1					X	X	X	X	X				X		X	X	X	X	X	X	X	X	X	X			

Chain-of-Custody Record and Analysis Request

Analysis Request

CIRCLE METHOD

For Lab Use Only

Relinquished by: *Chris Arroyo* Date: 5/7/12 Time: 1509 Received by: \_\_\_\_\_

Relinquished by: \_\_\_\_\_ Date: \_\_\_\_\_ Time: \_\_\_\_\_ Received by: \_\_\_\_\_

Relinquished by: \_\_\_\_\_ Date: 050712 Time: 1509 Received by Laboratory: *John White* KIFF Analytical

Remarks:

**SAMPLE RECEIPT CHECKLIST**

RECEIVER  
LJR  
Initials

SRG#: 81189 Date: 050712

Project ID: Tesoro Livermore #67076

Method of Receipt:  Courier  Over-the-counter  Shipper

**COC Inspection**

Is COC present?  Yes  No  
 Custody seals on shipping container?  Intact  Broken  Not present  N/A  
 Is COC Signed by Relinquisher?  Yes  No Dated?  Yes  No  
 Is sampler name legibly indicated on COC?  Yes  No  
 Is analysis or hold requested for all samples?  Yes  No  
 Is the turnaround time indicated on COC?  Yes  No  
 Is COC free of whiteout and uninitialed cross-outs?  Yes  No, Whiteout  No, Cross-outs

**Sample Inspection**

Coolant Present:  Yes  No (includes water)  
 Temperature °C 13.6 Therm. ID# FR-4 Initial LJR Date/Time 050712/1719  N/A  
 Are there custody seals on sample containers?  Intact  Broken  Not present  
 Do containers match COC?  Yes  No  No, COC lists absent sample(s)  No, Extra sample(s) present  
 Are there samples matrices other than soil, water, air or carbon?  Yes  No  
 Are any sample containers broken, leaking or damaged?  Yes  No  
 Are preservatives indicated?  Yes, on sample containers  Yes, on COC  Not indicated  N/A  
 Are preservatives correct for analyses requested?  Yes  No  N/A  
 Are samples within holding time for analyses requested?  Yes  No  
 Are the correct sample containers used for the analyses requested?  Yes  No  
 Is there sufficient sample to perform testing?  Yes  No  
 Does any sample contain product, have strong odor or are otherwise suspected to be hot?  Yes  No

**Receipt Details**

Matrix WA Container type VOA # of containers received 23  
 Matrix WA Container type glass # of containers received 1  
 Matrix WA Container type poly # of containers received 2  
 Date and Time Sample Put into Temp Storage Date: 050712 Time: 1723

**Quicklog**

Are the Sample ID's indicated:  On COC  On sample container(s)  On Both  Not indicated  
 If Sample ID's are listed on both COC and containers, do they all match?  Yes  No  N/A  
 Is the Project ID indicated:  On COC  On sample container(s)  On Both  Not indicated  
 If project ID is listed on both COC and containers, do they all match?  Yes  No  N/A  
 Are the sample collection dates indicated:  On COC  On sample container(s)  On Both  Not indicated  
 If collection dates are listed on both COC and containers, do they all match?  Yes  No  N/A  
 Are the sample collection times indicated:  On COC  On sample container(s)  On Both  Not indicated  
 If collection times are listed on both COC and containers, do they all match?  Yes  No  N/A

COMMENTS: Sample -07 is a water sample. LTR050712-1725  
TOT of Client Services spoke with P. Ardyo of EFS. As no  
1 liter poly was received for -07, the BOD analysis requested  
for this sample will not be logged in for this project. MAS  
050812 ~~0724~~ 0724



# Subcontract Laboratory Report Attachments



# CALSCIENCE

WORK ORDER NUMBER: 12-05-0575

*The difference is service*



AIR | SOIL | WATER | MARINE CHEMISTRY

## Analytical Report For

**Client:** Kiff Analytical

**Client Project Name:** Tesoro Livermore #67076

**Attention:** Joel Kiff  
2795 2nd Street, Suite 300  
Davis, CA 95616-6593

*Amanda Porter*

Approved for release on 05/14/2012 by:  
Amanda Porter  
Project Manager

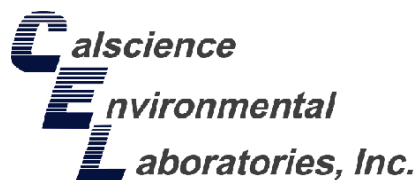
ResultLink ▶

Email your PM ▶



Calscience Environmental Laboratories, Inc. (Calscience) certifies that the test results provided in this report meet all NELAC requirements for parameters for which accreditation is required or available. Any exceptions to NELAC requirements are noted in the case narrative. The original report of subcontracted analyses, if any, is attached to this report. The results in this report are limited to the sample(s) tested and any reproduction thereof must be made in its entirety. The client or recipient of this report is specifically prohibited from making material changes to said report and, to the extent that such changes are made, Calscience is not responsible, legally or otherwise. The client or recipient agrees to indemnify Calscience for any defense to any litigation which may arise.





## Contents

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Work Order Number: 12-05-0575

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**Analytical Report**



Kiff Analytical  
 2795 2nd Street, Suite 300  
 Davis, CA 95616-6593

Date Received: 05/08/12  
 Work Order No: 12-05-0575  
 Preparation: N/A  
 Method: RSK-175M

Project: Tesoro Livermore #67076

Page 1 of 1

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
MW-4	12-05-0575-1-A	05/07/12 14:10	Aqueous	GC 52	N/A	05/09/12 12:45	120509L01

<u>Parameter</u>	<u>Result</u>	<u>RL</u>	<u>DF</u>	<u>Qual</u>	<u>Units</u>
Methane	ND	1.00	1		ug/L

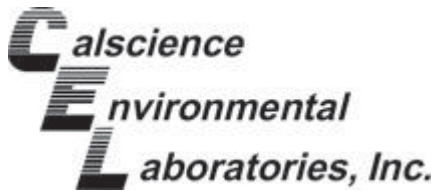
Method Blank	099-12-663-1,596	N/A	Aqueous	GC 52	N/A	05/09/12 12:14	120509L01
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<u>Parameter</u>	<u>Result</u>	<u>RL</u>	<u>DF</u>	<u>Qual</u>	<u>Units</u>
Methane	ND	1.00	1		ug/L

Return to Contents

RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers





Analytical Report



Kiff Analytical  
2795 2nd Street, Suite 300  
Davis, CA 95616-6593

Date Received: 05/08/12  
Work Order No: 12-05-0575

Project: Tesoro Livermore #67076

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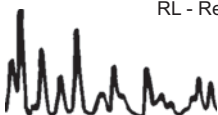
Client Sample Number	Lab Sample Number	Date Collected	Matrix
MW-4	12-05-0575-1	05/07/12	Aqueous

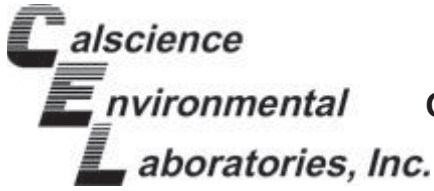
Parameter	Results	RL	DF	Qual	Units	Date Prepared	Date Analyzed	Method
Chemical Oxygen Demand	6.0	5.0	1		mg/L	05/11/12	05/11/12	EPA 410.4
Alkalinity, Total (as CaCO3)	490	5.00	1		mg/L	N/A	05/08/12	SM 2320B
Carbon, Total Organic	32	2.5	5		mg/L	05/09/12	05/09/12	SM 5310 D
<b>Method Blank</b>					<b>N/A</b>			<b>Aqueous</b>

Parameter	Results	RL	DF	Qual	Units	Date Prepared	Date Analyzed	Method
Chemical Oxygen Demand	ND	5.0	1		mg/L	05/11/12	05/11/12	EPA 410.4
Alkalinity, Total (as CaCO3)	ND	1.0	1		mg/L	N/A	05/08/12	SM 2320B
Carbon, Total Organic	ND	0.50	1		mg/L	05/09/12	05/09/12	SM 5310 D

Return to Contents

RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers





Quality Control - Spike/Spike Duplicate



Kiff Analytical  
 2795 2nd Street, Suite 300  
 Davis, CA 95616-6593

Date Received: N/A  
 Work Order No: 12-05-0575

Project: Tesoro Livermore #67076

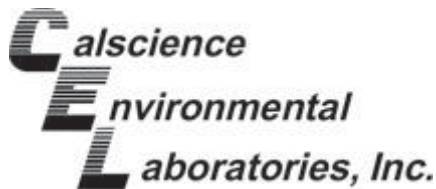
Matrix: Aqueous or Solid

<u>Parameter</u>	<u>Method</u>	<u>Quality Control Sample ID</u>	<u>Date Analyzed</u>	<u>Date Extracted</u>	<u>MS% REC</u>	<u>MSD % REC</u>	<u>%REC CL</u>	<u>RPD</u>	<u>RPD CL</u>	<u>Qualifiers</u>
Carbon, Total Organic	SM 5310 D	12-05-0659-2	05/09/12	5/9/12	84	83	75-125	0	0-25	

Return to Contents

RPD - Relative Percent Difference , CL - Control Limit





Quality Control - Duplicate



Kiff Analytical  
 2795 2nd Street, Suite 300  
 Davis, CA 95616-6593

Date Received: N/A  
 Work Order No: 12-05-0575

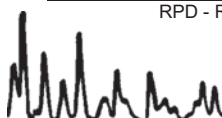
Project: Tesoro Livermore #67076

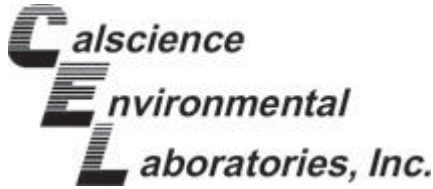
Matrix: Aqueous or Solid

<u>Parameter</u>	<u>Method</u>	<u>QC Sample ID</u>	<u>Date Analyzed</u>	<u>Sample Conc.</u>	<u>DUP Conc.</u>	<u>RPD</u>	<u>RPD CL</u>	<u>Qualifiers</u>
Alkalinity, Total (as CaCO <sub>3</sub> )	SM 2320B	12-05-0528-1	05/08/12	103	103	0	0-25	
Chemical Oxygen Demand	EPA 410.4	MW-4	05/11/12	6.0	7.0	15	0-25	

Return to Contents

RPD - Relative Percent Difference , CL - Control Limit





Quality Control - LCS/LCS Duplicate



Kiff Analytical  
2795 2nd Street, Suite 300  
Davis, CA 95616-6593

Date Received: N/A  
Work Order No: 12-05-0575  
Preparation: N/A  
Method: RSK-175M

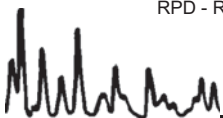
Project: Tesoro Livermore #67076

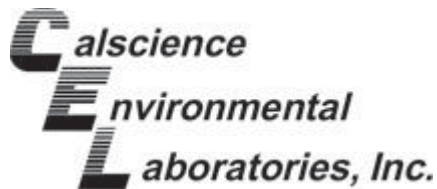
Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number
099-12-663-1,596	Aqueous	GC 52	N/A	05/09/12	120509L01

Parameter	SPIKE ADDED	LCS %REC	LCSD %REC	%REC CL	RPD	RPD CL	Qualifiers
Methane	100.0	97	96	79-109	1	0-20	

Return to Contents

RPD - Relative Percent Difference , CL - Control Limit





Quality Control - LCS/LCS Duplicate



Kiff Analytical  
 2795 2nd Street, Suite 300  
 Davis, CA 95616-6593

Date Received: N/A  
 Work Order No: 12-05-0575

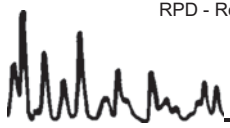
Project: Tesoro Livermore #67076

Matrix: Aqueous or Solid

<u>Parameter</u>	<u>Method</u>	<u>Quality Control</u> Sample ID	<u>Date</u> <u>Extracted</u>	<u>Date</u> <u>Analyzed</u>	<u>LCS %</u> <u>REC</u>	<u>LCSD %</u> <u>REC</u>	<u>%REC</u> <u>CL</u>	<u>RPD</u>	<u>RPD</u> <u>CL</u>	<u>Qual</u>
Carbon, Total Organic	SM 5310 D	099-05-097-4,604	05/09/12	05/09/12	101	100	80-120	1	0-20	

Return to Contents

RPD - Relative Percent Difference , CL - Control Limit



Work Order Number: 12-05-0575

<u>Qualifier</u>	<u>Definition</u>
*	See applicable analysis comment.
<	Less than the indicated value.
>	Greater than the indicated value.
1	Surrogate compound recovery was out of control due to a required sample dilution. Therefore, the sample data was reported without further clarification.
2	Surrogate compound recovery was out of control due to matrix interference. The associated method blank surrogate spike compound was in control and, therefore, the sample data was reported without further clarification.
3	Recovery of the Matrix Spike (MS) or Matrix Spike Duplicate (MSD) compound was out of control due to matrix interference. The associated LCS and/or LCSD was in control and, therefore, the sample data was reported without further clarification.
4	The MS/MSD RPD was out of control due to matrix interference. The LCS/LCSD RPD was in control and, therefore, the sample data was reported without further clarification.
5	The PDS/PDSD or PES/PESD associated with this batch of samples was out of control due to a matrix interference effect. The associated batch LCS/LCSD was in control and, hence, the associated sample data was reported without further clarification.
6	Surrogate recovery below the acceptance limit.
7	Surrogate recovery above the acceptance limit.
B	Analyte was present in the associated method blank.
BU	Sample analyzed after holding time expired.
E	Concentration exceeds the calibration range.
ET	Sample was extracted past end of recommended max. holding time.
HD	The chromatographic pattern was inconsistent with the profile of the reference fuel standard.
HDH	The sample chromatographic pattern for TPH matches the chromatographic pattern of the specified standard but heavier hydrocarbons were also present (or detected).
HDL	The sample chromatographic pattern for TPH matches the chromatographic pattern of the specified standard but lighter hydrocarbons were also present (or detected).
J	Analyte was detected at a concentration below the reporting limit and above the laboratory method detection limit. Reported value is estimated.
ME	LCS/LCSD Recovery Percentage is within Marginal Exceedance (ME) Control Limit range.
ND	Parameter not detected at the indicated reporting limit.
Q	Spike recovery and RPD control limits do not apply resulting from the parameter concentration in the sample exceeding the spike concentration by a factor of four or greater.
SG	The sample extract was subjected to Silica Gel treatment prior to analysis.
X	% Recovery and/or RPD out-of-range.
Z	Analyte presence was not confirmed by second column or GC/MS analysis.

Solid - Unless otherwise indicated, solid sample data is reported on a wet weight basis, not corrected for % moisture. All QC results are reported on a wet weight basis.

MPN - Most Probable Number





2795 Second Street, Suite 300  
 Davis, CA 95618  
 Lab: 530.297.4800  
 Fax: 530.297.4808

Calscience  
 7440 Lincoln Way  
 Garden Grove, CA 92841-1427  
 714-895-5494

**12-05-0575**  
 COC No. **81189** Page 1 of 1

Project Contact (Hardcopy or PDF to): <b>Scott Forbes</b>		EDF Report? <b>YES</b>		<b>Chain-of-Custody Record and Analysis Request</b>												
Company/Address: <b>Kiff Analytical</b>		Recommended but not mandatory to complete this section: Sampling Company Log Code: <b>EFSP</b>		<b>Analysis Request</b>										<b>TAT</b>		
Phone No.: <b>530-297-4800</b>	FAX No.: <b>530-297-4808</b>	Global ID: <b>T0600101410</b>														
Project Number: <b>01LV</b>	P.O. No.: <b>81189</b>	Deliverables to (Email Address): <b>inbox@kiffanalytical.com</b>														
Project Name: <b>TESORO LIVERMORE #67076</b>		<b>Container / Preservative</b>				<b>Matrix</b>										
Project Address:		<b>Sampling</b>		250ml Glass H2SO4		Water		Alkalinity SM 2320 (1)				4-Days		For Lab Use Only		
<b>Sample Designation</b>		<b>Date</b>	<b>Time</b>	250ml Poly None	VOA 40 ml HCl											
<b>MW-4</b>	<b>05/07/12</b>	<b>14:10</b>	<b>1</b>	<b>2</b>	<b>2</b>											
Relinquished by: <i>[Signature]</i> Kiff Analytical LLC	Date <b>05/07/12</b>	Time <b>1800</b>	Received by:		Remarks: Please refer to attached Test Detail.											
Relinquished by:	Date	Time	Received by:													
Relinquished by:	Date <b>5/8/12</b>	Time <b>1000</b>	Received by Laboratory <i>[Signature]</i>		Bill to: <b>Accounts Payable</b>											

OSTS

## Test Detail for Kiff Work Order: 81189

**Alkalinity SM 2320 (1)**  
Alkalinity, Total (as CaCO<sub>3</sub>)

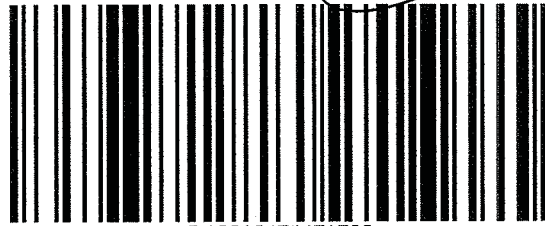
**Hydrocarbons in Water by RSK 175 (1)**  
Methane



0575



**800.334.5000**  
ontrac.com



D10010474451790

Date Printed 5/7/2012

Tracking#D10010474451790

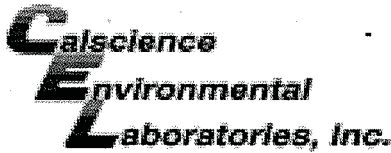
*Shipped From:*  
KIFF ANALYTICAL  
2795 2ND STREET 300  
DAVIS, CA 95616

*Sent By:* SAMPLE RECEIVING  
*Phone#:* (530)297-4800  
*wgt(lbs):* 1  
*Reference:* SUBS 81183, 92, 89  
*Reference 2:* CLASS 600

*Ship To Company:*  
**CALSCIENCE ENVIRONMENTAL LABS**  
**7440 LINCOLN WAY**  
**GARDEN GROVE, CA 92841**  
**SAMPLE RECEIVING (714)895-5494**

*Service:* **S**  
*Sort Code:* **ORG**  
*Special Services:*  
**Signature Required**

Return to Contents



WORK ORDER #: 12-05-0575

SAMPLE RECEIPT FORM

Cooler 1 of 1

CLIENT: Kiff

DATE: 05/08/12

TEMPERATURE: Thermometer ID: SC2 (Criteria: 0.0°C - 6.0°C, not frozen)

Temperature 2.8°C - 0.3°C (CF) = 2.5°C [X] Blank [ ] Sample

[ ] Sample(s) outside temperature criteria (PM/APM contacted by: \_\_\_\_\_).

[ ] Sample(s) outside temperature criteria but received on ice/chilled on same day of sampling.

[ ] Received at ambient temperature, placed on ice for transport by Courier.

Ambient Temperature: [ ] Air [ ] Filter

Initial: AF

CUSTODY SEALS INTACT:

[X] Cooler [ ] [ ] No (Not Intact) [ ] Not Present [ ] N/A

Initial: JP

[ ] Sample [ ] [ ] No (Not Intact) [X] Not Present

Initial: WSc

SAMPLE CONDITION:

Table with 4 columns: Question, Yes, No, N/A. Rows include Chain-Of-Custody (COC) document(s) received with samples, COC document(s) received complete, Sampler's name indicated on COC, Sample container label(s) consistent with COC, etc.

CONTAINER TYPE:

Solid: [ ] 4ozCGJ [ ] 8ozCGJ [ ] 16ozCGJ [ ] Sleeve ( ) [ ] EnCores® [ ] TerraCores® [ ]
Water: [ ] VOA [X] VOAh [ ] VOAna2 [ ] 125AGB [ ] 125AGBh [ ] 125AGBp [ ] 1AGB [ ] 1AGBna2 [ ] 1AGBs
[ ] 500AGB [ ] 500AGJ [ ] 500AGJs [ ] 250AGB [ ] 250CGB [X] 250CGBs [ ] 1PB [ ] 1PBna [ ] 500PB
[X] 250PB [ ] 250PBn [ ] 125PB [ ] 125PBzanna [ ] 100PJ [ ] 100PJna2 [ ] [ ] [ ] [ ]

Air: [ ] Tedlar® [ ] Summa® Other: [ ] Trip Blank Lot#: Labeled/Checked by: WSc

Container: C: Clear A: Amber P: Plastic G: Glass J: Jar B: Bottle Z: Ziploc/Resealable Bag E: Envelope Reviewed by: JL

Preservative: h: HCL n: HNO3 na2:Na2S2O3 na: NaOH p: H3PO4 s: H2SO4 u: Ultra-pure zanna: ZnAc2+NaOH f: Filtered Scanned by: JL



## SAMPLE ANOMALY FORM

**SAMPLES - CONTAINERS & LABELS:**

- Sample(s) NOT RECEIVED but listed on COC
- Sample(s) received but NOT LISTED on COC
- Holding time expired – list sample ID(s) and test
- Insufficient quantities for analysis – list test
- Improper container(s) used – list test
- Improper preservative used – list test
- No preservative noted on COC or label – list test & notify lab
- Sample labels illegible – note test/container type
- Sample label(s) do not match COC – Note in comments
  - Sample ID
  - Date and/or Time Collected
  - Project Information
  - # of Container(s)
    - Analysis
- Sample container(s) compromised – Note in comments
  - Water present in sample container
  - Broken
- Sample container(s) not labeled
- Air sample container(s) compromised – Note in comments
  - Flat
  - Very low in volume
  - Leaking (Not transferred - duplicate bag submitted)
  - Leaking (transferred into Calscience Tedlar® Bag\*)
  - Leaking (transferred into Client's Tedlar® Bag\*)
- Other: \_\_\_\_\_

**Comments:**

(1) received 4 Containers  
 1 X 250ml glass / H<sub>2</sub>SO<sub>4</sub>  
 1 X " plastic / unpreserved  
 2 X Vials / HCL

**HEADSPACE – Containers with Bubble > 6mm or ¼ inch:**

Sample #	Container ID(s)	# of Vials Received	Sample #	Container ID(s)	# of Vials Received	Sample #	Container ID(s)	# of Cont. received	Analysis

Comments: \_\_\_\_\_

\*Transferred at Client's request.

Initial / Date: WS 05/08/12



## Laboratory Results

Matt Nelson  
Orion Environmental  
3450 East Spring Street, Suite 212  
Long Beach, CA 90806

Subject : 10 Water Samples  
Project Name : Tesoro Livermore #67076  
Project Number : 01LV

Dear Mr. Nelson,

Chemical analysis of the samples referenced above has been completed. Summaries of the data are contained on the following pages. Sample(s) were received under documented chain-of-custody. US EPA protocols for sample storage and preservation were followed. Testing procedures comply with the 2003 NELAC and TNI 2009 standards. Laboratory results relate only to the samples tested. This report may be freely reproduced in full, but may only be reproduced in part with the express permission of Kiff Analytical, LLC. Kiff Analytical, LLC is certified by the State of California under the National Environmental Laboratory Accreditation Program (NELAP), lab # 08263CA. If you have any questions regarding procedures or results, please call me at 530-297-4800.

Sincerely,



Troy Turpen

Subject : 10 Water Samples  
Project Name : Tesoro Livermore #67076  
Project Number : 01LV

## Case Narrative

The Method Reporting Limit for Methanol has been increased due to the presence of an interfering compound for samples DW-3 and TP-1.

Matrix Spike/Matrix Spike Duplicate results associated with samples MW-9 and TP-1 for the analytes Benzene, Ethylbenzene, P + M Xylene, and Toluene were affected by the analyte concentrations already present in the un-spiked sample.

Project Name : **Tesoro Livermore #67076**

Project Number : **01LV**

Sample : **IP-3**

Matrix : Water

Lab Number : 81207-02

Sample Date :05/08/2012

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date/Time Analyzed
Benzene	< 0.50	0.50	ug/L	EPA 8260B	05/09/12 12:46
Toluene	< 0.50	0.50	ug/L	EPA 8260B	05/09/12 12:46
Ethylbenzene	< 0.50	0.50	ug/L	EPA 8260B	05/09/12 12:46
Total Xylenes	< 0.50	0.50	ug/L	EPA 8260B	05/09/12 12:46
Methyl-t-butyl ether (MTBE)	< 0.50	0.50	ug/L	EPA 8260B	05/09/12 12:46
Diisopropyl ether (DIPE)	< 0.50	0.50	ug/L	EPA 8260B	05/09/12 12:46
Ethyl-t-butyl ether (ETBE)	< 0.50	0.50	ug/L	EPA 8260B	05/09/12 12:46
Tert-amyl methyl ether (TAME)	< 0.50	0.50	ug/L	EPA 8260B	05/09/12 12:46
Tert-Butanol	< 5.0	5.0	ug/L	EPA 8260B	05/09/12 12:46
Methanol	< 50	50	ug/L	EPA 8260B	05/09/12 12:46
Ethanol	< 5.0	5.0	ug/L	EPA 8260B	05/09/12 12:46
TPH as Gasoline	< 50	50	ug/L	EPA 8260B	05/09/12 12:46
1,2-Dichloroethane	< 0.50	0.50	ug/L	EPA 8260B	05/09/12 12:46
1,2-Dibromoethane	< 0.50	0.50	ug/L	EPA 8260B	05/09/12 12:46
1,2-Dichloroethane-d4 (Surr)	102		% Recovery	EPA 8260B	05/09/12 12:46
Toluene - d8 (Surr)	99.6		% Recovery	EPA 8260B	05/09/12 12:46

Project Name : **Tesoro Livermore #67076**

Project Number : **01LV**

Sample : **IP-4**

Matrix : Water

Lab Number : 81207-03

Sample Date :05/08/2012

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date/Time Analyzed
Benzene	< 0.50	0.50	ug/L	EPA 8260B	05/09/12 13:19
Toluene	< 0.50	0.50	ug/L	EPA 8260B	05/09/12 13:19
Ethylbenzene	< 0.50	0.50	ug/L	EPA 8260B	05/09/12 13:19
Total Xylenes	< 0.50	0.50	ug/L	EPA 8260B	05/09/12 13:19
Methyl-t-butyl ether (MTBE)	< 0.50	0.50	ug/L	EPA 8260B	05/09/12 13:19
Diisopropyl ether (DIPE)	< 0.50	0.50	ug/L	EPA 8260B	05/09/12 13:19
Ethyl-t-butyl ether (ETBE)	< 0.50	0.50	ug/L	EPA 8260B	05/09/12 13:19
Tert-amyl methyl ether (TAME)	< 0.50	0.50	ug/L	EPA 8260B	05/09/12 13:19
Tert-Butanol	< 5.0	5.0	ug/L	EPA 8260B	05/09/12 13:19
Methanol	< 50	50	ug/L	EPA 8260B	05/09/12 13:19
<b>Ethanol</b>	<b>5.3</b>	5.0	ug/L	EPA 8260B	05/09/12 13:19
TPH as Gasoline	< 50	50	ug/L	EPA 8260B	05/09/12 13:19
1,2-Dichloroethane	< 0.50	0.50	ug/L	EPA 8260B	05/09/12 13:19
1,2-Dibromoethane	< 0.50	0.50	ug/L	EPA 8260B	05/09/12 13:19
1,2-Dichloroethane-d4 (Surr)	99.7		% Recovery	EPA 8260B	05/09/12 13:19
Toluene - d8 (Surr)	99.4		% Recovery	EPA 8260B	05/09/12 13:19

Project Name : **Tesoro Livermore #67076**

Project Number : **01LV**

Sample : **IP-5**

Matrix : Water

Lab Number : 81207-04

Sample Date :05/08/2012

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date/Time Analyzed
Benzene	< 0.50	0.50	ug/L	EPA 8260B	05/09/12 13:52
Toluene	< 0.50	0.50	ug/L	EPA 8260B	05/09/12 13:52
Ethylbenzene	< 0.50	0.50	ug/L	EPA 8260B	05/09/12 13:52
Total Xylenes	< 0.50	0.50	ug/L	EPA 8260B	05/09/12 13:52
Methyl-t-butyl ether (MTBE)	< 0.50	0.50	ug/L	EPA 8260B	05/09/12 13:52
Diisopropyl ether (DIPE)	< 0.50	0.50	ug/L	EPA 8260B	05/09/12 13:52
Ethyl-t-butyl ether (ETBE)	< 0.50	0.50	ug/L	EPA 8260B	05/09/12 13:52
Tert-amyl methyl ether (TAME)	< 0.50	0.50	ug/L	EPA 8260B	05/09/12 13:52
Tert-Butanol	< 5.0	5.0	ug/L	EPA 8260B	05/09/12 13:52
Methanol	< 50	50	ug/L	EPA 8260B	05/09/12 13:52
Ethanol	< 5.0	5.0	ug/L	EPA 8260B	05/09/12 13:52
TPH as Gasoline	< 50	50	ug/L	EPA 8260B	05/09/12 13:52
1,2-Dichloroethane	< 0.50	0.50	ug/L	EPA 8260B	05/09/12 13:52
1,2-Dibromoethane	< 0.50	0.50	ug/L	EPA 8260B	05/09/12 13:52
1,2-Dichloroethane-d4 (Surr)	101		% Recovery	EPA 8260B	05/09/12 13:52
Toluene - d8 (Surr)	99.9		% Recovery	EPA 8260B	05/09/12 13:52



Project Name : **Tesoro Livermore #67076**

Project Number : **01LV**

Sample : **IP-6**

Matrix : Water

Lab Number : 81207-05

Sample Date :05/08/2012

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date/Time Analyzed
Benzene	< 0.50	0.50	ug/L	EPA 8260B	05/09/12 14:24
Toluene	< 0.50	0.50	ug/L	EPA 8260B	05/09/12 14:24
Ethylbenzene	< 0.50	0.50	ug/L	EPA 8260B	05/09/12 14:24
Total Xylenes	< 0.50	0.50	ug/L	EPA 8260B	05/09/12 14:24
Methyl-t-butyl ether (MTBE)	< 0.50	0.50	ug/L	EPA 8260B	05/09/12 14:24
Diisopropyl ether (DIPE)	< 0.50	0.50	ug/L	EPA 8260B	05/09/12 14:24
Ethyl-t-butyl ether (ETBE)	< 0.50	0.50	ug/L	EPA 8260B	05/09/12 14:24
Tert-amyl methyl ether (TAME)	< 0.50	0.50	ug/L	EPA 8260B	05/09/12 14:24
Tert-Butanol	< 5.0	5.0	ug/L	EPA 8260B	05/09/12 14:24
Methanol	< 50	50	ug/L	EPA 8260B	05/10/12 01:42
Ethanol	< 5.0	5.0	ug/L	EPA 8260B	05/09/12 14:24
TPH as Gasoline	< 50	50	ug/L	EPA 8260B	05/09/12 14:24
1,2-Dichloroethane	< 0.50	0.50	ug/L	EPA 8260B	05/09/12 14:24
1,2-Dibromoethane	< 0.50	0.50	ug/L	EPA 8260B	05/09/12 14:24
1,2-Dichloroethane-d4 (Surr)	102		% Recovery	EPA 8260B	05/09/12 14:24
Toluene - d8 (Surr)	99.4		% Recovery	EPA 8260B	05/09/12 14:24

Project Name : **Tesoro Livermore #67076**

Project Number : **01LV**

Sample : **MW-5**

Matrix : Water

Lab Number : 81207-06

Sample Date :05/08/2012

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date/Time Analyzed
Benzene	< 0.50	0.50	ug/L	EPA 8260B	05/09/12 14:57
Toluene	< 0.50	0.50	ug/L	EPA 8260B	05/09/12 14:57
Ethylbenzene	< 0.50	0.50	ug/L	EPA 8260B	05/09/12 14:57
Total Xylenes	< 0.50	0.50	ug/L	EPA 8260B	05/09/12 14:57
Methyl-t-butyl ether (MTBE)	< 0.50	0.50	ug/L	EPA 8260B	05/09/12 14:57
Diisopropyl ether (DIPE)	< 0.50	0.50	ug/L	EPA 8260B	05/09/12 14:57
Ethyl-t-butyl ether (ETBE)	< 0.50	0.50	ug/L	EPA 8260B	05/09/12 14:57
Tert-amyl methyl ether (TAME)	< 0.50	0.50	ug/L	EPA 8260B	05/09/12 14:57
Tert-Butanol	< 5.0	5.0	ug/L	EPA 8260B	05/09/12 14:57
Methanol	< 50	50	ug/L	EPA 8260B	05/10/12 02:13
Ethanol	< 5.0	5.0	ug/L	EPA 8260B	05/09/12 14:57
TPH as Gasoline	< 50	50	ug/L	EPA 8260B	05/09/12 14:57
1,2-Dichloroethane	< 0.50	0.50	ug/L	EPA 8260B	05/09/12 14:57
1,2-Dibromoethane	< 0.50	0.50	ug/L	EPA 8260B	05/09/12 14:57
1,2-Dichloroethane-d4 (Surr)	99.7		% Recovery	EPA 8260B	05/09/12 14:57
Toluene - d8 (Surr)	101		% Recovery	EPA 8260B	05/09/12 14:57

Project Name : **Tesoro Livermore #67076**

Project Number : **01LV**

Sample : **IP-7**

Matrix : Water

Lab Number : 81207-07

Sample Date :05/08/2012

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date/Time Analyzed
Benzene	< 0.50	0.50	ug/L	EPA 8260B	05/09/12 15:29
Toluene	< 0.50	0.50	ug/L	EPA 8260B	05/09/12 15:29
Ethylbenzene	< 0.50	0.50	ug/L	EPA 8260B	05/09/12 15:29
Total Xylenes	< 0.50	0.50	ug/L	EPA 8260B	05/09/12 15:29
Methyl-t-butyl ether (MTBE)	< 0.50	0.50	ug/L	EPA 8260B	05/09/12 15:29
Diisopropyl ether (DIPE)	< 0.50	0.50	ug/L	EPA 8260B	05/09/12 15:29
Ethyl-t-butyl ether (ETBE)	< 0.50	0.50	ug/L	EPA 8260B	05/09/12 15:29
Tert-amyl methyl ether (TAME)	< 0.50	0.50	ug/L	EPA 8260B	05/09/12 15:29
Tert-Butanol	< 5.0	5.0	ug/L	EPA 8260B	05/09/12 15:29
Methanol	< 50	50	ug/L	EPA 8260B	05/09/12 15:29
Ethanol	< 5.0	5.0	ug/L	EPA 8260B	05/09/12 15:29
TPH as Gasoline	< 50	50	ug/L	EPA 8260B	05/09/12 15:29
1,2-Dichloroethane	< 0.50	0.50	ug/L	EPA 8260B	05/09/12 15:29
1,2-Dibromoethane	< 0.50	0.50	ug/L	EPA 8260B	05/09/12 15:29
1,2-Dichloroethane-d4 (Surr)	100		% Recovery	EPA 8260B	05/09/12 15:29
Toluene - d8 (Surr)	100		% Recovery	EPA 8260B	05/09/12 15:29

Project Name : **Tesoro Livermore #67076**

Project Number : **01LV**

Sample : **MW-9**

Matrix : Water

Lab Number : 81207-08

Sample Date :05/08/2012

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date/Time Analyzed
Ferrous Iron	< 0.10	0.10	mg/L	SM 3500-Fe D	05/09/12 11:38
Nitrate as N	< 0.10	0.10	mg/L	EPA 300.0	05/09/12 19:47
Sulfate	< 0.50	0.50	mg/L	EPA 300.0	05/09/12 16:49
<b>Benzene</b>	<b>12</b>	0.50	ug/L	EPA 8260B	05/14/12 13:16
<b>Toluene</b>	<b>1.1</b>	0.50	ug/L	EPA 8260B	05/14/12 13:16
<b>Ethylbenzene</b>	<b>9.0</b>	0.50	ug/L	EPA 8260B	05/14/12 13:16
<b>Total Xylenes</b>	<b>3.0</b>	0.50	ug/L	EPA 8260B	05/14/12 13:16
<b>Methyl-t-butyl ether (MTBE)</b>	<b>7.4</b>	0.50	ug/L	EPA 8260B	05/14/12 13:16
Diisopropyl ether (DIPE)	< 0.50	0.50	ug/L	EPA 8260B	05/14/12 13:16
Ethyl-t-butyl ether (ETBE)	< 0.50	0.50	ug/L	EPA 8260B	05/14/12 13:16
Tert-amyl methyl ether (TAME)	< 0.50	0.50	ug/L	EPA 8260B	05/14/12 13:16
<b>Tert-Butanol</b>	<b>8.8</b>	5.0	ug/L	EPA 8260B	05/14/12 13:16
Methanol	< 50	50	ug/L	EPA 8260B	05/14/12 13:16
Ethanol	< 5.0	5.0	ug/L	EPA 8260B	05/14/12 13:16
<b>TPH as Gasoline</b>	<b>2500</b>	50	ug/L	EPA 8260B	05/14/12 13:16
1,2-Dichloroethane	< 0.50	0.50	ug/L	EPA 8260B	05/14/12 13:16
1,2-Dibromoethane	< 0.50	0.50	ug/L	EPA 8260B	05/14/12 13:16
1,2-Dichloroethane-d4 (Surr)	97.8		% Recovery	EPA 8260B	05/14/12 13:16
Toluene - d8 (Surr)	95.4		% Recovery	EPA 8260B	05/14/12 13:16

Project Name : **Tesoro Livermore #67076**

Project Number : **01LV**

Sample : **IP-2**

Matrix : Water

Lab Number : 81207-09

Sample Date :05/08/2012

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date/Time Analyzed
<b>Benzene</b>	<b>10</b>	0.50	ug/L	EPA 8260B	05/09/12 16:02
<b>Toluene</b>	<b>4.8</b>	0.50	ug/L	EPA 8260B	05/09/12 16:02
<b>Ethylbenzene</b>	<b>6.3</b>	0.50	ug/L	EPA 8260B	05/09/12 16:02
<b>Total Xylenes</b>	<b>13</b>	0.50	ug/L	EPA 8260B	05/09/12 16:02
<b>Methyl-t-butyl ether (MTBE)</b>	<b>2.4</b>	0.50	ug/L	EPA 8260B	05/09/12 16:02
Diisopropyl ether (DIPE)	< 0.50	0.50	ug/L	EPA 8260B	05/09/12 16:02
Ethyl-t-butyl ether (ETBE)	< 0.50	0.50	ug/L	EPA 8260B	05/09/12 16:02
Tert-amyl methyl ether (TAME)	< 0.50	0.50	ug/L	EPA 8260B	05/09/12 16:02
Tert-Butanol	< 5.0	5.0	ug/L	EPA 8260B	05/09/12 16:02
Methanol	< 50	50	ug/L	EPA 8260B	05/09/12 16:02
Ethanol	< 5.0	5.0	ug/L	EPA 8260B	05/09/12 16:02
<b>TPH as Gasoline</b>	<b>340</b>	50	ug/L	EPA 8260B	05/09/12 16:02
1,2-Dichloroethane	< 0.50	0.50	ug/L	EPA 8260B	05/09/12 16:02
1,2-Dibromoethane	< 0.50	0.50	ug/L	EPA 8260B	05/09/12 16:02
1,2-Dichloroethane-d4 (Surr)	100		% Recovery	EPA 8260B	05/09/12 16:02
Toluene - d8 (Surr)	99.7		% Recovery	EPA 8260B	05/09/12 16:02

Project Name : **Tesoro Livermore #67076**

Project Number : **01LV**

Sample : **DW-3**

Matrix : Water

Lab Number : 81207-10

Sample Date :05/08/2012

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date/Time Analyzed
<b>Benzene</b>	<b>1.2</b>	0.50	ug/L	EPA 8260B	05/09/12 16:34
Toluene	< 0.50	0.50	ug/L	EPA 8260B	05/09/12 16:34
<b>Ethylbenzene</b>	<b>5.4</b>	0.50	ug/L	EPA 8260B	05/09/12 16:34
<b>Total Xylenes</b>	<b>4.5</b>	0.50	ug/L	EPA 8260B	05/09/12 16:34
Methyl-t-butyl ether (MTBE)	< 0.50	0.50	ug/L	EPA 8260B	05/09/12 16:34
Diisopropyl ether (DIPE)	< 0.50	0.50	ug/L	EPA 8260B	05/09/12 16:34
Ethyl-t-butyl ether (ETBE)	< 0.50	0.50	ug/L	EPA 8260B	05/09/12 16:34
Tert-amyl methyl ether (TAME)	< 0.50	0.50	ug/L	EPA 8260B	05/09/12 16:34
Tert-Butanol	< 5.0	5.0	ug/L	EPA 8260B	05/09/12 16:34
Methanol	< 80	80	ug/L	EPA 8260B	05/09/12 16:34
Ethanol	< 5.0	5.0	ug/L	EPA 8260B	05/09/12 16:34
<b>TPH as Gasoline</b>	<b>750</b>	50	ug/L	EPA 8260B	05/09/12 16:34
1,2-Dichloroethane	< 0.50	0.50	ug/L	EPA 8260B	05/09/12 16:34
1,2-Dibromoethane	< 0.50	0.50	ug/L	EPA 8260B	05/09/12 16:34
1,2-Dichloroethane-d4 (Surr)	99.1		% Recovery	EPA 8260B	05/09/12 16:34
Toluene - d8 (Surr)	99.5		% Recovery	EPA 8260B	05/09/12 16:34

Project Name : **Tesoro Livermore #67076**

Project Number : **01LV**

Sample : **TP-1**

Matrix : Water

Lab Number : 81207-11

Sample Date :05/08/2012

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date/Time Analyzed
<b>Benzene</b>	<b>1.6</b>	0.50	ug/L	EPA 8260B	05/14/12 12:44
Toluene	< 0.50	0.50	ug/L	EPA 8260B	05/14/12 12:44
<b>Ethylbenzene</b>	<b>7.1</b>	0.50	ug/L	EPA 8260B	05/14/12 12:44
<b>Total Xylenes</b>	<b>22</b>	0.50	ug/L	EPA 8260B	05/14/12 12:44
<b>Methyl-t-butyl ether (MTBE)</b>	<b>28</b>	0.50	ug/L	EPA 8260B	05/14/12 12:44
Diisopropyl ether (DIPE)	< 0.50	0.50	ug/L	EPA 8260B	05/14/12 12:44
Ethyl-t-butyl ether (ETBE)	< 0.50	0.50	ug/L	EPA 8260B	05/14/12 12:44
Tert-amyl methyl ether (TAME)	< 0.50	0.50	ug/L	EPA 8260B	05/14/12 12:44
<b>Tert-Butanol</b>	<b>27</b>	5.0	ug/L	EPA 8260B	05/14/12 12:44
Methanol	< 80	80	ug/L	EPA 8260B	05/14/12 12:44
Ethanol	< 5.0	5.0	ug/L	EPA 8260B	05/14/12 12:44
<b>TPH as Gasoline</b>	<b>590</b>	50	ug/L	EPA 8260B	05/14/12 12:44
1,2-Dichloroethane	< 0.50	0.50	ug/L	EPA 8260B	05/14/12 12:44
1,2-Dibromoethane	< 0.50	0.50	ug/L	EPA 8260B	05/14/12 12:44
1,2-Dichloroethane-d4 (Surr)	100		% Recovery	EPA 8260B	05/14/12 12:44
Toluene - d8 (Surr)	96.1		% Recovery	EPA 8260B	05/14/12 12:44

**QC Report : Method Blank Data**

Project Name : **Tesoro Livermore #67076**

Project Number : **01LV**

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Methanol	< 50	50	ug/L	EPA 8260B	05/09/2012
Benzene	< 0.50	0.50	ug/L	EPA 8260B	05/14/2012
Ethylbenzene	< 0.50	0.50	ug/L	EPA 8260B	05/14/2012
Toluene	< 0.50	0.50	ug/L	EPA 8260B	05/14/2012
Total Xylenes	< 0.50	0.50	ug/L	EPA 8260B	05/14/2012
Diisopropyl ether (DIPE)	< 0.50	0.50	ug/L	EPA 8260B	05/14/2012
Ethanol	< 5.0	5.0	ug/L	EPA 8260B	05/14/2012
Ethyl-t-butyl ether (ETBE)	< 0.50	0.50	ug/L	EPA 8260B	05/14/2012
Methanol	< 50	50	ug/L	EPA 8260B	05/14/2012
Methyl-t-butyl ether (MTBE)	< 0.50	0.50	ug/L	EPA 8260B	05/14/2012
Tert-Butanol	< 5.0	5.0	ug/L	EPA 8260B	05/14/2012
Tert-amyl methyl ether (TAME)	< 0.50	0.50	ug/L	EPA 8260B	05/14/2012
TPH as Gasoline	< 50	50	ug/L	EPA 8260B	05/14/2012
1,2-Dibromoethane	< 0.50	0.50	ug/L	EPA 8260B	05/14/2012
1,2-Dichloroethane	< 0.50	0.50	ug/L	EPA 8260B	05/14/2012
1,2-Dichloroethane-d4 (Surr)	101		%	EPA 8260B	05/14/2012
Toluene - d8 (Surr)	99.8		%	EPA 8260B	05/14/2012
Benzene	< 0.50	0.50	ug/L	EPA 8260B	05/09/2012
Ethylbenzene	< 0.50	0.50	ug/L	EPA 8260B	05/09/2012
Toluene	< 0.50	0.50	ug/L	EPA 8260B	05/09/2012
Total Xylenes	< 0.50	0.50	ug/L	EPA 8260B	05/09/2012
Diisopropyl ether (DIPE)	< 0.50	0.50	ug/L	EPA 8260B	05/09/2012
Ethanol	< 5.0	5.0	ug/L	EPA 8260B	05/09/2012
Ethyl-t-butyl ether (ETBE)	< 0.50	0.50	ug/L	EPA 8260B	05/09/2012
Methanol	< 50	50	ug/L	EPA 8260B	05/09/2012
Methyl-t-butyl ether (MTBE)	< 0.50	0.50	ug/L	EPA 8260B	05/09/2012
Tert-Butanol	< 5.0	5.0	ug/L	EPA 8260B	05/09/2012
Tert-amyl methyl ether (TAME)	< 0.50	0.50	ug/L	EPA 8260B	05/09/2012
TPH as Gasoline	< 50	50	ug/L	EPA 8260B	05/09/2012
1,2-Dibromoethane	< 0.50	0.50	ug/L	EPA 8260B	05/09/2012
1,2-Dichloroethane	< 0.50	0.50	ug/L	EPA 8260B	05/09/2012

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
1,2-Dichloroethane-d4 (Surr)	101		%	EPA 8260B	05/09/2012
Toluene - d8 (Surr)	99.9		%	EPA 8260B	05/09/2012
Ferrous Iron	<0.10	0.10	mg/L	SM 3500-Fe D	05/09/2012
Nitrate as N	<0.10	0.10	mg/L	EPA 300.0	05/09/2012
Sulfate	<0.50	0.50	mg/L	EPA 300.0	05/09/2012



**QC Report : Matrix Spike/ Matrix Spike Duplicate**Project Name : **Tesoro Livermore #67076**Project Number : **01LV**

Parameter	Spiked Sample	Sample Value	Spike Level	Spike Dup. Level	Spiked Sample Value	Duplicate Spiked Sample Value	Units	Analysis Method	Date Analyzed	Spiked Sample Percent Recov.	Duplicate Spiked Sample Percent Recov.	Relative Percent Diff.	Spiked Sample Percent Recov. Limit	Relative Percent Diff. Limit
Ferrous Iron	81207-08	< 0.10	0.252	0.252	0.316	0.317	mg/L	SM 3500-Fe D	5/9/12	105	106	0.316	70.0-130	25
Nitrate as N	81203-01	0.13	0.500	0.500	0.578	0.632	mg/L	EPA 300.0	5/9/12	90.1	101	8.90	85.0-115	10
Sulfate	81203-01	6.1	2.50	2.50	8.40	8.53	mg/L	EPA 300.0	5/9/12	91.2	96.3	1.50	85.0-115	10
Methanol	81186-02	74	1000	1000	1230	1160	ug/L	EPA 8260B	5/9/12	116	109	6.19	53.2-147	25
1,2-Dibromoethane	81247-09	<0.50	39.9	39.9	40.8	38.2	ug/L	EPA 8260B	5/14/12	102	95.6	6.66	80-120	25
1,2-Dichloroethane	81247-09	<0.50	40.0	40.0	39.7	36.9	ug/L	EPA 8260B	5/14/12	99.2	92.3	7.22	75.7-122	25
<b>Benzene</b>	81247-09	1200	40.0	40.0	1220	1160	ug/L	EPA 8260B	5/14/12	<b>0.00</b>	<b>0.00</b>	0.00	80-120	25
Diisopropyl ether	81247-09	<0.50	39.5	39.5	41.1	39.3	ug/L	EPA 8260B	5/14/12	104	99.4	4.61	80-120	25

## QC Report : Matrix Spike/ Matrix Spike Duplicate

Project Name : Tesoro Livermore #67076

Project Number : 01LV

Parameter	Spiked Sample	Sample Value	Spike Level	Spike Dup. Level	Spiked Sample Value	Duplicate Spiked Sample Value	Units	Analysis Method	Date Analyzed	Spiked Sample Percent Recov.	Duplicate Spiked Sample Percent Recov.	Relative Percent Diff.	Spiked Sample Percent Recov. Limit	Relative Percent Diff. Limit
Ethanol	81247-09	<5.0	100	100	92.2	103	ug/L	EPA 8260B	5/14/12	92.0	102	10.8	55.1-159	25
Ethyl-tert-butyl ether	81247-09	<0.50	39.8	39.8	38.8	36.5	ug/L	EPA 8260B	5/14/12	97.4	91.7	6.01	76.5-120	25
<b>Ethylbenzene</b>	81247-09	280	40.0	40.0	303	285	ug/L	EPA 8260B	5/14/12	<b>60.5</b>	<b>14.8</b>	<b>122</b>	80-120	25
Methanol	81247-09	<50	1000	1000	1180	1120	ug/L	EPA 8260B	5/14/12	118	112	4.73	53.2-147	25
Methyl-t-butyl ether	81247-09	<0.50	40.0	40.0	38.4	36.4	ug/L	EPA 8260B	5/14/12	96.1	91.1	5.38	69.7-121	25
<b>P + M Xylene</b>	81247-09	290	40.0	40.0	317	297	ug/L	EPA 8260B	5/14/12	<b>73.3</b>	<b>22.3</b>	<b>107</b>	76.8-120	25
Tert-Butanol	81247-09	14	202	202	221	211	ug/L	EPA 8260B	5/14/12	103	97.6	5.12	80-120	25
Tert-amyl-methyl ether	81247-09	<0.50	39.9	39.9	39.2	37.4	ug/L	EPA 8260B	5/14/12	98.1	93.7	4.58	78.9-120	25
<b>Toluene</b>	81247-09	200	40.0	40.0	230	213	ug/L	EPA 8260B	5/14/12	<b>69.7</b>	<b>26.0</b>	<b>91.3</b>	80-120	25

## QC Report : Matrix Spike/ Matrix Spike Duplicate

Project Name : Tesoro Livermore #67076

Project Number : 01LV

Parameter	Spiked Sample	Sample Value	Spike Level	Spike Dup. Level	Spiked Sample Value	Duplicate Spiked Sample Value	Units	Analysis Method	Date Analyzed	Spiked Sample Percent Recov.	Duplicate Spiked Sample Percent Recov.	Relative Percent Diff.	Spiked Sample Percent Recov. Limit	Relative Percent Diff. Limit
1,2-Dibromoethane	81186-04	<0.50	39.9	39.9	41.6	41.5	ug/L	EPA 8260B	5/9/12	104	104	0.143	80-120	25
1,2-Dichloroethane	81186-04	<0.50	40.0	40.0	39.7	40.3	ug/L	EPA 8260B	5/9/12	99.3	101	1.54	75.7-122	25
Benzene	81186-04	<0.50	40.0	40.0	41.3	40.8	ug/L	EPA 8260B	5/9/12	103	102	1.22	80-120	25
Diisopropyl ether	81186-04	<0.50	39.5	39.5	42.1	43.2	ug/L	EPA 8260B	5/9/12	106	109	2.67	80-120	25
Ethanol	81186-04	<5.0	100	100	98.0	90.4	ug/L	EPA 8260B	5/9/12	97.8	90.2	8.06	55.1-159	25
Ethyl-tert-butyl ether	81186-04	<0.50	39.8	39.8	40.0	42.6	ug/L	EPA 8260B	5/9/12	100	107	6.40	76.5-120	25
Ethylbenzene	81186-04	<0.50	40.0	40.0	43.0	41.5	ug/L	EPA 8260B	5/9/12	107	104	3.38	80-120	25
Methanol	81186-04	<50	1000	1000	1070	975	ug/L	EPA 8260B	5/9/12	107	97.5	9.35	53.2-147	25
Methyl-t-butyl ether	81186-04	0.51	40.0	40.0	38.8	44.3	ug/L	EPA 8260B	5/9/12	95.7	110	13.5	69.7-121	25
P + M Xylene	81186-04	<0.50	40.0	40.0	42.3	40.9	ug/L	EPA 8260B	5/9/12	106	102	3.49	76.8-120	25

**QC Report : Matrix Spike/ Matrix Spike Duplicate**Project Name : **Tesoro Livermore #67076**Project Number : **01LV**

Parameter	Spiked Sample	Sample Value	Spike Level	Spike Dup. Level	Spiked Sample Value	Duplicate Spiked Sample Value	Units	Analysis Method	Date Analyzed	Spiked Sample Percent Recov.	Duplicate Spiked Sample Percent Recov.	Relative Percent Diff.	Spiked Sample Percent Recov. Limit	Relative Percent Diff. Limit
Tert-Butanol	81186-04	<5.0	202	202	205	201	ug/L	EPA 8260B	5/9/12	102	99.5	2.16	80-120	25
Tert-amyl-methyl ether	81186-04	<0.50	39.9	39.9	41.5	42.5	ug/L	EPA 8260B	5/9/12	104	106	2.45	78.9-120	25
Toluene	81186-04	<0.50	40.0	40.0	41.4	40.6	ug/L	EPA 8260B	5/9/12	104	101	2.09	80-120	25

## QC Report : Laboratory Control Sample (LCS)

Project Name : **Tesoro Livermore #67076**Project Number : **01LV**

Parameter	Spike Level	Units	Analysis Method	Date Analyzed	LCS Percent Recov.	LCS Percent Recov. Limit
Methanol	995	ug/L	EPA 8260B	5/9/12	121	53.2-147
1,2-Dibromoethane	39.9	ug/L	EPA 8260B	5/14/12	106	80-120
1,2-Dichloroethane	40.0	ug/L	EPA 8260B	5/14/12	103	75.7-122
Benzene	40.0	ug/L	EPA 8260B	5/14/12	97.2	80-120
Diisopropyl ether	39.5	ug/L	EPA 8260B	5/14/12	101	80-120
Ethanol	100	ug/L	EPA 8260B	5/14/12	98.9	55.1-159
Ethyl-tert-butyl ether	39.8	ug/L	EPA 8260B	5/14/12	96.3	76.5-120
Ethylbenzene	40.0	ug/L	EPA 8260B	5/14/12	106	80-120
Methanol	1000	ug/L	EPA 8260B	5/14/12	112	53.2-147
Methyl-t-butyl ether	40.0	ug/L	EPA 8260B	5/14/12	93.1	69.7-121
P + M Xylene	40.0	ug/L	EPA 8260B	5/14/12	103	76.8-120
TPH as Gasoline	507	ug/L	EPA 8260B	5/14/12	110	70.0-130
Tert-Butanol	202	ug/L	EPA 8260B	5/14/12	102	80-120
Tert-amyl-methyl ether	39.9	ug/L	EPA 8260B	5/14/12	98.1	78.9-120
Toluene	40.0	ug/L	EPA 8260B	5/14/12	102	80-120
1,2-Dibromoethane	40.0	ug/L	EPA 8260B	5/9/12	112	80-120
1,2-Dichloroethane	40.1	ug/L	EPA 8260B	5/9/12	106	75.7-122
Benzene	40.1	ug/L	EPA 8260B	5/9/12	110	80-120
Diisopropyl ether	39.6	ug/L	EPA 8260B	5/9/12	114	80-120
Ethanol	100	ug/L	EPA 8260B	5/9/12	107	55.1-159

**QC Report : Laboratory Control Sample (LCS)**Project Name : **Tesoro Livermore #67076**Project Number : **01LV**

Parameter	Spike Level	Units	Analysis Method	Date Analyzed	LCS Percent Recov.	LCS Percent Recov. Limit
Ethyl-tert-butyl ether	39.9	ug/L	EPA 8260B	5/9/12	108	76.5-120
Ethylbenzene	40.1	ug/L	EPA 8260B	5/9/12	113	80-120
Methanol	1000	ug/L	EPA 8260B	5/9/12	121	53.2-147
Methyl-t-butyl ether	40.1	ug/L	EPA 8260B	5/9/12	104	69.7-121
P + M Xylene	40.1	ug/L	EPA 8260B	5/9/12	112	76.8-120
TPH as Gasoline	504	ug/L	EPA 8260B	5/9/12	104	70.0-130
Tert-Butanol	202	ug/L	EPA 8260B	5/9/12	108	80-120
Tert-amyl-methyl ether	40.0	ug/L	EPA 8260B	5/9/12	112	78.9-120
Toluene	40.1	ug/L	EPA 8260B	5/9/12	110	80-120
Ferrous Iron	0.252	mg/L	SM 3500-Fe D	5/9/12	98.2	70.0-130
Nitrate as N	0.500	mg/L	EPA 300.0	5/9/12	97.5	85.0-115
Sulfate	2.50	mg/L	EPA 300.0	5/9/12	93.4	85.0-115





2795 2nd Street, Suite 300  
 Davis, CA 95618  
 Lab: 530.297.4800  
 Fax: 530.297.4802

SRG # / Lab No. 81207

Project Contact (Hardcopy or PDF To): Matthew Nelson  
 Company / Address: Orion Environmental  
3450 E. Spring St. # 212 Long Beach, CA  
 Phone Number: 562-988-2755  
 Fax Number: 562-988-2759  
 Project #: 01LV P.O. #:  
 Project Name: Tesoro Livermore  
#67076  
 California EDF Report?  Yes  No  
 Sampling Company Log Code: EFSP  
 Global ID: T0600101410  
 EDF Deliverable To (Email Address):  
MNELSON@orionenv.com  
 Bill to:  
 Sampler Print Name: Chris Arroyo  
 Sampler Signature: [Signature]

Project Address: <u>1619 First Street</u> <u>Livermore, CA</u>	Sampling		Container				Preservative			Matrix			MTBE @ 0.5 ppb (EPA 8260B)	BTEX (EPA 8260B)	TPH Gas (EPA 8260B)	5 Oxygenates (MTBE, DIPE, ETBE, TAME, TBA) (EPA 8260B)	7 Oxygenates (5 oxy + EtOH, MeOH) (EPA 8260B)	Lead Scav. (1,2 DCA & 1,2 EDB) (EPA 8260B)	Volatile Halocarbons (EPA 8260B)	Volatile Organics Full List (EPA 8260B)	Volatile Organics (EPA 524.2 Drinking Water)	TPH as Diesel (EPA 8015M)	TPH as Motor Oil (EPA 8015M)	CAM 17 Metals (EPA 200.7 / 6010)	5 Waste Oil Metals (Cd, Cr, Ni, Pb, Zn) (EPA 200.7 / 6010)	Mercury (EPA 245.1 / 7470 / 7471)	Total Lead (EPA 200.7 / 6010)	W.E.T. Lead (STLC)	TAT	For Lab Use Only
	Date	Time	40 ml VOA	Sleeve	Poly	Glass	Tedlar	HCl	HNO <sub>3</sub>	None	Water	Soil																		
Sample Designation: <u>TR-1</u>	<u>5/8/12</u>	<u>1440</u>	<u>3</u>					<u>3</u>			<u>X</u>			<u>X</u>	<u>X</u>	<u>X</u>	<u>X</u>											<input type="checkbox"/> 12 hr		
																												<input type="checkbox"/> 24 hr		
																												<input type="checkbox"/> 48 hr		
																												<input type="checkbox"/> 72hr		
																												<input checked="" type="checkbox"/> 1 wk	<u>11</u>	

Relinquished by: [Signature] Date: 5/8/12 Time: 1515 Received by: \_\_\_\_\_  
 Relinquished by: \_\_\_\_\_ Date: \_\_\_\_\_ Time: \_\_\_\_\_ Received by: \_\_\_\_\_  
 Relinquished by: \_\_\_\_\_ Date: 050812 Time: 1515 Received by Laboratory: [Signature] KIFF Analytical LLC

Remarks:



**SAMPLE RECEIPT CHECKLIST**

RECEIVER  
TJB  
Initials

SRG#: 81207 Date: 050812

Project ID: Tesoro Livermore #67076

Method of Receipt:  Courier  Over-the-counter  Shipper

**COC Inspection**

- Is COC present?  Yes  No
- Custody seals on shipping container?  Intact  Broken  Not present  N/A
- Is COC Signed by Relinquisher?  Yes  No Dated?  Yes  No
- Is sampler name legibly indicated on COC?  Yes  No
- Is analysis or hold requested for all samples?  Yes  No
- Is the turnaround time indicated on COC?  Yes  No
- Is COC free of whiteout and uninitialed cross-outs?  Yes  No, Whiteout  No, Cross-outs

**Sample Inspection**

- Coolant Present:  Yes  No (includes water)
  - Temperature °C 4.8 Therm. ID# IR-4 Initial TJB Date/Time 050812/1756  N/A
  - Are there custody seals on sample containers?  Intact  Broken  Not present
  - Do containers match COC?  Yes  No  No, COC lists absent sample(s)  No, Extra sample(s) present
  - Are there samples matrices other than soil, water, air or carbon?  Yes  No
  - Are any sample containers broken, leaking or damaged?  Yes  No
  - Are preservatives indicated?  Yes, on sample containers  Yes, on COC  Not indicated  N/A
  - Are preservatives correct for analyses requested?  Yes  No  N/A
  - Are samples within holding time for analyses requested?  Yes  No
  - Are the correct sample containers used for the analyses requested?  Yes  No
  - Is there sufficient sample to perform testing?  Yes  No
  - Does any sample contain product, have strong odor or are otherwise suspected to be hot?  Yes  No
- Receipt Details
- |                  |                             |                                   |
|------------------|-----------------------------|-----------------------------------|
| Matrix <u>WA</u> | Container type <u>VJA</u>   | # of containers received <u>4</u> |
| Matrix <u>WA</u> | Container type <u>poly</u>  | # of containers received <u>4</u> |
| Matrix <u>WA</u> | Container type <u>Glass</u> | # of containers received <u>1</u> |
- Date and Time Sample Put into Temp Storage Date: 050812 Time: 1801

**Quicklog**

- Are the Sample ID's indicated:  On COC  On sample container(s)  On Both  Not indicated
- If Sample ID's are listed on both COC and containers, do they all match?  Yes  No  N/A
- Is the Project ID indicated:  On COC  On sample container(s)  On Both  Not indicated
- If project ID is listed on both COC and containers, do they all match?  Yes  No  N/A
- Are the sample collection dates indicated:  On COC  On sample container(s)  On Both  Not indicated
- If collection dates are listed on both COC and containers, do they all match?  Yes  No  N/A
- Are the sample collection times indicated:  On COC  On sample container(s)  On Both  Not indicated
- If collection times are listed on both COC and containers, do they all match?  Yes  No  N/A

**COMMENTS:**

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# Subcontract Laboratory Report Attachments



# CALSCIENCE

WORK ORDER NUMBER: 12-05-0659

*The difference is service*



AIR | SOIL | WATER | MARINE CHEMISTRY

## Analytical Report For

**Client:** Kiff Analytical

**Client Project Name:** Tesoro Livermore #67076

**Attention:** Joel Kiff  
2795 2nd Street, Suite 300  
Davis, CA 95616-6593

*Amanda Porter*

Approved for release on 05/15/2012 by:  
Amanda Porter  
Project Manager

ResultLink ▶

Email your PM ▶



Calscience Environmental Laboratories, Inc. (Calscience) certifies that the test results provided in this report meet all NELAC requirements for parameters for which accreditation is required or available. Any exceptions to NELAC requirements are noted in the case narrative. The original report of subcontracted analyses, if any, is attached to this report. The results in this report are limited to the sample(s) tested and any reproduction thereof must be made in its entirety. The client or recipient of this report is specifically prohibited from making material changes to said report and, to the extent that such changes are made, Calscience is not responsible, legally or otherwise. The client or recipient agrees to indemnify Calscience for any defense to any litigation which may arise.





