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March 15, 2012

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

**Subject: In Situ Chemical Oxidation (ISCO) Pilot Test 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 ISCO pilot test 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 Matthew Nelson of Arctos Environmental at 562/988-2755 with questions.

Sincerely,

A handwritten signature in blue ink that reads "Jeffrey M. Baker".

Jeffrey M. Baker, P.E.
Supervisor, Environmental
Compliance & Remediation
Tesoro Companies, Inc.

Attachments

CC: Arctos – Matthew Nelson



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In Situ Chemical Oxidation (ISCO) Pilot Test Report

Tesoro Site No. 67076 (Former Beacon 3604)
1619 1st Street
Livermore, California

prepared for:

Tesoro Environmental Resources Company
3450 South 344th Way, Suite 201
Auburn, Washington 98001

March 2012

16 March 2012
Project No. 01LV

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

**Subject: In Situ Chemical Oxidation (ISCO) Pilot Test 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 report summarizing the results of an ISCO pilot test conducted at the subject site. The pilot test was performed in accordance with Arctos's September 2011 work plan approved by Alameda County Environmental Health in a letter dated 27 September 2011.

If you have questions or comments regarding this report, please call either Matthew Nelson at 562/988-2755 or Michael Purchase at 510/525-2180.

Very truly yours,

ARCTOS ENVIRONMENTAL



Matthew J. Nelson, P.E.
Project Engineer



Michael P. Purchase
Principal Engineer

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

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EXECUTIVE SUMMARY

Tesoro Environmental Resources Company (Tesoro) retained Arctos Environmental (Arctos) to conduct an in situ chemical oxidation (ISCO) pilot test at the site during the fourth quarter 2011. The objective of the pilot test was to evaluate the effectiveness of an oxidant (RegenOx™) in (1) destroying hydrocarbons and (2) desorbing hydrocarbons for removal by groundwater extraction. RegenOx™ was injected in a source area identified during a January 2011 membrane interface probe (MIP) investigation near injection well IP-9. RegenOx™ was effective at desorbing petroleum hydrocarbon mass from soil with a radius of influence of approximately 20 feet. However, the ISCO radius of influence for hydrocarbon destruction was limited to 10 feet because of the high oxidant demand surrounding the injection well. An estimated 130 pounds of total petroleum hydrocarbons (TPHg) were destroyed by chemical oxidation during the pilot test. Groundwater was extracted from the injection well and surrounding monitoring wells IP-8 and DW-8 to remove high TPHg concentrations after desorption. During the pilot test, 7,300 gallons of groundwater water was extracted with an average TPHg concentration of 55,000 micrograms per liter (µg/l), resulting in an estimated 3.7 pounds of TPHg removed from three wells. ISCO destroyed approximately 35 times the amount of mass removed by groundwater extraction during the pilot test.

Based on the results, Arctos recommends (1) continuing to monitor the groundwater response to injection activities in the pilot test area and (2) evaluating the expanded use of the same ISCO technology both on site and off site.

1.0 INTRODUCTION

Tesoro retained Arctos to conduct an ISCO pilot test at 1619 1st Street, Livermore, California (the site; Figure 1). The pilot test was conducted in the southwestern area of the site, adjacent to the underground storage tanks (USTs). Arctos performed three injections of the RegenOx™ chemical oxidant and three groundwater extraction events. The pilot test was performed in accordance with Arctos's September 2011 work plan approved by Alameda County Environmental Health (ACEH) in a letter dated 27 September 2011 (Arctos, 2011 and ACEH, 2011).

1.1 Background

A soil vapor extraction (SVE) system was installed in June 2010 to remediate hydrocarbon-impacted vadose zone soil and saturated soil exposed during periods of low groundwater levels. The system removes hydrocarbon mass from the exposed soil and assists with groundwater remediation. Arctos started an oxygen injection system on 18 October 2010 to enhance the biodegradation of petroleum hydrocarbons in groundwater on site.

Arctos performed a MIP investigation in January 2011 to assess the lateral and vertical extent of free product after it was detected at the site on 25 October 2010 in well IP-8. The highest impacts were generally encountered between 55 and 70 feet below grade in the southwest portion of the site near the USTs. These impacts were approximately 20 feet below the top of the current water table. Based on the results of the MIP borings, Arctos installed deep monitoring well DW-8 on 13 April 2011 downgradient of the USTs. The highest TPHg and benzene concentrations in groundwater at the site are currently reported at well DW-8 (Figure 2).

A complete site description and background are included in Appendix A.

1.2 Objective and Scope of Work

The objective of the pilot test was to evaluate the effectiveness of RegenOx™ in (1) destroying hydrocarbons and (2) desorbing hydrocarbons for removal by groundwater extraction. To complete the pilot test objective, Arctos conducted the following scope of work:

- Obtained a temporary permit to discharge treated wastewater into the sanitary sewer from City of Livermore
- Performed baseline groundwater monitoring of injection well IP-9 and designated monitoring wells
- Injected 900 pounds of RegenOx™ activator complex followed by 900 pounds of RegenOx™ chemical oxidant during the first injection event
- Performed groundwater monitoring approximately 2 weeks after initial injection
- Extracted groundwater from wells IP-9, IP-8, and DW-8
- Injected 600 pounds of RegenOx™ activator complex followed by 900 pounds of RegenOx™ chemical oxidant during the second injection event
- Performed groundwater monitoring approximately 2 weeks after the second injection
- Extracted groundwater from wells IP-9, IP-8, and DW-8 with vacuum from the SVE system applied during extraction from IP-9
- Injected 840 pounds of RegenOx™ activator complex and 840 pounds of RegenOx™ chemical oxidant combined into a single solution during the third, and final, injection event
- Performed groundwater monitoring approximately 2 weeks after the final injection
- Extracted groundwater from wells IP-9, IP-8, and DW-8 with vacuum applied to well casings using the SVE system
- Evaluated the monitoring results and prepared a summary report.

2.0 ISCO PILOT TEST

The following sections summarize the ISCO technology selected for the pilot test, the injection and extraction procedures, and the analytical program.

2.1 Description of Technology

RegenOx™ is an ISCO technology developed by Regenesi Bioremediation Products, Inc. (Regenesi), that includes a two-phase injection process involving a solid oxidant complex (sodium carbonate and sodium percarbonate) and an activator complex (ferrous iron sulfate and sodium silicate). The published benefits of RegenOx™ include subsurface longevity ranging from weeks to months and a relatively low increase in groundwater temperature due to the oxidation reaction (Regenesi, 2007).

RegenOx™ is similar to other ISCO technologies in that only the soluble portion of the petroleum hydrocarbons will be remediated by the oxidation reaction. However, the RegenOx activator complex has surfactant properties and will desorb additional hydrocarbon mass from the soil matrix, enhancing the oxidation reaction. The oxidant complex oxidizes hydrocarbons by mechanisms of surface-mediated oxidation, direct oxidation, and free radical oxidation (Regenesi, 2007).

2.2 Pilot Test Procedures

The pilot test procedures for injection and extraction are summarized in the following sections.

2.2.1 Injection Procedures

During each of the three injection events, each RegenOx™ component was mixed with water to form an approximately 4 to 5 percent solution for injection into well IP-9 (Figure 3). The activator complex was injected first to desorb hydrocarbon mass from soil and distribute the ferrous sulfate activator to enhance the oxidation reaction. The oxidant was injected immediately following the activator to oxidize hydrocarbons. Approximately 50 to 100 gallons of clean water were injected at the end of injection day and after each complex to clean the well casing and screen. For the third injection event, the activator and oxidant were mixed to form a single 5 percent solution and injected simultaneously to evaluate the effectiveness of combining the components.

During the first two injection events, injection flow rates decreased during injection of the oxidant because of increased back pressure caused by the oxidation reactions. The injection flow rate decreased significantly during the third injection event because of a buildup of fine-grained material in the casing of well IP-9. Well IP-9 was re-developed after the pilot test. The following table summarizes the injection parameters for each event.

Injection Event		Volume of RegenOx™ Injected (gallons)	Concentration of RegenOx™ (percent)	Average Injection Rate (gpm) ^(a)	Average Wellhead Pressure (psi) ^(b)
First Injection	Activator	2,100	4.8	2.4	55
	Oxidant	2,400	4.4	1.4	90
Second Injection	Activator	1,400	4.8	4.2	65
	Oxidant	2,100	4.8	1.5	65
Third Injection	Activator and Oxidant	1,900	5.2	0.7	75

(a) gpm – gallons per minute.

(b) psi – pounds per square inch.

2.2.2 Extraction Procedures

To increase mass removal after each injection event, Arctos extracted groundwater from injection well IP-9 and two surrounding wells (IP-8 and DW-8) to remove contaminant mass that had been desorbed by the RegenOx™ activator complex (Figure 3). During the three groundwater extraction events, groundwater was pumped from the wells, treated by granular activated carbon, and discharged to the sanitary sewer under a permit from the City of Livermore. During the second extraction event, well IP-9 was pumped for an additional day with vacuum applied to the well casing using the existing SVE system. With an average of approximately 60 inches of water column (in. wc) vacuum applied to well IP-9, the average extraction flow rate increased from approximately 0.6 to 1.3 gpm. During the third extraction event, vacuum was applied to each of the well casings using the SVE system causing an increase in the average extraction flow rates from wells IP-8 and DW-8. The average flow rate decreased from IP-9 because of buildup of fine-grained material in the well casing. The following table summarizes the extraction parameters for each event.

Extraction Event	Well	Volume of Groundwater Extracted (gallons)	Average Vacuum at Wellhead (in. wc)	Average Flow Rate (gpm)	Average TPHg Concentration (µg/l)
First	IP-8	590	-- ^(a)	0.92	65,000
	IP-9	560	--	0.58	35,000
	DW-8	650	--	1.2	64,000
Second	IP-8	980	--	1.1	73,000
		560	--	0.58	31,000
	IP-9	520	60	1.3	NA ^(b)
	DW-8	1,200	--	1.5	73,000
Third	IP-8	760	50	1.3	73,000
	IP-9	160	70	0.22	12,000
	DW-8	1,300	70	2.1	71,000

(a) Vacuum not applied to well during extraction.

(b) No laboratory sample collected during extraction.

2.3 Analytical Program

The following wells were monitored throughout the pilot test to (1) measure changes in petroleum hydrocarbon concentrations, (2) measure the general groundwater quality, and (3) track the changes in groundwater quality with time:

- Background (Upgradient) Well: Injection well IP-10 (24 feet southeast)
- Injection Well: Injection well IP-9
- Cross-Gradient Wells: Injection well IP-8 (15 feet north-northwest)
Injection well IP-1 (34 feet north-northwest)
- Downgradient Wells: Monitoring well MW-11 (6 feet northwest)
Monitoring well DW-8 (26 feet northwest)

Before the application of RegenOx™, a monitoring event was conducted to establish the baseline groundwater conditions. Performance monitoring occurred 2 weeks after each injection, before the groundwater extraction events, and quarterly thereafter. Groundwater samples were collected following the procedures in Arctos's Interim Remedial Action Plan (IRAP) dated 21 March 2008 (Arctos, 2008) and analyzed for the following parameters:

- Field parameters including pH, temperature, conductivity, and oxidation reduction potential (ORP)

- TPHg, benzene, toluene, ethylbenzene, and xylenes (BTEX), and oxygenates including methyl tert-butyl ether (MTBE), di-isopropyl ether (DIPE), ethyl tert-butyl ether (ETBE), tert-amyl methyl ether (TAME), and tert-butyl alcohol (TBA) by Environmental Protection Agency (EPA) Method 8260B
- Water quality parameters including ferrous iron, total iron, methane, total dissolved solids (TDS), nitrate, sulfate, sodium, carbon dioxide, manganese, total chromium, hexavalent chromium, arsenic, and alkalinity.

Arctos monitored ORP weekly following the initial injection and until 2 weeks after the final injection. Dissolved oxygen (DO) was not monitored during the pilot test due to corrosion of the DO probe when submerged into the RegenOx™ solution. After the pilot test, DO and ORP were, and continue to be, monitored as part of monthly oxygen system monitoring. The following table summarizes the parameters and sampling frequency during monitoring to assess the effectiveness of the pilot test.

Monitoring Wells	Sampling Frequency	Parameter
MW-11, DW-8, IP-1, IP-8, IP-9, and IP-10	Baseline and weekly until 2 weeks after last groundwater extraction event and monthly thereafter	Temperature, conductivity, pH, and ORP
	Baseline, 2 weeks after each injection, and quarterly thereafter	Temperature, conductivity, pH, and ORP
		Dissolved petroleum hydrocarbons including TPHg, BTEX, MTBE, and TBA
		Water quality parameters

3.0 DISCUSSION OF RESULTS

The results of the field parameters and analytical data collected throughout the pilot test were used to estimate the ISCO radius of influence and hydrocarbon mass removal by oxidation and groundwater extraction.

3.1 Activator Complex Radius of Influence

The RegenOx™ activator complex is a ferrous iron solution with a pH greater than 10. An increase in the pH, conductivity, and iron content in addition to a decrease in ORP was used to estimate the radius of influence of injection. The following table summarizes the changes in field parameters and total iron monitored before and after the first injection of the RegenOx™ activator complex:

Well	pH ^(a)	ORP ^(b) (mV)	Conductivity ^(c) (μ S/cm)	Temperature ^(d) (°F)	Total Iron ^(e) (mg/l)
MW-11	Increase	Decrease	Increase	Stable	Increase
IP-8	Increase	Decrease	Increase	Stable	Increase
IP-10	Stable	Decrease	Stable	Stable	Stable
DW-8	Increase	Decrease	Increase	Stable	Stable
IP-1	Stable	Decrease	Stable	Stable	Increase

(a) pH change defined as increase of at least 2.

(b) ORP measured in millivolts (mV); change defined as decrease of at least 200 mV.

(c) Conductivity measured in microsiemens per centimeter (μ S/cm); change defined as increase of at least 200 μ S/cm.

(d) Temperature measured in degrees Fahrenheit (°F); change defined as increase of at least 2 °F.

(e) Total iron concentration measured in milligrams per liter (mg/l); change defined as increase of at least 1 mg/l.

During the first injection, the radius of influence extended approximately 20 feet upgradient and cross gradient and approximately 40 feet downgradient of well IP-9 (Figure 3). Because of the surfactant properties of the activator complex, petroleum hydrocarbons were desorbed from soil during injection throughout the radius of influence. After the first injection, TPHg concentrations increased in wells IP-8 (from 14,000 to 79,000 μ g/l) and IP-9 (from 4,300 to 37,000 μ g/l; Figures 4-1 to 4-6). Throughout the pilot test, free product sheen was often measured and a maximum thickness of 0.05 foot of free product was measured in well IP-8 following the injections.

Graphs of hydrocarbon concentrations, field parameters, and general chemistry concentrations are in Figures 4, 5, and 6, respectively. Volatile organic compound and general chemistry analytical results are summarized in Tables 1 and 2, respectively. A table of field parameters recorded during the pilot test including depth to water, depth to

product, pH, ORP, conductivity, and temperature is in Appendix B. Laboratory reports and the chain-of-custody forms are in Appendix C.

3.2 Oxidant Complex Radius of Influence

The RegenOx™ oxidant complex creates a chemical oxidation reaction that destroys dissolved-phase petroleum hydrocarbons in groundwater. Arctos monitored other parameters that were expected to change because of the ISCO reaction including methane, sulfate, and sodium. Methane was expected to decrease and sulfate to increase because of oxidation reactions. Sodium was expected to increase because it is a major ingredient of the oxidant complex. The changes in these compounds were used to estimate the radius of influence of the oxidation reactions caused by the oxidant complex. The following table summarizes changes in TPHg concentration and general water chemistry.

Well	TPHg ^(a)		Methane ^(b) (µg/l)	Sulfate ^(c) (mg/l)	Sodium ^(d) (mg/l)
	Baseline to after first injection	After first to after third injection			
IP-9	Increase	Decrease	Decrease	Increase	Increase
MW-11	Stable	Decrease	Decrease	Increase	Increase
IP-8	Increase	Stable	Stable	Stable	Stable
IP-10	Increase	Stable	Stable	Stable	Stable
DW-8	Stable	Stable	Stable	Stable	Stable
IP-1	Stable	Stable	Stable	Stable	Stable

(a) TPHg increase defined as at least 100 percent increase; TPHg decrease defined as at least 50 percent decrease.

(b) Methane decrease defined as at least 10 µg/l decrease from baseline to after third injection.

(c) Sulfate increase defined as at least 100 mg/l increase from baseline to after third injection.

(d) Sodium increase defined as at least 100 mg/l increase from baseline to after third injection.

The oxidation radius of influence extended approximately 10 feet radially from well IP-9 (Figure 3). Following the pilot test, TPHg concentrations in well IP-9 decreased from 37,000 to 16,000 µg/l and remained stable at well IP-8, located approximately 15 feet away (Figures 4-1 to 4-6). Despite similar injection pressures and volumes, the radius of influence of oxidation reactions caused by the RegenOx™ oxidant complex was smaller than the radius of influence of the RegenOx™ activator complex. The smaller radius was likely the result of the high oxidant demand in the vicinity of well IP-9. Oxidation reactions were carried out almost instantaneously because of the high concentrations of dissolved-phase hydrocarbons.

The oxidation reaction caused increased concentrations of hexavalent chromium in groundwater at well IP-9 following the injection events. The highest concentration of 90 µg/l was reported in December 2011 but was not detected at downgradient and nearby wells (DW-8 and IP-8, respectively).

Volatile organic compound and general chemistry analytical results are summarized in Tables 1 and 2, respectively. Graphs of hydrocarbon concentrations, field parameters, and general chemistry concentrations are in Figures 4, 5, and 6, respectively. Laboratory reports and the chain-of-custody forms are in Appendix C.

3.3 Hydrocarbon Mass Removal

Hydrocarbon mass destruction caused by the oxidation reaction was estimated based on a degradation ratio of 1 pound of TPHg per 20 pounds of RegenOx™ oxidant (Regenesis, 2007). The degradation ratio assumed (1) natural soil oxidant demand was minimal relative to hydrocarbon oxidant demand and (2) all of the oxidant was consumed based on the high hydrocarbon oxidant demand. The total mass of oxidant injected during the pilot test was 2,640 pounds resulting in an estimated 130 pounds of TPHg removed through chemical oxidation.

Hydrocarbon mass removal from groundwater extraction was calculated from the volume of groundwater extracted and the TPHg concentrations. During the pilot test, 7,300 gallons of groundwater was extracted with an average TPHg concentration of 55,000 µg/l, resulting in an estimated 3.7 pounds of TPHg removed.

4.0 CONCLUSIONS AND RECOMMENDATIONS

Results of the ISCO pilot test indicate the following conclusions:

1. RegenOx™ was effective at desorbing petroleum hydrocarbon mass from soil with a radius of influence of approximately 20 feet.
2. The radius of influence of the oxidation reaction was limited to 10 feet because of the high oxidant demand surrounding the injection well.
3. Groundwater extraction rates were increased by applying vacuum during the pilot test, but the total hydrocarbon mass removed was only 3.7 pounds. The hydrocarbon mass destroyed by ISCO was estimated to be 35 times greater than the mass removed by groundwater extraction during the pilot test.

Based on the results of the ISCO pilot test, Arctos recommends the following tasks during the first and second quarters of 2012:

- Continue to monitor ISCO pilot test groundwater monitoring wells in accordance with the work plan to assess when groundwater concentrations return to baseline
- Evaluate the feasibility of conducting additional applications of RegenOx™ on and off site.

5.0 REFERENCES

Alameda County Environmental Health, 2011. Letter from Jerry Wickham to Jeffrey Baker (Tesoro Petroleum Companies, Inc.), "Work Plan Approval for Fuel Leak Case No. RO0000434 and Geotracker Global ID T0600101410, Beacon #3604, 1619 First Street, Livermore, CA," 27 September.

Arctos Environmental, 2008. "Interim Remedial Action Plan for Groundwater, 1619 1st Street, Livermore, California, Tesoro Station No. 67076, Former Beacon Station No. 3604, ACEH Case No. RO04343," 21 March.

Arctos Environmental, 2011. "Work Plan for ISCO Pilot Test, 1619 1st Street, Livermore, California," prepared for Tesoro Environmental Resources Company by Arctos Environmental, 9 September.

Regenes Bioremediation Products Incorporated, 2007. "Principles of Chemical Oxidation Technology for the Remediation of Groundwater and Soil: RegenOx™ Design and Application Manual," 7 April.

6.0 LIMITATIONS

Arctos has prepared this document for the exclusive use of Tesoro as it pertains to the subject property located at 1619 1st Street, Livermore, California. Any use of or reliance on this document by a third party shall be at such party's sole risk. Arctos performed a limited scope of work as described in the work plan, client contract, and proposal. The pilot test was performed at specific areas of environmental concern and other impacted media may be present at other areas of the site. Therefore, despite the use of reasonable care, Arctos may not have detected such hazardous substances.

No warranty or guarantee concerning the findings or conclusions of the proposed activities is offered or intended. Rather, Arctos's professional services were provided in accordance with the current state of practice as conducted in the site region by similarly qualified practitioners.

TABLE 1

**ISCO PILOT TEST VOC CONCENTRATIONS
TESORO - LIVERMORE, 67076**

Monitoring Well	Event	Sample Date	TPHg ^(a) (µg/l)	Benzene ^(a) (µg/l)	Toluene ^(a) (µg/l)	Ethylbenzene ^(a) (µg/l)	Total Xylenes ^(a) (µg/l)	MTBE ^(a) (µg/l)	DIPE ^(a) (µg/l)	ETBE ^(a) (µg/l)	TAME ^(a) (µg/l)	TBA ^(a) (µg/l)	Methanol ^(a) (µg/l)	Ethanol ^(a) (µg/l)
MW-11	Baseline	9/20/11	16,000	95	500	230	3,200	ND<4 ^(b)	ND<4	ND<4	ND<4	ND<20	ND<400	ND<40
	2 wk Post-Inj #1	10/25/11	18,000	130	500	310	2,900	ND<0.5	ND<0.5	ND<0.5	ND<0.5	18	ND<50	ND<10
	2 wk Post-Inj #2	11/17/11	9,100	200	580	170	1,300	ND<1.5	ND<1.5	ND<1.5	ND<1.5	15	ND<150	ND<50
	2 wk Post-Inj #3	12/14/11	2,600	18	39	28	240	ND<0.5	ND<0.5	ND<0.5	ND<0.5	13	ND<50	ND<50
MW-2	2 wk Post-Inj #3	12/15/11	6,600	640	84	140	340	450	ND<1.5	ND<1.5	4.2	270	ND<250	ND<15
MW-7	2 wk Post-Inj #3	12/15/11	1,500	38	100	27	130	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	ND<50	ND<8
IP-1	Baseline	9/20/11	14,000	520	960	63	2,500	ND<4	ND<4	ND<4	ND<4	47	ND<400	ND<40
	2 wk Post-Inj #1	10/25/11	13,000	340	680	140	1,800	ND<2	ND<2	ND<2	ND<2	22	ND<200	ND<20
	2 wk Post-Inj #2	11/17/11	27,000	1,100	2,000	620	3,200	ND<4	ND<4	ND<4	5.4	29	ND<400	ND<40
	2 wk Post-Inj #3	12/15/11	15,000	680	860	450	1,800	ND<4	ND<4	ND<4	ND<4	ND<20	ND<400	ND<80
IP-8	Baseline	9/20/11	14,000	780	1,800	170	2,000	ND<3	ND<3	ND<3	ND<3	20	ND<300	ND<30
	2 wk Post-Inj #1	10/25/11	79,000	3,000	8,400	1,500	12,000	ND<4	ND<4	ND<4	ND<4	45	ND<400	ND<80
	Pumped 108 gal	10/26/11	52,000	2,400	7,200	1,200	7,300	ND<15	ND<15	ND<15	ND<15	ND<15	ND<1,500	ND<150
	Pumped 257 gal	10/27/11	67,000	3,000	9,100	1,600	9,200	ND<15	ND<15	ND<15	ND<15	ND<70	ND<1,500	ND<150
	Pumped 550 gal	10/27/11	76,000	2,600	9,500	1,900	11,000	ND<15	ND<15	ND<15	ND<15	ND<70	ND<1,500	ND<150
	2 wk Post-Inj #2	11/17/11	130,000	2,300	11,000	2,000	16,000	ND<3	ND<3	ND<3	8.2	44	ND<300	ND<200
	Pumped 157 gal	11/21/11	74,000	4,400	13,000	2,000	12,000	ND<25	ND<25	ND<25	ND<25	ND<150	ND<2,500	ND<250
	Pumped 411 gal	11/21/11	70,000	3,900	13,000	2,100	12,000	ND<25	ND<25	ND<25	ND<25	150	ND<2,500	ND<250
	Pumped 645 gal	11/22/11	75,000	4,000	13,000	2,200	13,000	ND<25	ND<25	ND<25	ND<25	ND<150	ND<2,500	ND<300
	Pumped 933 gal	11/22/11	71,000	3,400	12,000	2,100	12,000	ND<25	ND<25	ND<25	ND<25	ND<150	ND<2,500	ND<500
	2 wk Post-Inj #3	12/14/11	92,000	3,000	10,000	2,300	15,000	ND<25	ND<25	ND<25	ND<25	ND<150	ND<2,500	ND<250
	Pumped 349 gal	12/20/11	73,000	3,200	11,000	2,000	12,000	ND<25	ND<25	ND<25	ND<25	ND<150	ND<2,500	ND<250
Pumped 678 gal	12/21/11	73,000	3,200	12,000	2,300	12,000	ND<15	ND<15	ND<15	ND<15	80	ND<1,500	ND<150	
IP-9	Baseline	9/20/11	4,300	140	510	56	730	ND<0.9	ND<0.9	ND<0.9	ND<0.9	13	ND<90	ND<9
	2 wk Post-Inj #1	10/25/11	37,000	270	1,900	960	5,400	ND<3	ND<3	ND<3	ND<3	18	ND<300	ND<30
	Pumped 206 gal	10/26/11	36,000	520	2,600	990	5,500	ND<7	ND<7	ND<7	ND<7	ND<40	ND<700	ND<70
	Pumped 302 gal	10/26/11	34,000	450	2,500	960	5,400	ND<7	ND<7	ND<7	ND<20	ND<40	ND<700	ND<70
	Pumped 396 gal	10/27/11	37,000	480	2,500	970	5,200	ND<5	ND<5	ND<5	ND<20	33	ND<500	ND<50
	Pumped 562 gal	10/27/11	31,000	400	2,200	820	4,600	ND<7	ND<7	ND<7	ND<10	ND<40	ND<700	ND<70

TABLE 1

**ISCO PILOT TEST VOC CONCENTRATIONS
TESORO - LIVERMORE, 67076**

Monitoring Well	Event	Sample Date	TPHg ^(a) (µg/l)	Benzene ^(a) (µg/l)	Toluene ^(a) (µg/l)	Ethylbenzene ^(a) (µg/l)	Total Xylenes ^(a) (µg/l)	MTBE ^(a) (µg/l)	DIPE ^(a) (µg/l)	ETBE ^(a) (µg/l)	TAME ^(a) (µg/l)	TBA ^(a) (µg/l)	Methanol ^(a) (µg/l)	Ethanol ^(a) (µg/l)
IP-9 (cont.)	2 wk Post-Inj #2	11/17/11	19,000	140	1,300	510	3,000	ND<0.9	ND<0.9	ND<0.9	ND<0.9	ND<5	ND<90	ND<200
	Pumped 120 gal	11/21/11	29,000	480	2,400	990	5,100	ND<5	ND<5	ND<5	ND<5	32	ND<500	ND<80
	Pumped 226 gal	11/21/11	32,000	460	2,400	1,100	5,400	ND<5	ND<5	ND<5	ND<5	33	ND<500	ND<200
	Pumped 374 gal	11/22/11	32,000	440	2,500	1,100	6,100	ND<5	ND<5	ND<5	ND<5	32	ND<500	ND<80
	Pumped 529 gal	11/22/11	30,000	410	2,300	1,000	5,300	ND<5	ND<5	ND<5	ND<5	28	ND<500	ND<80
	2 wk Post-Inj #3	12/14/11	23,000	600	2,300	680	4,400	ND<5	ND<5	ND<5	ND<5	ND<25	ND<500	ND<50
	Pumped 116 gal	12/20/11	7,100	88	630	230	1,300	ND<2	ND<2	ND<2	ND<2	18	ND<200	ND<40
Pumped 162 gal	12/21/11	16,000	260	1,600	470	2,900	ND<4	ND<4	ND<4	ND<4	22	ND<400	ND<50	
IP-10	Baseline	9/20/11	620	1.7	11	12	58	ND<0.5	ND<0.5	ND<0.5	ND<0.5	7.6	ND<50	ND<5
	2 wk Post-Inj #1	10/25/11	1,400	20	31	34	84	ND<0.5	ND<0.5	ND<0.5	ND<0.5	5.3	ND<50	ND<8
	2 wk Post-Inj #2	11/17/11	4,400	83	120	96	400	ND<0.5	ND<0.5	ND<0.5	ND<0.8	7.2	ND<50	ND<10
	2 wk Post-Inj #3	12/14/11	4,200	62	72	110	260	ND<0.9	ND<0.9	ND<0.9	ND<0.9	ND<5	ND<90	ND<20
DW-8	Baseline	9/20/11	77,000	4,500	10,000	2,000	11,000	ND<20	ND<20	ND<20	ND<20	200	ND<2,000	ND<200
	2 wk Post-Inj #1	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
	Pumped 313 gal	10/26/11	71,000	3,100	8,900	2,000	9,800	ND<20	ND<20	ND<20	ND<20	ND<90	ND<2,000	ND<200
	Pumped 514 gal	10/27/11	70,000	3,600	9,500	2,100	9,800	ND<15	ND<15	ND<15	ND<15	ND<70	ND<1,500	ND<150
	Pumped 648 gal	10/27/11	50,000	2,000	4,500	1,600	7,300	ND<15	ND<15	ND<15	ND<15	ND<70	ND<1,500	ND<150
	2 wk Post-Inj #2	11/17/11	43,000	1,600	3,400	560	7,000	ND<9	ND<9	ND<9	ND<9	ND<50	ND<900	ND<90
	Pumped 137 gal	11/21/11	74,000	4,500	12,000	2,300	13,000	ND<20	ND<20	ND<20	ND<20	150.0	ND<2,000	ND<300
	Pumped 466 gal	11/21/11	74,000	3,700	10,000	2,400	12,000	ND<20	ND<20	ND<20	ND<20	140	ND<2,000	ND<200
	Pumped 794 gal	11/22/11	71,000	3,700	9,500	2,600	12,000	ND<20	ND<20	ND<20	ND<20	ND<90	ND<2,000	ND<300
	Pumped 1,138 gal	11/22/11	73,000	3,600	10,000	2,600	13,000	ND<20	ND<20	ND<20	ND<20	ND<90	ND<2,000	ND<300
	2 wk Post-Inj #3	12/15/11	54,000	2,400	5,400	1,700	9,400	ND<15	ND<15	ND<15	ND<15	ND<70	ND<1,500	ND<200
	Pumped 713 gal	12/20/11	66,000	2,800	6,700	2,300	10,000	ND<15	ND<15	ND<15	ND<15	76	ND<1,500	ND<150
	Pumped 1,233 gal	12/21/11	75,000	2,800	8,600	2,300	11,000	ND<20	ND<20	ND<20	ND<20	100	ND<2,000	ND<200

(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 8260B; reported in micrograms per liter (µg/l).

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

TABLE 2

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

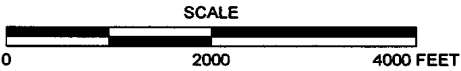
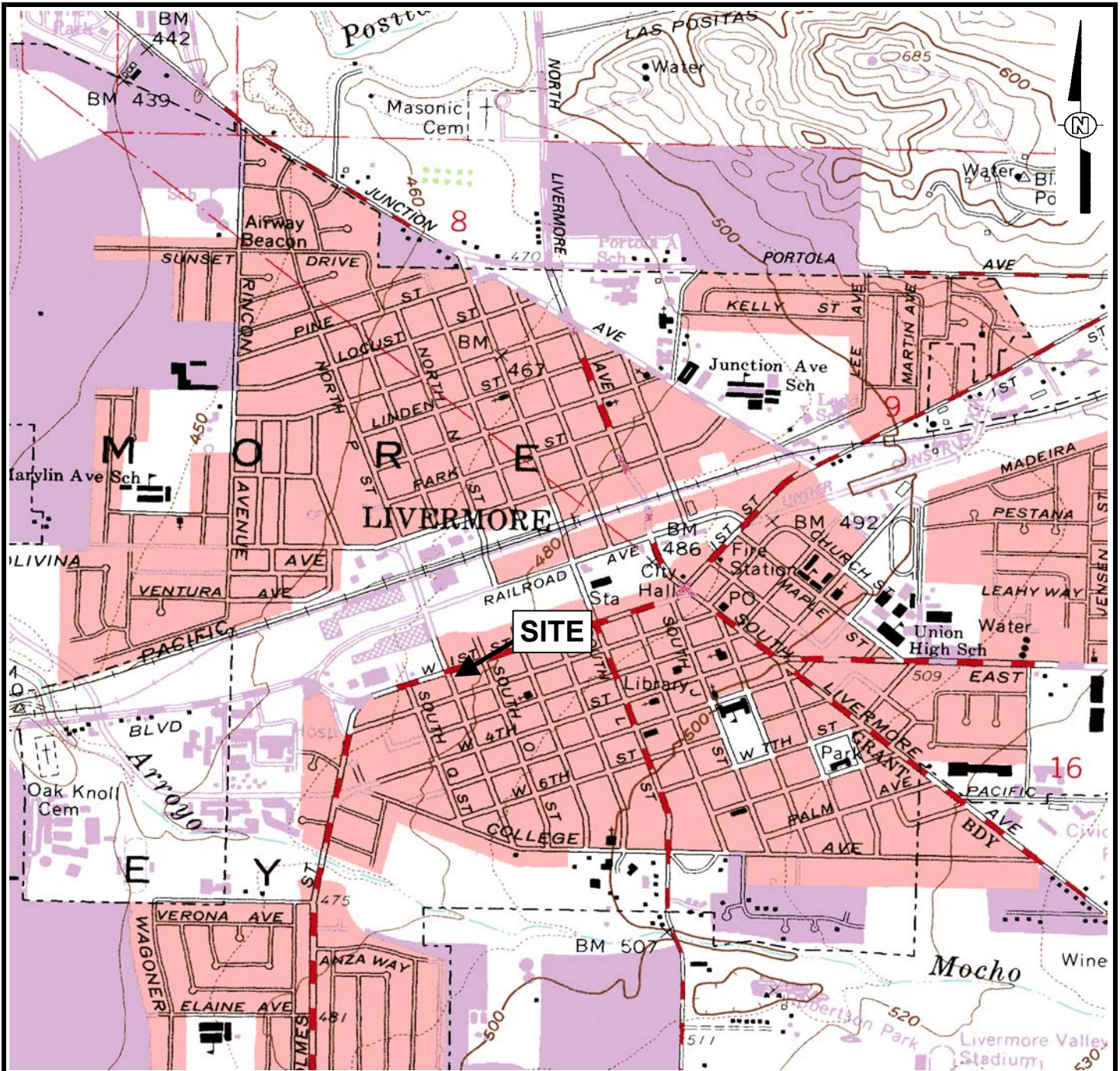
Monitoring Well	Sample Date	Nitrate ^(a) (mg/l)	Sulfate ^(a) (mg/l)	Arsenic ^(d) (mg/l)	Chromium ^(d) (mg/l)	Hex Chrome ^(b) (µg/l)	Iron ^(d) (mg/l)	Fe(2+) ^(c) (mg/l)	Manganese ^(d) (mg/l)	Sodium ^(d) (mg/l)	CO ₂ ^(e) (µg/l)	CH ₄ ^(e) (µg/l)	Alk ^(f) (mg/l)	TDS ^(g) (mg/l)
MW-11	9/20/11	ND<0.1 ^(h)	30	ND<0.015	0.0056	ND<1	1.8	ND<0.1	3.6	67	90,300	36.0	702	840
	10/25/11	ND<0.5	85	ND<0.015	0.011	ND<1	3.2	ND<0.1	2.8	290	60,100	55.1	1,200	1,520
	11/17/11	ND<0.1	170	0.03	0.010	ND<1	2.9	ND<0.15	1.2	740	1,870	6.52	1,630	2,340
	12/14/11	0.12	140	0.021	0.034	2.6	9.6	ND<0.1	0.84	540	29,200	10.1	316	2,270
MW-2	12/15/11	ND<0.1	23	ND<0.015	0.026	ND<1	7.4	ND<0.1	2.2	51	64,200	2,040	574	540
MW-7	12/15/11	ND<0.1	6.5	ND<0.015	0.32	ND<1	88	ND<0.1	5.4	58	28,100	1,080	433	515
IP-1	9/20/11	ND<0.1	3.9	ND<0.015	ND<0.005	ND<1	1.3	ND<0.1	2.6	34	24,000	474	369	483
	10/25/11	ND<0.5	11	ND<0.015	0.018	ND<1	2.6	ND<0.1	2.4	64	20,600	311	378	557
	11/17/11	ND<0.1	24	0.02	0.012	ND<1	3.9	ND<0.1	3.8	93	34,300	1,180	576	660
	12/15/11	0.2	26	0.015	0.017	ND<1	5.5	0.11	3.3	110	12,800	916	580	620
IP-8	9/20/11	0.17	10	ND<0.015	ND<0.005	ND<1	0.54	ND<0.1	2.0	35	6,930	49.6	229	350
	10/25/11	ND<0.5	44	ND<0.015	ND<0.005	ND<1	1.6	ND<0.1	3.8	140	12,300	109	692	1,020
	11/17/11	ND<0.1	69	ND<0.015	0.011	ND<1	3.2	ND<0.1	3.3	160	4,470	184	7,950	960
	11/22/11	0.31	34	ND<0.015	0.011	ND<1	2.9	ND<0.1	2.4	81	32,800	1,150	562	715
	12/14/11	0.24	52	ND<0.015	0.023	ND<1	6.2	ND<0.1	3.7	110	11,800	80.6	650	920
IP-9	9/20/11	ND<0.1	11	ND<0.015	ND<0.005	ND<1	0.34	ND<0.1	1.1	41	10,100	64.6	305	413
	10/25/11	ND<2.5	630	0.24	0.21	84	50	ND<0.1	0.92	4,700	935	7.51	9,770	12,200
	11/17/11	2.5	710	0.16	0.15	79	34	ND<0.15	0.54	8,500	14,500	3.88	18,700	21,300
	11/22/11	ND<0.5	300	0.049	0.017	12	1.8	ND<0.1	0.1	1,500	1,080	302	3,010	3,960
	12/14/11	ND<2	1,400	0.42	0.15	90	30	ND<0.1	0.65	18,000	5,130	5.12	35,100	44,300
IP-10	9/20/11	ND<0.1	26	ND<0.015	ND<0.005	ND<1	0.46	ND<0.1	1.4	48	5,530	39.0	290	483
	10/25/11	ND<0.5	37	ND<0.015	ND<0.005	ND<1	0.79	ND<0.1	4.2	74	15,500	139	390	625
	11/17/11	ND<0.1	34	ND<0.015	0.015	ND<1	4.2	ND<0.1	2.8	96	26,700	711	458	510
	12/14/11	ND<0.1	31	ND<0.015	ND<0.01	ND<1	3.2	ND<0.1	3.5	92	14,000	644	455	640
DW-8	9/20/11	ND<0.1	6.7	ND<0.015	ND<0.005	ND<1	1.9	ND<0.1	2.8	45	27,600	1,110	502	615

TABLE 2

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

Monitoring Well	Sample Date	Nitrate ^(a) (mg/l)	Sulfate ^(a) (mg/l)	Arsenic ^(d) (mg/l)	Chromium ^(d) (mg/l)	Hex Chrome ^(b) (µg/l)	Iron ^(d) (mg/l)	Fe(2+) ^(c) (mg/l)	Manganese ^(d) (mg/l)	Sodium ^(d) (mg/l)	CO ₂ ^(e) (µg/l)	CH ₄ ^(e) (µg/l)	Alk ^(f) (mg/l)	TDS ^(g) (mg/l)
DW-8	10/25/11	ND<0.5	85	ND<0.015	ND<0.005	ND<1	1.4	ND<0.1	1.2	100	16,000	519	564	780
(cont.)	11/17/11	ND<0.1	48	ND<0.015	ND<0.005	ND<1	0.76	ND<0.1	1.5	92	19,100	140	591	610
	11/22/11	ND<0.1	24	ND<0.015	0.031	ND<1	9.1	0.16	2.4	64	23,200	1,480	498	560
	12/15/11	ND<0.1	36	ND<0.015	ND<0.005	ND<1	0.88	ND<0.1	2.4	78	19,100	1,210	510	560

- (a) Nitrate and sulfate analyzed by EPA Method 300.0; reported in milligrams per liter (mg/l).
- (b) Hexavalent chromium (Hex Chrome) analyzed by EPA Method 7199; reported in micrograms per liter (µg/l).
- (c) Ferrous Iron (Fe (2+)) analyzed by Standard Method 3500-Fe D; reported in milligrams per liter (mg/l).
- (d) Arsenic, chromium, iron, manganese, and sodium analyzed by EPA Method 6010B; reported in milligrams per liter (mg/l).
- (e) Carbon dioxide (CO₂) and methane (CH₄) analyzed by RSK-175M; reported in micrograms per liter (µg/l).
- (f) Total alkalinity as CaCO₃ analyzed by Standard Method 2320B; reported in milligrams per liter (mg/l).
- (g) Total dissolved solids (TDS) analyzed by Standard Method 2540 C; reported in milligrams per liter (mg/l).
- (h) ND - Not detected at the reporting limit listed.



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

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

1/11/2012 4:01PM 01LV11B-20514.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
- DW-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

- VW-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
- 1,000 TPHg Concentration Contour (µg/L), Queried Where Uncertain
- ND Not Detected
- NS Not Sampled
- (130/1500) Previous Quarter/Current Quarter TPHg Results in µg/L



REVISION	REVISIONS		
	NO.	BY	DATE
14	10	MY	3/1/11
	11	MY	5/13/11
	12	MY	8/15/11
	13	MY	11/15/11
	14	MY	2/15/12

ARCTOS ENVIRONMENTAL			
TESORO - LIVERMORE			
TPHg CONCENTRATION CONTOURS			
PROJECT NO. OILV	DRAWN BY MY	CHECKED BY MP	APPROVED BY JPG
FILE NO. OILV11B-20514.DWG		FIGURE 2	

01LV11B1300.dwg
1/30/2012 6:38PM



Legend

- MW-1 Groundwater Monitoring Well
- DW-1 Deep Groundwater Monitoring Well
- IP-1 Injection Well
- IP-6 Angled Injection Well Screen Location
- VW-3 Vapor Extraction Well (Not Connected to System)
- TP-2 Monitoring Well/Vapor Extraction Well
- MIP-1 January 2011 Membrane Interface Probe (MIP) Boring

Flame Ionization Detector (FID) Response Contours from January 2011 MIP Borings

- 1.0E6 - 5.0E6
- >5.0E6

Injection Radius of Influence at 65 PSI

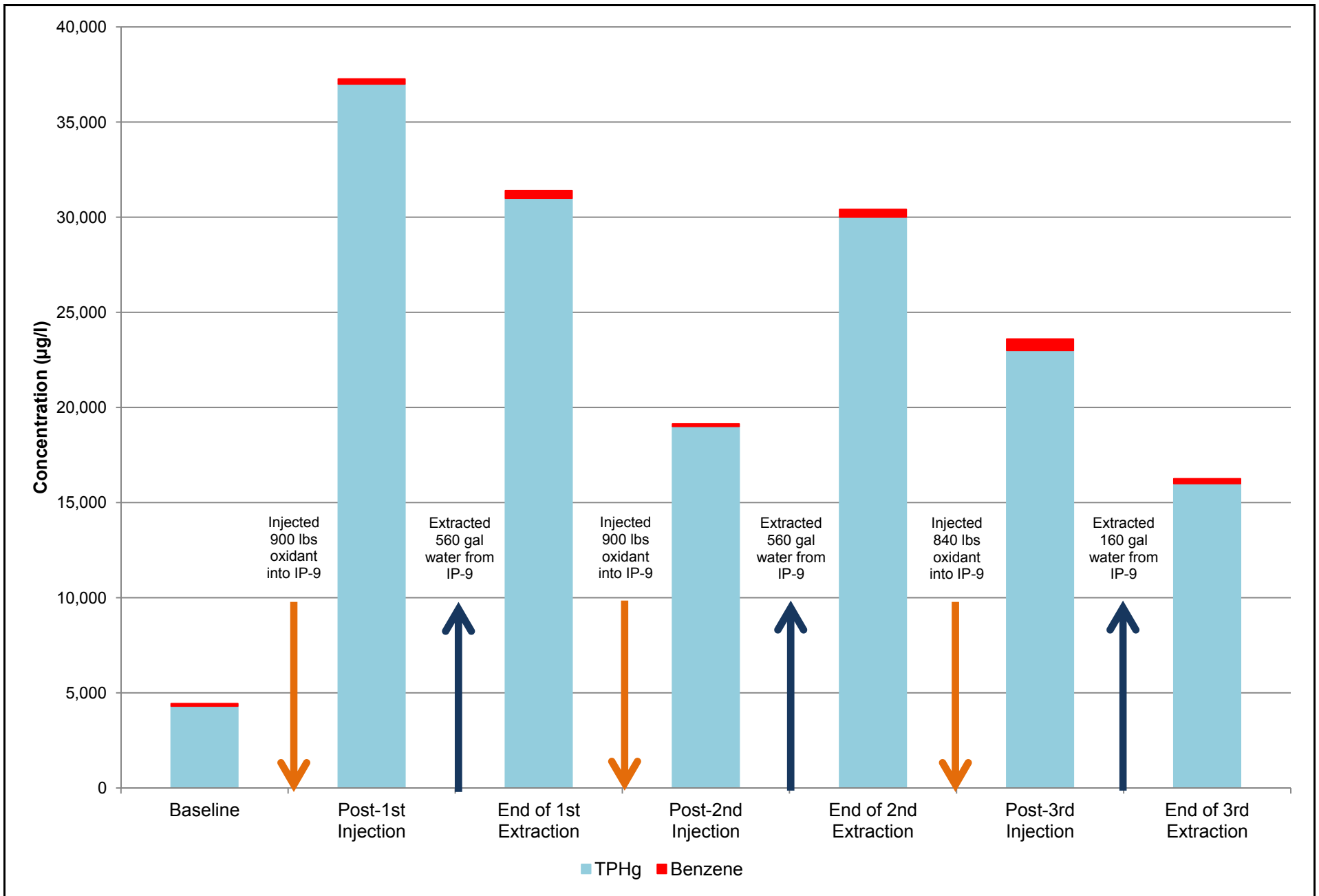
- pH 2 Increase During Injection of RegenOx™ Activator Complex

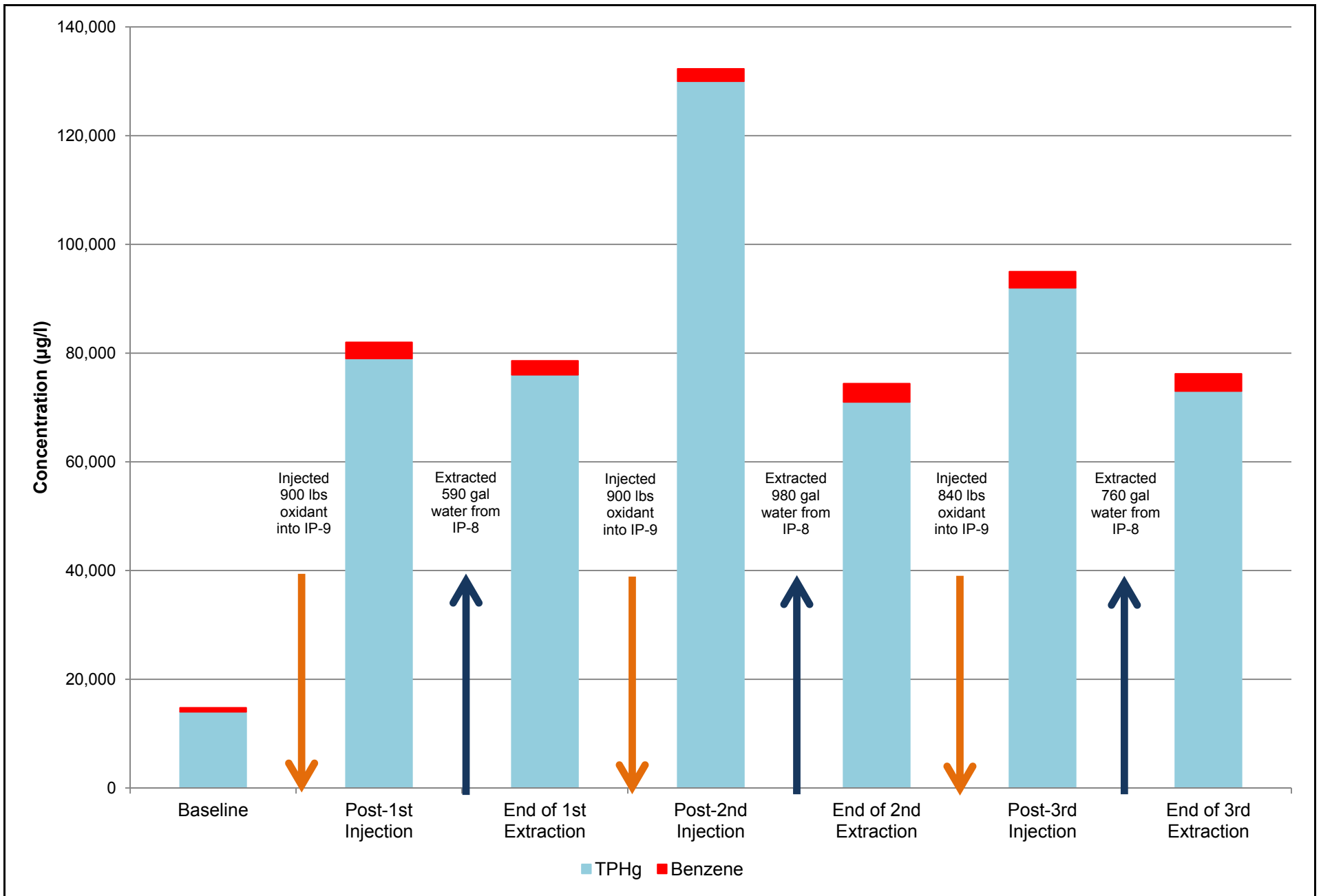
Oxidation Radius of Influence at 75 PSI

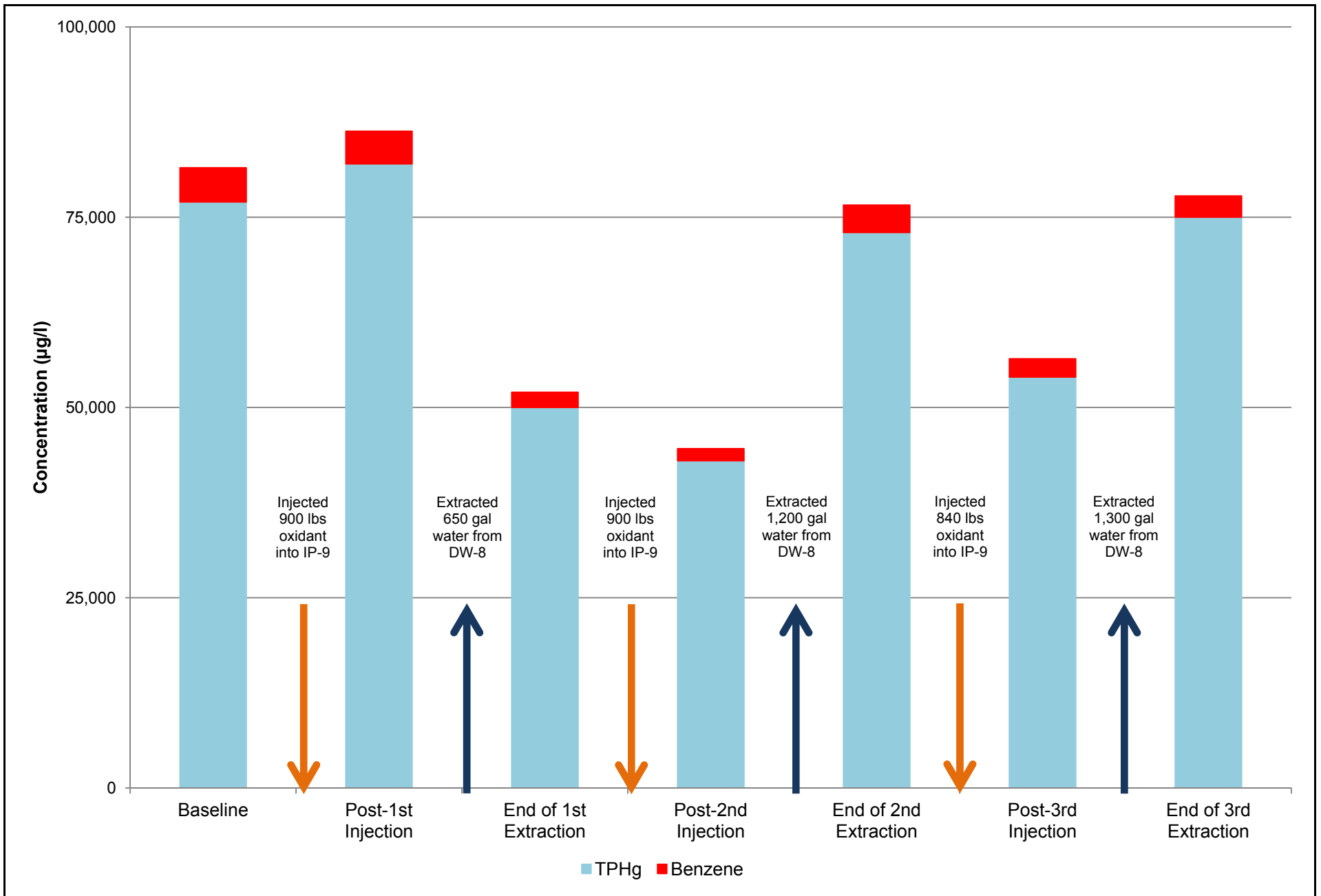
- >50% Reduction in TPHg Concentration from First to Third RegenOx™ Injection

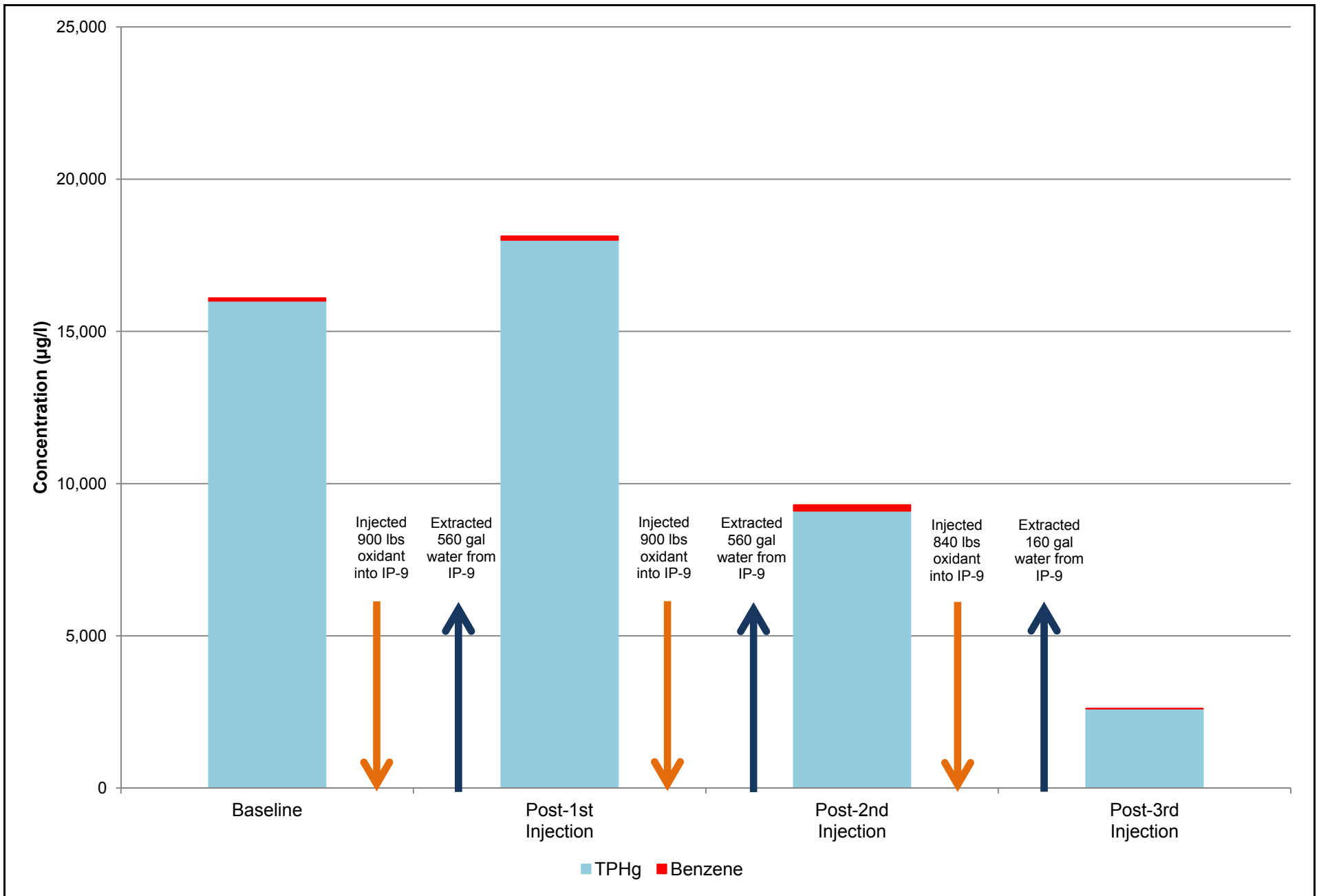
ARCTOS ENVIRONMENTAL			
TESORO - LIVERMORE			
ISCO PILOT TEST RADIUS OF INFLUENCE			
PROJECT NO. OILV	DRAWN BY MY	CHECKED BY MN	APPROVED BY JPG
FILE NO. OILVIB1300.DWG	FIGURE 3		

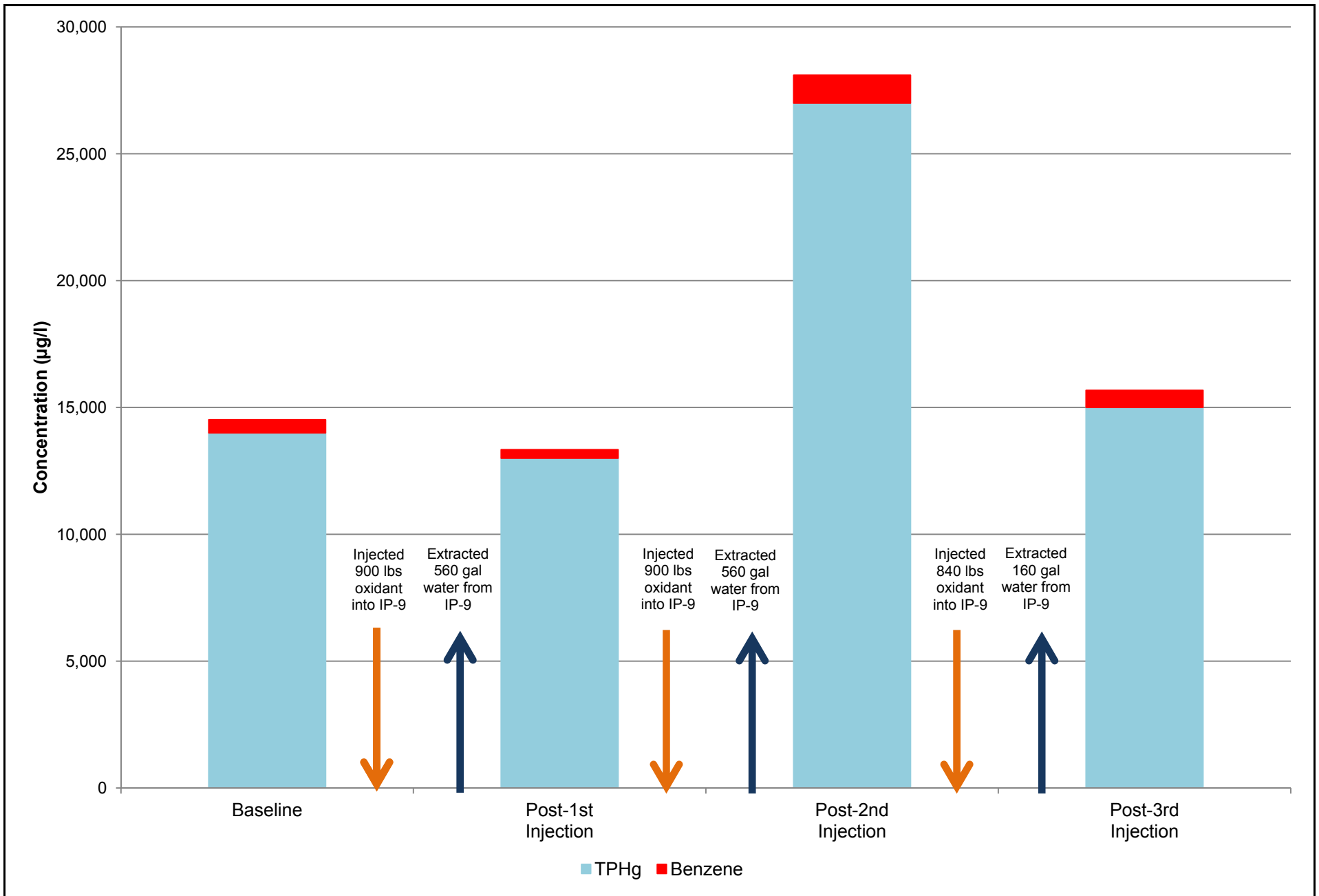
REVISION	REVISIONS		
	NO.	BY	DATE
0	MY	2/15/12	ISCO Pilot Test Report

