



GETTLER-RYAN INC.

TRANSMITTAL

February 7, 2002 G-R #180181

TO:

Mr. David B. De Witt

Phillips 66 Company

2000 Crow Canyon Place, Suite 4000

San Ramon, California 94583

CC:

Mr. David Vossler

Gettler-Ryan Inc.

Petaluma, California

FROM:

Deanna L. Harding

Project Coordinator Gettler-Ryan Inc.

6747 Sierra Court, Suite J Dublin, California 94568 RE:

E: Tosco (Unocal) Service Station

#4186

1771 First Street

Livermore, California

WE HAVE ENCLOSED THE FOLLOWING:

COPIES	DATED	DESCRIPTION
1	February 5, 2002	Groundwater Monitoring and Sampling Report First Quarter - Event of January 3, 2002

COMMENTS:

This report is being sent to you for your review/comment, prior to being distributed on your behalf. If no comments are received by *February 21, 2002*, this report will be distributed to the following:

cc: Ms. Eva Chu, Alameda County Health Care Services, 1131 Harbor Bay Pkwy, Alameda CA 94502 Ms. Carol Mahoney, Zone 7 Water Zone, 5997 Parkside Drive, Pleasanton, CA 94588

Enclosure

trans/4186-dbd



February 5, 2002 G-R Job #180181

Mr. David B. De Witt Phillips 66 Company 2000 Crow Canyon Place, Suite 400 San Ramon, California 94583

RE: First Quarter Event of January 3, 2002

Groundwater Monitoring & Sampling Report

Tosco (Unocal) Service Station #4186

1771 First Street Livermore, California

Dear Mr. De Witt:

This report documents the most recent well development and groundwater monitoring and sampling events performed by Gettler-Ryan Inc. (G-R) at the referenced site. All field work was conducted in accordance with G-R Standard Operating Procedure - Groundwater Sampling (attached).

Static groundwater levels were measured and all wells were checked for the presence of separate-phase hydrocarbons. Separate-phase hydrocarbons were not present in the wells. Static water level data and groundwater elevations are summarized in Table 1. A Potentiometric Map is included as Figure 1.

Groundwater samples were collected from the monitoring wells as specified by G-R Standard Operating Procedure - Groundwater Sampling (attached). The field data sheets are also attached. The samples were analyzed by Sequoia Analytical results are summarized in Tables 1 and 2. A Concentration Map is included as Figure 2. The chain of custody document and laboratory analytical reports are also attached.

No. 6882

Sincerely,

Deanna L. Harding Project Coordinator

Douglas J. Lee

Senior Geologist, R.G. No. 6882

Figure 1: Potentiometric Map
Figure 2: Concentration Map

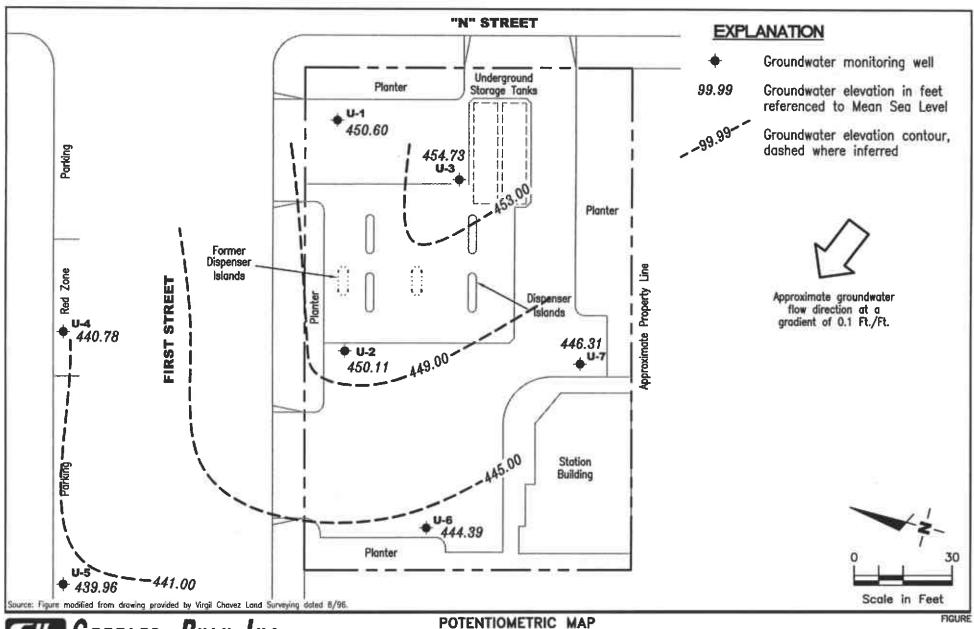
Table 1: Groundwater Monitoring Data and Analytical Results
Table 2: Groundwater Analytical Results - Oxygenate Compounds

1. Herding

Attachments: Standard Operating Procedure - Groundwater Sampling

Field Data Sheets

4186 qml Chain of Custody Document and Laboratory Analytical Reports





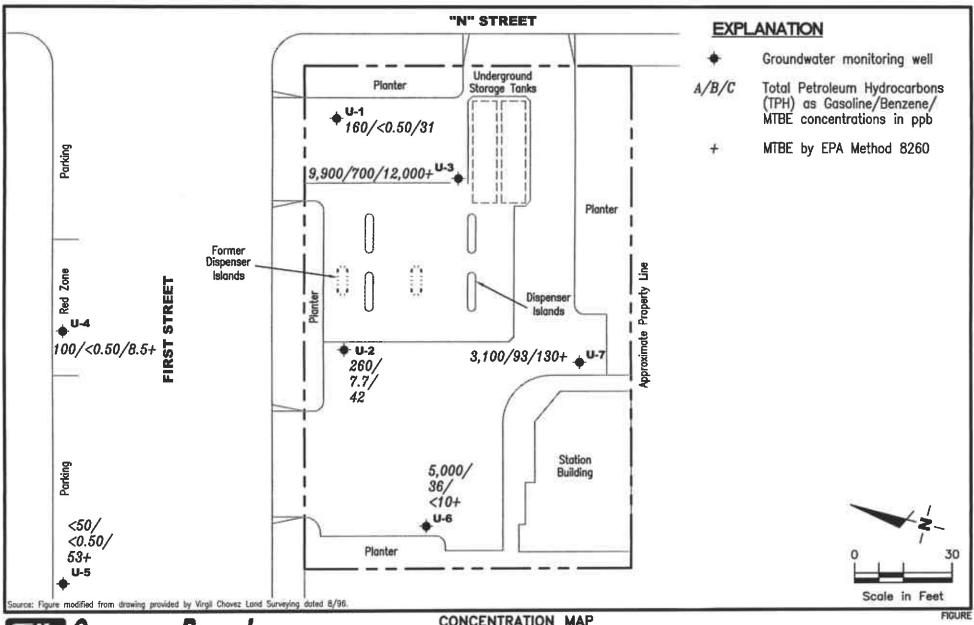
REVIEWED BY

Tosco (Unocal) Service Station #4186 1771 First Street

Livermore, California

DATE January 3, 2002 REVISED DATE

PROJECT NUMBER 180181





CONCENTRATION MAP

Tosco (Unocal) Service Station #4186 1771 First Street Livermore, California

REVISED DATE

PROJECT NUMBER REVIEWED BY 180181

DATE January 3, 2002

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Table 1Groundwater Monitoring Data and Analytical Results

WELL ID/	DATE	DTW	S.I.	GWE	TPH-G	В	T	E	X	MTBE
TOC*(ft.)		(ft.)	(ft.bgs)	(msl)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)
U-1										
478.27	07/13/98	23.28	14.0-34.0	454,99	ND	ND	ND	ND	ND	ND
	10/07/98	26.43		451.84	ND	NĐ	ND	ND	ND	ND
	01/15/99	30.42		447.85	ND	ND	ND	ND	1.1	7.3
	04/14/99	24.21		454.06	ND	ND	ND	ND	ND	160
	07/19/99	27.10		451.17	ND	ND	ND	ND	ND	92
	10/12/99	29.40		448.87	ND	ND	ND	ND	ND	37
	01/24/00	27.90		450.37	ND	ND	ND	ND	ND	28
	04/10/00	26.16		452.11	ND	ND	0.930	ND	ND	ND
	07/17/00	28.04		450.23	ND	ND	ND	ND	ND	160
	10/02/00	28.41		449.86	ND	ND	ND	ND	ND	120
	01/08/01	28.68		449.59	ND	ND	ND	ND	ND	103
	04/03/01	25.74		452.53	ND	ND	ND	ND	ND	55.1
	07/02/01	30.67		447.60	ND	ND	ND	ND	ND	ND
NI	10/08/01	33.13		445.14	<50	< 0.50	< 0.50	< 0.50	< 0.50	<5.0
	01/03/02	27.67		450.60	160 ⁹	<0.50	0.51	<0.50	0.69	31
U-2						·				
477.44	07/13/98	23.52	13.0-33.0	453.92	1,200	130	12	62	180	1,100
	10/07/98	25.31		452.13	ND	ND	ND	ND	ND	160
	01/15/99	30.22		447.22	ND	ND	ND	ND	ND	280
	04/14/99	24.50		452.94	ND	ND	ND	ND	ND	460
	07/19/99	28.54		448.90	ND	ND	ND	ND	ND	220
	10/12/99	30.48		446.96	ND	ND	ND	ND	ND	160
	01/24/00	24.52		452.92	ND	ND	ND	ND	ND	150
	04/10/00	23.68		453.76	ND	ND	ND	ND	ND .	177
	07/17/00	28.35		449.09	ND	ND	ND	ND	ND	62.7
	10/02/00	28.72		448.72	ND	ND	ND	ND	ND	52
	01/08/01	29.11		448.33	ND	ND	ND	ND	ND	57.3
	04/03/01	25.95		451.49	ND	ND	ND	ND	ND	30.2