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Client Project Name: Tesoro Livermore #67076  
Work Order Number: 12-05-0659

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	1.2 Combined Inorganic Tests . . . . .	4
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**Analytical Report**



Kiff Analytical  
 2795 2nd Street, Suite 300  
 Davis, CA 95616-6593

Date Received: 05/09/12  
 Work Order No: 12-05-0659  
 Preparation: N/A  
 Method: RSK-175M

Project: Tesoro Livermore #67076

Page 1 of 1

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
MW-9	12-05-0659-2-A	05/08/12 12:45	Aqueous	GC 52	N/A	05/10/12 13:28	120510L01

Parameter	Result	RL	DF	Qual	Units
Methane	87.7	1.00	1		ug/L

Method Blank	099-12-663-1,598-A	N/A	Aqueous	GC 52	N/A	05/10/12 13:00	120510L01
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Parameter	Result	RL	DF	Qual	Units
Methane	ND	1.00	1		ug/L

Return to Contents

RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers

## Analytical Report



Kiff Analytical  
2795 2nd Street, Suite 300  
Davis, CA 95616-6593

Date Received: 05/09/12  
Work Order No: 12-05-0659

Project: Tesoro Livermore #67076

Page 1 of 1

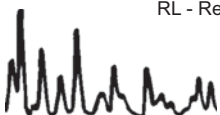
Client Sample Number	Lab Sample Number	Date Collected	Matrix
MW-4	12-05-0659-1	05/07/12	Aqueous

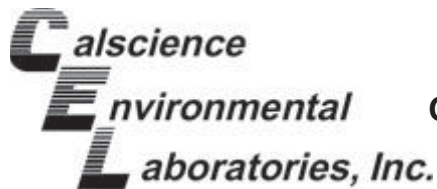
Parameter	Results	RL	DF	Qual	Units	Date Prepared	Date Analyzed	Method
Biochemical Oxygen Demand	2.1	1.0	1		mg/L	05/09/12	05/14/12	SM 5210 B
<b>MW-9</b>								

Parameter	Results	RL	DF	Qual	Units	Date Prepared	Date Analyzed	Method
Chemical Oxygen Demand	21	20	1		mg/L	05/12/12	05/12/12	EPA 410.4
Alkalinity, Total (as CaCO <sub>3</sub> )	346	5.00	1		mg/L	N/A	05/10/12	SM 2320B
Biochemical Oxygen Demand	ND	1.0	1		mg/L	05/09/12	05/14/12	SM 5210 B
Carbon, Total Organic	53	10	20		mg/L	05/09/12	05/09/12	SM 5310 D
<b>Method Blank</b>					<b>N/A</b>			<b>Aqueous</b>

Parameter	Results	RL	DF	Qual	Units	Date Prepared	Date Analyzed	Method
Chemical Oxygen Demand	ND	20	1		mg/L	05/12/12	05/12/12	EPA 410.4
Alkalinity, Total (as CaCO <sub>3</sub> )	ND	1.0	1		mg/L	N/A	05/10/12	SM 2320B
Biochemical Oxygen Demand	ND	1.0	1		mg/L	05/09/12	05/14/12	SM 5210 B
Carbon, Total Organic	ND	0.50	1		mg/L	05/09/12	05/09/12	SM 5310 D

RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers





Quality Control - Spike/Spike Duplicate



Kiff Analytical  
2795 2nd Street, Suite 300  
Davis, CA 95616-6593

Date Received: N/A  
Work Order No: 12-05-0659

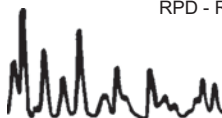
Project: Tesoro Livermore #67076

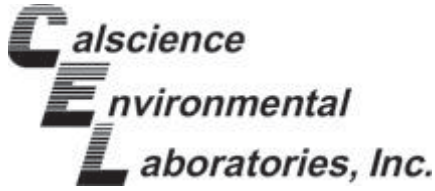
Matrix: Aqueous or Solid

<u>Parameter</u>	<u>Method</u>	<u>Quality Control Sample ID</u>	<u>Date Analyzed</u>	<u>Date Extracted</u>	<u>MS% REC</u>	<u>MSD % REC</u>	<u>%REC CL</u>	<u>RPD</u>	<u>RPD CL</u>	<u>Qualifiers</u>
Carbon, Total Organic	SM 5310 D	MW-9	05/09/12	5/9/12	84	83	75-125	0	0-25	

  
Return to Contents

RPD - Relative Percent Difference , CL - Control Limit





Quality Control - Duplicate



Kiff Analytical  
2795 2nd Street, Suite 300  
Davis, CA 95616-6593

Date Received: N/A  
Work Order No: 12-05-0659

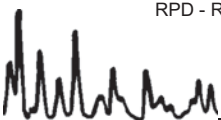
Project: Tesoro Livermore #67076

Matrix: Aqueous or Solid

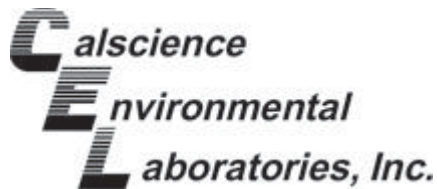
Parameter	Method	QC Sample ID	Date Analyzed	Sample Conc.	DUP Conc.	RPD	RPD CL	Qualifiers
Alkalinity, Total (as CaCO3)	SM 2320B	12-05-0650-5	05/10/12	220	221	0	0-25	
Bicarbonate (as CaCO3)	SM 2320B	12-05-0650-5	05/10/12	220	221	0	0-25	
Carbonate (as CaCO3)	SM 2320B	12-05-0650-5	05/10/12	ND	ND	NA	0-25	
Hydroxide (as CaCO3)	SM 2320B	12-05-0650-5	05/10/12	ND	ND	NA	0-25	
Chemical Oxygen Demand	EPA 410.4	12-05-0580-1	05/12/12	150	140	4	0-25	
Biochemical Oxygen Demand	SM 5210 B	12-05-0699-1	05/14/12	1.7	1.6	6	0-25	

Return to Contents

RPD - Relative Percent Difference , CL - Control Limit







Quality Control - LCS/LCS Duplicate



Kiff Analytical  
 2795 2nd Street, Suite 300  
 Davis, CA 95616-6593

Date Received: N/A  
 Work Order No: 12-05-0659  
 Preparation: N/A  
 Method: RSK-175M

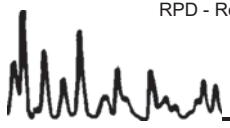
Project: Tesoro Livermore #67076

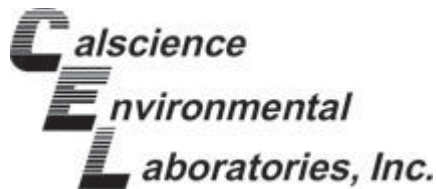
Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number
099-12-663-1,598	Aqueous	GC 52	N/A	05/10/12	120510L01

Parameter	SPIKE ADDED	LCS %REC	LCSD %REC	%REC CL	RPD	RPD CL	Qualifiers
Methane	100.0	96	96	79-109	1	0-20	

Return to Contents

RPD - Relative Percent Difference , CL - Control Limit





Quality Control - LCS/LCS Duplicate



Kiff Analytical  
2795 2nd Street, Suite 300  
Davis, CA 95616-6593

Date Received: N/A  
Work Order No: 12-05-0659

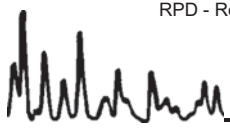
Project: Tesoro Livermore #67076

Matrix: Aqueous or Solid

<u>Parameter</u>	<u>Method</u>	<u>Quality Control</u> Sample ID	<u>Date</u> <u>Extracted</u>	<u>Date</u> <u>Analyzed</u>	<u>LCS %</u> <u>REC</u>	<u>LCSD %</u> <u>REC</u>	<u>%REC</u> <u>CL</u>	<u>RPD</u>	<u>RPD</u> <u>CL</u>	<u>Qual</u>
Carbon, Total Organic	SM 5310 D	099-05-097-4,604	05/09/12	05/09/12	101	100	80-120	1	0-20	

Return to Contents

RPD - Relative Percent Difference , CL - Control Limit



Work Order Number: 12-05-0659

<u>Qualifier</u>	<u>Definition</u>
*	See applicable analysis comment.
<	Less than the indicated value.
>	Greater than the indicated value.
1	Surrogate compound recovery was out of control due to a required sample dilution. Therefore, the sample data was reported without further clarification.
2	Surrogate compound recovery was out of control due to matrix interference. The associated method blank surrogate spike compound was in control and, therefore, the sample data was reported without further clarification.
3	Recovery of the Matrix Spike (MS) or Matrix Spike Duplicate (MSD) compound was out of control due to matrix interference. The associated LCS and/or LCSD was in control and, therefore, the sample data was reported without further clarification.
4	The MS/MSD RPD was out of control due to matrix interference. The LCS/LCSD RPD was in control and, therefore, the sample data was reported without further clarification.
5	The PDS/PDSD or PES/PESD associated with this batch of samples was out of control due to a matrix interference effect. The associated batch LCS/LCSD was in control and, hence, the associated sample data was reported without further clarification.
6	Surrogate recovery below the acceptance limit.
7	Surrogate recovery above the acceptance limit.
B	Analyte was present in the associated method blank.
BU	Sample analyzed after holding time expired.
E	Concentration exceeds the calibration range.
ET	Sample was extracted past end of recommended max. holding time.
HD	The chromatographic pattern was inconsistent with the profile of the reference fuel standard.
HDH	The sample chromatographic pattern for TPH matches the chromatographic pattern of the specified standard but heavier hydrocarbons were also present (or detected).
HDL	The sample chromatographic pattern for TPH matches the chromatographic pattern of the specified standard but lighter hydrocarbons were also present (or detected).
J	Analyte was detected at a concentration below the reporting limit and above the laboratory method detection limit. Reported value is estimated.
ME	LCS/LCSD Recovery Percentage is within Marginal Exceedance (ME) Control Limit range.
ND	Parameter not detected at the indicated reporting limit.
Q	Spike recovery and RPD control limits do not apply resulting from the parameter concentration in the sample exceeding the spike concentration by a factor of four or greater.
SG	The sample extract was subjected to Silica Gel treatment prior to analysis.
X	% Recovery and/or RPD out-of-range.
Z	Analyte presence was not confirmed by second column or GC/MS analysis.

Solid - Unless otherwise indicated, solid sample data is reported on a wet weight basis, not corrected for % moisture. All QC results are reported on a wet weight basis.

MPN - Most Probable Number





0659

## Test Detail for Kiff Work Order: 81207

### **Alkalinity SM 2320 (1)**

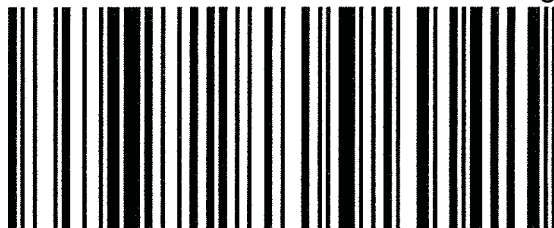
Alkalinity, Total (as CaCO<sub>3</sub>)

### **Hydrocarbons in Water by RSK 175 (1)**

Methane



800.334.5000  
ontrac.com



D10010474847155

Date Printed 5/8/2012

Tracking#D10010474847155

0659

Shipped From:  
KIFF ANALYTICAL  
2795 2ND STREET 300  
DAVIS, CA 95616

Sent By: SAMPLE RECEIVING  
Phone#: (530)297-4800  
wgt(lbs): 1  
Reference: SUB SRG SAMPLES  
Reference 2:

Ship To Company:  
**CALSCIENCE ENVIRONMENTAL**  
**7440 LINCOLN WAY**  
**GARDEN GROVE, CA 92841**  
**RECEIVING (714)895-5494**  
  
**B10207210772**

Service: **S**  
Sort Code: **ORG**  
  
Special Services:  
**Signature Required**

**SAMPLE RECEIPT FORM**

Cooler 1 of 1

CLIENT: Kiff

DATE: 05/09/12

TEMPERATURE: Thermometer ID: SC2 (Criteria: 0.0 °C – 6.0 °C, not frozen)

Temperature 2.2 °C - 0.3 °C (CF) = 1.9 °C  Blank  Sample

Sample(s) outside temperature criteria (PM/APM contacted by: \_\_\_\_\_).

Sample(s) outside temperature criteria but received on ice/chilled on same day of sampling.

Received at ambient temperature, placed on ice for transport by Courier.

Ambient Temperature:  Air  Filter

Initial: JP

**CUSTODY SEALS INTACT:**

Cooler  \_\_\_\_\_  No (Not Intact)  Not Present  N/A

Initial: JP

Sample  \_\_\_\_\_  No (Not Intact)  Not Present

Initial: PS

**SAMPLE CONDITION:**

Chain-Of-Custody (COC) document(s) received with samples.....  Yes  No  N/A

COC document(s) received complete.....  Yes  No  N/A

Collection date/time, matrix, and/or # of containers logged in based on sample labels.

No analysis requested.  Not relinquished.  No date/time relinquished.

Sampler's name indicated on COC.....  Yes  No  N/A

Sample container label(s) consistent with COC.....  Yes  No  N/A

Sample container(s) intact and good condition.....  Yes  No  N/A

Proper containers and sufficient volume for analyses requested.....  Yes  No  N/A

Analyses received within holding time.....  Yes  No  N/A

pH / Res. Chlorine / Diss. Sulfide / Diss. Oxygen received within 24 hours...  Yes  No  N/A

Proper preservation noted on COC or sample container.....  Yes  No  N/A

Unpreserved vials received for Volatiles analysis

Volatile analysis container(s) free of headspace.....  Yes  No  N/A

Tedlar bag(s) free of condensation.....  Yes  No  N/A

**CONTAINER TYPE:**

Solid:  4ozCGJ  8ozCGJ  16ozCGJ  Sleeve (\_\_\_\_)  EnCores®  TerraCores®  \_\_\_\_\_

Water:  VOA  VOAh  VOAna<sub>2</sub>  125AGB  125AGBh  125AGBp  1AGB  1AGBna<sub>2</sub>  1AGBs

500AGB  500AGJ  500AGJs  250AGB  250CGB  250CGBs  1PB  1PBna  500PB

250PB  250PBn  125PB  125PBz<sub>na</sub>  100PJ  100PJna<sub>2</sub>  \_\_\_\_\_  \_\_\_\_\_  \_\_\_\_\_

Air:  Tedlar®  Summa® Other:  \_\_\_\_\_ Trip Blank Lot#: \_\_\_\_\_ Labeled/Checked by: PS

Container: C: Clear A: Amber P: Plastic G: Glass J: Jar B: Bottle Z: Ziploc/Resealable Bag E: Envelope Reviewed by: YL

Preservative: h: HCL n: HNO<sub>3</sub> na<sub>2</sub>: Na<sub>2</sub>S<sub>2</sub>O<sub>3</sub> na: NaOH p: H<sub>3</sub>PO<sub>4</sub> s: H<sub>2</sub>SO<sub>4</sub> u: Ultra-pure z<sub>na</sub>: ZnAc<sub>2</sub>+NaOH f: Filtered Scanned by: YL



## Laboratory Results

Matt Nelson  
Orion Environmental  
3450 East Spring Street, Suite 212  
Long Beach, CA 90806

Subject : 7 Water Samples  
Project Name : Tesoro Livermore #67076  
Project Number : 01LV

Dear Mr. Nelson,

Chemical analysis of the samples referenced above has been completed. Summaries of the data are contained on the following pages. Sample(s) were received under documented chain-of-custody. US EPA protocols for sample storage and preservation were followed. Testing procedures comply with the 2003 NELAC and TNI 2009 standards. Laboratory results relate only to the samples tested. This report may be freely reproduced in full, but may only be reproduced in part with the express permission of Kiff Analytical, LLC. Kiff Analytical, LLC is certified by the State of California under the National Environmental Laboratory Accreditation Program (NELAP), lab # 08263CA. If you have any questions regarding procedures or results, please call me at 530-297-4800.

Sincerely,



Troy Turpen



Subject : 7 Water Samples  
Project Name : Tesoro Livermore #67076  
Project Number : 01LV

## Case Narrative

Page 1 of 2

California Laboratory Services provided analytical testing associated with these samples, but is not accredited by the National Environmental Laboratory Accreditation Program (NELAP). Please refer to the attached subcontract report for a list of this laboratory's current certifications.

The Method Reporting Limit for Methanol has been increased due to the presence of an interfering compound for sample MW-1.

The Method Reporting Limit for Ethanol has been increased due to the presence of an interfering compound for sample IP-10.

Matrix Spike/Matrix Spike Duplicate results associated with samples IP-1, IP-10, IP-8, IP-9 and MW-7 for the analyte Hexavalent Chromium were outside of control limits. This may indicate a bias for the sample that was spiked. Since the LCS recoveries were within control limits, no data are flagged.

Matrix Spike/Matrix Spike Duplicate results associated with sample IP-9 for the analyte Nitrate as N were outside of control limits. This may indicate a bias for the sample that was spiked. Since the LCS recoveries were within control limits, no data are flagged.

The Matrix Spike RPD was outside of control limits for the analyte Hexavalent Chromium associated with samples IP-1, IP-10, IP-8, IP-9 and MW-7.

Matrix Spike/Matrix Spike Duplicate results associated with samples IP-1 and IP-8 for the analytes Ethanol and Methanol were outside of control limits. This may indicate a bias for the sample that was spiked. Since the LCS recoveries were within control limits, no data are flagged.

Matrix Spike/Matrix Spike Duplicate results associated with sample IP-8 for the analyte 1,2-Dichloroethane were outside of control limits. This may indicate a bias for the sample that was spiked. Since the LCS recoveries were within control limits, no data are flagged.

Matrix Spike/Matrix Spike Duplicate results associated with sample IP-9 for the analytes Benzene, Ethylbenzene, P + M Xylene, and Toluene were affected by the analyte concentrations already present in the un-spiked sample.

Matrix Spike/Matrix Spike Duplicate results associated with sample IP-10 for the analyte

Subject : 7 Water Samples  
Project Name : Tesoro Livermore #67076  
Project Number : 01LV

## Case Narrative

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Ethanol were outside of control limits. This may indicate a bias for the sample that was spiked. Since the LCS recoveries were within control limits, no data are flagged. Matrix Spike/Matrix Spike Duplicate results associated with sample IP-9 for the analyte Sodium were affected by the analyte concentrations already present in the un-spiked sample.

Project Name : **Tesoro Livermore #67076**

Project Number : **01LV**

Sample : **MW-1**

Matrix : Water

Lab Number : 81217-01

Sample Date :05/09/2012

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date/Time Analyzed
<b>Benzene</b>	<b>2.2</b>	0.50	ug/L	EPA 8260B	05/10/12 13:29
<b>Toluene</b>	<b>5.5</b>	0.50	ug/L	EPA 8260B	05/10/12 13:29
<b>Ethylbenzene</b>	<b>52</b>	0.50	ug/L	EPA 8260B	05/10/12 13:29
<b>Total Xylenes</b>	<b>89</b>	0.50	ug/L	EPA 8260B	05/10/12 13:29
Methyl-t-butyl ether (MTBE)	< 0.50	0.50	ug/L	EPA 8260B	05/10/12 13:29
Diisopropyl ether (DIPE)	< 0.50	0.50	ug/L	EPA 8260B	05/10/12 13:29
Ethyl-t-butyl ether (ETBE)	< 0.50	0.50	ug/L	EPA 8260B	05/10/12 13:29
Tert-amyl methyl ether (TAME)	< 0.50	0.50	ug/L	EPA 8260B	05/10/12 13:29
Tert-Butanol	< 5.0	5.0	ug/L	EPA 8260B	05/10/12 13:29
Methanol	< 100	100	ug/L	EPA 8260B	05/10/12 13:29
Ethanol	< 5.0	5.0	ug/L	EPA 8260B	05/10/12 13:29
<b>TPH as Gasoline</b>	<b>3300</b>	50	ug/L	EPA 8260B	05/10/12 13:29
1,2-Dichloroethane	< 0.50	0.50	ug/L	EPA 8260B	05/10/12 13:29
1,2-Dibromoethane	< 0.50	0.50	ug/L	EPA 8260B	05/10/12 13:29
1,2-Dichloroethane-d4 (Surr)	96.9		% Recovery	EPA 8260B	05/10/12 13:29
Toluene - d8 (Surr)	95.7		% Recovery	EPA 8260B	05/10/12 13:29

Project Name : **Tesoro Livermore #67076**

Project Number : **01LV**

Sample : **IP-10**

Matrix : Water

Lab Number : 81217-02

Sample Date :05/09/2012

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date/Time Analyzed
Nitrate as N	< 0.10	0.10	mg/L	EPA 300.0	05/10/12 05:54
<b>Sulfate</b>	<b>4.2</b>	0.50	mg/L	EPA 300.0	05/10/12 05:54
Ferrous Iron	< 0.10	0.10	mg/L	SM 3500-Fe D	05/10/12 09:24
Hexavalent Chromium	< 1.0	1.0	ug/L	EPA 7199	05/09/12 22:58
Arsenic	< 0.015	0.015	mg/L	EPA 200.7	05/14/12 16:10
Chromium	< 0.0050	0.0050	mg/L	EPA 200.7	05/14/12 16:10
<b>Iron</b>	<b>1.0</b>	0.10	mg/L	EPA 200.7	05/14/12 16:10
<b>Manganese</b>	<b>3.0</b>	0.0050	mg/L	EPA 200.7	05/14/12 16:10
<b>Sodium</b>	<b>66</b>	0.50	mg/L	EPA 200.7	05/14/12 16:10
<b>Benzene</b>	<b>24</b>	0.50	ug/L	EPA 8260B	05/10/12 09:51
<b>Toluene</b>	<b>38</b>	0.50	ug/L	EPA 8260B	05/10/12 09:51
<b>Ethylbenzene</b>	<b>110</b>	0.50	ug/L	EPA 8260B	05/10/12 09:51
<b>Total Xylenes</b>	<b>58</b>	0.50	ug/L	EPA 8260B	05/10/12 09:51
Methyl-t-butyl ether (MTBE)	< 0.50	0.50	ug/L	EPA 8260B	05/10/12 09:51
Diisopropyl ether (DIPE)	< 0.50	0.50	ug/L	EPA 8260B	05/10/12 09:51
Ethyl-t-butyl ether (ETBE)	< 0.50	0.50	ug/L	EPA 8260B	05/10/12 09:51
Tert-amyl methyl ether (TAME)	< 0.50	0.50	ug/L	EPA 8260B	05/10/12 09:51
Tert-Butanol	< 5.0	5.0	ug/L	EPA 8260B	05/10/12 09:51
Methanol	< 50	50	ug/L	EPA 8260B	05/10/12 09:51
Ethanol	< 20	20	ug/L	EPA 8260B	05/10/12 09:51
<b>TPH as Gasoline</b>	<b>3900</b>	50	ug/L	EPA 8260B	05/10/12 09:51
1,2-Dichloroethane	< 0.50	0.50	ug/L	EPA 8260B	05/10/12 09:51
1,2-Dibromoethane	< 0.50	0.50	ug/L	EPA 8260B	05/10/12 09:51
1,2-Dichloroethane-d4 (Surr)	89.6		% Recovery	EPA 8260B	05/10/12 09:51
Toluene - d8 (Surr)	87.2		% Recovery	EPA 8260B	05/10/12 09:51

Project Name : **Tesoro Livermore #67076**

Project Number : **01LV**

Sample : **MW-7**

Matrix : Water

Lab Number : 81217-03

Sample Date :05/09/2012

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date/Time Analyzed
Nitrate as N	< 0.10	0.10	mg/L	EPA 300.0	05/10/12 06:22
<b>Sulfate</b>	<b>7.3</b>	0.50	mg/L	EPA 300.0	05/10/12 06:22
Ferrous Iron	< 0.10	0.10	mg/L	SM 3500-Fe D	05/10/12 09:20
Hexavalent Chromium	< 1.0	1.0	ug/L	EPA 7199	05/09/12 23:26
<b>Arsenic</b>	<b>0.037</b>	0.015	mg/L	EPA 200.7	05/14/12 16:14
<b>Chromium</b>	<b>0.36</b>	0.0050	mg/L	EPA 200.7	05/14/12 16:14
<b>Iron</b>	<b>110</b>	0.10	mg/L	EPA 200.7	05/14/12 16:14
<b>Manganese</b>	<b>7.1</b>	0.0050	mg/L	EPA 200.7	05/14/12 16:14
<b>Sodium</b>	<b>59</b>	0.50	mg/L	EPA 200.7	05/14/12 16:14
<b>Benzene</b>	<b>1.4</b>	0.50	ug/L	EPA 8260B	05/10/12 09:38
<b>Toluene</b>	<b>0.79</b>	0.50	ug/L	EPA 8260B	05/10/12 09:38
<b>Ethylbenzene</b>	<b>1.4</b>	0.50	ug/L	EPA 8260B	05/10/12 09:38
<b>Total Xylenes</b>	<b>0.95</b>	0.50	ug/L	EPA 8260B	05/10/12 09:38
Methyl-t-butyl ether (MTBE)	< 0.50	0.50	ug/L	EPA 8260B	05/10/12 09:38
Diisopropyl ether (DIPE)	< 0.50	0.50	ug/L	EPA 8260B	05/10/12 09:38
Ethyl-t-butyl ether (ETBE)	< 0.50	0.50	ug/L	EPA 8260B	05/10/12 09:38
Tert-amyl methyl ether (TAME)	< 0.50	0.50	ug/L	EPA 8260B	05/10/12 09:38
Tert-Butanol	< 5.0	5.0	ug/L	EPA 8260B	05/10/12 09:38
Methanol	< 50	50	ug/L	EPA 8260B	05/10/12 09:38
Ethanol	< 5.0	5.0	ug/L	EPA 8260B	05/10/12 09:38
<b>TPH as Gasoline</b>	<b>1600</b>	50	ug/L	EPA 8260B	05/10/12 09:38
1,2-Dichloroethane	< 0.50	0.50	ug/L	EPA 8260B	05/10/12 09:38
1,2-Dibromoethane	< 0.50	0.50	ug/L	EPA 8260B	05/10/12 09:38
1,2-Dichloroethane-d4 (Surr)	98.4		% Recovery	EPA 8260B	05/10/12 09:38
Toluene - d8 (Surr)	99.1		% Recovery	EPA 8260B	05/10/12 09:38

Project Name : **Tesoro Livermore #67076**

Project Number : **01LV**

Sample : **IP-1**

Matrix : Water

Lab Number : 81217-04

Sample Date :05/09/2012

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date/Time Analyzed
Nitrate as N	< 0.10	0.10	mg/L	EPA 300.0	05/10/12 06:50
Sulfate	< 0.50	0.50	mg/L	EPA 300.0	05/10/12 06:50
Ferrous Iron	< 0.10	0.10	mg/L	SM 3500-Fe D	05/10/12 09:26
Hexavalent Chromium	< 1.0	1.0	ug/L	EPA 7199	05/09/12 23:36
Arsenic	< 0.015	0.015	mg/L	EPA 200.7	05/14/12 16:18
<b>Chromium</b>	<b>0.011</b>	0.0050	mg/L	EPA 200.7	05/14/12 16:18
<b>Iron</b>	<b>5.8</b>	0.10	mg/L	EPA 200.7	05/14/12 16:18
<b>Manganese</b>	<b>3.7</b>	0.0050	mg/L	EPA 200.7	05/14/12 16:18
<b>Sodium</b>	<b>76</b>	0.50	mg/L	EPA 200.7	05/14/12 16:18
<b>Benzene</b>	<b>580</b>	2.0	ug/L	EPA 8260B	05/10/12 15:15
<b>Toluene</b>	<b>850</b>	2.0	ug/L	EPA 8260B	05/10/12 15:15
<b>Ethylbenzene</b>	<b>800</b>	2.0	ug/L	EPA 8260B	05/10/12 15:15
<b>Total Xylenes</b>	<b>2100</b>	2.0	ug/L	EPA 8260B	05/10/12 15:15
Methyl-t-butyl ether (MTBE)	< 2.0	2.0	ug/L	EPA 8260B	05/10/12 15:15
Diisopropyl ether (DIPE)	< 2.0	2.0	ug/L	EPA 8260B	05/10/12 15:15
Ethyl-t-butyl ether (ETBE)	< 2.0	2.0	ug/L	EPA 8260B	05/10/12 15:15
Tert-amyl methyl ether (TAME)	< 2.0	2.0	ug/L	EPA 8260B	05/10/12 15:15
<b>Tert-Butanol</b>	<b>12</b>	9.0	ug/L	EPA 8260B	05/10/12 15:15
Methanol	< 200	200	ug/L	EPA 8260B	05/10/12 15:15
Ethanol	< 20	20	ug/L	EPA 8260B	05/10/12 15:15
<b>TPH as Gasoline</b>	<b>16000</b>	200	ug/L	EPA 8260B	05/10/12 15:15
1,2-Dichloroethane	< 2.0	2.0	ug/L	EPA 8260B	05/10/12 15:15
1,2-Dibromoethane	< 2.0	2.0	ug/L	EPA 8260B	05/10/12 15:15
1,2-Dichloroethane-d4 (Surr)	92.9		% Recovery	EPA 8260B	05/10/12 15:15
Toluene - d8 (Surr)	94.6		% Recovery	EPA 8260B	05/10/12 15:15

Project Name : **Tesoro Livermore #67076**

Project Number : **01LV**

Sample : **IP-9**

Matrix : Water

Lab Number : 81217-05

Sample Date :05/09/2012

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date/Time Analyzed
<b>Nitrate as N</b>	<b>0.62</b>	0.20	mg/L	EPA 300.0	05/10/12 18:23
<b>Sulfate</b>	<b>620</b>	10	mg/L	EPA 300.0	05/10/12 18:52
Ferrous Iron	< 0.10	0.10	mg/L	SM 3500-Fe D	05/10/12 09:28
<b>Hexavalent Chromium</b>	<b>60</b>	10	ug/L	EPA 7199	05/10/12 00:53
<b>Arsenic</b>	<b>0.66</b>	0.015	mg/L	EPA 200.7	05/16/12 15:47
<b>Chromium</b>	<b>0.074</b>	0.0050	mg/L	EPA 200.7	05/16/12 15:47
<b>Iron</b>	<b>12</b>	0.10	mg/L	EPA 200.7	05/16/12 15:47
<b>Manganese</b>	<b>0.14</b>	0.0052	mg/L	EPA 200.7	05/16/12 15:47
<b>Sodium</b>	<b>4600</b>	2.1	mg/L	EPA 200.7	05/16/12 15:57
<b>Benzene</b>	<b>14</b>	1.5	ug/L	EPA 8260B	05/14/12 17:29
<b>Toluene</b>	<b>180</b>	1.5	ug/L	EPA 8260B	05/14/12 17:29
<b>Ethylbenzene</b>	<b>270</b>	1.5	ug/L	EPA 8260B	05/14/12 17:29
<b>Total Xylenes</b>	<b>780</b>	1.5	ug/L	EPA 8260B	05/14/12 17:29
Methyl-t-butyl ether (MTBE)	< 1.5	1.5	ug/L	EPA 8260B	05/14/12 17:29
Diisopropyl ether (DIPE)	< 1.5	1.5	ug/L	EPA 8260B	05/14/12 17:29
Ethyl-t-butyl ether (ETBE)	< 1.5	1.5	ug/L	EPA 8260B	05/14/12 17:29
Tert-amyl methyl ether (TAME)	< 1.5	1.5	ug/L	EPA 8260B	05/14/12 17:29
Tert-Butanol	< 7.0	7.0	ug/L	EPA 8260B	05/14/12 17:29
Methanol	< 150	150	ug/L	EPA 8260B	05/14/12 17:29
Ethanol	< 15	15	ug/L	EPA 8260B	05/14/12 17:29
<b>TPH as Gasoline</b>	<b>10000</b>	150	ug/L	EPA 8260B	05/14/12 17:29
1,2-Dichloroethane	< 1.5	1.5	ug/L	EPA 8260B	05/14/12 17:29
1,2-Dibromoethane	< 1.5	1.5	ug/L	EPA 8260B	05/14/12 17:29
1,2-Dichloroethane-d4 (Surr)	95.7		% Recovery	EPA 8260B	05/14/12 17:29
Toluene - d8 (Surr)	93.4		% Recovery	EPA 8260B	05/14/12 17:29

Project Name : **Tesoro Livermore #67076**

Project Number : **01LV**

Sample : **IP-8**

Matrix : Water

Lab Number : 81217-06

Sample Date :05/09/2012

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date/Time Analyzed
Nitrate as N	< 0.10	0.10	mg/L	EPA 300.0	05/10/12 08:16
<b>Sulfate</b>	<b>26</b>	0.50	mg/L	EPA 300.0	05/10/12 08:16
Ferrous Iron	< 0.10	0.10	mg/L	SM 3500-Fe D	05/10/12 09:32
Hexavalent Chromium	< 1.0	1.0	ug/L	EPA 7199	05/09/12 23:58
Arsenic	< 0.015	0.015	mg/L	EPA 200.7	05/14/12 16:22
<b>Chromium</b>	<b>0.0098</b>	0.0050	mg/L	EPA 200.7	05/14/12 16:22
<b>Iron</b>	<b>3.1</b>	0.10	mg/L	EPA 200.7	05/14/12 16:22
<b>Manganese</b>	<b>2.5</b>	0.0050	mg/L	EPA 200.7	05/14/12 16:22
<b>Sodium</b>	<b>100</b>	0.50	mg/L	EPA 200.7	05/14/12 16:22
<b>Benzene</b>	<b>2400</b>	9.0	ug/L	EPA 8260B	05/10/12 16:19
<b>Toluene</b>	<b>4900</b>	9.0	ug/L	EPA 8260B	05/10/12 16:19
<b>Ethylbenzene</b>	<b>790</b>	9.0	ug/L	EPA 8260B	05/10/12 16:19
<b>Total Xylenes</b>	<b>8600</b>	9.0	ug/L	EPA 8260B	05/10/12 16:19
Methyl-t-butyl ether (MTBE)	< 9.0	9.0	ug/L	EPA 8260B	05/10/12 16:19
Diisopropyl ether (DIPE)	< 9.0	9.0	ug/L	EPA 8260B	05/10/12 16:19
Ethyl-t-butyl ether (ETBE)	< 9.0	9.0	ug/L	EPA 8260B	05/10/12 16:19
Tert-amyl methyl ether (TAME)	< 9.0	9.0	ug/L	EPA 8260B	05/10/12 16:19
Tert-Butanol	< 50	50	ug/L	EPA 8260B	05/10/12 16:19
Methanol	< 900	900	ug/L	EPA 8260B	05/10/12 16:19
Ethanol	< 90	90	ug/L	EPA 8260B	05/10/12 16:19
<b>TPH as Gasoline</b>	<b>50000</b>	900	ug/L	EPA 8260B	05/10/12 16:19
1,2-Dichloroethane	< 9.0	9.0	ug/L	EPA 8260B	05/12/12 04:50
1,2-Dibromoethane	< 9.0	9.0	ug/L	EPA 8260B	05/10/12 16:19
1,2-Dichloroethane-d4 (Surr)	98.1		% Recovery	EPA 8260B	05/10/12 16:19
Toluene - d8 (Surr)	95.2		% Recovery	EPA 8260B	05/10/12 16:19



Project Name : **Tesoro Livermore #67076**

Project Number : **01LV**

Sample : **DW-1**

Matrix : Water

Lab Number : 81217-07

Sample Date :05/09/2012

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date/Time Analyzed
<b>Nitrate as N</b>	<b>0.77</b>	0.10	mg/L	EPA 300.0	05/09/12 21:54
<b>Sulfate</b>	<b>42</b>	0.50	mg/L	EPA 300.0	05/09/12 21:54
Ferrous Iron	< 0.10	0.10	mg/L	SM 3500-Fe D	05/10/12 09:32
<b>Benzene</b>	<b>24</b>	0.50	ug/L	EPA 8260B	05/10/12 14:00
<b>Toluene</b>	<b>5.6</b>	0.50	ug/L	EPA 8260B	05/10/12 14:00
<b>Ethylbenzene</b>	<b>75</b>	0.50	ug/L	EPA 8260B	05/10/12 14:00
<b>Total Xylenes</b>	<b>160</b>	0.50	ug/L	EPA 8260B	05/10/12 14:00
<b>Methyl-t-butyl ether (MTBE)</b>	<b>2.9</b>	0.50	ug/L	EPA 8260B	05/10/12 14:00
Diisopropyl ether (DIPE)	< 0.50	0.50	ug/L	EPA 8260B	05/10/12 14:00
Ethyl-t-butyl ether (ETBE)	< 0.50	0.50	ug/L	EPA 8260B	05/10/12 14:00
Tert-amyl methyl ether (TAME)	< 0.50	0.50	ug/L	EPA 8260B	05/10/12 14:00
Tert-Butanol	< 5.0	5.0	ug/L	EPA 8260B	05/10/12 14:00
Methanol	< 50	50	ug/L	EPA 8260B	05/10/12 14:00
Ethanol	< 5.0	5.0	ug/L	EPA 8260B	05/10/12 14:00
<b>TPH as Gasoline</b>	<b>2000</b>	50	ug/L	EPA 8260B	05/10/12 14:00
1,2-Dichloroethane	< 0.50	0.50	ug/L	EPA 8260B	05/10/12 14:00
1,2-Dibromoethane	< 0.50	0.50	ug/L	EPA 8260B	05/10/12 14:00
1,2-Dichloroethane-d4 (Surr)	100		% Recovery	EPA 8260B	05/10/12 14:00
Toluene - d8 (Surr)	97.6		% Recovery	EPA 8260B	05/10/12 14:00

**QC Report : Method Blank Data**

Project Name : **Tesoro Livermore #67076**

Project Number : **01LV**

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed	Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Arsenic	< 0.015	0.015	mg/L	EPA 200.7	05/14/2012	1,2-Dichloroethane	< 0.50	0.50	ug/L	EPA 8260B	05/11/2012
Chromium	< 0.0050	0.0050	mg/L	EPA 200.7	05/14/2012	Benzene	< 0.50	0.50	ug/L	EPA 8260B	05/10/2012
Iron	< 0.10	0.10	mg/L	EPA 200.7	05/14/2012	Ethylbenzene	< 0.50	0.50	ug/L	EPA 8260B	05/10/2012
Manganese	< 0.0050	0.0050	mg/L	EPA 200.7	05/14/2012	Toluene	< 0.50	0.50	ug/L	EPA 8260B	05/10/2012
Sodium	< 0.50	0.50	mg/L	EPA 200.7	05/14/2012	Total Xylenes	< 0.50	0.50	ug/L	EPA 8260B	05/10/2012
Arsenic	< 0.015	0.015	mg/L	EPA 200.7	05/16/2012	Diisopropyl ether (DIPE)	< 0.50	0.50	ug/L	EPA 8260B	05/10/2012
Chromium	< 0.0050	0.0050	mg/L	EPA 200.7	05/16/2012	Ethanol	< 5.0	5.0	ug/L	EPA 8260B	05/10/2012
Iron	< 0.10	0.10	mg/L	EPA 200.7	05/16/2012	Ethyl-t-butyl ether (ETBE)	< 0.50	0.50	ug/L	EPA 8260B	05/10/2012
Manganese	< 0.0050	0.0050	mg/L	EPA 200.7	05/16/2012	Methanol	< 50	50	ug/L	EPA 8260B	05/10/2012
Sodium	< 0.50	0.50	mg/L	EPA 200.7	05/16/2012	Methyl-t-butyl ether (MTBE)	< 0.50	0.50	ug/L	EPA 8260B	05/10/2012
Benzene	< 0.50	0.50	ug/L	EPA 8260B	05/10/2012	Tert-Butanol	< 5.0	5.0	ug/L	EPA 8260B	05/10/2012
Ethylbenzene	< 0.50	0.50	ug/L	EPA 8260B	05/10/2012	Tert-amyl methyl ether (TAME)	< 0.50	0.50	ug/L	EPA 8260B	05/10/2012
Toluene	< 0.50	0.50	ug/L	EPA 8260B	05/10/2012	TPH as Gasoline	< 50	50	ug/L	EPA 8260B	05/10/2012
Total Xylenes	< 0.50	0.50	ug/L	EPA 8260B	05/10/2012	1,2-Dibromoethane	< 0.50	0.50	ug/L	EPA 8260B	05/10/2012
Diisopropyl ether (DIPE)	< 0.50	0.50	ug/L	EPA 8260B	05/10/2012	1,2-Dichloroethane	< 0.50	0.50	ug/L	EPA 8260B	05/10/2012
Ethanol	< 5.0	5.0	ug/L	EPA 8260B	05/10/2012	1,2-Dichloroethane-d4 (Surr)	100		%	EPA 8260B	05/10/2012
Ethyl-t-butyl ether (ETBE)	< 0.50	0.50	ug/L	EPA 8260B	05/10/2012	Toluene - d8 (Surr)	100		%	EPA 8260B	05/10/2012
Methanol	< 50	50	ug/L	EPA 8260B	05/10/2012	Benzene	< 0.50	0.50	ug/L	EPA 8260B	05/14/2012
Methyl-t-butyl ether (MTBE)	< 0.50	0.50	ug/L	EPA 8260B	05/10/2012	Ethylbenzene	< 0.50	0.50	ug/L	EPA 8260B	05/14/2012
Tert-Butanol	< 5.0	5.0	ug/L	EPA 8260B	05/10/2012	Toluene	< 0.50	0.50	ug/L	EPA 8260B	05/14/2012
Tert-amyl methyl ether (TAME)	< 0.50	0.50	ug/L	EPA 8260B	05/10/2012	Total Xylenes	< 0.50	0.50	ug/L	EPA 8260B	05/14/2012
TPH as Gasoline	< 50	50	ug/L	EPA 8260B	05/10/2012	Diisopropyl ether (DIPE)	< 0.50	0.50	ug/L	EPA 8260B	05/14/2012
1,2-Dibromoethane	< 0.50	0.50	ug/L	EPA 8260B	05/10/2012	Ethanol	< 5.0	5.0	ug/L	EPA 8260B	05/14/2012
1,2-Dichloroethane	< 0.50	0.50	ug/L	EPA 8260B	05/10/2012	Ethyl-t-butyl ether (ETBE)	< 0.50	0.50	ug/L	EPA 8260B	05/14/2012
1,2-Dichloroethane-d4 (Surr)	100		%	EPA 8260B	05/10/2012	Methanol	< 50	50	ug/L	EPA 8260B	05/14/2012
Toluene - d8 (Surr)	99.7		%	EPA 8260B	05/10/2012	Methyl-t-butyl ether (MTBE)	< 0.50	0.50	ug/L	EPA 8260B	05/14/2012
						Tert-Butanol	< 5.0	5.0	ug/L	EPA 8260B	05/14/2012
						Tert-amyl methyl ether (TAME)	< 0.50	0.50	ug/L	EPA 8260B	05/14/2012
						TPH as Gasoline	< 50	50	ug/L	EPA 8260B	05/14/2012
						1,2-Dibromoethane	< 0.50	0.50	ug/L	EPA 8260B	05/14/2012
						1,2-Dichloroethane	< 0.50	0.50	ug/L	EPA 8260B	05/14/2012

**QC Report : Method Blank Data**Project Name : **Tesoro Livermore #67076**Project Number : **01LV**

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
1,2-Dichloroethane-d4 (Surr)	101		%	EPA 8260B	05/14/2012
Toluene - d8 (Surr)	99.8		%	EPA 8260B	05/14/2012
Benzene	< 0.50	0.50	ug/L	EPA 8260B	05/10/2012
Ethylbenzene	< 0.50	0.50	ug/L	EPA 8260B	05/10/2012
Toluene	< 0.50	0.50	ug/L	EPA 8260B	05/10/2012
Total Xylenes	< 0.50	0.50	ug/L	EPA 8260B	05/10/2012
Diisopropyl ether (DIPE)	< 0.50	0.50	ug/L	EPA 8260B	05/10/2012
Ethanol	< 5.0	5.0	ug/L	EPA 8260B	05/10/2012
Ethyl-t-butyl ether (ETBE)	< 0.50	0.50	ug/L	EPA 8260B	05/10/2012
Methanol	< 50	50	ug/L	EPA 8260B	05/10/2012
Methyl-t-butyl ether (MTBE)	< 0.50	0.50	ug/L	EPA 8260B	05/10/2012
Tert-Butanol	< 5.0	5.0	ug/L	EPA 8260B	05/10/2012
Tert-amyl methyl ether (TAME)	< 0.50	0.50	ug/L	EPA 8260B	05/10/2012
TPH as Gasoline	< 50	50	ug/L	EPA 8260B	05/10/2012
1,2-Dibromoethane	< 0.50	0.50	ug/L	EPA 8260B	05/10/2012
1,2-Dichloroethane	< 0.50	0.50	ug/L	EPA 8260B	05/10/2012
1,2-Dichloroethane-d4 (Surr)	101		%	EPA 8260B	05/10/2012
Toluene - d8 (Surr)	99.2		%	EPA 8260B	05/10/2012
Nitrate as N	<0.10	0.10	mg/L	EPA 300.0	05/09/2012
Sulfate	<0.50	0.50	mg/L	EPA 300.0	05/09/2012

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Hexavalent Chromium	<1.0	1.0	ug/L	EPA 7199	05/09/2012
Ferrous Iron	<0.10	0.10	mg/L	SM 3500-Fe D	05/10/2012
Nitrate as N	<0.10	0.10	mg/L	EPA 300.0	05/10/2012
Sulfate	<0.50	0.50	mg/L	EPA 300.0	05/10/2012

## QC Report : Matrix Spike/ Matrix Spike Duplicate

Project Name : **Tesoro Livermore #67076**Project Number : **01LV**

Parameter	Spiked Sample	Sample Value	Spike Level	Spike Dup. Level	Spiked Sample Value	Duplicate Spiked Sample Value	Units	Analysis Method	Date Analyzed	Spiked Sample Percent Recov.	Duplicate Spiked Sample Percent Recov.	Relative Percent Diff.	Spiked Sample Percent Recov. Limit	Relative Percent Diff. Limit
Nitrate as N	81203-01	0.13	0.500	0.500	0.578	0.632	mg/L	EPA 300.0	5/9/12	90.1	101	8.90	85.0-115	10
Sulfate	81203-01	6.1	2.50	2.50	8.40	8.53	mg/L	EPA 300.0	5/9/12	91.2	96.3	1.50	85.0-115	10
<b>Hexavalent Chromium</b>	81217-02	< 1.0	5.00	5.00	5.07	4.47	ug/L	EPA 7199	5/9/12	101	<b>89.5</b>	<b>12.6</b>	90.0-110	10
Ferrous Iron	81217-03	< 0.10	0.253	0.253	0.271	0.296	mg/L	SM 3500-Fe D	5/10/12	98.1	108	8.82	70.0-130	25
<b>Nitrate as N</b>	81218-01	< 0.10	0.500	0.500	0.851	0.853	mg/L	EPA 300.0	5/10/12	<b>170</b>	<b>170</b>	0.194	85.0-115	10
Sulfate	81218-01	1.8	2.50	2.50	4.29	4.22	mg/L	EPA 300.0	5/10/12	98.5	95.8	1.60	85.0-115	10
Arsenic	81203-01	< 0.015	0.400	0.400	0.416	0.412	mg/L	EPA 200.7	5/14/12	104	103	0.797	75-125	20
Chromium	81203-01	< 0.0050	0.400	0.400	0.418	0.414	mg/L	EPA 200.7	5/14/12	104	103	0.986	75-125	20

**QC Report : Matrix Spike/ Matrix Spike Duplicate**Project Name : **Tesoro Livermore #67076**Project Number : **01LV**

Parameter	Spiked Sample	Sample Value	Spike Level	Spike Dup. Level	Spiked Sample Value	Duplicate Spiked Sample Value	Units	Analysis Method	Date Analyzed	Spiked Sample Percent Recov.	Duplicate Spiked Sample Percent Recov.	Relative Percent Diff.	Spiked Sample Percent Recov. Limit	Relative Percent Diff. Limit
Iron	81203-01	11	0.400	0.400	11.8	11.7	mg/L	EPA 200.7	5/14/12	105	92.5	0.425	75-125	20
Manganese	81203-01	3.2	0.400	0.400	3.59	3.58	mg/L	EPA 200.7	5/14/12	98.8	96.5	0.251	75-125	20
Sodium	81203-01	6.5	0.400	0.400	6.89	6.87	mg/L	EPA 200.7	5/14/12	98.2	94.2	0.232	75-125	20
1,2-Dibromoethane	81189-05	<0.50	38.8	39.4	41.6	40.0	ug/L	EPA 8260B	5/10/12	107	102	5.09	80-120	25
1,2-Dichloroethane	81189-05	<0.50	38.9	39.4	39.7	40.0	ug/L	EPA 8260B	5/10/12	102	101	0.638	75.7-122	25
Benzene	81189-05	<0.50	38.9	39.4	38.4	39.1	ug/L	EPA 8260B	5/10/12	98.8	99.1	0.318	80-120	25
Diisopropyl ether	81189-05	<0.50	38.5	39.0	38.9	40.5	ug/L	EPA 8260B	5/10/12	101	104	2.82	80-120	25
<b>Ethanol</b>	81189-05	<5.0	97.4	98.8	64.3	115	ug/L	EPA 8260B	5/10/12	66.0	116	<b>55.1</b>	55.1-159	25
Ethyl-tert-butyl ether	81189-05	<0.50	38.7	39.3	37.2	35.9	ug/L	EPA 8260B	5/10/12	96.0	91.5	4.79	76.5-120	25