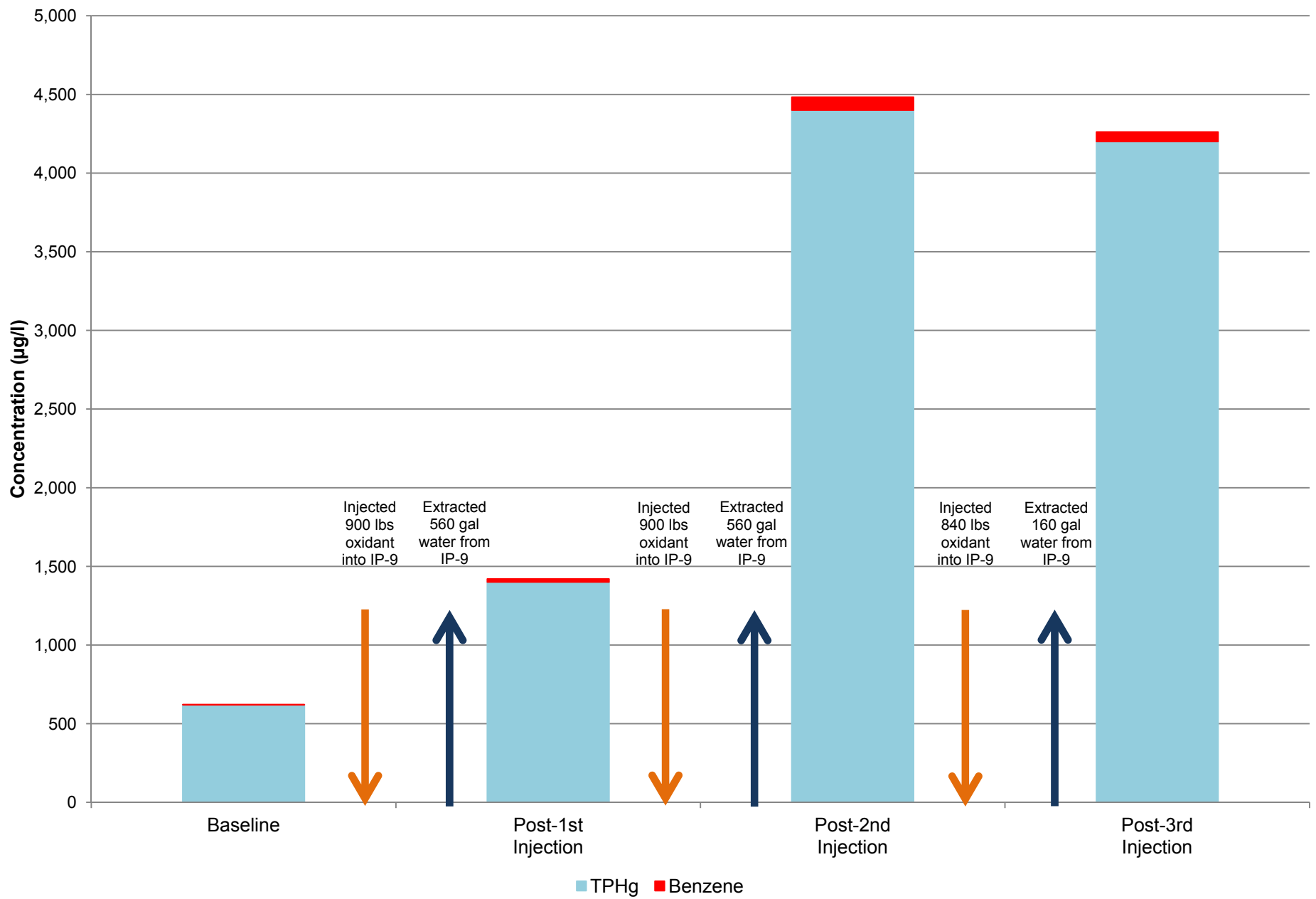


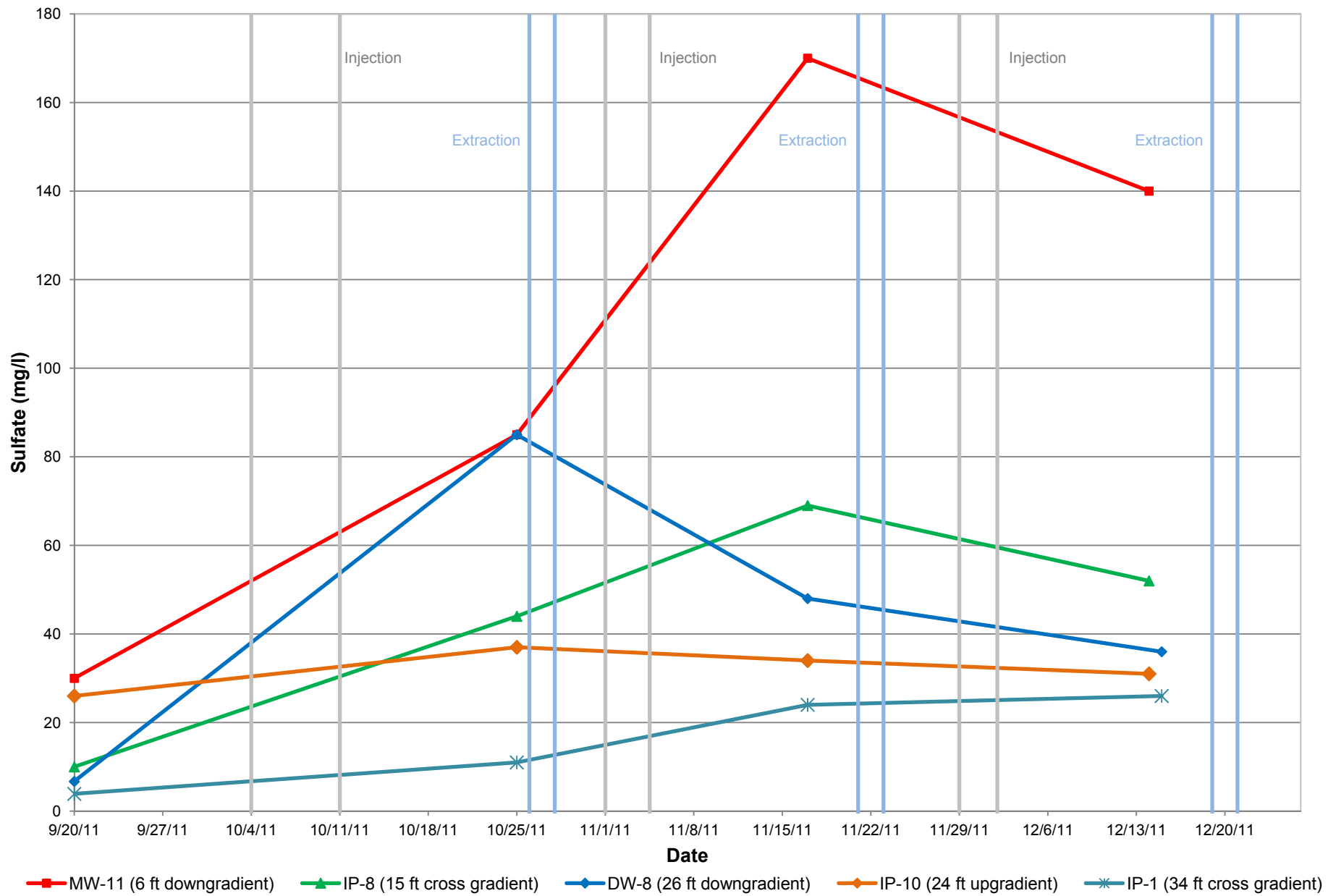


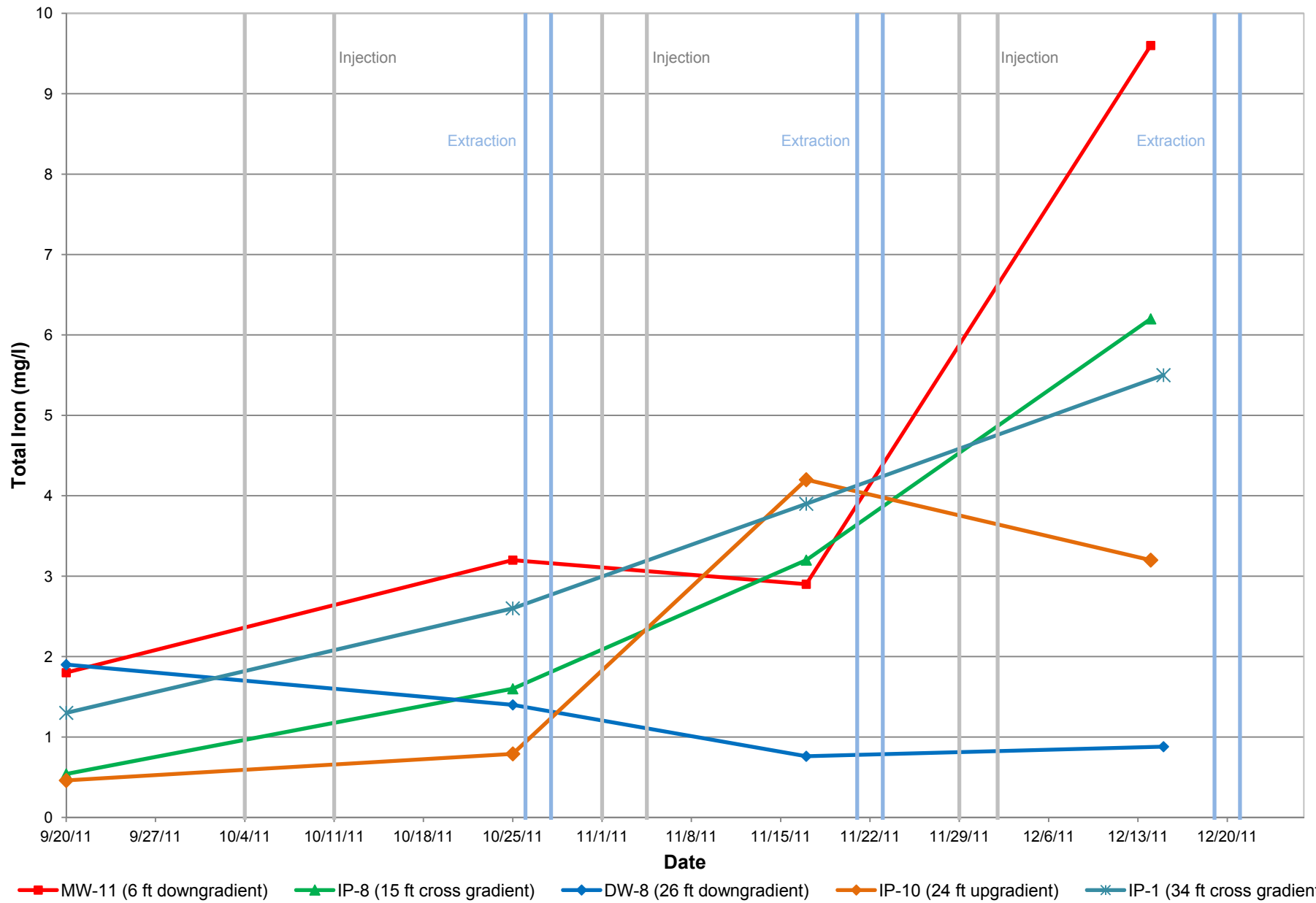


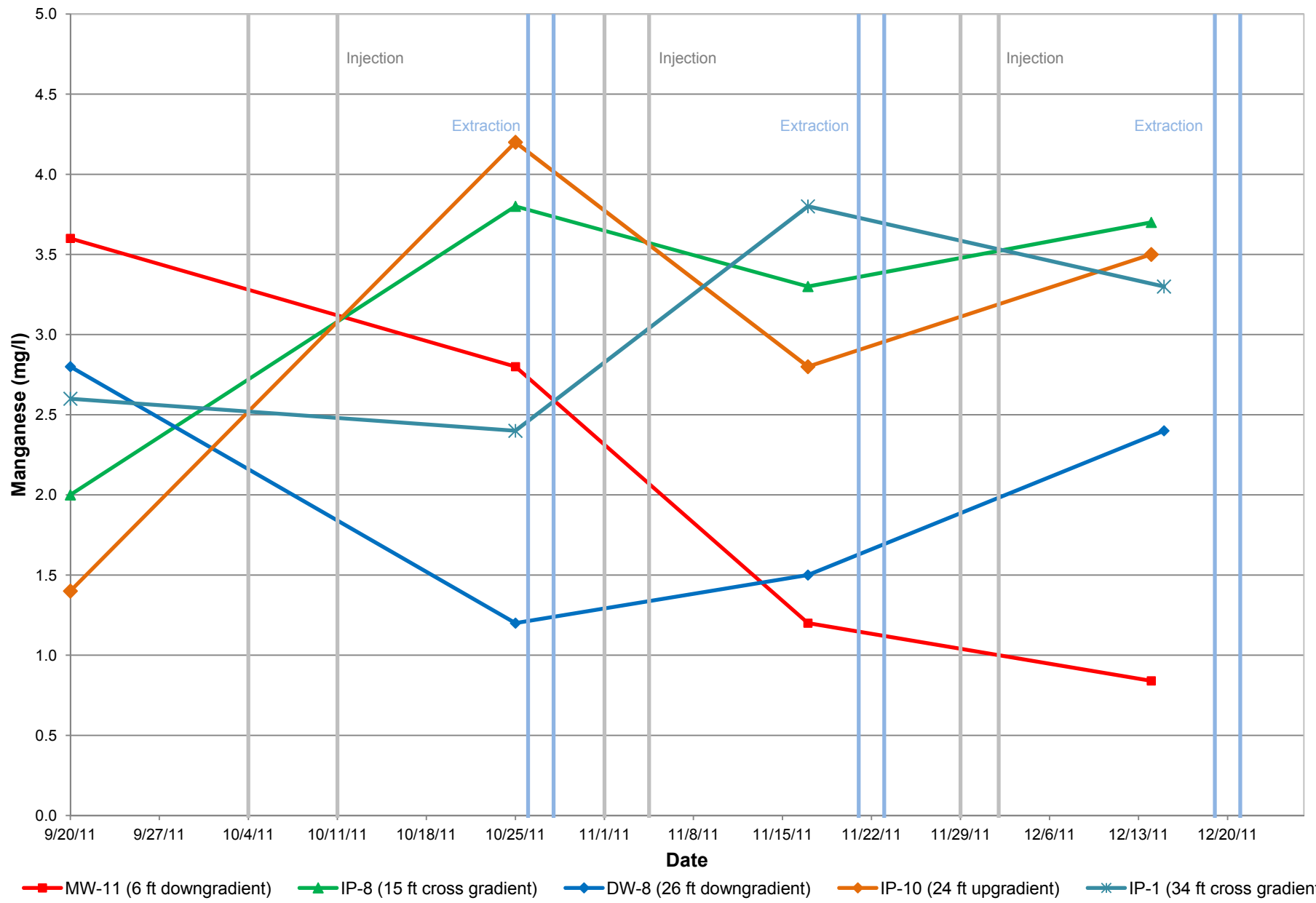


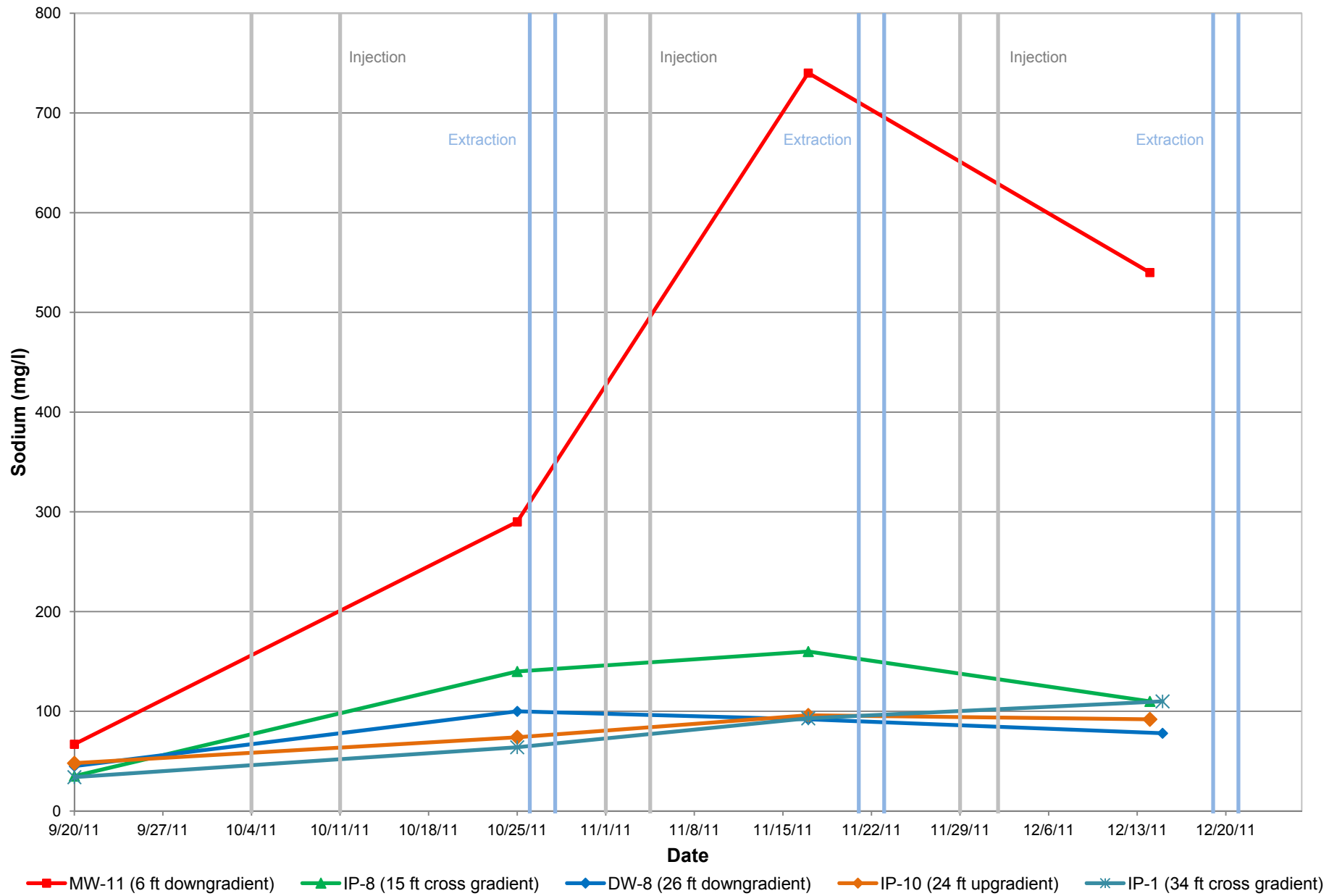


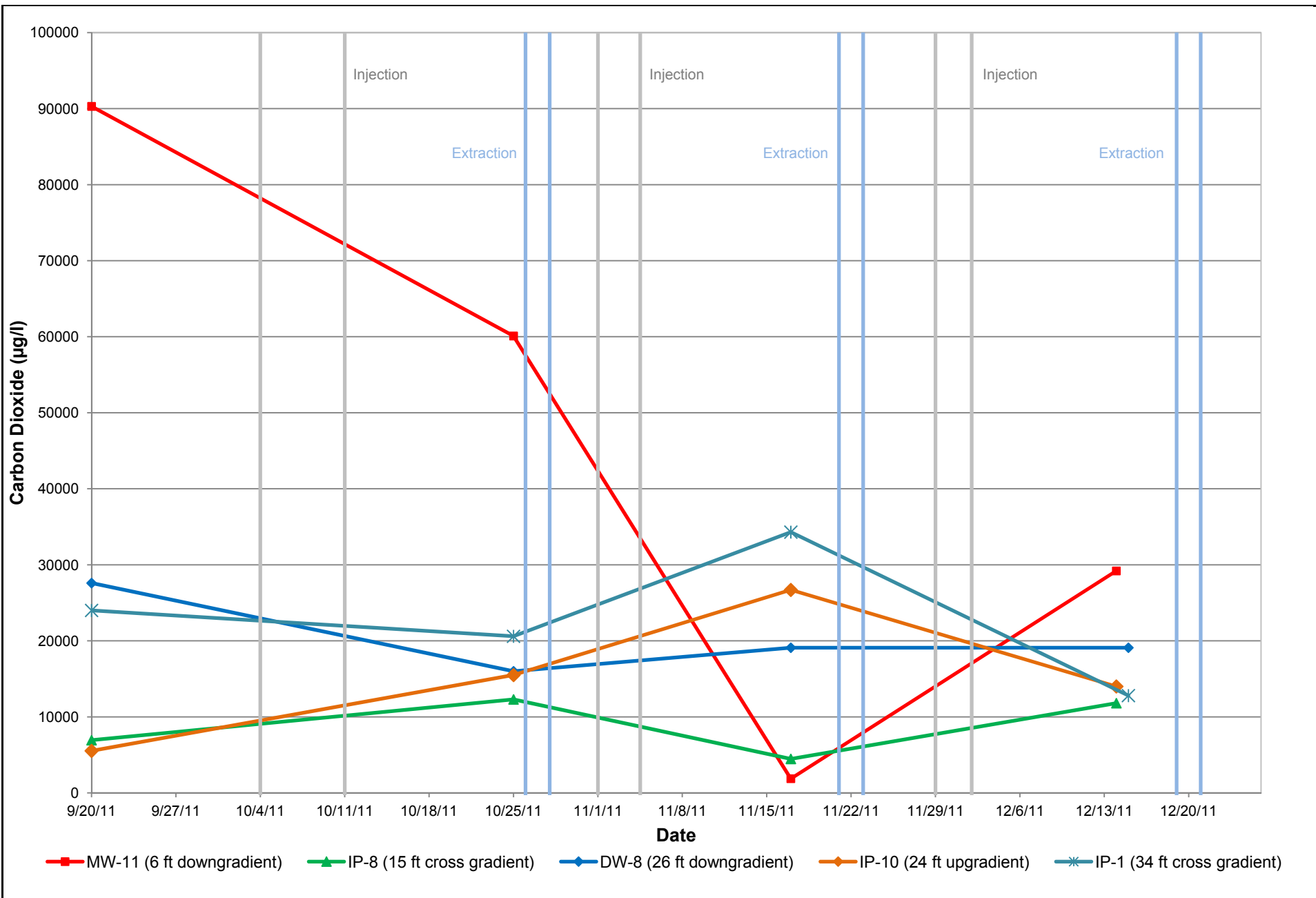


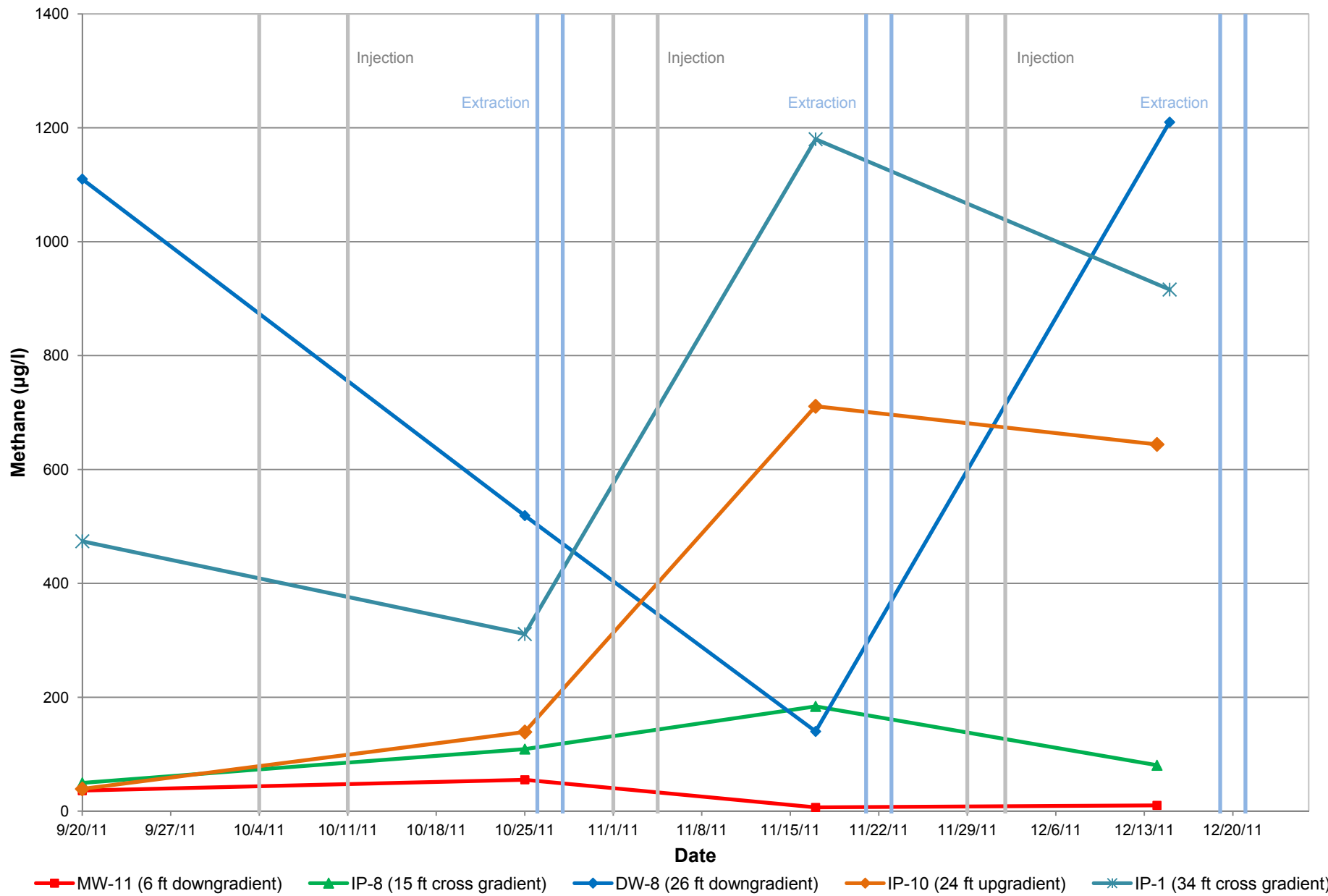


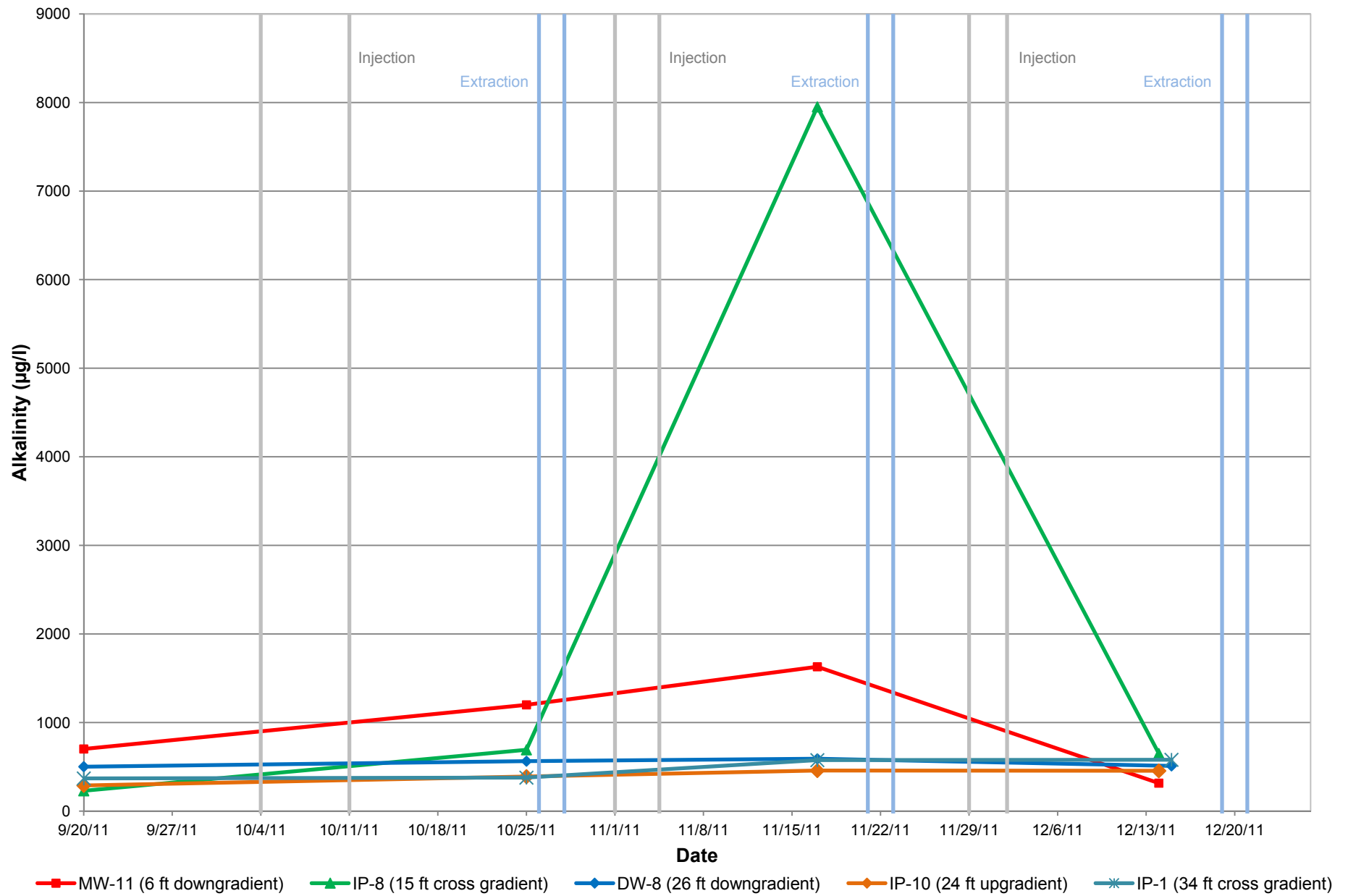


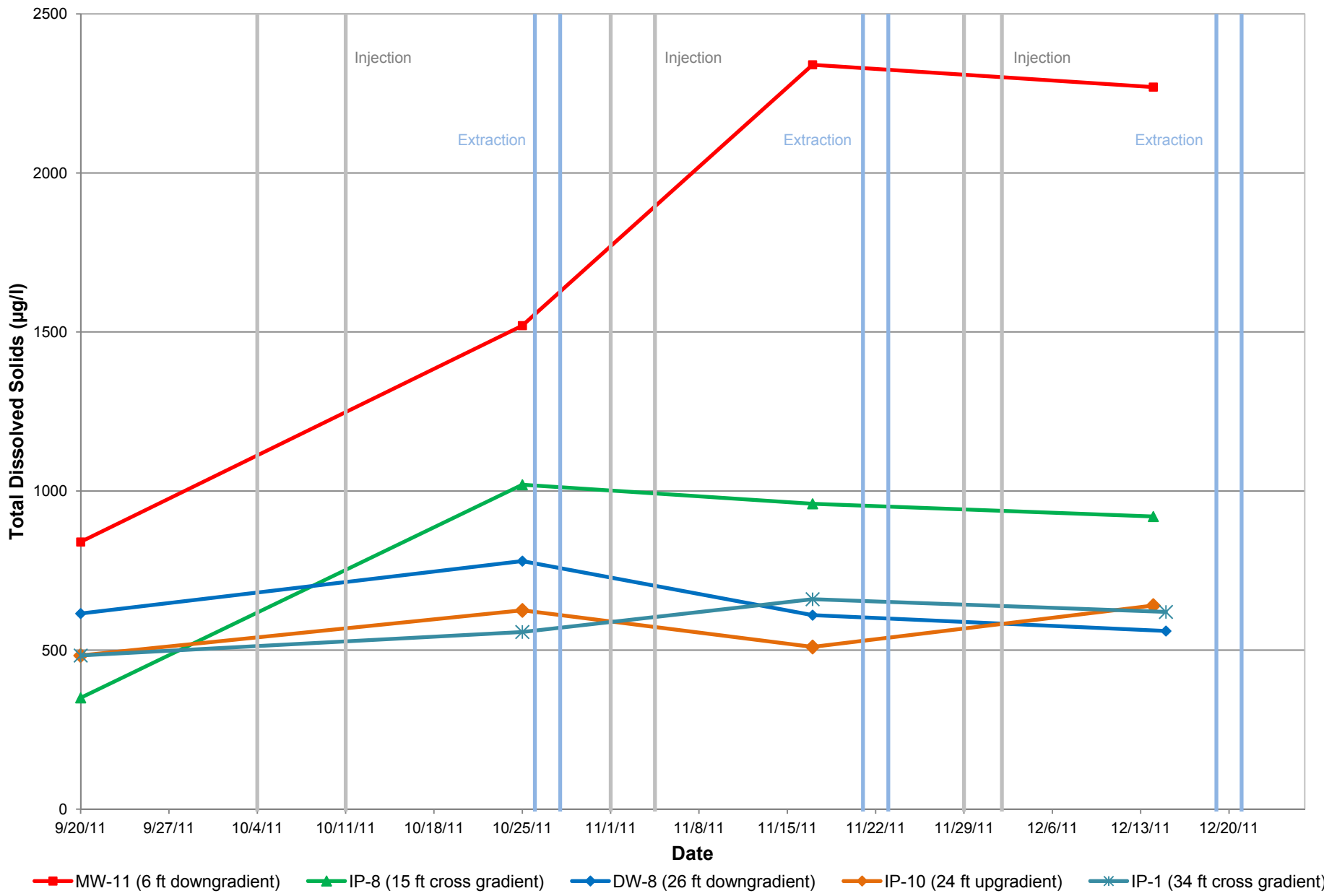




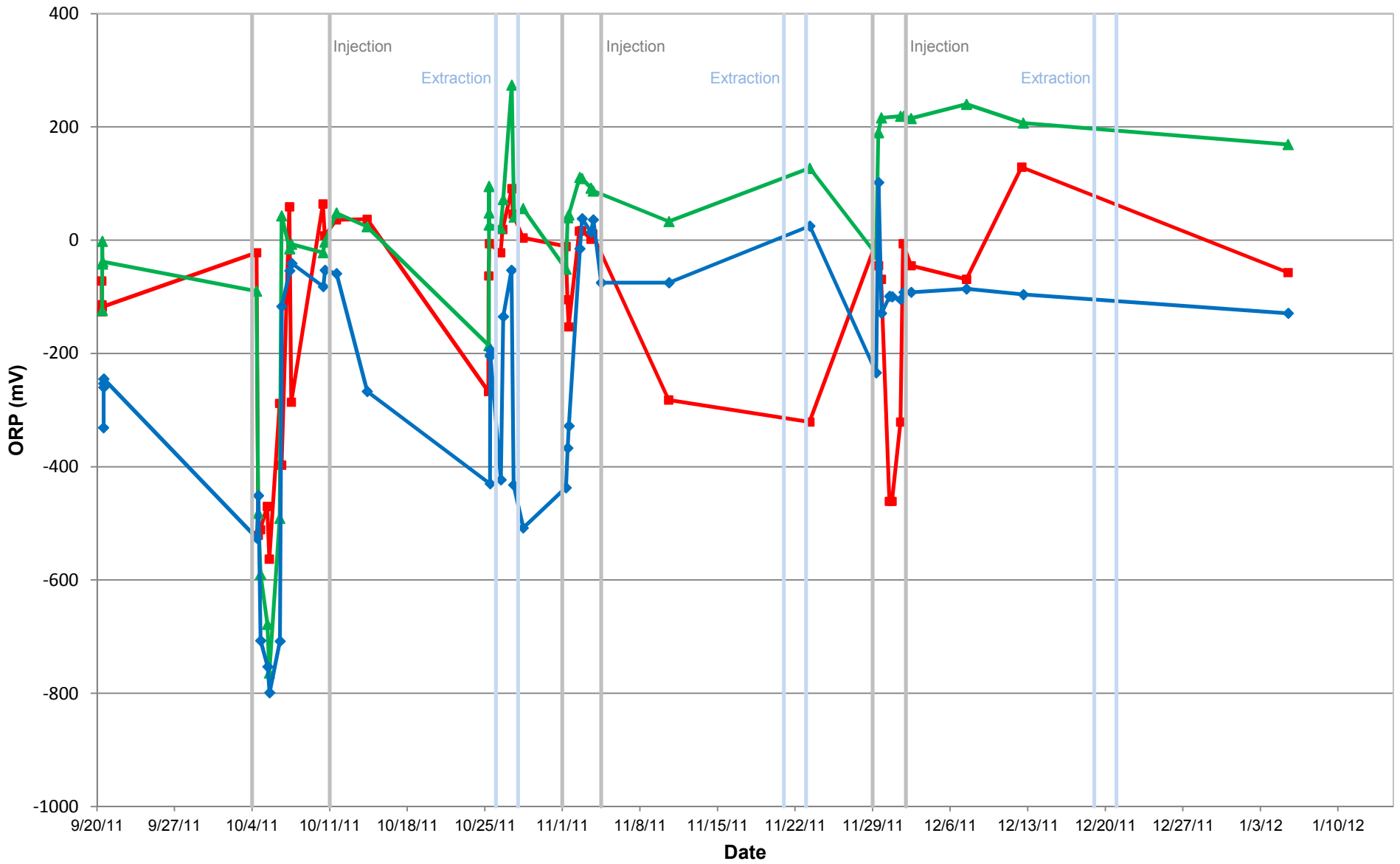




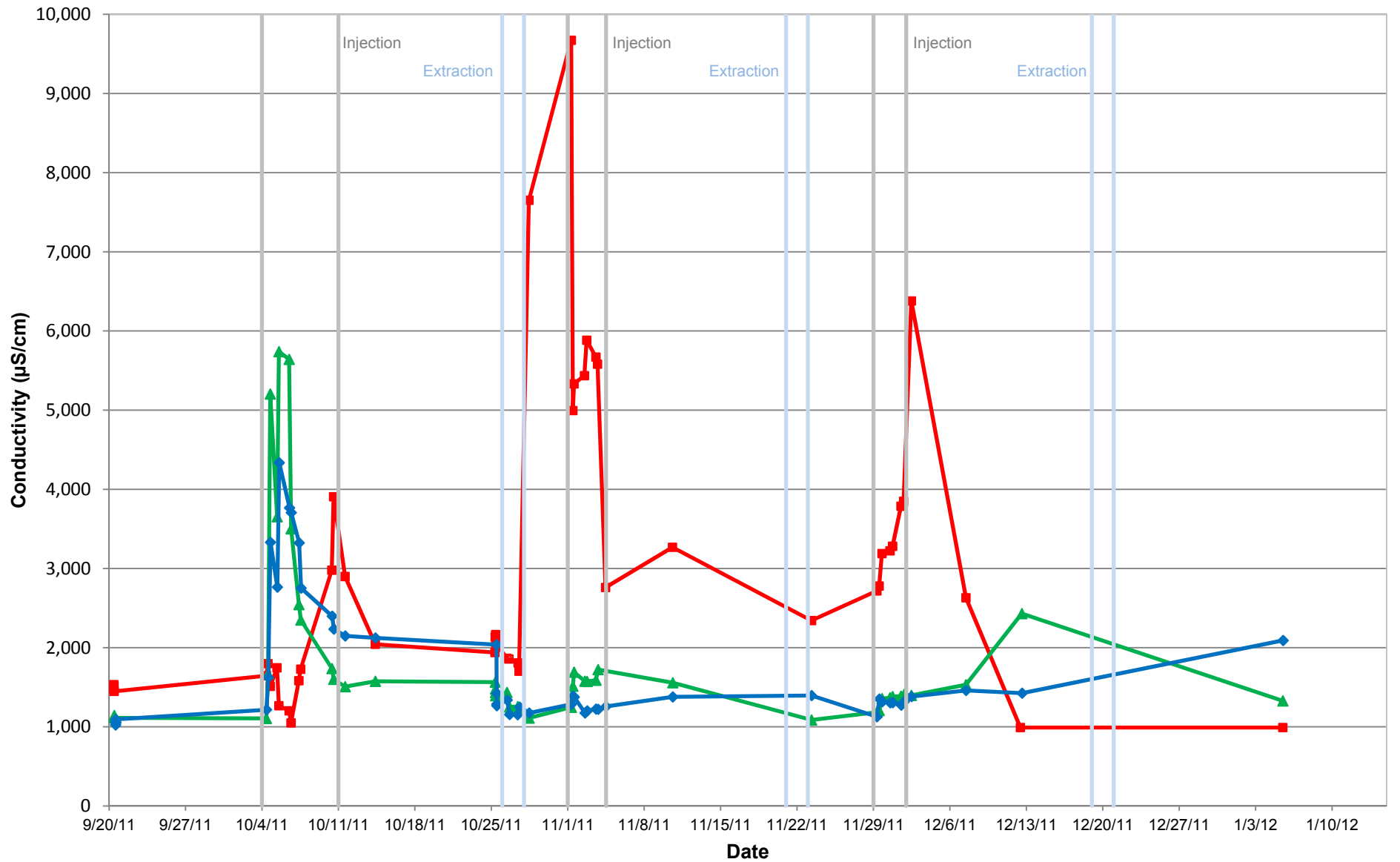




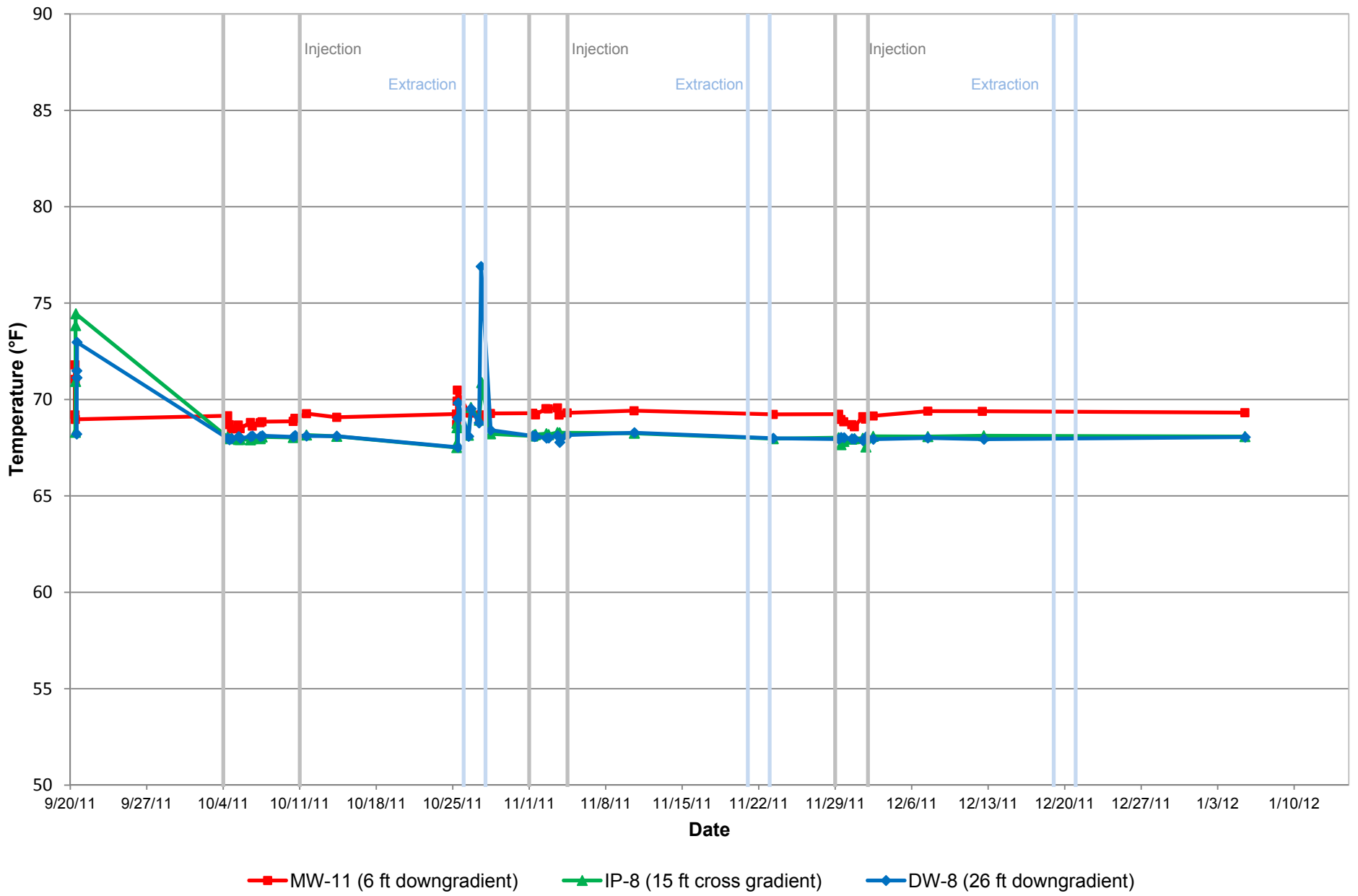




■ MW-11 (6 ft downgradient)
 ▲ IP-8 (15 ft cross gradient)
 ◆ DW-8 (26 ft downgradient)



■ MW-11 (6 ft downgradient)
 ▲ IP-8 (15 ft cross gradient)
 ◆ DW-8 (26 ft downgradient)



APPENDIX A
SITE BACKGROUND

APPENDIX A SITE BACKGROUND

The site is located on the southeast corner of the intersection of 1st Street and South P Street at an active automobile service station. Adjacent properties include an office building to the east, Fosters Freeze restaurant to the west, Safeway supermarket and Hollywood Video to the north, and apartments to the south (Figure 2).

Previous investigations indicate that the groundwater beneath the site is impacted by petroleum hydrocarbons including total petroleum hydrocarbons as gasoline (TPHg); benzene, toluene, ethylbenzene, and total xylenes (BTEX); methyl tert-butyl ether (MTBE); and tert-butyl alcohol (TBA). Current groundwater monitoring and analytical results indicate that the highest TPHg and benzene concentrations of 82,000 and 4,300 micrograms per liter ($\mu\text{g/l}$), respectively, were reported at well DW-8 during the fourth quarter 2011 monitoring event. The highest MTBE and TBA concentrations of 1,500 and 1,000 $\mu\text{g/l}$, respectively, were reported at well TP-1. Elevated benzene and MTBE concentrations in groundwater (1,000 and 370 $\mu\text{g/l}$, respectively) were also reported approximately 140 feet downgradient of the site at well MW-6.

In November 1992, three underground service tanks (USTs) and associated product piping were removed from the site. Soil samples collected below the USTs at a depth of 14 feet below grade contained TPHg concentrations of 600 and 1,400 milligrams per kilogram (mg/kg) at the west end of the unleaded plus and unleaded tanks, respectively. The UST excavation was overexcavated to a depth of 19 feet below grade for installation of the new USTs. A TPHg concentration of 4,700 mg/kg was detected at a depth 19 feet below grade at the southwest corner of the tank pit. This area was overexcavated to a depth of 27 feet to remove impacted soil until TPHg was detected at 490 mg/kg at a depth of 27 feet below grade. The only detection of benzene at the site was a concentration of 1.4 mg/kg at this depth. TPHg was also detected under the product piping at the eastern pump island at concentrations of 2.7 and 4.4 mg/kg. A total of 1,200 cubic yards of soil were excavated and disposed of off site. Soil samples were not analyzed for MTBE (Arctos, 2005).

A soil and groundwater remediation system, including 27 dual-completion groundwater air sparging and vapor extraction wells (7 on site and 20 off site at the Livermore Arcade Shopping Center [LASC] site) was installed in September and October 1995. The system operated from May 1996 through February 1997. Groundwater concentrations in onsite well MW-2 decreased by 73 and 78 percent for TPHg and benzene, respectively, and concentrations in offsite well MW-6 decreased by 77 and 60 percent for TPHg and benzene, respectively (Arctos, 2005).

Groundwater grab samples were collected from six offsite vapor extraction wells and LASC groundwater well MW-23 in March 1997. Only one well (VE-10) had detectable TPHg and benzene concentrations of 440 and 5.1 $\mu\text{g/l}$, respectively (Arctos, 2005).

Hydrocarbon-impacted soil exposed during periods of low groundwater levels is currently being remediated on site by a soil vapor extraction (SVE) system, which has operated since 28 June 2010. The system removes hydrocarbon mass from the exposed soil and assists with groundwater remediation. Arctos started an oxygen injection system on 18 October 2010 to enhance the biodegradation of petroleum hydrocarbons in groundwater on site.

Arctos performed a MIP investigation to assess the lateral and vertical extent of free product after it was detected at the site on 25 October 2010 in well IP-8. The investigation was conducted in January 2011. The highest impacts were generally encountered between 55 and 70 feet below grade in the southwest portion of the site near the USTs. These impacts are approximately 20 feet below the top of the current water table. Based on the results of the MIP borings, Arctos installed deep monitoring well DW-8 on 13 April 2011 downgradient of the USTs. The highest TPHg and benzene concentrations in groundwater at the site are currently reported at well DW-8.

Geology and Hydrogeology

The site is underlain by approximately 100 feet of Quaternary alluvial fan deposits overlaying the Livermore gravels. The Tertiary-aged Livermore gravels extend to 600 feet deep and consist of massive beds of rounded gravel cemented by a sandy clay and sandy silt matrix. The alluvial fan deposits consist of semiconsolidated deposits of clay, silt, sand, and gravel (California Department of Water Resources [CDWR], 1974). The north-south trending Livermore fault is mapped 0.5 mile west of the site.

The site lies in the Mocho II Subbasin of the Livermore Valley groundwater basin. This area is drained by Arroyo Mocho, which runs from the southeast toward the northwest approximately 0.5 mile southwest of the site (Figure 1). The Arroyo Mocho also provides groundwater recharge in the area (CDWR, 1974).

In the site vicinity, subsurface investigations have found a shallow, upper unconfined water-bearing zone consisting primarily of gravels with sand and clay. Underlying the gravels, an approximately 45-foot-thick, low-permeability clay unit (aquitar) is found at depths of approximately 60 to 110 feet below grade at the LASC site, 800 feet northwest of the site. Fine-grained units of clay containing sand and gravel are present across the site at varying depths. The deposits vary laterally and may include channel deposits. Below the clayey unit is the top of the underlying semiconfined aquifer. Groundwater extraction for municipal water supply occurs in the semiconfined aquifer and in a deeper confined aquifer.

No evidence of communication between the shallow water-bearing zone and the underlying aquifers in the site vicinity has been documented. Groundwater elevations in the shallow water-bearing zone and the semiconfined aquifer are similar and indicate that hydraulic connection at some point between these two water-bearing zones is likely. Over the last 17 years, static water levels at the site have ranged from 17 feet below grade in March 1996 to 48 feet below grade in November 2007. The groundwater flow direction

generally is to the northwest with a hydraulic gradient ranging from 0.01 to 0.03 since 1993.

References

Arctos Environmental, 2005. "Initial Site Conceptual Model, Tesoro Livermore Site, No. 67076," prepared for Tesoro Environmental Resources Company by Arctos Environmental, September.

California Department of Water Resources, 1974. "Bulletin 118-2, Evaluation of Groundwater Resources: Livermore and Sunol Valleys," June.

APPENDIX B
ISCO PILOT TEST FIELD READINGS

TABLE B-1

ISCO PILOT TEST FIELD READINGS
TESORO - LIVERMORE, 67076

Well	Date	Time	Depth to Water (feet below casing)	Depth to Product (feet below casing)	DO ^(a) (mg/l)	ORP ^(a) (mV)	Temperature ^(a) (°F)	pH ^(a)	Conductivity ^(a) (µS/cm)
MW-2	11/1/11	09:07	34.76	-- ^(a)	--	--	--	--	--
	11/1/11	09:23	--	--	--	-210	68.6	6.74	1,239
	11/1/11	11:35	34.51	--	--	--	--	--	--
	11/1/11	11:41	--	--	--	-187	68.7	6.85	1,197
	11/1/11	14:01	34.33	--	--	--	--	--	--
	11/1/11	14:12	--	--	--	-298	68.8	6.79	1,156
	11/2/11	07:10	34.45	--	--	--	--	--	--
	11/2/11	12:49	34.32	--	--	40	68.7	6.78	1,153
	11/2/11	17:54	34.14	--	--	--	--	--	--
	11/3/11	07:26	34.19	--	--	--	--	--	--
	11/3/11	14:04	34.18	--	--	--	--	--	--
	11/3/11	14:17	--	--	--	-76	68.9	6.73	1,169
	11/3/11	17:42	34.08	--	--	30	68.2	6.79	1,161
	11/4/11	09:01	34.20	--	--	--	--	--	--
	11/4/11	11:16	34.11	--	--	-74	68.6	6.87	1,182
	11/10/11	15:05	34.51	--	0.49	-66	68.8	6.77	1260
	11/21/11	07:33	34.53	NA ^(c)	--	--	--	--	--
	11/21/11	10:32	34.67	--	--	--	--	--	--
	11/21/11	13:00	34.87	NA	--	--	--	--	--
	11/21/11	16:13	35.15	--	--	--	--	--	--
	11/22/11	07:28	34.77	NA	--	--	--	--	--
	11/22/11	10:08	34.97	NA	--	--	--	--	--
	11/22/11	13:42	35.13	NA	--	--	--	--	--
	11/22/11	16:19	35.22	NA	--	--	--	--	--
	11/28/11	10:02	34.58	34.58	--	--	--	--	--
	11/28/11	11:49	34.56	NA	--	--	--	--	--
	11/28/11	14:34	34.61	NA	--	--	--	--	--
	11/28/11	16:40	34.65	34.65	--	--	--	--	--
	11/29/11	08:01	34.61	34.61	--	--	--	--	--
	11/29/11	08:06	--	--	--	-88	68.7	6.75	1305
	11/29/11	12:41	34.44	NA	--	--	--	--	--
	11/29/11	12:49	--	--	--	-62	68.8	6.75	1290
	11/29/11	18:58	34.35	--	--	--	--	--	--
	11/29/11	19:05	--	--	--	-67	68.8	6.75	1292
	11/30/11	07:06	34.41	34.41	--	--	--	--	--
	11/30/11	12:23	34.36	NA	--	--	--	--	--
	11/30/11	12:29	--	--	--	-68	68.9	6.73	1,270
	11/30/11	18:10	34.30	NA	--	--	--	--	--
	11/30/11	18:16	--	--	--	-68	68.8	6.73	1,265
	12/1/11	06:31	34.42	NA	--	--	--	--	--
	12/1/11	12:44	34.38	NA	--	--	--	--	--
	12/1/11	12:50	--	--	--	-103	68.7	6.78	1,269
	12/1/11	19:24	34.29	NA	--	--	--	--	--
	12/1/11	19:28	--	--	--	-60	68.9	6.74	1,220
	12/2/11	05:27	34.30	34.30	--	--	--	--	--
	12/2/11	11:22	34.31	NA	--	--	--	--	--
	12/2/11	11:29	--	--	--	-84	68.8	6.74	1,202
	12/7/11	11:39	37.85	34.85	--	--	--	--	--

TABLE B-1

ISCO PILOT TEST FIELD READINGS
TESORO - LIVERMORE, 67076

Well	Date	Time	Depth to Water (feet below casing)	Depth to Product (feet below casing)	DO ^(a) (mg/l)	ORP ^(a) (mV)	Temperature ^(a) (°F)	pH ^(a)	Conductivity ^(a) (µS/cm)
MW-2 (cont.)	12/7/11	11:46	--	--	--	-103	68.8	6.74	1274
	12/12/11	14:49	34.90	NA	--	--	--	--	--
	12/12/11	14:57	--	--	--	-63	68.7	6.72	2019
	12/19/11	08:16	35.76	NA	--	--	--	--	--
	12/19/11	15:09	35.97	NA	--	--	--	--	--
	12/20/11	08:34	35.37	NA	--	--	--	--	--
	12/20/11	14:40	36.36	NA	--	--	--	--	--
	12/21/11	10:23	36.25	NA	--	--	--	--	--
	12/21/11	14:49	36.72	NA	--	--	--	--	--
	1/5/12	12:06	37.82	--	--	--	--	--	--
1/5/12	12:18	--	--	--	-1	68.8	6.74	1,185	
MW-7	11/1/11	12:10	33.59	--	--	--	--	--	--
	11/1/11	12:19	--	--	--	-412	68.5	7.31	832
	11/1/11	14:19	33.48	--	--	--	--	--	--
	11/1/11	--	--	--	--	-481	69.0	7.26	843
	11/2/11	07:09	33.46	--	--	--	--	--	--
	11/2/11	13:04	33.34	--	--	-283	68.6	7.17	822
	11/2/11	17:57	33.11	--	--	--	--	--	--
	11/3/11	07:29	32.98	--	--	--	--	--	--
	11/3/11	14:20	32.90	--	--	--	--	--	--
	11/3/11	14:28	--	--	--	-406	68.9	7.22	827
	11/3/11	17:56	32.90	--	--	-402	68.6	7.16	826
	11/4/11	09:03	32.89	--	--	--	--	--	--
	11/4/11	11:20	32.98	--	--	-399	68.7	7.17	828
	11/10/11	15:25	33.34	--	0.33	-447	69.1	7.19	862
	11/21/11	07:36	33.48	NA	--	--	--	--	--
	11/21/11	10:37	33.58	NA	--	--	--	--	--
	11/21/11	12:58	33.59	NA	--	--	--	--	--
	11/21/11	16:16	33.71	--	--	--	--	--	--
	11/22/11	07:27	33.82	NA	--	--	--	--	--
	11/22/11	10:10	33.82	NA	--	--	--	--	--
	11/22/11	13:35	33.77	33.77	--	--	--	--	--
	11/22/11	16:23	33.82	NA	--	--	--	--	--
	11/28/11	09:59	33.62	NA	--	--	--	--	--
	11/28/11	11:47	33.62	NA	--	--	--	--	--
	11/28/11	14:38	33.59	NA	--	--	--	--	--
	11/28/11	16:44	33.58	NA	--	--	--	--	--
	11/29/11	07:53	33.66	NA	--	--	--	--	--
	11/29/11	08:02	--	--	--	-126	68.6	7.2	880.9
	11/29/11	12:53	33.57	NA	--	--	--	--	--
	11/29/11	12:59	--	--	--	-102	68.9	7.17	888.1
	11/29/11	19:13	33.51	NA	--	--	--	--	--
	11/29/11	19:25	--	--	--	-111	68.6	7.17	879.1
	11/30/11	07:03	33.45	NA	--	--	--	--	--
11/30/11	12:36	33.41	NA	--	--	--	--	--	
11/30/11	12:45	--	--	--	-115	68.8	7.16	857.2	
11/30/11	18:21	33.34	NA	--	--	--	--	--	

TABLE B-1

ISCO PILOT TEST FIELD READINGS
TESORO - LIVERMORE, 67076

Well	Date	Time	Depth to Water (feet below casing)	Depth to Product (feet below casing)	DO ^(a) (mg/l)	ORP ^(a) (mV)	Temperature ^(a) (°F)	pH ^(a)	Conductivity ^(a) (µS/cm)
MW-7 (cont.)	11/30/11	18:28	--	--	--	-111	68.3	7.16	854.6
	12/1/11	06:33	33.41	NA	--	--	--	--	--
	12/1/11	12:56	33.34	NA	--	--	--	--	--
	12/1/11	13:04	--	--	--	-103	68.8	7.18	824.9
	12/1/11	19:32	33.29	NA	--	--	--	--	--
	12/1/11	19:37	--	--	--	-100	68.6	7.16	833.7
	12/2/11	05:26	33.24	NA	--	--	--	--	--
	12/2/11	11:29	33.28	NA	--	--	--	--	--
	12/2/11	11:35	--	--	--	-108	68.8	7.16	826.3
	12/7/11	11:32	33.91	NA	--	--	--	--	--
	12/7/11	11:39	--	--	--	-137	68.8	7.76	908.1
	12/12/11	14:44	33.72	NA	--	--	--	--	--
	12/12/11	14:51	--	--	--	-128	68.9	7.11	1,701
	12/19/11	08:19	34.69	NA	--	--	--	--	--
	12/19/11	15:12	34.66	34.66	--	--	--	--	--
	12/20/11	08:41	34.83	NA	--	--	--	--	--
	12/20/11	14:38	34.86	NA	--	--	--	--	--
	12/21/11	09:28	35.11	NA	--	--	--	--	--
	12/21/11	14:55	35.15	35.15	--	--	--	--	--
1/5/12	11:59	36.74	--	--	--	--	--	--	
1/5/12	12:10	--	--	--	-123	68.9	7.06	1,057	
MW-11	9/20/11	10:07	32.79	--	4.85	-72	69.2	7.06	1,474
	9/20/11	10:20	37.38	--	2.35	-126	71.8	7.22	1,534
	9/20/11	10:46	37.61	--	2.87	-114	71.1	6.77	1,518
	9/20/11	11:00	37.45	--	2.67	-118	69.0	6.68	--
	10/4/11	09:35	--	--	5.07	-22	69.2	6.98	1,448
	10/4/11	09:47	31.84	--	--	--	--	--	--
	10/4/11	11:31	31.79	--	--	--	--	--	--
	10/4/11	13:02	31.55	--	--	--	--	--	--
	10/4/11	13:09	--	--	0.17	-521	68.7	10.53	1,646
	10/4/11	17:51	31.17	--	--	--	--	--	--
	10/4/11	18:05	--	--	0.05	-511	68.5	10.11	1,799
	10/5/11	08:35	32.51	--	--	--	--	--	--
	10/5/11	08:58	--	--	0.81	-470	68.7	8.91	1,511
	10/5/11	12:53	31.55	--	--	--	--	--	--
	10/5/11	13:05	--	--	--	-563	68.5	8.78	1,746
	10/5/11	16:42	31.73	--	--	--	--	--	--
	10/6/11	11:36	--	--	--	-288	68.8	7.52	1,267
	10/6/11	11:24	33.00	--	--	--	--	--	--
	10/6/11	15:33	32.55	--	--	--	--	--	--
	10/6/11	15:46	--	--	--	-397	68.6	7.77	1,203
	10/7/11	08:40	32.71	--	--	--	--	--	--
	10/7/11	08:58	--	--	--	59	68.8	7.39	1,050
	10/7/11	12:28	30.05	--	--	--	--	--	--
	10/7/11	12:57	--	--	--	-286	68.9	8.36	1,583
	10/10/11	09:09	30.11	--	--	--	--	--	--
	10/10/11	09:26	--	--	--	64	68.9	7.24	1,728

TABLE B-1

ISCO PILOT TEST FIELD READINGS
TESORO - LIVERMORE, 67076

Well	Date	Time	Depth to Water (feet below casing)	Depth to Product (feet below casing)	DO ^(a) (mg/l)	ORP ^(a) (mV)	Temperature ^(a) (°F)	pH ^(a)	Conductivity ^(a) (µS/cm)
MW-11 (cont.)	10/10/11	13:00	27.74	--	--	--	--	--	--
	10/10/11	13:20	--	--	--	8	69.0	9.08	2,979
	10/10/11	15:24	27.04	--	--	--	--	--	--
	10/11/11	14:21	23.44	--	--	--	--	--	--
	10/11/11	14:34	--	--	--	36	69.3	9.20	3,907
	10/14/11	08:46	33.69	--	--	--	--	--	--
	10/14/11	09:01	--	--	--	37	69.1	8.05	2,899
	10/25/11	07:57	33.50	NA	--	-267	69.3	7.22	2,043
	10/25/11	08:31	38.41	--	--	-63	68.7	7.13	1,939
	10/25/11	09:33	37.41	--	--	--	69.9	7.31	2,228
	10/25/11	09:55	38.68	--	--	-6	70.5	7.15	2,136
	10/26/11	08:12	33.54	NA	--	--	--	--	--
	10/26/11	10:10	33.95	NA	--	--	--	--	--
	10/26/11	10:18	--	--	--	-22	69.3	7.20	2,165
	10/26/11	12:55	34.03	--	--	--	--	--	--
	10/26/11	14:10	34.08	--	--	--	--	--	--
	10/26/11	14:35	--	--	--	19	69.3	7.21	2,059
	10/27/11	08:11	33.73	--	--	--	--	--	--
	10/27/11	10:39	34.51	NA	--	--	--	--	--
	10/27/11	10:47	--	--	--	91	69.1	6.78	1,866
	10/27/11	12:39	34.86	NA	--	--	--	--	--
	10/27/11	12:51	--	--	--	46	69.2	7.06	1,857
	10/28/11	10:10	33.81	NA	--	--	--	--	--
	10/28/11	10:41	--	--	--	4	69.3	7.03	1,807
	11/1/11	07:33	33.29	NA	--	--	--	--	--
	11/1/11	07:39	--	--	--	-11	69.3	7.04	1,703
	11/1/11	08:57	31.88	NA	--	--	--	--	--
	11/1/11	11:01	30.44	NA	--	--	--	--	--
	11/1/11	11:12	--	--	--	-105	69.2	10.56	7,652
	11/1/11	13:35	28.79	NA	--	--	--	--	--
	11/1/11	13:49	--	--	--	-153	69.2	10.90	9,672
	11/2/11	06:59	32.30	NA	--	--	--	--	--
	11/2/11	12:20	27.21	NA	--	--	--	--	--
	11/2/11	12:39	--	--	--	16	69.5	9.64	4,995
	11/2/11	17:33	24.92	NA	--	--	--	--	--
	11/2/11	17:40	--	--	--	17	69.5	9.63	5,332
	11/3/11	07:22	27.37	NA	--	--	--	--	--
	11/3/11	13:34	27.89	NA	--	--	--	--	--
	11/3/11	13:52	--	--	--	2	69.6	9.53	5,436
	11/3/11	17:15	26.66	NA	--	--	--	--	--
	11/3/11	17:24	--	--	--	11	69.2	9.59	5,884
	11/4/11	08:58	28.58	NA	--	--	--	--	--
	11/4/11	11:00	28.79	NA	--	--	--	--	--
	11/4/11	11:06	--	--	--	-7	69.3	9.51	5,671
	11/10/11	14:10	--	--	0.57	-282	69.4	9.60	5,581
	11/21/11	07:23	33.36	NA	--	--	--	--	--
	11/21/11	10:28	33.61	--	--	--	--	--	--

TABLE B-1

ISCO PILOT TEST FIELD READINGS
TESORO - LIVERMORE, 67076

Well	Date	Time	Depth to Water (feet below casing)	Depth to Product (feet below casing)	DO ^(a) (mg/l)	ORP ^(a) (mV)	Temperature ^(a) (°F)	pH ^(a)	Conductivity ^(a) (µS/cm)
MW-11 (cont.)	11/21/11	12:53	33.94	NA	--	--	--	--	--
	11/21/11	16:12	34.49	--	--	--	--	--	--
	11/22/11	07:20	33.94	NA	--	--	--	--	--
	11/22/11	10:50	34.25	NA	--	--	--	--	--
	11/22/11	13:32	34.77	NA	--	--	--	--	--
	11/22/11	16:17	35.04	NA	--	--	--	--	--
	11/23/11	07:45	--	--	--	129	69.2	8.62	2760
	11/23/11	08:48	33.82	NA	--	--	--	--	--
	11/28/11	09:48	33.49	NA	--	--	--	--	--
	11/28/11	11:40	33.70	NA	--	--	--	--	--
	11/28/11	14:30	34.04	NA	--	--	--	--	--
	11/28/11	16:40	34.29	NA	--	--	--	--	--
	11/29/11	06:56	33.67	NA	--	--	--	--	--
	11/29/11	07:27	--	--	--	-57	69.2	8.75	3,268
	11/29/11	12:24	30.10	NA	--	--	--	--	--
	11/29/11	12:29	--	--	--	268	69.0	7.87	2,342
	11/29/11	18:34	29.12	NA	--	--	--	--	--
	11/29/11	18:38	--	--	--	232	68.9	8.17	2,717
	11/30/11	06:56	30.24	NA	--	--	--	--	--
	11/30/11	12:11	30.35	NA	--	--	--	--	--
	11/30/11	12:15	--	--	--	218	68.7	8.23	2,779
	11/30/11	17:55	29.52	NA	--	--	--	--	--
	11/30/11	17:59	--	--	--	214	68.6	8.60	3,189
	12/1/11	06:23	30.47	NA	--	--	--	--	--
	12/1/11	12:09	30.71	NA	--	--	--	--	--
	12/1/11	12:30	--	--	--	201	69.1	8.55	3,223
	12/1/11	17:52	30.37	NA	--	--	--	--	--
	12/1/11	18:07	--	--	--	212	69.0	8.49	3,281
	12/2/11	05:19	30.99	NA	--	--	--	--	--
	12/2/11	11:04	30.97	NA	--	--	--	--	--
	12/2/11	11:12	--	--	--	196	69.2	8.85	3,787
	12/7/11	11:11	34.14	NA	--	--	--	--	--
	12/7/11	11:16	--	--	--	113	69.4	8.49	3,849
12/12/11	10:29	33.82	NA	--	--	--	--	--	
12/12/11	10:53	--	--	--	126	69.4	8.47	6,380	
12/19/11	07:59	34.68	NA	--	--	--	--	--	
12/19/11	15:01	34.58	NA	--	--	--	--	--	
12/20/11	08:30	34.82	NA	--	--	--	--	--	
12/20/11	14:20	35.41	NA	--	--	--	--	--	
12/21/11	09:19	35.15	NA	--	--	--	--	--	
12/21/11	14:41	35.90	NA	--	--	--	--	--	
1/5/12	11:28	36.73	--	--	--	--	--	--	
1/5/12	11:36	--	--	--	-62	69.3	7.59	2,630	
IP-1	9/20/11	12:36	34.16	--	0.06	-321	69.1	6.91	991
	9/20/11	12:50	44.36	--	5.97	-6	74.9	6.80	1,207
	9/20/11	12:57	42.35	--	3.75	-45	74.2	6.66	1,340
	9/20/11	13:04	36.34	--	3.23	-69	73.8	6.63	1,346

TABLE B-1

ISCO PILOT TEST FIELD READINGS
TESORO - LIVERMORE, 67076

Well	Date	Time	Depth to Water (feet below casing)	Depth to Product (feet below casing)	DO ^(a) (mg/l)	ORP ^(a) (mV)	Temperature ^(a) (°F)	pH ^(a)	Conductivity ^(a) (µS/cm)
IP-1 (cont.)	10/4/11	09:33	32.74	--	--	--	--	--	--
	10/4/11	09:51	--	--	0.01	-461	68.2	6.65	1,187
	10/4/11	12:38	32.66	--	--	--	--	--	--
	10/4/11	13:27	32.39	--	--	--	--	--	--
	10/4/11	13:32	--	--	0.06	-325	68.2	6.74	1,194
	10/4/11	18:09	32.33	--	--	--	--	--	--
	10/4/11	18:26	--	--	0.28	-488	68.6	6.66	1,191
	10/5/11	09:08	33.35	--	--	--	--	--	--
	10/5/11	09:26	--	--	--	-520	68.1	6.85	1,229
	10/5/11	13:08	32.77	--	--	--	--	--	--
	10/5/11	13:40	--	--	--	-551	68.1	6.90	1,240
	10/5/11	16:45	33.10	--	--	--	--	--	--
	10/6/11	12:11	34.01	--	--	--	--	--	--
	10/6/11	12:22	--	--	--	-456	68.0	7.03	1,283
	10/6/11	15:52	33.74	--	--	--	--	--	--
	10/6/11	16:05	--	--	--	-423	68.0	6.94	1,078
	10/7/11	09:05	33.85	--	--	--	--	--	--
	10/7/11	09:33	--	--	--	-474	68.1	6.94	1,296
	10/7/11	13:24	33.51	--	--	--	--	--	--
	10/7/11	13:46	--	--	--	-512	68.2	6.95	1,304
	10/10/11	09:44	33.60	--	--	--	--	--	--
	10/10/11	10:09	--	--	--	-474	68.0	7.02	1,291
	10/10/11	13:27	33.04	--	--	--	--	--	--
	10/10/11	13:40	--	--	--	-417	68.2	7.01	1,288
	10/11/11	14:39	33.34	--	--	--	--	--	--
	10/11/11	14:52	--	--	--	-404	68.2	7.01	1,273
	10/14/11	09:04	34.07	--	--	--	--	--	--
	10/14/11	09:19	--	--	--	-426	68.1	7.00	1,265
	10/25/11	09:47	34.47	NA	--	-344	68.0	6.95	1,270
	10/25/11	10:07	46.91	--	--	-226	67.4	6.96	1,172
	10/25/11	10:11	--	--	--	-227	68.7	6.79	1,276
	10/25/11	10:13	47.21	--	--	-271	68.6	6.76	1,281
	10/26/11	08:15	34.22	NA	--	--	--	--	--
	10/26/11	10:29	34.53	NA	--	--	--	--	--
	10/26/11	10:41	--	--	--	-453	68.1	6.86	1,292
	10/26/11	12:55	34.69	--	--	--	--	--	--
	10/26/11	14:15	36.30	--	--	--	--	--	--
	10/26/11	14:50	--	--	--	-470	68.1	6.88	1,275
	10/27/11	08:12	34.45	--	--	--	--	--	--
	10/27/11	10:44	36.97	NA	--	--	--	--	--
	10/27/11	10:59	--	--	--	-338	68.0	6.81	1,300
	10/27/11	12:55	37.48	--	--	--	--	--	--
10/27/11	13:02	--	--	--	-380	68.1	6.84	1,274	
10/28/11	10:57	34.37	NA	--	--	--	--	--	
10/28/11	11:06	--	--	--	-435	68.1	6.83	1,259	
11/1/11	07:44	33.95	NA	--	--	--	--	--	
11/1/11	07:54	--	--	--	-417	68.1	6.53	1,213	

TABLE B-1

ISCO PILOT TEST FIELD READINGS
TESORO - LIVERMORE, 67076

Well	Date	Time	Depth to Water (feet below casing)	Depth to Product (feet below casing)	DO ^(a) (mg/l)	ORP ^(a) (mV)	Temperature ^(a) (°F)	pH ^(a)	Conductivity ^(a) (µS/cm)	
IP-1 (cont.)	11/1/11	09:00	33.43	NA	--	--	--	--	--	
	11/1/11	11:17	32.19	NA	--	--	--	--	--	
	11/1/11	11:31	--	--	--	-471	68.1	6.92	1,190	
	11/1/11	13:53	31.62	NA	--	--	--	--	--	
	11/1/11	14:03	--	--	--	-432	68.1	6.98	1,171	
	11/2/11	07:04	33.76	NA	--	--	--	--	--	
	11/2/11	13:13	31.94	NA	--	--	--	--	--	
	11/2/11	13:22	--	--	--	-334	68.0	6.88	1,160	
	11/2/11	18:02	32.23	NA	--	--	--	--	--	
	11/2/11	18:09	--	--	--	-371	67.9	7.01	1,164	
	11/3/11	07:25	33.48	NA	--	--	--	--	--	
	11/3/11	13:59	33.28	NA	--	--	--	--	--	
	11/3/11	14:06	--	--	--	-390	68.1	7.02	1,173	
	11/3/11	18:11	32.69	NA	--	--	--	--	--	
	11/3/11	18:20	--	--	--	-385	67.7	6.97	1,176	
	11/4/11	09:05	33.56	NA	--	--	--	--	--	
	11/4/11	11:27	33.58	NA	--	--	--	--	--	
	11/4/11	11:41	--	--	--	-409	67.9	6.98	1,179	
	11/10/11	14:30	33.88	--	--	0.39	-419	68.1	7.01	1,143
	11/21/11	07:28	33.87	NA	--	--	--	--	--	
	11/21/11	10:31	35.88	--	--	--	--	--	--	
	11/21/11	12:54	37.58	NA	--	--	--	--	--	
	11/21/11	16:15	38.03	--	--	--	--	--	--	
	11/22/11	07:29	34.28	NA	--	--	--	--	--	
	11/22/11	10:06	37.45	NA	--	--	--	--	--	
	11/22/11	13:44	38.15	NA	--	--	--	--	--	
	11/22/11	16:18	38.24	NA	--	--	--	--	--	
	11/23/11	08:01	34.05	NA	--	--	--	--	--	
	11/23/11	08:10	--	--	--	-115	67.9	7.06	1,082	
	11/28/11	09:54	34.00	NA	--	--	--	--	--	
	11/28/11	11:44	34.60	NA	--	--	--	--	--	
	11/28/11	14:32	35.06	NA	--	--	--	--	--	
	11/28/11	16:46	35.11	NA	--	--	--	--	--	
	11/29/11	07:30	34.07	NA	--	--	--	--	--	
	11/29/11	07:40	--	--	--	-139	67.9	7.03	1,115	
	11/29/11	12:35	33.21	NA	--	--	--	--	--	
	11/29/11	12:42	--	--	--	-92	68.0	7.04	1,079	
	11/29/11	18:49	33.12	NA	--	--	--	--	--	
	11/29/11	18:58	--	--	--	-104	68.0	7.06	1,089	
	11/30/11	06:59	33.87	NA	--	--	--	--	--	
	11/30/11	12:19	33.51	NA	--	--	--	--	--	
	11/30/11	12:25	--	--	--	-103	68.0	7.05	1,122	
	11/30/11	18:05	33.37	NA	--	--	--	--	--	
	11/30/11	18:11	--	--	--	-103	68.0	7.05	1,116	
	12/1/11	06:27	33.95	NA	--	--	--	--	--	
	12/1/11	12:35	33.72	NA	--	--	--	--	--	
	12/1/11	12:45	--	--	--	-98	67.9	7.06	1,116	

TABLE B-1

ISCO PILOT TEST FIELD READINGS
TESORO - LIVERMORE, 67076

Well	Date	Time	Depth to Water (feet below casing)	Depth to Product (feet below casing)	DO ^(a) (mg/l)	ORP ^(a) (mV)	Temperature ^(a) (°F)	pH ^(a)	Conductivity ^(a) (µS/cm)
IP-1 (cont.)	12/1/11	18:12	33.62	NA	--	--	--	--	--
	12/1/11	19:25	--	--	--	-87	67.9	7.07	1,138
	12/2/11	05:23	33.83	NA	--	--	--	--	--
	12/2/11	11:15	33.63	NA	--	--	--	--	--
	12/2/11	11:25	--	--	--	-113	68.0	7.06	1,150
	12/7/11	11:21	34.47	NA	--	--	--	--	--
	12/7/11	11:26	--	--	--	-128	68.0	7.04	1,197
	12/12/11	14:13	34.32	NA	--	--	--	--	--
	12/12/11	14:21	--	--	--	-135	67.8	7.11	1,760
	12/19/11	08:09	35.37	NA	--	--	--	--	--
	12/19/11	15:09	35.89	NA	--	--	--	--	--
	12/20/11	08:27	35.43	NA	--	--	--	--	--
	12/20/11	14:36	38.15	NA	--	--	--	--	--
	12/21/11	09:22	35.80	NA	--	--	--	--	--
	12/21/11	14:45	40.45	NA	--	--	--	--	--
	1/5/12	11:53	37.34	--	--	--	--	--	--
1/5/12	12:01	--	--	--	-137	67.9	7.02	1,151	
IP-8	9/20/11	11:15	34.07	--	3.09	-124	68.3	6.95	1,143
	9/20/11	11:32	42.33	--	13.88	-2	70.9	7.15	1,120
	9/20/11	11:41	38.26	--	12.07	-42	73.8	7.18	1,127
	9/20/11	12:14	40.22	--	11.49	-38	74.5	7.15	1,114
	10/4/11	09:02	28.75	--	--	--	--	--	--
	10/4/11	09:28	--	--	0.01	-90	68.1	7.17	1,106
	10/4/11	11:29	29.36	--	--	--	--	--	--
	10/4/11	13:14	28.40	--	--	--	--	--	--
	10/4/11	13:22	--	--	0.01	-482	68.0	9.91	1,670
	10/4/11	18:00	27.67	--	--	--	--	--	--
	10/4/11	18:11	--	--	0.01	-590	68.0	10.82	5,204
	10/5/11	08:45	30.40	--	--	--	--	--	--
	10/5/11	09:15	--	--	--	-678	67.9	10.46	3,654
	10/5/11	13:00	27.99	--	--	--	--	--	--
	10/5/11	13:19	--	--	--	-764	67.9	10.81	5,739
	10/5/11	16:43	32.04	--	--	--	--	--	--
	10/6/11	11:34	34.09	--	--	--	--	--	--
	10/6/11	11:42	--	--	--	-491	67.9	10.79	5,642
	10/6/11	15:41	30.37	--	--	--	--	--	--
	10/6/11	15:56	--	--	--	43	68.0	10.02	3,501
	10/7/11	08:49	31.28	--	--	--	--	--	--
	10/7/11	09:12	--	--	--	-15	68.0	9.69	2,544
	10/7/11	12:49	30.62	--	--	--	--	--	--
	10/7/11	13:23	--	--	--	-7	68.1	9.54	2,349
	10/10/11	09:27	34.31	--	--	--	--	--	--
	10/10/11	09:44	--	--	--	-22	68.0	9.03	1,736
	10/10/11	13:11	28.27	--	--	--	--	--	--
	10/10/11	13:36	--	--	--	-3	68.1	8.81	1,601
	10/11/11	14:28	31.56	31.56 (Sheen)	--	--	--	--	--
	10/11/11	14:43	--	--	--	48	68.2	8.47	1,507

TABLE B-1

ISCO PILOT TEST FIELD READINGS
TESORO - LIVERMORE, 67076

Well	Date	Time	Depth to Water (feet below casing)	Depth to Product (feet below casing)	DO ^(a) (mg/l)	ORP ^(a) (mV)	Temperature ^(a) (°F)	pH ^(a)	Conductivity ^(a) (µS/cm)
IP-8 (cont.)	10/14/11	08:57	33.51	--	--	--	--	--	--
	10/14/11	09:11	--	--	--	24	68.1	8.30	1,575
	10/25/11	08:46	34.39	Sheen	--	-186	67.5	7.70	1,565
	10/25/11	09:12	50.26	--	--	95	67.7	7.91	1,479
	10/25/11	09:16	54.83	--	--	48	68.5	7.78	1,434
	10/25/11	09:21	53.10	--	--	27	68.8	7.69	1,394
	10/26/11	08:13	33.54	NA	--	--	--	--	--
	10/26/11	10:20	34.61	NA	--	--	--	--	--
	10/26/11	10:27	--	--	--	21	68.2	7.63	1,435
	10/26/11	15:57	--	--	--	72	69.6	7.49	1,251
	10/27/11	10:20	--	--	--	274	68.9	7.44	1,256
	10/27/11	15:36	--	--	--	41	70.9	7.46	1,237
	10/28/11	10:42	34.37	NA	--	--	--	--	--
	10/28/11	10:58	--	--	--	56	68.2	7.51	1,110
	11/1/11	07:39	33.95	NA	--	--	--	--	--
	11/1/11	07:45	--	--	--	-51	68.1	7.38	1,247
	11/1/11	08:59	31.76	NA	--	--	--	--	--
	11/1/11	11:05	29.60	NA	--	--	--	--	--
	11/1/11	11:21	--	--	--	40	68.2	7.75	1,514
	11/1/11	13:45	27.65	NA	--	--	--	--	--
	11/1/11	13:54	--	--	--	45	68.2	8.03	1,690
	11/2/11	07:02	33.41	33.40	--	--	--	--	--
	11/2/11	13:28	30.38	NA	--	--	--	--	--
	11/2/11	13:35	--	--	--	111	68.2	7.89	1,577
	11/2/11	18:23	29.35	NA	--	--	--	--	--
	11/2/11	18:29	--	--	--	109	68.2	7.90	1,574
	11/3/11	07:24	33.43	33.43	--	--	--	--	--
	11/3/11	13:42	32.71	NA	--	--	--	--	--
	11/3/11	14:00	--	--	--	92	68.3	7.90	1,589
	11/3/11	18:23	29.71	NA	--	--	--	--	--
	11/3/11	18:38	--	--	--	87	68.3	7.93	1,723
	11/4/11	09:07	33.16	33.11	--	--	--	--	--
	11/4/11	11:38	33.55	NA	--	--	--	--	--
	11/4/11	11:52	--	--	--	86	68.4	7.89	1,725
	11/10/11	14:50	33.82	--	12.9	33	68.3	7.51	1,557
	11/23/11	07:44	34.05	NA	--	--	--	--	--
	11/23/11	07:56	--	--	--	127	68.0	7.35	1,087
	11/28/11	09:52	34.04	34.03	--	--	--	--	--
	11/28/11	11:43	34.98	34.98	--	--	--	--	--
	11/28/11	14:31	35.52	NA	--	--	--	--	--
	11/28/11	16:42	35.43	35.43	--	--	--	--	--
	11/29/11	07:25	34.11	34.11	--	--	--	--	--
11/29/11	07:32	--	--	--	-25	68.0	7.48	1,184	
11/29/11	12:31	32.98	NA	--	--	--	--	--	
11/29/11	12:36	--	--	--	190	67.7	7.36	1,207	
11/29/11	18:44	32.71	NA	--	--	--	--	--	
11/29/11	18:51	--	--	--	216	67.8	7.33	1,356	

TABLE B-1

ISCO PILOT TEST FIELD READINGS
TESORO - LIVERMORE, 67076

Well	Date	Time	Depth to Water (feet below casing)	Depth to Product (feet below casing)	DO ^(a) (mg/l)	ORP ^(a) (mV)	Temperature ^(a) (°F)	pH ^(a)	Conductivity ^(a) (µS/cm)
IP-8 (cont.)	11/30/11	06:57	33.85	33.84	--	--	--	--	--
	11/30/11	12:14	33.14	NA	--	--	--	--	--
	11/30/11	12:20	--	--	--	219	68.0	7.37	1,367
	11/30/11	17:58	33.12	NA	--	--	--	--	--
	11/30/11	18:06	--	--	--	219	68.0	7.47	1,382
	12/1/11	06:25	33.97	33.97	--	--	--	--	--
	12/1/11	12:27	33.68	NA	--	--	--	--	--
	12/1/11	12:30	--	--	--	215	68.0	7.46	1,387
	12/1/11	18:01	33.56	NA	--	--	--	--	--
	12/1/11	19:20	--	--	--	240	67.5	7.46	1,410
	12/2/11	05:21	33.88	NA	--	--	--	--	--
	12/2/11	11:10	33.47	NA	--	--	--	--	--
	12/2/11	11:17	--	--	--	207	68.1	7.43	1,397
	12/7/11	11:15	34.56	NA	--	--	--	--	--
	12/7/11	11:20	--	--	--	169	68.1	7.28	1,531
	12/12/11	14:02	34.43	NA	--	--	--	--	--
	12/12/11	14:11	--	--	--	179	68.1	7.28	2,430
	12/19/11	08:07	35.39	NA	--	--	--	--	--
	12/19/11	15:05	35.93	NA	--	--	--	--	--
	12/20/11	08:26	35.53	NA	--	--	--	--	--
12/21/11	09:18	35.87	NA	--	--	--	--	--	
1/5/12	11:36	37.11	--	--	--	--	--	--	
1/5/12	11:46	--	--	--	12	68.1	7.14	1,328	
IP-9	9/20/11	13:36	34.18	--	17.63	-60	69.3	6.92	990
	9/20/11	13:46	46.45	--	5.04	-140	72.0	6.87	1,085
	9/20/11	13:52	47.20	--	1.73	-208	71.7	6.87	1,120
	9/20/11	13:58	47.39	--	1.01	-231	72.9	6.90	1,143
	10/4/11	16:08	23.81	--	--	--	--	--	--
	10/5/11	07:45	--	--	0.95	-571	68.7	10.88	3,063
	10/6/11	11:14	--	--	--	-23	68.9	10.40	2,872
	10/10/11	07:05	--	--	--	-7	68.8	10.43	19,700
	10/11/11	06:46	31.13	--	--	--	--	--	--
	10/11/11	07:05	--	--	--	-5	70.1	10.39	21,230
	10/14/11	08:43	35.10	--	--	--	--	--	--
	10/14/11	08:51	--	--	--	-29	69.5	10.32	21,880
	10/25/11	07:18	34.32	NA	--	-35	67.6	10.27	20,530
	10/25/11	07:32	39.80	--	--	-42	68.1	10.20	18,160
	10/25/11	07:36	52.41	--	--	-40	67.7	10.16	15,350
	10/25/11	07:43	56.09	--	--	-37	75.5	9.95	18,430
	10/26/11	13:33	>61	--	--	13	72.1	9.55	5,382
	10/26/11	16:26	--	--	--	-49	77.4	9.47	5,421
	10/27/11	09:47	--	--	--	-28	69.5	9.52	5,176
	10/27/11	15:18	--	--	--	-23	71.0	9.43	4,284
	10/28/11	10:04	34.28	NA	--	--	--	--	--
	10/28/11	10:13	--	--	--	-23	68.4	9.41	3,951
	11/1/11	07:24	33.82	NA	--	--	--	--	--
11/1/11	07:33	--	--	--	-59	68.0	9.40	4,485	

TABLE B-1

ISCO PILOT TEST FIELD READINGS
TESORO - LIVERMORE, 67076

Well	Date	Time	Depth to Water (feet below casing)	Depth to Product (feet below casing)	DO ^(a) (mg/l)	ORP ^(a) (mV)	Temperature ^(a) (°F)	pH ^(a)	Conductivity ^(a) (µS/cm)
IP-9 (cont.)	11/1/11	14:43	--	--	--	-457	64.7	10.83	3,747
	11/2/11	06:57	32.75	NA	--	--	--	--	--
	11/4/11	13:14	--	--	--	6	66.4	10.33	22,100
	11/10/11	14:20	34.97	--	>40	-63	68.4	10.44	22,310
	11/21/11	07:21	34.40	NA	--	--	--	--	--
	11/21/11	09:24	53.56	--	--	--	--	--	--
	11/21/11	10:53	>61	--	--	--	--	--	--
	11/21/11	12:34	>61	--	--	--	--	--	--
	11/21/11	14:19	>61	--	--	--	--	--	--
	11/21/11	16:07	59.46	--	--	--	--	--	--
	11/22/11	07:19	34.35	NA	--	--	--	--	--
	11/22/11	08:28	49.53	--	--	--	--	--	--
	11/22/11	09:57	58.87	--	--	--	--	--	--
	11/22/11	13:22	61.07	--	--	--	--	--	--
	11/22/11	16:12	61.42	--	--	--	--	--	--
	11/23/11	07:20	34.12	NA	--	--	--	--	--
	11/23/11	07:39	--	--	--	194	67.2	9.31	3,295
	11/28/11	09:42	33.97	NA	--	--	--	--	--
	11/28/11	11:07	51.90	--	--	--	--	--	--
	11/28/11	12:10	38.10	--	--	--	--	--	--
	11/28/11	13:44	~59	--	--	--	--	--	--
	11/28/11	14:03	60.00	--	--	--	--	--	--
	11/28/11	14:08	59.30	--	--	--	--	--	--
	11/28/11	14:28	60.00	--	--	--	--	--	--
	11/28/11	14:46	60.50	--	--	--	--	--	--
	11/28/11	15:05	61.10	--	--	--	--	--	--
	11/28/11	15:22	60.80	--	--	--	--	--	--
	11/28/11	15:37	61.10	--	--	--	--	--	--
	11/28/11	15:52	61.00	--	--	--	--	--	--
	11/28/11	16:09	61.10	--	--	--	--	--	--
	11/28/11	16:30	61.50	--	--	--	--	--	--
	11/28/11	16:48	61.20	--	--	--	--	--	--
	11/28/11	16:58	61.20	--	--	--	--	--	--
	11/28/11	17:18	61.30	--	--	--	--	--	--
	11/29/11	06:53	34.11	NA	--	--	--	--	--
	11/29/11	07:03	--	--	--	180	66.5	9.12	2,550
	12/7/11	11:01	44.11	NA	--	--	--	--	--
	12/7/11	11:10	--	--	--	-43	68.3	10.83	24,370
	12/12/11	10:27	36.49	NA	--	--	--	--	--
	12/12/11	10:33	--	--	--	-34	67.6	10.79	49,520
	12/19/11	08:02	36.22	NA	--	--	--	--	--
12/19/11	15:00	46.98	NA	--	--	--	--	--	
12/20/11	08:24	36.57	NA	--	--	--	--	--	
12/21/11	09:15	36.39	NA	--	--	--	--	--	
1/5/12	11:28	--	--	--	--	75	67.4	10.56	22,150
IP-10	9/20/11	08:34	34.00	--	13.02	-19	67.0	6.95	895
	9/20/11	09:05	41.38	--	3.09	-107	70.7	7.01	978

TABLE B-1

**ISCO PILOT TEST FIELD READINGS
TESORO - LIVERMORE, 67076**

Well	Date	Time	Depth to Water (feet below casing)	Depth to Product (feet below casing)	DO ^(a) (mg/l)	ORP ^(a) (mV)	Temperature ^(a) (°F)	pH ^(a)	Conductivity ^(a) (µS/cm)	
IP-10 (cont.)	9/20/11	09:24	40.86	--	2.31	-148	70.2	7.05	969	
	9/20/11	09:37	40.52	--	1.99	-167	71.4	7.07	987	
	10/4/11	09:48	32.56	--	--	--	--	--	--	
	10/4/11	10:12	--	--	0.06	-447	67.0	7.04	870	
	10/4/11	12:58	--	--	0.01	-382	66.9	7.03	922	
	10/4/11	17:45	32.63	--	--	--	--	--	--	
	10/4/11	17:57	--	--	0.01	-388	66.8	8.27	1,081	
	10/5/11	08:23	33.93	--	--	--	--	--	--	
	10/5/11	08:41	--	--	0.83	-486	66.3	8.04	1,116	
	10/5/11	12:41	32.96	--	--	--	--	--	--	
	10/5/11	12:58	--	--	--	-508	66.6	8.57	1,119	
	10/5/11	16:34	33.58	--	--	--	--	--	--	
	10/6/11	11:27	33.94	--	--	--	--	--	--	
	10/6/11	12:09	--	--	--	-489	67.0	8.96	1,271	
	10/6/11	15:21	33.91	--	--	--	--	--	--	
	10/6/11	15:33	--	--	--	-357	66.5	8.68	1,216	
	10/7/11	08:28	34.02	--	--	--	--	--	--	
	10/7/11	08:40	--	--	--	-285	66.0	8.31	1,124	
	10/7/11	12:18	33.77	--	--	--	--	--	--	
	10/7/11	12:46	--	--	--	-426	66.6	8.27	1,175	
	10/10/11	08:41	33.72	--	--	--	--	--	--	
	10/10/11	09:10	--	--	--	-448	66.9	7.96	1,130	
	10/10/11	12:48	33.00	--	--	--	--	--	--	
	10/10/11	13:01	--	--	--	-431	67.2	7.73	1,086	
	10/11/11	10:42	33.67	--	--	--	--	--	--	
	10/11/11	11:52	--	--	--	-384	67.2	7.62	1,087	
	10/11/11	13:58	33.23	--	--	--	--	--	--	
	10/11/11	14:23	--	--	--	-398	67.3	7.64	1,116	
	10/14/11	08:35	33.90	--	--	--	--	--	--	
	10/14/11	08:51	--	--	--	-417	66.7	7.58	1,123	
	10/25/11	06:21	34.49	NA	--	--	-369	66.7	7.37	1,016
	10/25/11	06:43	51.49	--	--	--	-222	65.6	7.49	1,005
	10/25/11	06:50	51.65	--	--	--	-259	66.7	7.50	1,066
	10/25/11	06:56	45.55	--	--	--	-250	67.7	7.44	1,069
	10/26/11	08:19	34.13	NA	--	--	--	--	--	--
	10/26/11	10:01	34.49	NA	--	--	--	--	--	--
	10/26/11	10:09	--	--	--	-418	66.8	7.40	1,060	
	10/26/11	13:00	34.58	--	--	--	--	--	--	
	10/26/11	14:18	34.72	NA	--	--	--	--	--	
	10/26/11	14:24	--	--	--	-390	67.1	7.58	1,073	
10/27/11	08:13	34.37	--	--	--	--	--	--		
10/27/11	09:30	--	--	--	-192	66.1	7.25	1,066		
10/27/11	12:33	35.11	NA	--	--	--	--	--		
10/27/11	12:42	--	--	--	-381	66.6	7.64	1,072		
10/28/11	09:44	34.34	NA	--	--	--	--	--		
10/28/11	10:01	--	--	--	-477	66.4	7.70	1,076		
11/1/11	07:57	33.97	NA	--	--	--	--	--		