Table 1
Groundwater Monitoring Data and Analytical Results

WELL ID/	DATE	DTW	S.I.	GWE	TPH-G	В	T	E	X	MTBE
TOC*(ft.)		(ft.)	(ft.bgs)	(msl)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)
U-2	07/02/01	29.01		448.43	ND	ND	ND	ND	ND	16
(cont)	10/08/01	30.94		446.50	<50	< 0.50	< 0.50	< 0.50	< 0.50	82
	01/03/02	27.33		450.11	260 ⁴	7.7	11	1.7	15	42
U-3										
478.46	07/13/98	23.82	14.0-34.0	454.64	70,000	3,100	5,500	2,700	16,000	7,500
	10/07/98	25.64	•	452.82	54,000	5,000	1,100	3,100	14,000	6,100
	01/15/99	30.92		447.54	41,000 ¹	3,100	ND^2	1,800	3,800	15,000
	04/14/99	24.48		453.98	33,000	86	290	2,200	7,800	39,000
	07/19/99	28.46		450.00	48,000	3,900	2,500	3,600	14,000	12,000/16,000 ³
	10/12/99	30.39		448.07	35,000 ⁴	4,200	ND^2	2,300	1,800	22,000/8,300 ⁵
	01/24/00	23,43		455.03	13,000 ⁴	260	ND^2	770	3,200	53,000/42,000 ³
	04/10/00	23.31		455.15	35,200 ⁴	1,070	241	2,820	8,850	35,600/40,900 ³
	07/17/00	27.53		450.93	$29,000^4$	3,570	525	3,180	5,660	$22,500/21,000^3$
	10/02/00	28.19		450.27	11,000 ⁴	2,100	31	2,000	780	25,000/28,000 ^{3,6}
	01/08/01	29.85		448.61	33,600 ⁴	3,060	427	3,040	4,190	24,700/30,900 ³
	04/03/01	24.98		453.48	5,390⁴	660	10.8	304	356	15,200/19,300 ⁵
	07/02/01	31.35		447.11	13,000 ⁴	1,200	58	1,300	930	25,000/26,000 ³
NP	10/08/01	32.69		445.77	$6,100^4$	500	<10	570	130	$23,000/22,000^3$
	01/03/02	23.73		454.73	9,900 ⁴	700	130	24	1,000	14,000/12,000 ³
U-4										
476.93	04/03/017	31.63	35.0-45.0	445.30	ND	ND	ND	ND	ND	37.8/38.2 ³
	07/02/01	37.96	22.0 .2.0	438.97	ND	ND	ND	ND	ND	ND/5.3 ³
	10/08/01	44.24		432.69	NOT SAMPLED DI					
	01/03/02	36.15	•	440.78	100 ⁹	< 0.50	< 0.50	< 0.50	< 0.50	$10/8.5^3$

Table 1
Groundwater Monitoring Data and Analytical Results

WELL ID/	DATE	DTW	S.J.	GWE	TPH-G	В	Т	E	X	MTBE
TOC*(ft.)		(ft.)	(ft.bgs)	(msl)	(ррв)	(ppb)	(ррв)	(ррв)	(ppb)	(ppb)
U-5										
476.51	04/03/017	31.75	37.0-47.0	444.76	ND	NID	0.700	NT.	0.000	540/55 43
470.51	07/02/01	38.68	37.0-47.0	437.83	ND ND	ND ND	0.728	ND	0.993	54.8/55.4 ³ 88/94 ³
NP	10/08/01	46.31			<50		ND	ND	ND	
141	01/03/02	36.55		430.20		<0.50	<0.50	<0.50	<0.50	37/54 ³
	01/03/02	30.33		439.96	<50	<0.50	0.59	<0.50	0.91	51/53 ³
U-6										
478.38	01/03/027	33.99		444,39	5,000 ⁸	36	<25	260	450	<250/<10 ³
U-7										
478.74	01/03/027	32.43		446.31	3,1008	93	<10	35	73	140/130 ³
TRIP BLANK										
I KIF DLANK	07/13/98				ND	ND	ND	ND	ND	ND
	10/07/98				ND	ND	ND	ND	ND	ND
	01/15/99				ND	ND	ND	ND	ND	ND
	04/14/99				ND	ND	ND	ND	ND	ND
	07/19/99				ND	ND	ND	ND	ND	ND
	10/12/99				ND	ND	ND	ND	ND	ND
	01/24/00				ND	ND	ND	ND	ND	ND
	04/10/00				ND	ND	ND	ND	ND	ND
	07/17/00				ND	ND	ND	ND	ND	ND
	10/02/00				ND	ND	ND	ND	ND	ND
	01/08/01				ND	ND	ND	ND	ND	ND
	04/03/01				ND	ND	ND	NĎ	ND	ND
	07/02/01				ND	ND	ND	ND	ND	ND
	10/08/01				<50	<0.50	<0.50	<0.50	<0.50	<5.0
	01/03/02				<50	<0.50	<0.50	<0.50	<0.50	<5.0

Table 1

Groundwater Monitoring Data and Analytical Results

Tosco (Unocal) Service Station #4186 1771 First Street Livermore, California

EXPLANATIONS:

TOC = Top of Casing

TPH-G = Total Petroleum Hydrocarbons as Gasoline

ND = Not Detected

DTW = Depth to Water

B = Benzene

-- = Not Measured/Not Analyzed

(ft.) = Feet

T = Toluene

NP = No Purge

S. I. = Screen Interval

E = Ethylbenzene

(ft.bgs) = Feet Below Ground Surface

X = Xylenes

GWE = Groundwater Elevation

MTBE = Methyl tertiary butyl ether

(msl) = Mean sea level

(ppb) = Parts per billion

- * TOC elevations are relative to msl in feet. The benchmark used was a City of Livermore survey monument at First & "Q" Streets, (Benchmark Elevation = 469.246 feet, msl). Wells U-6 and U-7 were surveyed on January 16, 2002, using the previous benchmark.
- Laboratory report indicates gasoline and unidentified hydrocarbons C6-C12.
- Detection limit raised. Refer to analytical reports.
- ³ MTBE by EPA Method 8260.
- Laboratory report indicates gasoline C6-C12.
- MTBE by EPA Method 8260 analyzed past EPA recommended holding time.
- Laboratory report indicates the sample was analyzed within holding time. Re-analysis for confirmation or dilution was performed past the recommend holding time.
- Well development performed.
- 8 Laboratory report indicates weathered gasoline C6-C12.
- Laboratory report indicates unidentified hydrocarbons C6-C12.

Table 2
Groundwater Analytical Results - Oxygenate Compounds

					ore, camornia		······		
WELL ID	DATE	ETHANOL	TBA	MTBE	DIPE	ETBE	TAME	EDB	1,2-DCA
		(ppb)	(ppb)	(ррь)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)
U-1	10/02/00		ND						
U-2	10/02/00		ND	 .	<u></u>				
U-3	07/19/99		•	16,000					
0-3	10/12/99			8,300					
	01/24/00			42,000					
	04/10/00			40,900					
	07/17/00			21,000			~~		
	10/02/00		63,000	28,000					
	01/08/01	 ND ¹	49,300	30,900	ND ¹	ND ^t	ND ¹	 ND ¹	 ND¹
	04/03/01 ²	ND ¹	22,200	19,300	ND ¹	ND ¹	ND ¹	ND ¹	ND ¹
	07/02/01	ND ¹	27,000	26,000	ND ¹	ND,	ND ¹	ND ¹	ND ¹
	10/08/01	<140,000	33,000	22,000	<290	<290	<290	<290	<290
	01/03/02	<50,000	17,000	12,000	<100	<100	<100	<100	<100
	01703/02	<50,000	17,000	12,000	<100	<100	<100		<100
U-4	04/03/01	ND	ND	38.2	ND	ND	ND	ND	ND
	07/02/01	ND	ND	5.3	ND	ND	ND	ND	ND
	01/03/02	<500	<20	8.5	<1.0	<1.0	<1.0	<1.0	<1.0
U-5	04/03/01	ND	ND	55.4	ND	ND	ND	ND	ND
J - J	07/02/01	ND	ND	94	ND	ND	ND	ND	ND
	10/08/01	<1,000	<100	54	<2.0	<2.0	<2.0	<2.0	<2.0
	01/03/02	<500	<20	53	<1.0	<1.0	<1.0	<1.0	<1.0
	var viri va								
U-6	01/03/02	<5,000	<200	<10	<10	<10	<10	<10	<10

Table 2

Groundwater Analytical Results - Oxygenate Compounds

Tosco (Unocal) Service Station #4186

1771 First Street

Livermore, California

WELL ID	DATE	ETHANOL (ppb)	TBA (ppb)	MTBE (ppb)	DIPE (ppb)	ETBE (ppb)	TAME (ppb)	EDB (ppb)	1,2-DCA (ppb)
U-7	01/03/02	<500	30	130	<1.0	<1.0	<1.0	<1.0	<1.0

Table 2

Groundwater Analytical Results - Oxygenate Compounds

Tosco (Unocal) Service Station #4186 1771 First Street Livermore, California

EXPLANATIONS:

ANALYTICAL METHOD:

EPA Method 8260 for Oxygenate Compounds

TBA = Tertiary butyl alcohol

MTBE = Methyl tertiary butyl ether

DIPE = Di-isopropyl ether

ETBE = Ethyl tertiary butyl ether

TAME = Tertiary amyl methyl ether

EDB = 1,2-Dibromoethane

1,2-DCA = 1,2-Dichloroethane

(ppb) = Parts per billion

ND = Not Detected

-- = Not Analyzed

Detection limit raised. Refer to analytical reports.

² Laboratory report indicates this sample was analyzed outside of the EPA recommended holding time.

STANDARD OPERATING PROCEDURE -GROUNDWATER SAMPLING

Gettler-Ryan Inc. field personnel adhere to the following procedures for the collection and handling of groundwater samples prior to analysis by the analytical laboratory. Prior to sample collection, the type of analysis to be performed is determined. Loss prevention of volatile compounds is controlled and sample preservation for subsequent analysis is maintained.