**QC Report : Matrix Spike/ Matrix Spike Duplicate**Project Name : **Tesoro Livermore #67076**Project Number : **01LV**

Parameter	Spiked Sample	Sample Value	Spike Level	Spike Dup. Level	Spiked Sample Value	Duplicate Spiked Sample Value	Units	Analysis Method	Date Analyzed	Spiked Sample Percent Recov.	Duplicate Spiked Sample Percent Recov.	Relative Percent Diff.	Spiked Sample Percent Recov. Limit	Relative Percent Diff. Limit
Ethylbenzene	81189-05	<0.50	38.9	39.4	40.0	40.8	ug/L	EPA 8260B	5/10/12	103	103	0.694	80-120	25
<b>Methanol</b>	81189-05	<50	973	986	686	1060	ug/L	EPA 8260B	5/10/12	70.6	107	<b>41.2</b>	53.2-147	25
Methyl-t-butyl ether	81189-05	<0.50	38.9	39.4	37.7	38.1	ug/L	EPA 8260B	5/10/12	97.0	96.6	0.361	69.7-121	25
P + M Xylene	81189-05	<0.50	38.9	39.4	39.1	39.6	ug/L	EPA 8260B	5/10/12	100	100	0.0240	76.8-120	25
Tert-Butanol	81189-05	<5.0	196	199	193	198	ug/L	EPA 8260B	5/10/12	98.3	99.5	1.18	80-120	25
Tert-amyl-methyl ether	81189-05	<0.50	38.8	39.4	40.6	38.6	ug/L	EPA 8260B	5/10/12	104	98.0	6.49	78.9-120	25
Toluene	81189-05	<0.50	38.9	39.4	39.1	39.5	ug/L	EPA 8260B	5/10/12	100	100	0.172	80-120	25
1,2-Dibromoethane	81217-03	<0.50	39.9	39.9	43.6	42.7	ug/L	EPA 8260B	5/10/12	109	107	2.08	80-120	25
1,2-Dichloroethane	81217-03	<0.50	40.0	40.0	42.3	41.6	ug/L	EPA 8260B	5/10/12	106	104	1.69	75.7-122	25

## QC Report : Matrix Spike/ Matrix Spike Duplicate

Project Name : Tesoro Livermore #67076

Project Number : 01LV

Parameter	Spiked Sample	Sample Value	Spike Level	Spike Dup. Level	Spiked Sample Value	Duplicate Spiked Sample Value	Units	Analysis Method	Date Analyzed	Spiked Sample Percent Recov.	Duplicate Spiked Sample Percent Recov.	Relative Percent Diff.	Spiked Sample Percent Recov. Limit	Relative Percent Diff. Limit
Benzene	81217-03	1.4	40.0	40.0	42.3	41.3	ug/L	EPA 8260B	5/10/12	102	99.6	2.54	80-120	25
Diisopropyl ether	81217-03	<0.50	39.5	39.5	43.3	44.0	ug/L	EPA 8260B	5/10/12	109	111	1.70	80-120	25
Ethanol	81217-03	<5.0	100	100	113	102	ug/L	EPA 8260B	5/10/12	112	101	10.4	55.1-159	25
Ethyl-tert-butyl ether	81217-03	<0.50	39.8	39.8	39.5	41.4	ug/L	EPA 8260B	5/10/12	99.2	104	4.67	76.5-120	25
Ethylbenzene	81217-03	1.4	40.0	40.0	45.6	43.9	ug/L	EPA 8260B	5/10/12	110	106	4.00	80-120	25
Methanol	81217-03	<50	1000	1000	1260	1190	ug/L	EPA 8260B	5/10/12	126	119	5.63	53.2-147	25
Methyl-t-butyl ether	81217-03	<0.50	40.0	40.0	38.0	41.4	ug/L	EPA 8260B	5/10/12	95.0	103	8.51	69.7-121	25
P + M Xylene	81217-03	0.95	40.0	40.0	43.3	41.7	ug/L	EPA 8260B	5/10/12	106	102	3.96	76.8-120	25
Tert-Butanol	81217-03	<5.0	202	202	208	208	ug/L	EPA 8260B	5/10/12	103	103	0.166	80-120	25
Tert-amyl-methyl ether	81217-03	<0.50	39.9	39.9	41.1	42.9	ug/L	EPA 8260B	5/10/12	103	107	4.23	78.9-120	25

## QC Report : Matrix Spike/ Matrix Spike Duplicate

Project Name : **Tesoro Livermore #67076**Project Number : **01LV**

Parameter	Spiked Sample	Sample Value	Spike Level	Spike Dup. Level	Spiked Sample Value	Duplicate Spiked Sample Value	Units	Analysis Method	Date Analyzed	Spiked Sample Percent Recov.	Duplicate Spiked Sample Percent Recov.	Relative Percent Diff.	Spiked Sample Percent Recov. Limit	Relative Percent Diff. Limit
Toluene	81217-03	0.79	40.0	40.0	42.5	40.9	ug/L	EPA 8260B	5/10/12	104	100	3.80	80-120	25
1,2-Dibromoethane	81247-09	<0.50	39.9	39.9	40.8	38.2	ug/L	EPA 8260B	5/14/12	102	95.6	6.66	80-120	25
1,2-Dichloroethane	81247-09	<0.50	40.0	40.0	39.7	36.9	ug/L	EPA 8260B	5/14/12	99.2	92.3	7.22	75.7-122	25
<b>Benzene</b>	81247-09	1200	40.0	40.0	1220	1160	ug/L	EPA 8260B	5/14/12	<b>0.00</b>	<b>0.00</b>	0.00	80-120	25
Diisopropyl ether	81247-09	<0.50	39.5	39.5	41.1	39.3	ug/L	EPA 8260B	5/14/12	104	99.4	4.61	80-120	25
Ethanol	81247-09	<5.0	100	100	92.2	103	ug/L	EPA 8260B	5/14/12	92.0	102	10.8	55.1-159	25
Ethyl-tert-butyl ether	81247-09	<0.50	39.8	39.8	38.8	36.5	ug/L	EPA 8260B	5/14/12	97.4	91.7	6.01	76.5-120	25
<b>Ethylbenzene</b>	81247-09	280	40.0	40.0	303	285	ug/L	EPA 8260B	5/14/12	<b>60.5</b>	<b>14.8</b>	<b>122</b>	80-120	25
Methanol	81247-09	<50	1000	1000	1180	1120	ug/L	EPA 8260B	5/14/12	118	112	4.73	53.2-147	25



## QC Report : Matrix Spike/ Matrix Spike Duplicate

Project Name : **Tesoro Livermore #67076**Project Number : **01LV**

Parameter	Spiked Sample	Sample Value	Spike Level	Spike Dup. Level	Spiked Sample Value	Duplicate Spiked Sample Value	Units	Analysis Method	Date Analyzed	Spiked Sample Percent Recov.	Duplicate Spiked Sample Percent Recov.	Relative Percent Diff.	Spiked Sample Percent Recov. Limit	Relative Percent Diff. Limit
Methyl-t-butyl ether	81247-09	<0.50	40.0	40.0	38.4	36.4	ug/L	EPA 8260B	5/14/12	96.1	91.1	5.38	69.7-121	25
<b>P + M Xylene</b>	81247-09	290	40.0	40.0	317	297	ug/L	EPA 8260B	5/14/12	<b>73.3</b>	<b>22.3</b>	<b>107</b>	76.8-120	25
Tert-Butanol	81247-09	14	202	202	221	211	ug/L	EPA 8260B	5/14/12	103	97.6	5.12	80-120	25
Tert-amyl-methyl ether	81247-09	<0.50	39.9	39.9	39.2	37.4	ug/L	EPA 8260B	5/14/12	98.1	93.7	4.58	78.9-120	25
<b>Toluene</b>	81247-09	200	40.0	40.0	230	213	ug/L	EPA 8260B	5/14/12	<b>69.7</b>	<b>26.0</b>	<b>91.3</b>	80-120	25
1,2-Dibromoethane	81217-02	<0.50	39.9	39.9	38.9	39.0	ug/L	EPA 8260B	5/10/12	97.4	97.8	0.412	80-120	25
1,2-Dichloroethane	81217-02	<0.50	40.0	40.0	36.8	36.9	ug/L	EPA 8260B	5/10/12	92.1	92.2	0.0689	75.7-122	25
Benzene	81217-02	24	40.0	40.0	63.0	61.0	ug/L	EPA 8260B	5/10/12	96.1	91.1	5.36	80-120	25
Diisopropyl ether	81217-02	<0.50	39.5	39.5	41.2	41.9	ug/L	EPA 8260B	5/10/12	104	106	1.65	80-120	25

**QC Report : Matrix Spike/ Matrix Spike Duplicate**Project Name : **Tesoro Livermore #67076**Project Number : **01LV**

Parameter	Spiked Sample	Sample Value	Spike Level	Spike Dup. Level	Spiked Sample Value	Duplicate Spiked Sample Value	Units	Analysis Method	Date Analyzed	Spiked Sample Percent Recov.	Duplicate Spiked Sample Percent Recov.	Relative Percent Diff.	Spiked Sample Percent Recov. Limit	Relative Percent Diff. Limit
<b>Ethanol</b>	81217-02	16	100	100	146	106	ug/L	EPA 8260B	5/10/12	129	89.5	<b>36.5</b>	55.1-159	25
Ethyl-tert-butyl ether	81217-02	<0.50	39.8	39.8	37.0	40.8	ug/L	EPA 8260B	5/10/12	92.9	102	9.90	76.5-120	25
Ethylbenzene	81217-02	110	40.0	40.0	148	144	ug/L	EPA 8260B	5/10/12	103	92.6	10.8	80-120	25
Methanol	81217-02	<50	1000	1000	1330	1100	ug/L	EPA 8260B	5/10/12	133	110	18.5	53.2-147	25
Methyl-t-butyl ether	81217-02	<0.50	40.0	40.0	36.4	44.0	ug/L	EPA 8260B	5/10/12	91.0	110	18.9	69.7-121	25
P + M Xylene	81217-02	34	40.0	40.0	78.4	75.3	ug/L	EPA 8260B	5/10/12	110	102	7.23	76.8-120	25
Tert-Butanol	81217-02	<5.0	202	202	226	212	ug/L	EPA 8260B	5/10/12	112	105	6.34	80-120	25
Tert-amyl-methyl ether	81217-02	<0.50	39.9	39.9	38.0	40.0	ug/L	EPA 8260B	5/10/12	95.2	100	5.25	78.9-120	25
Toluene	81217-02	38	40.0	40.0	74.9	73.1	ug/L	EPA 8260B	5/10/12	91.6	87.2	4.99	80-120	25

## QC Report : Matrix Spike/ Matrix Spike Duplicate

Project Name : **Tesoro Livermore #67076**Project Number : **01LV**

Parameter	Spiked Sample	Sample Value	Spike Level	Spike Dup. Level	Spiked Sample Value	Duplicate Spiked Sample Value	Units	Analysis Method	Date Analyzed	Spiked Sample Percent Recov.	Duplicate Spiked Sample Percent Recov.	Relative Percent Diff.	Spiked Sample Percent Recov. Limit	Relative Percent Diff. Limit
<b>1,2-Dichloroethane</b>	81220-01	4.7	39.2	39.4	30.4	30.1	ug/L	EPA 8260B	5/11/12	<b>65.6</b>	<b>64.4</b>	1.77	75.7-122	25
Arsenic	81224-01	< 0.015	0.400	0.400	0.430	0.425	mg/L	EPA 200.7	5/16/12	107	106	1.17	75-125	20
Chromium	81224-01	< 0.0050	0.400	0.400	0.435	0.433	mg/L	EPA 200.7	5/16/12	108	108	0.300	75-125	20
Iron	81224-01	0.60	0.400	0.400	0.966	0.967	mg/L	EPA 200.7	5/16/12	92.0	92.2	0.0828	75-125	20
Manganese	81224-01	0.11	0.400	0.400	0.497	0.502	mg/L	EPA 200.7	5/16/12	97.2	98.3	0.821	75-125	20
<b>Sodium</b>	81224-01	15	0.400	0.400	14.9	15.2	mg/L	EPA 200.7	5/16/12	<b>45.0</b>	122	2.06	75-125	20

**QC Report : Laboratory Control Sample (LCS)**Project Name : **Tesoro Livermore #67076**Project Number : **01LV**

Parameter	Spike Level	Units	Analysis Method	Date Analyzed	LCS Percent Recov.	LCS Percent Recov. Limit
Arsenic	0.400	mg/L	EPA 200.7	5/14/12	96.3	85-115
Chromium	0.400	mg/L	EPA 200.7	5/14/12	99.8	85-115
Iron	0.400	mg/L	EPA 200.7	5/14/12	97.7	85-115
Manganese	0.400	mg/L	EPA 200.7	5/14/12	95.2	85-115
Sodium	0.400	mg/L	EPA 200.7	5/14/12	101	85-115
Arsenic	0.400	mg/L	EPA 200.7	5/16/12	102	85-115
Chromium	0.400	mg/L	EPA 200.7	5/16/12	107	85-115
Iron	0.400	mg/L	EPA 200.7	5/16/12	102	85-115
Manganese	0.400	mg/L	EPA 200.7	5/16/12	99.6	85-115
Sodium	0.400	mg/L	EPA 200.7	5/16/12	104	85-115
1,2-Dibromoethane	39.9	ug/L	EPA 8260B	5/10/12	100	80-120
1,2-Dichloroethane	40.0	ug/L	EPA 8260B	5/10/12	100	75.7-122
Benzene	40.0	ug/L	EPA 8260B	5/10/12	99.6	80-120
Diisopropyl ether	39.5	ug/L	EPA 8260B	5/10/12	103	80-120
Ethanol	100	ug/L	EPA 8260B	5/10/12	153	55.1-159
Ethyl-tert-butyl ether	39.8	ug/L	EPA 8260B	5/10/12	82.0	76.5-120
Ethylbenzene	40.0	ug/L	EPA 8260B	5/10/12	105	80-120
Methanol	1000	ug/L	EPA 8260B	5/10/12	137	53.2-147
Methyl-t-butyl ether	40.0	ug/L	EPA 8260B	5/10/12	91.1	69.7-121
Tert-Butanol	202	ug/L	EPA 8260B	5/10/12	96.5	80-120

## QC Report : Laboratory Control Sample (LCS)

Project Name : **Tesoro Livermore #67076**Project Number : **01LV**

Parameter	Spike Level	Units	Analysis Method	Date Analyzed	LCS Percent Recov.	LCS Percent Recov. Limit
Tert-amyl-methyl ether	39.9	ug/L	EPA 8260B	5/10/12	85.6	78.9-120
Toluene	40.0	ug/L	EPA 8260B	5/10/12	100	80-120
P + M Xylene	40.0	ug/L	EPA 8260B	5/10/12	102	76.8-120
1,2-Dichloroethane	40.0	ug/L	EPA 8260B	5/11/12	81.0	75.7-122
1,2-Dibromoethane	39.9	ug/L	EPA 8260B	5/10/12	112	80-120
1,2-Dichloroethane	40.0	ug/L	EPA 8260B	5/10/12	111	75.7-122
Benzene	40.0	ug/L	EPA 8260B	5/10/12	106	80-120
Diisopropyl ether	39.5	ug/L	EPA 8260B	5/10/12	111	80-120
Ethanol	100	ug/L	EPA 8260B	5/10/12	115	55.1-159
Ethyl-tert-butyl ether	39.8	ug/L	EPA 8260B	5/10/12	102	76.5-120
Ethylbenzene	40.0	ug/L	EPA 8260B	5/10/12	111	80-120
Methanol	1000	ug/L	EPA 8260B	5/10/12	131	53.2-147
Methyl-t-butyl ether	40.0	ug/L	EPA 8260B	5/10/12	96.7	69.7-121
P + M Xylene	40.0	ug/L	EPA 8260B	5/10/12	108	76.8-120
TPH as Gasoline	502	ug/L	EPA 8260B	5/10/12	108	70.0-130
Tert-Butanol	202	ug/L	EPA 8260B	5/10/12	106	80-120
Tert-amyl-methyl ether	39.9	ug/L	EPA 8260B	5/10/12	106	78.9-120
Toluene	40.0	ug/L	EPA 8260B	5/10/12	110	80-120
1,2-Dibromoethane	39.9	ug/L	EPA 8260B	5/14/12	106	80-120

## QC Report : Laboratory Control Sample (LCS)

Project Name : **Tesoro Livermore #67076**Project Number : **01LV**

Parameter	Spike Level	Units	Analysis Method	Date Analyzed	LCS Percent Recov.	LCS Percent Recov. Limit
1,2-Dichloroethane	40.0	ug/L	EPA 8260B	5/14/12	103	75.7-122
Benzene	40.0	ug/L	EPA 8260B	5/14/12	97.2	80-120
Diisopropyl ether	39.5	ug/L	EPA 8260B	5/14/12	101	80-120
Ethanol	100	ug/L	EPA 8260B	5/14/12	98.9	55.1-159
Ethyl-tert-butyl ether	39.8	ug/L	EPA 8260B	5/14/12	96.3	76.5-120
Ethylbenzene	40.0	ug/L	EPA 8260B	5/14/12	106	80-120
Methanol	1000	ug/L	EPA 8260B	5/14/12	112	53.2-147
Methyl-t-butyl ether	40.0	ug/L	EPA 8260B	5/14/12	93.1	69.7-121
P + M Xylene	40.0	ug/L	EPA 8260B	5/14/12	103	76.8-120
TPH as Gasoline	507	ug/L	EPA 8260B	5/14/12	110	70.0-130
Tert-Butanol	202	ug/L	EPA 8260B	5/14/12	102	80-120
Tert-amyl-methyl ether	39.9	ug/L	EPA 8260B	5/14/12	98.1	78.9-120
Toluene	40.0	ug/L	EPA 8260B	5/14/12	102	80-120
1,2-Dibromoethane	39.8	ug/L	EPA 8260B	5/10/12	110	80-120
1,2-Dichloroethane	39.9	ug/L	EPA 8260B	5/10/12	105	75.7-122
Benzene	39.9	ug/L	EPA 8260B	5/10/12	109	80-120
Diisopropyl ether	39.4	ug/L	EPA 8260B	5/10/12	111	80-120
Ethanol	99.9	ug/L	EPA 8260B	5/10/12	93.4	55.1-159
Ethyl-tert-butyl ether	39.7	ug/L	EPA 8260B	5/10/12	108	76.5-120
Ethylbenzene	39.9	ug/L	EPA 8260B	5/10/12	112	80-120
Methanol	997	ug/L	EPA 8260B	5/10/12	110	53.2-147
Methyl-t-butyl ether	39.9	ug/L	EPA 8260B	5/10/12	112	69.7-121

**QC Report : Laboratory Control Sample (LCS)**Project Name : **Tesoro Livermore #67076**Project Number : **01LV**

Parameter	Spike Level	Units	Analysis Method	Date Analyzed	LCS Percent Recov.	LCS Percent Recov. Limit
P + M Xylene	39.9	ug/L	EPA 8260B	5/10/12	111	76.8-120
TPH as Gasoline	504	ug/L	EPA 8260B	5/10/12	105	70.0-130
Tert-Butanol	201	ug/L	EPA 8260B	5/10/12	105	80-120
Tert-amyl-methyl ether	39.8	ug/L	EPA 8260B	5/10/12	110	78.9-120
Toluene	39.9	ug/L	EPA 8260B	5/10/12	109	80-120
Nitrate as N	0.500	mg/L	EPA 300.0	5/9/12	97.5	85.0-115
Sulfate	2.50	mg/L	EPA 300.0	5/9/12	93.4	85.0-115
Hexavalent Chromium	5.00	ug/L	EPA 7199	5/9/12	99.3	90.0-110
Ferrous Iron	0.253	mg/L	SM 3500-Fe D	5/10/12	97.3	70.0-130
Nitrate as N	0.500	mg/L	EPA 300.0	5/10/12	99.3	85.0-115
Sulfate	2.50	mg/L	EPA 300.0	5/10/12	92.4	85.0-115





**SAMPLE RECEIPT CHECKLIST**

RECEIVER  
TJB  
Initials

SRG#: 81217 Date: 050912

Project ID: Tesoro Livermore #67076

Method of Receipt:  Courier  Over-the-counter  Shipper

**COC Inspection**

Is COC present?  Yes  No  
 Custody seals on shipping container?  Intact  Broken  Not present  N/A  
 Is COC Signed by Relinquisher?  Yes  No Dated?  Yes  No  
 Is sampler name legibly indicated on COC?  Yes  No  
 Is analysis or hold requested for all samples?  Yes  No  
 Is the turnaround time indicated on COC?  Yes  No  
 Is COC free of whiteout and uninitialed cross-outs?  Yes  No, Whiteout  No, Cross-outs

**Sample Inspection**

Coolant Present:  Yes  No (includes water)  
 Temperature °C 2.4 Therm. ID# IR-4 Initial TJB Date/Time 050912/1746  N/A  
 Are there custody seals on sample containers?  Intact  Broken  Not present  
 Do containers match COC?  Yes  No  No, COC lists absent sample(s)  No, Extra sample(s) present  
 Are there samples matrices other than soil, water, air or carbon?  Yes  No  
 Are any sample containers broken, leaking or damaged?  Yes  No  
 Are preservatives indicated?  Yes, on sample containers  Yes, on COC  Not indicated  N/A  
 Are preservatives correct for analyses requested?  Yes  No  N/A  
 Are samples within holding time for analyses requested?  Yes  No  
 Are the correct sample containers used for the analyses requested?  Yes  No  
 Is there sufficient sample to perform testing?  Yes  No  
 Does any sample contain product, have strong odor or are otherwise suspected to be hot?  Yes  No

**Receipt Details**

Matrix WA Container type VOA # of containers received 43  
 Matrix WA Container type Poly # of containers received 33  
 Matrix WA Container type Glass # of containers received 1  
 Date and Time Sample Put into Temp Storage Date: 050912 Time: 1806

**Quicklog**

Are the Sample ID's indicated:  On COC  On sample container(s)  On Both  Not indicated  
 If Sample ID's are listed on both COC and containers, do they all match?  Yes  No  N/A  
 Is the Project ID indicated:  On COC  On sample container(s)  On Both  Not indicated  
 If project ID is listed on both COC and containers, do they all match?  Yes  No  N/A  
 Are the sample collection dates indicated:  On COC  On sample container(s)  On Both  Not indicated  
 If collection dates are listed on both COC and containers, do they all match?  Yes  No  N/A  
 Are the sample collection times indicated:  On COC  On sample container(s)  On Both  Not indicated  
 If collection times are listed on both COC and containers, do they all match?  Yes  No  N/A

COMMENTS: The COC requests metals, but does not specify which ones or by which method. TJB 050912 1535



# Subcontract Laboratory Report Attachments

# CALIFORNIA LABORATORY SERVICES

3249 Fitzgerald Road Rancho Cordova, CA 95742

May 17, 2012

**CLS Work Order #: CVE0556**  
**COC #: 81217**

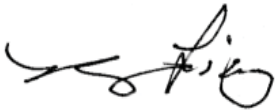
Scott Forbes  
KIFF Analytical  
2795 Second St. Suite 300  
Davis, CA 95616

**Project Name: Tesoro Livermore #67076**

Enclosed are the results of analyses for samples received by the laboratory on 05/11/12 11:40. Samples were analyzed pursuant to client request utilizing EPA or other ELAP approved methodologies. I certify that the results are in compliance both technically and for completeness.

Analytical results are attached to this letter. Please call if we can provide additional assistance.

Sincerely,




James Liang, Ph.D.  
Laboratory Director

CA DOHS ELAP Accreditation/Registration number 1233

# CALIFORNIA LABORATORY SERVICES

KIFF Analytical 2795 Second St. Suite 300 Davis, CA 95616	Project: Tesoro Livermore #67076 Project Number: 01LV Project Manager: Scott Forbes	CLS Work Order #: CVE0556 COC #: 81217
---	---	---

CVE0556

		2795 Second Street, Suite 300 Davis, CA 95618 Lab: 530.297.4800 Fax: 530.297.4808		California Laboratory Services 3249 Fitzgerald Road Rancho Cordova, CA 95742 916-638-7301		COC No. <b>81217</b> Page 1 of 1		
Project Contact (Hardcopy or PDF to): <b>Scott Forbes</b>		EDF Report? <b>YES</b>		<b>Chain-of-Custody Record and Analysis Request</b>				
Company/Address: <b>Kiff Analytical</b>		Recommended but not mandatory to complete this section: Sampling Company Log Code: <b>EFSP</b>		<b>Analysis Request</b>				<b>TAT</b>
Phone No.: <b>530-297-4800</b>	FAX No.: <b>530-297-4808</b>	Global ID: <b>T0600101410</b>						
Project Number: <b>01LV</b>	P.O. No.: <b>81217</b>	Deliverables to (Email Address): <b>inbox@kiffanalytical.com</b>						
Project Name: <b>Tesoro Livermore #67076</b>		<b>Container / Preservative</b>		<b>Matrix</b>				
Project Address:		250ml Poly Nona		Water	Carbon Dioxide			Standard
<b>Sample Designation</b>	<b>Date</b>	<b>Time</b>						For Lab Use Only
IP-10	05/09/12	09:45	1		X	X		X
MW-7	05/09/12	10:00	1		X	X		X
IP-1	05/09/12	10:10	1		X	X		X
IP-9	05/09/12	10:40	1		X	X		X
IP-8	05/09/12	11:00	1		X	X		X
Relinquished by: <i>[Signature]</i>		Date	Time	Received by:		Remarks:		
		05/11/12	11:40					
Relinquished by:		Date	Time	Received by:				
Relinquished by:		Date	Time	Received by Laboratory:		Bill to:		
				FOR R 5-11-12 11:40		3.2°C Accounts Payable		

# CALIFORNIA LABORATORY SERVICES

Page 2 of 4

05/17/12 16:38

KIFF Analytical  
2795 Second St. Suite 300  
Davis, CA 95616

Project: Tesoro Livermore #67076  
Project Number: 01LV  
Project Manager: Scott Forbes

CLS Work Order #: CVE0556  
COC #: 81217

## Conventional Chemistry Parameters by APHA/EPA Methods

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>IP-10 (CVE0556-01) Water Sampled: 05/09/12 09:45 Received: 05/11/12 11:40</b>									
Carbon Dioxide as CO2	46	5.0	mg/L	1	CV03187	05/14/12	05/14/12	SM 4500C	
<b>MW-7 (CVE0556-02) Water Sampled: 05/09/12 10:00 Received: 05/11/12 11:40</b>									
Carbon Dioxide as CO2	55	5.0	mg/L	1	CV03187	05/14/12	05/14/12	SM 4500C	
<b>IP-1 (CVE0556-03) Water Sampled: 05/09/12 10:10 Received: 05/11/12 11:40</b>									
Carbon Dioxide as CO2	96	5.0	mg/L	1	CV03187	05/14/12	05/14/12	SM 4500C	
<b>IP-9 (CVE0556-04) Water Sampled: 05/09/12 10:40 Received: 05/11/12 11:40</b>									
Carbon Dioxide as CO2	ND	5.0	mg/L	1	CV03187	05/14/12	05/14/12	SM 4500C	
<b>IP-8 (CVE0556-05) Water Sampled: 05/09/12 11:00 Received: 05/11/12 11:40</b>									
Carbon Dioxide as CO2	44	5.0	mg/L	1	CV03187	05/14/12	05/14/12	SM 4500C	

CA DOHS ELAP Accreditation/Registration Number 1233

# CALIFORNIA LABORATORY SERVICES

Page 3 of 4

05/17/12 16:38

KIFF Analytical 2795 Second St. Suite 300 Davis, CA 95616	Project: Tesoro Livermore #67076 Project Number: 01LV Project Manager: Scott Forbes	CLS Work Order #: CVE0556 COC #: 81217
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## Conventional Chemistry Parameters by APHA/EPA Methods - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
---------	--------	-----------------	-------	-------------	---------------	------	-------------	-----	-----------	-------

### Batch CV03187 - General Preparation

#### Blank (CV03187-BLK1)

Prepared & Analyzed: 05/14/12

Carbon Dioxide as CO2	ND	5.0	mg/L
-----------------------	----	-----	------

# CALIFORNIA LABORATORY SERVICES

Page 4 of 4

05/17/12 16:38

KIFF Analytical  
2795 Second St. Suite 300  
Davis, CA 95616

Project: Tesoro Livermore #67076  
Project Number: 01LV  
Project Manager: Scott Forbes

**CLS Work Order #: CVE0556**  
COC #: 81217

## 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

---

CA DOHS ELAP Accreditation/Registration Number 1233

3249 Fitzgerald Road Rancho Cordova, CA 95742

[www.californialab.com](http://www.californialab.com)

916-638-7301

Fax: 916-638-4510



# CALSCIENCE

WORK ORDER NUMBER: 12-05-0732

*The difference is service*



AIR | SOIL | WATER | MARINE CHEMISTRY

## Analytical Report For

**Client:** Kiff Analytical

**Client Project Name:** Tesoro Livermore #67076

**Attention:** Joel Kiff  
2795 2nd Street, Suite 300  
Davis, CA 95616-6593

*Amanda Porter*

Approved for release on 05/16/2012 by:  
Amanda Porter  
Project Manager

ResultLink ▶

Email your PM ▶



Calscience Environmental Laboratories, Inc. (Calscience) certifies that the test results provided in this report meet all NELAC requirements for parameters for which accreditation is required or available. Any exceptions to NELAC requirements are noted in the case narrative. The original report of subcontracted analyses, if any, is attached to this report. The results in this report are limited to the sample(s) tested and any reproduction thereof must be made in its entirety. The client or recipient of this report is specifically prohibited from making material changes to said report and, to the extent that such changes are made, Calscience is not responsible, legally or otherwise. The client or recipient agrees to indemnify Calscience for any defense to any litigation which may arise.







# Contents

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Client Project Name: Tesoro Livermore #67076

Work Order Number: 12-05-0732

1	Client Sample Data . . . . .	3
	1.1 SM 5210 B Biochemical Oxygen Demand (Aqueous) . . . . .	3
2	Quality Control Sample Data . . . . .	4
	2.1 MS/MSD and/or Duplicate . . . . .	4
3	Glossary of Terms and Qualifiers . . . . .	5
4	Chain of Custody/Sample Receipt Form . . . . .	6

Analytical Report



Kiff Analytical  
2795 2nd Street, Suite 300  
Davis, CA 95616-6593

Date Received: 05/10/12  
Work Order No: 12-05-0732  
Preparation: N/A  
Method: SM 5210 B

Project: Tesoro Livermore #67076

Page 1 of 1

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
DW-1	12-05-0732-1-A	05/09/12 14:35	Aqueous	BOD 1	05/10/12	05/15/12 20:10	C0510BODB1

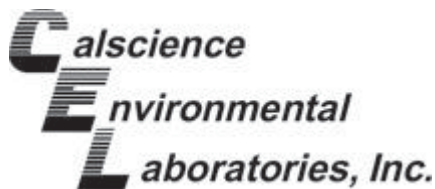
<u>Parameter</u>	<u>Result</u>	<u>RL</u>	<u>DF</u>	<u>Qual</u>	<u>Units</u>
Biochemical Oxygen Demand	3.0	1.0	1		mg/L

Method Blank	099-05-054-3,706	N/A	Aqueous	BOD 1	05/10/12	05/15/12 20:10	C0510BODB1
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<u>Parameter</u>	<u>Result</u>	<u>RL</u>	<u>DF</u>	<u>Qual</u>	<u>Units</u>
Biochemical Oxygen Demand	ND	1.0	1		mg/L

Return to Contents

RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers



Quality Control - Duplicate



Kiff Analytical  
 2795 2nd Street, Suite 300  
 Davis, CA 95616-6593

Date Received: 05/10/12  
 Work Order No: 12-05-0732  
 Preparation: N/A  
 Method: SM 5210 B

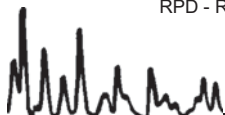
Project: Tesoro Livermore #67076

Quality Control Sample ID	Matrix	Instrument	Date Prepared:	Date Analyzed:	Duplicate Batch Number
12-05-0795-1	Aqueous	BOD 1	05/10/12	05/15/12	C0510BODD1

Parameter	Sample Conc.	DUP Conc	RPD	RPD CL	Qualifiers
Biochemical Oxygen Demand	ND	ND	NA	0-25	

Return to Contents

RPD - Relative Percent Difference , CL - Control Limit



Work Order Number: 12-05-0732

<u>Qualifier</u>	<u>Definition</u>
*	See applicable analysis comment.
<	Less than the indicated value.
>	Greater than the indicated value.
1	Surrogate compound recovery was out of control due to a required sample dilution. Therefore, the sample data was reported without further clarification.
2	Surrogate compound recovery was out of control due to matrix interference. The associated method blank surrogate spike compound was in control and, therefore, the sample data was reported without further clarification.
3	Recovery of the Matrix Spike (MS) or Matrix Spike Duplicate (MSD) compound was out of control due to matrix interference. The associated LCS and/or LCSD was in control and, therefore, the sample data was reported without further clarification.
4	The MS/MSD RPD was out of control due to matrix interference. The LCS/LCSD RPD was in control and, therefore, the sample data was reported without further clarification.
5	The PDS/PDSD or PES/PESD associated with this batch of samples was out of control due to a matrix interference effect. The associated batch LCS/LCSD was in control and, hence, the associated sample data was reported without further clarification.
6	Surrogate recovery below the acceptance limit.
7	Surrogate recovery above the acceptance limit.
B	Analyte was present in the associated method blank.
BU	Sample analyzed after holding time expired.
E	Concentration exceeds the calibration range.
ET	Sample was extracted past end of recommended max. holding time.
HD	The chromatographic pattern was inconsistent with the profile of the reference fuel standard.
HDH	The sample chromatographic pattern for TPH matches the chromatographic pattern of the specified standard but heavier hydrocarbons were also present (or detected).
HDL	The sample chromatographic pattern for TPH matches the chromatographic pattern of the specified standard but lighter hydrocarbons were also present (or detected).
J	Analyte was detected at a concentration below the reporting limit and above the laboratory method detection limit. Reported value is estimated.
ME	LCS/LCSD Recovery Percentage is within Marginal Exceedance (ME) Control Limit range.
ND	Parameter not detected at the indicated reporting limit.
Q	Spike recovery and RPD control limits do not apply resulting from the parameter concentration in the sample exceeding the spike concentration by a factor of four or greater.
SG	The sample extract was subjected to Silica Gel treatment prior to analysis.
X	% Recovery and/or RPD out-of-range.
Z	Analyte presence was not confirmed by second column or GC/MS analysis.

Solid - Unless otherwise indicated, solid sample data is reported on a wet weight basis, not corrected for % moisture. All QC results are reported on a wet weight basis.

MPN - Most Probable Number





2795 Second Street, Suite 300  
 Davis, CA 95618  
 Lab: 530.297.4800  
 Fax: 530.297.4808

Calscience  
 7440 Lincoln Way  
 Garden Grove, CA 92841-1427  
 714-895-5494

**12-05-0732**

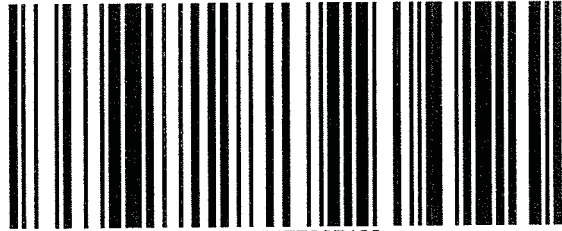
COC No. **81217** Page 1 of 1

Project Contact (Hardcopy or PDF to): <b>Scott Forbes</b>		EDF Report? <b>YES</b>		<b>Chain-of-Custody Record and Analysis Request</b>																	
Company/Address: <b>Kiff Analytical</b>		Recommended but not mandatory to complete this section: Sampling Company Log Code: <b>EFSP</b>		<b>Analysis Request</b>										<b>TAT</b>							
Phone No.: <b>530-297-4800</b>	FAX No.: <b>530-297-4808</b>	Global ID: <b>T0600101410</b>																			
Project Number: <b>01LV</b>	P.O. No.: <b>81217</b>	Deliverables to (Email Address): <b>inbox@kiffanalytical.com</b>																			
Project Name: <b>Tesoro Livermore #67076</b>		<b>Container / Preservative</b>				<b>Matrix</b>															
Project Address:																					
<b>Sample Designation</b>		<b>Sampling</b>																			
		<b>Date</b>	<b>Time</b>																		
<b>DW-1</b>		<b>05/09/12</b>	<b>14:35</b>																		

Relinquished by: <i>[Signature]</i> Kiff Analytical	Date <b>05/09/12</b>	Time <b>1900</b>	Received by:	Remarks:   <b>Bill to: Accounts Payable</b>
Relinquished by:	Date	Time	Received by:	
Relinquished by: <i>[Signature]</i>	Date <b>5/10/12</b>	Time <b>0800</b>	Received by Laboratory: <i>[Signature]</i> CA	



**800.334.5000**  
ontrac.com



0732

D10010475237496

Date Printed 5/9/2012

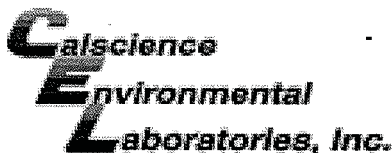
Tracking#D10010475237496

*Shipped From:*  
KIFF ANALYTICAL  
2795 2ND STREET 300  
DAVIS, CA 95616

*Sent By:* SAMPLE RECEIVING  
*Phone#:* (530)297-4800  
*wgt(lbs):* 1  
*Reference:* SUB SRG SAMPLES  
*Reference 2:*

*Ship To Company:*  
**CALSCIENCE ENVIRONMENTAL**  
**7440 LINCOLN WAY**  
**GARDEN GROVE, CA 92841**  
**RECEIVING (714)895-5494**  
  
**B10207210772**

*Service:* **G**  
*Sort Code:* **ORG**  
  
*Special Services:*  
**Signature Required**



WORK ORDER #: 12-05-0732

SAMPLE RECEIPT FORM

Cooler 1 of 1

CLIENT: KIFF ANALYTICAL

DATE: 05/10/12

TEMPERATURE: Thermometer ID: SC2 (Criteria: 0.0 °C - 6.0 °C, not frozen)
Temperature 2.6 °C - 0.3 °C (CF) = 2.3 °C [X] Blank [ ] Sample
[ ] Sample(s) outside temperature criteria (PM/APM contacted by: \_\_\_\_\_).
[ ] Sample(s) outside temperature criteria but received on ice/chilled on same day of sampling.
[ ] Received at ambient temperature, placed on ice for transport by Courier.
Ambient Temperature: [ ] Air [ ] Filter Initial: WS

CUSTODY SEALS INTACT:
[X] Cooler [ ] \_\_\_\_\_ [ ] No (Not Intact) [ ] Not Present [ ] N/A Initial: WS
[ ] Sample [ ] \_\_\_\_\_ [ ] No (Not Intact) [X] Not Present Initial: WS

SAMPLE CONDITION:
Chain-Of-Custody (COC) document(s) received with samples..... [X] Yes [ ] No [ ] N/A
COC document(s) received complete..... [X] Yes [ ] No [ ] N/A
[ ] Collection date/time, matrix, and/or # of containers logged in based on sample labels.
[ ] No analysis requested. [ ] Not relinquished. [ ] No date/time relinquished.
Sampler's name indicated on COC..... [ ] Yes [ ] No [X] N/A
Sample container label(s) consistent with COC..... [X] Yes [ ] No [ ] N/A
Sample container(s) intact and good condition..... [X] Yes [ ] No [ ] N/A
Proper containers and sufficient volume for analyses requested..... [X] Yes [ ] No [ ] N/A
Analyses received within holding time..... [X] Yes [ ] No [ ] N/A
pH / Res. Chlorine / Diss. Sulfide / Diss. Oxygen received within 24 hours... [ ] Yes [ ] No [X] N/A
Proper preservation noted on COC or sample container..... [X] Yes [ ] No [ ] N/A
[ ] Unpreserved vials received for Volatiles analysis
Volatile analysis container(s) free of headspace..... [ ] Yes [ ] No [X] N/A
Tedlar bag(s) free of condensation..... [ ] Yes [ ] No [X] N/A

CONTAINER TYPE:
Solid: [ ] 4ozCGJ [ ] 8ozCGJ [ ] 16ozCGJ [ ] Sleeve (\_\_\_\_) [ ] EnCores® [ ] TerraCores® [ ] \_\_\_\_\_
Water: [ ] VOA [ ] VOAh [ ] VOAna2 [ ] 125AGB [ ] 125AGBh [ ] 125AGBp [ ] 1AGB [ ] 1AGBna2 [ ] 1AGBs
[ ] 500AGB [ ] 500AGJ [ ] 500AGJs [ ] 250AGB [ ] 250CGB [ ] 250CGBs [X] 1PB [ ] 1PBna [ ] 500PB
[ ] 250PB [ ] 250PBn [ ] 125PB [ ] 125PBzanna [ ] 100PJ [ ] 100PJna2 [ ] \_\_\_\_\_ [ ] \_\_\_\_\_ [ ] \_\_\_\_\_
Air: [ ] Tedlar® [ ] Summa® Other: [ ] \_\_\_\_\_ Trip Blank Lot#: \_\_\_\_\_ Labeled/Checked by: WS
Container: C: Clear A: Amber P: Plastic G: Glass J: Jar B: Bottle Z: Ziploc/Resealable Bag E: Envelope Reviewed by: AP
Preservative: h: HCL n: HNO3 na2:Na2S2O3 na: NaOH p: H3PO4 s: H2SO4 u: Ultra-pure zanna: ZnAc2+NaOH f: Filtered Scanned by: AP

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# CALSCIENCE

WORK ORDER NUMBER: 12-05-0809

*The difference is service*



AIR SOIL WATER MARINE CHEMISTRY

## Analytical Report For

**Client:** Kiff Analytical

**Client Project Name:** Tesoro Livermore #67076

**Attention:** Joel Kiff  
2795 2nd Street, Suite 300  
Davis, CA 95616-6593

*Amanda Porter*

Approved for release on 05/17/2012 by:  
Amanda Porter  
Project Manager

ResultLink ▶

Email your PM ▶



Calscience Environmental Laboratories, Inc. (Calscience) certifies that the test results provided in this report meet all NELAC requirements for parameters for which accreditation is required or available. Any exceptions to NELAC requirements are noted in the case narrative. The original report of subcontracted analyses, if any, is attached to this report. The results in this report are limited to the sample(s) tested and any reproduction thereof must be made in its entirety. The client or recipient of this report is specifically prohibited from making material changes to said report and, to the extent that such changes are made, Calscience is not responsible, legally or otherwise. The client or recipient agrees to indemnify Calscience for any defense to any litigation which may arise.





## Contents

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Client Project Name: Tesoro Livermore #67076

Work Order Number: 12-05-0809

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**Analytical Report**



Kiff Analytical  
 2795 2nd Street, Suite 300  
 Davis, CA 95616-6593

Date Received: 05/11/12  
 Work Order No: 12-05-0809  
 Preparation: N/A  
 Method: RSK-175M

Project: Tesoro Livermore #67076

Page 1 of 2

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
IP-10	12-05-0809-1-A	05/09/12 09:45	Aqueous	GC 52	N/A	05/11/12 15:18	120511L01

Parameter	Result	RL	DF	Qual	Units
Methane	478	1.00	1		ug/L

MW-7	12-05-0809-2-A	05/09/12 10:00	Aqueous	GC 52	N/A	05/11/12 17:46	120511L01
------	----------------	----------------	---------	-------	-----	----------------	-----------

Parameter	Result	RL	DF	Qual	Units
Methane	1210	4.00	4		ug/L

IP-1	12-05-0809-3-A	05/09/12 10:10	Aqueous	GC 52	N/A	05/11/12 17:23	120511L01
------	----------------	----------------	---------	-------	-----	----------------	-----------

Parameter	Result	RL	DF	Qual	Units
Methane	1060	4.00	4		ug/L

IP-9	12-05-0809-4-A	05/09/12 10:40	Aqueous	GC 52	N/A	05/11/12 16:43	120511L01
------	----------------	----------------	---------	-------	-----	----------------	-----------

Parameter	Result	RL	DF	Qual	Units
Methane	59.4	1.00	1		ug/L

IP-8	12-05-0809-5-A	05/09/12 11:00	Aqueous	GC 52	N/A	05/11/12 14:55	120511L01
------	----------------	----------------	---------	-------	-----	----------------	-----------

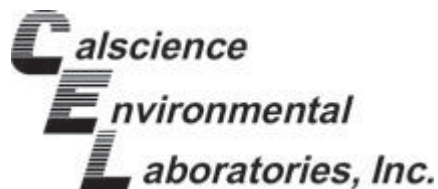
Parameter	Result	RL	DF	Qual	Units
Methane	143	1.00	1		ug/L

DW-1	12-05-0809-6-A	05/09/12 14:35	Aqueous	GC 52	N/A	05/11/12 17:03	120511L01
------	----------------	----------------	---------	-------	-----	----------------	-----------

Parameter	Result	RL	DF	Qual	Units
Methane	10.1	1.00	1		ug/L

RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers

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Analytical Report



Kiff Analytical  
 2795 2nd Street, Suite 300  
 Davis, CA 95616-6593

Date Received: 05/11/12  
 Work Order No: 12-05-0809  
 Preparation: N/A  
 Method: RSK-175M

Project: Tesoro Livermore #67076

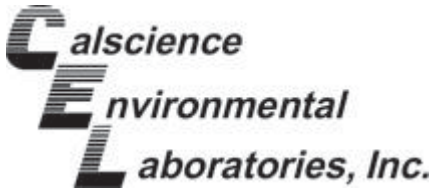
Page 2 of 2

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Method Blank	099-12-663-1,600	N/A	Aqueous	GC 52	N/A	05/11/12 12:14	120511L01

Parameter	Result	RL	DF	Qual	Units
Methane	ND	1.00	1		ug/L

Return to Contents

RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers



Analytical Report



Kiff Analytical  
2795 2nd Street, Suite 300  
Davis, CA 95616-6593

Date Received: 05/11/12  
Work Order No: 12-05-0809

Project: Tesoro Livermore #67076

Page 1 of 2

Client Sample Number	Lab Sample Number	Date Collected	Matrix
IP-10	12-05-0809-1	05/09/12	Aqueous

Parameter	Results	RL	DF	Qual	Units	Date Prepared	Date Analyzed	Method
Alkalinity, Total (as CaCO3)	368	5.00	1		mg/L	N/A	05/11/12	SM 2320B
Solids, Total Dissolved	530	1.00	1		mg/L	05/14/12	05/14/12	SM 2540 C
<b>MW-7</b>								

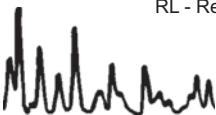
Parameter	Results	RL	DF	Qual	Units	Date Prepared	Date Analyzed	Method
Alkalinity, Total (as CaCO3)	377	5.00	1		mg/L	N/A	05/11/12	SM 2320B
Solids, Total Dissolved	540	1.00	1		mg/L	05/14/12	05/14/12	SM 2540 C
<b>IP-1</b>								

Parameter	Results	RL	DF	Qual	Units	Date Prepared	Date Analyzed	Method
Alkalinity, Total (as CaCO3)	530	5.00	1		mg/L	N/A	05/11/12	SM 2320B
Solids, Total Dissolved	650	1.00	1		mg/L	05/14/12	05/14/12	SM 2540 C
<b>IP-9</b>								

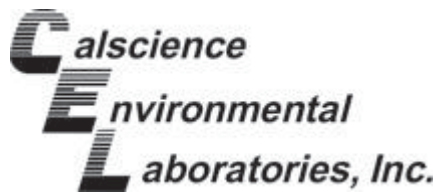
Parameter	Results	RL	DF	Qual	Units	Date Prepared	Date Analyzed	Method
Alkalinity, Total (as CaCO3)	9490	10.0	1		mg/L	N/A	05/11/12	SM 2320B
Solids, Total Dissolved	7480	10.0	1		mg/L	05/14/12	05/14/12	SM 2540 C
<b>IP-8</b>								

Parameter	Results	RL	DF	Qual	Units	Date Prepared	Date Analyzed	Method
Alkalinity, Total (as CaCO3)	686	5.00	1		mg/L	N/A	05/11/12	SM 2320B
Solids, Total Dissolved	925	1.00	1		mg/L	05/14/12	05/14/12	SM 2540 C

RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers



Return to Contents



Analytical Report



Kiff Analytical  
2795 2nd Street, Suite 300  
Davis, CA 95616-6593

Date Received: 05/11/12  
Work Order No: 12-05-0809

Project: Tesoro Livermore #67076

Page 2 of 2

Client Sample Number	Lab Sample Number	Date Collected	Matrix
DW-1	12-05-0809-6	05/09/12	Aqueous

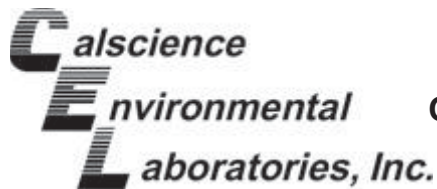
Parameter	Results	RL	DF	Qual	Units	Date Prepared	Date Analyzed	Method
Chemical Oxygen Demand	21	20	1		mg/L	05/17/12	05/17/12	EPA 410.4
Alkalinity, Total (as CaCO3)	342	5.00	1		mg/L	N/A	05/11/12	SM 2320B
Carbon, Total Organic	35	10	20		mg/L	05/11/12	05/11/12	SM 5310 D
<b>Method Blank</b>					<b>N/A</b>			<b>Aqueous</b>

Parameter	Results	RL	DF	Qual	Units	Date Prepared	Date Analyzed	Method
Chemical Oxygen Demand	ND	20	1		mg/L	05/17/12	05/17/12	EPA 410.4
Alkalinity, Total (as CaCO3)	ND	1.0	1		mg/L	N/A	05/11/12	SM 2320B
Solids, Total Dissolved	ND	1.0	1		mg/L	05/14/12	05/14/12	SM 2540 C
Carbon, Total Organic	ND	0.50	1		mg/L	05/11/12	05/11/12	SM 5310 D

Return to Contents

RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers





Quality Control - Spike/Spike Duplicate



Kiff Analytical  
 2795 2nd Street, Suite 300  
 Davis, CA 95616-6593

Date Received: N/A  
 Work Order No: 12-05-0809

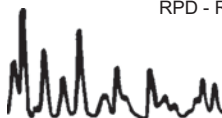
Project: Tesoro Livermore #67076

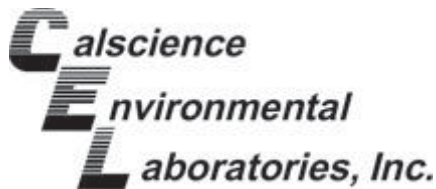
Matrix: Aqueous or Solid

<u>Parameter</u>	<u>Method</u>	<u>Quality Control Sample ID</u>	<u>Date Analyzed</u>	<u>Date Extracted</u>	<u>MS% REC</u>	<u>MSD % REC</u>	<u>%REC CL</u>	<u>RPD</u>	<u>RPD CL</u>	<u>Qualifiers</u>
Carbon, Total Organic	SM 5310 D	DW-1	05/11/12	5/11/12	95	94	75-125	1	0-25	

Return to Contents

RPD - Relative Percent Difference , CL - Control Limit





Quality Control - Duplicate



Kiff Analytical  
2795 2nd Street, Suite 300  
Davis, CA 95616-6593

Date Received: N/A  
Work Order No: 12-05-0809

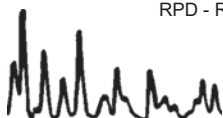
Project: Tesoro Livermore #67076

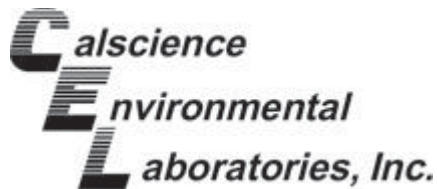
Matrix: Aqueous or Solid

<u>Parameter</u>	<u>Method</u>	<u>QC Sample ID</u>	<u>Date Analyzed</u>	<u>Sample Conc.</u>	<u>DUP Conc.</u>	<u>RPD</u>	<u>RPD CL</u>	<u>Qualifiers</u>
Alkalinity, Total (as CaCO3)	SM 2320B	IP-9	05/11/12	9490	9320	2	0-25	
Chemical Oxygen Demand	EPA 410.4	12-05-0864-1	05/17/12	130	130	2	0-25	
Solids, Total Dissolved	SM 2540 C	MW-7	05/14/12	540	510	6	0-10	

Return to Contents

RPD - Relative Percent Difference , CL - Control Limit





Quality Control - LCS/LCS Duplicate



Kiff Analytical  
2795 2nd Street, Suite 300  
Davis, CA 95616-6593

Date Received: N/A  
Work Order No: 12-05-0809  
Preparation: N/A  
Method: RSK-175M

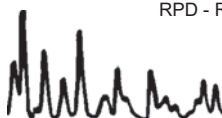
Project: Tesoro Livermore #67076

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number
099-12-663-1,600	Aqueous	GC 52	N/A	05/11/12	120511L01

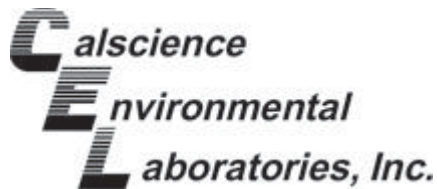
Parameter	SPIKE ADDED	LCS %REC	LCSD %REC	%REC CL	RPD	RPD CL	Qualifiers
Methane	100.0	94	95	79-109	2	0-20	

Return to Contents

RPD - Relative Percent Difference , CL - Control Limit







Quality Control - LCS/LCS Duplicate



Kiff Analytical  
2795 2nd Street, Suite 300  
Davis, CA 95616-6593

Date Received: N/A  
Work Order No: 12-05-0809

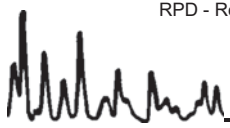
Project: Tesoro Livermore #67076

Matrix: Aqueous or Solid

<u>Parameter</u>	<u>Method</u>	<u>Quality Control</u> Sample ID	<u>Date</u> <u>Extracted</u>	<u>Date</u> <u>Analyzed</u>	<u>LCS %</u> <u>REC</u>	<u>LCSD %</u> <u>REC</u>	<u>%REC</u> <u>CL</u>	<u>RPD</u>	<u>RPD</u> <u>CL</u>	<u>Qual</u>
Carbon, Total Organic	SM 5310 D	099-05-097-4,608	05/11/12	05/11/12	109	109	80-120	0	0-20	

Return to Contents

RPD - Relative Percent Difference , CL - Control Limit



Work Order Number: 12-05-0809

<u>Qualifier</u>	<u>Definition</u>
*	See applicable analysis comment.
<	Less than the indicated value.
>	Greater than the indicated value.
1	Surrogate compound recovery was out of control due to a required sample dilution. Therefore, the sample data was reported without further clarification.
2	Surrogate compound recovery was out of control due to matrix interference. The associated method blank surrogate spike compound was in control and, therefore, the sample data was reported without further clarification.
3	Recovery of the Matrix Spike (MS) or Matrix Spike Duplicate (MSD) compound was out of control due to matrix interference. The associated LCS and/or LCSD was in control and, therefore, the sample data was reported without further clarification.
4	The MS/MSD RPD was out of control due to matrix interference. The LCS/LCSD RPD was in control and, therefore, the sample data was reported without further clarification.
5	The PDS/PDSD or PES/PESD associated with this batch of samples was out of control due to a matrix interference effect. The associated batch LCS/LCSD was in control and, hence, the associated sample data was reported without further clarification.
6	Surrogate recovery below the acceptance limit.
7	Surrogate recovery above the acceptance limit.
B	Analyte was present in the associated method blank.
BU	Sample analyzed after holding time expired.
E	Concentration exceeds the calibration range.
ET	Sample was extracted past end of recommended max. holding time.
HD	The chromatographic pattern was inconsistent with the profile of the reference fuel standard.
HDH	The sample chromatographic pattern for TPH matches the chromatographic pattern of the specified standard but heavier hydrocarbons were also present (or detected).
HDL	The sample chromatographic pattern for TPH matches the chromatographic pattern of the specified standard but lighter hydrocarbons were also present (or detected).
J	Analyte was detected at a concentration below the reporting limit and above the laboratory method detection limit. Reported value is estimated.
ME	LCS/LCSD Recovery Percentage is within Marginal Exceedance (ME) Control Limit range.
ND	Parameter not detected at the indicated reporting limit.
Q	Spike recovery and RPD control limits do not apply resulting from the parameter concentration in the sample exceeding the spike concentration by a factor of four or greater.
SG	The sample extract was subjected to Silica Gel treatment prior to analysis.
X	% Recovery and/or RPD out-of-range.
Z	Analyte presence was not confirmed by second column or GC/MS analysis.