TABLE B-1

ISCO PILOT TEST FIELD READINGS
TESORO - LIVERMORE, 67076

Well	Date	Time	Depth to Water (feet below casing)	Depth to Product (feet below casing)	DO ^(a) (mg/l)	ORP ^(a) (mV)	Temperature ^(a) (°F)	pH ^(a)	Conductivity ^(a) (µS/cm)
IP-10 (cont.)	11/1/11	08:07	--	--	--	-483	67.0	7.52	1,009
	11/1/11	09:05	33.18	NA	--	--	--	--	--
	11/1/11	10:42	32.43	NA	--	--	--	--	--
	11/1/11	10:59	--	--	--	-431	66.6	7.52	981
	11/1/11	13:29	31.99	NA	--	--	--	--	--
	11/1/11	13:40	--	--	--	-420	66.7	7.58	1,061
	11/2/11	07:12	33.32	NA	--	--	--	--	--
	11/2/11	13:40	32.21	NA	--	--	--	--	--
	11/2/11	13:47	--	--	--	-279	66.7	7.50	1,008
	11/2/11	18:36	32.32	NA	--	--	--	--	--
	11/2/11	18:44	--	--	--	-317	66.6	7.54	1,098
	11/3/11	07:30	33.45	NA	--	--	--	--	--
	11/3/11	13:29	33.30	NA	--	--	--	--	--
	11/3/11	13:38	--	--	--	-365	66.8	7.55	1,185
	11/3/11	18:43	32.52	NA	--	--	--	--	--
	11/3/11	18:49	--	--	--	-293	66.2	7.56	1,043
	11/4/11	09:09	33.30	--	--	--	--	--	--
	11/4/11	11:48	33.27	NA	--	--	--	--	--
	11/4/11	12:08	--	--	--	-314	67.1	7.63	1,149
	11/10/11	15:10	33.97	--	0.26	-479	67.0	7.62	1,079
	11/21/11	10:35	34.31	NA	--	--	--	--	--
	11/21/11	12:55	34.90	NA	--	--	--	--	--
	11/21/11	16:14	35.18	--	--	--	--	--	--
	11/22/11	07:17	34.22	NA	--	--	--	--	--
	11/22/11	10:04	34.96	NA	--	--	--	--	--
	11/22/11	13:30	35.22	NA	--	--	--	--	--
	11/22/11	16:21	35.31	NA	--	--	--	--	--
	11/23/11	08:10	33.97	NA	--	--	--	--	--
	11/23/11	08:32	--	--	--	-140	66.9	7.50	1,086
	11/28/11	10:00	34.11	NA	--	--	--	--	--
	11/28/11	11:41	34.53	NA	--	--	--	--	--
	11/28/11	14:35	34.81	NA	--	--	--	--	--
	11/28/11	16:39	34.88	NA	--	--	--	--	--
	11/29/11	07:31	34.16	NA	--	--	--	--	--
	11/29/11	07:57	--	--	--	-135	66.9	7.46	1,096
	11/29/11	12:47	33.25	NA	--	--	--	--	--
	11/29/11	12:54	--	--	--	-95	66.9	7.38	1,026
	11/29/11	19:02	33.11	NA	--	--	--	--	--
	11/29/11	19:15	--	--	--	-113	66.8	7.35	1,123
	11/30/11	07:00	33.78	NA	--	--	--	--	--
	11/30/11	12:28	33.22	NA	--	--	--	--	--
	11/30/11	12:37	--	--	--	-112	66.7	7.32	1,143
11/30/11	18:15	33.19	NA	--	--	--	--	--	
11/30/11	18:21	--	--	--	-106	66.8	7.31	1,252	
12/1/11	06:30	33.84	NA	--	--	--	--	--	
12/1/11	12:53	33.41	NA	--	--	--	--	--	
12/1/11	12:58	--	--	--	-107	66.8	7.39	1,249	

TABLE B-1

**ISCO PILOT TEST FIELD READINGS
TESORO - LIVERMORE, 67076**

Well	Date	Time	Depth to Water (feet below casing)	Depth to Product (feet below casing)	DO ^(a) (mg/l)	ORP ^(a) (mV)	Temperature ^(a) (°F)	pH ^(a)	Conductivity ^(a) (µS/cm)
IP-10 (cont.)	12/1/11	19:27	33.48	NA	--	--	--	--	--
	12/1/11	19:33	--	--	--	-101	66.8	7.35	1,267
	12/2/11	05:29	33.72	NA	--	--	--	--	--
	12/2/11	11:25	33.39	NA	--	--	--	--	--
	12/2/11	11:47	--	--	--	-120	66.9	7.35	1,181
	12/7/11	11:45	34.58	NA	--	--	--	--	--
	12/7/11	11:56	--	--	--	-146	66.9	7.35	1,113
	12/12/11	14:19	34.58	NA	--	--	--	--	--
	12/12/11	14:35	--	--	--	-136	66.9	7.33	1,708
	12/19/11	07:05	35.60	35.60	--	--	--	--	--
	12/19/11	15:10	35.83	NA	--	--	--	--	--
	12/20/11	08:32	35.74	35.74	--	--	--	--	--
	12/20/11	14:34	36.53	NA	--	--	--	--	--
	12/21/11	09:20	35.97	NA	--	--	--	--	--
	12/21/11	14:42	37.10	NA	--	--	--	--	--
	1/5/12	11:40	37.79	--	--	--	--	--	--
	1/5/12	11:55	--	--	--	-127	66.9	7.20	895.3
DW-8	9/20/11	14:17	33.69	--	0.05	-331	68.2	7.12	1,023
	9/20/11	14:32	45.79	--	0.76	-253	71.5	7.17	1,062
	9/20/11	14:43	49.95	--	0.50	-260	71.1	7.17	1,049
	9/20/11	14:53	51.89	--	0.66	-245	73.0	7.16	1,094
	10/4/11	09:51	30.77	--	--	--	--	--	--
	10/4/11	10:02	--	--	0.01	-526	68.0	8.60	1,216
	10/4/11	13:42	30.77	--	--	--	--	--	--
	10/4/11	13:47	--	--	0.03	-451	67.9	9.47	1,623
	10/4/11	18:18	30.22	--	--	--	--	--	--
	10/4/11	18:35	--	--	0.37	-707	68.0	10.35	3,331
	10/5/11	09:27	31.78	--	--	--	--	--	--
	10/5/11	09:54	--	--	--	-753	68.1	10.14	2,765
	10/5/11	13:31	30.77	--	--	--	--	--	--
	10/5/11	13:52	--	--	--	-799	68.0	10.56	4,336
	10/5/11	16:47	32.08	--	--	--	--	--	--
	10/6/11	12:21	33.44	--	--	--	--	--	--
	10/6/11	12:32	--	--	--	-708	68.1	10.42	3,766
	10/6/11	16:05	32.29	--	--	--	--	--	--
	10/6/11	16:18	--	--	--	-117	68.1	10.12	3,706
	10/7/11	09:28	32.79	--	--	--	--	--	--
	10/7/11	09:41	--	--	--	-54	68.1	9.84	3,324
	10/7/11	13:47	31.78	--	--	--	--	--	--
	10/7/11	13:57	--	--	--	-41	68.1	9.58	2,752
	10/10/11	10:04	32.56	--	--	--	--	--	--
	10/10/11	10:17	--	--	--	-82	68.1	9.49	2,398
	10/10/11	13:48	30.72	--	--	--	--	--	--
	10/10/11	14:01	--	--	--	-53	68.1	9.40	2,234
10/11/11	14:47	32.41	--	--	--	--	--	--	
10/11/11	14:57	--	--	--	-59	68.1	9.35	2,148	
10/14/11	09:13	33.41	--	--	--	--	--	--	

TABLE B-1

ISCO PILOT TEST FIELD READINGS
TESORO - LIVERMORE, 67076

Well	Date	Time	Depth to Water (feet below casing)	Depth to Product (feet below casing)	DO ^(a) (mg/l)	ORP ^(a) (mV)	Temperature ^(a) (°F)	pH ^(a)	Conductivity ^(a) (µS/cm)
DW-8 (cont.)	10/14/11	09:26	--	--	--	-267	68.1	9.32	2,123
	10/25/11	11:34	33.63	NA	--	-430	67.5	9.13	2,038
	10/25/11	11:49	--	--	--	-203	69.0	8.20	1,423
	10/25/11	11:59	54.16	--	--	-194	69.1	7.92	1,286
	10/25/11	12:10	56.59	--	--	-205	69.8	7.66	1,267
	10/26/11	08:17	33.46	NA	--	--	--	--	--
	10/26/11	10:49	33.92	NA	--	--	--	--	--
	10/26/11	10:56	--	--	--	-423	68.1	7.97	1,339
	10/26/11	12:50	--	--	--	--	--	--	--
	10/26/11	16:11	--	--	--	-135	69.5	7.38	1,155
	10/27/11	09:59	--	--	--	-53	68.8	7.45	1,153
	10/27/11	14:19	--	--	--	-432	76.9	7.38	1,249
	10/28/11	11:08	33.64	NA	--	--	--	--	--
	10/28/11	11:19	--	--	--	-508	68.4	7.82	1,175
	11/1/11	07:54	33.21	NA	--	--	--	--	--
	11/1/11	08:00	--	--	--	-437	68.1	7.88	1,285
	11/1/11	09:02	32.44	NA	--	--	--	--	--
	11/1/11	11:26	30.96	NA	--	--	--	--	--
	11/1/11	11:36	--	--	--	-367	68.1	8.35	1,388
	11/1/11	14:07	30.17	NA	--	--	--	--	--
	11/1/11	14:18	--	--	--	-328	68.1	8.48	1,376
	11/2/11	07:06	33.17	NA	--	--	--	--	--
	11/2/11	13:56	30.41	NA	--	--	--	--	--
	11/2/11	14:02	--	--	--	-15	68.0	7.89	1,175
	11/2/11	18:52	31.03	NA	--	--	--	--	--
	11/2/11	18:59	--	--	--	38	68.0	7.94	1,202
	11/3/11	07:28	32.51	NA	--	--	--	--	--
	11/3/11	14:10	32.56	NA	--	--	--	--	--
	11/3/11	14:21	--	--	--	14	68.1	7.89	1,225
	11/3/11	18:56	31.26	NA	--	--	--	--	--
	11/3/11	19:04	--	--	--	36	67.8	8.00	1,221
	11/4/11	09:11	32.97	NA	--	--	--	--	--
	11/4/11	11:58	32.99	NA	--	--	--	--	--
	11/4/11	12:13	--	--	--	25	68.2	8.44	1,378
	11/10/11	15:00	33.24	--	0.90	-234	68.3	7.76	1,395
	11/21/11	07:31	33.08	NA	--	--	--	--	--
	11/21/11	10:59	46.98	--	--	--	--	--	--
	11/21/11	12:36	60.05	--	--	--	--	--	--
	11/21/11	14:27	62.15	--	--	--	--	--	--
	11/21/11	16:11	62.18	--	--	--	--	--	--
	11/22/11	07:25	33.64	NA	--	--	--	--	--
	11/22/11	08:27	51.61	--	--	--	--	--	--
11/22/11	10:00	56.28	--	--	--	--	--	--	
11/22/11	11:32	38.90	--	--	--	--	--	--	
11/22/11	13:25	62.32	--	--	--	--	--	--	
11/22/11	16:16	62.24	--	--	--	--	--	--	
11/23/11	07:56	33.43	NA	--	--	--	--	--	

TABLE B-1

ISCO PILOT TEST FIELD READINGS
TESORO - LIVERMORE, 67076

Well	Date	Time	Depth to Water (feet below casing)	Depth to Product (feet below casing)	DO ^(a) (mg/l)	ORP ^(a) (mV)	Temperature ^(a) (°F)	pH ^(a)	Conductivity ^(a) (µS/cm)
DW-8 (cont.)	11/23/11	08:04	--	--	--	102	68.0	7.60	1,127
	11/28/11	09:56	33.32	NA	--	--	--	--	--
	11/28/11	11:45	33.97	NA	--	--	--	--	--
	11/28/11	14:37	33.48	NA	--	--	--	--	--
	11/28/11	16:43	34.58	NA	--	--	--	--	--
	11/29/11	07:42	33.41	NA	--	--	--	--	--
	11/29/11	07:48	--	--	--	-129	68.0	7.73	1,352
	11/29/11	12:58	32.69	NA	--	--	--	--	--
	11/29/11	13:04	--	--	--	-99	68.0	7.70	1,318
	11/29/11	19:22	32.53	NA	--	--	--	--	--
	11/29/11	19:30	--	--	--	-100	68.0	7.68	1,304
	11/30/11	07:02	33.21	NA	--	--	--	--	--
	11/30/11	12:41	32.83	NA	--	--	--	--	--
	11/30/11	12:50	--	--	--	-105	68.0	7.65	1,306
	11/30/11	18:27	32.73	NA	--	--	--	--	--
	11/30/11	18:34	--	--	--	-92	68.0	7.53	1,274
	12/1/11	06:28	33.29	NA	--	--	--	--	--
	12/1/11	13:01	33.06	NA	--	--	--	--	--
	12/1/11	13:07	--	--	--	-92	67.9	7.54	1,318
	12/1/11	19:36	33.02	NA	--	--	--	--	--
	12/1/11	19:41	--	--	--	-86	68.1	7.52	1,382
	12/2/11	05:24	33.19	NA	--	--	--	--	--
	12/2/11	11:36	33.00	NA	--	--	--	--	--
	12/2/11	11:41	--	--	--	-96	67.9	7.60	1,460
	12/7/11	11:26	33.80	NA	--	--	--	--	--
	12/7/11	11:32	--	--	--	-129	68.0	7.66	1,425
	12/12/11	14:37	33.65	NA	--	--	--	--	--
	12/12/11	14:45	--	--	--	-117	67.9	7.36	2,091
	12/19/11	08:05	34.65	NA	--	--	--	--	--
	12/19/11	15:03	35.38	NA	--	--	--	--	--
	12/20/11	08:31	34.95	NA	--	--	--	--	--
	12/21/11	09:24	35.15	NA	--	--	--	--	--
	1/5/12	12:17	36.75	--	--	--	--	--	--
1/5/12	12:23	--	--	--	-75	68.1	7.19	1,257	

(a) Dissolved oxygen (DO) reported in milligrams per liter (mg/l); oxidation reduction potential (ORP) reported in millivolts (mV); temperature reported in degrees Fahrenheit (°F); pH reported without units; conductivity reported in microsiemens per centimeter (µS/cm).

(b) "--" - Not measured.

(c) "NA" - No free product encountered.

APPENDIX C
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 : 6 Water Samples
Project Name : TESORO - LIVERMORE
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 standard. All soil samples are reported on a total weight (wet weight) basis unless noted otherwise in the case narrative. 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,



Joel Kiff

Subject : 6 Water Samples
Project Name : TESORO - LIVERMORE
Project Number : 01LV

Case Narrative

Matrix Spike/Matrix Spike Duplicate results associated with samples DW-8, IP-1, IP-10, IP-8, IP-9 and MW-11 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.

Matrix Spike/Matrix Spike Duplicate results associated with samples IP-10, MW-11, DW-8, IP-1, IP-8, and IP-9 for the analyte Sodium were affected by the analyte concentrations already present in the un-spiked sample.

Project Name : **TESORO - LIVERMORE**

Project Number : **01LV**

Sample : **IP-10**

Matrix : Water

Lab Number : 78834-01

Sample Date :09/20/2011

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date/Time Analyzed
Nitrate as N	< 0.10	0.10	mg/L	EPA 300.0	09/21/11 21:00
Sulfate	26	0.50	mg/L	EPA 300.0	09/21/11 21:00
Hexavalent Chromium	< 1.0	1.0	ug/L	EPA 7199	09/21/11 14:45
Ferrous Iron	< 0.10	0.10	mg/L	SM 3500-Fe D	09/21/11 12:29
Arsenic	< 0.015	0.015	mg/L	EPA 6010B	09/27/11 10:35
Chromium	< 0.0050	0.0050	mg/L	EPA 6010B	09/27/11 10:35
Iron	0.46	0.10	mg/L	EPA 6010B	09/27/11 10:35
Manganese	1.4	0.0050	mg/L	EPA 6010B	09/27/11 10:35
Sodium	48	0.50	mg/L	EPA 6010B	09/27/11 10:35
Benzene	1.7	0.50	ug/L	EPA 8260B	09/27/11 23:07
Toluene	11	0.50	ug/L	EPA 8260B	09/27/11 23:07
Ethylbenzene	12	0.50	ug/L	EPA 8260B	09/27/11 23:07
Total Xylenes	58	0.50	ug/L	EPA 8260B	09/27/11 23:07
Methyl-t-butyl ether (MTBE)	< 0.50	0.50	ug/L	EPA 8260B	09/27/11 23:07
Diisopropyl ether (DIPE)	< 0.50	0.50	ug/L	EPA 8260B	09/27/11 23:07
Ethyl-t-butyl ether (ETBE)	< 0.50	0.50	ug/L	EPA 8260B	09/27/11 23:07
Tert-amyl methyl ether (TAME)	< 0.50	0.50	ug/L	EPA 8260B	09/27/11 23:07
Tert-Butanol	7.6	5.0	ug/L	EPA 8260B	09/27/11 23:07
Methanol	< 50	50	ug/L	EPA 8260B	09/27/11 23:07
Ethanol	< 5.0	5.0	ug/L	EPA 8260B	09/27/11 23:07
TPH as Gasoline	620	50	ug/L	EPA 8260B	09/27/11 23:07
1,2-Dichloroethane-d4 (Surr)	99.2		% Recovery	EPA 8260B	09/27/11 23:07
Toluene - d8 (Surr)	100		% Recovery	EPA 8260B	09/27/11 23:07

Project Name : **TESORO - LIVERMORE**

Project Number : **01LV**

Sample : **MW-11**

Matrix : Water

Lab Number : 78834-02

Sample Date :09/20/2011

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date/Time Analyzed
Nitrate as N	< 0.10	0.10	mg/L	EPA 300.0	09/22/11 13:05
Sulfate	30	0.50	mg/L	EPA 300.0	09/21/11 22:54
Hexavalent Chromium	< 1.0	1.0	ug/L	EPA 7199	09/21/11 14:55
Ferrous Iron	< 0.10	0.10	mg/L	SM 3500-Fe D	09/21/11 12:29
Arsenic	< 0.015	0.015	mg/L	EPA 6010B	09/27/11 10:59
Chromium	0.0056	0.0050	mg/L	EPA 6010B	09/27/11 10:59
Iron	1.8	0.10	mg/L	EPA 6010B	09/27/11 10:59
Manganese	3.6	0.0050	mg/L	EPA 6010B	09/27/11 10:59
Sodium	67	0.50	mg/L	EPA 6010B	09/27/11 10:59
Benzene	95	4.0	ug/L	EPA 8260B	09/28/11 00:17
Toluene	500	4.0	ug/L	EPA 8260B	09/28/11 00:17
Ethylbenzene	230	4.0	ug/L	EPA 8260B	09/28/11 00:17
Total Xylenes	3200	4.0	ug/L	EPA 8260B	09/28/11 00:17
Methyl-t-butyl ether (MTBE)	< 4.0	4.0	ug/L	EPA 8260B	09/28/11 00:17
Diisopropyl ether (DIPE)	< 4.0	4.0	ug/L	EPA 8260B	09/28/11 00:17
Ethyl-t-butyl ether (ETBE)	< 4.0	4.0	ug/L	EPA 8260B	09/28/11 00:17
Tert-amyl methyl ether (TAME)	< 4.0	4.0	ug/L	EPA 8260B	09/28/11 00:17
Tert-Butanol	< 20	20	ug/L	EPA 8260B	09/28/11 00:17
Methanol	< 400	400	ug/L	EPA 8260B	09/28/11 00:17
Ethanol	< 40	40	ug/L	EPA 8260B	09/28/11 00:17
TPH as Gasoline	16000	400	ug/L	EPA 8260B	09/28/11 00:17
1,2-Dichloroethane-d4 (Surr)	99.7		% Recovery	EPA 8260B	09/28/11 00:17
Toluene - d8 (Surr)	100		% Recovery	EPA 8260B	09/28/11 00:17

Project Name : **TESORO - LIVERMORE**

Project Number : **01LV**

Sample : **DW-8**

Matrix : Water

Lab Number : 78834-03

Sample Date :09/20/2011

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date/Time Analyzed
Nitrate as N	< 0.10	0.10	mg/L	EPA 300.0	09/22/11 13:34
Sulfate	6.7	0.50	mg/L	EPA 300.0	09/21/11 23:22
Hexavalent Chromium	< 1.0	1.0	ug/L	EPA 7199	09/21/11 15:32
Ferrous Iron	< 0.10	0.10	mg/L	SM 3500-Fe D	09/21/11 12:30
Arsenic	< 0.015	0.015	mg/L	EPA 6010B	09/27/11 11:03
Chromium	< 0.0050	0.0050	mg/L	EPA 6010B	09/27/11 11:03
Iron	1.9	0.10	mg/L	EPA 6010B	09/27/11 11:03
Manganese	2.8	0.0050	mg/L	EPA 6010B	09/27/11 11:03
Sodium	45	0.50	mg/L	EPA 6010B	09/27/11 11:03
Benzene	4500	20	ug/L	EPA 8260B	09/28/11 02:03
Toluene	10000	20	ug/L	EPA 8260B	09/28/11 02:03
Ethylbenzene	2000	20	ug/L	EPA 8260B	09/28/11 02:03
Total Xylenes	11000	20	ug/L	EPA 8260B	09/28/11 02:03
Methyl-t-butyl ether (MTBE)	< 20	20	ug/L	EPA 8260B	09/28/11 02:03
Diisopropyl ether (DIPE)	< 20	20	ug/L	EPA 8260B	09/28/11 02:03
Ethyl-t-butyl ether (ETBE)	< 20	20	ug/L	EPA 8260B	09/28/11 02:03
Tert-amyl methyl ether (TAME)	< 20	20	ug/L	EPA 8260B	09/28/11 02:03
Tert-Butanol	200	90	ug/L	EPA 8260B	09/28/11 02:03
Methanol	< 2000	2000	ug/L	EPA 8260B	09/28/11 02:03
Ethanol	< 200	200	ug/L	EPA 8260B	09/28/11 02:03
TPH as Gasoline	77000	2000	ug/L	EPA 8260B	09/28/11 02:03
1,2-Dichloroethane-d4 (Surr)	98.1		% Recovery	EPA 8260B	09/28/11 02:03
Toluene - d8 (Surr)	99.7		% Recovery	EPA 8260B	09/28/11 02:03

Project Name : **TESORO - LIVERMORE**

Project Number : **01LV**

Sample : **IP-1**

Matrix : Water

Lab Number : 78834-04

Sample Date :09/20/2011

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date/Time Analyzed
Nitrate as N	< 0.10	0.10	mg/L	EPA 300.0	09/22/11 12:37
Sulfate	3.9	0.50	mg/L	EPA 300.0	09/21/11 23:51
Hexavalent Chromium	< 1.0	1.0	ug/L	EPA 7199	09/21/11 15:42
Ferrous Iron	< 0.10	0.10	mg/L	SM 3500-Fe D	09/21/11 12:30
Arsenic	< 0.015	0.015	mg/L	EPA 6010B	09/27/11 11:14
Chromium	< 0.0050	0.0050	mg/L	EPA 6010B	09/27/11 11:14
Iron	1.3	0.10	mg/L	EPA 6010B	09/27/11 11:14
Manganese	2.6	0.0050	mg/L	EPA 6010B	09/27/11 11:14
Sodium	34	0.50	mg/L	EPA 6010B	09/27/11 11:14
Benzene	520	4.0	ug/L	EPA 8260B	09/28/11 15:43
Toluene	960	4.0	ug/L	EPA 8260B	09/28/11 15:43
Ethylbenzene	63	4.0	ug/L	EPA 8260B	09/28/11 15:43
Total Xylenes	2500	4.0	ug/L	EPA 8260B	09/28/11 15:43
Methyl-t-butyl ether (MTBE)	< 4.0	4.0	ug/L	EPA 8260B	09/28/11 15:43
Diisopropyl ether (DIPE)	< 4.0	4.0	ug/L	EPA 8260B	09/28/11 15:43
Ethyl-t-butyl ether (ETBE)	< 4.0	4.0	ug/L	EPA 8260B	09/28/11 15:43
Tert-amyl methyl ether (TAME)	< 4.0	4.0	ug/L	EPA 8260B	09/28/11 15:43
Tert-Butanol	47	20	ug/L	EPA 8260B	09/28/11 15:43
Methanol	< 400	400	ug/L	EPA 8260B	09/28/11 15:43
Ethanol	< 40	40	ug/L	EPA 8260B	09/28/11 15:43
TPH as Gasoline	14000	400	ug/L	EPA 8260B	09/28/11 15:43
1,2-Dichloroethane-d4 (Surr)	102		% Recovery	EPA 8260B	09/28/11 15:43
Toluene - d8 (Surr)	98.8		% Recovery	EPA 8260B	09/28/11 15:43

Project Name : **TESORO - LIVERMORE**

Project Number : **01LV**

Sample : **IP-8**

Matrix : Water

Lab Number : 78834-05

Sample Date :09/20/2011

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date/Time Analyzed
Nitrate as N	0.17	0.10	mg/L	EPA 300.0	09/22/11 00:19
Sulfate	10	0.50	mg/L	EPA 300.0	09/22/11 00:19
Hexavalent Chromium	< 1.0	1.0	ug/L	EPA 7199	09/21/11 15:51
Ferrous Iron	< 0.10	0.10	mg/L	SM 3500-Fe D	09/21/11 12:32
Arsenic	< 0.015	0.015	mg/L	EPA 6010B	09/27/11 11:18
Chromium	< 0.0050	0.0050	mg/L	EPA 6010B	09/27/11 11:18
Iron	0.54	0.10	mg/L	EPA 6010B	09/27/11 11:18
Manganese	2.0	0.0050	mg/L	EPA 6010B	09/27/11 11:18
Sodium	35	0.50	mg/L	EPA 6010B	09/27/11 11:18
Benzene	780	3.0	ug/L	EPA 8260B	09/27/11 23:42
Toluene	1800	3.0	ug/L	EPA 8260B	09/27/11 23:42
Ethylbenzene	170	3.0	ug/L	EPA 8260B	09/27/11 23:42
Total Xylenes	2000	3.0	ug/L	EPA 8260B	09/27/11 23:42
Methyl-t-butyl ether (MTBE)	< 3.0	3.0	ug/L	EPA 8260B	09/27/11 23:42
Diisopropyl ether (DIPE)	< 3.0	3.0	ug/L	EPA 8260B	09/27/11 23:42
Ethyl-t-butyl ether (ETBE)	< 3.0	3.0	ug/L	EPA 8260B	09/27/11 23:42
Tert-amyl methyl ether (TAME)	< 3.0	3.0	ug/L	EPA 8260B	09/27/11 23:42
Tert-Butanol	20	15	ug/L	EPA 8260B	09/27/11 23:42
Methanol	< 300	300	ug/L	EPA 8260B	09/27/11 23:42
Ethanol	< 30	30	ug/L	EPA 8260B	09/27/11 23:42
TPH as Gasoline	14000	300	ug/L	EPA 8260B	09/27/11 23:42
1,2-Dichloroethane-d4 (Surr)	98.7		% Recovery	EPA 8260B	09/27/11 23:42
Toluene - d8 (Surr)	100		% Recovery	EPA 8260B	09/27/11 23:42

Project Name : **TESORO - LIVERMORE**

Project Number : **01LV**

Sample : **IP-9**

Matrix : Water

Lab Number : 78834-06

Sample Date :09/20/2011

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date/Time Analyzed
Nitrate as N	< 0.10	0.10	mg/L	EPA 300.0	09/21/11 22:25
Sulfate	11	0.50	mg/L	EPA 300.0	09/21/11 22:25
Hexavalent Chromium	< 1.0	1.0	ug/L	EPA 7199	09/21/11 15:04
Ferrous Iron	< 0.10	0.10	mg/L	SM 3500-Fe D	09/21/11 12:28
Arsenic	< 0.015	0.015	mg/L	EPA 6010B	09/27/11 11:22
Chromium	< 0.0050	0.0050	mg/L	EPA 6010B	09/27/11 11:22
Iron	0.34	0.10	mg/L	EPA 6010B	09/27/11 11:22
Manganese	1.1	0.0050	mg/L	EPA 6010B	09/27/11 11:22
Sodium	41	0.50	mg/L	EPA 6010B	09/27/11 11:22
Benzene	140	0.90	ug/L	EPA 8260B	09/28/11 15:08
Toluene	510	0.90	ug/L	EPA 8260B	09/28/11 15:08
Ethylbenzene	56	0.90	ug/L	EPA 8260B	09/28/11 15:08
Total Xylenes	730	0.90	ug/L	EPA 8260B	09/28/11 15:08
Methyl-t-butyl ether (MTBE)	< 0.90	0.90	ug/L	EPA 8260B	09/28/11 15:08
Diisopropyl ether (DIPE)	< 0.90	0.90	ug/L	EPA 8260B	09/28/11 15:08
Ethyl-t-butyl ether (ETBE)	< 0.90	0.90	ug/L	EPA 8260B	09/28/11 15:08
Tert-amyl methyl ether (TAME)	< 1.0	1.0	ug/L	EPA 8260B	09/28/11 15:08
Tert-Butanol	13	5.0	ug/L	EPA 8260B	09/28/11 15:08
Methanol	< 90	90	ug/L	EPA 8260B	09/28/11 15:08
Ethanol	< 9.0	9.0	ug/L	EPA 8260B	09/28/11 15:08
TPH as Gasoline	4300	90	ug/L	EPA 8260B	09/28/11 15:08
1,2-Dichloroethane-d4 (Surr)	103		% Recovery	EPA 8260B	09/28/11 15:08
Toluene - d8 (Surr)	98.7		% Recovery	EPA 8260B	09/28/11 15:08

QC Report : Method Blank Data

Project Name : **TESORO - LIVERMORE**

Project Number : **01LV**

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Arsenic	< 0.015	0.015	mg/L	EPA 6010B	09/27/2011
Chromium	< 0.0050	0.0050	mg/L	EPA 6010B	09/27/2011
Iron	< 0.10	0.10	mg/L	EPA 6010B	09/27/2011
Manganese	< 0.0050	0.0050	mg/L	EPA 6010B	09/27/2011
Sodium	< 0.50	0.50	mg/L	EPA 6010B	09/27/2011
Benzene	< 0.50	0.50	ug/L	EPA 8260B	09/28/2011
Ethylbenzene	< 0.50	0.50	ug/L	EPA 8260B	09/28/2011
Toluene	< 0.50	0.50	ug/L	EPA 8260B	09/28/2011
Total Xylenes	< 0.50	0.50	ug/L	EPA 8260B	09/28/2011
Diisopropyl ether (DIPE)	< 0.50	0.50	ug/L	EPA 8260B	09/28/2011
Ethanol	< 5.0	5.0	ug/L	EPA 8260B	09/28/2011
Ethyl-t-butyl ether (ETBE)	< 0.50	0.50	ug/L	EPA 8260B	09/28/2011
Methanol	< 50	50	ug/L	EPA 8260B	09/28/2011
Methyl-t-butyl ether (MTBE)	< 0.50	0.50	ug/L	EPA 8260B	09/28/2011
Tert-Butanol	< 5.0	5.0	ug/L	EPA 8260B	09/28/2011
Tert-amyl methyl ether (TAME)	< 0.50	0.50	ug/L	EPA 8260B	09/28/2011
TPH as Gasoline	< 50	50	ug/L	EPA 8260B	09/28/2011
1,2-Dichloroethane-d4 (Surr)	101		%	EPA 8260B	09/28/2011
Toluene - d8 (Surr)	98.2		%	EPA 8260B	09/28/2011
Benzene	< 0.50	0.50	ug/L	EPA 8260B	09/28/2011
Ethylbenzene	< 0.50	0.50	ug/L	EPA 8260B	09/28/2011
Toluene	< 0.50	0.50	ug/L	EPA 8260B	09/28/2011
Total Xylenes	< 0.50	0.50	ug/L	EPA 8260B	09/28/2011
Diisopropyl ether (DIPE)	< 0.50	0.50	ug/L	EPA 8260B	09/28/2011
Ethanol	< 5.0	5.0	ug/L	EPA 8260B	09/28/2011
Ethyl-t-butyl ether (ETBE)	< 0.50	0.50	ug/L	EPA 8260B	09/28/2011
Methanol	< 50	50	ug/L	EPA 8260B	09/28/2011
Methyl-t-butyl ether (MTBE)	< 0.50	0.50	ug/L	EPA 8260B	09/28/2011
Tert-Butanol	< 5.0	5.0	ug/L	EPA 8260B	09/28/2011
Tert-amyl methyl ether (TAME)	< 0.50	0.50	ug/L	EPA 8260B	09/28/2011
TPH as Gasoline	< 50	50	ug/L	EPA 8260B	09/28/2011
1,2-Dichloroethane-d4 (Surr)	99.2		%	EPA 8260B	09/28/2011

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Toluene - d8 (Surr)	100		%	EPA 8260B	09/28/2011
Ferrous Iron	<0.10	0.10	mg/L	SM 3500-Fe D	09/21/2011
Hexavalent Chromium	<1.0	1.0	ug/L	EPA 7199	09/21/2011
Nitrate as N	<0.10	0.10	mg/L	EPA 300.0	09/21/2011
Sulfate	<0.50	0.50	mg/L	EPA 300.0	09/21/2011
Nitrate as N	<0.10	0.10	mg/L	EPA 300.0	09/22/2011

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
Ferrous Iron														
	78834-06	< 0.10	0.252	0.252	0.230	0.257	mg/L	SM 3500-Fe D	9/21/11	91.6	102	11.1	70.0-130	25
Hexavalent Chromium														
	78834-06	< 1.0	5.00	5.00	5.13	5.28	ug/L	EPA 7199	9/21/11	102	106	3.01	90.0-110	10
Nitrate as N														
	78834-01	< 0.10	0.500	0.500	0.432	0.441	mg/L	EPA 300.0	9/21/11	75.2	77.0	2.05	85.0-115	10
Sulfate														
	78834-01	26	2.50	2.50	28.5	28.3	mg/L	EPA 300.0	9/21/11	101	92.9	0.735	85.0-115	10
Nitrate as N														
	78834-04	< 0.10	0.500	0.500	0.527	0.503	mg/L	EPA 300.0	9/22/11	86.4	81.6	4.70	85.0-115	10
Arsenic														
	78834-01	< 0.015	0.400	0.400	0.400	0.403	mg/L	EPA 6010B	9/27/11	99.5	100	0.573	75-125	20
Chromium														
	78834-01	< 0.0050	0.400	0.400	0.409	0.412	mg/L	EPA 6010B	9/27/11	102	102	0.536	75-125	20
Iron														
	78834-01	0.46	0.400	0.400	0.831	0.864	mg/L	EPA 6010B	9/27/11	92.8	101	3.94	75-125	20

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
Manganese	78834-01	1.4	0.400	0.400	1.70	1.78	mg/L	EPA 6010B	9/27/11	75.0	94.8	4.53	75-125	20
Sodium	78834-01	48	0.400	0.400	46.0	48.4	mg/L	EPA 6010B	9/27/11	0.00	208	4.94	75-125	20
Benzene	78887-08	<0.50	40.0	40.0	41.1	37.9	ug/L	EPA 8260B	9/28/11	103	94.8	8.04	80-120	25
Diisopropyl ether	78887-08	<0.50	39.6	39.6	42.5	39.6	ug/L	EPA 8260B	9/28/11	107	99.9	7.01	80-120	25
Ethanol	78887-08	<5.0	99.7	99.7	92.5	88.4	ug/L	EPA 8260B	9/28/11	92.8	88.6	4.56	55.1-159	25
Ethyl-tert-butyl ether	78887-08	<0.50	39.9	39.9	42.4	39.5	ug/L	EPA 8260B	9/28/11	106	99.0	7.02	76.5-120	25
Ethylbenzene	78887-08	<0.50	40.0	40.0	40.9	37.8	ug/L	EPA 8260B	9/28/11	102	94.6	7.79	80-120	25
Methanol	78887-08	<50	998	998	921	861	ug/L	EPA 8260B	9/28/11	92.3	86.3	6.75	53.2-147	25
Methyl-t-butyl ether	78887-08	<0.50	40.2	40.2	43.5	40.9	ug/L	EPA 8260B	9/28/11	108	102	6.11	69.7-121	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
P + M Xylene	78887-08	<0.50	40.0	40.0	37.4	33.5	ug/L	EPA 8260B	9/28/11	93.6	83.8	11.0	76.8-120	25
Tert-Butanol	78887-08	<5.0	193	193	203	192	ug/L	EPA 8260B	9/28/11	105	99.1	5.60	80-120	25
Tert-amyl-methyl ether	78887-08	<0.50	39.9	39.9	42.9	39.9	ug/L	EPA 8260B	9/28/11	107	100	7.12	78.9-120	25
Toluene	78887-08	<0.50	40.0	40.0	40.3	37.3	ug/L	EPA 8260B	9/28/11	101	93.2	7.78	80-120	25
Benzene	78849-02	<0.50	40.0	40.0	39.8	38.5	ug/L	EPA 8260B	9/27/11	99.5	96.3	3.28	80-120	25
Diisopropyl ether	78849-02	<0.50	39.6	39.6	39.6	38.9	ug/L	EPA 8260B	9/27/11	100	98.2	1.81	80-120	25
Ethanol	78849-02	<5.0	99.7	99.7	87.8	90.7	ug/L	EPA 8260B	9/27/11	88.0	90.9	3.24	55.1-159	25
Ethyl-tert-butyl ether	78849-02	<0.50	39.9	39.9	41.2	40.8	ug/L	EPA 8260B	9/27/11	103	102	1.10	76.5-120	25
Ethylbenzene	78849-02	<0.50	40.0	40.0	39.3	37.8	ug/L	EPA 8260B	9/27/11	98.2	94.5	3.80	80-120	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
Methanol	78849-02	<50	998	998	1040	1040	ug/L	EPA 8260B	9/27/11	104	104	0.00591	53.2-147	25
Methyl-t-butyl ether	78849-02	<0.50	40.2	40.2	41.9	41.5	ug/L	EPA 8260B	9/27/11	104	103	0.793	69.7-121	25
P + M Xylene	78849-02	<0.50	40.0	40.0	39.6	38.2	ug/L	EPA 8260B	9/27/11	99.1	95.5	3.71	76.8-120	25
Tert-Butanol	78849-02	<5.0	193	193	202	204	ug/L	EPA 8260B	9/27/11	104	105	0.868	80-120	25
Tert-amyl-methyl ether	78849-02	<0.50	39.9	39.9	40.4	39.7	ug/L	EPA 8260B	9/27/11	101	99.5	1.82	78.9-120	25
Toluene	78849-02	<0.50	40.0	40.0	39.7	38.4	ug/L	EPA 8260B	9/27/11	99.3	96.1	3.29	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
Arsenic	0.400	mg/L	EPA 6010B	9/27/11	98.0	85-115
Chromium	0.400	mg/L	EPA 6010B	9/27/11	104	85-115
Iron	0.400	mg/L	EPA 6010B	9/27/11	99.4	85-115
Manganese	0.400	mg/L	EPA 6010B	9/27/11	97.7	85-115
Sodium	0.400	mg/L	EPA 6010B	9/27/11	95.6	85-115
Benzene	40.2	ug/L	EPA 8260B	9/28/11	99.8	80-120
Diisopropyl ether	39.8	ug/L	EPA 8260B	9/28/11	104	80-120
Ethanol	100	ug/L	EPA 8260B	9/28/11	95.9	55.1-159
Ethyl-tert-butyl ether	40.1	ug/L	EPA 8260B	9/28/11	102	76.5-120
Ethylbenzene	40.2	ug/L	EPA 8260B	9/28/11	104	80-120
Methanol	1000	ug/L	EPA 8260B	9/28/11	93.0	53.2-147
Methyl-t-butyl ether	40.4	ug/L	EPA 8260B	9/28/11	104	69.7-121
P + M Xylene	40.2	ug/L	EPA 8260B	9/28/11	101	76.8-120
TPH as Gasoline	501	ug/L	EPA 8260B	9/28/11	106	70.0-130
Tert-Butanol	194	ug/L	EPA 8260B	9/28/11	102	80-120
Tert-amyl-methyl ether	40.1	ug/L	EPA 8260B	9/28/11	103	78.9-120
Toluene	40.2	ug/L	EPA 8260B	9/28/11	99.5	80-120
Benzene	40.0	ug/L	EPA 8260B	9/27/11	98.5	80-120
Diisopropyl ether	39.6	ug/L	EPA 8260B	9/27/11	99.8	80-120
Ethanol	99.7	ug/L	EPA 8260B	9/27/11	87.9	55.1-159

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
Ethyl-tert-butyl ether	39.9	ug/L	EPA 8260B	9/27/11	102	76.5-120
Ethylbenzene	40.0	ug/L	EPA 8260B	9/27/11	97.7	80-120
Methanol	998	ug/L	EPA 8260B	9/27/11	106	53.2-147
Methyl-t-butyl ether	40.2	ug/L	EPA 8260B	9/27/11	103	69.7-121
P + M Xylene	40.0	ug/L	EPA 8260B	9/27/11	97.9	76.8-120
TPH as Gasoline	501	ug/L	EPA 8260B	9/27/11	92.9	70.0-130
Tert-Butanol	193	ug/L	EPA 8260B	9/27/11	102	80-120
Tert-amyl-methyl ether	39.9	ug/L	EPA 8260B	9/27/11	101	78.9-120
Toluene	40.0	ug/L	EPA 8260B	9/27/11	99.3	80-120
Ferrous Iron	0.252	mg/L	SM 3500-Fe D	9/21/11	110	70.0-130
Hexavalent Chromium	5.00	ug/L	EPA 7199	9/21/11	101	90.0-110
Nitrate as N	0.500	mg/L	EPA 300.0	9/21/11	91.6	85.0-115
Sulfate	2.50	mg/L	EPA 300.0	9/21/11	98.0	85.0-115
Nitrate as N	0.500	mg/L	EPA 300.0	9/22/11	94.4	85.0-115



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

SRG # / Lab No. 18834

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

Company/Address: **ARCTOS ENV. 1332 PERALTA AVE, BERKELEY CA 94702**

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

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

Project #: **01LV** P.O. #: **67076**

Project Name: **TESORO - LIVERMORE**

California EDF Report? Yes No

Sampling Company Log Code:

Global ID: **T0600101410**

EDF Deliverable To (Email Address): **MNELSON@ORIONENV.COM**

Bill to:

Sampler Print Name: **SLOTT STROMBERG**

Sampler Signature: *[Signature]*

Chain-of-Custody Record and Analysis Request

Project Address:	Sampling		Container				Preservative			Matrix			
	Date	Time	40 ml VOA	Sleeve	Poly	Glass	Tedlar	HCl	HNO ₃	None	Water	Soil	Air
	9/20/11	1505	5					X			X		
		1505	2						X		X		
		1505			3				X		X		
		1505		1				X			X		
		1517	5					X			X		
		1517	2						X		X		
		1517			3				X		X		
		1517		1				X			X		
		1617	5					X			X		
		1617	2						X		X		

Analysis Request										TAT	
CIRCLE METHOD											
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> 12 hr
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> 24 hr
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> 48 hr
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> 72 hr
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/> 1 wk

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)
 METHANE (CO₂) (SM 2540C)
 METALS BY ICP (Fe, Mg, Mn, Cr, As) (EPA 6010)
 TOTAL ALK (SM 2320 B)
 NO₃ / SO₄²⁻ (EPA 300); Fe²⁺ (SM 3500-FeD)
 Cr⁶⁺ (EPA 7179)

Relinquished by: *[Signature]* Date: **9/20/11** Time: **1930**

Relinquished by: _____ Date: _____ Time: _____

Relinquished by: _____ Date: **092111** Time: **0945** Received by Laboratory: *[Signature]* KIFF Analytical LLC

Remarks:



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

SRG # / Lab No. 78834

Project Contact (Hardcopy or PDF To): California EDF Report? Yes No

Company / Address: Sampling Company Log Code:

Phone Number: SEE PAGE 1 OR 3 Global ID:

Fax Number: EDF Deliverable To (Email Address):

Project #: P.O. #: Bill to:

Project Name: Sampler Print Name:
 Sampler Signature: *[Signature]*

Chain-of-Custody Record and Analysis Request

Sample Designation	Sampling		Container				Preservative			Matrix			
	Date	Time	40 ml VOA	Sleeve	Poly	Glass	Tedlar	HCl	HNO ₃	None	Water	Soil	Air
DW-8	9/20/11	1617			W					X	X		
DW-8		1617			I			X			X		
IP-1		1653	5					X			X		
IP-1		1653	2						X		X		
IP-1		1653			3				X		X		
IP-1		1653			1			X			X		
IP-8		1723	5					X			X		
IP-8		1723	2						X		X		
IP-8		1723			3				X		X		
IP-8		1723			1			X			X		

Analysis Request										TAT	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	12 hr
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	24 hr
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	48 hr
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	72 hr
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1 wk
CIRCLE METHOD 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) TPH as Diesel (EPA 8015M) TPH as Motor Oil (EPA 8015M) 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) CH ₄ / CO ₂ (RSK 175M) METALS BY CP (As, Cr, Ni, Pb, Zn) (EPA 6010) TOTAL ALK (SM 2320 B) NO ₃ -75042 (EPA 300); Fe ³⁺ (SM 3700-Fe D); Cr 6+ (EPA 7199)											

Relinquished by: *[Signature]* Date: 9/20/11 Time: 1930 Received by: _____

Relinquished by: _____ Date: _____ Time: _____ Received by: _____

Relinquished by: _____ Date: 092111 Time: 0945 Received by Laboratory: *[Signature]* KIFF Analytical LLC

Remarks:



2795 2nd Street Suite 300
 Davis, CA 95616
 Lab: 530.297.4800
 Fax: 530.297.4808

Lab No. 78834

Page 3 of 3

Project Contact (Hardcopy or PDF To):

Matthew Nelson

California EDF Report? Yes No

Chain-of-Custody Record and Analysis Request

Company / Address:

Arctos Environmental
 1332 Peralta Ave., Berkeley, CA. 94702

Recommended but not mandatory to complete this section:

Sampling Company Log Code:

Global ID:

T0600101410

EDF Deliverable To (Email Address):

mnelson@orionenv.com

Phone No.:

562-988-2755

Fax No.:

562-988-2759

Project Number:

01LV

P.O. No.:

67076

Project Name:

Tesoro - Livermore

Sampler

Signature SCOTT STROMBERG

Project Address:

1619 1st Street
 Livermore, CA

Sampling Container Preservative Matrix

Sample Designation

Date Time 40 ml VOA SLEEVE POLY AMBER TEDLAR HCl HNO₃ ICE NONE WATER SOIL VAPOR

~~SYSTEM FOLD HEADER~~

Sample Designation	Date	Time	40 ml VOA	SLEEVE	POLY	AMBER	TEDLAR	HCl	HNO ₃	ICE	NONE	WATER	SOIL	VAPOR	MTBE/TPH Gas/BTEX (8260B)	Fixed Gases	TPHG/BTEX / 7 OXY (EPA 8260B)	TDS (SM 2540 C)	CH ₄ / CO ₂ (RSK 175 M)	METALS BY ICP (Fe, Ni, Mn, Cr, As) (EPA 6010)	TOTAL ALK (SM 2320 B)	NO ₃ (SM 3500-FeD); (EPA 300); (EPA 7199)	TAT	For Lab Use Only
SYSTEM FOLD HEADER							X				X			X	X	X							1 wk	
IP-9	9/20/11	1802	5					X				X					X		X				X	06
IP-9		1802	2								X	X							X				X	
IP-9		1802			W						X	X					X			X	X		X	
IP-9		1802			I			X				X							X				X	

Relinquished by:

[Signature]

Date

9/20/11

Time

1830

Received by:

[Signature]

Remarks:

Relinquished by:

[Signature]

Date

Time

Received by:

[Signature]

Relinquished by:

[Signature]

Date

092111

Time

0945

Received by Laboratory:

[Signature] KIFF Analytical LLC

Bill to:

TESORO

SAMPLE RECEIPT CHECKLIST

RECEIVER

TJB
Initials

SRG#: 78834 Date: 092111

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: Yes No (includes water)
 Temperature °C 8.7 Therm. ID# IR-1 Initial TJB Date/Time 092111/0940 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 42
 Matrix WA Container type Poly # of containers received 24
 Matrix _____ Container type _____ # of containers received _____
 Date and Time Sample Put into Temp Storage Date: 092111 Time: 0945

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: Temp exception - VOA vials transported in box, insufficient ice on top of samples. TJB 092111 1000



Subcontract Laboratory Report Attachments



Environmental & Marine Chemistry Laboratories



CALSCIENCE

WORK ORDER NUMBER: 11-09-1441

The difference is service



AIR | SOIL | WATER | MARINE CHEMISTRY

Analytical Report For

Client: Kiff Analytical

Client Project Name: Tesoro - Livermore

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

Amanda Porter

Approved for release on 09/29/2011 by:
Amanda Porter
Project Manager

ResultLink ▶

Email your PM ▶



Calscience Environmental Laboratories 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 provided herein, and follows the standard Calscience data package. The results in this analytical report are limited to the samples tested and any reproduction thereof must be made in its entirety. Note that the Chain-of-Custody Record and Sample Receipt Form are integral parts of this report.





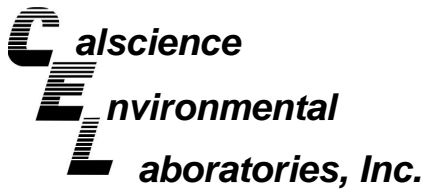
Environmental & Marine Chemistry Laboratories

Contents

Client Project Name: Tesoro - Livermore

Work Order Number: 11-09-1441

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Analytical Report



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

Date Received: 09/22/11
Work Order No: 11-09-1441
Preparation: N/A
Method: RSK-175M

Project: Tesoro - Livermore

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	11-09-1441-1-D	09/20/11 15:05	Aqueous	GC 14	N/A	09/24/11 21:45	110924L01

Parameter	Result	RL	DF	Qual	Units
Carbon Dioxide	5530	1.70	1		ug/L

MW-11	11-09-1441-2-D	09/20/11 15:17	Aqueous	GC 14	N/A	09/24/11 12:02	110924L01
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Parameter	Result	RL	DF	Qual	Units
Carbon Dioxide	90300	17.0	10		ug/L

DW-8	11-09-1441-3-A	09/20/11 16:17	Aqueous	GC 14	N/A	09/24/11 12:21	110924L01
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Parameter	Result	RL	DF	Qual	Units
Carbon Dioxide	27600	17.0	10		ug/L

IP-1	11-09-1441-4-D	09/20/11 16:53	Aqueous	GC 14	N/A	09/24/11 12:41	110924L01
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Parameter	Result	RL	DF	Qual	Units
Carbon Dioxide	24000	17.0	10		ug/L

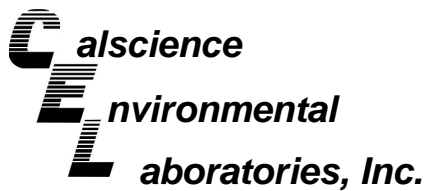
IP-8	11-09-1441-5-D	09/20/11 17:23	Aqueous	GC 14	N/A	09/24/11 22:07	110924L01
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Parameter	Result	RL	DF	Qual	Units
Carbon Dioxide	6930	1.70	1		ug/L

IP-9	11-09-1441-6-D	09/20/11 18:02	Aqueous	GC 14	N/A	09/24/11 14:36	110924L01
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Parameter	Result	RL	DF	Qual	Units
Carbon Dioxide	10100	17.0	10		ug/L

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



Analytical Report



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

Date Received: 09/22/11
Work Order No: 11-09-1441
Preparation: N/A
Method: RSK-175M

Project: Tesoro - Livermore

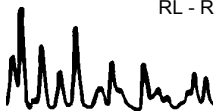
Page 2 of 2

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Method Blank	099-12-659-275	N/A	Aqueous	GC 14	N/A	09/24/11 10:46	110924L01

<u>Parameter</u>	<u>Result</u>	<u>RL</u>	<u>DF</u>	<u>Qual</u>	<u>Units</u>
Carbon Dioxide	ND	1.70	1		ug/L

Return to Contents

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





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

Date Received: 09/22/11
 Work Order No: 11-09-1441
 Preparation: N/A
 Method: RSK-175M

Project: Tesoro - Livermore

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	11-09-1441-1-A	09/20/11 15:05	Aqueous	GC 33	N/A	09/23/11 12:21	110923L01

Parameter	Result	RL	DF	Qual	Units
Methane	39.0	1.00	1		ug/L

MW-11	11-09-1441-2-A	09/20/11 15:17	Aqueous	GC 33	N/A	09/23/11 12:42	110923L01
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Parameter	Result	RL	DF	Qual	Units
Methane	36.0	1.00	1		ug/L

DW-8	11-09-1441-3-A	09/20/11 16:17	Aqueous	GC 33	N/A	09/23/11 14:59	110923L01
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Parameter	Result	RL	DF	Qual	Units
Methane	1110	8.00	8		ug/L

IP-1	11-09-1441-4-A	09/20/11 16:53	Aqueous	GC 33	N/A	09/23/11 15:21	110923L01
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Parameter	Result	RL	DF	Qual	Units
Methane	474	8.00	8		ug/L

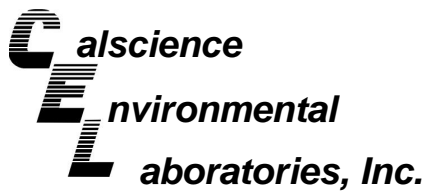
IP-8	11-09-1441-5-A	09/20/11 17:23	Aqueous	GC 33	N/A	09/23/11 13:52	110923L01
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Parameter	Result	RL	DF	Qual	Units
Methane	49.6	1.00	1		ug/L

IP-9	11-09-1441-6-A	09/20/11 18:02	Aqueous	GC 33	N/A	09/23/11 14:16	110923L01
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Parameter	Result	RL	DF	Qual	Units
Methane	64.6	1.00	1		ug/L

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



Analytical Report



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

Date Received: 09/22/11
Work Order No: 11-09-1441
Preparation: N/A
Method: RSK-175M

Project: Tesoro - Livermore

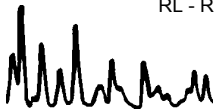
Page 2 of 2

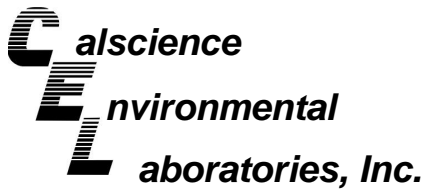
Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Method Blank	099-12-663-1,402-A	N/A	Aqueous	GC 33	N/A	09/23/11 11:50	110923L01

<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: 09/22/11
Work Order No: 11-09-1441
Preparation: N/A
Method: SM 2320B

Project: Tesoro - Livermore

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	11-09-1441-1-F	09/20/11 15:05	Aqueous	PH1/BUR03	N/A	09/26/11 16:15	B0926ALKB1

Parameter	Result	RL	DF	Qual	Units
Alkalinity, Total (as CaCO3)	290	5.00	1		mg/L

MW-11	11-09-1441-2-F	09/20/11 15:17	Aqueous	PH1/BUR03	N/A	09/26/11 16:15	B0926ALKB1
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Parameter	Result	RL	DF	Qual	Units
Alkalinity, Total (as CaCO3)	702	5.00	1		mg/L

DW-8	11-09-1441-3-F	09/20/11 16:17	Aqueous	PH1/BUR03	N/A	09/26/11 16:15	B0926ALKB1
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Parameter	Result	RL	DF	Qual	Units
Alkalinity, Total (as CaCO3)	502	5.00	1		mg/L

IP-1	11-09-1441-4-F	09/20/11 16:53	Aqueous	PH1/BUR03	N/A	09/26/11 16:15	B0926ALKB1
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Parameter	Result	RL	DF	Qual	Units
Alkalinity, Total (as CaCO3)	369	5.00	1		mg/L

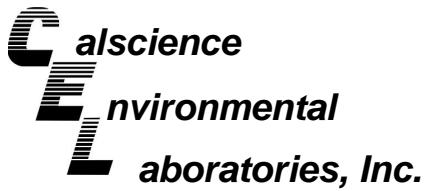
IP-8	11-09-1441-5-F	09/20/11 17:23	Aqueous	PH1/BUR03	N/A	09/26/11 16:15	B0926ALKB1
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Parameter	Result	RL	DF	Qual	Units
Alkalinity, Total (as CaCO3)	229	5.00	1		mg/L

IP-9	11-09-1441-6-F	09/20/11 18:02	Aqueous	PH1/BUR03	N/A	09/26/11 16:15	B0926ALKB1
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Parameter	Result	RL	DF	Qual	Units
Alkalinity, Total (as CaCO3)	305	5.00	1		mg/L

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



Analytical Report



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

Date Received: 09/22/11
Work Order No: 11-09-1441
Preparation: N/A
Method: SM 2320B

Project: Tesoro - Livermore

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	099-12-223-4,749-E	N/A	Aqueous	PH1/BUR03	N/A	09/26/11 16:15	B0926ALKB1

<u>Parameter</u>	<u>Result</u>	<u>RL</u>	<u>DF</u>	<u>Qual</u>	<u>Units</u>
Alkalinity, Total (as CaCO3)	ND	1.0	1		mg/L

Return to Contents

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



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

Date Received: 09/22/11
 Work Order No: 11-09-1441
 Preparation: N/A
 Method: SM 2540 C

Project: Tesoro - Livermore

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	11-09-1441-1-E	09/20/11 15:05	Aqueous	N/A	09/23/11	09/23/11 18:00	B0923TDSB2

Parameter	Result	RL	DF	Qual	Units
Solids, Total Dissolved	483	1.00	1		mg/L

MW-11	11-09-1441-2-E	09/20/11 15:17	Aqueous	N/A	09/23/11	09/23/11 18:00	B0923TDSB2
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Parameter	Result	RL	DF	Qual	Units
Solids, Total Dissolved	840	1.00	1		mg/L

DW-8	11-09-1441-3-E	09/20/11 16:17	Aqueous	N/A	09/23/11	09/23/11 18:00	B0923TDSB2
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Parameter	Result	RL	DF	Qual	Units
Solids, Total Dissolved	615	1.00	1		mg/L

IP-1	11-09-1441-4-E	09/20/11 16:53	Aqueous	N/A	09/23/11	09/23/11 18:00	B0923TDSB2
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Parameter	Result	RL	DF	Qual	Units
Solids, Total Dissolved	483	1.00	1		mg/L

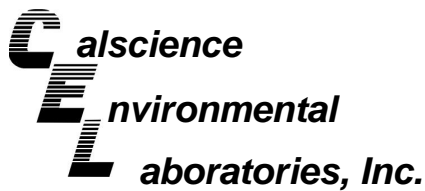
IP-8	11-09-1441-5-E	09/20/11 17:23	Aqueous	N/A	09/23/11	09/23/11 18:00	B0923TDSB2
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Parameter	Result	RL	DF	Qual	Units
Solids, Total Dissolved	350	1.00	1		mg/L

IP-9	11-09-1441-6-E	09/20/11 18:02	Aqueous	N/A	09/23/11	09/23/11 18:00	B0923TDSB2
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Parameter	Result	RL	DF	Qual	Units
Solids, Total Dissolved	413	1.00	1		mg/L

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



Analytical Report



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

Date Received: 09/22/11
Work Order No: 11-09-1441
Preparation: N/A
Method: SM 2540 C

Project: Tesoro - Livermore

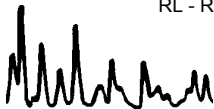
Page 2 of 2

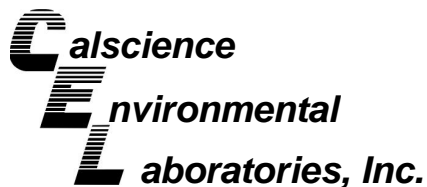
Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Method Blank	099-12-180-2,799	N/A	Aqueous	N/A	09/23/11	09/23/11 18:00	B0923TDSB2

<u>Parameter</u>	<u>Result</u>	<u>RL</u>	<u>DF</u>	<u>Qual</u>	<u>Units</u>
Solids, Total Dissolved	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: 09/22/11
Work Order No: 11-09-1441
Preparation: N/A
Method: SM 2320B

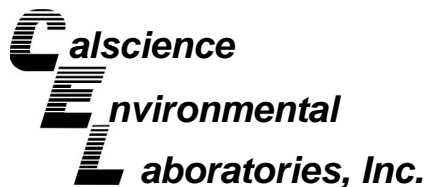
Project: Tesoro - Livermore

Quality Control Sample ID	Matrix	Instrument	Date Prepared:	Date Analyzed:	Duplicate Batch Number
11-09-1626-2	Aqueous	PH1/BUR03	N/A	09/26/11	B0926ALKD1

Parameter	Sample Conc.	DUP Conc	RPD	RPD CL	Qualifiers
Alkalinity, Total (as CaCO3)	377	377	0	0-25	
Bicarbonate (as CaCO3)	377	377	0	0-25	
Carbonate (as CaCO3)	ND	ND	NA	0-25	
Hydroxide (as CaCO3)	ND	ND	NA	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: 09/22/11
Work Order No: 11-09-1441
Preparation: N/A
Method: SM 2540 C

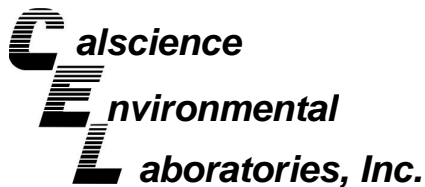
Project: Tesoro - Livermore

Quality Control Sample ID	Matrix	Instrument	Date Prepared:	Date Analyzed:	Duplicate Batch Number
11-09-1583-10	Aqueous	N/A	09/23/11	09/23/11	B0923TDSD2

Parameter	Sample Conc.	DUP Conc	RPD	RPD CL	Qualifiers
Solids, Total Dissolved	3070	3060	0	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: 11-09-1441
 Preparation: N/A
 Method: RSK-175M

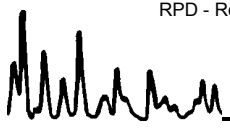
Project: Tesoro - Livermore

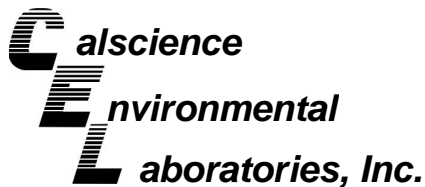
Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number
099-12-659-275	Aqueous	GC 14	N/A	09/24/11	110924L01

Parameter	SPIKE ADDED	LCS %REC	LCSD %REC	%REC CL	RPD	RPD CL	Qualifiers
Carbon Dioxide	102.0	99	99	80-120	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: 11-09-1441
 Preparation: N/A
 Method: RSK-175M

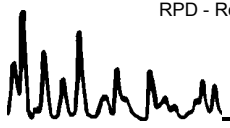
Project: Tesoro - Livermore

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number
099-12-663-1,402	Aqueous	GC 33	N/A	09/23/11	110923L01

Parameter	SPIKE ADDED	LCS %REC	LCSD %REC	%REC CL	RPD	RPD CL	Qualifiers
Methane	100.0	88	86	79-109	3	0-20	

Return to Contents

RPD - Relative Percent Difference , CL - Control Limit



Work Order Number: 11-09-1441

<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.





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

11-09-1441

COC No. **78834** Page 1 of 1

Project Contact (Hardcopy or PDF to): **Scott Forbes** EDF Report? **YES** Chain-of-Custody Record and Analysis Request

Company/Address: **Kiff Analytical** Recommended but not mandatory to complete this section: Sampling Company Log Code: **AEO** Analysis Request TAT

Phone No.: **530-297-4800** FAX No.: **530-297-4808** Global ID: **T0600101410**
 Project Number: **01LV** P.O. No.: **78834** Deliverables to (Email Address): **inbox@kiffanalytical.com**

Project Name: **TESORO - LIVERMORE** Container / Preservative Matrix
 Project Address: **Sampling** 1-L Poly None 250ml Poly None VOA 40 ml None VOA 40 ml HCl Water Alkalinity SM 2320 (1) Carbon Dioxide Hydrocarbons in Water by RSK 175 (1) Total Dissolved Solids 4-Days For Lab Use Only

Sample Designation	Date	Time	1-L Poly None	250ml Poly None	VOA 40 ml None	VOA 40 ml HCl	Water	Alkalinity SM 2320 (1)	Carbon Dioxide	Hydrocarbons in Water by RSK 175 (1)	Total Dissolved Solids	4-Days	For Lab Use Only
IP-10	09/20/11	15:05	1	1	2	2	X	X	X	X	X	X	1
MW-11	09/20/11	15:17	1	1	2	2	X	X	X	X	X	X	2
DW-8	09/20/11	16:17	1	1	2	2	X	X	X	X	X	X	3
IP-1	09/20/11	16:53	1	1	2	2	X	X	X	X	X	X	4
IP-8	09/20/11	17:23	1	1	2	2	X	X	X	X	X	X	5
IP-9	09/20/11	18:02	1	1	2	2	X	X	X	X	X	X	6

Relinquished by: *[Signature]* Kiff Analytical Date: **09/21/11** Time: **1900** Received by:
 Relinquished by: Date: Time: Received by:
 Relinquished by: Date: **9/22/11** Time: **1000** Received by: *[Signature]*

Remarks: Please refer to attached Test Detail.
 Bill to: **Accounts Payable**

(144)

Test Detail for Kiff Work Order: 78834

Alkalinity SM 2320 (1)

Alkalinity, Total (as CaCO₃)

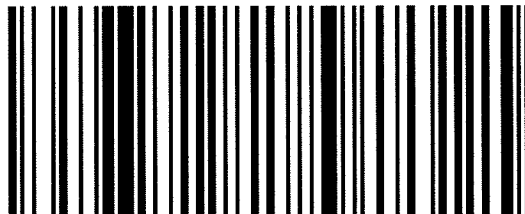
Hydrocarbons in Water by RSK 175 (1)

Methane

(1441)



800.334.5000
ontrac.com



D10010411843372

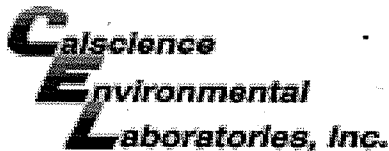
Date Printed 9/21/2011

Tracking#D10010411843372

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
Reference 2:

<p>Ship To Company: CALSCIENCE ENVIRONMENTAL 7440 LINCOLN WAY GARDEN GROVE, CA 92841 RECEIVING (714)895-5494</p> <p>B10207210772</p>	<p>Service: S Sort Code: ORG</p> <p>Special Services: Signature Required</p>
---	---



WORK ORDER #: 11-09-1441

SAMPLE RECEIPT FORM

Cooler 1 of 1

CLIENT: Kiff

DATE: 09/22/11

TEMPERATURE: Thermometer ID: SC1 (Criteria: 0.0°C – 6.0°C, not frozen)

Temperature 2.4 °C + 0.5°C (CF) = 2.9 °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: DL

SAMPLE CONDITION:	Yes	No	N/A
Chain-Of-Custody (COC) document(s) received with samples.....	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
COC document(s) received complete.....	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/> Collection date/time, matrix, and/or # of containers logged in based on sample labels.			
<input type="checkbox"/> No analysis requested. <input type="checkbox"/> Not relinquished. <input type="checkbox"/> No date/time relinquished.			
Sampler's name indicated on COC.....	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Sample container label(s) consistent with COC.....	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sample container(s) intact and good condition.....	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Proper containers and sufficient volume for analyses requested.....	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Analyses received within holding time.....	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
pH / Res. Chlorine / Diss. Sulfide / Diss. Oxygen received within 24 hours...	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Proper preservation noted on COC or sample container.....	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/> Unpreserved vials received for Volatiles analysis			
Volatile analysis container(s) free of headspace.....	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Tedlar bag(s) free of condensation.....	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

CONTAINER TYPE:

Solid: 4ozCGJ 8ozCGJ 16ozCGJ Sleeve (____) EnCores® TerraCores® _____

Water: VOA² VOAh² VOAna₂ 125AGB 125AGBh 125AGBp 1AGB 1AGBna₂ 1AGBs

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

250PB 250PBn 125PB 125PBzanna 100PJ 100PJna₂ _____ _____ _____

Air: Tedlar® Summa® Other: _____ Trip Blank Lot#: _____ Labeled/Checked by: DL

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

Preservative: h: HCL n: HNO₃ na₂: Na₂S₂O₃ na: NaOH p: H₃PO₄ s: H₂SO₄ zanna: ZnAc₂+NaOH f: Field-filtered Scanned by: WSE

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Laboratory Results

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

Subject : 6 Water Samples
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 standard. All soil samples are reported on a total weight (wet weight) basis unless noted otherwise in the case narrative. 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,



Joel Kiff

Subject : 6 Water Samples
Project Name : Tesoro - Livermore
Project Number : 01LV
P.O. Number : 67076

Case Narrative

California Laboratory Services provided analytical testing associated with these samples, but is not accredited by the National Environmental Laboratory Accreditation Program (NELAP).

The Method Reporting Limit for Ethanol has been increased due to the presence of an interfering compound for samples MW-11, IP-8 and IP-10.

Matrix Spike/Matrix Spike Duplicate results associated with samples MW-11, DW-8, IP-1, IP-8, IP-9, and IP-10 for the analytes Iron and Sodium were affected by the analyte concentrations already present in the un-spiked sample.

Matrix Spike/Matrix Spike Duplicate results associated with samples MW-11, IP-8, DW-8, and 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.