Prior to well development, each well is monitored for the presence of free-phase hydrocarbons and the depth to water is recorded. Wells are then developed by alternately surging the well with the bailer, then purging the well with a pump to remove accumulated sediments and draw groundwater into the well. Development continues until the groundwater parameters (temperature, pH, and conductivity) have stabilized.

Prior to sampling, the presence or absence of free-phase hydrocarbons is determined using an interface probe. Product thickness, if present, is measured to the nearest 0.01 foot and is noted in the field notes. In addition, static water level measurements are collected with the interface probe and are also recorded in the field notes.

After water levels are collected and prior to sampling, temperature, pH and electrical conductivity are measured. If purging is to occur, each well is purged a minimum of three well casing volumes of water using pre-cleaned pumps (stack, suction, Grundfos), or polyvinyl chloride bailers. The measurements are taken a minimum of three times during the purging. Purging continues until these parameters stabilize.

Groundwater samples are collected using disposable bailers. The water samples are transferred from the bailer into appropriate containers. Pre-preserved containers, supplied by analytical laboratories, are used when possible. When pre-preserved containers are not available, the laboratory is instructed to preserve the sample as appropriate. Duplicate samples are collected for the laboratory to use in maintaining quality assurance/quality control standards. The samples are labeled to include the job number, sample identification, collection date and time, analysis, preservation (if any), and the sample collector's initials. The water samples are placed in a cooler, maintained at 4°C for transport to the laboratory. Once collected in the field, all samples are maintained under chain of custody until delivered to the laboratory.

The chain of custody document includes the job number, type of preservation, if any, analysis requested, sample identification, date and time collected, and the sample collector's name. The chain of custody is signed and dated (including time of transfer) by each person who receives or surrenders the samples, beginning with the field personnel and ending with the laboratory personnel.

A laboratory supplied trip blank accompanies each sampling set. For sampling sets greater than 20 samples, 5% trip blanks are included. The trip blank is analyzed for some or all of the same compounds as the groundwater samples.

As requested by Phillips 66 Company, the purge water and decontamination water generated during sampling activities is transported to Phillips 66 - San Francisco Refinery, located in Rodeo, California.

nt/	5 CO 107.	•		Job#:	180181		
lity #	771 5	-+ ef		Date:	1/3/02		
ress: /7	71 F	<u> </u>			Vartkey		
: <i></i>	<u>iverm</u>	irst st	2	Sampler	_vaux		
Well ID	<u>u</u> -		Well Condition	: On	<u>/</u>		
Diameter		2 in	Hydrocarbon Thickness:	ව. පව	Amount Bail	71	(psl.)
al Depth	<u> 34.</u>	05 4	Volume	2" = 0.17	3" = 0.38		- 0.66
th to Water	27.	67 4	Factor (VF)	· · · · · · · · · · · · · · · · · · ·	6" = 1.50	12" = 5.80	
	í	38	012 1:08	V 9 (man amb)	me) = Estimated Pur	 	3.5 tools
•		770 X VF	•				
urge		able Bailer		impling juipment:	Disposable Bai	ler)	•
ipment:	Bailer Stack			Opinoni	Bailer		
	Suction	,			Pressure Bailer	r ·	
	Grundf			04	Grab Sample		
	Other:		•	.01	her:	• 	
			· .		o ver	east	•
arting Time:		05		Conditions:			· <u>-</u>
the state of the s					1		Δ.
_		030	Water C	ol or:	brr.	Odor:	3
mpling Time:		gpm.	Sedimer	nt Descriptio	n: 55/7		
mpling Time: rging Flow Ra	ete:		Sedimer	nt Descriptio			
mpling Time: rging Flow Ra	ete:	gpm.	Sedimer	nt Descriptio Time: Tempera	n: Volum ture D.O. (mg/L)		(gal.
mpling Time: rging Flow Ra d well de-wat	volume (gal.)	gpm.	Sedimer If yes; Conductivity	Tempera	n: Volum ture D.O. (mg/L)	orp	.(gal.
mpling Time: rging Flow Ra d well de-wat Time	volume (gal.)	gpm. G∽ų	Sedimer If yes; Conductivity	Tempera F 66.1	n: Volum ture D.O. (mg/L)	orp	(gel.
mpling Time: rging Flow Ra d well de-wat Time	Volume (gal.)	pH 7.73	Sedimer If yes; Conductivity	Tempera	n: Volum ture D.O. (mg/L)	orp	.(gal.
mpling Time: rging Flow Ra d well de-wat Time	volume (gal.)	pH 7.73	Sedimer If yes; Conductivity	Tempera F 66.1	n: Volum ture D.O. (mg/L)	orp	.(gal.
mpling Time: rging Flow Ra d well de-wat Time	Volume (gal.)	pH 7.73	Sedimer If yes; Conductivity	Tempera F 66.1	n: Volum ture D.O. (mg/L)	orp	.(gal.
ripling Time: rging Flow Ra d well de-wat Time	Volume (gal.)	pH 7.73	Sedimer If yes; Conductivity	Tempera F 65.7 66.1	n: Volum ture D.O. (mg/L)	orp	.(gal.
ripling Time: rging Flow Ra d well de-wat Time	Volume (gal.)	pH 7.73	Sedimer If yes; Conductivity	Tempera F 65.7 66.1	n:Volum ture D.O. (mg/L)	orp	.(gal.
riging Flow Rad well de-water Time	Volume (gal.)	pH <u>7.73</u> <u>7.53</u> <u>7.53</u>	Sedimer If yes; Conductivity	Tempera F 65.7 66.1	n:Volum ture D.O. (mg/L)	ORP (mV)	.(gal.
rmpling Time: rging Flow Ra d well de-wat Time (010 ,016 ,024 SAMPLE ID	Volume (gal.) 7 3.)	pH 7.73 7.55 7.57 7.57	Sedimer If yes; Conductivity	Tempera F 65.7 66.1 INFORMAT RV. TYPE	n:Volum ture D.O. (mg/L)	ORP (mV)	Alkalinity (ppm)
ripling Time: rging Flow Ra d well de-wat Time (010 (016 1024	Volume (gal.) 7 3.)	pH 7.73 7.55 7.57 ONTAINER F	Sedimer If yes; Conductivity	Tempera F 65.7 66.1 INFORMAT RV. TYPE	n:Volum ture D.O. (mg/L)	ORP (mV)	Alkalinity (ppm)
rmpling Time: rging Flow Ra d well de-wat Time (010 ,016 ,024 SAMPLE ID	Volume (gal.) 7 3.)	pH 7.73 7.55 7.57 7.57	Sedimer If yes; Conductivity	Tempera F 65.7 66.1 INFORMAT RV. TYPE	n:Volum ture D.O. (mg/L)	ORP (mV)	Alkalinity (ppm)
ripling Time: riging Flow Rad well de-wate Time (0)0	Volume (gal.) 7 3.)	pH 7.73 7.55 7.57 7.57	Sedimer If yes; Conductivity	Tempera F 65.7 66.1 INFORMAT RV. TYPE	n:Volum ture D.O. (mg/L)	ORP (mV)	Alkalinity (ppm)

nt/ ility #_ 4/86		000%.	80181	•.	<u>-</u>
ress: <u>1771 First</u>	et.	, DUI.U	3/02		
: Livermore,	<u>Ca.</u>	Sampler://	ertkez		
Well ID <u>U_2</u>	Well Condition	n: OW		· · · · · · · · · · · · · · · ·	
Diameter 2 in.	Hydrocarbon Thickness: _	~	Amount Baile (product/weter)	(4)	(0al.)
1) Depth 33.20 ft. 1) th to Water 27-33 ft.	Volume Factor (VF)	2" = 0.17 6" = 1.5	3" = 0.38 50 1	2" = 5.80	= 0.66
<u>5.87</u> ,	K VF 0.17 -0.99	X 3 (case volume) =	Estimated Purge	s Volume:	3_(gal.)
Disposable Baile sipment: Bailer Stack Suction		Bail Pre	posable Baile ler ssure Bailer ab Sample	Ď	
Grundfos Other:		Other:			
mpling Time: 1045	·	Conditions:	overea.	Odor: no	
rging Flow Rate:		nt Description:		•	lgal.)
		Temperature	D.O.	ORP (mV)	Alkalinity
Time Volume pH (gal.)	Conductivity	1 F	(mg/L)	(202.1)	(bbw)
(gal.) 10.50 1 7.60 10.55 2 7.4	µmhos/cm	66.7 66.7	(mg/L)		(bbw)
(gal.)	/mhos/cm 2 823	6 60	(mg/L)		(bbw)
(gal.) 10.50 (7.60 10.55 2 7.45 1102 3 7.45	### ### ##############################	66.7 66.7 66.9			
(gal.) (10.50 (7.60 (0.55 2 7.4) (102 3 7.4) SAMPLE ID (11) - CONTAINER	LABORATORY REFRIG. PRESER	INFORMATION IV. TYPE LABO	DRATORY		YSES
(gal.) 18.50 [7.60 10.55 2 7.45 1102 3 7.45	LABORATORY REFRIG. PRESER	INFORMATION IV. TYPE LABO	DRATORY	ANAL	LYSES
(gal.) 10.50 (7.60 10.55 2 7.45 1102 3 7.45 SAMPLE ID (11) - CONTAINER	LABORATORY REFRIG. PRESER	INFORMATION IV. TYPE LABO	DRATORY	ANAL	YSES