Solid - Unless otherwise indicated, solid sample data is reported on a wet weight basis, not corrected for % moisture. All QC results are reported on a wet weight basis.

MPN - Most Probable Number





2795 Second Street, Suite 300  
 Davis, CA 95618  
 Lab: 530.297.4800  
 Fax: 530.297.4808

Calscience  
 7440 Lincoln Way  
 Garden Grove, CA 92841-1427  
 714-895-5494

**12-05-0809**

COC No. **81217** Page 1 of 1

Project Contact (Hardcopy or PDF to): <b>Scott Forbes</b>		EDF Report? <b>YES</b>		<b>Chain-of-Custody Record and Analysis Request</b>															
Company/Address: <b>Kiff Analytical</b>		Recommended but not mandatory to complete this section: Sampling Company Log Code: <b>EFSP</b>		<b>Analysis Request</b>										<b>TAT</b>					
Phone No.: <b>530-297-4800</b>	FAX No.: <b>530-297-4808</b>	Global ID: <b>T0600101410</b>																	
Project Number: <b>01LV</b>	P.O. No.: <b>81217</b>	Deliverables to (Email Address): <b>inbox@kiffanalytical.com</b>																	
Project Name: <b>Tesoro Livermore #67076</b>		<b>Container / Preservative</b>				<b>Matrix</b>													
Project Address:		250ml Glass H2SO4	1-L Poly None	250ml Poly None	VOA 40 ml HCl	Water	Alkalinity SM 2320 (1)	Biochemical Oxygen Demand*	Chemical Oxygen Demand	Hydrocarbons in Water by RSK 175 (1)	Total Dissolved Solids	Total Organic Carbon	4-Days	For Lab Use Only					
<b>Sampling</b>																			
<b>Sample Designation</b>		<b>Date</b>	<b>Time</b>																
IP-10		05/09/12	09:45	1	1	2									1				
MW-7		05/09/12	10:00	1	1	2									2				
IP-1		05/09/12	10:10	1	1	2									3				
IP-9		05/09/12	10:40	1	1	2									4				
IP-8		05/09/12	11:00	1	1	2									5				
DW-1		05/09/12	14:35	1	1*	1	2								6				

Relinquished by: <i>[Signature]</i> Kiff Analytical	Date 05/10/12	Time 1900	Received by:
Relinquished by:	Date	Time	Received by:
Relinquished by: (OUTPAC)	Date 5/11/12	Time 0930	Received by Laboratory: <i>[Signature]</i> n. 42

Remarks: Please refer to attached Test Detail.  
 \*BOD sample for DW-1 already received by Calscience on 05/10/12.

Bill to: Accounts Payable

## Test Detail for Kiff Work Order: 81217

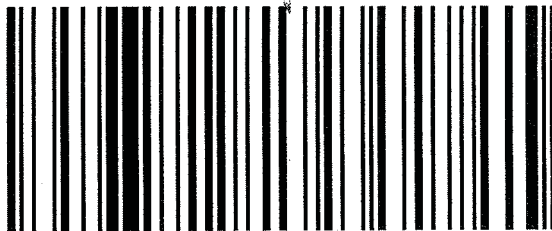
0809

**Alkalinity SM 2320 (1)**  
Alkalinity, Total (as CaCO<sub>3</sub>)

**Hydrocarbons in Water by RSK 175 (1)**  
Methane



800.334.5000  
ontrac.com



D10010475617010

0809

Date Printed 5/10/2012

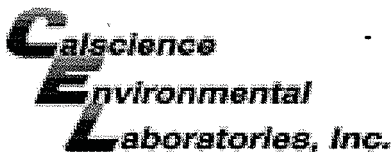
Tracking#D10010475617010

Shipped From:  
KIFF ANALYTICAL  
2795 2ND STREET 300  
DAVIS, CA 95616

Sent By: SAMPLE RECEIVING  
Phone#: (530)297-4800  
wgt(lbs): 1  
Reference: SUB SRG SAMPLES  
Reference 2:

Ship To Company:  
**CALSCIENCE ENVIRONMENTAL**  
**7440 LINCOLN WAY**  
**GARDEN GROVE, CA 92841**  
**RECEIVING (714)895-5494**  
  
**B10207210772**

Service: **S**  
Sort Code: **ORG**  
Special Services:  
**Signature Required**



WORK ORDER #: 12-05-0809

SAMPLE RECEIPT FORM

Cooler 1 of 1

CLIENT: KIFF

DATE: 05/11/12

TEMPERATURE: Thermometer ID: SC2 (Criteria: 0.0°C – 6.0°C, not frozen)

Temperature 1.4°C - 0.3°C (CF) = 1.1°C [X] Blank [ ] Sample

[ ] Sample(s) outside temperature criteria (PM/APM contacted by: \_\_\_\_\_).

[ ] Sample(s) outside temperature criteria but received on ice/chilled on same day of sampling.

[ ] Received at ambient temperature, placed on ice for transport by Courier.

Ambient Temperature: [ ] Air [ ] Filter

Initial: PS

CUSTODY SEALS INTACT:

[ ] Cooler [ ] \_\_\_\_\_ [ ] No (Not Intact) [X] Not Present [ ] N/A

Initial: PS

[ ] Sample [ ] \_\_\_\_\_ [ ] No (Not Intact) [X] Not Present

Initial: JSI

SAMPLE CONDITION:

Table with 4 columns: Item, Yes, No, N/A. Rows include Chain-Of-Custody (COC) document(s) received with samples, COC document(s) received complete, Sampler's name indicated on COC, Sample container label(s) consistent with COC, Sample container(s) intact and good condition, Proper containers and sufficient volume for analyses requested, Analyses received within holding time, pH / Res. Chlorine / Diss. Sulfide / Diss. Oxygen received within 24 hours, Proper preservation noted on COC or sample container, Volatile analysis container(s) free of headspace, Tedlar bag(s) free of condensation.

CONTAINER TYPE:

Solid: [ ] 4ozCGJ [ ] 8ozCGJ [ ] 16ozCGJ [ ] Sleeve (\_\_\_\_) [ ] EnCores® [ ] TerraCores® [ ] \_\_\_\_\_
Water: [ ] VOA [X] VOA<sup>2</sup>h [ ] VOAna<sub>2</sub> [ ] 125AGB [ ] 125AGBh [ ] 125AGBp [ ] 1AGB [ ] 1AGBna<sub>2</sub> [ ] 1AGBs
[ ] 500AGB [ ] 500AGJ [ ] 500AGJs [ ] 250AGB [ ] 250CGB [X] 250CGBs [X] 1PB [ ] 1PBna [ ] 500PB
[X] 250PB [ ] 250PBn [ ] 125PB [ ] 125PBz<sub>2</sub>na [ ] 100PJ [ ] 100PJna<sub>2</sub> [ ] \_\_\_\_\_ [ ] \_\_\_\_\_ [ ] \_\_\_\_\_

Air: [ ] Tedlar® [ ] Summa® Other: [ ] \_\_\_\_\_ Trip Blank Lot#: \_\_\_\_\_ Labeled/Checked by: JSI

Container: C: Clear A: Amber P: Plastic G: Glass J: Jar B: Bottle Z: Ziploc/Resealable Bag E: Envelope Reviewed by: PS

Preservative: h: HCL n: HNO<sub>3</sub> na<sub>2</sub>:Na<sub>2</sub>S<sub>2</sub>O<sub>3</sub> na: NaOH p: H<sub>3</sub>PO<sub>4</sub> s: H<sub>2</sub>SO<sub>4</sub> u: Ultra-pure z<sub>2</sub>na: ZnAc<sub>2</sub>+NaOH f: Filtered Scanned by: PS





## Laboratory Results

Matt Nelson  
Orion Environmental  
3450 East Spring Street, Suite 212  
Long Beach, CA 90806

Subject : 5 Water Samples  
Project Name : Tesoro Livermore #67076  
Project Number : 01LV

Dear Mr. Nelson,

Chemical analysis of the samples referenced above has been completed. Summaries of the data are contained on the following pages. Sample(s) were received under documented chain-of-custody. US EPA protocols for sample storage and preservation were followed. Testing procedures comply with the 2003 NELAC and TNI 2009 standards. Laboratory results relate only to the samples tested. This report may be freely reproduced in full, but may only be reproduced in part with the express permission of Kiff Analytical, LLC. Kiff Analytical, LLC is certified by the State of California under the National Environmental Laboratory Accreditation Program (NELAP), lab # 08263CA. If you have any questions regarding procedures or results, please call me at 530-297-4800.

Sincerely,

Troy Turpen

Subject : 5 Water Samples  
Project Name : Tesoro Livermore #67076  
Project Number : 01LV

## Case Narrative

The Method Reporting Limit for Methanol has been increased due to the presence of an interfering compound for sample DW-2.

The Method Reporting Limit for Ethanol has been increased due to the presence of an interfering compound for samples DW-5 and DW-2.

California Laboratory Services provided analytical testing associated with these samples, but is not accredited by the National Environmental Laboratory Accreditation Program (NELAP). Please refer to the attached subcontract report for a list of this laboratory's current certifications.

Matrix Spike/Matrix Spike Duplicate results associated with samples DW-5, DW-2, and MW-6 for the analytes Ethanol and Methanol were outside of control limits. This may indicate a bias for the sample that was spiked. Since the LCS recoveries were within control limits, no data are flagged.

Matrix Spike/Matrix Spike Duplicate results associated with samples DW-5, DW-2, and MW-6 for the analyte Benzene were affected by the analyte concentrations already present in the un-spiked sample.



Project Name : **Tesoro Livermore #67076**

Project Number : **01LV**

Sample : **DW-6**

Matrix : Water

Lab Number : 81228-01

Sample Date :05/10/2012

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date/Time Analyzed
<b>Benzene</b>	<b>7.8</b>	0.50	ug/L	EPA 8260B	05/17/12 12:02
<b>Toluene</b>	<b>1.6</b>	0.50	ug/L	EPA 8260B	05/17/12 12:02
<b>Ethylbenzene</b>	<b>12</b>	0.50	ug/L	EPA 8260B	05/17/12 12:02
<b>Total Xylenes</b>	<b>5.2</b>	0.50	ug/L	EPA 8260B	05/17/12 12:02
<b>Methyl-t-butyl ether (MTBE)</b>	<b>4.6</b>	0.50	ug/L	EPA 8260B	05/17/12 12:02
Diisopropyl ether (DIPE)	< 0.50	0.50	ug/L	EPA 8260B	05/17/12 12:02
Ethyl-t-butyl ether (ETBE)	< 0.50	0.50	ug/L	EPA 8260B	05/17/12 12:02
Tert-amyl methyl ether (TAME)	< 0.50	0.50	ug/L	EPA 8260B	05/17/12 12:02
<b>Tert-Butanol</b>	<b>17</b>	5.0	ug/L	EPA 8260B	05/17/12 12:02
Methanol	< 50	50	ug/L	EPA 8260B	05/17/12 12:02
Ethanol	< 5.0	5.0	ug/L	EPA 8260B	05/17/12 12:02
<b>TPH as Gasoline</b>	<b>2600</b>	50	ug/L	EPA 8260B	05/17/12 12:02
1,2-Dichloroethane	< 0.50	0.50	ug/L	EPA 8260B	05/17/12 12:02
Trichloroethene	< 0.50	0.50	ug/L	EPA 8260B	05/17/12 12:02
Tetrachloroethene	< 0.50	0.50	ug/L	EPA 8260B	05/17/12 12:02
1,2-Dibromoethane	< 0.50	0.50	ug/L	EPA 8260B	05/17/12 12:02
1,2-Dichloroethane-d4 (Surr)	95.6		% Recovery	EPA 8260B	05/17/12 12:02
4-Bromofluorobenzene (Surr)	100		% Recovery	EPA 8260B	05/17/12 12:02
Toluene - d8 (Surr)	95.5		% Recovery	EPA 8260B	05/17/12 12:02

Project Name : **Tesoro Livermore #67076**

Project Number : **01LV**

Sample : **DW-5**

Matrix : Water

Lab Number : 81228-02

Sample Date :05/10/2012

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date/Time Analyzed
<b>Benzene</b>	<b>100</b>	1.5	ug/L	EPA 8260B	05/17/12 05:35
<b>Toluene</b>	<b>6.8</b>	1.5	ug/L	EPA 8260B	05/17/12 05:35
<b>Ethylbenzene</b>	<b>320</b>	1.5	ug/L	EPA 8260B	05/17/12 05:35
<b>Total Xylenes</b>	<b>380</b>	1.5	ug/L	EPA 8260B	05/17/12 05:35
Methyl-t-butyl ether (MTBE)	< 1.5	1.5	ug/L	EPA 8260B	05/17/12 05:35
Diisopropyl ether (DIPE)	< 1.5	1.5	ug/L	EPA 8260B	05/17/12 05:35
Ethyl-t-butyl ether (ETBE)	< 1.5	1.5	ug/L	EPA 8260B	05/17/12 05:35
Tert-amyl methyl ether (TAME)	< 1.5	1.5	ug/L	EPA 8260B	05/17/12 05:35
Tert-Butanol	< 7.0	7.0	ug/L	EPA 8260B	05/17/12 05:35
Methanol	< 150	150	ug/L	EPA 8260B	05/17/12 05:35
Ethanol	< 20	20	ug/L	EPA 8260B	05/17/12 05:35
<b>TPH as Gasoline</b>	<b>11000</b>	150	ug/L	EPA 8260B	05/17/12 05:35
1,2-Dichloroethane	< 1.5	1.5	ug/L	EPA 8260B	05/17/12 05:35
1,2-Dibromoethane	< 1.5	1.5	ug/L	EPA 8260B	05/17/12 05:35
1,2-Dichloroethane-d4 (Surr)	92.8		% Recovery	EPA 8260B	05/17/12 05:35
Toluene - d8 (Surr)	96.4		% Recovery	EPA 8260B	05/17/12 05:35

Project Name : **Tesoro Livermore #67076**

Project Number : **01LV**

Sample : **DW-2**

Matrix : Water

Lab Number : 81228-03

Sample Date :05/10/2012

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date/Time Analyzed
Ferrous Iron	< 0.10	0.10	mg/L	SM 3500-Fe D	05/11/12 09:22
Nitrate as N	< 0.10	0.10	mg/L	EPA 300.0	05/11/12 15:33
<b>Sulfate</b>	<b>1.2</b>	0.50	mg/L	EPA 300.0	05/11/12 15:33
<b>Benzene</b>	<b>140</b>	0.50	ug/L	EPA 8260B	05/16/12 12:53
<b>Toluene</b>	<b>8.6</b>	0.50	ug/L	EPA 8260B	05/16/12 12:53
<b>Ethylbenzene</b>	<b>0.63</b>	0.50	ug/L	EPA 8260B	05/16/12 12:53
<b>Total Xylenes</b>	<b>15</b>	0.50	ug/L	EPA 8260B	05/16/12 12:53
<b>Methyl-t-butyl ether (MTBE)</b>	<b>98</b>	0.50	ug/L	EPA 8260B	05/16/12 12:53
Diisopropyl ether (DIPE)	< 0.50	0.50	ug/L	EPA 8260B	05/16/12 12:53
Ethyl-t-butyl ether (ETBE)	< 0.50	0.50	ug/L	EPA 8260B	05/16/12 12:53
<b>Tert-amyl methyl ether (TAME)</b>	<b>1.1</b>	0.50	ug/L	EPA 8260B	05/16/12 12:53
<b>Tert-Butanol</b>	<b>430</b>	5.0	ug/L	EPA 8260B	05/16/12 12:53
Methanol	< 200	200	ug/L	EPA 8260B	05/16/12 12:53
Ethanol	< 8.0	8.0	ug/L	EPA 8260B	05/16/12 12:53
<b>TPH as Gasoline</b>	<b>2200</b>	50	ug/L	EPA 8260B	05/16/12 12:53
1,2-Dichloroethane	< 0.50	0.50	ug/L	EPA 8260B	05/16/12 12:53
1,2-Dibromoethane	< 0.50	0.50	ug/L	EPA 8260B	05/16/12 12:53
1,2-Dichloroethane-d4 (Surr)	90.0		% Recovery	EPA 8260B	05/16/12 12:53
Toluene - d8 (Surr)	93.4		% Recovery	EPA 8260B	05/16/12 12:53

Project Name : **Tesoro Livermore #67076**

Project Number : **01LV**

Sample : **MW-6**

Matrix : Water

Lab Number : 81228-04

Sample Date :05/10/2012

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date/Time Analyzed
<b>Ferrous Iron</b>	<b>0.18</b>	0.10	mg/L	SM 3500-Fe D	05/11/12 09:22
Nitrate as N	< 0.10	0.10	mg/L	EPA 300.0	05/11/12 16:09
<b>Sulfate</b>	<b>1.1</b>	0.50	mg/L	EPA 300.0	05/11/12 16:09
<b>Benzene</b>	<b>1200</b>	2.5	ug/L	EPA 8260B	05/17/12 13:07
<b>Toluene</b>	<b>60</b>	0.90	ug/L	EPA 8260B	05/17/12 03:52
<b>Ethylbenzene</b>	<b>140</b>	0.90	ug/L	EPA 8260B	05/17/12 03:52
<b>Total Xylenes</b>	<b>69</b>	0.90	ug/L	EPA 8260B	05/17/12 03:52
<b>Methyl-t-butyl ether (MTBE)</b>	<b>150</b>	0.90	ug/L	EPA 8260B	05/17/12 03:52
Diisopropyl ether (DIPE)	< 0.90	0.90	ug/L	EPA 8260B	05/17/12 03:52
Ethyl-t-butyl ether (ETBE)	< 0.90	0.90	ug/L	EPA 8260B	05/17/12 03:52
Tert-amyl methyl ether (TAME)	< 2.0	2.0	ug/L	EPA 8260B	05/17/12 03:52
<b>Tert-Butanol</b>	<b>290</b>	5.0	ug/L	EPA 8260B	05/17/12 03:52
Methanol	< 250	250	ug/L	EPA 8260B	05/17/12 13:07
Ethanol	< 9.0	9.0	ug/L	EPA 8260B	05/17/12 03:52
<b>TPH as Gasoline</b>	<b>11000</b>	250	ug/L	EPA 8260B	05/17/12 13:07
1,2-Dichloroethane	< 0.90	0.90	ug/L	EPA 8260B	05/17/12 03:52
1,2-Dibromoethane	< 0.90	0.90	ug/L	EPA 8260B	05/17/12 03:52
1,2-Dichloroethane-d4 (Surr)	92.4		% Recovery	EPA 8260B	05/17/12 03:52
Toluene - d8 (Surr)	95.1		% Recovery	EPA 8260B	05/17/12 03:52

Project Name : **Tesoro Livermore #67076**

Project Number : **01LV**

Sample : **DW-7**

Matrix : Water

Lab Number : 81228-05

Sample Date :05/10/2012

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date/Time Analyzed
Ferrous Iron	< 0.10	0.10	mg/L	SM 3500-Fe D	05/11/12 09:23
Nitrate as N	< 0.10	0.10	mg/L	EPA 300.0	05/11/12 16:46
<b>Sulfate</b>	<b>1.6</b>	0.50	mg/L	EPA 300.0	05/11/12 16:46
<b>Benzene</b>	<b>47</b>	0.50	ug/L	EPA 8260B	05/17/12 12:35
<b>Toluene</b>	<b>1.6</b>	0.50	ug/L	EPA 8260B	05/17/12 12:35
<b>Ethylbenzene</b>	<b>6.1</b>	0.50	ug/L	EPA 8260B	05/17/12 12:35
<b>Total Xylenes</b>	<b>5.2</b>	0.50	ug/L	EPA 8260B	05/17/12 12:35
<b>Methyl-t-butyl ether (MTBE)</b>	<b>120</b>	0.50	ug/L	EPA 8260B	05/17/12 12:35
Diisopropyl ether (DIPE)	< 0.50	0.50	ug/L	EPA 8260B	05/17/12 12:35
Ethyl-t-butyl ether (ETBE)	< 0.50	0.50	ug/L	EPA 8260B	05/17/12 12:35
<b>Tert-amyl methyl ether (TAME)</b>	<b>1.1</b>	0.50	ug/L	EPA 8260B	05/17/12 12:35
<b>Tert-Butanol</b>	<b>280</b>	5.0	ug/L	EPA 8260B	05/17/12 12:35
Methanol	< 50	50	ug/L	EPA 8260B	05/17/12 12:35
Ethanol	< 5.0	5.0	ug/L	EPA 8260B	05/17/12 12:35
<b>TPH as Gasoline</b>	<b>940</b>	50	ug/L	EPA 8260B	05/17/12 12:35
1,2-Dichloroethane	< 0.50	0.50	ug/L	EPA 8260B	05/17/12 12:35
Trichloroethene	< 0.50	0.50	ug/L	EPA 8260B	05/17/12 12:35
Tetrachloroethene	< 0.50	0.50	ug/L	EPA 8260B	05/17/12 12:35
1,2-Dibromoethane	< 0.50	0.50	ug/L	EPA 8260B	05/17/12 12:35
1,2-Dichloroethane-d4 (Surr)	101		% Recovery	EPA 8260B	05/17/12 12:35
4-Bromofluorobenzene (Surr)	103		% Recovery	EPA 8260B	05/17/12 12:35
Toluene - d8 (Surr)	102		% Recovery	EPA 8260B	05/17/12 12:35

## QC Report : Method Blank Data

Project Name : Tesoro Livermore #67076

Project Number : 01LV

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed	Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	< 0.50	0.50	ug/L	EPA 8260B	05/16/2012	1,2-Dichloroethane-d4 (Surr)	102		%	EPA 8260B	05/17/2012
Ethylbenzene	< 0.50	0.50	ug/L	EPA 8260B	05/16/2012	4-Bromofluorobenzene (Surr)	100		%	EPA 8260B	05/17/2012
Toluene	< 0.50	0.50	ug/L	EPA 8260B	05/16/2012	Toluene - d8 (Surr)	97.4		%	EPA 8260B	05/17/2012
Total Xylenes	< 0.50	0.50	ug/L	EPA 8260B	05/16/2012						
Diisopropyl ether (DIPE)	< 0.50	0.50	ug/L	EPA 8260B	05/16/2012	Ferrous Iron	<0.10	0.10	mg/L	SM 3500-Fe D	05/11/2012
Ethanol	< 5.0	5.0	ug/L	EPA 8260B	05/16/2012						
Ethyl-t-butyl ether (ETBE)	< 0.50	0.50	ug/L	EPA 8260B	05/16/2012	Nitrate as N	<0.10	0.10	mg/L	EPA 300.0	05/11/2012
Methanol	< 50	50	ug/L	EPA 8260B	05/16/2012	Sulfate	<0.50	0.50	mg/L	EPA 300.0	05/11/2012
Methyl-t-butyl ether (MTBE)	< 0.50	0.50	ug/L	EPA 8260B	05/16/2012						
Tert-Butanol	< 5.0	5.0	ug/L	EPA 8260B	05/16/2012						
Tert-amyl methyl ether (TAME)	< 0.50	0.50	ug/L	EPA 8260B	05/16/2012						
TPH as Gasoline	< 50	50	ug/L	EPA 8260B	05/16/2012						
1,2-Dibromoethane	< 0.50	0.50	ug/L	EPA 8260B	05/16/2012						
1,2-Dichloroethane	< 0.50	0.50	ug/L	EPA 8260B	05/16/2012						
1,2-Dichloroethane-d4 (Surr)	99.1		%	EPA 8260B	05/16/2012						
Toluene - d8 (Surr)	99.3		%	EPA 8260B	05/16/2012						
Benzene	< 0.50	0.50	ug/L	EPA 8260B	05/17/2012						
Ethylbenzene	< 0.50	0.50	ug/L	EPA 8260B	05/17/2012						
Toluene	< 0.50	0.50	ug/L	EPA 8260B	05/17/2012						
Total Xylenes	< 0.50	0.50	ug/L	EPA 8260B	05/17/2012						
Diisopropyl ether (DIPE)	< 0.50	0.50	ug/L	EPA 8260B	05/17/2012						
Ethanol	< 5.0	5.0	ug/L	EPA 8260B	05/17/2012						
Ethyl-t-butyl ether (ETBE)	< 0.50	0.50	ug/L	EPA 8260B	05/17/2012						
Methanol	< 50	50	ug/L	EPA 8260B	05/17/2012						
Methyl-t-butyl ether (MTBE)	< 0.50	0.50	ug/L	EPA 8260B	05/17/2012						
Tert-Butanol	< 5.0	5.0	ug/L	EPA 8260B	05/17/2012						
Tert-amyl methyl ether (TAME)	< 0.50	0.50	ug/L	EPA 8260B	05/17/2012						
TPH as Gasoline	< 50	50	ug/L	EPA 8260B	05/17/2012						
1,2-Dibromoethane	< 0.50	0.50	ug/L	EPA 8260B	05/17/2012						
1,2-Dichloroethane	< 0.50	0.50	ug/L	EPA 8260B	05/17/2012						
Tetrachloroethene	< 0.50	0.50	ug/L	EPA 8260B	05/17/2012						
Trichloroethene	< 0.50	0.50	ug/L	EPA 8260B	05/17/2012						

## QC Report : Matrix Spike/ Matrix Spike Duplicate

Project Name : **Tesoro Livermore #67076**Project Number : **01LV**

Parameter	Spiked Sample	Sample Value	Spike Level	Spike Dup. Level	Spiked Sample Value	Duplicate Spiked Sample Value	Units	Analysis Method	Date Analyzed	Spiked Sample Percent Recov.	Duplicate Spiked Sample Percent Recov.	Relative Percent Diff.	Spiked Sample Percent Recov. Limit	Relative Percent Diff. Limit
Ferrous Iron														
	81228-03	< 0.10	0.253	0.253	0.292	0.284	mg/L	SM 3500-Fe D	5/11/12	105	102	2.78	70.0-130	25
Nitrate as N														
	81028-02	< 0.10	0.500	0.500	0.502	0.483	mg/L	EPA 300.0	5/12/12	98.3	94.6	3.81	85.0-115	10
Sulfate														
	81028-02	1.4	2.50	2.50	3.89	3.90	mg/L	EPA 300.0	5/12/12	99.7	100	0.175	85.0-115	10
1,2-Dibromoethane														
	81228-03	<0.50	39.2	39.8	38.1	37.7	ug/L	EPA 8260B	5/16/12	97.1	94.6	2.59	80-120	25
1,2-Dichloroethane														
	81228-03	<0.50	39.3	39.9	36.7	36.9	ug/L	EPA 8260B	5/16/12	93.5	92.5	1.07	75.7-122	25
<b>Benzene</b>														
	81228-03	140	39.3	39.9	171	172	ug/L	EPA 8260B	5/16/12	<b>75.8</b>	<b>77.5</b>	2.22	80-120	25
Diisopropyl ether														
	81228-03	<0.50	38.8	39.5	35.2	35.9	ug/L	EPA 8260B	5/16/12	90.7	90.9	0.182	80-120	25
<b>Ethanol</b>														
	81228-03	6.4	97.9	99.5	43.4	81.7	ug/L	EPA 8260B	5/16/12	<b>37.7</b>	75.6	<b>66.9</b>	55.1-159	25
Ethyl-tert-butyl ether														
	81228-03	<0.50	39.1	39.7	33.2	33.9	ug/L	EPA 8260B	5/16/12	84.8	85.2	0.502	76.5-120	25

## QC Report : Matrix Spike/ Matrix Spike Duplicate

Project Name : **Tesoro Livermore #67076**Project Number : **01LV**

Parameter	Spiked Sample	Sample Value	Spike Level	Spike Dup. Level	Spiked Sample Value	Duplicate Spiked Sample Value	Units	Analysis Method	Date Analyzed	Spiked Sample Percent Recov.	Duplicate Spiked Sample Percent Recov.	Relative Percent Diff.	Spiked Sample Percent Recov. Limit	Relative Percent Diff. Limit
Ethylbenzene	81228-03	0.63	39.3	39.9	40.6	41.4	ug/L	EPA 8260B	5/16/12	102	102	0.522	80-120	25
<b>Methanol</b>	81228-03	180	980	996	579	943	ug/L	EPA 8260B	5/16/12	<b>40.8</b>	76.8	<b>61.2</b>	53.2-147	25
Methyl-t-butyl ether	81228-03	98	39.3	39.9	136	138	ug/L	EPA 8260B	5/16/12	97.6	102	4.08	69.7-121	25
P + M Xylene	81228-03	12	39.3	39.9	50.5	50.9	ug/L	EPA 8260B	5/16/12	96.7	96.3	0.470	76.8-120	25
Tert-Butanol	81228-03	430	198	201	633	633	ug/L	EPA 8260B	5/16/12	102	100	1.78	80-120	25
Tert-amyl-methyl ether	81228-03	1.1	39.2	39.9	38.1	38.8	ug/L	EPA 8260B	5/16/12	94.3	94.4	0.106	78.9-120	25
Toluene	81228-03	8.6	39.3	39.9	44.6	44.9	ug/L	EPA 8260B	5/16/12	91.7	90.9	0.802	80-120	25
1,2-Dibromoethane	81273-04	<0.50	39.9	39.9	45.4	43.5	ug/L	EPA 8260B	5/17/12	114	109	4.31	80-120	25
1,2-Dichloroethane	81273-04	<0.50	40.0	40.0	42.7	42.4	ug/L	EPA 8260B	5/17/12	107	106	0.693	75.7-122	25



## QC Report : Matrix Spike/ Matrix Spike Duplicate

Project Name : Tesoro Livermore #67076

Project Number : 01LV

Parameter	Spiked Sample	Sample Value	Spike Level	Spike Dup. Level	Spiked Sample Value	Duplicate Spiked Sample Value	Units	Analysis Method	Date Analyzed	Spiked Sample Percent Recov.	Duplicate Spiked Sample Percent Recov.	Relative Percent Diff.	Spiked Sample Percent Recov. Limit	Relative Percent Diff. Limit
Benzene	81273-04	<0.50	40.0	40.0	41.8	40.9	ug/L	EPA 8260B	5/17/12	104	102	2.13	80-120	25
Diisopropyl ether	81273-04	<0.50	39.5	39.5	43.7	44.1	ug/L	EPA 8260B	5/17/12	111	112	0.900	80-120	25
Ethanol	81273-04	<5.0	99.7	99.7	124	103	ug/L	EPA 8260B	5/17/12	124	103	18.1	55.1-159	25
Ethyl-tert-butyl ether	81273-04	<0.50	39.8	39.8	41.0	44.1	ug/L	EPA 8260B	5/17/12	103	111	7.43	76.5-120	25
Ethylbenzene	81273-04	<0.50	40.0	40.0	42.8	42.2	ug/L	EPA 8260B	5/17/12	107	105	1.50	80-120	25
Methanol	81273-04	<50	998	998	1120	964	ug/L	EPA 8260B	5/17/12	112	96.7	14.7	53.2-147	25
Methyl-t-butyl ether	81273-04	9.6	40.0	40.0	47.0	55.6	ug/L	EPA 8260B	5/17/12	93.6	115	20.5	69.7-121	25
P + M Xylene	81273-04	<0.50	40.0	40.0	41.9	41.2	ug/L	EPA 8260B	5/17/12	105	103	1.76	76.8-120	25
Tert-Butanol	81273-04	<5.0	202	202	210	201	ug/L	EPA 8260B	5/17/12	104	99.8	4.42	80-120	25
Tert-amyl-methyl ether	81273-04	<0.50	39.9	39.9	41.8	43.2	ug/L	EPA 8260B	5/17/12	104	108	3.33	78.9-120	25

**QC Report : Matrix Spike/ Matrix Spike Duplicate**

Project Name : **Tesoro Livermore #67076**

Project Number : **01LV**

Parameter	Spiked Sample	Sample Value	Spike Level	Spike Dup. Level	Spiked Sample Value	Duplicate Spiked Sample Value	Units	Analysis Method	Date Analyzed	Spiked Sample Percent Recov.	Duplicate Spiked Sample Percent Recov.	Relative Percent Diff.	Spiked Sample Percent Recov. Limit	Relative Percent Diff. Limit
Tetrachloroethene	81273-04	<0.50	40.0	40.0	42.7	38.8	ug/L	EPA 8260B	5/17/12	107	96.9	9.65	77.0-120	25
Toluene	81273-04	<0.50	40.0	40.0	42.0	40.8	ug/L	EPA 8260B	5/17/12	105	102	2.98	80-120	25
Trichloroethene	81273-04	<0.50	40.0	40.0	41.3	40.1	ug/L	EPA 8260B	5/17/12	103	100	2.80	80-120	25

**QC Report : Laboratory Control Sample (LCS)**Project Name : **Tesoro Livermore #67076**Project Number : **01LV**

Parameter	Spike Level	Units	Analysis Method	Date Analyzed	LCS Percent Recov.	LCS Percent Recov. Limit
1,2-Dibromoethane	39.9	ug/L	EPA 8260B	5/16/12	101	80-120
1,2-Dichloroethane	40.0	ug/L	EPA 8260B	5/16/12	101	75.7-122
Benzene	40.0	ug/L	EPA 8260B	5/16/12	98.2	80-120
Diisopropyl ether	39.5	ug/L	EPA 8260B	5/16/12	102	80-120
Ethanol	99.7	ug/L	EPA 8260B	5/16/12	119	55.1-159
Ethyl-tert-butyl ether	39.8	ug/L	EPA 8260B	5/16/12	88.8	76.5-120
Ethylbenzene	40.0	ug/L	EPA 8260B	5/16/12	103	80-120
Methanol	998	ug/L	EPA 8260B	5/16/12	106	53.2-147
Methyl-t-butyl ether	40.0	ug/L	EPA 8260B	5/16/12	95.0	69.7-121
P + M Xylene	40.0	ug/L	EPA 8260B	5/16/12	100	76.8-120
Tert-Butanol	202	ug/L	EPA 8260B	5/16/12	98.6	80-120
Tert-amyl-methyl ether	39.9	ug/L	EPA 8260B	5/16/12	95.5	78.9-120
Toluene	40.0	ug/L	EPA 8260B	5/16/12	99.7	80-120
1,2-Dibromoethane	40.0	ug/L	EPA 8260B	5/17/12	107	80-120
1,2-Dichloroethane	40.1	ug/L	EPA 8260B	5/17/12	105	75.7-122
Benzene	40.1	ug/L	EPA 8260B	5/17/12	102	80-120
Diisopropyl ether	39.6	ug/L	EPA 8260B	5/17/12	113	80-120
Ethanol	99.9	ug/L	EPA 8260B	5/17/12	92.2	55.1-159
Ethyl-tert-butyl ether	39.9	ug/L	EPA 8260B	5/17/12	112	76.5-120
Ethylbenzene	40.1	ug/L	EPA 8260B	5/17/12	107	80-120
Methanol	1000	ug/L	EPA 8260B	5/17/12	99.5	53.2-147
Methyl-t-butyl ether	40.1	ug/L	EPA 8260B	5/17/12	111	69.7-121

**QC Report : Laboratory Control Sample (LCS)**Project Name : **Tesoro Livermore #67076**Project Number : **01LV**

Parameter	Spike Level	Units	Analysis Method	Date Analyzed	LCS Percent Recov.	LCS Percent Recov. Limit
P + M Xylene	40.1	ug/L	EPA 8260B	5/17/12	104	76.8-120
TPH as Gasoline	507	ug/L	EPA 8260B	5/17/12	110	70.0-130
Tert-Butanol	202	ug/L	EPA 8260B	5/17/12	100	80-120
Tert-amyl-methyl ether	40.0	ug/L	EPA 8260B	5/17/12	107	78.9-120
Tetrachloroethene	40.1	ug/L	EPA 8260B	5/17/12	102	77.0-120
Toluene	40.1	ug/L	EPA 8260B	5/17/12	104	80-120
Trichloroethene	40.1	ug/L	EPA 8260B	5/17/12	103	80-120
Ferrous Iron	0.253	mg/L	SM 3500-Fe D	5/11/12	102	70.0-130
Nitrate as N	0.500	mg/L	EPA 300.0	5/11/12	100	85.0-115
Sulfate	2.50	mg/L	EPA 300.0	5/11/12	92.9	85.0-115







# Subcontract Laboratory Report Attachments

# CALIFORNIA LABORATORY SERVICES

3249 Fitzgerald Road Rancho Cordova, CA 95742

May 17, 2012

**CLS Work Order #: CVE0557**  
**COC #: 81228**

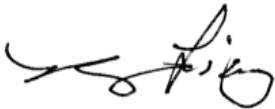
Scott Forbes  
KIFF Analytical  
2795 Second St. Suite 300  
Davis, CA 95616

**Project Name: Tesoro Livermore #67076**

Enclosed are the results of analyses for samples received by the laboratory on 05/11/12 11:40. Samples were analyzed pursuant to client request utilizing EPA or other ELAP approved methodologies. I certify that the results are in compliance both technically and for completeness.

Analytical results are attached to this letter. Please call if we can provide additional assistance.

Sincerely,



James Liang, Ph.D.  
Laboratory Director

CA DOHS ELAP Accreditation/Registration number 1233





# CALIFORNIA LABORATORY SERVICES

Page 2 of 4

05/17/12 16:40

KIFF Analytical  
2795 Second St. Suite 300  
Davis, CA 95616

Project: Tesoro Livermore #67076  
Project Number: 01LV  
Project Manager: Scott Forbes

CLS Work Order #: CVE0557  
COC #: 81228

## Conventional Chemistry Parameters by APHA/EPA Methods

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>DW-2 (CVE0557-01) Water Sampled: 05/10/12 10:15 Received: 05/11/12 11:40</b>									
Biochemical Oxygen Demand	4.2	3.0	mg/L	1	CV03140	05/11/12	05/16/12	SM5210B	
<b>MW-6 (CVE0557-02) Water Sampled: 05/10/12 10:20 Received: 05/11/12 11:40</b>									
Biochemical Oxygen Demand	12	3.0	mg/L	1	CV03140	05/11/12	05/16/12	SM5210B	
<b>DW-7 (CVE0557-03) Water Sampled: 05/10/12 10:35 Received: 05/11/12 11:40</b>									
Biochemical Oxygen Demand	ND	3.0	mg/L	1	CV03140	05/11/12	05/16/12	SM5210B	

CA DOHS ELAP Accreditation/Registration Number 1233

3249 Fitzgerald Road Rancho Cordova, CA 95742

www.californialab.com

916-638-7301

Fax: 916-638-4510

# CALIFORNIA LABORATORY SERVICES

KIFF Analytical 2795 Second St. Suite 300 Davis, CA 95616	Project: Tesoro Livermore #67076 Project Number: 01LV Project Manager: Scott Forbes	CLS Work Order #: CVE0557 COC #: 81228
---	---	---

## Conventional Chemistry Parameters by APHA/EPA Methods - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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### Batch CV03140 - General

<b>Blank (CV03140-BLK1)</b>				Prepared: 05/11/12 Analyzed: 05/16/12						
Biochemical Oxygen Demand	ND	3.0	mg/L							
<b>LCS (CV03140-BS1)</b>				Prepared: 05/11/12 Analyzed: 05/16/12						
Biochemical Oxygen Demand	195	3.0	mg/L	167		117	83-138			
<b>LCS Dup (CV03140-BSD1)</b>				Prepared: 05/11/12 Analyzed: 05/16/12						
Biochemical Oxygen Demand	192	3.0	mg/L	167		115	83-138	2	21	

# CALIFORNIA LABORATORY SERVICES

Page 4 of 4

05/17/12 16:40

KIFF Analytical  
2795 Second St. Suite 300  
Davis, CA 95616

Project: Tesoro Livermore #67076  
Project Number: 01LV  
Project Manager: Scott Forbes

**CLS Work Order #: CVE0557**  
COC #: 81228

## 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

---

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916-638-7301

Fax: 916-638-4510



# CALSCIENCE

WORK ORDER NUMBER: 12-05-0973

*The difference is service*



AIR | SOIL | WATER | MARINE CHEMISTRY

## Analytical Report For

**Client:** Kiff Analytical

**Client Project Name:** Tesoro Livermore #67076

**Attention:** Joel Kiff  
2795 2nd Street, Suite 300  
Davis, CA 95616-6593

*Amanda Porter*

Approved for release on 05/18/2012 by:  
Amanda Porter  
Project Manager

ResultLink ▶

Email your PM ▶



Calscience Environmental Laboratories, Inc. (Calscience) certifies that the test results provided in this report meet all NELAC requirements for parameters for which accreditation is required or available. Any exceptions to NELAC requirements are noted in the case narrative. The original report of subcontracted analyses, if any, is attached to this report. The results in this report are limited to the sample(s) tested and any reproduction thereof must be made in its entirety. The client or recipient of this report is specifically prohibited from making material changes to said report and, to the extent that such changes are made, Calscience is not responsible, legally or otherwise. The client or recipient agrees to indemnify Calscience for any defense to any litigation which may arise.





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Client Project Name: Tesoro Livermore #67076  
Work Order Number: 12-05-0973

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**Analytical Report**



Kiff Analytical  
 2795 2nd Street, Suite 300  
 Davis, CA 95616-6593

Date Received: 05/12/12  
 Work Order No: 12-05-0973  
 Preparation: N/A  
 Method: RSK-175M

Project: Tesoro Livermore #67076

Page 1 of 1

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
DW-2	12-05-0973-1-A	05/10/12 10:15	Aqueous	GC 52	N/A	05/14/12 17:11	120514L01

Parameter	Result	RL	DF	Qual	Units
Methane	948	2.00	2		ug/L

MW-6	12-05-0973-2-A	05/10/12 10:20	Aqueous	GC 52	N/A	05/14/12 18:05	120514L01
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Parameter	Result	RL	DF	Qual	Units
Methane	1790	8.00	8		ug/L

DW-7	12-05-0973-3-A	05/10/12 10:35	Aqueous	GC 52	N/A	05/14/12 16:27	120514L01
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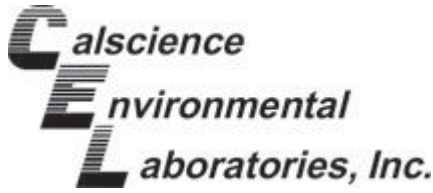
Parameter	Result	RL	DF	Qual	Units
Methane	615	1.00	1		ug/L

Method Blank	099-12-663-1,602	N/A	Aqueous	GC 52	N/A	05/14/12 12:48	120514L01
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Parameter	Result	RL	DF	Qual	Units
Methane	ND	1.00	1		ug/L

Return to Contents

RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers



Analytical Report



Kiff Analytical  
2795 2nd Street, Suite 300  
Davis, CA 95616-6593

Date Received: 05/12/12  
Work Order No: 12-05-0973

Project: Tesoro Livermore #67076

Page 1 of 1

Client Sample Number	Lab Sample Number	Date Collected	Matrix
DW-2	12-05-0973-1	05/10/12	Aqueous

Parameter	Results	RL	DF	Qual	Units	Date Prepared	Date Analyzed	Method
Chemical Oxygen Demand	48	5.0	1		mg/L	05/17/12	05/17/12	EPA 410.4
Alkalinity, Total (as CaCO3)	487	5.00	1		mg/L	N/A	05/14/12	SM 2320B
Carbon, Total Organic	74	2.5	5		mg/L	N/A	05/14/12	SM 5310 D

<b>MW-6</b>	<b>12-05-0973-2</b>	<b>05/10/12</b>	<b>Aqueous</b>
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Parameter	Results	RL	DF	Qual	Units	Date Prepared	Date Analyzed	Method
Chemical Oxygen Demand	38	5.0	1		mg/L	05/17/12	05/17/12	EPA 410.4
Alkalinity, Total (as CaCO3)	594	5.00	1		mg/L	N/A	05/14/12	SM 2320B
Carbon, Total Organic	62	2.5	5		mg/L	N/A	05/14/12	SM 5310 D

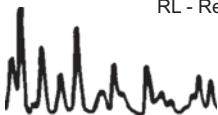
<b>DW-7</b>	<b>12-05-0973-3</b>	<b>05/10/12</b>	<b>Aqueous</b>
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Parameter	Results	RL	DF	Qual	Units	Date Prepared	Date Analyzed	Method
Chemical Oxygen Demand	8.0	5.0	1		mg/L	05/17/12	05/17/12	EPA 410.4
Alkalinity, Total (as CaCO3)	444	5.00	1		mg/L	N/A	05/14/12	SM 2320B
Carbon, Total Organic	36	2.5	5		mg/L	N/A	05/14/12	SM 5310 D

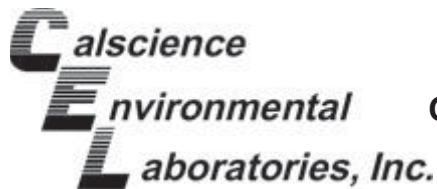
<b>Method Blank</b>	<b>N/A</b>	<b>Aqueous</b>
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Parameter	Results	RL	DF	Qual	Units	Date Prepared	Date Analyzed	Method
Chemical Oxygen Demand	ND	5.0	1		mg/L	05/17/12	05/17/12	EPA 410.4
Alkalinity, Total (as CaCO3)	ND	1.0	1		mg/L	N/A	05/14/12	SM 2320B
Carbon, Total Organic	ND	0.50	1		mg/L	N/A	05/14/12	SM 5310 D

RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers







Quality Control - Spike/Spike Duplicate



Kiff Analytical  
 2795 2nd Street, Suite 300  
 Davis, CA 95616-6593

Date Received: N/A  
 Work Order No: 12-05-0973

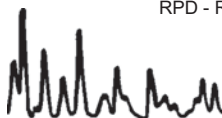
Project: Tesoro Livermore #67076

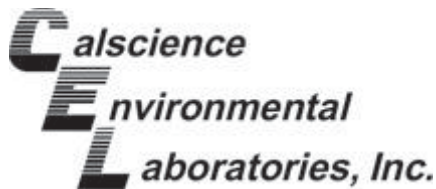
Matrix: Aqueous or Solid

<u>Parameter</u>	<u>Method</u>	<u>Quality Control Sample ID</u>	<u>Date Analyzed</u>	<u>Date Extracted</u>	<u>MS% REC</u>	<u>MSD % REC</u>	<u>%REC CL</u>	<u>RPD</u>	<u>RPD CL</u>	<u>Qualifiers</u>
Carbon, Total Organic	SM 5310 D	12-05-0972-2	05/14/12	N/A	99	103	75-125	1	0-25	

Return to Contents

RPD - Relative Percent Difference , CL - Control Limit





Quality Control - Duplicate



Kiff Analytical  
2795 2nd Street, Suite 300  
Davis, CA 95616-6593

Date Received: N/A  
Work Order No: 12-05-0973

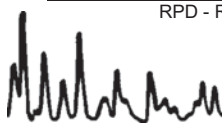
Project: Tesoro Livermore #67076

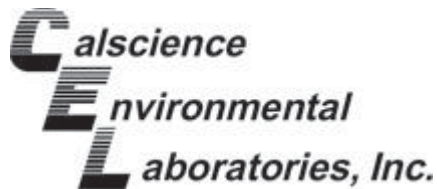
Matrix: Aqueous or Solid

<u>Parameter</u>	<u>Method</u>	<u>QC Sample ID</u>	<u>Date Analyzed</u>	<u>Sample Conc.</u>	<u>DUP Conc.</u>	<u>RPD</u>	<u>RPD CL</u>	<u>Qualifiers</u>
Alkalinity, Total (as CaCO3)	SM 2320B	12-05-0956-1	05/14/12	736	732	1	0-25	
Chemical Oxygen Demand	EPA 410.4	12-05-0972-1	05/17/12	41	42	2	0-25	

Return to Contents

RPD - Relative Percent Difference , CL - Control Limit





Quality Control - LCS/LCS Duplicate



Kiff Analytical  
 2795 2nd Street, Suite 300  
 Davis, CA 95616-6593

Date Received: N/A  
 Work Order No: 12-05-0973  
 Preparation: N/A  
 Method: RSK-175M

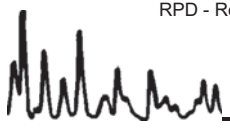
Project: Tesoro Livermore #67076

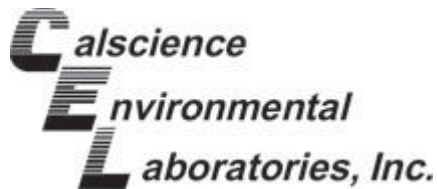
Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number
099-12-663-1,602	Aqueous	GC 52	N/A	05/14/12	120514L01

Parameter	SPIKE ADDED	LCS %REC	LCSD %REC	%REC CL	RPD	RPD CL	Qualifiers
Methane	100.0	96	96	79-109	0	0-20	

Return to Contents

RPD - Relative Percent Difference , CL - Control Limit





Quality Control - LCS/LCS Duplicate



Kiff Analytical  
 2795 2nd Street, Suite 300  
 Davis, CA 95616-6593

Date Received: N/A  
 Work Order No: 12-05-0973

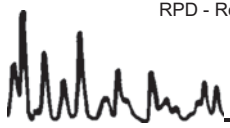
Project: Tesoro Livermore #67076

Matrix: Aqueous or Solid

<u>Parameter</u>	<u>Method</u>	<u>Quality Control</u> Sample ID	<u>Date</u> <u>Extracted</u>	<u>Date</u> <u>Analyzed</u>	<u>LCS %</u> <u>REC</u>	<u>LCSD %</u> <u>REC</u>	<u>%REC</u> <u>CL</u>	<u>RPD</u>	<u>RPD</u> <u>CL</u>	<u>Qual</u>
Carbon, Total Organic	SM 5310 D	099-05-097-4,609	N/A	05/14/12	102	100	80-120	1	0-20	

Return to Contents

RPD - Relative Percent Difference , CL - Control Limit



Work Order Number: 12-05-0973

<u>Qualifier</u>	<u>Definition</u>
*	See applicable analysis comment.
<	Less than the indicated value.
>	Greater than the indicated value.
1	Surrogate compound recovery was out of control due to a required sample dilution. Therefore, the sample data was reported without further clarification.
2	Surrogate compound recovery was out of control due to matrix interference. The associated method blank surrogate spike compound was in control and, therefore, the sample data was reported without further clarification.
3	Recovery of the Matrix Spike (MS) or Matrix Spike Duplicate (MSD) compound was out of control due to matrix interference. The associated LCS and/or LCSD was in control and, therefore, the sample data was reported without further clarification.
4	The MS/MSD RPD was out of control due to matrix interference. The LCS/LCSD RPD was in control and, therefore, the sample data was reported without further clarification.
5	The PDS/PDSD or PES/PESD associated with this batch of samples was out of control due to a matrix interference effect. The associated batch LCS/LCSD was in control and, hence, the associated sample data was reported without further clarification.
6	Surrogate recovery below the acceptance limit.
7	Surrogate recovery above the acceptance limit.
B	Analyte was present in the associated method blank.
BU	Sample analyzed after holding time expired.
E	Concentration exceeds the calibration range.
ET	Sample was extracted past end of recommended max. holding time.
HD	The chromatographic pattern was inconsistent with the profile of the reference fuel standard.
HDH	The sample chromatographic pattern for TPH matches the chromatographic pattern of the specified standard but heavier hydrocarbons were also present (or detected).
HDL	The sample chromatographic pattern for TPH matches the chromatographic pattern of the specified standard but lighter hydrocarbons were also present (or detected).
J	Analyte was detected at a concentration below the reporting limit and above the laboratory method detection limit. Reported value is estimated.
ME	LCS/LCSD Recovery Percentage is within Marginal Exceedance (ME) Control Limit range.
ND	Parameter not detected at the indicated reporting limit.
Q	Spike recovery and RPD control limits do not apply resulting from the parameter concentration in the sample exceeding the spike concentration by a factor of four or greater.
SG	The sample extract was subjected to Silica Gel treatment prior to analysis.
X	% Recovery and/or RPD out-of-range.
Z	Analyte presence was not confirmed by second column or GC/MS analysis.

Solid - Unless otherwise indicated, solid sample data is reported on a wet weight basis, not corrected for % moisture. All QC results are reported on a wet weight basis.

MPN - Most Probable Number





2795 Second Street, Suite 300  
 Davis, CA 95618  
 Lab: 530.297.4800  
 Fax: 530.297.4808

Calscience  
 7440 Lincoln Way  
 Garden Grove, CA 92841-1427  
 714-895-5494

**12-05-0973**

COC No. **81228** Page 1 of 1

Project Contact (Hardcopy or PDF to): <b>Scott Forbes</b>	EDF Report? <b>YES</b>	<b>Chain-of-Custody Record and Analysis Request</b>
--	------------------------	---

Company/Address: <b>Kiff Analytical</b>	Recommended but not mandatory to complete this section: Sampling Company Log Code: <b>EFSP</b>	<b>Analysis Request</b>	<b>TAT</b>
--	---	-------------------------	------------

Phone No.: <b>530-297-4800</b>	FAX No.: <b>530-297-4808</b>	Global ID: <b>T0600101410</b>	
Project Number: <b>01LV</b>	P.O. No.: <b>81228</b>	Deliverables to (Email Address): <b>inbox@kiffanalytical.com</b>	

Project Name: Tesoro Livermore #67076	Project Address:	Container / Preservative						Matrix		Alkalinity SM 2320 (1)	Chemical Oxygen Demand	Hydrocarbons in Water by RSK 175 (1)	Total Organic Carbon	4-Days	For Lab Use Only
		250ml Glass H2SO4	250ml Poly None	VOA 40 ml HCl				Water							
<b>Sample Designation</b>	<b>Date</b>	<b>Time</b>													
DW-2	05/10/12	10:15	1	1	2				X	X	X	X	X	1	
MW-6	05/10/12	10:20	1	1	2				X	X	X	X	X	2	
DW-7	05/10/12	10:35	1	1	2				X	X	X	X	X	3	

Relinquished by: <i>[Signature]</i> Kiff Analytical	Date 05/11/12	Time 1900	Received by:	Remarks: Please refer to attached Test Detail.
Relinquished by:	Date	Time	Received by:	Bill to: <b>Accounts Payable</b>
Relinquished by:	Date 05/12/12	Time 10:20	Received by Laboratory: <i>[Signature]</i> CBE	

# Test Detail for Kiff Work Order: 81228

**Alkalinity SM 2320 (1)**  
Alkalinity, Total (as CaCO<sub>3</sub>)

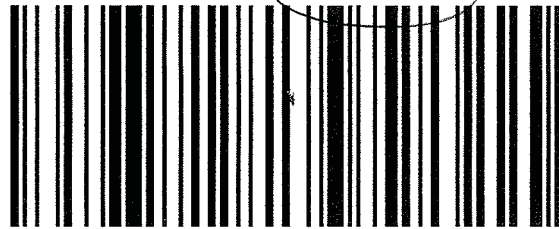
**Hydrocarbons in Water by RSK 175 (1)**  
Methane





**800.334.5000**  
ontrac.com

0973



D10010475971672

Date Printed 5/11/2012

Tracking#D10010475971672

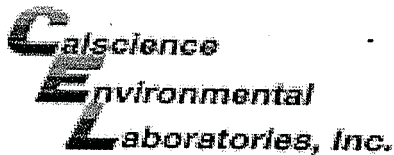
*Shipped From:*  
KIFF ANALYTICAL  
2795 2ND STREET 300  
DAVIS, CA 95616

*Sent By:* SAMPLE RECEIVING  
*Phone#:* (530)297-4800  
*wgt(lbs):* 1  
*Reference:* SUB SRG SAMPLES  
*Reference 2:*

*Ship To Company:*  
**CALSCIENCE ENVIRONMENTAL**  
**7440 LINCOLN WAY**  
**GARDEN GROVE, CA 92841**  
**RECEIVING (714)895-5494**  
  
**B10207210772**

*Service:* **S**  
*Sort Code:* **ORG**  
  
*Special Services:*  
**Saturday Delivery**  
**Signature Required**





WORK ORDER #: 12-05-0973

SAMPLE RECEIPT FORM

Cooler 1 of 1

CLIENT: Kiff

DATE: 05/12/12

TEMPERATURE: Thermometer ID: SC2 (Criteria: 0.0°C - 6.0°C, not frozen)

Temperature 1.8°C - 0.3°C (CF) = 1.5°C [X] Blank [ ] Sample

[ ] Sample(s) outside temperature criteria (PM/APM contacted by: \_\_\_\_\_).

[ ] Sample(s) outside temperature criteria but received on ice/chilled on same day of sampling.

[ ] Received at ambient temperature, placed on ice for transport by Courier.

Ambient Temperature: [ ] Air [ ] Filter

Initial: WSE

CUSTODY SEALS INTACT:

[X] Cooler [ ] \_\_\_\_\_ [ ] No (Not Intact) [ ] Not Present [ ] N/A

Initial: WSE

[ ] Sample [ ] \_\_\_\_\_ [ ] No (Not Intact) [X] Not Present

Initial: TS

SAMPLE CONDITION:

Table with 4 columns: Item, Yes, No, N/A. Rows include Chain-Of-Custody (COC) document(s) received with samples, COC document(s) received complete, Sampler's name indicated on COC, etc.