Project Name : **Tesoro - Livermore**

Project Number : **01LV**

Sample : **MW-11**

Matrix : Water

Lab Number : 79233-01

Sample Date :10/25/2011

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date/Time Analyzed
Arsenic	< 0.015	0.015	mg/L	EPA 6010B	10/26/11 17:22
Chromium	0.011	0.0050	mg/L	EPA 6010B	10/26/11 17:22
Iron	3.2	0.10	mg/L	EPA 6010B	10/26/11 17:22
Manganese	2.8	0.0050	mg/L	EPA 6010B	10/26/11 17:22
Sodium	290	5.0	mg/L	EPA 6010B	10/27/11 15:55
Benzene	130	0.50	ug/L	EPA 8260B	10/26/11 12:12
Toluene	500	5.0	ug/L	EPA 8260B	10/27/11 06:17
Ethylbenzene	310	0.50	ug/L	EPA 8260B	10/26/11 12:12
Total Xylenes	2900	5.0	ug/L	EPA 8260B	10/27/11 06:17
Methyl-t-butyl ether (MTBE)	< 0.50	0.50	ug/L	EPA 8260B	10/26/11 12:12
Diisopropyl ether (DIPE)	< 0.50	0.50	ug/L	EPA 8260B	10/26/11 12:12
Ethyl-t-butyl ether (ETBE)	< 0.50	0.50	ug/L	EPA 8260B	10/26/11 12:12
Tert-amyl methyl ether (TAME)	< 0.50	0.50	ug/L	EPA 8260B	10/26/11 12:12
Tert-Butanol	18	5.0	ug/L	EPA 8260B	10/26/11 12:12
Methanol	< 50	50	ug/L	EPA 8260B	10/26/11 12:12
Ethanol	< 10	10	ug/L	EPA 8260B	10/26/11 12:12
TPH as Gasoline	18000	500	ug/L	EPA 8260B	10/27/11 06:17
1,2-Dichloroethane	< 0.50	0.50	ug/L	EPA 8260B	10/26/11 12:12
1,2-Dibromoethane	< 0.50	0.50	ug/L	EPA 8260B	10/26/11 12:12
1,2-Dichloroethane-d4 (Surr)	92.7		% Recovery	EPA 8260B	10/26/11 12:12
Toluene - d8 (Surr)	85.5		% Recovery	EPA 8260B	10/26/11 12:12

Project Name : **Tesoro - Livermore**

Project Number : **01LV**

Sample : **DW-8**

Matrix : Water

Lab Number : 79233-02

Sample Date :10/25/2011

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date/Time Analyzed
Arsenic	< 0.015	0.015	mg/L	EPA 6010B	10/26/11 17:35
Chromium	< 0.0050	0.0050	mg/L	EPA 6010B	10/26/11 17:35
Iron	1.4	0.10	mg/L	EPA 6010B	10/26/11 17:35
Manganese	1.2	0.0050	mg/L	EPA 6010B	10/26/11 17:35
Sodium	100	5.0	mg/L	EPA 6010B	10/27/11 16:00
Benzene	4300	15	ug/L	EPA 8260B	10/27/11 06:54
Toluene	10000	25	ug/L	EPA 8260B	10/27/11 12:08
Ethylbenzene	1900	4.0	ug/L	EPA 8260B	10/26/11 17:48
Total Xylenes	12000	15	ug/L	EPA 8260B	10/27/11 06:54
Methyl-t-butyl ether (MTBE)	< 4.0	4.0	ug/L	EPA 8260B	10/26/11 17:48
Diisopropyl ether (DIPE)	< 4.0	4.0	ug/L	EPA 8260B	10/26/11 17:48
Ethyl-t-butyl ether (ETBE)	< 4.0	4.0	ug/L	EPA 8260B	10/26/11 17:48
Tert-amyl methyl ether (TAME)	< 4.0	4.0	ug/L	EPA 8260B	10/26/11 17:48
Tert-Butanol	58	20	ug/L	EPA 8260B	10/26/11 17:48
Methanol	< 400	400	ug/L	EPA 8260B	10/26/11 17:48
Ethanol	< 40	40	ug/L	EPA 8260B	10/26/11 17:48
TPH as Gasoline	82000	1500	ug/L	EPA 8260B	10/27/11 06:54
1,2-Dichloroethane	< 4.0	4.0	ug/L	EPA 8260B	10/26/11 17:48
1,2-Dibromoethane	< 4.0	4.0	ug/L	EPA 8260B	10/26/11 17:48
1,2-Dichloroethane-d4 (Surr)	102		% Recovery	EPA 8260B	10/26/11 17:48
Toluene - d8 (Surr)	94.4		% Recovery	EPA 8260B	10/26/11 17:48

Project Name : **Tesoro - Livermore**

Project Number : **01LV**

Sample : **IP-1**

Matrix : Water

Lab Number : 79233-03

Sample Date :10/25/2011

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date/Time Analyzed
Arsenic	< 0.015	0.015	mg/L	EPA 6010B	10/26/11 17:39
Chromium	0.018	0.0050	mg/L	EPA 6010B	10/26/11 17:39
Iron	2.6	0.10	mg/L	EPA 6010B	10/26/11 17:39
Manganese	2.4	0.0050	mg/L	EPA 6010B	10/26/11 17:39
Sodium	64	0.50	mg/L	EPA 6010B	10/26/11 17:39
Benzene	340	2.0	ug/L	EPA 8260B	10/27/11 07:01
Toluene	680	2.0	ug/L	EPA 8260B	10/27/11 07:01
Ethylbenzene	140	2.0	ug/L	EPA 8260B	10/27/11 07:01
Total Xylenes	1800	2.0	ug/L	EPA 8260B	10/27/11 07:01
Methyl-t-butyl ether (MTBE)	< 2.0	2.0	ug/L	EPA 8260B	10/27/11 07:01
Diisopropyl ether (DIPE)	< 2.0	2.0	ug/L	EPA 8260B	10/27/11 07:01
Ethyl-t-butyl ether (ETBE)	< 2.0	2.0	ug/L	EPA 8260B	10/27/11 07:01
Tert-amyl methyl ether (TAME)	< 2.0	2.0	ug/L	EPA 8260B	10/27/11 07:01
Tert-Butanol	22	9.0	ug/L	EPA 8260B	10/27/11 07:01
Methanol	< 200	200	ug/L	EPA 8260B	10/27/11 07:01
Ethanol	< 20	20	ug/L	EPA 8260B	10/27/11 07:01
TPH as Gasoline	13000	200	ug/L	EPA 8260B	10/27/11 07:01
1,2-Dichloroethane-d4 (Surr)	99.7		% Recovery	EPA 8260B	10/27/11 07:01
Toluene - d8 (Surr)	96.9		% Recovery	EPA 8260B	10/27/11 07:01

Project Name : **Tesoro - Livermore**

Project Number : **01LV**

Sample : **IP-8**

Matrix : Water

Lab Number : 79233-04

Sample Date :10/25/2011

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date/Time Analyzed
Arsenic	< 0.015	0.015	mg/L	EPA 6010B	10/26/11 17:43
Chromium	< 0.0050	0.0050	mg/L	EPA 6010B	10/26/11 17:43
Iron	1.6	0.10	mg/L	EPA 6010B	10/26/11 17:43
Manganese	3.8	0.0050	mg/L	EPA 6010B	10/26/11 17:43
Sodium	140	5.0	mg/L	EPA 6010B	10/27/11 16:04
Benzene	3000	15	ug/L	EPA 8260B	10/26/11 17:08
Toluene	8400	15	ug/L	EPA 8260B	10/26/11 17:08
Ethylbenzene	1500	4.0	ug/L	EPA 8260B	10/26/11 14:58
Total Xylenes	12000	15	ug/L	EPA 8260B	10/26/11 17:08
Methyl-t-butyl ether (MTBE)	< 4.0	4.0	ug/L	EPA 8260B	10/26/11 14:58
Diisopropyl ether (DIPE)	< 4.0	4.0	ug/L	EPA 8260B	10/26/11 14:58
Ethyl-t-butyl ether (ETBE)	< 4.0	4.0	ug/L	EPA 8260B	10/26/11 14:58
Tert-amyl methyl ether (TAME)	< 4.0	4.0	ug/L	EPA 8260B	10/26/11 14:58
Tert-Butanol	45	20	ug/L	EPA 8260B	10/26/11 14:58
Methanol	< 400	400	ug/L	EPA 8260B	10/26/11 14:58
Ethanol	< 80	80	ug/L	EPA 8260B	10/26/11 14:58
TPH as Gasoline	79000	1500	ug/L	EPA 8260B	10/26/11 17:08
1,2-Dichloroethane-d4 (Surr)	96.6		% Recovery	EPA 8260B	10/26/11 14:58
Toluene - d8 (Surr)	93.6		% Recovery	EPA 8260B	10/26/11 14:58

Project Name : **Tesoro - Livermore**

Project Number : **01LV**

Sample : **IP-9**

Matrix : Water

Lab Number : 79233-05

Sample Date :10/25/2011

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date/Time Analyzed
Arsenic	0.24	0.015	mg/L	EPA 6010B	10/26/11 17:47
Chromium	0.21	0.0050	mg/L	EPA 6010B	10/26/11 17:47
Iron	50	0.10	mg/L	EPA 6010B	10/26/11 17:47
Manganese	0.92	0.0050	mg/L	EPA 6010B	10/26/11 17:47
Sodium	4700	50	mg/L	EPA 6010B	10/27/11 16:08
Benzene	270	3.0	ug/L	EPA 8260B	10/26/11 14:23
Toluene	1900	3.0	ug/L	EPA 8260B	10/26/11 14:23
Ethylbenzene	960	3.0	ug/L	EPA 8260B	10/26/11 14:23
Total Xylenes	5400	7.0	ug/L	EPA 8260B	10/26/11 16:28
Methyl-t-butyl ether (MTBE)	< 3.0	3.0	ug/L	EPA 8260B	10/26/11 14:23
Diisopropyl ether (DIPE)	< 3.0	3.0	ug/L	EPA 8260B	10/26/11 14:23
Ethyl-t-butyl ether (ETBE)	< 3.0	3.0	ug/L	EPA 8260B	10/26/11 14:23
Tert-amyl methyl ether (TAME)	< 3.0	3.0	ug/L	EPA 8260B	10/26/11 14:23
Tert-Butanol	18	15	ug/L	EPA 8260B	10/26/11 14:23
Methanol	< 300	300	ug/L	EPA 8260B	10/26/11 14:23
Ethanol	< 30	30	ug/L	EPA 8260B	10/26/11 14:23
TPH as Gasoline	37000	700	ug/L	EPA 8260B	10/26/11 16:28
1,2-Dichloroethane-d4 (Surr)	95.1		% Recovery	EPA 8260B	10/26/11 14:23
Toluene - d8 (Surr)	94.8		% Recovery	EPA 8260B	10/26/11 14:23

Project Name : **Tesoro - Livermore**

Project Number : **01LV**

Sample : **IP-10**

Matrix : Water

Lab Number : 79233-06

Sample Date :10/25/2011

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date/Time Analyzed
Arsenic	< 0.015	0.015	mg/L	EPA 6010B	10/26/11 18:00
Chromium	< 0.0050	0.0050	mg/L	EPA 6010B	10/26/11 18:00
Iron	0.79	0.10	mg/L	EPA 6010B	10/26/11 18:00
Manganese	4.2	0.0050	mg/L	EPA 6010B	10/26/11 18:00
Sodium	74	0.50	mg/L	EPA 6010B	10/26/11 18:00
Benzene	20	0.50	ug/L	EPA 8260B	10/27/11 02:22
Toluene	31	0.50	ug/L	EPA 8260B	10/27/11 02:22
Ethylbenzene	34	0.50	ug/L	EPA 8260B	10/27/11 02:22
Total Xylenes	84	0.50	ug/L	EPA 8260B	10/27/11 02:22
Methyl-t-butyl ether (MTBE)	< 0.50	0.50	ug/L	EPA 8260B	10/27/11 02:22
Diisopropyl ether (DIPE)	< 0.50	0.50	ug/L	EPA 8260B	10/27/11 02:22
Ethyl-t-butyl ether (ETBE)	< 0.50	0.50	ug/L	EPA 8260B	10/27/11 02:22
Tert-amyl methyl ether (TAME)	< 0.50	0.50	ug/L	EPA 8260B	10/27/11 02:22
Tert-Butanol	5.3	5.0	ug/L	EPA 8260B	10/27/11 02:22
Methanol	< 50	50	ug/L	EPA 8260B	10/27/11 02:22
Ethanol	< 8.0	8.0	ug/L	EPA 8260B	10/27/11 02:22
TPH as Gasoline	1400	50	ug/L	EPA 8260B	10/27/11 02:22
1,2-Dichloroethane-d4 (Surr)	101		% Recovery	EPA 8260B	10/27/11 02:22
Toluene - d8 (Surr)	96.9		% Recovery	EPA 8260B	10/27/11 02:22

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
Arsenic	< 0.015	0.015	mg/L	EPA 6010B	10/26/2011	Toluene	< 0.50	0.50	ug/L	EPA 8260B	10/27/2011
Chromium	< 0.0050	0.0050	mg/L	EPA 6010B	10/26/2011	Benzene	< 0.50	0.50	ug/L	EPA 8260B	10/26/2011
Iron	< 0.10	0.10	mg/L	EPA 6010B	10/26/2011	Ethylbenzene	< 0.50	0.50	ug/L	EPA 8260B	10/26/2011
Manganese	< 0.0050	0.0050	mg/L	EPA 6010B	10/26/2011	Toluene	< 0.50	0.50	ug/L	EPA 8260B	10/26/2011
Sodium	< 0.50	0.50	mg/L	EPA 6010B	10/26/2011	Total Xylenes	< 0.50	0.50	ug/L	EPA 8260B	10/26/2011
Benzene	< 0.50	0.50	ug/L	EPA 8260B	10/26/2011	Diisopropyl ether (DIPE)	< 0.50	0.50	ug/L	EPA 8260B	10/26/2011
Ethylbenzene	< 0.50	0.50	ug/L	EPA 8260B	10/26/2011	Ethanol	< 5.0	5.0	ug/L	EPA 8260B	10/26/2011
Toluene	< 0.50	0.50	ug/L	EPA 8260B	10/26/2011	Ethyl-t-butyl ether (ETBE)	< 0.50	0.50	ug/L	EPA 8260B	10/26/2011
Diisopropyl ether (DIPE)	< 0.50	0.50	ug/L	EPA 8260B	10/26/2011	Methanol	< 50	50	ug/L	EPA 8260B	10/26/2011
Ethanol	< 5.0	5.0	ug/L	EPA 8260B	10/26/2011	Methyl-t-butyl ether (MTBE)	< 0.50	0.50	ug/L	EPA 8260B	10/26/2011
Ethyl-t-butyl ether (ETBE)	< 0.50	0.50	ug/L	EPA 8260B	10/26/2011	Tert-Butanol	< 5.0	5.0	ug/L	EPA 8260B	10/26/2011
Methanol	< 50	50	ug/L	EPA 8260B	10/26/2011	Tert-amyl methyl ether (TAME)	< 0.50	0.50	ug/L	EPA 8260B	10/26/2011
Methyl-t-butyl ether (MTBE)	< 0.50	0.50	ug/L	EPA 8260B	10/26/2011	TPH as Gasoline	< 50	50	ug/L	EPA 8260B	10/26/2011
Tert-Butanol	< 5.0	5.0	ug/L	EPA 8260B	10/26/2011	1,2-Dibromoethane	< 0.50	0.50	ug/L	EPA 8260B	10/26/2011
Tert-amyl methyl ether (TAME)	< 0.50	0.50	ug/L	EPA 8260B	10/26/2011	1,2-Dichloroethane	< 0.50	0.50	ug/L	EPA 8260B	10/26/2011
1,2-Dichloroethane-d4 (Surr)	101		%	EPA 8260B	10/26/2011	1,2-Dichloroethane-d4 (Surr)	104		%	EPA 8260B	10/26/2011
Toluene - d8 (Surr)	98.7		%	EPA 8260B	10/26/2011	Toluene - d8 (Surr)	95.7		%	EPA 8260B	10/26/2011
Benzene	< 0.50	0.50	ug/L	EPA 8260B	10/26/2011	Benzene	< 0.50	0.50	ug/L	EPA 8260B	10/26/2011
Ethylbenzene	< 0.50	0.50	ug/L	EPA 8260B	10/26/2011	Toluene	< 0.50	0.50	ug/L	EPA 8260B	10/26/2011
Toluene	< 0.50	0.50	ug/L	EPA 8260B	10/26/2011	Total Xylenes	< 0.50	0.50	ug/L	EPA 8260B	10/26/2011
Total Xylenes	< 0.50	0.50	ug/L	EPA 8260B	10/26/2011	TPH as Gasoline	< 50	50	ug/L	EPA 8260B	10/26/2011
Diisopropyl ether (DIPE)	< 0.50	0.50	ug/L	EPA 8260B	10/26/2011						
Ethanol	< 5.0	5.0	ug/L	EPA 8260B	10/26/2011						
Ethyl-t-butyl ether (ETBE)	< 0.50	0.50	ug/L	EPA 8260B	10/26/2011						
Methanol	< 50	50	ug/L	EPA 8260B	10/26/2011						
Methyl-t-butyl ether (MTBE)	< 0.50	0.50	ug/L	EPA 8260B	10/26/2011						
Tert-Butanol	< 5.0	5.0	ug/L	EPA 8260B	10/26/2011						
Tert-amyl methyl ether (TAME)	< 0.50	0.50	ug/L	EPA 8260B	10/26/2011						
TPH as Gasoline	< 50	50	ug/L	EPA 8260B	10/26/2011						
1,2-Dichloroethane-d4 (Surr)	102		%	EPA 8260B	10/26/2011						
Toluene - d8 (Surr)	99.3		%	EPA 8260B	10/26/2011						

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
Arsenic	79233-01	< 0.015	0.400	0.400	0.427	0.444	mg/L	EPA 6010B	10/26/11	104	108	3.86	75-125	20
Chromium	79233-01	0.011	0.400	0.400	0.418	0.424	mg/L	EPA 6010B	10/26/11	102	103	1.45	75-125	20
Iron	79233-01	3.2	0.400	0.400	3.78	3.76	mg/L	EPA 6010B	10/26/11	149	144	0.530	75-125	20
Manganese	79233-01	2.8	0.400	0.400	3.17	3.14	mg/L	EPA 6010B	10/26/11	100	91.5	1.11	75-125	20
Sodium	79233-01	290	0.400	0.400	290	287	mg/L	EPA 6010B	10/26/11	0.00	0.00	0.937	75-125	20
Benzene	79151-11	<0.50	40.0	40.0	41.7	40.4	ug/L	EPA 8260B	10/26/11	104	101	3.11	80-120	25
Diisopropyl ether	79151-11	<0.50	39.6	39.6	42.8	42.0	ug/L	EPA 8260B	10/26/11	108	106	1.91	80-120	25
Ethanol	79151-11	<5.0	99.7	99.7	98.2	99.5	ug/L	EPA 8260B	10/26/11	98.4	99.8	1.37	55.1-159	25
Ethyl-tert-butyl ether	79151-11	<0.50	39.9	39.9	42.2	41.2	ug/L	EPA 8260B	10/26/11	106	103	2.47	76.5-120	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
Ethylbenzene	79151-11	<0.50	40.0	40.0	42.3	40.6	ug/L	EPA 8260B	10/26/11	106	101	4.31	80-120	25
Methanol	79151-11	<50	998	998	934	942	ug/L	EPA 8260B	10/26/11	93.6	94.5	0.924	53.2-147	25
Methyl-t-butyl ether	79151-11	<0.50	40.2	40.2	43.4	42.8	ug/L	EPA 8260B	10/26/11	108	106	1.37	69.7-121	25
Tert-Butanol	79151-11	<5.0	193	193	206	205	ug/L	EPA 8260B	10/26/11	107	106	0.651	80-120	25
Tert-amyl-methyl ether	79151-11	<0.50	39.9	39.9	42.8	42.1	ug/L	EPA 8260B	10/26/11	107	105	1.57	78.9-120	25
Toluene	79151-11	<0.50	40.0	40.0	41.6	40.2	ug/L	EPA 8260B	10/26/11	104	100	3.42	80-120	25
Benzene	79220-01	<0.50	40.0	40.0	41.0	39.8	ug/L	EPA 8260B	10/26/11	102	99.4	3.09	80-120	25
Diisopropyl ether	79220-01	<0.50	39.6	39.6	42.5	42.2	ug/L	EPA 8260B	10/26/11	107	107	0.544	80-120	25
Ethanol	79220-01	<5.0	99.7	99.7	95.2	95.1	ug/L	EPA 8260B	10/26/11	95.4	95.3	0.130	55.1-159	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
Ethyl-tert-butyl ether	79220-01	<0.50	39.9	39.9	42.6	42.5	ug/L	EPA 8260B	10/26/11	107	106	0.341	76.5-120	25
Ethylbenzene	79220-01	<0.50	40.0	40.0	40.4	39.6	ug/L	EPA 8260B	10/26/11	101	99.0	2.01	80-120	25
Methanol	79220-01	<50	998	998	978	960	ug/L	EPA 8260B	10/26/11	98.0	96.2	1.89	53.2-147	25
Methyl-t-butyl ether	79220-01	<0.50	40.2	40.2	44.3	44.1	ug/L	EPA 8260B	10/26/11	110	110	0.481	69.7-121	25
P + M Xylene	79220-01	<0.50	40.0	40.0	37.9	37.0	ug/L	EPA 8260B	10/26/11	94.8	92.5	2.41	76.8-120	25
Tert-Butanol	79220-01	<5.0	193	193	203	205	ug/L	EPA 8260B	10/26/11	105	106	0.800	80-120	25
Tert-amyl-methyl ether	79220-01	<0.50	39.9	39.9	42.8	42.9	ug/L	EPA 8260B	10/26/11	107	108	0.343	78.9-120	25
Toluene	79220-01	<0.50	40.0	40.0	40.4	39.2	ug/L	EPA 8260B	10/26/11	101	98.1	2.85	80-120	25
Toluene	79211-01	<0.50	40.0	40.0	40.0	38.7	ug/L	EPA 8260B	10/27/11	100	96.8	3.34	80-120	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
1,2-Dibromoethane	79233-01	<0.50	39.8	39.8	36.8	36.4	ug/L	EPA 8260B	10/26/11	92.5	91.3	1.32	80-120	25
1,2-Dichloroethane	79233-01	<0.50	40.0	40.0	41.1	40.9	ug/L	EPA 8260B	10/26/11	103	102	0.495	75.7-122	25
Benzene	79233-01	130	40.0	40.0	165	162	ug/L	EPA 8260B	10/26/11	80.1	74.3	7.46	80-120	25
Diisopropyl ether	79233-01	<0.50	39.6	39.6	38.4	37.6	ug/L	EPA 8260B	10/26/11	96.9	94.9	2.06	80-120	25
Ethanol	79233-01	9.8	99.7	99.7	133	140	ug/L	EPA 8260B	10/26/11	123	130	5.34	55.1-159	25
Ethyl-tert-butyl ether	79233-01	<0.50	39.9	39.9	37.1	36.8	ug/L	EPA 8260B	10/26/11	93.0	92.2	0.890	76.5-120	25
Ethylbenzene	79233-01	310	40.0	40.0	342	340	ug/L	EPA 8260B	10/26/11	70.8	65.0	8.50	80-120	25
Methanol	79233-01	<50	998	998	1220	1200	ug/L	EPA 8260B	10/26/11	122	121	1.12	53.2-147	25
Methyl-t-butyl ether	79233-01	<0.50	40.2	40.2	37.7	37.2	ug/L	EPA 8260B	10/26/11	93.8	92.5	1.38	69.7-121	25
P + M Xylene	79233-01	1500	40.0	40.0	1560	1550	ug/L	EPA 8260B	10/26/11	54.8	11.0	133	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	79233-01	18	193	193	228	227	ug/L	EPA 8260B	10/26/11	109	108	0.366	80-120	25
Tert-amyl-methyl ether	79233-01	<0.50	39.9	39.9	39.1	39.3	ug/L	EPA 8260B	10/26/11	98.0	98.5	0.520	78.9-120	25
Toluene	79233-01	460	40.0	40.0	490	484	ug/L	EPA 8260B	10/26/11	87.1	72.1	18.9	80-120	25
Benzene	79220-02	<0.50	40.0	40.0	40.2	39.7	ug/L	EPA 8260B	10/26/11	100	99.4	1.05	80-120	25
P + M Xylene	79220-02	<0.50	40.0	40.0	41.1	41.0	ug/L	EPA 8260B	10/26/11	103	103	0.0959	76.8-120	25
Toluene	79220-02	<0.50	40.0	40.0	40.2	39.7	ug/L	EPA 8260B	10/26/11	100	99.4	1.21	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
Arsenic	0.400	mg/L	EPA 6010B	10/26/11	97.5	85-115
Chromium	0.400	mg/L	EPA 6010B	10/26/11	103	85-115
Iron	0.400	mg/L	EPA 6010B	10/26/11	99.7	85-115
Manganese	0.400	mg/L	EPA 6010B	10/26/11	100	85-115
Sodium	0.400	mg/L	EPA 6010B	10/26/11	98.8	85-115
Benzene	40.2	ug/L	EPA 8260B	10/26/11	102	80-120
Diisopropyl ether	39.8	ug/L	EPA 8260B	10/26/11	108	80-120
Ethanol	100	ug/L	EPA 8260B	10/26/11	101	55.1-159
Ethyl-tert-butyl ether	40.1	ug/L	EPA 8260B	10/26/11	105	76.5-120
Ethylbenzene	40.2	ug/L	EPA 8260B	10/26/11	103	80-120
Methanol	1000	ug/L	EPA 8260B	10/26/11	96.8	53.2-147
Methyl-t-butyl ether	40.4	ug/L	EPA 8260B	10/26/11	107	69.7-121
Tert-Butanol	194	ug/L	EPA 8260B	10/26/11	104	80-120
Tert-amyl-methyl ether	40.1	ug/L	EPA 8260B	10/26/11	106	78.9-120
Toluene	40.2	ug/L	EPA 8260B	10/26/11	102	80-120
Benzene	40.2	ug/L	EPA 8260B	10/26/11	101	80-120
Diisopropyl ether	39.8	ug/L	EPA 8260B	10/26/11	106	80-120
Ethanol	100	ug/L	EPA 8260B	10/26/11	97.7	55.1-159
Ethyl-tert-butyl ether	40.1	ug/L	EPA 8260B	10/26/11	104	76.5-120
Ethylbenzene	40.2	ug/L	EPA 8260B	10/26/11	103	80-120

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
Methanol	1000	ug/L	EPA 8260B	10/26/11	93.7	53.2-147
Methyl-t-butyl ether	40.4	ug/L	EPA 8260B	10/26/11	106	69.7-121
P + M Xylene	40.2	ug/L	EPA 8260B	10/26/11	102	76.8-120
TPH as Gasoline	502	ug/L	EPA 8260B	10/26/11	105	70.0-130
Tert-Butanol	194	ug/L	EPA 8260B	10/26/11	104	80-120
Tert-amyl-methyl ether	40.1	ug/L	EPA 8260B	10/26/11	105	78.9-120
Toluene	40.2	ug/L	EPA 8260B	10/26/11	101	80-120
Toluene	40.0	ug/L	EPA 8260B	10/27/11	103	80-120
1,2-Dibromoethane	39.6	ug/L	EPA 8260B	10/26/11	102	80-120
1,2-Dichloroethane	39.8	ug/L	EPA 8260B	10/26/11	118	75.7-122
Benzene	39.8	ug/L	EPA 8260B	10/26/11	100	80-120
Diisopropyl ether	39.4	ug/L	EPA 8260B	10/26/11	112	80-120
Ethanol	99.3	ug/L	EPA 8260B	10/26/11	139	55.1-159
Ethyl-tert-butyl ether	39.7	ug/L	EPA 8260B	10/26/11	111	76.5-120
Ethylbenzene	39.8	ug/L	EPA 8260B	10/26/11	103	80-120
Methanol	993	ug/L	EPA 8260B	10/26/11	133	53.2-147
Methyl-t-butyl ether	40.0	ug/L	EPA 8260B	10/26/11	109	69.7-121
P + M Xylene	39.8	ug/L	EPA 8260B	10/26/11	100	76.8-120
TPH as Gasoline	500	ug/L	EPA 8260B	10/26/11	99.2	70.0-130
Tert-Butanol	192	ug/L	EPA 8260B	10/26/11	109	80-120
Tert-amyl-methyl ether	39.7	ug/L	EPA 8260B	10/26/11	108	78.9-120

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
Toluene	39.8	ug/L	EPA 8260B	10/26/11	95.1	80-120
Benzene	40.2	ug/L	EPA 8260B	10/26/11	99.2	80-120
P + M Xylene	40.2	ug/L	EPA 8260B	10/26/11	102	76.8-120
TPH as Gasoline	501	ug/L	EPA 8260B	10/26/11	98.3	70.0-130
Toluene	40.2	ug/L	EPA 8260B	10/26/11	99.0	80-120



2795 2nd Street Suite 300
 Davis, CA 95616
 Lab: 530.297.4800
 Fax: 530.297.4808

Lab No. 79233

Page 1 of 6

Project Contact (Hardcopy or PDF To):

Matthew Nelson

California EDF Report? Yes No

Chain-of-Custody Record and Analysis Request

Company / Address:

Arctos Environmental
 1332 Peralta Ave., Berkeley, CA. 94702

Recommended but not mandatory to complete this section:

Sampling Company Log Code:

Analysis Request

Phone No.:

562-988-2755

Fax No.:

562-988-2759

Global ID:

T0600101410

Project Number:

01LV

P.O. No.:

67076

EDF Deliverable To (Email Address):

mnelson@orionenv.com

Project Name:

Tesoro - Livermore

Sampler

Signature: *Scott Stromberg*

Project Address:

1619 1st Street
 Livermore, CA

Sampling

Container

Preservative

Matrix

TPHg, BTEX, 7 Oxygenates (EPA 8260B)

Nitrate, Sulfate (EPA 300.0)

Ferrous Iron (SM 3500-Fe D)

Hexavalent Chromium (EPA 7199)

Metals by ICP (Fe/Ni/Mn/Cr/As) (EPA 6010)

Total Alkalinity (SM 2320 B)

TDS (SM 2540 C)

Carbon Dioxide (RSK 175M)

Methane (RSK 175M)

Lead Scav. (1,2 DCA & 1,2 EDB - 8260B)

TOC (SM 5310 B)

COD (SM 5220 D)

BOD (SM 5210 B)

TAT

18hr

24hr

48hr

72hr

1wk

2wk

For Lab Use Only

Sample Designation

Date

Time

40 ml VOA

500 mL HDPE

250 mL POLY

1 L POLY

250.7L GLASS

HCl

HNO₃

ICE

NONE

H₂SO₄

WATER

SOIL

VAPOR

MW-11

10/25/11

1334

3

X

X

X

12 hr

01

MW-11

1

X

X

X

X

1 wk

02

MW-11

1

X

X

1 wk

03

MW-11

1

X

X

1 wk

04

MW-11

1

X

X

1 wk

05

MW-11

2

X

X

1 wk

06

MW-11

2

X

X

1 wk

07

MW-11

1

X

X

1 wk

08

MW-11

1

X

X

X

1 wk

09

MW-11

1

X

X

X

1 wk

10

Relinquished by:

Matthew Nelson

Date

10/25/11

Time

1700

Received by:

[Signature]

Remarks:

12 hour TAT requested for TPHg, BTEX, and 7 oxy. 1 week TAT for all other analyses.

Relinquished by:

Date

Time

Received by:

Relinquished by:

Date

10/26/11

Time

0800

Received by Laboratory:

[Signature]

Bill to:

TESORO



2795 2nd Street Suite 300
 Davis, CA 95616
 Lab: 530.297.4800
 Fax: 530.297.4808

Lab No. 79233

Page 2 of 6

Project Contact (Hardcopy or PDF To):
 Matthew Nelson

Company / Address:
 Arctos Environmental
 1332 Peralta Ave., Berkeley, CA. 94702

Phone No.: 562-988-2755
Fax No.: 562-988-2759

Project Number: 01LV
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: *Scott Stromberg*

Chain-of-Custody Record and Analysis Request

Analysis Request												TAT	For Lab Use Only									
TPHg, BTEX, 7 Oxygenates (EPA 8260B)	Nitrate, Sulfate (EPA 300.0)	Ferrous Iron (SM 3500-Fe D)	Hexavalent Chromium (EPA 7199)	Metals by ICP (Fe/Na/Mn/Cr/As) (EPA 6010)	Total Alkalinity (SM 2320 B)	TDS (SM 2540 C)	Carbon Dioxide (RSK 175M)	Methane (RSK 175M)	Lead Scav. (1,2 DCA & 1,2 EDB - 8260B)	TOC (SM 5310 B)	COD SM 5220 D (SM 5220 D)	BOD (SM 5210 B)		12 hr	24 hr	48 hr	72 hr	1 wk	2 wk			
X									X											12 hr	1	
	X	X	X																		1 wk	2
					X																1 wk	3
						X															1 wk	4
							X														1 wk	5
								X													1 wk	6
				X									X								1 wk	7
					X			X						X							1 wk	8
							X	X													1 wk	9

Sample Designation	Sampling		Container				Preservative				Matrix			
	Date	Time	40 ml VOA	500 mL HDPE	250 mL POLY	1 L POLY	HCl	HNO ₃	ICE	NONE	H ₂ SO ₄	WATER	SOIL	VAPOR
DW-8	10/25/11	1430	3				X				X			
DW-8				1				X			X			
DW-8					1			X			X			
DW-8					1				X		X			
DW-8						2			X		X			
DW-8							2			X	X			
DW-8											X			
DW-8											X			
DW-8											X			

Relinquished by: *[Signature]* **Date:** 10/25/11 **Time:** 1700 **Received by:** _____

Relinquished by: _____ **Date:** _____ **Time:** _____ **Received by:** _____

Relinquished by: _____ **Date:** 10/26/11 **Time:** 0800 **Received by Laboratory:** *[Signature]* **Bill to:** TESORO

Remarks:
 12 hour TAT requested for TPHg, BTEX, and 7 olys. 1 week TAT for all other analyses.



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 Davis, CA 95616
 Lab: 530.297.4800
 Fax: 530.297.4808

Lab No. 79233

Page 3 of 6

Project Contact (Hardcopy or PDF To):
 Matthew Nelson

California EDF Report? Yes No

Chain-of-Custody Record and Analysis Request

Company / Address:
 Arctos Environmental
 1332 Peralta Ave., Berkeley, CA. 94702

Recommended but not mandatory to complete this section:

Sampling Company Log Code:

Phone No.: 562-988-2755
 Fax No.: 562-988-2759

Global ID:
 T0600101410

Project Number: 01LV
 P.O. No.: 67076

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

Project Name:
 Tesoro - Livermore

Sampler Signature:
 Scott Stromberg

Project Address:
 1619 1st Street
 Livermore, CA

Sampling Container Preservative Matrix

Sample Designation

Sample Designation	Date	Time	Container				Preservative				Matrix			TPHg, BTEX, 7 Oxygenates (EPA 8260B)	Nitrate, Sulfate (EPA 300.0)	Ferrous Iron (SM 3500-Fe D)	Hexavalent Chromium (EPA 7199)	Metals by ICP (Fe/Na/Mn/Cr/IAs) (EPA 6010)	Total Alkalinity (SM 2320 B)	TDS (SM 2540 C)	Carbon Dioxide (RSK 175M)	Methane (RSK 175M)	TAT	For Lab Use Only		
			40 ml VOA	500 mL HDPE	250 mL POLY	1 L POLY	HCl	HNO ₃	ICE	NONE	WATER	SOIL	VAPOR													
IP-1	10/25/11	1502	3				X					X												12 hr	03	
IP-1				1					X			X	X	X											1 wk	03
IP-1					1			X				X					X								1 wk	03
IP-1					1				X			X					X								1 wk	03
IP-1						1			X			X							X						1 wk	03
IP-1				2					X			X							X						1 wk	03
IP-1				2				X				X								X					1 wk	03

Relinquished by:	Date: 10/25/11	Time: 1700	Received by: _____
Relinquished by: _____	Date: _____	Time: _____	Received by: _____
Relinquished by: _____	Date: 10/26/11	Time: 0800	Received by Laboratory: Kiff Analytical

Remarks:
 12 hour TAT requested for TPHg, BTEX, and 7 oxy. 1 week TAT for all other analyses.
 Bill to:
 TESORO



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 Davis, CA 95616
 Lab: 530.297.4800
 Fax: 530.297.4808

Lab No. 79233

Page 4 of 6

Project Contact (Hardcopy or PDF To):
 Matthew Nelson

Company / Address:
 Arctos Environmental
 1332 Peralta Ave., Berkeley, CA. 94702

Phone No.: 562-988-2755
Fax No.: 562-988-2759

Project Number: 01LV
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: *Scott Stromberg*

Chain-of-Custody Record and Analysis Request

Sample Designation	Sampling		Container				Preservative				Matrix			TPHg, BTEX, 7 Oxygenates (EPA 8260B)	Nitrate, Sulfate (EPA 300.0)	Ferrous Iron (SM 3500-Fe D)	Hexavalent Chromium (EPA 7199)	Metals by ICP (Fe/Na/Mn/Cr/IAs) (EPA 6010)	Total Alkalinity (SM 2320 B)	TDS (SM 2540 C)	Carbon Dioxide (RSK 175M)	Methane (RSK 175M)	TAT	For Lab Use Only
	Date	Time	40 ml VOA	500 mL HDPE	250 mL POLY	1 L POLY	HCl	HNO ₃	ICE	NONE	WATER	SOIL	VAPOR											
IP-8	10/25/11	1405	3					X			X			X									12 hr	af
IP-8				1					X		X			X	X	X							1 wk	af
IP-8					1			X			X					X							1 wk	af
IP-8					1				X		X					X							1 wk	af
IP-8						1			X		X												1 wk	af
IP-8			2						X		X						X						1 wk	af
IP-8			2					X			X							X					1 wk	af

Relinquished by: *[Signature]* **Date:** 10/23/11 **Time:** 1700

Received by: _____

Remarks:

Relinquished by: _____ **Date:** _____ **Time:** _____

Received by: _____

12 hour TAT requested for TPHg, BTEX, and 7 oxy. 1 week TAT for all other analyses.

Relinquished by: _____ **Date:** 10/24/11 **Time:** 0800

Received by Laboratory: *[Signature]*

Bill to: TESORO



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 Davis, CA 95616
 Lab: 530.297.4800
 Fax: 530.297.4808

Lab No. 79233

Page 5 of 6

Project Contact (Hardcopy or PDF To):
 Matthew Nelson

California EDF Report? Yes No

Chain-of-Custody Record and Analysis Request

Company / Address:
 Arctos Environmental
 1332 Peralta Ave., Berkeley, CA. 94702

Recommended but not mandatory to complete this section:

Sampling Company Log Code:

Phone No.: 562-988-2755
 Fax No.: 562-988-2759

Global ID:
 T0600101410

Project Number: 01LV
 P.O. No.: 67076

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

Project Name:
 Tesoro - Livermore

Sampler Signature:
 Scott Stromberg

Project Address:
 1619 1st Street
 Livermore, CA

Sample Designation

Sampling Container Preservative Matrix

Analysis Request											TAT	For Lab Use Only		
TPHg, BTEX, 7 Oxygenates (EPA 8260B)	Nitrate, Sulfate (EPA 300.0)	Ferrous Iron (SM 3500-Fe D)	Hexavalent Chromium (EPA 7199)	Metals by ICP (Fe/Na/Mn/Cr/As) (EPA 6010)	Total Alkalinity (SM 2320 B)	TDS (SM 2540 C)	Carbon Dioxide (RSK 175M)	Methane (RSK 175M)						
X													1hr	
													24hr	
													48hr	
													72hr	
													1wk	
													2wk	
X													12 hr	05
	X	X	X										1 wk	05
				X									1 wk	05
					X								1 wk	05
			1		X								1 wk	05
			2		X					X			1 wk	05
			2		X						X		1 wk	05

Relinquished by:
 Date: 10/25/11 Time: 1700
 Received by: _____

Relinquished by: _____
 Date: _____ Time: _____
 Received by: _____

Relinquished by:
 Date: 10/26/11 Time: 0800
 Received by: Laboratory: Andrew

Remarks:
 12 hour TAT requested for TPHg, BTEX, and 7 oxys. 1 week TAT for all other analyses.
 Bill to:
 TESORO

Project Contact (Hardcopy or PDF To):

Matthew Nelson

California EDF Report? Yes No

Chain-of-Custody Record and Analysis Request

Company / Address:

Arctos Environmental
 1332 Peralta Ave., Berkeley, CA. 94702

Recommended but not mandatory to complete this section:

Sampling Company Log Code:

Analysis Request

Phone No.:

562-988-2755

Fax No.:

562-988-2759

Global ID:

T0600101410

Project Number:

01LV

P.O. No.:

67076

EDF Deliverable To (Email Address):

mnelson@orionenv.com

Project Name:

Tesoro - Livermore

Sampler Signature:

Scott Stromberg
 Scott Stromberg

Project Address:

1619 1st Street
 Livermore, CA

Sampling

Container

Preservative

Matrix

Sample Designation

Date

Time

40 ml VOA

500 mL HDPE

250 mL POLY

1 L POLY

HCl

HNO₃

ICE

NONE

WATER

SOIL

VAPOR

TPHg, BTEX, 7 Oxygenates (EPA 8260B)

Nitrate, Sulfate (EPA 300.0)

Ferrous Iron (SM 3500-Fe D)

Hexavalent Chromium (EPA 7199)

Metals by ICP (Fe/Na/Mn/Cr/As) (EPA 6010)

Total Alkalinity (SM 2320 B)

TDS (SM 2540 C)

Carbon Dioxide (RSK 175M)

Methane (RSK 175M)

TAT

12hr

24hr

48hr

72hr

1wk

2wk

For Lab Use Only

Sample Designation	Date	Time	Container				Preservative				Matrix			TPHg, BTEX, 7 Oxygenates (EPA 8260B)	Nitrate, Sulfate (EPA 300.0)	Ferrous Iron (SM 3500-Fe D)	Hexavalent Chromium (EPA 7199)	Metals by ICP (Fe/Na/Mn/Cr/As) (EPA 6010)	Total Alkalinity (SM 2320 B)	TDS (SM 2540 C)	Carbon Dioxide (RSK 175M)	Methane (RSK 175M)	TAT				
			40 ml VOA	500 mL HDPE	250 mL POLY	1 L POLY	HCl	HNO ₃	ICE	NONE	WATER	SOIL	VAPOR														
IP-10	10/25/11	1249	3				X					X													12hr	06	
IP-10				1					X			X		X	X	X										1 wk	06
IP-10					1			X				X					X									1 wk	06
IP-10					1				X			X						X								1 wk	06
IP-10			2						X			X							X							1 wk	06
IP-10			2					X				X								X						1 wk	06

Relinquished by:

Scott Stromberg

Date

10/25/11

Time

1700

Received by:

Remarks:

Relinquished by:

Date

Time

Received by:

12 hour TAT requested for TPHg, BTEX, and 7 oxys. 1 week TAT for all other analyses.

Relinquished by:

Date

10/26/11

Time

0800

Received by Laboratory:

Scott Stromberg
 KIFF Analytical

Bill to:

TESORO

SAMPLE RECEIPT CHECKLIST

RECEIVER
[Signature]
Initials

SRG#: 79233 Date: 102611

Project ID: Tesoro - Livermore

Method of Receipt: Courier Over-the-counter Shipper ups

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 3.2 Therm. ID# 125 Initial gaj Date/Time 102611 0730 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 VOAS # of containers received 42
 Matrix WA Container type poly # of containers received 26
 Matrix WA Container type glass # of containers received 4
 Date and Time Sample Put into Temp Storage Date: 102611 Time: 0800

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: Page 1 and 2 of the COC have no containers listed for two 250m glass H2SO4 preserved containers. SR received 2 250m glass containers per sample. gaj 102611 0840



Subcontract Laboratory Report Attachments

CALIFORNIA LABORATORY SERVICES

3249 Fitzgerald Road Rancho Cordova, CA 95742

November 01, 2011

CLS Work Order #: CUJ1311

COC #: 79233

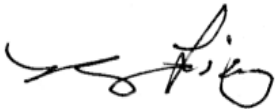
Scott Forbes
KIFF Analytical
2795 Second St. Suite 300
Davis, CA 95616

Project Name: Tesoro-Livermore

Enclosed are the results of analyses for samples received by the laboratory on 10/26/11 10:05. 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 Project Number: 01LV Project Manager: Scott Forbes	CLS Work Order #: CUJ1311 COC #: 79233
---	--	---

CUJ1311

KIFF Analytical LLC		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. 79233	Page 1 of 1
Project Contact (Hardcopy or PDF to): Scott Forbes		EDF Report? YES		Chain-of-Custody Record and Analysis Request			
Company/Address: Kiff Analytical		Recommended but not mandatory to complete this section: Sampling Company Log Code: AEO		Analysis Request			TAT
Phone No.: 530-297-4800	FAX No.: 530-297-4808	Global ID: T0600101410					
Project Number: 01LV	P.O. No.: 79233	Deliverables to (Email Address): inbox@kiffanalytical.com					
Project Name: Tesoro - Livermore		Container / Preservative		Matrix			
Project Address:		Sampling					
Sample Designation		Date		Time			
		1-L Poly None		500 ml Poly None			
		Water					
		Anions by EPA 306.0 SUB (1)		Biochemical Oxygen Demand		Chromium, Hexavalent by EPA 7199 SUB	
		Iron, Ferrous SUB				5-days	
						For Lab Use Only	
MW-11		10/25/11		13:34		X X X X X	
DW-8		10/25/11		14:30		X X X X X	
IP-1		10/25/11		15:02		X X X X	
IP-8		10/25/11		14:05		X X X X	
IP-9		10/25/11		13:14		X X X X	
IP-10		10/25/11		12:49		X X X X	
Relinquished by: <i>[Signature]</i> kiff Analytical		Date	Time	Received by:		Remarks: Please refer to attached Test Detail.	
		10/24/11	10:05				
Relinquished by:		Date	Time	Received by:			
Relinquished by:		Date	Time	Received by Laboratory:		Bill to:	
				Scott 10-26-11 10:05		4.1°C Accounts Payable	

CALIFORNIA LABORATORY SERVICES

Page 2 of 8

11/01/11 11:51

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

Project: Tesoro-Livermore
Project Number: 01LV
Project Manager: Scott Forbes

CLS Work Order #: CUJ1311
COC #: 79233

CVJ1311

Test Detail for Kiff Work Order: 79233

Anions by EPA 300.0 SUB (1)
Nitrate as N
Sulfate

Page 1 of 1

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 Project Number: 01LV Project Manager: Scott Forbes	CLS Work Order #: CUJ1311 COC #: 79233
---	--	---

Conventional Chemistry Parameters by APHA/EPA Methods

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
MW-11 (CUJ1311-01) Water Sampled: 10/25/11 13:34 Received: 10/26/11 10:05									
Biochemical Oxygen Demand	19	3.0	mg/L	1	CU07795	10/27/11	11/01/11	SM5210B	
Hexavalent Chromium	ND	1.0	µg/L	"	CU07775	10/26/11	10/26/11	EPA 7199	
Ferrous Iron	ND	0.10	mg/L	"	CU07776	10/26/11	10/26/11	SM3500-Fe D	
Nitrate as N	ND	0.50	"	"	CU07751	10/26/11	10/26/11	EPA 300.0	
Sulfate as SO4	85	10	"	20	"	"	"	"	
DW-8 (CUJ1311-02) Water Sampled: 10/25/11 14:30 Received: 10/26/11 10:05									
Biochemical Oxygen Demand	61	3.0	mg/L	1	CU07795	10/27/11	11/01/11	SM5210B	
Hexavalent Chromium	ND	1.0	µg/L	"	CU07775	10/26/11	10/26/11	EPA 7199	
Ferrous Iron	ND	0.10	mg/L	"	CU07776	10/26/11	10/26/11	SM3500-Fe D	
Nitrate as N	ND	0.50	"	"	CU07751	10/26/11	10/26/11	EPA 300.0	
Sulfate as SO4	36	0.50	"	"	"	"	"	"	
IP-1 (CUJ1311-03) Water Sampled: 10/25/11 15:02 Received: 10/26/11 10:05									
Hexavalent Chromium	ND	1.0	µg/L	1	CU07775	10/26/11	10/26/11	EPA 7199	
Ferrous Iron	ND	0.10	mg/L	"	CU07776	10/26/11	10/26/11	SM3500-Fe D	
Nitrate as N	ND	0.50	"	"	CU07751	10/26/11	10/26/11	EPA 300.0	
Sulfate as SO4	11	0.50	"	"	"	"	"	"	
IP-8 (CUJ1311-04) Water Sampled: 10/25/11 14:05 Received: 10/26/11 10:05									
Hexavalent Chromium	ND	1.0	µg/L	1	CU07775	10/26/11	10/26/11	EPA 7199	
Ferrous Iron	ND	0.10	mg/L	"	CU07776	10/26/11	10/26/11	SM3500-Fe D	
Nitrate as N	ND	0.50	"	"	CU07751	10/26/11	10/26/11	EPA 300.0	
Sulfate as SO4	44	5.0	"	10	"	"	"	"	

CALIFORNIA LABORATORY SERVICES

Page 4 of 8

11/01/11 11:51

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

Project: Tesoro-Livermore
Project Number: 01LV
Project Manager: Scott Forbes

CLS Work Order #: CUJ1311
COC #: 79233

Conventional Chemistry Parameters by APHA/EPA Methods

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
IP-9 (CUJ1311-05) Water Sampled: 10/25/11 13:14 Received: 10/26/11 10:05									
Hexavalent Chromium	84	5.0	µg/L	5	CU07775	10/26/11	10/26/11	EPA 7199	
Ferrous Iron	ND	0.10	mg/L	1	CU07776	10/26/11	10/26/11	SM3500-Fe D	
Nitrate as N	ND	2.5	"	5	CU07751	10/26/11	10/27/11	EPA 300.0	QRL-5
Sulfate as SO4	630	50	"	100	"	"	"	"	
IP-10 (CUJ1311-06) Water Sampled: 10/25/11 12:49 Received: 10/26/11 10:05									
Hexavalent Chromium	ND	1.0	µg/L	1	CU07775	10/26/11	10/26/11	EPA 7199	
Ferrous Iron	ND	0.10	mg/L	"	CU07776	10/26/11	10/26/11	SM3500-Fe D	
Nitrate as N	ND	0.50	"	"	CU07751	10/26/11	10/26/11	EPA 300.0	
Sulfate as SO4	37	0.50	"	"	"	"	"	"	

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 Project Number: 01LV Project Manager: Scott Forbes	CLS Work Order #: CUJ1311 COC #: 79233
---	--	---

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 CU07751 - General Prep

Blank (CU07751-BLK1) Prepared & Analyzed: 10/26/11

Sulfate as SO4	ND	0.50	mg/L							
Nitrate as N	ND	0.50	"							

LCS (CU07751-BS1) Prepared & Analyzed: 10/26/11

Sulfate as SO4	5.15	0.50	mg/L	5.00		103	80-120			
Nitrate as N	0.462	0.50	"	0.451		103	80-120			

LCS Dup (CU07751-BSD1) Prepared & Analyzed: 10/26/11

Sulfate as SO4	5.12	0.50	mg/L	5.00		102	80-120	0.6	20	
Nitrate as N	0.459	0.50	"	0.451		102	80-120	0.6	20	

Matrix Spike (CU07751-MS1) Source: CUJ1285-01 Prepared & Analyzed: 10/26/11

Sulfate as SO4	13.4	0.50	mg/L	5.00	7.56	116	75-125			
Nitrate as N	0.488	0.50	"	0.451	0.0677	93	80-120			

Matrix Spike Dup (CU07751-MSD1) Source: CUJ1285-01 Prepared & Analyzed: 10/26/11

Sulfate as SO4	13.0	0.50	mg/L	5.00	7.56	108	75-125	3	25	
Nitrate as N	0.472	0.50	"	0.451	0.0677	90	80-120	3	20	

Batch CU07775 - General Prep

Blank (CU07775-BLK1) Prepared & Analyzed: 10/26/11

Hexavalent Chromium	ND	1.0	µg/L							
---------------------	----	-----	------	--	--	--	--	--	--	--

LCS (CU07775-BS1) Prepared & Analyzed: 10/26/11

Hexavalent Chromium	4.52	1.0	µg/L	5.00		90	80-120			
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CALIFORNIA LABORATORY SERVICES

KIFF Analytical 2795 Second St. Suite 300 Davis, CA 95616	Project: Tesoro-Livermore Project Number: 01LV Project Manager: Scott Forbes	CLS Work Order #: CUJ1311 COC #: 79233
---	--	---

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 CU07775 - General Prep

LCS Dup (CU07775-BSD1)

Prepared & Analyzed: 10/26/11

Hexavalent Chromium	5.31	1.0	µg/L	5.00		106	80-120	16	20	
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Matrix Spike (CU07775-MS1)

Source: CUJ1311-04

Prepared & Analyzed: 10/26/11

Hexavalent Chromium	4.51	1.0	µg/L	5.00	ND	90	75-125			
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Matrix Spike Dup (CU07775-MSD1)

Source: CUJ1311-04

Prepared & Analyzed: 10/26/11

Hexavalent Chromium	3.98	1.0	µg/L	5.00	ND	80	75-125	13	25	
---------------------	------	-----	------	------	----	----	--------	----	----	--

Batch CU07776 - General Preparation

Blank (CU07776-BLK1)

Prepared & Analyzed: 10/26/11

Ferrous Iron	ND	0.10	mg/L							
--------------	----	------	------	--	--	--	--	--	--	--

LCS (CU07776-BS1)

Prepared & Analyzed: 10/26/11

Ferrous Iron	0.254	0.10	mg/L	0.250		102	80-120			
--------------	-------	------	------	-------	--	-----	--------	--	--	--

LCS Dup (CU07776-BSD1)

Prepared & Analyzed: 10/26/11

Ferrous Iron	0.280	0.10	mg/L	0.250		112	80-120	10	25	
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Matrix Spike (CU07776-MS1)

Source: CUJ1311-01

Prepared & Analyzed: 10/26/11

Ferrous Iron	0.189	0.10	mg/L	0.250	0.00800	72	75-125			QM-7
--------------	-------	------	------	-------	---------	----	--------	--	--	------

Matrix Spike Dup (CU07776-MSD1)

Source: CUJ1311-01

Prepared & Analyzed: 10/26/11

Ferrous Iron	0.196	0.10	mg/L	0.250	0.00800	75	75-125	4	30	
--------------	-------	------	------	-------	---------	----	--------	---	----	--

Batch CU07795 - General

Blank (CU07795-BLK1)

Prepared: 10/27/11 Analyzed: 11/01/11

Biochemical Oxygen Demand	ND	3.0	mg/L							
---------------------------	----	-----	------	--	--	--	--	--	--	--

CALIFORNIA LABORATORY SERVICES

KIFF Analytical 2795 Second St. Suite 300 Davis, CA 95616	Project: Tesoro-Livermore Project Number: 01LV Project Manager: Scott Forbes	CLS Work Order #: CUJ1311 COC #: 79233
---	--	---

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 CU07795 - General

LCS (CU07795-BS1)

Prepared: 10/27/11 Analyzed: 11/01/11

Biochemical Oxygen Demand	186	3.0	mg/L	167		112	83-138			
---------------------------	-----	-----	------	-----	--	-----	--------	--	--	--

LCS Dup (CU07795-BSD1)

Prepared: 10/27/11 Analyzed: 11/01/11

Biochemical Oxygen Demand	189	3.0	mg/L	167		113	83-138	2	21	
---------------------------	-----	-----	------	-----	--	-----	--------	---	----	--

CALIFORNIA LABORATORY SERVICES

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

Project: Tesoro-Livermore
Project Number: 01LV
Project Manager: Scott Forbes

CLS Work Order #: CUJ1311
COC #: 79233

Notes and Definitions

- QRL-5 The sample was diluted due to the presence of high levels of non-target analytes or matrix interference resulting in elevated reporting limits.
- QM-7 The spike recovery was outside acceptance limits for the MS and/or MSD. The batch was accepted based on acceptable LCS/LCSD recovery.
- 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



CALSCIENCE

WORK ORDER NUMBER: 11-10-1864

The difference is service



AIR | SOIL | WATER | MARINE CHEMISTRY

Analytical Report For

Client: Kiff Analytical

Client Project Name: Tesoro - Livermore

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

Amanda Porter

Approved for release on 11/3/2011 by:
Amanda Porter
Project Manager

ResultLink ▶

Email your PM ▶



Calscience Environmental Laboratories 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 provided herein, and follows the standard Calscience data package. The results in this analytical report are limited to the samples tested and any reproduction thereof must be made in its entirety. Note that the Chain-of-Custody Record and Sample Receipt Form are integral parts of this report.





Contents

Client Project Name: Tesoro - Livermore
Work Order Number: 11-10-1864

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1.1	RSK-175M Carbon Dioxide (Aqueous)	3
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2	Quality Control Sample Data	9
2.1	MS/MSD and/or Duplicate	9
2.2	LCS/LCSD	11
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4	Chain of Custody/Sample Receipt Form	16

Analytical Report



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

Date Received: 10/27/11
Work Order No: 11-10-1864
Preparation: N/A
Method: RSK-175M

Project: Tesoro - Livermore

Page 1 of 2

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
MW-11	11-10-1864-1-C	10/25/11 13:34	Aqueous	GC 14	N/A	10/27/11 21:22	111027L01

Parameter	Result	RL	DF	Qual	Units
Carbon Dioxide	60100	17.0	10		ug/L

DW-8	11-10-1864-2-C	10/25/11 14:30	Aqueous	GC 14	N/A	10/27/11 21:52	111027L01
------	----------------	----------------	---------	-------	-----	----------------	-----------

Parameter	Result	RL	DF	Qual	Units
Carbon Dioxide	16000	17.0	10		ug/L

IP-1	11-10-1864-3-C	10/25/11 15:02	Aqueous	GC 14	N/A	10/27/11 22:34	111027L01
------	----------------	----------------	---------	-------	-----	----------------	-----------

Parameter	Result	RL	DF	Qual	Units
Carbon Dioxide	20600	17.0	10		ug/L

IP-8	11-10-1864-4-C	10/25/11 14:05	Aqueous	GC 14	N/A	10/27/11 23:15	111027L01
------	----------------	----------------	---------	-------	-----	----------------	-----------

Parameter	Result	RL	DF	Qual	Units
Carbon Dioxide	12300	17.0	10		ug/L

IP-9	11-10-1864-5-D	10/25/11 13:14	Aqueous	GC 14	N/A	10/28/11 13:04	111028L01
------	----------------	----------------	---------	-------	-----	----------------	-----------

Parameter	Result	RL	DF	Qual	Units
Carbon Dioxide	935	1.70	1		ug/L

IP-10	11-10-1864-6-A	10/25/11 12:49	Aqueous	GC 14	N/A	10/28/11 01:23	111027L01
-------	----------------	----------------	---------	-------	-----	----------------	-----------

Parameter	Result	RL	DF	Qual	Units
Carbon Dioxide	15500	17.0	10		ug/L

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

Analytical Report



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

Date Received: 10/27/11
Work Order No: 11-10-1864
Preparation: N/A
Method: RSK-175M

Project: Tesoro - Livermore

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	099-12-659-295-A	N/A	Aqueous	GC 14	N/A	10/27/11 10:36	111027L01

<u>Parameter</u>	<u>Result</u>	<u>RL</u>	<u>DF</u>	<u>Qual</u>	<u>Units</u>
Carbon Dioxide	ND	1.70	1		ug/L

Method Blank	099-12-659-296-A	N/A	Aqueous	GC 14	N/A	10/28/11 00:00	111028L01
--------------	------------------	-----	---------	-------	-----	----------------	-----------

<u>Parameter</u>	<u>Result</u>	<u>RL</u>	<u>DF</u>	<u>Qual</u>	<u>Units</u>
Carbon Dioxide	ND	1.70	1		ug/L

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Analytical Report



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

Date Received: 10/27/11
Work Order No: 11-10-1864
Preparation: N/A
Method: RSK-175M

Project: Tesoro - Livermore

Page 1 of 2

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
MW-11	11-10-1864-1-A	10/25/11 13:34	Aqueous	GC 52	N/A	10/28/11 15:44	111028L01

Parameter	Result	RL	DF	Qual	Units
Methane	55.1	1.00	1		ug/L

DW-8	11-10-1864-2-A	10/25/11 14:30	Aqueous	GC 52	N/A	10/28/11 18:20	111028L01
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Parameter	Result	RL	DF	Qual	Units
Methane	519	8.00	8		ug/L

IP-1	11-10-1864-3-A	10/25/11 15:02	Aqueous	GC 52	N/A	10/28/11 16:54	111028L01
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Parameter	Result	RL	DF	Qual	Units
Methane	311	1.00	1		ug/L

IP-8	11-10-1864-4-A	10/25/11 14:05	Aqueous	GC 52	N/A	10/28/11 17:14	111028L01
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Parameter	Result	RL	DF	Qual	Units
Methane	109	1.00	1		ug/L

IP-9	11-10-1864-5-A	10/25/11 13:14	Aqueous	GC 52	N/A	10/28/11 17:34	111028L01
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Parameter	Result	RL	DF	Qual	Units
Methane	7.51	1.00	1		ug/L

IP-10	11-10-1864-6-A	10/25/11 12:49	Aqueous	GC 52	N/A	10/28/11 17:54	111028L01
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Parameter	Result	RL	DF	Qual	Units
Methane	139	1.00	1		ug/L

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

Analytical Report



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

Date Received: 10/27/11
 Work Order No: 11-10-1864
 Preparation: N/A
 Method: RSK-175M

Project: Tesoro - Livermore

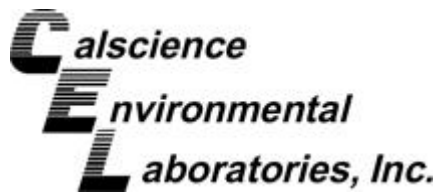
Page 2 of 2

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Method Blank	099-12-663-1,435-A	N/A	Aqueous	GC 52	N/A	10/28/11 11:40	111028L01

<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: 10/27/11
Work Order No: 11-10-1864

Project: Tesoro - Livermore

Page 1 of 2

Client Sample Number	Lab Sample Number	Date Collected	Matrix
MW-11	11-10-1864-1	10/25/11	Aqueous

Parameter	Results	RL	DF	Qual	Units	Date Prepared	Date Analyzed	Method
Chemical Oxygen Demand	120	20	1		mg/L	10/28/11	10/28/11	EPA 410.4
Alkalinity, Total (as CaCO3)	1200	10.0	1		mg/L	N/A	10/31/11	SM 2320B
Solids, Total Dissolved	1520	10.0	1		mg/L	10/28/11	10/28/11	SM 2540 C
Carbon, Total Organic	21	2.5	5		mg/L	N/A	11/01/11	SM 5310 D

DW-8	11-10-1864-2	10/25/11	Aqueous
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Parameter	Results	RL	DF	Qual	Units	Date Prepared	Date Analyzed	Method
Chemical Oxygen Demand	240	20	1		mg/L	10/28/11	10/28/11	EPA 410.4
Alkalinity, Total (as CaCO3)	564	5.00	1		mg/L	N/A	10/31/11	SM 2320B
Solids, Total Dissolved	780	1.00	1		mg/L	10/28/11	10/28/11	SM 2540 C
Carbon, Total Organic	16	2.5	5		mg/L	N/A	11/01/11	SM 5310 D

IP-1	11-10-1864-3	10/25/11	Aqueous
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Parameter	Results	RL	DF	Qual	Units	Date Prepared	Date Analyzed	Method
Alkalinity, Total (as CaCO3)	378	5.00	1		mg/L	N/A	10/31/11	SM 2320B
Solids, Total Dissolved	557	1.00	1		mg/L	10/28/11	10/28/11	SM 2540 C

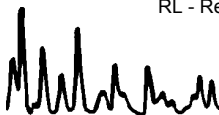
IP-8	11-10-1864-4	10/25/11	Aqueous
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Parameter	Results	RL	DF	Qual	Units	Date Prepared	Date Analyzed	Method
Alkalinity, Total (as CaCO3)	692	5.00	1		mg/L	N/A	10/31/11	SM 2320B
Solids, Total Dissolved	1020	10.0	1		mg/L	10/28/11	10/28/11	SM 2540 C

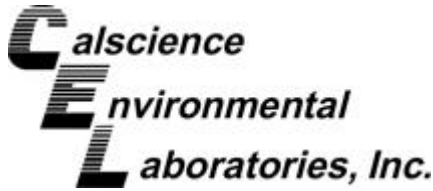
IP-9	11-10-1864-5	10/25/11	Aqueous
------	--------------	----------	---------

Parameter	Results	RL	DF	Qual	Units	Date Prepared	Date Analyzed	Method
Alkalinity, Total (as CaCO3)	9770	10.0	1		mg/L	N/A	10/31/11	SM 2320B
Solids, Total Dissolved	12200	100	1		mg/L	10/28/11	10/28/11	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: 10/27/11
Work Order No: 11-10-1864

Project: Tesoro - Livermore

Page 2 of 2

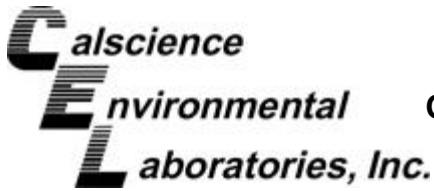
Client Sample Number	Lab Sample Number	Date Collected	Matrix
IP-10	11-10-1864-6	10/25/11	Aqueous

Parameter	Results	RL	DF	Qual	Units	Date Prepared	Date Analyzed	Method
Alkalinity, Total (as CaCO3)	390	5.00	1		mg/L	N/A	10/31/11	SM 2320B
Solids, Total Dissolved	625	1.00	1		mg/L	10/28/11	10/28/11	SM 2540 C
Method Blank					N/A			Aqueous

Parameter	Results	RL	DF	Qual	Units	Date Prepared	Date Analyzed	Method
Chemical Oxygen Demand	ND	20	1		mg/L	10/28/11	10/28/11	EPA 410.4
Alkalinity, Total (as CaCO3)	ND	1.0	1		mg/L	N/A	10/31/11	SM 2320B
Solids, Total Dissolved	ND	1.0	1		mg/L	10/28/11	10/28/11	SM 2540 C
Carbon, Total Organic	ND	0.50	1		mg/L	N/A	11/01/11	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: 11-10-1864

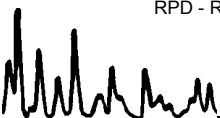
Project: Tesoro - Livermore

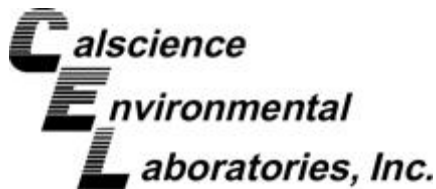
Matrix: Aqueous or Solid

<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	11-10-1745-5	11/01/11	N/A	92	91	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: 11-10-1864

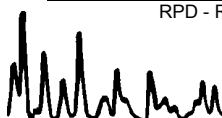
Project: Tesoro - Livermore

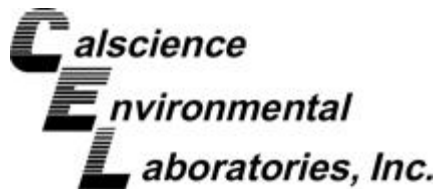
Matrix: Aqueous or Solid

Parameter	Method	QC Sample ID	Date Analyzed	Sample Conc	DUP Conc	RPD	RPD CL	Qualifiers
Alkalinity, Total (as CaCO3)	SM 2320B	MW-11	10/31/11	1200	1200	0	0-25	
Bicarbonate (as CaCO3)	SM 2320B	MW-11	10/31/11	1200	1200	0	0-25	
Carbonate (as CaCO3)	SM 2320B	MW-11	10/31/11	ND	ND	NA	0-25	
Hydroxide (as CaCO3)	SM 2320B	MW-11	10/31/11	ND	ND	NA	0-25	
Chemical Oxygen Demand	EPA 410.4	11-10-1819-2	10/28/11	180	180	2	0-25	
Solids, Total Dissolved	SM 2540 C	11-10-1891-1	10/28/11	2860	2870	0	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: 11-10-1864
 Preparation: N/A
 Method: RSK-175M

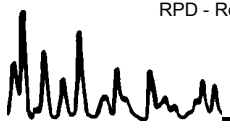
Project: Tesoro - Livermore

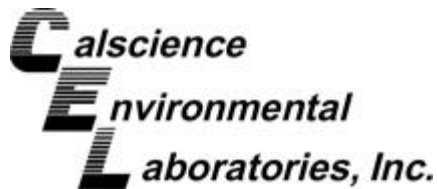
Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number
099-12-659-295	Aqueous	GC 14	N/A	10/27/11	111027L01

Parameter	SPIKE ADDED	LCS %REC	LCSD %REC	%REC CL	RPD	RPD CL	Qualifiers
Carbon Dioxide	102.0	105	105	80-120	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: 11-10-1864
 Preparation: N/A
 Method: RSK-175M

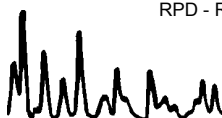
Project: Tesoro - Livermore

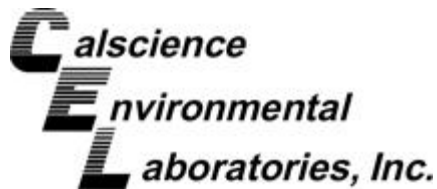
Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number
099-12-659-296	Aqueous	GC 14	N/A	10/28/11	111028L01

Parameter	SPIKE ADDED	LCS %REC	LCSD %REC	%REC CL	RPD	RPD CL	Qualifiers
Carbon Dioxide	102.0	105	105	80-120	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: 11-10-1864
 Preparation: N/A
 Method: RSK-175M

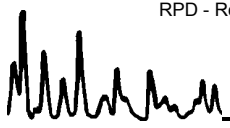
Project: Tesoro - Livermore

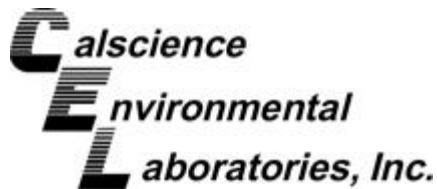
Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number
099-12-663-1,435	Aqueous	GC 52	N/A	10/28/11	111028L01

Parameter	SPIKE ADDED	LCS %REC	LCSD %REC	%REC CL	RPD	RPD CL	Qualifiers
Methane	100.0	93	94	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: 11-10-1864

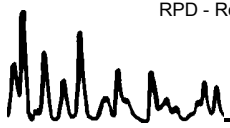
Project: Tesoro - Livermore

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	099-05-097-4,432	N/A	11/01/11	111	110	80-120	1	0-20	

Return to Contents

RPD - Relative Percent Difference , CL - Control Limit



Work Order Number: 11-10-1864

<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.





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

11-10-1864

COC No. **79233** Page 1 of 1

Project Contact (Hardcopy or PDF to): **Scott Forbes** EDF Report? **YES** Chain-of-Custody Record and Analysis Request

Company/Address: **Kiff Analytical** Recommended but not mandatory to complete this section:
 Phone No.: **530-297-4800** FAX No.: **530-297-4808** Sampling Company Log Code: **AEO**
 Project Number: **01LV** P.O. No.: **79233** Global ID: **T0600101410**
 Deliverables to (Email Address): **inbox@kiffanalytical.com**

Project Name:	Container / Preservative							Matrix		Alkalinity SM 2320 (1)	Carbon Dioxide by RSK 175 (1)	Chemical Oxygen Demand	Hydrocarbons in Water by RSK 175 (1)	Total Dissolved Solids	Total Organic Carbon	TAT	For Lab Use Only	
	Tesoro - Livermore	250ml Glass H2SO4	1-L Poly None	250ml Poly None	VOA 40 ml None	VOA 40 ml HCl			Water									
Project Address:	Sampling																	
Sample Designation	Date	Time																
MW-11	10/25/11	13:34	2	1	1	2	2			X	X	X	X	X	X	X	X	1
DW-8	10/25/11	14:30	2	1	1	2	2			X	X	X	X	X	X		X	2
IP-1	10/25/11	15:02		1	1	2	2			X	X		X	X			X	3
IP-8	10/25/11	14:05		1	1	2	2			X	X		X	X			X	4
IP-9	10/25/11	13:14		1	1	2	2			X	X		X	X			X	5
IP-10	10/25/11	12:49		1	1	2	2			X	X		X	X			X	6

Relinquished by: *[Signature]* Kiff Analytical Date: **10/26/11** Time: **19:00**
 Relinquished by: _____ Date: _____ Time: _____ Received by: _____
 Relinquished by: **ONTRAC** Date: **10/27/11** Time: **10:10** Received by Laboratory: *[Signature]*

Remarks: Please refer to attached Test Detail.
 Bill to: **Accounts Payable**

1864

Test Detail for Kiff Work Order: 79233

Alkalinity SM 2320 (1)

Alkalinity, Total (as CaCO₃)

Carbon Dioxide by RSK 175 (1)

Carbon Dioxide

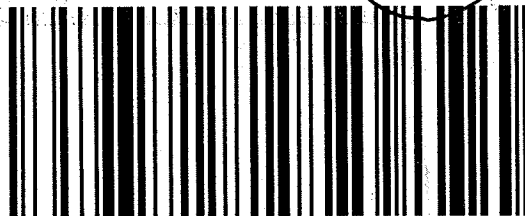
Hydrocarbons in Water by RSK 175 (1)

Methane

1864



800.334.5000
ontrac.com



D10010421445663

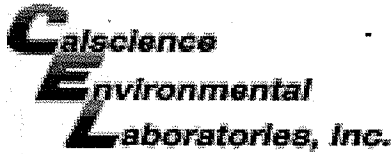
Date Printed: 10/26/2011

Tracking#D10010421445663

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
Reference 2:

<p>Ship To Company: CALSCIENCE ENVIRONMENTAL 7440 LINCOLN WAY GARDEN GROVE, CA 92841 RECEIVING (714)895-5494</p> <p>B10207210772</p>	<p>Service: S</p> <p>Sort Code: ORG</p> <p>Special Services: Signature Required</p>
---	---



WORK ORDER #: 11-10-1864

SAMPLE RECEIPT FORM

Cooler 1 of 1

CLIENT: KIFF

DATE: 10/27/11

TEMPERATURE: Thermometer ID: SC1 (Criteria: 0.0 °C – 6.0 °C, not frozen)

Temperature 0.9 °C + 0.5 °C (CF) = 1.4 °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: PS

CUSTODY SEALS INTACT:

Cooler _____ No (Not Intact) Not Present N/A Initial: PS

Sample _____ No (Not Intact) Not Present Initial: ky

SAMPLE CONDITION:	Yes	No	N/A
Chain-Of-Custody (COC) document(s) received with samples.....	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
COC document(s) received complete.....	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/> Collection date/time, matrix, and/or # of containers logged in based on sample labels.			
<input type="checkbox"/> No analysis requested. <input type="checkbox"/> Not relinquished. <input type="checkbox"/> No date/time relinquished.			
Sampler's name indicated on COC.....	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Sample container label(s) consistent with COC.....	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sample container(s) intact and good condition.....	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Proper containers and sufficient volume for analyses requested.....	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Analyses received within holding time.....	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
pH / Res. Chlorine / Diss. Sulfide / Diss. Oxygen received within 24 hours...	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Proper preservation noted on COC or sample container.....	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/> Unpreserved vials received for Volatiles analysis			
Volatile analysis container(s) free of headspace.....	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Tedlar bag(s) free of condensation.....	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

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 1PB 1PBna 500PB

250PB 250PBn 125PB 125PBzanna 100PJ 100PJna₂ _____ _____ _____

Air: Tedlar® Summa® **Other:** _____ **Trip Blank Lot#:** _____ **Labeled/Checked by:** ky

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

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

Return to Contents



Laboratory Results

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

Subject : 9 Water Samples
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 standard. All soil samples are reported on a total weight (wet weight) basis unless noted otherwise in the case narrative. 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,



Joel Kiff

Subject : 9 Water Samples
Project Name : Tesoro - Livermore
Project Number : 01LV
P.O. Number : 67076

Case Narrative

The Method Reporting Limit for Ethanol has been increased due to the presence of an interfering compound for sample CV-2.

The Method Reporting Limit for Tert-amyl methyl ether has been increased due to the presence of an interfering compound for sample IP-9.

Sample IP-9 was analyzed by EPA Method 8260B using bottles that contained headspace bubbles greater than 1/4 inch in diameter.