	S 00				•	-			
nt/ // lity #					Job#:	18	0181	· · · · · · · · · · · · · · · · · · ·	
ress:	771 F	irst so	<i>F</i>		Date:	1/	3/02		
ress:/	-		<u> </u>		Samnle:	r. Va	etker		
":	-, verm	sre =	<u> </u>	 .	Sample			· .	
						,			
Well ID	<u> </u>	_ 3	Well C	Condition:	<u> </u>		<u> </u>		
l Diameter		2, in.	-	carbon ness:	ని.రారి		mount Bail	(7_)	(pal.)
al Depth	33	3.40 tr	Volum		2" = 0.17		3" = 0.38	4" : 12" = 5.80	- 0.66
oth to Water	23	73.	Facto	or (VF)		6" = 1.50	· ·	12 - 3.50	
707 10 1100									
• • • •	9	x x <u>2 d.</u>	F 0.1+	- <u>1.64</u> >	(3 (case vo	lume) = E	etimated Pur	ge Volume:	- (gel.)
egu.	Disposi	able Bailer	•		npling		· · · · · · · · · · · · · · · · · · ·		
sipment:	Bailer			Equ	ipment:	Bail	osable Bai er		
	Stack Suction	n				Pres	ssure Bailer	• •	
	Grundf				_	_	b Sample		•
	Other:		-						- · · · · · · · · · · · · · · · · · · ·
,	. ,, .	2 2			Conditions	2.	clear		
arting Time:		25	_	wearner Water Co			2	Odor: 4	
mpling Time		50		-	Descripti			. (
irging Flow F		gpf					Volum	e:	
d well de-wa	iter?	<u>~</u>	_	ii yesi					
Time	Volume (gal.)	pН		luctivity ws/cm	Temper F	ature	D.O. (mg/L)	ORP (mV)	Alkalinity (ppm)
1130	1.5	7.48	6	4.1	65.	3		,	
1136	3	7.34		29	66.		<u>.</u>		
1194	5	7,29	6	,21	66.	<u>4</u>	<u> </u>		- ;
									-
1				<u> </u>		<u> </u>			
			LABOR	LATORY I	NFORMA	TION		4 81 4 1	LYSE S
SAMPLE ID	(#) - C	ONTAINER	REFRIG.	PRESER	V. TYPE		RATORY		
4-3	5 × 1	JOA VIAL	4	. He		SEQU	OIA	TPHG BTE	K /MTDE
				-				1	
				L	·				
OMMENTS:									
,									
							• .		

Well III	<u> </u>	4	Well Condition	n: 04			
Well ID Diameter	2		Hydrocarbon	· · · · _	Amount	~ /	
Depth	45.3	0 4	Thickness:	<u> න වේ</u> 2* = 0.17	$\frac{\text{in.} (\text{product})}{3^n = 0}$		= 0.66
th to Water	36.1		Factor (VF)		6" = 1.50	12 - 3.50	7
	9.13	X,VF	0.17 - 1.53	•	ume) = Estimated	l Purge Volume: _	<u> (Jed.)</u>
rge ipment:	Disposable Bailer Stack	: Bailer		ampling quipment:	Disposable Bailer		·
	Suction Grundfos Other:			.0	Pressure B Grab Samp ther:		
	097	8	Weathe	r Conditions	. Ove	reast_	
rting Time: npling Time:	094	· S	Water 0	Color:	on: Self	. Odor: n	ට
ging Flow Ra well de-wat		nd gpm.	, Seaime If yes;	nt Description	Vc	olume:	(gal.)
•			Conductivity	Temper	ature D.C (mg/		Alkalinity (ppm)
Time	Volume (gal.)	рĦ	µmhos/cm	7-	, ,	-,	474
930	(gal.)	12-76-7 12-76-7	umhos/cm 706	64. 68.	7		
930 932	(gal.)		µmhos/cm	64. 65.	7		
0930	(gal.)	7.50	106 691	6 5 .	7		
730 0732 0734 SAMPLE ID	(gal.)	1.50 7.50 7.46	#mhos/cm 706 691 680 CM	6 5 .	7 3 7 —	y AN	ALYSES EX /MTOE+

ddress: 1771 First Livermore	ca.	Date:/_ Sampler:/_	3/02 utkes	· · · · · · · · · · · · · · · · · · ·	
Well ID U_5	Well Condition	ow.			
ell Diameter 2		^	Amount Baild	~~ 1	(nel.)
otal Depth 47.20	TINCKI WOOD	2" = 0.17	3" = 0.38	4*	- 0.66
epth to Water 36.55	ft. Factor (VF)	6" = 1.5	50 · 1	12" = 5.80	
	x vr 8.17 -1.81		Friday and Duce	a Volumet	57.5
Purge Disposable Ba Equipment: Bailer Stack Suction Grundfos Other:		Bai Pre Gra	posable Baile ler ssure Bailer ab Sample		•
Secreting Time: 0857	2	Conditions:	Overco	74	
Starting Time.	Water Cr	olor: br		Odor: n.D	
Sampling Time:/ Purging Flow Rate:/	Sedimen	t Description:	5/17	 	
Did well de-water?	if yes;	Time:	Volume):	(gel.
Time Volume pl	H Conductivity μmhos/cm	Temperature	D.O. (m g/L)	ORP (mV)	Alkalinity (ppm)
	71 693	64.1			
0854 1 2.	.56 674	65.2			
<u> </u>				•	·
	<u> </u>				•
	LABORATORY	NFORMATION	ORATORY	ANAI	YSES
SAMPLE ID (#) - CONTAINI U - 5 5 × VDA VIA		Z-5.		TPHG BTE	
	AL Y HO				
4					
U S C VOA V.					·

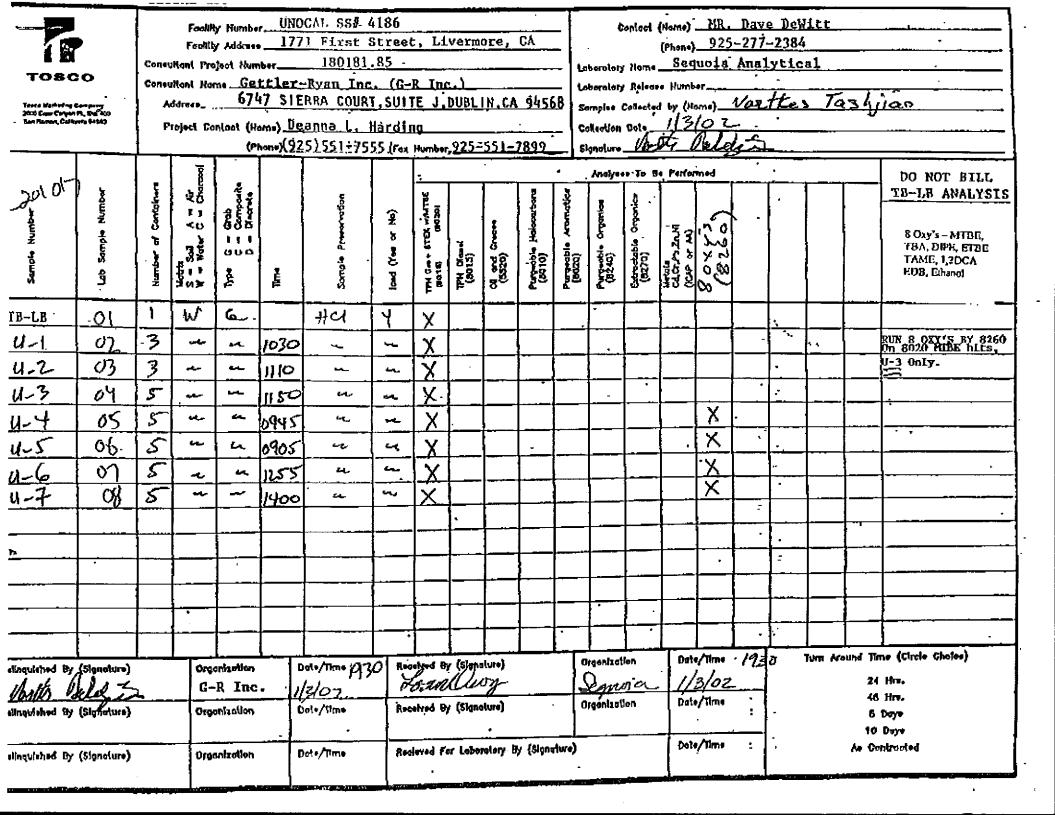
WELL MONITORING/DEVELOPMENT FIELD DATA SHEET