CONTAINER TYPE:

Solid: [ ] 4ozCGJ [ ] 8ozCGJ [ ] 16ozCGJ [ ] Sleeve ( ) [ ] EnCores® [ ] TerraCores® [ ] \_\_\_\_\_
Water: [ ] VOA [X] VOAh [ ] VOAna2 [ ] 125AGB [ ] 125AGBh [ ] 125AGBp [ ] 1AGB [ ] 1AGBna2 [ ] 1AGBs
[ ] 500AGB [ ] 500AGJ [ ] 500AGJs [ ] 250AGB [ ] 250CGB [X] 250CGBs [ ] 1PB [ ] 1PBna [ ] 500PB
[X] 250PB [ ] 250PBn [ ] 125PB [ ] 125PBzanna [ ] 100PJ [ ] 100PJna2 [ ] \_\_\_\_\_ [ ] \_\_\_\_\_

Air: [ ] Tedlar® [ ] Summa® Other: [ ] \_\_\_\_\_ Trip Blank Lot#: \_\_\_\_\_ Labeled/Checked by: TS
Container: C: Clear A: Amber P: Plastic G: Glass J: Jar B: Bottle Z: Ziploc/Resealable Bag E: Envelope Reviewed by: YU
Preservative: h: HCL n: HNO3 na2:Na2S2O3 na: NaOH p: H3PO4 s: H2SO4 u: Ultra-pure zanna: ZnAc2+NaOH f: Filtered Scanned by: YU



Report Number : 81249

Date : 05/21/2012

## Laboratory Results

Matt Nelson  
Orion Environmental  
3450 East Spring Street, Suite 212  
Long Beach, CA 90806

Subject : 3 Water Samples  
Project Name : Tesoro Livermore #67076  
Project Number : 01LV

Dear Mr. Nelson,

Chemical analysis of the samples referenced above has been completed. Summaries of the data are contained on the following pages. Sample(s) were received under documented chain-of-custody. US EPA protocols for sample storage and preservation were followed. Testing procedures comply with the 2003 NELAC and TNI 2009 standards. Laboratory results relate only to the samples tested. This report may be freely reproduced in full, but may only be reproduced in part with the express permission of Kiff Analytical, LLC. Kiff Analytical, LLC is certified by the State of California under the National Environmental Laboratory Accreditation Program (NELAP), lab # 08263CA. If you have any questions regarding procedures or results, please call me at 530-297-4800.

Sincerely,

A handwritten signature in black ink that reads "Troy G. Turpen". The signature is written in a cursive style with a large, prominent initial "T".

Troy Turpen



Report Number : 81249

Date : 05/21/2012

Subject : 3 Water Samples  
Project Name : Tesoro Livermore #67076  
Project Number : 01LV

## Case Narrative

California Laboratory Services provided analytical testing associated with these samples, but is not accredited by the National Environmental Laboratory Accreditation Program (NELAP). Please refer to the attached subcontract report for a list of this laboratory's current certifications.

The Method Reporting Limit for Ethanol has been increased due to the presence of an interfering compound for sample MW-11.

Matrix Spike/Matrix Spike Duplicate results associated with samples MW-11, MW-2, and DW-8 for the analyte Sodium were affected by the analyte concentrations already present in the un-spiked sample.



Report Number : 81249

Date : 05/21/2012

Project Name : **Tesoro Livermore #67076**

Project Number : **01LV**

Sample : **MW-11**

Matrix : Water

Lab Number : 81249-01

Sample Date :05/11/2012

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date/Time Analyzed
Hexavalent Chromium	< 1.0	1.0	ug/L	EPA 7199	05/11/12 17:20
<b>Ferrous Iron</b>	<b>0.11</b>	0.10	mg/L	SM 3500-Fe D	05/11/12 16:51
<b>Nitrate as N</b>	<b>0.34</b>	0.10	mg/L	EPA 300.0	05/11/12 21:03
<b>Sulfate</b>	<b>14</b>	0.50	mg/L	EPA 300.0	05/11/12 18:37
Arsenic	< 0.015	0.015	mg/L	EPA 200.7	05/18/12 14:00
<b>Chromium</b>	<b>0.050</b>	0.0050	mg/L	EPA 200.7	05/18/12 14:00
<b>Iron</b>	<b>15</b>	0.10	mg/L	EPA 200.7	05/18/12 14:00
<b>Manganese</b>	<b>2.8</b>	0.0050	mg/L	EPA 200.7	05/18/12 14:00
<b>Sodium</b>	<b>210</b>	0.50	mg/L	EPA 200.7	05/21/12 14:13
<b>Benzene</b>	<b>3.8</b>	0.50	ug/L	EPA 8260B	05/16/12 15:40
<b>Toluene</b>	<b>15</b>	0.50	ug/L	EPA 8260B	05/16/12 15:40
<b>Ethylbenzene</b>	<b>6.7</b>	0.50	ug/L	EPA 8260B	05/16/12 15:40
<b>Total Xylenes</b>	<b>150</b>	0.50	ug/L	EPA 8260B	05/16/12 15:40
<b>Methyl-t-butyl ether (MTBE)</b>	<b>0.52</b>	0.50	ug/L	EPA 8260B	05/16/12 15:40
Diisopropyl ether (DIPE)	< 0.50	0.50	ug/L	EPA 8260B	05/16/12 15:40
Ethyl-t-butyl ether (ETBE)	< 0.50	0.50	ug/L	EPA 8260B	05/16/12 15:40
Tert-amyl methyl ether (TAME)	< 0.50	0.50	ug/L	EPA 8260B	05/16/12 15:40
Tert-Butanol	< 5.0	5.0	ug/L	EPA 8260B	05/16/12 15:40
Methanol	< 50	50	ug/L	EPA 8260B	05/16/12 15:40
Ethanol	< 8.0	8.0	ug/L	EPA 8260B	05/16/12 15:40
<b>TPH as Gasoline</b>	<b>1100</b>	50	ug/L	EPA 8260B	05/16/12 15:40
1,2-Dichloroethane	< 0.50	0.50	ug/L	EPA 8260B	05/16/12 15:40
1,2-Dibromoethane	< 0.50	0.50	ug/L	EPA 8260B	05/16/12 15:40
1,2-Dichloroethane-d4 (Surr)	101		% Recovery	EPA 8260B	05/16/12 15:40
Toluene - d8 (Surr)	99.7		% Recovery	EPA 8260B	05/16/12 15:40



Report Number : 81249

Date : 05/21/2012

Project Name : **Tesoro Livermore #67076**

Project Number : **01LV**

Sample : **MW-2**

Matrix : Water

Lab Number : 81249-02

Sample Date :05/11/2012

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date/Time Analyzed
Hexavalent Chromium	< 1.0	1.0	ug/L	EPA 7199	05/11/12 17:54
Ferrous Iron	< 0.10	0.10	mg/L	SM 3500-Fe D	05/11/12 16:51
Nitrate as N	< 0.10	0.10	mg/L	EPA 300.0	05/11/12 23:28
<b>Sulfate</b>	<b>12</b>	0.50	mg/L	EPA 300.0	05/11/12 19:14
Arsenic	< 0.015	0.015	mg/L	EPA 200.7	05/18/12 14:03
<b>Chromium</b>	<b>0.098</b>	0.0050	mg/L	EPA 200.7	05/18/12 14:03
<b>Iron</b>	<b>29</b>	0.10	mg/L	EPA 200.7	05/18/12 14:03
<b>Manganese</b>	<b>5.5</b>	0.0050	mg/L	EPA 200.7	05/18/12 14:03
<b>Sodium</b>	<b>46</b>	0.50	mg/L	EPA 200.7	05/21/12 14:25
<b>Benzene</b>	<b>1200</b>	2.5	ug/L	EPA 8260B	05/16/12 05:39
<b>Toluene</b>	<b>140</b>	2.5	ug/L	EPA 8260B	05/16/12 05:39
<b>Ethylbenzene</b>	<b>490</b>	2.5	ug/L	EPA 8260B	05/16/12 05:39
<b>Total Xylenes</b>	<b>1000</b>	2.5	ug/L	EPA 8260B	05/16/12 05:39
<b>Methyl-t-butyl ether (MTBE)</b>	<b>220</b>	2.5	ug/L	EPA 8260B	05/16/12 05:39
Diisopropyl ether (DIPE)	< 2.5	2.5	ug/L	EPA 8260B	05/16/12 05:39
Ethyl-t-butyl ether (ETBE)	< 2.5	2.5	ug/L	EPA 8260B	05/16/12 05:39
<b>Tert-amyl methyl ether (TAME)</b>	<b>2.7</b>	2.5	ug/L	EPA 8260B	05/16/12 05:39
<b>Tert-Butanol</b>	<b>120</b>	15	ug/L	EPA 8260B	05/16/12 05:39
Methanol	< 250	250	ug/L	EPA 8260B	05/16/12 05:39
Ethanol	< 25	25	ug/L	EPA 8260B	05/16/12 05:39
<b>TPH as Gasoline</b>	<b>14000</b>	250	ug/L	EPA 8260B	05/16/12 05:39
1,2-Dichloroethane	< 2.5	2.5	ug/L	EPA 8260B	05/16/12 05:39
1,2-Dibromoethane	< 2.5	2.5	ug/L	EPA 8260B	05/16/12 05:39
1,2-Dichloroethane-d4 (Surr)	94.3		% Recovery	EPA 8260B	05/16/12 05:39
Toluene - d8 (Surr)	96.9		% Recovery	EPA 8260B	05/16/12 05:39



Report Number : 81249

Date : 05/21/2012

Project Name : **Tesoro Livermore #67076**

Project Number : **01LV**

Sample : **DW-8**

Matrix : Water

Lab Number : 81249-03

Sample Date :05/11/2012

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date/Time Analyzed
<b>Hexavalent Chromium</b>	<b>2.2</b>	1.0	ug/L	EPA 7199	05/11/12 18:05
Ferrous Iron	< 0.10	0.10	mg/L	SM 3500-Fe D	05/11/12 16:52
Nitrate as N	< 0.10	0.10	mg/L	EPA 300.0	05/11/12 21:39
<b>Sulfate</b>	<b>14</b>	0.50	mg/L	EPA 300.0	05/11/12 19:50
Arsenic	< 0.015	0.015	mg/L	EPA 200.7	05/18/12 14:08
Chromium	< 0.0050	0.0050	mg/L	EPA 200.7	05/18/12 14:08
<b>Iron</b>	<b>0.12</b>	0.10	mg/L	EPA 200.7	05/18/12 14:08
<b>Manganese</b>	<b>0.14</b>	0.0050	mg/L	EPA 200.7	05/18/12 14:08
<b>Sodium</b>	<b>77</b>	0.50	mg/L	EPA 200.7	05/21/12 14:29
<b>Benzene</b>	<b>500</b>	2.5	ug/L	EPA 8260B	05/17/12 04:39
<b>Toluene</b>	<b>1000</b>	2.5	ug/L	EPA 8260B	05/17/12 04:39
<b>Ethylbenzene</b>	<b>300</b>	2.5	ug/L	EPA 8260B	05/17/12 04:39
<b>Total Xylenes</b>	<b>1200</b>	2.5	ug/L	EPA 8260B	05/17/12 04:39
Methyl-t-butyl ether (MTBE)	< 2.5	2.5	ug/L	EPA 8260B	05/17/12 04:39
Diisopropyl ether (DIPE)	< 2.5	2.5	ug/L	EPA 8260B	05/17/12 04:39
Ethyl-t-butyl ether (ETBE)	< 2.5	2.5	ug/L	EPA 8260B	05/17/12 04:39
Tert-amyl methyl ether (TAME)	< 2.5	2.5	ug/L	EPA 8260B	05/17/12 04:39
<b>Tert-Butanol</b>	<b>25</b>	15	ug/L	EPA 8260B	05/17/12 04:39
Methanol	< 250	250	ug/L	EPA 8260B	05/17/12 04:39
Ethanol	< 25	25	ug/L	EPA 8260B	05/17/12 04:39
<b>TPH as Gasoline</b>	<b>11000</b>	250	ug/L	EPA 8260B	05/17/12 04:39
1,2-Dichloroethane	< 2.5	2.5	ug/L	EPA 8260B	05/17/12 04:39
1,2-Dibromoethane	< 2.5	2.5	ug/L	EPA 8260B	05/17/12 04:39
1,2-Dichloroethane-d4 (Surr)	101		% Recovery	EPA 8260B	05/17/12 04:39
Toluene - d8 (Surr)	101		% Recovery	EPA 8260B	05/17/12 04:39

**QC Report : Method Blank Data**Project Name : **Tesoro Livermore #67076**Project Number : **01LV**

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed	Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Arsenic	< 0.015	0.015	mg/L	EPA 200.7	05/18/2012	Benzene	< 0.50	0.50	ug/L	EPA 8260B	05/16/2012
Chromium	< 0.0050	0.0050	mg/L	EPA 200.7	05/18/2012	Ethylbenzene	< 0.50	0.50	ug/L	EPA 8260B	05/16/2012
Iron	< 0.10	0.10	mg/L	EPA 200.7	05/18/2012	Toluene	< 0.50	0.50	ug/L	EPA 8260B	05/16/2012
Manganese	< 0.0050	0.0050	mg/L	EPA 200.7	05/18/2012	Total Xylenes	< 0.50	0.50	ug/L	EPA 8260B	05/16/2012
Sodium	< 0.50	0.50	mg/L	EPA 200.7	05/21/2012	Diisopropyl ether (DIPE)	< 0.50	0.50	ug/L	EPA 8260B	05/16/2012
Benzene	< 0.50	0.50	ug/L	EPA 8260B	05/15/2012	Ethanol	< 5.0	5.0	ug/L	EPA 8260B	05/16/2012
Ethylbenzene	< 0.50	0.50	ug/L	EPA 8260B	05/15/2012	Ethyl-t-butyl ether (ETBE)	< 0.50	0.50	ug/L	EPA 8260B	05/16/2012
Toluene	< 0.50	0.50	ug/L	EPA 8260B	05/15/2012	Methanol	< 50	50	ug/L	EPA 8260B	05/16/2012
Total Xylenes	< 0.50	0.50	ug/L	EPA 8260B	05/15/2012	Methyl-t-butyl ether (MTBE)	< 0.50	0.50	ug/L	EPA 8260B	05/16/2012
Diisopropyl ether (DIPE)	< 0.50	0.50	ug/L	EPA 8260B	05/15/2012	Tert-Butanol	< 5.0	5.0	ug/L	EPA 8260B	05/16/2012
Ethanol	< 5.0	5.0	ug/L	EPA 8260B	05/15/2012	Tert-amyl methyl ether (TAME)	< 0.50	0.50	ug/L	EPA 8260B	05/16/2012
Ethyl-t-butyl ether (ETBE)	< 0.50	0.50	ug/L	EPA 8260B	05/15/2012	TPH as Gasoline	< 50	50	ug/L	EPA 8260B	05/16/2012
Methanol	< 50	50	ug/L	EPA 8260B	05/15/2012	1,2-Dibromoethane	< 0.50	0.50	ug/L	EPA 8260B	05/16/2012
Methyl-t-butyl ether (MTBE)	< 0.50	0.50	ug/L	EPA 8260B	05/15/2012	1,2-Dichloroethane	< 0.50	0.50	ug/L	EPA 8260B	05/16/2012
Tert-Butanol	< 5.0	5.0	ug/L	EPA 8260B	05/15/2012	1,2-Dichloroethane-d4 (Surr)	100		%	EPA 8260B	05/16/2012
Tert-amyl methyl ether (TAME)	< 0.50	0.50	ug/L	EPA 8260B	05/15/2012	Toluene - d8 (Surr)	100		%	EPA 8260B	05/16/2012
TPH as Gasoline	< 50	50	ug/L	EPA 8260B	05/15/2012	Benzene	< 0.50	0.50	ug/L	EPA 8260B	05/16/2012
1,2-Dibromoethane	< 0.50	0.50	ug/L	EPA 8260B	05/15/2012	Ethylbenzene	< 0.50	0.50	ug/L	EPA 8260B	05/16/2012
1,2-Dichloroethane	< 0.50	0.50	ug/L	EPA 8260B	05/15/2012	Toluene	< 0.50	0.50	ug/L	EPA 8260B	05/16/2012
1,2-Dichloroethane-d4 (Surr)	101		%	EPA 8260B	05/15/2012	Total Xylenes	< 0.50	0.50	ug/L	EPA 8260B	05/16/2012
Toluene - d8 (Surr)	99.6		%	EPA 8260B	05/15/2012	Diisopropyl ether (DIPE)	< 0.50	0.50	ug/L	EPA 8260B	05/16/2012
						Ethanol	< 5.0	5.0	ug/L	EPA 8260B	05/16/2012
						Ethyl-t-butyl ether (ETBE)	< 0.50	0.50	ug/L	EPA 8260B	05/16/2012
						Methanol	< 50	50	ug/L	EPA 8260B	05/16/2012
						Methyl-t-butyl ether (MTBE)	< 0.50	0.50	ug/L	EPA 8260B	05/16/2012
						Tert-Butanol	< 5.0	5.0	ug/L	EPA 8260B	05/16/2012
						Tert-amyl methyl ether (TAME)	< 0.50	0.50	ug/L	EPA 8260B	05/16/2012
						TPH as Gasoline	< 50	50	ug/L	EPA 8260B	05/16/2012
						1,2-Dibromoethane	< 0.50	0.50	ug/L	EPA 8260B	05/16/2012
						1,2-Dichloroethane	< 0.50	0.50	ug/L	EPA 8260B	05/16/2012
						1,2-Dichloroethane-d4 (Surr)	101		%	EPA 8260B	05/16/2012
						Toluene - d8 (Surr)	99.5		%	EPA 8260B	05/16/2012

Report Number : 81249

Date : 05/21/2012

**QC Report : Method Blank Data**

Project Name : **Tesoro Livermore #67076**

Project Number : **01LV**

<u>Parameter</u>	<u>Measured Value</u>	<u>Method Reporting Limit</u>	<u>Units</u>	<u>Analysis Method</u>	<u>Date Analyzed</u>
Ferrous Iron	<0.10	0.10	mg/L	SM 3500-Fe D	05/11/2012
Nitrate as N	<0.10	0.10	mg/L	EPA 300.0	05/11/2012
Sulfate	<0.50	0.50	mg/L	EPA 300.0	05/11/2012
Hexavalent Chromium	<1.0	1.0	ug/L	EPA 7199	05/11/2012

<u>Parameter</u>	<u>Measured Value</u>	<u>Method Reporting Limit</u>	<u>Units</u>	<u>Analysis Method</u>	<u>Date Analyzed</u>
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**QC Report : Matrix Spike/ Matrix Spike Duplicate**Project Name : **Tesoro Livermore #67076**Project Number : **01LV**

Parameter	Spiked Sample	Sample Value	Spike Level	Spike Dup. Level	Spiked Sample Value	Duplicate Spiked Sample Value	Units	Analysis Method	Date Analyzed	Spiked Sample Percent Recov.	Duplicate Spiked Sample Percent Recov.	Relative Percent Diff.	Spiked Sample Percent Recov. Limit	Relative Percent Diff. Limit
Ferrous Iron	81228-03	< 0.10	0.253	0.253	0.292	0.284	mg/L	SM 3500-Fe D	5/11/12	105	102	2.78	70.0-130	25
Nitrate as N	81028-02	< 0.10	0.500	0.500	0.502	0.483	mg/L	EPA 300.0	5/12/12	98.3	94.6	3.81	85.0-115	10
Sulfate	81028-02	1.4	2.50	2.50	3.89	3.90	mg/L	EPA 300.0	5/12/12	99.7	100	0.175	85.0-115	10
Hexavalent Chromium	81249-01	< 1.0	5.00	5.00	4.83	5.13	ug/L	EPA 7199	5/11/12	96.6	103	6.00	90.0-110	10
1,2-Dibromoethane	81243-03	<0.50	39.7	39.2	40.5	38.5	ug/L	EPA 8260B	5/15/12	102	98.1	3.92	80-120	25
1,2-Dichloroethane	81243-03	<0.50	39.8	39.3	40.3	38.9	ug/L	EPA 8260B	5/15/12	101	99.1	2.38	75.7-122	25
Benzene	81243-03	<0.50	39.8	39.3	39.1	38.2	ug/L	EPA 8260B	5/15/12	98.3	97.2	1.10	80-120	25
Diisopropyl ether	81243-03	<0.50	39.3	38.8	40.3	39.9	ug/L	EPA 8260B	5/15/12	102	103	0.158	80-120	25

## QC Report : Matrix Spike/ Matrix Spike Duplicate

Project Name : Tesoro Livermore #67076

Project Number : 01LV

Parameter	Spiked Sample	Sample Value	Spike Level	Spike Dup. Level	Spiked Sample Value	Duplicate Spiked Sample Value	Units	Analysis Method	Date Analyzed	Spiked Sample Percent Recov.	Duplicate Spiked Sample Percent Recov.	Relative Percent Diff.	Spiked Sample Percent Recov. Limit	Relative Percent Diff. Limit
Ethanol	81243-03	<5.0	99.6	98.4	130	157	ug/L	EPA 8260B	5/15/12	131	159	19.7	55.1-159	25
Ethyl-tert-butyl ether	81243-03	<0.50	39.6	39.1	34.6	32.7	ug/L	EPA 8260B	5/15/12	87.4	83.6	4.51	76.5-120	25
Ethylbenzene	81243-03	<0.50	39.8	39.3	40.8	40.9	ug/L	EPA 8260B	5/15/12	103	104	1.26	80-120	25
Methanol	81243-03	<50	994	982	1160	1400	ug/L	EPA 8260B	5/15/12	117	143	20.0	53.2-147	25
Methyl-t-butyl ether	81243-03	<0.50	39.8	39.3	37.3	35.9	ug/L	EPA 8260B	5/15/12	93.7	91.4	2.54	69.7-121	25
P + M Xylene	81243-03	<0.50	39.8	39.3	40.3	39.6	ug/L	EPA 8260B	5/15/12	101	101	0.661	76.8-120	25
Tert-Butanol	81243-03	<5.0	200	198	200	200	ug/L	EPA 8260B	5/15/12	99.6	101	1.68	80-120	25
Tert-amyl-methyl ether	81243-03	<0.50	39.7	39.2	36.9	34.8	ug/L	EPA 8260B	5/15/12	93.0	88.8	4.60	78.9-120	25
Toluene	81243-03	<0.50	39.8	39.3	39.7	39.1	ug/L	EPA 8260B	5/15/12	99.9	99.6	0.314	80-120	25

## QC Report : Matrix Spike/ Matrix Spike Duplicate

Project Name : Tesoro Livermore #67076

Project Number : 01LV

Parameter	Spiked Sample	Sample Value	Spike Level	Spike Dup. Level	Spiked Sample Value	Duplicate Spiked Sample Value	Units	Analysis Method	Date Analyzed	Spiked Sample Percent Recov.	Duplicate Spiked Sample Percent Recov.	Relative Percent Diff.	Spiked Sample Percent Recov. Limit	Relative Percent Diff. Limit
1,2-Dibromoethane	81211-08	<0.50	39.9	39.9	43.0	43.2	ug/L	EPA 8260B	5/16/12	108	108	0.466	80-120	25
1,2-Dichloroethane	81211-08	<0.50	40.0	40.0	41.8	42.3	ug/L	EPA 8260B	5/16/12	104	106	1.21	75.7-122	25
Benzene	81211-08	<0.50	40.0	40.0	41.6	41.3	ug/L	EPA 8260B	5/16/12	104	103	0.663	80-120	25
Diisopropyl ether	81211-08	<0.50	39.5	39.5	41.3	42.9	ug/L	EPA 8260B	5/16/12	104	108	3.76	80-120	25
Ethanol	81211-08	<5.0	99.7	99.7	97.6	108	ug/L	EPA 8260B	5/16/12	97.8	108	10.0	55.1-159	25
Ethyl-tert-butyl ether	81211-08	<0.50	39.8	39.8	41.6	43.3	ug/L	EPA 8260B	5/16/12	104	109	3.92	76.5-120	25
Ethylbenzene	81211-08	<0.50	40.0	40.0	43.2	41.9	ug/L	EPA 8260B	5/16/12	108	105	3.20	80-120	25
Methanol	81211-08	<50	998	998	1060	1050	ug/L	EPA 8260B	5/16/12	106	105	1.33	53.2-147	25
Methyl-t-butyl ether	81211-08	<0.50	40.0	40.0	40.2	42.6	ug/L	EPA 8260B	5/16/12	101	106	5.73	69.7-121	25
P + M Xylene	81211-08	<0.50	40.0	40.0	42.3	41.3	ug/L	EPA 8260B	5/16/12	106	103	2.43	76.8-120	25

**QC Report : Matrix Spike/ Matrix Spike Duplicate**Project Name : **Tesoro Livermore #67076**Project Number : **01LV**

Parameter	Spiked Sample	Sample Value	Spike Level	Spike Dup. Level	Spiked Sample Value	Duplicate Spiked Sample Value	Units	Analysis Method	Date Analyzed	Spiked Sample Percent Recov.	Duplicate Spiked Sample Percent Recov.	Relative Percent Diff.	Spiked Sample Percent Recov. Limit	Relative Percent Diff. Limit
Tert-Butanol	81211-08	<5.0	202	202	205	203	ug/L	EPA 8260B	5/16/12	102	101	1.09	80-120	25
Tert-amyl-methyl ether	81211-08	<0.50	39.9	39.9	42.0	43.2	ug/L	EPA 8260B	5/16/12	105	108	2.69	78.9-120	25
Toluene	81211-08	<0.50	40.0	40.0	41.8	41.2	ug/L	EPA 8260B	5/16/12	104	103	1.45	80-120	25
1,2-Dibromoethane	81273-03	<0.50	39.9	39.9	43.7	42.3	ug/L	EPA 8260B	5/16/12	109	106	3.14	80-120	25
1,2-Dichloroethane	81273-03	<0.50	40.0	40.0	42.1	41.2	ug/L	EPA 8260B	5/16/12	105	103	2.30	75.7-122	25
Benzene	81273-03	<0.50	40.0	40.0	41.7	40.1	ug/L	EPA 8260B	5/16/12	104	100	4.03	80-120	25
Diisopropyl ether	81273-03	1.4	39.5	39.5	45.7	45.2	ug/L	EPA 8260B	5/16/12	112	111	1.06	80-120	25
Ethanol	81273-03	<5.0	99.7	99.7	99.3	104	ug/L	EPA 8260B	5/16/12	99.6	105	5.05	55.1-159	25
Ethyl-tert-butyl ether	81273-03	<0.50	39.8	39.8	42.0	42.6	ug/L	EPA 8260B	5/16/12	106	107	1.28	76.5-120	25

**QC Report : Matrix Spike/ Matrix Spike Duplicate**Project Name : **Tesoro Livermore #67076**Project Number : **01LV**

Parameter	Spiked Sample	Sample Value	Spike Level	Spike Dup. Level	Spiked Sample Value	Duplicate Spiked Sample Value	Units	Analysis Method	Date Analyzed	Spiked Sample Percent Recov.	Duplicate Spiked Sample Percent Recov.	Relative Percent Diff.	Spiked Sample Percent Recov. Limit	Relative Percent Diff. Limit
Ethylbenzene	81273-03	<0.50	40.0	40.0	43.1	41.4	ug/L	EPA 8260B	5/16/12	108	103	4.03	80-120	25
Methanol	81273-03	<50	998	998	956	957	ug/L	EPA 8260B	5/16/12	95.9	95.9	0.0180	53.2-147	25
Methyl-t-butyl ether	81273-03	2.3	40.0	40.0	44.6	45.0	ug/L	EPA 8260B	5/16/12	106	106	0.783	69.7-121	25
P + M Xylene	81273-03	<0.50	40.0	40.0	42.1	40.2	ug/L	EPA 8260B	5/16/12	105	100	4.46	76.8-120	25
Tert-Butanol	81273-03	<5.0	202	202	208	204	ug/L	EPA 8260B	5/16/12	103	101	1.76	80-120	25
Tert-amyl-methyl ether	81273-03	<0.50	39.9	39.9	41.8	42.3	ug/L	EPA 8260B	5/16/12	105	106	1.30	78.9-120	25
Toluene	81273-03	<0.50	40.0	40.0	42.3	40.5	ug/L	EPA 8260B	5/16/12	106	101	4.42	80-120	25
Arsenic	81231-01	< 0.015	0.800	0.800	0.832	0.840	mg/L	EPA 200.7	5/18/12	103	104	0.981	75-125	20
Chromium	81231-01	< 0.0050	0.800	0.800	0.814	0.821	mg/L	EPA 200.7	5/18/12	102	102	0.868	75-125	20

**QC Report : Matrix Spike/ Matrix Spike Duplicate**Project Name : **Tesoro Livermore #67076**Project Number : **01LV**

Parameter	Spiked Sample	Sample Value	Spike Level	Spike Dup. Level	Spiked Sample Value	Duplicate Spiked Sample Value	Units	Analysis Method	Date Analyzed	Spiked Sample Percent Recov.	Duplicate Spiked Sample Percent Recov.	Relative Percent Diff.	Spiked Sample Percent Recov. Limit	Relative Percent Diff. Limit
<b>Iron</b>	81231-01	24	0.800	0.800	25.3	25.4	mg/L	EPA 200.7	5/18/12	102	121	0.591	75-125	20
<b>Manganese</b>	81231-01	4.1	0.800	0.800	4.75	4.84	mg/L	EPA 200.7	5/18/12	85.8	96.2	1.75	75-125	20
<b>Sodium</b>	81249-01	210	0.400	0.400	203	200	mg/L	EPA 200.7	5/21/12	<b>0.00</b>	<b>0.00</b>	1.39	75-125	20

**QC Report : Laboratory Control Sample (LCS)**Project Name : **Tesoro Livermore #67076**Project Number : **01LV**

Parameter	Spike Level	Units	Analysis Method	Date Analyzed	LCS Percent Recov.	LCS Percent Recov. Limit
Arsenic	0.800	mg/L	EPA 200.7	5/18/12	100	85-115
Chromium	0.800	mg/L	EPA 200.7	5/18/12	102	85-115
Iron	0.800	mg/L	EPA 200.7	5/18/12	99.1	85-115
Manganese	0.800	mg/L	EPA 200.7	5/18/12	97.5	85-115
Sodium	0.400	mg/L	EPA 200.7	5/21/12	102	85-115
1,2-Dibromoethane	39.9	ug/L	EPA 8260B	5/15/12	102	80-120
1,2-Dichloroethane	40.0	ug/L	EPA 8260B	5/15/12	100	75.7-122
Benzene	40.0	ug/L	EPA 8260B	5/15/12	96.4	80-120
Diisopropyl ether	39.5	ug/L	EPA 8260B	5/15/12	99.6	80-120
Ethanol	100	ug/L	EPA 8260B	5/15/12	79.4	55.1-159
Ethyl-tert-butyl ether	39.8	ug/L	EPA 8260B	5/15/12	95.0	76.5-120
Ethylbenzene	40.0	ug/L	EPA 8260B	5/15/12	102	80-120
Methanol	1000	ug/L	EPA 8260B	5/15/12	83.4	53.2-147
Methyl-t-butyl ether	40.0	ug/L	EPA 8260B	5/15/12	95.8	69.7-121
P + M Xylene	40.0	ug/L	EPA 8260B	5/15/12	99.6	76.8-120
Tert-Butanol	202	ug/L	EPA 8260B	5/15/12	96.0	80-120
Tert-amyl-methyl ether	39.9	ug/L	EPA 8260B	5/15/12	105	78.9-120
Toluene	40.0	ug/L	EPA 8260B	5/15/12	99.2	80-120
1,2-Dibromoethane	40.1	ug/L	EPA 8260B	5/16/12	108	80-120

## QC Report : Laboratory Control Sample (LCS)

Project Name : **Tesoro Livermore #67076**Project Number : **01LV**

Parameter	Spike Level	Units	Analysis Method	Date Analyzed	LCS Percent Recov.	LCS Percent Recov. Limit
1,2-Dichloroethane	40.2	ug/L	EPA 8260B	5/16/12	105	75.7-122
Benzene	40.2	ug/L	EPA 8260B	5/16/12	104	80-120
Diisopropyl ether	39.7	ug/L	EPA 8260B	5/16/12	106	80-120
Ethanol	100	ug/L	EPA 8260B	5/16/12	92.2	55.1-159
Ethyl-tert-butyl ether	40.0	ug/L	EPA 8260B	5/16/12	110	76.5-120
Ethylbenzene	40.2	ug/L	EPA 8260B	5/16/12	109	80-120
Methanol	1000	ug/L	EPA 8260B	5/16/12	98.3	53.2-147
Methyl-t-butyl ether	40.2	ug/L	EPA 8260B	5/16/12	104	69.7-121
P + M Xylene	40.2	ug/L	EPA 8260B	5/16/12	106	76.8-120
TPH as Gasoline	502	ug/L	EPA 8260B	5/16/12	110	70.0-130
Tert-Butanol	202	ug/L	EPA 8260B	5/16/12	101	80-120
Tert-amyl-methyl ether	40.1	ug/L	EPA 8260B	5/16/12	104	78.9-120
Toluene	40.2	ug/L	EPA 8260B	5/16/12	105	80-120
1,2-Dibromoethane	39.9	ug/L	EPA 8260B	5/16/12	107	80-120
1,2-Dichloroethane	40.0	ug/L	EPA 8260B	5/16/12	104	75.7-122
Benzene	40.0	ug/L	EPA 8260B	5/16/12	103	80-120
Diisopropyl ether	39.5	ug/L	EPA 8260B	5/16/12	108	80-120
Ethanol	99.7	ug/L	EPA 8260B	5/16/12	101	55.1-159
Ethyl-tert-butyl ether	39.8	ug/L	EPA 8260B	5/16/12	107	76.5-120
Ethylbenzene	40.0	ug/L	EPA 8260B	5/16/12	107	80-120
Methanol	998	ug/L	EPA 8260B	5/16/12	102	53.2-147
Methyl-t-butyl ether	40.0	ug/L	EPA 8260B	5/16/12	105	69.7-121



**QC Report : Laboratory Control Sample (LCS)**Project Name : **Tesoro Livermore #67076**Project Number : **01LV**

Parameter	Spike Level	Units	Analysis Method	Date Analyzed	LCS Percent Recov.	LCS Percent Recov. Limit
P + M Xylene	40.0	ug/L	EPA 8260B	5/16/12	104	76.8-120
TPH as Gasoline	507	ug/L	EPA 8260B	5/16/12	108	70.0-130
Tert-Butanol	202	ug/L	EPA 8260B	5/16/12	101	80-120
Tert-amyl-methyl ether	39.9	ug/L	EPA 8260B	5/16/12	104	78.9-120
Toluene	40.0	ug/L	EPA 8260B	5/16/12	104	80-120
Ferrous Iron	0.253	mg/L	SM 3500-Fe D	5/11/12	102	70.0-130
Nitrate as N	0.500	mg/L	EPA 300.0	5/11/12	100	85.0-115
Sulfate	2.50	mg/L	EPA 300.0	5/11/12	92.9	85.0-115
Hexavalent Chromium	5.00	ug/L	EPA 7199	5/11/12	97.1	90.0-110



2795 2nd Street, Suite 300  
 Davis, CA 95618  
 Lab: 530.297.4800  
 Fax: 530.297.4802

SRG # / Lab No. 81249

Page i of 1

Project Contact (Hardcopy or PDF To): Matthew Nelson  
 California EDF Report?  Yes  No

Company / Address: 3450 E. Spring St #212 Long Beach CA  
 Sampling Company Log Code: EFSF

Phone Number: 562-988-2755  
 Global ID: T0600101410

Fax Number: 562-988-2759  
 EDF Deliverable To (Email Address): MNelson@origenew.com

Project #: 01LV P.O. #:  
 Bill to:

Project Name: Tesoro Livermore #67076  
 Sampler Print Name: Chris Arroyo  
 Sampler Signature: [Signature]

Project Address: 1619 First Street Livermore, CA  
 Sampling Container Preservative Matrix

Sample Designation	Sampling		Container				Preservative				Matrix			MTBE @ 0.5 ppb (EPA 8260B)	BTEX (EPA 8260B)	TPH Gas (EPA 8260B)	5 Oxygenates (MTBE, DIPE, ETBE, TAME, TBA) (EPA 8260B)	7 Oxygenates (5 oxy + EtOH, MeOH) (EPA 8260B)	Lead Scav. (1,2 DCA & 1,2 EDB) (EPA 8260B)	Volatile Halocarbons (EPA 8260B)	Volatile Organics Full List (EPA 92000) (NSK-175M)	Volatile Organics (EPA 524.2 Drinking Water)	PHT as Diesel (EPA 8005M) Hexavalent Chromium	PHT as Motor Oil (EPA 8005M) Total Organic Carbon	EPA 17 Metals (EPA-200.7.16040) Metals by ICP	5 Waste Oil Metals (Cd, Cr, Ni, Pb, Zn) (EPA 200.7 / 6010)	Mercury (EPA 246.4-7770-7474) COD (410.4)	Total Lead (EPA 200.7-6040) BOD (SM 5210B)	Wet Lead (EPA 200.7-6040) Ferrous Iron (SM 3500-Fe-D)	Methane	Nitrate and Sulfate	Alkalinity Total (SM 2320 B)	Total Dissolved Solids (SM 2540C)	TAT	
	Date	Time	40 ml VOA	Sleeve	Poly	Glass	Tedlar	HCl	HNO <sub>3</sub>	None	H <sub>2</sub> SO <sub>4</sub>	Water	Soil																						Air
MW-11	5/11/12	0900	7	6	1		7	1	5	1	X			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	01
MW-2	5/11/12	0915	7	6	1		7	1	5	1	X			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	02
DW-8	5/11/12	0910	7	6			7	1	5		X			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	03

Chain-of-Custody Record and Analysis Request

Analysis Request		TAT
<input type="checkbox"/> 12 hr	<input type="checkbox"/> 24 hr	<input type="checkbox"/> 48 hr
<input type="checkbox"/> 72 hr	<input checked="" type="checkbox"/> 1 wk	

Relinquished by: [Signature] EFS Date: 5/11/12 Time: 0925  
 Received by: [Signature]  
 Relinquished by: \_\_\_\_\_ Date: \_\_\_\_\_ Time: \_\_\_\_\_  
 Received by: \_\_\_\_\_  
 Relinquished by: [Signature] Date: 05/11/12 Time: 1135  
 Received by Laboratory: [Signature] KIFF Analytical

Remarks:

**SAMPLE RECEIPT CHECKLIST**

RECEIVER  
RLM  
Initials

SRG#: 81249 Date: 051112

Project ID: Tesoro Livermore #67076

Method of Receipt:  Courier  Over-the-counter  Shipper

**COC Inspection**

Is COC present?  Yes  No  
 Custody seals on shipping container?  Intact  Broken  Not present  N/A  
 Is COC Signed by Relinquisher?  Yes  No Dated?  Yes  No  
 Is sampler name legibly indicated on COC?  Yes  No  
 Is analysis or hold requested for all samples?  Yes  No  
 Is the turnaround time indicated on COC?  Yes  No  
 Is COC free of whiteout and uninitialed cross-outs?  Yes  No, Whiteout  No, Cross-outs

**Sample Inspection**

Coolant Present:  Yes  No (includes water)  
 Temperature °C 4.2 Therm. ID# IR-4 Initial RLM Date/Time 051112/1435  N/A  
 Are there custody seals on sample containers?  Intact  Broken  Not present  
 Do containers match COC?  Yes  No  No, COC lists absent sample(s)  No, Extra sample(s) present  
 Are there samples matrices other than soil, water, air or carbon?  Yes  No  
 Are any sample containers broken, leaking or damaged?  Yes  No  
 Are preservatives indicated?  Yes, on sample containers  Yes, on COC  Not indicated  N/A  
 Are preservatives correct for analyses requested?  Yes  No  N/A  
 Are samples within holding time for analyses requested?  Yes  No  
 Are the correct sample containers used for the analyses requested?  Yes  No  
 Is there sufficient sample to perform testing?  Yes  No  
 Does any sample contain product, have strong odor or are otherwise suspected to be hot?  Yes  No

**Receipt Details**

Matrix WA Container type VOA # of containers received 21  
 Matrix WA Container type Ply # of containers received 18  
 Matrix WA Container type Glass # of containers received 2  
 Date and Time Sample Put into Temp Storage Date: 051112 Time: 1443

**Quicklog**

Are the Sample ID's indicated:  On COC  On sample container(s)  On Both  Not indicated  
 If Sample ID's are listed on both COC and containers, do they all match?  Yes  No  N/A  
 Is the Project ID indicated:  On COC  On sample container(s)  On Both  Not indicated  
 If project ID is listed on both COC and containers, do they all match?  Yes  No  N/A  
 Are the sample collection dates indicated:  On COC  On sample container(s)  On Both  Not indicated  
 If collection dates are listed on both COC and containers, do they all match?  Yes  No  N/A  
 Are the sample collection times indicated:  On COC  On sample container(s)  On Both  Not indicated  
 If collection times are listed on both COC and containers, do they all match?  Yes  No  N/A

COMMENTS: The CDC requests "Metals by ICP" but does not specify the metals or method. SR will not log in metals analysis pending clarification by Client Services. MAS 051112 1520



# Subcontract Laboratory Report Attachments

# CALIFORNIA LABORATORY SERVICES

3249 Fitzgerald Road Rancho Cordova, CA 95742

May 18, 2012

**CLS Work Order #: CVE0644**

**COC #: 81249**

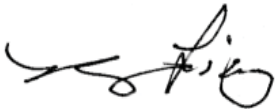
Scott Forbes  
KIFF Analytical  
2795 Second St. Suite 300  
Davis, CA 95616

**Project Name: Tesoro Livermore #67076**

Enclosed are the results of analyses for samples received by the laboratory on 05/14/12 14:46. Samples were analyzed pursuant to client request utilizing EPA or other ELAP approved methodologies. I certify that the results are in compliance both technically and for completeness.

Analytical results are attached to this letter. Please call if we can provide additional assistance.

Sincerely,

A handwritten signature in black ink, appearing to read 'James Liang', written in a cursive style.

James Liang, Ph.D.  
Laboratory Director

CA DOHS ELAP Accreditation/Registration number 1233



# CALIFORNIA LABORATORY SERVICES

Page 2 of 4

05/18/12 13:27

KIFF Analytical  
2795 Second St. Suite 300  
Davis, CA 95616

Project: Tesoro Livermore #67076  
Project Number: 01LV  
Project Manager: Scott Forbes

CLS Work Order #: CVE0644  
COC #: 81249

## Conventional Chemistry Parameters by APHA/EPA Methods

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>MW-11 (CVE0644-01) Water    Sampled: 05/11/12 09:00    Received: 05/14/12 14:46</b>									
Carbon Dioxide as CO2	140	5.0	mg/L	1	CV03234	05/15/12	05/15/12	SM 4500C	
Total Dissolved Solids	870	10	"	"	CV03219	05/15/12	05/16/12	SM2540C	
<b>MW-2 (CVE0644-02) Water    Sampled: 05/11/12 09:15    Received: 05/14/12 14:46</b>									
Carbon Dioxide as CO2	120	5.0	mg/L	1	CV03234	05/15/12	05/15/12	SM 4500C	
Total Dissolved Solids	600	10	"	"	CV03219	05/15/12	05/16/12	SM2540C	
<b>DW-8 (CVE0644-03) Water    Sampled: 05/11/12 09:10    Received: 05/14/12 14:46</b>									
Carbon Dioxide as CO2	ND	5.0	mg/L	1	CV03234	05/15/12	05/15/12	SM 4500C	
Total Dissolved Solids	330	10	"	"	CV03219	05/15/12	05/16/12	SM2540C	

CA DOHS ELAP Accreditation/Registration Number 1233

# CALIFORNIA LABORATORY SERVICES

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05/18/12 13:27

KIFF Analytical  
2795 Second St. Suite 300  
Davis, CA 95616

Project: Tesoro Livermore #67076  
Project Number: 01LV  
Project Manager: Scott Forbes

CLS Work Order #: CVE0644  
COC #: 81249

## Conventional Chemistry Parameters by APHA/EPA Methods - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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### Batch CV03219 - General Preparation

**Blank (CV03219-BLK1)** Prepared: 05/15/12 Analyzed: 05/16/12

Total Dissolved Solids ND 10 mg/L

**Duplicate (CV03219-DUP1)** Source: CVE0579-01 Prepared: 05/15/12 Analyzed: 05/16/12

Total Dissolved Solids 356 10 mg/L 350 2 20

### Batch CV03234 - General Preparation

**Blank (CV03234-BLK1)** Prepared & Analyzed: 05/15/12

Carbon Dioxide as CO2 ND 5.0 mg/L



# CALIFORNIA LABORATORY SERVICES

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05/18/12 13:27

KIFF Analytical  
2795 Second St. Suite 300  
Davis, CA 95616

Project: Tesoro Livermore #67076  
Project Number: 01LV  
Project Manager: Scott Forbes

**CLS Work Order #: CVE0644**  
COC #: 81249

## 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

---

CA DOHS ELAP Accreditation/Registration Number 1233

3249 Fitzgerald Road Rancho Cordova, CA 95742

[www.californialab.com](http://www.californialab.com)

916-638-7301

Fax: 916-638-4510



# CALSCIENCE

WORK ORDER NUMBER: 12-05-0972

*The difference is service*



AIR | SOIL | WATER | MARINE CHEMISTRY

## Analytical Report For

**Client:** Kiff Analytical

**Client Project Name:** Tesoro Livermore #67076

**Attention:** Joel Kiff  
2795 2nd Street, Suite 300  
Davis, CA 95616-6593

*Amanda Porter*

Approved for release on 05/18/2012 by:  
Amanda Porter  
Project Manager

ResultLink ▶

Email your PM ▶



Calscience Environmental Laboratories, Inc. (Calscience) certifies that the test results provided in this report meet all NELAC requirements for parameters for which accreditation is required or available. Any exceptions to NELAC requirements are noted in the case narrative. The original report of subcontracted analyses, if any, is attached to this report. The results in this report are limited to the sample(s) tested and any reproduction thereof must be made in its entirety. The client or recipient of this report is specifically prohibited from making material changes to said report and, to the extent that such changes are made, Calscience is not responsible, legally or otherwise. The client or recipient agrees to indemnify Calscience for any defense to any litigation which may arise.





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Work Order Number: 12-05-0972

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**Analytical Report**



Kiff Analytical  
 2795 2nd Street, Suite 300  
 Davis, CA 95616-6593

Date Received: 05/12/12  
 Work Order No: 12-05-0972  
 Preparation: N/A  
 Method: RSK-175M

Project: Tesoro Livermore #67076

Page 1 of 1

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
MW-11	12-05-0972-1-A	05/11/12 09:00	Aqueous	GC 52	N/A	05/14/12 13:19	120514L01

Parameter	Result	RL	DF	Qual	Units
Methane	99.1	1.00	1		ug/L

MW-2	12-05-0972-2-A	05/11/12 09:15	Aqueous	GC 52	N/A	05/14/12 14:20	120514L01
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Parameter	Result	RL	DF	Qual	Units
Methane	1670	8.00	8		ug/L

DW-8	12-05-0972-3-A	05/11/12 09:10	Aqueous	GC 52	N/A	05/14/12 14:00	120514L01
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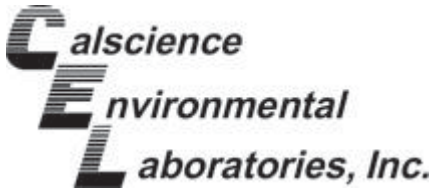
Parameter	Result	RL	DF	Qual	Units
Methane	306	1.00	1		ug/L

Method Blank	099-12-663-1,602	N/A	Aqueous	GC 52	N/A	05/14/12 12:48	120514L01
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Parameter	Result	RL	DF	Qual	Units
Methane	ND	1.00	1		ug/L

Return to Contents

RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers



Analytical Report



Kiff Analytical  
2795 2nd Street, Suite 300  
Davis, CA 95616-6593

Date Received: 05/12/12  
Work Order No: 12-05-0972

Project: Tesoro Livermore #67076

Page 1 of 1

Client Sample Number	Lab Sample Number	Date Collected	Matrix
MW-11	12-05-0972-1	05/11/12	Aqueous

Parameter	Results	RL	DF	Qual	Units	Date Prepared	Date Analyzed	Method
Chemical Oxygen Demand	41	5.0	1		mg/L	05/17/12	05/17/12	EPA 410.4
Alkalinity, Total (as CaCO3)	771	5.00	1		mg/L	N/A	05/14/12	SM 2320B
Biochemical Oxygen Demand	26	1.0	1		mg/L	05/12/12	05/17/12	SM 5210 B
Carbon, Total Organic	62	2.5	5		mg/L	N/A	05/14/12	SM 5310 D

MW-2	12-05-0972-2	05/11/12	Aqueous
------	--------------	----------	---------

Parameter	Results	RL	DF	Qual	Units	Date Prepared	Date Analyzed	Method
Chemical Oxygen Demand	44	5.0	1		mg/L	05/17/12	05/17/12	EPA 410.4
Alkalinity, Total (as CaCO3)	496	5.00	1		mg/L	N/A	05/14/12	SM 2320B
Biochemical Oxygen Demand	15	1.0	1		mg/L	05/12/12	05/17/12	SM 5210 B
Carbon, Total Organic	49	2.5	5		mg/L	N/A	05/14/12	SM 5310 D

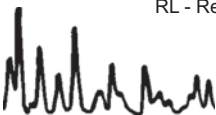
DW-8	12-05-0972-3	05/11/12	Aqueous
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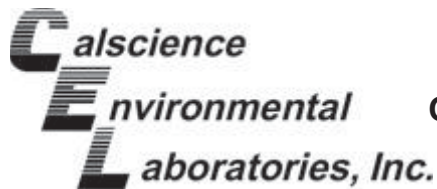
Parameter	Results	RL	DF	Qual	Units	Date Prepared	Date Analyzed	Method
Alkalinity, Total (as CaCO3)	195	5.00	1		mg/L	N/A	05/14/12	SM 2320B

Method Blank					N/A			Aqueous
--------------	--	--	--	--	-----	--	--	---------

Parameter	Results	RL	DF	Qual	Units	Date Prepared	Date Analyzed	Method
Chemical Oxygen Demand	ND	5.0	1		mg/L	05/17/12	05/17/12	EPA 410.4
Alkalinity, Total (as CaCO3)	ND	1.0	1		mg/L	N/A	05/14/12	SM 2320B
Biochemical Oxygen Demand	ND	1.0	1		mg/L	05/12/12	05/17/12	SM 5210 B
Carbon, Total Organic	ND	0.50	1		mg/L	N/A	05/14/12	SM 5310 D

RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers





Quality Control - Spike/Spike Duplicate



Kiff Analytical  
 2795 2nd Street, Suite 300  
 Davis, CA 95616-6593

Date Received: N/A  
 Work Order No: 12-05-0972

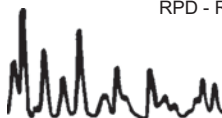
Project: Tesoro Livermore #67076

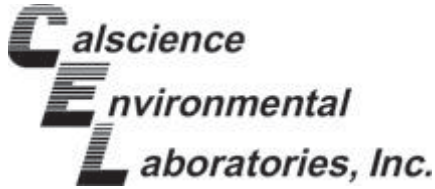
Matrix: Aqueous or Solid

<u>Parameter</u>	<u>Method</u>	<u>Quality Control Sample ID</u>	<u>Date Analyzed</u>	<u>Date Extracted</u>	<u>MS% REC</u>	<u>MSD % REC</u>	<u>%REC CL</u>	<u>RPD</u>	<u>RPD CL</u>	<u>Qualifiers</u>
Carbon, Total Organic	SM 5310 D	MW-2	05/14/12	N/A	99	103	75-125	1	0-25	

Return to Contents

RPD - Relative Percent Difference , CL - Control Limit





Quality Control - Duplicate



Kiff Analytical  
 2795 2nd Street, Suite 300  
 Davis, CA 95616-6593

Date Received: N/A  
 Work Order No: 12-05-0972

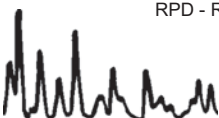
Project: Tesoro Livermore #67076

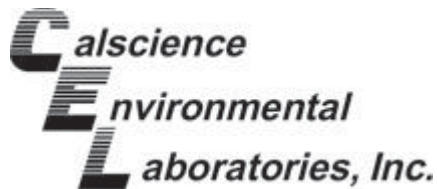
Matrix: Aqueous or Solid

Parameter	Method	QC Sample ID	Date Analyzed	Sample Conc.	DUP Conc.	RPD	RPD CL	Qualifiers
Alkalinity, Total (as CaCO3)	SM 2320B	12-05-0956-1	05/14/12	736	732	1	0-25	
Chemical Oxygen Demand	EPA 410.4	MW-11	05/17/12	41	42	2	0-25	
Biochemical Oxygen Demand	SM 5210 B	MW-2	05/17/12	15	16	6	0-25	

Return to Contents

RPD - Relative Percent Difference , CL - Control Limit





Quality Control - LCS/LCS Duplicate



Kiff Analytical  
 2795 2nd Street, Suite 300  
 Davis, CA 95616-6593

Date Received: N/A  
 Work Order No: 12-05-0972  
 Preparation: N/A  
 Method: RSK-175M

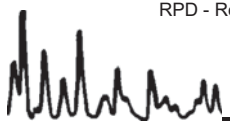
Project: Tesoro Livermore #67076

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number
099-12-663-1,602	Aqueous	GC 52	N/A	05/14/12	120514L01

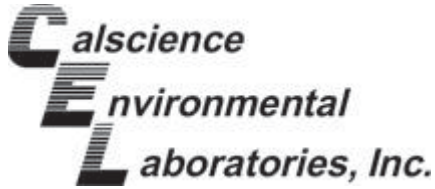
Parameter	SPIKE ADDED	LCS %REC	LCSD %REC	%REC CL	RPD	RPD CL	Qualifiers
Methane	100.0	96	96	79-109	0	0-20	

Return to Contents

RPD - Relative Percent Difference , CL - Control Limit







Quality Control - LCS/LCS Duplicate



Kiff Analytical  
2795 2nd Street, Suite 300  
Davis, CA 95616-6593

Date Received: N/A  
Work Order No: 12-05-0972

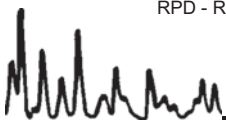
Project: Tesoro Livermore #67076

Matrix: Aqueous or Solid

<u>Parameter</u>	<u>Method</u>	<u>Quality Control</u> Sample ID	<u>Date</u> <u>Extracted</u>	<u>Date</u> <u>Analyzed</u>	<u>LCS %</u> <u>REC</u>	<u>LCSD %</u> <u>REC</u>	<u>%REC</u> <u>CL</u>	<u>RPD</u>	<u>RPD</u> <u>CL</u>	<u>Qual</u>
Carbon, Total Organic	SM 5310 D	099-05-097-4,609	N/A	05/14/12	102	100	80-120	1	0-20	

Return to Contents

RPD - Relative Percent Difference , CL - Control Limit



Work Order Number: 12-05-0972

<u>Qualifier</u>	<u>Definition</u>
*	See applicable analysis comment.
<	Less than the indicated value.
>	Greater than the indicated value.
1	Surrogate compound recovery was out of control due to a required sample dilution. Therefore, the sample data was reported without further clarification.
2	Surrogate compound recovery was out of control due to matrix interference. The associated method blank surrogate spike compound was in control and, therefore, the sample data was reported without further clarification.
3	Recovery of the Matrix Spike (MS) or Matrix Spike Duplicate (MSD) compound was out of control due to matrix interference. The associated LCS and/or LCSD was in control and, therefore, the sample data was reported without further clarification.
4	The MS/MSD RPD was out of control due to matrix interference. The LCS/LCSD RPD was in control and, therefore, the sample data was reported without further clarification.
5	The PDS/PDSD or PES/PESD associated with this batch of samples was out of control due to a matrix interference effect. The associated batch LCS/LCSD was in control and, hence, the associated sample data was reported without further clarification.
6	Surrogate recovery below the acceptance limit.
7	Surrogate recovery above the acceptance limit.
B	Analyte was present in the associated method blank.
BU	Sample analyzed after holding time expired.
E	Concentration exceeds the calibration range.
ET	Sample was extracted past end of recommended max. holding time.
HD	The chromatographic pattern was inconsistent with the profile of the reference fuel standard.
HDH	The sample chromatographic pattern for TPH matches the chromatographic pattern of the specified standard but heavier hydrocarbons were also present (or detected).
HDL	The sample chromatographic pattern for TPH matches the chromatographic pattern of the specified standard but lighter hydrocarbons were also present (or detected).
J	Analyte was detected at a concentration below the reporting limit and above the laboratory method detection limit. Reported value is estimated.
ME	LCS/LCSD Recovery Percentage is within Marginal Exceedance (ME) Control Limit range.
ND	Parameter not detected at the indicated reporting limit.
Q	Spike recovery and RPD control limits do not apply resulting from the parameter concentration in the sample exceeding the spike concentration by a factor of four or greater.
SG	The sample extract was subjected to Silica Gel treatment prior to analysis.
X	% Recovery and/or RPD out-of-range.
Z	Analyte presence was not confirmed by second column or GC/MS analysis.