Project Name : **Tesoro - Livermore**

Project Number : **01LV**

Sample : **CV-4**

Matrix : Water

Lab Number : 79249-01

Sample Date :10/26/2011

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date/Time Analyzed
Benzene	< 0.50	0.50	ug/L	EPA 8260B	10/27/11 23:49
Toluene	< 0.50	0.50	ug/L	EPA 8260B	10/27/11 23:49
Ethylbenzene	< 0.50	0.50	ug/L	EPA 8260B	10/27/11 23:49
Total Xylenes	< 0.50	0.50	ug/L	EPA 8260B	10/27/11 23:49
Methyl-t-butyl ether (MTBE)	< 0.50	0.50	ug/L	EPA 8260B	10/27/11 23:49
Diisopropyl ether (DIPE)	< 0.50	0.50	ug/L	EPA 8260B	10/27/11 23:49
Ethyl-t-butyl ether (ETBE)	< 0.50	0.50	ug/L	EPA 8260B	10/27/11 23:49
Tert-amyl methyl ether (TAME)	< 0.50	0.50	ug/L	EPA 8260B	10/27/11 23:49
Tert-Butanol	< 5.0	5.0	ug/L	EPA 8260B	10/27/11 23:49
Methanol	< 50	50	ug/L	EPA 8260B	10/27/11 23:49
Ethanol	6.5	5.0	ug/L	EPA 8260B	10/27/11 23:49
TPH as Gasoline	89	50	ug/L	EPA 8260B	10/27/11 23:49
(Note: Primarily compounds not found in typical Gasoline)					
1,2-Dichloroethane-d4 (Surr)	99.9		% Recovery	EPA 8260B	10/27/11 23:49
Toluene - d8 (Surr)	98.6		% Recovery	EPA 8260B	10/27/11 23:49

Project Name : **Tesoro - Livermore**

Project Number : **01LV**

Sample : **IP-9**

Matrix : Water

Lab Number : 79249-02

Sample Date :10/26/2011

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date/Time Analyzed
Benzene	520	7.0	ug/L	EPA 8260B	10/27/11 13:53
Toluene	2600	7.0	ug/L	EPA 8260B	10/27/11 13:53
Ethylbenzene	990	7.0	ug/L	EPA 8260B	10/27/11 13:53
Total Xylenes	5500	7.0	ug/L	EPA 8260B	10/27/11 13:53
Methyl-t-butyl ether (MTBE)	< 7.0	7.0	ug/L	EPA 8260B	10/27/11 13:53
Diisopropyl ether (DIPE)	< 7.0	7.0	ug/L	EPA 8260B	10/27/11 13:53
Ethyl-t-butyl ether (ETBE)	< 7.0	7.0	ug/L	EPA 8260B	10/27/11 13:53
Tert-amyl methyl ether (TAME)	< 7.0	7.0	ug/L	EPA 8260B	10/27/11 13:53
Tert-Butanol	< 40	40	ug/L	EPA 8260B	10/27/11 13:53
Methanol	< 700	700	ug/L	EPA 8260B	10/27/11 13:53
Ethanol	< 70	70	ug/L	EPA 8260B	10/27/11 13:53
TPH as Gasoline	36000	700	ug/L	EPA 8260B	10/27/11 13:53
1,2-Dichloroethane-d4 (Surr)	99.3		% Recovery	EPA 8260B	10/27/11 13:53
Toluene - d8 (Surr)	97.0		% Recovery	EPA 8260B	10/27/11 13:53

Project Name : **Tesoro - Livermore**

Project Number : **01LV**

Sample : **CV-1**

Matrix : Water

Lab Number : 79249-03

Sample Date :10/26/2011

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date/Time Analyzed
Benzene	2700	10	ug/L	EPA 8260B	10/28/11 03:18
Toluene	7600	10	ug/L	EPA 8260B	10/28/11 03:18
Ethylbenzene	1700	10	ug/L	EPA 8260B	10/28/11 03:18
Total Xylenes	8900	10	ug/L	EPA 8260B	10/28/11 03:18
Methyl-t-butyl ether (MTBE)	< 10	10	ug/L	EPA 8260B	10/28/11 03:18
Diisopropyl ether (DIPE)	< 10	10	ug/L	EPA 8260B	10/28/11 03:18
Ethyl-t-butyl ether (ETBE)	< 10	10	ug/L	EPA 8260B	10/28/11 03:18
Tert-amyl methyl ether (TAME)	< 10	10	ug/L	EPA 8260B	10/28/11 03:18
Tert-Butanol	54	50	ug/L	EPA 8260B	10/28/11 03:18
Methanol	< 1000	1000	ug/L	EPA 8260B	10/28/11 03:18
Ethanol	< 100	100	ug/L	EPA 8260B	10/28/11 03:18
TPH as Gasoline	67000	1000	ug/L	EPA 8260B	10/28/11 03:18
1,2-Dichloroethane-d4 (Surr)	100		% Recovery	EPA 8260B	10/28/11 03:18
Toluene - d8 (Surr)	97.1		% Recovery	EPA 8260B	10/28/11 03:18

Project Name : **Tesoro - Livermore**

Project Number : **01LV**

Sample : **CV-2**

Matrix : Water

Lab Number : 79249-04

Sample Date :10/26/2011

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date/Time Analyzed
Benzene	180	1.0	ug/L	EPA 8260B	10/28/11 02:08
Toluene	500	1.0	ug/L	EPA 8260B	10/28/11 02:08
Ethylbenzene	120	1.0	ug/L	EPA 8260B	10/28/11 02:08
Total Xylenes	590	1.0	ug/L	EPA 8260B	10/28/11 02:08
Methyl-t-butyl ether (MTBE)	< 1.0	1.0	ug/L	EPA 8260B	10/28/11 02:08
Diisopropyl ether (DIPE)	< 1.0	1.0	ug/L	EPA 8260B	10/28/11 02:08
Ethyl-t-butyl ether (ETBE)	< 1.0	1.0	ug/L	EPA 8260B	10/28/11 02:08
Tert-amyl methyl ether (TAME)	< 1.0	1.0	ug/L	EPA 8260B	10/28/11 02:08
Tert-Butanol	6.0	5.0	ug/L	EPA 8260B	10/28/11 02:08
Methanol	< 100	100	ug/L	EPA 8260B	10/28/11 02:08
Ethanol	< 20	20	ug/L	EPA 8260B	10/28/11 02:08
TPH as Gasoline	5900	100	ug/L	EPA 8260B	10/28/11 02:08
1,2-Dichloroethane-d4 (Surr)	97.8		% Recovery	EPA 8260B	10/28/11 02:08
Toluene - d8 (Surr)	97.9		% Recovery	EPA 8260B	10/28/11 02:08

Project Name : **Tesoro - Livermore**

Project Number : **01LV**

Sample : **CV-3**

Matrix : Water

Lab Number : 79249-05

Sample Date :10/26/2011

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date/Time Analyzed
Benzene	< 0.50	0.50	ug/L	EPA 8260B	10/28/11 00:24
Toluene	< 0.50	0.50	ug/L	EPA 8260B	10/28/11 00:24
Ethylbenzene	< 0.50	0.50	ug/L	EPA 8260B	10/28/11 00:24
Total Xylenes	< 0.50	0.50	ug/L	EPA 8260B	10/28/11 00:24
Methyl-t-butyl ether (MTBE)	< 0.50	0.50	ug/L	EPA 8260B	10/28/11 00:24
Diisopropyl ether (DIPE)	< 0.50	0.50	ug/L	EPA 8260B	10/28/11 00:24
Ethyl-t-butyl ether (ETBE)	< 0.50	0.50	ug/L	EPA 8260B	10/28/11 00:24
Tert-amyl methyl ether (TAME)	< 0.50	0.50	ug/L	EPA 8260B	10/28/11 00:24
Tert-Butanol	< 5.0	5.0	ug/L	EPA 8260B	10/28/11 00:24
Methanol	< 50	50	ug/L	EPA 8260B	10/28/11 00:24
Ethanol	< 5.0	5.0	ug/L	EPA 8260B	10/28/11 16:35
TPH as Gasoline	100	50	ug/L	EPA 8260B	10/28/11 00:24
(Note: Primarily compounds not found in typical Gasoline)					
1,2-Dichloroethane-d4 (Surr)	102		% Recovery	EPA 8260B	10/28/11 00:24
Toluene - d8 (Surr)	98.3		% Recovery	EPA 8260B	10/28/11 00:24

Project Name : **Tesoro - Livermore**

Project Number : **01LV**

Sample : **CV-4**

Matrix : Water

Lab Number : 79249-06

Sample Date :10/26/2011

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date/Time Analyzed
Benzene	< 0.50	0.50	ug/L	EPA 8260B	10/28/11 01:33
Toluene	< 0.50	0.50	ug/L	EPA 8260B	10/28/11 01:33
Ethylbenzene	< 0.50	0.50	ug/L	EPA 8260B	10/28/11 01:33
Total Xylenes	< 0.50	0.50	ug/L	EPA 8260B	10/28/11 01:33
Methyl-t-butyl ether (MTBE)	< 0.50	0.50	ug/L	EPA 8260B	10/28/11 01:33
Diisopropyl ether (DIPE)	< 0.50	0.50	ug/L	EPA 8260B	10/28/11 01:33
Ethyl-t-butyl ether (ETBE)	< 0.50	0.50	ug/L	EPA 8260B	10/28/11 01:33
Tert-amyl methyl ether (TAME)	< 0.50	0.50	ug/L	EPA 8260B	10/28/11 01:33
Tert-Butanol	< 5.0	5.0	ug/L	EPA 8260B	10/28/11 01:33
Methanol	< 50	50	ug/L	EPA 8260B	10/28/11 01:33
Ethanol	< 5.0	5.0	ug/L	EPA 8260B	10/28/11 17:09
TPH as Gasoline	86	50	ug/L	EPA 8260B	10/28/11 01:33
(Note: Primarily compounds not found in typical Gasoline)					
1,2-Dichloroethane-d4 (Surr)	101		% Recovery	EPA 8260B	10/28/11 01:33
Toluene - d8 (Surr)	98.5		% Recovery	EPA 8260B	10/28/11 01:33

Project Name : **Tesoro - Livermore**

Project Number : **01LV**

Sample : **IP-8**

Matrix : Water

Lab Number : 79249-07

Sample Date :10/26/2011

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date/Time Analyzed
Benzene	2400	15	ug/L	EPA 8260B	10/27/11 14:28
Toluene	7200	15	ug/L	EPA 8260B	10/27/11 14:28
Ethylbenzene	1200	15	ug/L	EPA 8260B	10/27/11 14:28
Total Xylenes	7300	15	ug/L	EPA 8260B	10/27/11 14:28
Methyl-t-butyl ether (MTBE)	< 15	15	ug/L	EPA 8260B	10/27/11 14:28
Diisopropyl ether (DIPE)	< 15	15	ug/L	EPA 8260B	10/27/11 14:28
Ethyl-t-butyl ether (ETBE)	< 15	15	ug/L	EPA 8260B	10/27/11 14:28
Tert-amyl methyl ether (TAME)	< 15	15	ug/L	EPA 8260B	10/27/11 14:28
Tert-Butanol	< 70	70	ug/L	EPA 8260B	10/27/11 14:28
Methanol	< 1500	1500	ug/L	EPA 8260B	10/27/11 14:28
Ethanol	< 150	150	ug/L	EPA 8260B	10/27/11 14:28
TPH as Gasoline	52000	1500	ug/L	EPA 8260B	10/27/11 14:28
1,2-Dichloroethane-d4 (Surr)	100		% Recovery	EPA 8260B	10/27/11 14:28
Toluene - d8 (Surr)	98.2		% Recovery	EPA 8260B	10/27/11 14:28

Project Name : **Tesoro - Livermore**

Project Number : **01LV**

Sample : **DW-8**

Matrix : Water

Lab Number : 79249-08

Sample Date :10/26/2011

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date/Time Analyzed
Benzene	3100	20	ug/L	EPA 8260B	10/27/11 15:02
Toluene	8900	20	ug/L	EPA 8260B	10/27/11 15:02
Ethylbenzene	2000	20	ug/L	EPA 8260B	10/27/11 15:02
Total Xylenes	9800	20	ug/L	EPA 8260B	10/27/11 15:02
Methyl-t-butyl ether (MTBE)	< 20	20	ug/L	EPA 8260B	10/27/11 15:02
Diisopropyl ether (DIPE)	< 20	20	ug/L	EPA 8260B	10/27/11 15:02
Ethyl-t-butyl ether (ETBE)	< 20	20	ug/L	EPA 8260B	10/27/11 15:02
Tert-amyl methyl ether (TAME)	< 20	20	ug/L	EPA 8260B	10/27/11 15:02
Tert-Butanol	< 90	90	ug/L	EPA 8260B	10/27/11 15:02
Methanol	< 2000	2000	ug/L	EPA 8260B	10/27/11 15:02
Ethanol	< 200	200	ug/L	EPA 8260B	10/27/11 15:02
TPH as Gasoline	71000	2000	ug/L	EPA 8260B	10/27/11 15:02
1,2-Dichloroethane-d4 (Surr)	100		% Recovery	EPA 8260B	10/27/11 15:02
Toluene - d8 (Surr)	97.8		% Recovery	EPA 8260B	10/27/11 15:02

Project Name : **Tesoro - Livermore**

Project Number : **01LV**

Sample : **IP-9**

Matrix : Water

Lab Number : 79249-09

Sample Date :10/26/2011

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date/Time Analyzed
Benzene	450	7.0	ug/L	EPA 8260B	10/28/11 02:43
Toluene	2500	7.0	ug/L	EPA 8260B	10/28/11 02:43
Ethylbenzene	960	7.0	ug/L	EPA 8260B	10/28/11 02:43
Total Xylenes	5400	7.0	ug/L	EPA 8260B	10/28/11 02:43
Methyl-t-butyl ether (MTBE)	< 7.0	7.0	ug/L	EPA 8260B	10/28/11 02:43
Diisopropyl ether (DIPE)	< 7.0	7.0	ug/L	EPA 8260B	10/28/11 02:43
Ethyl-t-butyl ether (ETBE)	< 7.0	7.0	ug/L	EPA 8260B	10/28/11 02:43
Tert-amyl methyl ether (TAME)	< 20	20	ug/L	EPA 8260B	10/28/11 02:43
Tert-Butanol	< 40	40	ug/L	EPA 8260B	10/28/11 02:43
Methanol	< 700	700	ug/L	EPA 8260B	10/28/11 02:43
Ethanol	< 70	70	ug/L	EPA 8260B	10/28/11 02:43
TPH as Gasoline	34000	700	ug/L	EPA 8260B	10/28/11 02:43
1,2-Dichloroethane-d4 (Surr)	98.2		% Recovery	EPA 8260B	10/28/11 02:43
Toluene - d8 (Surr)	96.9		% Recovery	EPA 8260B	10/28/11 02:43

QC Report : Method Blank Data

Project Name : **Tesoro - Livermore**

Project Number : **01LV**

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Ethanol	< 5.0	5.0	ug/L	EPA 8260B	10/28/2011
Benzene	< 0.50	0.50	ug/L	EPA 8260B	10/27/2011
Ethylbenzene	< 0.50	0.50	ug/L	EPA 8260B	10/27/2011
Toluene	< 0.50	0.50	ug/L	EPA 8260B	10/27/2011
Total Xylenes	< 0.50	0.50	ug/L	EPA 8260B	10/27/2011
Diisopropyl ether (DIPE)	< 0.50	0.50	ug/L	EPA 8260B	10/27/2011
Ethanol	< 5.0	5.0	ug/L	EPA 8260B	10/27/2011
Ethyl-t-butyl ether (ETBE)	< 0.50	0.50	ug/L	EPA 8260B	10/27/2011
Methanol	< 50	50	ug/L	EPA 8260B	10/27/2011
Methyl-t-butyl ether (MTBE)	< 0.50	0.50	ug/L	EPA 8260B	10/27/2011
Tert-Butanol	< 5.0	5.0	ug/L	EPA 8260B	10/27/2011
Tert-amyl methyl ether (TAME)	< 0.50	0.50	ug/L	EPA 8260B	10/27/2011
TPH as Gasoline	< 50	50	ug/L	EPA 8260B	10/27/2011
1,2-Dichloroethane-d4 (Surr)	101		%	EPA 8260B	10/27/2011
Toluene - d8 (Surr)	98.6		%	EPA 8260B	10/27/2011
Benzene	< 0.50	0.50	ug/L	EPA 8260B	10/27/2011
Ethylbenzene	< 0.50	0.50	ug/L	EPA 8260B	10/27/2011
Toluene	< 0.50	0.50	ug/L	EPA 8260B	10/27/2011
Total Xylenes	< 0.50	0.50	ug/L	EPA 8260B	10/27/2011
Diisopropyl ether (DIPE)	< 0.50	0.50	ug/L	EPA 8260B	10/27/2011
Ethanol	< 5.0	5.0	ug/L	EPA 8260B	10/27/2011
Ethyl-t-butyl ether (ETBE)	< 0.50	0.50	ug/L	EPA 8260B	10/27/2011
Methanol	< 50	50	ug/L	EPA 8260B	10/27/2011
Methyl-t-butyl ether (MTBE)	< 0.50	0.50	ug/L	EPA 8260B	10/27/2011
Tert-Butanol	< 5.0	5.0	ug/L	EPA 8260B	10/27/2011
Tert-amyl methyl ether (TAME)	< 0.50	0.50	ug/L	EPA 8260B	10/27/2011
TPH as Gasoline	< 50	50	ug/L	EPA 8260B	10/27/2011
1,2-Dichloroethane-d4 (Surr)	100		%	EPA 8260B	10/27/2011
Toluene - d8 (Surr)	98.8		%	EPA 8260B	10/27/2011

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
Ethanol	79249-01	5.3	99.5	99.5	89.4	98.8	ug/L	EPA 8260B	10/28/11	84.6	94.0	10.6	55.1-159	25
Benzene	79211-01	<0.50	40.0	40.0	40.4	39.2	ug/L	EPA 8260B	10/27/11	101	98.1	3.00	80-120	25
Diisopropyl ether	79211-01	<0.50	39.6	39.6	42.0	41.3	ug/L	EPA 8260B	10/27/11	106	104	1.70	80-120	25
Ethanol	79211-01	<5.0	99.7	99.7	95.9	98.2	ug/L	EPA 8260B	10/27/11	96.1	98.5	2.38	55.1-159	25
Ethyl-tert-butyl ether	79211-01	<0.50	39.9	39.9	41.9	41.2	ug/L	EPA 8260B	10/27/11	105	103	1.58	76.5-120	25
Ethylbenzene	79211-01	<0.50	40.0	40.0	40.5	39.0	ug/L	EPA 8260B	10/27/11	101	97.5	3.67	80-120	25
Methanol	79211-01	<50	998	998	984	1000	ug/L	EPA 8260B	10/27/11	98.6	100	1.78	53.2-147	25
Methyl-t-butyl ether	79211-01	14	40.2	40.2	57.4	56.7	ug/L	EPA 8260B	10/27/11	108	106	1.54	69.7-121	25
P + M Xylene	79211-01	<0.50	40.0	40.0	39.3	38.4	ug/L	EPA 8260B	10/27/11	98.4	96.0	2.47	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	79211-01	<5.0	193	193	206	206	ug/L	EPA 8260B	10/27/11	106	106	0.0158	80-120	25
Tert-amyl-methyl ether	79211-01	<0.50	39.9	39.9	41.8	42.1	ug/L	EPA 8260B	10/27/11	105	106	0.669	78.9-120	25
Toluene	79211-01	<0.50	40.0	40.0	40.0	38.7	ug/L	EPA 8260B	10/27/11	100	96.8	3.34	80-120	25
Benzene	79214-02	5.6	40.0	40.0	47.1	46.6	ug/L	EPA 8260B	10/27/11	104	102	1.16	80-120	25
Diisopropyl ether	79214-02	2.0	39.6	39.6	44.8	45.2	ug/L	EPA 8260B	10/27/11	108	109	0.854	80-120	25
Ethanol	79214-02	<5.0	99.7	99.7	98.8	102	ug/L	EPA 8260B	10/27/11	99.0	102	2.83	55.1-159	25
Ethyl-tert-butyl ether	79214-02	<0.50	39.9	39.9	42.6	43.1	ug/L	EPA 8260B	10/27/11	107	108	1.07	76.5-120	25
Ethylbenzene	79214-02	<0.50	40.0	40.0	40.9	40.1	ug/L	EPA 8260B	10/27/11	102	100	2.00	80-120	25
Methanol	79214-02	<50	998	998	980	961	ug/L	EPA 8260B	10/27/11	98.2	96.3	1.99	53.2-147	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
Methyl-t-butyl ether	79214-02	9.2	40.2	40.2	53.9	54.0	ug/L	EPA 8260B	10/27/11	111	112	0.341	69.7-121	25
P + M Xylene	79214-02	<0.50	40.0	40.0	36.9	35.6	ug/L	EPA 8260B	10/27/11	92.2	89.0	3.51	76.8-120	25
Tert-Butanol	79214-02	84	193	193	289	293	ug/L	EPA 8260B	10/27/11	106	108	1.67	80-120	25
Tert-amyl-methyl ether	79214-02	<0.50	39.9	39.9	43.0	43.0	ug/L	EPA 8260B	10/27/11	108	108	0.0355	78.9-120	25
Toluene	79214-02	<0.50	40.0	40.0	40.4	39.8	ug/L	EPA 8260B	10/27/11	101	99.4	1.69	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
Ethanol	99.7	ug/L	EPA 8260B	10/28/11	76.0	55.1-159
Benzene	40.0	ug/L	EPA 8260B	10/27/11	103	80-120
Diisopropyl ether	39.6	ug/L	EPA 8260B	10/27/11	107	80-120
Ethanol	99.7	ug/L	EPA 8260B	10/27/11	96.1	55.1-159
Ethyl-tert-butyl ether	39.9	ug/L	EPA 8260B	10/27/11	107	76.5-120
Ethylbenzene	40.0	ug/L	EPA 8260B	10/27/11	104	80-120
Methanol	998	ug/L	EPA 8260B	10/27/11	94.2	53.2-147
Methyl-t-butyl ether	40.2	ug/L	EPA 8260B	10/27/11	109	69.7-121
P + M Xylene	40.0	ug/L	EPA 8260B	10/27/11	102	76.8-120
TPH as Gasoline	505	ug/L	EPA 8260B	10/27/11	103	70.0-130
Tert-Butanol	193	ug/L	EPA 8260B	10/27/11	106	80-120
Tert-amyl-methyl ether	39.9	ug/L	EPA 8260B	10/27/11	108	78.9-120
Toluene	40.0	ug/L	EPA 8260B	10/27/11	103	80-120
Benzene	39.8	ug/L	EPA 8260B	10/27/11	103	80-120
Diisopropyl ether	39.4	ug/L	EPA 8260B	10/27/11	108	80-120
Ethanol	99.3	ug/L	EPA 8260B	10/27/11	100	55.1-159
Ethyl-tert-butyl ether	39.7	ug/L	EPA 8260B	10/27/11	107	76.5-120
Ethylbenzene	39.8	ug/L	EPA 8260B	10/27/11	103	80-120
Methanol	993	ug/L	EPA 8260B	10/27/11	95.1	53.2-147
Methyl-t-butyl ether	40.0	ug/L	EPA 8260B	10/27/11	110	69.7-121

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	39.8	ug/L	EPA 8260B	10/27/11	103	76.8-120
TPH as Gasoline	505	ug/L	EPA 8260B	10/27/11	103	70.0-130
Tert-Butanol	192	ug/L	EPA 8260B	10/27/11	105	80-120
Tert-amyl-methyl ether	39.7	ug/L	EPA 8260B	10/27/11	109	78.9-120
Toluene	39.8	ug/L	EPA 8260B	10/27/11	102	80-120



2795 2nd Street Suite 300
 Davis, CA 95616
 Lab: 530.297.4800
 Fax: 530.297.4808

Lab No. (79249) 79249-00 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:

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: *Scott Strum*

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"/>			
				X				X						12hr	01
				X				X						12hr	02
				X				X						12hr	03
				X				X						12hr	04
				X				X						12hr	05
				X				X						12hr	06
				X				X						12hr	07
				X				X						12hr	08
				X				X						12hr	09

Project Address:
 1619 1st Street
 Livermore, California

Sample Designation	Sampling		Container				Preservative				Matrix			
	Date	Time	40 ml VOA	SLEEVE	POLY	AMBER	TEDLAR	HCl	HNO ₃	ICE	NONE	WATER	SOIL	VAPOR
CV-4	10/26/11	0924	3					X				X		
IP-9		1248	3					X				X		
CV-1		1521	3					X				X		
CV-2		1523	3					X				X		
CV-3		1525	3					X				X		
CV-4		1527	3					X				X		
IP-8		1548	3					X				X		
DW-8		1601	3					X				X		
IP-9		1616	3					X				X		

Relinquished by: <i>Scott Strum</i>	Date: 10/26/11	Time: 1700	Received by: _____
Relinquished by: _____	Date: _____	Time: _____	Received by: _____
Relinquished by: _____	Date: 10/27/11	Time: 0820	Received by Laboratory: <i>Will Analytical</i>

Remarks:
 IF 12-HR TAT NOT AVAILABLE,
 PLEASE PROVIDE QUICKEST
 POSSIBLE TAT, OR PRELIM RESULTS
 ONCE AVAILABLE. THANKS.

Bill to:
 Tesoro Companies, Inc.

SAMPLE RECEIPT CHECKLIST

RECEIVER

ELC
Initials

SRG#: 79249 Date: 102711

Project ID: Tesoro - Livermore

Method of Receipt: Courier Over-the-counter Shipper UPS

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 3.4 Therm. ID# 12-5 Initial ELC Date/Time 102711 0816 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 27
 Matrix _____ Container type _____ # of containers received _____
 Matrix _____ Container type _____ # of containers received _____
 Date and Time Sample Put into Temp Storage Date: 102711 Time: 0820

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: COC has sampling date for sample 01 only. sig 102711 0820

Sample 79249-09 has bubbles. sig 102711 0850



Laboratory Results

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

Subject : 10 Water Samples
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 standard. All soil samples are reported on a total weight (wet weight) basis unless noted otherwise in the case narrative. 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,



Joel Kiff

Subject : 10 Water Samples
Project Name : Tesoro - Livermore
Project Number : 01LV
P.O. Number : 67076

Case Narrative

The Method Reporting Limit for Tert-amyl methyl ether has been increased due to the presence of an interfering compound for samples IP-9 (09:35) and IP-9 (15:02).

Project Name : **Tesoro - Livermore**

Project Number : **01LV**

Sample : **IP-9**

Matrix : Water

Lab Number : 79270-01

Sample Date :10/27/2011

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date/Time Analyzed
Benzene	480	5.0	ug/L	EPA 8260B	10/28/11 15:14
Toluene	2500	5.0	ug/L	EPA 8260B	10/28/11 15:14
Ethylbenzene	970	5.0	ug/L	EPA 8260B	10/28/11 15:14
Total Xylenes	5200	5.0	ug/L	EPA 8260B	10/28/11 15:14
Methyl-t-butyl ether (MTBE)	< 5.0	5.0	ug/L	EPA 8260B	10/28/11 15:14
Diisopropyl ether (DIPE)	< 5.0	5.0	ug/L	EPA 8260B	10/28/11 15:14
Ethyl-t-butyl ether (ETBE)	< 5.0	5.0	ug/L	EPA 8260B	10/28/11 15:14
Tert-amyl methyl ether (TAME)	< 20	20	ug/L	EPA 8260B	10/28/11 15:14
Tert-Butanol	33	25	ug/L	EPA 8260B	10/28/11 15:14
Methanol	< 500	500	ug/L	EPA 8260B	10/28/11 15:14
Ethanol	< 50	50	ug/L	EPA 8260B	10/28/11 15:14
TPH as Gasoline	37000	500	ug/L	EPA 8260B	10/28/11 15:14
1,2-Dichloroethane-d4 (Surr)	98.4		% Recovery	EPA 8260B	10/28/11 15:14
Toluene - d8 (Surr)	95.5		% Recovery	EPA 8260B	10/28/11 15:14

Project Name : **Tesoro - Livermore**

Project Number : **01LV**

Sample : **DW-8 (0950)**

Matrix : Water

Lab Number : 79270-02

Sample Date :10/27/2011

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date/Time Analyzed
Benzene	3600	15	ug/L	EPA 8260B	10/28/11 15:50
Toluene	9500	15	ug/L	EPA 8260B	10/28/11 15:50
Ethylbenzene	2100	15	ug/L	EPA 8260B	10/28/11 15:50
Total Xylenes	9800	15	ug/L	EPA 8260B	10/28/11 15:50
Methyl-t-butyl ether (MTBE)	< 15	15	ug/L	EPA 8260B	10/28/11 15:50
Diisopropyl ether (DIPE)	< 15	15	ug/L	EPA 8260B	10/28/11 15:50
Ethyl-t-butyl ether (ETBE)	< 15	15	ug/L	EPA 8260B	10/28/11 15:50
Tert-amyl methyl ether (TAME)	< 15	15	ug/L	EPA 8260B	10/28/11 15:50
Tert-Butanol	< 70	70	ug/L	EPA 8260B	10/28/11 15:50
Methanol	< 1500	1500	ug/L	EPA 8260B	10/28/11 15:50
Ethanol	< 150	150	ug/L	EPA 8260B	10/28/11 15:50
TPH as Gasoline	70000	1500	ug/L	EPA 8260B	10/28/11 15:50
1,2-Dichloroethane-d4 (Surr)	99.2		% Recovery	EPA 8260B	10/28/11 15:50
Toluene - d8 (Surr)	97.4		% Recovery	EPA 8260B	10/28/11 15:50

Project Name : **Tesoro - Livermore**

Project Number : **01LV**

Sample : **IP-8**

Matrix : Water

Lab Number : 79270-03

Sample Date :10/27/2011

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date/Time Analyzed
Benzene	3000	15	ug/L	EPA 8260B	10/28/11 16:24
Toluene	9100	15	ug/L	EPA 8260B	10/28/11 16:24
Ethylbenzene	1600	15	ug/L	EPA 8260B	10/28/11 16:24
Total Xylenes	9200	15	ug/L	EPA 8260B	10/28/11 16:24
Methyl-t-butyl ether (MTBE)	< 15	15	ug/L	EPA 8260B	10/28/11 16:24
Diisopropyl ether (DIPE)	< 15	15	ug/L	EPA 8260B	10/28/11 16:24
Ethyl-t-butyl ether (ETBE)	< 15	15	ug/L	EPA 8260B	10/28/11 16:24
Tert-amyl methyl ether (TAME)	< 15	15	ug/L	EPA 8260B	10/28/11 16:24
Tert-Butanol	< 70	70	ug/L	EPA 8260B	10/28/11 16:24
Methanol	< 1500	1500	ug/L	EPA 8260B	10/28/11 16:24
Ethanol	< 150	150	ug/L	EPA 8260B	10/28/11 16:24
TPH as Gasoline	67000	1500	ug/L	EPA 8260B	10/28/11 16:24
1,2-Dichloroethane-d4 (Surr)	100		% Recovery	EPA 8260B	10/28/11 16:24
Toluene - d8 (Surr)	97.8		% Recovery	EPA 8260B	10/28/11 16:24

Project Name : **Tesoro - Livermore**

Project Number : **01LV**

Sample : **DW-8 (1335)**

Matrix : Water

Lab Number : 79270-04

Sample Date :10/27/2011

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date/Time Analyzed
Benzene	2000	15	ug/L	EPA 8260B	10/28/11 16:59
Toluene	4500	15	ug/L	EPA 8260B	10/28/11 16:59
Ethylbenzene	1600	15	ug/L	EPA 8260B	10/28/11 16:59
Total Xylenes	7300	15	ug/L	EPA 8260B	10/28/11 16:59
Methyl-t-butyl ether (MTBE)	< 15	15	ug/L	EPA 8260B	10/28/11 16:59
Diisopropyl ether (DIPE)	< 15	15	ug/L	EPA 8260B	10/28/11 16:59
Ethyl-t-butyl ether (ETBE)	< 15	15	ug/L	EPA 8260B	10/28/11 16:59
Tert-amyl methyl ether (TAME)	< 15	15	ug/L	EPA 8260B	10/28/11 16:59
Tert-Butanol	< 70	70	ug/L	EPA 8260B	10/28/11 16:59
Methanol	< 1500	1500	ug/L	EPA 8260B	10/28/11 16:59
Ethanol	< 150	150	ug/L	EPA 8260B	10/28/11 16:59
TPH as Gasoline	50000	1500	ug/L	EPA 8260B	10/28/11 16:59
1,2-Dichloroethane-d4 (Surr)	99.6		% Recovery	EPA 8260B	10/28/11 16:59
Toluene - d8 (Surr)	97.4		% Recovery	EPA 8260B	10/28/11 16:59

Project Name : **Tesoro - Livermore**

Project Number : **01LV**

Sample : **CV-1**

Matrix : Water

Lab Number : 79270-05

Sample Date :10/27/2011

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date/Time Analyzed
Benzene	1700	15	ug/L	EPA 8260B	10/28/11 17:34
Toluene	5900	15	ug/L	EPA 8260B	10/28/11 17:34
Ethylbenzene	1200	15	ug/L	EPA 8260B	10/28/11 17:34
Total Xylenes	6600	15	ug/L	EPA 8260B	10/28/11 17:34
Methyl-t-butyl ether (MTBE)	< 15	15	ug/L	EPA 8260B	10/28/11 17:34
Diisopropyl ether (DIPE)	< 15	15	ug/L	EPA 8260B	10/28/11 17:34
Ethyl-t-butyl ether (ETBE)	< 15	15	ug/L	EPA 8260B	10/28/11 17:34
Tert-amyl methyl ether (TAME)	< 15	15	ug/L	EPA 8260B	10/28/11 17:34
Tert-Butanol	< 70	70	ug/L	EPA 8260B	10/28/11 17:34
Methanol	< 1500	1500	ug/L	EPA 8260B	10/28/11 17:34
Ethanol	< 150	150	ug/L	EPA 8260B	10/28/11 17:34
TPH as Gasoline	50000	1500	ug/L	EPA 8260B	10/28/11 17:34
1,2-Dichloroethane-d4 (Surr)	101		% Recovery	EPA 8260B	10/28/11 17:34
Toluene - d8 (Surr)	98.2		% Recovery	EPA 8260B	10/28/11 17:34

Project Name : **Tesoro - Livermore**

Project Number : **01LV**

Sample : **CV-2**

Matrix : Water

Lab Number : 79270-06

Sample Date :10/27/2011

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date/Time Analyzed
Benzene	170	0.90	ug/L	EPA 8260B	10/28/11 14:05
Toluene	550	0.90	ug/L	EPA 8260B	10/28/11 14:05
Ethylbenzene	120	0.90	ug/L	EPA 8260B	10/28/11 14:05
Total Xylenes	640	0.90	ug/L	EPA 8260B	10/28/11 14:05
Methyl-t-butyl ether (MTBE)	< 0.90	0.90	ug/L	EPA 8260B	10/28/11 14:05
Diisopropyl ether (DIPE)	< 0.90	0.90	ug/L	EPA 8260B	10/28/11 14:05
Ethyl-t-butyl ether (ETBE)	< 0.90	0.90	ug/L	EPA 8260B	10/28/11 14:05
Tert-amyl methyl ether (TAME)	< 0.90	0.90	ug/L	EPA 8260B	10/28/11 14:05
Tert-Butanol	6.8	5.0	ug/L	EPA 8260B	10/28/11 14:05
Methanol	< 90	90	ug/L	EPA 8260B	10/28/11 14:05
Ethanol	< 9.0	9.0	ug/L	EPA 8260B	10/28/11 14:05
TPH as Gasoline	5300	90	ug/L	EPA 8260B	10/28/11 14:05
1,2-Dichloroethane-d4 (Surr)	99.4		% Recovery	EPA 8260B	10/28/11 14:05
Toluene - d8 (Surr)	96.7		% Recovery	EPA 8260B	10/28/11 14:05

Project Name : **Tesoro - Livermore**

Project Number : **01LV**

Sample : **CV-3**

Matrix : Water

Lab Number : 79270-07

Sample Date :10/27/2011

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date/Time Analyzed
Benzene	< 0.50	0.50	ug/L	EPA 8260B	10/28/11 11:45
Toluene	< 0.50	0.50	ug/L	EPA 8260B	10/28/11 11:45
Ethylbenzene	< 0.50	0.50	ug/L	EPA 8260B	10/28/11 11:45
Total Xylenes	< 0.50	0.50	ug/L	EPA 8260B	10/28/11 11:45
Methyl-t-butyl ether (MTBE)	< 0.50	0.50	ug/L	EPA 8260B	10/28/11 11:45
Diisopropyl ether (DIPE)	< 0.50	0.50	ug/L	EPA 8260B	10/28/11 11:45
Ethyl-t-butyl ether (ETBE)	< 0.50	0.50	ug/L	EPA 8260B	10/28/11 11:45
Tert-amyl methyl ether (TAME)	< 0.50	0.50	ug/L	EPA 8260B	10/28/11 11:45
Tert-Butanol	< 5.0	5.0	ug/L	EPA 8260B	10/28/11 11:45
Methanol	< 50	50	ug/L	EPA 8260B	10/28/11 11:45
Ethanol	< 5.0	5.0	ug/L	EPA 8260B	10/28/11 17:43
TPH as Gasoline	100	50	ug/L	EPA 8260B	10/28/11 11:45
(Note: Primarily compounds not found in typical Gasoline)					
1,2-Dichloroethane-d4 (Surr)	101		% Recovery	EPA 8260B	10/28/11 11:45
Toluene - d8 (Surr)	98.6		% Recovery	EPA 8260B	10/28/11 11:45

Project Name : **Tesoro - Livermore**

Project Number : **01LV**

Sample : **CV-4**

Matrix : Water

Lab Number : 79270-08

Sample Date :10/27/2011

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date/Time Analyzed
Benzene	< 0.50	0.50	ug/L	EPA 8260B	10/28/11 13:30
Toluene	< 0.50	0.50	ug/L	EPA 8260B	10/28/11 13:30
Ethylbenzene	< 0.50	0.50	ug/L	EPA 8260B	10/28/11 13:30
Total Xylenes	< 0.50	0.50	ug/L	EPA 8260B	10/28/11 13:30
Methyl-t-butyl ether (MTBE)	< 0.50	0.50	ug/L	EPA 8260B	10/28/11 13:30
Diisopropyl ether (DIPE)	< 0.50	0.50	ug/L	EPA 8260B	10/28/11 13:30
Ethyl-t-butyl ether (ETBE)	< 0.50	0.50	ug/L	EPA 8260B	10/28/11 13:30
Tert-amyl methyl ether (TAME)	< 0.50	0.50	ug/L	EPA 8260B	10/28/11 13:30
Tert-Butanol	< 5.0	5.0	ug/L	EPA 8260B	10/28/11 13:30
Methanol	< 50	50	ug/L	EPA 8260B	10/28/11 13:30
Ethanol	< 5.0	5.0	ug/L	EPA 8260B	10/28/11 13:30
TPH as Gasoline	70	50	ug/L	EPA 8260B	10/28/11 13:30
(Note: Primarily compounds not found in typical Gasoline)					
1,2-Dichloroethane-d4 (Surr)	102		% Recovery	EPA 8260B	10/28/11 13:30
Toluene - d8 (Surr)	98.7		% Recovery	EPA 8260B	10/28/11 13:30

Project Name : **Tesoro - Livermore**

Project Number : **01LV**

Sample : **IP-9**

Matrix : Water

Lab Number : 79270-09

Sample Date :10/27/2011

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date/Time Analyzed
Benzene	400	7.0	ug/L	EPA 8260B	10/28/11 14:40
Toluene	2200	7.0	ug/L	EPA 8260B	10/28/11 14:40
Ethylbenzene	820	7.0	ug/L	EPA 8260B	10/28/11 14:40
Total Xylenes	4600	7.0	ug/L	EPA 8260B	10/28/11 14:40
Methyl-t-butyl ether (MTBE)	< 7.0	7.0	ug/L	EPA 8260B	10/28/11 14:40
Diisopropyl ether (DIPE)	< 7.0	7.0	ug/L	EPA 8260B	10/28/11 14:40
Ethyl-t-butyl ether (ETBE)	< 7.0	7.0	ug/L	EPA 8260B	10/28/11 14:40
Tert-amyl methyl ether (TAME)	< 10	10	ug/L	EPA 8260B	10/28/11 14:40
Tert-Butanol	< 40	40	ug/L	EPA 8260B	10/28/11 14:40
Methanol	< 700	700	ug/L	EPA 8260B	10/28/11 14:40
Ethanol	< 70	70	ug/L	EPA 8260B	10/28/11 14:40
TPH as Gasoline	31000	700	ug/L	EPA 8260B	10/28/11 14:40
1,2-Dichloroethane-d4 (Surr)	97.8		% Recovery	EPA 8260B	10/28/11 14:40
Toluene - d8 (Surr)	97.3		% Recovery	EPA 8260B	10/28/11 14:40

Project Name : **Tesoro - Livermore**

Project Number : **01LV**

Sample : **IP-8**

Matrix : Water

Lab Number : 79270-10

Sample Date :10/27/2011

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date/Time Analyzed
Benzene	2600	15	ug/L	EPA 8260B	10/28/11 18:09
Toluene	9500	15	ug/L	EPA 8260B	10/28/11 18:09
Ethylbenzene	1900	15	ug/L	EPA 8260B	10/28/11 18:09
Total Xylenes	11000	15	ug/L	EPA 8260B	10/28/11 18:09
Methyl-t-butyl ether (MTBE)	< 15	15	ug/L	EPA 8260B	10/28/11 18:09
Diisopropyl ether (DIPE)	< 15	15	ug/L	EPA 8260B	10/28/11 18:09
Ethyl-t-butyl ether (ETBE)	< 15	15	ug/L	EPA 8260B	10/28/11 18:09
Tert-amyl methyl ether (TAME)	< 15	15	ug/L	EPA 8260B	10/28/11 18:09
Tert-Butanol	< 70	70	ug/L	EPA 8260B	10/28/11 18:09
Methanol	< 1500	1500	ug/L	EPA 8260B	10/28/11 18:09
Ethanol	< 150	150	ug/L	EPA 8260B	10/28/11 18:09
TPH as Gasoline	76000	1500	ug/L	EPA 8260B	10/28/11 18:09
1,2-Dichloroethane-d4 (Surr)	101		% Recovery	EPA 8260B	10/28/11 18:09
Toluene - d8 (Surr)	97.7		% Recovery	EPA 8260B	10/28/11 18:09

QC Report : Method Blank DataProject Name : **Tesoro - Livermore**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>
Ethanol	< 5.0	5.0	ug/L	EPA 8260B	10/28/2011
Benzene	< 0.50	0.50	ug/L	EPA 8260B	10/28/2011
Ethylbenzene	< 0.50	0.50	ug/L	EPA 8260B	10/28/2011
Toluene	< 0.50	0.50	ug/L	EPA 8260B	10/28/2011
Total Xylenes	< 0.50	0.50	ug/L	EPA 8260B	10/28/2011
Diisopropyl ether (DIPE)	< 0.50	0.50	ug/L	EPA 8260B	10/28/2011
Ethanol	< 5.0	5.0	ug/L	EPA 8260B	10/28/2011
Ethyl-t-butyl ether (ETBE)	< 0.50	0.50	ug/L	EPA 8260B	10/28/2011
Methanol	< 50	50	ug/L	EPA 8260B	10/28/2011
Methyl-t-butyl ether (MTBE)	< 0.50	0.50	ug/L	EPA 8260B	10/28/2011
Tert-Butanol	< 5.0	5.0	ug/L	EPA 8260B	10/28/2011
Tert-amyl methyl ether (TAME)	< 0.50	0.50	ug/L	EPA 8260B	10/28/2011
TPH as Gasoline	< 50	50	ug/L	EPA 8260B	10/28/2011
1,2-Dichloroethane-d4 (Surr)	102		%	EPA 8260B	10/28/2011
Toluene - d8 (Surr)	99.3		%	EPA 8260B	10/28/2011

<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**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	79249-01	5.3	99.5	99.5	89.4	98.8	ug/L	EPA 8260B	10/28/11	84.6	94.0	10.6	55.1-159	25
Benzene	79215-07	<0.50	40.0	40.0	41.5	40.3	ug/L	EPA 8260B	10/28/11	104	101	2.86	80-120	25
Diisopropyl ether	79215-07	<0.50	39.6	39.6	42.7	42.2	ug/L	EPA 8260B	10/28/11	108	106	1.22	80-120	25
Ethanol	79215-07	<5.0	99.7	99.7	95.5	94.0	ug/L	EPA 8260B	10/28/11	95.8	94.3	1.58	55.1-159	25
Ethyl-tert-butyl ether	79215-07	<0.50	39.9	39.9	42.6	42.8	ug/L	EPA 8260B	10/28/11	107	107	0.472	76.5-120	25
Ethylbenzene	79215-07	<0.50	40.0	40.0	42.0	40.3	ug/L	EPA 8260B	10/28/11	105	101	4.34	80-120	25
Methanol	79215-07	<50	998	998	982	955	ug/L	EPA 8260B	10/28/11	98.4	95.7	2.82	53.2-147	25
Methyl-t-butyl ether	79215-07	77	40.2	40.2	122	121	ug/L	EPA 8260B	10/28/11	111	109	2.14	69.7-121	25
P + M Xylene	79215-07	<0.50	40.0	40.0	41.0	39.6	ug/L	EPA 8260B	10/28/11	102	98.9	3.48	76.8-120	25

QC Report : Matrix Spike/ Matrix Spike DuplicateProject 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	79215-07	<5.0	193	193	207	204	ug/L	EPA 8260B	10/28/11	107	105	1.72	80-120	25
Tert-amyl-methyl ether	79215-07	<0.50	39.9	39.9	43.3	43.0	ug/L	EPA 8260B	10/28/11	109	108	0.672	78.9-120	25
Toluene	79215-07	<0.50	40.0	40.0	41.0	39.9	ug/L	EPA 8260B	10/28/11	102	99.7	2.79	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
Ethanol	99.7	ug/L	EPA 8260B	10/28/11	76.0	55.1-159
Benzene	39.9	ug/L	EPA 8260B	10/28/11	103	80-120
Diisopropyl ether	39.5	ug/L	EPA 8260B	10/28/11	107	80-120
Ethanol	99.5	ug/L	EPA 8260B	10/28/11	102	55.1-159
Ethyl-tert-butyl ether	39.8	ug/L	EPA 8260B	10/28/11	107	76.5-120
Ethylbenzene	39.9	ug/L	EPA 8260B	10/28/11	106	80-120
Methanol	995	ug/L	EPA 8260B	10/28/11	97.2	53.2-147
Methyl-t-butyl ether	40.1	ug/L	EPA 8260B	10/28/11	110	69.7-121
P + M Xylene	39.9	ug/L	EPA 8260B	10/28/11	105	76.8-120
TPH as Gasoline	505	ug/L	EPA 8260B	10/28/11	104	70.0-130
Tert-Butanol	193	ug/L	EPA 8260B	10/28/11	106	80-120
Tert-amyl-methyl ether	39.8	ug/L	EPA 8260B	10/28/11	108	78.9-120
Toluene	39.9	ug/L	EPA 8260B	10/28/11	104	80-120



2795 2nd Street Suite 300
 Davis, CA 95616
 Lab: 530.297.4800
 Fax: 530.297.4808

Lab No. 79270

Page 1 of 1

Project Contact (Hardcopy or PDF To):
 Matthew Nelson

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

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: *Scott Stromber*

Chain-of-Custody Record and Analysis Request

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"/>			
				X				X						12hr	
				X				X						24hr	
				X				X						48hr	
				X				X						72hr	
				X				X						1wk	
				X				X						2wk	
				X				X							01
				X				X							02
				X				X							03
				X				X							04
				X				X							05
				X				X							06
				X				X							07
				X				X							08
				X				X							09
				X				X							10

Sample Designation	Sampling		Container				Preservative				Matrix			
	Date	Time	40 ml VOA	SLEEVE	POLY	AMBER	TEDLAR	HCl	HNO ₃	ICE	NONE	WATER	SOIL	VAPOR
IP-9	10/27/11	0935	3					X				X		
DW-8		0950	3					X				X		
IP-8		1005	3					X				X		
DW-8		1335	3					X				X		
CV-1		1440	3					X				X		
CV-2		1442	3					X				X		
CV-3		1444	3					X				X		
CV-4		1446	3					X				X		
IP-9		1502	3					X				X		
IP-8		1522												

Relinquished by: *[Signature]* **Date:** 10/27/11 **Time:** 1700

Received by: _____

Remarks: 12-HR TAT OR FASTEST POSSIBLE. THANKS.

Relinquished by: _____ **Date:** _____ **Time:** _____

Received by: _____

Relinquished by: _____ **Date:** 10/28/11 **Time:** 0805

Received by Laboratory: *[Signature]* Kiff Analytical

Bill to: Tesoro Companies, Inc.

SAMPLE RECEIPT CHECKLIST

RECEIVER
Gay
Initials

SRG#: 79270 Date: 102811

Project ID: Tesoro - Livermore

Method of Receipt: Courier Over-the-counter Shipper UPS

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# R-5 Initial Gay Date/Time 102811 0755 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 30
 Matrix _____ Container type _____ # of containers received _____
 Matrix _____ Container type _____ # of containers received _____
 Date and Time Sample Put into Temp Storage Date: 102811 Time: 0805

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: SR received 3 HCV Voa for "IP 8", sample #10 which is not on the COC. No analysis information for the same sample. UAG 102811 0805



Laboratory Results

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

Subject : 6 Water Samples
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 standard. All soil samples are reported on a total weight (wet weight) basis unless noted otherwise in the case narrative. 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,



Joel Kiff

Subject : 6 Water Samples
Project Name : TESORO - LIVERMORE
Project Number : 01LV
P.O. Number : 67076

Case Narrative

A version of this report was previously issued on 11/18/2011. This revised version replaces that report.

The Method Reporting Limit for Ferrous Iron has been increased due to the presence of an interferent for samples IP-9 and MW-11. These samples remained highly turbid after filtration.

The Method Reporting Limit for Ethanol has been increased due to the presence of an interfering compound for samples IP-10, IP-9, IP-8 and MW-11.

Matrix Spike/Matrix Spike Duplicate results associated with sample IP-8 for the analyte P + M Xylene 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-8, IP-1, IP-10, IP-8, IP-9 and MW-11 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.

Matrix Spike/Matrix Spike Duplicate results associated with sample IP-9 for the analytes Iron and Sodium were affected by the analyte concentrations already present in the un-spiked sample.

Matrix Spike/Matrix Spike Duplicate results associated with samples IP-10, IP-8, DW-8, IP-1, and MW-11 for the analytes Iron and Sodium were affected by the analyte concentrations already present in the un-spiked sample.

Project Name : **TESORO - LIVERMORE**

Project Number : **01LV**

Sample : **IP-10**

Matrix : Water

Lab Number : 79512-01

Sample Date :11/17/2011

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date/Time Analyzed
Nitrate as N	< 0.10	0.10	mg/L	EPA 300.0	11/18/11 15:51
Sulfate	34	0.50	mg/L	EPA 300.0	11/18/11 15:51
Ferrous Iron	< 0.10	0.10	mg/L	SM 3500-Fe D	11/18/11 11:34
Hexavalent Chromium	< 1.0	1.0	ug/L	EPA 7199	11/18/11 12:18
Arsenic	< 0.015	0.015	mg/L	EPA 6010B	11/28/11 10:27
Chromium	0.015	0.0050	mg/L	EPA 6010B	11/28/11 10:27
Iron	4.2	0.10	mg/L	EPA 6010B	11/28/11 10:27
Manganese	2.8	0.0050	mg/L	EPA 6010B	11/28/11 10:27
Sodium	96	0.50	mg/L	EPA 6010B	11/28/11 10:27
Benzene	83	0.50	ug/L	EPA 8260B	11/17/11 22:46
Toluene	120	0.50	ug/L	EPA 8260B	11/17/11 22:46
Ethylbenzene	96	0.50	ug/L	EPA 8260B	11/17/11 22:46
Total Xylenes	400	0.50	ug/L	EPA 8260B	11/17/11 22:46
Methyl-t-butyl ether (MTBE)	< 0.50	0.50	ug/L	EPA 8260B	11/17/11 22:46
Diisopropyl ether (DIPE)	< 0.50	0.50	ug/L	EPA 8260B	11/17/11 22:46
Ethyl-t-butyl ether (ETBE)	< 0.50	0.50	ug/L	EPA 8260B	11/17/11 22:46
Tert-amyl methyl ether (TAME)	< 0.80	0.80	ug/L	EPA 8260B	11/17/11 22:46
Tert-Butanol	7.2	5.0	ug/L	EPA 8260B	11/17/11 22:46
Methanol	< 50	50	ug/L	EPA 8260B	11/17/11 22:46
Ethanol	< 10	10	ug/L	EPA 8260B	11/17/11 22:46
TPH as Gasoline	4400	90	ug/L	EPA 8260B	11/18/11 13:00
1,2-Dichloroethane-d4 (Surr)	91.2		% Recovery	EPA 8260B	11/17/11 22:46
Toluene - d8 (Surr)	89.5		% Recovery	EPA 8260B	11/17/11 22:46

Project Name : **TESORO - LIVERMORE**

Project Number : **01LV**

Sample : **IP-9**

Matrix : Water

Lab Number : 79512-02

Sample Date :11/17/2011

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date/Time Analyzed
Nitrate as N	2.5	1.0	mg/L	EPA 300.0	11/18/11 23:55
Sulfate	710	25	mg/L	EPA 300.0	11/18/11 17:16
Ferrous Iron	< 0.15	0.15	mg/L	SM 3500-Fe D	11/18/11 11:35
Hexavalent Chromium	79	1.0	ug/L	EPA 7199	11/18/11 13:14
Arsenic	0.16	0.015	mg/L	EPA 6010B	11/22/11 11:03
Chromium	0.15	0.0050	mg/L	EPA 6010B	11/22/11 11:03
Iron	34	0.10	mg/L	EPA 6010B	11/22/11 11:03
Manganese	0.54	0.0052	mg/L	EPA 6010B	11/22/11 11:03
Sodium	8500	52	mg/L	EPA 6010B	11/22/11 11:27
Benzene	140	0.90	ug/L	EPA 8260B	11/17/11 23:21
Toluene	1300	5.0	ug/L	EPA 8260B	11/18/11 12:25
Ethylbenzene	510	0.90	ug/L	EPA 8260B	11/17/11 23:21
Total Xylenes	3000	5.0	ug/L	EPA 8260B	11/18/11 12:25
Methyl-t-butyl ether (MTBE)	< 0.90	0.90	ug/L	EPA 8260B	11/17/11 23:21
Diisopropyl ether (DIPE)	< 0.90	0.90	ug/L	EPA 8260B	11/17/11 23:21
Ethyl-t-butyl ether (ETBE)	< 0.90	0.90	ug/L	EPA 8260B	11/17/11 23:21
Tert-amyl methyl ether (TAME)	< 0.90	0.90	ug/L	EPA 8260B	11/17/11 23:21
Tert-Butanol	< 5.0	5.0	ug/L	EPA 8260B	11/17/11 23:21
Methanol	< 90	90	ug/L	EPA 8260B	11/17/11 23:21
Ethanol	< 200	200	ug/L	EPA 8260B	11/17/11 23:21
TPH as Gasoline	19000	500	ug/L	EPA 8260B	11/18/11 12:25
1,2-Dichloroethane-d4 (Surr)	88.8		% Recovery	EPA 8260B	11/17/11 23:21
Toluene - d8 (Surr)	87.7		% Recovery	EPA 8260B	11/17/11 23:21

Project Name : **TESORO - LIVERMORE**

Project Number : **01LV**

Sample : **IP-8**

Matrix : Water

Lab Number : 79512-03

Sample Date :11/17/2011

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date/Time Analyzed
Nitrate as N	< 0.10	0.10	mg/L	EPA 300.0	11/19/11 00:23
Sulfate	69	1.0	mg/L	EPA 300.0	11/23/11 22:42
Ferrous Iron	< 0.10	0.10	mg/L	SM 3500-Fe D	11/18/11 11:36
Hexavalent Chromium	< 1.0	1.0	ug/L	EPA 7199	11/18/11 13:05
Arsenic	< 0.015	0.015	mg/L	EPA 6010B	11/28/11 10:39
Chromium	0.011	0.0050	mg/L	EPA 6010B	11/28/11 10:39
Iron	3.2	0.10	mg/L	EPA 6010B	11/28/11 10:39
Manganese	3.3	0.0050	mg/L	EPA 6010B	11/28/11 10:39
Sodium	160	0.50	mg/L	EPA 6010B	11/28/11 10:39
Benzene	2300	3.0	ug/L	EPA 8260B	11/17/11 23:56
Toluene	11000	25	ug/L	EPA 8260B	11/18/11 11:16
Ethylbenzene	2000	3.0	ug/L	EPA 8260B	11/17/11 23:56
Total Xylenes	16000	25	ug/L	EPA 8260B	11/18/11 11:16
Methyl-t-butyl ether (MTBE)	< 3.0	3.0	ug/L	EPA 8260B	11/17/11 23:56
Diisopropyl ether (DIPE)	< 3.0	3.0	ug/L	EPA 8260B	11/17/11 23:56
Ethyl-t-butyl ether (ETBE)	< 3.0	3.0	ug/L	EPA 8260B	11/17/11 23:56
Tert-amyl methyl ether (TAME)	8.2	3.0	ug/L	EPA 8260B	11/17/11 23:56
Tert-Butanol	44	15	ug/L	EPA 8260B	11/17/11 23:56
Methanol	< 300	300	ug/L	EPA 8260B	11/17/11 23:56
Ethanol	< 200	200	ug/L	EPA 8260B	11/17/11 23:56
TPH as Gasoline	130000	2500	ug/L	EPA 8260B	11/18/11 11:16
1,2-Dichloroethane-d4 (Surr)	90.9		% Recovery	EPA 8260B	11/17/11 23:56
Toluene - d8 (Surr)	90.2		% Recovery	EPA 8260B	11/17/11 23:56

Project Name : **TESORO - LIVERMORE**

Project Number : **01LV**

Sample : **DW-8**

Matrix : Water

Lab Number : 79512-04

Sample Date :11/17/2011

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date/Time Analyzed
Nitrate as N	< 0.10	0.10	mg/L	EPA 300.0	11/18/11 18:13
Sulfate	48	0.50	mg/L	EPA 300.0	11/18/11 18:13
Ferrous Iron	< 0.10	0.10	mg/L	SM 3500-Fe D	11/18/11 11:37
Hexavalent Chromium	< 1.0	1.0	ug/L	EPA 7199	11/18/11 13:42
Arsenic	< 0.015	0.015	mg/L	EPA 6010B	11/28/11 10:43
Chromium	< 0.0050	0.0050	mg/L	EPA 6010B	11/28/11 10:43
Iron	0.76	0.10	mg/L	EPA 6010B	11/28/11 10:43
Manganese	1.5	0.0050	mg/L	EPA 6010B	11/28/11 10:43
Sodium	92	0.50	mg/L	EPA 6010B	11/28/11 10:43
Benzene	1600	9.0	ug/L	EPA 8260B	11/18/11 15:19
Toluene	3400	9.0	ug/L	EPA 8260B	11/18/11 15:19
Ethylbenzene	560	9.0	ug/L	EPA 8260B	11/18/11 15:19
Total Xylenes	7000	20	ug/L	EPA 8260B	11/18/11 01:41
Methyl-t-butyl ether (MTBE)	< 9.0	9.0	ug/L	EPA 8260B	11/18/11 15:19
Diisopropyl ether (DIPE)	< 9.0	9.0	ug/L	EPA 8260B	11/18/11 15:19
Ethyl-t-butyl ether (ETBE)	< 9.0	9.0	ug/L	EPA 8260B	11/18/11 15:19
Tert-amyl methyl ether (TAME)	< 9.0	9.0	ug/L	EPA 8260B	11/18/11 15:19
Tert-Butanol	< 50	50	ug/L	EPA 8260B	11/18/11 15:19
Methanol	< 900	900	ug/L	EPA 8260B	11/18/11 15:19
Ethanol	< 90	90	ug/L	EPA 8260B	11/18/11 15:19
TPH as Gasoline	43000	900	ug/L	EPA 8260B	11/18/11 15:19
1,2-Dichloroethane-d4 (Surr)	99.4		% Recovery	EPA 8260B	11/18/11 15:19
Toluene - d8 (Surr)	96.7		% Recovery	EPA 8260B	11/18/11 15:19

Project Name : **TESORO - LIVERMORE**

Project Number : **01LV**

Sample : **IP-1**

Matrix : Water

Lab Number : 79512-05

Sample Date :11/17/2011

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date/Time Analyzed
Nitrate as N	< 0.10	0.10	mg/L	EPA 300.0	11/19/11 00:51
Sulfate	24	0.50	mg/L	EPA 300.0	11/18/11 18:41
Ferrous Iron	< 0.10	0.10	mg/L	SM 3500-Fe D	11/18/11 11:40
Hexavalent Chromium	< 1.0	1.0	ug/L	EPA 7199	11/18/11 13:23
Arsenic	0.020	0.015	mg/L	EPA 6010B	11/28/11 10:48
Chromium	0.012	0.0050	mg/L	EPA 6010B	11/28/11 10:48
Iron	3.9	0.10	mg/L	EPA 6010B	11/28/11 10:48
Manganese	3.8	0.0050	mg/L	EPA 6010B	11/28/11 10:48
Sodium	93	0.50	mg/L	EPA 6010B	11/28/11 10:48
Benzene	1100	4.0	ug/L	EPA 8260B	11/18/11 00:31
Toluene	2000	4.0	ug/L	EPA 8260B	11/18/11 00:31
Ethylbenzene	620	4.0	ug/L	EPA 8260B	11/18/11 00:31
Total Xylenes	3200	4.0	ug/L	EPA 8260B	11/18/11 00:31
Methyl-t-butyl ether (MTBE)	< 4.0	4.0	ug/L	EPA 8260B	11/18/11 00:31
Diisopropyl ether (DIPE)	< 4.0	4.0	ug/L	EPA 8260B	11/18/11 00:31
Ethyl-t-butyl ether (ETBE)	< 4.0	4.0	ug/L	EPA 8260B	11/18/11 00:31
Tert-amyl methyl ether (TAME)	5.4	4.0	ug/L	EPA 8260B	11/18/11 00:31
Tert-Butanol	29	20	ug/L	EPA 8260B	11/18/11 00:31
Methanol	< 400	400	ug/L	EPA 8260B	11/18/11 00:31
Ethanol	< 40	40	ug/L	EPA 8260B	11/18/11 00:31
TPH as Gasoline	27000	400	ug/L	EPA 8260B	11/18/11 00:31
1,2-Dichloroethane-d4 (Surr)	97.1		% Recovery	EPA 8260B	11/18/11 00:31
Toluene - d8 (Surr)	95.2		% Recovery	EPA 8260B	11/18/11 00:31

Project Name : **TESORO - LIVERMORE**

Project Number : **01LV**

Sample : **MW-11**

Matrix : Water

Lab Number : 79512-06

Sample Date :11/17/2011

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date/Time Analyzed
Nitrate as N	< 0.10	0.10	mg/L	EPA 300.0	11/19/11 02:17
Sulfate	170	5.0	mg/L	EPA 300.0	11/23/11 20:49
Ferrous Iron	< 0.15	0.15	mg/L	SM 3500-Fe D	11/18/11 11:41
Hexavalent Chromium	< 1.0	1.0	ug/L	EPA 7199	11/18/11 13:33
Arsenic	0.030	0.015	mg/L	EPA 6010B	11/28/11 12:26
Chromium	0.010	0.0050	mg/L	EPA 6010B	11/28/11 12:26
Iron	2.9	0.10	mg/L	EPA 6010B	11/28/11 12:26
Manganese	1.2	0.0050	mg/L	EPA 6010B	11/28/11 12:26
Sodium	740	5.0	mg/L	EPA 6010B	11/28/11 12:22
Benzene	200	1.5	ug/L	EPA 8260B	11/18/11 14:45
Toluene	580	1.5	ug/L	EPA 8260B	11/18/11 14:45
Ethylbenzene	170	1.5	ug/L	EPA 8260B	11/18/11 14:45
Total Xylenes	1300	4.0	ug/L	EPA 8260B	11/18/11 01:06
Methyl-t-butyl ether (MTBE)	< 1.5	1.5	ug/L	EPA 8260B	11/18/11 14:45
Diisopropyl ether (DIPE)	< 1.5	1.5	ug/L	EPA 8260B	11/18/11 14:45
Ethyl-t-butyl ether (ETBE)	< 1.5	1.5	ug/L	EPA 8260B	11/18/11 14:45
Tert-amyl methyl ether (TAME)	< 1.5	1.5	ug/L	EPA 8260B	11/18/11 14:45
Tert-Butanol	15	7.0	ug/L	EPA 8260B	11/18/11 14:45
Methanol	< 150	150	ug/L	EPA 8260B	11/18/11 14:45
Ethanol	< 50	50	ug/L	EPA 8260B	11/18/11 14:45
TPH as Gasoline	9100	150	ug/L	EPA 8260B	11/18/11 14:45
1,2-Dichloroethane-d4 (Surr)	99.4		% Recovery	EPA 8260B	11/18/11 14:45
Toluene - d8 (Surr)	95.6		% Recovery	EPA 8260B	11/18/11 14:45

QC Report : Method Blank Data

Project Name : **TESORO - LIVERMORE**

Project Number : **01LV**

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Arsenic	< 0.015	0.015	mg/L	EPA 6010B	11/22/2011
Chromium	< 0.0050	0.0050	mg/L	EPA 6010B	11/22/2011
Iron	< 0.10	0.10	mg/L	EPA 6010B	11/22/2011
Manganese	< 0.0050	0.0050	mg/L	EPA 6010B	11/22/2011
Sodium	< 0.50	0.50	mg/L	EPA 6010B	11/22/2011
Arsenic	< 0.015	0.015	mg/L	EPA 6010B	11/28/2011
Chromium	< 0.0050	0.0050	mg/L	EPA 6010B	11/28/2011
Iron	< 0.10	0.10	mg/L	EPA 6010B	11/28/2011
Manganese	< 0.0050	0.0050	mg/L	EPA 6010B	11/28/2011
Sodium	< 0.50	0.50	mg/L	EPA 6010B	11/28/2011
Benzene	< 0.50	0.50	ug/L	EPA 8260B	11/17/2011
Ethylbenzene	< 0.50	0.50	ug/L	EPA 8260B	11/17/2011
Toluene	< 0.50	0.50	ug/L	EPA 8260B	11/17/2011
Total Xylenes	< 0.50	0.50	ug/L	EPA 8260B	11/17/2011
Diisopropyl ether (DIPE)	< 0.50	0.50	ug/L	EPA 8260B	11/17/2011
Ethanol	< 5.0	5.0	ug/L	EPA 8260B	11/17/2011
Ethyl-t-butyl ether (ETBE)	< 0.50	0.50	ug/L	EPA 8260B	11/17/2011
Methanol	< 50	50	ug/L	EPA 8260B	11/17/2011
Methyl-t-butyl ether (MTBE)	< 0.50	0.50	ug/L	EPA 8260B	11/17/2011
Tert-Butanol	< 5.0	5.0	ug/L	EPA 8260B	11/17/2011
Tert-amyl methyl ether (TAME)	< 0.50	0.50	ug/L	EPA 8260B	11/17/2011
TPH as Gasoline	< 50	50	ug/L	EPA 8260B	11/17/2011
1,2-Dichloroethane-d4 (Surr)	99.9		%	EPA 8260B	11/17/2011
Toluene - d8 (Surr)	98.8		%	EPA 8260B	11/17/2011

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	< 0.50	0.50	ug/L	EPA 8260B	11/18/2011
Ethylbenzene	< 0.50	0.50	ug/L	EPA 8260B	11/18/2011
Toluene	< 0.50	0.50	ug/L	EPA 8260B	11/18/2011
Total Xylenes	< 0.50	0.50	ug/L	EPA 8260B	11/18/2011
Diisopropyl ether (DIPE)	< 0.50	0.50	ug/L	EPA 8260B	11/18/2011
Ethanol	< 5.0	5.0	ug/L	EPA 8260B	11/18/2011
Ethyl-t-butyl ether (ETBE)	< 0.50	0.50	ug/L	EPA 8260B	11/18/2011
Methanol	< 50	50	ug/L	EPA 8260B	11/18/2011
Methyl-t-butyl ether (MTBE)	< 0.50	0.50	ug/L	EPA 8260B	11/18/2011
Tert-Butanol	< 5.0	5.0	ug/L	EPA 8260B	11/18/2011
Tert-amyl methyl ether (TAME)	< 0.50	0.50	ug/L	EPA 8260B	11/18/2011
TPH as Gasoline	< 50	50	ug/L	EPA 8260B	11/18/2011
1,2-Dichloroethane-d4 (Surr)	101		%	EPA 8260B	11/18/2011
Toluene - d8 (Surr)	98.0		%	EPA 8260B	11/18/2011
Toluene	< 0.50	0.50	ug/L	EPA 8260B	11/18/2011
Total Xylenes	< 0.50	0.50	ug/L	EPA 8260B	11/18/2011
TPH as Gasoline	< 50	50	ug/L	EPA 8260B	11/18/2011
Ferrous Iron	<0.10	0.10	mg/L	SM 3500-Fe D	11/18/2011
Hexavalent Chromium	<1.0	1.0	ug/L	EPA 7199	11/18/2011

QC Report : Method Blank Data

Project Name : **TESORO - LIVERMORE**

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>
Nitrate as N	<0.10	0.10	mg/L	EPA 300.0	11/18/2011
Sulfate	<0.50	0.50	mg/L	EPA 300.0	11/18/2011
Sulfate	<0.50	0.50	mg/L	EPA 300.0	11/23/2011

<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**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	79513-03	< 0.10	0.251	0.251	0.250	0.255	mg/L	SM 3500-Fe D	11/18/11	92.9	94.8	1.98	70.0-130	25
Benzene	79467-02	<0.50	40.0	40.0	41.9	40.3	ug/L	EPA 8260B	11/17/11	105	101	4.07	80-120	25
Diisopropyl ether	79467-02	<0.50	39.6	39.6	42.4	42.6	ug/L	EPA 8260B	11/17/11	107	108	0.506	80-120	25
Ethanol	79467-02	<5.0	99.7	99.7	84.4	87.0	ug/L	EPA 8260B	11/17/11	84.6	87.2	2.96	55.1-159	25
Ethyl-tert-butyl ether	79467-02	<0.50	39.9	39.9	43.8	43.5	ug/L	EPA 8260B	11/17/11	110	109	0.861	76.5-120	25
Ethylbenzene	79467-02	<0.50	40.0	40.0	40.9	38.7	ug/L	EPA 8260B	11/17/11	102	96.7	5.51	80-120	25
Methanol	79467-02	<50	998	998	810	802	ug/L	EPA 8260B	11/17/11	81.2	80.4	1.03	53.2-147	25
Methyl-t-butyl ether	79467-02	<0.50	40.2	40.2	45.7	45.1	ug/L	EPA 8260B	11/17/11	114	112	1.30	69.7-121	25
P + M Xylene	79467-02	<0.50	40.0	40.0	39.2	37.0	ug/L	EPA 8260B	11/17/11	98.1	92.5	5.80	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	79467-02	<5.0	193	193	204	205	ug/L	EPA 8260B	11/17/11	105	106	0.373	80-120	25
Tert-amyl-methyl ether	79467-02	<0.50	39.9	39.9	44.9	43.8	ug/L	EPA 8260B	11/17/11	112	110	2.39	78.9-120	25
Toluene	79467-02	<0.50	40.0	40.0	40.7	39.3	ug/L	EPA 8260B	11/17/11	102	98.2	3.50	80-120	25
P + M Xylene	79480-05	<0.50	40.0	40.0	39.7	38.5	ug/L	EPA 8260B	11/18/11	99.3	96.3	3.12	76.8-120	25
Toluene	79480-05	<0.50	40.0	40.0	40.3	39.1	ug/L	EPA 8260B	11/18/11	101	97.8	2.89	80-120	25
Benzene	79480-01	<0.50	40.0	40.0	40.8	40.1	ug/L	EPA 8260B	11/18/11	102	100	1.82	80-120	25
Diisopropyl ether	79480-01	<0.50	39.5	39.5	42.1	41.5	ug/L	EPA 8260B	11/18/11	106	105	1.45	80-120	25
Ethanol	79480-01	<5.0	100	100	88.6	88.2	ug/L	EPA 8260B	11/18/11	88.4	88.0	0.465	55.1-159	25
Ethyl-tert-butyl ether	79480-01	<0.50	40.0	40.0	44.2	44.2	ug/L	EPA 8260B	11/18/11	110	110	0.0464	76.5-120	25

QC Report : Matrix Spike/ Matrix Spike DuplicateProject 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	79480-01	<0.50	40.0	40.0	37.2	35.8	ug/L	EPA 8260B	11/18/11	93.1	89.4	4.04	80-120	25
Methanol	79480-01	<50	1000	1000	890	877	ug/L	EPA 8260B	11/18/11	89.0	87.7	1.54	53.2-147	25
Methyl-t-butyl ether	79480-01	36	40.4	40.4	79.9	80.1	ug/L	EPA 8260B	11/18/11	109	110	0.509	69.7-121	25
P + M Xylene	79480-01	<0.50	40.0	40.0	29.1	28.1	ug/L	EPA 8260B	11/18/11	72.7	70.4	3.23	76.8-120	25
Tert-Butanol	79480-01	14	201	201	217	216	ug/L	EPA 8260B	11/18/11	101	100	0.634	80-120	25
Tert-amyl-methyl ether	79480-01	<0.50	39.4	39.4	43.8	44.0	ug/L	EPA 8260B	11/18/11	111	112	0.375	78.9-120	25
Toluene	79480-01	<0.50	40.0	40.0	37.0	36.0	ug/L	EPA 8260B	11/18/11	92.4	90.0	2.74	80-120	25
Hexavalent Chromium	79512-01	< 1.0	5.00	5.00	5.35	5.26	ug/L	EPA 7199	11/18/11	107	105	1.64	90.0-110	10
Nitrate as N	79512-01	< 0.10	0.500	0.500	0.711	0.670	mg/L	EPA 300.0	11/18/11	142	134	5.96	85.0-115	10

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
Sulfate	79512-01	34	2.50	2.50	36.9	36.7	mg/L	EPA 300.0	11/18/11	105	97.0	0.527	85.0-115	10
Sulfate	79550-01	1.5	2.50	2.50	4.09	4.20	mg/L	EPA 300.0	11/23/11	105	109	2.64	85.0-115	10
Arsenic	79513-01	0.021	0.400	0.400	0.428	0.424	mg/L	EPA 6010B	11/22/11	102	101	1.17	75-125	20
Chromium	79513-01	0.013	0.400	0.400	0.424	0.421	mg/L	EPA 6010B	11/22/11	103	102	0.852	75-125	20
Iron	79513-01	41	0.400	0.400	41.1	39.0	mg/L	EPA 6010B	11/22/11	0.00	0.00	5.24	75-125	20
Manganese	79513-01	1.6	0.400	0.400	1.92	1.90	mg/L	EPA 6010B	11/22/11	82.8	79.2	0.734	75-125	20
Sodium	79513-01	50	0.400	0.400	50.4	49.4	mg/L	EPA 6010B	11/22/11	0.00	0.00	2.02	75-125	20
Arsenic	79512-01	< 0.015	0.400	0.400	0.422	0.424	mg/L	EPA 6010B	11/28/11	103	104	0.472	75-125	20
Chromium	79512-01	0.015	0.400	0.400	0.418	0.419	mg/L	EPA 6010B	11/28/11	101	101	0.167	75-125	20

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
Iron														
	79512-01	4.2	0.400	0.400	4.59	4.68	mg/L	EPA 6010B	11/28/11	108	131	2.01	75-125	20
Manganese														
	79512-01	2.8	0.400	0.400	3.16	3.26	mg/L	EPA 6010B	11/28/11	93.2	118	3.15	75-125	20
Sodium														
	79512-01	96	0.400	0.400	97.6	100	mg/L	EPA 6010B	11/28/11	402	1000	2.43	75-125	20

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
Arsenic	0.400	mg/L	EPA 6010B	11/22/11	95.7	85-115
Chromium	0.400	mg/L	EPA 6010B	11/22/11	101	85-115
Iron	0.400	mg/L	EPA 6010B	11/22/11	96.8	85-115
Manganese	0.400	mg/L	EPA 6010B	11/22/11	94.6	85-115
Sodium	0.400	mg/L	EPA 6010B	11/22/11	98.1	85-115
Arsenic	0.400	mg/L	EPA 6010B	11/28/11	99.8	85-115
Chromium	0.400	mg/L	EPA 6010B	11/28/11	102	85-115
Iron	0.400	mg/L	EPA 6010B	11/28/11	99.7	85-115
Manganese	0.400	mg/L	EPA 6010B	11/28/11	96.6	85-115
Sodium	0.400	mg/L	EPA 6010B	11/28/11	96.8	85-115
Benzene	40.0	ug/L	EPA 8260B	11/17/11	99.0	80-120
Diisopropyl ether	39.5	ug/L	EPA 8260B	11/17/11	104	80-120
Ethanol	100	ug/L	EPA 8260B	11/17/11	84.8	55.1-159
Ethyl-tert-butyl ether	40.0	ug/L	EPA 8260B	11/17/11	109	76.5-120
Ethylbenzene	40.0	ug/L	EPA 8260B	11/17/11	100	80-120
Methanol	1000	ug/L	EPA 8260B	11/17/11	84.7	53.2-147
Methyl-t-butyl ether	40.4	ug/L	EPA 8260B	11/17/11	110	69.7-121
P + M Xylene	40.0	ug/L	EPA 8260B	11/17/11	98.2	76.8-120
TPH as Gasoline	504	ug/L	EPA 8260B	11/17/11	101	70.0-130
Tert-Butanol	201	ug/L	EPA 8260B	11/17/11	98.6	80-120

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
Tert-amyl-methyl ether	39.4	ug/L	EPA 8260B	11/17/11	108	78.9-120
Toluene	40.0	ug/L	EPA 8260B	11/17/11	97.8	80-120
Benzene	40.2	ug/L	EPA 8260B	11/18/11	97.8	80-120
Diisopropyl ether	39.7	ug/L	EPA 8260B	11/18/11	102	80-120
Ethanol	101	ug/L	EPA 8260B	11/18/11	84.1	55.1-159
Ethyl-tert-butyl ether	40.2	ug/L	EPA 8260B	11/18/11	107	76.5-120
Ethylbenzene	40.2	ug/L	EPA 8260B	11/18/11	99.5	80-120
Methanol	1000	ug/L	EPA 8260B	11/18/11	84.8	53.2-147
Methyl-t-butyl ether	40.6	ug/L	EPA 8260B	11/18/11	108	69.7-121
P + M Xylene	40.2	ug/L	EPA 8260B	11/18/11	98.0	76.8-120
TPH as Gasoline	504	ug/L	EPA 8260B	11/18/11	103	70.0-130
Tert-Butanol	202	ug/L	EPA 8260B	11/18/11	97.9	80-120
Tert-amyl-methyl ether	39.6	ug/L	EPA 8260B	11/18/11	107	78.9-120
Toluene	40.2	ug/L	EPA 8260B	11/18/11	97.7	80-120
P + M Xylene	39.9	ug/L	EPA 8260B	11/18/11	102	76.8-120
TPH as Gasoline	504	ug/L	EPA 8260B	11/18/11	103	70.0-130
Toluene	39.9	ug/L	EPA 8260B	11/18/11	103	80-120
Ferrous Iron	0.251	mg/L	SM 3500-Fe D	11/18/11	95.2	70.0-130

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
Hexavalent Chromium	5.00	ug/L	EPA 7199	11/18/11	102	90.0-110
Nitrate as N	0.500	mg/L	EPA 300.0	11/18/11	94.0	85.0-115
Sulfate	2.50	mg/L	EPA 300.0	11/18/11	102	85.0-115
Sulfate	2.50	mg/L	EPA 300.0	11/23/11	97.7	85.0-115



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 Fax: 530.297.4802

SRG # / Lab No. 79512

Page 1 of 1

Project Contact (Hardcopy or PDF To): **MATTHEW NELSON**
 Company / Address: **ARCTOS ENV. 1332 PERALTA AVE, BERKELEY, CA 94702**
 Phone Number: **562-988-2755**
 Fax Number: **562-988-2759**
 Project #: **OILV** P.O. #: **67076**
 Project Name: **TESORO - LIVERMORE**
 Global ID: **T0600101410**
 EDF Deliverable To (Email Address): **MNELSON@ORIONENV.COM**
 Bill to:
 Sampler Print Name: **SCOTT STROMBERG**
 Sampler Signature: *[Signature]*

Sample Designation	Date	Time	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)	NO ₃ ⁻ , SO ₄ ²⁻ , Fe ²⁺ , Cr ⁶⁺ , Methals By ICP (Fe, Mg, Mn, Cr, As)	TOTAL ALK, TDS, CO ₂ , CH ₄	TAT
			40 ml VOA	Sleeve	Poly	Glass	Tedlar	50% AL HDPE	HCl	HNO ₃	None / ICE	Water	Soil	Air																					
IP-10	11/17/11	1325	7	3				1	X	X	X		X			X	X	X													X	01			
IP-9		1405	7	3				1	X	X	X		X			X	X	X												X	02				
IP-8		1427	7	3				1	X	X	X		X			X	X	X											X	03					
DW-8		1452	7	3				1	X	X	X		X			X	X	X											X	04					
IP-1		1505	7	3				1	X	X	X		X			X	X	X											X	05					
MW-11		1534	7	3				1	X	X	X		X			X	X	X											X	06					

California EDF Report? Yes No

Chain-of-Custody Record and Analysis Request

Analysis Request

CIRCLE METHOD

For Lab Use Only

12 hr

24 hr

48 hr

72 hr

1 wk

Relinquished by: *[Signature]* Date: **11/17/11** Time: **1600**
 Relinquished by: _____ Date: _____ Time: _____
 Relinquished by: _____ Date: **11/17/11** Time: **1640**
 Received by Laboratory: *[Signature]* **KIFF Analytical LLC**

Remarks:
1-WK TAT ON ALL ANALYSES EXCEPT VOCs - 24-HR TAT PLEASE.

SAMPLE RECEIPT CHECKLIST

RECEIVER

TJB
Initials

SRG#: 79512 Date: 111711

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: Yes No (includes water)
 Temperature °C 1.0 Therm. ID# IR-5 Initial LJR Date/Time 111711/1910 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 VGA # of containers received 42
 Matrix WA Container type Poly # of containers received 24
 Matrix _____ Container type _____ # of containers received _____
 Date and Time Sample Put into Temp Storage Date: 111711 Time: 1916

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: No metals method; SR will log in as EPA 6010
per bottle order 1008232. TJB 111711 1645



Subcontract Laboratory Report Attachments



CALSCIENCE

WORK ORDER NUMBER: 11-11-1593

The difference is service



AIR | SOIL | WATER | MARINE CHEMISTRY

Analytical Report For

Client: Kiff Analytical

Client Project Name: Tesoro - Livermore

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

Amanda Porter

Approved for release on 11/22/2011 by:
Amanda Porter
Project Manager

ResultLink ▶

Email your PM ▶



Calscience Environmental Laboratories 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 provided herein, and follows the standard Calscience data package. The results in this analytical report are limited to the samples tested and any reproduction thereof must be made in its entirety. Note that the Chain-of-Custody Record and Sample Receipt Form are integral parts of this report.