Facility# 4186	<u></u>	Job#: <u>パタン/多 /</u>
Address: <u>17-7-1</u>		
City: <u>Live</u>	rmore, Ca	Sampler: Varthy
Well ID _	u-6	Well Condition:
Well Diameter	Z in.	Hydrocarbon Amount Bailed Thickness: 5. 55 Ft. (product/water): (gal.
Total Depth _	44.65 th	Volume 2" = 0.17 3" = 0.38 4" = 0.66
Depth to Water	33.99 ft.	Factor (VF) $6^n = 1.50$ $12^n = 5.80$
-	10-66 x VF	F <u>0. j } = 1. 81 X 9 (case volume) = Estimated Purge Volume: 18 (qal</u>
Equipment:	Disposable Bailer Bailer Stack	Sampling Equipment: Disposable Bailer Bailer
(Suction Grundfos Other:	Pressure Bailer Grab Sample Other:
Starting Time:	1205	Weather Conditions:
Sampling Time:	1755	Water Color: bro Odor: mild
Purging Flow Rate:		apm. Sediment Description: \(\sigma_i = \sigma_i \)
Did well de-water?		If yes; Time: 1214, 1229, 124) Volume: 8, 124/5 (gz
Time Volus	_	Conductivity Temperature D.O. ORP Alkalinin μmhos/cm (mg/L) (mV) (ppm)
(gal 1207 2	.) 	μ mhos/cm (mg/L) (mV) (ppm) 780 67.6
(gal 1207 2 1209 4	.) 7.77 	μmhos/cm (mg/L) (mV) (ppm) 780 67.6 803 68.2 Clear after 229 qa.
(gal 1207 2 1209 4 12\$1 6	7.77 7.63 7.60	μmhos/cm (mg/L) (mV) (ppm) 780 67.6 803 68.2 Clear after 229 ga. 809 68.0
(gal 1207 4 1209 4 1241 6 1214 8	7.77 7.63 7.60 7.54	μmhos/cm (mg/L) (mV) (ppm) 780 67.6 803 68.2 Clear after 229 ga. 809 68.0 816 68.2
(gal 1207 2 1209 4 1241 6 1214 8 1227 10	7.77 7.63 7.60 7.56 7.56	μmhos/cm 780 67.6 803 68.2 Clear after 229 ga. 809 68.0 816 68.2 907 68.1
(gal 1207 4 1209 4 1241 6 1214 8 1227 10 1229 12	7.77 7.63 7.60 7.54	μmhos/cm 780 67.6 803 68.2 Clear after 229 ga. 809 68.0 816 68.2 907 68.1 901 68.3
(gal 1207 4 1209 4 1241 6 1214 8 1227 10 1229 12	7.63 7.63 7.60 7.54 7.56 7.47 7.42	μmhos/cm 780 67.6 803 68.2 Clear after 229 ga. 809 68.0 816 68.2 907 68.3 806 68.5
(gal 1207 4 1209 4 1241 6 1214 8 1227 10	7.77 7.63 7.60 7.54 7.56 7.47	μmhos/cm 780 67.6 803 68.2 Clear after 229 ga. 809 68.0 816 68.2 907 68.1 901 68.3 806 68.5
(gal 1207 4 1209 4 1241 6 1214 8 1227 10 1229 12	7.63 7.63 7.60 7.54 7.56 7.47 7.42	μmhos/cm 780 67.6 803 68.2 Clear after 229 ga. 809 68.0 816 68.2 907 68.3 806 68.5
(gal 1207 4 1209 4 1241 6 1214 8 1227 10 1229 12 1245 15	7.63 7.60 7.54 7.56 7.47 7.42 Dewatere	μmhos/cm 780 67.6 803 68.2 Clear after 229 ga. 809 68.0 816 68.2 907 68.1 901 68.3 806 68.5 2d 3 times. / s/ow recovery.
(gal 1207 2 1209 4 1241 6 1214 8 1227 10 1229 12 1245 15	7.63 7.63 7.60 7.54 7.56 7.47 7.42 Dewatere	#mhos/cm (mg/L) (mV) (ppm) 780 67.6 803 68.2 Clear after 2 nd 9a. 809 68.0 816 68.2 907 68.1 801 68.3 806 68.5 LABORATORY INFORMATION EFRIG. PRESERV. TYPE LABORATORY ANALYSES
(gal 1207 4 1209 4 1241 6 1214 8 1227 10 1229 12 1245 15	7.63 7.60 7.54 7.56 7.47 7.42 Dewatere	μmhos/cm 780 67.6 803 68.2 Clear after 229 ga. 809 68.0 816 68.2 907 68.1 901 68.3 806 68.5 2d 3 times. / s/ow recovery.

_9/97-fieldat.frm

WELL MONITORING/DEVELOPMENT

Well ID U-7 Well Cond Vell Diameter Vell Diameter Thickness Total Depth Depth to Water Well Cond Tydrocarl Thickness Volume Factor (VI	bon Amount Bailed s: (product/water): (gal.) 2" = 0.17 3" = 0.38 4" = 0.66
Well ID Well Diameter Otal Depth Depth to Water With First St. Well First St. Well Conc. Well Conc. Hydrocarl Thickness Volume Factor (VI	Date: 1/3/02 Sampler: Vartlus dition: 0 k bon Amount Bailed (product/water): (gal.) 2" = 0.17 3" = 0.38 4" = 0.66
Well ID Well Diameter Vell Diameter Volume Factor (VI Depth to Water City: Creeners, Ca. Well Cond Phydrocarl Thickness Volume Factor (VI Cond Con	Sampler: <u>Vartles</u> dition: <u>O k</u> bon Amount Bailed (product/water): 2" = 0.17 3" = 0.38 4" = 0.66
Well ID U-7 Well Cond Vell Diameter Vell Diameter Thickness Total Depth Depth to Water Well Cond Tydrocarl Thickness Volume Factor (VI	dition: OK bon Amount Bailed s: OF Ft. (product/water): (gal.) 2" = 0.17 3" = 0.38 4" = 0.66
Vell Diameter Z in. Hydrocarl Thickness Otal Depth Volume Factor (VI	bon Amount Bailed (gal.) 2" = 0.17 3" = 0.38 4" = 0.66
Thickness Volume Factor (VI Depth to Water 32.43 ft.	s: O Ft. (product/water): (gal.) 2" = 0.17 3" = 0.38 4" = 0.66
Total Depth 44.45 ft. Volume Factor (VI	2" = 0.17 3" = 0.38 4" = 0.66
Depth to Water 32.43ft. Factor (VI	
	F) 6" = 1.50 12" = 5.80
10,00 X VF 0.17 = 0.	어 (case volume) = Estimated Purge Volume: 20. (gal.)
Purge Disposable Bailer Equipment: Bailer Stack Suction Grundfos Other:	Sampling Equipment: Disposable Bailer Bailer Pressure Bailer Grab Sample Other:
Starting Time: Weat	ther Conditions:
	er Color: Clear Odor: mild
Purging Flow Rate:	ment Description:
Did well de-water? If yes	s; Time: 1718, 1779, 177 Evolume: 1, 177, 177 (dal.)
Time Volume pH Conductivit	
m */ 60 mg - 1	
1310 7 7.53 762	
13,6 6 7.50 763	
1318 7 7.43 767	684
1333 10 7.38 760	68.3
1345 12 7.32 772 1346 13 7.35 776	
1346 13 7.35 770	
Newstered 3 time	er - slow recovery
	<u> </u>
LABORATOR	RY INFORMATION
SAMPLE ID (#) - CONTAINER REFRIG. PRES	SERV. TYPE LABORATORY ANALYSES
	SERV. TYPE LABORATORY ANALYSES
SAMPLE ID (#) - CONTAINER REFRIG. PRES	SERV. TYPE LABORATORY ANALYSES







22 January, 2002

Deanna Harding Gettler-Ryan/Geostrategies(1) 6747 Sierra Court, Suite J Dublin, CA 94568

RE: Tosco(1)

Sequoia Report: L201017

REPENSIO

M. 4 4 4 99

GETTLER KTAN HAL.

GENERAL CONTRACTORS

Enclosed are the results of analyses for samples received by the laboratory on 01/03/02 19:30. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Sdorya K. Palt

Latonya Pelt Project Manager

CA ELAP Certificate #2360



Gettler-Ryan/Geostrategies(1) 6747 Sierra Court, Suite J

6747 Sierra Court, Suite J Dublin CA, 94568 Project: Tosco(1)

Project Number: Unocal SS#4186, Livermore, CA

Project Manager: Deanna Harding

Reported: 01/22/02 12:10

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
TB-LB	L201017-01	Water	01/03/02 00:00	01/03/02 19:30
U-1	L201017-02	Water	01/03/02 10:30	01/03/02 19:30
U-2	L201017-03	Water	01/03/02 11:10	01/03/02 19:30
U-3	L201017-04	Water	01/03/02 11:50	01/03/02 19:30
U-4	L201017-05	Water	01/03/02 09:45	01/03/02 19:30
U-5	L201017-06	Water	01/03/02 09:05	01/03/02 19:30
U-6	L201017-07	Water	01/03/02 12:55	01/03/02 19:30
U-7	L201017-08	Water	01/03/02 14:00	01/03/02 19:30

Sequoia Analytical - San Carlos

Johnya K. Pelt

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



Gettler-Ryan/Geostrategies(1)

6747 Sierra Court, Suite J Dublin CA, 94568 Project: Tosco(1)

Project Number: Unocal SS#4186, Livermore, CA

Project Manager: Deanna Harding

Reported: 01/22/02 12:10

Total Purgeable Hydrocarbon (C6-C12) by EPA 8015M and BTEX/MTBE by EPA 8021B

Sequoia Analytical - San Carlos

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
TB-LB (L201017-01) Water Sampled:	01/03/02 00:00	Received: 0	1/03/02 1	19:30					
Purgeable Hydrocarbons as Gasoline	ND	50	ug/l	1	2010043	01/14/02	01/14/02	EPA 8021B	
Benzene	ND -	0.50	II	n	*	**	π		
Toluene	ND	0.50	ш	11	n	τι	"	tt	
Ethylbenzene	ND	0.50	u	Ħ	***	47	"	**	
Xylenes (total)	ND	0.50	u	π	11	Ð	11	п	
Methyl tert-butyl ether	ND	5.0	н	*	ш		н	н	
Surrogate: a,a,a-Trifluorotoluene	<u>-</u>	90.2 %	70-	130	"	п	"	rr .	· · · · · · · · · · · · · · · · · · ·
U-1 (L201017-02) Water Sampled: 01/0	3/02 10:30 Re	ceived: 01/0	3/02 19:3	30					
Purgeable Hydrocarbons as	160	50	ug/l	1	2010044	01/14/02	01/14/02	EPA 8021B	P-03
Gasoline			-						
Benzene	ND	0.50	n	11	*	11	II	H	
Toluene	0.51	0.50	**	п		li	N	Ħ	
Ethylbenzene	ND	0.50	**	п	11	Ħ	**	11	
Xylenes (total)	0.69	0.50	,,	Ħ	II	*	#1	**	
Methyl tert-butyl ether	31	5.0	*	*	H	71	u .	**	
Surrogate: a,a,a-Trifluorotoluene		86.8 %	70-	-130	tr.	"	"	"	
U-2 (L201017-03) Water Sampled: 01/0	3/02 11:10 Re	ceived: 01/0	3/02 19:3	30					
Purgeable Hydrocarbons as	260	50	ug/l	1	2010043	01/14/02	01/14/02	EPA 8021B	P-0
Gasoline									
Benzene	7.7	0.50	41	**	**	11	#	11	
Toluene	11	0.50	11	11	11	•	"	11	
Ethylbenzene	1.7	0.50	11	п	п	19	11	ш	
Xylenes (total)	15	0.50	ft	п	н	n	u	**	
Methyl tert-butyl ether	42	5.0	11	11	н	u .	"		
Surrogate: a,a,a-Trifluorotoluene	· · · · · · · · · · · · · · · · · · ·	124 %	70-	130	u	п	и	"	