Solid - Unless otherwise indicated, solid sample data is reported on a wet weight basis, not corrected for % moisture. All QC results are reported on a wet weight basis.

MPN - Most Probable Number





2795 Second Street, Suite 300  
 Davis, CA 95618  
 Lab: 530.297.4800  
 Fax: 530.297.4808

Calscience  
 7440 Lincoln Way  
 Garden Grove, CA 92841-1427  
 714-895-5494

**12-05-0972**

COC No. **81249** Page 1 of 1

Project Contact (Hardcopy or PDF to): <b>Scott Forbes</b>	EDF Report? <b>YES</b>	<b>Chain-of-Custody Record and Analysis Request</b>	
--	------------------------	---	--

Company/Address: <b>Kiff Analytical</b>	Recommended but not mandatory to complete this section: Sampling Company Log Code: <b>EFSP</b>	<b>Analysis Request</b>		<b>TAT</b>
--	---	-------------------------	--	------------

Phone No.: <b>530-297-4800</b>	FAX No.: <b>530-297-4808</b>	Global ID: <b>T0600101410</b>	Alkalinity SM 2320 (1) Biochemical Oxygen Demand Chemical Oxygen Demand Hydrocarbons in Water by RSK 175 (1) Total Organic Carbon	4-Days	For Lab Use Only
Project Number: <b>01LV</b>	P.O. No.: <b>81249</b>	Deliverables to (Email Address): <b>inbox@kiffanalytical.com</b>			

Sample Designation	Sampling		Container / Preservative				Matrix		Alkalinity SM 2320 (1)	Biochemical Oxygen Demand	Chemical Oxygen Demand	Hydrocarbons in Water by RSK 175 (1)	Total Organic Carbon	4-Days	For Lab Use Only
	Date	Time	250ml Glass H2SO4	1-L Poly None	VOA 40 ml HCl		Water								
MW-11	05/11/12	09:00	1	1	2			X	X	X	X	X	X	X	1
MW-2	05/11/12	09:15	1	1	2			X	X	X	X	X	X	X	2
DW-8	05/11/12	09:10		1	2			X	X	X	X	X	X	X	3

Relinquished by: <i>[Signature]</i> Kiff Analytical	Date <b>05/11/12</b>	Time <b>1900</b>	Received by:	Remarks: Please refer to attached Test Detail.
Relinquished by:	Date	Time	Received by:	
Relinquished by:	Date <b>05/12/12</b>	Time <b>10:20</b>	Received by Laboratory: <i>[Signature]</i>	
Bill to: <b>Accounts Payable</b>				Page 10 of 13

## Test Detail for Kiff Work Order: 81249

### **Alkalinity SM 2320 (1)**

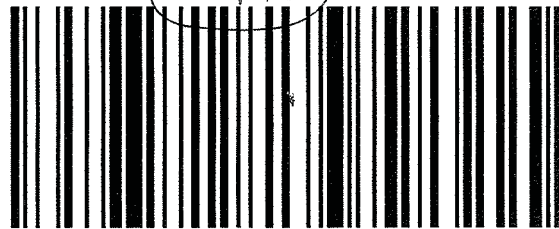
Alkalinity, Total (as CaCO<sub>3</sub>)

### **Hydrocarbons in Water by RSK 175 (1)**

Methane



**800.334.5000**  
ontrac.com



D10010475971672

Date Printed 5/11/2012

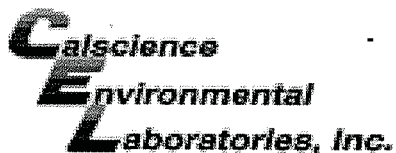
Tracking#D10010475971672

*Shipped From:*  
KIFF ANALYTICAL  
2795 2ND STREET 300  
DAVIS, CA 95616

*Sent By:* SAMPLE RECEIVING  
*Phone#:* (530)297-4800  
*wgt(lbs):* 1  
*Reference:* SUB SRG SAMPLES  
*Reference 2:*

*Ship To Company:*  
**CALSCIENCE ENVIRONMENTAL**  
**7440 LINCOLN WAY**  
**GARDEN GROVE, CA 92841**  
**RECEIVING (714)895-5494**  
  
**B10207210772**

*Service:* **S**  
*Sort Code:* **ORG**  
  
*Special Services:*  
**Saturday Delivery**  
**Signature Required**



WORK ORDER #: 12-05-0972

SAMPLE RECEIPT FORM

Cooler 1 of 1

CLIENT: Kiff

DATE: 05/12/12

TEMPERATURE: Thermometer ID: SC2 (Criteria: 0.0 °C - 6.0 °C, not frozen)
Temperature 1.8 °C - 0.3 °C (CF) = 1.5 °C [X] Blank [ ] Sample
[ ] Sample(s) outside temperature criteria (PM/APM contacted by: \_\_\_\_\_).
[ ] Sample(s) outside temperature criteria but received on ice/chilled on same day of sampling.
[ ] Received at ambient temperature, placed on ice for transport by Courier.
Ambient Temperature: [ ] Air [ ] Filter Initial: WSR

CUSTODY SEALS INTACT:
[X] Cooler [ ] \_\_\_\_\_ [ ] No (Not Intact) [ ] Not Present [ ] N/A Initial: WSR
[ ] Sample [ ] \_\_\_\_\_ [ ] No (Not Intact) [X] Not Present Initial: JS

SAMPLE CONDITION:
Chain-Of-Custody (COC) document(s) received with samples..... [X] Yes [ ] No [ ] N/A
COC document(s) received complete..... [X] Yes [ ] No [ ] N/A
[ ] Collection date/time, matrix, and/or # of containers logged in based on sample labels.
[ ] No analysis requested. [ ] Not relinquished. [ ] No date/time relinquished.
Sampler's name indicated on COC..... [ ] Yes [ ] No [X] N/A
Sample container label(s) consistent with COC..... [X] Yes [ ] No [ ] N/A
Sample container(s) intact and good condition..... [X] Yes [ ] No [ ] N/A
Proper containers and sufficient volume for analyses requested..... [X] Yes [ ] No [ ] N/A
Analyses received within holding time..... [X] Yes [ ] No [ ] N/A
pH / Res. Chlorine / Diss. Sulfide / Diss. Oxygen received within 24 hours... [ ] Yes [ ] No [X] N/A
Proper preservation noted on COC or sample container..... [X] Yes [ ] No [ ] N/A
[ ] Unpreserved vials received for Volatiles analysis
Volatile analysis container(s) free of headspace..... [ ] Yes [ ] No [ ] N/A
Tedlar bag(s) free of condensation..... [ ] Yes [ ] No [X] N/A

CONTAINER TYPE:
Solid: [ ] 4ozCGJ [ ] 8ozCGJ [ ] 16ozCGJ [ ] Sleeve (\_\_\_\_) [ ] EnCores® [ ] TerraCores® [ ] \_\_\_\_\_
Water: [ ] VOA [X] VOAh [ ] VOAna2 [ ] 125AGB [ ] 125AGBh [ ] 125AGBp [ ] 1AGB [ ] 1AGBna2 [ ] 1AGBs
[ ] 500AGB [ ] 500AGJ [ ] 500AGJs [ ] 250AGB [ ] 250CGB [X] 250CGBs [X] 1PB [ ] 1PBna [ ] 500PB
[ ] 250PB [ ] 250PBn [ ] 125PB [ ] 125PBzanna [ ] 100PJ [ ] 100PJna2 [ ] \_\_\_\_\_ [ ] \_\_\_\_\_ [ ] \_\_\_\_\_
Air: [ ] Tedlar® [ ] Summa® Other: [ ] \_\_\_\_\_ Trip Blank Lot#: \_\_\_\_\_ Labeled/Checked by: JS
Container: C: Clear A: Amber P: Plastic G: Glass J: Jar B: Bottle Z: Ziploc/Resealable Bag E: Envelope Reviewed by: YL
Preservative: h: HCL n: HNO3 na2: Na2S2O3 na: NaOH p: H3PO4 s: H2SO4 u: Ultra-pure zanna: ZnAc2+NaOH f: Filtered Scanned by: YL





## Laboratory Results

Matt Nelson  
Orion Environmental  
3450 East Spring Street, Suite 212  
Long Beach, CA 90806

Subject : 12 Soil Samples and 1 Water Sample  
Project Name : Tesoro - Livermore  
Project Number : 01LV  
P.O. Number : 67076

Dear Mr. Nelson,

Chemical analysis of the samples referenced above has been completed. Summaries of the data are contained on the following pages. Sample(s) were received under documented chain-of-custody. US EPA protocols for sample storage and preservation were followed. Testing procedures comply with the 2003 NELAC and TNI 2009 standards. Laboratory results relate only to the samples tested. This report may be freely reproduced in full, but may only be reproduced in part with the express permission of Kiff Analytical, LLC. Kiff Analytical, LLC is certified by the State of California under the National Environmental Laboratory Accreditation Program (NELAP), lab # 08263CA. If you have any questions regarding procedures or results, please call me at 530-297-4800.

Sincerely,

Troy Turpen

Subject : 12 Soil Samples and 1 Water Sample  
Project Name : Tesoro - Livermore  
Project Number : 01LV  
P.O. Number : 67076

## Case Narrative

All soil samples were reported on a total weight (wet weight) basis.

The Method Reporting Limit for Ethanol has been increased due to the presence of an interfering compound for sample DW-9@75.

Matrix Spike/Matrix Spike Duplicate results associated with samples DW-9@70 and DW-9@75 for the analyte Methanol were outside of control limits. This may indicate a bias for the sample that was spiked. Since the LCS recoveries were within control limits, no data are flagged.

Matrix Spike/Matrix Spike Duplicate results associated with sample DW-9@70 for the analyte Ethanol were outside of control limits. This may indicate a bias for the sample that was spiked. Since the LCS recoveries were within control limits, no data are flagged.

Matrix Spike/Matrix Spike Duplicate results associated with sample DB-8@55 for the analyte Ethanol were outside of control limits. This may indicate a bias for the sample that was spiked. Since the LCS recoveries were within control limits, no data are flagged.



Project Name : **Tesoro - Livermore**

Project Number : **01LV**

Sample : **DW-9@5**

Matrix : Soil

Lab Number : 81467-01

Sample Date :06/04/2012

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date/Time Analyzed
Benzene	< 0.0050	0.0050	mg/Kg	EPA 8260B	06/14/12 11:45
Toluene	< 0.0050	0.0050	mg/Kg	EPA 8260B	06/14/12 11:45
Ethylbenzene	< 0.0050	0.0050	mg/Kg	EPA 8260B	06/14/12 11:45
Total Xylenes	< 0.0050	0.0050	mg/Kg	EPA 8260B	06/14/12 11:45
Methyl-t-butyl ether (MTBE)	< 0.0050	0.0050	mg/Kg	EPA 8260B	06/14/12 11:45
Diisopropyl ether (DIPE)	< 0.0050	0.0050	mg/Kg	EPA 8260B	06/14/12 11:45
Ethyl-t-butyl ether (ETBE)	< 0.0050	0.0050	mg/Kg	EPA 8260B	06/14/12 11:45
Tert-amyl methyl ether (TAME)	< 0.0050	0.0050	mg/Kg	EPA 8260B	06/14/12 11:45
Tert-Butanol	< 0.0050	0.0050	mg/Kg	EPA 8260B	06/14/12 11:45
Methanol	< 0.20	0.20	mg/Kg	EPA 8260B	06/14/12 11:45
Ethanol	< 0.050	0.050	mg/Kg	EPA 8260B	06/14/12 11:45
TPH as Gasoline	< 1.0	1.0	mg/Kg	EPA 8260B	06/14/12 11:45
1,2-Dichloroethane	< 0.0050	0.0050	mg/Kg	EPA 8260B	06/14/12 11:45
1,2-Dibromoethane	< 0.0050	0.0050	mg/Kg	EPA 8260B	06/14/12 11:45
1,2-Dichloroethane-d4 (Surr)	95.0		% Recovery	EPA 8260B	06/14/12 11:45
Toluene - d8 (Surr)	92.5		% Recovery	EPA 8260B	06/14/12 11:45

Project Name : **Tesoro - Livermore**

Project Number : **01LV**

Sample : **DW-9@15**

Matrix : Soil

Lab Number : 81467-02

Sample Date :06/04/2012

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date/Time Analyzed
Benzene	< 0.0050	0.0050	mg/Kg	EPA 8260B	06/14/12 11:29
Toluene	< 0.0050	0.0050	mg/Kg	EPA 8260B	06/14/12 11:29
Ethylbenzene	< 0.0050	0.0050	mg/Kg	EPA 8260B	06/14/12 11:29
Total Xylenes	< 0.0050	0.0050	mg/Kg	EPA 8260B	06/14/12 11:29
Methyl-t-butyl ether (MTBE)	< 0.0050	0.0050	mg/Kg	EPA 8260B	06/14/12 11:29
Diisopropyl ether (DIPE)	< 0.0050	0.0050	mg/Kg	EPA 8260B	06/14/12 11:29
Ethyl-t-butyl ether (ETBE)	< 0.0050	0.0050	mg/Kg	EPA 8260B	06/14/12 11:29
Tert-amyl methyl ether (TAME)	< 0.0050	0.0050	mg/Kg	EPA 8260B	06/14/12 11:29
Tert-Butanol	< 0.0050	0.0050	mg/Kg	EPA 8260B	06/14/12 11:29
Methanol	< 0.20	0.20	mg/Kg	EPA 8260B	06/14/12 11:29
Ethanol	< 0.050	0.050	mg/Kg	EPA 8260B	06/14/12 11:29
TPH as Gasoline	< 1.0	1.0	mg/Kg	EPA 8260B	06/14/12 11:29
1,2-Dichloroethane	< 0.0050	0.0050	mg/Kg	EPA 8260B	06/14/12 11:29
1,2-Dibromoethane	< 0.0050	0.0050	mg/Kg	EPA 8260B	06/14/12 11:29
1,2-Dichloroethane-d4 (Surr)	105		% Recovery	EPA 8260B	06/14/12 11:29
Toluene - d8 (Surr)	98.2		% Recovery	EPA 8260B	06/14/12 11:29

Project Name : **Tesoro - Livermore**

Project Number : **01LV**

Sample : **DW-9@20**

Matrix : Soil

Lab Number : 81467-03

Sample Date :06/04/2012

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date/Time Analyzed
Benzene	< 0.0050	0.0050	mg/Kg	EPA 8260B	06/14/12 12:06
Toluene	< 0.0050	0.0050	mg/Kg	EPA 8260B	06/14/12 12:06
Ethylbenzene	< 0.0050	0.0050	mg/Kg	EPA 8260B	06/14/12 12:06
Total Xylenes	< 0.0050	0.0050	mg/Kg	EPA 8260B	06/14/12 12:06
Methyl-t-butyl ether (MTBE)	< 0.0050	0.0050	mg/Kg	EPA 8260B	06/14/12 12:06
Diisopropyl ether (DIPE)	< 0.0050	0.0050	mg/Kg	EPA 8260B	06/14/12 12:06
Ethyl-t-butyl ether (ETBE)	< 0.0050	0.0050	mg/Kg	EPA 8260B	06/14/12 12:06
Tert-amyl methyl ether (TAME)	< 0.0050	0.0050	mg/Kg	EPA 8260B	06/14/12 12:06
Tert-Butanol	< 0.0050	0.0050	mg/Kg	EPA 8260B	06/14/12 12:06
Methanol	< 0.20	0.20	mg/Kg	EPA 8260B	06/14/12 12:06
Ethanol	< 0.050	0.050	mg/Kg	EPA 8260B	06/14/12 12:06
TPH as Gasoline	< 1.0	1.0	mg/Kg	EPA 8260B	06/14/12 12:06
1,2-Dichloroethane	< 0.0050	0.0050	mg/Kg	EPA 8260B	06/14/12 12:06
1,2-Dibromoethane	< 0.0050	0.0050	mg/Kg	EPA 8260B	06/14/12 12:06
1,2-Dichloroethane-d4 (Surr)	106		% Recovery	EPA 8260B	06/14/12 12:06
Toluene - d8 (Surr)	98.8		% Recovery	EPA 8260B	06/14/12 12:06

Project Name : **Tesoro - Livermore**

Project Number : **01LV**

Sample : **DW-9@30**

Matrix : Soil

Lab Number : 81467-05

Sample Date :06/04/2012

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date/Time Analyzed
Benzene	< 0.0050	0.0050	mg/Kg	EPA 8260B	06/14/12 12:43
Toluene	< 0.0050	0.0050	mg/Kg	EPA 8260B	06/14/12 12:43
Ethylbenzene	< 0.0050	0.0050	mg/Kg	EPA 8260B	06/14/12 12:43
Total Xylenes	< 0.0050	0.0050	mg/Kg	EPA 8260B	06/14/12 12:43
Methyl-t-butyl ether (MTBE)	< 0.0050	0.0050	mg/Kg	EPA 8260B	06/14/12 12:43
Diisopropyl ether (DIPE)	< 0.0050	0.0050	mg/Kg	EPA 8260B	06/14/12 12:43
Ethyl-t-butyl ether (ETBE)	< 0.0050	0.0050	mg/Kg	EPA 8260B	06/14/12 12:43
Tert-amyl methyl ether (TAME)	< 0.0050	0.0050	mg/Kg	EPA 8260B	06/14/12 12:43
Tert-Butanol	< 0.0050	0.0050	mg/Kg	EPA 8260B	06/14/12 12:43
Methanol	< 0.20	0.20	mg/Kg	EPA 8260B	06/14/12 12:43
Ethanol	< 0.050	0.050	mg/Kg	EPA 8260B	06/14/12 12:43
TPH as Gasoline	< 1.0	1.0	mg/Kg	EPA 8260B	06/14/12 12:43
1,2-Dichloroethane	< 0.0050	0.0050	mg/Kg	EPA 8260B	06/14/12 12:43
1,2-Dibromoethane	< 0.0050	0.0050	mg/Kg	EPA 8260B	06/14/12 12:43
1,2-Dichloroethane-d4 (Surr)	104		% Recovery	EPA 8260B	06/14/12 12:43
Toluene - d8 (Surr)	98.7		% Recovery	EPA 8260B	06/14/12 12:43

Project Name : **Tesoro - Livermore**

Project Number : **01LV**

Sample : **DW-9@40**

Matrix : Soil

Lab Number : 81467-06

Sample Date :06/04/2012

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date/Time Analyzed
Benzene	< 0.0050	0.0050	mg/Kg	EPA 8260B	06/14/12 13:20
Toluene	< 0.0050	0.0050	mg/Kg	EPA 8260B	06/14/12 13:20
Ethylbenzene	< 0.0050	0.0050	mg/Kg	EPA 8260B	06/14/12 13:20
Total Xylenes	< 0.0050	0.0050	mg/Kg	EPA 8260B	06/14/12 13:20
Methyl-t-butyl ether (MTBE)	< 0.0050	0.0050	mg/Kg	EPA 8260B	06/14/12 13:20
Diisopropyl ether (DIPE)	< 0.0050	0.0050	mg/Kg	EPA 8260B	06/14/12 13:20
Ethyl-t-butyl ether (ETBE)	< 0.0050	0.0050	mg/Kg	EPA 8260B	06/14/12 13:20
Tert-amyl methyl ether (TAME)	< 0.0050	0.0050	mg/Kg	EPA 8260B	06/14/12 13:20
Tert-Butanol	< 0.0050	0.0050	mg/Kg	EPA 8260B	06/14/12 13:20
Methanol	< 0.20	0.20	mg/Kg	EPA 8260B	06/14/12 13:20
Ethanol	< 0.050	0.050	mg/Kg	EPA 8260B	06/14/12 13:20
TPH as Gasoline	< 1.0	1.0	mg/Kg	EPA 8260B	06/14/12 13:20
1,2-Dichloroethane	< 0.0050	0.0050	mg/Kg	EPA 8260B	06/14/12 13:20
1,2-Dibromoethane	< 0.0050	0.0050	mg/Kg	EPA 8260B	06/14/12 13:20
1,2-Dichloroethane-d4 (Surr)	104		% Recovery	EPA 8260B	06/14/12 13:20
Toluene - d8 (Surr)	98.4		% Recovery	EPA 8260B	06/14/12 13:20

Project Name : **Tesoro - Livermore**

Project Number : **01LV**

Sample : **DW-9@45**

Matrix : Soil

Lab Number : 81467-07

Sample Date :06/04/2012

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date/Time Analyzed
Benzene	< 0.0050	0.0050	mg/Kg	EPA 8260B	06/14/12 13:59
Toluene	< 0.0050	0.0050	mg/Kg	EPA 8260B	06/14/12 13:59
Ethylbenzene	< 0.0050	0.0050	mg/Kg	EPA 8260B	06/14/12 13:59
Total Xylenes	< 0.0050	0.0050	mg/Kg	EPA 8260B	06/14/12 13:59
Methyl-t-butyl ether (MTBE)	< 0.0050	0.0050	mg/Kg	EPA 8260B	06/14/12 13:59
Diisopropyl ether (DIPE)	< 0.0050	0.0050	mg/Kg	EPA 8260B	06/14/12 13:59
Ethyl-t-butyl ether (ETBE)	< 0.0050	0.0050	mg/Kg	EPA 8260B	06/14/12 13:59
Tert-amyl methyl ether (TAME)	< 0.0050	0.0050	mg/Kg	EPA 8260B	06/14/12 13:59
Tert-Butanol	< 0.0050	0.0050	mg/Kg	EPA 8260B	06/14/12 13:59
Methanol	< 0.20	0.20	mg/Kg	EPA 8260B	06/14/12 13:59
Ethanol	< 0.050	0.050	mg/Kg	EPA 8260B	06/14/12 13:59
TPH as Gasoline	< 1.0	1.0	mg/Kg	EPA 8260B	06/14/12 13:59
1,2-Dichloroethane	< 0.0050	0.0050	mg/Kg	EPA 8260B	06/14/12 13:59
1,2-Dibromoethane	< 0.0050	0.0050	mg/Kg	EPA 8260B	06/14/12 13:59
1,2-Dichloroethane-d4 (Surr)	107		% Recovery	EPA 8260B	06/14/12 13:59
Toluene - d8 (Surr)	98.3		% Recovery	EPA 8260B	06/14/12 13:59

Project Name : **Tesoro - Livermore**

Project Number : **01LV**

Sample : **DW-9@50**

Matrix : Soil

Lab Number : 81467-08

Sample Date :06/04/2012

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date/Time Analyzed
<b>Benzene</b>	<b>0.10</b>	0.025	mg/Kg	EPA 8260B	06/14/12 17:10
Toluene	< 0.025	0.025	mg/Kg	EPA 8260B	06/14/12 17:10
<b>Ethylbenzene</b>	<b>1.4</b>	0.025	mg/Kg	EPA 8260B	06/14/12 17:10
<b>Total Xylenes</b>	<b>1.6</b>	0.025	mg/Kg	EPA 8260B	06/14/12 17:10
Methyl-t-butyl ether (MTBE)	< 0.025	0.025	mg/Kg	EPA 8260B	06/14/12 17:10
Diisopropyl ether (DIPE)	< 0.025	0.025	mg/Kg	EPA 8260B	06/14/12 17:10
Ethyl-t-butyl ether (ETBE)	< 0.025	0.025	mg/Kg	EPA 8260B	06/14/12 17:10
Tert-amyl methyl ether (TAME)	< 0.025	0.025	mg/Kg	EPA 8260B	06/14/12 17:10
Tert-Butanol	< 0.15	0.15	mg/Kg	EPA 8260B	06/14/12 17:10
Methanol	< 2.5	2.5	mg/Kg	EPA 8260B	06/14/12 17:10
Ethanol	< 0.25	0.25	mg/Kg	EPA 8260B	06/14/12 17:10
<b>TPH as Gasoline</b>	<b>72</b>	2.5	mg/Kg	EPA 8260B	06/14/12 17:10
1,2-Dichloroethane	< 0.025	0.025	mg/Kg	EPA 8260B	06/14/12 17:10
1,2-Dibromoethane	< 0.025	0.025	mg/Kg	EPA 8260B	06/14/12 17:10
1,2-Dichloroethane-d4 (Surr)	101		% Recovery	EPA 8260B	06/14/12 17:10
Toluene - d8 (Surr)	99.1		% Recovery	EPA 8260B	06/14/12 17:10
2-Bromochlorobenzene (Surr)	106		% Recovery	EPA 8260B	06/14/12 17:10

Project Name : **Tesoro - Livermore**

Project Number : **01LV**

Sample : **DW-9@60**

Matrix : Soil

Lab Number : 81467-09

Sample Date :06/04/2012

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date/Time Analyzed
Benzene	< 0.050	0.050	mg/Kg	EPA 8260B	06/14/12 17:51
Toluene	< 0.050	0.050	mg/Kg	EPA 8260B	06/14/12 17:51
<b>Ethylbenzene</b>	<b>1.2</b>	0.050	mg/Kg	EPA 8260B	06/14/12 17:51
<b>Total Xylenes</b>	<b>0.46</b>	0.050	mg/Kg	EPA 8260B	06/14/12 17:51
Methyl-t-butyl ether (MTBE)	< 0.050	0.050	mg/Kg	EPA 8260B	06/14/12 17:51
Diisopropyl ether (DIPE)	< 0.050	0.050	mg/Kg	EPA 8260B	06/14/12 17:51
Ethyl-t-butyl ether (ETBE)	< 0.050	0.050	mg/Kg	EPA 8260B	06/14/12 17:51
Tert-amyl methyl ether (TAME)	< 0.050	0.050	mg/Kg	EPA 8260B	06/14/12 17:51
Tert-Butanol	< 0.25	0.25	mg/Kg	EPA 8260B	06/14/12 17:51
Methanol	< 5.0	5.0	mg/Kg	EPA 8260B	06/14/12 17:51
Ethanol	< 0.50	0.50	mg/Kg	EPA 8260B	06/14/12 17:51
<b>TPH as Gasoline</b>	<b>260</b>	5.0	mg/Kg	EPA 8260B	06/14/12 17:51
1,2-Dichloroethane	< 0.050	0.050	mg/Kg	EPA 8260B	06/14/12 17:51
1,2-Dibromoethane	< 0.050	0.050	mg/Kg	EPA 8260B	06/14/12 17:51
1,2-Dichloroethane-d4 (Surr)	101		% Recovery	EPA 8260B	06/14/12 17:51
Toluene - d8 (Surr)	98.1		% Recovery	EPA 8260B	06/14/12 17:51
2-Bromochlorobenzene (Surr)	109		% Recovery	EPA 8260B	06/14/12 17:51



Project Name : **Tesoro - Livermore**

Project Number : **01LV**

Sample : **DW-9@65**

Matrix : Soil

Lab Number : 81467-10

Sample Date :06/04/2012

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date/Time Analyzed
Benzene	< 0.0050	0.0050	mg/Kg	EPA 8260B	06/14/12 14:36
Toluene	< 0.0050	0.0050	mg/Kg	EPA 8260B	06/14/12 14:36
<b>Ethylbenzene</b>	<b>0.069</b>	0.0050	mg/Kg	EPA 8260B	06/14/12 14:36
<b>Total Xylenes</b>	<b>0.037</b>	0.0050	mg/Kg	EPA 8260B	06/14/12 14:36
Methyl-t-butyl ether (MTBE)	< 0.0050	0.0050	mg/Kg	EPA 8260B	06/14/12 14:36
Diisopropyl ether (DIPE)	< 0.0050	0.0050	mg/Kg	EPA 8260B	06/14/12 14:36
Ethyl-t-butyl ether (ETBE)	< 0.0050	0.0050	mg/Kg	EPA 8260B	06/14/12 14:36
Tert-amyl methyl ether (TAME)	< 0.0050	0.0050	mg/Kg	EPA 8260B	06/14/12 14:36
<b>Tert-Butanol</b>	<b>0.0070</b>	0.0050	mg/Kg	EPA 8260B	06/14/12 14:36
Methanol	< 0.20	0.20	mg/Kg	EPA 8260B	06/14/12 14:36
Ethanol	< 0.050	0.050	mg/Kg	EPA 8260B	06/14/12 14:36
<b>TPH as Gasoline</b>	<b>70</b>	5.0	mg/Kg	EPA 8260B	06/15/12 13:56
1,2-Dichloroethane	< 0.0050	0.0050	mg/Kg	EPA 8260B	06/14/12 14:36
1,2-Dibromoethane	< 0.0050	0.0050	mg/Kg	EPA 8260B	06/14/12 14:36
1,2-Dichloroethane-d4 (Surr)	84.8		% Recovery	EPA 8260B	06/14/12 14:36
Toluene - d8 (Surr)	88.3		% Recovery	EPA 8260B	06/14/12 14:36
2-Bromochlorobenzene (Surr)	92.8		% Recovery	EPA 8260B	06/15/12 13:56

Project Name : **Tesoro - Livermore**

Project Number : **01LV**

Sample : **DW-9@70**

Matrix : Soil

Lab Number : 81467-11

Sample Date :06/04/2012

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date/Time Analyzed
Benzene	< 0.0050	0.0050	mg/Kg	EPA 8260B	06/16/12 06:33
Toluene	< 0.0050	0.0050	mg/Kg	EPA 8260B	06/16/12 06:33
<b>Ethylbenzene</b>	<b>0.13</b>	0.025	mg/Kg	EPA 8260B	06/15/12 16:14
<b>Total Xylenes</b>	<b>0.087</b>	0.025	mg/Kg	EPA 8260B	06/15/12 16:14
Methyl-t-butyl ether (MTBE)	< 0.0050	0.0050	mg/Kg	EPA 8260B	06/16/12 06:33
Diisopropyl ether (DIPE)	< 0.0050	0.0050	mg/Kg	EPA 8260B	06/16/12 06:33
Ethyl-t-butyl ether (ETBE)	< 0.0050	0.0050	mg/Kg	EPA 8260B	06/16/12 06:33
Tert-amyl methyl ether (TAME)	< 0.0050	0.0050	mg/Kg	EPA 8260B	06/16/12 06:33
Tert-Butanol	< 0.15	0.15	mg/Kg	EPA 8260B	06/15/12 16:14
Methanol	< 2.5	2.5	mg/Kg	EPA 8260B	06/15/12 16:14
Ethanol	< 0.050	0.050	mg/Kg	EPA 8260B	06/16/12 06:33
TPH as Gasoline	< 1.0	1.0	mg/Kg	EPA 8260B	06/16/12 06:33
1,2-Dichloroethane	< 0.0050	0.0050	mg/Kg	EPA 8260B	06/16/12 06:33
1,2-Dibromoethane	< 0.0050	0.0050	mg/Kg	EPA 8260B	06/16/12 06:33
1,2-Dichloroethane-d4 (Surr)	99.0		% Recovery	EPA 8260B	06/16/12 06:33
Toluene - d8 (Surr)	97.9		% Recovery	EPA 8260B	06/16/12 06:33
2-Bromochlorobenzene (Surr)	91.2		% Recovery	EPA 8260B	06/15/12 16:14

Project Name : **Tesoro - Livermore**

Project Number : **01LV**

Sample : **DW-9@75**

Matrix : Soil

Lab Number : 81467-12

Sample Date :06/04/2012

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date/Time Analyzed
<b>Benzene</b>	<b>0.028</b>	0.0050	mg/Kg	EPA 8260B	06/15/12 13:22
Toluene	< 0.0050	0.0050	mg/Kg	EPA 8260B	06/15/12 13:22
<b>Ethylbenzene</b>	<b>0.18</b>	0.025	mg/Kg	EPA 8260B	06/15/12 16:41
<b>Total Xylenes</b>	<b>0.13</b>	0.025	mg/Kg	EPA 8260B	06/15/12 16:41
Methyl-t-butyl ether (MTBE)	< 0.0050	0.0050	mg/Kg	EPA 8260B	06/15/12 13:22
Diisopropyl ether (DIPE)	< 0.0050	0.0050	mg/Kg	EPA 8260B	06/15/12 13:22
Ethyl-t-butyl ether (ETBE)	< 0.0050	0.0050	mg/Kg	EPA 8260B	06/15/12 13:22
Tert-amyl methyl ether (TAME)	< 0.0050	0.0050	mg/Kg	EPA 8260B	06/15/12 13:22
Tert-Butanol	< 0.025	0.025	mg/Kg	EPA 8260B	06/15/12 13:22
Methanol	< 0.50	0.50	mg/Kg	EPA 8260B	06/15/12 13:22
Ethanol	< 0.080	0.080	mg/Kg	EPA 8260B	06/15/12 13:22
<b>TPH as Gasoline</b>	<b>28</b>	2.5	mg/Kg	EPA 8260B	06/15/12 16:41
1,2-Dichloroethane	< 0.0050	0.0050	mg/Kg	EPA 8260B	06/15/12 13:22
1,2-Dibromoethane	< 0.0050	0.0050	mg/Kg	EPA 8260B	06/15/12 13:22
1,2-Dichloroethane-d4 (Surr)	81.8		% Recovery	EPA 8260B	06/15/12 13:22
Toluene - d8 (Surr)	84.7		% Recovery	EPA 8260B	06/15/12 13:22
2-Bromochlorobenzene (Surr)	97.4		% Recovery	EPA 8260B	06/15/12 16:41

Project Name : **Tesoro - Livermore**

Project Number : **01LV**

Sample : **DW-9@80**

Matrix : Soil

Lab Number : 81467-13

Sample Date :06/04/2012

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date/Time Analyzed
Benzene	< 0.0050	0.0050	mg/Kg	EPA 8260B	06/14/12 15:48
Toluene	< 0.0050	0.0050	mg/Kg	EPA 8260B	06/14/12 15:48
<b>Ethylbenzene</b>	<b>0.0089</b>	0.0050	mg/Kg	EPA 8260B	06/14/12 15:48
<b>Total Xylenes</b>	<b>0.0055</b>	0.0050	mg/Kg	EPA 8260B	06/14/12 15:48
Methyl-t-butyl ether (MTBE)	< 0.0050	0.0050	mg/Kg	EPA 8260B	06/14/12 15:48
Diisopropyl ether (DIPE)	< 0.0050	0.0050	mg/Kg	EPA 8260B	06/14/12 15:48
Ethyl-t-butyl ether (ETBE)	< 0.0050	0.0050	mg/Kg	EPA 8260B	06/14/12 15:48
Tert-amyl methyl ether (TAME)	< 0.0050	0.0050	mg/Kg	EPA 8260B	06/14/12 15:48
Tert-Butanol	< 0.0050	0.0050	mg/Kg	EPA 8260B	06/14/12 15:48
Methanol	< 0.20	0.20	mg/Kg	EPA 8260B	06/14/12 15:48
Ethanol	< 0.050	0.050	mg/Kg	EPA 8260B	06/14/12 15:48
TPH as Gasoline	< 1.0	1.0	mg/Kg	EPA 8260B	06/14/12 15:48
1,2-Dichloroethane	< 0.0050	0.0050	mg/Kg	EPA 8260B	06/14/12 15:48
1,2-Dibromoethane	< 0.0050	0.0050	mg/Kg	EPA 8260B	06/14/12 15:48
1,2-Dichloroethane-d4 (Surr)	100		% Recovery	EPA 8260B	06/14/12 15:48
Toluene - d8 (Surr)	99.1		% Recovery	EPA 8260B	06/14/12 15:48

Project Name : **Tesoro - Livermore**

Project Number : **01LV**

Sample : **DB-8@55**

Matrix : Water

Lab Number : 81467-14

Sample Date :06/04/2012

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date/Time Analyzed
Benzene	< 0.50	0.50	ug/L	EPA 8260B	06/12/12 13:38
Toluene	< 0.50	0.50	ug/L	EPA 8260B	06/12/12 13:38
Ethylbenzene	< 0.50	0.50	ug/L	EPA 8260B	06/12/12 13:38
Total Xylenes	< 0.50	0.50	ug/L	EPA 8260B	06/12/12 13:38
Methyl-t-butyl ether (MTBE)	< 0.50	0.50	ug/L	EPA 8260B	06/12/12 13:38
Diisopropyl ether (DIPE)	< 0.50	0.50	ug/L	EPA 8260B	06/12/12 13:38
Ethyl-t-butyl ether (ETBE)	< 0.50	0.50	ug/L	EPA 8260B	06/12/12 13:38
Tert-amyl methyl ether (TAME)	< 0.50	0.50	ug/L	EPA 8260B	06/12/12 13:38
Tert-Butanol	< 5.0	5.0	ug/L	EPA 8260B	06/12/12 13:38
Methanol	< 50	50	ug/L	EPA 8260B	06/12/12 13:38
Ethanol	< 5.0	5.0	ug/L	EPA 8260B	06/12/12 13:38
TPH as Gasoline	< 50	50	ug/L	EPA 8260B	06/12/12 13:38
1,2-Dichloroethane	< 0.50	0.50	ug/L	EPA 8260B	06/12/12 13:38
1,2-Dibromoethane	< 0.50	0.50	ug/L	EPA 8260B	06/12/12 13:38
1,2-Dichloroethane-d4 (Surr)	104		% Recovery	EPA 8260B	06/12/12 13:38
Toluene - d8 (Surr)	87.6		% Recovery	EPA 8260B	06/12/12 13:38

## QC Report : Method Blank Data

Project Name : Tesoro - Livermore

Project Number : 01LV

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed	Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	< 0.0050	0.0050	mg/Kg	EPA 8260B	06/14/2012	Benzene	< 0.0050	0.0050	mg/Kg	EPA 8260B	06/16/2012
Ethylbenzene	< 0.0050	0.0050	mg/Kg	EPA 8260B	06/14/2012	Toluene	< 0.0050	0.0050	mg/Kg	EPA 8260B	06/16/2012
Toluene	< 0.0050	0.0050	mg/Kg	EPA 8260B	06/14/2012	Diisopropyl ether (DIPE)	< 0.0050	0.0050	mg/Kg	EPA 8260B	06/16/2012
Total Xylenes	< 0.0050	0.0050	mg/Kg	EPA 8260B	06/14/2012	Ethanol	< 0.050	0.050	mg/Kg	EPA 8260B	06/16/2012
Diisopropyl ether (DIPE)	< 0.0050	0.0050	mg/Kg	EPA 8260B	06/14/2012	Ethyl-t-butyl ether (ETBE)	< 0.0050	0.0050	mg/Kg	EPA 8260B	06/16/2012
Ethanol	< 0.050	0.050	mg/Kg	EPA 8260B	06/14/2012	Methyl-t-butyl ether (MTBE)	< 0.0050	0.0050	mg/Kg	EPA 8260B	06/16/2012
Ethyl-t-butyl ether (ETBE)	< 0.0050	0.0050	mg/Kg	EPA 8260B	06/14/2012	Tert-amyl methyl ether (TAME)	< 0.0050	0.0050	mg/Kg	EPA 8260B	06/16/2012
Methanol	< 0.20	0.20	mg/Kg	EPA 8260B	06/14/2012	TPH as Gasoline	< 1.0	1.0	mg/Kg	EPA 8260B	06/16/2012
Methyl-t-butyl ether (MTBE)	< 0.0050	0.0050	mg/Kg	EPA 8260B	06/14/2012	1,2-Dibromoethane	< 0.0050	0.0050	mg/Kg	EPA 8260B	06/16/2012
Tert-Butanol	< 0.0050	0.0050	mg/Kg	EPA 8260B	06/14/2012	1,2-Dichloroethane	< 0.0050	0.0050	mg/Kg	EPA 8260B	06/16/2012
Tert-amyl methyl ether (TAME)	< 0.0050	0.0050	mg/Kg	EPA 8260B	06/14/2012	1,2-Dichloroethane-d4 (Surr)	97.5		%	EPA 8260B	06/16/2012
TPH as Gasoline	< 1.0	1.0	mg/Kg	EPA 8260B	06/14/2012	Toluene - d8 (Surr)	92.5		%	EPA 8260B	06/16/2012
1,2-Dibromoethane	< 0.0050	0.0050	mg/Kg	EPA 8260B	06/14/2012						
1,2-Dichloroethane	< 0.0050	0.0050	mg/Kg	EPA 8260B	06/14/2012	Benzene	< 0.50	0.50	ug/L	EPA 8260B	06/12/2012
1,2-Dichloroethane-d4 (Surr)	96.0		%	EPA 8260B	06/14/2012	Ethylbenzene	< 0.50	0.50	ug/L	EPA 8260B	06/12/2012
Toluene - d8 (Surr)	93.2		%	EPA 8260B	06/14/2012	Toluene	< 0.50	0.50	ug/L	EPA 8260B	06/12/2012
						Total Xylenes	< 0.50	0.50	ug/L	EPA 8260B	06/12/2012
Benzene	< 0.0050	0.0050	mg/Kg	EPA 8260B	06/15/2012	Diisopropyl ether (DIPE)	< 0.50	0.50	ug/L	EPA 8260B	06/12/2012
Ethylbenzene	< 0.0050	0.0050	mg/Kg	EPA 8260B	06/15/2012	Ethanol	< 5.0	5.0	ug/L	EPA 8260B	06/12/2012
Toluene	< 0.0050	0.0050	mg/Kg	EPA 8260B	06/15/2012	Ethyl-t-butyl ether (ETBE)	< 0.50	0.50	ug/L	EPA 8260B	06/12/2012
Total Xylenes	< 0.0050	0.0050	mg/Kg	EPA 8260B	06/15/2012	Methanol	< 50	50	ug/L	EPA 8260B	06/12/2012
Diisopropyl ether (DIPE)	< 0.0050	0.0050	mg/Kg	EPA 8260B	06/15/2012	Methyl-t-butyl ether (MTBE)	< 0.50	0.50	ug/L	EPA 8260B	06/12/2012
Ethanol	< 0.050	0.050	mg/Kg	EPA 8260B	06/15/2012	Tert-Butanol	< 5.0	5.0	ug/L	EPA 8260B	06/12/2012
Ethyl-t-butyl ether (ETBE)	< 0.0050	0.0050	mg/Kg	EPA 8260B	06/15/2012	Tert-amyl methyl ether (TAME)	< 0.50	0.50	ug/L	EPA 8260B	06/12/2012
Methanol	< 0.20	0.20	mg/Kg	EPA 8260B	06/15/2012	TPH as Gasoline	< 50	50	ug/L	EPA 8260B	06/12/2012
Methyl-t-butyl ether (MTBE)	< 0.0050	0.0050	mg/Kg	EPA 8260B	06/15/2012	1,2-Dibromoethane	< 0.50	0.50	ug/L	EPA 8260B	06/12/2012
Tert-Butanol	< 0.0050	0.0050	mg/Kg	EPA 8260B	06/15/2012	1,2-Dichloroethane	< 0.50	0.50	ug/L	EPA 8260B	06/12/2012
Tert-amyl methyl ether (TAME)	< 0.0050	0.0050	mg/Kg	EPA 8260B	06/15/2012	1,2-Dichloroethane-d4 (Surr)	102		%	EPA 8260B	06/12/2012
TPH as Gasoline	< 1.0	1.0	mg/Kg	EPA 8260B	06/15/2012	Toluene - d8 (Surr)	88.0		%	EPA 8260B	06/12/2012
1,2-Dibromoethane	< 0.0050	0.0050	mg/Kg	EPA 8260B	06/15/2012						
1,2-Dichloroethane	< 0.0050	0.0050	mg/Kg	EPA 8260B	06/15/2012						
1,2-Dichloroethane-d4 (Surr)	94.2		%	EPA 8260B	06/15/2012						
Toluene - d8 (Surr)	92.7		%	EPA 8260B	06/15/2012						

## QC Report : Matrix Spike/ Matrix Spike Duplicate

Project Name : **Tesoro - Livermore**Project Number : **01LV**

Parameter	Spiked Sample	Sample Value	Spike Level	Spike Dup. Level	Spiked Sample Value	Duplicate Spiked Sample Value	Units	Analysis Method	Date Analyzed	Spiked Sample Percent Recov.	Duplicate Spiked Sample Percent Recov.	Relative Percent Diff.	Spiked Sample Percent Recov. Limit	Relative Percent Diff. Limit
1,2-Dibromoethane	81467-01	<0.0050	0.0391	0.0390	0.0352	0.0335	mg/Kg	EPA 8260B	6/14/12	90.0	85.9	4.66	67.2-121	25
1,2-Dichloroethane	81467-01	<0.0050	0.0392	0.0391	0.0343	0.0333	mg/Kg	EPA 8260B	6/14/12	87.4	85.2	2.57	64.0-124	25
Benzene	81467-01	<0.0050	0.0392	0.0391	0.0345	0.0337	mg/Kg	EPA 8260B	6/14/12	87.9	86.1	2.15	67.9-120	25
Diisopropyl ether	81467-01	<0.0050	0.0388	0.0387	0.0335	0.0331	mg/Kg	EPA 8260B	6/14/12	86.4	85.4	1.13	65.2-122	25
Ethanol	81467-01	<0.050	0.0978	0.0976	0.0826	0.0973	mg/Kg	EPA 8260B	6/14/12	84.5	99.7	16.6	37.1-156	25
Ethyl-tert-butyl ether	81467-01	<0.0050	0.0390	0.0390	0.0320	0.0316	mg/Kg	EPA 8260B	6/14/12	81.9	81.0	1.11	64.6-122	25
Ethylbenzene	81467-01	<0.0050	0.0392	0.0391	0.0377	0.0372	mg/Kg	EPA 8260B	6/14/12	96.2	95.0	1.19	65.5-127	25
Methanol	81467-01	<0.20	0.978	0.976	0.761	0.924	mg/Kg	EPA 8260B	6/14/12	77.8	94.6	19.5	26.8-154	25
Methyl-t-butyl ether	81467-01	<0.0050	0.0392	0.0391	0.0320	0.0309	mg/Kg	EPA 8260B	6/14/12	81.5	79.0	3.17	57.0-122	25
P + M Xylene	81467-01	<0.0050	0.0392	0.0391	0.0372	0.0365	mg/Kg	EPA 8260B	6/14/12	94.9	93.2	1.74	62.5-124	25

## QC Report : Matrix Spike/ Matrix Spike Duplicate

Project Name : **Tesoro - Livermore**Project Number : **01LV**

Parameter	Spiked Sample	Sample Value	Spike Level	Spike Dup. Level	Spiked Sample Value	Duplicate Spiked Sample Value	Units	Analysis Method	Date Analyzed	Spiked Sample Percent Recov.	Duplicate Spiked Sample Percent Recov.	Relative Percent Diff.	Spiked Sample Percent Recov. Limit	Relative Percent Diff. Limit
Tert-Butanol	81467-01	<0.0050	0.198	0.197	0.187	0.180	mg/Kg	EPA 8260B	6/14/12	94.5	91.4	3.42	64.3-122	25
Tert-amyl-methyl ether	81467-01	<0.0050	0.0392	0.0391	0.0319	0.0313	mg/Kg	EPA 8260B	6/14/12	81.4	80.2	1.59	64.9-122	25
Toluene	81467-01	<0.0050	0.0392	0.0391	0.0347	0.0344	mg/Kg	EPA 8260B	6/14/12	88.6	87.9	0.784	65.7-120	25
1,2-Dibromoethane	81494-01	<0.0050	0.0379	0.0390	0.0277	0.0294	mg/Kg	EPA 8260B	6/15/12	73.3	75.4	2.86	67.2-121	25
1,2-Dichloroethane	81494-01	<0.0050	0.0380	0.0391	0.0273	0.0295	mg/Kg	EPA 8260B	6/15/12	71.9	75.5	4.80	64.0-124	25
Benzene	81494-01	<0.0050	0.0380	0.0391	0.0288	0.0306	mg/Kg	EPA 8260B	6/15/12	75.8	78.2	3.09	67.9-120	25
Diisopropyl ether	81494-01	<0.0050	0.0375	0.0386	0.0265	0.0281	mg/Kg	EPA 8260B	6/15/12	70.8	72.8	2.84	65.2-122	25
Ethanol	81494-01	<0.050	0.0946	0.0974	0.0696	0.0889	mg/Kg	EPA 8260B	6/15/12	73.6	91.3	21.5	37.1-156	25
Ethyl-tert-butyl ether	81494-01	<0.0050	0.0378	0.0389	0.0247	0.0258	mg/Kg	EPA 8260B	6/15/12	65.3	66.3	1.52	64.6-122	25



## QC Report : Matrix Spike/ Matrix Spike Duplicate

Project Name : **Tesoro - Livermore**Project Number : **01LV**

Parameter	Spiked Sample	Sample Value	Spike Level	Spike Dup. Level	Spiked Sample Value	Duplicate Spiked Sample Value	Units	Analysis Method	Date Analyzed	Spiked Sample Percent Recov.	Duplicate Spiked Sample Percent Recov.	Relative Percent Diff.	Spiked Sample Percent Recov. Limit	Relative Percent Diff. Limit
Ethylbenzene	81494-01	<0.0050	0.0380	0.0391	0.0315	0.0334	mg/Kg	EPA 8260B	6/15/12	83.0	85.6	3.09	65.5-127	25
<b>Methanol</b>	81494-01	<0.20	0.947	0.974	0.647	0.866	mg/Kg	EPA 8260B	6/15/12	68.3	88.9	<b>26.1</b>	26.8-154	25
Methyl-t-butyl ether	81494-01	<0.0050	0.0380	0.0391	0.0248	0.0247	mg/Kg	EPA 8260B	6/15/12	65.2	63.2	3.20	57.0-122	25
P + M Xylene	81494-01	<0.0050	0.0380	0.0391	0.0298	0.0318	mg/Kg	EPA 8260B	6/15/12	78.5	81.3	3.51	62.5-124	25
Tert-Butanol	81494-01	<0.0050	0.191	0.197	0.142	0.151	mg/Kg	EPA 8260B	6/15/12	74.2	76.8	3.36	64.3-122	25
Tert-amyl-methyl ether	81494-01	<0.0050	0.0379	0.0390	0.0248	0.0260	mg/Kg	EPA 8260B	6/15/12	65.4	66.5	1.77	64.9-122	25
Toluene	81494-01	<0.0050	0.0380	0.0391	0.0284	0.0302	mg/Kg	EPA 8260B	6/15/12	74.9	77.2	2.97	65.7-120	25
1,2-Dibromoethane	81514-01	<0.0050	0.0376	0.0392	0.0320	0.0335	mg/Kg	EPA 8260B	6/16/12	85.0	85.5	0.550	67.2-121	25
1,2-Dichloroethane	81514-01	<0.0050	0.0377	0.0393	0.0316	0.0343	mg/Kg	EPA 8260B	6/16/12	83.8	87.4	4.14	64.0-124	25

## QC Report : Matrix Spike/ Matrix Spike Duplicate

Project Name : **Tesoro - Livermore**Project Number : **01LV**

Parameter	Spiked Sample	Sample Value	Spike Level	Spike Dup. Level	Spiked Sample Value	Duplicate Spiked Sample Value	Units	Analysis Method	Date Analyzed	Spiked Sample Percent Recov.	Duplicate Spiked Sample Percent Recov.	Relative Percent Diff.	Spiked Sample Percent Recov. Limit	Relative Percent Diff. Limit
Benzene	81514-01	<0.0050	0.0377	0.0393	0.0314	0.0341	mg/Kg	EPA 8260B	6/16/12	83.2	86.9	4.33	67.9-120	25
Diisopropyl ether	81514-01	<0.0050	0.0373	0.0388	0.0308	0.0336	mg/Kg	EPA 8260B	6/16/12	82.5	86.5	4.76	65.2-122	25
<b>Ethanol</b>	81514-01	<0.050	0.0941	0.0979	0.0482	0.109	mg/Kg	EPA 8260B	6/16/12	51.2	111	<b>73.6</b>	37.1-156	25
Ethyl-tert-butyl ether	81514-01	<0.0050	0.0376	0.0391	0.0295	0.0319	mg/Kg	EPA 8260B	6/16/12	78.5	81.5	3.74	64.6-122	25
Methyl-t-butyl ether	81514-01	<0.0050	0.0377	0.0393	0.0296	0.0315	mg/Kg	EPA 8260B	6/16/12	78.4	80.2	2.26	57.0-122	25
Tert-amyl-methyl ether	81514-01	<0.0050	0.0377	0.0392	0.0294	0.0320	mg/Kg	EPA 8260B	6/16/12	78.1	81.6	4.35	64.9-122	25
Toluene	81514-01	<0.0050	0.0377	0.0393	0.0309	0.0337	mg/Kg	EPA 8260B	6/16/12	81.8	85.8	4.82	65.7-120	25
1,2-Dibromoethane	81524-13	<0.50	39.9	39.9	38.2	38.1	ug/L	EPA 8260B	6/12/12	95.8	95.4	0.397	80-120	25
1,2-Dichloroethane	81524-13	<0.50	40.0	40.0	40.8	40.8	ug/L	EPA 8260B	6/12/12	102	102	0.0849	75.7-122	25

## QC Report : Matrix Spike/ Matrix Spike Duplicate

Project Name : **Tesoro - Livermore**Project Number : **01LV**

Parameter	Spiked Sample	Sample Value	Spike Level	Spike Dup. Level	Spiked Sample Value	Duplicate Spiked Sample Value	Units	Analysis Method	Date Analyzed	Spiked Sample Percent Recov.	Duplicate Spiked Sample Percent Recov.	Relative Percent Diff.	Spiked Sample Percent Recov. Limit	Relative Percent Diff. Limit
Benzene	81524-13	3.6	40.0	40.0	44.2	43.6	ug/L	EPA 8260B	6/12/12	101	99.9	1.56	80-120	25
Diisopropyl ether	81524-13	<0.50	39.5	39.5	45.6	46.5	ug/L	EPA 8260B	6/12/12	115	118	2.01	80-120	25
<b>Ethanol</b>	81524-13	19	99.7	99.7	147	118	ug/L	EPA 8260B	6/12/12	128	99.3	<b>25.7</b>	55.1-159	25
Ethyl-tert-butyl ether	81524-13	<0.50	39.8	39.8	41.0	44.3	ug/L	EPA 8260B	6/12/12	103	111	7.91	76.5-120	25
Ethylbenzene	81524-13	15	40.0	40.0	56.7	54.5	ug/L	EPA 8260B	6/12/12	103	97.8	5.59	80-120	25
Methanol	81524-13	<50	998	998	1160	957	ug/L	EPA 8260B	6/12/12	116	95.9	18.9	53.2-147	25
Methyl-t-butyl ether	81524-13	<0.50	40.0	40.0	38.2	44.5	ug/L	EPA 8260B	6/12/12	95.6	111	15.0	69.7-121	25
P + M Xylene	81524-13	62	40.0	40.0	100	96.8	ug/L	EPA 8260B	6/12/12	96.6	88.0	9.37	76.8-120	25
Tert-Butanol	81524-13	<5.0	202	202	206	199	ug/L	EPA 8260B	6/12/12	102	98.8	3.42	80-120	25
Tert-amyl-methyl ether	81524-13	<0.50	39.9	39.9	40.7	42.5	ug/L	EPA 8260B	6/12/12	102	106	4.36	78.9-120	25

**QC Report : Matrix Spike/ Matrix Spike Duplicate**

Project Name : **Tesoro - Livermore**

Project Number : **01LV**

Parameter	Spiked Sample	Sample Value	Spike Level	Spike Dup. Level	Spiked Sample Value	Duplicate Spiked Sample Value	Units	Analysis Method	Date Analyzed	Spiked Sample Percent Recov.	Duplicate Spiked Sample Percent Recov.	Relative Percent Diff.	Spiked Sample Percent Recov. Limit	Relative Percent Diff. Limit
Toluene	81524-13	45	40.0	40.0	79.1	77.8	ug/L	EPA 8260B	6/12/12	85.1	82.0	3.72	80-120	25

**QC Report : Laboratory Control Sample (LCS)**Project Name : **Tesoro - Livermore**Project Number : **01LV**

Parameter	Spike Level	Units	Analysis Method	Date Analyzed	LCS Percent Recov.	LCS Percent Recov. Limit
1,2-Dibromoethane	0.0379	mg/Kg	EPA 8260B	6/14/12	94.1	67.2-121
1,2-Dichloroethane	0.0380	mg/Kg	EPA 8260B	6/14/12	91.0	64.0-124
Benzene	0.0380	mg/Kg	EPA 8260B	6/14/12	89.5	67.9-120
Diisopropyl ether	0.0375	mg/Kg	EPA 8260B	6/14/12	87.4	65.2-122
Ethanol	0.0946	mg/Kg	EPA 8260B	6/14/12	94.6	37.1-156
Ethyl-tert-butyl ether	0.0378	mg/Kg	EPA 8260B	6/14/12	82.9	64.6-122
Ethylbenzene	0.0380	mg/Kg	EPA 8260B	6/14/12	99.0	65.5-127
Methanol	0.947	mg/Kg	EPA 8260B	6/14/12	80.4	26.8-154
Methyl-t-butyl ether	0.0380	mg/Kg	EPA 8260B	6/14/12	82.8	57.0-122
P + M Xylene	0.0380	mg/Kg	EPA 8260B	6/14/12	95.8	62.5-124
Tert-Butanol	0.191	mg/Kg	EPA 8260B	6/14/12	94.8	64.3-122
Tert-amyl-methyl ether	0.0379	mg/Kg	EPA 8260B	6/14/12	83.4	64.9-122
Toluene	0.0380	mg/Kg	EPA 8260B	6/14/12	89.1	65.7-120
1,2-Dibromoethane	0.0391	mg/Kg	EPA 8260B	6/15/12	89.9	67.2-121
1,2-Dichloroethane	0.0392	mg/Kg	EPA 8260B	6/15/12	88.1	64.0-124
Benzene	0.0392	mg/Kg	EPA 8260B	6/15/12	87.4	67.9-120
Diisopropyl ether	0.0388	mg/Kg	EPA 8260B	6/15/12	85.1	65.2-122
Ethanol	0.0978	mg/Kg	EPA 8260B	6/15/12	107	37.1-156
Ethyl-tert-butyl ether	0.0390	mg/Kg	EPA 8260B	6/15/12	80.1	64.6-122
Ethylbenzene	0.0392	mg/Kg	EPA 8260B	6/15/12	97.2	65.5-127
Methanol	0.978	mg/Kg	EPA 8260B	6/15/12	96.8	26.8-154
Methyl-t-butyl ether	0.0392	mg/Kg	EPA 8260B	6/15/12	79.5	57.0-122

## QC Report : Laboratory Control Sample (LCS)

Project Name : **Tesoro - Livermore**Project Number : **01LV**

Parameter	Spike Level	Units	Analysis Method	Date Analyzed	LCS Percent Recov.	LCS Percent Recov. Limit
P + M Xylene	0.0392	mg/Kg	EPA 8260B	6/15/12	93.4	62.5-124
Tert-Butanol	0.198	mg/Kg	EPA 8260B	6/15/12	91.3	64.3-122
Tert-amyl-methyl ether	0.0392	mg/Kg	EPA 8260B	6/15/12	79.9	64.9-122
Toluene	0.0392	mg/Kg	EPA 8260B	6/15/12	86.8	65.7-120
1,2-Dibromoethane	0.0372	mg/Kg	EPA 8260B	6/16/12	91.6	67.2-121
1,2-Dichloroethane	0.0373	mg/Kg	EPA 8260B	6/16/12	89.4	64.0-124
Benzene	0.0373	mg/Kg	EPA 8260B	6/16/12	88.2	67.9-120
Diisopropyl ether	0.0369	mg/Kg	EPA 8260B	6/16/12	85.8	65.2-122
Ethanol	0.0930	mg/Kg	EPA 8260B	6/16/12	95.7	37.1-156
Ethyl-tert-butyl ether	0.0372	mg/Kg	EPA 8260B	6/16/12	82.4	64.6-122
Methyl-t-butyl ether	0.0373	mg/Kg	EPA 8260B	6/16/12	82.1	57.0-122
Tert-amyl-methyl ether	0.0373	mg/Kg	EPA 8260B	6/16/12	81.8	64.9-122
Toluene	0.0373	mg/Kg	EPA 8260B	6/16/12	87.8	65.7-120
1,2-Dibromoethane	39.7	ug/L	EPA 8260B	6/12/12	98.9	80-120
1,2-Dichloroethane	39.8	ug/L	EPA 8260B	6/12/12	105	75.7-122
Benzene	39.8	ug/L	EPA 8260B	6/12/12	104	80-120
Diisopropyl ether	39.4	ug/L	EPA 8260B	6/12/12	117	80-120
Ethanol	99.2	ug/L	EPA 8260B	6/12/12	133	55.1-159
Ethyl-tert-butyl ether	39.6	ug/L	EPA 8260B	6/12/12	105	76.5-120
Ethylbenzene	39.8	ug/L	EPA 8260B	6/12/12	107	80-120
Methanol	993	ug/L	EPA 8260B	6/12/12	140	53.2-147

**QC Report : Laboratory Control Sample (LCS)**Project Name : **Tesoro - Livermore**Project Number : **01LV**

Parameter	Spike Level	Units	Analysis Method	Date Analyzed	LCS Percent Recov.	LCS Percent Recov. Limit
Methyl-t-butyl ether	39.8	ug/L	EPA 8260B	6/12/12	95.4	69.7-121
P + M Xylene	39.8	ug/L	EPA 8260B	6/12/12	103	76.8-120
TPH as Gasoline	502	ug/L	EPA 8260B	6/12/12	109	70.0-130
Tert-Butanol	201	ug/L	EPA 8260B	6/12/12	106	80-120
Tert-amyl-methyl ether	39.7	ug/L	EPA 8260B	6/12/12	105	78.9-120
Toluene	39.8	ug/L	EPA 8260B	6/12/12	93.1	80-120







2795 2nd Street Suite 300  
 Davis, CA 95616  
 Lab: 530.297.4800  
 Fax: 530.297.4808

Lab No. 81467

Page 2 of 2

**Project Contact (Hardcopy or PDF To):**  
 Matthew Nelson

**California EDF Report?**  Yes  No

**Company / Address:**  
 Tesoro c/o Arctos Environmental  
 1332 Peralta Ave, Berkeley, CA 94702

**Phone No.:** 510-525-2180 **Fax No.:** 510-525-2392

**Project Number:** 67076 **P.O. No.:** 67076

**Project Name:**  
 Tesoro - Livermore

**Recommended but not mandatory to complete this section:**

**Sampling Company Log Code:**

**Global ID:** T0600101410

**EDF Deliverable To (Email Address):**  
 mnelson@orionenv.com

**Sampler Signature:** *[Signature]*

**Chain-of-Custody Record and Analysis Request**

Sample Designation	Sampling		Container				Preservative				Matrix			Analysis Request										TAT	For Lab Use Only						
	Date	Time	40 ml VOA	SLEEVE	POLY	AMBER	TEDLAR	HCl	HNO <sub>3</sub>	ICE	NONE	WATER	SOIL	VAPOR	BTEX (8021B)	BTEX/TPH Gas/MTBE (8021B/M8015)	TPH as Diesel (M8015)	TPH as Motor Oil (M8015)	TPH Gas/BTEX/MTBE (8260B)	5 Oxygenates/TPH Gas (8260B)	7 Oxygenates/TPH Gas (8260B)	5 Oxygenates (8260B)	7 Oxygenates (8260B)			Lead Scav. (1,2 DCA & 1,2 EDB - 8260B)	EPA 8260B (Full List)	Volatile Halocarbons (EPA 8260B)	Lead (7421/239.2) TOTAL <input type="checkbox"/> W.E.T. <input type="checkbox"/>		
DW-9 e 70	6/2/12	1000		X						X			X						X				X	X							11
DW-9 e 75		1015		X						X			X						X				X	X							12
DW-9 e 80		1025		X						X			X						X				X	X							13
DB-8 e 55	6/2/12	1145	4					X	X			X							X			X	X								14

**Relinquished by:** *[Signature]* **Date:** 6/2/12 **Time:** 1430 **Received by:** \_\_\_\_\_ **Remarks:**

**Relinquished by:** \_\_\_\_\_ **Date:** \_\_\_\_\_ **Time:** \_\_\_\_\_ **Received by:** \_\_\_\_\_

**Relinquished by:** \_\_\_\_\_ **Date:** 06/05/12 **Time:** 1035 **Received by Laboratory:** *[Signature]* **Bill to:** Tesoro Companies, Inc.