Contents

Client Project Name: Tesoro - Livermore
Work Order Number: 11-11-1593

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Analytical Report



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

Date Received: 11/19/11
Work Order No: 11-11-1593
Preparation: N/A
Method: RSK-175M

Project: Tesoro - Livermore

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	11-11-1593-1-C	11/17/11 13:25	Aqueous	GC 14	N/A	11/19/11 14:23	111119L01

Parameter	Result	RL	DF	Qual	Units
Carbon Dioxide	26700	17.0	10		ug/L

IP-9	11-11-1593-2-C	11/17/11 14:05	Aqueous	GC 14	N/A	11/19/11 14:43	111119L01
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Parameter	Result	RL	DF	Qual	Units
Carbon Dioxide	14500	17.0	10		ug/L

IP-8	11-11-1593-3-C	11/17/11 14:27	Aqueous	GC 14	N/A	11/19/11 17:40	111119L01
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Parameter	Result	RL	DF	Qual	Units
Carbon Dioxide	4470	1.70	1		ug/L

DW-8	11-11-1593-4-C	11/17/11 14:52	Aqueous	GC 14	N/A	11/19/11 15:59	111119L01
------	----------------	----------------	---------	-------	-----	----------------	-----------

Parameter	Result	RL	DF	Qual	Units
Carbon Dioxide	19100	17.0	10		ug/L

IP-1	11-11-1593-5-C	11/17/11 15:05	Aqueous	GC 14	N/A	11/19/11 16:24	111119L01
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Parameter	Result	RL	DF	Qual	Units
Carbon Dioxide	34300	17.0	10		ug/L

MW-11	11-11-1593-6-C	11/17/11 15:34	Aqueous	GC 14	N/A	11/19/11 18:49	111119L01
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Parameter	Result	RL	DF	Qual	Units
Carbon Dioxide	1870	1.70	1		ug/L

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

Analytical Report



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

Date Received: 11/19/11
 Work Order No: 11-11-1593
 Preparation: N/A
 Method: RSK-175M

Project: Tesoro - Livermore

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	099-12-659-302	N/A	Aqueous	GC 14	N/A	11/19/11 13:24	111119L01

<u>Parameter</u>	<u>Result</u>	<u>RL</u>	<u>DF</u>	<u>Qual</u>	<u>Units</u>
Carbon Dioxide	ND	1.70	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: 11/19/11
Work Order No: 11-11-1593
Preparation: N/A
Method: RSK-175M

Project: Tesoro - Livermore

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	11-11-1593-1-B	11/17/11 13:25	Aqueous	GC 52	N/A	11/19/11 18:22	111119L01

Parameter	Result	RL	DF	Qual	Units
Methane	711	8.00	8		ug/L

IP-9	11-11-1593-2-A	11/17/11 14:05	Aqueous	GC 52	N/A	11/19/11 13:39	111119L01
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Parameter	Result	RL	DF	Qual	Units
Methane	3.88	1.00	1		ug/L

IP-8	11-11-1593-3-A	11/17/11 14:27	Aqueous	GC 52	N/A	11/19/11 13:59	111119L01
------	----------------	----------------	---------	-------	-----	----------------	-----------

Parameter	Result	RL	DF	Qual	Units
Methane	184	1.00	1		ug/L

DW-8	11-11-1593-4-A	11/17/11 14:52	Aqueous	GC 52	N/A	11/19/11 14:26	111119L01
------	----------------	----------------	---------	-------	-----	----------------	-----------

Parameter	Result	RL	DF	Qual	Units
Methane	140	1.00	1		ug/L

IP-1	11-11-1593-5-A	11/17/11 15:05	Aqueous	GC 52	N/A	11/19/11 18:00	111119L01
------	----------------	----------------	---------	-------	-----	----------------	-----------

Parameter	Result	RL	DF	Qual	Units
Methane	1180	8.00	8		ug/L

MW-11	11-11-1593-6-B	11/17/11 15:34	Aqueous	GC 52	N/A	11/19/11 16:52	111119L01
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Parameter	Result	RL	DF	Qual	Units
Methane	6.52	1.00	1		ug/L

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

Analytical Report



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

Date Received: 11/19/11
Work Order No: 11-11-1593
Preparation: N/A
Method: RSK-175M

Project: Tesoro - Livermore

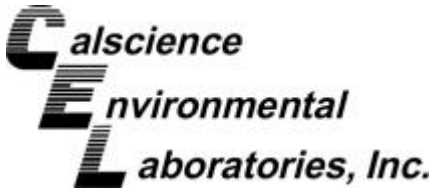
Page 2 of 2

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Method Blank	099-12-663-1,448	N/A	Aqueous	GC 52	N/A	11/19/11 11:21	111119L01

<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: 11/19/11
Work Order No: 11-11-1593

Project: Tesoro - Livermore

Page 1 of 2

Client Sample Number	Lab Sample Number	Date Collected	Matrix
IP-10	11-11-1593-1	11/17/11	Aqueous

Parameter	Results	RL	DF	Qual	Units	Date Prepared	Date Analyzed	Method
Alkalinity, Total (as CaCO3)	458	5.00	1		mg/L	N/A	11/19/11	SM 2320B
Solids, Total Dissolved	510	1.00	1		mg/L	11/21/11	11/21/11	SM 2540 C
IP-9 11-11-1593-2 11/17/11 Aqueous								

Parameter	Results	RL	DF	Qual	Units	Date Prepared	Date Analyzed	Method
Alkalinity, Total (as CaCO3)	18700	100	1		mg/L	N/A	11/19/11	SM 2320B
Solids, Total Dissolved	21300	100	1		mg/L	11/21/11	11/21/11	SM 2540 C
IP-8 11-11-1593-3 11/17/11 Aqueous								

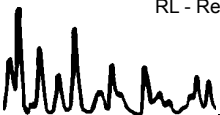
Parameter	Results	RL	DF	Qual	Units	Date Prepared	Date Analyzed	Method
Alkalinity, Total (as CaCO3)	7950	10.0	1		mg/L	N/A	11/19/11	SM 2320B
Solids, Total Dissolved	960	1.00	1		mg/L	11/21/11	11/21/11	SM 2540 C
DW-8 11-11-1593-4 11/17/11 Aqueous								

Parameter	Results	RL	DF	Qual	Units	Date Prepared	Date Analyzed	Method
Alkalinity, Total (as CaCO3)	591	5.00	1		mg/L	N/A	11/19/11	SM 2320B
Solids, Total Dissolved	610	1.00	1		mg/L	11/21/11	11/21/11	SM 2540 C
IP-1 11-11-1593-5 11/17/11 Aqueous								

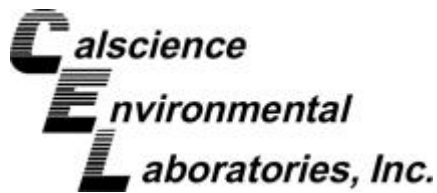
Parameter	Results	RL	DF	Qual	Units	Date Prepared	Date Analyzed	Method
Alkalinity, Total (as CaCO3)	576	5.00	1		mg/L	N/A	11/19/11	SM 2320B
Solids, Total Dissolved	660	1.00	1		mg/L	11/21/11	11/21/11	SM 2540 C
MW-11 11-11-1593-6 11/17/11 Aqueous								

Parameter	Results	RL	DF	Qual	Units	Date Prepared	Date Analyzed	Method
Alkalinity, Total (as CaCO3)	1630	10.0	1		mg/L	N/A	11/19/11	SM 2320B
Solids, Total Dissolved	2340	10.0	1		mg/L	11/21/11	11/21/11	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: 11/19/11
 Work Order No: 11-11-1593

Project: Tesoro - Livermore

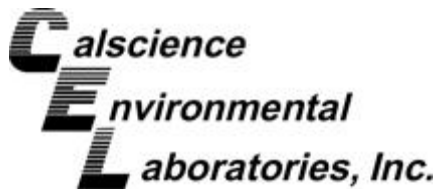
Page 2 of 2

Client Sample Number	Lab Sample Number	Date Collected	Matrix
Method Blank		N/A	Aqueous

Parameter	Results	RL	DF	Qual	Units	Date Prepared	Date Analyzed	Method
Alkalinity, Total (as CaCO3)	ND	1.0	1		mg/L	N/A	11/19/11	SM 2320B
Solids, Total Dissolved	ND	1.0	1		mg/L	11/21/11	11/21/11	SM 2540 C

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: N/A
Work Order No: 11-11-1593

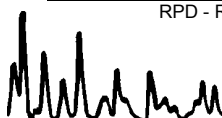
Project: Tesoro - Livermore

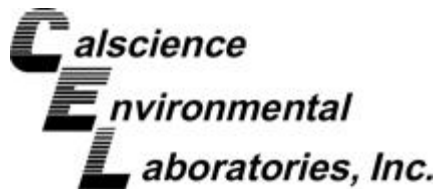
Matrix: Aqueous or Solid

<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-10	11/19/11	458	460	0	0-25	
Solids, Total Dissolved	SM 2540 C	IP-1	11/21/11	660	680	3	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: 11-11-1593
Preparation: N/A
Method: RSK-175M

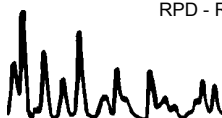
Project: Tesoro - Livermore

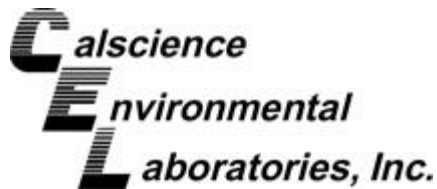
Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number
099-12-659-302	Aqueous	GC 14	N/A	11/19/11	111119L01

Parameter	SPIKE ADDED	LCS %REC	LCSD %REC	%REC CL	RPD	RPD CL	Qualifiers
Carbon Dioxide	102.0	100	101	80-120	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: 11-11-1593
 Preparation: N/A
 Method: RSK-175M

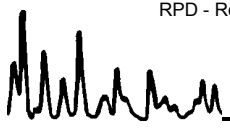
Project: Tesoro - Livermore

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number
099-12-663-1,448	Aqueous	GC 52	N/A	11/19/11	111119L01

Parameter	SPIKE ADDED	LCS %REC	LCSD %REC	%REC CL	RPD	RPD CL	Qualifiers
Methane	100.0	92	93	79-109	1	0-20	

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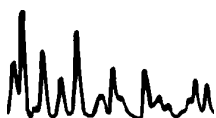
RPD - Relative Percent Difference , CL - Control Limit



Work Order Number: 11-11-1593

<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.





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

11-11-1593

COC No. **79512** Page 1 of 1

Project Contact (Hardcopy or PDF to): **Scott Forbes** EDF Report? **NO** Chain-of-Custody Record and Analysis Request

Company/Address: **Kiff Analytical** Recommended but not mandatory to complete this section: **Analysis Request** TAT

Phone No.: **530-297-4800** FAX No.: **530-297-4808** Global ID:
 Project Number: **01LV** P.O. No.: **79512** Deliverables to (Email Address): **inbox@kiffanalytical.com**

Project Name:	Container / Preservative				Matrix		Alkalinity SM 2320 (1)	Carbon Dioxide by RSK 175 (1)	Hydrocarbons in Water by RSK 175 (1)	Total Dissolved Solids	Analysis Request				24-Hours	For Lab Use Only			
	TESORO - LIVERMORE	1-L Poly None	250ml Poly None	VOA 40 ml None	VOA 40 ml HCl	Water													
Project Address:	Sampling																		
Sample Designation	Date	Time																	
IP-10	11/17/11	13:25	1	1	2	2											X		1
IP-9	11/17/11	14:05	1	1	2	2											X		2
IP-8	11/17/11	14:27	1	1	2	2											X		3
DW-8	11/17/11	14:52	1	1	2	2											X		4
IP-1	11/17/11	15:05	1	1	2	2											X		5
MW-11	11/17/11	15:34	1	1	2	2											X		6

Relinquished by: <i>[Signature]</i> Kiff Analytical LLC	Date: 11/18/11	Time: 1900	Received by:	Remarks: Please refer to attached Test Detail.
Relinquished by:	Date:	Time:	Received by:	
Relinquished by:	Date: 11/9/11	Time: 1100	Received by Laboratory: <i>[Signature]</i>	
Bill to: Accounts Payable				Page 13 of 16

1593

Test Detail for Kiff Work Order: 79512

Alkalinity SM 2320 (1)
Alkalinity, Total (as CaCO₃)

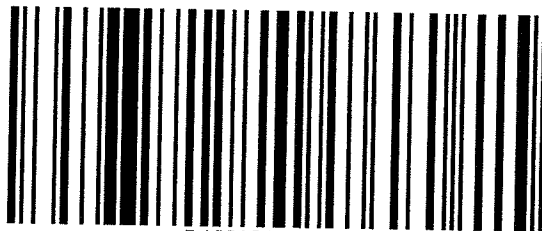
Carbon Dioxide by RSK 175 (1)
Carbon Dioxide

Hydrocarbons in Water by RSK 175 (1)
Methane


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800.334.5000
ontrac.com



D10010428366474

Date Printed 11/18/2011

Tracking#D10010428366474

Shipped From:

KIFF ANALYTICAL
2795 2ND STREET 300
DAVIS, CA 95616

Sent By: SAMPLE RECEIVING

Phone#: (530)297-4800

wgt(lbs): 25

Reference: SUBS 79521, 12, 13, 34

Reference 2: CLASS 600

Ship To Company:

CALSCIENCE ENVIRONMENTAL LABS
7440 LINCOLN WAY
GARDEN GROVE, CA 92841
SAMPLE RECEIVING (714)895-5494

Service: **S**

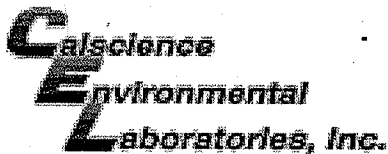
Sort Code: **ORG**

Special Services:

Saturday Delivery
Signature Required

1593





WORK ORDER #: 11-11-1593

SAMPLE RECEIPT FORM

Cooler 1 of 1

CLIENT: KIFF

DATE: 11/19/11

TEMPERATURE: Thermometer ID: SC1 (Criteria: 0.0°C – 6.0°C, not frozen)

Temperature 1.0°C + 0.5°C (CF) = 1.5°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: YL

CUSTODY SEALS INTACT:

Cooler _____ No (Not Intact) Not Present N/A Initial: YL

Sample _____ No (Not Intact) Not Present Initial: KM

SAMPLE CONDITION:

	Yes	No	N/A
Chain-Of-Custody (COC) document(s) received with samples.....	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
COC document(s) received complete.....	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/> Collection date/time, matrix, and/or # of containers logged in based on sample labels.			
<input type="checkbox"/> No analysis requested. <input type="checkbox"/> Not relinquished. <input type="checkbox"/> No date/time relinquished.			
Sampler's name indicated on COC.....	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Sample container label(s) consistent with COC.....	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sample container(s) intact and good condition.....	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Proper containers and sufficient volume for analyses requested.....	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Analyses received within holding time.....	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
pH / Res. Chlorine / Diss. Sulfide / Diss. Oxygen received within 24 hours...	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Proper preservation noted on COC or sample container.....	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/> Unpreserved vials received for Volatiles analysis			
Volatile analysis container(s) free of headspace.....	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Tedlar bag(s) free of condensation.....	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

CONTAINER TYPE:

Solid: 4ozCGJ 8ozCGJ 16ozCGJ Sleeve (____) EnCores® TerraCores® _____

Water: VOA VOA_h VOAn₂ 125AGB 125AGB_h 125AGB_p 1AGB 1AGBna₂ 1AGBs

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

250PB 250PBn 125PB 125PBz_{na} 100PJ 100PJna₂ _____ _____ _____

Air: Tedlar® Summa® Other: _____ Trip Blank Lot#: _____ Labeled/Checked by: KM

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

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

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Laboratory Results

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

Subject : 10 Water Samples
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 standard. All soil samples are reported on a total weight (wet weight) basis unless noted otherwise in the case narrative. 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,



Joel Kiff



Report Number : 79549

Date : 12/01/2011

Subject : 10 Water Samples
Project Name : Tesoro - Livermore
Project Number : 01LV
P.O. Number : 67076

Case Narrative

The Method Reporting Limit for Ethanol has been increased due to the presence of an interfering compound for samples IP-9 (11:40), DW-8 (12:00), CV-3, CV-4 and IP-9 (15:25).

Samples IP-9 (11:40) and IP-9 (15:25) were analyzed outside of hold time for Method EPA 8260B. The hydrochloric acid (HCl) preservation was insufficient to maintain a pH of 2.0 or less required to extend sample hold time.



Report Number : 79549

Date : 12/01/2011

Project Name : **Tesoro - Livermore**

Project Number : **01LV**

Sample : **IP-9 (11:40)**

Matrix : Water

Lab Number : 79549-01

Sample Date :11/21/2011

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date/Time Analyzed
Benzene	480	5.0	ug/L	EPA 8260B	12/01/11 04:24
Toluene	2400	5.0	ug/L	EPA 8260B	12/01/11 04:24
Ethylbenzene	990	5.0	ug/L	EPA 8260B	12/01/11 04:24
Total Xylenes	5100	5.0	ug/L	EPA 8260B	12/01/11 04:24
Methyl-t-butyl ether (MTBE)	< 5.0	5.0	ug/L	EPA 8260B	12/01/11 04:24
Diisopropyl ether (DIPE)	< 5.0	5.0	ug/L	EPA 8260B	12/01/11 04:24
Ethyl-t-butyl ether (ETBE)	< 5.0	5.0	ug/L	EPA 8260B	12/01/11 04:24
Tert-amyl methyl ether (TAME)	< 5.0	5.0	ug/L	EPA 8260B	12/01/11 04:24
Tert-Butanol	32	25	ug/L	EPA 8260B	12/01/11 04:24
Methanol	< 500	500	ug/L	EPA 8260B	12/01/11 04:24
Ethanol	< 80	80	ug/L	EPA 8260B	12/01/11 04:24
TPH as Gasoline	29000	500	ug/L	EPA 8260B	12/01/11 04:24
1,2-Dichloroethane-d4 (Surr)	97.5		% Recovery	EPA 8260B	12/01/11 04:24
Toluene - d8 (Surr)	96.0		% Recovery	EPA 8260B	12/01/11 04:24



Report Number : 79549

Date : 12/01/2011

Project Name : **Tesoro - Livermore**

Project Number : **01LV**

Sample : **IP-8 (11:50)**

Matrix : Water

Lab Number : 79549-02

Sample Date :11/21/2011

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date/Time Analyzed
Benzene	4400	25	ug/L	EPA 8260B	11/29/11 06:05
Toluene	13000	25	ug/L	EPA 8260B	11/29/11 06:05
Ethylbenzene	2000	25	ug/L	EPA 8260B	11/29/11 06:05
Total Xylenes	12000	25	ug/L	EPA 8260B	11/29/11 06:05
Methyl-t-butyl ether (MTBE)	< 25	25	ug/L	EPA 8260B	11/29/11 06:05
Diisopropyl ether (DIPE)	< 25	25	ug/L	EPA 8260B	11/29/11 06:05
Ethyl-t-butyl ether (ETBE)	< 25	25	ug/L	EPA 8260B	11/29/11 06:05
Tert-amyl methyl ether (TAME)	< 25	25	ug/L	EPA 8260B	11/29/11 06:05
Tert-Butanol	< 150	150	ug/L	EPA 8260B	11/29/11 06:05
Methanol	< 2500	2500	ug/L	EPA 8260B	11/29/11 06:05
Ethanol	< 250	250	ug/L	EPA 8260B	11/29/11 06:05
TPH as Gasoline	74000	2500	ug/L	EPA 8260B	11/29/11 06:05
1,2-Dichloroethane-d4 (Surr)	104		% Recovery	EPA 8260B	11/29/11 06:05
Toluene - d8 (Surr)	100		% Recovery	EPA 8260B	11/29/11 06:05



Report Number : 79549

Date : 12/01/2011

Project Name : **Tesoro - Livermore**

Project Number : **01LV**

Sample : **DW-8 (12:00)**

Matrix : Water

Lab Number : 79549-03

Sample Date :11/21/2011

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date/Time Analyzed
Benzene	4500	20	ug/L	EPA 8260B	11/30/11 03:57
Toluene	12000	20	ug/L	EPA 8260B	11/30/11 03:57
Ethylbenzene	2300	20	ug/L	EPA 8260B	11/30/11 03:57
Total Xylenes	13000	20	ug/L	EPA 8260B	11/30/11 03:57
Methyl-t-butyl ether (MTBE)	< 20	20	ug/L	EPA 8260B	11/30/11 03:57
Diisopropyl ether (DIPE)	< 20	20	ug/L	EPA 8260B	11/30/11 03:57
Ethyl-t-butyl ether (ETBE)	< 20	20	ug/L	EPA 8260B	11/30/11 03:57
Tert-amyl methyl ether (TAME)	< 20	20	ug/L	EPA 8260B	11/30/11 03:57
Tert-Butanol	150	90	ug/L	EPA 8260B	11/30/11 03:57
Methanol	< 2000	2000	ug/L	EPA 8260B	11/30/11 03:57
Ethanol	< 300	300	ug/L	EPA 8260B	11/30/11 03:57
TPH as Gasoline	74000	2000	ug/L	EPA 8260B	11/30/11 03:57
1,2-Dichloroethane-d4 (Surr)	101		% Recovery	EPA 8260B	11/30/11 03:57
Toluene - d8 (Surr)	99.3		% Recovery	EPA 8260B	11/30/11 03:57



Report Number : 79549

Date : 12/01/2011

Project Name : **Tesoro - Livermore**

Project Number : **01LV**

Sample : **CV-1**

Matrix : Water

Lab Number : 79549-04

Sample Date :11/21/2011

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date/Time Analyzed
Benzene	3100	15	ug/L	EPA 8260B	11/29/11 17:26
Toluene	8800	15	ug/L	EPA 8260B	11/29/11 17:26
Ethylbenzene	2000	15	ug/L	EPA 8260B	11/29/11 17:26
Total Xylenes	10000	15	ug/L	EPA 8260B	11/29/11 17:26
Methyl-t-butyl ether (MTBE)	< 15	15	ug/L	EPA 8260B	11/29/11 17:26
Diisopropyl ether (DIPE)	< 15	15	ug/L	EPA 8260B	11/29/11 17:26
Ethyl-t-butyl ether (ETBE)	< 15	15	ug/L	EPA 8260B	11/29/11 17:26
Tert-amyl methyl ether (TAME)	< 15	15	ug/L	EPA 8260B	11/29/11 17:26
Tert-Butanol	90	70	ug/L	EPA 8260B	11/29/11 17:26
Methanol	< 1500	1500	ug/L	EPA 8260B	11/29/11 17:26
Ethanol	< 150	150	ug/L	EPA 8260B	11/29/11 17:26
TPH as Gasoline	63000	1500	ug/L	EPA 8260B	11/29/11 17:26
1,2-Dichloroethane-d4 (Surr)	99.3		% Recovery	EPA 8260B	11/29/11 17:26
Toluene - d8 (Surr)	99.8		% Recovery	EPA 8260B	11/29/11 17:26



Report Number : 79549

Date : 12/01/2011

Project Name : **Tesoro - Livermore**

Project Number : **01LV**

Sample : **CV-2**

Matrix : Water

Lab Number : 79549-05

Sample Date :11/21/2011

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date/Time Analyzed
Benzene	2800	8.0	ug/L	EPA 8260B	11/29/11 10:12
Toluene	7600	15	ug/L	EPA 8260B	12/01/11 06:13
Ethylbenzene	1800	8.0	ug/L	EPA 8260B	11/29/11 10:12
Total Xylenes	9300	8.0	ug/L	EPA 8260B	11/29/11 10:12
Methyl-t-butyl ether (MTBE)	< 8.0	8.0	ug/L	EPA 8260B	11/29/11 10:12
Diisopropyl ether (DIPE)	< 8.0	8.0	ug/L	EPA 8260B	11/29/11 10:12
Ethyl-t-butyl ether (ETBE)	< 8.0	8.0	ug/L	EPA 8260B	11/29/11 10:12
Tert-amyl methyl ether (TAME)	< 8.0	8.0	ug/L	EPA 8260B	11/29/11 10:12
Tert-Butanol	< 70	70	ug/L	EPA 8260B	12/01/11 06:13
Methanol	< 1500	1500	ug/L	EPA 8260B	12/01/11 06:13
Ethanol	< 150	150	ug/L	EPA 8260B	12/01/11 06:13
TPH as Gasoline	57000	800	ug/L	EPA 8260B	11/29/11 10:12
1,2-Dichloroethane-d4 (Surr)	96.5		% Recovery	EPA 8260B	11/29/11 10:12
Toluene - d8 (Surr)	98.6		% Recovery	EPA 8260B	11/29/11 10:12



Report Number : 79549

Date : 12/01/2011

Project Name : **Tesoro - Livermore**

Project Number : **01LV**

Sample : **CV-3**

Matrix : Water

Lab Number : 79549-06

Sample Date :11/21/2011

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date/Time Analyzed
Benzene	46	0.50	ug/L	EPA 8260B	11/29/11 02:26
Toluene	51	0.50	ug/L	EPA 8260B	11/29/11 02:26
Ethylbenzene	11	0.50	ug/L	EPA 8260B	11/29/11 02:26
Total Xylenes	110	0.50	ug/L	EPA 8260B	11/30/11 01:59
Methyl-t-butyl ether (MTBE)	< 0.50	0.50	ug/L	EPA 8260B	11/29/11 02:26
Diisopropyl ether (DIPE)	< 0.50	0.50	ug/L	EPA 8260B	11/29/11 02:26
Ethyl-t-butyl ether (ETBE)	< 0.50	0.50	ug/L	EPA 8260B	11/29/11 02:26
Tert-amyl methyl ether (TAME)	< 0.50	0.50	ug/L	EPA 8260B	11/29/11 02:26
Tert-Butanol	23	5.0	ug/L	EPA 8260B	11/29/11 02:26
Methanol	< 50	50	ug/L	EPA 8260B	11/29/11 02:26
Ethanol	< 20	20	ug/L	EPA 8260B	11/30/11 01:59
TPH as Gasoline	2400	50	ug/L	EPA 8260B	11/30/11 01:59
1,2-Dichloroethane-d4 (Surr)	103		% Recovery	EPA 8260B	11/29/11 02:26
Toluene - d8 (Surr)	102		% Recovery	EPA 8260B	11/29/11 02:26



Report Number : 79549

Date : 12/01/2011

Project Name : **Tesoro - Livermore**

Project Number : **01LV**

Sample : **CV-4**

Matrix : Water

Lab Number : 79549-07

Sample Date :11/21/2011

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date/Time Analyzed
Benzene	49	0.50	ug/L	EPA 8260B	11/29/11 16:05
Toluene	73	0.50	ug/L	EPA 8260B	11/29/11 16:05
Ethylbenzene	18	0.50	ug/L	EPA 8260B	11/29/11 16:05
Total Xylenes	91	0.50	ug/L	EPA 8260B	11/29/11 16:05
Methyl-t-butyl ether (MTBE)	< 0.50	0.50	ug/L	EPA 8260B	11/29/11 16:05
Diisopropyl ether (DIPE)	< 0.50	0.50	ug/L	EPA 8260B	11/29/11 16:05
Ethyl-t-butyl ether (ETBE)	< 0.50	0.50	ug/L	EPA 8260B	11/29/11 16:05
Tert-amyl methyl ether (TAME)	< 0.50	0.50	ug/L	EPA 8260B	11/29/11 16:05
Tert-Butanol	18	5.0	ug/L	EPA 8260B	11/29/11 16:05
Methanol	< 50	50	ug/L	EPA 8260B	11/29/11 16:05
Ethanol	< 20	20	ug/L	EPA 8260B	11/29/11 16:05
TPH as Gasoline	1400	50	ug/L	EPA 8260B	11/29/11 16:05
1,2-Dichloroethane-d4 (Surr)	102		% Recovery	EPA 8260B	11/29/11 16:05
Toluene - d8 (Surr)	99.2		% Recovery	EPA 8260B	11/29/11 16:05



Report Number : 79549

Date : 12/01/2011

Project Name : **Tesoro - Livermore**

Project Number : **01LV**

Sample : **IP-9 (15:25)**

Matrix : Water

Lab Number : 79549-08

Sample Date :11/21/2011

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date/Time Analyzed
Benzene	460	5.0	ug/L	EPA 8260B	11/30/11 04:32
Toluene	2400	5.0	ug/L	EPA 8260B	11/30/11 04:32
Ethylbenzene	1100	5.0	ug/L	EPA 8260B	11/30/11 04:32
Total Xylenes	5400	7.0	ug/L	EPA 8260B	12/01/11 13:05
Methyl-t-butyl ether (MTBE)	< 5.0	5.0	ug/L	EPA 8260B	11/30/11 04:32
Diisopropyl ether (DIPE)	< 5.0	5.0	ug/L	EPA 8260B	11/30/11 04:32
Ethyl-t-butyl ether (ETBE)	< 5.0	5.0	ug/L	EPA 8260B	11/30/11 04:32
Tert-amyl methyl ether (TAME)	< 5.0	5.0	ug/L	EPA 8260B	11/30/11 04:32
Tert-Butanol	33	25	ug/L	EPA 8260B	11/30/11 04:32
Methanol	< 500	500	ug/L	EPA 8260B	11/30/11 04:32
Ethanol	< 200	200	ug/L	EPA 8260B	11/30/11 04:32
TPH as Gasoline	32000	500	ug/L	EPA 8260B	11/30/11 04:32
1,2-Dichloroethane-d4 (Surr)	100		% Recovery	EPA 8260B	11/30/11 04:32
Toluene - d8 (Surr)	96.5		% Recovery	EPA 8260B	11/30/11 04:32



Report Number : 79549

Date : 12/01/2011

Project Name : **Tesoro - Livermore**

Project Number : **01LV**

Sample : **IP-8 (15:35)**

Matrix : Water

Lab Number : 79549-09

Sample Date :11/21/2011

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date/Time Analyzed
Benzene	3900	25	ug/L	EPA 8260B	11/30/11 05:40
Toluene	13000	25	ug/L	EPA 8260B	11/30/11 05:40
Ethylbenzene	2100	25	ug/L	EPA 8260B	11/30/11 05:40
Total Xylenes	12000	25	ug/L	EPA 8260B	11/30/11 05:40
Methyl-t-butyl ether (MTBE)	< 25	25	ug/L	EPA 8260B	11/30/11 05:40
Diisopropyl ether (DIPE)	< 25	25	ug/L	EPA 8260B	11/30/11 05:40
Ethyl-t-butyl ether (ETBE)	< 25	25	ug/L	EPA 8260B	11/30/11 05:40
Tert-amyl methyl ether (TAME)	< 25	25	ug/L	EPA 8260B	11/30/11 05:40
Tert-Butanol	150	150	ug/L	EPA 8260B	11/30/11 05:40
Methanol	< 2500	2500	ug/L	EPA 8260B	11/30/11 05:40
Ethanol	< 250	250	ug/L	EPA 8260B	11/30/11 05:40
TPH as Gasoline	70000	2500	ug/L	EPA 8260B	11/30/11 05:40
1,2-Dichloroethane-d4 (Surr)	103		% Recovery	EPA 8260B	11/30/11 05:40
Toluene - d8 (Surr)	99.6		% Recovery	EPA 8260B	11/30/11 05:40



Report Number : 79549

Date : 12/01/2011

Project Name : **Tesoro - Livermore**

Project Number : **01LV**

Sample : **DW-8 (15:45)**

Matrix : Water

Lab Number : 79549-10

Sample Date :11/21/2011

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date/Time Analyzed
Benzene	3700	20	ug/L	EPA 8260B	11/29/11 18:03
Toluene	10000	20	ug/L	EPA 8260B	11/29/11 18:03
Ethylbenzene	2400	20	ug/L	EPA 8260B	11/29/11 18:03
Total Xylenes	12000	20	ug/L	EPA 8260B	11/29/11 18:03
Methyl-t-butyl ether (MTBE)	< 20	20	ug/L	EPA 8260B	11/29/11 18:03
Diisopropyl ether (DIPE)	< 20	20	ug/L	EPA 8260B	11/29/11 18:03
Ethyl-t-butyl ether (ETBE)	< 20	20	ug/L	EPA 8260B	11/29/11 18:03
Tert-amyl methyl ether (TAME)	< 20	20	ug/L	EPA 8260B	11/29/11 18:03
Tert-Butanol	140	90	ug/L	EPA 8260B	11/29/11 18:03
Methanol	< 2000	2000	ug/L	EPA 8260B	11/29/11 18:03
Ethanol	< 200	200	ug/L	EPA 8260B	11/29/11 18:03
TPH as Gasoline	74000	2000	ug/L	EPA 8260B	11/29/11 18:03
1,2-Dichloroethane-d4 (Surr)	100		% Recovery	EPA 8260B	11/29/11 18:03
Toluene - d8 (Surr)	99.7		% Recovery	EPA 8260B	11/29/11 18:03

QC Report : Method Blank DataProject 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	11/29/2011
Ethylbenzene	< 0.50	0.50	ug/L	EPA 8260B	11/29/2011
Toluene	< 0.50	0.50	ug/L	EPA 8260B	11/29/2011
Total Xylenes	< 0.50	0.50	ug/L	EPA 8260B	11/29/2011
Diisopropyl ether (DIPE)	< 0.50	0.50	ug/L	EPA 8260B	11/29/2011
Ethanol	< 5.0	5.0	ug/L	EPA 8260B	11/29/2011
Ethyl-t-butyl ether (ETBE)	< 0.50	0.50	ug/L	EPA 8260B	11/29/2011
Methanol	< 50	50	ug/L	EPA 8260B	11/29/2011
Methyl-t-butyl ether (MTBE)	< 0.50	0.50	ug/L	EPA 8260B	11/29/2011
Tert-Butanol	< 5.0	5.0	ug/L	EPA 8260B	11/29/2011
Tert-amyl methyl ether (TAME)	< 0.50	0.50	ug/L	EPA 8260B	11/29/2011
TPH as Gasoline	< 50	50	ug/L	EPA 8260B	11/29/2011
1,2-Dichloroethane-d4 (Surr)	106		%	EPA 8260B	11/29/2011
Toluene - d8 (Surr)	102		%	EPA 8260B	11/29/2011

Benzene	< 0.50	0.50	ug/L	EPA 8260B	12/01/2011
Ethylbenzene	< 0.50	0.50	ug/L	EPA 8260B	12/01/2011
Toluene	< 0.50	0.50	ug/L	EPA 8260B	12/01/2011
Total Xylenes	< 0.50	0.50	ug/L	EPA 8260B	12/01/2011
Diisopropyl ether (DIPE)	< 0.50	0.50	ug/L	EPA 8260B	12/01/2011
Ethanol	< 5.0	5.0	ug/L	EPA 8260B	12/01/2011
Ethyl-t-butyl ether (ETBE)	< 0.50	0.50	ug/L	EPA 8260B	12/01/2011
Methanol	< 50	50	ug/L	EPA 8260B	12/01/2011
Methyl-t-butyl ether (MTBE)	< 0.50	0.50	ug/L	EPA 8260B	12/01/2011
Tert-Butanol	< 5.0	5.0	ug/L	EPA 8260B	12/01/2011
Tert-amyl methyl ether (TAME)	< 0.50	0.50	ug/L	EPA 8260B	12/01/2011
TPH as Gasoline	< 50	50	ug/L	EPA 8260B	12/01/2011
1,2-Dichloroethane-d4 (Surr)	102		%	EPA 8260B	12/01/2011
Toluene - d8 (Surr)	101		%	EPA 8260B	12/01/2011

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Total Xylenes	< 0.50	0.50	ug/L	EPA 8260B	11/29/2011
Ethanol	< 5.0	5.0	ug/L	EPA 8260B	11/29/2011
TPH as Gasoline	< 50	50	ug/L	EPA 8260B	11/29/2011

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	79549-06	46	39.9	40.0	84.5	84.8	ug/L	EPA 8260B	11/29/11	96.6	97.1	0.599	80-120	25
Diisopropyl ether	79549-06	<0.50	39.5	39.5	44.4	44.5	ug/L	EPA 8260B	11/29/11	112	113	0.105	80-120	25
Ethanol	79549-06	21	100	100	121	128	ug/L	EPA 8260B	11/29/11	99.6	107	6.82	55.1-159	25
Ethyl-tert-butyl ether	79549-06	<0.50	39.9	40.0	44.4	45.3	ug/L	EPA 8260B	11/29/11	111	113	1.74	76.5-120	25
Ethylbenzene	79549-06	11	39.9	40.0	50.5	50.1	ug/L	EPA 8260B	11/29/11	99.4	98.2	1.27	80-120	25
Methanol	79549-06	<50	998	1000	1190	1160	ug/L	EPA 8260B	11/29/11	120	116	2.81	53.2-147	25
Methyl-t-butyl ether	79549-06	<0.50	40.3	40.4	44.7	44.8	ug/L	EPA 8260B	11/29/11	111	111	0.0541	69.7-121	25
P + M Xylene	79549-06	32	39.9	40.0	69.3	69.8	ug/L	EPA 8260B	11/29/11	94.1	95.1	1.06	76.8-120	25
Tert-Butanol	79549-06	23	201	201	224	225	ug/L	EPA 8260B	11/29/11	100	101	0.553	80-120	25
Tert-amyl-methyl ether	79549-06	<0.50	39.4	39.4	45.7	45.5	ug/L	EPA 8260B	11/29/11	116	115	0.562	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	79549-06	51	39.9	40.0	89.2	89.4	ug/L	EPA 8260B	11/29/11	94.6	95.0	0.518	80-120	25
Benzene	79560-04	<0.50	39.9	40.0	39.7	40.3	ug/L	EPA 8260B	12/1/11	99.5	101	1.21	80-120	25
Diisopropyl ether	79560-04	<0.50	39.5	39.5	41.3	41.9	ug/L	EPA 8260B	12/1/11	105	106	1.12	80-120	25
Ethanol	79560-04	<5.0	100	100	111	109	ug/L	EPA 8260B	12/1/11	111	109	1.56	55.1-159	25
Ethyl-tert-butyl ether	79560-04	<0.50	39.9	40.0	41.4	42.1	ug/L	EPA 8260B	12/1/11	104	105	1.43	76.5-120	25
Ethylbenzene	79560-04	<0.50	39.9	40.0	39.3	39.6	ug/L	EPA 8260B	12/1/11	98.5	99.1	0.655	80-120	25
Methanol	79560-04	<50	998	1000	1150	1110	ug/L	EPA 8260B	12/1/11	115	111	3.61	53.2-147	25
Methyl-t-butyl ether	79560-04	1.1	40.3	40.4	40.4	41.6	ug/L	EPA 8260B	12/1/11	97.4	100	3.01	69.7-121	25
P + M Xylene	79560-04	<0.50	39.9	40.0	39.6	40.1	ug/L	EPA 8260B	12/1/11	99.2	100	1.04	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	79560-04	<5.0	201	201	205	208	ug/L	EPA 8260B	12/1/11	102	104	1.25	80-120	25
Tert-amyl-methyl ether	79560-04	<0.50	39.4	39.4	40.8	41.3	ug/L	EPA 8260B	12/1/11	104	105	0.988	78.9-120	25
Toluene	79560-04	<0.50	39.9	40.0	39.8	40.2	ug/L	EPA 8260B	12/1/11	99.8	100	0.746	80-120	25
Ethanol	79592-01	<5.0	100	100	86.7	87.9	ug/L	EPA 8260B	11/29/11	86.5	87.8	1.43	55.1-159	25
P + M Xylene	79592-01	<0.50	40.0	40.0	40.2	39.1	ug/L	EPA 8260B	11/29/11	101	97.9	2.79	76.8-120	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
Benzene	40.0	ug/L	EPA 8260B	11/29/11	109	80-120
Diisopropyl ether	39.5	ug/L	EPA 8260B	11/29/11	114	80-120
Ethanol	100	ug/L	EPA 8260B	11/29/11	103	55.1-159
Ethyl-tert-butyl ether	40.0	ug/L	EPA 8260B	11/29/11	113	76.5-120
Ethylbenzene	40.0	ug/L	EPA 8260B	11/29/11	103	80-120
Methanol	1000	ug/L	EPA 8260B	11/29/11	109	53.2-147
Methyl-t-butyl ether	40.4	ug/L	EPA 8260B	11/29/11	111	69.7-121
P + M Xylene	40.0	ug/L	EPA 8260B	11/29/11	104	76.8-120
Tert-Butanol	201	ug/L	EPA 8260B	11/29/11	97.8	80-120
Tert-amyl-methyl ether	39.4	ug/L	EPA 8260B	11/29/11	115	78.9-120
Toluene	40.0	ug/L	EPA 8260B	11/29/11	107	80-120
Benzene	40.0	ug/L	EPA 8260B	12/1/11	99.5	80-120
Diisopropyl ether	39.5	ug/L	EPA 8260B	12/1/11	103	80-120
Ethanol	100	ug/L	EPA 8260B	12/1/11	97.1	55.1-159
Ethyl-tert-butyl ether	40.0	ug/L	EPA 8260B	12/1/11	104	76.5-120
Ethylbenzene	40.0	ug/L	EPA 8260B	12/1/11	98.8	80-120
Methanol	1000	ug/L	EPA 8260B	12/1/11	106	53.2-147
Methyl-t-butyl ether	40.4	ug/L	EPA 8260B	12/1/11	99.1	69.7-121
P + M Xylene	40.0	ug/L	EPA 8260B	12/1/11	98.6	76.8-120
Tert-Butanol	201	ug/L	EPA 8260B	12/1/11	102	80-120
Tert-amyl-methyl ether	39.4	ug/L	EPA 8260B	12/1/11	104	78.9-120
Toluene	40.0	ug/L	EPA 8260B	12/1/11	99.8	80-120

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
Ethanol	101	ug/L	EPA 8260B	11/29/11	88.7	55.1-159
P + M Xylene	40.2	ug/L	EPA 8260B	11/29/11	101	76.8-120
TPH as Gasoline	502	ug/L	EPA 8260B	11/29/11	104	70.0-130



2795 2nd Street Suite 300
 Davis, CA 95616
 Lab: 530.297.4800
 Fax: 530.297.4808

Lab No. 79549

Page 1 of 1

Project Contact (Hardcopy or PDF To): Matthew Nelson		California EDF Report? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> 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												TAT 24hr 48hr 72hr 1wk 2wk	For Lab Use Only							
Phone No.: 510-525-2180	Fax No.: 510-525-2392	Global ID: T0600101410		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"/>						
Project Number: 67076	P.O. No.: 67076	EDF Deliverable To (Email Address): mnelson@orionenv.com																						
Project Name: Tesoro - Livermore		Sampler Signature: <i>Scott Strombecky</i>																						
Project Address: 1619 1st Street Livermore, California		Sampling		Container				Preservative				Matrix												
Sample Designation		Date	Time	40 ml VOA	SLEEVE	POLY	AMBER	TEDLAR	HCl	HNO ₃	ICE	NONE		WATER	SOIL			VAPOR						
IP-9	11/21/11	1140	3						X					X								1wk 12hr	01	
IP-8		1150	3						X					X									1wk 12hr	02
DW-8		1200	3						X					X									1wk 12hr	03
CV-1		1430	3						X					X									1wk 12hr	04
CV-2		1440	3						X					X							1wk 12hr	05		
CV-3		1450	3						X					X							1wk 12hr	06		
CV-4		1500	3						X					X							1wk 12hr	07		
IP-9		1525	3						X					X							1wk 12hr	08		
IP-8		1535	3						X					X							1wk 12hr	09		
DW-8		1545	3						X					X							1wk 12hr	10		
Relinquished by: <i>[Signature]</i>		Date: 11/21/11	Time: 1600	Received by: _____				Remarks: 																
Relinquished by: _____		Date:	Time:	Received by: _____																				
Relinquished by: _____		Date: 11/21/11	Time: 0800	Received by Laboratory: <i>Michelle Spencer</i>																Bill to: <i>KIFF</i> Tesoro Companies, Inc.				

Page 19 of 20

SAMPLE RECEIPT CHECKLIST

RECEIVER

MAS
Initials

SRG#: 79549 Date: 11/22/11

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: Yes No (includes water)
 Temperature °C 5.4 Therm. ID# IR-S Initial MAS Date/Time 11/22/11/0754 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 VDA # of containers received 30
 Matrix _____ Container type _____ # of containers received _____
 Matrix _____ Container type _____ # of containers received _____
 Date and Time Sample Put into Temp Storage Date: 11/22/11 Time: 0800

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: No sample times on VDAs for -08. All other VDAs had sample times that matched the COC. MAS/11/22/11 0800



Laboratory Results

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

Subject : 10 Water Samples
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 standard. All soil samples are reported on a total weight (wet weight) basis unless noted otherwise in the case narrative. 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,



Joel Kiff

Subject : 10 Water Samples
Project Name : Tesoro - Livermore
Project Number : 01LV
P.O. Number : 67076

Case Narrative

The Method Reporting Limit for Nitrate by EPA method 300.0 has been raised for sample IP-9 due to interference from carbonate.

The Method Reporting Limit for Ethanol has been increased due to the presence of an interfering compound for samples IP-9 (1040), IP-8 (1050), DW-8 (1140), CV-1, CV-3, CV-4, IP-9 (1515), IP-8 (1530) and DW-8 (1545).

Matrix Spike/Matrix Spike Duplicate results associated with samples DW-8 (1545), IP-8 (1530) and IP-9 (1515) 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 (1515) for the analyte Sulfate were affected by the analyte concentration present in the un-spiked sample.

Matrix Spike/Matrix Spike Duplicate results associated with samples IP-9 (1515), IP-8 (1530), and DW-8 (1545) for the analyte Sodium were affected by the analyte concentrations already present in the un-spiked sample.

Sample IP-9 (1040) was analyzed for Total Xylenes outside of hold time for Method EPA 8260B. The hydrochloric acid (HCl) preservation was insufficient to maintain a pH of 2.0 or less required to extend sample hold time beyond seven days.

Project Name : **Tesoro - Livermore**

Project Number : **01LV**

Sample : **IP-9 (1040)**

Matrix : Water

Lab Number : 79564-01

Sample Date :11/22/2011

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date/Time Analyzed
Benzene	440	5.0	ug/L	EPA 8260B	11/29/11 17:48
Toluene	2500	5.0	ug/L	EPA 8260B	11/29/11 17:48
Ethylbenzene	1100	5.0	ug/L	EPA 8260B	11/29/11 17:48
Total Xylenes	6100	9.0	ug/L	EPA 8260B	12/01/11 04:28
Methyl-t-butyl ether (MTBE)	< 5.0	5.0	ug/L	EPA 8260B	11/29/11 17:48
Diisopropyl ether (DIPE)	< 5.0	5.0	ug/L	EPA 8260B	11/29/11 17:48
Ethyl-t-butyl ether (ETBE)	< 5.0	5.0	ug/L	EPA 8260B	11/29/11 17:48
Tert-amyl methyl ether (TAME)	< 5.0	5.0	ug/L	EPA 8260B	11/29/11 17:48
Tert-Butanol	32	25	ug/L	EPA 8260B	11/29/11 17:48
Methanol	< 500	500	ug/L	EPA 8260B	11/29/11 17:48
Ethanol	< 80	80	ug/L	EPA 8260B	11/29/11 17:48
TPH as Gasoline	32000	500	ug/L	EPA 8260B	11/29/11 17:48
1,2-Dichloroethane-d4 (Surr)	101		% Recovery	EPA 8260B	11/29/11 17:48
Toluene - d8 (Surr)	96.6		% Recovery	EPA 8260B	11/29/11 17:48

Project Name : **Tesoro - Livermore**

Project Number : **01LV**

Sample : **IP-8 (1050)**

Matrix : Water

Lab Number : 79564-02

Sample Date :11/22/2011

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date/Time Analyzed
Benzene	4000	25	ug/L	EPA 8260B	11/30/11 05:06
Toluene	13000	25	ug/L	EPA 8260B	11/30/11 05:06
Ethylbenzene	2200	25	ug/L	EPA 8260B	11/30/11 05:06
Total Xylenes	13000	25	ug/L	EPA 8260B	11/30/11 05:06
Methyl-t-butyl ether (MTBE)	< 25	25	ug/L	EPA 8260B	11/30/11 05:06
Diisopropyl ether (DIPE)	< 25	25	ug/L	EPA 8260B	11/30/11 05:06
Ethyl-t-butyl ether (ETBE)	< 25	25	ug/L	EPA 8260B	11/30/11 05:06
Tert-amyl methyl ether (TAME)	< 25	25	ug/L	EPA 8260B	11/30/11 05:06
Tert-Butanol	< 150	150	ug/L	EPA 8260B	11/30/11 05:06
Methanol	< 2500	2500	ug/L	EPA 8260B	11/30/11 05:06
Ethanol	< 300	300	ug/L	EPA 8260B	11/30/11 05:06
TPH as Gasoline	75000	2500	ug/L	EPA 8260B	11/30/11 05:06
1,2-Dichloroethane-d4 (Surr)	103		% Recovery	EPA 8260B	11/30/11 05:06
Toluene - d8 (Surr)	98.9		% Recovery	EPA 8260B	11/30/11 05:06

Project Name : **Tesoro - Livermore**

Project Number : **01LV**

Sample : **DW-8 (1140)**

Matrix : Water

Lab Number : 79564-03

Sample Date :11/22/2011

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date/Time Analyzed
Benzene	3700	20	ug/L	EPA 8260B	11/30/11 03:23
Toluene	9500	20	ug/L	EPA 8260B	11/30/11 03:23
Ethylbenzene	2600	20	ug/L	EPA 8260B	11/30/11 03:23
Total Xylenes	12000	20	ug/L	EPA 8260B	11/30/11 03:23
Methyl-t-butyl ether (MTBE)	< 20	20	ug/L	EPA 8260B	11/30/11 03:23
Diisopropyl ether (DIPE)	< 20	20	ug/L	EPA 8260B	11/30/11 03:23
Ethyl-t-butyl ether (ETBE)	< 20	20	ug/L	EPA 8260B	11/30/11 03:23
Tert-amyl methyl ether (TAME)	< 20	20	ug/L	EPA 8260B	11/30/11 03:23
Tert-Butanol	< 90	90	ug/L	EPA 8260B	11/30/11 03:23
Methanol	< 2000	2000	ug/L	EPA 8260B	11/30/11 03:23
Ethanol	< 300	300	ug/L	EPA 8260B	11/30/11 03:23
TPH as Gasoline	71000	2000	ug/L	EPA 8260B	11/30/11 03:23
1,2-Dichloroethane-d4 (Surr)	102		% Recovery	EPA 8260B	11/30/11 03:23
Toluene - d8 (Surr)	98.6		% Recovery	EPA 8260B	11/30/11 03:23

Project Name : **Tesoro - Livermore**

Project Number : **01LV**

Sample : **CV-1**

Matrix : Water

Lab Number : 79564-04

Sample Date :11/22/2011

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date/Time Analyzed
Benzene	2800	15	ug/L	EPA 8260B	12/01/11 06:11
Toluene	8400	15	ug/L	EPA 8260B	12/01/11 06:11
Ethylbenzene	1800	15	ug/L	EPA 8260B	12/01/11 06:11
Total Xylenes	9600	15	ug/L	EPA 8260B	12/01/11 06:11
Methyl-t-butyl ether (MTBE)	< 15	15	ug/L	EPA 8260B	12/01/11 06:11
Diisopropyl ether (DIPE)	< 15	15	ug/L	EPA 8260B	12/01/11 06:11
Ethyl-t-butyl ether (ETBE)	< 15	15	ug/L	EPA 8260B	12/01/11 06:11
Tert-amyl methyl ether (TAME)	< 15	15	ug/L	EPA 8260B	12/01/11 06:11
Tert-Butanol	77	70	ug/L	EPA 8260B	12/01/11 06:11
Methanol	< 1500	1500	ug/L	EPA 8260B	12/01/11 06:11
Ethanol	< 300	300	ug/L	EPA 8260B	12/01/11 06:11
TPH as Gasoline	54000	1500	ug/L	EPA 8260B	12/01/11 06:11
1,2-Dichloroethane-d4 (Surr)	102		% Recovery	EPA 8260B	12/01/11 06:11
Toluene - d8 (Surr)	99.4		% Recovery	EPA 8260B	12/01/11 06:11

Project Name : **Tesoro - Livermore**

Project Number : **01LV**

Sample : **CV-2**

Matrix : Water

Lab Number : 79564-05

Sample Date :11/22/2011

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date/Time Analyzed
Benzene	2700	9.0	ug/L	EPA 8260B	11/29/11 09:38
Toluene	9100	15	ug/L	EPA 8260B	12/01/11 14:04
Ethylbenzene	1800	9.0	ug/L	EPA 8260B	11/29/11 09:38
Total Xylenes	8800	9.0	ug/L	EPA 8260B	11/29/11 09:38
Methyl-t-butyl ether (MTBE)	< 9.0	9.0	ug/L	EPA 8260B	11/29/11 09:38
Diisopropyl ether (DIPE)	< 9.0	9.0	ug/L	EPA 8260B	11/29/11 09:38
Ethyl-t-butyl ether (ETBE)	< 9.0	9.0	ug/L	EPA 8260B	11/29/11 09:38
Tert-amyl methyl ether (TAME)	< 9.0	9.0	ug/L	EPA 8260B	11/29/11 09:38
Tert-Butanol	< 50	50	ug/L	EPA 8260B	11/29/11 09:38
Methanol	< 900	900	ug/L	EPA 8260B	11/29/11 09:38
Ethanol	< 90	90	ug/L	EPA 8260B	11/29/11 09:38
TPH as Gasoline	53000	900	ug/L	EPA 8260B	11/29/11 09:38
1,2-Dichloroethane-d4 (Surr)	98.6		% Recovery	EPA 8260B	11/29/11 09:38
Toluene - d8 (Surr)	98.0		% Recovery	EPA 8260B	11/29/11 09:38

Project Name : **Tesoro - Livermore**

Project Number : **01LV**

Sample : **CV-3**

Matrix : Water

Lab Number : 79564-06

Sample Date :11/22/2011

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date/Time Analyzed
Benzene	140	0.50	ug/L	EPA 8260B	11/29/11 15:31
Toluene	190	0.50	ug/L	EPA 8260B	11/29/11 15:31
Ethylbenzene	37	0.50	ug/L	EPA 8260B	11/29/11 15:31
Total Xylenes	170	0.50	ug/L	EPA 8260B	11/29/11 15:31
Methyl-t-butyl ether (MTBE)	0.56	0.50	ug/L	EPA 8260B	11/29/11 15:31
Diisopropyl ether (DIPE)	< 0.50	0.50	ug/L	EPA 8260B	11/29/11 15:31
Ethyl-t-butyl ether (ETBE)	< 0.50	0.50	ug/L	EPA 8260B	11/29/11 15:31
Tert-amyl methyl ether (TAME)	< 0.50	0.50	ug/L	EPA 8260B	11/29/11 15:31
Tert-Butanol	24	5.0	ug/L	EPA 8260B	11/29/11 15:31
Methanol	< 50	50	ug/L	EPA 8260B	11/29/11 15:31
Ethanol	< 20	20	ug/L	EPA 8260B	11/29/11 15:31
TPH as Gasoline	2000	50	ug/L	EPA 8260B	11/29/11 15:31
1,2-Dichloroethane-d4 (Surr)	103		% Recovery	EPA 8260B	11/29/11 15:31
Toluene - d8 (Surr)	99.5		% Recovery	EPA 8260B	11/29/11 15:31

Project Name : **Tesoro - Livermore**

Project Number : **01LV**

Sample : **CV-4**

Matrix : Water

Lab Number : 79564-07

Sample Date :11/22/2011

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date/Time Analyzed
Benzene	120	0.50	ug/L	EPA 8260B	11/29/11 14:56
Toluene	170	0.50	ug/L	EPA 8260B	11/29/11 14:56
Ethylbenzene	35	0.50	ug/L	EPA 8260B	11/29/11 14:56
Total Xylenes	160	0.50	ug/L	EPA 8260B	11/29/11 14:56
Methyl-t-butyl ether (MTBE)	0.57	0.50	ug/L	EPA 8260B	11/29/11 14:56
Diisopropyl ether (DIPE)	< 0.50	0.50	ug/L	EPA 8260B	11/29/11 14:56
Ethyl-t-butyl ether (ETBE)	< 0.50	0.50	ug/L	EPA 8260B	11/29/11 14:56
Tert-amyl methyl ether (TAME)	< 0.50	0.50	ug/L	EPA 8260B	11/29/11 14:56
Tert-Butanol	18	5.0	ug/L	EPA 8260B	11/29/11 14:56
Methanol	< 50	50	ug/L	EPA 8260B	11/29/11 14:56
Ethanol	< 20	20	ug/L	EPA 8260B	11/29/11 14:56
TPH as Gasoline	1800	50	ug/L	EPA 8260B	11/29/11 14:56
1,2-Dichloroethane-d4 (Surr)	101		% Recovery	EPA 8260B	11/29/11 14:56
Toluene - d8 (Surr)	98.7		% Recovery	EPA 8260B	11/29/11 14:56

Project Name : **Tesoro - Livermore**

Project Number : **01LV**

Sample : **IP-9 (1515)**

Matrix : Water

Lab Number : 79564-08

Sample Date :11/22/2011

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date/Time Analyzed
Nitrate as N	< 0.50	0.50	mg/L	EPA 300.0	11/23/11 18:27
Sulfate	300	5.0	mg/L	EPA 300.0	11/29/11 16:19
Ferrous Iron	< 0.10	0.10	mg/L	SM 3500-Fe D	11/23/11 12:02
Hexavalent Chromium	12	1.0	ug/L	EPA 7199	11/23/11 14:07
Arsenic	0.049	0.015	mg/L	EPA 200.7	11/30/11 11:35
Chromium	0.017	0.0050	mg/L	EPA 200.7	11/30/11 11:35
Iron	1.8	0.10	mg/L	EPA 200.7	11/30/11 11:35
Manganese	0.10	0.0050	mg/L	EPA 200.7	11/30/11 11:35
Sodium	1500	5.0	mg/L	EPA 200.7	11/30/11 15:06
Benzene	410	5.0	ug/L	EPA 8260B	11/29/11 17:13
Toluene	2300	5.0	ug/L	EPA 8260B	11/29/11 17:13
Ethylbenzene	1000	5.0	ug/L	EPA 8260B	11/29/11 17:13
Total Xylenes	5300	5.0	ug/L	EPA 8260B	11/29/11 17:13
Methyl-t-butyl ether (MTBE)	< 5.0	5.0	ug/L	EPA 8260B	11/29/11 17:13
Diisopropyl ether (DIPE)	< 5.0	5.0	ug/L	EPA 8260B	11/29/11 17:13
Ethyl-t-butyl ether (ETBE)	< 5.0	5.0	ug/L	EPA 8260B	11/29/11 17:13
Tert-amyl methyl ether (TAME)	< 5.0	5.0	ug/L	EPA 8260B	11/29/11 17:13
Tert-Butanol	28	25	ug/L	EPA 8260B	11/29/11 17:13
Methanol	< 500	500	ug/L	EPA 8260B	11/29/11 17:13
Ethanol	< 80	80	ug/L	EPA 8260B	11/29/11 17:13
TPH as Gasoline	30000	500	ug/L	EPA 8260B	11/29/11 17:13
1,2-Dichloroethane-d4 (Surr)	101		% Recovery	EPA 8260B	11/29/11 17:13
Toluene - d8 (Surr)	96.9		% Recovery	EPA 8260B	11/29/11 17:13

Project Name : **Tesoro - Livermore**

Project Number : **01LV**

Sample : **IP-8 (1530)**

Matrix : Water

Lab Number : 79564-09

Sample Date :11/22/2011

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date/Time Analyzed
Nitrate as N	0.31	0.10	mg/L	EPA 300.0	11/23/11 18:55
Sulfate	34	0.50	mg/L	EPA 300.0	11/23/11 16:26
Ferrous Iron	< 0.10	0.10	mg/L	SM 3500-Fe D	11/23/11 12:03
Hexavalent Chromium	< 1.0	1.0	ug/L	EPA 7199	11/23/11 14:16
Arsenic	< 0.015	0.015	mg/L	EPA 200.7	11/30/11 11:39
Chromium	0.011	0.0050	mg/L	EPA 200.7	11/30/11 11:39
Iron	2.9	0.10	mg/L	EPA 200.7	11/30/11 11:39
Manganese	2.4	0.0050	mg/L	EPA 200.7	11/30/11 11:39
Sodium	81	0.50	mg/L	EPA 200.7	11/30/11 11:39
Benzene	3400	25	ug/L	EPA 8260B	11/30/11 06:15
Toluene	12000	25	ug/L	EPA 8260B	11/30/11 06:15
Ethylbenzene	2100	25	ug/L	EPA 8260B	11/30/11 06:15
Total Xylenes	12000	25	ug/L	EPA 8260B	11/30/11 06:15
Methyl-t-butyl ether (MTBE)	< 25	25	ug/L	EPA 8260B	11/30/11 06:15
Diisopropyl ether (DIPE)	< 25	25	ug/L	EPA 8260B	11/30/11 06:15
Ethyl-t-butyl ether (ETBE)	< 25	25	ug/L	EPA 8260B	11/30/11 06:15
Tert-amyl methyl ether (TAME)	< 25	25	ug/L	EPA 8260B	11/30/11 06:15
Tert-Butanol	< 150	150	ug/L	EPA 8260B	11/30/11 06:15
Methanol	< 2500	2500	ug/L	EPA 8260B	11/30/11 06:15
Ethanol	< 500	500	ug/L	EPA 8260B	11/30/11 06:15
TPH as Gasoline	71000	2500	ug/L	EPA 8260B	11/30/11 06:15
1,2-Dichloroethane-d4 (Surr)	103		% Recovery	EPA 8260B	11/30/11 06:15
Toluene - d8 (Surr)	99.4		% Recovery	EPA 8260B	11/30/11 06:15

Project Name : **Tesoro - Livermore**

Project Number : **01LV**

Sample : **DW-8 (1545)**

Matrix : Water

Lab Number : 79564-10

Sample Date :11/22/2011

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date/Time Analyzed
Nitrate as N	< 0.10	0.10	mg/L	EPA 300.0	11/23/11 20:21
Sulfate	24	0.50	mg/L	EPA 300.0	11/23/11 16:55
Ferrous Iron	0.16	0.10	mg/L	SM 3500-Fe D	11/23/11 12:04
Hexavalent Chromium	< 1.0	1.0	ug/L	EPA 7199	11/23/11 13:39
Arsenic	< 0.015	0.015	mg/L	EPA 200.7	11/30/11 11:43
Chromium	0.031	0.0050	mg/L	EPA 200.7	11/30/11 11:43
Iron	9.1	0.10	mg/L	EPA 200.7	11/30/11 11:43
Manganese	2.4	0.0050	mg/L	EPA 200.7	11/30/11 11:43
Sodium	64	0.50	mg/L	EPA 200.7	11/30/11 11:43
Benzene	3600	20	ug/L	EPA 8260B	11/30/11 06:49
Toluene	10000	20	ug/L	EPA 8260B	11/30/11 06:49
Ethylbenzene	2600	20	ug/L	EPA 8260B	11/30/11 06:49
Total Xylenes	13000	20	ug/L	EPA 8260B	11/30/11 06:49
Methyl-t-butyl ether (MTBE)	< 20	20	ug/L	EPA 8260B	11/30/11 06:49
Diisopropyl ether (DIPE)	< 20	20	ug/L	EPA 8260B	11/30/11 06:49
Ethyl-t-butyl ether (ETBE)	< 20	20	ug/L	EPA 8260B	11/30/11 06:49
Tert-amyl methyl ether (TAME)	< 20	20	ug/L	EPA 8260B	11/30/11 06:49
Tert-Butanol	< 90	90	ug/L	EPA 8260B	11/30/11 06:49
Methanol	< 2000	2000	ug/L	EPA 8260B	11/30/11 06:49
Ethanol	< 300	300	ug/L	EPA 8260B	11/30/11 06:49
TPH as Gasoline	73000	2000	ug/L	EPA 8260B	11/30/11 06:49
1,2-Dichloroethane-d4 (Surr)	102		% Recovery	EPA 8260B	11/30/11 06:49
Toluene - d8 (Surr)	98.9		% Recovery	EPA 8260B	11/30/11 06:49

QC Report : Method Blank Data

Project Name : **Tesoro - Livermore**

Project Number : **01LV**

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Arsenic	< 0.015	0.015	mg/L	EPA 200.7	11/30/2011
Chromium	< 0.0050	0.0050	mg/L	EPA 200.7	11/30/2011
Iron	< 0.10	0.10	mg/L	EPA 200.7	11/30/2011
Manganese	< 0.0050	0.0050	mg/L	EPA 200.7	11/30/2011
Sodium	< 0.50	0.50	mg/L	EPA 200.7	11/30/2011
Benzene	< 0.50	0.50	ug/L	EPA 8260B	11/29/2011
Ethylbenzene	< 0.50	0.50	ug/L	EPA 8260B	11/29/2011
Toluene	< 0.50	0.50	ug/L	EPA 8260B	11/29/2011
Total Xylenes	< 0.50	0.50	ug/L	EPA 8260B	11/29/2011
Diisopropyl ether (DIPE)	< 0.50	0.50	ug/L	EPA 8260B	11/29/2011
Ethanol	< 5.0	5.0	ug/L	EPA 8260B	11/29/2011
Ethyl-t-butyl ether (ETBE)	< 0.50	0.50	ug/L	EPA 8260B	11/29/2011
Methanol	< 50	50	ug/L	EPA 8260B	11/29/2011
Methyl-t-butyl ether (MTBE)	< 0.50	0.50	ug/L	EPA 8260B	11/29/2011
Tert-Butanol	< 5.0	5.0	ug/L	EPA 8260B	11/29/2011
Tert-amyl methyl ether (TAME)	< 0.50	0.50	ug/L	EPA 8260B	11/29/2011
TPH as Gasoline	< 50	50	ug/L	EPA 8260B	11/29/2011
1,2-Dichloroethane-d4 (Surr)	106		%	EPA 8260B	11/29/2011
Toluene - d8 (Surr)	102		%	EPA 8260B	11/29/2011
Benzene	< 0.50	0.50	ug/L	EPA 8260B	12/01/2011
Ethylbenzene	< 0.50	0.50	ug/L	EPA 8260B	12/01/2011
Toluene	< 0.50	0.50	ug/L	EPA 8260B	12/01/2011
Total Xylenes	< 0.50	0.50	ug/L	EPA 8260B	12/01/2011
Diisopropyl ether (DIPE)	< 0.50	0.50	ug/L	EPA 8260B	12/01/2011
Ethanol	< 5.0	5.0	ug/L	EPA 8260B	12/01/2011
Ethyl-t-butyl ether (ETBE)	< 0.50	0.50	ug/L	EPA 8260B	12/01/2011
Methanol	< 50	50	ug/L	EPA 8260B	12/01/2011
Methyl-t-butyl ether (MTBE)	< 0.50	0.50	ug/L	EPA 8260B	12/01/2011
Tert-Butanol	< 5.0	5.0	ug/L	EPA 8260B	12/01/2011
Tert-amyl methyl ether (TAME)	< 0.50	0.50	ug/L	EPA 8260B	12/01/2011
TPH as Gasoline	< 50	50	ug/L	EPA 8260B	12/01/2011
1,2-Dichloroethane-d4 (Surr)	102		%	EPA 8260B	12/01/2011

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Toluene - d8 (Surr)	101		%	EPA 8260B	12/01/2011
Nitrate as N	<0.50	0.50	mg/L	EPA 300.0	11/23/2011
Sulfate	<0.50	0.50	mg/L	EPA 300.0	11/23/2011
Ferrous Iron	<0.10	0.10	mg/L	SM 3500-Fe D	11/23/2011
Hexavalent Chromium	<1.0	1.0	ug/L	EPA 7199	11/23/2011
Sulfate	<0.50	0.50	mg/L	EPA 300.0	11/29/2011

QC Report : Matrix Spike/ Matrix Spike DuplicateProject 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
Nitrate as N														
	79550-01	< 0.50	0.500	0.500	0.729	0.732	mg/L	EPA 300.0	11/23/11	90.5	91.2	0.478	85.0-115	10
Sulfate														
	79550-01	1.5	2.50	2.50	4.09	4.20	mg/L	EPA 300.0	11/23/11	105	109	2.64	85.0-115	10
Ferrous Iron														
	79564-08	< 0.10	0.251	0.251	0.327	0.316	mg/L	SM 3500-Fe D	11/23/11	121	117	3.42	70.0-130	25
Hexavalent Chromium														
	79564-10	< 1.0	5.00	5.00	5.55	5.14	ug/L	EPA 7199	11/23/11	111	103	7.72	90.0-110	10
Benzene														
	79549-06	46	39.9	40.0	84.5	84.8	ug/L	EPA 8260B	11/29/11	96.6	97.1	0.599	80-120	25
Diisopropyl ether														
	79549-06	<0.50	39.5	39.5	44.4	44.5	ug/L	EPA 8260B	11/29/11	112	113	0.105	80-120	25
Ethanol														
	79549-06	21	100	100	121	128	ug/L	EPA 8260B	11/29/11	99.6	107	6.82	55.1-159	25
Ethyl-tert-butyl ether														
	79549-06	<0.50	39.9	40.0	44.4	45.3	ug/L	EPA 8260B	11/29/11	111	113	1.74	76.5-120	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
Ethylbenzene	79549-06	11	39.9	40.0	50.5	50.1	ug/L	EPA 8260B	11/29/11	99.4	98.2	1.27	80-120	25
Methanol	79549-06	<50	998	1000	1190	1160	ug/L	EPA 8260B	11/29/11	120	116	2.81	53.2-147	25
Methyl-t-butyl ether	79549-06	<0.50	40.3	40.4	44.7	44.8	ug/L	EPA 8260B	11/29/11	111	111	0.0541	69.7-121	25
P + M Xylene	79549-06	32	39.9	40.0	69.3	69.8	ug/L	EPA 8260B	11/29/11	94.1	95.1	1.06	76.8-120	25
Tert-Butanol	79549-06	23	201	201	224	225	ug/L	EPA 8260B	11/29/11	100	101	0.553	80-120	25
Tert-amyl-methyl ether	79549-06	<0.50	39.4	39.4	45.7	45.5	ug/L	EPA 8260B	11/29/11	116	115	0.562	78.9-120	25
Toluene	79549-06	51	39.9	40.0	89.2	89.4	ug/L	EPA 8260B	11/29/11	94.6	95.0	0.518	80-120	25
Benzene	79560-04	<0.50	39.9	40.0	39.7	40.3	ug/L	EPA 8260B	12/1/11	99.5	101	1.21	80-120	25
Diisopropyl ether	79560-04	<0.50	39.5	39.5	41.3	41.9	ug/L	EPA 8260B	12/1/11	105	106	1.12	80-120	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
Ethanol	79560-04	<5.0	100	100	111	109	ug/L	EPA 8260B	12/1/11	111	109	1.56	55.1-159	25
Ethyl-tert-butyl ether	79560-04	<0.50	39.9	40.0	41.4	42.1	ug/L	EPA 8260B	12/1/11	104	105	1.43	76.5-120	25
Ethylbenzene	79560-04	<0.50	39.9	40.0	39.3	39.6	ug/L	EPA 8260B	12/1/11	98.5	99.1	0.655	80-120	25
Methanol	79560-04	<50	998	1000	1150	1110	ug/L	EPA 8260B	12/1/11	115	111	3.61	53.2-147	25
Methyl-t-butyl ether	79560-04	1.1	40.3	40.4	40.4	41.6	ug/L	EPA 8260B	12/1/11	97.4	100	3.01	69.7-121	25
P + M Xylene	79560-04	<0.50	39.9	40.0	39.6	40.1	ug/L	EPA 8260B	12/1/11	99.2	100	1.04	76.8-120	25
Tert-Butanol	79560-04	<5.0	201	201	205	208	ug/L	EPA 8260B	12/1/11	102	104	1.25	80-120	25
Tert-amyl-methyl ether	79560-04	<0.50	39.4	39.4	40.8	41.3	ug/L	EPA 8260B	12/1/11	104	105	0.988	78.9-120	25
Toluene	79560-04	<0.50	39.9	40.0	39.8	40.2	ug/L	EPA 8260B	12/1/11	99.8	100	0.746	80-120	25

QC Report : Matrix Spike/ Matrix Spike DuplicateProject 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
Sulfate	79564-09	33	2.50	2.50	35.3	35.8	mg/L	EPA 300.0	11/29/11	73.6	94.5	1.46	85.0-115	10
Arsenic	79540-01	< 0.015	0.400	0.400	0.410	0.405	mg/L	EPA 200.7	11/30/11	102	101	1.18	75-125	20
Chromium	79540-01	< 0.0050	0.400	0.400	0.401	0.400	mg/L	EPA 200.7	11/30/11	99.6	99.3	0.250	75-125	20
Iron	79540-01	0.76	0.400	0.400	1.14	1.10	mg/L	EPA 200.7	11/30/11	94.7	83.7	3.93	75-125	20
Manganese	79540-01	0.038	0.400	0.400	0.422	0.419	mg/L	EPA 200.7	11/30/11	95.9	95.2	0.642	75-125	20
Sodium	79540-01	220	0.400	0.400	209	215	mg/L	EPA 200.7	11/30/11	0.00	0.00	2.74	75-125	20

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
Arsenic	0.400	mg/L	EPA 200.7	11/30/11	96.4	85-115
Chromium	0.400	mg/L	EPA 200.7	11/30/11	100	85-115
Iron	0.400	mg/L	EPA 200.7	11/30/11	101	85-115
Manganese	0.400	mg/L	EPA 200.7	11/30/11	97.9	85-115
Sodium	0.400	mg/L	EPA 200.7	11/30/11	102	85-115
Benzene	40.0	ug/L	EPA 8260B	11/29/11	109	80-120
Diisopropyl ether	39.5	ug/L	EPA 8260B	11/29/11	114	80-120
Ethanol	100	ug/L	EPA 8260B	11/29/11	103	55.1-159
Ethyl-tert-butyl ether	40.0	ug/L	EPA 8260B	11/29/11	113	76.5-120
Ethylbenzene	40.0	ug/L	EPA 8260B	11/29/11	103	80-120
Methanol	1000	ug/L	EPA 8260B	11/29/11	109	53.2-147
Methyl-t-butyl ether	40.4	ug/L	EPA 8260B	11/29/11	111	69.7-121
P + M Xylene	40.0	ug/L	EPA 8260B	11/29/11	104	76.8-120
Tert-Butanol	201	ug/L	EPA 8260B	11/29/11	97.8	80-120
Tert-amyl-methyl ether	39.4	ug/L	EPA 8260B	11/29/11	115	78.9-120
Toluene	40.0	ug/L	EPA 8260B	11/29/11	107	80-120
Benzene	40.0	ug/L	EPA 8260B	12/1/11	99.5	80-120
Diisopropyl ether	39.5	ug/L	EPA 8260B	12/1/11	103	80-120
Ethanol	100	ug/L	EPA 8260B	12/1/11	97.1	55.1-159
Ethyl-tert-butyl ether	40.0	ug/L	EPA 8260B	12/1/11	104	76.5-120

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
Ethylbenzene	40.0	ug/L	EPA 8260B	12/1/11	98.8	80-120
Methanol	1000	ug/L	EPA 8260B	12/1/11	106	53.2-147
Methyl-t-butyl ether	40.4	ug/L	EPA 8260B	12/1/11	99.1	69.7-121
P + M Xylene	40.0	ug/L	EPA 8260B	12/1/11	98.6	76.8-120
Tert-Butanol	201	ug/L	EPA 8260B	12/1/11	102	80-120
Tert-amyl-methyl ether	39.4	ug/L	EPA 8260B	12/1/11	104	78.9-120
Toluene	40.0	ug/L	EPA 8260B	12/1/11	99.8	80-120
Nitrate as N	0.500	mg/L	EPA 300.0	11/23/11	95.1	85.0-115
Sulfate	2.50	mg/L	EPA 300.0	11/23/11	97.7	85.0-115
Ferrous Iron	0.251	mg/L	SM 3500-Fe D	11/23/11	101	70.0-130
Hexavalent Chromium	5.00	ug/L	EPA 7199	11/23/11	95.8	90.0-110
Sulfate	2.50	mg/L	EPA 300.0	11/29/11	99.0	85.0-115



2795 2nd Street Suite 300
 Davis, CA 95616
 Lab: 530.297.4800
 Fax: 530.297.4808

Lab No. 79564

Page 1 of 1

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: *SCOTT STROMBELY*

Chain-of-Custody Record and Analysis Request

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"/>	METHODS BY ICP NO ₃ ⁻ , SO ₄ ²⁻ , Fe ³⁺ , Cr ⁶⁺ , (Fe, Ni, Mn, Cr, As)	TOTAL ALK, TDS, CO ₂ , CH ₄	<input checked="" type="checkbox"/> 24hr <input type="checkbox"/> 48hr <input type="checkbox"/> 72hr <input type="checkbox"/> 1wk <input checked="" type="checkbox"/> 2wk <input type="checkbox"/>	
				X				X							1wk 48hr	01
				X				X							1wk 48hr	02
				X				X							1wk 48hr	03
				X				X							1wk 48hr	04
				X				X							1wk 48hr	05
				X				X							1wk	06
				X				X					X	X	1wk	08
				X	X	X		X					X	X	1wk	09
				X	X	X		X					X	X	1wk	10

Sample Designation	Sampling		Container					Preservative				Matrix		
	Date	Time	40 ml VOA	SLEEVE	POLY	AMBER	TEDLAR	HCl	HNO ₃	ICE	NONE	WATER	SOIL	VAPOR
1P-9	11/22/11	1040	3					X				X		
1P-8		1050	3					X				X		
DW-8		1140	3					X				X		
CV-1		1230	3					X				X		
CV-2		1240	3					X				X		
CV-3		1250	3					X				X		
CV-4		1300	3					X				X		
1P-9		1515	7		4			X	X	X		X		
1P-8		1530	7		4			X	X	X		X		
DW-8		1545	7		4			X	X	X		X		

Relinquished by: *SM* **Date:** 11/22/11 **Time:** 1600 **Received by:** _____

Relinquished by: _____ **Date:** _____ **Time:** _____ **Received by:** _____

Relinquished by: _____ **Date:** 11/23/11 **Time:** 0818 **Received by Laboratory:** *KIFF* **Bill to:** Tesoro Companies, Inc.

SAMPLE RECEIPT CHECKLIST

RECEIVER

MAS
Initials

SRG#: 79564 Date: 112311

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: Yes No (includes water)
 Temperature °C 5.0 Therm. ID# IR-5 Initial MAS Date/Time 11/23/11 0809 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 42
 Matrix WA Container type POly # of containers received 12
 Matrix _____ Container type _____ # of containers received _____
 Date and Time Sample Put into Temp Storage Date: 112311 Time: 0818

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: No metals method. One ^{HCl} VOA for - 09 was received broken.
MAS 112311 0852



Subcontract Laboratory Report Attachments



CALSCIENCE

WORK ORDER NUMBER: 11-11-1847

The difference is service



AIR | SOIL | WATER | MARINE CHEMISTRY

Analytical Report For

Client: Kiff Analytical

Client Project Name: Tesoro - Livermore

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

Approved for release on 12/2/2011 by:
Amanda Porter
Project Manager

ResultLink ▶

Email your PM ▶



Calscience Environmental Laboratories 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 provided herein, and follows the standard Calscience data package. The results in this analytical report are limited to the samples tested and any reproduction thereof must be made in its entirety. Note that the Chain-of-Custody Record and Sample Receipt Form are integral parts of this report.