Gettler-Ryan/Geostrategies(1)

6747 Sierra Court, Suite J Dublin CA, 94568 Project: Tosco(1)

Project Number: Unocal SS#4186, Livermore, CA

Project Manager: Deanna Harding

Reported: 01/22/02 12:10

Total Purgeable Hydrocarbon (C6-C12) by EPA 8015M and BTEX/MTBE by EPA 8021B Sequoia Analytical - San Carlos

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
U-3 (L201017-04) Water Sampled: 01/	03/02 11:50	Received: 01/0	3/02 19:3	30					
Purgeable Hydrocarbons as	9900	1200	ug/l	25	2010044	01/14/02	01/14/02	EPA 8021B	P-01
Gasoline									
Benzene	700	12	п	**	U	*1	п	*1	
Toluene	130	12	н	**	н	11	Ħ	11	
Ethylbenzene	24	12	11	"	II	19	r	11	
Xylenes (total)	1000	12	n		II .	и	"	II	
Methyl tert-butyl ether	14000	500	11	100	H	*1	н	н	M-04
Surrogate: a,a,a-Trifluorotoluene	•••	84.0 %	70-	130	tt	n	н	"	
U-4 (L201017-05) Water Sampled: 01/	03/02 09:45	Received: 01/0	3/02 19:3	10					
Purgeable Hydrocarbons as	100	50	ug/l	1	2010044	01/14/02	01/15/02	EPA 8021B	P-03
Gasoline									
Benzene	ND	0.50		"	**	и	It	11	
Toluene	ND	0.50	••	*	**	er	n	11	
Ethylbenzene	ND	0.50	**	**	11	n	•	ш	
Xylenes (total)	ND	0.50	.,	**	"	"	**	11	
Methyl tert-butyl ether	10	5.0	11	*		n	IT .	н	
Surrogate: a,a,a-Trifluorotoluene		100 %	70-	130	"	n	11	"	
U-5 (L201017-06) Water Sampled: 01/	03/02 09:05 J	Received: 01/0	3/02 19:3	30					
Purgeable Hydrocarbons as Gasoline	ND	50	ug/l	1	2010044	01/14/02	01/15/02	EPA 8021B	
Benzene	ND	0.50	,,	11	11	Ħ	11	"	
Toluene	0.59	0.50	Ħ	71	п	n	11	**	
Ethylbenzene	ND	0.50	**	11	n	n	Ħ	п	
Xylenes (total)	0.91	0.50	**	п	u	11	11	п	
Methyl tert-butyl ether	51	5.0		11	II	н	+1	n n	
Surrogate: a.a.a-Trifluorotoluene		92.3 %	70-	130	ıı	"	"	"	



Gettler-Ryan/Geostrategies(1) 6747 Sierra Court, Suite J

Dublin CA, 94568

Project: Tosco(1)

Project Number: Unocal SS#4186, Livermore, CA

Reported: 01/22/02 12:10

Project Manager: Deanna Harding

Total Purgeable Hydrocarbon (C6-C12) by EPA 8015M and BTEX/MTBE by EPA 8021B Sequoia Analytical - San Carlos

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
U-6 (L201017-07) Water Samp	pled: 01/03/02 12:55	Received: 01/0	3/02 19:3	0					
Purgeable Hydrocarbons as	5000	2500	ug/l	50	2010044	01/14/02	01/15/02	EPA 8021B	P-02
Gasoline									
Benzene	36	25	•	Ħ	"	"	n	•	
Toluene	ND	25	**	n	н	**	**	n .	
Ethylbenzene	260	25	**	Ħ	**	n		**	
Xylenes (total)	450	25	п	11	H	11	n	*	
Methyl tert-butyl ether	ND	250	Ħ	п	II.	π	**	77	
Surrogate: a,a,a-Trifluorotoluene		76.8 %	70-	130	п	,,	,,	#	
U-7 (L201017-08) Water Samp	oled: 01/03/02 14:00	Received: 01/0	<u>3/02 19:3</u>	0					
Purgeable Hydrocarbons as	3100	1000	ug/l	20	2010044	01/14/02	01/15/02	EPA 8021B	P-02
Gasoline									
Benzene	93	10	n		,,	"	•	11	
Toluene	ND	10	II	**	**	11	41	11	
Ethylbenzene	35	10	II	**	**	11	11	п	
Xylenes (total)	73	10	n		**	н	Ħ	п	
Methyl tert-butyl ether	140	100	11	**	**	II .	ш	п	
Surrogate: a,a,a-Trifluorotoluene		84.6 %	70-	130	"	"	"	"	



Gettler-Ryan/Geostrategies(1)

6747 Sierra Court, Suite J Dublin CA, 94568 Project: Tosco(1)

Project Number: Unocal SS#4186, Livermore, CA

Project Manager: Deanna Harding

Reported: 01/22/02 12:10

Volatile Organic 8 Oxygenated Compounds by EPA Method 8260B

Sequoia Analytical - San Carlos

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
U-3 (L201017-04) Water	Sampled: 01/03/02 11:50	Received: 01/0	3/02 19:3	0					
Ethanol	ND	50000	ug/l	100	2010020	01/07/02	01/07/02	EPA 8260B	
1,2-Dibromoethane	ND	100	11	**	a	u	11	H	
1,2-Dichloroethane	ND	100	n	Ħ	H	н	"	**	
Di-isopropyl ether	ND	100	Ħ	H	N	"	11	Ħ	
Ethyl tert-butyl ether	ND	100	n	"	R	**	II .	tf	
Methyl tert-butyl ether	12000	100	11	H	"	π	ji	n	
Tert-amyl methyl ether	ND	100	"	in	**	**	n	*1	
Tert-butyl alcohol	17000	2000	п	"	н	n		и .	
Surrogate: 1,2-Dichloroetho	ine-d4	93.5 %	70-	130	"	21	"	rr	
Surrogate: Toluene-d8		99.8 %	70-	130	#	n	n	Ħ	
U-4 (L201017-05) Water	Sampled: 01/03/02 09:45	Received: 01/0	3/02 19:3	0					
Ethanol	ND	500	ug/l	1	2010014	01/07/02	01/07/02	EPA 8260B	
1,2-Dibromoethane	ND	1.0	11	11	11		II	"	
1,2-Dichloroethane	ND	1.0	н	11	п	**	Ц	11	
Di-isopropyl ether	ND	1.0	11	.,	n	n	"	II .	
Ethyl tert-butyl ether	ND	1.0	11	*1	n	**	н	н	
Methyl tert-butyl ether	8.5	1.0	*	11	н	**	n	н	
Tert-amyl methyl ether	ND	1.0		**	H	11	π	n	
Tert-butyl alcohol	ND	20	н	#	"	II .	**	n	
Surrogate: 1,2-Dichloroetha	ne-d4	98.2 %	70-	130	"	п	11	"	
Surrogate: Toluene-d8		101 %	70-	130	*	*	II.	#	
U-5 (L201017-06) Water	Sampled: 01/03/02 09:05	Received: 01/0	3/02 19:3	0			<u> </u>		
Ethanol	ND	500	ug/l	1	2010014	01/07/02	01/07/02	EPA 8260B	
1,2-Dibromoethane	ND	1.0	"	ш	71	н	Ħ	tt	
1,2-Dichloroethane	ND	1.0	IŦ	ш	n	**	. "	P	
Di-isopropyl ether	ND	1.0	**	n	n	n	tt.	11	
Ethyl tert-butyl ether	ND	1.0	*1	1+	u	d1	•	u	
Methyl tert-butyl ether	53	1.0	u	**	n	47	Ħ	n	
Tert-amyl methyl ether	ND-	1.0	н	**	11	W.	11		
Tert-butyl alcohol	ND	20	II	**	"	"	11	Ħ	
Surrogate: 1,2-Dichloroetha	ne-d4	97.8 %	70-	130	,,	tr	#	"	
Surrogate: Toluene-d8		101 %	70-		,,	"	,,	,,	



Gettler-Ryan/Geostrategies(1)

6747 Sierra Court, Suite J Dublin CA, 94568 Project: Tosco(1)

Project Number: Unocal SS#4186, Livermore, CA

Project Manager: Deanna Harding

Reported: 01/22/02 12:10

Volatile Organic 8 Oxygenated Compounds by EPA Method 8260B

Sequoia Analytical - San Carlos

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
U-6 (L201017-07) Water	Sampled: 01/03/02 12:55	Received: 01/0	3/02 19:30)					R-05
Ethanol	ND	5000	ug/l	10	2010020	01/07/02	01/07/02	EPA 8260B	
1,2-Dibromoethane	ND	10	n	ш	II	**	W	11	
1,2-Dichloroethane	ND	10	п	н	u	**	**	.tr	
Di-isopropyl ether	ND	10	li .	n	ŧŧ	#1	**	10	
Ethyl tert-butyl ether	ND	10	li		**	"	"	11	
Methyl tert-butyl ether	ND	10	u		17	tı	II	11	
Tert-amyl methyl ether	ND	10	"	**	**	II	Ħ	II	
Tert-butyl alcohol	ND	200	"	Ħ	**	u	#	#	
Surrogate: 1,2-Dichloroeth	ane-d4	94.5 %	70-1	30	"	"	#	"	
Surrogate: Toluene-d8		99.7 %	70-1	30	н	n	#	"	
U-7 (L201017-08) Water	Sampled: 01/03/02 14:00	Received: 01/0	3/02 19:30)				<u> </u>	
Ethanol	ND	500	ug/l	1	2010014	01/07/02	01/07/02	EPA 8260B	
1,2-Dibromoethane	ND	1.0	Ħ	11	**	п	tt	R	
1,2-Dichloroethane	ND	1.0	H	п	11	Ħ	"	**	
Di-isopropyl ether	ND	1.0	"	Ħ	n	*	#	**	
Ethyl tert-butyl ether	ND	1.0	Ħ	Ħ	H	11	"	**	
Methyl tert-butyl ether	130	1. 0	**	rr .	**	**	"	11	
Tert-amyl methyl ether	ND	1.0	11		11	*1	11	II	
Tert-butyl alcohol	30	20	**	n	11	n	n	H	
Surrogate: 1,2-Dichloroeth	ane-d4	99.7 %	70-	130	π	"	"	Ħ	
Surrogate: Toluene-d8		100 %	70-	130	*	#	"	"	