2795 2nd Street Suite 300  
 Davis, CA 95616  
 Lab: 530.297.4800  
 Fax: 530.297.4808

Lab No. 81467

Page 1 of 2

**Project Contact (Hardcopy or PDF To):**  
 Matthew Nelson

**Company / Address:**  
 Tesoro c/o Arcos Environmental  
 1332 Peralta Ave, Berkeley, CA 94702

**Phone No.:** 510-525-2180 **Fax No.:** 510-525-2392

**Project Number:** 67076 **P.O. No.:** 67076

**Project Name:** Tesoro - Livermore

**California EDF Report?**  Yes  No

**Recommended but not mandatory to complete this section:**

**Sampling Company Log Code:**

**Global ID:** T0600101410

**EDF Deliverable To (Email Address):** mnelson@orionenv.com

**Sampler Signature:** *[Signature]*

**Chain-of-Custody Record and Analysis Request**

Project Address: 1619 1st Street Livermore, California	Sampling		Container				Preservative				Matrix			Analysis Request										TAT	For Lab Use Only												
	Date	Time	40 ml VOA	SLEEVE	POLY	AMBER	TEDLAR	HCl	HNO <sub>3</sub>	ICE	NONE	WATER	SOIL	VAPOR	BTEX (8021B)	BTEX/TPH Gas/MTBE (8021B/M8015)	TPH as Diesel (M8015)	TPH as Motor Oil (M8015)	TPH Gas/BTEX/MTBE (8260B)	5 Oxygenates/TPH Gas (8260B)	7 Oxygenates/TPH Gas (8260B)	5 Oxygenates (8260B)	7 Oxygenates (8260B)	Lead Scav. (1,2 DCA & 1,2 EDB - 8260B)		EPA 8260B (Full List)	Volatile Halocarbons (EPA 8260B)	Lead (7421/239.2) TOTAL <input type="checkbox"/> W.E.T. <input type="checkbox"/>	Hold	12hr	24hr	48hr	72hr	1wk	2wk		
DW-9e5	6/2/12	0809	X						X			X						X					X	X													01
DW-9e15		0820	X						X			X						X				X	X														02
DW-9e20		0830	X						X			X						X				X	X														03
DW-9e25		0837	X						X			X														X											04
DW-9e30		0845	X						X			X						X				X	X														05
DW-9e40		0858	X						X			X						X				X	X														06
DW-9e45		0905	X						X			X						X				X	X														07
DW-9e50		0915	X						X			X						X				X	X														08
DW-9e60		0930	X						X			X						X				X	X														09
DW-9e65		0945	X						X			X						X				X	X														10

**Relinquished by:** *[Signature]* **Date:** 6/2/12 **Time:** 1430 **Received by:** \_\_\_\_\_

**Relinquished by:** \_\_\_\_\_ **Date:** \_\_\_\_\_ **Time:** \_\_\_\_\_ **Received by:** \_\_\_\_\_

**Relinquished by:** \_\_\_\_\_ **Date:** 060512 **Time:** 1035 **Received by Laboratory:** *[Signature]* **Bill to:** Tesoro Companies, Inc.

**Remarks:**

All samples collected on 6/4/12 - MP



2795 2nd Street Suite 300  
 Davis, CA 95616  
 Lab: 530.297.4800  
 Fax: 530.297.4808

Lab No. 81467

Page 2 of 2

Project Contact (Hardcopy or PDF To):  
 Matthew Nelson

California EDF Report?  Yes  No

**Chain-of-Custody Record and Analysis Request**

Company / Address:  
 Tesoro c/o Arctos Environmental  
 1332 Peralta Ave, Berkeley, CA 94702

Recommended but not mandatory to complete this section:  
 Sampling Company Log Code:

**Analysis Request**

Phone No.: 510-525-2180  
 Fax No.: 510-525-2392  
 Project Number: 67076  
 P.O. No.: 67076

Global ID: T0600101410  
 EDF Deliverable To (Email Address):  
 mnelson@orionenv.com

Project Name:  
 Tesoro - Livermore

Sampler Signature: *[Signature]*

Project Address:  
 1619 1st Street  
 Livermore, California

Date	Time	Sampling				Container				Preservative				Matrix		
		40 ml VOA	SLEEVE	POLY	AMBER	TEDLAR	HCl	HNO <sub>3</sub>	ICE	NONE	WATER	SOIL	VAPOR			

Analysis Request													TAT	For Lab Use Only	
BTEX (8021B)	BTEX/TPH Gas/MTBE (8021B/M8015)	TPH as Diesel (M8015)	TPH as Motor Oil (M8015)	TPH Gas/BTEX/MTBE (8260B)	5 Oxygenates/TPH Gas (8260B)	7 Oxygenates/TPH Gas (8260B)	5 Oxygenates (8260B)	7 Oxygenates (8260B)	Lead Scav. (1,2 DCA & 1,2 EDB - 8260B)	EPA 8260B (Full List)	Volatile Halocarbons (EPA 8260B)	Lead (7421/239.2) TOTAL <input type="checkbox"/> W.E.T. <input type="checkbox"/>	12hr		11
				X				X	X			24hr	12		
				X				X	X			48hr		13	
				X				X	X			72hr			
												1wk			
												2wk			

Sample Designation

DW-9 e 70  
 DW-9 e 75  
 DW-9 e 80  
 DB-8 e 55

6/2/12 1000  
 1015  
 1025  
 6/2/12 1145

All samples collected on 6/4/12 - MP

Relinquished by: *[Signature]* Date: 6/2/12 Time: 1430 Received by: \_\_\_\_\_

Remarks:

Relinquished by: \_\_\_\_\_ Date: \_\_\_\_\_ Time: \_\_\_\_\_ Received by: \_\_\_\_\_

Relinquished by: \_\_\_\_\_ Date: 6/5/12 Time: 1035 Received by Laboratory: *[Signature]* Kiff Analytical LLC

Bill to: Tesoro Companies, Inc.

**SAMPLE RECEIPT CHECKLIST**

RECEIVER

TJB  
Initials

SRG#: 81467 Date: 060512

Project ID: Tesoro - Livermore

Method of Receipt:  Courier  Over-the-counter  Shipper

**COC Inspection**

Is COC present?  Yes  No  
 Custody seals on shipping container?  Intact  Broken  Not present  N/A  
 Is COC Signed by Relinquisher?  Yes  No Dated?  Yes  No  
 Is sampler name legibly indicated on COC?  Yes  No  
 Is analysis or hold requested for all samples?  Yes  No  
 Is the turnaround time indicated on COC?  Yes  No  
 Is COC free of whiteout and uninitialed cross-outs?  Yes  No, Whiteout  No, Cross-outs *(write over)*

**Sample Inspection**

Coolant Present:  Yes  No (includes water)  
 Temperature °C 5.5 Therm. ID# IR-4 Initial TJB Date/Time 060512/1021  N/A  
 Are there custody seals on sample containers?  Intact  Broken  Not present  
 Do containers match COC?  Yes  No  No, COC lists absent sample(s)  No, Extra sample(s) present  
 Are there samples matrices other than soil, water, air or carbon?  Yes  No  
 Are any sample containers broken, leaking or damaged?  Yes  No  
 Are preservatives indicated?  Yes, on sample containers  Yes, on COC  Not indicated  N/A  
 Are preservatives correct for analyses requested?  Yes  No  N/A  
 Are samples within holding time for analyses requested?  Yes  No  
 Are the correct sample containers used for the analyses requested?  Yes  No  
 Is there sufficient sample to perform testing?  Yes  No  
 Does any sample contain product, have strong odor or are otherwise suspected to be hot?  Yes  No  
**Receipt Details**  
 Matrix SO Container type sleeve # of containers received 13  
 Matrix WA Container type VOA # of containers received 4  
 Matrix \_\_\_\_\_ Container type \_\_\_\_\_ # of containers received \_\_\_\_\_  
 Date and Time Sample Put into Temp Storage Date: 060512 Time: 1035

**Quicklog**

Are the Sample ID's indicated:  On COC  On sample container(s)  On Both  Not indicated  
 If Sample ID's are listed on both COC and containers, do they all match?  Yes  No  N/A  
 Is the Project ID indicated:  On COC  On sample container(s)  On Both  Not indicated  
 If project ID is listed on both COC and containers, do they all match?  Yes  No  N/A  
 Are the sample collection dates indicated:  On COC  On sample container(s)  On Both  Not indicated  
 If collection dates are listed on both COC and containers, do they all match?  Yes  No  N/A  
 Are the sample collection times indicated:  On COC  On sample container(s)  On Both  Not indicated  
 If collection times are listed on both COC and containers, do they all match?  Yes  No  N/A

COMMENTS: Per an email from Mike Purchase, all samples on this project were collected on 060412. SR will log in the date as such. TJB 060512 1042

Sediment is present in all VOAs. TJB 060612 1201

## Laboratory Results

Matt Nelson  
Orion Environmental  
3450 East Spring Street, Suite 212  
Long Beach, CA 90806

Subject : 1 Water Sample  
Project Name : Tesoro - Livermore  
Project Number : 01LV  
P.O. Number : 67076

Dear Mr. Nelson,

Chemical analysis of the samples referenced above has been completed. Summaries of the data are contained on the following pages. Sample(s) were received under documented chain-of-custody. US EPA protocols for sample storage and preservation were followed. Testing procedures comply with the 2003 NELAC and TNI 2009 standards. Laboratory results relate only to the samples tested. This report may be freely reproduced in full, but may only be reproduced in part with the express permission of Kiff Analytical, LLC. Kiff Analytical, LLC is certified by the State of California under the National Environmental Laboratory Accreditation Program (NELAP), lab # 08263CA. If you have any questions regarding procedures or results, please call me at 530-297-4800.

Sincerely,



Troy Turpen

Project Name : **Tesoro - Livermore**

Project Number : **01LV**

Sample : **DB-9 @ 55**

Matrix : Water

Lab Number : 81489-01

Sample Date :06/05/2012

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date/Time Analyzed
<b>Benzene</b>	<b>610</b>	4.0	ug/L	EPA 8260B	06/11/12 16:27
<b>Toluene</b>	<b>21</b>	4.0	ug/L	EPA 8260B	06/11/12 16:27
<b>Ethylbenzene</b>	<b>210</b>	4.0	ug/L	EPA 8260B	06/11/12 16:27
<b>Total Xylenes</b>	<b>25</b>	4.0	ug/L	EPA 8260B	06/11/12 16:27
<b>Methyl-t-butyl ether (MTBE)</b>	<b>180</b>	4.0	ug/L	EPA 8260B	06/11/12 16:27
Diisopropyl ether (DIPE)	< 4.0	4.0	ug/L	EPA 8260B	06/11/12 16:27
Ethyl-t-butyl ether (ETBE)	< 4.0	4.0	ug/L	EPA 8260B	06/11/12 16:27
Tert-amyl methyl ether (TAME)	< 4.0	4.0	ug/L	EPA 8260B	06/11/12 16:27
<b>Tert-Butanol</b>	<b>410</b>	20	ug/L	EPA 8260B	06/11/12 16:27
Methanol	< 400	400	ug/L	EPA 8260B	06/11/12 16:27
Ethanol	< 40	40	ug/L	EPA 8260B	06/11/12 16:27
<b>TPH as Gasoline</b>	<b>18000</b>	400	ug/L	EPA 8260B	06/11/12 16:27
1,2-Dichloroethane	< 4.0	4.0	ug/L	EPA 8260B	06/11/12 16:27
1,2-Dibromoethane	< 4.0	4.0	ug/L	EPA 8260B	06/11/12 16:27
1,2-Dichloroethane-d4 (Surr)	98.4		% Recovery	EPA 8260B	06/11/12 16:27
Toluene - d8 (Surr)	89.3		% Recovery	EPA 8260B	06/11/12 16:27

**QC Report : Method Blank Data**

Project Name : **Tesoro - Livermore**

Project Number : **01LV**

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	< 0.50	0.50	ug/L	EPA 8260B	06/11/2012
Ethylbenzene	< 0.50	0.50	ug/L	EPA 8260B	06/11/2012
Toluene	< 0.50	0.50	ug/L	EPA 8260B	06/11/2012
Total Xylenes	< 0.50	0.50	ug/L	EPA 8260B	06/11/2012
Diisopropyl ether (DIPE)	< 0.50	0.50	ug/L	EPA 8260B	06/11/2012
Ethanol	< 5.0	5.0	ug/L	EPA 8260B	06/11/2012
Ethyl-t-butyl ether (ETBE)	< 0.50	0.50	ug/L	EPA 8260B	06/11/2012
Methanol	< 50	50	ug/L	EPA 8260B	06/11/2012
Methyl-t-butyl ether (MTBE)	< 0.50	0.50	ug/L	EPA 8260B	06/11/2012
Tert-Butanol	< 5.0	5.0	ug/L	EPA 8260B	06/11/2012
Tert-amyl methyl ether (TAME)	< 0.50	0.50	ug/L	EPA 8260B	06/11/2012
TPH as Gasoline	< 50	50	ug/L	EPA 8260B	06/11/2012
1,2-Dibromoethane	< 0.50	0.50	ug/L	EPA 8260B	06/11/2012
1,2-Dichloroethane	< 0.50	0.50	ug/L	EPA 8260B	06/11/2012
1,2-Dichloroethane-d4 (Surr)	105		%	EPA 8260B	06/11/2012
Toluene - d8 (Surr)	92.0		%	EPA 8260B	06/11/2012

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
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## QC Report : Matrix Spike/ Matrix Spike Duplicate

Project Name : **Tesoro - Livermore**Project Number : **01LV**

Parameter	Spiked Sample	Sample Value	Spike Level	Spike Dup. Level	Spiked Sample Value	Duplicate Spiked Sample Value	Units	Analysis Method	Date Analyzed	Spiked Sample Percent Recov.	Duplicate Spiked Sample Percent Recov.	Relative Percent Diff.	Spiked Sample Percent Recov. Limit	Relative Percent Diff. Limit
1,2-Dibromoethane	81468-04	<0.50	39.9	39.9	39.6	39.6	ug/L	EPA 8260B	6/11/12	99.3	99.3	0.0814	80-120	25
1,2-Dichloroethane	81468-04	<0.50	40.0	40.0	41.8	40.5	ug/L	EPA 8260B	6/11/12	104	101	3.15	75.7-122	25
Benzene	81468-04	<0.50	40.0	40.0	41.3	39.5	ug/L	EPA 8260B	6/11/12	103	98.9	4.33	80-120	25
Diisopropyl ether	81468-04	<0.50	39.5	39.5	42.9	43.4	ug/L	EPA 8260B	6/11/12	108	110	1.04	80-120	25
Ethanol	81468-04	<5.0	99.7	99.7	115	126	ug/L	EPA 8260B	6/11/12	116	126	8.62	55.1-159	25
Ethyl-tert-butyl ether	81468-04	<0.50	39.8	39.8	41.1	40.3	ug/L	EPA 8260B	6/11/12	103	101	1.88	76.5-120	25
Ethylbenzene	81468-04	<0.50	40.0	40.0	41.0	40.1	ug/L	EPA 8260B	6/11/12	102	100	2.15	80-120	25
Methanol	81468-04	230	998	998	1390	1460	ug/L	EPA 8260B	6/11/12	117	124	5.96	53.2-147	25
Methyl-t-butyl ether	81468-04	<0.50	40.0	40.0	39.9	37.3	ug/L	EPA 8260B	6/11/12	99.8	93.2	6.84	69.7-121	25
P + M Xylene	81468-04	<0.50	40.0	40.0	39.5	38.6	ug/L	EPA 8260B	6/11/12	98.7	96.4	2.30	76.8-120	25



**QC Report : Matrix Spike/ Matrix Spike Duplicate**

Project Name : **Tesoro - Livermore**

Project Number : **01LV**

Parameter	Spiked Sample	Sample Value	Spike Level	Spike Dup. Level	Spiked Sample Value	Duplicate Spiked Sample Value	Units	Analysis Method	Date Analyzed	Spiked Sample Percent Recov.	Duplicate Spiked Sample Percent Recov.	Relative Percent Diff.	Spiked Sample Percent Recov. Limit	Relative Percent Diff. Limit
Tert-Butanol	81468-04	<5.0	202	202	211	209	ug/L	EPA 8260B	6/11/12	105	104	1.12	80-120	25
Tert-amyl-methyl ether	81468-04	<0.50	39.9	39.9	42.2	41.1	ug/L	EPA 8260B	6/11/12	106	103	2.58	78.9-120	25
Toluene	81468-04	<0.50	40.0	40.0	36.9	36.0	ug/L	EPA 8260B	6/11/12	92.3	89.9	2.63	80-120	25

**QC Report : Laboratory Control Sample (LCS)**Project Name : **Tesoro - Livermore**Project Number : **01LV**

Parameter	Spike Level	Units	Analysis Method	Date Analyzed	LCS Percent Recov.	LCS Percent Recov. Limit
1,2-Dibromoethane	39.9	ug/L	EPA 8260B	6/11/12	99.6	80-120
1,2-Dichloroethane	40.0	ug/L	EPA 8260B	6/11/12	103	75.7-122
Benzene	40.0	ug/L	EPA 8260B	6/11/12	103	80-120
Diisopropyl ether	39.5	ug/L	EPA 8260B	6/11/12	110	80-120
Ethanol	99.7	ug/L	EPA 8260B	6/11/12	134	55.1-159
Ethyl-tert-butyl ether	39.8	ug/L	EPA 8260B	6/11/12	99.4	76.5-120
Ethylbenzene	40.0	ug/L	EPA 8260B	6/11/12	105	80-120
Methanol	998	ug/L	EPA 8260B	6/11/12	130	53.2-147
Methyl-t-butyl ether	40.0	ug/L	EPA 8260B	6/11/12	90.4	69.7-121
P + M Xylene	40.0	ug/L	EPA 8260B	6/11/12	101	76.8-120
TPH as Gasoline	502	ug/L	EPA 8260B	6/11/12	106	70.0-130
Tert-Butanol	202	ug/L	EPA 8260B	6/11/12	104	80-120
Tert-amyl-methyl ether	39.9	ug/L	EPA 8260B	6/11/12	103	78.9-120
Toluene	40.0	ug/L	EPA 8260B	6/11/12	93.2	80-120



2795 2nd Street Suite 300  
 Davis, CA 95616  
 Lab: 530.297.4800  
 Fax: 530.297.4808

Lab No. 81489

Page 1 of 1

Project Contact (Hardcopy or PDF To):

Matthew Nelson

California EDF Report?  Yes  No

Chain-of-Custody Record and Analysis Request

Company / Address:

Tesoro c/o Arctos Environmental  
 1332 Peralta Ave, Berkeley, CA 94702

Recommended but not mandatory to complete this section:

Sampling Company Log Code:

Analysis Request

Phone No.:

510-525-2180

Fax No.:

510-525-2392

Global ID:

T0600101410

Project Number:

67076

P.O. No.:

67076

EDF Deliverable To (Email Address):

mnelson@orionenv.com

Project Name:

Tesoro - Livermore

Sampler

Signature: *[Signature]*

Project Address:

1619 1st Street  
 Livermore, California

Sampling

Container

Preservative

Matrix

Sample Designation

Date

Time

40 ml VOA

SLEEVE

POLY

AMBER

TEDLAR

HCl

HNO<sub>3</sub>

ICE

NONE

WATER

SOIL

VAPOR

BTEX (8021B)

BTEX/TPH Gas/MTBE (8021B/M8015)

TPH as Diesel (M8015)

TPH as Motor Oil (M8015)

TPH Gas/BTEX/MTBE (8260B)

5 Oxygenates/TPH Gas (8260B)

7 Oxygenates/TPH Gas (8260B)

5 Oxygenates (8260B)

7 Oxygenates (8260B)

Lead Scav. (1,2 DCA & 1,2 EDB - 8260B)

EPA 8260B (Full List)

Volatile Halocarbons (EPA 8260B)

Lead (7421/239.2) TOTAL  W.E.T.

TAT

12hr   
 24hr   
 48hr   
 72hr   
 1wk   
 2wk

For Lab Use Only

01

Relinquished by:

*[Signature]*

Date

6/5/12

Time

1120

Received by:

*[Signature]*

Remarks:

Relinquished by:

*[Signature]*

Date

Time

Received by:

Relinquished by:

*[Signature]*

Date

06/06/12

Time

1128

Received by Laboratory:

*[Signature]*

KIFF Analytical

Bill to:

Tesoro Companies, Inc.

**SAMPLE RECEIPT CHECKLIST**

RECEIVER  
LJR  
Initials

SRG#: 81489 Date: 060612  
Project ID: Tesoro - Livermore  
Method of Receipt:  Courier  Over-the-counter  Shipper

**COC Inspection**

Is COC present?  Yes  No  
Custody seals on shipping container?  Intact  Broken  Not present  N/A  
Is COC Signed by Relinquisher?  Yes  No Dated?  Yes  No  
Is sampler name legibly indicated on COC?  Yes  No  
Is analysis or hold requested for all samples?  Yes  No  
Is the turnaround time indicated on COC?  Yes  No  
Is COC free of whiteout and uninitialed cross-outs?  Yes  No, Whiteout  No, Cross-outs

**Sample Inspection**

Coolant Present: 3.6  Yes  No (includes water)  
Temperature °C 3.6 Therm. ID# IR-4 Initial LJR Date/Time 060612/1127  N/A  
Are there custody seals on sample containers?  Intact  Broken  Not present  
Do containers match COC?  Yes  No  No, COC lists absent sample(s)  No, Extra sample(s) present  
Are there samples matrices other than soil, water, air or carbon?  Yes  No  
Are any sample containers broken, leaking or damaged?  Yes  No  
Are preservatives indicated?  Yes, on sample containers  Yes, on COC  Not indicated  N/A  
Are preservatives correct for analyses requested?  Yes  No  N/A  
Are samples within holding time for analyses requested?  Yes  No  
Are the correct sample containers used for the analyses requested?  Yes  No  
Is there sufficient sample to perform testing?  Yes  No  
Does any sample contain product, have strong odor or are otherwise suspected to be hot?  Yes  No

**Receipt Details**

Matrix WA Container type VOA # of containers received 4  
Matrix \_\_\_\_\_ Container type \_\_\_\_\_ # of containers received \_\_\_\_\_  
Matrix \_\_\_\_\_ Container type \_\_\_\_\_ # of containers received \_\_\_\_\_  
Date and Time Sample Put into Temp Storage Date: 060612 Time: 1128

**Quicklog**

Are the Sample ID's indicated:  On COC  On sample container(s)  On Both  Not indicated  
If Sample ID's are listed on both COC and containers, do they all match?  Yes  No  N/A  
Is the Project ID indicated:  On COC  On sample container(s)  On Both  Not indicated  
If project ID is listed on both COC and containers, do they all match?  Yes  No  N/A  
Are the sample collection dates indicated:  On COC  On sample container(s)  On Both  Not indicated  
If collection dates are listed on both COC and containers, do they all match?  Yes  No  N/A  
Are the sample collection times indicated:  On COC  On sample container(s)  On Both  Not indicated  
If collection times are listed on both COC and containers, do they all match?  Yes  No  N/A

COMMENTS: Sample ID on VOA labels is DW-9@ 55. Date and time match COC - LJR 060612 - 1410

**ATTACHMENT G**  
**OXYGEN SYSTEM MONITORING RESULTS**

TABLE G-1

OXYGEN SYSTEM MONITORING RESULTS  
TESORO - LIVERMORE, 67076

Well	Date	Dissolved Oxygen <sup>(a)</sup> (mg/l)	Oxygen Purity <sup>(b)</sup> (%)
IP-1	10/15/2010	0.03	NM <sup>(c)</sup>
	10/18/2010	NM	NM
	10/22/2010	9.96	NM
	10/25/2010	41.75	82.2
	11/1/2010	51.19	77.7
	12/9/2010	24.66	51.3
	12/14/2010	23.67	53.3
	12/23/2010	28.27	58.1
	1/5/2011	29.06	52.0
	1/18/2011	0.0	0.0
	2/1/2011	0.25	88.9
	3/4/2011	15.02	90.4
	4/8/2011	0.12	49.8
	5/3/2011	0.01	88.0
	6/27/2011	0.01	0.0
	6/28/2011	0.24	91.3
	6/30/2011	0.08	94.3
	7/5/2011	0.13	94.5
	7/7/2011	0.01	94.2
	7/13/2011	0.01	95.3
	7/22/2011	0.01	94.5
	8/9/2011	0.01	94.5
	9/1/2011	0.05	92.9
	11/29/2011	NM	0.0
	1/5/2012	NM	93.6
	2/2/2012	0.01	91.0
	3/20/2012	0.02	93.0
4/26/2012	NM	94.7	
5/16/2012	0.01	NM	
6/19/2012	NM	NM	
IP-2	10/15/2010	0.03	NM
	10/18/2010	NM	NM
	10/22/2010	0.05	NM
	10/25/2010	0.29	82.2
	11/1/2010	0.02	77.7
	12/9/2010	0.46	51.3
	12/14/2010	0.84	53.3

TABLE G-1

OXYGEN SYSTEM MONITORING RESULTS  
TESORO - LIVERMORE, 67076

Well	Date	Dissolved Oxygen <sup>(a)</sup> (mg/l)	Oxygen Purity <sup>(b)</sup> (%)
IP-2 (cont.)	12/23/2010	0.41	58.1
	1/5/2011	NM	52.0
	1/18/2011	2.01	0.0
	2/1/2011	2.09	88.9
	3/4/2011	1.45	90.4
	4/8/2011	3.38	49.8
	5/3/2011	0.47	88.0
	6/27/2011	0.01	0.0
	6/28/2011	25.05	91.3
	6/30/2011	NM	94.3
	7/5/2011	NM	94.5
	7/7/2011	NM	94.2
	7/13/2011	NM	95.3
	7/22/2011	9.31	94.5
	8/9/2011	17.38	94.5
	9/1/2011	24.79	92.9
	11/29/2011	1.14	0.0
	1/5/2012	44.72	93.6
	2/2/2012	36.25	91.0
	3/20/2012	7.40	93.0
4/26/2012	11.27	94.7	
5/16/2012	8.48	NM	
6/19/2012	18.34	NM	
IP-3	10/15/2010	0.06	NM
	10/18/2010	NM	NM
	10/22/2010	NM	NM
	10/25/2010	NM	82.2
	11/1/2010	0.12	77.7
	12/9/2010	0.15	51.3
	12/14/2010	0.19	53.3
	12/23/2010	0.33	58.1
	1/5/2011	0.66	52.0
	1/18/2011	0.08	0.0
	2/1/2011	15.12	88.9
	3/4/2011	14.61	90.4
	4/8/2011	20.46	49.8
	5/3/2011	5.59	88.0
	6/27/2011	0.01	0.0

TABLE G-1

OXYGEN SYSTEM MONITORING RESULTS  
TESORO - LIVERMORE, 67076

Well	Date	Dissolved Oxygen <sup>(a)</sup> (mg/l)	Oxygen Purity <sup>(b)</sup> (%)
IP-3 (cont.)	6/28/2011	0.96	91.3
	6/30/2011	0.67	94.3
	7/5/2011	0.55	94.5
	7/7/2011	1.32	94.2
	7/13/2011	0.26	95.3
	7/22/2011	0.30	94.5
	8/9/2011	0.49	94.5
	9/1/2011	3.63	92.9
	11/29/2011	2.11	0.0
	1/5/2012	11.85	93.6
	2/2/2012	8.91	91.0
	3/20/2012	2.97	93.0
	4/26/2012	1.17	94.7
	5/16/2012	2.11	NM
	6/19/2012	11.83	NM
IP-4	10/15/2010	0.01	NM
	10/18/2010	NM	NM
	10/22/2010	0.04	NM
	10/25/2010	0.14	82.2
	11/1/2010	0.15	77.7
	12/9/2010	0.09	51.3
	12/14/2010	0.01	53.3
	12/23/2010	0.03	58.1
	1/5/2011	0.02	52.0
	1/18/2011	1.04	0.0
	2/1/2011	1.25	88.9
	3/4/2011	0.18	90.4
	4/8/2011	1.02	49.8
	5/3/2011	13.77	88.0
	6/27/2011	1.33	0.0
	6/28/2011	7.11	91.3
	6/30/2011	NM	94.3
	7/5/2011	NM	94.5
	7/7/2011	NM	94.2
	7/13/2011	NM	95.3
7/22/2011	9.74	94.5	



TABLE G-1

OXYGEN SYSTEM MONITORING RESULTS  
TESORO - LIVERMORE, 67076

Well	Date	Dissolved Oxygen <sup>(a)</sup> (mg/l)	Oxygen Purity <sup>(b)</sup> (%)
IP-4 (cont.)	8/9/2011	15.48	94.5
	9/1/2011	16.45	92.9
	11/29/2011	0.91	0.0
	1/5/2012	15.56	93.6
	2/2/2012	26.26	91.0
	3/20/2012	0.58	93.0
	4/26/2012	1.06	94.7
	5/16/2012	0.38	NM
	6/19/2012	2.22	NM
IP-5	10/15/2010	0.02	NM
	10/18/2010	NM	NM
	10/22/2010	0.04	NM
	10/25/2010	0.09	82.2
	11/1/2010	0.02	77.7
	12/9/2010	0.21	51.3
	12/14/2010	0.01	53.3
	12/23/2010	0.07	58.1
	1/5/2011	NM	52.0
	1/18/2011	0.72	0.0
	2/1/2011	0.77	88.9
	3/4/2011	50.28	90.4
	4/8/2011	25.82	49.8
	5/3/2011	19.23	88
	6/27/2011	0.03	0.0
	6/28/2011	38.65	91.3
	6/30/2011	30.79	94.3
	7/5/2011	41.81	94.5
	7/7/2011	42.53	94.2
	7/13/2011	38.87	95.3
	7/22/2011	31.29	94.5
	8/9/2011	32.78	94.5
	9/1/2011	40.51	92.9
	11/29/2011	13.76	0.0
	1/5/2012	16.42	93.6
	2/2/2012	16.21	91.0
	3/20/2012	4.49	93.0
4/26/2012	12.87	94.7	

TABLE G-1

OXYGEN SYSTEM MONITORING RESULTS  
TESORO - LIVERMORE, 67076

Well	Date	Dissolved Oxygen <sup>(a)</sup> (mg/l)	Oxygen Purity <sup>(b)</sup> (%)
IP-5 (cont.)	5/16/2012	7.53	NM
	6/19/2012	11.44	NM
IP-6	10/15/2010	0.25	NM
	10/18/2010	NM	NM
	10/22/2010	0.27	NM
	10/25/2010	0.44	82.2
	11/1/2010	11.22	77.7
	12/9/2010	12.55	51.3
	12/14/2010	12.79	53.3
	12/23/2010	12.82	58.1
	1/5/2011	14.3	52
	1/18/2011	5.19	0.0
	2/1/2011	15.94	88.9
	3/4/2011	10.31	90.4
	4/8/2011	13.22	49.8
	5/3/2011	9.97	88.0
	6/27/2011	4.88	0.0
	6/28/2011	3.65	91.3
	6/30/2011	NM	94.3
	7/5/2011	NM	94.5
	7/7/2011	NM	94.2
	7/13/2011	NM	95.3
	7/22/2011	2.69	94.5
	8/9/2011	2.40	94.5
	9/1/2011	2.79	92.9
	11/29/2011	1.17	0.0
	1/5/2012	3.30	93.6
	2/2/2012	2.72	91.0
3/20/2012	2.43	93.0	
4/26/2012	2.29	94.7	
5/16/2012	2.36	NM	
6/19/2012	10.41	NM	
IP-7	10/15/2010	0.01	NM
	10/18/2010	NM	NM
	10/22/2010	0.13	NM
	10/25/2010	0.17	82.2
	11/1/2010	0.34	77.7
	12/9/2010	5.75	51.3

TABLE G-1

OXYGEN SYSTEM MONITORING RESULTS  
TESORO - LIVERMORE, 67076

Well	Date	Dissolved Oxygen <sup>(a)</sup> (mg/l)	Oxygen Purity <sup>(b)</sup> (%)
IP-7 (cont.)	12/14/2010	4.72	53.3
	12/23/2010	6.29	58.1
	1/5/2011	5.75	52.0
	1/18/2011	0.14	0.0
	2/1/2011	32.69	88.9
	3/4/2011	10.22	90.4
	4/8/2011	2.58	49.8
	5/3/2011	0.75	88.0
	6/27/2011	0.26	0.0
	6/28/2011	0.26	91.3
	6/30/2011	NM	94.3
	7/5/2011	NM	94.5
	7/7/2011	NM	94.2
	7/13/2011	NM	95.3
	7/22/2011	0.15	94.5
	8/9/2011	0.10	94.5
	9/1/2011	0.24	92.9
	11/29/2011	0.74	0.0
	1/5/2012	1.17	93.6
	2/2/2012	0.17	91.0
3/20/2012	0.12	93.0	
4/26/2012	0.94	94.7	
5/16/2012	0.05	NM	
6/19/2012	0.06	NM	
IP-8	10/15/2010	0.02	NM
	10/18/2010	NM	NM
	10/22/2010	0.27	NM
	10/25/2010	0.21	82.2
	11/1/2010	NM	77.7
	12/9/2010	NM	51.3
	12/14/2010	NM	53.3
	12/23/2010	NM	58.1
	1/5/2011	NM	52.0
	1/18/2011	NM	0.0
	2/1/2011	NM	88.9
	3/4/2011	NM	90.4
	4/8/2011	24.74	49.8
	5/3/2011	5.15	88.0

TABLE G-1

OXYGEN SYSTEM MONITORING RESULTS  
TESORO - LIVERMORE, 67076

Well	Date	Dissolved Oxygen <sup>(a)</sup> (mg/l)	Oxygen Purity <sup>(b)</sup> (%)
IP-8 (cont.)	6/27/2011	0.01	0.0
	6/28/2011	21.98	91.3
	6/30/2011	NM	94.3
	7/5/2011	NM	94.5
	7/7/2011	NM	94.2
	7/13/2011	NM	95.3
	7/22/2011	11.34	94.5
	8/9/2011	12.88	94.5
	9/1/2011	16.02	92.9
	11/29/2011	NM	0.0
	1/5/2012	NM	93.6
	2/2/2012	26.83	91.0
	3/20/2012	1.94	93.0
	4/26/2012	NM	94.7
	5/16/2012	1.64	NM
	6/19/2012	NM	NM
IP-9	10/15/2010	0.01	NM
	10/18/2010	NM	NM
	10/22/2010	11.27	NM
	10/25/2010	18.36	82.2
	11/1/2010	18.96	77.7
	12/9/2010	31.42	51.3
	12/14/2010	33.16	53.3
	12/23/2010	31.77	58.1
	1/5/2011	35.3	52.0
	1/18/2011	0.0	0.0
	2/1/2011	0.65	88.9
	3/4/2011	0.45	90.4
	4/8/2011	0.42	49.8
	5/3/2011	0.55	88.0
	6/27/2011	0.01	0.0
	6/28/2011	NM	91.3
	6/30/2011	27.14	94.3
	7/5/2011	23.48	94.5
	7/7/2011	22.62	94.2
	7/13/2011	21.37	95.3
7/22/2011	20.65	94.5	
8/9/2011	16.24	94.5	

TABLE G-1

**OXYGEN SYSTEM MONITORING RESULTS  
TESORO - LIVERMORE, 67076**

<b>Well</b>	<b>Date</b>	<b>Dissolved Oxygen<sup>(a)</sup> (mg/l)</b>	<b>Oxygen Purity<sup>(b)</sup> (%)</b>
IP-9 (cont.)	9/1/2011	36.38	92.9
	11/29/2011	NM	0.0
	1/5/2012	NM	93.6
	2/2/2012	46.40	91.0
	3/20/2012	33.17	93.0
	4/26/2012	NM	94.7
	5/16/2012	28.85	NM
	6/19/2012	NM	NM
IP-10	10/15/2010	0.11	NM
	10/18/2010	NM	NM
	10/22/2010	0.07	NM
	10/25/2010	5.33	82.2
	11/1/2010	8.48	77.7
	12/9/2010	0.25	51.3
	12/14/2010	0.30	53.3
	12/23/2010	0.04	58.1
	1/5/2011	0.01	52.0
	1/18/2011	0.0	0.0
	2/1/2011	0.18	88.9
	3/4/2011	0.04	90.4
	4/8/2011	26.54	49.8
	5/3/2011	4.45	88.0
	6/27/2011	0.04	0.0
	6/28/2011	10.08	91.3
	6/30/2011	NM	94.3
	7/5/2011	NM	94.5
	7/7/2011	NM	94.2
	7/13/2011	NM	95.3
	7/22/2011	29.15	94.5
	8/9/2011	11.44	94.5
	9/1/2011	37.28	92.9
	11/29/2011	NM	0.0
	1/5/2012	NM	93.6
	2/2/2012	0.14	91.0
	3/20/2012	0.01	93.0
	4/26/2012	NM	94.7
	5/16/2012	0.09	NM
	6/19/2012	NM	NM

TABLE G-1

OXYGEN SYSTEM MONITORING RESULTS  
TESORO - LIVERMORE, 67076

Well	Date	Dissolved Oxygen <sup>(a)</sup> (mg/l)	Oxygen Purity <sup>(b)</sup> (%)
MW-1	10/15/2010	0.11	NM
	10/18/2010	NM	NM
	10/22/2010	0.31	NM
	10/25/2010	0.35	82.2
	11/1/2010	1.79	77.7
	12/9/2010	0.21	51.3
	12/14/2010	0.01	53.3
	12/23/2010	0.01	58.1
	1/5/2011	0.0	52.0
	1/18/2011	0.0	0.0
	2/1/2011	0.66	88.9
	3/4/2011	NM	90.4
	4/8/2011	10.53	49.8
	5/3/2011	10.43	88.0
	6/27/2011	0.71	0.0
	6/28/2011	NM	91.3
	6/30/2011	NM	94.3
	7/5/2011	NM	94.5
	7/7/2011	NM	94.2
	7/13/2011	11.42	95.3
	7/22/2011	16.04	94.5
	8/9/2011	27.72	94.5
	9/1/2011	32.16	92.9
	11/29/2011	NM	0.0
	1/5/2012	0.97	93.6
	2/2/2012	1.73	91.0
	3/20/2012	0.32	93.0
4/26/2012	NM	94.7	
5/16/2012	0.01	NM	
6/19/2012	NM	NM	
MW-2	10/15/2010	0.02	NM
	10/18/2010	NM	NM
	10/22/2010	0.15	NM
	10/25/2010	0.04	82.2
	11/1/2010	0.08	77.7
	12/9/2010	0.03	51.3
	12/14/2010	0.21	53.3
	12/23/2010	0.01	58.1

TABLE G-1

OXYGEN SYSTEM MONITORING RESULTS  
TESORO - LIVERMORE, 67076

Well	Date	Dissolved Oxygen <sup>(a)</sup> (mg/l)	Oxygen Purity <sup>(b)</sup> (%)
MW-2 (cont.)	1/5/2011	0.06	52.0
	1/18/2011	0.0	0.0
	2/1/2011	0.15	88.9
	3/4/2011	0.44	90.4
	4/8/2011	0.06	49.8
	5/3/2011	0.01	88.0
	6/27/2011	0.02	0.0
	6/28/2011	NM	91.3
	6/30/2011	0.04	94.3
	7/5/2011	0.01	94.5
	7/7/2011	0.07	94.2
	7/13/2011	0.04	95.3
	7/22/2011	0.11	94.5
	8/9/2011	1.14	94.5
	9/1/2011	0.24	92.9
	11/29/2011	0.71	0.0
	1/5/2012	1.92	93.6
	2/2/2012	0.17	91.0
	3/20/2012	0.02	93.0
	4/26/2012	0.93	94.7
5/16/2012	0.24	NM	
6/19/2012	0.41	NM	
MW-11	10/15/2010	0.04	NM
	10/18/2010	NM	NM
	10/22/2010	29.48	NM
	10/25/2010	29.78	82.2
	11/1/2010	32.42	77.7
	12/9/2010	5.07	51.3
	12/14/2010	13.39	53.3
	12/23/2010	11.87	58.1
	1/5/2011	11.42	52.0
	1/18/2011	0.0	0.0
	2/1/2011	1.18	88.9
	3/4/2011	0.23	90.4
	4/8/2011	16.87	49.8
	5/3/2011	12.14	88.0
	6/27/2011	0.01	0.0
	6/28/2011	36.72	91.3

TABLE G-1

OXYGEN SYSTEM MONITORING RESULTS  
TESORO - LIVERMORE, 67076

Well	Date	Dissolved Oxygen <sup>(a)</sup> (mg/l)	Oxygen Purity <sup>(b)</sup> (%)
MW-11 (cont.)	6/30/2011	32.83	94.3
	7/5/2011	33.76	94.5
	7/7/2011	33.91	94.2
	7/13/2011	35.42	95.3
	7/22/2011	33.97	94.5
	8/9/2011	34.22	94.5
	9/1/2011	27.88	92.9
	11/29/2011	NM	0.0
	1/5/2012	NM	93.6
	2/2/2012	0.04	91.0
	3/20/2012	0.01	93.0
	4/26/2012	NM	94.7
	5/16/2012	6.89	NM
	6/19/2012	NM	NM
DW-1	10/15/2010	0.03	NM
	10/18/2010	NM	NM
	10/22/2010	NM	NM
	10/25/2010	NM	82.2
	11/1/2010	0.03	77.7
	12/9/2010	10.38	51.3
	12/14/2010	9.93	53.3
	12/23/2010	7.14	58.1
	1/5/2011	15.77	52.0
	1/18/2011	11.58	0.0
	2/1/2011	24.42	88.9
	3/4/2011	28.71	90.4
	4/8/2011	19.81	49.8
	5/3/2011	0.01	88.0
	6/27/2011	0.02	0.0
	6/28/2011	0.24	91.3
	6/30/2011	0.05	94.3
	7/5/2011	0.08	94.5
	7/7/2011	0.16	94.2
	7/13/2011	0.04	95.3
	7/22/2011	0.08	94.5
	8/9/2011	0.46	94.5
	9/1/2011	0.09	92.9
11/29/2011	0.94	0.0	



TABLE G-1

OXYGEN SYSTEM MONITORING RESULTS  
TESORO - LIVERMORE, 67076

Well	Date	Dissolved Oxygen <sup>(a)</sup> (mg/l)	Oxygen Purity <sup>(b)</sup> (%)
DW-1 (cont.)	1/5/2012	3.25	93.6
	2/2/2012	15.07	91.0
	3/20/2012	0.17	93.0
	4/26/2012	1.30	94.7
	5/16/2012	0.42	NM
	6/19/2012	0.92	NM
TP-1	10/15/2010	0.12	NM
	10/18/2010	NM	NM
	10/22/2010	2.11	NM
	10/25/2010	16.11	82.2
	11/1/2010	5.15	77.7
	12/9/2010	0.01	51.3
	12/14/2010	0.33	53.3
	12/23/2010	0.16	58.1
	1/5/2011	0.0	52.0
	1/18/2011	0.0	0.0
	2/1/2011	27.22	88.9
	3/4/2011	12.11	90.4
	4/8/2011	15.61	49.8
	5/3/2011	1.25	88.0
	6/27/2011	0.01	0.0
	6/28/2011	7.49	91.3
	6/30/2011	0.02	94.3
	7/5/2011	0.19	94.5
	7/7/2011	8.43	94.2
	7/13/2011	0.02	95.3
	7/22/2011	11.89	94.5
	8/9/2011	18.19	94.5
	9/1/2011	10.35	92.9
	11/29/2011	0.67	0.0
	1/5/2012	12.64	93.6
	2/2/2012	2.75	91.0
3/20/2012	0.03	93.0	
4/26/2012	16.60	94.7	
5/16/2012	16.03	NM	
6/19/2012	7.31	NM	
TP-2	10/15/2010	0.05	NM
	10/18/2010	NM	NM

TABLE G-1

OXYGEN SYSTEM MONITORING RESULTS  
TESORO - LIVERMORE, 67076

Well	Date	Dissolved Oxygen <sup>(a)</sup> (mg/l)	Oxygen Purity <sup>(b)</sup> (%)
TP-2 (cont.)	10/22/2010	25.44	NM
	10/25/2010	24.90	82.2
	11/1/2010	25.83	77.7
	12/9/2010	6.03	51.3
	12/14/2010	5.12	53.3
	12/23/2010	0.63	58.1
	1/5/2011	0.43	52.0
	1/18/2011	0.0	0.0
	2/1/2011	33.44	88.9
	3/4/2011	34.15	90.4
	4/8/2011	19.31	49.8
	5/3/2011	11.95	88.0
	6/27/2011	0.01	0.0
	6/28/2011	24.27	91.3
	6/30/2011	23.57	94.3
	7/5/2011	31.33	94.5
	7/7/2011	33.74	94.2
	7/13/2011	33.16	95.3
	7/22/2011	33.72	94.5
	8/9/2011	35.64	94.5
9/1/2011	26.08	92.9	
11/29/2011	0.69	0.0	
1/5/2012	14.77	93.6	
2/2/2012	21.95	91.0	
3/20/2012	16.32	93.0	
4/26/2012	8.75	94.7	
5/16/2012	19.78	NM	
6/19/2012	19.87	NM	
VW-2	1/5/2012	13.24	93.6
	2/2/2012	5.56	91.0
	3/20/2012	6.11	93.0
	4/26/2012	10.57	94.7
	5/16/2012	10.52	NM
	6/19/2012	5.87	NM

(a) Dissolved oxygen measured in milligrams per liter (mg/l).

(b) Oxygen purity measured at injection manifold (same for all wells) in percent (%).

(c) Not measured.

**ATTACHMENT H**

**ZONE 7 WATER AGENCY**  
**WELL INSTALLATION PERMIT**



# ZONE 7 WATER AGENCY

100 NORTH CANYONS PARKWAY, LIVERMORE, CALIFORNIA 94551 VOICE (925) 454-5000 FAX (925) 245-9306  
E-MAIL [whong@zone7water.com](mailto:whong@zone7water.com)

## DRILLING PERMIT APPLICATION

FOR APPLICANT TO COMPLETE

FOR OFFICE USE

LOCATION OF PROJECT 1619 1st Street, Livermore, California

PERMIT NUMBER 2012049  
WELL NUMBER 3S/2E-17B98 (MW-12), 17B99 (DW-9)  
APN 098-0403-019-00

Coordinates Source \_\_\_\_\_ ft. Accuracy ✓ \_\_\_\_\_ ft.  
LAT: \_\_\_\_\_ ft. LONG: \_\_\_\_\_ ft.  
APN 98-403-19

PERMIT CONDITIONS  
(Circled Permit Requirements Apply)

### CLIENT

Name Tesoro Environmental Resources Company  
Address 3450 South 344th Way, Suite 201 Phone 253-896-8708  
City Auburn, WA Zip 98001-9540

### APPLICANT

Name Arctos Environmental  
Email sstromberg@orionenv.com Fax 562-988-2759  
Address 3450 E Spring St., #212 Phone 562-988-2755  
City Long Beach, CA Zip 90806

### TYPE OF PROJECT:

Well Construction  Geotechnical Investigation \_\_\_\_\_  
Well Destruction \_\_\_\_\_ Contamination Investigation \_\_\_\_\_  
Cathodic Protection \_\_\_\_\_ Other \_\_\_\_\_

### PROPOSED WELL USE:

Domestic \_\_\_\_\_ Irrigation \_\_\_\_\_  
Municipal \_\_\_\_\_ Remediation \_\_\_\_\_  
Industrial \_\_\_\_\_ Groundwater Monitoring   
Dewatering \_\_\_\_\_ Other \_\_\_\_\_

### DRILLING METHOD:

Mud Rotary \_\_\_\_\_ Air Rotary \_\_\_\_\_ Hollow Stem Auger   
Cable Tool \_\_\_\_\_ Direct Push \_\_\_\_\_ Other \_\_\_\_\_

DRILLING COMPANY Gregg Drilling & Testing Inc.

DRILLER'S LICENSE NO. 485165

### WELL SPECIFICATIONS:

Drill Hole Diameter 10 in. Maximum \_\_\_\_\_  
Casing Diameter 4 in. Depth 45 and 60 ft.  
Surface Seal Depth 21-23 ft. Number 2

### SOIL BORINGS:

Number of Borings \_\_\_\_\_ Maximum \_\_\_\_\_  
Hole Diameter \_\_\_\_\_ in. Depth \_\_\_\_\_ ft.

ESTIMATED STARTING DATE 21 May 2012  
ESTIMATED COMPLETION DATE 23 May 2012

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

APPLICANT'S SIGNATURE [Signature] Date 5/7/12

- A. GENERAL**
1. A permit application should be submitted so as to arrive at the Zone 7 office five days prior to your proposed starting date.
  2. Submit to Zone 7 within 60 days after completion of permitted work the original **Department of Water Resources Water Well Drillers Report (DWR Form 188), signed by the driller.**
  3. Permit is void if project not begun within 90 days of approval date.
  4. **Notify Zone 7 at least 24 hours before the start of work.**

- B. WATER SUPPLY WELLS**
1. Minimum surface seal diameter is four inches greater than the well casing diameter.
  2. Minimum seal depth is 50 feet for municipal and industrial wells or 20 feet for domestic and irrigation wells unless a lesser depth is specially approved.
  3. Grout placed by tremie.
  4. An access port at least 0.5 inches in diameter is required on the wellhead for water level measurements.
  5. A sample port is required on the discharge pipe near the wellhead.