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Client Project Name: Tesoro - Livermore
Work Order Number: 11-11-1847

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Analytical Report



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

Date Received: 11/25/11
 Work Order No: 11-11-1847
 Preparation: N/A
 Method: RSK-175M

Project: Tesoro - Livermore

Page 1 of 1

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
IP-9	11-11-1847-1-C	11/22/11 15:15	Aqueous	GC 14	N/A	11/25/11 17:44	111125L01

<u>Parameter</u>	<u>Result</u>	<u>RL</u>	<u>DF</u>	<u>Qual</u>	<u>Units</u>
Carbon Dioxide	1080	1.70	1		ug/L

IP-8	11-11-1847-2-C	11/22/11 15:30	Aqueous	GC 14	N/A	11/25/11 16:46	111125L01
------	----------------	----------------	---------	-------	-----	----------------	-----------

<u>Parameter</u>	<u>Result</u>	<u>RL</u>	<u>DF</u>	<u>Qual</u>	<u>Units</u>
Carbon Dioxide	32800	17.0	10		ug/L

DW-8	11-11-1847-3-C	11/22/11 15:45	Aqueous	GC 14	N/A	11/25/11 17:17	111125L01
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<u>Parameter</u>	<u>Result</u>	<u>RL</u>	<u>DF</u>	<u>Qual</u>	<u>Units</u>
Carbon Dioxide	23200	17.0	10		ug/L

Method Blank	099-12-659-309	N/A	Aqueous	GC 14	N/A	11/25/11 11:34	111125L01
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<u>Parameter</u>	<u>Result</u>	<u>RL</u>	<u>DF</u>	<u>Qual</u>	<u>Units</u>
Carbon Dioxide	ND	1.70	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: 11/25/11
 Work Order No: 11-11-1847
 Preparation: N/A
 Method: RSK-175M

Project: Tesoro - Livermore

Page 1 of 1

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
IP-9	11-11-1847-1-A	11/22/11 15:15	Aqueous	GC 33	N/A	11/26/11 01:22	111125L01

<u>Parameter</u>	<u>Result</u>	<u>RL</u>	<u>DF</u>	<u>Qual</u>	<u>Units</u>
Methane	302	4.00	4		ug/L

IP-8	11-11-1847-2-A	11/22/11 15:30	Aqueous	GC 33	N/A	11/26/11 01:43	111125L01
------	----------------	----------------	---------	-------	-----	----------------	-----------

<u>Parameter</u>	<u>Result</u>	<u>RL</u>	<u>DF</u>	<u>Qual</u>	<u>Units</u>
Methane	1150	8.00	8		ug/L

DW-8	11-11-1847-3-A	11/22/11 15:45	Aqueous	GC 33	N/A	11/26/11 02:17	111125L01
------	----------------	----------------	---------	-------	-----	----------------	-----------

<u>Parameter</u>	<u>Result</u>	<u>RL</u>	<u>DF</u>	<u>Qual</u>	<u>Units</u>
Methane	1480	8.00	8		ug/L

Method Blank	099-12-663-1,454	N/A	Aqueous	GC 33	N/A	11/25/11 17:23	111125L01
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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: 11/25/11
Work Order No: 11-11-1847
Preparation: N/A
Method: SM 2320B

Project: Tesoro - Livermore

Page 1 of 1

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
IP-9	11-11-1847-1-E	11/22/11 15:15	Aqueous	PH1/B4/B12	N/A	11/30/11 15:10	B1130ALKB1

Parameter	Result	RL	DF	Qual	Units
Alkalinity, Total (as CaCO3)	3010	10.0	1		mg/L

IP-8	11-11-1847-2-E	11/22/11 15:30	Aqueous	PH1/B4/B12	N/A	11/30/11 15:10	B1130ALKB1
------	----------------	----------------	---------	------------	-----	----------------	------------

Parameter	Result	RL	DF	Qual	Units
Alkalinity, Total (as CaCO3)	562	5.00	1		mg/L

DW-8	11-11-1847-3-E	11/22/11 15:45	Aqueous	PH1/B4/B12	N/A	11/30/11 15:10	B1130ALKB1
------	----------------	----------------	---------	------------	-----	----------------	------------

Parameter	Result	RL	DF	Qual	Units
Alkalinity, Total (as CaCO3)	498	5.00	1		mg/L

Method Blank	099-12-223-4,926	N/A	Aqueous	PH1/B4/B12	N/A	11/30/11 15:10	B1130ALKB1
--------------	------------------	-----	---------	------------	-----	----------------	------------

Parameter	Result	RL	DF	Qual	Units
Alkalinity, Total (as CaCO3)	ND	1.0	1		mg/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: 11/25/11
 Work Order No: 11-11-1847
 Preparation: N/A
 Method: SM 2540 C

Project: Tesoro - Livermore

Page 1 of 1

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
IP-9	11-11-1847-1-F	11/22/11 15:15	Aqueous	N/A	11/28/11	11/28/11 16:00	B1128TDSB1

<u>Parameter</u>	<u>Result</u>	<u>RL</u>	<u>DF</u>	<u>Qual</u>	<u>Units</u>
Solids, Total Dissolved	3960	10.0	1		mg/L

IP-8	11-11-1847-2-F	11/22/11 15:30	Aqueous	N/A	11/28/11	11/28/11 16:00	B1128TDSB1
------	----------------	----------------	---------	-----	----------	----------------	------------

<u>Parameter</u>	<u>Result</u>	<u>RL</u>	<u>DF</u>	<u>Qual</u>	<u>Units</u>
Solids, Total Dissolved	715	1.00	1		mg/L

DW-8	11-11-1847-3-F	11/22/11 15:45	Aqueous	N/A	11/28/11	11/28/11 16:00	B1128TDSB1
------	----------------	----------------	---------	-----	----------	----------------	------------

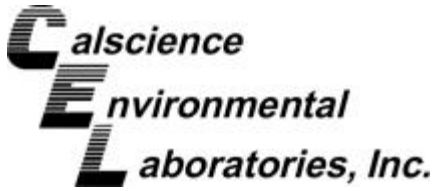
<u>Parameter</u>	<u>Result</u>	<u>RL</u>	<u>DF</u>	<u>Qual</u>	<u>Units</u>
Solids, Total Dissolved	560	1.00	1		mg/L

Method Blank	099-12-180-2,902	N/A	Aqueous	N/A	11/28/11	11/28/11 16:00	B1128TDSB1
--------------	------------------	-----	---------	-----	----------	----------------	------------

<u>Parameter</u>	<u>Result</u>	<u>RL</u>	<u>DF</u>	<u>Qual</u>	<u>Units</u>
Solids, Total Dissolved	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: 11/25/11
Work Order No: 11-11-1847
Preparation: N/A
Method: SM 2320B

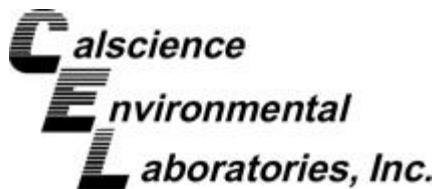
Project: Tesoro - Livermore

Quality Control Sample ID	Matrix	Instrument	Date Prepared:	Date Analyzed:	Duplicate Batch Number
11-11-1916-2	Aqueous	PH1/B4/B12	N/A	11/30/11	B1130ALKD1

Parameter	Sample Conc.	DUP Conc	RPD	RPD CL	Qualifiers
Alkalinity, Total (as CaCO3)	162	162	0	0-25	
Bicarbonate (as CaCO3)	162	162	0	0-25	
Carbonate (as CaCO3)	ND	ND	NA	0-25	
Hydroxide (as CaCO3)	ND	ND	NA	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: 11/25/11
Work Order No: 11-11-1847
Preparation: N/A
Method: SM 2540 C

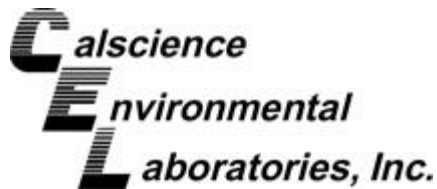
Project: Tesoro - Livermore

Quality Control Sample ID	Matrix	Instrument	Date Prepared:	Date Analyzed:	Duplicate Batch Number
IP-8	Aqueous	N/A	11/28/11	11/28/11	B1128TDSD1

Parameter	Sample Conc.	DUP Conc	RPD	RPD CL	Qualifiers
Solids, Total Dissolved	715	700	2	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: 11-11-1847
Preparation: N/A
Method: RSK-175M

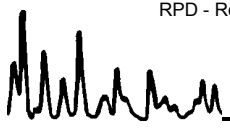
Project: Tesoro - Livermore

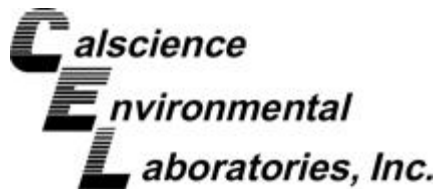
Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number
099-12-659-309	Aqueous	GC 14	N/A	11/25/11	111125L01

Parameter	SPIKE ADDED	LCS %REC	LCSD %REC	%REC CL	RPD	RPD CL	Qualifiers
Carbon Dioxide	102.0	113	108	80-120	4	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: 11-11-1847
 Preparation: N/A
 Method: RSK-175M

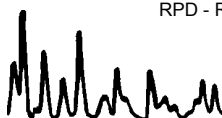
Project: Tesoro - Livermore

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number
099-12-663-1,454	Aqueous	GC 33	N/A	11/25/11	111125L01

Parameter	SPIKE ADDED	LCS %REC	LCSD %REC	%REC CL	RPD	RPD CL	Qualifiers
Methane	100.0	95	90	79-109	5	0-20	

Return to Contents

RPD - Relative Percent Difference , CL - Control Limit



Work Order Number: 11-11-1847

<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.



1847

Test Detail for Kiff Work Order: 79564

Alkalinity SM 2320 (1)

Alkalinity, Total (as CaCO₃)

Carbon Dioxide by RSK 175 (1)

Carbon Dioxide

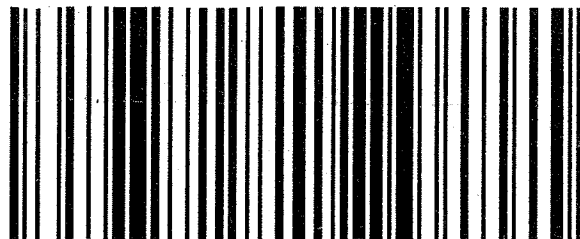
Hydrocarbons in Water by RSK 175 (1)

Methane





800.334.5000
ontrac.com



D10010429539533

Date Printed 11/23/2011

Tracking#D10010429539533

Shipped From:

KIFF ANALYTICAL
2795 2ND STREET 300
DAVIS, CA 95616

Sent By: SAMPLE RECEIVING

Phone#: (530)297-4800

wgt(lbs): 1

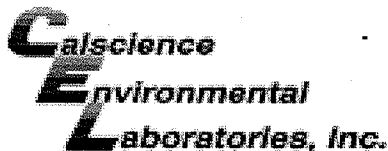
Reference: SUB SRG SAMPLES

Reference 2:

<p><i>Ship To Company:</i> CALSCIENCE ENVIRONMENTAL 7440 LINCOLN WAY GARDEN GROVE, CA 92841 RECEIVING (714)895-5494</p> <p>B10207210772</p>	<p><i>Service:</i> S</p> <p><i>Sort Code:</i> ORG</p> <p><i>Special Services:</i> Signature Required</p>
--	---

1847





WORK ORDER #: 11-11-1847

SAMPLE RECEIPT FORM

Cooler 1 of 1

CLIENT: KIFF

DATE: 11/25/11

TEMPERATURE: Thermometer ID: SC1 (Criteria: 0.0°C - 6.0°C, not frozen)
Temperature 3.0°C + 0.5°C (CF) = 3.5°C
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: TN

CUSTODY SEALS INTACT:
Cooler No (Not Intact) Not Present N/A Initial: TN
Sample No (Not Intact) Not Present Initial: KR

SAMPLE CONDITION:
Chain-Of-Custody (COC) document(s) received with samples...
COC document(s) received complete...
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...
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...
Unpreserved vials received for Volatiles analysis
Volatile analysis container(s) free of headspace...
Tedlar bag(s) free of condensation...
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 1PB 1PBna 500PB
250PB 250PBn 125PB 125PBzanna 100PJ 100PJna2
Air: Tedlar Summa Other: Trip Blank Lot#: Labeled/Checked by: KR
Container: C: Clear A: Amber P: Plastic G: Glass J: Jar B: Bottle Z: Ziploc/Resealable Bag E: Envelope Reviewed by: TN
Preservative: h: HCL n: HNO3 na2:Na2S2O3 na: NaOH p: H3PO4 s: H2SO4 u: Ultra-pure zanna: ZnAc2+NaOH f: Filtered Scanned by: TN

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Laboratory Results

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

Subject : 4 Water Samples
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 standard. All soil samples are reported on a total weight (wet weight) basis unless noted otherwise in the case narrative. 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,



Joel Kiff

Subject : 4 Water Samples
Project Name : Tesoro - Livermore
Project Number : 01LV
P.O. Number : 67076

Case Narrative

A version of this report was previously issued on 12/22/2011. This revised version replaces that report. For sample MW-11, results for 1,2-Dichloroethane and 1,2-Dibromoethane have been added. For sample IP-9, the Measured Values and Method Detection Limits for method EPA 6010B have changed. A dilution factor for the excess acid needed to preserve IP-9 was not applied in the original report.

The Method Reporting Limit for Nitrate as N by Method EPA 300.0 was raised due to high concentration of other analytes present for sample IP-9.

Samples IP-10 and IP-8 were analyzed out of hold time for Hexavalent Chromium by EPA method 7199.

The Method Reporting Limit for Ethanol has been increased due to the presence of an interfering compound for samples IP-10 and MW-11.

Matrix Spike/Matrix Spike Duplicate results associated with samples IP-10, IP-8, and IP-9 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 IP-10, IP-8, MW-11, and IP-9 for the analytes Iron, Manganese, and Sodium were affected by the analyte concentrations already present in the un-spiked sample.

Project Name : **Tesoro - Livermore**

Project Number : **01LV**

Sample : **IP-10**

Matrix : Water

Lab Number : 79803-01

Sample Date :12/14/2011

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date/Time Analyzed
Nitrate as N	< 0.10	0.10	mg/L	EPA 300.0	12/15/11 11:24
Sulfate	31	0.50	mg/L	EPA 300.0	12/15/11 11:24
Hexavalent Chromium	< 1.0	1.0	ug/L	EPA 7199	12/15/11 14:07
Ferrous Iron	< 0.10	0.10	mg/L	SM 3500-Fe D	12/15/11 12:28
Arsenic	< 0.015	0.015	mg/L	EPA 6010B	12/22/11 11:53
Chromium	0.010	0.0050	mg/L	EPA 6010B	12/22/11 11:53
Iron	3.2	0.10	mg/L	EPA 6010B	12/22/11 11:53
Manganese	3.5	0.0050	mg/L	EPA 6010B	12/22/11 11:53
Sodium	92	0.50	mg/L	EPA 6010B	12/22/11 11:53
Benzene	62	0.90	ug/L	EPA 8260B	12/16/11 01:30
Toluene	72	0.90	ug/L	EPA 8260B	12/16/11 01:30
Ethylbenzene	110	0.90	ug/L	EPA 8260B	12/16/11 01:30
Total Xylenes	260	0.90	ug/L	EPA 8260B	12/16/11 01:30
Methyl-t-butyl ether (MTBE)	< 0.90	0.90	ug/L	EPA 8260B	12/16/11 01:30
Diisopropyl ether (DIPE)	< 0.90	0.90	ug/L	EPA 8260B	12/16/11 01:30
Ethyl-t-butyl ether (ETBE)	< 0.90	0.90	ug/L	EPA 8260B	12/16/11 01:30
Tert-amyl methyl ether (TAME)	< 0.90	0.90	ug/L	EPA 8260B	12/16/11 01:30
Tert-Butanol	< 5.0	5.0	ug/L	EPA 8260B	12/16/11 01:30
Methanol	< 90	90	ug/L	EPA 8260B	12/16/11 01:30
Ethanol	< 20	20	ug/L	EPA 8260B	12/16/11 01:30
TPH as Gasoline	4200	90	ug/L	EPA 8260B	12/16/11 01:30
1,2-Dichloroethane-d4 (Surr)	91.8		% Recovery	EPA 8260B	12/16/11 01:30
Toluene - d8 (Surr)	92.9		% Recovery	EPA 8260B	12/16/11 01:30

Project Name : **Tesoro - Livermore**

Project Number : **01LV**

Sample : **IP-8**

Matrix : Water

Lab Number : 79803-02

Sample Date :12/14/2011

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date/Time Analyzed
Nitrate as N	0.24	0.10	mg/L	EPA 300.0	12/15/11 21:45
Sulfate	52	1.0	mg/L	EPA 300.0	12/15/11 19:52
Hexavalent Chromium	< 1.0	1.0	ug/L	EPA 7199	12/15/11 14:17
Ferrous Iron	< 0.10	0.10	mg/L	SM 3500-Fe D	12/15/11 12:29
Arsenic	< 0.015	0.015	mg/L	EPA 6010B	12/22/11 12:04
Chromium	0.023	0.0050	mg/L	EPA 6010B	12/22/11 12:04
Iron	6.2	0.10	mg/L	EPA 6010B	12/22/11 12:04
Manganese	3.7	0.0050	mg/L	EPA 6010B	12/22/11 12:04
Sodium	110	0.50	mg/L	EPA 6010B	12/22/11 12:04
Benzene	3000	25	ug/L	EPA 8260B	12/16/11 02:10
Toluene	10000	25	ug/L	EPA 8260B	12/16/11 02:10
Ethylbenzene	2300	25	ug/L	EPA 8260B	12/16/11 02:10
Total Xylenes	15000	25	ug/L	EPA 8260B	12/16/11 02:10
Methyl-t-butyl ether (MTBE)	< 25	25	ug/L	EPA 8260B	12/16/11 02:10
Diisopropyl ether (DIPE)	< 25	25	ug/L	EPA 8260B	12/16/11 02:10
Ethyl-t-butyl ether (ETBE)	< 25	25	ug/L	EPA 8260B	12/16/11 02:10
Tert-amyl methyl ether (TAME)	< 25	25	ug/L	EPA 8260B	12/16/11 02:10
Tert-Butanol	< 150	150	ug/L	EPA 8260B	12/16/11 02:10
Methanol	< 2500	2500	ug/L	EPA 8260B	12/16/11 02:10
Ethanol	< 250	250	ug/L	EPA 8260B	12/16/11 02:10
TPH as Gasoline	92000	2500	ug/L	EPA 8260B	12/16/11 02:10
1,2-Dichloroethane-d4 (Surr)	102		% Recovery	EPA 8260B	12/16/11 02:10
Toluene - d8 (Surr)	99.2		% Recovery	EPA 8260B	12/16/11 02:10

Project Name : **Tesoro - Livermore**

Project Number : **01LV**

Sample : **MW-11**

Matrix : Water

Lab Number : 79803-03

Sample Date :12/14/2011

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date/Time Analyzed
Nitrate as N	0.12	0.10	mg/L	EPA 300.0	12/15/11 12:31
Sulfate	140	5.0	mg/L	EPA 300.0	12/15/11 20:20
Hexavalent Chromium	2.6	1.0	ug/L	EPA 7199	12/15/11 13:57
Ferrous Iron	< 0.10	0.10	mg/L	SM 3500-Fe D	12/15/11 12:30
Arsenic	0.021	0.015	mg/L	EPA 6010B	12/22/11 12:08
Chromium	0.034	0.0050	mg/L	EPA 6010B	12/22/11 12:08
Iron	9.6	0.10	mg/L	EPA 6010B	12/22/11 12:08
Manganese	0.84	0.0050	mg/L	EPA 6010B	12/22/11 12:08
Sodium	540	5.0	mg/L	EPA 6010B	12/22/11 13:17
Benzene	18	0.50	ug/L	EPA 8260B	12/16/11 14:44
Toluene	39	0.50	ug/L	EPA 8260B	12/16/11 14:44
Ethylbenzene	28	0.50	ug/L	EPA 8260B	12/16/11 14:44
Total Xylenes	240	0.50	ug/L	EPA 8260B	12/16/11 14:44
Methyl-t-butyl ether (MTBE)	< 0.50	0.50	ug/L	EPA 8260B	12/16/11 14:44
Diisopropyl ether (DIPE)	< 0.50	0.50	ug/L	EPA 8260B	12/16/11 14:44
Ethyl-t-butyl ether (ETBE)	< 0.50	0.50	ug/L	EPA 8260B	12/16/11 14:44
Tert-amyl methyl ether (TAME)	< 0.50	0.50	ug/L	EPA 8260B	12/16/11 14:44
Tert-Butanol	13	5.0	ug/L	EPA 8260B	12/16/11 14:44
Methanol	< 50	50	ug/L	EPA 8260B	12/16/11 14:44
Ethanol	< 50	50	ug/L	EPA 8260B	12/20/11 14:50
TPH as Gasoline	2600	50	ug/L	EPA 8260B	12/16/11 14:44
1,2-Dichloroethane	< 0.50	0.50	ug/L	EPA 8260B	12/16/11 14:44
1,2-Dibromoethane	< 0.50	0.50	ug/L	EPA 8260B	12/16/11 14:44
1,2-Dichloroethane-d4 (Surr)	99.2		% Recovery	EPA 8260B	12/16/11 14:44
Toluene - d8 (Surr)	101		% Recovery	EPA 8260B	12/16/11 14:44

Project Name : **Tesoro - Livermore**

Project Number : **01LV**

Sample : **IP-9**

Matrix : Water

Lab Number : 79803-04

Sample Date :12/14/2011

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date/Time Analyzed
Nitrate as N	< 2.0	2.0	mg/L	EPA 300.0	12/15/11 14:11
Sulfate	1400	25	mg/L	EPA 300.0	12/15/11 20:49
Hexavalent Chromium	90	10	ug/L	EPA 7199	12/15/11 15:02
Ferrous Iron	< 0.10	0.10	mg/L	SM 3500-Fe D	12/15/11 12:30
Arsenic	0.42	0.11	mg/L	EPA 6010B	12/22/11 16:09
Chromium	0.15	0.022	mg/L	EPA 6010B	12/22/11 16:09
Iron	30	0.22	mg/L	EPA 6010B	12/22/11 16:09
Manganese	0.65	0.054	mg/L	EPA 6010B	12/22/11 16:09
Sodium	18000	54	mg/L	EPA 6010B	12/22/11 13:22
Benzene	600	5.0	ug/L	EPA 8260B	12/16/11 03:22
Toluene	2300	5.0	ug/L	EPA 8260B	12/16/11 03:22
Ethylbenzene	680	5.0	ug/L	EPA 8260B	12/16/11 03:22
Total Xylenes	4400	5.0	ug/L	EPA 8260B	12/16/11 03:22
Methyl-t-butyl ether (MTBE)	< 5.0	5.0	ug/L	EPA 8260B	12/16/11 03:22
Diisopropyl ether (DIPE)	< 5.0	5.0	ug/L	EPA 8260B	12/16/11 03:22
Ethyl-t-butyl ether (ETBE)	< 5.0	5.0	ug/L	EPA 8260B	12/16/11 03:22
Tert-amyl methyl ether (TAME)	< 5.0	5.0	ug/L	EPA 8260B	12/16/11 03:22
Tert-Butanol	< 25	25	ug/L	EPA 8260B	12/16/11 03:22
Methanol	< 500	500	ug/L	EPA 8260B	12/16/11 03:22
Ethanol	< 50	50	ug/L	EPA 8260B	12/16/11 03:22
TPH as Gasoline	23000	500	ug/L	EPA 8260B	12/16/11 03:22
1,2-Dichloroethane-d4 (Surr)	98.2		% Recovery	EPA 8260B	12/16/11 03:22
Toluene - d8 (Surr)	97.6		% Recovery	EPA 8260B	12/16/11 03:22

QC Report : Method Blank Data

Project Name : **Tesoro - Livermore**

Project Number : **01LV**

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Arsenic	< 0.015	0.015	mg/L	EPA 6010B	12/22/2011
Chromium	< 0.0050	0.0050	mg/L	EPA 6010B	12/22/2011
Iron	< 0.10	0.10	mg/L	EPA 6010B	12/22/2011
Manganese	< 0.0050	0.0050	mg/L	EPA 6010B	12/22/2011
Sodium	< 0.50	0.50	mg/L	EPA 6010B	12/22/2011
Benzene	< 0.50	0.50	ug/L	EPA 8260B	12/15/2011
Ethylbenzene	< 0.50	0.50	ug/L	EPA 8260B	12/15/2011
Toluene	< 0.50	0.50	ug/L	EPA 8260B	12/15/2011
Total Xylenes	< 0.50	0.50	ug/L	EPA 8260B	12/15/2011
Diisopropyl ether (DIPE)	< 0.50	0.50	ug/L	EPA 8260B	12/15/2011
Ethanol	< 5.0	5.0	ug/L	EPA 8260B	12/15/2011
Ethyl-t-butyl ether (ETBE)	< 0.50	0.50	ug/L	EPA 8260B	12/15/2011
Methanol	< 50	50	ug/L	EPA 8260B	12/15/2011
Methyl-t-butyl ether (MTBE)	< 0.50	0.50	ug/L	EPA 8260B	12/15/2011
Tert-Butanol	< 5.0	5.0	ug/L	EPA 8260B	12/15/2011
Tert-amyl methyl ether (TAME)	< 0.50	0.50	ug/L	EPA 8260B	12/15/2011
TPH as Gasoline	< 50	50	ug/L	EPA 8260B	12/15/2011
1,2-Dichloroethane-d4 (Surr)	101		%	EPA 8260B	12/15/2011
Toluene - d8 (Surr)	100		%	EPA 8260B	12/15/2011
Benzene	< 0.50	0.50	ug/L	EPA 8260B	12/16/2011
Ethylbenzene	< 0.50	0.50	ug/L	EPA 8260B	12/16/2011
Toluene	< 0.50	0.50	ug/L	EPA 8260B	12/16/2011
Total Xylenes	< 0.50	0.50	ug/L	EPA 8260B	12/16/2011
Diisopropyl ether (DIPE)	< 0.50	0.50	ug/L	EPA 8260B	12/16/2011
Ethyl-t-butyl ether (ETBE)	< 0.50	0.50	ug/L	EPA 8260B	12/16/2011
Methanol	< 50	50	ug/L	EPA 8260B	12/16/2011
Methyl-t-butyl ether (MTBE)	< 0.50	0.50	ug/L	EPA 8260B	12/16/2011
Tert-Butanol	< 5.0	5.0	ug/L	EPA 8260B	12/16/2011
Tert-amyl methyl ether (TAME)	< 0.50	0.50	ug/L	EPA 8260B	12/16/2011
TPH as Gasoline	< 50	50	ug/L	EPA 8260B	12/16/2011
1,2-Dibromoethane	< 0.50	0.50	ug/L	EPA 8260B	12/16/2011
1,2-Dichloroethane	< 0.50	0.50	ug/L	EPA 8260B	12/16/2011

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
1,2-Dichloroethane-d4 (Surr)	99.0		%	EPA 8260B	12/16/2011
Toluene - d8 (Surr)	101		%	EPA 8260B	12/16/2011
Ethanol	< 5.0	5.0	ug/L	EPA 8260B	12/20/2011
Nitrate as N	<0.10	0.10	mg/L	EPA 300.0	12/15/2011
Sulfate	<0.50	0.50	mg/L	EPA 300.0	12/15/2011
Ferrous Iron	<0.10	0.10	mg/L	SM 3500-Fe D	12/15/2011
Hexavalent Chromium	<1.0	1.0	ug/L	EPA 7199	12/15/2011

QC Report : Matrix Spike/ Matrix Spike DuplicateProject 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
Nitrate as N														
	79803-01	< 0.10	0.500	0.500	0.479	0.484	mg/L	EPA 300.0	12/15/11	95.7	96.7	1.06	85.0-115	10
Sulfate														
	79803-01	31	2.50	2.50	33.5	33.3	mg/L	EPA 300.0	12/15/11	108	99.7	0.606	85.0-115	10
Ferrous Iron														
	79803-01	< 0.10	0.251	0.251	0.328	0.332	mg/L	SM 3500-Fe D	12/15/11	98.0	99.6	1.21	70.0-130	25
Hexavalent Chromium														
	79803-01	< 1.0	5.00	5.00	5.20	5.24	ug/L	EPA 7199	12/15/11	103	104	0.874	90.0-110	10
Benzene														
	79808-02	<0.50	40.0	40.0	41.7	41.8	ug/L	EPA 8260B	12/16/11	104	104	0.306	80-120	25
Diisopropyl ether														
	79808-02	0.89	39.5	39.5	42.9	43.2	ug/L	EPA 8260B	12/16/11	106	107	0.633	80-120	25
Ethanol														
	79808-02	10	100	100	98.2	138	ug/L	EPA 8260B	12/16/11	87.6	127	37.0	55.1-159	25
Ethyl-tert-butyl ether														
	79808-02	<0.50	40.0	40.0	39.6	39.8	ug/L	EPA 8260B	12/16/11	98.9	99.5	0.567	76.5-120	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
Ethylbenzene	79808-02	99	40.0	40.0	131	132	ug/L	EPA 8260B	12/16/11	80.5	84.0	4.21	80-120	25
Methanol	79808-02	<50	1000	1000	912	1190	ug/L	EPA 8260B	12/16/11	91.2	119	26.7	53.2-147	25
Methyl-t-butyl ether	79808-02	<0.50	40.4	40.4	41.2	40.9	ug/L	EPA 8260B	12/16/11	102	101	0.797	69.7-121	25
P + M Xylene	79808-02	94	40.0	40.0	128	130	ug/L	EPA 8260B	12/16/11	85.9	89.9	4.50	76.8-120	25
Tert-Butanol	79808-02	<5.0	201	201	203	200	ug/L	EPA 8260B	12/16/11	101	99.5	1.64	80-120	25
Tert-amyl-methyl ether	79808-02	<0.50	39.4	39.4	39.1	39.4	ug/L	EPA 8260B	12/16/11	99.0	99.8	0.804	78.9-120	25
Toluene	79808-02	<0.50	40.0	40.0	40.9	41.3	ug/L	EPA 8260B	12/16/11	102	103	1.12	80-120	25
Benzene	79779-01	<0.50	40.0	40.0	38.6	38.4	ug/L	EPA 8260B	12/16/11	96.5	96.1	0.425	80-120	25
Diisopropyl ether	79779-01	<0.50	39.5	39.5	37.5	38.3	ug/L	EPA 8260B	12/16/11	95.0	97.0	2.10	80-120	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
Ethyl-tert-butyl ether	79779-01	<0.50	40.0	40.0	38.6	39.0	ug/L	EPA 8260B	12/16/11	96.4	97.5	1.10	76.5-120	25
Ethylbenzene	79779-01	<0.50	40.0	40.0	41.4	40.4	ug/L	EPA 8260B	12/16/11	103	101	2.45	80-120	25
Methanol	79779-01	<50	1000	1000	1200	1190	ug/L	EPA 8260B	12/16/11	120	119	0.678	53.2-147	25
Methyl-t-butyl ether	79779-01	<0.50	40.4	40.4	39.2	40.1	ug/L	EPA 8260B	12/16/11	96.9	99.1	2.26	69.7-121	25
P + M Xylene	79779-01	<0.50	40.0	40.0	43.2	42.3	ug/L	EPA 8260B	12/16/11	108	106	2.14	76.8-120	25
Tert-Butanol	79779-01	<5.0	201	201	200	195	ug/L	EPA 8260B	12/16/11	99.5	96.9	2.64	80-120	25
Tert-amyl-methyl ether	79779-01	<0.50	39.4	39.4	40.6	41.2	ug/L	EPA 8260B	12/16/11	103	104	1.41	78.9-120	25
Toluene	79779-01	<0.50	40.0	40.0	39.9	39.7	ug/L	EPA 8260B	12/16/11	99.8	99.3	0.519	80-120	25
Ethanol	79840-03	<5.0	100	100	87.5	91.5	ug/L	EPA 8260B	12/20/11	87.3	91.4	4.53	55.1-159	25

QC Report : Matrix Spike/ Matrix Spike DuplicateProject 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
Arsenic	79803-01	< 0.015	0.400	0.400	0.420	0.417	mg/L	EPA 6010B	12/22/11	103	103	0.502	75-125	20
Chromium	79803-01	0.010	0.400	0.400	0.430	0.426	mg/L	EPA 6010B	12/22/11	105	104	0.981	75-125	20
Iron	79803-01	3.2	0.400	0.400	3.46	3.30	mg/L	EPA 6010B	12/22/11	71.2	30.5	4.82	75-125	20
Manganese	79803-01	3.5	0.400	0.400	3.75	3.64	mg/L	EPA 6010B	12/22/11	61.2	35.0	2.84	75-125	20
Sodium	79803-01	92	0.400	0.400	90.7	89.3	mg/L	EPA 6010B	12/22/11	0.00	0.00	1.62	75-125	20
1,2-Dibromoethane	79779-01	<0.50	40.2	40.2	40.9	41.0	ug/L	EPA 8260B	12/16/11	102	102	0.141	80-120	25
1,2-Dichloroethane	79779-01	<0.50	40.0	40.0	38.5	38.2	ug/L	EPA 8260B	12/16/11	96.3	95.5	0.796	75.7-122	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
Arsenic	0.400	mg/L	EPA 6010B	12/22/11	96.3	85-115
Chromium	0.400	mg/L	EPA 6010B	12/22/11	101	85-115
Iron	0.400	mg/L	EPA 6010B	12/22/11	94.4	85-115
Manganese	0.400	mg/L	EPA 6010B	12/22/11	97.3	85-115
Sodium	0.400	mg/L	EPA 6010B	12/22/11	94.3	85-115
Benzene	40.0	ug/L	EPA 8260B	12/16/11	105	80-120
Diisopropyl ether	39.5	ug/L	EPA 8260B	12/16/11	110	80-120
Ethanol	100	ug/L	EPA 8260B	12/16/11	74.3	55.1-159
Ethyl-tert-butyl ether	40.0	ug/L	EPA 8260B	12/16/11	104	76.5-120
Ethylbenzene	40.0	ug/L	EPA 8260B	12/16/11	103	80-120
Methanol	1000	ug/L	EPA 8260B	12/16/11	55.5	53.2-147
Methyl-t-butyl ether	40.4	ug/L	EPA 8260B	12/16/11	105	69.7-121
P + M Xylene	40.0	ug/L	EPA 8260B	12/16/11	104	76.8-120
Tert-Butanol	201	ug/L	EPA 8260B	12/16/11	100	80-120
Tert-amyl-methyl ether	39.4	ug/L	EPA 8260B	12/16/11	107	78.9-120
Toluene	40.0	ug/L	EPA 8260B	12/16/11	103	80-120
Benzene	40.0	ug/L	EPA 8260B	12/16/11	96.5	80-120
Diisopropyl ether	39.5	ug/L	EPA 8260B	12/16/11	94.3	80-120
Ethyl-tert-butyl ether	40.0	ug/L	EPA 8260B	12/16/11	94.6	76.5-120
Ethylbenzene	40.0	ug/L	EPA 8260B	12/16/11	103	80-120

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
Methanol	1000	ug/L	EPA 8260B	12/16/11	119	53.2-147
Methyl-t-butyl ether	40.4	ug/L	EPA 8260B	12/16/11	93.4	69.7-121
P + M Xylene	40.0	ug/L	EPA 8260B	12/16/11	108	76.8-120
TPH as Gasoline	501	ug/L	EPA 8260B	12/16/11	107	70.0-130
Tert-Butanol	201	ug/L	EPA 8260B	12/16/11	98.2	80-120
Tert-amyl-methyl ether	39.4	ug/L	EPA 8260B	12/16/11	101	78.9-120
Toluene	40.0	ug/L	EPA 8260B	12/16/11	99.2	80-120
1,2-Dibromoethane	40.2	ug/L	EPA 8260B	12/16/11	99.7	80-120
1,2-Dichloroethane	40.0	ug/L	EPA 8260B	12/16/11	94.6	75.7-122
Ethanol	100	ug/L	EPA 8260B	12/20/11	90.5	55.1-159
Nitrate as N	0.500	mg/L	EPA 300.0	12/15/11	99.0	85.0-115
Sulfate	2.50	mg/L	EPA 300.0	12/15/11	108	85.0-115
Ferrous Iron	0.251	mg/L	SM 3500-Fe D	12/15/11	99.6	70.0-130
Hexavalent Chromium	5.00	ug/L	EPA 7199	12/15/11	100	90.0-110



2795 2nd Street Suite 300
 Davis, CA 95616
 Lab: 530.297.4800
 Fax: 530.297.4808

Lab No. 79803

Page 2 of 4

Project Contact (Hardcopy or PDF To):

Matthew Nelson

California EDF Report? Yes No

Chain-of-Custody Record and Analysis Request

Company / Address:

Arctos Environmental
 1332 Peralta Ave., Berkeley, CA. 94702

Recommended but not mandatory to complete this section:

Sampling Company Log Code:

Analysis Request

Phone No.:

562-988-2755

Fax No.:

562-988-2759

Global ID:

T0600101410

Project Number:

01LV

P.O. No.:

67076

EDF Deliverable To (Email Address):

mnelson@orionenv.com

Project Name:

Tesoro - Livermore

Sampler

Signature: *Scott Stromberg*
 Scott Stromberg

Project Address:

1619 1st Street
 Livermore, CA

Sampling

Container

Preservative

Matrix

TPHg, BTEX, 7 Oxygenates (EPA 8260B)

Nitrate, Sulfate (EPA 300.0)

Ferrous Iron (SM 3500-Fe D)

Hexavalent Chromium (EPA 7199)

Metals by ICP (Fe/Na/Mn/Cr/As) (EPA 6010)

Total Alkalinity (SM 2320 B)

TDS (SM 2540 C)

Carbon Dioxide (RSK 175M)

Methane (RSK 175M)

TAT

18hr
 24hr
 48hr
 72hr
 1 wk
 2 wk

For Lab Use Only

Sample Designation

Date

Time

40 ml VOA

500 mL HDPE

250 mL POLY

1 L POLY

HCl

HNO₃

ICE

NONE

WATER

SOIL

VAPOR

IP-8

12/14/11 1345

3

X

X

X

1 wk

IP-8

1

X

X

X

X

X

1 wk

IP-8

1

X

X

X

1 wk

IP-8

1

X

X

X

1 wk

IP-8

1

X

X

X

1 wk

IP-8

2

X

X

X

1 wk

IP-8

2

X

X

X

1 wk

02

Relinquished by:

Scott Stromberg

Date

12/14/11

Time

1700

Received by:

Remarks:

Relinquished by:

Date

Time

Received by:

Relinquished by:

12/15/11

0758

Received by Laboratory:

Michelle Spencer

KIFF Analytical

Bill to:

TESORO



2795 2nd Street Suite 300
 Davis, CA 95616
 Lab: 530.297.4800
 Fax: 530.297.4808

Lab No. 79803

Page 4 of 4

Project Contact (Hardcopy or PDF To):
 Matthew Nelson

California EDF Report? Yes No

Company / Address:
 Arctos Environmental
 1332 Peralta Ave., Berkeley, CA. 94702

Phone No.: 562-988-2755 **Fax No.:** 562-988-2759

Project Number: 01LV **P.O. No.:** 67076

Project Name:
 Tesoro - Livermore

Global ID: T0600101410

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

Sampler Signature: *Scott Stromberg*

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	500 mL HDPE	250 mL POLY	1 L POLY	HCl	HNO ₃	ICE	NONE	WATER	SOIL	VAPOR	TPHg, BTEX, 7 Oxygenates (EPA 8260B)	Nitrate, Sulfate (EPA 300.0)	Ferrous Iron (SM 3500-Fe D)	Hexavalent Chromium (EPA 7199)	Metals by ICP (Fe/Na/Mn/Cr/As) (EPA 6010)	Total Alkalinity (SM 2320 B)	TDS (SM 2540 C)	Carbon Dioxide (RSK 175M)	Methane (RSK 175M)	15hr	24hr	48hr			72hr	1wk	2wk	
IP-9	12/14/11	1605	3				X			X			X																		1 wk
IP-9				1				X		X				X	X	X															1 wk
IP-9					1			X		X							X														1 wk
IP-9					1			X		X								X													1 wk
IP-9			2					X		X									X												1 wk
IP-9			2				X			X											X										1 wk

Relinquished by: *Scott Stromberg* **Date:** 12/14/11 **Time:** 1700 **Received by:** _____ **Remarks:**

Relinquished by: _____ **Date:** _____ **Time:** _____ **Received by:** _____

Relinquished by: _____ **Date:** 12/15/11 **Time:** 0758 **Received by Laboratory:** *Michelle Spencer* **Bill to:** *KIFF Analytical* TESORO

SAMPLE RECEIPT CHECKLIST

RECEIVER

MAS
Initials

SRG#: 79803 Date: 121511

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: Yes No (includes water)
 Temperature °C 4.6 Therm. ID# IR-5 Initial MAS Date/Time 121511/0740 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 28
 Matrix WA Container type Poly # of containers received 16
 Matrix _____ Container type _____ # of containers received _____
 Date and Time Sample Put into Temp Storage Date: 121511 Time: 0758

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: One ^{HCl} VOA received broken from both sample -01 and -02.
MAS 121511 0803 SR will keep 2 HCl VOAs for in-house ^{MAS} analysis
of B67 and sub 2 HCl VOAs to CSE for methane analysis. MAS 121511 0843



Subcontract Laboratory Report Attachments



CALSCIENCE

WORK ORDER NUMBER: 11-12-1253

The difference is service



AIR | SOIL | WATER | MARINE CHEMISTRY

Analytical Report For

Client: Kiff Analytical

Client Project Name: Tesoro - Livermore

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

Amanda Porter

Approved for release on 12/28/2011 by:
Amanda Porter
Project Manager

ResultLink ▶

Email your PM ▶



Calscience Environmental Laboratories 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 provided herein, and follows the standard Calscience data package. The results in this analytical report are limited to the samples tested and any reproduction thereof must be made in its entirety. Note that the Chain-of-Custody Record and Sample Receipt Form are integral parts of this report.





Contents

Client Project Name: Tesoro - Livermore
Work Order Number: 11-12-1253

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Analytical Report



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

Date Received: 12/16/11
Work Order No: 11-12-1253
Preparation: N/A
Method: RSK-175M

Project: Tesoro - Livermore

Page 1 of 1

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
IP-10	11-12-1253-1-C	12/14/11 13:22	Aqueous	GC 14	N/A	12/17/11 11:46	111217L01

<u>Parameter</u>	<u>Result</u>	<u>RL</u>	<u>DF</u>	<u>Qual</u>	<u>Units</u>
Carbon Dioxide	14000	17.0	10		ug/L

IP-8	11-12-1253-2-C	12/14/11 13:45	Aqueous	GC 14	N/A	12/17/11 12:47	111217L01
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<u>Parameter</u>	<u>Result</u>	<u>RL</u>	<u>DF</u>	<u>Qual</u>	<u>Units</u>
Carbon Dioxide	11800	17.0	10		ug/L

MW-11	11-12-1253-3-C	12/14/11 14:07	Aqueous	GC 14	N/A	12/17/11 13:07	111217L01
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<u>Parameter</u>	<u>Result</u>	<u>RL</u>	<u>DF</u>	<u>Qual</u>	<u>Units</u>
Carbon Dioxide	29200	17.0	10		ug/L

IP-9	11-12-1253-4-C	12/14/11 16:05	Aqueous	GC 14	N/A	12/17/11 14:16	111217L01
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<u>Parameter</u>	<u>Result</u>	<u>RL</u>	<u>DF</u>	<u>Qual</u>	<u>Units</u>
Carbon Dioxide	5130	17.0	10		ug/L

Method Blank	099-12-659-317	N/A	Aqueous	GC 14	N/A	12/17/11 10:25	111217L01
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<u>Parameter</u>	<u>Result</u>	<u>RL</u>	<u>DF</u>	<u>Qual</u>	<u>Units</u>
Carbon Dioxide	ND	1.70	1		ug/L

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

Analytical Report



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

Date Received: 12/16/11
Work Order No: 11-12-1253
Preparation: N/A
Method: RSK-175M

Project: Tesoro - Livermore

Page 1 of 1

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
IP-10	11-12-1253-1-A	12/14/11 13:22	Aqueous	GC 52	N/A	12/17/11 21:46	111217L01

Parameter	Result	RL	DF	Qual	Units
Methane	644	4.00	4		ug/L

IP-8	11-12-1253-2-A	12/14/11 13:45	Aqueous	GC 52	N/A	12/17/11 19:34	111217L01
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Parameter	Result	RL	DF	Qual	Units
Methane	80.6	1.00	1		ug/L

MW-11	11-12-1253-3-A	12/14/11 14:07	Aqueous	GC 52	N/A	12/17/11 19:56	111217L01
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Parameter	Result	RL	DF	Qual	Units
Methane	10.1	1.00	1		ug/L

IP-9	11-12-1253-4-A	12/14/11 16:05	Aqueous	GC 52	N/A	12/17/11 20:57	111217L01
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Parameter	Result	RL	DF	Qual	Units
Methane	5.12	1.00	1		ug/L

Method Blank	099-12-663-1,471	N/A	Aqueous	GC 52	N/A	12/17/11 11:08	111217L01
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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



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

Date Received: 12/16/11
Work Order No: 11-12-1253

Project: Tesoro - Livermore

Page 1 of 1

Client Sample Number	Lab Sample Number	Date Collected	Matrix
IP-10	11-12-1253-1	12/14/11	Aqueous

Parameter	Results	RL	DF	Qual	Units	Date Prepared	Date Analyzed	Method
Alkalinity, Total (as CaCO3)	455	5.00	1		mg/L	N/A	12/19/11	SM 2320B
Solids, Total Dissolved	640	1.00	1		mg/L	12/16/11	12/16/11	SM 2540 C

IP-8	11-12-1253-2	12/14/11	Aqueous
------	--------------	----------	---------

Parameter	Results	RL	DF	Qual	Units	Date Prepared	Date Analyzed	Method
Alkalinity, Total (as CaCO3)	650	5.00	1		mg/L	N/A	12/19/11	SM 2320B
Solids, Total Dissolved	920	1.00	1		mg/L	12/16/11	12/16/11	SM 2540 C

MW-11	11-12-1253-3	12/14/11	Aqueous
-------	--------------	----------	---------

Parameter	Results	RL	DF	Qual	Units	Date Prepared	Date Analyzed	Method
Alkalinity, Total (as CaCO3)	316	5.00	1		mg/L	N/A	12/19/11	SM 2320B
Solids, Total Dissolved	2270	10.0	1		mg/L	12/16/11	12/16/11	SM 2540 C

IP-9	11-12-1253-4	12/14/11	Aqueous
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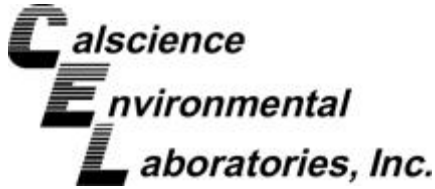
Parameter	Results	RL	DF	Qual	Units	Date Prepared	Date Analyzed	Method
Alkalinity, Total (as CaCO3)	35100	100	1		mg/L	N/A	12/19/11	SM 2320B
Solids, Total Dissolved	44300	100	1		mg/L	12/16/11	12/16/11	SM 2540 C

Method Blank					N/A			Aqueous
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Parameter	Results	RL	DF	Qual	Units	Date Prepared	Date Analyzed	Method
Alkalinity, Total (as CaCO3)	ND	1.0	1		mg/L	N/A	12/19/11	SM 2320B
Solids, Total Dissolved	ND	1.0	1		mg/L	12/16/11	12/16/11	SM 2540 C

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

Return to Contents



Quality Control - Duplicate



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

Date Received: N/A
 Work Order No: 11-12-1253

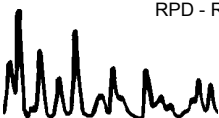
Project: Tesoro - Livermore

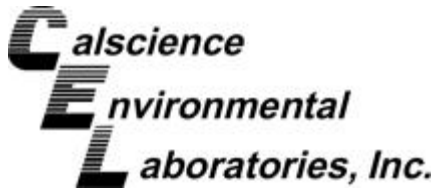
Matrix: Aqueous or Solid

Parameter	Method	QC Sample ID	Date Analyzed	Sample Conc.	DUP Conc.	RPD	RPD CL	Qualifiers
Alkalinity, Total (as CaCO ₃)	SM 2320B	11-12-1098-4	12/19/11	204	203	0	0-25	
Bicarbonate (as CaCO ₃)	SM 2320B	11-12-1098-4	12/19/11	204	203	0	0-25	
Carbonate (as CaCO ₃)	SM 2320B	11-12-1098-4	12/19/11	ND	ND	NA	0-25	
Hydroxide (as CaCO ₃)	SM 2320B	11-12-1098-4	12/19/11	ND	ND	NA	0-25	
Solids, Total Dissolved	SM 2540 C	IP-10	12/16/11	640	620	3	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: 11-12-1253
 Preparation: N/A
 Method: RSK-175M

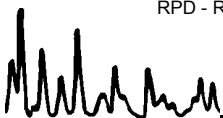
Project: Tesoro - Livermore

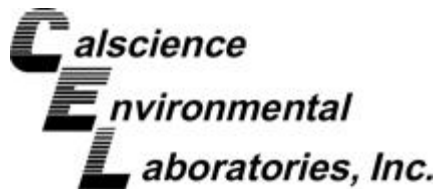
Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number
099-12-659-317	Aqueous	GC 14	N/A	12/17/11	111217L01

Parameter	SPIKE ADDED	LCS %REC	LCSD %REC	%REC CL	RPD	RPD CL	Qualifiers
Carbon Dioxide	102.0	99	100	80-120	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: 11-12-1253
 Preparation: N/A
 Method: RSK-175M

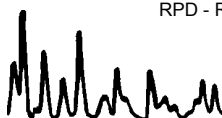
Project: Tesoro - Livermore

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number
099-12-663-1,471	Aqueous	GC 52	N/A	12/17/11	111217L01

Parameter	SPIKE ADDED	LCS %REC	LCSD %REC	%REC CL	RPD	RPD CL	Qualifiers
Methane	100.0	94	92	79-109	2	0-20	

Return to Contents

RPD - Relative Percent Difference , CL - Control Limit



Work Order Number: 11-12-1253

<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



1253

Test Detail for Kiff Work Order: 79803

Alkalinity SM 2320 (1)

Alkalinity, Total (as CaCO₃)

Carbon Dioxide by RSK 175 (1)

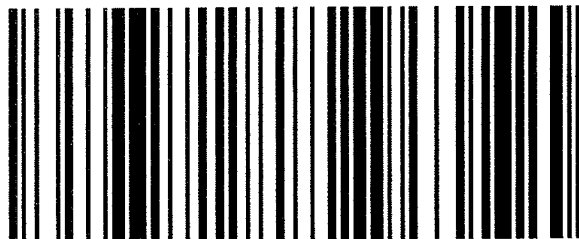
Carbon Dioxide

Hydrocarbons in Water by RSK 175 (1)

Methane



800.334.5000
ontrac.com



D10010435536573

Date Printed 12/15/2011

Tracking#D10010435536573

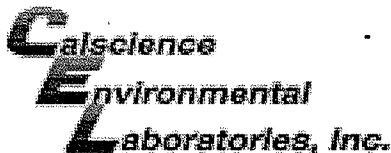
1253

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:

<p><i>Ship To Company:</i> CALSCIENCE ENVIRONMENTAL 7440 LINCOLN WAY GARDEN GROVE, CA 92841 RECEIVING (714)895-5494</p> <p>B10207210772</p>	<p><i>Service:</i> S</p> <p><i>Sort Code:</i> ORG</p> <p><i>Special Services:</i> Signature Required</p>
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WORK ORDER #: 11-12-1253

SAMPLE RECEIPT FORM

Cooler 1 of 1

CLIENT: KIFF

DATE: 12/16/11

TEMPERATURE: Thermometer ID: SC3 (Criteria: 0.0°C - 6.0°C, not frozen)

Temperature 0.9°C - 0.3°C (CF) = 0.6°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: KR

SAMPLE CONDITION:

Table with 4 columns: Sample Condition, 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: [X] VOA [X] VOAh [] VOAna2 [] 125AGB [] 125AGBh [] 125AGBp [] 1AGB [] 1AGBna2 [] 1AGBs

[] 500AGB [] 500AGJ [] 500AGJs [] 250AGB [] 250CGB [] 250CGBs [X] 1PB [] 1PBna [] 500PB

[X] 250PB [] 250PBn [] 125PB [] 125PBzanna [] 100PJ [] 100PJna2 [] _____ [] _____ [] _____

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

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

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



Laboratory Results

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

Subject : 4 Water Samples
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 standard. All soil samples are reported on a total weight (wet weight) basis unless noted otherwise in the case narrative. 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,



Joel Kiff

Subject : 4 Water Samples
Project Name : Tesoro - Livermore
Project Number : 01LV
P.O. Number : 67076

Case Narrative

A version of this report was previously issued on 12/22/2011. This revised version replaces that report.

The Method Reporting Limit for Ethanol has been increased due to the presence of an interfering compound for samples IP-1 and MW-7.

Matrix Spike/Matrix Spike Duplicate results associated with samples DW-8, IP-1, MW-2 and MW-7 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.

Matrix Spike/Matrix Spike Duplicate results associated with samples DW-8, IP-1, MW-2 and MW-7 for the analyte Sulfate were affected by the analyte concentration present in the un-spiked sample.

Matrix Spike/Matrix Spike Duplicate results associated with sample DW-8 for the analytes 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 samples IP-1, DW-8, MW-2, and MW-7 for the analytes Iron, Manganese, and Sodium were affected by the analyte concentrations already present in the un-spiked sample.

Project Name : **Tesoro - Livermore**

Project Number : **01LV**

Sample : **IP-1**

Matrix : Water

Lab Number : 79816-01

Sample Date :12/15/2011

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date/Time Analyzed
Nitrate as N	0.20	0.10	mg/L	EPA 300.0	12/16/11 12:45
Sulfate	26	0.50	mg/L	EPA 300.0	12/16/11 12:45
Hexavalent Chromium	< 1.0	1.0	ug/L	EPA 7199	12/16/11 10:57
Ferrous Iron	0.11	0.10	mg/L	SM 3500-Fe D	12/16/11 12:21
Arsenic	0.015	0.015	mg/L	EPA 6010B	12/22/11 12:24
Chromium	0.017	0.0050	mg/L	EPA 6010B	12/22/11 12:24
Iron	5.5	0.10	mg/L	EPA 6010B	12/22/11 12:24
Manganese	3.3	0.0050	mg/L	EPA 6010B	12/22/11 12:24
Sodium	110	0.50	mg/L	EPA 6010B	12/22/11 12:24
Benzene	680	4.0	ug/L	EPA 8260B	12/17/11 00:38
Toluene	860	4.0	ug/L	EPA 8260B	12/17/11 00:38
Ethylbenzene	450	4.0	ug/L	EPA 8260B	12/17/11 00:38
Total Xylenes	1800	4.0	ug/L	EPA 8260B	12/17/11 00:38
Methyl-t-butyl ether (MTBE)	< 4.0	4.0	ug/L	EPA 8260B	12/17/11 00:38
Diisopropyl ether (DIPE)	< 4.0	4.0	ug/L	EPA 8260B	12/17/11 00:38
Ethyl-t-butyl ether (ETBE)	< 4.0	4.0	ug/L	EPA 8260B	12/17/11 00:38
Tert-amyl methyl ether (TAME)	< 4.0	4.0	ug/L	EPA 8260B	12/17/11 00:38
Tert-Butanol	< 20	20	ug/L	EPA 8260B	12/17/11 00:38
Methanol	< 400	400	ug/L	EPA 8260B	12/17/11 00:38
Ethanol	< 80	80	ug/L	EPA 8260B	12/17/11 00:38
TPH as Gasoline	15000	400	ug/L	EPA 8260B	12/17/11 00:38
1,2-Dichloroethane-d4 (Surr)	102		% Recovery	EPA 8260B	12/17/11 00:38
Toluene - d8 (Surr)	97.0		% Recovery	EPA 8260B	12/17/11 00:38

Project Name : **Tesoro - Livermore**

Project Number : **01LV**

Sample : **DW-8**

Matrix : Water

Lab Number : 79816-02

Sample Date :12/15/2011

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date/Time Analyzed
Nitrate as N	< 0.10	0.10	mg/L	EPA 300.0	12/16/11 13:14
Sulfate	36	0.50	mg/L	EPA 300.0	12/16/11 13:14
Hexavalent Chromium	< 1.0	1.0	ug/L	EPA 7199	12/16/11 11:25
Ferrous Iron	< 0.10	0.10	mg/L	SM 3500-Fe D	12/16/11 12:35
Arsenic	< 0.015	0.015	mg/L	EPA 6010B	12/22/11 12:28
Chromium	< 0.0050	0.0050	mg/L	EPA 6010B	12/22/11 12:28
Iron	0.88	0.10	mg/L	EPA 6010B	12/22/11 12:28
Manganese	2.4	0.0050	mg/L	EPA 6010B	12/22/11 12:28
Sodium	78	0.50	mg/L	EPA 6010B	12/22/11 12:28
Benzene	2400	20	ug/L	EPA 8260B	12/17/11 01:17
Toluene	5400	15	ug/L	EPA 8260B	12/19/11 23:06
Ethylbenzene	1700	15	ug/L	EPA 8260B	12/19/11 23:06
Total Xylenes	9400	15	ug/L	EPA 8260B	12/19/11 23:06
Methyl-t-butyl ether (MTBE)	< 15	15	ug/L	EPA 8260B	12/19/11 23:06
Diisopropyl ether (DIPE)	< 15	15	ug/L	EPA 8260B	12/19/11 23:06
Ethyl-t-butyl ether (ETBE)	< 15	15	ug/L	EPA 8260B	12/19/11 23:06
Tert-amyl methyl ether (TAME)	< 15	15	ug/L	EPA 8260B	12/19/11 23:06
Tert-Butanol	< 70	70	ug/L	EPA 8260B	12/19/11 23:06
Methanol	< 1500	1500	ug/L	EPA 8260B	12/19/11 23:06
Ethanol	< 200	200	ug/L	EPA 8260B	12/17/11 01:17
TPH as Gasoline	54000	1500	ug/L	EPA 8260B	12/19/11 23:06
1,2-Dichloroethane	< 15	15	ug/L	EPA 8260B	12/19/11 23:06
1,2-Dibromoethane	< 15	15	ug/L	EPA 8260B	12/19/11 23:06
1,2-Dichloroethane-d4 (Surr)	104		% Recovery	EPA 8260B	12/19/11 23:06
Toluene - d8 (Surr)	99.0		% Recovery	EPA 8260B	12/19/11 23:06

Project Name : **Tesoro - Livermore**

Project Number : **01LV**

Sample : **MW-2**

Matrix : Water

Lab Number : 79816-03

Sample Date :12/15/2011

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date/Time Analyzed
Nitrate as N	< 0.10	0.10	mg/L	EPA 300.0	12/16/11 13:42
Sulfate	23	0.50	mg/L	EPA 300.0	12/16/11 13:42
Hexavalent Chromium	< 1.0	1.0	ug/L	EPA 7199	12/16/11 11:34
Ferrous Iron	< 0.10	0.10	mg/L	SM 3500-Fe D	12/16/11 12:40
Arsenic	< 0.015	0.015	mg/L	EPA 6010B	12/22/11 12:32
Chromium	0.026	0.0050	mg/L	EPA 6010B	12/22/11 12:32
Iron	7.4	0.10	mg/L	EPA 6010B	12/22/11 12:32
Manganese	2.2	0.0050	mg/L	EPA 6010B	12/22/11 12:32
Sodium	51	0.50	mg/L	EPA 6010B	12/22/11 12:32
Benzene	640	1.5	ug/L	EPA 8260B	12/20/11 15:25
Toluene	84	1.5	ug/L	EPA 8260B	12/20/11 15:25
Ethylbenzene	140	1.5	ug/L	EPA 8260B	12/20/11 15:25
Total Xylenes	340	1.5	ug/L	EPA 8260B	12/20/11 15:25
Methyl-t-butyl ether (MTBE)	450	1.5	ug/L	EPA 8260B	12/20/11 15:25
Diisopropyl ether (DIPE)	< 1.5	1.5	ug/L	EPA 8260B	12/20/11 15:25
Ethyl-t-butyl ether (ETBE)	< 1.5	1.5	ug/L	EPA 8260B	12/20/11 15:25
Tert-amyl methyl ether (TAME)	4.2	1.5	ug/L	EPA 8260B	12/20/11 15:25
Tert-Butanol	270	7.0	ug/L	EPA 8260B	12/20/11 15:25
Methanol	< 250	250	ug/L	EPA 8260B	12/17/11 01:52
Ethanol	< 15	15	ug/L	EPA 8260B	12/20/11 15:25
TPH as Gasoline	6600	150	ug/L	EPA 8260B	12/20/11 15:25
1,2-Dichloroethane-d4 (Surr)	94.1		% Recovery	EPA 8260B	12/20/11 15:25
Toluene - d8 (Surr)	98.5		% Recovery	EPA 8260B	12/20/11 15:25

Project Name : **Tesoro - Livermore**

Project Number : **01LV**

Sample : **MW-7**

Matrix : Water

Lab Number : 79816-04

Sample Date :12/15/2011

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date/Time Analyzed
Nitrate as N	< 0.10	0.10	mg/L	EPA 300.0	12/16/11 14:10
Sulfate	6.5	0.50	mg/L	EPA 300.0	12/16/11 14:10
Hexavalent Chromium	< 1.0	1.0	ug/L	EPA 7199	12/16/11 11:44
Ferrous Iron	< 0.10	0.10	mg/L	SM 3500-Fe D	12/16/11 12:45
Arsenic	< 0.015	0.015	mg/L	EPA 6010B	12/22/11 12:36
Chromium	0.32	0.0050	mg/L	EPA 6010B	12/22/11 12:36
Iron	88	0.10	mg/L	EPA 6010B	12/22/11 12:36
Manganese	5.4	0.0050	mg/L	EPA 6010B	12/22/11 12:36
Sodium	58	0.50	mg/L	EPA 6010B	12/22/11 12:36
Benzene	38	0.50	ug/L	EPA 8260B	12/17/11 02:26
Toluene	100	0.50	ug/L	EPA 8260B	12/17/11 02:26
Ethylbenzene	27	0.50	ug/L	EPA 8260B	12/17/11 02:26
Total Xylenes	130	0.50	ug/L	EPA 8260B	12/17/11 02:26
Methyl-t-butyl ether (MTBE)	< 0.50	0.50	ug/L	EPA 8260B	12/17/11 02:26
Diisopropyl ether (DIPE)	< 0.50	0.50	ug/L	EPA 8260B	12/17/11 02:26
Ethyl-t-butyl ether (ETBE)	< 0.50	0.50	ug/L	EPA 8260B	12/17/11 02:26
Tert-amyl methyl ether (TAME)	< 0.50	0.50	ug/L	EPA 8260B	12/17/11 02:26
Tert-Butanol	< 5.0	5.0	ug/L	EPA 8260B	12/17/11 02:26
Methanol	< 50	50	ug/L	EPA 8260B	12/17/11 02:26
Ethanol	< 8.0	8.0	ug/L	EPA 8260B	12/17/11 02:26
TPH as Gasoline	1500	50	ug/L	EPA 8260B	12/17/11 02:26
1,2-Dichloroethane-d4 (Surr)	104		% Recovery	EPA 8260B	12/17/11 02:26
Toluene - d8 (Surr)	99.1		% Recovery	EPA 8260B	12/17/11 02:26

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
Arsenic	< 0.015	0.015	mg/L	EPA 6010B	12/22/2011	Toluene - d8 (Surr)	99.9		%	EPA 8260B	12/19/2011
Chromium	< 0.0050	0.0050	mg/L	EPA 6010B	12/22/2011	Benzene	< 0.50	0.50	ug/L	EPA 8260B	12/20/2011
Iron	< 0.10	0.10	mg/L	EPA 6010B	12/22/2011	Toluene	< 0.50	0.50	ug/L	EPA 8260B	12/20/2011
Manganese	< 0.0050	0.0050	mg/L	EPA 6010B	12/22/2011	Ethylbenzene	< 0.50	0.50	ug/L	EPA 8260B	12/20/2011
Sodium	< 0.50	0.50	mg/L	EPA 6010B	12/22/2011	Total Xylenes	< 0.50	0.50	ug/L	EPA 8260B	12/20/2011
Benzene	< 0.50	0.50	ug/L	EPA 8260B	12/16/2011	Methyl-t-butyl ether (MTBE)	< 0.50	0.50	ug/L	EPA 8260B	12/20/2011
Toluene	< 0.50	0.50	ug/L	EPA 8260B	12/16/2011	Diisopropyl ether (DIPE)	< 0.50	0.50	ug/L	EPA 8260B	12/20/2011
Ethylbenzene	< 0.50	0.50	ug/L	EPA 8260B	12/16/2011	Ethyl-t-butyl ether (ETBE)	< 0.50	0.50	ug/L	EPA 8260B	12/20/2011
Total Xylenes	< 0.50	0.50	ug/L	EPA 8260B	12/16/2011	Tert-amyl methyl ether (TAME)	< 0.50	0.50	ug/L	EPA 8260B	12/20/2011
Methyl-t-butyl ether (MTBE)	< 0.50	0.50	ug/L	EPA 8260B	12/16/2011	Tert-Butanol	< 5.0	5.0	ug/L	EPA 8260B	12/20/2011
Diisopropyl ether (DIPE)	< 0.50	0.50	ug/L	EPA 8260B	12/16/2011	Ethanol	< 5.0	5.0	ug/L	EPA 8260B	12/20/2011
Ethyl-t-butyl ether (ETBE)	< 0.50	0.50	ug/L	EPA 8260B	12/16/2011	TPH as Gasoline	< 50	50	ug/L	EPA 8260B	12/20/2011
Tert-amyl methyl ether (TAME)	< 0.50	0.50	ug/L	EPA 8260B	12/16/2011	1,2-Dichloroethane-d4 (Surr)	97.0		%	EPA 8260B	12/20/2011
Tert-Butanol	< 5.0	5.0	ug/L	EPA 8260B	12/16/2011	Toluene - d8 (Surr)	100		%	EPA 8260B	12/20/2011
Methanol	< 50	50	ug/L	EPA 8260B	12/16/2011	Hexavalent Chromium	<1.0	1.0	ug/L	EPA 7199	12/16/2011
Ethanol	< 5.0	5.0	ug/L	EPA 8260B	12/16/2011	Nitrate as N	<0.10	0.10	mg/L	EPA 300.0	12/16/2011
TPH as Gasoline	< 50	50	ug/L	EPA 8260B	12/16/2011	Sulfate	<0.50	0.50	mg/L	EPA 300.0	12/16/2011
1,2-Dichloroethane-d4 (Surr)	106		%	EPA 8260B	12/16/2011	Ferrous Iron	<0.10	0.10	mg/L	SM 3500-Fe D	12/16/2011
Toluene - d8 (Surr)	98.9		%	EPA 8260B	12/16/2011						
Toluene	< 0.50	0.50	ug/L	EPA 8260B	12/19/2011						
Ethylbenzene	< 0.50	0.50	ug/L	EPA 8260B	12/19/2011						
Total Xylenes	< 0.50	0.50	ug/L	EPA 8260B	12/19/2011						
Methyl-t-butyl ether (MTBE)	< 0.50	0.50	ug/L	EPA 8260B	12/19/2011						
Diisopropyl ether (DIPE)	< 0.50	0.50	ug/L	EPA 8260B	12/19/2011						
Ethyl-t-butyl ether (ETBE)	< 0.50	0.50	ug/L	EPA 8260B	12/19/2011						
Tert-amyl methyl ether (TAME)	< 0.50	0.50	ug/L	EPA 8260B	12/19/2011						
Tert-Butanol	< 5.0	5.0	ug/L	EPA 8260B	12/19/2011						
Methanol	< 50	50	ug/L	EPA 8260B	12/19/2011						
TPH as Gasoline	< 50	50	ug/L	EPA 8260B	12/19/2011						
1,2-Dichloroethane	< 0.50	0.50	ug/L	EPA 8260B	12/19/2011						
1,2-Dibromoethane	< 0.50	0.50	ug/L	EPA 8260B	12/19/2011						
1,2-Dichloroethane-d4 (Surr)	102		%	EPA 8260B	12/19/2011						

QC Report : Matrix Spike/ Matrix Spike DuplicateProject 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
Hexavalent Chromium														
	79816-01	< 1.0	5.00	5.00	5.15	5.36	ug/L	EPA 7199	12/16/11	97.8	102	3.94	90.0-110	10
Nitrate as N														
	79816-01	0.20	0.500	0.500	1.23	1.21	mg/L	EPA 300.0	12/16/11	206	201	2.07	85.0-115	10
Sulfate														
	79816-01	26	2.50	2.50	27.6	28.1	mg/L	EPA 300.0	12/16/11	56.1	77.8	1.95	85.0-115	10
Ferrous Iron														
	79816-01	0.11	0.252	0.252	0.294	0.287	mg/L	SM 3500-Fe D	12/16/11	74.7	71.9	2.41	70.0-130	25
Benzene														
	79809-01	27	39.8	39.9	67.4	67.9	ug/L	EPA 8260B	12/16/11	102	103	0.951	80-120	25
Diisopropyl ether														
	79809-01	3.9	39.4	39.5	48.4	48.5	ug/L	EPA 8260B	12/16/11	113	113	0.0653	80-120	25
Ethanol														
	79809-01	<5.0	99.8	100	132	122	ug/L	EPA 8260B	12/16/11	132	122	8.24	55.1-159	25
Ethyl-tert-butyl ether														
	79809-01	<0.50	39.9	39.9	43.2	42.6	ug/L	EPA 8260B	12/16/11	108	107	1.41	76.5-120	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
Ethylbenzene	79809-01	89	39.8	39.9	122	124	ug/L	EPA 8260B	12/16/11	82.4	87.5	6.07	80-120	25
Methanol	79809-01	<50	996	998	1190	1340	ug/L	EPA 8260B	12/16/11	119	134	11.9	53.2-147	25
Methyl-t-butyl ether	79809-01	5.1	40.2	40.3	47.1	46.3	ug/L	EPA 8260B	12/16/11	104	102	2.20	69.7-121	25
P + M Xylene	79809-01	53	39.8	39.9	91.0	93.0	ug/L	EPA 8260B	12/16/11	95.2	100	4.98	76.8-120	25
Tert-Butanol	79809-01	<5.0	200	201	199	202	ug/L	EPA 8260B	12/16/11	99.2	100	1.27	80-120	25
Tert-amyl-methyl ether	79809-01	<0.50	39.3	39.4	42.2	42.2	ug/L	EPA 8260B	12/16/11	108	107	0.240	78.9-120	25
Toluene	79809-01	16	39.8	39.9	56.0	56.9	ug/L	EPA 8260B	12/16/11	102	104	1.99	80-120	25
Diisopropyl ether	79841-01	<0.50	39.5	39.5	35.0	35.1	ug/L	EPA 8260B	12/19/11	88.6	88.7	0.186	80-120	25
Ethanol	79841-01	<5.0	100	100	108	101	ug/L	EPA 8260B	12/19/11	108	101	6.04	55.1-159	25

QC Report : Matrix Spike/ Matrix Spike DuplicateProject 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
Ethyl-tert-butyl ether	79841-01	<0.50	40.0	40.0	35.6	35.3	ug/L	EPA 8260B	12/19/11	88.9	88.1	0.920	76.5-120	25
Ethylbenzene	79841-01	290	40.0	40.0	291	281	ug/L	EPA 8260B	12/19/11	6.76	0.00	200	80-120	25
Methanol	79841-01	<50	1000	1000	1100	989	ug/L	EPA 8260B	12/19/11	110	99.0	10.5	53.2-147	25
Methyl-t-butyl ether	79841-01	1.4	40.4	40.4	35.7	36.3	ug/L	EPA 8260B	12/19/11	85.0	86.3	1.57	69.7-121	25
P + M Xylene	79841-01	880	40.0	40.0	836	817	ug/L	EPA 8260B	12/19/11	0.00	0.00	0.00	76.8-120	25
Tert-Butanol	79841-01	130	201	201	323	313	ug/L	EPA 8260B	12/19/11	95.8	90.8	5.41	80-120	25
Tert-amyl-methyl ether	79841-01	<0.50	39.4	39.4	35.9	36.1	ug/L	EPA 8260B	12/19/11	91.0	91.6	0.677	78.9-120	25
Toluene	79841-01	500	40.0	40.0	492	483	ug/L	EPA 8260B	12/19/11	0.00	0.00	0.00	80-120	25
Benzene	79840-03	<0.50	40.0	40.0	42.1	41.7	ug/L	EPA 8260B	12/20/11	105	104	0.971	80-120	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
Diisopropyl ether	79840-03	<0.50	39.5	39.5	41.2	41.3	ug/L	EPA 8260B	12/20/11	104	104	0.0738	80-120	25
Ethanol	79840-03	<5.0	100	100	87.5	91.5	ug/L	EPA 8260B	12/20/11	87.3	91.4	4.53	55.1-159	25
Ethyl-tert-butyl ether	79840-03	<0.50	40.0	40.0	41.4	40.9	ug/L	EPA 8260B	12/20/11	104	102	1.33	76.5-120	25
Ethylbenzene	79840-03	<0.50	40.0	40.0	38.3	38.3	ug/L	EPA 8260B	12/20/11	95.8	95.7	0.106	80-120	25
Methyl-t-butyl ether	79840-03	<0.50	40.4	40.4	41.2	40.8	ug/L	EPA 8260B	12/20/11	102	101	1.05	69.7-121	25
P + M Xylene	79840-03	<0.50	40.0	40.0	37.6	37.5	ug/L	EPA 8260B	12/20/11	94.0	93.8	0.251	76.8-120	25
Tert-Butanol	79840-03	140	201	201	360	364	ug/L	EPA 8260B	12/20/11	106	109	2.16	80-120	25
Tert-amyl-methyl ether	79840-03	<0.50	39.4	39.4	42.4	41.9	ug/L	EPA 8260B	12/20/11	107	106	1.12	78.9-120	25
Toluene	79840-03	<0.50	40.0	40.0	41.7	41.5	ug/L	EPA 8260B	12/20/11	104	104	0.501	80-120	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
Arsenic	79803-01	< 0.015	0.400	0.400	0.420	0.417	mg/L	EPA 6010B	12/22/11	103	103	0.502	75-125	20
Chromium	79803-01	0.010	0.400	0.400	0.430	0.426	mg/L	EPA 6010B	12/22/11	105	104	0.981	75-125	20
Iron	79803-01	3.2	0.400	0.400	3.46	3.30	mg/L	EPA 6010B	12/22/11	71.2	30.5	4.82	75-125	20
Manganese	79803-01	3.5	0.400	0.400	3.75	3.64	mg/L	EPA 6010B	12/22/11	61.2	35.0	2.84	75-125	20
Sodium	79803-01	92	0.400	0.400	90.7	89.3	mg/L	EPA 6010B	12/22/11	0.00	0.00	1.62	75-125	20
1,2-Dibromoethane	79841-01	<0.50	40.2	40.2	36.6	38.1	ug/L	EPA 8260B	12/19/11	90.9	94.7	4.10	80-120	25
1,2-Dichloroethane	79841-01	<0.50	40.0	40.0	35.5	35.3	ug/L	EPA 8260B	12/19/11	88.8	88.3	0.501	75.7-122	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
Arsenic	0.400	mg/L	EPA 6010B	12/22/11	96.3	85-115
Chromium	0.400	mg/L	EPA 6010B	12/22/11	101	85-115
Iron	0.400	mg/L	EPA 6010B	12/22/11	94.4	85-115
Manganese	0.400	mg/L	EPA 6010B	12/22/11	97.3	85-115
Sodium	0.400	mg/L	EPA 6010B	12/22/11	94.3	85-115
Benzene	40.0	ug/L	EPA 8260B	12/16/11	108	80-120
Diisopropyl ether	39.5	ug/L	EPA 8260B	12/16/11	112	80-120
Ethanol	100	ug/L	EPA 8260B	12/16/11	80.2	55.1-159
Ethyl-tert-butyl ether	40.0	ug/L	EPA 8260B	12/16/11	107	76.5-120
Ethylbenzene	40.0	ug/L	EPA 8260B	12/16/11	106	80-120
Methanol	1000	ug/L	EPA 8260B	12/16/11	61.6	53.2-147
Methyl-t-butyl ether	40.4	ug/L	EPA 8260B	12/16/11	108	69.7-121
P + M Xylene	40.0	ug/L	EPA 8260B	12/16/11	109	76.8-120
Tert-Butanol	201	ug/L	EPA 8260B	12/16/11	100	80-120
Tert-amyl-methyl ether	39.4	ug/L	EPA 8260B	12/16/11	108	78.9-120
Toluene	40.0	ug/L	EPA 8260B	12/16/11	105	80-120
Diisopropyl ether	39.5	ug/L	EPA 8260B	12/19/11	101	80-120
Ethyl-tert-butyl ether	40.0	ug/L	EPA 8260B	12/19/11	101	76.5-120
Ethylbenzene	40.0	ug/L	EPA 8260B	12/19/11	108	80-120
Methanol	1000	ug/L	EPA 8260B	12/19/11	94.8	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	40.4	ug/L	EPA 8260B	12/19/11	98.5	69.7-121
P + M Xylene	40.0	ug/L	EPA 8260B	12/19/11	110	76.8-120
Tert-Butanol	201	ug/L	EPA 8260B	12/19/11	90.5	80-120
Tert-amyl-methyl ether	39.4	ug/L	EPA 8260B	12/19/11	105	78.9-120
Toluene	40.0	ug/L	EPA 8260B	12/19/11	105	80-120
1,2-Dibromoethane	40.2	ug/L	EPA 8260B	12/19/11	103	80-120
1,2-Dichloroethane	40.0	ug/L	EPA 8260B	12/19/11	99.8	75.7-122
Benzene	40.1	ug/L	EPA 8260B	12/20/11	107	80-120
Diisopropyl ether	39.6	ug/L	EPA 8260B	12/20/11	106	80-120
Ethanol	100	ug/L	EPA 8260B	12/20/11	90.5	55.1-159
Ethyl-tert-butyl ether	40.1	ug/L	EPA 8260B	12/20/11	106	76.5-120
Ethylbenzene	40.1	ug/L	EPA 8260B	12/20/11	98.1	80-120
Methyl-t-butyl ether	40.5	ug/L	EPA 8260B	12/20/11	103	69.7-121
P + M Xylene	40.1	ug/L	EPA 8260B	12/20/11	96.3	76.8-120
TPH as Gasoline	504	ug/L	EPA 8260B	12/20/11	103	70.0-130
Tert-Butanol	202	ug/L	EPA 8260B	12/20/11	111	80-120
Tert-amyl-methyl ether	39.5	ug/L	EPA 8260B	12/20/11	109	78.9-120
Toluene	40.1	ug/L	EPA 8260B	12/20/11	106	80-120
Hexavalent Chromium	5.00	ug/L	EPA 7199	12/16/11	99.7	90.0-110

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
Nitrate as N	0.500	mg/L	EPA 300.0	12/16/11	94.7	85.0-115
Sulfate	2.50	mg/L	EPA 300.0	12/16/11	103	85.0-115
Ferrous Iron	0.252	mg/L	SM 3500-Fe D	12/16/11	104	70.0-130



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 Davis, CA 95616
 Lab: 530.297.4800
 Fax: 530.297.4808

Lab No. 79816

Page 2 of 4

Project Contact (Hardcopy or PDF To): Matthew Nelson		California EDF Report? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No				Chain-of-Custody Record and Analysis Request																																																																																																																																																						
Company / Address: Arctos Environmental 1332 Peralta Ave., Berkeley, CA. 94702		Recommended but not mandatory to complete this section: Sampling Company Log Code:				Analysis Request										TAT																																																																																																																																												
Phone No.: 562-988-2755	Fax No.: 562-988-2759	Global ID: T0600101410				TPHg, BTEX, 7 Oxygenates (EPA 8260B)	Nitrate, Sulfate (EPA 300.0)	Ferrous Iron (SM 3500-Fe D)	Hexavalent Chromium (EPA 7199)	Metals by ICP (Fe/Na/Mn/Cr/As) (EPA 6010)	Total Alkalinity (SM 2320 B)	TDS (SM 2540 C)	Carbon Dioxide (RSK 175M)	Methane (RSK 175M)	Lead Scav. (1,2 DCA & 1,2 EDB - 8260B)	TOC	COD and BOD	15hr	For Lab Use Only																																																																																																																																									
Project Number: 01LV	P.O. No.: 67076	EDF Deliverable To (Email Address): mnelson@orionenv.com																24hr		48hr	72hr	<input checked="" type="radio"/> 1wk	<input type="radio"/> 2wk																																																																																																																																					
Project Name: Tesoro - Livermore		Sampler Signature: Scott Stromberg																																																																																																																																																										
Project Address: 1619 1st Street Livermore, CA		Sampling		Container		Preservative				Matrix																																																																																																																																																		
Sample Designation		Date	Time	40 ml VOA	500 mL HDPE	250 mL POLY	1 L POLY	HCl	HNO ₃	ICE	NONE	WATER	SOIL	VAPOR																																																																																																																																														
		<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td style="width:20%;">DW-8</td> <td style="width:10%;">12/15/11</td> <td style="width:10%;">1319</td> <td style="width:5%;">3</td> <td></td> <td></td> <td></td> <td></td> <td style="text-align: center;">X</td> <td></td> <td></td> <td></td> <td style="text-align: center;">X</td> <td></td> <td></td> <td style="text-align: center;">X</td> <td></td> <td></td> <td style="width:5%;">1 wk</td> <td style="width:5%;">02</td> </tr> <tr> <td>DW-8</td> <td></td> <td></td> <td></td> <td style="text-align: center;">1</td> <td></td> <td></td> <td></td> <td></td> <td style="text-align: center;">X</td> <td></td> <td></td> <td style="text-align: center;">X</td> <td></td> <td></td> <td style="text-align: center;">X</td> <td></td> <td></td> <td>1 wk</td> <td>02</td> </tr> <tr> <td>DW-8</td> <td></td> <td></td> <td></td> <td></td> <td style="text-align: center;">1</td> <td></td> <td></td> <td></td> <td style="text-align: center;">X</td> <td></td> <td></td> <td style="text-align: center;">X</td> <td></td> <td></td> <td></td> <td style="text-align: center;">X</td> <td></td> <td>1 wk</td> <td>02</td> </tr> <tr> <td>DW-8</td> <td></td> <td></td> <td></td> <td></td> <td style="text-align: center;">1</td> <td></td> <td></td> <td></td> <td></td> <td style="text-align: center;">X</td> <td></td> <td style="text-align: center;">X</td> <td></td> <td></td> <td></td> <td style="text-align: center;">X</td> <td></td> <td>1 wk</td> <td>02</td> </tr> <tr> <td>DW-8</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td style="text-align: center;">1</td> <td></td> <td></td> <td></td> <td style="text-align: center;">X</td> <td></td> <td style="text-align: center;">X</td> <td></td> <td></td> <td></td> <td style="text-align: center;">X</td> <td></td> <td>1 wk</td> <td>02</td> </tr> <tr> <td>DW-8</td> <td></td> <td></td> <td></td> <td style="text-align: center;">2</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td style="text-align: center;">X</td> <td></td> <td style="text-align: center;">X</td> <td></td> <td></td> <td></td> <td style="text-align: center;">X</td> <td></td> <td>1 wk</td> <td>02</td> </tr> <tr> <td>DW-8</td> <td></td> <td></td> <td></td> <td style="text-align: center;">2</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td style="text-align: center;">X</td> <td></td> <td style="text-align: center;">X</td> <td></td> <td></td> <td></td> <td style="text-align: center;">X</td> <td></td> <td>1 wk</td> <td>02</td> </tr> </table>																	DW-8	12/15/11	1319	3					X				X			X			1 wk	02	DW-8				1					X			X			X			1 wk	02	DW-8					1				X			X				X		1 wk	02	DW-8					1					X		X				X		1 wk	02	DW-8						1				X		X				X		1 wk	02	DW-8				2						X		X				X		1 wk	02	DW-8				2						X		X				X	
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Relinquished by:		Date 12/16/11	Time 0818	Received by Laboratory: KIFF Analytical				Bill to: TESORO																																																																																																																																																				



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 Davis, CA 95616
 Lab: 530.297.4800
 Fax: 530.297.4808

Lab No. 79816

Page 3 of 4

Project Contact (Hardcopy or PDF To):
 Matthew Nelson

California EDF Report? Yes No

Company / Address:
 Arctos Environmental
 1332 Peralta Ave., Berkeley, CA. 94702

Phone No.: 562-988-2755 **Fax No.:** 562-988-2759

Project Number: 01LV **P.O. No.:** 67076

Project Name:
 Tesoro - Livermore

Sampler Signature: *Scott Stromberg*

Recommended but not mandatory to complete this section:

Sampling Company Log Code:

Global ID: T0600101410

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

Chain-of-Custody Record and Analysis Request

Analysis Request														TAT	
TPHg, BTEX, 7 Oxygenates (EPA 8260B)	Nitrate, Sulfate (EPA 300.0)	Ferrous Iron (SM 3500-Fe D)	Hexavalent Chromium (EPA 7199)	Metals by ICP (Fe/Na/Mn/Cr/As) (EPA 6010)	Total Alkalinity (SM 2320 B)	TDS (SM 2540 C)	Carbon Dioxide (RSK 175M)	Methane (RSK 175M)							13hr
															24hr
															48hr
															72hr
															1wk
															2wk

Sample Designation	Sampling		Container				Preservative				Matrix			TAT	For Lab Use Only	
	Date	Time	40 ml VOA	500 mL HDPE	250 mL POLY	1 L POLY	HCl	HNO ₃	ICE	NONE	WATER	SOIL	VAPOR			
MW-2	12/15/11	1343	3				X				X			X	1 wk	03
MW-2				1				X		X				X	1 wk	03
MW-2					1			X		X				X	1 wk	03
MW-2					1			X		X				X	1 wk	03
MW-2					1			X		X				X	1 wk	03
MW-2			2					X		X				X	1 wk	03
MW-2			2				X			X				X	1 wk	03

Relinquished by: <i>Scott Stromberg</i>	Date: 12/15/11	Time: 1700	Received by:	Remarks:
Relinquished by:	Date:	Time:	Received by:	
Relinquished by:	Date: 12/18/11	Time: 0818	Received by Laboratory: <i>Will Analytical</i>	



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 Davis, CA 95616
 Lab: 530.297.4800
 Fax: 530.297.4808

Lab No. 79816

Page 4 of 4

Project Contact (Hardcopy or PDF To):
 Matthew Nelson

Company / Address:
 Arctos Environmental
 1332 Peralta Ave., Berkeley, CA. 94702

Phone No.: 562-988-2755 **Fax No.:** 562-988-2759

Project Number: 01LV **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: Scott Stromberg

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	500 mL HDPE	250 mL POLY	1 L POLY	HCl	HNO ₃	ICE	NONE	WATER	SOIL	VAPOR	TPHg, BTEX, 7 Oxygenates (EPA 8260B)	Nitrate, Sulfate (EPA 300.0)	Ferrous Iron (SM 3500-Fe D)	Hexavalent Chromium (EPA 7199)	Metals by ICP (Fe/Na/Mn/Cr/As) (EPA 6010)	Total Alkalinity (SM 2320 B)	TDS (SM 2540 C)	Carbon Dioxide (RSK 175M)	Methane (RSK 175M)	15hr	24hr	48hr			72hr	1wk	2wk		
MW-7	12/15/11	1400	3					X			X			X																	1 wk	04
MW-7				1					X		X				X	X	X														1 wk	04
MW-7					1				X		X							X													1 wk	04
MW-7					1				X		X								X												1 wk	04
MW-7						1			X		X									X											1 wk	04
MW-7				2					X		X										X										1 wk	04
MW-7				2				X			X											X									1 wk	04

Relinquished by: 	Date: 12/15/11	Time: 1700	Received by: 	Remarks:
Relinquished by:	Date:	Time:	Received by:	
Relinquished by:	Date: 12/16/11	Time: 0818	Received by Laboratory: Kiff Analytical	
				Bill to: TESORO

SAMPLE RECEIPT CHECKLIST

RECEIVER
Eug
Initials

SRG#: 79816 Date: 12/16/11

Project ID: Tesoro - Lwermore

Method of Receipt: Courier Over-the-counter Shipper ups

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 30 Therm. ID# IR-5 Initial Eug Date/Time 12/16/11 0812 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 VCA # of containers received 28
 Matrix WA Container type Poly # of containers received 16
 Matrix WA Container type MA # of containers received 16
 Date and Time Sample Put into Temp Storage Date: 12/16/11 Time: 0818

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: No date and time for all samples listed on page 4 of the COC. Eug 12/16/11 0818

Sample date and time is listed on 1st ^{sample} line of page 4 but not drawn down through other lines. Per labels all containers ^{with 2b of MW-7} were taken on 12/15/11 at 1400. SR will treat as one sample. MAS 12/16/11 0856



Subcontract Laboratory Report Attachments



CALSCIENCE

WORK ORDER NUMBER: 11-12-1400

The difference is service



AIR | SOIL | WATER | MARINE CHEMISTRY

Analytical Report For

Client: Kiff Analytical

Client Project Name: Tesoro Livermore

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

Amanda Porter

Approved for release on 12/27/2011 by:
Amanda Porter
Project Manager

ResultLink ▶

Email your PM ▶



Calscience Environmental Laboratories 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 provided herein, and follows the standard Calscience data package. The results in this analytical report are limited to the samples tested and any reproduction thereof must be made in its entirety. Note that the Chain-of-Custody Record and Sample Receipt Form are integral parts of this report.