Gettler-Ryan/Geostrategies(1) 6747 Sierra Court, Suite J

Dublin CA, 94568

Project: Tosco(1)

Project Number: Unocal SS#4186, Livermore, CA

Project Manager: Deanna Harding

Reported: 01/22/02 12:10

Total Purgeable Hydrocarbon (C6-C12) by EPA 8015M and BTEX/MTBE by EPA 8021B - Quality Control Sequoia Analytical - San Carlos

LCS (2010043-BS1) Prepared & Analyzed: 01/14/02 Benzene 11.4 0.50 ug/l 10.0 114 Toluene 11.1 0.50 " 10.0 111 Ethylbenzene 10.9 0.50 " 10.0 109 Xylenes (total) 33.2 0.50 " 30.0 111 Surrogate: a,a,a-Trifluorotoluene 8.65 " 10.0 86.5 LCS (2010043-BS2) Prepared & Analyzed: 01/14/02 Purgeable Hydrocarbons as Gasoline 270 50 ug/l 250 108 Matrix Spike (2010043-MS1) Source: L201019-04 Prepared: 01/14/02 Analyzed: 01/14/02 Prepared: 01/14/02 Analyzed: 01/14/02 Purgeable Hydrocarbons as Gasoline 264 50 ug/l 250 ND 106		RPD	RPD Limit	Notes
Purgeable Hydrocarbons as Gasoline				
Description	<u> </u>			
Toluene ND 0.50 " Ethylbenzene ND 0.50 " Xylenes (total) ND 0.50 " Methyl tert-butyl ether ND 5.0 " Surrogate: a,a,a-Trifluorotoluene 8.21 " 10.0 82.1 LCS (2010043-BS1) Prepared & Analyzed: 01/14/02 Benzene 11.4 0.50 ug/l 10.0 114 Toluene 11.1 0.50 " 10.0 111 Ethylbenzene 10.9 0.50 " 10.0 109 Xylenes (total) 33.2 0.50 " 30.0 111 Surrogate: a,a,a-Trifluorotoluene 8.65 " 10.0 86.5 LCS (2010043-BS2) Prepared & Analyzed: 01/14/02 Purgeable Hydrocarbons as Gasoline 270 50 ug/l 250 108 Surrogate: a,a,a-Trifluorotoluene 9.16 " 10.0 91.6 Matrix Spike (2010043-MS1) Source: L201019-04 Prepared: 01/14/02 Analyzed: 01/14/02 Purgeable Hydrocarbons as Gasoline 264 50 ug/l 250 ND 106				
Ethylbenzene ND 0.50 " Xylenes (total) ND 0.50 " Methyl tert-butyl ether ND 5.0 " Surrogate: a,a,a-Trifluorotoluene 8.21 " 10.0 82.1 LCS (2010043-BS1) Prepared & Analyzed: 01/14/02 Benzene 11.4 0.50 ug/l 10.0 114 Toluene 11.1 0.50 " 10.0 111 Ethylbenzene 10.9 0.50 " 10.0 109 Xylenes (total) 33.2 0.50 " 30.0 111 Surrogate: a,a,a-Trifluorotoluene 8.65 " 10.0 86.5 LCS (2010043-BS2) Prepared & Analyzed: 01/14/02 Purgeable Hydrocarbons as Gasoline 270 50 ug/l 250 108 Surrogate: a,a,a-Trifluorotoluene 9.16 " 10.0 91.6 Matrix Spike (2010043-MS1) Source: L201019-04 Prepared: 01/14/02 Analyzed: 01/14/02 Purgeable Hydrocarbons as Gasoline 264 50 ug/l 250 ND 106				
ND 0.50 "				
Methyl tert-butyl ether ND 5.0 " Surrogate: a,a,a-Trifluorotoluene 8.21 " 10.0 82.1 LCS (2010043-BS1) Prepared & Analyzed: 01/14/02 Benzene 11.4 0.50 ug/l 10.0 114 Toluene 11.1 0.50 " 10.0 111 Ethylbenzene 10.9 0.50 " 10.0 109 Xylenes (total) 33.2 0.50 " 30.0 111 Surrogate: a,a,a-Trifluorotoluene 8.65 " 10.0 86.5 LCS (2010043-BS2) Prepared & Analyzed: 01/14/02 108 Purgeable Hydrocarbons as Gasoline 270 50 ug/l 250 108 Matrix Spike (2010043-MS1) Source: L201019-04 Prepared: 01/14/02 Analyzed: 01/14/02 Purgeable Hydrocarbons as Gasoline 264 50 ug/l 250 ND 106				
Surrogate: a,a,a-Trifluorotoluene 8.21 " 10.0 82.1 LCS (2010043-BS1) Prepared & Analyzed: 01/14/02 Benzene 11.4 0.50 ug/l 10.0 114 Toluene 11.1 0.50 " 10.0 109 Kylenes (total) 33.2 0.50 " 30.0 111 Surrogate: a,a,a-Trifluorotoluene 8.65 " 10.0 86.5 LCS (2010043-BS2) Prepared & Analyzed: 01/14/02 Purgeable Hydrocarbons as Gasoline 270 50 ug/l 250 108 Surrogate: a,a,a-Trifluorotoluene 9.16 " 10.0 91.6 Matrix Spike (2010043-MS1) Source: L201019-04 Prepared: 01/14/02 Analyzed: 01/14/02 Purgeable Hydrocarbons as Gasoline 264 50 ug/l 250 ND 106				
Description				
Benzene	70-130			<u>, </u>
Toluene	2	_		
Ethylbenzene 10.9 0.50 " 10.0 109 Xylenes (total) 33.2 0.50 " 30.0 111 Surrogate: a,a,a-Trifluorotoluene 8.65 " 10.0 86.5 LCS (2010043-BS2) Prepared & Analyzed: 01/14/02 Purgeable Hydrocarbons as Gasoline 270 50 ug/l 250 108 Surrogate: a,a,a-Trifluorotoluene 9.16 " 10.0 91.6 Matrix Spike (2010043-MS1) Source: L201019-04 Prepared: 01/14/02 Analyzed: 01/14/02 Purgeable Hydrocarbons as Gasoline 264 50 ug/l 250 ND 106	70-130			
Xylenes (total) 33.2 0.50 " 30.0 111 Surrogate: a,a,a-Trifluorotoluene 8.65 " 10.0 86.5 LCS (2010043-BS2) Prepared & Analyzed: 01/14/02 Purgeable Hydrocarbons as Gasoline 270 50 ug/l 250 108 Surrogate: a,a,a-Trifluorotoluene 9.16 " 10.0 91.6 Matrix Spike (2010043-MS1) Source: L201019-04 Prepared: 01/14/02 Analyzed: 0 Purgeable Hydrocarbons as Gasoline 264 50 ug/l 250 ND 106	70-130			
Surrogate: a,a,a-Trifluorotoluene 8.65 " 10.0 86.5 LCS (2010043-BS2) Prepared & Analyzed: 01/14/02 Purgeable Hydrocarbons as Gasoline 270 50 ug/l 250 108 Surrogate: a,a,a-Trifluorotoluene 9.16 " 10.0 91.6 Matrix Spike (2010043-MS1) Source: L201019-04 Prepared: 01/14/02 Analyzed: 0 Purgeable Hydrocarbons as Gasoline 264 50 ug/l 250 ND 106	70-130			
LCS (2010043-BS2) Prepared & Analyzed: 01/14/02 Purgeable Hydrocarbons as Gasoline 270 50 ug/l 250 108 Surrogate: a,a,a-Trifluorotoluene 9.16 " 10.0 91.6 Matrix Spike (2010043-MS1) Source: L201019-04 Prepared: 01/14/02 Analyzed: 0.0 Purgeable Hydrocarbons as Gasoline 264 50 ug/l 250 ND 106	70-130			
Purgeable Hydrocarbons as Gasoline 270 50 ug/l 250 108 Surrogate: a,a,a-Trifluorotoluene 9.16 " 10.0 91.6 Matrix Spike (2010043-MS1) Source: L201019-04 Prepared: 01/14/02 Analyzed: 0 Purgeable Hydrocarbons as Gasoline 264 50 ug/l 250 ND 106	70-130			
Surrogate: a,a,a-Trifluorotoluene 9.16 " 10.0 91.6 Matrix Spike (2010043-MS1) Source: L201019-04 Prepared: 01/14/02 Analyzed: 0 Purgeable Hydrocarbons as Gasoline 264 50 ug/l 250 ND 106	2			
Matrix Spike (2010043-MS1) Source: L201019-04 Prepared: 01/14/02 Analyzed: 0 Purgeable Hydrocarbons as Gasoline 264 50 ug/l 250 ND 106	70-130			
Purgeable Hydrocarbons as Gasoline 264 50 ug/l 250 ND 106	70-130			
	01/15/02			
Surrogate: a,a,a-Trifluorotoluene 9.73 " 10.0 97.3	60-140	•		
	70-130	-		
Matrix Spike Dup (2010043-MSD1) Source: L201019-04 Prepared: 01/14/02 Analyzed: 0	01/15/02			
	60-140	1.14	25	
	70-130			



Gettler-Ryan/Geostrategies(1)

6747 Sierra Court, Suite J Dublin CA, 94568 Project: Tosco(1)

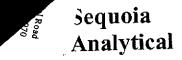
Project Number: Unocal SS#4186, Livermore, CA