- C. GROUNDWATER MONITORING WELLS INCLUDING PIEZOMETERS**
1. Minimum surface seal diameter is four inches greater than the well or piezometer casing diameter.
  2. Minimum seal depth for monitoring wells is the maximum depth practicable or 20 feet.
  3. Grout placed by tremie.

- D. GEOTECHNICAL.** Backfill bore hole with compacted cuttings or heavy bentonite and upper two feet with compacted material. In areas of known or suspected contamination, tremied cement grout shall be used in place of compacted cuttings.

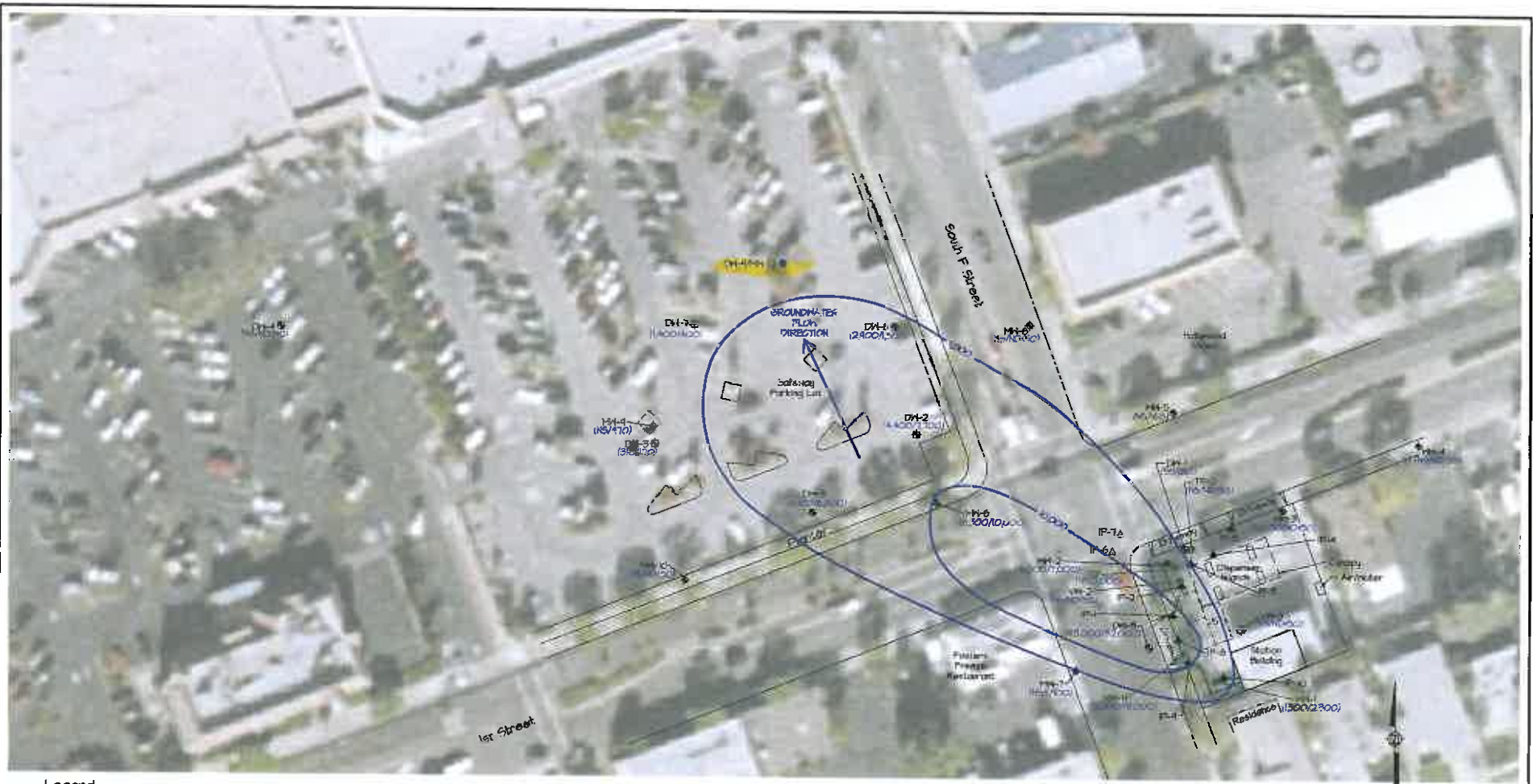
- E. CATHODIC.** Fill hole above anode zone with concrete placed by tremie.

- F. WELL DESTRUCTION.** See attached.

- G. SPECIAL CONDITIONS.** Submit to Zone 7 within 60 days after completion of permitted work the well installation report **including all soil and water laboratory analysis results.**

Approved [Signature] Date 5/22/12  
Wyman Hong

ATTACH SITE PLAN OR SKETCH



3/9/2012 6:56PM 0:LV11B-20800.dwg

**Legend**

- MW-7 Groundwater Monitoring Well with 3 and 4 August 2011 and 10, 11 and 25 October 2011 Total Petroleum Hydrocarbons as Gasoline (TPHg) Results in µg/L
- MW-1 Deep Groundwater Monitoring Well with 3 and 4 August 2011 and 10, 11 and 25 October 2011 TPHg Results in µg/L
- IP-1 Injection Well
- IP-6 Angled Injection Well Screen Location
- DW-9/MW-12 Proposed Dual-Nested Groundwater Monitoring Well

- VE-2 Vapor Extraction Well with 3 and 4 August 2011 and 10, 11 and 25 October 2011 TPHg Results in µg/L
- TP-2 Monitoring Well/Vapor Extraction Well with 3 and 4 August 2011 and 10, 11 and 25 October 2011 TPHg Results in µg/L
- 1000 TPHg Concentration Contour (µg/L), Queried Where Uncertain
- ND Not Detected
- NS Not Sampled
- (801,500) Previous Quarter/Current Quarter TPHg Results in µg/L



REVISION	NO.	BY	DATE	DESCRIPTION
	01	HY	5/15/12	Well Installation Mark Plan

ARCTOS ENVIRONMENTAL			
TESORO - LIVERMORE			
<b>SITE PLAN WITH TPHg CONCENTRATION CONTOURS</b>			
PROJECT NO. OILV	DRAWN BY HY	CHECKED BY MN	APPROVED BY MP
FILE NO. OILVIB-20800.DWG	FIGURE 2		

**ATTACHMENT I**

**ZONE 7 WATER AGENCY**  
**WELL COMPLETION REPORTS**

**CONFIDENTIAL**

STATE OF CALIFORNIA DWR  
WELL COMPLETION REPORT  
(WELL LOGS)

**REMOVED**

**Project: Tesoro - Livermore**  
**Project Location: 1619 1st Street, Livermore, CA**  
**Project Number: 01LV**

**Log of Boring / Well MW-12**

Sheet 1 of 2

Date(s) Drilled	6/5/12			Logged By	M. Purchase	Checked By	M. Nelson
Drilling Method	Hollow-Stem Auger			Drill Bit Size/Type	10-inch-OD auger	Total Depth of Borehole	45.0 feet
Drill Rig Type	Marl M11			Drilling Contractor	Gregg Drilling & Testing	Surface Elevation	To be determined
Groundwater Level (feet bgs)	First 40	Completion --	Development --	Sampling Method	No sampling performed	Top of Casing Elevation	Not available
Diameter of Hole (inches)	10	Diameter of Well (inches)	4	Type of Well Casing	4-inch-dia. Schedule 40 PVC	Screen Perforation	0.020-inch slot (25-45 ft)
Type of Sand Pack	Monterey #2/12 (23-45 feet)			Type and Depth of Seal(s)	Hydrated bentonite chips 21-23 ft, portland cement 2-21 ft, concrete 0-2 ft		
Comments	Located at NW corner of 1st and P St., in Safeway parking log. Completed at surface with 12-inch-dia. flush-mount well vault.						

Elevation, feet	SAMPLES			Graphic Log	MATERIAL DESCRIPTION	Well Completion Diagram	Headspace PID, ppm	Background PID, ppm	Drilling Progress, 24-hour clock	REMARKS
	Type	Number	Blows / 6 in.							
0					Asphalt 4 inches thick					Hand auger first 5 ft.
5					<p>MW-12 was installed adjacent to DW-9. The borehole for well MW-12 was advanced to total depth of 45 feet without collecting samples or observing cuttings. Refer to Log of Boring/Well DW-9 for lithology at this location.</p>					
10										
15										
20										
25										
30										

ORION\_1W; TESLMOR.GPJ-MW-12; 6/21/12



**Project: Tesoro - Livermore**  
**Project Location: 1619 1st Street, Livermore, CA**  
**Project Number: 01LV**

**Log of Boring / Well MW-12**

Sheet 2 of 2

Elevation, feet	SAMPLES			Graphic Log	MATERIAL DESCRIPTION	Well Completion Diagram	Headspace PID, ppm	Background PID, ppm	Drilling Progress, 24-hour clock	REMARKS
	Type	Number	Blows / 6 in.							
30					MW-12 was installed adjacent to DW-9. The borehole for well MW-12 was advanced to total depth of 45 feet without collecting samples or observing cuttings. Refer to Log of Boring/Well DW-9 for lithology at this location.					
35										
40										
45					Bottom of boring at 45.0 feet					
50										
55										
60										
65										
70										

ORION\_1W; TESLMOR.GPJ-MW-12; 6/21/12

**CONFIDENTIAL**

STATE OF CALIFORNIA DWR  
WELL COMPLETION REPORT  
(WELL LOGS)

**REMOVED**

**Project: Tesoro - Livermore**  
**Project Location: 1619 1st Street, Livermore, CA**  
**Project Number: 01LV**

**Log of Boring / Well DW-9**

Sheet 1 of 3

Date(s) Drilled	6/4/12 (well installed 6/5/12)			Logged By	M. Purchase	Checked By	M. Nelson
Drilling Method	Hollow-Stem Auger			Drill Bit Size/Type	8-inch-OD auger for sampling; 10-inch-OD auger for reaming	Total Depth of Borehole	80.0 feet
Drill Rig Type	Marl M11			Drilling Contractor	Gregg Drilling & Testing	Surface Elevation	To be determined
Groundwater Level (feet bgs)	First	Completion	Development	Sampling Method	California Modified split spoon	Top of Casing Elevation	To be determined
	40	--	--				
Diameter of Hole (inches)	10	Diameter of Well (inches)	4	Type of Well Casing	4-inch-dia. Schedule 40 PVC	Screen Perforation	0.020-inch slot (50-60 ft)
Type of Sand Pack	#2/12 Monterey (48-62 ft)			Type and Depth of Seal(s)	Hydrated bentonite chips 62-80 ft and 46-48 ft, portland cement grout 2-46 ft, concrete 0-2 ft		
Comments	Located at NW corner of 1st and P St., in Safeway parking log. Completed at surface with 12-inch-dia. flush-mount well vault.						

Elevation, feet	Depth, feet	SAMPLES			Graphic Log	MATERIAL DESCRIPTION	Well Completion Diagram	Headspace PID, ppm	Background PID, ppm	Drilling Progress, 24-hour clock	REMARKS
		Type	Number	Blows / 6 in.							
0						Asphalt at surface					Hand auger first 5 ft.
						Subsurface material not observed or logged during hand augering to depth of 5 feet.					
5		⊗ DW-9@5		13 29 30		Dense, moist, brown, well-graded SAND with GRAVEL (SW), fine- to coarse-grained sand, fine to coarse subangular gravel to 1-1/2 inches, no odor		0.2	0.1	0809	
10				15 50/2"				0.3	0.1		
15		⊗ DW-9@15		14 20 17		Medium dense, moist, brown, SILTY SAND (SM), fine- to coarse-grained sand, trace fine subangular gravel to 1/2 inch, no odor		0.2	0.2	0820	PID in operator breathing zone (OBZ) = 0.0 ppm
20		⊗ DW-9@20		17 25 10		Very stiff to hard, moist, brown, SILT with SAND (ML), fine- to coarse-grained sand, trace clay, trace fine subrounded gravel to 1/2 inch, no odor		0.3	0.1	0830	
25		⊗ DW-9@25		7 7 7		Stiff, moist, brown, SILT (ML), trace clay, no odor		0.4	0.1	0837	OBZ PID=0.1 ppm
30		⊗ DW-9@30		5 7 8		Stiff, moist, brown, SANDY SILT (ML), fine-grained sand, no odor		--	--	0845	

ORION\_1W; TESLMOR.GPJ-DW-09; 6/21/12

**Project: Tesoro - Livermore**  
**Project Location: 1619 1st Street, Livermore, CA**  
**Project Number: 01LV**

**Log of Boring / Well DW-9**

Sheet 2 of 3

Elevation, feet	Depth, feet	SAMPLES			Graphic Log	MATERIAL DESCRIPTION	Well Completion Diagram	Headspace PID, ppm	Background PID, ppm	Drilling Progress, 24-hour clock	REMARKS
		Type	Number	Blows / 6 in.							
30					Stiff, moist, brown, SANDY SILT (ML), fine-grained sand, no odor (continued)						
35	34.5			10 12 15	Medium dense, moist to wet, brown, well-graded SAND with SILT (SW-SM), fine- to coarse-grained sand, ~10% silt, trace fine to coarse subangular gravel to 1 inch, no odor		0.7	0.1	0850	OBZ PID=0.1 ppm	
40	39.5	⊗	DW-9@40	17 17 25	Dense, wet, brown, poorly graded SAND (SP), medium- to coarse-grained sand, ~10% fine to coarse subangular to subrounded gravel to 1 inch, trace clay, no odor	▽	5.8	0.1	0858		
45	44.5	⊗	DW-9@45	17 23 26	Dense, wet, brown, poorly graded SAND with GRAVEL (SP), medium- to coarse-grained sand, ~20% fine to coarse subangular to subrounded gravel to 1 inch, trace clay, no odor		12	0.1	0905	OBZ PID=0.0 ppm	
50	49.5	⊗	DW-9@50	6 14 31	Dense, wet, brown, well-graded SAND (SW), fine- to coarse-grained sand, trace fines, trace fine gravel to 3/4 inch, odor		132	0.1	0915		
55	54.5			50/5"	↓ Becomes very dense		836	0.2		OBZ PID=0.1 ppm	
60	59.5	⊗	DW-9@60	14 17 17	↓ Becomes medium dense		---	---	0930		
65	64.5	⊗	DW-9@65	12 17 50/2"	↓ Becomes dense to very dense, slight odor		34	0.1	0945		
70	69.5	⊗	DW-9@70	12 15 18	Stiff, wet, brown, SANDY SILT (ML), fine-grained sand, trace coarse-grained sand, slight odor		25	0.1	1000		

ORION\_1W\_TESLMOR.GPJ-DW-09: 6/21/12

**Project: Tesoro - Livermore**  
**Project Location: 1619 1st Street, Livermore, CA**  
**Project Number: 01LV**

**Log of Boring / Well DW-9**

Sheet 3 of 3

Elevation, feet	Depth, feet	SAMPLES		Graphic Log	MATERIAL DESCRIPTION	Well Completion Diagram	Headspace PID, ppm	Background PID, ppm	Drilling Progress, 24-hour clock	REMARKS
		Type	Number							
70					Stiff, wet, brown, SANDY SILT (ML), fine-grained sand, trace coarse-grained sand, slight odor (continued)					
	75	⊗	DW-9@75	12 18 25			18	0.2	1015	OBZ PID=0.0 ppm
	80	⊗	DW-9@80	10 17 33	Dense, wet, brown, SILTY SAND (SM), fine- to coarse-grained sand, trace fine to coarse subrounded gravel to 1 inch, no odor		11	0.2	1025	
					<b>Bottom of boring at 80.0 feet</b>  At completion of drilling on 6/4/12, backfilled 8-inch-dia. borehole to 62 feet below grade with bentonite chips.  On 6/5/12, overdrilled borehole to 62 feet with 10-inch-dia. auger and installed well using materials and placement depths recorded on sheet 1 and shown in well completion schematic.					
	85									
	90									
	95									
	100									
	105									
	110									

ORION\_1W; TESLMOR.GPJ-DW-09; 6/21/12


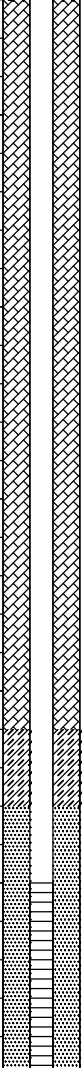
**ATTACHMENT J**  
**BORING AND WELL CONSTRUCTION LOGS**

**Project: Tesoro - Livermore**  
**Project Location: 1619 1st Street, Livermore, CA**  
**Project Number: 01LV**

**Log of Boring / Well MW-12**

Sheet 1 of 2

Date(s) Drilled	6/5/12			Logged By	M. Purchase	Checked By	M. Nelson
Drilling Method	Hollow-Stem Auger			Drill Bit Size/Type	10-inch-OD auger	Total Depth of Borehole	45.0 feet
Drill Rig Type	Marl M11			Drilling Contractor	Gregg Drilling & Testing	Surface Elevation	To be determined
Groundwater Level (feet bgs)	First	Completion	Development	Sampling Method	No sampling performed	Top of Casing Elevation	Not available
	40	--	--				
Diameter of Hole (inches)	10	Diameter of Well (inches)	4	Type of Well Casing	4-inch-dia. Schedule 40 PVC	Screen Perforation	0.020-inch slot (25-45 ft)
Type of Sand Pack	Monterey #2/12 (23-45 feet)			Type and Depth of Seal(s)	Hydrated bentonite chips 21-23 ft, portland cement 2-21 ft, concrete 0-2 ft		
Comments	Located at NW corner of 1st and P St., in Safeway parking log. Completed at surface with 12-inch-dia. flush-mount well vault.						

Elevation, feet	SAMPLES			Graphic Log	MATERIAL DESCRIPTION	Well Completion Diagram	Headspace PID, ppm	Background PID, ppm	Drilling Progress, 24-hour clock	REMARKS
	Type	Number	Blows / 6 in.							
0					Asphalt 4 inches thick					Hand auger first 5 ft.
5					<p>MW-12 was installed adjacent to DW-9. The borehole for well MW-12 was advanced to total depth of 45 feet without collecting samples or observing cuttings. Refer to Log of Boring/Well DW-9 for lithology at this location.</p>					
10										
15										
20										
25										
30										

ORION\_1W; TESLMOR.GPJ-MW-12; 6/21/12

**Project: Tesoro - Livermore**  
**Project Location: 1619 1st Street, Livermore, CA**  
**Project Number: 01LV**

**Log of Boring / Well MW-12**

Sheet 2 of 2

Elevation, feet	SAMPLES			Graphic Log	MATERIAL DESCRIPTION	Well Completion Diagram	Headspace PID, ppm	Background PID, ppm	Drilling Progress, 24-hour clock	REMARKS
	Type	Number	Blows / 6 in.							
30					MW-12 was installed adjacent to DW-9. The borehole for well MW-12 was advanced to total depth of 45 feet without collecting samples or observing cuttings. Refer to Log of Boring/Well DW-9 for lithology at this location.					
35										
40										
45					Bottom of boring at 45.0 feet					
50										
55										
60										
65										
70										

ORION\_1W; TESLMOR.GPJ-MW-12; 6/21/12



**Project: Tesoro - Livermore**  
**Project Location: 1619 1st Street, Livermore, CA**  
**Project Number: 01LV**

**Log of Boring / Well DW-9**

Sheet 1 of 3

Date(s) Drilled	6/4/12 (well installed 6/5/12)			Logged By	M. Purchase	Checked By	M. Nelson
Drilling Method	Hollow-Stem Auger			Drill Bit Size/Type	8-inch-OD auger for sampling; 10-inch-OD auger for reaming	Total Depth of Borehole	80.0 feet
Drill Rig Type	Marl M11			Drilling Contractor	Gregg Drilling & Testing	Surface Elevation	To be determined
Groundwater Level (feet bgs)	First	Completion	Development	Sampling Method	California Modified split spoon	Top of Casing Elevation	To be determined
	40	--	--				
Diameter of Hole (inches)	10	Diameter of Well (inches)	4	Type of Well Casing	4-inch-dia. Schedule 40 PVC	Screen Perforation	0.020-inch slot (50-60 ft)
Type of Sand Pack	#2/12 Monterey (48-62 ft)			Type and Depth of Seal(s)	Hydrated bentonite chips 62-80 ft and 46-48 ft, portland cement grout 2-46 ft, concrete 0-2 ft		
Comments	Located at NW corner of 1st and P St., in Safeway parking log. Completed at surface with 12-inch-dia. flush-mount well vault.						

Elevation, feet	Depth, feet	SAMPLES			Graphic Log	MATERIAL DESCRIPTION	Well Completion Diagram	Headspace PID, ppm	Background PID, ppm	Drilling Progress, 24-hour clock	REMARKS
		Type	Number	Blows / 6 in.							
0						Asphalt at surface					Hand auger first 5 ft.
						Subsurface material not observed or logged during hand augering to depth of 5 feet.					
5		⊗ DW-9@5		13 29 30		Dense, moist, brown, well-graded SAND with GRAVEL (SW), fine- to coarse-grained sand, fine to coarse subangular gravel to 1-1/2 inches, no odor		0.2	0.1	0809	
10				15 50/2"				0.3	0.1		
15		⊗ DW-9@15		14 20 17		Medium dense, moist, brown, SILTY SAND (SM), fine- to coarse-grained sand, trace fine subangular gravel to 1/2 inch, no odor		0.2	0.2	0820	PID in operator breathing zone (OBZ) = 0.0 ppm
20		⊗ DW-9@20		17 25 10		Very stiff to hard, moist, brown, SILT with SAND (ML), fine- to coarse-grained sand, trace clay, trace fine subrounded gravel to 1/2 inch, no odor		0.3	0.1	0830	
25		⊗ DW-9@25		7 7 7		Stiff, moist, brown, SILT (ML), trace clay, no odor		0.4	0.1	0837	OBZ PID=0.1 ppm
30		⊗ DW-9@30		5 7 8		Stiff, moist, brown, SANDY SILT (ML), fine-grained sand, no odor		--	--	0845	

ORION\_1W; TESLMOR.GPJ-DW-09; 6/21/12

**Project: Tesoro - Livermore**  
**Project Location: 1619 1st Street, Livermore, CA**  
**Project Number: 01LV**

**Log of Boring / Well DW-9**

Sheet 2 of 3

Elevation, feet	Depth, feet	SAMPLES			Graphic Log	MATERIAL DESCRIPTION	Well Completion Diagram	Headspace PID, ppm	Background PID, ppm	Drilling Progress, 24-hour clock	REMARKS
		Type	Number	Blows / 6 in.							
30											
						Stiff, moist, brown, SANDY SILT (ML), fine-grained sand, no odor (continued)					
	35			10 12 15		Medium dense, moist to wet, brown, well-graded SAND with SILT (SW-SM), fine- to coarse-grained sand, ~10% silt, trace fine to coarse subangular gravel to 1 inch, no odor		0.7	0.1	0850	OBZ PID=0.1 ppm
	40			17 17 25		Dense, wet, brown, poorly graded SAND (SP), medium- to coarse-grained sand, ~10% fine to coarse subangular to subrounded gravel to 1 inch, trace clay, no odor		5.8	0.1	0858	
	45			17 23 26		Dense, wet, brown, poorly graded SAND with GRAVEL (SP), medium- to coarse-grained sand, ~20% fine to coarse subangular to subrounded gravel to 1 inch, trace clay, no odor		12	0.1	0905	OBZ PID=0.0 ppm
	50			6 14 31		Dense, wet, brown, well-graded SAND (SW), fine- to coarse-grained sand, trace fines, trace fine gravel to 3/4 inch, odor		132	0.1	0915	
	55			50/5"		▼ Becomes very dense		836	0.2		OBZ PID=0.1 ppm
	60			14 17 17		▼ Becomes medium dense		---	---	0930	
	65			12 17 50/2"		▼ Becomes dense to very dense, slight odor		34	0.1	0945	
	70			12 15 18		Stiff, wet, brown, SANDY SILT (ML), fine-grained sand, trace coarse-grained sand, slight odor		25	0.1	1000	

ORION\_1W: TESLMOR.GPJ-DW-09: 6/21/12

**Project: Tesoro - Livermore**  
**Project Location: 1619 1st Street, Livermore, CA**  
**Project Number: 01LV**

**Log of Boring / Well DW-9**

Sheet 3 of 3

Elevation, feet	SAMPLES			Graphic Log	MATERIAL DESCRIPTION	Well Completion Diagram	Headspace PID, ppm	Background PID, ppm	Drilling Progress, 24-hour clock	REMARKS
	Type	Number	Blows / 6 in.							
70					Stiff, wet, brown, SANDY SILT (ML), fine-grained sand, trace coarse-grained sand, slight odor (continued)					
75	⊗	DW-9@75	12 18 25				18	0.2	1015	OBZ PID=0.0 ppm
80	⊗	DW-9@80	10 17 33		Dense, wet, brown, SILTY SAND (SM), fine- to coarse-grained sand, trace fine to coarse subrounded gravel to 1 inch, no odor		11	0.2	1025	
					<b>Bottom of boring at 80.0 feet</b>  At completion of drilling on 6/4/12, backfilled 8-inch-dia. borehole to 62 feet below grade with bentonite chips.  On 6/5/12, overdrilled borehole to 62 feet with 10-inch-dia. auger and installed well using materials and placement depths recorded on sheet 1 and shown in well completion schematic.					
85										
90										
95										
100										
105										
110										

ORION\_1W; TESLMOR.GPJ-DW-09; 6/21/12

**ATTACHMENT K**  
**WELL INSTALLATION AND FIELD INVESTIGATION**  
**QA/QC PROCEDURES**

**ATTACHMENT K**  
**WELL INSTALLATION AND FIELD INVESTIGATION QA/QC PROCEDURES**

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### **Hollow-Stem Auger Drilling and Sampling**

Before initiating drilling activities, Arctos marked the well locations and contacted underground service alert (USA) to clear the area of subsurface lines and utilities. Arctos also obtained boring and well permits from Zone 7 Water Agency (Attachment H).

The soil boring for DW-9 was advanced with 8-inch-diameter, hollow-stem, continuous-flight augers. Soil samples were collected using a split-spoon sampler (California-modified or similar) containing three brass tubes, each 2 inches in diameter and 6 inches in length. The sampler was driven to the sampling depth by dropping a 140-pound hammer approximately 30 inches. Samples were collected for visual logging at various depth intervals with the objectives of observing and describing the locations of lithologic units and obtaining representative samples for physical and/or chemical analysis. Soil samples were collected at 5 feet below ground surface and at 5-foot intervals thereafter.

After the sampler was retrieved from the auger, it was placed on a portable field stand near the boring and the tubes were removed. The ends of one of the tubes were covered with Teflon sheeting, capped with polyvinyl chloride (PVC) end caps, and placed in a sealable plastic bag. A portion of the soil from one of the tubes was extruded and placed in a sealable plastic bag, which was closed and allowed to equilibrate for approximately 10 minutes. The organic vapor levels in the headspace were measured using a field photoionization detector.

The same sample was visually examined and the results of the visual observation and headspace reading were recorded on the boring logs. Soil samples were examined for staining or odors. Soils were classified following the Unified Soil Classification System.

#### Equipment Decontamination Procedures

Soil sampling equipment was decontaminated between sampling events using the following procedures:

- Rinse with water using a brush to remove soil and mud
- Wash with non-phosphate detergent and water using a brush
- Rinse with deionized water
- Rinse again with deionized water
- Air dry.

Brass tubes and end caps were new or cleaned using the decontamination procedures described above. Drill augers were steam-cleaned before each boring is drilled.

#### Management of Drill Cuttings and Wastewater

Drill cuttings and wastewater were placed in 55-gallon drums that meet U.S. Department of Transportation (DOT) specifications and stored on site. Each drum was labeled with the date and drum contents. The soil was transported off site by Belshire Environmental Services, Inc., (Belshire), of Lake Forest, California, for recycling as a non-hazardous waste at the TPST Soil Recyclers of California facility in Adelanto, California. Wastewater was transported off site by Belshire for recycling as a non-hazardous waste at the DeMenno/Kerdoon facility in Compton, California. Manifests for the soil and wastewater disposal are included in Attachment N.

#### Documentation Procedures

Arctos personnel followed documentation procedures developed for site investigation work. The procedures serve to provide a record of the activities performed in the field.

Arctos field personnel were on site to observe the progress of sampling and to log the borings. The information recorded on the boring logs included drilling equipment used, boring locations, nature of the materials encountered, sampling depths, time of day, and other pertinent data. The boring logs were drafted for presentation in this report (Attachment J).

### **Well Installation**

An Arctos engineer supervised the well construction and installation. Shallow and deep monitoring wells, designated as MW-12 and DW-9, respectively, were installed offsite in the Safeway parking lot. The objective of the downgradient monitoring wells is to monitor downgradient migration of petroleum hydrocarbon-impacted groundwater in the deep and shallow intervals. The soil boring for the installation of well DW-9 was drilled with 8-inch-diameter hollow-stem continuous-flight augers to create a pilot hole, and then over drilled with 10-inch-diameter hollow-stem continuous-flight augers. The soil boring for the installation of well MW-12 was blind-drilled with 10-inch-diameter hollow-stem continuous-flight augers.

The monitoring wells were constructed using 4-inch-diameter, flush-threaded Schedule 40 PVC casing. Well MW-12 was screened from 25 to 45 feet below grade using 0.020-inch slotted screen. Well DW-9 was screened from 50 to 60 feet below grade using 0.020-inch slotted screen. A Monterey #2/12 sand pack filled the annular space around the casings to approximately 2 feet above the screened intervals. A 2- to 3-foot thick bentonite seal was placed on top of the sand pack. The remaining annular space was filled with Portland cement slurry. The monitoring wells were completed at the surface with 12-inch-diameter traffic-rated vaults set in concrete. Well construction diagrams are shown in Attachment I.

A licensed surveyor surveyed the elevation and location of the new wells on 12 June 2012 following the requirements of State Assembly Bill 2886. The locations were measured to the nearest 1/10 foot and the elevations to the nearest 1/100 foot relative to mean sea level.

### **Well Development**

The wells were developed approximately 72 hours after installation. Well development activities were recorded on Well Development Logs (Attachment L). Immediately before well development commenced, the depth to groundwater and total well depth were measured using an electric water well sounder with an accuracy of 0.01 feet. A Smeal rig outfitted with a surge block continuously swabbed the well screen at 5-foot intervals for 15 minutes. Immediately following surging, a stainless steel bottom bailer was used to remove fines from the water column. After bailing, a stainless steel pump was lowered into the well to rapidly evacuate fines.

Field measurements of the evacuated groundwater were collected at regular intervals including pH, specific conductivity, temperature, and turbidity. Development was considered complete when pH, temperature, and specific conductivity measurements of the evacuated groundwater stabilized to within 10 percent of the previous readings and turbidity readings dropped below 50 Nephelometric Turbidity Units, or 10 casing volumes of groundwater were evacuated from the well.

Wastewater generated during well development was stored on site in 55-gallon drums that meet DOT specifications. Belshire transported the wastewater off site for recycling as a non-hazardous waste to the DeMenno Kerdoon facility in Los Angeles, California. Manifests for the wastewater disposal are included in Attachment N.

### **Cone Penetration Test (CPT) Drilling**

CPT borings were advanced using a 20-ton capacity integrated electronic cone system advanced by direct-push using the weight of the rig. The cone takes measurements of cone bearing (qc), sleeve friction (fs), and dynamic pore water pressure (u<sub>2</sub>) at 5-centimeter intervals during penetration to provide a nearly continuous geologic log. Soil behavior type and stratigraphic interpretation is based on relationships between cone bearing, sleeve friction, and dynamic pore water pressure (Robertson, 1990). The boring logs are in Attachment J.

### **Grab Groundwater Sampling Procedures**

A direct-push groundwater sampler (consisting of a 5-foot-long screen inside a metal sheath) was advanced hydraulically within the soil boring to the depth of permeable zones identified from soil sampling. The sampling tool was then retracted, exposing the inlet screen and allowing groundwater to enter the chamber. The sampling tool remained in

the ground until a sufficient volume of water entered the chamber and a water sample could be collected.

The groundwater sample was collected using new 3/8-inch Teflon tubing equipped with a bottom check valve. The tubing was lowered into the well casing until it reached the water collected in the bottom of the well screen. The tubing was oscillated up and down, and the water sample was pushed upward into the tubing as the check valve repeatedly lifted and seated. When an adequate amount of water filled the tubing, the tubing was removed from the sampling tool.

Water was decanted from the tubing into a new 40-milliliter glass bottle with Teflon-lined caps provided by the analytical laboratory. The grab sample was collected so that no headspace was present in the bottle. The preservative necessary for the analyses performed was provided in the glass bottle by the analytical laboratory.

### **General Field Quality Assurance/Control Procedures**

See Attachment A for personal decontamination and health and safety procedures.

### **Reference**

Robertson, P.K, 1990. *Soil Classification using the Cone Penetration Test*, Canadian Geotechnical Journal, Volume 27.



**ATTACHMENT L**  
**WELL DEVELOPMENT LOG**





# MONITORING WELL DEVELOPMENT LOG

All measurements taken from:  Top of Casing  Protective Casing  Ground Level

Sample ID \_\_\_\_\_

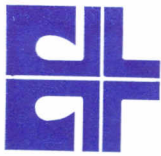
Well Number DW-9  
 Date 6.7.12  
 Time Start: 7:05 End: 9:40  
 Client ARCTORS  
 Project 554 1st, Livermore  
 Job Number D2080398  
 Installation Date \_\_\_\_\_  
 Well Diameter 4"

Borehole Diameter 10"  
 Screen Length 10FT  
 Measured Depth (pre-development) 57.11  
 Measured Depth (post-development) 59.80  
 Static Water Level (ft.) 45.65  
 Standing Water Column (ft.) 14.15  
 One Well Volume (gal.) 9.339  
 One Annulus Vol. (gal.) \_\_\_\_\_

Qty. of Drilling Fluid Lost \_\_\_\_\_  
 Minimum Gal. to be Purged \_\_\_\_\_  
 Development Method Bail-Surge  
Bail-Pump  
 Purging Equipment SS Bailers - 3" pump  
 Water Level Equipment Solinst  
 pH/EC Meter HORZA U10  
 Turbidity Meter HORZA U10  
 Other \_\_\_\_\_

Time	Amount Purged (gal.)	Field Parameters Measured							GPM	W.L.	Comments	Field Tech.
		pH	EC	Turbidity	D.O.	D.O. Temp.	SAL					
8:45	50	7.45	1.27	488	-	18.8	.05	2	48.85	Bail-20		
8:50	60	7.11	1.15	200	-	18.4	.05	2	49.11	Surge 25 min		
8:55	70	6.85	1.18	124	-	18.6	.05	2	47.11	Bail-15		
9:00	80	6.88	1.16	112	-	18.8	.05	2	49.11			
9:05	90	6.86	1.15	74	-	18.4	.05	2	49.11			
9:10	100	6.87	1.14	69	-	18.6	.05	2	49.11			
9:15	110	6.89	1.13	71	-	18.2	.05	2	49.11			
9:20	120	6.84	1.12	75	-	18.4	.05	2	49.11			
9:25	130	6.85	1.15	72	-	18.7	.05	2	49.11			
<b>FINAL FIELD PARAMETER MEASUREMENTS</b>												

**ATTACHMENT M**  
**SITE SURVEY REPORT**



**CROSS LAND SURVEYING, INC.**

Consulting Land Surveyors • GPS Control Surveys

**KRISTINA D. COMERER, PLS 6766**

2210 Mt. Pleasant Road  
San Jose, CA 95148  
(408) 274-7994  
FAX (408) 270-8670

MONITORING WELL REPORT  
TESORO SITE  
1619 WEST FIRST STREET  
LIVERMORE, CALIFORNIA  
JUNE 11, 2012

WELL NO.	LATITUDE	LONGITUDE	CASING ELEV.	GROUND ELEV.	RISER HT.
DW-9	37.6798780 N	121.7767855 W	469.80	470.22	-0.42
MW-12	37.6798640 N	121.7767906 W	469.77	470.20	-0.43
DB-8	37.6794108 N	121.7768107 W		471.97	
DB-9	37.6796902 N	121.7768361 W		471.31	
DB-10	37.6796180 N	121.7766529 W		471.58	

Horizontal datum is NAD83 derived from a GPS Fast-Static survey holding California High Precision Geodetic Network Densification (HPGN-D) points CA 04-FK and CA 04-FL fixed horizontally, as published for epoch 1991.35, from the NGS Data Sheet, in a least squares adjustment of the GPS data.

Vertical datum is NGVD29. Found City of Livermore Bench Mark K2-741 being a brass pin in concrete, dn. 0.4' in easterly monument well at the intersection of S. "P" Street and Railroad Avenue. Published elevation for K2-741 is 467.835 feet, NGVD29, on file with the City of Livermore.

Monitoring well location is to a black mark on the northerly side of 4" PVC pipe casing. Ground elevations are to the center of the lid for the monitoring well.

*Kristina D. Comerer*

Kristina D. Comerer, PLS 6766

Date: June 12, 2012

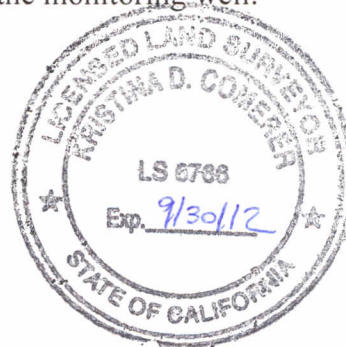


TABLE OF BORING COORDINATE VALUES  
HORIZONTAL DATUM--NAD83/VERTICAL DATUM--NGVD29

BORING	LATITUDE	LONGITUDE	BORING ELEV.
SG-1	37.6791912	121.7758364	474.41
SG-2	37.6792881	121.7757928	474.22
SG-3	37.6792864	121.7756919	474.46
SG-4	37.6793119	121.7758894	473.56
SG-5	37.6793315	121.7757811	474.12
SG-6	37.6793570	121.7756889	474.09
SG-7	37.6793620	121.7758664	473.56
SG-8	37.6793991	121.7757558	473.78
SG-9	37.6792596	121.7756289	474.80
DB-1	37.6793203	121.7759196	473.42
DB-2	37.6793686	121.7759036	473.27
DB-3	37.6793803	121.7758508	473.47
DB-4	37.6794084	121.7757639	473.61
DB-5	37.6795087	121.7765196	472.01
DB-6	37.6796013	121.7772700	469.35
DB-7	37.6796982	121.7778144	468.80
DB-8	37.6794108	121.7768107	471.97
DB-9	37.6796902	121.7768361	471.31
DB-10	37.6796180	121.7766529	471.58
MIP-1	37.6791890	121.7758908	473.71
MIP-2	37.6792114	121.7759009	473.61
MIP-3	37.6792381	121.7759121	473.55
MIP-4	37.6791955	121.7759559	473.03
MIP-5	37.6792186	121.7759670	472.97
MIP-6	37.6791726	121.7759432	473.06
MIP-7	37.6791618	121.7758745	474.27
MIP-8	37.6792086	121.7760069	473.32
MIP-9	37.6792503	121.7760295	473.16
MIP-10	37.6792452	121.7759833	472.98

TABLE OF WELL COORDINATE VALUES  
HORIZONTAL DATUM--NAD83/VERTICAL DATUM--NGVD29

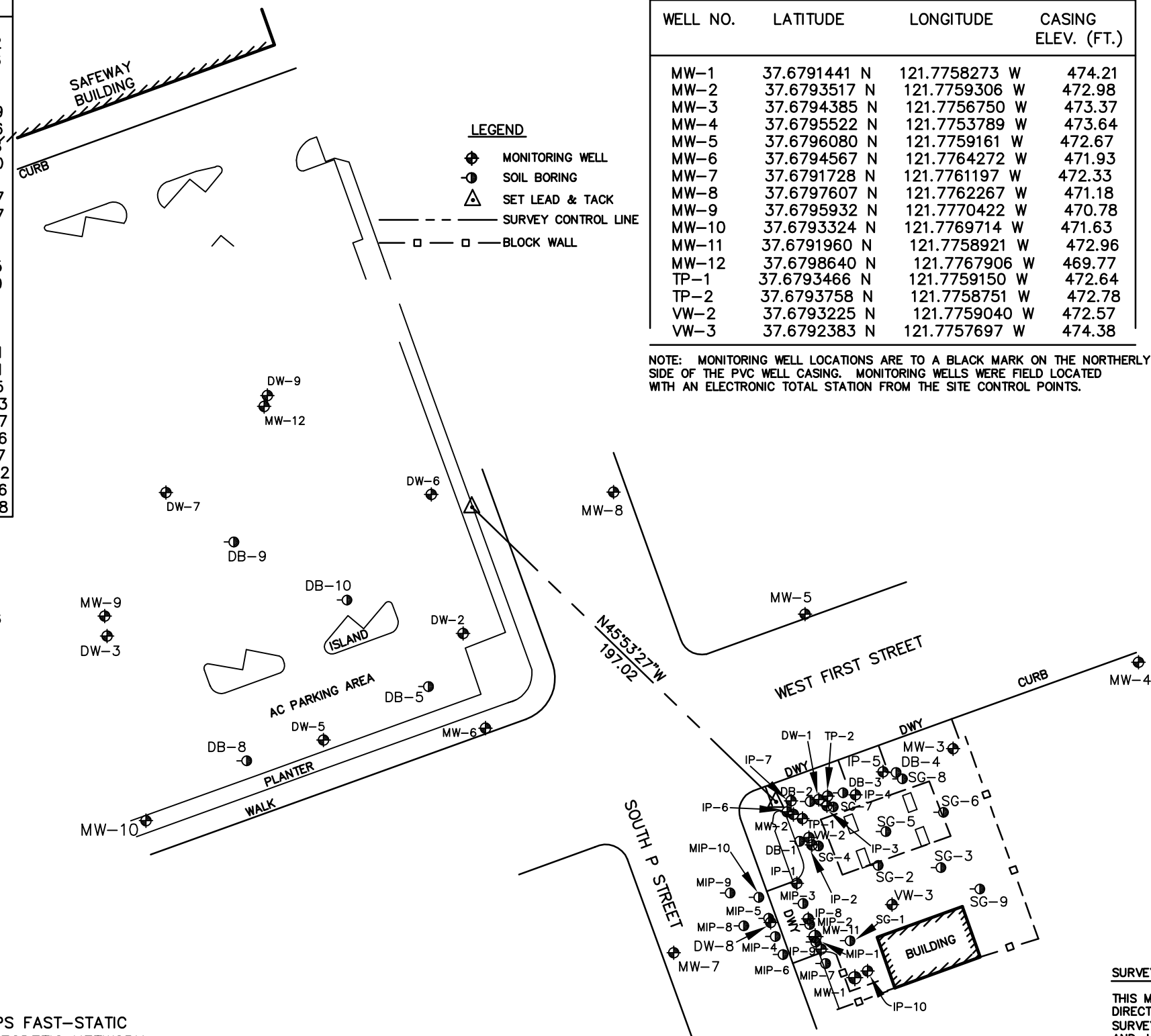
WELL NO.	LATITUDE	LONGITUDE	CASING ELEV. (FT.)
MW-1	37.6791441 N	121.7758273 W	474.21
MW-2	37.6793517 N	121.7759306 W	472.98
MW-3	37.6794385 N	121.7756750 W	473.37
MW-4	37.6795522 N	121.7753789 W	473.64
MW-5	37.6796080 N	121.7759161 W	472.67
MW-6	37.6794567 N	121.7764272 W	471.93
MW-7	37.6791728 N	121.7761197 W	472.33
MW-8	37.6797607 N	121.7762267 W	471.18
MW-9	37.6795932 N	121.7770422 W	470.78
MW-10	37.6793324 N	121.7769714 W	471.63
MW-11	37.6791960 N	121.7758921 W	472.96
MW-12	37.6798640 N	121.7767906 W	469.77
TP-1	37.6793466 N	121.7759150 W	472.64
TP-2	37.6793758 N	121.7758751 W	472.78
VW-2	37.6793225 N	121.7759040 W	472.57
VW-3	37.6792383 N	121.7757697 W	474.38

MONITORING WELL SURVEY  
TESORO SITE  
1619 WEST FIRST STREET  
LIVERMORE, CALIFORNIA  
AUGUST 31, 2005  
(REVISED JANUARY 9, 2007)  
(REVISED OCTOBER 16, 2008)  
(REVISED DECEMBER 18, 2008)  
(REVISED DECEMBER 2, 2009)  
(REVISED OCTOBER 19, 2010)  
(REVISED FEBRUARY 4, 2011)  
(REVISED APRIL 18, 2011)  
(REVISED JUNE 12, 2012)  
SCALE: 1" = 60'

TABLE OF WELL COORDINATE VALUES  
HORIZONTAL DATUM--NAD83/VERTICAL DATUM--NGVD29

WELL NO.	LATITUDE	LONGITUDE	CASING ELEV. (FT.)
IP-1	37.6792638 N	121.7759226 W	473.06
IP-2	37.6793131 N	121.7758990 W	473.06
IP-3	37.6793634 N	121.7758759 W	473.05
IP-4	37.6793779 N	121.7758302 W	473.10
IP-5	37.6794078 N	121.7757863 W	473.05
IP-6	37.6793551 N	121.7759395 W	472.43
IP-7	37.6793691 N	121.7759336 W	472.43
IP-8	37.6792187 N	121.7759034 W	473.22
IP-9	37.6791801 N	121.7758820 W	473.35
IP-10	37.6791530 N	121.7758069 W	473.88
DW-1	37.6793712 N	121.7758889 W	472.85
DW-2	37.6795773 N	121.7764647 W	471.61
DW-3	37.6795678 N	121.7770369 W	470.33
DW-4	37.6796795 N	121.7778064 W	468.48
DW-5	37.6794386 N	121.7766868 W	471.86
DW-6	37.6797544 N	121.7765190 W	471.77
DW-7	37.6797523 N	121.7769456 W	470.07
DW-8	37.6792134 N	121.7759646 W	472.31
DW-9	37.6798780 N	121.7767855 W	469.80

NOTE: MONITORING WELL LOCATIONS ARE TO A BLACK MARK ON THE NORTHERLY SIDE OF THE PVC WELL CASING. MONITORING WELLS WERE FIELD LOCATED WITH AN ELECTRONIC TOTAL STATION FROM THE SITE CONTROL POINTS.



HORIZONTAL DATUM IS NAD83 DERIVED FROM A GPS FAST-STATIC SURVEYING HOLDING CALIFORNIA HIGH PRECISION GEODETIC NETWORK DENSIFICATION (HPGN-D) POINTS CA 04-FK AND CA 04-FL FIXED HORIZONTALLY, AS PUBLISHED FOR EPOCH 1991.35, FROM THE NGS DATA SHEET, IN A LEAST SQUARES ADJUSTMENT OF THE GPS DATA.

VERTICAL DATUM IS NGVD29. FOUND CITY OF LIVERMORE BENCH MARK K2-741 BEING A BRASS PIN IN CONCRETE, DN. 0.4' IN EASTERLY MONUMENT WELL AT THE INTERSECTION OF S. "P" STREET AND RAILROAD AVENUE. PUBLISHED ELEVATION FOR K2-741 IS 467.835 FEET, NGVD29, ON FILE WITH THE CITY OF LIVERMORE.

**SURVEYOR'S STATEMENT**

THIS MAP CORRECTLY REPRESENTS A SURVEY MADE BY ME OR UNDER MY DIRECTION IN CONFORMANCE WITH THE REQUIREMENTS OF THE PROFESSIONAL LAND SURVEYORS' ACT AT THE REQUEST OF MIKE PURCHASE, AUGUST 2005, MARCH 2009 AND JANUARY 2007 AND MATTHEW NELSON IN SEPTEMBER 2008, DECEMBER 2009, OCTOBER 2010, FEBRUARY 4, 2011, APRIL 19, 2011, AND JUNE 12, 2012.

KRISTINA D. COMERER, PLS 6766

DATE: \_\_\_\_\_

CROSS LAND SURVEYING, INC.  
2210 MT. PLEASANT ROAD  
SAN JOSE, CA 95148  
(408) 274-7994  
PROJECT NO. 05-32



**ATTACHMENT N**  
**WASTE MANIFESTS**

# NON-HAZARDOUS WASTE MANIFEST

Print or type (Form designed for use on elite (12 pitch) typewriter)

<b>NON-HAZARDOUS WASTE MANIFEST</b>		1. Generator's US EPA ID No. <b>N/A</b>		Manifest Document No. <b>19777</b> <b>19729</b>		2. Page 1 of 1				
3. Generator's Name and Mailing Address <b>Tesaro Environmental Resource Co.</b> <b>3450 344th Way Auburn, WA 98001</b>				Tesaro # <b>67076</b> <b>1619 FIRST STREET.</b> <b>LIVERMORE, CA</b>						
4. Generator's Phone ( )										
5. Transporter 1 Company Name <b>EXCEL Environmental Services</b>		6. US EPA ID Number <b>CA 000209350</b>		A. State Transporter's ID						
				B. Transporter 1 Phone <b>800-376-6008</b>						
7. Transporter 2 Company Name		8. US EPA ID Number		C. State Transporter's ID						
				D. Transporter 2 Phone						
9. Designated Facility Name and Site Address <b>ROT (Riverbank Oil Transfer)</b> <b>5300 CLAWS RD.</b> <b>Riverbank, CA 95367</b>				US EPA ID Number <b>CA 000190816</b>		E. State Facility's ID				
				F. Facility's Phone <b>209-863-8181</b>						
11. WASTE DESCRIPTION						12. Containers		13. Total Quantity	14. Unit Wt./Vol.	
						No.	Type			
a. <b>NON HAZARDOUS WASTE WATER</b>						<b>EDI</b>	<b>11</b>	<b>700</b>	<b>G</b>	
b.										
c.										
d.										
G. Additional Descriptions for Materials Listed Above <b>NON HAZ WATER</b>						H. Handling Codes for Wastes Listed Above				
15. Special Handling Instructions and Additional Information <b>Gloves ERG 171</b>										
16. GENERATOR'S CERTIFICATION: I hereby certify that the contents of this shipment are fully and accurately described and are in all respects in proper condition for transport. The materials described on this manifest are not subject to federal hazardous waste regulations.										
Printed/Typed Name						Signature		Date		
								Month Day Year		
TRANSPORTER	17. Transporter 1 Acknowledgement of Receipt of Materials						Date			
	Printed/Typed Name <b>Peter Arroyo</b>						Signature <i>[Signature]</i>		Month Day Year <b>5 11 12</b>	
	18. Transporter 2 Acknowledgement of Receipt of Materials						Date			
	Printed/Typed Name <b>Tim Licgett</b>						Signature <i>[Signature]</i>		Month Day Year <b>5 11 12</b>	
FACILITY	19. Discrepancy Indication Space									
	20. Facility Owner or Operator; Certification of receipt of the waste materials covered by this manifest, except as noted in item 19.						Date			
Printed/Typed Name						Signature		Month Day Year		



# Manifest

## SOIL SAFE OF CA - TPST Non-Hazardous Soils

↓ Manifest # ↓

Date of Shipment: 1 1	Responsible for Payment:	Transport Truck #: 394/732	Facility #: A07	Approval Number: 393971001	Load #:
--------------------------	--------------------------	-------------------------------	--------------------	-------------------------------	---------

Generator's Name and Billing Address: TESORO P.O. BOX 80730 RANCHO SANTA MARGARITA, CA 92888	Generator's Phone #: 949-460-6200	Approval Number: CAR000142298
	Person to Contact:	
	FAX#:	Customer Account Number

Consultant's Name and Billing Address:	Consultant's Phone #:	
	Person to Contact:	
	FAX#:	Customer Account Number

Generation Site (Transport from): (name & address) TESORO 87070 (FORMER) 1010 FIRST ST. LIVERMORE, CA 94550	Site Phone #:	
	Person to Contact:	
	FAX#:	

Designated Facility (Transport to): (name & address) SOIL SAFE 12328 HIBISCUS AVENUE ADELANTO, CA 92301	Facility Phone #: (800) 982-8001	
	Person to Contact: DELLENA JEFFREY	
	FAX#: (780) 248-8004	

Transporter Name and Mailing Address: BELSHIRE 25071 TOWNE CENTRE DRIVE FOOTHILL RANCH, CA 92610 BESI: 200874	Transporter's Phone #: 949-460-6200	Approval Number: CAR000183813
	Person to Contact: LARRY MOOTHART	450647
	FAX#: 949-460-6210	Customer Account Number

Description of Soil	Moisture Content	Contaminated by:	Approx. Qty:	Description of Delivery	Gross Weight	Tare Weight	Net Weight
Sand <input type="checkbox"/> Organic <input type="checkbox"/> Clay <input type="checkbox"/> Other <input type="checkbox"/>	0 - 10% <input type="checkbox"/> 10 - 20% <input type="checkbox"/> 20% - over <input type="checkbox"/>	Gas <input type="checkbox"/> Diesel <input type="checkbox"/> Other <input type="checkbox"/>	16 drums		47640	37600	10040
Sand <input type="checkbox"/> Organic <input type="checkbox"/> Clay <input type="checkbox"/> Other <input type="checkbox"/>	0 - 10% <input type="checkbox"/> 10 - 20% <input type="checkbox"/> 20% - over <input type="checkbox"/>	Gas <input type="checkbox"/> Diesel <input type="checkbox"/> Other <input type="checkbox"/>					5.02

List any exception to items listed above: \_\_\_\_\_ Scale Ticket # 102418

Generator's and/or consultant's certification: I/We certify that the soil referenced herein is taken entirely from those soils described in the Soil Data Sheet completed and certified by me/us for the Generation Site shown above and nothing has been added or done to such soil that would alter it in any way.

Print or Type Name: Generator <input type="checkbox"/> Consultant <input type="checkbox"/> Larry Moothart of BESI on behalf of generator	Signature and date: 	Month Day Year 10/12/12
---	-------------------------	----------------------------

Transporter's certification: I/We acknowledge receipt of the soil referenced above and certify that such soil is being delivered in exactly the same condition as when received. I/We further certify that the soil is being directly transported from the Generation Site to the Designated Facility without off-loading, adding to, subtracting from or in any way delaying delivery to such site.

Print or Type Name: Kevin Dunsen	Signature and date: 	Month Day Year 10/12/12
-------------------------------------	-------------------------	----------------------------

Discrepancies: \_\_\_\_\_

Recycling Facility certifies the receipt of the soil covered by this manifest except as noted above:	
Print or Type Name: D. JEFFREY/J. PROVANSAL	Signature and date:  7-2-12

Please print or type.

NON-HAZARDOUS WASTE DATA FORM

BESI # 206874

Generator's Name and Mailing Address: TESORO, P.O. BOX 80730, RANCHO SANTA MARGARITA, CA 92688  
 Generator's Site Address (if different than mailing address): TESORO 67076 (FORMER), 1019 FIRST ST., LIVERMORE, CA 94550

Generator's Phone: 949-460-5200

Container type removed from site:  Drums  Vacuum Truck  Roll-off Truck  Dump Truck  
 Container type transported to receiving facility:  Drums  Vacuum Truck  Roll-off Truck  Dump Truck

Quantity: 4  
 Quantity: 1 Volume: 220 gallons

WASTE DESCRIPTION			GENERATING PROCESS		
COMPONENTS OF WASTE	PPM	%	COMPONENTS OF WASTE	PPM	%
1. WATER		99-100%	3.		
2. TPH		<1%	4.		

Waste Profile: \_\_\_\_\_ PROPERTIES: pH 7-10  SOLID  LIQUID  SLUDGE  SLURRY  OTHER \_\_\_\_\_

HANDLING INSTRUCTIONS: WEAR ALL APPROPRIATE PROTECTIVE CLOTHING.

Generator Printed/Typed Name: Larry Moothart of BESI on behalf of generator  
 Signature: [Signature]  
 Month Day Year: 6/12/12

The Generator certifies that the waste as described is 100% non-hazardous

Transporter 1 Company Name: BELSHIRE Phone#: 949-460-5200

Transporter 1 Printed/Typed Name: Larry Moothart  
 Signature: [Signature]  
 Month Day Year: 6/12/12

Transporter Acknowledgment of Receipt of Materials

Transporter 2 Company Name: NIETO & SONS TRUCKING, INC. Phone#: 714-990-8855

Transporter 2 Printed/Typed Name: Miguel Carro  
 Signature: [Signature]  
 Month Day Year: 6/15/12

Transporter Acknowledgment of Receipt of Materials

Designated Facility Name and Site Address: DEMENNO KERDOON, 2000 N. ALAMEDA ST., COMPTON, CA 90222  
 Phone#: 310-537-7100

Printed/Typed Name: Jose Ramos  
 Signature: [Signature]  
 Month Day Year: 6/15/12

Designated Facility Owner or Operator: Certification of receipt of materials covered by this data form.

GENERATOR

TRANSPORTER

RECEIVING FACILITY