Contents

Client Project Name: Tesoro Livermore
Work Order Number: 11-12-1400

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1.3	Combined Inorganic Tests	5
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Analytical Report



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

Date Received: 12/17/11
 Work Order No: 11-12-1400
 Preparation: N/A
 Method: RSK-175M

Project: Tesoro Livermore

Page 1 of 1

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
IP-1	11-12-1400-1-C	12/15/11 12:26	Aqueous	GC 14	N/A	12/20/11 11:29	111220L01

Parameter	Result	RL	DF	Qual	Units
Carbon Dioxide	12800	17.0	10		ug/L

DW-8	11-12-1400-2-C	12/15/11 13:19	Aqueous	GC 14	N/A	12/20/11 11:52	111220L01
------	----------------	----------------	---------	-------	-----	----------------	-----------

Parameter	Result	RL	DF	Qual	Units
Carbon Dioxide	19100	17.0	10		ug/L

MW-2	11-12-1400-3-C	12/15/11 13:43	Aqueous	GC 14	N/A	12/20/11 12:16	111220L01
------	----------------	----------------	---------	-------	-----	----------------	-----------

Parameter	Result	RL	DF	Qual	Units
Carbon Dioxide	64200	17.0	10		ug/L

MW-7	11-12-1400-4-C	12/15/11 14:00	Aqueous	GC 14	N/A	12/20/11 12:35	111220L01
------	----------------	----------------	---------	-------	-----	----------------	-----------

Parameter	Result	RL	DF	Qual	Units
Carbon Dioxide	28100	17.0	10		ug/L

Method Blank	099-12-659-318	N/A	Aqueous	GC 14	N/A	12/20/11 11:08	111220L01
--------------	----------------	-----	---------	-------	-----	----------------	-----------

Parameter	Result	RL	DF	Qual	Units
Carbon Dioxide	ND	1.70	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: 12/17/11
Work Order No: 11-12-1400
Preparation: N/A
Method: RSK-175M

Project: Tesoro Livermore

Page 1 of 1

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
IP-1	11-12-1400-1-A	12/15/11 12:26	Aqueous	GC 52	N/A	12/20/11 13:43	111220L01

Parameter	Result	RL	DF	Qual	Units
Methane	916	8.00	8		ug/L

DW-8	11-12-1400-2-A	12/15/11 13:19	Aqueous	GC 52	N/A	12/20/11 14:09	111220L01
------	----------------	----------------	---------	-------	-----	----------------	-----------

Parameter	Result	RL	DF	Qual	Units
Methane	1210	8.00	8		ug/L

MW-2	11-12-1400-3-A	12/15/11 13:43	Aqueous	GC 52	N/A	12/20/11 14:29	111220L01
------	----------------	----------------	---------	-------	-----	----------------	-----------

Parameter	Result	RL	DF	Qual	Units
Methane	2040	8.00	8		ug/L

MW-7	11-12-1400-4-A	12/15/11 14:00	Aqueous	GC 52	N/A	12/20/11 14:53	111220L01
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Parameter	Result	RL	DF	Qual	Units
Methane	1080	8.00	8		ug/L

Method Blank	099-12-663-1,472	N/A	Aqueous	GC 52	N/A	12/20/11 10:48	111220L01
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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



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

Date Received: 12/17/11
Work Order No: 11-12-1400

Project: Tesoro Livermore

Page 1 of 1

Client Sample Number	Lab Sample Number	Date Collected	Matrix
IP-1	11-12-1400-1	12/15/11	Aqueous

Parameter	Results	RL	DF	Qual	Units	Date Prepared	Date Analyzed	Method
Alkalinity, Total (as CaCO3)	580	5.00	1		mg/L	N/A	12/20/11	SM 2320B
Solids, Total Dissolved	620	1.00	1		mg/L	12/17/11	12/17/11	SM 2540 C
DW-8					11-12-1400-2	12/15/11		Aqueous

Parameter	Results	RL	DF	Qual	Units	Date Prepared	Date Analyzed	Method
Alkalinity, Total (as CaCO3)	510	5.00	1		mg/L	N/A	12/20/11	SM 2320B
Solids, Total Dissolved	560	1.00	1		mg/L	12/17/11	12/17/11	SM 2540 C
MW-2					11-12-1400-3	12/15/11		Aqueous

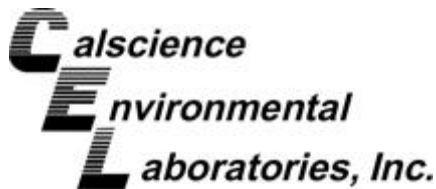
Parameter	Results	RL	DF	Qual	Units	Date Prepared	Date Analyzed	Method
Alkalinity, Total (as CaCO3)	574	5.00	1		mg/L	N/A	12/20/11	SM 2320B
Solids, Total Dissolved	540	1.00	1		mg/L	12/17/11	12/17/11	SM 2540 C
MW-7					11-12-1400-4	12/15/11		Aqueous

Parameter	Results	RL	DF	Qual	Units	Date Prepared	Date Analyzed	Method
Alkalinity, Total (as CaCO3)	433	5.00	1		mg/L	N/A	12/20/11	SM 2320B
Solids, Total Dissolved	515	1.00	1		mg/L	12/17/11	12/17/11	SM 2540 C
Method Blank					N/A			Aqueous

Parameter	Results	RL	DF	Qual	Units	Date Prepared	Date Analyzed	Method
Alkalinity, Total (as CaCO3)	ND	1.0	1		mg/L	N/A	12/20/11	SM 2320B
Solids, Total Dissolved	ND	1.0	1		mg/L	12/17/11	12/17/11	SM 2540 C

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

Return to Contents



Quality Control - Duplicate



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

Date Received: N/A
 Work Order No: 11-12-1400

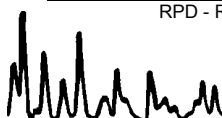
Project: Tesoro Livermore

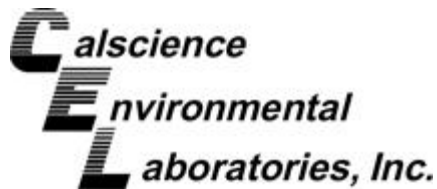
Matrix: Aqueous or Solid

Parameter	Method	QC Sample ID	Date Analyzed	Sample Conc.	DUP Conc.	RPD	RPD CL	Qualifiers
Alkalinity, Total (as CaCO ₃)	SM 2320B	11-12-1495-2	12/20/11	561	552	2	0-25	
Bicarbonate (as CaCO ₃)	SM 2320B	11-12-1495-2	12/20/11	561	552	2	0-25	
Carbonate (as CaCO ₃)	SM 2320B	11-12-1495-2	12/20/11	ND	ND	NA	0-25	
Hydroxide (as CaCO ₃)	SM 2320B	11-12-1495-2	12/20/11	ND	ND	NA	0-25	
Solids, Total Dissolved	SM 2540 C	11-12-1216-1	12/17/11	930	940	1	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: 11-12-1400
 Preparation: N/A
 Method: RSK-175M

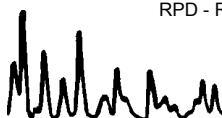
Project: Tesoro Livermore

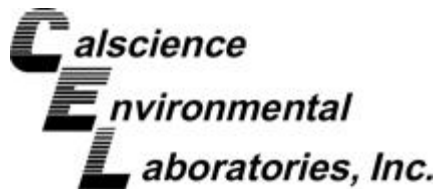
Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number
099-12-659-318	Aqueous	GC 14	N/A	12/20/11	111220L01

Parameter	SPIKE ADDED	LCS %REC	LCSD %REC	%REC CL	RPD	RPD CL	Qualifiers
Carbon Dioxide	102.0	100	112	80-120	11	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: 11-12-1400
 Preparation: N/A
 Method: RSK-175M

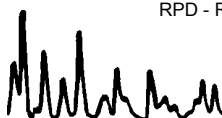
Project: Tesoro Livermore

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number
099-12-663-1,472	Aqueous	GC 52	N/A	12/20/11	111220L01

Parameter	SPIKE ADDED	LCS %REC	LCSD %REC	%REC CL	RPD	RPD CL	Qualifiers
Methane	100.0	92	84	79-109	9	0-20	

Return to Contents

RPD - Relative Percent Difference , CL - Control Limit



Work Order Number: 11-12-1400

<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

11-12-1400

COC No. **79816** Page 1 of 1

Project Contact (Hardcopy or PDF to): **Scott Forbes** EDF Report? **NO** Chain-of-Custody Record and Analysis Request

Company/Address: **Kiff Analytical** Recommended but not mandatory to complete this section: **Analysis Request** TAT

Phone No.: **530-297-4800** FAX No.: **530-297-4808** Global ID:
 Project Number: **01LV** P.O. No.: **79816** Deliverables to (Email Address): **inbox@kiffanalytical.com**

Sample Designation	Sampling		Container / Preservative				Matrix		Water	Alkalinity SM 2320 (1)	Carbon Dioxide by RSK 175 (1)	Hydrocarbons in Water by RSK 175 (1)	Total Dissolved Solids													4-Days	For Lab Use Only
	Date	Time	1-L Poly None	250ml Poly None	VOA 40 ml None	VOA 40 ml HCl																					
IP-1	12/15/11	12:26	1	1	2	2			X	X	X	X														X	1
DW-8	12/15/11	13:19	1	1	2	2			X	X	X	X														X	2
MW-2	12/15/11	13:43	1	1	2	2			X	X	X	X														X	3
MW-7	12/15/11	14:00	1	1	2	2			X	X	X	X														X	4

Relinquished by: <i>[Signature]</i> Kiff Analytical	Date: 12/16/11	Time: 1900	Received by:	Remarks: Please refer to attached Test Detail.
Relinquished by:	Date:	Time:	Received by:	
Relinquished by:	Date: 12/17/11	Time: 1045	Received by Laboratory: <i>[Signature]</i>	

Bill to: **Accounts Payable**

1400

Test Detail for Kiff Work Order: 79816

Alkalinity SM 2320 (1)

Alkalinity, Total (as CaCO₃)

Carbon Dioxide by RSK 175 (1)

Carbon Dioxide

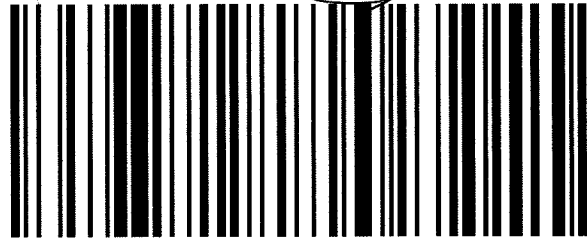
Hydrocarbons in Water by RSK 175 (1)

Methane

1400



800.334.5000
ontrac.com



D10010435856913

Date Printed 12/16/2011

Tracking#D10010435856913

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 SATURDAY SAMPLES
Reference 2:

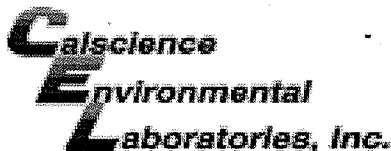
Ship To Company:
CALSCIENCE ENVIRONMENTAL
7440 LINCOLN WAY
GARDEN GROVE, CA 92841
RECEIVING (714)895-5494

B10207210772

Service: **S**
Sort Code: **ORG**

Special Services:
Saturday Delivery
Signature Required





WORK ORDER #: 11-12-1400

SAMPLE RECEIPT FORM

Cooler 1 of 1

CLIENT: KIFF

DATE: 12/17/11

TEMPERATURE: Thermometer ID: SC3 (Criteria: 0.0 °C – 6.0 °C, not frozen)

Temperature > .1 °C - 0.3 °C (CF) = 1.8 °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: YL

CUSTODY SEALS INTACT:

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

Initial: YL

Initial: WSC

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, 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, 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, Unpreserved vials received for Volatiles analysis, Volatile analysis container(s) free of headspace, Tedlar bag(s) free of condensation.



CONTAINER TYPE:

Solid: [] 4ozCGJ [] 8ozCGJ [] 16ozCGJ [] Sleeve (____) [] EnCores® [] TerraCores® [] _____
Water: [X] VOA [X] VOAh [] VOAna2 [] 125AGB [] 125AGBh [] 125AGBp [] 1AGB [] 1AGBna2 [] 1AGBs
[] 500AGB [] 500AGJ [] 500AGJs [] 250AGB [] 250CGB [] 250CGBs [X] 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: WSC
Preservative: h: HCL n: HNO3 na2: Na2S2O3 na: NaOH p: H3PO4 s: H2SO4 u: Ultra-pure zanna: ZnAc2+NaOH f: Filtered Scanned by: WSC



Laboratory Results

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

Subject : 6 Water Samples
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 standard. All soil samples are reported on a total weight (wet weight) basis unless noted otherwise in the case narrative. 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,



Joel Kiff

Project Name : **Tesoro - Livermore**

Project Number : **01LV**

Sample : **IP-9**

Matrix : Water

Lab Number : 79867-01

Sample Date :12/20/2011

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date/Time Analyzed
Benzene	88	2.0	ug/L	EPA 8260B	12/23/11 13:14
Toluene	630	2.0	ug/L	EPA 8260B	12/23/11 13:14
Ethylbenzene	230	2.0	ug/L	EPA 8260B	12/23/11 13:14
Total Xylenes	1300	2.0	ug/L	EPA 8260B	12/23/11 13:14
Methyl-t-butyl ether (MTBE)	< 2.0	2.0	ug/L	EPA 8260B	12/23/11 13:14
Diisopropyl ether (DIPE)	< 2.0	2.0	ug/L	EPA 8260B	12/23/11 13:14
Ethyl-t-butyl ether (ETBE)	< 2.0	2.0	ug/L	EPA 8260B	12/23/11 13:14
Tert-amyl methyl ether (TAME)	< 2.0	2.0	ug/L	EPA 8260B	12/23/11 13:14
Tert-Butanol	18	8.0	ug/L	EPA 8260B	12/23/11 13:14
Methanol	< 200	200	ug/L	EPA 8260B	12/23/11 13:14
Ethanol	< 40	40	ug/L	EPA 8260B	12/22/11 15:07
TPH as Gasoline	7100	200	ug/L	EPA 8260B	12/23/11 13:14
1,2-Dichloroethane-d4 (Surr)	101		% Recovery	EPA 8260B	12/23/11 13:14
Toluene - d8 (Surr)	99.8		% Recovery	EPA 8260B	12/23/11 13:14

Project Name : **Tesoro - Livermore**

Project Number : **01LV**

Sample : **IP-8**

Matrix : Water

Lab Number : 79867-02

Sample Date :12/20/2011

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date/Time Analyzed
Benzene	3200	25	ug/L	EPA 8260B	12/22/11 17:35
Toluene	11000	25	ug/L	EPA 8260B	12/22/11 17:35
Ethylbenzene	2000	25	ug/L	EPA 8260B	12/22/11 17:35
Total Xylenes	12000	25	ug/L	EPA 8260B	12/22/11 17:35
Methyl-t-butyl ether (MTBE)	< 25	25	ug/L	EPA 8260B	12/22/11 17:35
Diisopropyl ether (DIPE)	< 25	25	ug/L	EPA 8260B	12/22/11 17:35
Ethyl-t-butyl ether (ETBE)	< 25	25	ug/L	EPA 8260B	12/22/11 17:35
Tert-amyl methyl ether (TAME)	< 25	25	ug/L	EPA 8260B	12/22/11 17:35
Tert-Butanol	< 150	150	ug/L	EPA 8260B	12/22/11 17:35
Methanol	< 2500	2500	ug/L	EPA 8260B	12/22/11 17:35
Ethanol	< 250	250	ug/L	EPA 8260B	12/22/11 17:35
TPH as Gasoline	73000	2500	ug/L	EPA 8260B	12/22/11 17:35
1,2-Dichloroethane-d4 (Surr)	102		% Recovery	EPA 8260B	12/22/11 17:35
Toluene - d8 (Surr)	99.7		% Recovery	EPA 8260B	12/22/11 17:35

Project Name : **Tesoro - Livermore**

Project Number : **01LV**

Sample : **DW-8**

Matrix : Water

Lab Number : 79867-03

Sample Date :12/20/2011

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date/Time Analyzed
Benzene	2800	15	ug/L	EPA 8260B	12/22/11 16:56
Toluene	6700	15	ug/L	EPA 8260B	12/22/11 16:56
Ethylbenzene	2300	15	ug/L	EPA 8260B	12/22/11 16:56
Total Xylenes	10000	15	ug/L	EPA 8260B	12/22/11 16:56
Methyl-t-butyl ether (MTBE)	< 15	15	ug/L	EPA 8260B	12/22/11 16:56
Diisopropyl ether (DIPE)	< 15	15	ug/L	EPA 8260B	12/22/11 16:56
Ethyl-t-butyl ether (ETBE)	< 15	15	ug/L	EPA 8260B	12/22/11 16:56
Tert-amyl methyl ether (TAME)	< 15	15	ug/L	EPA 8260B	12/22/11 16:56
Tert-Butanol	76	70	ug/L	EPA 8260B	12/22/11 16:56
Methanol	< 1500	1500	ug/L	EPA 8260B	12/22/11 16:56
Ethanol	< 150	150	ug/L	EPA 8260B	12/22/11 16:56
TPH as Gasoline	66000	1500	ug/L	EPA 8260B	12/22/11 16:56
1,2-Dichloroethane-d4 (Surr)	100		% Recovery	EPA 8260B	12/22/11 16:56
Toluene - d8 (Surr)	98.3		% Recovery	EPA 8260B	12/22/11 16:56

Project Name : **Tesoro - Livermore**

Project Number : **01LV**

Sample : **CV-2**

Matrix : Water

Lab Number : 79867-04

Sample Date :12/20/2011

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date/Time Analyzed
Benzene	2200	15	ug/L	EPA 8260B	12/22/11 15:42
Toluene	6000	15	ug/L	EPA 8260B	12/22/11 15:42
Ethylbenzene	1700	15	ug/L	EPA 8260B	12/22/11 15:42
Total Xylenes	7900	15	ug/L	EPA 8260B	12/22/11 15:42
Methyl-t-butyl ether (MTBE)	< 15	15	ug/L	EPA 8260B	12/22/11 15:42
Diisopropyl ether (DIPE)	< 15	15	ug/L	EPA 8260B	12/22/11 15:42
Ethyl-t-butyl ether (ETBE)	< 15	15	ug/L	EPA 8260B	12/22/11 15:42
Tert-amyl methyl ether (TAME)	< 15	15	ug/L	EPA 8260B	12/22/11 15:42
Tert-Butanol	< 70	70	ug/L	EPA 8260B	12/22/11 15:42
Methanol	< 1500	1500	ug/L	EPA 8260B	12/22/11 15:42
Ethanol	< 150	150	ug/L	EPA 8260B	12/22/11 15:42
TPH as Gasoline	55000	1500	ug/L	EPA 8260B	12/22/11 15:42
1,2-Dichloroethane-d4 (Surr)	95.8		% Recovery	EPA 8260B	12/22/11 15:42
Toluene - d8 (Surr)	98.6		% Recovery	EPA 8260B	12/22/11 15:42

Project Name : **Tesoro - Livermore**

Project Number : **01LV**

Sample : **CV-3**

Matrix : Water

Lab Number : 79867-05

Sample Date :12/20/2011

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date/Time Analyzed
Benzene	< 0.50	0.50	ug/L	EPA 8260B	12/23/11 00:10
Toluene	< 0.50	0.50	ug/L	EPA 8260B	12/23/11 00:10
Ethylbenzene	< 0.50	0.50	ug/L	EPA 8260B	12/23/11 00:10
Total Xylenes	< 0.50	0.50	ug/L	EPA 8260B	12/23/11 00:10
Methyl-t-butyl ether (MTBE)	< 0.50	0.50	ug/L	EPA 8260B	12/23/11 00:10
Diisopropyl ether (DIPE)	< 0.50	0.50	ug/L	EPA 8260B	12/23/11 00:10
Ethyl-t-butyl ether (ETBE)	< 0.50	0.50	ug/L	EPA 8260B	12/23/11 00:10
Tert-amyl methyl ether (TAME)	< 0.50	0.50	ug/L	EPA 8260B	12/23/11 00:10
Tert-Butanol	< 5.0	5.0	ug/L	EPA 8260B	12/23/11 00:10
Methanol	< 50	50	ug/L	EPA 8260B	12/23/11 00:10
Ethanol	10	5.0	ug/L	EPA 8260B	12/23/11 00:10
TPH as Gasoline	< 50	50	ug/L	EPA 8260B	12/23/11 00:10
1,2-Dichloroethane-d4 (Surr)	99.5		% Recovery	EPA 8260B	12/23/11 00:10
Toluene - d8 (Surr)	101		% Recovery	EPA 8260B	12/23/11 00:10

Project Name : **Tesoro - Livermore**

Project Number : **01LV**

Sample : **CV-4**

Matrix : Water

Lab Number : 79867-06

Sample Date :12/20/2011

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date/Time Analyzed
Benzene	< 0.50	0.50	ug/L	EPA 8260B	12/27/11 16:34
Toluene	< 0.50	0.50	ug/L	EPA 8260B	12/27/11 16:34
Ethylbenzene	< 0.50	0.50	ug/L	EPA 8260B	12/27/11 16:34
Total Xylenes	0.58	0.50	ug/L	EPA 8260B	12/27/11 16:34
Methyl-t-butyl ether (MTBE)	< 0.50	0.50	ug/L	EPA 8260B	12/27/11 16:34
Diisopropyl ether (DIPE)	< 0.50	0.50	ug/L	EPA 8260B	12/27/11 16:34
Ethyl-t-butyl ether (ETBE)	< 0.50	0.50	ug/L	EPA 8260B	12/27/11 16:34
Tert-amyl methyl ether (TAME)	< 0.50	0.50	ug/L	EPA 8260B	12/27/11 16:34
Tert-Butanol	< 5.0	5.0	ug/L	EPA 8260B	12/27/11 16:34
Methanol	< 50	50	ug/L	EPA 8260B	12/27/11 16:34
Ethanol	10	5.0	ug/L	EPA 8260B	12/27/11 16:34
TPH as Gasoline	91	50	ug/L	EPA 8260B	12/27/11 16:34
1,2-Dichloroethane-d4 (Surr)	98.9		% Recovery	EPA 8260B	12/27/11 16:34
Toluene - d8 (Surr)	100		% Recovery	EPA 8260B	12/27/11 16:34

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	< 0.50	0.50	ug/L	EPA 8260B	12/22/2011	Benzene	< 0.50	0.50	ug/L	EPA 8260B	12/22/2011
Ethylbenzene	< 0.50	0.50	ug/L	EPA 8260B	12/22/2011	Ethylbenzene	< 0.50	0.50	ug/L	EPA 8260B	12/22/2011
Toluene	< 0.50	0.50	ug/L	EPA 8260B	12/22/2011	Toluene	< 0.50	0.50	ug/L	EPA 8260B	12/22/2011
Total Xylenes	< 0.50	0.50	ug/L	EPA 8260B	12/22/2011	Total Xylenes	< 0.50	0.50	ug/L	EPA 8260B	12/22/2011
Diisopropyl ether (DIPE)	< 0.50	0.50	ug/L	EPA 8260B	12/22/2011	Diisopropyl ether (DIPE)	< 0.50	0.50	ug/L	EPA 8260B	12/22/2011
Ethanol	< 5.0	5.0	ug/L	EPA 8260B	12/22/2011	Ethanol	< 5.0	5.0	ug/L	EPA 8260B	12/22/2011
Ethyl-t-butyl ether (ETBE)	< 0.50	0.50	ug/L	EPA 8260B	12/22/2011	Ethyl-t-butyl ether (ETBE)	< 0.50	0.50	ug/L	EPA 8260B	12/22/2011
Methanol	< 50	50	ug/L	EPA 8260B	12/22/2011	Methanol	< 50	50	ug/L	EPA 8260B	12/22/2011
Methyl-t-butyl ether (MTBE)	< 0.50	0.50	ug/L	EPA 8260B	12/22/2011	Methyl-t-butyl ether (MTBE)	< 0.50	0.50	ug/L	EPA 8260B	12/22/2011
Tert-Butanol	< 5.0	5.0	ug/L	EPA 8260B	12/22/2011	Tert-Butanol	< 5.0	5.0	ug/L	EPA 8260B	12/22/2011
Tert-amyl methyl ether (TAME)	< 0.50	0.50	ug/L	EPA 8260B	12/22/2011	Tert-amyl methyl ether (TAME)	< 0.50	0.50	ug/L	EPA 8260B	12/22/2011
TPH as Gasoline	< 50	50	ug/L	EPA 8260B	12/22/2011	TPH as Gasoline	< 50	50	ug/L	EPA 8260B	12/22/2011
1,2-Dichloroethane-d4 (Surr)	102		%	EPA 8260B	12/22/2011	1,2-Dichloroethane-d4 (Surr)	101		%	EPA 8260B	12/22/2011
Toluene - d8 (Surr)	100		%	EPA 8260B	12/22/2011	Toluene - d8 (Surr)	100		%	EPA 8260B	12/22/2011
Benzene	< 0.50	0.50	ug/L	EPA 8260B	12/23/2011	Benzene	< 0.50	0.50	ug/L	EPA 8260B	12/27/2011
Ethylbenzene	< 0.50	0.50	ug/L	EPA 8260B	12/23/2011	Ethylbenzene	< 0.50	0.50	ug/L	EPA 8260B	12/27/2011
Toluene	< 0.50	0.50	ug/L	EPA 8260B	12/23/2011	Toluene	< 0.50	0.50	ug/L	EPA 8260B	12/27/2011
Total Xylenes	< 0.50	0.50	ug/L	EPA 8260B	12/23/2011	Total Xylenes	< 0.50	0.50	ug/L	EPA 8260B	12/27/2011
Diisopropyl ether (DIPE)	< 0.50	0.50	ug/L	EPA 8260B	12/23/2011	Diisopropyl ether (DIPE)	< 0.50	0.50	ug/L	EPA 8260B	12/27/2011
Ethyl-t-butyl ether (ETBE)	< 0.50	0.50	ug/L	EPA 8260B	12/23/2011	Ethanol	< 5.0	5.0	ug/L	EPA 8260B	12/27/2011
Methanol	< 50	50	ug/L	EPA 8260B	12/23/2011	Ethyl-t-butyl ether (ETBE)	< 0.50	0.50	ug/L	EPA 8260B	12/27/2011
Methyl-t-butyl ether (MTBE)	< 0.50	0.50	ug/L	EPA 8260B	12/23/2011	Methanol	< 50	50	ug/L	EPA 8260B	12/27/2011
Tert-Butanol	< 5.0	5.0	ug/L	EPA 8260B	12/23/2011	Methyl-t-butyl ether (MTBE)	< 0.50	0.50	ug/L	EPA 8260B	12/27/2011
Tert-amyl methyl ether (TAME)	< 0.50	0.50	ug/L	EPA 8260B	12/23/2011	Tert-Butanol	< 5.0	5.0	ug/L	EPA 8260B	12/27/2011
TPH as Gasoline	< 50	50	ug/L	EPA 8260B	12/23/2011	Tert-amyl methyl ether (TAME)	< 0.50	0.50	ug/L	EPA 8260B	12/27/2011
1,2-Dichloroethane-d4 (Surr)	101		%	EPA 8260B	12/23/2011	TPH as Gasoline	< 50	50	ug/L	EPA 8260B	12/27/2011
Toluene - d8 (Surr)	101		%	EPA 8260B	12/23/2011	1,2-Dichloroethane-d4 (Surr)	98.4		%	EPA 8260B	12/27/2011
						Toluene - d8 (Surr)	99.7		%	EPA 8260B	12/27/2011

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	79859-01	<0.50	39.4	39.9	41.4	41.4	ug/L	EPA 8260B	12/22/11	105	104	1.23	80-120	25
Diisopropyl ether	79859-01	<0.50	39.0	39.5	40.1	40.5	ug/L	EPA 8260B	12/22/11	103	102	0.227	80-120	25
Ethanol	79859-01	7.7	98.8	100	89.3	90.9	ug/L	EPA 8260B	12/22/11	82.5	83.2	0.821	55.1-159	25
Ethyl-tert-butyl ether	79859-01	<0.50	39.5	39.9	40.6	40.8	ug/L	EPA 8260B	12/22/11	103	102	0.734	76.5-120	25
Ethylbenzene	79859-01	<0.50	39.4	39.9	43.9	43.9	ug/L	EPA 8260B	12/22/11	111	110	1.15	80-120	25
Methanol	79859-01	<50	986	998	944	906	ug/L	EPA 8260B	12/22/11	95.7	90.8	5.34	53.2-147	25
Methyl-t-butyl ether	79859-01	<0.50	39.9	40.3	39.4	40.8	ug/L	EPA 8260B	12/22/11	98.8	101	2.37	69.7-121	25
P + M Xylene	79859-01	<0.50	39.4	39.9	41.2	41.3	ug/L	EPA 8260B	12/22/11	104	103	0.932	76.8-120	25
Tert-Butanol	79859-01	<5.0	198	201	186	185	ug/L	EPA 8260B	12/22/11	94.0	92.4	1.73	80-120	25
Tert-amyl-methyl ether	79859-01	<0.50	38.9	39.4	41.3	41.8	ug/L	EPA 8260B	12/22/11	106	106	0.0781	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	79859-01	<0.50	39.4	39.9	41.0	41.1	ug/L	EPA 8260B	12/22/11	104	103	0.736	80-120	25
Benzene	79886-04	<0.50	39.3	39.8	40.9	41.0	ug/L	EPA 8260B	12/23/11	104	103	0.920	80-120	25
Diisopropyl ether	79886-04	<0.50	38.8	39.3	40.4	40.9	ug/L	EPA 8260B	12/23/11	104	104	0.0257	80-120	25
Ethyl-tert-butyl ether	79886-04	<0.50	39.3	39.8	40.3	41.1	ug/L	EPA 8260B	12/23/11	102	103	0.854	76.5-120	25
Ethylbenzene	79886-04	0.79	39.3	39.8	44.3	44.0	ug/L	EPA 8260B	12/23/11	111	109	1.89	80-120	25
Methanol	79886-04	<50	982	994	931	937	ug/L	EPA 8260B	12/23/11	94.8	94.3	0.519	53.2-147	25
Methyl-t-butyl ether	79886-04	1.3	39.7	40.2	40.7	41.6	ug/L	EPA 8260B	12/23/11	99.2	100	1.21	69.7-121	25
P + M Xylene	79886-04	2.0	39.3	39.8	42.7	42.4	ug/L	EPA 8260B	12/23/11	104	102	1.91	76.8-120	25
Tert-Butanol	79886-04	<5.0	198	200	187	185	ug/L	EPA 8260B	12/23/11	94.7	92.6	2.28	80-120	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-amyl-methyl ether														
	79886-04	<0.50	38.8	39.2	41.2	42.0	ug/L	EPA 8260B	12/23/11	106	107	0.500	78.9-120	25
Toluene														
	79886-04	<0.50	39.3	39.8	40.5	40.6	ug/L	EPA 8260B	12/23/11	103	102	1.07	80-120	25
Benzene														
	79869-01	<0.50	40.0	40.0	39.2	38.3	ug/L	EPA 8260B	12/22/11	98.0	95.7	2.36	80-120	25
Diisopropyl ether														
	79869-01	<0.50	39.5	39.5	41.5	41.3	ug/L	EPA 8260B	12/22/11	105	104	0.363	80-120	25
Ethanol														
	79869-01	<5.0	100	100	86.0	81.6	ug/L	EPA 8260B	12/22/11	85.9	81.4	5.31	55.1-159	25
Ethyl-tert-butyl ether														
	79869-01	<0.50	40.0	40.0	41.2	41.2	ug/L	EPA 8260B	12/22/11	103	103	0.0877	76.5-120	25
Ethylbenzene														
	79869-01	<0.50	40.0	40.0	40.8	39.4	ug/L	EPA 8260B	12/22/11	102	98.5	3.35	80-120	25
Methanol														
	79869-01	<50	1000	1000	904	906	ug/L	EPA 8260B	12/22/11	90.4	90.6	0.269	53.2-147	25
Methyl-t-butyl ether														
	79869-01	<0.50	40.4	40.4	41.7	42.0	ug/L	EPA 8260B	12/22/11	103	104	0.808	69.7-121	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
P + M Xylene	79869-01	<0.50	40.0	40.0	40.1	39.3	ug/L	EPA 8260B	12/22/11	100	98.4	1.96	76.8-120	25
Tert-Butanol	79869-01	6.5	201	201	212	203	ug/L	EPA 8260B	12/22/11	102	97.7	4.33	80-120	25
Tert-amyl-methyl ether	79869-01	<0.50	39.4	39.4	42.5	42.6	ug/L	EPA 8260B	12/22/11	108	108	0.302	78.9-120	25
Toluene	79869-01	<0.50	40.0	40.0	40.5	39.4	ug/L	EPA 8260B	12/22/11	101	98.5	2.76	80-120	25
Benzene	79893-03	<0.50	40.0	40.0	39.2	38.6	ug/L	EPA 8260B	12/27/11	98.0	96.4	1.68	80-120	25
Diisopropyl ether	79893-03	<0.50	39.5	39.5	39.7	39.5	ug/L	EPA 8260B	12/27/11	100	99.9	0.440	80-120	25
Ethanol	79893-03	<5.0	100	100	95.4	94.8	ug/L	EPA 8260B	12/27/11	95.2	94.6	0.646	55.1-159	25
Ethyl-tert-butyl ether	79893-03	<0.50	40.0	40.0	41.0	41.0	ug/L	EPA 8260B	12/27/11	102	102	0.175	76.5-120	25
Ethylbenzene	79893-03	<0.50	40.0	40.0	37.7	36.6	ug/L	EPA 8260B	12/27/11	94.3	91.5	2.99	80-120	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
Methanol	79893-03	52	1000	1000	1100	1100	ug/L	EPA 8260B	12/27/11	105	105	0.0705	53.2-147	25
Methyl-t-butyl ether	79893-03	28	40.4	40.4	68.9	69.2	ug/L	EPA 8260B	12/27/11	102	102	0.870	69.7-121	25
P + M Xylene	79893-03	<0.50	40.0	40.0	38.5	37.5	ug/L	EPA 8260B	12/27/11	96.2	93.8	2.51	76.8-120	25
Tert-Butanol	79893-03	31	201	201	227	228	ug/L	EPA 8260B	12/27/11	97.8	98.0	0.181	80-120	25
Tert-amyl-methyl ether	79893-03	<0.50	39.4	39.4	40.9	40.8	ug/L	EPA 8260B	12/27/11	104	104	0.0632	78.9-120	25
Toluene	79893-03	<0.50	40.0	40.0	39.1	38.2	ug/L	EPA 8260B	12/27/11	97.7	95.4	2.37	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
Benzene	40.0	ug/L	EPA 8260B	12/22/11	105	80-120
Diisopropyl ether	39.5	ug/L	EPA 8260B	12/22/11	105	80-120
Ethanol	100	ug/L	EPA 8260B	12/22/11	87.5	55.1-159
Ethyl-tert-butyl ether	40.0	ug/L	EPA 8260B	12/22/11	105	76.5-120
Ethylbenzene	40.0	ug/L	EPA 8260B	12/22/11	111	80-120
Methanol	1000	ug/L	EPA 8260B	12/22/11	90.3	53.2-147
Methyl-t-butyl ether	40.4	ug/L	EPA 8260B	12/22/11	103	69.7-121
P + M Xylene	40.0	ug/L	EPA 8260B	12/22/11	104	76.8-120
Tert-Butanol	201	ug/L	EPA 8260B	12/22/11	94.6	80-120
Tert-amyl-methyl ether	39.4	ug/L	EPA 8260B	12/22/11	109	78.9-120
Toluene	40.0	ug/L	EPA 8260B	12/22/11	104	80-120
Benzene	40.0	ug/L	EPA 8260B	12/23/11	105	80-120
Diisopropyl ether	39.5	ug/L	EPA 8260B	12/23/11	105	80-120
Ethyl-tert-butyl ether	40.0	ug/L	EPA 8260B	12/23/11	104	76.5-120
Ethylbenzene	40.0	ug/L	EPA 8260B	12/23/11	110	80-120
Methanol	1000	ug/L	EPA 8260B	12/23/11	86.7	53.2-147
Methyl-t-butyl ether	40.4	ug/L	EPA 8260B	12/23/11	102	69.7-121
P + M Xylene	40.0	ug/L	EPA 8260B	12/23/11	103	76.8-120
Tert-Butanol	201	ug/L	EPA 8260B	12/23/11	92.3	80-120
Tert-amyl-methyl ether	39.4	ug/L	EPA 8260B	12/23/11	108	78.9-120
Toluene	40.0	ug/L	EPA 8260B	12/23/11	104	80-120

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
Benzene	40.0	ug/L	EPA 8260B	12/22/11	97.3	80-120
Diisopropyl ether	39.5	ug/L	EPA 8260B	12/22/11	105	80-120
Ethanol	100	ug/L	EPA 8260B	12/22/11	78.2	55.1-159
Ethyl-tert-butyl ether	40.0	ug/L	EPA 8260B	12/22/11	104	76.5-120
Ethylbenzene	40.0	ug/L	EPA 8260B	12/22/11	102	80-120
Methanol	1000	ug/L	EPA 8260B	12/22/11	90.4	53.2-147
Methyl-t-butyl ether	40.4	ug/L	EPA 8260B	12/22/11	104	69.7-121
P + M Xylene	40.0	ug/L	EPA 8260B	12/22/11	101	76.8-120
TPH as Gasoline	505	ug/L	EPA 8260B	12/22/11	96.1	70.0-130
Tert-Butanol	201	ug/L	EPA 8260B	12/22/11	96.9	80-120
Tert-amyl-methyl ether	39.4	ug/L	EPA 8260B	12/22/11	108	78.9-120
Toluene	40.0	ug/L	EPA 8260B	12/22/11	101	80-120
Benzene	39.9	ug/L	EPA 8260B	12/27/11	99.3	80-120
Diisopropyl ether	39.4	ug/L	EPA 8260B	12/27/11	101	80-120
Ethanol	99.9	ug/L	EPA 8260B	12/27/11	90.2	55.1-159
Ethyl-tert-butyl ether	39.9	ug/L	EPA 8260B	12/27/11	103	76.5-120
Ethylbenzene	39.9	ug/L	EPA 8260B	12/27/11	96.2	80-120
Methanol	997	ug/L	EPA 8260B	12/27/11	97.8	53.2-147
Methyl-t-butyl ether	40.3	ug/L	EPA 8260B	12/27/11	101	69.7-121
P + M Xylene	39.9	ug/L	EPA 8260B	12/27/11	97.9	76.8-120
TPH as Gasoline	502	ug/L	EPA 8260B	12/27/11	95.4	70.0-130
Tert-Butanol	200	ug/L	EPA 8260B	12/27/11	98.3	80-120

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
Tert-amyl-methyl ether	39.4	ug/L	EPA 8260B	12/27/11	104	78.9-120
Toluene	39.9	ug/L	EPA 8260B	12/27/11	98.8	80-120



2795 2nd Street Suite 300
 Davis, CA 95616
 Lab: 530.297.4800
 Fax: 530.297.4808

Lab No. 79867

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:

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: *SCOTT STRONDEZ*

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		24hr	48hr	72hr	1wk	2wk	
				X				X											1 wk	01
				X				X											1 wk	02
				X				X											1 wk	03
				X				X											1wk	04
				X				X											1wk	05
				X				X											1wk	06

Project Address:

1619 1st Street
 Livermore, California

Sampling Container Preservative Matrix

Sample Designation

Date	Time	40 ml VOA	SLEEVE	POLY	AMBER	TEDLAR	HCl	HNO ₃	ICE	NONE	WATER	SOIL	VAPOR
12/20/11	1530	3					X				X		
	1537	3					X				X		
	1600	3					X				X		
	1605	3					X				X		
	1608	3					X				X		
↓	1610	3					X				X		

Relinquished by:

Matthew Nelson

Date: 12/20/11 **Time:** 1700
Received by: _____

Remarks:

Relinquished by:

Date: _____ **Time:** _____
Received by: _____

Relinquished by:

Date: 12/21/11 **Time:** 1245
Received by Laboratory: *mtf*
Analytical LLC

Bill to:

Tesoro Companies, Inc.



Laboratory Results

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

Subject : 6 Water Samples
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 standard. All soil samples are reported on a total weight (wet weight) basis unless noted otherwise in the case narrative. 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,



Joel Kiff

Subject : 6 Water Samples
Project Name : Tesoro - Livermore
Project Number : 01LV
P.O. Number : 67076

Case Narrative

The Method Reporting Limit for Ethanol has been increased due to the presence of an interfering compound for samples CV-4, CV-3 and IP-9.

Matrix Spike/Matrix Spike Duplicate results associated with sample DW-8 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-8 for the analytes Benzene and Methyl-t-butyl ether were affected by the analyte concentrations already present in the un-spiked sample.

Sample IP-9 was analyzed outside of hold time for Method EPA 8260B. The hydrochloric acid (HCl) preservation was insufficient to maintain a pH of 2.0 or less required to extend sample hold time.

Project Name : **Tesoro - Livermore**

Project Number : **01LV**

Sample : **CV-4**

Matrix : Water

Lab Number : 79881-01

Sample Date :12/21/2011

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date/Time Analyzed
Benzene	< 0.50	0.50	ug/L	EPA 8260B	12/27/11 16:42
Toluene	3.5	0.50	ug/L	EPA 8260B	12/27/11 16:42
Ethylbenzene	8.2	0.50	ug/L	EPA 8260B	12/27/11 16:42
Total Xylenes	44	0.50	ug/L	EPA 8260B	12/27/11 16:42
Methyl-t-butyl ether (MTBE)	< 0.50	0.50	ug/L	EPA 8260B	12/27/11 16:42
Diisopropyl ether (DIPE)	< 0.50	0.50	ug/L	EPA 8260B	12/27/11 16:42
Ethyl-t-butyl ether (ETBE)	< 0.50	0.50	ug/L	EPA 8260B	12/27/11 16:42
Tert-amyl methyl ether (TAME)	< 0.50	0.50	ug/L	EPA 8260B	12/27/11 16:42
Tert-Butanol	< 5.0	5.0	ug/L	EPA 8260B	12/27/11 16:42
Methanol	< 50	50	ug/L	EPA 8260B	12/27/11 16:42
Ethanol	< 20	20	ug/L	EPA 8260B	12/27/11 16:42
TPH as Gasoline	1200	50	ug/L	EPA 8260B	12/27/11 16:42
1,2-Dichloroethane-d4 (Surr)	99.0		% Recovery	EPA 8260B	12/27/11 16:42
Toluene - d8 (Surr)	100		% Recovery	EPA 8260B	12/27/11 16:42

Project Name : **Tesoro - Livermore**

Project Number : **01LV**

Sample : **CV-3**

Matrix : Water

Lab Number : 79881-02

Sample Date :12/21/2011

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date/Time Analyzed
Benzene	0.72	0.50	ug/L	EPA 8260B	12/27/11 17:13
Toluene	4.6	0.50	ug/L	EPA 8260B	12/27/11 17:13
Ethylbenzene	6.0	0.50	ug/L	EPA 8260B	12/27/11 17:13
Total Xylenes	33	0.50	ug/L	EPA 8260B	12/27/11 17:13
Methyl-t-butyl ether (MTBE)	< 0.50	0.50	ug/L	EPA 8260B	12/27/11 17:13
Diisopropyl ether (DIPE)	< 0.50	0.50	ug/L	EPA 8260B	12/27/11 17:13
Ethyl-t-butyl ether (ETBE)	< 0.50	0.50	ug/L	EPA 8260B	12/27/11 17:13
Tert-amyl methyl ether (TAME)	< 0.50	0.50	ug/L	EPA 8260B	12/27/11 17:13
Tert-Butanol	< 5.0	5.0	ug/L	EPA 8260B	12/27/11 17:13
Methanol	< 50	50	ug/L	EPA 8260B	12/27/11 17:13
Ethanol	< 10	10	ug/L	EPA 8260B	12/27/11 17:13
TPH as Gasoline	1300	50	ug/L	EPA 8260B	12/27/11 17:13
1,2-Dichloroethane-d4 (Surr)	98.2		% Recovery	EPA 8260B	12/27/11 17:13
Toluene - d8 (Surr)	100		% Recovery	EPA 8260B	12/27/11 17:13

Project Name : **Tesoro - Livermore**

Project Number : **01LV**

Sample : **CV-2**

Matrix : Water

Lab Number : 79881-03

Sample Date :12/21/2011

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date/Time Analyzed
Benzene	2300	7.0	ug/L	EPA 8260B	12/29/11 04:19
Toluene	7400	15	ug/L	EPA 8260B	12/30/11 14:12
Ethylbenzene	2000	7.0	ug/L	EPA 8260B	12/29/11 04:19
Total Xylenes	9800	15	ug/L	EPA 8260B	12/30/11 14:12
Methyl-t-butyl ether (MTBE)	< 7.0	7.0	ug/L	EPA 8260B	12/29/11 04:19
Diisopropyl ether (DIPE)	< 7.0	7.0	ug/L	EPA 8260B	12/29/11 04:19
Ethyl-t-butyl ether (ETBE)	< 7.0	7.0	ug/L	EPA 8260B	12/29/11 04:19
Tert-amyl methyl ether (TAME)	< 7.0	7.0	ug/L	EPA 8260B	12/29/11 04:19
Tert-Butanol	41	40	ug/L	EPA 8260B	12/29/11 04:19
Methanol	< 700	700	ug/L	EPA 8260B	12/29/11 04:19
Ethanol	< 150	150	ug/L	EPA 8260B	12/30/11 14:12
TPH as Gasoline	62000	1500	ug/L	EPA 8260B	12/30/11 14:12
1,2-Dichloroethane-d4 (Surr)	94.9		% Recovery	EPA 8260B	12/29/11 04:19
Toluene - d8 (Surr)	96.0		% Recovery	EPA 8260B	12/29/11 04:19

Project Name : **Tesoro - Livermore**

Project Number : **01LV**

Sample : **IP-9**

Matrix : Water

Lab Number : 79881-04

Sample Date :12/21/2011

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date/Time Analyzed
Benzene	260	4.0	ug/L	EPA 8260B	12/29/11 04:56
Toluene	1600	4.0	ug/L	EPA 8260B	12/29/11 04:56
Ethylbenzene	470	4.0	ug/L	EPA 8260B	12/29/11 04:56
Total Xylenes	2900	4.0	ug/L	EPA 8260B	12/29/11 04:56
Methyl-t-butyl ether (MTBE)	< 4.0	4.0	ug/L	EPA 8260B	12/29/11 04:56
Diisopropyl ether (DIPE)	< 4.0	4.0	ug/L	EPA 8260B	12/29/11 04:56
Ethyl-t-butyl ether (ETBE)	< 4.0	4.0	ug/L	EPA 8260B	12/29/11 04:56
Tert-amyl methyl ether (TAME)	< 4.0	4.0	ug/L	EPA 8260B	12/29/11 04:56
Tert-Butanol	22	20	ug/L	EPA 8260B	12/29/11 04:56
Methanol	< 400	400	ug/L	EPA 8260B	12/29/11 04:56
Ethanol	< 50	50	ug/L	EPA 8260B	12/29/11 23:27
TPH as Gasoline	16000	400	ug/L	EPA 8260B	12/29/11 04:56
1,2-Dichloroethane-d4 (Surr)	97.9		% Recovery	EPA 8260B	12/29/11 04:56
Toluene - d8 (Surr)	98.7		% Recovery	EPA 8260B	12/29/11 04:56

Project Name : **Tesoro - Livermore**

Project Number : **01LV**

Sample : **IP-8**

Matrix : Water

Lab Number : 79881-05

Sample Date :12/21/2011

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date/Time Analyzed
Benzene	3200	15	ug/L	EPA 8260B	12/28/11 02:09
Toluene	12000	25	ug/L	EPA 8260B	12/29/11 05:37
Ethylbenzene	2300	15	ug/L	EPA 8260B	12/28/11 02:09
Total Xylenes	12000	15	ug/L	EPA 8260B	12/28/11 02:09
Methyl-t-butyl ether (MTBE)	< 15	15	ug/L	EPA 8260B	12/28/11 02:09
Diisopropyl ether (DIPE)	< 15	15	ug/L	EPA 8260B	12/28/11 02:09
Ethyl-t-butyl ether (ETBE)	< 15	15	ug/L	EPA 8260B	12/28/11 02:09
Tert-amyl methyl ether (TAME)	< 15	15	ug/L	EPA 8260B	12/28/11 02:09
Tert-Butanol	80	70	ug/L	EPA 8260B	12/28/11 02:09
Methanol	< 1500	1500	ug/L	EPA 8260B	12/28/11 02:09
Ethanol	< 150	150	ug/L	EPA 8260B	12/28/11 02:09
TPH as Gasoline	73000	1500	ug/L	EPA 8260B	12/28/11 02:09
1,2-Dichloroethane-d4 (Surr)	101		% Recovery	EPA 8260B	12/28/11 02:09
Toluene - d8 (Surr)	99.8		% Recovery	EPA 8260B	12/28/11 02:09

Project Name : **Tesoro - Livermore**

Project Number : **01LV**

Sample : **DW-8**

Matrix : Water

Lab Number : 79881-06

Sample Date :12/21/2011

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date/Time Analyzed
Benzene	2800	20	ug/L	EPA 8260B	12/29/11 03:26
Toluene	8600	20	ug/L	EPA 8260B	12/29/11 03:26
Ethylbenzene	2300	20	ug/L	EPA 8260B	12/29/11 03:26
Total Xylenes	11000	20	ug/L	EPA 8260B	12/29/11 03:26
Methyl-t-butyl ether (MTBE)	< 20	20	ug/L	EPA 8260B	12/29/11 03:26
Diisopropyl ether (DIPE)	< 20	20	ug/L	EPA 8260B	12/29/11 03:26
Ethyl-t-butyl ether (ETBE)	< 20	20	ug/L	EPA 8260B	12/29/11 03:26
Tert-amyl methyl ether (TAME)	< 20	20	ug/L	EPA 8260B	12/29/11 03:26
Tert-Butanol	100	90	ug/L	EPA 8260B	12/29/11 03:26
Methanol	< 2000	2000	ug/L	EPA 8260B	12/29/11 03:26
Ethanol	< 200	200	ug/L	EPA 8260B	12/29/11 03:26
TPH as Gasoline	75000	2000	ug/L	EPA 8260B	12/29/11 03:26
1,2-Dichloroethane-d4 (Surr)	98.5		% Recovery	EPA 8260B	12/29/11 03:26
Toluene - d8 (Surr)	99.0		% Recovery	EPA 8260B	12/29/11 03:26

QC Report : Method Blank DataProject 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	< 0.50	0.50	ug/L	EPA 8260B	12/27/2011	Ethanol	< 5.0	5.0	ug/L	EPA 8260B	12/29/2011
Ethylbenzene	< 0.50	0.50	ug/L	EPA 8260B	12/27/2011	Toluene	< 0.50	0.50	ug/L	EPA 8260B	12/30/2011
Total Xylenes	< 0.50	0.50	ug/L	EPA 8260B	12/27/2011	Total Xylenes	< 0.50	0.50	ug/L	EPA 8260B	12/30/2011
Diisopropyl ether (DIPE)	< 0.50	0.50	ug/L	EPA 8260B	12/27/2011	Ethanol	< 5.0	5.0	ug/L	EPA 8260B	12/30/2011
Ethanol	< 5.0	5.0	ug/L	EPA 8260B	12/27/2011	TPH as Gasoline	< 50	50	ug/L	EPA 8260B	12/30/2011
Ethyl-t-butyl ether (ETBE)	< 0.50	0.50	ug/L	EPA 8260B	12/27/2011	Benzene	< 0.50	0.50	ug/L	EPA 8260B	12/27/2011
Methanol	< 50	50	ug/L	EPA 8260B	12/27/2011	Ethylbenzene	< 0.50	0.50	ug/L	EPA 8260B	12/27/2011
Methyl-t-butyl ether (MTBE)	< 0.50	0.50	ug/L	EPA 8260B	12/27/2011	Toluene	< 0.50	0.50	ug/L	EPA 8260B	12/27/2011
Tert-Butanol	< 5.0	5.0	ug/L	EPA 8260B	12/27/2011	Total Xylenes	< 0.50	0.50	ug/L	EPA 8260B	12/27/2011
Tert-amyl methyl ether (TAME)	< 0.50	0.50	ug/L	EPA 8260B	12/27/2011	Diisopropyl ether (DIPE)	< 0.50	0.50	ug/L	EPA 8260B	12/27/2011
TPH as Gasoline	< 50	50	ug/L	EPA 8260B	12/27/2011	Ethanol	< 5.0	5.0	ug/L	EPA 8260B	12/27/2011
1,2-Dichloroethane-d4 (Surr)	102	%		EPA 8260B	12/27/2011	Ethyl-t-butyl ether (ETBE)	< 0.50	0.50	ug/L	EPA 8260B	12/27/2011
Toluene - d8 (Surr)	101	%		EPA 8260B	12/27/2011	Methanol	< 50	50	ug/L	EPA 8260B	12/27/2011
Benzene	< 0.50	0.50	ug/L	EPA 8260B	12/28/2011	Methyl-t-butyl ether (MTBE)	< 0.50	0.50	ug/L	EPA 8260B	12/27/2011
Ethylbenzene	< 0.50	0.50	ug/L	EPA 8260B	12/28/2011	Tert-Butanol	< 5.0	5.0	ug/L	EPA 8260B	12/27/2011
Toluene	< 0.50	0.50	ug/L	EPA 8260B	12/28/2011	Tert-amyl methyl ether (TAME)	< 0.50	0.50	ug/L	EPA 8260B	12/27/2011
Total Xylenes	< 0.50	0.50	ug/L	EPA 8260B	12/28/2011	TPH as Gasoline	< 50	50	ug/L	EPA 8260B	12/27/2011
Diisopropyl ether (DIPE)	< 0.50	0.50	ug/L	EPA 8260B	12/28/2011	1,2-Dichloroethane-d4 (Surr)	99.7	%		EPA 8260B	12/27/2011
Ethyl-t-butyl ether (ETBE)	< 0.50	0.50	ug/L	EPA 8260B	12/28/2011	Toluene - d8 (Surr)	99.3	%		EPA 8260B	12/27/2011
Methanol	< 50	50	ug/L	EPA 8260B	12/28/2011						
Methyl-t-butyl ether (MTBE)	< 0.50	0.50	ug/L	EPA 8260B	12/28/2011						
Tert-Butanol	< 5.0	5.0	ug/L	EPA 8260B	12/28/2011						
Tert-amyl methyl ether (TAME)	< 0.50	0.50	ug/L	EPA 8260B	12/28/2011						
TPH as Gasoline	< 50	50	ug/L	EPA 8260B	12/28/2011						
1,2-Dichloroethane-d4 (Surr)	103	%		EPA 8260B	12/28/2011						
Toluene - d8 (Surr)	101	%		EPA 8260B	12/28/2011						

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	12/28/2011
Ethylbenzene	< 0.50	0.50	ug/L	EPA 8260B	12/28/2011
Toluene	< 0.50	0.50	ug/L	EPA 8260B	12/28/2011
Total Xylenes	< 0.50	0.50	ug/L	EPA 8260B	12/28/2011
Diisopropyl ether (DIPE)	< 0.50	0.50	ug/L	EPA 8260B	12/28/2011
Ethanol	< 5.0	5.0	ug/L	EPA 8260B	12/28/2011
Ethyl-t-butyl ether (ETBE)	< 0.50	0.50	ug/L	EPA 8260B	12/28/2011
Methanol	< 50	50	ug/L	EPA 8260B	12/28/2011
Methyl-t-butyl ether (MTBE)	< 0.50	0.50	ug/L	EPA 8260B	12/28/2011
Tert-Butanol	< 5.0	5.0	ug/L	EPA 8260B	12/28/2011
Tert-amyl methyl ether (TAME)	< 0.50	0.50	ug/L	EPA 8260B	12/28/2011
TPH as Gasoline	< 50	50	ug/L	EPA 8260B	12/28/2011
1,2-Dichloroethane-d4 (Surr)	99.7		%	EPA 8260B	12/28/2011
Toluene - d8 (Surr)	101		%	EPA 8260B	12/28/2011

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
Benzene	79846-01	<0.50	39.4	39.2	40.3	40.5	ug/L	EPA 8260B	12/27/11	102	103	0.877	80-120	25
Diisopropyl ether	79846-01	<0.50	38.9	38.8	40.3	40.8	ug/L	EPA 8260B	12/27/11	104	105	1.46	80-120	25
Ethanol	79846-01	7.3	98.6	98.2	87.0	105	ug/L	EPA 8260B	12/27/11	80.8	99.2	20.4	55.1-159	25
Ethyl-tert-butyl ether	79846-01	<0.50	39.4	39.2	40.7	40.6	ug/L	EPA 8260B	12/27/11	103	104	0.119	76.5-120	25
Ethylbenzene	79846-01	<0.50	39.4	39.2	41.3	42.1	ug/L	EPA 8260B	12/27/11	105	107	2.22	80-120	25
Methanol	79846-01	<50	984	980	943	1080	ug/L	EPA 8260B	12/27/11	95.8	110	14.2	53.2-147	25
Methyl-t-butyl ether	79846-01	<0.50	39.8	39.6	40.4	38.7	ug/L	EPA 8260B	12/27/11	102	97.7	3.81	69.7-121	25
P + M Xylene	79846-01	<0.50	39.4	39.2	38.8	39.5	ug/L	EPA 8260B	12/27/11	98.5	101	2.14	76.8-120	25
Tert-Butanol	79846-01	<5.0	198	197	181	186	ug/L	EPA 8260B	12/27/11	91.6	94.2	2.84	80-120	25
Tert-amyl-methyl ether	79846-01	<0.50	38.8	38.7	41.8	41.0	ug/L	EPA 8260B	12/27/11	108	106	1.53	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
Benzene	79899-05	<0.50	38.9	39.4	39.8	40.6	ug/L	EPA 8260B	12/28/11	102	103	0.613	80-120	25
Diisopropyl ether	79899-05	<0.50	38.5	39.0	39.5	40.2	ug/L	EPA 8260B	12/28/11	103	103	0.182	80-120	25
Ethyl-tert-butyl ether	79899-05	<0.50	38.9	39.5	39.6	40.0	ug/L	EPA 8260B	12/28/11	102	101	0.460	76.5-120	25
Ethylbenzene	79899-05	<0.50	38.9	39.4	41.3	42.3	ug/L	EPA 8260B	12/28/11	106	107	1.02	80-120	25
Methanol	79899-05	<50	973	986	1050	1010	ug/L	EPA 8260B	12/28/11	108	103	5.33	53.2-147	25
Methyl-t-butyl ether	79899-05	<0.50	39.3	39.9	38.7	38.6	ug/L	EPA 8260B	12/28/11	98.4	96.8	1.54	69.7-121	25
P + M Xylene	79899-05	<0.50	38.9	39.4	38.8	39.7	ug/L	EPA 8260B	12/28/11	99.6	101	0.967	76.8-120	25
Tert-Butanol	79899-05	<5.0	196	198	179	182	ug/L	EPA 8260B	12/28/11	91.3	91.8	0.503	80-120	25
Tert-amyl-methyl ether	79899-05	<0.50	38.4	38.9	40.0	40.1	ug/L	EPA 8260B	12/28/11	104	103	1.14	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	79899-05	<0.50	38.9	39.4	39.2	40.2	ug/L	EPA 8260B	12/28/11	101	102	1.19	80-120	25
Ethanol	79907-01	11	99.4	100	100	98.5	ug/L	EPA 8260B	12/29/11	89.8	87.1	3.08	55.1-159	25
Ethanol	79908-17	9.8	98.2	99.0	108	108	ug/L	EPA 8260B	12/30/11	99.9	99.7	0.135	55.1-159	25
P + M Xylene	79908-17	<0.50	39.2	39.5	41.6	40.8	ug/L	EPA 8260B	12/30/11	106	103	2.76	76.8-120	25
Toluene	79908-17	<0.50	39.2	39.5	42.2	42.1	ug/L	EPA 8260B	12/30/11	108	106	1.01	80-120	25
Benzene	79893-01	<0.50	40.0	40.0	39.7	39.3	ug/L	EPA 8260B	12/27/11	99.2	98.2	0.995	80-120	25
Diisopropyl ether	79893-01	<0.50	39.5	39.5	42.4	42.4	ug/L	EPA 8260B	12/27/11	107	107	0.0226	80-120	25
Ethanol	79893-01	<5.0	100	100	88.8	85.6	ug/L	EPA 8260B	12/27/11	88.6	85.4	3.67	55.1-159	25
Ethyl-tert-butyl ether	79893-01	<0.50	40.0	40.0	42.4	43.0	ug/L	EPA 8260B	12/27/11	106	107	1.25	76.5-120	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
Ethylbenzene	79893-01	<0.50	40.0	40.0	42.1	41.7	ug/L	EPA 8260B	12/27/11	105	104	1.11	80-120	25
Methanol	79893-01	<50	1000	1000	964	981	ug/L	EPA 8260B	12/27/11	96.5	98.1	1.69	53.2-147	25
Methyl-t-butyl ether	79893-01	13	40.4	40.4	56.0	56.8	ug/L	EPA 8260B	12/27/11	106	108	1.97	69.7-121	25
P + M Xylene	79893-01	<0.50	40.0	40.0	41.8	41.8	ug/L	EPA 8260B	12/27/11	104	104	0.0838	76.8-120	25
Tert-Butanol	79893-01	<5.0	201	201	202	202	ug/L	EPA 8260B	12/27/11	101	100	0.378	80-120	25
Tert-amyl-methyl ether	79893-01	<0.50	39.4	39.4	43.4	43.8	ug/L	EPA 8260B	12/27/11	110	111	1.10	78.9-120	25
Toluene	79893-01	<0.50	40.0	40.0	41.0	40.4	ug/L	EPA 8260B	12/27/11	103	101	1.61	80-120	25
Benzene														
	79911-04	520	40.0	40.0	556	546	ug/L	EPA 8260B	12/28/11	80.3	57.0	34.0	80-120	25
Diisopropyl ether	79911-04	<0.50	39.5	39.5	41.0	41.2	ug/L	EPA 8260B	12/28/11	104	104	0.443	80-120	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
Ethanol	79911-04	<5.0	100	100	104	105	ug/L	EPA 8260B	12/28/11	104	105	1.22	55.1-159	25
Ethyl-tert-butyl ether	79911-04	<0.50	40.0	40.0	40.7	40.1	ug/L	EPA 8260B	12/28/11	102	100	1.52	76.5-120	25
Ethylbenzene	79911-04	62	40.0	40.0	106	104	ug/L	EPA 8260B	12/28/11	109	105	3.79	80-120	25
Methanol	79911-04	<50	1000	1000	1620	1640	ug/L	EPA 8260B	12/28/11	162	164	1.44	53.2-147	25
Methyl-t-butyl ether	79911-04	600	40.4	40.4	663	665	ug/L	EPA 8260B	12/28/11	150	155	3.78	69.7-121	25
P + M Xylene	79911-04	52	40.0	40.0	97.2	96.0	ug/L	EPA 8260B	12/28/11	113	110	2.61	76.8-120	25
Tert-Butanol	79911-04	78	201	201	285	281	ug/L	EPA 8260B	12/28/11	103	101	1.62	80-120	25
Tert-amyl-methyl ether	79911-04	100	39.4	39.4	143	142	ug/L	EPA 8260B	12/28/11	106	104	2.44	78.9-120	25
Toluene	79911-04	11	40.0	40.0	49.6	48.7	ug/L	EPA 8260B	12/28/11	95.4	93.2	2.36	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
Benzene	40.0	ug/L	EPA 8260B	12/27/11	102	80-120
Diisopropyl ether	39.5	ug/L	EPA 8260B	12/27/11	103	80-120
Ethanol	100	ug/L	EPA 8260B	12/27/11	87.5	55.1-159
Ethyl-tert-butyl ether	40.0	ug/L	EPA 8260B	12/27/11	102	76.5-120
Ethylbenzene	40.0	ug/L	EPA 8260B	12/27/11	107	80-120
Methanol	1000	ug/L	EPA 8260B	12/27/11	95.8	53.2-147
Methyl-t-butyl ether	40.4	ug/L	EPA 8260B	12/27/11	98.8	69.7-121
P + M Xylene	40.0	ug/L	EPA 8260B	12/27/11	100	76.8-120
Tert-Butanol	201	ug/L	EPA 8260B	12/27/11	91.7	80-120
Tert-amyl-methyl ether	39.4	ug/L	EPA 8260B	12/27/11	105	78.9-120
Benzene	40.0	ug/L	EPA 8260B	12/28/11	103	80-120
Diisopropyl ether	39.5	ug/L	EPA 8260B	12/28/11	102	80-120
Ethyl-tert-butyl ether	40.0	ug/L	EPA 8260B	12/28/11	102	76.5-120
Ethylbenzene	40.0	ug/L	EPA 8260B	12/28/11	108	80-120
Methanol	1000	ug/L	EPA 8260B	12/28/11	116	53.2-147
Methyl-t-butyl ether	40.4	ug/L	EPA 8260B	12/28/11	94.7	69.7-121
P + M Xylene	40.0	ug/L	EPA 8260B	12/28/11	101	76.8-120
Tert-Butanol	201	ug/L	EPA 8260B	12/28/11	90.9	80-120
Tert-amyl-methyl ether	39.4	ug/L	EPA 8260B	12/28/11	103	78.9-120
Toluene	40.0	ug/L	EPA 8260B	12/28/11	102	80-120

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
Ethanol	100	ug/L	EPA 8260B	12/29/11	99.9	55.1-159
Ethanol	100	ug/L	EPA 8260B	12/30/11	95.0	55.1-159
P + M Xylene	40.0	ug/L	EPA 8260B	12/30/11	105	76.8-120
Toluene	40.0	ug/L	EPA 8260B	12/30/11	107	80-120
Benzene	40.1	ug/L	EPA 8260B	12/27/11	99.9	80-120
Diisopropyl ether	39.6	ug/L	EPA 8260B	12/27/11	109	80-120
Ethanol	100	ug/L	EPA 8260B	12/27/11	94.4	55.1-159
Ethyl-tert-butyl ether	40.1	ug/L	EPA 8260B	12/27/11	110	76.5-120
Ethylbenzene	40.1	ug/L	EPA 8260B	12/27/11	107	80-120
Methanol	1000	ug/L	EPA 8260B	12/27/11	91.4	53.2-147
Methyl-t-butyl ether	40.5	ug/L	EPA 8260B	12/27/11	107	69.7-121
P + M Xylene	40.1	ug/L	EPA 8260B	12/27/11	107	76.8-120
TPH as Gasoline	502	ug/L	EPA 8260B	12/27/11	96.5	70.0-130
Tert-Butanol	202	ug/L	EPA 8260B	12/27/11	102	80-120
Tert-amyl-methyl ether	39.5	ug/L	EPA 8260B	12/27/11	109	78.9-120
Toluene	40.1	ug/L	EPA 8260B	12/27/11	103	80-120
Benzene	39.8	ug/L	EPA 8260B	12/28/11	98.4	80-120
Diisopropyl ether	39.4	ug/L	EPA 8260B	12/28/11	110	80-120
Ethanol	99.7	ug/L	EPA 8260B	12/28/11	91.9	55.1-159

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
Ethyl-tert-butyl ether	39.8	ug/L	EPA 8260B	12/28/11	109	76.5-120
Ethylbenzene	39.8	ug/L	EPA 8260B	12/28/11	104	80-120
Methanol	995	ug/L	EPA 8260B	12/28/11	98.5	53.2-147
Methyl-t-butyl ether	40.2	ug/L	EPA 8260B	12/28/11	108	69.7-121
P + M Xylene	39.8	ug/L	EPA 8260B	12/28/11	103	76.8-120
TPH as Gasoline	500	ug/L	EPA 8260B	12/28/11	94.7	70.0-130
Tert-Butanol	200	ug/L	EPA 8260B	12/28/11	103	80-120
Tert-amyl-methyl ether	39.3	ug/L	EPA 8260B	12/28/11	112	78.9-120
Toluene	39.8	ug/L	EPA 8260B	12/28/11	102	80-120



2795 2nd Street Suite 300
 Davis, CA 95616
 Lab: 530.297.4800
 Fax: 530.297.4808

Lab No. 79881

Page 1 of 1

Project Contact (Hardcopy or PDF To):
 Matthew Nelson

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

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: *SCOTT STROMBERG*

Chain-of-Custody Record and Analysis Request

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		24hr	48hr	72hr	1wk	2wk	
				X				X											1 wk	01
				X				X											1 wk	02
				X				X											1 wk	03
				X				X											1 wk	04
				X				X											1 wk	05
				X				X											1 wk	06

Sample Designation	Sampling		Container				Preservative				Matrix			
	Date	Time	40 ml VOA	SLEEVE	POLY	AMBER	TEDLAR	HCl	HNO ₃	ICE	NONE	WATER	SOIL	VAPOR
CV-4	12/21/11	1312	3					X				X		
CV-3		1318	3					X				X		
CV-2		1323	3					X				X		
1P-9		1407	3					X				X		
1P-8		1410	3					X				X		
DW-8		1415	3					X				X		

Relinquished by: *SCOTT STROMBERG* **Date:** 12/21/11 **Time:** 1700 **Received by:** _____

Relinquished by: _____ **Date:** _____ **Time:** _____ **Received by:** _____

Relinquished by: _____ **Date:** 12/22/11 **Time:** 1107 **Received by Laboratory:** *Michelle Spencer* **Bill to:** *Kiff Analytical* Tesoro Companies, Inc.

SAMPLE RECEIPT CHECKLIST

RECEIVER

MAS
Initials

SRG#: 79881 Date: 122211

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: Yes No (includes water)
 Temperature °C 5-2 Therm. ID# IR-5 Initial MAS Date/Time 122211 / 1101 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 18
 Matrix _____ Container type _____ # of containers received _____
 Matrix _____ Container type _____ # of containers received _____
 Date and Time Sample Put into Temp Storage Date: 122211 Time: 1107

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: No date on COC for samples 02-10 through -06. Per labels all samples collected on 122111. MAS 122211 1114

Bubbles in samples -04 and -06. See 122211 1431