Project Manager: Deanna Harding

Reported: 01/22/02 12:10

Total Purgeable Hydrocarbon (C6-C12) by EPA 8015M and BTEX/MTBE by EPA 8021B - Quality Control Sequoia Analytical - San Carlos

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 2010044 - EPA 5030B (P/T)									Diffit	Notes
Blank (2010044-BLK1)				Prenared	& Analyze	ad: 01/14/	02			
Purgeable Hydrocarbons as Gasoline	ND	50	ug/l	repared	& Allalyzi	5d. 01/14/	02			
Benzene	ND	0.50	 11							
l'oluene	ND	0.50	H							
Ethylbenzene	ND	0.50	**							
Xylenes (total)	ND	0.50	li							
Methyl tert-butyl ether	ND	5.0	Pt							-
Surrogate: a,a,a-Trifluorotoluene	7.63		tı	10.0		76.3	70-130			
LCS (2010044-BS1)				Prepared a	& Analysa	A- 01/14#	2			
Веплепе	8.17	0.50	ug/l	10.0	Allalyze	81.7	70-130			
Foluene	7.32	0.50	n	10.0		73.2	70-130			
Ethylbenzene	7.11	0.50	**	10.0		71.1	70-130			
(ylenes (total)	21.0	0.50	17	30.0		70.0	70-130 70-130			
urrogate: a,a,a-Trifluorotoluene	7.83		п	10.0		78.3	70-130	- - ,		
CS (2010044-BS2)				Prepared &	amalama	d- 01/14/0				
urgeable Hydrocarbons as Gasoline	275	50	ug/l	250	× Allalyze	110	70-130			
urrogate: a,a,a-Trifluorotoluene	7.89		<u>"</u>	10.0	_ ·	78.9	70-130		<u> </u>	
1atrix Spike (2010044-MS1)	Sou	rce: L20101 <i>6</i>	i-06	Prepared:	01/14/02	Analyzad				
urgeable Hydrocarbons as Gasoline	263	50	ug/l	250	ND	Analyzed:	60-140		<u> </u>	
urrogate: a,a,a-Trifluorotoluene	9.81		"	10.0		98.1	70-130			
latrix Spike Dup (2010044-MSD1)	Sou	rce: L201016	i-06	Ртерагеd: (01/14/02					
irgeable Hydrocarbons as Gasoline	246	50	ug/l	250	ND	98.4	60-140	6.68	25	
urrogate: a,a,a-Trifluorotaluene	9.17		u u	10.0		91.7	70-130	0.00	- 23	



Gettler-Ryan/Geostrategies(1) 6747 Sierra Court, Suite J Dublin CA, 94568 Project: Tosco(1)

Project Number: Unocal SS#4186, Livermore, CA

Project Manager: Deanna Harding

Reported: 01/22/02 12:10

Volatile Organic 8 Oxygenated Compounds by EPA Method 8260B - Quality Control Sequoia Analytical - San Carlos

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 2010014 - EPA 5030B [P/T]			_							
Blank (2010014-BLK1)			_	Prepared	& Analyz	ed: 01/04/0)2			
Ethanol	ND	500	ug/l							
1,2-Dibromoethane	ND	1.0	и							
,2-Dichloroethane	ND	1.0	"							
Di-isopropyl ether	ND	1.0	11							
Ethyl tert-butyl ether	ND	1.0	11							
Methyl tert-butyl ether	ND	1.0	•							
Tert-amyl methyl ether	ND	1.0	"							
Tert-butyl alcohol	ND	20	JI							
Surrogate: 1,2-Dichloroethane-d4	9.68		"	10.0		96.8	70-130			
Surrogate: Toluene-d8	9.91		"	10.0		99.1	70-130			
Blank (2010014-BLK2)				Prepared	& Analy	zed: 01/07.	/02			
Ethanol	ND	500	ug/l							
	ND	1.0	"							
1,2-Dibromoethane	ND	1.0	li .							
1,2-Dichloroethane	ND	1.0	**							
Di-isopropyl ether	ND	1.0								
Ethyl tert-butyl ether	ND	1.0	11							
Methyl tert-butyl ether	ND	1.0	**							
Tert-amyl methyl ether Tert-butyl alcohol	ND	20	**							
	9.78		,,	10.0		97.8	70-130			
Surrogate: 1,2-Dichloroethane-d4	10.1		#	10.0		101	70-130			
Surrogate: Toluene-d8	10.1				J 0. Amal.	ad- 01/0/	1/02			
LCS (2010014-BS1)					o & Anaiy	zed: 01/04/ 91.0	70-130			
Methyl tert-butyl ether	45.5	1.0	ug/l	50.0						
Surrogate: 1,2-Dichloroethane-d4	9.67		tt	10.0		96.7	70-130			
Surrogate: Toluene-d8	9.72		n	10.0		97.2	70-130	'		



Gettler-Ryan/Geostrategies(1)

6747 Sierra Court, Suite J Dublin CA, 94568 Project: Tosco(1)

Project Number: Unocal SS#4186, Livermore, CA

Project Manager: Deanna Harding

Reported: 01/22/02 12:10

Volatile Organic 8 Oxygenated Compounds by EPA Method 8260B - Quality Control Sequoia Analytical - San Carlos

Amalue	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Analyte	Result	Limi	Units	Level	Result	70KEC	Limits	KPD	LIIIII	Notes
Batch 2010014 - EPA 5030B [P/T]		•								
LCS (2010014-BS2)				Prepared	& Analyze	ed: 01/07/0)2			
Methyl tert-butyl ether	44.3	1.0	ug/l	50.0		88.6	70-130			
Surrogate: 1,2-Dichloroethane-d4	9.42		"	10.0		94.2	70-130			
Surrogate: Toluene-d8	9.80		"	10.0		98.0	70-130			
Matrix Spike (2010014-MS1)	So	urce: L20101	4-04	Prepared	& Analyz	ed: 01/04/	02			
Methyl tert-butyl ether	45.2	1.0	ug/l	50.0	3.6	83.2	60-140			
Surrogate: 1,2-Dichloroethane-d4	9.39		"	10.0		93.9	70-130			
Surrogate: Toluene-d8	9.60		"	10.0		96.0	70-130			
Matrix Spike Dup (2010014-MSD1)	So	urce: L20101	4-04	Prepared	& Analyz	ed: 01/04/	02			
Methyl tert-butyl ether	47.9	1.0	ug/l	50.0	3.6	88.6	60-140	6.29	25	
Surrogate: 1,2-Dichloroethane-d4	9.53		"	10.0		95.3	70-130			
Surrogate: Toluene-d8	9.79		"	10.0		97.9	70-130			
Batch 2010020 - EPA 5030B [P/T]										
Blank (2010020-BLK1)				Prepared	& Analyz	ed: 01/07/	02			
Ethanol	ND	500	ug/l							
1,2-Dibromoethane	ND	1.0	*11							
1,2-Dichloroethane	ND	1.0	11							
Di-isopropyl ether	ND	1.0	11							
Ethyl tert-butyl ether	ND	1.0	II							
Methyl tert-butyl ether	ND	1.0	н							
Tert-amyl methyl ether	ND	1.0	n						•	
Tert-butyl alcohol	ND	20	u							
Surrogate: 1,2-Dichloroethane-d4	9.78		71	10.0		97.8	70-130		-	
Surrogate: Toluene-d8	10.1		n	10.0		101	70-130			



Gettler-Ryan/Geostrategies(1)

6747 Sierra Court, Suite J Dublin CA, 94568 Project: Tosco(1)

Project Number: Unocal SS#4186, Livermore, CA

Project Manager: Deanna Harding

Reported: 01/22/02 12:10

Volatile Organic 8 Oxygenated Compounds by EPA Method 8260B - Quality Control Sequoia Analytical - San Carlos

Analys	Result	Reporting	Ilmia	Spike	Source	0/ DEC	%REC	DDD	RPD	NI
Analyte	Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	Notes
Batch 2010020 - EPA 5030B [P/T]										
LCS (2010020-BS1)				Prepared	& Analyze	ed: 01/07/0	02			
Methyl tert-butyl ether	44.3	1.0	ug/l	50.0		88.6	70-130		-	
Surrogate: 1,2-Dichloroethane-d4	9.42		11	10.0		94.2	70-130			
Surrogate: Toluene-d8	9.80		н	10.0		98.0	70-130			
Matrix Spike (2010020-MS1)	So	urce: L20101	5-09	Prepared	& Analyz	ed: 01/07/	02			
Methyl tert-butyl ether	42.3	1.0	ug/i	50.0	ND	84.6	60-140			
Surrogate: 1,2-Dichloroethane-d4	9.50		Ħ	10.0		95.0	70-130		·	-
Surrogate: Toluene-d8	9.75		"	10.0		97.5	70-130			
Matrix Spike Dup (2010020-MSD1)	So	urce: L20101	5-09	Prepared	& Analyz	ed: 01/07/	02			
Methyl tert-butyl ether	41.0	1.0	ug/l	50.0	ND	82.0	60-140	3.12	25	
Surrogate: 1,2-Dichloroethane-d4	9.47		"	10.0		94.7	70-130	<u>-</u>	***	
Surrogate: Toluene-d8	9.77		"	10.0		97.7	70-130			



Gettler-Ryan/Geostrategies(1) 6747 Sierra Court, Suite J Dublin CA, 94568

Project: Tosco(1)

Project Number: Unocal SS#4186, Livermore, CA

Project Manager: Deanna Harding

Reported:

01/22/02 12:10

Notes and Definitions

M-04 MTBE was reported from second analysis.

P-01 Chromatogram Pattern: Gasoline C6-C12

P-02 Chromatogram Pattern: Weathered Gasoline C6-C12

P-03 Chromatogram Pattern: Unidentified Hydrocarbons C6-C12

R-05 The reporting limit(s) for this sample have been raised due to high levels of non-target interferents.

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